IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

FORCE MOS TECHNOLOGY, CO, LTD.,	(	CAUSE NO. 2:22-CV-460-JRG
	)	
Plaintiff,	(	
	)	
vs.	(	
	)	
ASUSTEK COMPUTER, INC.,	(	MARSHALL, TEXAS
	)	FEBRUARY 11, 2025
Defendant.	(	8:30 A.M.

VOLUME 3

TRIAL ON THE MERITS

BEFORE THE HONORABLE RODNEY GILSTRAP
UNITED STATES CHIEF DISTRICT JUDGE
and a jury

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THE COURT: Be seated, please.

08:33 Counsel, are the parties prepared to read into the record those items from the list of pre-admitted exhibits used during yesterday's portion of the trial?

MR. THANE: We are, Your Honor.

THE COURT: All right. Please proceed.

MR. THANE: DX 25, DX 27, DX 28, PX 27, PX 28, PX 08:33 30, PX 31, PX 32, PX 34, PX 37, PX 42, PX 50, JX 14, JX 15, JX 16, JX 17, JX 18, JX 52, JX 53, JX 68, DX 23, PX 41, PX 13, PX 08:34 14, JX 42, DX 16, JX 40, JX 43, JX 46, JX 48, JX 49, and DX 22 moved into evidence.

THE COURT: All right. Thank you, Mr. Thane.

Is there objection from the Defendant?

MS. LYNCH: No, Your Honor.

THE COURT: All right. Does Defendant have a similar list to read into the record?

MS. LYNCH: Same list.

THE COURT: Same list. All right. Thank you, counsel.

MS. LYNCH: Thank you.

08:34 THE COURT: Do we still have a missing juror, Mr. Estes? They're all here? Good. With the weather, I understood one of them was running late.

All right. Plaintiff, are you prepared to call your next witness?

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MS. PELLEGRINO: Yes, Your Honor. We'll call Mr. Ryan Lamotta.

THE COURT: All right. Let me get the jury in the room on the record and then I'll ask for that announcement.

Bring the jury in, please.

(Whereupon, the jury entered the courtroom.)

08:35 THE COURT: Good morning, ladies and gentlemen. Please have a seat.

All right. Plaintiff call your next witness, please.

MS. PELLEGRINO: Force MOS calls Mr. Ryan Lamotta.

THE COURT: All right, Mr. Lamotta, if you'll come

08:35 forward and be sworn by the Courtroom Deputy, please.

MS. PELLEGRINO: And if we may distribute witness binders, Your Honor.

THE COURT: You may. And you may go to the podium in the meantime, Ms. Pellegrino.

MS. PELLEGRINO: Thank you, Your Honor.

(Whereupon, the oath was administered by the Clerk.)

THE COURT: If you'll come around, Mr. Lamotta and

08:36 have a seat on the witness stand.

All right. Ms. Pellegrino, you may proceed with direct examination.

MS. PELLEGRINO: Thank you, Your Honor.

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RYAN LAMOTTA,

having been first duly sworn, testified under oath as follows:

DIRECT EXAMINATION

BY MS. PELLEGRINO:

Q. Good morning, Mr. Lamotta. How are you today?

A. Good morning.

Good morning, folks.

I'm doing well. Thank you.

Q. Where you do work, Mr. Lamotta.

A. I'm a partner at a consulting firm called HKA Global. We do economic and financial consulting for companies typically in the context of disputes.

08:37

Prior to HKAs, I was at other similar consulting firms where I did similar type of work.

Q. Where are you in town from today?

A. [redacted]

Q. Is that where you live?

A. Yes, ma'am.

Q. How long have you lived there?

A. [redacted]

Q. Could you tell us a little bit about your family?

A. Sure. [redacted]

08:37

Q. You're busy?

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A. Very busy.
Q. Now, could you please describe your educational background? I think you said you went to college in Texas.
A. Yes, ma'am. So I have two degrees, both from Baylor University just down the road in Waco. I have a post-grad credential. So I have an undergrad business administration degree as well as a master's in business administration with a finance focus. After college, I was awarded the certified licensing professional credential. That's a credential given
08:37 to those with a demonstrated proficiency in licensing and evaluation of intellectual property.
Q. Now, did you always want to be a financial professional when you grew up, Mr. Lamotta?
A. I did not, believe it or not.
Q. What did you want to be when you grew up?
A. So my vision for my life was to be a baseball player actually, and I chased that career pursuant forever essentially. Ultimately got a scholarship to play baseball at Baylor. That's how I ended up there. Actually I was on the
08:38 mound and got the strike out against Clemson to send us to the College World Series in 2005.

Now, full disclosure, I was also on the mound two weeks later and got the loss when we were with eliminated from the College World Series in 2005. So fast forward a little bit, I was drafted later than I expected and came to the realization

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that I was going to need a real job. So I went back to Baylor, and that's where the MBA came from.

THE COURT: Mr. Lamotta, could you slow down a little bit?

THE WITNESS: Yes, sir.

THE COURT: Thank you.

Go ahead, counsel.

Q. (BY MS. PELLEGRINO) You said that you were a certified licensing professional. Do you belong to any other professional organizations?

A. I do.

Q. Could you describe them?

A. Sure. I'm a member of the certified fraud examiners organization. I'm also a member of an organization called NABE or National Association of Business Economics. And I'm a member of some other organizations like the International Trade Commission Trial Lawyers Association among others.

Q. How long have you been in this line of work?

A. I've been doing this for about 15 years now. I started my career at an accounting firm called Grant Thornton doing some audit work. But for the last 15 years or so, I've been doing economic consulting evaluating damages.

Q. Approximately how many patent infringement cases have you worked on?

A. Oh, hundreds.

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Q. Was your work in all of those cases related to economic issues?

A. Yes. So my work on patent infringement cases in district court like this one always relates to issues around licensing or economic damages like we're talking about this week.

08:39 I also do some work at the International Trade Commission, which is another venue where you can litigate patent infringement. There's no damages there, but there is different types of economic analyses that are very similar. So I do some of that work as well.

Q. Can you give examples of some other companies who have hired you in a similar role?

A. Yes. So I got hired by companies big and small. Start-ups, entrepreneurial firms, and some big firms like that we interact with every day. So I'll give you some examples of

08:40 those. I've been hired by Amazon, Whirlpool, Ford, Home Depot, Lowe's, companies that we interact with every day that deal with patent disputes like we're dealing with today.

And one that's maybe particularly relevant to this part of the state, I was hired by Boot Barn on an intellectual property dispute.

Q. Have you testified as an expert on the question of economic damages?

A. Yes. So I testified as a court-accepted expert in federal district court proceedings in Texas and other places

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in the country as well as at the International Trade Commission.

Q. Have you authored any publications on economic damages?

A. Yes, ma'am. I am a co-author of a book called *Calculating and Proving Damages* that's been published several times.

MS. PELLEGRINO: Your Honor, at this time I'd move to qualify Mr. Lamotta as an expert in the field of intellectual property valuation, licensing, and economic damages.

THE COURT: Is there objection?

MR. UNDERWOOD: No objection, Your Honor.

THE COURT: Without objection, the Court will recognize this witness as an expert in those designated fields.

Please continue.

MS. PELLEGRINO: Thank you, Your Honor.

Q. (BY MS. PELLEGRINO) Mr. Lamotta, could you please just tell the jury at a high level what you expect to testify about today?

A. Sure. So I'm asked to be an independent evaluator of accounting, financial, and economic issues, to analyze those things and to give you my opinion as to Force MOS's damages that arise out of the alleged infringement. So I'm going to talk about some of the things that led up to that opinion, and

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I'm going to give you my opinion on damages that are applicable in this case.

08:41 Q. How long have you been working on this case?

A. So I've been on this case for more than a year. I have hundreds of hours on the job. My team also has additional time on the case.

Q. Are you going to present to the jury today all of the analyses you've done in the course of more than a year?

A. Fortunately for you folks, I will not do that, and I'll tell you why. So from a practical perspective, there's just not enough time in a trial, but also these cases start broad

08:42 and it's kind of like a funnel, they tend to narrow and we -- by the time we get to trial a lot of the work I've done is no longer applicable.

But what I will do is I'll highlight what I believe to be the key evidence, the key considerations, and the support for my opinions, and ultimately provide my opinion.

Q. Now, in the time that you've worked on this case, could you describe some of the evidence, some of the information that you studied?

A. Yes, ma'am. So at a high level, I get access to all the documents and all the information in the case so that allows

08:42 me to look at things like financial and accounting records from both parties, sales reports, specification information for the products at issue, marketing information. I also look

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at the expert reports of others, and I review the deposition testimony. And, of course, I've been at trial and I've heard all the trial evidence as well.

Q. Are you familiar with Force MOS's patents in this case?

A. I am.

Q. What are they?

A. So that's what we've heard described as the '409 Patent and the '634 Patent.

08:43 Q. Before we talk about your analyses more in depth, could you describe at a high level how intellectual property is typically valued?

A. Sure. So there's a variety of calculations that lead up to the valuation of intellectual property, but at a high level, at a conceptual level, intellectual property is valued relative to the next best alternative.

Patents and other intellectual property are going to vary in value based on their incremental benefit over other options

08:43 that are available. I'll give you an everyday example. If you want to move into a neighborhood and because you want to be in a certain school district and you're looking for a house, if there is a variety of houses available, the value of each one of those individual houses is going to be relatively subdued because of your options.

Conversely, if there is only a single house available and you need to live in that neighborhood to go to a certain

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school, the value of that house is more, not because the cost of the bricks or the paint; it's because of the lack of other options. The same is true with respect to patents.

Q. Now, in the context of your work in a patent infringement case, where do you begin when you evaluate damages?

A. There's a statute as part of the U.S. Code that gives us some guidance.

Q. What is your understanding of what the statute requires?

A. Sure. So I have a slide on this actually if we want to pull it up.

So we're showing here 35 U.S.C. 284. This is a portion of the U.S. Code. And what this tells us is that upon finding for the claimant, that's Force MOS in this case, the court shall award the claimant damages adequate to compensate for the infringement.

And then it goes on to give us some guidance as to what that means. It describes, in no event less than a reasonable royalty for the use made of the invention by the infringer. That last clause is important.

Q. Why is it important?

A. Because what that tells us is that the value of the intellectual property or the damages is going to be different for different infringers or for different potential licensees.

We need to focus on the use made of the invention by ASUS in this case for purposes of evaluating damages. So we should

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keep our eye on that ball as we wrestle with the damages question.

Q. Now you said the phrase 'reasonable royalty'. What's a royalty?

A. You can think of a royalty as rent. So if you want to rent an apartment, you pay money to the landlord, he gives you the keys to the apartment. You get to use the apartment.

08:45 Similar, with respect to patents, if you want to use someone's patents, you pay a royalty and they give you the keys to the patents. This is what we call a license agreement. A license agreement is the keys to use someone else's patents.

Q. In your work as a damages expert, how do you evaluate what would be a reasonable royalty?

A. We typically do this through what we call the hypothetical negotiation.

Q. What's a hypothetical negotiation?

08:46 A. Well, this asks us to step into the shoes of Force MOS and ASUS back in time right on the eve of the first infringement, and we ask ourselves what would they agree to in terms of a royalty for the known use of Force MOS's patents.

Q. Does the hypothetical negotiation have any rules?

A. It does.

Q. What are they?

A. So this is a little bit different than a real-world

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negotiation. That's why we call it hypothetical. But there's a few key rules we need to keep in mind. The first one is that the parties have to reach an agreement at this negotiation. No one can walk away because they're unhappy with the terms.

Secondly, at this negotiation, both Force MOS and ASUS agree that the patents are valid and they agree that the patents are infringed by the products that are alleged to infringe those patents. There is no discount for arguments related to infringement once you get to the damages question.

Finally, the parties have access to all the relevant information from each other. Think of it as a poker game with the cards face up. There's no bluffing because everybody knows everything.

Q. So let's start with the patents that are going to be the subject of this hypothetical negotiation.

A. Okay.

Q. Do you have an understanding of the benefits of the patents?

A. I do.

Q. So let's start with the '634 Patent. What do you understand the benefits of that patent to be?

A. So this patent provides for increased ruggedness, resistance to failure, and some flexibility in designing the circuit, relative to MOSFETs that existed without this

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technology.

Q. Now, what about the '409 Patent? What do you understand the benefits of that patent to be?

A. It's very similar: improves the ruggedness of the device, gives the board designer increased flexibility in the circuit operation.

Q. And so, practically speaking, what are the benefits to people like me and you?

A. So these things go in laptops among other things. They make your laptop more durable, they make it last longer, they make it safer and prevent it from overheating.

And we heard some testimony yesterday that ASUS doesn't advertise the MOSFETs. They advertise the benefits of the MOSFETs when they advertise their laptops as being more rugged and durable.

Q. Do you have an understanding of the kinds of electronics products that are accused of infringement in this case?

A. I do.

Q. Could you generally describe them?

A. We're talking about laptops, desktops, motherboards, graphics cards, things like that.

Q. Now, what about the MOSFETs accused of infringement in this case? Do you have an understanding of those?

A. I do.

Q. And what are they?

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A. So these are the ones we've seen through the testimony already. There's four suppliers that provide the infringing MOSFETs. It's Panjit, LRC, UBIQ, and Excelliance. All of the MOSFETs in this case are alleged to infringe the '634 Patent. Five of the seven you see there on the right are alleged to infringe the '409 Patent.

08:49

Q. Mr. Lamotta, have you analyzed the hypothetical negotiation between Force MOS and ASUS in this case?

A. I have.

Q. Let's start with the timing of that negotiation.

A. Okay.

Q. When did it take place?

A. Oh, sorry. I stepped on your question there.

Q. I apologize. When would that negotiation take place?

A. Okay. So as I mentioned, it's said to take place on the date of the first alleged infringement. You can see on the far left of the slide there, that's April of 2012 in this case. That's the uncontested date we all agree.

08:49

Q. Now, for purposes of your work, what is your understanding of the damages period?

A. Right. So the statute governs how long damages are collectable under different circumstances. In this case, Force MOS is only entitled to collect damages from sales beginning in April of 2017. So as you look at the slide, you'll see a period to the left of April 2017 where there's no

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damages period.

08:50 There's still infringing sales during that period. My damages analysis effectively ignores that. There is no royalty for those sales. The numbers I'm going to talk about today are only applicable from April 2017 to September 2024. Those are the only sales that we're talking about.

Q. Generally speaking, what types of analyses do you perform in your work?

A. You can think of these as qualitative and quantitative.

Q. Let's start with the qualitative analyses. How do you

08:50 evaluate economic damages qualitatively?

A. So there's a famous case called the *Georgia-Pacific* case that gives us some guidance or some factors to consider.

Q. Are these the *Georgia-Pacific* factors on the screen here?

A. Yes.

Q. Do you apply all of these factors in every case?

A. I consider them all. They're not all applicable because they're circumstantial. So I'll give you an example. The first two *Georgia-Pacific* factors ask us to look at license

08:51 agreements that the parties may have entered into for same or similar technology. In this case there's no such license agreements from either party. So those two factors, although I consider them, they don't really have any weight to the damages question here.

Q. Let's also talk about the quantitative analyses.

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A. Okay.
Q. In your experience as an economic expert, what type of quantitative analyses might the parties consider at the hypothetical negotiation?
08:51 A. So in a typical case with typical records when evaluating damages or when valuing intellectual property, you might consider these three approaches that I have on the screen here--the income approach, the cost approach, and the market approach.
Q. Could you briefly describe each of these approaches?
A. Sure. So the income approach asks us to look at the profits made by the infringer from the infringing devices and then determine the portion of those profits that can be attributed to the infringing component. That's what the income approach calls for.
08:52 Q. What about the cost approach?
A. So the cost approach has two considerations. The first, what's the cost to make the patented technology or the infringing components; or, two, what's the cost or the economic impact to the infringer if they couldn't use the patented technology. This considers things like switching costs or disruption or the overall cost from not being able to use that patented technology.
Q. And what about the market approach?
A. The market approach is similar to the first two GP

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factors that we just looked at. It looks for similar license agreements to provide guidance for what the royalty might be.

Q. In your experience, when are these kinds of analyses appropriate?

A. So these are your traditional or typical analyses that you would use when you have traditional or typical or reliable records measuring the infringement.

Q. Is there an economic approach that you can apply if you do not have reliable data?

A. There is.

Q. And what is it?

A. So there's another quantitative approach that can be used and has been used in circumstances with incomplete or unreliable records. That's what I've called here in No. 4 the unreliable records approach.

Q. Have you reached an opinion of which approach is appropriate in this case?

A. Yes, ma'am.

Q. And what is that?

A. The evidence is clear that we need to be doing the quantitative unreliable records approach due to the nature of the data that we have.

Q. So let's talk about how and why you reached that opinion.

A. Okay.

Q. In this case does ASUS know the mix or combination of

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MOSFETs in the accused products?
A. They do not.
Q. Is that important in your work?
A. It's critical.
Q. Why?
A. We have a range of devices, they use different types of MOSFETs and different quantities that are at different costs. So to understand the economics or the magnitude of the infringement, we need to know what's in these devices.
Q. So if ASUS doesn't know, how do you go about figuring this out?
08:54 A. So we do what you do when you don't have actual data--we use estimates.
Q. Did you personally do estimates?
A. No. I rely on Dr. Neikirk's estimates of what's in the devices.
Q. Are you comfortable with Dr. Neikirk's estimates?
A. Very.
Q. Why?
A. Let's remember the context of where we're at. So there's been lots of discussion in this trial about the estimates of the MOSFET counts. That's abnormal because we don't normally
08:55 have estimates. We're using estimates here because we don't have actuals. Okay? So absent actuals, estimates are the best we have.

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Dr. Neikirk provided those estimates. ASUS' expert issued a rebuttal report and did not offer a different set of estimates, did not offer a correction to the estimates. So we have one set of estimates in the record, and they've been challenged in two ways.

08:55 On the one hand, they've been challenged by comparing the estimates to the data that ASUS provided. Well, I would tell you that that doesn't make a lot of sense because we know the data is wrong. So comparing estimates to faulty data and using that to suggest the estimates are wrong doesn't make any sense.

They've also been challenged by comparing the estimates to the counts that Microtech did. That's also not meaningful to me because the sample is so small. Looking at five or six

08:55 devices and discrediting estimates that apply to 6,000 devices is not informative.

Q. Let's talk about how Dr. Neikirk's estimates have impacted your analyses in this case?

A. Okay.

Q. And if we could start with desktops for an example. Could you describe the combination of MOSFETs in those products?

A. Yes. So we see it on the screen here. There's 26 of the

08:56 LRC components: Six Excelliance, 35 Panjit KDWs, and 52 patents 2K MOSFETs in a given desktop.

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Q. How does that compare to the combination of MOSFETs in a notebook, for example?
A. It's very different.
Q. How so?
A. Well, instead of 26 LRC MOSFETs, there's one. Instead of 35 KDW Panjit chips, there's one. There's no Excelliance
08:56 MOSFETs. And now we see that there is these Ubiq MOSFETs that apply to notebooks but not desktops. So there's two of each of those, and we have 56 Panjit 138Ks.
Q. And, again, why does this matter for purposes of your work?
A. It matters because the price differences between these MOSFETs is significant. So we have different quantities of each type of MOSFET, and they're very different prices.
Q. What is the significance in the price differences?
08:57 A. So do you remember at opening where there was a MOSFET placed next to a penny and the statement was made that the MOSFET was worth less than the penny it was sitting next to? That's true for some of the MOSFETs. That's true for the Panjit MOSFET. That's very much not true for the Ubiq MOSFET you see over on the right that's 12 cents a unit. It's a significant difference.
Q. What's the magnitude of that difference?
08:57 A. That's a 2500 percent difference in price. And so as we evaluate the economics or the use made of the invention by the

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infringer, that is significant.

Q. Now, you said a moment ago that ASUS does not know the mix or combination of MOSFETs in the accused devices. Right?

A. That's their testimony. That's correct.

MS. PELLEGRINO: Mr. Doyle, if I could please have JX 7. Thank you.

Q. (BY MS. PELLEGRINO) Do you recognize this document, Mr. Lamotta?

A. I do.

08:58 Q. Did you consider this document in forming your opinions in this case?

A. Yes, I did.

Q. Could you describe your understanding of what JX 7 tells us?

A. Okay. So this is a spreadsheet provided by ASUS that tells us a couple of things. It tells us the infringing devices like the laptops that they've sold and in what quantities. And then over here in columns F through M where

08:58 you see the Ys, that purports to indicate the slots that are available for a given type of MOSFET.

Q. Were you here during the testimony of Mr. Fu, ASUS's representative?

A. I was.

Q. Do you recall Mr. Fu's testimony about the creation of this data?

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A. I do.
Q. What's your recollection?
A. So he testified that it was assembled by a lawyer in Taiwan, that he had not verified it, and that he was not aware if anyone had verified it.
08:59 Q. Did you also hear the testimony of Mr. Hung, ASUS's director of research and development regarding this data?
A. Yes. I think that was Friday.
Q. Had he ever seen this document?
A. No. He testified that he'd never seen it, and he didn't think he'd seen anything like it.
Q. Now, you testified a moment ago to your understanding of what JX 7 shows us. Right?
A. Yes.
Q. How did you reach that understanding?
09:00 A. From reviewing the document in connection with the ASUS witness testimony.
Q. And what was the testimony from ASUS's witness about this document?
A. So we have some of it on the screen here. And just to orient you, at this point in time in his testimony he was looking at and being asked questions about the same JX 7 that we were just looking at.
And he was asked, So if you look at row 3, AIT-embedded
09:00 model, that's what's highlighted above his Q&A here, EVS S100,

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it shows that there is a Y for the LRC MOSFET and a Y for the Panjit 2KDW. Right? Those are highlighted there.

Answer, Yes.

He was then asked, Is it your understanding that that indicates that both the LRC and the Panjit MOSFETs are used in the AIOT embedded model EVS 100.

09:00 Look at his answer, "This information does not indicate that the AIOT embedded did use these components."

Q. Did you rely on any other testimony from Mr. Hung?

A. Yes. He was asked further questions about this file.

Q. Could you describe that testimony?

A. Yes, ma'am. So the Q&A continues, and he's asked, Looking at this spreadsheet, you cannot tell whether any of the accused components listed in columns F through N is used

09:01 in the products shown in column A through E.

Answer, correct.

The testimony goes on. He was asked, Does ASUS have any BOM? That's a bill of materials. Does ASUS have any bill of materials that definitively tell you which MOSFET is in which ASUS device?

And look at that answer. ASUS doesn't have one. It doesn't have such a bill of materials.

09:01 He was asked further, And this spreadsheet also does not list any accused components used in any of the accessories, such as batteries, power supplies, or display panels.

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Correct?

Answer, Correct.

Q. So let's summarize this testimony and this information. Let's take an accused laptop for an example. What does JX 7 tell us about the motherboard?

A. At best it gives us the available slots for MOSFETs in the motherboard within a laptop. It does not tell us the mix or the combination or any specifics about which MOSFETs are in there.

Q. What does JX 7 tell us about how many MOSFETs are in batteries sold by ASUS?

A. It doesn't tell us anything, not slots, nothing.

Q. What about power supplies?

A. Nothing.

Q. What about display panels?

A. Nothing.

Q. Did you also hear Mr. Hung testify about touch pads and cameras?

09:02 A. The answer is the same. They don't have any records, slots or otherwise, with respect to those items.

Q. Were you here during opening statements, Mr. Lamotta?

A. I was.

Q. Do you recall ASUS's attorney referring to that peg game we've all played at Cracker Barrel?

A. I do.

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Q. What did Mr. McMahon say about that game in the context of this case?
A. He showed you the triangle, and he said, there's only 15 holes in here, and those are like the slots that the ASUS data
09:03 provides. And you can't have 16 tees and 15 holes, just like you can't have more MOSFETs than you have slots. That's what he told us.
Q. Do you think there's something wrong with that example?
A. There is.
Q. What do you think is wrong with it?
A. That only applies to the motherboard component within the laptop. If that was going to be a relevant analogy, we would need another one for the batteries. We would need another one
09:03 for the power supplies. We would need another one for the display panels, and I ran out. But we would need another one for the camera, and the touch pad.
So to compare the estimates to the slots, the estimates that apply to everything to the slots available in just the motherboard and suggest that that indicates the estimates are overstated is very misleading.
Q. Now, you said earlier, Mr. Lamotta, that you've served as
09:04 an economic expert in hundreds of cases like this. Right?
A. I've worked on hundreds of patent cases, yes.
Q. Based on your experience, do you have an opinion about the reliability of the financial data in this case?

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A. I do.
Q. And what's your opinion?
A. It's simply not reliable for measuring or understanding the scope of the infringement or the mix of the components that infringe.
Q. Having considered all of that information and that testimony, do you have an opinion about the appropriate economic approach to apply in this case?
A. I do.
Q. And what is it?
A. We fall squarely in the quantitative approach for unreliable records. That was No. 4 on the screen we looked at earlier.
Q. Did you perform an analysis under that approach?
A. I did.
Q. Could you describe your analysis?
A. Sure. So what we do in these circumstances is we look at the revenue made from the infringing devices, because we have that evidence. And then we ask ourselves what portion of that revenue is attributable to the infringing MOSFETs only, because we have to recognize that there is many contributions to that revenue that are unrelated to the infringing components or the patented technology.

So we isolate the MOSFETs' contribution to that revenue through what's called apportionment.

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Q. Now, let's start with the revenue component of this analysis. Could you explain that part of your analysis?
A. Yes. So we have sales information from ASUS that tells us what the revenue generated was from the infringing products during the damages period we looked at. So that's just the subset that we looked at earlier.
Q. Could you describe -- for each category here, could you describe the revenue?
A. Yes. I'll -- the very specific numbers are on the screen, but I'll talk in rounded numbers here. So it's $505 million in revenue for desktops; 5.5 billion in revenue for notebooks, laptops; 1.2 billion in motherboard revenue; 272 million in server revenue; and about 1.7 billion in graphics card revenue. That's from devices that ASUS sells that contain the infringing components.
Q. After you analyzed the revenue, what do you do next?
A. We go to the second part of that analysis I described as the apportionment analysis.
Q. And did you conduct that analysis here?
A. I did.
Q. Could you describe your analysis?
A. Yes. So we go back to the estimated component counts and mix, and I apply those to the cost of each different MOSFET type to identify the cost in total of the infringing MOSFETs in those devices.

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And this is a good opportunity to make another point about the estimates. What we have not heard in the discussion about the estimates is how those estimates relate to the cost. So this is an important point. Dr. Neikirk's estimates are heavily, heavily weighted towards the least expensive components. We haven't heard that yet. That's an important consideration.

For example, I can take 24 Panjit chips off these counts and replace them with one Ubiq chip, and the cost of the components is the same. So when you're being shown a comparison of total counts to some other measure of total counts, the mix of those counts is critical and this estimate is heavily weighted to the least expensive components.

Q. Now, did you reach a total MOSFET cost for each category?

A. I did.

Q. Could you --

A. So --

Q. I apologize. Could you describe those total costs?

A. Sure. So applying the yellow row there, the unit cost, to the number of units in each device, lets me identify the cost of the infringing components in each device.

Q. So once you have the cost of the components in each device, what do you do next?

A. I compare that to the overall revenue -- I'm sorry. I compare that to the overall price of the device to get an

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apportionment factor on a percentage basis.
Q. And could you describe the apportionment factors for each category in this case?
A. Yes. So first let me give you the cost of the infringing components so we have that in the record. It's 93 cents for the desktop, it's $1.34 for the notebooks, 75 cents for the motherboard, 93 cents for the servers, and 18 cents for each graphics card.
Q. And what about the apportionment factors for each category?
A. Okay. So then let's just take the top row here. We take 93 cents for a desktop times the average selling price of about a thousand dollars, which gives me an apportionment factor of 0.09 percent.
Q. So that's not 9 percent.
A. Oh, no. That is a fraction, a fraction, of 1 percent. Said another way, that removes 99.9 percent of that price.
Q. Once you calculated the apportionment factor, what did you do next?
A. I can take that apportionment factor and answer the question we talked about earlier, which is what portion of the infringing revenue can be attributed to just the infringing MOSFETs.
Q. So let's talk about that calculation in the context of the accused devices in this case. For each category of

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accused device, could you describe the amount of damages you concluded would be appropriate under this analysis?

A. I did. If we go to the next screen, it will be a little bit easier to follow. Let's go one more if we can.

09:10 Okay. So doing the math we just described, what we see is that for desktops, the damages are 467,000. Again, that's the fraction of the 500 million in revenue, to keep us oriented. For notebooks, the damages come out to about 13.6 million. For motherboards, it's about 5.3 million in damages. For servers, are about 32,000; and for graphics cards, the damages are 674,000.

09:10 Q. And so considering all of those categories in total, what is your opinion about the amount of damages that should be awarded to Force MOS in this case?

A. It's about 20.1 million.

Q. How many MOSFETs does that take into account?

A. That's based on 1.5 billion MOSFETs. So to orient you, that's about 1.3 cents in terms of a royalty per unit.

Q. Do you believe your opinion regarding the appropriate amount of damages in this case is reasonable?

09:11 A. Oh, it's very reasonable.

MS. PELLEGRINO: Mr. Doyle, if I could go back to slide 6, please.

Q. (BY MS. PELLEGRINO) We talked earlier about your qualitative analyses. Do you remember that?

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A. I do.
Q. Could you describe the qualitative analyses you performed in this case?
A. Well, I'll highlight a few that are going to be most significant to this hypothetical negotiation. Let's start with No. 8. This asks us to consider the commercial success of the infringing products. We've looked at that, very successful.
09:12 Factor 9 here is a critical factor. This asks for consideration of non-infringing alternatives. This is going to pay -- play a significant role as these parties negotiate for this license.
GP factor 11 talks about the extent of use to which the infringer has made of the invention. In other words, is the infringement widespread, is it minimal. Well, here we're
09:12 talking about tens of millions of devices. That's a highly relevant consideration.
GP factor 13 talks about apportionment. We just walked through that analysis. We acknowledge and give credit to the fact that many contributions of ASUS drive that revenue, and the infringing MOSFETs are only a small component. We accounted for that.
Q. Now, you said factor 9 plays a significant role. What do you mean by that?
A. So remember at the beginning of my exam, I said that

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intellectual property is valued relative to the next best alternative? That's what is at the heart of GP factor 9, and that's a critical consideration in this negotiation.

Q. Why is it critical in this negotiation in this case?

A. Because there's no evidence, no testimony, no indication that ASUS has any other options. We haven't heard anything about a way to design around the patented elements within these MOSFETs and continue to use the infringing MOSFETs in a legitimate way.

In other words, there's two choices here. There's take a license to the patents or remove the infringing components, and the economics around removing the infringing components is far, far greater than $20 million. So business people sitting at this negotiation with all the cards face up will know that, and they will determine that this royalty is very reasonable in light of the realities in which they're negotiating.

Q. What would be the impact of removal?

A. We heard the testimony yesterday. The devices won't work without the MOSFETs. So from a practical perspective, if they couldn't use these, they would have to qualify new suppliers, find some other way to get some MOSFETs that don't infringe the patents. We haven't heard what those would be. They would need to have the same features and benefits to operate the devices the same.

At a minimum, you're going to have significant

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disruption, significant disruption in terms of products already on the marketplace, delays in getting your products to the marketplace, and that impact is very significant from a dollars-and-cents' perspective.

Q. Are you aware that ASUS also is going to present an economic expert in this case?

A. Yes.

Q. Do you know who it is?

A. It's Dr. Ugone.

Q. Does Dr. Ugone always agree with your opinions?

09:14 A. No. There are some things we agree on and there are some things that we don't.

Q. Where do you disagree?

A. The biggest area that we disagree is the reliability of the records provided by ASUS. He believes that they are adequate and he performs an analysis under the assumption that they're adequate. I disagree. I go this way. We're trains running down two different paths.

He also is going to testify that something less than a

09:15 million dollars would be a reasonable outcome of this negotiation. I disagree with that.

MS. PELLEGRINO: Mr. Doyle, if we could please return to slide 19. Thank you.

Q. (BY MS. PELLEGRINO) Given all of these considerations, given all the information you testified about today, where

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does that leave us for damages in this case?

A. Well, I'll say two things. In my view, the testimony and the evidence is clear that the records are unreliable. We don't know from ASUS how they're using these infringing components. That leads us to the unreliable records approach. Only Dr. Neikirk has provided estimates to give us some guidance on to what that use is. Those are the only estimates in the case.

Only I have given you a damages analysis under the unreliable records framework. If you agree that the records are unreliable, this is the only evidence and it's $20.1 million. It's 1.3 cents per unit.

Q. Thank you, Mr. Lamotta.

MS. PELLEGRINO: I pass the witness, Your Honor.

THE COURT: Cross examination by the Defendant.

MR. UNDERWOOD: Yes, Your Honor. May I distribute binders?

THE COURT: You may.

MR. UNDERWOOD: Thank you.

MR. McMAHON: Your Honor, may I approach?

THE COURT: You may.

MR. UNDERWOOD: May I proceed, Your Honor?

THE COURT: You may proceed, counsel.

MR. UNDERWOOD: Thank you, Your Honor.

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CROSS EXAMINATION

BY MR. UNDERWOOD:

Q. Good morning, Mr. Lamotta. How are you?

09:17 A. Good morning, sir. I'm doing well.

Q. Would it be okay if I ask you some questions about your opinions in this case?

A. Certainly.

Q. Do you think it would be helpful if we begin by level setting what you're here to talk about?

A. It's your exam, yes, sir.

Q. You're not a technical expert. Right?

A. Absolutely not.

Q. Not an engineer?

A. Definitely not.

Q. Not a MOSFET guy?

A. No, sir.

Q. Not a semiconductor guy?

A. No, sir.

Q. You're not here to offer any opinions on infringement. Correct?

A. Oh, that's correct. I have to assume that.

09:18 Q. You're not here to offer any opinions on invalidity.

A. That's true.

Q. Now, as you just said, you assumed that those were present. Right?

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A. Yes, sir.
Q. You assumed that there was infringement. Correct?
A. I did.
Q. You assumed that the patents were valid. Correct?
A. That is correct.
Q. You understand that at the end of this week, the jury's going to have to answer some questions. Right?
A. They will, yes.
Q. One of those questions is whether there's infringement. Right?
A. That's my understanding.
09:18 Q. Now, if the jury doesn't agree with your assumption and if the jury finds there is no infringement, what's the correct amount of damages?
A. They will not even get to the question of damages.
Q. That's right. Damages would be zero in that case. Correct?
A. That is correct.
Q. And what if the jury finds that the '409 Patent is invalid? What about damages on that patent then?
A. With respect to my opinion, if they find the '409 Patent invalid but infringement on the '634 Patent, the answer would be the same.
09:18 Q. Okay. And what about, Mr. Lamotta, have you heard any evidence about whether or not the Plaintiff actually owns the

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'409 Patent?
A. I've heard that testimony.
Q. You remember the evidence about the assignment agreements. Correct?
A. I did. That was your exam. I remember.
Q. And you remember the evidence about how Dr. Hsieh assigned his patent to a company that was different than this company here?
A. I remember that, yes.
Q. And you remember about how Dr. Hsieh assigned his patent to a company that didn't exist?
A. I know that's your position, yes.
09:19 Q. And you understand, sir, that if this Plaintiff doesn't own the '409 Patent, they're not entitled to damages on it. Correct?
A. Oh, that's correct.
Q. Now, you understand that I have to ask you some questions about your testimony so that the jury has a full and complete record of the evidence. Right?
A. Yes, sir.
Q. We want the jury to have all the available evidence to make their decisions. Correct?
A. Absolutely.
Q. And do you, sir, agree that the positions that a party
09:19 takes with respect to damages can actually reflect on the

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credibility of the entire case as a whole?
A. I'm not sure I'm following that question.
Q. Well, sir, if the Plaintiff is taking an unreasonable position on damages in the jury's eyes, then that could reflect on their credibility with respect to their assertions of infringement and validity. Fair?
A. I hesitate to speak for the jury.
Q. Now, Mr. Lamotta, you mentioned on your direct
09:20 examinations that you had a bunch of opinions in your reports. Right?
A. I don't think that's exactly what I said.
Q. Okay.
A. I can clarify if you'd like.
Q. Well, you have more than the opinions that you discussed today. Correct?
A. That's true.
Q. And the opinion you discussed today was that your client, the Plaintiff, would be entitled to $20 million in damages. Right?
A. That's about right.
Q. There were other numbers in your report that you did not discuss today. Correct?
A. Oh, many.
Q. Is it okay if we discuss those?
09:20 A. Yes, sir.

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MR. UNDERWOOD: Your Honor, may I approach the easel?

THE COURT: You may.

MR. UNDERWOOD: And may I position it so that the jury may view it?

THE COURT: You may use it.

MR. UNDERWOOD: Thank you, Your Honor.

Q. (BY MR. UNDERWOOD) Mr. Lamotta, the number you discussed again today was $20 million?

A. 20.1.

Q. Okay for shorthand if I just call it 20 million? Is that a yes?

A. Oh, sure.

09:21 Q. Thank you. $20 million was the number that you discussed today. Correct?

A. That was my damages opinion, yes, sir.

Q. I believe you referred to this as an alternative approach. Do those words ring a bell?

A. Those are the words from my report.

Q. Okay. An alternative approach. Right?

A. Yes, sir.

Q. So kind of like your fallback?

A. Disagree with that characterization.

Q. Well, you're a baseball player. Right?

A. I once was.

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Q. You were a baseball player. Right?
A. Yes, sir.
Q. This is like your pinch hitter. Right?
09:22 A. I disagree with that, also.
Q. Well, it is your alternative approach. Those are your words. Correct?
A. That's correct.
Q. Let's talk about your other numbers now. Is that okay?
A. Yes, sir.
Q. Now, it's also your opinion, sir, that royalty damages applied under a different framework would be $1.3 million or $6.8 million. Do those numbers ring a bell?
A. In the proper context, yes, sir.
Q. Okay. And can we discuss those with the jury?
A. Absolutely.
09:22 Q. And that was $1.3 million was one of them. Correct?
A. I believe that is correct.
Q. And the other one was $6.8 million. Correct?
A. That is correct.
09:22 Q. Pretty big range there, isn't there?
A. I don't know if I know how to answer that.
Q. Well, you don't think 1 million to 20 million is a big range?
A. It's a range, I'll give you that.
Q. You don't think it's big, sir?

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A. Describing a range as big is very contextual.
Q. Well, what would it take to be a big range for you?
A. Depends on the context. I can agree that it's $18.7 million between the two.
Q. And that's not a lot?
09:23 A. I think $18.7 million is a lot, yes.
Q. Sir, you described royalties like paying rent for an apartment. Right?
A. That's an analogy I used, yes.
Q. And have you ever had to search for an apartment to rent in your life?
A. I have.
Q. And let's talk through a hypothetical if that would be okay, sir. Is that all right?
A. Sounds good to me.
Q. Let's say you're looking for an apartment. Let's say you
09:23 go online and you find one that interests you. Are you with me?
A. I'm with you.
Q. But it doesn't say how much the monthly rent is. Okay?
A. Okay.
Q. But there's a number for you to contact the owner. All right?
A. Okay.
Q. You want to call the owner; you want to know how much the

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monthly rent is. Okay?
A. Okay.
Q. So you pick up is the phone and you call the owner. Are you with me?
A. I'm with you so far.
Q. And you ask that owner what's the monthly rent on this property I'm interested in. Okay?
A. Okay.
Q. And the owner says, well, it's $500 a month. All right?
A. All right.
09:24 Q. You might think, okay, that may or may not be reasonable depending on the context. Right?
A. Is that a question? Yes.
Q. But then the person goes on. Are you with me?
A. They go on.
Q. And they say, you know what, the rent is either $500, or
09:24 it's $2,500, or it's $7,500 a month. Are you following me?
A. I'm with you on your hypothetical.
Q. Might your reaction be, well, which is it?
A. Are you asking me for what my reaction would be?
Q. I am.
A. My reaction would be you're the owner of the apartment, you should know. And that's my same reaction in this case.
Q. Well, you were hired by the owner of the patents here. Correct?

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A. That's correct.
Q. And these numbers all come from your report, don't they?
A. Oh, that's correct.
09:25 Q. And I guess I left something out, Mr. Lamotta. These numbers aren't for different patents, are they?
A. No. They're for the patents we're talking about here.
Q. There's two patents in this lawsuit. Correct?
A. That's right.
Q. And you are opining that $20 million would be a reasonable royalty for the two patents in this lawsuit. Right?
A. Oh, absolutely.
Q. And in your report you also opine that $6.8 million would
09:25 be a reasonable royalty for the two patents in this lawsuit. Correct?
A. Under a different circumstance.
Q. This was your opinion that this would be a reasonable royalty. Correct?
A. That's correct.
Q. And let's be clear, Mr. Lamotta. You wouldn't put something in your report that you thought was unreasonable, would you?
A. No, sir.
Q. So your suggestion in your report that $6.8 million for a license to the two patents in this lawsuit, that's reasonable.

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Correct?
A. Under the context it was described, yes.
09:26 Q. And for the $1.3 million number, Mr. Lamotta, this was also a number from your report. Correct?
A. It was.
Q. And it was your opinion that $1.3 million would be a reasonable royalty for a license to the two patents in this lawsuit. Correct?
A. Under the context it was described.
Q. Were you paying attention, Mr. Lamotta, when the Judge gave his opening instructions to the jury?
A. I was.
09:26 Q. And you recall the Judge saying that damages cannot be speculative?
A. I do.
Q. 1.3, 6.8, 20 million starting to sound a little speculative?
A. I disagree.
Q. You understand the jury will be the judge of that, don't you, Mr. Lamotta?
A. I think they will.
Q. Now, let's talk about this $20 million number up here. Are you with me?
A. Yes, sir.
09:27 Q. I think you talked about a concept called apportionment.

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Correct?
A. I did.
Q. An apportionment is a concept which involves the determination of how much value the product embodying the patented feature is attributable to the patented invention. Correct?
A. I agree with that.
MR. UNDERWOOD: Mr. Buck, if it's possible, I don't know, do you have access to Mr. Lamotta's PDX 4.17 and can we pull that up?
09:27
Q. (BY MR. UNDERWOOD) All right. This is one of the slides that you showed the jury. Correct?
A. It is.
MR. UNDERWOOD: Mr. Buck, do you see the column cost of infringing MOSFET components? Could we blow that up?
Q. (BY MR. UNDERWOOD) I want to ask you some questions about this information, if that's okay, Mr. Lamotta?
A. Please go ahead.
Q. So when you were calculating the cost of the infringing MOSFET components as you put it, you took 100 percent of the cost. Correct?
09:28
A. Yes.
Q. You did not apportion the cost of the MOSFETs. Correct?
A. Correct. Just to be clear with what's on the screen, this is not the cost of one MOSFET. That's the cost of all

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the MOSFETs in a given device.
Q. That's right. And to be clear, Mr. Lamotta, you didn't apportion the cost of any individual MOSFET. Correct?
A. That's correct.
09:28 Q. And you also didn't apportion the cost of all the MOSFETs added up together. Correct?
A. I don't think I understand that question. Sorry.
Q. Well, if I have it correct, Mr. LaMotta, you just said that this column that is displayed on the screen is the cost of the infringing MOSFETs added up together. Was that what you said?
A. Yes. So, for example, 93 cents is the cost of the MOSFETs in a desktop, not a single MOSFET.
09:29 Q. And to be clear, Mr. Lamotta, with respect to these costs of infringing MOSFET components you displayed to the jury, you took 100 percent of those. Correct?
A. That's right. That's the cost.
Q. Did you hear Dr. Neikirk in his testimony yesterday?
A. I did.
Q. And did you hear him --
MR. UNDERWOOD: Actually, Mr. Buck, do we have access -- can we pull up the trial transcript page 572, lines 20 to 25?
09:29 Q. (BY MR. UNDERWOOD) All right. This is from Dr. Neikirk's testimony yesterday. And do you recall him

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saying in response to this question, "And did you assess that the '409 Patent and the '634 Patent are responsible for 100 percent of the value of an accused MOSFET?"

Answer: "So I don't recall how it was phrased, but it wasn't a hundred percent, no."

Do you recall that testimony?

A. I do.

MR. UNDERWOOD: Mr. Buck, can we get page 573, lines 1 to 3?

09:30 Q. (BY MR. UNDERWOOD) This was the very next question: "Can't be a hundred percent. Right?"

Answer: "Well, in the way I did the technical assessment, no, it wasn't a hundred percent."

Do you recall that?

A. I do.

Q. And, in fact, sir, in your report -- strike that.

In fact, sir, you relied upon Dr. Neikirk to figure out how much value the patents attributed to MOSFETs. Correct?

09:30 A. Under one of the analyses, I did, that's correct.

Q. You relied on him. Correct?

A. Under one of the analyses.

MR. UNDERWOOD: And can we go, Mr. Buck, to Mr. Lamotta's original report, the table in paragraph 136?

Q. (BY MR. UNDERWOOD) Okay. This is from your report. Correct? And I apologize, Mr. Lamotta. You've got your

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reports in the binder. I think it's actually in both the binders.

09:31 A. I'm trying to catch up with you, just trying to get to the page here. Okay. So you're on page 57. I'm with you now.

Q. Okay. And this table that's displayed on the screen is a table that's from your report. Correct?

A. It is.

Q. And in this table what you reported --

MR. UNDERWOOD: And, Mr. Buck, can we highlight this bottom row, please?

Q. (BY MR. UNDERWOOD) What you reported was that the

09:31 apportioned technological contribution to overall MOSFET was 40 percent for the '409 Patent. Correct?

A. Yes.

Q. And it was 13.3 percent for the '634 Patent. Correct?

A. That's correct under this analysis.

Q. And the fact is, sir, that notwithstanding this information from your report, this information from Dr. Neikirk, Dr. Neikirk's testimony on the stand yesterday, you still took 100 percent of the cost of the MOSFETs. Correct?

09:32 A. That's right. You're making an apples-and-oranges comparison there, but it's correct.

MR. UNDERWOOD: You can take that down, Mr. Buck.

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Q. (BY MR. UNDERWOOD) Now, Mr. Lamotta you spoke a lot about the reliability of ASUSTek's data. You remember that?
A. I do.
Q. And there was a document, really an Excel spreadsheet, that you displayed, JX 7. Do you remember talking about that?
A. I do.
Q. And do I have it right, sir, that it was your opinion
09:32 that because, in your view, that that spreadsheet was unreliable, you needed to go a different route for damages? Correct?
A. I would say that differently.
Q. Okay. How would you say it?
A. It's not just because that spreadsheet is unreliable; it's because that spreadsheet is unreliable and we have no other evidence. So the totality of the relevant evidence is unreliable and incomplete.
Q. Now, Mr. Lamotta, you don't actually have an opinion on
09:33 the correct number of MOSFETs or the mix of MOSFETs, do you?
A. I'm not sure I can answer that as you asked, or can you ask it again maybe?
Q. Let me help you out. Can you turn, please, sir, to your original report which was issued back in May?
A. Okay.
09:33 Q. Page 9, footnote 6. I want you to read -- well, actually tell me when you get there first?

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A. Page 9, footnote 6.
Q. Yes, sir. Are you there?
A. Yes.
Q. I want you to read the very last sentence to yourself quietly -- silently, please. Let me know when you've read it.
A. Okay.
Q. Sir, you would agree with me that you do not have an opinion as to the correct number of MOSFETs or the mix of MOSFETs, do you?
A. I'm with you. I rely on Dr. Neikirk.
Q. You agree with that statement. Correct?
A. I do.
09:34 Q. You don't have opinions on these issues, do you, sir?
A. That's correct.
Q. You got that from Dr. Neikirk.
A. Yes, sir.
Q. And Dr. Neikirk testified yesterday about JX 7, did he not?
A. That was part of his exam. I think that's correct.
Q. Do you recall him actually displaying JX 7 to the jury?
A. I can't remember if he did that.
Q. Well, he displayed it and he actually walked through several entries and reported that information to the jury, didn't he?
09:34 A. Okay.

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Q. Seems like a weird thing to do if it's unreliable, don't you think?
A. I disagree with that.
Q. Do you also remember him saying that he considered JX 7 as part of making his estimates?
A. That's one of the things he compared them to, I think is what his testimony was.
Q. So just to level set, Mr. Lamotta, you're not the one who has opinions on the number of MOSFETs. Right?
A. That's correct.
Q. Dr. Neikirk is. Correct?
A. He's the one that came up with those estimates.
09:35 Q. And Dr. Neikirk said, as part of coming up with those estimates, he relied on JX 7. Correct?
A. I think he said he compared his work to JX 7, but I agree with you on the rest of it.
Q. Okay. He didn't say that JX 7 was unreliable, did he?
A. I just don't recall all his testimony that well.
Q. Don't you think you'd remember that if he said it?
A. No, not necessarily.
Q. I mean, this is like the linchpin of your opinion, isn't it?
09:35 A. Oh, this is a critical element of the damages case. I agree.
Q. It's a critical element of the damages case, and it's an

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element you got from Dr. Neikirk. Correct?
A. The estimates?
Q. Yes, sir.
A. That's correct.
Q. And he did not say yesterday that the information was unreliable, did he?
A. No, that's my opinion.
Q. That's your opinion, isn't it?
A. That's correct.
Q. Even though you don't have an opinion on the number of MOSFETs. Right?
A. That's correct.
Q. Okay.

MR. UNDERWOOD: Now, Ms. Brunson, could I have the elmo, please?

09:36 Q. (BY MR. UNDERWOOD) You understand, sir, there's only one person in this case who actually did an exercise where they opened up products and counted MOSFETs. You understand that, don't you?
A. I think that sounds right.
Q. Well, it wasn't you, though, was it?
A. That would be highly useless for everybody.
Q. It wasn't Dr. Neikirk, was it?
A. That's correct.
Q. Who was it?

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A. It's Mr. Diep, I believe, from the lab.
09:36 Q. Mr. Diep. And he was with a lab called Microtech. Correct?
A. That is correct.
Q. And Mr. Diep's role in some ways isn't that different from your role, is it?
A. You're going to have to clarify that for me.
Q. Well, your role in this case is that you were hired by the Plaintiff to do work on this case. Correct?
A. That's correct.
Q. Mr. Diep was also hired by the Plaintiff to do work on this case. Correct?
A. We're similar in that respect.
09:37 Q. My client ASUSTek did not hire him. Correct?
A. As far as I know, that's correct.
Q. He was hired by your client, the Plaintiff. Correct?
A. I believe that's correct.
Q. Now, did you actually compare Mr. Diep's counts to the ASUSTek data that you claim is unreliable?
A. Can you ask that again?
Q. Did you compare Mr. Diep's counts to the ASUSTek data
09:38 that you claim is unreliable?
A. I think we saw that yesterday.
Q. Okay. Well, can we show the jury again?
A. Absolutely.

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Q. Do you understand what's displayed on this screen, Mr. Lamotta?
A. Why don't you orient me on what this is or where it came from at least.
09:38 Q. All right. Well, let's read the title for starters: "Comparison of number of accused components identified by Microtech to maximum possible accused components in ASUSTek data." Did I read that right?
A. You did.
Q. And by the way, Mr. Lamotta, that's what the ASUSTek data shows, isn't it? It's the number of slots. Correct?
A. In some parts.
09:38 Q. And, in fact, you agree, as Dr. Neikirk agreed, you can't put more MOSFETs in a product than you have slots. Right?
A. That's correct.
Q. I mean, that's pretty simple. Correct?
A. I agree with you.
Q. All right. So what we're comparing here is Mr. Diep's counts from Microtech to the ASUSTek data over here that reflects the maximum counts. Agreed?
A. I see your table, yes.
09:39 Q. All right. Well, let's walk through it. The very first one, Zenbook Pro. We're not going read all that just for the sake of time. Okay?
A. I'm happy to hear that.

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Q. And Mr. Diep counted how many components?
A. 58.
Q. And how many components were the maximum possible accused components based upon the ASUSTek data that you claim is unreliable?
A. 64.
Q. All right. So that checks out, doesn't it?
09:39 A. I disagree.
Q. You disagree that that checks out?
A. I do disagree.
Q. Do you disagree that 258 is lower than 64?
A. I do not disagree with that.
Q. Okay. Let's look at the next one. The next one was 22 in his count, and it was actually lower in the ASUSTek data. Correct?
A. I see that.
Q. Now, you understand that's because Mr. Diep actually counted some additional MOSFETs from an additional component. Correct?
A. That is consistent with what I remember.
09:40 Q. All right. And the next one is another Zenbook, Mr. Diep counted two. Correct?
A. Uh-huh.
Q. And the range reflected in the data is 2 to 16. Correct?
A. Yep.

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Q. We'll keep going. The next one, ROG Strix, Mr. Diep counted how many?
A. 70.
Q. And how many maximum possible accused components are there?
A. 72 to 94.
Q. All right. Also consistent. Correct?
A. In terms of the raw count, yes.
Q. All right. I mean you can't debate these numbers, can you, Mr. Lamotta?
09:40 A. I'm not debating the numbers.
Q. All right. We won't go through the last two, but those are also consistent based on the numbers. Correct?
A. Based on the raw counts.
Q. Based on the raw counts. Correct?
A. Yes.
Q. Now, the fact is, Mr. Lamotta, that this data that you claim is unreliable is data that even you yourself relied upon. Correct?
A. Are you talking about JX 7?
Q. Yes, sir, I am?
A. I used JX 7 for the sales of the ASUS devices like notebooks.
09:41 Q. All right. And that's because JX 7 reflected several categories of information. Right?

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A. That's correct.
Q. And so you relied upon it to get the sales evidence to calculate the revenue. Correct?
A. That's correct.
Q. But you did not rely upon it for the counts of the MOSFETs. Correct?
A. It doesn't give us counts of MOSFETs.
Q. Well, sir, do you recall -- let's actually -- let's go to the trial transcript --
MR. UNDERWOOD: Ms. Brunson, could I get the access for Mr. Buck again?
09:41
Mr. Buck, can we pull up trial day 2, page 569:11 through 14?
Q. (BY MR. UNDERWOOD) This is Dr. Neikirk's testimony that he gave yesterday. Do you recall it?
A. I'm reading it.
Q. And the question was, "And let's be clear about what the ASUSTek data represents, sir. It represents the number of
09:42
slots. Right? Not necessarily the number of accused MOSFETs. Correct?"
"Yes, I do understand that."
A. That's exactly what I just told you.
Q. It represents the number of slots. Right?
A. That was different than your prior question.
Q. Okay. Fair enough. Fair enough.

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And you agree with me that you can't have more MOSFETs than slots. Right?

A. I agree with that.

Q. So back to your reliance on JX 7, Mr. Lamotta, you've just told the jury that you relied upon JX 7 for some

09:42 information, but not for other information. Do I have that right?

A. That's absolutely correct.

Q. You use it when it suits you, but not when you don't like the numbers. Right?

A. That is absolutely incorrect.

Q. Now, all of this -- all of these numbers, Mr. Lamotta, 20 million, 6.8 million, 1. -- can you see okay?

A. I'm doing good. We're good.

Q. All three of these numbers all rely upon count estimates from Dr. Neikirk. Right?

09:43 A. That's an input to all three of those. You are correct.

Q. They all rely upon it. Correct?

A. Yes.

Q. And, in fact, you reported that there were two count estimates from Dr. Neikirk. Do you remember that?

A. I do, yes.

Q. And you categorized or -- strike that.

You characterized one as being his low estimate. Do you remember that?

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A. I do. And that's the 1.5 billion we talked about today.
Q. That's the 1.5 billion. Right?
A. Yes, sir.
09:43 Q. And you also characterized one as being the high estimate. Do you remember that?
A. I do.
Q. And do I have it right, sir, that the $1.3 million number relies upon the low estimate?
A. So does the 20 million.
Q. So does the 20 million.
A. Yes, sir.
Q. The 6.8 relies upon the highest estimate.
A. That is correct.
Q. Can we talk about the low estimate for a minute?
A. Let's do that.
Q. So 1.3 million and 20 million are both based upon the
09:44 same royalty base, for lack of a better term. Right?
A. Sure. And just to clarify, the same number of infringing MOSFETs.
Q. So you as an input into both of these used the same number of alleged infringing MOSFETs. Correct?
A. That's correct.
Q. You got that from Dr. Neikirk?
A. Correct.
Q. And that was what you called his low end estimate?

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A. Yes, sir.
Q. The only difference between these is the rate of apportionment. Correct?
A. The way we did the apportionment.
09:44 Q. Well, and the rate that you applied. Correct, sir?
A. I just don't know what you mean by the rate of apportionment.
Q. You don't know what the rate of apportionment means?
A. Not in the way you're using it.
Q. How many patent cases have you served on, sir?
A. Hundreds.
Q. Hundreds?
A. Yes, sir.
Q. How many times have you gotten up in that witness stand and testified about patent damages?
A. Many.
Q. The rate of apportionment is the rate -- the percentage applied to the accused products. Correct?
A. Okay. If that's how you're using it, I'm with you.
09:45 Q. I'm sorry. Are you finished?
A. Yeah, I'm good.
Q. And that rate was different between those two numbers. Right?
A. It was.
Q. For the $1.3 million, you actually apportioned the price

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of the accused MOSFETs. Correct?
A. Yes, using the technical apportionment we looked at earlier.
Q. For the $20 million number, you did not apportion the price of the accused MOSFETs. Correct?
A. That's correct. That framework requires a different approach.
Q. That was 100 percent of the value of the accused MOSFETs. Correct?
09:46 A. That is not correct.
Q. That was 100 percent of the price of the accused MOSFETs. Correct?
A. That is correct.
MR. UNDERWOOD: Mr. Buck, can we get Mr. Lamotta's demonstrative PDX-4.16? And can we zoom in, please, on that
09:46 top table?
Q. (BY MR. UNDERWOOD) This you refer to as Dr. Neikirk's MOSFET count estimates. Correct?
A. Yes, sir.
Q. And you used the terminology that we've just been using. This was what you referred to as his low-end estimate. Right?
A. I didn't say that today, but that's what's in my report, yes.
Q. Okay. In your report you called it his low-end estimate. Correct?

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A. That is correct.
Q. And now there was another estimate. This was the estimate that went into the $6.8 million number. Correct?
A. Yes.
09:46 Q. And that one in your reports you referred to as the high-end estimate. Correct?
A. That is correct.
Q. Now, the only difference between those numbers is that you took the low-end estimate and you multiplied it by five. Correct?
A. That's correct.
MR. UNDERWOOD: Mr. Buck, can we get Mr. Lamotta's second supplemental report attachment 7.1? And can we display it under this table here?
09:47 Q. (BY MR. UNDERWOOD) So just to take an example, on the bottom of the screen, what's reflected here are the numbers that you referred to as Dr. Neikirk's high-end estimate. Correct?
A. Yes.
Q. And to do an example, let's take the notebooks. You recorded that Dr. Neikirk's low-end estimate for -- excuse
09:47 me -- notebooks was 65. Correct?
A. You got it.
Q. And if you multiply that by five, what do you get?
A. 325.

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Q. And so what you did is you took the low end, you multiplied it by five to get to the high end. Correct?
A. That's correct.
Q. Now, you don't know why you multiplied it by five, do you?
A. That's not true.
09:48 Q. That's not true? Sir, you didn't choose the 5X number, did you?
A. No, I didn't.
Q. Dr. Neikirk chose the 5X number? Is that your position?
A. That's correct.
Q. You don't know, sir, why the multiplier was five versus four versus three versus two, do you?
A. That's correct.
Q. Do you recall Dr. Neikirk's testimony yesterday about these estimates?
A. Yes.
09:48 Q. Do you recall him talking about the estimates that he recorded in his report?
A. Correct.
Q. And those are the estimates you call the low-end estimate. Correct?
A. And the ones I presented today. That's correct.
Q. That's right. Now, he didn't put what you call the high-end estimate in his report, did he?

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A. I believe that's correct.
Q. And he also said he couldn't remember having any conversations with you about any numbers that were not in his report. Do you remember that?
A. I do.
Q. It's a little strange, isn't it, sir?
A. I disagree.
09:49 Q. You don't think it's strange that Dr. Neikirk couldn't remember telling you these numbers that you've put in your report?
A. No, that's not surprising to me.
Q. That's not surprising to you, sir?
A. No. The information flow going from him to me for things that are critical for my report, it's not surprising he doesn't remember all that.
MR. UNDERWOOD: Mr. Buck, we can take that down.
Your Honor, may I approach the easel again to continue using it?
THE COURT: You may.
MR. UNDERWOOD: Thank you.
THE COURT: And, Mr. Lamotta, the last question was
09:49 fully answered when you said no. He didn't invite you to give an explanation as to why you didn't think that was a problem. So try to limit your answers to the questions asked. Okay?
THE WITNESS: My fault, Your Honor. Yes, sir.

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THE COURT: All right. Let's continue.

Q. (BY MR. UNDERWOOD) Mr. Lamotta, did you ever compare the numbers for the estimates with the ASUSTek data?

A. Can you ask that again?

09:50 Q. Absolutely. The ASUSTek data has a column, and if you add up all of the counts in it, you get to a number. Right?

A. Yes.

Q. Okay. And that number was, give or take, about 550 million. Right?

A. I think that's right. I thought it was a touch higher but good enough.

Q. Okay. Close enough?

A. Yeah.

09:51 Q. The truth is, sir, that Dr. Neikirk's estimates that you used as the basis for your damages significantly inflate the actual count number. Correct?

A. I disagree with inflate.

Q. Well, can we talk about what those numbers were?

A. Yes.

Q. I think you said the, quote, low-end estimate was 1.5 billion?

09:51 A. That's the number I used, yes.

Q. So I'm not a math guy, but about three times higher than this?

A. That's about right.

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Q. Okay. 1.5 billion is significantly higher than 550 million. Correct?
A. I'll agree with that.
Q. And did you add up the total number of alleged MOSFETs under the high-end estimate?
09:52 A. Yes.
Q. It's about 7.6 billion, isn't it?
A. I agree with that.
Q. That significantly inflates the actual counts from the real-world ASUSTek data, does it not, sir?
A. Sir, I'm going to have to disagree with you there.
Q. It's significantly higher?
A. Than what?
Q. Than 550 million.
A. Oh, yes.
09:52 Q. Now, the very first *Georgia-Pacific* factor is what?
A. Relates to licensing.
Q. Specifically licensing of what?
A. Same or similar intellectual property.
Q. And there are no licenses to the patents in this case. Correct?
A. That's correct.
Q. You recall Mr. Chung's testimony on Friday where he said that the Plaintiff had tried to license the patents?
A. I do.

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Q. They approached companies like Dell. You remember that?
A. I do.
09:52 Q. Do you remember him saying those companies had no interest in taking a license of the patents?
A. I think it was similar to that.
Q. Okay. But the bottom line, sir, is even though the Plaintiff has tried to license its patents, it's never gotten the license to its patents. Correct?
A. That's true.
Q. The Plaintiff has received zero dollars for its patents. Correct?
A. That's true.
Q. And, sir, you would agree with me if the jury finds that
09:53 the Defendant doesn't infringe these patents, the correct amount of damages would also be zero dollars. Fair?
A. Oh, sure. No infringement, no damages.
Q. Thank you, Mr. Lamotta.

MR. UNDERWOOD: I pass the witness, Your Honor.

THE COURT: Is there redirect, Ms. Pellegrino?

MS. PELLEGRINO: Yes, Your Honor.

THE COURT: All right.

Mr. Underwood, you need to move the easel back, turn it to a clean sheet, please.

MR. UNDERWOOD: Certainly, Your Honor. My
09:54 apologies.

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THE COURT: All right. Counsel, you may proceed with redirect.

MS. PELLEGRINO: Thank you, Your Honor.

REDIRECT EXAMINATION

BY MS. PELLEGRINO:

Q. Hi again, Mr. Lamotta.

A. Hello.

Q. Do you recall that Mr. Underwood asked you some questions about other analyses you performed over the course of your work in this case?

A. I do.

Q. Why do economic experts evaluate damages under a variety of frameworks?

A. So this process is iterative. Not all the information is available to me at the time of my report, so I have to account for things that may come into the record or opinions that may be rendered by others.

Q. And you conducted a variety of analyses in this case?

A. I did, yes.

Q. Why didn't you present all of those analyses to the jury?

A. For the reasons I described in my direct. So things get more clear as we go through this iterative process and as we get closer to trial, and I present the ones that I think best fit the evidence and are most appropriate at the time of trial. That's the opinion I presented today.

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Q. And Mr. Underwood also asked you some questions about what he called a range in those analyses. Do you recall that?
A. I do.
09:55 MS. PELLEGRINO: Mr. Doyle, if I could please have back slide 3. Thank you.
Q. (BY MS. PELLEGRINO) Do you recall, Mr. Lamotta, that we spoke about this slide on your direct examination?
A. Yes, ma'am.
Q. What is one of the fundamental rules in the hypothetical negotiation?
A. That the patents are valid and infringed and that the parties have access to all relevant information.
Q. Are we playing poker face-up here?
A. In this courtroom?
09:55 Q. In this case.
A. Yes.
Q. Is -- are we playing poker face-up with ASUS' data in this case?
A. No.
THE COURT: The cards may be face-up, but there's no poker being played in this courtroom. At least not while I'm on the bench.
MS. PELLEGRINO: Thank you, Your Honor.
Q. (BY MS. PELLEGRINO) Now, your 1.3 and $1.6 million
09:56 analyses, did those rely an assumption or one of these rules?

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A. Yes.
Q. What rule?
A. Well, they were based on the assumption that we were going to have a complete and accurate representation of the infringing MOSFETs, including the mix. I raise this issue in my report. I expected that we would get that, and that's why I left open this analysis. That's part of the iterative process.
Q. Do we have access to all the relevant information here?
A. We do not.
09:57 Q. Now, Mr. Underwood also asked you some questions about apportionment. Do you recall that?
A. I do.
Q. For the damages analysis that you presented to the jury today, did you conduct an apportionment analysis?
A. I did.
Q. Could you describe it?
A. Sure. It's what we looked at in my direct exam. We compared the cost of the MOSFETs to the selling price of the device to get an economic representation of the contribution
09:57 of the patented or the infringing MOSFETs to the overall device in the way that ASUS is using it.
Q. Now, Mr. Underwood also asked you about some apportionment opinions that you received from Dr. Neikirk. Do you recall that?

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A. I do.

And I believe that your testimony was Mr. Underwood was comparing apples to oranges. Do you remember that?

A. Yes.

Q. What did you mean?

A. Well, it's two things there. So these are two separate analyses that apply in two separate contexts so we do the apportionment two separate ways.

09:57 What Mr. Underwood was describing was what I would do typically under a traditional approach like I talked about cost approach, market approach, income approach when we have complete records. What I did here is a different quantitative analysis under a different set of circumstances.

Q. And Mr. Underwood asked you if you were, I believe the way he phrased it, was whether you were assigning 100 percent of the value of the chips to Force MOS. Do you remember that?

A. I do remember that.

Q. And you said no. Right?

A. I did.

Q. Why?

09:58 A. Because cost should not be confused with value. I'll give you an example. Okay? The cost of those MOSFETs does not represent the value to ASUS because they have no other alternatives.

Think about the cost of a stent you need to prevent

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blockage in your heart or risk a heart attack. The cost of that product is a couple of hundred dollars. The value is enormous. Cost and value are not the same. I used the entire cost; I did not take the entire value. That value is shared as part of that negotiation.

Q. Now, you were also asked about some comparisons between Dr. Neikirk's estimates and the Microtech counts. Do you recall that?

A. I do.

Q. Is there a difference between what Dr. Neikirk's estimates represent and what Microtech's counts represent?

A. Absolutely.

Q. What's the difference?

A. Because we don't have actual data, Dr. Neikirk set forth a set of estimates that can be applied to the products generally across a wide range of products. I would expect and there are some examples of products with lower numbers of MOSFETs than his estimates and products that are higher. That's the nature of this type of estimate. Microtech looked at a few specific devices and did counts. That's a very, very small sample size and in my view does not diminish the credibility of the estimates.

Q. Do you recall in total how many accused ASUS devices there are in this case?

A. There's more than 10 million.

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Q. I'm sorry. I asked -- let me rephrase my question.
A. Okay.
Q. Do you recall how many accused SKUs are in this case?
A. I think there's 6,000, give or take.
10:00 Q. Did Microtech perform a counting analysis on all 6,000 accused SKUs?
A. Not even close.
Q. You were also asked some questions about how you did or did not use JX 7. Do you remember that?
A. Yes.
Q. Why would you use JX 7 for ASUS's revenue?
A. It's all we had.
Q. Is it -- I'm sorry.
A. It's the best available evidence. In that respect it's similar to the estimates. It's the best available evidence. I did write in my report that the revenue in the units in that
10:00 spreadsheet are likely understated, but I used them anyway.
Q. Now, if you use the revenue in JX 7, what about the data related to the MOSFETs? Why isn't that reliable?
A. It doesn't even purport to be reliable.
Q. What do you mean?
A. It absolutely does not tell us the counts of the MOSFETs by MOSFET type. It doesn't give us the mix. It gives us a
10:01 little bit of information related to some slots that are available in there, but it doesn't even tell us within those

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available slots which MOSFETs are actually in there.
Q. Has anything that you've heard during the course of this trial changed your opinion about what the appropriate damages framework is in this case?
A. Not at all.
Q. What's the appropriate damages framework in this case, in your opinion?
A. It's the quantitative framework that I presented, and it leads to the answer of $20.1 million.
10:01 Q. Thank you, Mr. Lamotta.
MS. PELLEGRINO: I pass the witness, Your Honor.
THE COURT: All right. Is there additional cross examination?
MR. UNDERWOOD: Very briefly, Your Honor.
THE COURT: All right. Proceed with additional cross.
MR. UNDERWOOD: Thank you, Your Honor.

RECROSS EXAMINATION

BY MR. UNDERWOOD:
Q. Mr. Lamotta, do I have it right that your testimony was that you went with the $20 million number because things got more clear over the course of the case?
10:02 A. I believe that is correct. That's what I said, yes.
Q. And I think you also said, this was at the beginning of the first time Ms. Pellegrino asked you questions, that

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certain information was no longer applicable as the case went down the path. Right?

A. That's right.

Q. Now, the truth is, sir, you've served and prepared multiple reports in this case. Correct?

A. Yes.

Q. In fact --

MR. UNDERWOOD: Ms. Brunson, could I get the elmo?

10:02 Q. (BY MR. UNDERWOOD) -- your latest report came this past weekend, didn't it?

A. It did.

Q. February 8th. That was Saturday?

A. Working the weekend.

Q. Well, I can appreciate that, Mr. Lamotta.

That was after the first day of trial in this case. Right?

A. That is correct.

Q. I mean, that was in the middle of this trial. Right?

A. Yes.

Q. And, Mr. Lamotta --

MR. UNDERWOOD: Your Honor, may I approach the easel?

THE COURT: You may.

MR. UNDERWOOD: Thank you.

10:03 MS. PELLEGRINO: Your Honor, I apologize. Before

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Mr. Underwood continues, may we approach?

THE COURT: All right. Approach the bench.

(The following was had outside the hearing of the jury.)

MS. PELLEGRINO: My concern, Your Honor, is that Mr. Lamotta served a supplemental report to reflect the dropped claims and chips in this case, which I cannot ask him about under Your Honor's standing order.

MR. UNDERWOOD: May I respond, Your Honor?

10:03 THE COURT: Please do.

MR. UNDERWOOD: I will not be getting into dropped chips, dropped patents, dropped claims, any of that. I understand the Court's limine orders, and I'm going to follow those.

But the fact is when he did update his report, he did not withdraw these theories that he now claims are inapplicable to the case. I'm not going to be getting into things that were dropped. But if he believed they were inapplicable, he could have dropped them.

10:04 THE COURT: All right. Well, you're both correct that prior claims and defenses that have been abandoned or dropped are excluded under my limine rulings, and I assume this witness understands that as well.

I'll let you go forward as long as you can avoid that. Just because there may be dropped claims in this late-breaking

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supplemental report doesn't -- that you can't go into Ms. Pellegrino doesn't tell me that it should be wholly excluded and can't be used for any purpose. I'm certainly not going to let anybody raise something that you can't respond to and hopefully there are no unintended doors that are going to be opened here, but I'm going to allow you to go forward with that understanding. Okay?

MR. UNDERWOOD: Thank you, Your Honor.

MS. PELLEGRINO: Thank you, Your Honor.

(The following was had in the presence and hearing of the jury.)

THE COURT: All right. Let's proceed.

Q. (BY MR. UNDERWOOD) So, Mr. Lamotta, just to be clear --

MR. UNDERWOOD: And I apologize, Ms. Brunson. Can I have access to the elmo again?

Q. (BY MR. UNDERWOOD) Just to be clear, Mr. Lamotta, this is your report that you signed that was served just a few days ago on Saturday. Correct?

A. Yes.

Q. And this report included in it the $6.8 million number and THE $1.3 million number. Correct?

A. That's correct. Would you like to go to page 5?

Q. We don't need to show it to the jury, Mr. Lamotta.

A. Okay.

Q. The fact is, though, sir, that this report served in the

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middle of this trial still contained the $6.8 million number and the $1.3 million. Correct?

A. It did.

Q. Even though you now claim they're inapplicable, as recently as this weekend you were serving new reports that contained these numbers. Correct?

10:06 A. That's correct. Should I explain?

MR. UNDERWOOD: No further questions, Your Honor.

THE WITNESS: Okay.

THE COURT: You pass the witness, Mr. Underwood.

MR. UNDERWOOD: I do, Your Honor.

THE COURT: If you'll return that easel.

Ms. Pellegrino, do you have additional direct?

MS. PELLEGRINO: I don't, Your Honor.

THE COURT: Then, Mr. Lamotta, you may step down.

THE WITNESS: Thank you, Your Honor.

THE COURT: You're welcome.

And, ladies and gentlemen, this is a good point for us to take a morning recess. If you'll simply close your notebooks, leave them in your chairs, remember to follow all my

10:06 instructions about your conduct, including not to discuss or communicate with each other about the case in any way, and we'll be back shortly to continue.

The jury's excused for recess.

(Whereupon, the jury left the courtroom.)

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THE COURT: Mr. Hanba, I assume at this point Plaintiff intends to rest its case in chief?

MR. HANBA: Yes, Your Honor, Plaintiff intends to rest.

THE COURT: All right. When I bring the jury back in, I'll ask you for your next witness, and you can make that announcement into the record at that time.

And then we'll proceed with -- I assume we'll proceed with the Defendant's case in chief, and I assume Defendants still intend to start with about a 10-minute deposition?

MR. UNDERWOOD: Yes, Your Honor.

THE COURT: Okay. All right. Court stands in recess.

(Brief recess.)

10:08 THE COURT: Be seated, please.

10:28 All right. Let's bring in the jury, please, Mr. Estes.

(Whereupon, the jury entered the courtroom.)

10:29 THE COURT: Welcome back, ladies and gentlemen. Please be seated.

Plaintiff, call your next witness, please.

MR. HANBA: Your Honor, Plaintiff has no further witnesses. Plaintiff rests.

THE COURT: All right. Plaintiff has rested its case in chief. We'll transition to the Defendant's case in chief.

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Defendant, call your first witness.

10:29 MS. LYNCH: Good morning. As its first witness, ASUSTek calls Dr. Ming-Tao Chung adversely. Dr. Chung is Force MOS's founder, general manager, and chairman of the board.

We're calling him by video deposition. It will run for about 12 minutes.

THE COURT: All right. Let's proceed with this witness by deposition.

MING-TAO CHUNG, Ph.D.,

BY VIDEO DEPOSITION

Q. All right. Let's load Exhibit 4 for the witness. And 10:29 for the record, Exhibit 4 is the May 31st, 2024 declaration of Mr. Ming-Tao Chung, bearing Bates No. FORCE-MOS0044179 through 181.

Do you recognize Exhibit 4 as your May 31st, 2024 declaration?

10:30 A. Yes.

Q. Sir, did you personally write this declaration?

A. No.

Q. Who wrote this declaration?

A. The vice president of our company, Mr. Ping-Chia Chung. 10:30 Ping-Chai or Chung Ping-Chai.

Q. Is that also -- is he also known as Rafael Chung?

A. Yes.

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Q. And Mr. Rafael Chung is your son?
A. Yes.
Q. Did you get a chance to review this Exhibit 4 before signing it?
10:31 A. He briefly explained to me the content of the document.
Q. Did you personally review the document, sir?
A. As I said earlier, I roughly know about the content within it. I did not read it in details.
10:31 Q. Is your understanding of Exhibit 4 based solely on the explanation provided by Mr. Rafael Chung?
A. Yes.
Q. Mr. Chung, if you had taken the time to read Exhibit 4, would you have been able to understand its contents?
10:32 A. I cannot.
Q. Could you look at paragraph 3 of Exhibit 4, sir?
A. I see that.
Q. Are you able to understand paragraph 3 without the assistance of an interpreter?
A. I cannot.
10:32 Q. So a statement saying that you were a supervisor for Force MOS Taiwan would be incorrect. True?
10:33 A. On May 31st, 2024, I signed a declaration. And later on I realized there was a mistake in that declaration.
10:33 Therefore, on June 18th, I sent another declaration correcting the previous declaration. So on June 18, 2024, I sent another

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declaration correcting the error from the May 31st declaration.

10:34 I cannot remember exactly whether it was June 28th or June something, whether it was June 18th or June 28th. Anyhow, it was roughly in June I signed another declaration.

Q. Mr. Chung, a statement saying that you were a supervisor for Force MOS Taiwan would be incorrect. True?

A. Yes.

10:34 Q. So the record's clear, we are referring to paragraph 3 in Exhibit 4 being incorrect. Yes?

A. Yes.

Q. And that is because you were not a supervisor for Force MOS Taiwan at this time?

A. Yes.

Q. Have you ever been a supervisor for Force MOS Taiwan?

A. No.

10:35 Q. And you do know the difference between the role of a supervisor of a company and the role of chairman of a company. Correct?

A. I know.

Q. You know there's a difference. Yes?

A. I know.

Q. So you agree that paragraph 11 of Exhibit 4 is wrong. Correct?

10:36 A. Yes.

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Q. It is factually incorrect. Yes?
A. Yes.
Q. Do you recall which company you signed the patent assignment agreement for?
A. I represented Force MOS Cayman.
10:36 Q. And do you recall who signed on behalf of Force MOS Taiwan?
A. At that time, it would be Supervisor Chang.
Q. Is that Mr. Chang Ching-Cheng?
10:36 A. Yes, Chang Ching-Cheng.
Q. Sir, can you turn to paragraph 12, please?
Mr. Chung, are you able to understand paragraph 12 of Exhibit 4 without the assistance of an interpreter?
A. I cannot.
10:37 Q. Let me read paragraph 12 into the record: "I executed the 2009 assignment on behalf of Force MOS Technology Co., LTD., in Taiwan under my authority as the then-supervisor of the company."
Do you understand paragraph 12 of Exhibit 4, sir?
10:37 Would you agree, sir, that paragraph 12 contains factually incorrect statements? Paragraph 12 of Exhibit 4 contains factually incorrect statements.
A. Yes, it's incorrect.
Q. That is because you did not sign the assignment on behalf of Force MOS Taiwan. Correct?

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A. Yes.
Q. And while Exhibit 6 is being retrieved, for the record, it is the patent assignment agreement produced by Force MOS bearing Bates number FORCE-MOS0039844 through 46.
Do you see Exhibit 6 on the screen, Mr. Chung?
A. Yes, I see it.
Q. Are you able to understand Exhibit 6 without the assistance of a translator, sir?
A. I cannot.
Q. Sir, do you see your signature at the bottom of the first page of Exhibit 6, bearing Bates number FORCE-MOS0039844?
A. Yes.
Q. And your signature is the one at the top of the two signatures. Correct?
A. Yes.
Q. And could we go through each page to confirm that it is your signature?
A. Yes.
Q. Have you confirmed that it is your signature on every page of Exhibit 6?
A. Yes.
Q. Sir, why did you sign on behalf of Force MOS Cayman, Ltd., in 2009 and not Dr. Hsieh?
A. At that time I was the corporate representative.
Q. Dr. Hsieh could not represent Force MOS Cayman, Ltd. at

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the time?

Are you able to answer, Mr. Chung?

10:40 A. I'm not sure. Whether he could be the representative or not, but I was the representative of the company and I signed it.

Q. And the other signature on Exhibit 6 belongs to Mr. Chang Ching-Cheng. Right?

A. Yes.

10:40 Q. Do you recognize Mr. -- actually, when --

You mentioned earlier that Mr. Rafael Chung had translated the entirety of the May 31st declaration. Is that correct?

A. Yes.

Q. Did he do the same for the June 28th declaration?

A. Yes.

10:41 THE COURT: Does that complete this witness by deposition?

MR. McMAHON: Yes, Your Honor.

THE COURT: All right. Call your next witness, please, Defendant.

MR. CHEN: Your Honor, Defendant calls Mr. Chao-Liang Hung.

THE COURT: All right. If you'll bring the witness in, please. We'll have him sworn.

10:41 And this witness is going to testify with the aid of an

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interpreter and the interpreter's previously been sworn, just for the record.

(Whereupon, the oath was administered by the Clerk.)

10:42 THE COURT: Please come around and have a seat at the witness stand.

CHAO-LIANG HUNG,

having been first duly sworn, testified under oath as follows:

DIRECT EXAMINATION

BY MR. CHEN:

Q. Good morning, Mr. Hung.

A. Good morning.

Q. Can you hear me okay?

A. Yes.

10:42 Q. Sir, could you state your full name for the record?

A. Chao-Liang Hung.

Q. I'd like to begin by briefly introducing your background to the jury.

Who is your current employer?

10:43 A. ASUSTek Computer Co., Ltd.

Q. And what is your title?

A. Director.

Q. In what department?

A. Consumer business unit system, R&D center.

10:43 Q. Can you please tell the jury about your educational background, beginning with your college degree?

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A. In 1998, I received a Bachelor's degree in electric engineering. In 2001, Master's degree in electric engineering.
Q. When did you start working at ASUSTek?
A. In year 2000.
Q. Have you been working continuously at ASUSTek since 2000?
A. Not really.
Q. What did you do in 2001?
A. I was serving in the military.
Q. Is there a military draft in Taiwan?
A. Yes.
Q. Why?
A. To defend the country and the homeland.
Q. To protect Taiwan from who?
A. China.
Q. After your military service ended, did you go back to ASUSTek?
A. That's correct.
Q. And from that point on, did you work continuously at ASUSTek?
A. Not really.
Q. When did you next leave ASUSTek?
A. In October 2005.
Q. Where did you go?
A. RichTek in Chupei, Hsinchu.

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10:46 Q. Why did you leave ASUSTek to join RichTek?
A. To realize my dream of BIC design.
Q. But you didn't stay at RichTek. Correct?
A. That's correct.
Q. When did you leave?
10:47 A. In March 2006.
Q. And where did you go?
A. I returned to ASUSTek.
Q. Why did you leave RichTek after only five months to return to ASUSTek if your dream was to be an IC engineer?
10:47 A. [redacted]
10:47 [redacted] I instead returned to ASUSTek and engaged in hardware development.
Q. [redacted]
A. [redacted]
Q. [redacted]
A. [redacted]
Q. Are you going to get her something before you go back?
10:48 A. I already did.
Q. Sir, what positions have you held at ASUSTek over time?
10:49 A. All the way from engineer, senior engineer, deputy section lead, section lead, supervisor, deputy director, all the way to director, my current title.
Q. Are you a listed inventor on any patents?

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A. I own two patents.
10:49 Q. What inventions do the patents relate to?
10:49 A. Power equipment and device and audio interface.
Q. Let's turn next to your roles and responsibilities at ASUSTek. What do you do in your current role as director of R&D?
10:50 A. To lead the whole R&D team of the consumer hardware.
Q. Do you know which product categories are accused of infringement in this case?
A. I have some rough ideas.
10:50 Q. Can you give the Court some examples of the product categories that are accused of infringement in this case?
A. Notebook, desktop, motherboard, graphic card, and server.
10:51 Q. Why are these product categories accused of infringement?
A. The components included in our design were accused of infringement.
Q. What are the components accused of infringement?
10:52 A. MOSFET.
MR. CHEN: Mr. Buck, let's please pull up Demonstrative Exhibit DDX -- I think it's 3.1.
Q. (BY MR. CHEN) Mr. Hung, does Exhibit DDX 3.1 show the MOSFETs that are accused of infringement in this case?
10:52 A. That's correct.
Q. In its product designs, does ASUSTek care about MOSFET functions, structures, or both?

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10:53 A. We only care about the function or functionality.
Q. Why just the functions?
A. Because only the functions are related to our design.
Q. Sir, during your time at ASUSTek, did you or your team have occasion to design some of the products that are accused of infringement in this case?
10:53 A. My team members were involved in some designs of notebooks.
10:53 Q. Can you walk the jury through the design process for an ASUS-branded laptop? What is the first step of that design process?
10:54 A. First we would get from the marketing department the
10:54 market spec, which includes all the specifications, and then from the power department we would have the circuit -- all circuitry, and then from the circuitry, we will get the -- all the function and then the R&D will complete the design.
MR. CHEN: Let me ask Mr. Buck to pull up Exhibit DX
10:55 20.
Q. (BY MR. CHEN) On the front page of DX 20, it bears the Bates number ASUS_00005302. Do you have that, sir?
A. Yes, I see it.
10:55 Q. Mr. Hung, do you recognize this as a document that ASUSTek's design team generates at the end of the circuit design step?
A. That's correct.

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MR. CHEN: Mr. Buck, please go to the end of this document.

10:56 Q. (BY MR. CHEN) Mr. Hung, how many pages are in Exhibit DX 20?

A. 103.

Q. And, sir, is it true that a document of this size is generated at the end of every circuit design step?

10:57 A. That's correct.

Q. What happens after the circuit design is complete?

10:57 A. After that, we would approach different departments like thermal, F, audio, and so on to decide the PBC -- sorry, PCB, and then we would also define the height of the components.

Q. And the next step after the design team determines the dimensions?

10:58 A. That's correct.

Q. What do you do after the design team determines the dimensions?

10:58 A. After the dimension of the PCB as well as the component height are finalized, then we would then look for the corresponding components, finish the layout, and generate a

10:58 file for the PCB manufacturers to manufacture.

Q. That layout file, that's the same as a design layout?

A. That's correct.

Q. What happens after design layout is complete?

10:59 A. Then the electric engineers would base on the file to

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generate BOM, bill of material.

Q. What is a bill of materials? Let me withdraw that.

What does a bill of materials contain?

11:00 A. It will include the number of slots for all the components on that PCB.

Q. What happens after the bill of materials is completed?

11:00 A. Based on BOM, the OEM will try to manufacture assemble.

Q. Does it also debug?

A. That's correct.

11:00 Q. How many times does ASUSTek go through the build and debug process?

A. At least three times.

Q. And when the product has been fully debugged, is that when it is ready to be commercialized?

11:01 A. That's correct.

Q. If this jury wants information concerning the components in the accused products, what is the best or most reliable information that ASUSTek can provide?

11:02 A. All the information is included in the BOM.

Q. We're going to explore that further in a minute, but first I want to talk about the qualification process within ASUSTek.

Is the component qualification process important to ASUSTek?

11:02 A. That's correct.

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Q. Why is that?
11:02 A. To make sure that the components' functionalities are consistent with the spec and also to avoid any concern of the product quality.
Q. Once a MOSFET have been qualified, does ASUSTek still track whether that MOSFET is used versus another qualified MOSFET that is in the bill of material?
11:03 A. No.
Q. Why not?
11:04 A. That is because our qualification process is reliable and it suits all the processes inside ASUSTek.
Q. Sir, how many types or models of MOSFETs would ASUSTek generally qualify for its notebooks?
11:04 A. In general, at least one.
Q. Do you have an estimate of the general range of how many different types it can go up to?
A. Up to five.
11:05 Q. And that's for each slot that can accommodate the MOSFETs. True?
A. That is correct.
Q. Sir, let's now discuss the MOSFETs that are used in the ASUS-branded products. What function do MOSFETs serve in ASUS-branded products?
11:05 A. In general, MOSFETs are used as switches or voltage-level shifts -- shift.

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Q. Are MOSFETs a new technology?
A. No.
Q. How long have they been around?
A. Before I was born, it was already there.
Q. Once MOSFETs are approved or qualified, who incorporates the MOSFETs into ASUSTek products?
A. Our OEM manufacturers.
Q. Are OEMs the same as third-party manufacturers?
A. That's correct.
Q. We talked about the fact that ASUSTek does not track MOSFETs, but does ASUSTek know how many physical slots for MOSFETs are in its accused products?
A. Yes. That information is included in the BOM.
Q. Why do we have that information?
A. The information is always there. Whenever a board has to be manufactured, that information should be ready.
Q. It's information that we generate and collect as part of the design process?
A. That's correct.
MR. CHEN: Mr. Buck, please pull up Exhibit JX 07, part 1.
Q. (BY MR. CHEN) Mr. Hung, did ASUSTek also compile this information for Force MOS that is reflected in JX 07?
A. Yes.
Q. And over the past few months have you had an opportunity

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to study this document that is JX 07?
A. Yes, I did.
11:09 Q. What kinds of information does Exhibit JX 07 reflect?
A. Starting from column F, can you scroll to the right?
11:09 Okay. Okay. Stop.
From what I can see in this document, I saw nine accused components.
11:10 Q. Mr. Hung, does JX 07 contain sales information for the accused ASUSTek products?
A. Yes.
Q. And is it also your understanding that this document contains the slot counts for the -- slot counts from the
11:10 accused MOSFETs for the accused ASUS-branded products?
A. That's correct.
Q. And this document is for sales occurring between the fourth quarter of 2016 through the fourth quarter of 2023. True?
11:11 A. Can you scroll to the right?
That's correct.
11:11 Q. Now, let's walk through this spreadsheet so that the jury would have an example.
Do you see that columns F through M reflects the accused MOSFETs in this case?
A. Yes.
Q. And do you see the cells under these columns sometimes

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are blank and other times they have a Y indication?
A. Yes.
Q. What does it mean when a cell in columns F through M contains a Y?
A. It means that it is likely one of the accused MOSFET was used or it was possible.
Q. What does it mean when the cell under columns F through M is blank, sir?
A. That means no accused MOSFET was used.
Q. It means it's not possible for an accused MOSFET to be used for that particular product. Right?
A. That's correct.
Q. And to the right of this spreadsheet, I believe it's column CW. Do you know what the information in column CW represents?
A. The maximum number of accused MOSFET that could be used in a slot of that specific model of the product.
Q. Actually, sir, I'm pointing to column CW, not column CZ. Do you know what column CW represents?
A. Yes.
Q. What is -- what does the information in column CW represent?
A. From the fourth quarter of 2016 to the fourth quarter of 2023, the sales quantity of each model.
Q. And now let's turn to column CZ. Do you know what the

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numbers in column CZ represent?
11:16 A. Yes.
Q. And what does the information in column CZ represent?
A. The maximum number of slots for possibly the accused
11:16 MOSFETs in each model.
Q. We're going to walk through an example here, but before doing so, over the past few months, Mr. Hung, did you have a chance to verify the information in this exhibit against the information in the BOM?
11:17 A. Yes.
Q. Are you satisfied that the information in this document is accurate and reliable?
11:17 A. Yes.
MR. CHEN: Mr. Buck, can you freeze the views of the column description and scroll to row 1158?
11:18 Q. (BY MR. CHEN) Mr. Hung, please tell the Court, what is the ASUSTek product on row 1158?
A. Notebook.
Q. And what's the model number?
11:18 A. Echo 410MA.
Q. That's the E410MA?
A. That's correct.
Q. For the E410MA shown on row 1158, which accused MOSFETs are shown as being qualified for use for this product?
11:19 A. They are Panjit PJX138K --

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THE INTERPRETER: Actually the Interpreter will restart again.

THE WITNESS: The Panjit PJX138X --

THE INTERPRETER: Is that K? The Interpreter will start again.

Panjit PJX138K, Panjit 2N7002KDW, and 2N7002K.

Q. (BY MR. CHEN) Are these accused Panjit MOSFETs shown under columns K, L, and M?

A. That's correct.

Q. For the remaining columns under columns F through M on row 1158, do you see any other accused components that have been qualified for this E410MA product?

A. No.

MR. CHEN: Let's go to column D, Mr. Buck.

Q. (BY MR. CHEN) Sir, what's the information under column D of row 1158?

A. It's a nine-character part number.

THE INTERPRETER: The Interpreter's correction.

THE WITNESS: It's the 90-level part number.

Q. (BY MR. CHEN) And is that 90-level part number for this row 115890NB0Q11-S00020?

A. That's correct.

Q. Is that a unique number?

A. That's correct.

Q. So for this particular product -- for any product

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that -- strike that.

What does column CW tell you about the number of units sold for this particular 90-level part number on row 1158 from Q4 of 2016 to Q4 of 2023?

11:23 A. One unit.

Q. And what does column CZ on the same row tell you about the number of slots for accused MOSFETs for this part number?

11:23 A. Fourteen.

Q. The slot count is 14, even though there are only three accused MOSFETs qualified for use on this?

11:23 A. That's correct.

Q. And column DA shows the total number of slots for accused MOSFETs for this 90-level part number. True?

A. That's correct.

11:24 Q. Am I correct that the information under column DA is the number in column CW times the number under column CZ?

A. That's correct.

MR. CHEN: Mr. Buck, can you filter this spreadsheet 11:24 for all E410MA models in the spreadsheet? And can you do the 11:25 auto sum for the numbers in column CW?

Q. (BY MR. CHEN) Mr. Hung, can you tell the Court what is the total number of E410MA models sold in the period from Q4 11:25 of 2016 to Q4 of 2023?

A. 633,344 units.

11:26 MR. CHEN: And, Mr. Buck, can you do the auto sum

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for column DA?

Q. (BY MR. CHEN) Mr. Hung, what is the total number of slots for accused MOSFETs for all E410MA products in the period from fourth quarter of 2016 to the fourth quarter of 2023?

A. 9,854,276.

Q. Sir, are there third-party parts, such as battery packs, in ASUSTek products?

A. Yes.

Q. Does ASUSTek know the number of MOSFETs in these third-party battery packs?

A. No.

Q. Does ASUSTek have a general idea of what that number might be?

A. To the best of my knowledge, there are at least two MOSFETs.

Q. Could the number of MOSFETs in these third-party battery packs be as many as a hundred?

A. It's impossible.

Q. Could it be more than 50?

A. No.

Q. Could it be more than 10?

A. Likewise, it won't be that much.

Q. Okay. Then I want to clarify your earlier testimony. You said at least two, but you didn't set an upper limit, so

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what do you mean -- how are you able to determine that it can't be greater than 10, 50, or a hundred?

11:29 A. You see, as for battery packs, the size of the PCB is quite small. However, due to the large current, the size of the MOSFET also is very large. In addition, the battery itself is attached to the battery PCB. Therefore, the space to put the MOSFET on the PCB of the battery pack is very limited.

11:30 Q. Have you seen photos of tear-downs of ASUSTek's laptops, sir?

A. Yes. Well, internally.

11:30 Q. Do you recall the color of the PCB board for the battery pack?

A. I don't have any recollection on that.

Q. Does ASUSTek know which MOSFET models are used in these third-party parts?

11:31 A. No.

Q. Does ASUSTek know if any accused MOSFETs are used in these third-party parts?

A. No.

11:31 Q. For example, if Force MOS MOSFETs are used in these third-party battery packs, then they wouldn't be infringing. Right?

THE INTERPRETER: Counsel, could you repeat the last part?

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Q. (BY MR. CHEN) Let me withdraw that question.

For example, Force MOS has not accused its own MOSFETs of infringing in this case. Right?

A. That's correct.

Q. And are you aware that Force MOS MOSFETs are sometimes used in these third-party battery packs?

A. Yes.

Q. Sir, if ASUSTek does not know the MOSFETs from third-party parts, such as battery packs, how can ASUSTek say JX 7, the document on the screen, reflects the maximum number of accused MOSFETs?

A. The document actually reflects the number of slots of MOSFET in reality. However, in reality, the number of accused MOSFET used would be fewer than the number of the slots. In addition, in battery packs, due to the small size of the PCB, there won't be many slots for MOSFETs.

In addition, the MOSFETs inside battery packs may come from Force MOS. In addition, for desktop computers, for motherboard, graphic cards, or server, they don't even have battery packs.

Q. Sir, you weren't here for opening statements, but Force MOS's counsel claimed that every ASUSTek laptop has hundreds of accused MOSFETs inside. What do you think about that claim?

A. That is impossible.

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Q. Did you use JX 07 to calculate the percentage of ASUS-branded products that have slots for over 100 of the accused MOSFETs?

THE INTERPRETER: The Interpreter is asked to repeat the rendition.

THE WITNESS: Yes, I did.

Q. (BY MR. CHEN) What is that percentage?

A. Less than 2 percent.

Q. What is the percentage of ASUS-branded products that have slots for less than -- for less than 100 accused MOSFETs?

A. More than 98 percent.

Q. What is the percentage -- did you also do the same calculation for MOSFETs -- strike that.

Sir, did you also do the same calculation for ASUS-branded products that have slots that have less than 60 accused MOSFETs?

A. Greater than 93 percent.

Q. Sir, let's discuss the price of the accused MOSFETs. Do you know the range of prices for the accused MOSFETs purchased by ASUSTek?

A. From .4 cents to a dime.

Q. What is the average price of accused MOSFETs that are purchased by ASUSTek?

A. One penny.

Q. Any idea why MOSFETs don't cost more?

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11:40 A. Since the technology is mature, the competition is fierce, and MOSFETs are produced in large quantities; therefore, in the market the price could never be higher.

THE COURT: Let me interrupt for a minute. We don't have time for another recess before lunch, but we've been in session for a good while. I'm simply going to ask everybody in the room to stand up stand 30 seconds and stretch and then 11:40 we're going to sit down.

(Pause in proceedings.)

THE COURT: All right. Let's have a seat.

11:41 And Mr. Shao, our interpreter, you don't need to speak quite as loudly as you are. You are quite loud around there.

THE INTERPRETER: So, Your Honor, is the Interpreter asked to lower down the voice?

THE COURT: I am asking you to lower down your volume a bit.

THE INTERPRETER: Okay.

THE COURT: All right. Let's proceed, counsel.

MR. CHEN: Thank you, Your Honor.

Q. (BY MR. CHEN) Mr. Hung, given that MOSFETs only cost 11:41 about one penny each on average, why doesn't ASUSTek incorporate more MOSFETs? Why doesn't ASUSTek incorporate over a hundred MOSFETs in each of its products?

11:42 A. Because those number of MOSFETs were sufficient. More MOSFET would not be better.

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MR. CHEN: We pass the witness, Your Honor.

THE COURT: All right. Cross examination by the Plaintiff.

11:43 Proceed when you're ready, Mr. Hanba.

MR. HANBA: Thank you, Your Honor. May it please the Court.

CROSS EXAMINATION

BY MR. HANBA:

Q. Good afternoon, sir.

THE COURT: It's still morning.

MR. HANBA: You know what? I even looked at the

11:43 clock, Your Honor.

Q. (BY MR. HANBA) Good morning, sir.

A. Good morning.

Q. My name is Chris Hanba. I'm going to ask you a few questions. Okay?

A. Okay.

Q. Most of them should be able to be answered with a yes or no answer. If you can't answer them with yes or no, please let me know. Okay?

11:44 A. Okay.

Q. And, sir, you're not here to offer any opinions on non-infringement. Right?

11:44 A. That's correct.

Q. And you're not here to offer any opinions on invalidity.

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Correct?

A. That's correct.

MR. HANBA: Mr. Doyle, if we could go to JX 7 part 1.

Q. (BY MR. HANBA) And, sir, do you recall looking at this document with Mr. Chen?

A. Yes.

Q. And Mr. Chen asked you to look at an E410A laptop. Do you remember that?

A. That's not correct.

Q. He asked you to look at row 1158, which is an E410 laptop. Correct?

A. I don't know how to respond. To the best of my knowledge, the name is Echo 410MA.

Q. Thank you.

MR. HANBA: Mr. Doyle, if you would please go down to row 1158.

Q. (BY MR. HANBA) And, sir, I just want to be clear. Your testimony was that if there is not a Y in one of the columns listing the accused components, that it is not possible for that MOSFET to appear in that product. Is that correct?

A. That's correct.

Q. And the only components bearing a Y in row 1158 are Panjit MOSFETs. Correct?

A. That's correct.

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Q. So your testimony is that it isn't possible for the other accused components that do not have a Y to be in the E410MA listed in row 1158. Right?

11:48 A. That's correct.

Q. And, sir, if we look -- we understand that you looked -- strike that.

I understand that you looked at today with Mr. Chen JX 7, part 1. Do you understand that?

11:49 A. That's correct.

Q. And you gave a number of percentages regarding the number of MOSFETs that were over -- excuse me. Strike that.

And you gave a number of percentages for the number of computers or products that had over 100 MOSFETs in them. Correct?

11:49 A. That's correct.

Q. And, sir, you understand that there is an update to part 1 and that's part 2. Do you understand that?

11:50 A. No, I don't.

Q. So you were never shown JX 7, part 2?

A. No.

11:50 Q. Sir, do you know this case was filed in November of 2022?

A. I'm not quite sure about it.

Q. You would take my word for it that this case was filed in November of 2022.

11:51 THE INTERPRETER: Counsel, could you repeat that

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question?

MR. HANBA: Yes, sir.

Q. (BY MR. HANBA) Would you take my word for it that this case was filed in November of 2022?

A. Yes.

11:51 Q. So the case is a little over two years old. Right?

A. Based on the date you just told me, then yes.

Q. And ASUS has produced documents in this case. Right?

11:52 A. I believe so.

MR. HANBA: All right. Mr. Doyle, you can take that down? Excuse me.

Q. (BY MR. HANBA) And there have been depositions in this case. Right?

A. That I don't know.

Q. Sir, weren't you deposed in this case?

A. Oh, yes; yes, I was there.

11:52 Q. And, sir, other of your colleagues were deposed in this case. Right?

A. That is correct.

Q. And as a matter of fact, you were deposed in May of 2024. Right?

A. I think so.

11:52 Q. And you were deposed, sir, as a corporate representative for ASUS in that case -- in this case. Right?

A. That's correct.

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Q. And, sir, in that deposition you took an oath to tell the truth. Right?
A. That's correct.
11:53 Q. And you told the truth in that deposition. Right?
A. That's correct.
Q. And that deposition was transcribed. Right?
A. That's correct.
Q. And after the deposition, you were allowed to review that transcript. Right?
11:54 A. That's correct.
Q. And, in fact, you did review the transcript. Right?
A. That's correct.
Q. And you were given the opportunity to make changes to the deposition transcript to any errors. Right?
11:54 A. Yes.
Q. And, in fact, you did make edits to correct any mistakes in the deposition transcript. Right?
A. That's correct.
Q. And, in fact, those edits were both to the translation aspects of the deposition and to the transcription. Correct?
11:55 A. That's correct.
Q. And you swore that those were the only edits that you had to the transcript. Right?
A. That's correct.
11:55 Q. And, in fact, in that deposition you were asked about the

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document that is now JX 7. Right?

THE COURT: Just a minute.

Mr. Chen?

MR. CHEN: Your Honor, improper impeachment.

THE COURT: Well it's certainly a long run up to it. We haven't gotten there yet. Overruled at this point.

Counsel, approach the bench.

(The following was had outside the hearing of the jury.)

THE COURT: I gather with all these questions, Mr. Hanba, you are intending to impeach the witness with his prior deposition?

MR. HANBA: No -- well, I may. It depends on what his answer is here. I don't know what his answer is.

THE COURT: I don't have a copy of his deposition, and if you're going to impeach him with it, I need a copy so I can follow along after you refresh him, but I'll leave that to you if you get to that point.

MR. HANBA: I didn't think we were going to, but I didn't think it was going to be --

THE COURT: All right. Then let's proceed.

(The following was had in the presence and hearing of the jury.)

THE COURT: All right, counsel. Let's proceed.

Q. (BY MR. HANBA) Do you remember the question, sir?

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11:57 A. No.

Q. And, sir, during your deposition you were asked about the document that is now marked as JX 7. Correct?

11:57 A. Well, it seems familiar, but it doesn't seem familiar at the same time.

Q. What do you mean by that?

11:57 A. I don't recall what documents were presented to me at that time.

MR. HANBA: Your Honor, may we hand up binders to the witness?

THE COURT: This is the prior deposition?

MR. HANBA: It is, Your Honor.

THE COURT: Yes, you may. And the Court needs one

11:58 as well. This is why we do this at the beginning of a witness so we don't have to interrupt in the middle of the examination.

MR. HANBA: I apologize, Your Honor.

THE COURT: All right. Proceed, Mr. Hanba.

11:59 Q. (BY MR. HANBA) Sir, if you would please look at, for example, page 60 through 62 of your deposition, and please

11:59 read it to yourself.

THE COURT: Counsel, you're going to reference three separate pages of his deposition? I mean, you need to target a specific prior statement that you believe is inconsistent with the testimony he's given today.

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Q. (BY MR. HANBA) Sir, would you please look at page 61, I
11:59 believe it is line 23 through 62, line 6?
12:00 I'm sorry, Mr. Hung. My notes are absolutely wrong and I
apologize to you and I apologize to the Court.
Would you please look at page 94, line 8 through, for
12:00 example, line 18. And, again, I apologize.
A. I'm done.
Q. And, sir, does this refresh your recollection as to
whether you were asked about the document, which is now
labeled as JX 7, during your deposition?
12:02 A. Yes.
12:02 Q. So let me ask that question again. Were you asked during
your deposition about the document which is now labeled JX 7?
A. Yes.
Q. And, sir, in fact, this is the first time that you've
12:02 attempted to explain the data in JX 7, isn't it?
A. That's correct.
Q. Because when you were asked about the document, which is
now JX 7, during your deposition you were unable to answer any
questions about it. Isn't that right?
12:03 A. That's not correct.
Q. You were unable to answer questions during your
deposition when asked about JX 7. Correct?
12:04 A. That's correct.
Q. In fact, this is the first time that you've attempted to

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explain where the data in JX 7 came from. Right?

12:04 A. That's correct.

Q. In fact, this is the first time that anyone has attempted to explain where the data in JX 7 came from. Correct?

12:05 A. My apologies. I don't know what your question mean.

MR. HANBA: No further questions, Your Honor.

THE COURT: You pass the witness?

MR. HANBA: I pass the witness.

THE COURT: Is there redirect?

MR. CHEN: Yes, Your Honor.

THE COURT: All right. Proceed with redirect.

REDIRECT EXAMINATION

BY MR. CHEN:

Q. Mr. Hung, do you still have your deposition transcript?

12:05 A. That's correct.

Q. Can you turn to the first page?

THE COURT: Mr. Chen, he's here to answer questions; he's not here to read or regurgitate his prior deposition. If he testifies inconsistently with what he says in his

12:05 deposition, then his deposition may be referenced to show that inconsistency; but, otherwise, his testimony should be what you elicit from him verbally today, not a re-reading of what he stated in an earlier deposition.

MR. CHEN: Yes, Your Honor. That's not my intent, but thank you, Your Honor.

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THE COURT: All right.

Q. (BY MR. CHEN) Mr. Hung, do you recall that you were deposed in this case on May 16th of 2024?

12:06 A. That's correct.

THE COURT: That's already been established.

MR. CHEN: Yes, Your Honor.

Q. (BY MR. CHEN) The -- do you recall, sir, being asked questions by me during that deposition?

A. Yes.

Q. And do you recall answering my questions concerning what

12:06 is now labeled JX 7 during that proceeding?

A. That's correct.

12:07 MR. CHEN: Mr. Buck, can you pull up JX 7 again? And can you do the same filter for the E410MA? And go to the

12:07 bottom of the filter and show the auto sum under columns -- I'm sorry. I believe it was CW and DA, if I recall correctly.

Q. (BY MR. CHEN) Mr. Hung, I want to clarify what you said

12:08 during cross. If the Court wants to determine which of the accused MOSFETs were qualified for all E410MA models, would they need to go through this filtering process to see what are the MOSFETs that have been qualified for all E410MA models?

12:09 A. Yes.

Q. Out of the over 633,000 units that have been sold, do all

12:09 of these E410MA models have the exact same configurations and contain and qualify the exact same MOSFETs?

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12:10 A. That's correct.
Q. For all 633,000 models?
A. Can you repeat the question?
12:10 Q. For the over 633,000 models of E410MA products that are shown in the current filtered results, would we need to look at columns F through M again to see which are the qualified MOSFET components?
12:11 A. Yes.
MR. CHEN: We pass the witness, Your Honor.
THE COURT: Is there further cross examination?
MR. HANBA: No, Your Honor.
12:11 THE COURT: All right. You may step down, Mr. Hung.
MR. CHEN: Your Honor, permission to approach?
THE COURT: Approach the bench.
(The following was had outside the hearing of the jury.)
THE COURT: Let's speak in the microphone.
What is it, Mr. Chen?
12:11 MR. CHEN: We just wanted to point out that at the start of the direct there was a slight translation error with regard to the name of ASUSTek. The parties had agreed how it should be translated, so we wanted to bring that to the Court's attention.
THE COURT: All right. So noted.
I mean, does that cause you any concern, Mr. Hanba?

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MR. HANBA: That there was a mistranslation? No, Your Honor.

THE COURT: You're not proposing any action of a curative nature of any kind, are you, Mr. Chen?

MR. CHEN: We would like it to be -- the record to reflect it should be ASUSTek Computer, Inc., the name of his employer.

THE COURT: Well, he's off the stand and he's not going to be recalled. You-all discuss it. I mean, that's a purely factual matter. If there needs to be some stipulation based on an agreement to correct or clarify something, I'll listen to that, but otherwise we're going to break for lunch at this point. Okay?

MR. CHEN: Thank you, Your Honor.

MR. HANBA: Thank you, Your Honor.

(The following was had in the presence and hearing of the jury.)

THE COURT: Ladies and gentlemen, we're going to break for lunch at this point. Please take your notebooks with you to the jury room.

Please remember all my instructions about not discussing or communicating with each other about the case, and we'll continue after lunch with the next Defense witness.

The jury's excused for lunch.

(Whereupon, the jury left the courtroom.)

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THE COURT: All right, counsel. Is there anything that I need to hear from you on before we break for lunch?

MR. HANBA: No, Your Honor.

12:13 THE COURT: We stand in recess for lunch.

(Lunch recess.)

THE COURT: Be seated, please.

01:13 All right. Defendant, are you prepared to go forward with your next witness?

MR. McMAHON: Yes, Your Honor.

MR. HANBA: Your Honor, if I may we have one quick clarification with regards to the meeting before recess.

THE COURT: All right. You're talking about the conference here at the bench.

MR. HANBA: Yes, yes, Your Honor.

THE COURT: I was told there was an unintended interpretation error in the name of the employer of Mr. Hung. Is that right?

MR. HANBA: Yes, Your Honor. We've agreed that a

01:14 curative instruction is appropriate based on a mistranslation of ASUSTek Computer Co., Ltd., should be ASUSTek Computer, Inc.

THE COURT: So it was mistranslated as ASUSTek

01:14 Computer Co., LTD., and it should have been ASUSTek Computer Technology, Inc.?

MR. HANBA: ASUSTek Computer, Inc.

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THE COURT: Computer, Inc. You agree with that Mr. Chen?

MR. CHEN: We do, Your Honor.

THE COURT: All right. I'll give that agreed-upon instruction as soon as the jury comes in, and then we'll proceed with the next defense witness.

MR. CHEN: Thank you, Your Honor.

MR. HANBA: Thank you.

THE COURT: Let's bring in the jury.

01:15 (Whereupon, the jury entered the courtroom.)

THE COURT: Welcome back from lunch, ladies and gentlemen. Please have a seat.

Before I ask Defendant to call their next witness, there's one matter I need to go over briefly with you, ladies

01:15 and gentlemen. Apparently during the testimony of Mr. Hung who testified just before lunch with the aid of the interpreter, he identified his employer or the interpreter misinterpreted the name of his employer and it was indicated at that time to be ASUSTek Computer, Co., LTD.

The parties have agreed and I am instructing you that it

01:16 should have been ASUSTek Computer, Inc., as Mr. Hung's employer. So I want to clarify that.

All right. Defendants, call your next witness.

MR. McMAHON: Your Honor, Defendants call Dr. Stanley Shanfield.

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THE COURT: All right. Dr. Shanfield, if you'll come forward and be sworn, please.

(Whereupon, the oath was administered by the Clerk.)

01:17 THE COURT: Please come around, Dr. Shanfield; have a seat on the witness stand.

MR. McMAHON: And, Your Honor, we have binders. May we approach?

THE COURT: Let's distribute those, please.

01:17 All right. Mr. McMahon, you may proceed with direct examination when you're ready.

MR. McMAHON: Thank you, Your Honor.

May it please the Court, before I begin, I wanted to preview for the Court that a little bit later in the examination, we do intend to use a board with the easel. I'll alert you at that time and seek leave.

01:17 THE COURT: You have leave to use it in the same manner it's been used earlier in the trial.

MR. McMAHON: Thank you, Your Honor.

THE COURT: All right. Let's proceed.

STANLEY SHANFIELD, Ph.D.,

having been first duly sworn, testified under oath as follows:

DIRECT EXAMINATION

BY MR. McMAHON:

Q. Good afternoon, Dr. Shanfield.

A. Good afternoon.

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Q. Could you please take a moment to introduce yourself to the jury?

A. Sure. My name is Stan Shanfield, and I can tell you a little about my background. I have a Bachelor's degree from the University of California in physics, and then I decided to go across the country to MIT to get a Ph.D. in physics again.

Would you like me to continue?

Q. That's enough for you. I'll give you some more questions. [redacted]

A. Oh, sure. [redacted]

THE COURT: Dr. Shanfield, pull the microphone a little closer, please, sir.

THE WITNESS: Sorry.

THE COURT: Thank you.

Q. (BY MR. McMAHON) And I do also want to make sure, Dr. Shanfield, can you hear me okay?

A. Yes.

Q. Okay. [redacted]

A. [redacted]

Q. You started to talk about your education. Could you please give the jury just a brief overview of your educational history?

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A. Sure. Well, I think you heard the first part, and that
01:19 was Bachelor's in physics and then a Ph.D. I have always been
interested in science, and my father was a professor actually
at the University of Houston. So I'm familiar with -- I came
down here in the summers. [redacted]
[redacted]
Then I went to a company called Raytheon up in
01:19 Massachusetts, and there I was made familiar with
semiconductor processing. My physics background was this
condensed matter physics, which is what transistors are, and I
got hands-on experience building many devices, but MOSFETs in
particular. It was --
Q. Thank you, Doctor. Just you're getting a little bit
ahead of me. But I understand. Thank you very much.
01:20 So what year did you get your Ph.D.?
A. In 1981.
Q. And where did you go right after that?
A. That's Raytheon. I had been -- I stayed there for 15
years.
Q. And what does Raytheon do?
A. Raytheon is a -- mostly a defense contractor, but they
had a commercial division as well.
Q. What did you do for Raytheon?
A. A lot of things. Raytheon was a builder of the Patriot
01:20 Missile Defense System, and I had some work actually with

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power transistors, MOSFETs, and their phased array radar that detects the incoming missiles.

Q. Anything else -- any other experience at Raytheon that might be relevant to this case?

A. Yeah, quite a bit. There was a lot of experience I had in starting as a staff engineer basically building chips and transistors and experimenting with laying them out, going in the lab, seeing how they're built, learning from technicians actually how you really do it, and testing them.

So I had that chance to work in the fab in a clean room. And after that, I ended up getting promoted, section manager, and then laboratory manager, and then eventually I became director of the Raytheon semiconductor manufacturing facility in Andover, Mass.

Q. Where are you currently employed?

A. I am at Draper Labs. That was a spin-out of MIT. It's a non-profit.

Q. And I want to come back to Draper in a moment. But before we do that, just to fill out your background, are you a member of any professional organizations that may be relevant?

A. Yes, several. Well, I'm a member of the IEEE, which is the International Institute of Electrical Engineers. I'm a member of the American Physical Association, which is a physicists organization, and probably several others.

Q. And we're here about patents. Sir, do you have any

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patents as an inventor?
A. I do, yes. I think around 12 or 13.
Q. Have you written any papers that are relevant to semiconductors or MOSFETs?
A. Yes, quite a few. And I'm still hearing about them, yes.
Q. During the course of your career, have you won any awards or distinguishing notable features?
A. Yes. Actually a few. The one I guess I could zero in on was in 2018, I won the Draper Award for the best patent. And the thing I liked about it was you got $500 along with it, so I felt like there was a team that did it but they awarded it to me.
Q. And Draper -- Draper is associated with a university. Correct?
A. Yes.
Q. What university?
A. MIT. We're right next door.
Q. That's the Massachusetts Institute of Technology?
A. Yes.
Q. So where do you live currently?
A. [redacted]
[redacted]
Q. Why did you decide to go down the path of this career?
A. Ahh. As far back as I can remember, I was fascinated with science and technology and having a father who's a

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professor of chemistry who showed me all this gee whiz stuff, and I would -- I was pretty soon building my own electronics.

I remember wiring up my doorknob to my room with 20,000 volts to keep my brother out, and he got suitably mad about that when he got shocked. So the fascination is still there, I still feel it, and I feel lucky be able to be doing science.

Q. What is your title currently at Draper Labs?

A. I'm technical director and a distinguished member of technical staff.

Q. How long have you been at Draper?

A. Since 2003, so that would be about 20 years.

Q. And what types of things do you work on in your role at Draper?

A. It's the same kinds of thing I did at Raytheon, except it's more on a system level. So we build equipment and systems that mostly for either space, for example, something that would go up in a satellite, the electronics. We do navigation and control. So how your jet plane lands on a runway automatically, we have a system that does that. You may not be aware of it, but a machine is usually doing the landing. So that's the kind of thing that we do.

Q. During the course of your career, have you had an opportunity to work with MOSFET technology and, in particular, trench MOSFET technology?

A. Yes; multiple times.

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Q. Can you provide an example?
A. Yeah. Well, in the 1980s, there was a lot of activity in
01:26 that area. And that's when I was just starting at Raytheon.
And so I had many opportunities to build silicon-based
MOSFETs, trenched MOSFETs, after people learned that that made
them work better. And I remember, you know, many hours of
either being involved in laying them out or testing them. So
01:26 those phases would go into Raytheon defense systems or
commercial systems.
Q. Were any of those trenched MOSFETs?
A. Yes. It turned out trenched MOSFETs really give you a
better result than some of the earlier planar MOSFETs, so we
switched once we realized that.
Q. And I believe you said this project you're talking about
now was in the 1980s?
A. That was the late '80s, yes.
01:27 Q. Any other examples from your career where you worked with
trenched MOSFET technology?
A. Yeah, the one memorable one, I was the lead for
development of the iridium phone. It was this big bulky
thing, but it could -- it would talk to satellites and you
could use it anywhere in the world. And I remember the
commercial showing some guy on the North Pole calling his
01:28 mother. And the thing was high power, but it used MOSFETs
that came out -- at that point I was a lab manager, came out

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of my lab, and eventually we handed them over to a larger fab. So that was one.

Q. And you've said fab a couple of times. What does that mean?

A. A fab is short for a factory that makes silicon chips and, for example, silicon MOSFETs.

01:28 Q. Is it sometimes referred to as fabrication?

A. Yes.

Q. In those experiences you just described, have you ever had occasion to design a trench MOSFET?

A. Yes, many times. There was a lot of attention paid to how you laid things out, how you -- much power you could get from a chip of a certain size. So I'd done multiple layouts.

01:28 Q. Have you had a chance to build or fabricate a trench MOSFET?

A. Yes, many times, and I've played with their dimensions with what process goes into them, all kinds of details about the way that the device is built to try and make it better.

Q. Have you done analysis of trench MOSFETs after they've been built?

A. Absolutely. That was an important thing to take the result that came out of the fab and bring it over to the test

01:29 lab. And because these things were high power, you had to have specialized equipment. Sometimes you'd run them at a high frequency, and I remember lots of times doing that kind

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of measurement.

Q. Looking at it more broadly, beyond trench MOSFETs, do you have experience with other types of semiconductors?

A. Yes. We had an integrated circuit layout group that I

01:29 eventually became responsible for and so we'd make chips, chips for -- some of them were for Raytheon. Mostly they were chips for things like the radar, and actually those use MOSFETs, too, the radar in the F-22 that's in the nose cone of the plane. I got to actually pop one open and on a real plane. But the -- those were MOSFETs and some integrated circuits that ran them.

01:30 Q. Dr. Shanfield, you've mentioned a couple of government-type projects. Do you have any sort of security clearance?

A. I do.

Q. So I assume there may be some things you can't tell us about in this open courtroom.

A. Yeah, and I'm not telling you.

MR. McMAHON: Your Honor, at this time we move to qualify Dr. Shanfield as an expert in the field of design, fabrication, and analysis of semiconductor devices, including trench MOSFETs.

THE COURT: Is there objection?

MR. HANBA: No objection.

THE COURT: Without objection, the Court will

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recognize this witness as an expert in those designated fields.

All right. Please continue, Mr. McMahon.

Q. (BY MR. McMAHON) Dr. Shanfield, I'd like to take a step back. We've heard a fair amount about MOSFETs, but could you take a moment and explain to the jury, what is a MOSFET?

A. Yeah. I think you've heard it explained as a switch, turns on and off electric current. And I think that's a pretty good explanation.

Another way to think of it is the faucet, the gate is the faucet handle that you turn on and off, and the source is the water coming into the faucet. The water coming out is the drain. So kind of sounds like a faucet, too.

Q. When were MOSFETs, just generally, not just trench MOSFETs, but when were MOSFETs invented?

A. The first transistors were invented in Bell Labs in late '50s. Those were junction FETs. The MOSFETs were in the '60s, so it was way back.

Q. To your knowledge, was it Force MOS that invented them?

A. No. I don't think they existed.

Q. What about trenched MOSFETs. When did those begin to appear?

A. There was people experimenting with them in the '70s, but they became known, I guess, in the '80s. That's when I got a chance to build them, and there was a lot of activity because

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they had these beneficial features.
Q. How do trench MOSFETs compare, similarities or differences, to other types of MOSFETs?
A. They are good for carrying high current and running high power. So if you want to run a drill, then there's a lot of power required. And a MOSFET, if you want to have it be variable speed, has to vary the power that goes into the drill. And they're a good device for that type of application.
Q. I'd like to zoom out even a little bit further and just talk about some fundamentals of semiconductors.
Can you please explain for the jury, what is a semiconductor?
A. Yeah. It sounds mysterious, but all it is it's neither a conductor or an insulator. So it sometimes conducts electricity and sometimes it doesn't. If you manipulate it just right, you can have a gate that makes a conduct or not conduct. So that's why it's called a semiconductor.
Q. How are semiconductors devices made?
A. They are done by starting with a silicon wafer.
Q. What is a wafer?
A. Well, I think I have a demonstrative to show that.
MR. McMAHON: Mr. Buck, can you please bring up DDX 7.3?
Q. (BY MR. McMAHON) Dr. Shanfield, is this the

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demonstrative you referenced?
A. Yes.
Q. I see five letters here A, B, C, D, E. Could you begin with A and describe to the jury what we're seeing here in this graphic?
A. Sure. That silicon wafer, it's actually a result of being cut out of this thing called a boule. It's probably
01:34 about that size in cross section and about that long. It's all silicon, solid silicon, and you saw it into really thin like slices of bread, and that's what gives you that silicon wafer. So those -- that silicon is very pure.
Q. And what about B?
A. Okay. Well, once you've got a wafer, you now need to
01:34 build chips on it, and the fabrication steps, which are pretty involved, as you already heard, are things like putting dopants into the material, etching away parts of it, adding material to it, and you end up with this pretty flat-looking device that might have current running through the wafer. But there -- it's made in chips, so that little -- those little
01:35 squares in the diagram B are the chips that I'm referring to.
They're actually -- there are many more of them than are shown there. And those little squares are where the MOSFETs, for example, would be that there will be thousands of them on a single wafer.
Q. If we hear the term 'computer chip' or 'electronic chip',

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is that the type of thing you're talking about?
A. It is. That's exactly what it is. Computer chips are integrated circuits. They have a lot of transistors that
01:35 aren't power transistors. A trench MOSFET, on the other hand, is a power transistor, and there might be one or two of them on each chip.
Q. What happens after the silicon wafer has been converted into those chips? What's the next step?
A. Then it goes to -- if you look in that broken lines square on the left, it goes through a saw. It's a very
01:36 specialized kind of saw, and it's called dicing, and actually nowadays people use lasers to cut the silicon wafers. And, strangely enough, it's called stealth dicing. I don't even want to explain why, but it divides up those chips.
Q. And is -- what's the word for just one chip after it has been sliced up?
01:36 A. The usual reference is die. It's a D-I-E, or almost like a machinist die.
Q. Is that what we see under the letter C here?
A. Yes.
Q. So moving on to D, what does this graphic illustrate in step D?
A. That's after the die have all been cut up from the wafer, and they're about to head to packaging. But usually they get tested to make sure they actually work.

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Q. And then what about step E?
A. And that's the package. It's this metal box or it could
01:37 be plastic. In fact, nowadays it's usually plastic. You
stick the chip in there, you attach wires to it which are
really tiny wires usually, and you cover it with epoxy. And
it's now reliably trapped in the epoxy, and it has these legs
attached to the wires that you stuck in there so that you can
get electrical access to the chip.
01:37 Q. You mentioned doping a few minutes ago. Can you please
explain for the jury, what does doping mean?
A. Yeah. Well, I think I said earlier that semiconductors
can sometimes conduct and sometimes insulate, and what affects
that is this thing called doping. And I think a good way to
think about it is salt and pepper.
01:38 So if you think of salt as the N type doping, you
sprinkle a little salt on the semiconductor, and under the
right conditions it can conduct. You can sprinkle a little
pepper on a nearby area of the wafer, and where those two,
salt and pepper, come together, you get various operations
like the way a MOSFET works.
Q. What are the terms that we use to refer to the two
different types of doping?
01:38 A. They have the names N-type for negative, and negative
being the electrons in the semiconductor, and P-type, and
P-type is the lack of an electron. A hole is actually what

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it's called. It moves around like it's a charged particle so there's electrons that are really real and holes that are a lack of electron that turns out to act just like a particle.

01:39 Q. And in your analogy of salt and pepper, what are the things that are actually being spread onto the semiconductor in doping?

A. It's elements that will make the semiconductor either salty or peppery. And that is stuff like boron or arsenic.

Q. Is doping something new or has it been around for a while?

01:39 A. It's been around a long time, since the beginning, as I said, from Bell Labs.

Q. Another term we've heard a lot about this week is SEM. Are you familiar with that?

A. Yes.

Q. What does SEM mean?

A. That stands for scanning electron microscope.

Q. What is a scanning electron microscope?

A. That is something I think maybe my demonstrative --

MR. McMAHON: DDX 7.4, Mr. Buck.

01:40 THE WITNESS: How do I get rid of this red line I accidentally put on it? Clear. Thank you.

Q. (BY MR. McMAHON) Dr. Shanfield, what do we see in this graphic in DDX 7.4?

A. Okay. I don't want to bore you guys, but it's really

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pretty interesting how it works.

What you have is in that thing that's called a sample stage at the bottom, the chip that you want to look at, for example. It's under vacuum. So it's like it's in outer space. And that big column up above is what shoots the electrons down onto the sample. It actually scans the electron across the sample like a television kind of scans and forms a picture from the electrons bouncing off.

Q. What -- how does the SEM machine, the microscope, detect the electrons?

A. There is a thing on the left in that diagram called SE detector, it's a secondary electron detector. That's the usual way. And so all it's doing is adding up -- counting up electrons.

Q. You mentioned the sample stage. What types of things can you put on that sample stage to use the SEM to look at?

A. Well, when I first learned how to run one, and not that well, either, but I stuck a fly in there and you could look at the fly's eye, which is really interesting. But normally people put in either chips or biological samples. You can see amazingly small things because it's much stronger magnification than just a regular light microscope.

Q. Is there anything you need to do to a sample in order to put it into an SEM machine?

A. Yes. Like with the fly, you had to put iridium on it so

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that it wouldn't charge up. And that's true in chips, too. Because it's an electron beam, it has these negative electrons coming in and it will charge up the object that it's scanning on.

So you usually you use iridium or some other metal like that in a very thin film, and that removes the charge and doesn't let it build up.

Q. Thank you, Doctor.

I'd like to turn to the work that you've done on this

01:42 case. And my first question is, how are you being compensated?

A. I am -- my original fee was $375 an hour. Just recently I've gone up to 450 because it seems like everybody else is doing it, too.

Q. And how much time have you spent on your work in this case?

A. Let's see. Well, up to the depositions, I was doing -- had done more than 200 hours, and I'm sure I've put

01:43 in at least another couple of hundred hours. So it's been a lot of work.

Q. So more than 400 hours total?

A. That's right.

Q. Do you recall how much time Dr. Neikirk had spent?

A. I think he said his net after his deposition was like 70 hours?

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Q. And up to this point in the case, do you recall the number he said?
A. Something like 200.
01:43 Q. Is your compensation in this case tied in any way to the substance of the opinions you're providing?
A. No.
Q. When did you begin work on this project?
A. As I remember, it was early 2023.
Q. And when did you receive -- your opinion -- you have provided opinions in response to Dr. Neikirk. Correct?
A. Yes, that's right.
Q. When did you receive Dr. Neikirk's opinions?
01:44 A. That was May 20th, I think, of this year. I mean, I'm sorry, last year. So it was just as spring was ending.
Q. And when did you respond to Dr. Neikirk?
A. I remember that really well because I only had three weeks to respond, and it was a voluminous, you know, I think it's like a 500-page report and I needed to not only read it but formulate what I was going to say in response. So I had
01:45 three weeks. I think it was June 6th or something like that.
Q. June 11the maybe?
A. Okay, June 11th.
Q. When you look at patents, there's a particular perspective that we need to use. Right?
A. Yes.

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Q. What is that called?
A. You have to view the patent from the point of view of a person of ordinary skill in the art, and all that is is a
01:45 fancy name for your average engineer who's looking at this patent.
Q. And in your case, I believe you proposed a specific level of ordinary skill in the art. I'll just read it for you: Master's degree in electrical engineering or a related field and had at least two years of relevant work experience in the field of integrated circuit design and manufacturing. Did I get that right?
A. Yep. That's right.
Q. And is that the level of ordinary skill in the art that you have applied in this case?
01:45 A. Yes, it is.
Q. As I recall, Dr. Neikirk had a slightly different view of the person of ordinary skill in the art. Is that correct?
A. Yeah, there was some small differences. It wasn't really substantive.
Q. Did Dr. Neikirk's differences impact in any way the outcome of your opinions in this case?
A. No. I could have used his just as well.
Q. Okay. I'd like to turn to the '634 Patent, please.
01:46 MR. McMAHON: Mr. Buck, if we could bring up the patent, please.

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Q. (BY MR. McMAHON) And, Dr. Shanfield, could you provide just a very brief overview of the patent as you understand it?
A. Sure. Probably it's best to start with a picture and a figure -- that figure I think is figure -- is it 5A?
Q. Actually let's go to figure 1 first before we get to that point.
MR. McMAHON: Mr. Buck, thank you.
Q. (BY MR. McMAHON) Actually before you begin,
01:46 Dr. Shanfield, figure 1 says prior art in parentheses. What does that mean?
A. What that means is that was the state of the art at the time, and I remember those times when that's what a trench MOSFET looked like before this patent.
Q. And what -- I'd like to focus your attention on one item in particular, and that is labeled 108. What is that element?
01:47 A. That is, as you can see it, it's called P+. What it represents is an area that's doped in this P way, like pepper, but highly doped directly under 111 which is the source contact, so you see one on that one and one on the right-hand one.
Q. Is 108 what the '634 Patent refers to as the base contact layer?
A. That's correct.
Q. Before we move on, there was a -- do you recall the
01:47 discussion of ruggedness with respect to this patent?

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A. Sure.
Q. What does that mean?
A. What they're talking about and, in fact, what both patents we're going to talk about here are looking to optimize is how much voltage and current can you run through this transistor before it burns out. If it's rugged, if it can tolerate a lot of current and voltage. So that's the meaning, and that's the focus.
01:48 MR. McMAHON: Let's turn, please, to figure 2G, Mr. Buck.
Q. (BY MR. McMAHON) Dr. Shanfield, this figure looks similar but not quite the same. Can you talk about the differences, please?
A. Yeah. It's almost the same. The difference is this 209, and it's under or next to the source contact surrounding it. So you'd call it the source contact wall, and that's a lateral
01:49 doping layer of P*.
Q. Is that what the claims refer to as the lateral contact layer?
A. Yes; correct.
Q. And that's what's labeled 209?
A. Yes.
Q. How does the -- according to the '634 Patent, how does the lateral contact layer increase ruggedness for the device?
A. The inventor said that because you make a better

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electrical contact with the P layer, that's that cross hatch 205 layer, that you'll end up avoiding this effect called latch-up, or punch-through is another description for it.

Q. What is latch-up or punch-through?

A. It's an effect, and actually people found out about it by really building these things at first, and then figuring out what happened. But it's an effect where the device essentially freezes up and shorts out. It usually burns in the device but not always, and you definitely don't want your device running at high power to suddenly freeze up and burn out with all this power running through it.

Q. Under what circumstances might that type of punch-through occur?

A. That occurs in the situation where you're pushing the device to its limits. So you're running it at its limit in voltage and its limits in current.

Q. Outside of those circumstances, in your opinion is there a need for the '634 Patent invention?

A. No.

MR. McMAHON: Let's go to figure 3A, please, Mr. Buck?

Q. (BY MR. McMAHON) Dr. Shanfield, what does the '634 Patent show in figure 3A?

A. Well, this is trying to show the reader what the technique is for creating that P+ layer region in the device

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that you saw on the first two diagrams.
Q. So this is an example the patent provides for how to create the base contact layer?
A. Correct, yes.
Q. Can you describe what's being illustrated here?
A. Yeah. I think probably the best way to think about the ion implant, it has -- the ions are a dopant like boron, let's say, and you think of it like hail coming down. So it's coming straight down an ion implanter and it's banging into the silicon and getting stuck in the silicon at the bottom and that dopes the material P+.
MR. McMAHON: Mr. Buck, if we could go to figure 3B.
Q. (BY MR. McMAHON) And this is another example provided in the patent, Dr. Shanfield. What do we see in this example?
A. Yes. When you want to coat the walls with hail, you can't go straight down and you can't depend on taper; you have to take -- the ion implanter, literally put it at an angle with respect to a hole via that's labeled 224. So it's showing the angled implant just schematically.
Q. And this is an example the '634 Patent provides for how to create a lateral contact layer?
A. That's right, yes.
Q. Let's turn to the claim, please.
MR. McMAHON: Mr. Buck, if we could go to claim 1.
Q. (BY MR. McMAHON) And, Dr. Shanfield, this claim bridges

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two columns, so we've put the two pieces together. Can you see that?

A. Yes.

Q. Okay. Are you familiar with this claim?

A. Yes, I am.

Q. You've studied it?

A. I have.

Q. Okay. Is there a particular feature that you have

01:53 focused on in claim 1?

A. Yes.

Q. Is it -- is there a number or a letter that you've used to refer to that?

A. Yeah. I divided it up into elements, and this one was -- turned out to be element 1[g].

Q. Is that the term that begins with "a plurality of source contact trenches"?

A. Yes, correct.

Q. And if you read down a few more lines, I see the words, "Lateral contact layer" there. Do you see that?

A. That's right.

Q. Is that what you're referring to?

A. Exactly.

01:53 Q. Why did you focus on this particular feature of claim 1?

A. This is really the basis for the invention.

Q. This is what distinguished it from the -- from what was

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there before?
A. Right. Exactly.
Q. While we're looking at the claim, I want to just go back to fundamentals a little bit. Were you here during opening statements?
A. Yes.
Q. At the time I talked a little bit about the instructions we would receive from the Court on infringement and how if
01:53 you're missing even a single limitation of a claim, there's no infringement. Do you recall that?
A. Yes, I do.
Q. Have you considered that in your analysis of this case?
A. I have.
Q. Okay.
A. You had that stool analogy.
Q. Exactly. The Court has provided a construction for all of us to use for that phrase 'lateral contact layer'. Right?
A. Yes.
MR. McMAHON: Mr. Buck, can we please bring up the Court's claim construction for lateral contact layer?
01:54 Q. (BY MR. McMAHON) Dr. Shanfield, this construction is a mouthful so I'm not going to ask you to read the whole thing aloud, but I want to focus your attention in the middle on what is in parentheses and reads, P* doping. Do you see that?
A. Yes.

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Q. What is P* doping in the context of the '634 Patent?
A. Well, I thought maybe taking this coffee cup would be a good way to explain. Here is the via, the P+ that I showed
01:54 you is down here, and the P* is the stuff along the side in the body layer, the P layer.
So it's got a doping level that's in between the P+ and the P layer out here. So it's on the side completely covering all the walls of this via.
Q. And P* means like an intermediate doping level?
A. Yeah, that's the intent.
01:55 Q. Okay. Did you reach a conclusion -- did you study Dr. Neikirk's opinion regarding infringement with respect to the lateral contact layer and P* doping?
A. I did.
Q. And did you -- in the end do you agree or disagree with Dr. Neikirk?
A. I disagree with what he is pointing to as evidence that it's there.
Q. And we'll come back to that evidence in a little bit, but just briefly why do you disagree with him?
01:56 A. Basically he shows no measurement of the P* layer, and you have to do a measurement to show that it's there.
Q. Why is that?
A. Otherwise, you're basing it on your assumptions. And in a lot of cases, particularly in these devices, assumptions get

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you into trouble.

MR. McMAHON: Mr. Buck, can we go back to claim 1 as a whole, please?

Q. (BY MR. McMAHON) So, Dr. Shanfield, we began with this limitation that you referred to as 1[g] that includes the phrase 'lateral contact layer'. We've talked about that one.

Have you considered the other limitations of claim 1?

A. Yes, I have.

Q. And have you formed any opinions on those?

A. Yes.

Q. What are your opinions?

A. Well, my opinion is that in the proof -- the evidence that was claimed to show those were there, there was, for example, no measurement that showed the presence of a particular doping layer or evidence that this was an epitaxial layer. And so it turned out really I felt that almost all the other elements were not -- there was no evidence that was I thought legitimate to say they were there.

There's one exception is the source metal. I think Dr. Neikirk showed that, yes, metal was present.

Q. So you're questioning Dr. Neikirk's evidence.

A. Yes.

Q. Is it your opinion that every single one of these limitations is missing from the accused MOSFETs?

A. No, not necessarily.

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Q. You're just questioning his evidence.
A. Right. There's just no scientific proof of its presence, and that was -- that's kind of basic.
Q. Okay. We'll come back to the evidence in a moment, but first I'd like to look at the '409 Patent, if that's okay.
A. Sure.
MR. McMAHON: Mr. Buck, could we please bring up the '409 Patent?
Q. (BY MR. McMAHON) Dr. Shanfield, we see -- well, let me ask you a couple of basic questions about the patent first.
First, when was this patent issued?
A. Up in the right-hand corner, it says October 12th, 2010.
Q. And when was -- when did the inventor apply for this patent?
A. It -- he filed for it December 4th, 2006.
Q. Okay. And in general, what's -- could you provide just a brief overview of what this patent is about?
A. Yeah. Again, the inventor is looking to avoid that latch-up or punch-through problem in MOSFETs. And the way it's being done here is not having sharp edges between the gate and the source contact.
So you round them out, you make it sort of square with round corners, and it will be less likely to show -- to have punch-through at high power.
Q. We heard the word 'rugged' also associated with this

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patent?
A. Right.
Q. Can you talk a little bit about that, please?
01:59 A. So the shorthand for not having punch-through is that it's rugged, it can tolerate extreme voltage and current and not suddenly burn out because of a punch-through.
MR. McMAHON: Mr. Buck, could we bring up figure 3 of the '409 Patent?
Q. (BY MR. McMAHON) And, Dr. Shanfield, can you talk a little bit about the objective of the '409 Patent with respect to the word 'rugged' that you were just describing?
01:59 A. Sure. You're looking down here now on the device, so it's a plan view, so called, and what you see is this thing called a trench gate 210 all surrounding this source contact which is labeled 220.
By making the distance A and B as shown there more equal by rounding those corners as shown, you'll end up making the device more rugged.
02:00 Q. Is this what we see here in figure 3, is this an example of the claimed invention?
A. Yes, that's what's being shown here is one -- it's one example of multiple ones that are shown in the patent.
MR. McMAHON: Let's go to the claim, please. Mr. Buck, can we look at claim 1 of the '409 Patent?
02:01 Q. (BY MR. McMAHON) Dr. Shanfield, is there a particular

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feature of this claim that you focused on?
A. Yes.
Q. Which one?
A. I had broken them up into elements similar to the other patent, and I had labeled this one 1[a].
Q. Which of these is limitation 1[a]?
A. It's the one that says, "Said trenched gates." And it says, "Said trenched gates surrounding said transistor cells as closed cells constitutes substantially square-shaped cells with rounded corners."
Q. Have you considered the evidence that Dr. Neikirk presented that in his opinion showed infringement of that limitation with respect to the seven accused MOSFETs?
A. Yes.
Q. And have you reached an opinion?
A. I have.
Q. What's your opinion?
02:01 A. That he did not show evidence that it was really there.
Q. What's -- why not?
A. The procedure that was used in the device that was examined basically tore the device to pieces, and it was -- because it was a hot acid treatment, it attacks the layer that was supposed to be the thing that demonstrated this round -- substantially square with rounded corners. It
02:02 removed the gate that has the shape as we saw in that drawing

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which I guess is gone.

So all of that to me says this is not the quality of evidence that proves it was actually there. It could have well been caused by the attack from the acids that are used to expose that layer.

Q. We talked here about what you call limitation 1[a]. There are a few other limitations in this claim. Have you considered whether Dr. Neikirk demonstrated that those features are met by the accused MOSFETs?

A. Yes.

Q. And did you reach a conclusion?

A. I did.

Q. What's your conclusion?

A. Well, once again, the -- there was a lack of evidence that was of the quality and the scientific verification quality, I mean, that showed those elements were really there. Instead, it was statements like, I know MOSFETs have to have these characteristics in certain cases. And that's not proof; that's just an assumption.

Q. Is that statement true that all MOSFETs must have every one of these features?

A. No.

Q. Aside from the first limitation that's highlighted here on the screen, limitation 1[a], and the substantially square-shaped cells with rounded corners, aside from that, is

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it your opinion that every limitation of this claim is missing from the accused MOSFETs?
A. Right now, in looking at the evidence that was presented to me, yes, there are parts to this that I don't think are actually present or are certainly not being shown.
02:04 Q. And let me clarify. I want to distinguish between two different concepts. One is, are you saying that you disagree with Dr. Neikirk's evidence or are you saying that you affirmatively believe none of these features are present?
A. No, I don't affirmatively believe that they're not present. They could well be. What I do disagree with is the evidence shows they are present; that there needed to
02:05 be -- there was a start to showing evidence, but it never really was followed through. And so there is no evidence that I can look at and say, oh, yeah, that's definitely right.
Q. Have you in the course of this trial or any of your work on this case, have you seen any evidence to convince you that any of the accused MOSFETs actually have substantially square-shaped cells with rounded corners?
A. No, none.
02:05 Q. Okay. Let's turn to Dr. Neikirk's analysis. And the first thing I'd like to ask you, Dr. Shanfield, is did you -- you heard Dr. Neikirk testify yesterday?
A. Yes.
Q. And did you hear Dr. Neikirk's testimony about his claim

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that he directed the analysis that Microtech conducted?
A. Yes, I heard that.
Q. And did you have any reaction to what you heard?
A. Well, I had found out that he actually hadn't been present and hadn't directly interacted with the person doing this scanning electron microscope work or the etching. And so as far as I was concerned, his statement wasn't true. He did not direct the treatment of these samples and an investigation into them.
Q. Did that surprise you?
A. Yes.
Q. Why?
A. Well, I guess in my experience you have to be there because what always happened and looked like it happened here, too, is that the operator will -- or the SEM guy will do an etch, put it in the SEM, and you'll see, you know, a lot of the features are distorted or overetched.

And then you'll have to then point to the operator of SEM, the scanning electron microscope, and say, okay, this is what I'm looking for and this looks like you've, you know, applied aggressive etching and we need to back off on that amount of etching so that you can get the features shown in a way that's, you know, really proving it scientifically is there. And being there is a necessity.
Q. Dr. Shanfield, have you done this type of tear-down

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analysis in your own work?
A. Yes.
02:07 Q. When you have done this, have you been present?
A. Yes, always, much to the chagrin of the scanning electron microscope operator, but yes.
Q. Why do you -- and if you already answered this, tell me, but why do you want to be present?
A. Because it's a -- it requires you to be providing
02:07 instructions with direct feedback to what's being seen in the microscope. And you can't do it with even a zoom call or, you know, email. You have to be actually watching what they're doing, making sure things like, you know, charging isn't interfering with the look of this image, making sure that they're looking at the right place, and that -- going back and forth with the, you know, chemistry that's used to etch the
02:08 material and the SEM, scanning electron microscope, is what gets you to the right answer and a quality answer. And a lot of times you end up having to do it -- visit multiple times to get it right.
Q. Dr. Shanfield, you mentioned the word 'etching' a couple of times. Could you please explain for the jury, what does etching mean?
A. Yeah. The -- I think the best way to explain it is when
02:08 you pull a chip out of a package, well, that's hard enough because it's in epoxy and so you've got to scrape away the

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epoxy. And then if you can pry that thing out without damaging it, then the next thing you do is in order to get to, say, the view of the square with substantially rounded corners image, you have to dip that into hot acid and remove the layers above it. And there's several of them.

02:09 This stuff is pretty aggressive chemistry. You don't know what the chip's going to do the first time you stick it in there. There is no standard concentration until you test it with this chip.

So that etching, in other words, the removal of those layers is what's going on in the hot acid and then you clean it and you remove the next layer with acid or a base, and you

02:09 keep going until you get to the layer you want. And that's the procedure that was applied here.

Q. And did I hear you correctly that you're talking about hot acid?

A. Yeah.

Q. When I hear acid, I think of dangerous stuff. Is that the type of thing you're talking about?

A. Yeah. It's sulfuric acid, though it's kind of fun to throw other stuff into it. But I won't get into that.

02:10 Q. Dr. Neikirk presented some images of two types, and we've talked about one of them. That's the SEM. Right?

A. Yes.

Q. The other one I think he called EDS?

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A. Yes.
Q. What is EDS?
A. That's an electron dispersive spectroscopy.
Q. What can you learn from EDS imagery?
A. All that is is people figured out that when you're running a scanning electron microscope and you're shooting it with these electrons, that X-rays come off. And if you
02:10 analyze those X-rays, you can get kind of a gross idea of what the material is that you're actually scanning on.
It's not very sensitive. It doesn't detect certain elements. It's usually, you know -- it will let you know if a metal is present.
Q. Have you used EDS imaging?
A. Yes.
Q. For what purpose?
A. Usually to check to see if we're looking in the right spot, you know, is -- if this is a source metal and it has
02:11 nickel and titanium in it, then you want to see nickel and titanium so you know where you're looking. It's not quantitative -- very quantitative; it's very inaccurate.
Q. Do you have -- and I'd like to start with an overview, and then we'll go through some of the images one by one. But, first, do you at a high level have an opinion about the quality of the images that Dr. Neikirk showed yesterday?
A. Yes.

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Q. What is your opinion?
02:11 A. Unfortunately, those images to a one are not of -- I wouldn't say the work that was done was not high quality, but the images that came out on this draft run, which is what I see, were not going to reveal anything useful.

And that's not unusual. Like I said, when you're doing your first try with -- after you etch something and stick it
02:12 in the SEM, you -- you know, most of the time it doesn't work the first time, and you have to go back.

So I think the SEM guy was a good person and did the correct procedure to do the first draft, but then he never got any further.

Q. How do you know -- he never got any further what?

A. In other words, what he -- he started to try and do, as I remember a second round, in other words, he knew those images
02:12 were bad and I think you heard him when he was on that video deposition, that he saw all these black spots, which is bad news. That means there's missing material, that had been completely overetched. And the black spots told him he's got to back off. And he wanted to go back and do a more mild
02:13 treatment of the chip, but he never got a chance to do that.

Q. Why not?

A. I'm not entirely sure, but I guess I'd surmise that the instruction he was getting didn't ask him to do anything further.

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Q. Is it okay if we start going through some specific images?
A. Sure.
Q. Okay.
THE COURT: Before you do that, we're going to do what we did earlier today. You've been going about an hour or
02:13 right after lunch. I'm going to ask everybody to stand up, move around for about 30 seconds, and then we'll sit back down.
02:14 (Pause in proceedings.)
THE COURT: All right. Have a seat.
All right. We're back on the record. Please continue, Mr. McMahon.
MR. McMAHON: Thank you, Your Honor.
Q. (BY MR. McMAHON) And, Dr. Shanfield, I should have mentioned at the beginning, I know you found the cup, but there is water there if you need some at any time.
A. Oh, thanks.
MR. McMAHON: Mr. Buck, could we please bring up PDX 3.2?
02:14 Q. (BY MR. McMAHON) Dr. Shanfield, is this one of the images that we saw with Dr. Neikirk yesterday?
A. Yes.
Q. My first question is about the colors. Do you have an understanding of what the colors are here?

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A. Well, what was done is what I call degraph engineering or slide engineering. They covered the actual data, which is the scanning electron microscope image, with these colors, and you can't tell anything.

02:15 Q. Can you see the image underneath the colors?

A. Maybe the very top front source metal layer, you can look through. The rest, you can't.

Q. Do these colors tell you as an expert anything about the accused MOSFET?

A. No, not at all.

MR. McMAHON: Mr. Buck, if we could go to just the SEM images only. There we go.

Q. (BY MR. McMAHON) Dr. Shanfield, what do we see here?

02:15 A. So if I start on the left image, that's the view of the -- if you remember, the chip that goes into hot acid, when you remove all the layers, so you've repeatedly put it in hot acid cleaned it, a different acid to remove another layer, eventually you get to this view of the layer that has the gate that you're looking for the shape of.

What you see here is, first, there's debris on the upper

02:16 right-hand corner of that photo, and that means whatever etching they did wasn't adequate to completely remove the upper layers, and that usually means it was being pretty stubborn about being removed.

And -- but the most striking part is the black lines, the

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black shapes that are surrounding each source contact. And those to me and to anybody who's familiar with scanning electron microscope images says there's nothing there. It's etched away the material.

That material, and it may have been -- since it's gone, you can't say, but it may have been a poly silicon. That's a typical gate material. And, furthermore, you can see on the silicon, which is outside that black ring, that it's been etched as well.

What that means to me is you've got a damaged sample with black holes in it, and that isn't going to reveal what the shape originally was.

Q. What about the image on the right, Dr. Shanfield?

A. Now it's the cross section of the same piece, and again you have the black holes, missing gates and black holes there and underneath the source contact.

So you can't deduce any -- you certainly can't deduce with a scanning electron microscope image any doping levels, and I think Dr. Neikirk agreed with that. And the etch just attacked the material that you were interested in and removed it. And the black holes to me say, you better back off on the etch; let's try and get a better view.

Q. If you were conducting an SEM exercise and you saw this on your first run, what would you do?

A. Well, I'd, first of all, find out and talk to the person

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that did the etching what was the concentrations, because -- and I'd show him this image and say, look, we overetched this thing it's damaged, but why don't we try something milder or maybe we can experiment.

Q. Thank you, Dr. Shanfield.

MR. McMAHON: Mr. Buck, could we please have PDX 3.5.

02:18

Q. (BY MR. McMAHON) And, Dr. Shanfield, we have a series of these. So I'd like to go through them, and if you're seeing the same thing, feel free to say that. If you see something new, maybe we can elaborate. But I'd like to go through these relatively quickly if we can.

So with that said, looking here at PDX 3.5, what do you see here?

A. Yeah. So the one on the left, which is supposedly the substantially square with rounded corners. The gate's missing again. It's just a very fussy image. The one on the right,

02:19

you see the black holes again and the overetching. So it's the same problem.

MR. McMAHON: Mr. Buck, can we go to PDX 3.4?

Q. (BY MR. McMAHON) Dr. Shanfield, what do we see here?

A. Here on the left, what you see is these structures that have been attacked, and there's part -- partly debris on the surface that makes me not trust this as a way of finding out what the shape was.

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02:19 On the right, again, here you've got varying depths of etching in the P layer, if that's what it is, and then black holes where the N layer is, which means it removed what would have been the N layers, if this were what, you know, we were speculating it might be.

MR. McMAHON: Mr. Buck, PDX 3.6, please?

Q. (BY MR. McMAHON) Dr. Shanfield, what do you see here?

02:20 A. Same problem. The slots, the black holes. So it's removed material. It's been overetched.

MR. McMAHON: Mr. Buck, PDX 3.7, please?

Q. (BY MR. McMAHON) Dr. Shanfield, what do you see in PDX 3.7?

A. Big black holes. It's the same problem. It's highly etched, and it's consistent with what Mr. Diep had said he'd

02:20 done. He said it was overetched and that he wanted to try it again.

MR. McMAHON: Mr. Buck, PX 27, please?

Q. (BY MR. McMAHON) Dr. Shanfield, I believe you've seen this one before. Am I right?

A. Yes.

Q. This was part of PDX 3.2?

A. That's right.

Q. Okay.

MR. McMAHON: Let's skip ahead to PX 28 -- PX 31, Mr. Buck.

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THE WITNESS: Okay. You see the holes again, the black holes of missing material. I don't know what to make of this. There's debris all over it as well, which needs it to be removed and can be removed but it was not.

Q. (BY MR. McMAHON) What do you mean by debris?

A. All those little specks of white because there was attack on a sample, some of the debris from that attack actually just stuck to it and was not removed.

MR. McMAHON: Mr. Buck, PX 32, please.

Q. (BY MR. McMAHON) Dr. Shanfield, what do we see here?

A. Yeah. You see around the source contacts, they're etched. The space above the source contact is completely missing, the gates are missing, and actually the layer of what might be P is partially etched. So it's, again, been completely overetched.

Q. Dr. Shanfield, the series of images that we've looked at, what, if anything, to you evidences P* doping in these devices?

A. Nothing.

Q. We also talked about EDS images.

MR. McMAHON: Mr. Buck, could we go to PX 34, please?

Q. (BY MR. McMAHON) This is one of those EDS images. Right?

A. Yes.

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Q. What do we see here?
A. So what you do in EDS is you crank up the voltage in the scanning electron microscope to generate X-rays, and then you look at the spectrum which is shown below. And the system automatically says, oh, look, you have silicon and you have
02:22 oxygen. The ratio can't be trusted. And so like I said, it's not that sensitive.
But it's where you're pointing that little cross that says spectrum 1, that's where it's being evaluated.
Q. What, if anything, in this image or these two images, the graph and the image above it, indicates to you the presence of P* doping?
A. Nothing in the least.
MR. McMAHON: Mr. Buck, PX 37, please.
Q. (BY MR. McMAHON) And, Dr. Shanfield, same question about this image.
02:23 A. Same problem. It doesn't indicate anything.
Q. Based on all of the images that you looked at, can you briefly summarize your opinions regarding the quality of the imaging analysis that Dr. Neikirk relied upon?
A. Yes. I believe that the evidence that he'd shown looks like the draft run only on the samples, which is low
02:23 quality -- not being -- the person that did it was not doing low quality work, but the quality of the first draft is almost always bad, and that is where it stood with no further

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instructions. So you can't draw much conclusion from the evidence that Dr. Neikirk showed.

Q. Based on all of that evidence, do you agree or disagree with Dr. Neikirk's conclusion that the seven accused MOSFETs infringe claim 1 of the '634 Patent?

A. Not at all.

Q. Why?

A. Well, I mean, just go back to the lateral doping layer. You need a super precise measurement of what the doping level actually is in that lateral area around the source, and unless you measure that, you can't say what doping is. So the methodology I would have chosen would be different.

Q. We've talked so far about claim 1 of the '634 Patent. That's an independent claim. Right?

A. Yes.

Q. And the Court instructed the jury on independent and dependent claims. Were you here for that?

A. Yes.

Q. If there's no infringement of an independent claim, what does that tell you about infringement of dependent claims 2 or 3?

A. They don't matter.

Q. Don't matter how?

A. In other words, there's no infringement, period.

Q. Why is that?

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A. The dependent claims, I've had this explained to me, is dependent on the initial claim, the primary claim. And if that is invalid, then what the dependent claims are saying is a limitation don't apply at all because they -- it refers back to the original independent claim in the dependent claim to begin with. So bottom line, there's no infringement.

Q. And I just want to clarify one thing you said. We will talk about patent validity in a few minutes. I think you said the word 'invalid'. Are you suggesting that this claim is invalid?

A. No, I'm sorry. That was -- I misspoke. We were talking infringement. So if something in the -- or if the independent claim isn't present, it doesn't matter what the dependent claims say.

Q. I'm sorry. Go ahead.

A. That's it.

Q. If you don't infringe an independent claim, there's no infringement of the dependent claims?

A. Right.

Q. Thank you.

Were you -- you said you were here for Dr. Neikirk's testimony. Did you hear Dr. Neikirk answer questions about whether SEM imaging by itself can indicate a doping concentration?

A. Yes, I did.

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Q. What did he say?
A. He was entirely correct. He said you can't get doping concentrations or know if it's P or N type from a scanning electron microscope image, period.
Q. What about EDS imaging? Can that give you a doping concentration?
A. No, it cannot.
Q. Did you hear Dr. Neikirk speak to that?
A. I believe he did, and he said the same thing about EDS.
Q. So the two of you agree on that?
02:27 A. Yeah, we do.
Q. Before we go on to invalidity, I want to ask you briefly about another part of Dr. Neikirk's testimony, and that was the component counting. Do you recall that?
A. Yes.
MR. McMAHON: Mr. Buck, could you please bring up DDX 7.6?
Q. (BY MR. McMAHON) Dr. Shanfield, do you recognize this table?
A. Yes.
Q. What does this represent?
A. The -- well, I think you guys have seen this before, but
02:27 the table on the left is what Mr. Diep had counted -- I'm sorry. The table on the left is what was -- the table on the right was the one that Mr. Diep had counted. No, it's the

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other way around. The table on the left is the one that Mr. Diep had counted, and the table on the right is the parts count that Force MOS had done.

02:28 Q. And to -- so what we see on the left-hand side are in the green -- the green headings, those are the products that were counted. Is that correct?

A. That's right. There was a laptop, a graphics card, motherboards, another laptop, and so on.

Q. And I don't mean to spend a lot of time on this. We've heard a lot about it. But have you had a chance to evaluate whether these counts look like they were accurate?

A. Yes. I looked carefully because it's kind of easy to tell.

Q. And what was your conclusion?

02:28 A. That what Mr. Diep counted and what's shown in -- what's detected across all boards are consistent.

Q. And have you had a chance to consider whether this data is consistent with ASUSTek's reported data?

A. Yes.

Q. What did you conclude?

A. That it is. The ASUSTek data, actually I went through it

02:29 pretty carefully, and it was very carefully produced, and clearly reflected what engineers had figured out, counted, let's say, slot counts. That's something that you as an engineer, you can look at the CAD and see the slots and count

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them. So it's almost a computer operation.

So the fact that those were accurate and consistent with what Mr. Diep counted didn't surprise me. And also the accuracy and reliability of, you know, the computer counts from their electronic layouts, you know, that they may have done is something that's -- that tells me this is reliable data.

Q. Were you here this morning when Mr. Lamotta testified?

A. Yes.

MR. McMAHON: Mr. Buck, can we please bring up PDX 4.13?

Q. (BY MR. McMAHON) And I just want to spend a moment on this, Dr. Shanfield. Mr. Lamotta testified -- well, let me -- I won't characterize what he said, but did you have occasion to evaluate Mr. Diep's counting of these various components?

A. Yes, I did.

Q. And what did you conclude?

A. Well, I concluded that what is pictured here is not actually correct.

Q. Why not?

A. When Diep -- Mr. Diep counted, let's say, this accused laptop, first of all, he did include the display in the count. I mean, it's part of the laptop, and by all indications he'd done that.

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He says there's no records on the batteries. It turned out there was no transistors, no MOSFETs in the batteries. I'm sorry. There was three transistors in the batteries, three MOSFETs that Mr. Diep reported.

The motherboard, I don't know what's meant by improper records. He had not only himself but two other people in his team do the counts to make sure they were accurate. And they came out with the same number which was somewhat miraculous, but it was to me a reassurance that they'd done the accounting right. So I don't understand this presentation.

Q. And do you recall what Mr. Diep found in the power supplies that he counted?

A. Yes.

Q. What did he find?

A. He found zero MOSFETs, not no records.

Q. Okay. Let's turn to invalidity, Dr. Shanfield. Have you had a chance to consider -- and I want to be clear for invalidity, we're focusing on just one claim. Right?

A. Right.

Q. Which claim is that?

A. That's the -- in the 409, claim 1[g].

Q. And so let's -- we've already looked at the '409 Patent. Did you reach a conclusion as to whether claim 1 of the '409 Patent is invalid?

A. Yes.

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Q. What's your conclusion?
A. That it is invalid.
Q. Why?
A. As I'll hopefully can get a chance to show, there was prior art in another patent that -- and it didn't surprise me given at the time there was a lot -- so much work being done in the area of the trench MOSFETs, but in any case Kobayashi did the exact same thing, but he did it before the '409 Patent.
MR. McMAHON: Can we please bring up JX 24?
Q. (BY MR. McMAHON) Dr. Shanfield, what are we looking at here?
A. Well, this is the Kobayashi patent I am talking about.
Q. And is Kobayashi prior art to the '409 Patent?
A. Yes, it is.
Q. How do you know that?
A. Well, the date of the patent is May 3rd, 2005, and that's before the date of the '409 Patent.
Q. And I believe you testified earlier that the application for the '409 Patent was in December 2006. Is that correct?
A. Yes, that's right.
Q. So Kobayashi was more than a year earlier?
A. Right.
Q. Okay. Can you -- we'll follow your direction. If you would walk us through what you found in terms of disclosure in

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Kobayashi that you found to be relevant to the validity analysis.

02:33 A. Sure. Probably the best figure to start with is figure 5A, I believe. Yes. So Kobayashi is -- shows this cross section of a trench MOSFET with all the elements that the '409 Patent describes. The bottom layer there, I think it's

02:34 labeled 1, is the substrate. The next layer labeled 2 is the epitaxial layer, and the body layer is labeled 9.

The source contact labeled 17, and it's up above. And the gates and the gate oxides, all of that is -- matches all of the elements that the '409 describes.

02:34 Q. And the '409 Patent is the rounded corners patent. Right?

A. Right.

Q. Do we see any rounded corners here in figure 5A?

A. Not in this figure, no.

Q. Where did you find rounded corners in Kobayashi?

A. If you look, I think it's figure 6A, B, C, D, if I remember correctly. Yeah.

Q. So what do we see in figure 6A through D?

A. Well, they're showing a sequence of fabrication for the

02:35 trenches that have the gates in them, and the 6A shows the -- what I was talking about, the substrate and the epitaxial layers.

6B shows the trenches being dug. I won't bore you with

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the details in how that's done.

6C is significant here. This is showing now the rounding of the trenches. And if you look at this diagram alone, what you see is it's rounded at the bottom of the trench but not at the top.

Q. Is there some disclosure in Kobayashi about rounding the corners at the top?

A. Yes. So if you can take me there.

MR. McMAHON: If we could go column 6, line 46 to 67.

THE WITNESS: Perfect. So it says -- it's talking about this -- oh, okay. This is the description of what I just pointed out in THE figure 5A. This doesn't have the description of what happens when you etch the opening and get a rounding at the top and that's what I was looking for.

Q. (BY MR. McMAHON) My apologies, Dr. Shanfield. I led you astray. One moment.

A. I can find it in here, if you want.

Q. You have a copy of the patent in your binder, there, sir.

A. Yeah.

MR. McMAHON: If we can please go to column 7, line 57.

THE WITNESS: So that's -- this is now talking about this figure I just showed with the cross section and the rounded corners in the bottom, and what it says, "next

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referring to figure 6C, after the composite film is removed by etching" and that's the masking, "Corners of each trench at the bottom are rounded." And that's what the diagram shows.

02:37 "In this event, corners of each trench 6 at the opening portion may also be rounded." So what they're talking about is the -- if you imagine digging a trench in wet sand, what happens when you dig the sand out, you don't get sharp corners; you get rounded corners because of the act of digging. It's analogous to that, that the etching that's

02:38 being done is not only rounding the bottom because you have rounding in the bottom of the wet sand, but at the top there's rounding as well. And he's essentially explicitly saying that it's present there.

If you look at that view of the sand from the top, and you do a plan view, so called, from the top, what you see if it was a square that you dug out is the square's corners are

02:38 rounded. There's the piles of -- I mean, there's sloped sand everywhere, including at the corners. And the profile of that is rounded.

So, in effect, what he's saying is it's a square pattern that with rounded corners, exactly what the '409 is describing.

Q. Dr. Shanfield, could we please look at figure 3A? Two questions for you here, sir. What do we see here and why

02:39 don't we see rounded corners?

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A. So this is now pointing out what is the view from the top for the -- I think it's prior art, if -- I'm not sure. I'd have to look at the reference again. But basically this is the source contact in the middle, 112. And 106, that's where
02:39 the gate is. So that's where the trenches, I'm talking about, that's the place where if it's rounded, if you dug trenches in a cross pattern, it would be rounded at the top, and that ends up making, when you look down on it, rounding of the corners. And I guess this is a good way -- good place to show that.

MR. McMAHON: And if we could go back to the text of
02:40 the patent, please, column 7, line 57.

Q. (BY MR. McMAHON) Dr. Shanfield, why did we not see the rounded corners in the diagram itself?

A. It's an option in the patent. So it's -- if you choose, you can have rounded corners, but they didn't necessarily illustrate it.

Q. Dr. Shanfield, based on your analysis of the Kobayashi reference as you've just described it, have you come to a
02:41 conclusion as to the validity of claim 1 of the '409 Patent?

A. Yes.

Q. What's that conclusion?

A. My conclusion is that Kobayashi anticipates, which means has every single element of the '409 Patent and, therefore, claim 1 of the '409 Patent is invalid.

MR. McMAHON: Your Honor, now is the time when I was

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going to use the easel briefly. May I approach?

THE COURT: You certainly may.

MR. McMAHON: Thank you. May I place it right there so the jury can see?

02:41

THE COURT: That will be fine.

02:42

Q. (BY MR. McMAHON) Dr. Shanfield, I think your view of this might be somewhat obstructed.

A. Yeah, it is a little bit, but I can look around.

MR. McMAHON: If we could bring up the Kobayashi checklist on the screen, we can look at it at the same time.

THE WITNESS: That's better.

Q. (BY MR. McMAHON) Dr. Shanfield, I'd like to ask you, can you walk through these limitations and just tell me if you've found that feature in Kobayashi, and if so, where?

02:42

A. Sure. The first one that's called Pre at the top a trenched semiconductor power device --

THE COURT: Slow down, please.

THE WITNESS: Sorry. "A trenched semiconductor power device comprising a plurality of trenched gates surrounding a plurality of transistor cells formed in a semiconductor substrate."

If you recall, that plan view of the squares shows

02:42

exactly that. This plurality means a multiple number. It shows the -- that it's being formed or describes it's being formed in a semiconductor substrate.

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Q. (BY MR. McMAHON) And which figures should -- can I create a checkmark for that?
A. Sure.
Q. And which figures would you point to?
A. I think it's 3A, the one we showed.
Q. Any others?
A. There's some other ones. I think 4A. Maybe I should get it out. It looks like I don't have the --
MR. McMAHON: Can we bring up the figure 5A?
Q. (BY MR. McMAHON) Is this one of the figures you're referencing?
A. Yes, that's what I was looking for.
Q. Okay. The next limitation, sir?
A. All right. That is the 1[a], "Said trenched gates surrounding said transistor cells as closed cells constituting substantially square-shaped cells with rounded corners."
And that's what I went through in this description that you looking in that plan view, you see the square. It says that there's rounded corners. So what you will view is closed cells around each source and the rounded corners that are being described here. They're substantially square; they have rounded corners.
Q. Can I create a checkmark?
A. Yes.
Q. And that was the plan view, figure 3[a]?

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A. Yes.
Q. And the text you were talking about, is that column 7?
A. Yes, that's right.
Q. Column 7, line 58.
Okay. The next one, can we create a check box there?
02:44 A. All right. That one is, "Each of said closed cells further includes a circular trench contact." That's the thing in the center, the source contact, what you saw in the plan view. "Disposed substantially in a central portion of said closed cells" in the center, which it was, "Penetrating through a source region surrounding said trenched gates and extending into a body region encompassing said source region."
02:45 And then in figure 5[A], it shows that, the penetration, where it's placed in the body region, and how it looks relative to the gates.
Q. Checkmark?
A. Yep.
Q. Next one, sir?
A. 1[c] is "Said circular trench contact comprises a hole opened up from a top surface of said semiconductor substrate and filled with a contact metal plug." And, once again, figure 5[A] shows exactly that.
02:46 Q. Checkmark?
A. Yep.

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Q. Thank you, sir. Next one?
A. "Wherein sidewalls of said hole are surrounded by and in contact with said source and body regions." Once again, in figure 5[A], it shows the body and source regions against the source contact, just like is being described here.
Q. 5[A], you said?
A. Yes.
02:46 Q. Checkmark?
A. Yes.
Q. Thank you. Next one?
A. That's 1[e], "And said circular trench contact is separate from said trenched gates with said source region and body region disposed between a gate oxide lining of trenched gates and all circumferential points of the circular trench contact."
Once again, figure 5[A], it shows the oxide, it shows the
02:46 trenched gates, it shows a body region, and the source, and it says -- shows what's disposed in between, exactly like this describes.
Q. Checkmark is okay?
A. Yes.
Q. And the last limitation?
A. That's 1[f] "Said contact metal plug connected to a source metal disposed on top of said circular trench contact." And if you look again at figure 5[A], it shows the

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source metal on top of the source plugs. So it makes that connection that's being described exactly as it says here.

Q. Checkmark?

A. Yep.

Q. So based on this chart that we've just created, Dr. Shanfield, what is your opinion about the validity of claim 1 of the '409 Patent?

A. Like I said, the fact that there is a -- Kobayashi anticipates this patent means that it's invalid and the claim 1 is invalid.

Q. You said the word 'anticipates'. What does that mean?

A. That's a legal term that means every element is exactly the same as what's in the patent that's in question.

Q. Did you have any other opinion regarding invalidity of claim 1 of the '409 Patent?

A. Yes.

Q. And what is that?

A. Well, if you want like another -- or a combination of patents to also show that this has all been done before in other patents, I found another patent. It's called Hshieh. And Hshieh plus Kobayashi also anticipates -- doesn't anticipate; it's obvious that those two would be put together by someone with skill in the art and would give you what's shown in '409.

MR. McMAHON: Mr. Buck, could you bring up JX 25,

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please?

Q. (BY MR. McMAHON) Dr. Shanfield, is this the Hshieh reference you mentioned?

02:48 A. Yes.

Q. What's the date of this patent?

A. It was issued June 9th, 1998.

Q. Was that before or after the application for the '409 Patent?

A. It was way before.

Q. What did you find relevant in the Hshieh reference?

A. Well, I guess the drawing I think is most relevant is 8[A] in this patent. And what it shows is substantially

02:49 square -- the gate trench from the -- looking from the top looks like this as substantially square with rounded corners. So exactly what's being described in the '409.

Q. And how might one of ordinary skill in the art have considered combining these two references, Kobayashi and Hshieh?

A. Sure. I actually personally know that. I was always

02:49 keeping my eye on patent literature, and these are both trying to solve the same problem. They are again looking at in Hshieh and also Kobayashi that punch-through problem, the device burning out because it's being driven too hard, and that's the ruggedness question they are trying to address.

So it's the same subject matter, it's the same kind of

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device, and it would be very reasonable that someone of skill in the art would combine these.

MR. McMAHON: I have another board, Your Honor. May I?

02:50

THE COURT: You may.

Q. (BY MR. McMAHON) Dr. Shanfield, here we have another checklist. There's a column for Kobayashi. Do you see that?

A. Yeah.

Q. Is that any different than the column we just put all the checkmarks into?

A. No. You can put checks all the way down that one.

Q. Okay. Not a very good checkmark drawer. 02:50

And what about the Hshieh column? Which of these features do you find relevant disclosure in Hshieh for?

A. So, in Hshieh, they have the trenched semiconductor power device comprising a plurality of trenched gates surrounding a plurality of transistor cells formed in the semiconductor substrate. So that one you can give a checkmark to, as I described. And -- 02:51

Q. I'm sorry, sir. Go ahead.

A. Well, I was going to again show that figure 8[A], but I don't think we need to.

And then "Said trenched gates surrounding said transistor cells as closed cells constituting substantially square-shaped cells with rounded corners," that was also visible in figure

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8[A] where you see those squares with the rounded corners.

02:51 Q. And can we just go back to figure 8[A] of Hshieh. Is this what you were talking about?

A. Yes, right.

Q. So should I write figure 8[A]?

A. Yes, please.

Q. For both of these?

A. Let me just look back at the first one if you wouldn't mind. That's in the description, and I'd have to -- I don't

02:52 seem to have the paper in front of me, but there is a description of a plurality of trenched gates. It does show a plurality of trenched gates in figure 8[A].

It doesn't say it's, you know, from the picture that it's formed in a semiconductor substrate, but in the language of the patent it says that.

MR. McMAHON: And if we could go, please, to the abstract on the cover of the Hshieh reference.

02:53 Q. (BY MR. McMAHON) Is this what you were referring to, Doctor?

A. Yes, that was it.

Q. What do you see here?

A. They are talking about a power transistor, a trenched MOSFET or at least trenched gate MOSFET, and with all those elements that were described in 1[a].

Q. So the figure you would refer to here was 8[A]?

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A. Yes.
Q. For both.
A. Yes.
02:53 Q. Dr. Shanfield, there is a video that the Court shows and showed to the jury about the patent system. Are you familiar with that video?
A. Yes.
Q. Do you recall -- I don't expect you to quote it, but do you recall what that video says about patent validity?
A. Yes. Would you like me to explain.
Q. Yes. What do you recall?
A. Well, I mean, the part that stuck in my head -- it's on
02:53 YouTube, by the way -- is that if -- that the Patent Office has people reviewing patent applications and they are very busy, and that occasionally one of them can make a mistake.

I can clearly see that in this situation because there's so much coming in in semiconductor devices, and it's hard to keep up with it all. But the patent -- the person that
02:54 reviewed the patent may have overlooked a reference that was applicable here, and that's apparently what happened because of Kobayashi being in this description.

And that, I believe, is why it was originally awarded, or at least claim 1, and there already was art that showed it.
02:54 Q. Dr. Shanfield, do you know whether the examiner who examined the '409 Patent application considered either

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Kobayashi or Hshieh?

A. I know that they didn't.

Q. Does that inform your opinion at all with respect to validity?

A. It does, because it explains why if -- I mean, if they'd seen it, they would have realized it's already been done.

02:55 Q. And one last thing I'd like to do here, Dr. Shanfield, for the jury's convenience will just identify those two exhibits, Kobayashi.

MR. McMAHON: If we could bring up Exhibit JX 24.

Q. (BY MR. McMAHON) That's the Kobayashi reference. Right?

A. Yes.

Q. So I'll just write JX 24.

MR. McMAHON: And please bring up JX 25, Mr. Buck.

Q. (BY MR. McMAHON) That's the Hshieh reference?

A. Yes.

02:55 Q. JX 25?

A. Same guy that did the '409.

Q. Same inventor?

A. Yep.

Q. Thank you, Dr. Shanfield.

MR. McMAHON: Your Honor, I'll pass the witness.

THE COURT: All right. If you'll take your boards down.

Ladies and gentlemen, we're going to take a short recess

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before we proceed with cross examination of Dr. Shanfield. You can simply close and leave your notebooks in your chairs, follow all any instructions, and we'll be back shortly to proceed with cross examination.

02:56 The jury's excused for recess.

(Whereupon, the jury left the courtroom.)

THE COURT: The Court stands in recess.

(Brief recess.)

02:56 THE COURT: Be seated.

03:20 Mr. Hanba, are you prepared to cross-examine the witness?

MR. HANBA: Yes, Your Honor.

THE COURT: All right. Am I correct that any cross examination binders have been distributed?

03:20 MR. HANBA: Your Honor, they have.

THE COURT: All right. Then you may go to the podium, and let's bring in the jury, please.

(Whereupon, the jury entered the courtroom.)

THE COURT: Please be seated, ladies and gentlemen.

03:21 We'll proceed with cross examination of the witness by counsel for the Plaintiff.

Mr. Hanba, you may proceed when you're ready.

MR. HANBA: May it please the Court.

CROSS EXAMINATION

BY MR. HANBA:

Q. Good afternoon, Dr. Shanfield. How are you?

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A. Good afternoon.
Q. We haven't had the chance to meet. My name is Chris Hanba. I will be questioning you today.
03:21 You're an expert in semiconductor technology. Correct?
A. Yes.
Q. And you're a named inventor on several patents. Right?
A. Yes.
Q. And are those patents in the field of semiconductors?
A. Most of them.
Q. And you're proud of your work as a semiconductor inventor?
A. Yes.
Q. And when you invented those technologies, you believed they were innovative and deserved patent protection. Right?
03:22 A. I don't remember. Some of them were too far back.
Q. It's possible that you didn't think that your patents that you applied for were innovative and deserved patent protection?
A. I just don't remember. I probably did.
Q. In fact, that's probably why you applied for those patents at the Patent Office. Right?
A. Yeah, probably, though another reason is there's -- it
03:22 was economic motivation. I mean, not from me but from my company.
Q. So I want you to suppose with me that a corporation is

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infringing one of those patents of yours that we just talked about. Are you with me?

A. Sure.

Q. And so we're supposing for a minute that a company was infringing one of your patents. You would want a fair process to address that. Right?

A. Yes.

Q. A fair approach would be to send a notice letter

03:22 explaining why you believed they're infringing. Right?

A. First thing I'd do is see a lawyer.

Q. You wouldn't want that lawyer to send a notice letter to let the person know they're infringing?

A. That sounds reasonable.

Q. Did you say that sounds reasonable?

A. Yes.

Q. Okay. Now, in this case you're aware that Force MOS sent notice letters to ASUS. Right?

A. Yes.

Q. And have you seen these letters?

03:23 A. I saw them up on the screen.

Q. But, sir, you have an expert report or reports that you've created as part of this case. Right?

A. Yes.

Q. And doesn't your expert report at least cite at least some portion to those notice letters?

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A. I believe so.
Q. Okay. Have you reviewed those notice letters?
A. Yes, a while back.
Q. You have?
03:23 A. Yes. But it's November, as I remember.
Q. Okay. And -- but you didn't provide an opinion or analysis to whether those letters were correct. Right?
A. Not that I recall, no.
Q. Okay. In fact, you have no reason to believe the letters sent from Force MOS to ASUS were incorrect. Right?
A. At the time you sent them or are you talking about or now?
03:24 Q. You have no reason to believe that the letters sent from Force MOS to ASUS were incorrect. Right?
A. Well, the letters said that ASUS was infringing, and I don't believe they are.
Q. How many hours have you billed to ASUS for your work in this case?
03:24 A. I was estimating 200 up to my deposition, and maybe another close to 200 accumulated since.
Q. About how much money have you been paid to date?
A. I have to do the arithmetic. I don't have my calculator. I get 375 an hour.
Q. And you just raised your rate. Right?
A. Yeah.

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Q. Okay. I'm bad at math also, sir.

03:25 THE COURT: All right. Let's move on. We don't need to discuss how bad everybody is in math.

Q. (BY MR. HANBA) You served as an expert witness in prior cases. Correct?

A. Yes.

Q. About how many cases?

A. In trial, maybe three.

Q. How many cases -- not including in trial, how many cases total have you served as an expert witness in semiconductor cases?

A. I think it might be 15 or 20.

03:25 Q. Okay.

A. Something like that.

Q. And you said you're employed by Draper Laboratories?

A. That's right.

Q. And at Draper Laboratories, you've been responsible for electronic system designs and fabrication. Right?

A. Among other things, yeah.

Q. Okay. So at Draper Laboratory, your laboratory, you can conduct testing on semiconductor components. Right?

A. Yes.

Q. As a matter of fact, you'll have access to SEMs at

03:26 Draper. Right?

A. Yes.

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Q. How much do those machines cost?
A. Over a million.
Q. And you have experience using SEM equipment for analyzing MOSFETs yourself. Right?
A. Yes, I do.
Q. And you would agree that SEM is a widely-used technique for analyzing semiconductor components. Correct?
A. It's one tool, yeah.
Q. There are many tools. Right?
A. Right.
Q. And SEM provides high resolution imaging that can reveal
03:26 fine details of semiconductor structures. Right?
A. Yes, correct.
Q. So you'd agree that an SEM is a useful imaging technology for evaluating semiconductor components.
A. Sure.
Q. So when you work as an expert on a semiconductor case and use your lab, do you charge a separate rate for use of the lab in addition to your hourly rate?
A. I'm not permitted to mix my expert work with Draper Lab activity. So I would use a service.
Q. You would use a service?
A. Yes.
03:27 Q. And can you use your lab at all for expert --
A. Only by permission.

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Q. So you just have to ask permission?
A. Right.
Q. And if you ask permission and you're granted permission, and you use your laboratory, would you charge a separate rate for the use of your laboratory as an expert?
A. I've never done it, and I would be reluctant to do it.
Q. And, sir, ASUS is paying you for your work as an expert here today. Right?
A. Yes.
03:28 Q. And you're here today to convince the jury that ASUS doesn't infringe Force MOS's patents. Right?
A. Yes.
Q. Okay. Do you think --
A. Actually I was here to look at the evidence as a scientist and decide does this support what's being said.
Q. Sir, do you think that you would have testified today had
03:28 your opinion been that ASUS infringed?
A. I'd simply look at the technical evidence and wouldn't have whatever ASUS said or Force MOS says make me decide. I'd look at it myself.
MR. HANBA: Your Honor, I'd like to strike as unresponsive.
03:29 THE COURT: Well, the objection is non-responsive, not unresponsive.
MR. HANBA: Excuse me.

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THE COURT: The question calls for him to speculate about something that he hasn't done. I'm just going suggest we start over. Ask your next question.

MR. HANBA: Okay.

Q. (BY MR. HANBA) Now, are there different ways you could try to demonstrate non-infringement? Correct?

03:29

A. Sure.

Q. There are different techniques that you could use to analyze semiconductor components like the MOSFETs accused in this case. Right?

A. Yes.

Q. One way would be to use a scanning electron microscope. Correct?

A. Yes.

Q. Another way would be to use EDS. Right?

A. Yes.

Q. And I think there's also another way that you could use called transmission electron microscopy, or TEM. Right?

A. Yes.

03:29

Q. And yet another way would be a scanning capacitance microscopy, which is an SCM image. Right?

A. Yes, that's one way.

Q. Now, Dr. Neikirk used multiple of these techniques in his infringement analysis. Correct?

A. He only used two.

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Q. Multiple.
A. Yeah, it's multiple, yes.
Q. Okay. In fact, you relied on the images that Dr. Neikirk provided in his expert report in doing your analysis. Isn't that right?
A. That's correct.
03:30 Q. But you didn't conduct your own SEM analysis, did you?
A. No.
Q. And you didn't conduct your own SCM analysis, did you?
A. No.
Q. And you didn't conduct your own EDS analysis. Correct?
A. Nope.
Q. Didn't do a TEM analysis?
A. Nope.
Q. And so you talked to some of the ASUS MOSFET suppliers, didn't you?
A. Yes, all of them.
Q. And those are the companies that provide ASUS with the accused MOSFET components. Right?
A. That's correct.
03:31 Q. Those are the components accused of infringing in this case. Right?
A. Yes.
Q. And when you spoke with those suppliers, you asked them for information about their components. Correct?

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A. About the processes that they used to build their components.
Q. But you didn't independently test any of those components that these suppliers supplied, did you?
A. No.
03:31 Q. And you didn't conduct any SEM testing on the accused components?
A. No.
Q. Or TEM testing on the accused components?
A. No.
Q. And you didn't conduct any EDS testing on the accused components?
A. No.
Q. And, again, you didn't conduct any SCM testing on the accused components.
A. No.
Q. Instead, at times you relied on conversations with third-party suppliers. Right?
03:31 A. Partly.
Q. You partly relied on conversations with the third-party suppliers. Correct?
A. That's right.
Q. And you even received some images from some of these suppliers. Correct?
A. I'm sorry. Could you repeat that?

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Q. Yeah. And you even received some images from some of these suppliers?
A. Yes, that's right.
Q. And you relied on those images in part on forming your non-infringement opinion. Right?
03:32 A. Yes.
Q. But you didn't instruct the suppliers on how to take those images, did you?
A. No.
Q. And you didn't present -- you were not present when those images were taken. Correct?
A. No.
Q. In fact, you had no personal knowledge of whether those images were taken under proper conditions, do you?
A. Yes, that's true.
03:32 Q. And, in fact, you didn't show the jury any of those SEMs that you received from the component suppliers. Correct?
A. No.
Q. No, you didn't --
A. I didn't, yes.
Q. Just for clarity, you did not. Correct?
A. Yes, I did not.
Q. And one of the suppliers that you received an SEM from was Ubiq. Right?
A. That's right.

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Q. And Ubiq sells multiple MOSFET components. Right?
A. Yes.
03:33 Q. But you didn't do anything to verify that the information in images Ubiq provided you was actually the accused MOSFETs, did you?
A. No.
Q. You just assumed they were the accused MOSFETs?
A. I took their word for it.
Q. Now, sir, you told Mr. McMahon earlier when you were discussing the '634 Patent, element g, you said assumptions get you into trouble. Do you remember that?
A. Sure.
03:33 Q. But you just took Ubiq's word for it. Is that right?
A. Yes.
Q. And Excelliance, that's another one of those SEMs you received. Right?
A. Yes. That's right.
Q. And Excelliance sells multiple MOSFET components. Correct?
A. Yes.
Q. And you didn't do anything to verify that the information and images from Excelliance provided you was actually the
03:34 accused MOSFETs. Right?
A. Well, in both Ubiq and Excelliance, I talked with people in -- who knew directly what the processing steps were and

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what the origin of those devices was. It didn't prove that it was, but I did talk with them.

Q. Assumptions get you into trouble, though. Right?

A. Uh-huh.

03:34 Q. And you didn't show those Excelliance SEMs to the jury, did you?

A. No.

Q. And Inergy, the vendor for both Panjit and LRC, you received some SEMs from them also. Right?

A. That I don't recall.

Q. You didn't show any SEM from Panjit or Inergy today, did you?

A. No.

03:35 Q. And, sir, you didn't do any independent investigation even though this information is coming from a supplier with every reason to tell you that their product doesn't infringe. Right?

A. I wouldn't agree with your premise.

Q. Let's take it in chunks then. You didn't do any independent investigation from any of the SEMs that you received. Right?

A. Well, like I said, I talked to them, I talked about what

03:35 their process was, and that was important.

Q. And that's all you did. No independent investigation. Correct?

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A. It sounds like an independent investigation, so it's not correct.

Q. So to be clear, you didn't take any steps on your own without talking to any suppliers to independently verify that the images you reviewed accurately depict the accused MOSFETs as they existed in the real world. Correct?

A. Independent? I checked the numbers on the photographs that they had supplied me, I made sure that those were the ones we were discussing when we did, and I guess I view that as a check.

03:36 Q. You checked the number on the chip in a picture against the number on an SEM in a picture. Right?

A. Right.

Q. But these are tiny, tiny components. Right?

A. Sure.

Q. 20 times smaller than a white blood cell, I think it is.

A. Yeah.

Q. So you can't look at a chip and say, well, that's the SEM that corresponds to that chip. Right?

A. Yes, that's right.

03:37 Q. Okay. And instead you just had off-the-record conversations. Right?

A. I don't know what you mean by off the record, if that's a legal term, but I had conversations, yes.

Q. And those were conversations were not memorialized as

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they were happening. Right?
A. Could you explain that question? I don't know what you mean.
Q. Have you ever heard the term off the record, sir?
A. I have.
03:37 Q. And so let's use it as you've heard it before. You had off-the-record conversations with the component suppliers. Right?
A. My understanding of that is that I didn't explain to Force MOS or to the jury that I had those conversations and I am explaining it. So I wouldn't consider it off the record.
Q. You didn't memorialize those conversations, did you?
03:38 A. Well, I put it in my report. Is that memorializing it?
Q. Did you take notes as to the conversations?
A. Yes, definitely.
Q. Did you provide those notes to anybody?
A. I included those in my report.
Q. Uh-huh. Did you give those to the attorneys to include in your report?
A. I put them in myself.
Q. You did. And those suppliers did not provide you with any formal written reports or documentation verifying their claims. Right?
03:38 A. They did. They showed me implant energies. They were lists from the process cards that they used to process their

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MOSFETs.

Q. Again, there's no way to tell which one -- which SEM came from which package. Right?

A. Well, these -- this was now talking about processes that they used to build the MOSFET because I had very specific

03:39 questions in order to try and clarify how these were built and it would tell me what -- you know, what the likelihood was there was infringement.

Q. I'm glad you said it. So you confirmed with these -- with all of the suppliers that they use ion implantation into the source contact trench. Right?

A. Right.

03:39 Q. In fact, the only things you discussed with ASUS's MOSFET suppliers were implantation into the source contact trenches annealing and the process for etching the source contact trenches. Correct?

A. I had other brief discussions around those three points, like what photo resist did they use, how did they etch affect the photo resist. That was -- I asked a lot of those kind of

03:40 questions to get a feel for what their process was.

Q. Sir, you were deposed as part of this case. Right?

A. Yes.

Q. And you were under oath?

A. Yes.

Q. Sir, in front of you, you have the deposition. Would you

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read page 240:23 to 241:5?

A. On which deposition?

Q. 6/18/2024?

03:40 A. You mean 17 or 18? Okay.

Q. 18.

A. Could you repeat the number again?

03:41 Q. Of course. 240:23 to 241:5.

A. Okay.

03:41 Q. Let me ask the -- the question again, sir. The only things you discussed with ASUS's MOSFET suppliers were ion implementation -- excuse me.

Sir, does that refresh your recollection as to the deposition?

A. First of all, I don't agree with your statement. Could you repeat that?

Q. Does that refresh your recollection --

A. I may have misheard you.

THE COURT: Just a minute. Dr. Shanfield, did you

03:42 read your deposition at page 240, line 23 through 241 page 5? Did you re-read that section of your deposition [sic].

THE WITNESS: Yes.

THE COURT: Okay. Having re-read that section of your deposition and refreshed your memory, counsel, ask a question.

MR. HANBA: Thank you.

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Q. (BY MR. HANBA) In fact, the only things you discussed with ASUS' MOSFET suppliers were ion implementation into the source contact trenches, annealing, and the process for etching the source contact trenches. Correct?

A. I said that I didn't recall, but --

THE COURT: Wait a second, Dr. Shanfield. He's not --

THE WITNESS: Oh, I should --

THE COURT: Wait a minute. He's not asking you what you said in your deposition. He asked you a question. You should just answer that question as any other question.

THE WITNESS: Right. No.

THE COURT: That's your answer.

THE WITNESS: Yeah.

MR. HANBA: May I publish, Your Honor?

THE COURT: You can publish those lines of those two pages.

MR. HANBA: Will you please publish 240:23 to 241:5, please.

Q. (BY MR. HANBA) And, sir --

MR. HANBA: Both pages, please.

THE COURT: That's the entire section you stated.

MR. HANBA: 240 -- that's correct, Your Honor. My apologies, Your Honor. Yes.

THE COURT: It's published.

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MR. HANBA: Thank you.

THE COURT: Next question?

Q. (BY MR. HANBA) And for your opinions regarding the '634 Patent, rather than running your own SEM tests, you relied on side view images from ASUS supplier Inergy. Is that right?

03:44 A. I viewed those images that were sent, yes.

Q. And in rendering your non-infringement opinions regarding the '409 Patent, you didn't look at any SEM or similar type of images other than the ones that Dr. Neikirk provided. Right?

A. That's correct.

Q. And the '634 Patent, that's a patent that we look at the side view in order to determine some of the analysis. Right?

A. Some of it, yes.

03:44 Q. Not the top view. Right?

A. The images -- no, that's not right.

Q. But the '409, that's the circular trenches. Right?

A. It's about the circular trenches, right.

Q. And, in part, you're looking from mainly the top view. That's what that patent's about. Right?

A. Partly.

03:45 Q. Right. As a matter of fact, that is the claim limitation that you focused on today in court. Right?

A. That's right.

Q. Okay. And do you recall, sir, that during your deposition you were asked whether there were any specific

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claim limitations at issue in this case that you had pointed out as being specifically implicating -- implicated by the difference in SEM beam energy that you believe should have been used versus those that were actually used?

03:45

MR. McMAHON: Objection, Your Honor, improper impeachment.

THE COURT: Sustained. He's not here to testify what he said in his deposition. If he, in response to an ordinary question, gives you an answer inconsistent with what he said in his prior deposition, then you may impeach him in the proper form. But to just ask him, didn't you say this or is this different than what you said in your deposition, is not proper.

03:46

I'll sustain that objection.

MR. HANBA: Yes, Your Honor.

Q. (BY MR. HANBA) Sir, are there any specific claim language that are at issue in this case that specifically implicate -- that are specifically implicated by the differences in SEM beam energy that you believe should have been used versus those that were actually used by Microtech?

03:46

A. Yes.

Q. And today you didn't point out a specific claim limitation as to that. Correct?

A. I'm sorry. I don't understand your question.

Q. You didn't point to a specific claim limitation that

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would have been problematic because the wrong process was used. Right?

A. No, I -- I did.

03:47 Q. During -- during your deposition -- strike that.

You were deposed on this very issue. Correct?

A. Which issue?

Q. Regarding whether a specific -- a specific claim limitation of the claims that are at issue in this case have been pointed out as specifically implicated by the difference

03:48 between SEM beam energy that you believe should have been used versus those that were actually used by Microtech?

MR. McMAHON: Objection, Your Honor, improper impeachment.

THE COURT: Mr. Hanba, I'm going to sustain that objection. If you want to question this witness substantively about anything, feel free to do so as long it falls within the

03:48 relevance requirements of Rule 402. But don't ask him to confirm or deny what he said or didn't say in his deposition unless you're going to use a prior inconsistent statement in that deposition to impeach his testimony.

MR. HANBA: Yes, Your Honor.

Q. (BY MR. HANBA) Dr. Neikirk [sic], if I were to use the

03:48 phrase -- or the --

THE COURT: Dr. Shanfield, not Dr. Neikirk.

Q. (BY MR. HANBA) Oh, my goodness. I am so sorry, Dr.

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Stanfield.
A. I'll still answer.
Q. Small K, big V, what is the -- what is that in scientifics terms?
A. That stands for kilovolt.
Q. Did -- were the SEM images done with the proper
03:49 kilovolts?
A. Which one?
Q. The ones in this case by Dr. Neikirk?
A. No.
Q. And, in fact, the images that the SEMs that Dr. Neikirk had taken were at 10 kilovolt. Correct?
A. Some of them.
03:49 Q. And you're saying it was wrong then for Dr. Neikirk to use a high energy electrons, I think those are the ones at 10 kilovolts, to show the features of a MOSFET in an SEM. Right?
A. Not exactly, no.
Q. You have no problem with the use of 10 kilovolt?
A. It's not what I said. I said -- the way you're relating what I meant is not correct.
03:50 Q. Please explain.
A. I said that for a draft look at devices that have been etched, it's fine to look at high energy and get oriented as to where you want to look and what to tell the operator next.
Q. Right. That's because in peer-reviewed papers that

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you've published that you authored, you used SEMs with high energy electrons using even greater than 10 kilovolt. Right?

A. Probably, yeah.

Q. So you said that you were here when Mr. Diep testified. Correct?

A. Yes.

Q. By video?

And as you understand it, Mr. Diep and Microtech sent several images to Dr. Neikirk. Right?

A. Yes.

Q. Did you review all those images?

A. Yes.

Q. There were hundreds of them?

A. Yep.

Q. Thousands of them?

A. I don't know about thousands. Hundreds.

Q. And you heard Mr. Diep say that they reran some of those SEM images. Right?

A. Yes.

Q. And they reran them if they had a problem. Right?

A. Well, I don't know what circumstances you're talking about.

Q. Didn't Mr. Diep during his deposition say that if there was a problem with the SEM image, that they reran the SEM?

A. My understanding is that he repolished some of the

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samples and then put them back in the SEM.

03:51 Q. That's right. So he reran --

THE COURT: Dr. Shanfield, please pull the microphone a little closer, please. Thank you.

THE WITNESS: Sure.

THE COURT: All right. Let's continue.

Q. (BY MR. HANBA) And so he reran the SEM?

A. Yes.

03:52 Q. Okay. Dr. Neikirk [sic], you used a coffee cup analogy earlier. Do you remember that?

A. Yes.

Q. And so the coffee cup has tapered sides. Right?

A. Yeah.

Q. So water falling from the ceiling get into the tapers on the sides. Right?

A. Not hail. Hail is what I used as an analogy.

Q. I'm using water.

A. Okay.

03:52 Q. I appreciate hail is water. How about wet water falling from the ceiling would get on the sides of that coffee cup?

A. No.

Q. No?

A. Not necessarily, but, I mean, it would wet it, but it wouldn't stick. It would go down to the bottom of the cup.

Q. And our semiconductor trenches are a lot like styrofoam?

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A. I don't think I can answer that question without a lot of explanation.

03:53 Q. So it is your testimony that if water falling from the ceiling, it wouldn't get the sides of the coffee cup wet. Right?

A. That's not what I said.

Q. You said it would drip down all the way to the bottom?

A. Right.

Q. But it would first get wet and then drip down to the bottom.

A. Right.

Q. Okay. Thank you.

And so just to reset, ASUS's MOSFET suppliers told you

03:53 that the accused MOSFETs are created using a single vertical ion implantation into the source contact trenches. Right?

A. 90 degree was the important part. Some of them used a double energy so they used two different energies, but they were 90 degrees.

Q. So ASUS's suppliers told you the accused MOSFETs are created using a single vertical ion implantation into the

03:54 source contact trenches. Correct?

A. Yes.

Q. And the purpose of that ion implantation is to enhance or reduce the contact resistance between the source and the body regions of the device. Right?

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A. That's correct.
Q. And you'd agree that a vertical ion implantation into a sloped sidewall results in less doping at the sidewalls of the source contact trench as opposed to the bottom of the trench. Right?
A. No, I don't.
03:55 Q. Sir, did you issue an invalidity report in this case?
A. Yes.
Q. Sir, if you could please turn to paragraph 214 of your
03:55 invalidity report.
A. Yes.
Q. And, sir, if you will also turn to your deposition of 6/17/2024.
THE COURT: Counsel, it's going to be hard to do
03:56 that at the same time with the size of these binders.
Q. (BY MR. HANBA) Dr. Shanfield, does that reading that paragraph refresh your recollection?
A. Which paragraph?
Q. 214 of your invalidity report.
A. Oh, I'm sorry. I thought you said page 214.
THE COURT: Is it page 214 or paragraph 214?
03:56 MR. HANBA: Paragraph 214, Your Honor.
THE WITNESS: Yes.
Q. (BY MR. HANBA) Yes, it refreshes your recollection?
A. Yep.

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Q. So let me ask the question again. You'd agree that a
03:57 vertical ion implantation into a sloped sidewall results in less doping concentration at the sidewalls of the source contact trench as opposed to the bottom of the trench.
A. No, I don't agree with that. I stand by my answer.
MR. HANBA: Your Honor, may I publish?
03:58 THE COURT: Just a moment. You may publish that particular statement, counsel.
MR. HANBA: Mr. Doyle, please publish paragraph 214 of the Shanfield invalidity report.
THE COURT: You need to highlight the sentence that calls for near the bottom that says, "a POSITA would
03:58 therefore." There.
MR. HANBA: Thank you.
Q. (BY MR. HANBA) And it's your opinion, sir --
MR. HANBA: You can take that down.
Q. (BY MR. HANBA) And it's your opinion, sir, that less doping concentration at the side walls of the source contact trench as opposed to the bottom of the trench results in P* doping at the sidewalls. Right?
03:59 A. Could you repeat that?
Q. Maybe. It's your opinion, sir, that less doping concentration at the sidewalls of the source contact trench as opposed to the bottom of the trench results in P* doping at the sidewalls. Correct?

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A. You're asking a very general question. I guess, under
03:59 what circumstances?
Q. You can't answer that question, sir?
A. I need a little more detail.
Q. Is it your opinion there is no more -- as an expert and one skilled in the art sitting here today, sir, it's your opinion, isn't it, that less doping concentration at the sidewalls with vertical ion implantation of the source contact
04:00 trench as opposed to the -- let me strike that.
We're going back to the vertical ion implantation, sir.
A. Okay.
Q. And it's your opinion that less doping concentration at the sidewalls of the source contact trench as opposed to the bottom of a trench results in P* doping at the sidewalls. Right?
A. It could.
04:00 Q. And you focused on element [a] of the '409 patent, right, for your non-infringement opinion?
A. That's correct.
Q. And I guess, going back, you focused only on limitation [g] for your non-infringement opinion as to the '634 Patent. Right?
A. Not only [g]. I focused on [g], though, relative to the other elements.
Q. Right. But that was the main focus of your

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non-infringement opinion. Right?
A. I guess I emphasized it. I wouldn't call it the main, but, yes, I emphasized it.
Q. As a matter of fact, you said the others weren't met because Dr. Neikirk didn't have proof or didn't have the evidence. Right?
A. That's true in all cases.
Q. But that's why you focused on just [g]. Right?
A. He didn't have evidence for any of the elements, in my opinion, except one.
Q. And that's why you focused on [g]. Right?
A. That -- I don't understand your question, I guess.
Q. So your main presentation on the '634 Patent focused on element [g]. Correct?
A. Yes.
Q. For the rest of the elements, you did not believe that Dr. Neikirk proved infringement because there was a lack of evidence. That's what you said. Right?
A. Yes, but it was true for all the elements.
Q. Okay. And so for element [a] of the '409 Patent, your focus was on the rounded corners. Is that right?
A. Yes.
Q. So let me show you one of Microtech's top view SEM images of the Panjit 2K.
MR. HANBA: Mr. Doyle, would you please show PX

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27.1?

Q. (BY MR. HANBA) And, sir, do you recall Dr. Neikirk opining that such an image illustrated infringement of limitation 1[a]?

A. Yes.

Q. Sir, it's your opinion that this image does not show rounded corners. Right?

A. No.

04:03 MR. HANBA: And so, Mr. Doyle, could you please bring up PDX 30.1? And this is the LRC MOS -- excuse me, 30.2, I believe it is.

THE WITNESS: You may have misunderstood me, I said, no, that's not my opinion. There are rounded corners there.

Q. (BY MR. HANBA) There were rounded corners in the Panjit 2K MOSFET?

A. In this image.

04:03 Q. Thank you.

MR. HANBA: And so if we go back to PX 30.1.

Q. (BY MR. HANBA) Do you recall Dr. Neikirk's opinion that such image demonstrated infringement of limitation 1[a] of the

04:04 '409 Patent? Excuse me, 30.2. Apologies.

THE WITNESS: Yes.

Q. (BY MR. HANBA) But it's your opinion that that image does not show rounded corners. Correct?

A. No. It does show rounded corners.

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Q. But it's your opinion that the accused MOSFETs do not infringe the '409 Patent -- strike that.

04:04 MR. HANBA: And can we bring up, Mr. Doyle, PDX 30.5. Excuse me, 3.5.

Q. (BY MR. HANBA) And you understand this is a demonstrative that Dr. Neikirk used to highlight some things?

A. I'll take your word for it.

Q. You saw this image from Mr. McMahon a little while ago. Right?

A. Yes.

04:05 MR. HANBA: And so, Mr. Doyle, could we go to the native image?

Q. (BY MR. HANBA) And so, sir, is it your opinion that this image does not show rounded corners?

A. Which one?

Q. The one on the left. Excuse me.

A. No, it looks rounded. It's damaged, too.

Q. But it looks rounded?

A. Yep.

Q. Okay. And so --

MR. HANBA: You can take that down.

04:05 Q. (BY MR. HANBA) And so, Dr. Shanfield, you talked with Mr. McMahon about some of the counts. Right?

A. Yes.

Q. And your entire critique of Dr. Neikirk's component count

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is based solely on the findings of Mr. Diep's counting exercise. Right?

A. No.

Q. It's not just on the counting exercise?

A. Could you repeat your question?

Q. Your entire critique of Dr. Neikirk's component count is based solely on the findings of Mr. Diep's counting exercise?

A. No.

Q. Do you have any reason to believe that Mr. Diep's counting -- component counts are unreliable?

A. No.

Q. And you didn't conduct your own independent component count, did you?

A. No.

Q. And you never physically expected -- inspected any ASUS products to verify the number of accused components?

A. No.

Q. And you acknowledge that Mr. Diep only counted components I believe in a handful of ASUS products. Right?

A. Well, more than a handful, but yes; just a few.

Q. In fact, the entire exercise was based on a small sample. Right?

A. Yeah. It's true.

Q. And you would agree that a single product sample doesn't necessarily represent an entire product line. Right?

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A. But Mr. Diep's counts wasn't the only way I formed my opinion.

MR. HANBA: Your Honor, move to strike as non-responsive.

THE COURT: Sustained.

Q. (BY MR. HANBA) The entire exercise was based on just a single sample of each product, wasn't it?

A. Which exercise?

Q. From Mr. Diep. Mr. Diep's and Microtech, the entire exercise was based on just a single sample of each product, accused product. Right?

A. That's correct.

Q. And you'd agree that a single product sample does not necessarily represent an entire product line. Right?

A. Yeah, sure.

Q. And you certainly wouldn't represent that every product sold by a company is represented by a small sample. Right?

A. Not normally, no.

Q. Dr. Neikirk, were you in the room when I believe JX 7 was discussed? I did it again, didn't I? I am so sorry. Dr. Shanfield?

A. Yes, I was in the room.

Q. And did you review JX 7?

A. Yes.

Q. And in considering component counts, you would expect to

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consider JX 7. Right?
A. Could you give a little more detail?
Q. Yeah. If I were to provide an estimate of component counts, I would use information like JX 7. Right?
04:09 A. The ASUS summary of slots, yes.
Q. And you would combine Mr. Diep's analysis and look at Mr. Diep's analysis in comparison to JX 7. Right?
A. Yes.
04:10 Q. You're not here to opine that claims 1 through 3 are invalid. Right? Excuse me, of the '634 Patent.
A. No.
04:10 Q. But you provided testimony today as to the fact that you believe that claim 1 of the '409 Patent is invalid. Right?
A. That's correct.
Q. And as I understand your testimony, you first testified regarding the opinion that claim 1 is invalid as anticipated by Kobayashi. Right?
A. Yes.
Q. And this is because in your opinion, Kobayashi 196 teaching each and every limitation of claim 1 of the '196 Patent. Correct?
04:10 A. That's correct.
Q. Specifically, you first testified regarding your opinion that claim 1 is -- is anticipated, and then you said that claim 1 is obvious by combining Kobayashi with Hshieh. Right?

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A. Yes.
Q. And is this because in your opinion despite Kobayashi not teaching or disclosing a limitation of claim 1, it would have been obvious to modify Kobayashi to include these missing
04:11 limitations based on the teachings of Hshieh?
A. Could you repeat that?
Q. Sure. You're using Kobayashi and Hshieh as an obviousness reference because you're not sure that the jury will think that Kobayashi shows all of the limitations of the '409 Patent. Right?
A. No.
Q. So you're not combining Kobayashi with Hshieh because there's a missing element?
04:11 A. No.
MR. HANBA: So if we could, could we go to figure 3 of the Kobayashi '196 Patent, please? Is that Kobayashi? Yes.
Q. (BY MR. HANBA) So the squares of figure 3 are not closed cells constituting substantially square-shaped cells with rounded corners. Right?
04:12 A. No.
Q. And you're not saying that the squares in figure 3 of Kobayashi have rounded corners. Right?
A. No.
MR. HANBA: So if we could go to figure 4?

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Q. (BY MR. HANBA) And figure 4 has some hexagons, right, and six-sided figures?
A. Right.
Q. And you didn't show these to the jury. Right?
A. No, I didn't.
Q. This is a teaching in Kobayashi. Right?
A. Yes.
04:12 Q. And hexagons, six-sided figures, are not squares. Right?
A. Right.
Q. And you're not going to tell the jury -- you did not tell the jury that hexagons are squares with rounded corners. Right?
A. No.
Q. Okay.
MR. HANBA: Can we go to the next figure, please?
04:13 Q. (BY MR. HANBA) And, sir, rather than -- excuse me.
04:13 MR. HANBA: Could you go to figure 6, please?
Q. (BY MR. HANBA) And, sir, you're not saying that the trenched bottoms here show rounded corners, are you?
A. I believe Kobayashi says that, yes. I am saying --
Q. You are saying that.
A. In figure 6C.
Q. In figure 6C, just to be clear, your opinion is that
04:14 this -- these trenched corners show -- excuse me. These trenches show rounded corners.

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A. At the bottom I believe you said. Right?
Q. Your -- let me re-ask that.
A. Okay.
Q. Is it your opinion that the bottoms of the trench show rounded corners that meet the limitations of the '409 Patent?
A. No.
Q. Okay.
04:15 MR. HANBA: So let's go to the Hshieh patent, please. If we could go to figure 8[A].
04:15 Q. (BY MR. HANBA) And so under this obviousness position, you claim it would have been obvious to modify Kobayashi by altering the shapes of the cells into substantially square-shaped cells with rounded corners based on the teachings of Hshieh. Correct?
A. Yes.
Q. And specifically modifying these to these. Correct?
04:15 A. Modifying the image here? I'm sorry.
Q. Let me re-ask -- let me re-ask that question. I'm sorry.
THE COURT: Gentlemen, one at a time, please. The court reporter cannot write accurately when two people are talking at the same time. So, please, make sure you don't talk over the other person.
Let's continue, counsel.
04:16 Q. (BY MR. HANBA) And the Hshieh '914 Patent teaches various cell layouts including a non-orthogonal parallelogram,

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regular square, rectangular, and orthogonal shapes. Right?
A. Yes.
Q. And is it your position, sir, that figure 8[A] meets the cells with substantially rounded corners limitation of the '409 Patent?
A. Yes.
04:17 Q. And so if we could go to the abstract of this patent. And beginning non-orthogonal?
04:17 THE WITNESS: You want me to read this?
Q. (BY MR. HANBA) I'm going to have Mr. --
MR. HANBA: The word non-orthogonal, would you please highlight that? Thank you.
Q. (BY MR. HANBA) And this says here, constitutes non-orthogonal parallelograms. Right?
A. Yes.
04:17 Q. A square is not a non-orthogonal parallelogram. Right?
A. A square can be a non-orthogonal parallelogram, yes.
MR. HANBA: If we could go to column 4:18 through 22, please.
04:18 Q. (BY MR. HANBA) And you would agree with the patent that the figures 8 -- 8[A] which we showed earlier shows a non-orthogonal parallelogram. Right?
04:18 A. Yes.
MR. HANBA: No further questions, Your Honor.
THE COURT: You pass the witness.

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MR. HANBA: Pass the witness.

THE COURT: Is there redirect, Mr. McMahon?

MR. McMAHON: Yes, sir.

THE COURT: All right. Proceed with redirect examination.

MR. McMAHON: Thank you, Your Honor.

Mr. Buck, could you please bring up PX 27.

REDIRECT EXAMINATION

BY MR. McMAHON:

04:19 Q. Dr. Shanfield, Mr. Hanba asked you about this image and asked you, I believe, if it shows rounded corners, and I think you said, yes, it does. Am I correct?

A. Yes.

Q. Is there anything else you'd like to add about your opinion regarding this particular image?

A. Yes, there is.

Q. What is that?

04:19 A. The rounded corners, I believe, were due to the very aggressive etching that was done on the sample which attacked the gates and removed them completely in the black lines, those black holes, and on the surface of the silicon that surrounds it. So it formed rounded corners, but that is, in my opinion, a consequence of the aggressive etch.

04:20 Q. What, if anything, Dr. Shanfield, do we know about the shape of these cells before the aggressive etch?

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A. Nothing.
Q. Mr. Hanba asked you about Mr. Diep re-running some images. Do you recall that?
A. Yes.
Q. Why did Mr. Diep re-run some images?
04:20 A. He felt that the quality with the etch was so poor that he needed to, after this first draft, make another try and try and get images that were sufficient.
Q. Do you believe that the images Dr. Neikirk showed yesterday were the first run or the second run?
A. First run.
Q. Why?
A. I know that the -- I think there were only two images that showed up from the repolishing that he did, and none of
04:21 the ones Dr. Neikirk showed were those.
Q. Mr. Hanba also showed you a paragraph from your invalidity report. Do you recall that?
A. Yes.
Q. Could you please turn back to that? That's your invalidity report, paragraph 214.
A. Yes.
Q. Do you have that in front of you?
A. I do.
Q. And Mr. Hanba had you read a statement from that and suggested that you had an inconsistent statement. Do you

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recall that?
A. Yes.
Q. Do you have anything you'd like to add about that question?
A. Yes, I do.
Q. What is that?
04:21 A. That it says, as known to a POSITA at the time of Hshieh 348 priority date, silicon wafers are found in one of three orientations --
THE COURT: Just a minute. We're not here to read it. He asked you if there's something you would like to add from that exchange.
THE WITNESS: Oh, okay.
THE COURT: And if there's something you would like to add from that exchange, just tell the jury what it is.
04:22 THE WITNESS: That the orientation -- depending on orientation, you might get a different effect and depending on how the via is patterned you might get a different effect. So that was why when I was asked a very general question that I didn't believe you will necessarily get higher doping on the tapered edges.
Q. (BY MR. McMAHON) Do you believe that the statement you made here in court was inconsistent with the statement you made in your report?
04:22 A. Not at all.

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Q. And just to be clear, can you explain why without reading the report?
A. Yes. The -- for example, the photo resist typically it's dry etched and has an overhang when dry etched in almost all cases. And that means if you have a taper down below, you'll still get just implant on the flat part and not on the tapered edges.
Q. When you refer to the photo resist, are you referring to the accused MOSFETs or to the prior art reference you discussed in your report? Let me ask that again. You just mentioned photo resist.
A. Yes.
Q. What was the context in which you were referring to photo resist?
A. In Hshieh in discussing -- in responding to the question I had, which was in regard to 214, paragraph 214, and also in response -- it also applies to the argument Mr. -- Dr. Neikirk made about the tapered sides always being doped in between P+ and P.
Q. Does anything that Mr. Hanba asked you on cross examination or you answered on cross examination change your opinion of Dr. Neikirk's infringement analysis?
A. No.
Q. Mr. Hanba asked you I believe if SEMs are useful in semiconductor investigations. Do you recall that?

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A. Yes.
Q. And what was your answer?
A. Yes.
Q. Are SEMs useful in all semiconductor investigations?
A. No.
Q. Why not?
A. They are limited in particular, just as Dr. Neikirk said, you can't tell what doping is, can't tell the type, you can't measure it with an SEM.
04:24 Q. And regarding invalidity toward the end of the cross examination, Mr. Hanba asked you about Kobayashi and about Hshieh. Do you recall that?
A. Yes.
Q. And where in Kobayashi did you find disclosure of round corners?
A. In the text. There's a description of figure 6C.
MR. McMAHON: Could we please bring up column 7 of Kobayashi? That's PX 24.
Q. (BY MR. McMAHON) Is this the text you're referring to?
A. Yes.
Q. And where in this text do you see the suggestion you were just talking about?
04:25 A. In the sentence, In this event corners of each trench 6 at an opening portion may also be rounded.
MR. McMAHON: Let's turn to Hshieh, PX 24. I'm

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sorry. I misstated that. PX 25, the Hshieh reference.

04:25 Q. (BY MR. McMAHON) Dr. Shanfield, where in Hshieh did you find disclosure of rounded corners?

A. In the text associated with figure 8[C].

Q. 8[A]?

A. 8[A]. I'm sorry.

MR. McMAHON: If we could go to figure 8[A]. Sorry. Could we just go to fig 8[A], please?

THE WITNESS: This is also the text.

Q. (BY MR. McMAHON) What is it about this figure that suggests it teaches rounded corners?

04:26 A. That, along with the description, but you can just see it. It's obvious those are rounded corners.

Q. Why, if Kobayashi also teaches rounded corners, why did you decide to combine these two references?

A. To create an obviousness argument.

Q. And why do that in addition to the anticipation argument you presented on Kobayashi?

A. I look it like a belt-and-suspenders. Kobayashi

04:26 anticipated, but if there is any doubt, and here is a drawing that shows the exact structure of rounded corners, essentially where they have rounded corners.

Q. Mr. Hanba asked you on cross if you conducted any SEM analysis. Remember?

A. Yes.

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Q. You said no.
A. Right.
Q. He asked if you conducted any TEM analysis. Remember?
A. Yes.
Q. You said no.
A. Right.
04:27 Q. He asked you if you conducted any EDS analysis. Remember?
A. Yes.
Q. You said no.
A. Right.
Q. He asked you if you conducted any SCM analysis. Remember?
A. Yes.
Q. You said no.
A. Yep.
Q. Why did you not conduct any of those four analyses?
A. The point at which I received Dr. Neikirk's report was May 20th, and I had until June 10th to respond. So I had the
04:28 images, I could see that it wasn't really showing the evidence that Dr. Neikirk claimed. But in three weeks I could not even get -- I could not get far enough in any kind of analysis SEM or in the proper analysis for measuring doping profiles like this, so I had to live with what he had shown.
04:28 Q. Dr. Shanfield, if you wanted to identify a specific

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doping concentration in a semiconductor device, would you use SEM?

A. No.

Q. Would you use TEM?

A. No.

Q. Would you use SCM?

A. No.

Q. Would you use EDS?

A. No.

Q. What would you use?

A. I'd use SIMS, which is secondary ion mass spectrometry.

Q. Why?

04:28 A. We have a unit like that at Draper. Because I know that it can with very high precision on a cross section take a point and tell you what the doping level is with good accuracy, and with the lateral contact, for example, measuring that it would be capable of doing that measurement next to the metal source contact. And so -- and I've had experience with etching, which is more old school, I guess, and the SIMS, 04:29 secondary ion mass spectrometry, I know gives the right result. It gives you the believable result.

Q. And you said you have a unit like that at Draper?

A. Yes.

Q. And I believe you said before that with permission you could use equipment at Draper. Correct?

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A. Yes. That's right.
Q. On May 20th when you received Dr. Neikirk's report, why did you not seek permission to use that equipment to test the doping concentrations?
04:29 A. There is a backlog in that system--I actually checked it--that was about -- almost three months of backlog of parts, so I knew I would never get to it in time.
Q. When you say "backlog of parts," what do you mean by that?
A. Draper is using that system constantly to do analysis of semiconductor structures, and so there is -- even though I'm
04:30 director, I can't push that stuff out of the way, and therefore, you know, I knew I had to wait in line and it wouldn't get done in time.
Q. Did Dr. Neikirk -- let me make sure I have that name right. You said you would use secondary ion mass spectrometry. Is that right?
A. Yeah, that's right.
Q. Did Dr. Neikirk use that type of machine?
A. No, he didn't.
Q. If Dr. Neikirk had used that type of machine, would he have been able to determine the precise doping concentration of the accused MOSFETs?
A. Yes.
04:30 Q. Let's turn to -- that was the '634 Patent. Right?

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A. Yep.
Q. Doping concentrations and the lateral contact layer?
A. Yes; correct.
Q. Let's turn to the '409 Patent. If you wanted to identify the shape of the cells in one of the accused MOSFETs, would you have used SEM?
A. No.
Q. Would you have used TEM?
A. No.
Q. Would you have used EDS?
A. No.
Q. Would you have used SCM?
A. No.
Q. Why not?
A. All of those methods wouldn't give me the answer that I could believe.
Q. Why not?
A. The requirement with all of those is to remove all the layers on top of the chip to get down to that layer where you want to look at the shape, and all of the methods from removing -- I mean, most of the methods, I should say, from removing all those layers will attack the layer underneath and it's a classic problem.
Q. And when you say "attack the layer underneath and the classic problem," what do you mean?

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A. That the -- as you saw in that SEM image, the gates were missing, there was a black hole where the gate was, all the silicon had been attacked and the edges rounded from the attack, so it clearly -- you know, and I would have anticipated it would have attacked the layer underneath. So you'd get a false reading.

Q. And when you say it in that sentence, you mean the hot acid bath that you referred to before?

A. Yes.

Q. If you wanted to identify accurately the shape of the cells in the accused MOSFETs, what would you have done?

A. I would have used ion beam profiling, which etches the material with a dry ion beam in a very precise way. It doesn't add any chemical. And you can control that within a nanometer, so you can stop that removal of material just before the surface you want to examine.

Q. On May 20th when you saw Dr. Neikirk's analysis, why did you not do just that?

A. We have that capability as well at Draper. And again, there's tremendous demand for this kind of analysis, and there was a long line. It was essentially the same laboratory and they were busy for almost three months.

Q. When did you need to respond to Dr. Neikirk's analysis?

A. Within three weeks of when I got the report.

Q. Would that have provided enough time to use any of the

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two -- either of the two devices you just referred to?
A. Not even close.
MR. McMAHON: Nothing further. Pass the witness, Your Honor.
THE COURT: All right. Further cross examination?
MR. HANBA: Quickly, Your Honor.
THE COURT: We'll see. Go ahead, Mr. Hanba.
MR. HANBA: If it please the Court.

RECROSS EXAMINATION

BY MR. HANBA:
04:33 Q. You mentioned the secondary ion mass spectrometry.
A. Yes.
Q. About how long would it take to do an analysis?
A. Are you talking about from what point? It would have taken me three months to get to the point where they could prepare the sample.
Q. And then after that, how long would it take to do the analysis?
A. It typically has to be done repeatedly to get assurance
04:34 that the measurements you're taking are correct, so I'd say maybe another three weeks.
Q. Three weeks. And what was the second one that you -- the second process --
A. It's ion milling.
Q. Okay. And how long would ion milling take?

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A. That takes -- well, again, I'd have to wait three months or two and a half months to get to the point where I could get the sample ready. We'd have to do a test sample, because the rate of milling has to be measured in some part that you don't care about. And that -- you know, those repeat runs to get rates at each layer, that typically itself could take -- I mean, the reality is it would take multiple weeks, maybe four, to the point where now you can do the complete mill and have the sample SEMmed. You've got to bring it back to the SEM and examine it, so another week for that.

Q. And I believe you said that Dr. Neikirk's report was due on May 20th. Is that right?

A. I said June 10th.

Q. Oh, your report was due on June 10th?

A. Yes.

Q. Okay. But you were hired in this case--right?--in January of 2024. Right?

A. Just about, yes.

Q. Okay. Thank you.

THE COURT: You pass the witness, counsel?

MR. HANBA: Pass the witness. Excuse me, Your Honor.

THE COURT: Any additional direct, Mr. McMahon?

MR. McMAHON: No, Your Honor.

THE COURT: You may step down, Dr. Shanfield.

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THE WITNESS: Thank you.

THE COURT: Defendant, call your next witness.

MR. CHEN: Defendant calls Dr. Keith Ugone.

THE COURT: All right. Dr. Ugone, if you'll come forward and be sworn, please.

Are there binders to distribute, Mr. Chen?

04:36 MR. CHEN: No, Your Honor.

THE COURT: All right.

(Whereupon, the oath was administered by the Clerk.)

THE COURT: Please come around; have a seat on the witness stand, sir.

04:37 All right, counsel. You may proceed with direct examination.

MR. CHEN: Thank you, Your Honor.

KEITH RAYMOND UGONE, Ph.D., SWORN, testified under oath as follows:

DIRECT EXAMINATION

BY MR. CHEN:

Q. Dr. Ugone, could you state your full name for the record?

A. Sure. My name is Keith Raymond Ugone. Last name is

04:37 spelled U-G-O-N-E.

Q. And it's pronounced Ugone like Capone?

A. Yes.

Q. Please tell the jury why you're here today.

A. Actually I'm here to evaluate the royalty damages if the

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jury were to find that the asserted patents in this case are found to be valid and infringed. So that's what I was asked to do.

Q. Before we go through your opinions, let's introduce you to the Court.

Where do you live, sir?

A. So I actually live in [redacted].

Q. And where is [redacted]?

A. So [redacted]

[redacted], so...

Q. How long have you lived in [redacted]?

A. Since [redacted].

Q. [redacted]

A. [redacted]

Q. [redacted]

A. [redacted]

[redacted]

Q. [redacted]

A. Yes; absolutely.

Q. Sir, what do you do for a living?

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A. So I have kind of a fancy name--forensic economist and damage quantifier.

Q. And what does a forensic economist and damages qualifier do?

A. Damages quantifier.

Q. Quantifier; I'm sorry.

A. The easiest way to think about it is it's not uncommon for companies to get into a dispute and then one of the companies is saying another company did some wrongful conduct, and they're claiming that they've been harmed because of that. And so the forensic economics part is kind of figuring out, well, what happened and what would have happened if that alleged wrongful conduct had not taken place. So that's kind of the forensic part.

The damage quantification part -- and these are just fancy terms, but the damage quantification part is just putting a monetary value on that harm. So it's called damages in this kind of environment.

Q. Dr. Ugone, let's discuss your background. Would you tell us about your educational background?

A. Yes. I've got an undergraduate degree from the University of Notre Dame, which I got in 1977; I've got a Master's degree in economics from the University of Southern California, which I got in 1979; and I've got a Ph.D. in economics from Arizona State University, which I received in

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1983.

04:40 MR. CHEN: Mr. Buck, can you display DDX 8.1?

Q. (BY MR. CHEN) So Dr. Ugone, does that accurately display your educational background?

A. Yes. So on the left-hand side there is my educational background. And all those degrees are in economics.

Q. Notre Dame, U.S.C. and Arizona State. Who do you root for during football season?

A. Well, we're in Texas which is a big football state, but

04:40 I'm going to have to say Notre Dame, my undergraduate school.

Q. Have you been employed in the field of economics since the time of your graduation?

A. Yes.

Q. And how long is that?

A. Well, it's been a long time since I graduated from college, 1983, but I've got my work experience here. When I was getting my Ph.D., I was teaching economics at Arizona State University. And then when I graduated with my Ph.D., I was working in one of the California State University system

04:41 schools, Cal State-Northridge, which is just north of Los Angeles. So that's where I started out.

Q. And what did you teach?

A. So I taught microeconomics, macroeconomics, intermediate price theory, an MBA course in macroeconomics; so general economics courses, but micro and macro.

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Q. What did you do after teaching?
04:41 A. So I taught full time for a couple of years, and continued to teach part time for another seven years because I enjoyed teaching, but in 1985 I joined PriceWaterhouseCoopers. At the time they were PriceWaterhouse. And you've probably heard of them. They count the Academy Award ballots. That's not what I did, but a lot of people have heard of them for that. But I was with them for 18 years.
Q. And you're now at the Analysis Group?
A. Yes. So at the very beginning of 2004 I joined Analysis Group, and have been with them ever since.
04:42 Q. What is your title at the Analysis Group?
A. Well, actually for about the first 16 years or so I was called a managing principal, which is a partner position, and then -- I've lost track. Three or four years ago I decided to retire, and they gave me a title called senior advisor. So I kind of like that title, but I'm known as a senior advisor right now.
Q. You've come out of retirement?
A. I've invented new term. It's called failed retirement.
04:42 I'm in a failed retirement mode right now.
Q. Sir, what type of work is the Analysis Group known for?
A. So Analysis Group is a consulting firm, so we do financial analysis, economic analysis, a lot of healthcare type consulting work, and we work with companies, government

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agencies, and so forth.
Q. And you yourself specialize in economics and damages-related work?
A. Economics and damages-related work. To put a finer point on it, sort of economic analysis, but in a dispute environment. So I usually work in the environment where companies are upset at each other and somebody's got to figure out if there's been any harm or not. So that's what I do.
Q. Have you testified in patent cases before?
A. Yes, I have testified in patent cases.
Q. About how many times?
A. I've probably -- I've been doing this for whatever, 40 years since I graduated, but I've probably testified in patent cases maybe 60 times over the course of my career.
Q. What has been the nature of your work and testimony in these patent cases?
A. I generally do economic analysis, I said, or damages-related analysis. So like in this case here, we're looking at, you know, something called reasonable royalty damages, and so I've done that numerous times during the course of my career.
Q. Do you typically only testify for plaintiffs, or do you testify for both plaintiffs and defendants?
A. Actually I could be retained on the patent holder side or I could be retained on the alleged infringer side, so I've

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done work on both sides.
Q. And who are some of the companies that have retained you in the past?
A. I've worked for or been retained by to do economic analysis by Samsung, by Verizon, Amazon, Pfizer. Those are some examples.
04:45 Q. Have you received any recognitions for your work?
A. I've been fortunate that, you know, my peers have recognized and I've received some honors. There is something put out by the Intellectual Asset Management that recognizes some world-leading practitioners, and I've gotten that every year since 2014. And then there's sort of a who's who legal
04:45 competition economics category, and I've gotten that quite frequently since 2014. And then in the last two years I was recognized as a thought leader in this area.
Q. Does the Analysis Group charge for your time that you spend on these types of cases?
A. Yes. So Analysis Group, the company I'm working for, sets my billing rate, yes.
Q. The -- what is the rate that the Analysis Group charges for your time?
04:46 A. So it's $980 an hour.
Q. Is Analysis Group's compensation dependent upon the opinions you give or on the outcome of this matter?
A. No, it does not depend on the outcome of this matter.

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It's basically the time you put in and the hourly rate is how Analysis Group gets compensated.

MR. CHEN: Your Honor, ASUSTek offers Dr. Keith Ugone as an expert in forensic economics and patent damages.

THE COURT: Is there objection?

04:46 MS. PELLEGRINO: No objection, Your Honor.

THE COURT: Without objection, the Court will recognize this witness as an expert in those designated fields.

Please continue, Mr. Chen.

MR. CHEN: Thank you, Your Honor.

Mr. Buck, let's display DDX 8.2.

Q. (BY MR. CHEN) Dr. Ugone, what were you asked to do for this case?

A. I was really asked to do two things, and you can see on the slide here I've listed them, but I was asked to evaluate

04:46 Force MOS's royalty claim as presented by Mr. LaMotta. You heard him testify this morning, so I'll be commenting on the work that he presented to the jury. And then I was also asked to independently evaluate a licensing royalty for Force MOS's patents that they're asserting in this case, so evaluating Mr. LaMotta's work and then saying what I think the appropriate number would be sort of independent of that.

04:47 Q. And what is your starting point for these evaluations?

A. Well, the starting point is -- there's really kind of two

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starting points what's the dispute over. Okay? This is a patent infringement case, so we've got two patents that are being asserted, but it's always interesting from the damages side because you never get to damages unless wrongful conduct is found that there's liability. So damages experts, whether it's me or Mr. LaMotta, has to assume that the patents in this
04:47 type of dispute are valid and infringed, and then my testimony would become relevant.

Q. And you understand it is the jury that will be determining whether these patents are valid and infringed. Right?

A. That's correct, yes.

Q. Sir, do you know ASUSTek's position in this case on these subjects?

A. I believe I do, yes.

Q. And what is that?

A. That the patents are not valid and not infringed, so they
04:48 do not believe that there's been any wrongful conduct.

Q. What happens if the jury determines ASUSTek is not infringing the patents?

A. If the patents are not being infringed, then there was no wrongful conduct so there's no damages. So another way to say that is damages would be zero. But in a sense you never even would get to that question.

MR. CHEN: Mr. Buck, can we display DDX 8.3?

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Q. (BY MR. CHEN) And does the left side of DDX 8.3, sir, reflect what you just opined on?
A. Right. So if the patents are not valid or not infringed, then damages are zero.
Q. Dr. Ugone, what is your ultimate conclusion on the amount of reasonable royalty in this case?
A. So if the jury were to find that the patents are valid and infringed, then my opinion is that the reasonable royalty damages would be $615,595.
Q. Does the fact that you are discussing damages mean you think the patents are valid and infringed?
A. No. I do not have an opinion on the technical side of the case.

MR. CHEN: Mr. Buck, please display DDX 8.4.

Q. (BY MR. CHEN) Dr. Ugone, can you remind the jury of Mr. LaMotta's damages opinion in this case?
A. Yes. So we -- a lot of this kind of came out this morning, but it's good to see what's going on.

So on the far left is my opinion--$615,596 if the patents are found to be valid and infringed.

Now, on the far right-hand side is what Mr. LaMotta presented, which was his alternative approach, and he said $20.1 million. But in his reports, which also came out this morning, he also had two other scenarios, and in those scenarios those claimed royalty damages ranged from $1.4

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million to $6.8 million. So he ultimately in his reports had opinions that range from $1.4 million all the way up to $20 million.

Q. So to be clear, both the red box in the middle of DDX 8.4 as well as the red box to the right on this page reflect Mr. LaMotta's opinions?

A. Correct, yes.

Q. Sir, why is there such a big difference between your reasonable royalty opinion and Mr. LaMotta's?

A. Yeah. The -- a couple of reasons. But I think, as the jury's probably learning, when you're talking about, you know, a reasonable royalty, there's a couple of different ways it can be calculated, but a lot of times it comes down to a royalty rate times a royalty base. Right?

It's kind of like when you go through and you buy something at the store, there's a -- or you go to the restaurant, there's a sales tax on, say -- let's just say the dollar amount of what you bought. So it's very similar, except here it's sort of a per-unit rather than a percent. But at the end of the day, it's one number times another, a rate times a base.

And so there's been a lot of discussion so far about what the royalty base is. That's what the argument's been about, the count of accused components, and that's one of the big reasons for these differences in the numbers. And then also

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when you get to the $20 million one, there's a big difference in the rate that essentially -- the rate that Mr. LaMotta is applying. So it always comes down kind of to those two numbers--what's the rate we're talking about and what's the royalty base to which you apply the rate. And that's at the heart of the disagreement.

Q. Sir, did you base your opinion on review of documents?

A. Yes.

Q. And could you just briefly summarize the types of documents you reviewed in formulating your opinions in this case?

A. Yes. So as economists and as a damage quantifier, you want to see the financial documents. You want to see things like Force MOS's financial documents, you want to see documents that tell us something about the accused products, so those sort of documents. There were depositions to read, some of which you've seen videotapes of. There's legal documents. There's the patents. So that would be the kind of the full range of documents you would see. There would be, you know, reports by the technical experts, portions of which I would want to review; and then, frankly, obviously Mr. LaMotta's reports as well.

Q. Dr. Ugone, did you prepare your own expert report?

A. Yes.

Q. Did ASUSTek's lawyers type any part of your report?

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A. No. The lawyers did not write my report.
Q. Did the lawyers direct you on the substance of your report?
A. No, I did my own independent analysis.
Q. And sir, have you been attending trial all week?
A. Yes.
04:53 Q. Let's discuss next your evaluation of Mr. LaMotta's claimed damages royalty opinions.
MR. CHEN: Mr. Buck, let's display DDX 8.5.
Q. (BY MR. CHEN) Dr. Ugone, can you give us a summary of Mr. LaMotta's opinions?
A. Yes. So this is kind of what I was saying before, and I'm just showing the lower bound and the upper bound. So I didn't put the 6.8 in there, million dollar number, but
04:54 essentially he uses a royalty base of the 1.5 billion accused components times a range of royalty rates he had. He actually had seven different royalty rates, and so I'm just showing the range here. And when you multiply those out times the royalty base--remember it's always a rate times a base--that gives the 1.4 million.
Now, what's not here is the 6.8. He used much larger
04:54 numbers for the 6.8, but that was in the middle of these two.
And then he's also got his $20 million number where he took a different approach, but he was basically looking at the price or the cost associated with the MOSFETs times the same

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1.5 billion accused products that gets him to $20 million. So a difference is that he's kind of -- at the top ones in the blue, he's using a royalty rate approach, whereas in bottom he's more looking at the price of the MOSFETs to ASUSTek.

Q. And were you here when Mr. Underwood asked Mr. LaMotta if Mr. LaMotta was using a hundred percent of the price of the MOSFETs?

A. Yes, I was here.

Q. And do you agree that Mr. LaMotta is using a hundred percent of the price of the MOSFETs for his alternative approach?

A. Yes, absolutely that's what he's doing.

MR. CHEN: Mr. Buck, please display DDX 8.6.

THE WITNESS: Now, I accidentally touched the screen and I have a red mark and I don't know how to get rid of it. Oh, there we go. Okay.

Q. (BY MR. CHEN) Sir, please share with the jury why you think Mr. LaMotta's claimed reasonable royalty damages are overstated?

A. Yeah. Well, I've kind of hinted at this. There's sort of three reasons. The first one is he's got an incorrect royalty base. He's using it to high. It's about three times too high, even on the low end, so that makes a big difference.

And then the way he does his royalty rates in that sort of middle approach of the $1.4 million opinion to the $6.8

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million opinion, the way he kind of develops his kind of tiers of royalty rates, he's got seven different royalty rates so there's some issues with the royalty rates.

Then on the alternative approach--that was the $20 million one--he's basically using MOSFET prices which incorporate a lot more than just the value of the technology. So he said he was doing apportionment, and we'll come back to what that means, but he really wasn't doing an apportionment; he was taking the full price of the MOSFET, and that's problematic from a damages perspective.

But I would say everything I'm going to talk about kind of fits into these three categories.

Q. Let's explore each of these in more detail.

Starting with your first reason, you previously stated that you reviewed financial information for your analysis. In the normal course of business, does ASUSTek keep track of the number of MOSFETs in the products it sells?

A. No, it does not.

Q. And how do you know this?

A. Well, we've heard that from the testimony throughout trial here that that's not something that's kept track of.

Q. And did ASUSTek provide any other relevant metrics or information for this lawsuit?

A. Well, they did end up -- if I understand your question, they did end up providing a spreadsheet where they went back

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and basically put together in response to the allegations, you know, the various products that they sell that are accused products, like, you know, the laptops and the desktops, and so forth, the motherboards and the graphic cards, where they put
04:58 that together, the number of units. But they also have these other documents called bills of materials or bill of material B-O-M, BOM, and you've kind of heard there throughout the trial, and putting those together you can get an estimate of the -- what we'll just call the accused components that are at issue in this case.

Q. Is that Exhibit JX 07 that multiple witnesses have discussed?

A. Yes.

04:58 Q. Did Mr. LaMotta use JX 07 in coming up with his estimate of the number of accused components?

A. No, he did not.

Q. Do you know how Mr. LaMotta came up with his numbers?

A. Essentially he took his numbers from Dr. Neikirk.

Q. And do you understand how Dr. Neikirk came up with his estimates of the accused components in each category of ASUSTek products?

04:59 A. I've got to give a two-part answer. At first I thought I understood because I thought he was relying on the Microtech analysis, but then during his testimony here he said he wasn't relying on that, so it's really unclear to me how he

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ultimately came up to his numbers. But at the end of the day, he provided accused component numbers to Mr. LaMotta. Mr. LaMotta used those. There are some ambiguity--I'll just put it that way--as to how those numbers were ultimately derived.

05:00 Q. Why did you think Dr. Neikirk relied on the Microtech counts in coming up with his estimates?

A. I'm sorry. If you could say -- ask the question again.

Q. Why did you think Dr. Neikirk relied on the Microtech counts in coming up with Dr. Neikirk's estimates?

A. Well, again, for two reasons; one being that Force MOS 05:00 had retained Microtech to tear down some sample products and to see the accused component count in there, and then when you kind of look at those counts and some of Mr. -- Dr. Neikirk's numbers, you know, they were very, very close. There was some discussion about that. And so it appeared as if that's how he got his numbers, but he seemed to say he didn't get that that way when he was testifying.

05:01 MR. CHEN: Mr. Buck, let's display DDX 8.7.

Q. (BY MR. CHEN) Dr. Ugone, this is -- these are the ASUSTek products that Microtech tore down and counted. Is that correct?

A. Yes. So we've got -- in the middle column, the 3, we've got notebooks, then to the right we have motherboards, and then with have a graphics card.

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Q. Were there any other products analyzed by Microtech, to your knowledge?
A. Not that I am aware of, no.
Q. Do you remember, sir, Dr. Neikirk saying Microtech was asked to count all accused MOSFETs in the products they analyzed?
A. Yes.
MR. CHEN: Mr. Buck let's display DDX 8.8.
Q. (BY MR. CHEN) Dr. Ugone, how did the MOSFET estimates used by Mr. LaMotta for each of the product categories compare with the Microtech count?
A. Okay. So we got this information -- you heard a deposition of Mr. Diep. He also issued a declaration that had these numbers. So Microtech had done a count, they did their analysis, which, you know, has been the subject of testimony with a scanning electron microscope. And on the notebooks, Microtech found in one of them 48 accused components--I'm sorry--58 accused components, and another one 22, and another one 2. In the motherboards they found 70 and 27, and then in the graphics card they found 9. So that was the count provided by Microtech.
Q. And how do these counts compare with Mr. LaMotta's low-end quantities?
A. Right. So Mr. LaMotta in his report actually used two sets of counts for the accused products. One he called a

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low-end and one he called a high-end. We've got his low-end here, and you can see that for the three notebooks, for all three he used 65 accused components; for the two motherboards he used 107; and the graphics card he used 12. And so you can kind of compare that far right-hand column of what Mr. LaMotta used versus what Microtech had uncovered when they did their analysis on these six devices.

Q. And Dr. Ugone, is it your understanding that Mr. LaMotta used these low-end quantity counts and applied them to every notebook sale by -- that were reported in JX 07?

A. Right. So an easy way -- so the answer is yes, and the way to see that is for the notebooks, the three of them, Microtech got 58, 22, and 2, but Mr. LaMotta used 65 for each of them.

Q. And for motherboards, Mr. LaMotta used the low-end quantity for every single motherboard sale that's reported in JX 07. Is that correct?

A. Yeah. Let's make sure there was no confusion. So Microtech did a count of 70 in one and 27 in the other, but on these specific products--so that's what we're showing here--he used 107 on both.

Q. Did Mr. LaMotta explain why his accused components were so much higher than the counts Force MOS actually had from Microtech?

A. I don't really believe so. He got those as an input from

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Dr. Neikirk, and that's what he used.

Q. Let's now compare Microtech's data to ASUSTek's data.

Dr. Ugone, have you previously performed an analysis comparing Microtech's count to ASUSTek's data?

A. Yes.

Q. And what did you conclude with respect to the reliability of ASUSTek's data?

A. Yeah. Well, doing that comparison allowed me to -- or 05:05 helped me to also reach the conclusion that the ASUSTek data is reliable because those numbers were actually pretty close for these corresponding -- just to be clear, for these corresponding products.

Q. And how does the numbers being close inform you or help you conclude that ASUSTek's data is reliable?

05:05 A. Well, so first of all, I had an understanding of how ASUSTek came up with that spreadsheet we've all been seeing in terms of all the products they've listed, they went back to the bill of materials, and they had someone figure out the counts for each of the products in those big spreadsheets.

And then I said to myself in my analysis, Well, okay, that Force MOS has also hired an independent company to do a 05:06 count, and, you know, it wasn't a lot but it was six different products. We may as well compare what did they get for the six products to what's in the database that ASUSTek counted, and so I did that as a test of reliability.

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Now, the thing that was interesting to me is that, you know, either those two parties didn't know about the other -- you know, ASUSTek didn't know about Microtech and Microtech didn't know about ASUSTek's count, and so it's not like what they were doing was biasing each other, so it was almost like two independent accounts -- two independent counts that were relatively close.

Q. And your analysis of these two independent counts, were they consistent with each other, the count from Microtech and the slot count from ASUSTek, as reflected in JX 07?

A. Yes, when you compare to the overlapping products.

Q. Dr. Ugone, as an expert in the field, what would you have done if you were unsure about the reliability of ASUSTek's data and you also had access to Microtech's count?

A. Well, I would have done exactly what I did. Now, I didn't do that because I thought ASUSTek was unreliable, but it's natural to say let me compare the two and see whether they're close or whether they're different.

Q. Did Dr. Neikirk do that?

A. Not that I'm aware of, no.

Q. Did Mr. LaMotta do that?

A. Not that I'm aware of.

Q. Did the lawyers for Force MOS do that?

A. Again, not that I'm aware of.

Q. What do you think about Force MOS's approach of

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criticizing ASUSTek's data without testing that criticism?
A. Well, I think it's always good to do a -- you know, a reasonableness test. That's part of what we do. In other words, when you're doing an analysis, you need to kind of take a step back and say, Does it make sense, and is there any way that I can help validate what I'm doing and that the numbers
05:08 I'm using make sense. And so that -- you know, that's what I try to do, frankly, over all the projects I work on.
Q. Back in your teaching days, what grade would you have given your students if he or she blindly criticized data without support?
A. Well, let's say this. I would have called them into my office and had a discussion with them.
05:08 Q. Sir, would you agree with me that each of the counts that Microtech provided was effectively a variable; a variable to test against ASUSTek's data in JX 07?
A. Well, if I understand your question, I would say yes, because they had a model, they had a count, and then you could go over to the ASUSTek data and look up the same model and get
05:09 the count and then do a comparison. If that's what you're asking, yes.
Q. And there were six models. Correct, sir?
A. Yes.
Q. And multiple MOSFET models were counted in each of the six models. Yes?

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A. Yes.

05:09 Q. And I'll represent to you, sir, that there were 15 MOSFET counts reflected in the Microtech MOSFET count. Does that indicate to you that there were 15 separate variables from MOSFET -- from Microtech's counting exercise that could be tested against ASUSTek's JX 07?

A. I'm not sure if I totally understand your question, but you can do some testing from counts, you know -- I mean, if

05:10 you know the models and you know, you know, the accused component and you can identify those and you can do some counts, then you can do the comparisons.

MR. CHEN: Mr. Buck, please display DDX 8.9.

Q. (BY MR. CHEN) Sir, how did Mr. LaMotta's estimated units compare to the maximum figures in the ASUSTek data?

A. Yeah. So what we're trying to show here is, you know,

05:10 we've got the various, I'll call them accused devices. So we've got the accused components which are the MOSFETs, and they are in, say, a desktop or a notebook. So we'll call those the accused products or the accused. So you have to keep the accused component and the accused products separate.

But in the desktops, you can see the pink bar is what Mr. LaMotta used, and then the blue bar is the average number in

05:11 the desktops that you get from the ASUSTek database or spreadsheet you've been seeing.

So you can look across here. I talked about the desktop.

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You can see he used 119 and the average number was 40. For notebooks he used 65, and the average number was 19. And we can go right across. Motherboard, he used 107, the average was 47 from the database. The servers were pretty close, 119 to 117. And then we have some smaller ones on the right-hand side, but those are not the same significant sales as the four on the left which dominate.

Q. And to be clear, these numbers from Mr. LaMotta's opinion reflect only his low-end estimates. Right?

A. Yep. Correct. So as I mentioned, in his report he had a low-end estimate and a high-end estimate, so right now I've only been showing the low-end estimate.

05:12 Q. And the high-end estimate is five times each of these low-end estimates?

A. That's correct. So actually -- and let's make that clear. If you take the pink bars and multiply by five, that's his high-end estimate.

Q. Sir, are there any ASUSTek products that have more MOSFET components than the low-end estimates provided by Dr. Neikirk?

A. Yes. So the way to -- so the answer -- to answer your

05:12 question, yes, there are some. It's small in number and small in percentages, but each of the various projects -- products, you know, one of the databases had like 5- or 5,000; another one had like 2,000. And so you have a whole range of accused components, as you might imagine.

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But as we heard from some of the testimony, the vast majority of them, you know, were under a hundred or under 60. But yeah, there's going to be a few that are above even the pink bars, but they're small in number. What I presented here are the average across all of those. But yes, there are some that are higher.

Q. Were you here in the courtroom when Mr. Hung testified that less than two percent of ASUSTek's products have over 100 MOSFETs?

A. Yes, I was.

Q. Sir, what conclusions do you draw from the charts that we've been looking at?

A. Well, the conclusion I have -- a couple of different conclusions: One, that Mr. LaMotta was using an unreliable accused component base--and remember, it's always a rate times a base for royalty damages--which leads him to overstate claim damages.

MR. CHEN: Mr. Buck, please display DDX 8.10.

Q. (BY MR. CHEN) Dr. Ugone, what is the impact of overstated estimates on the actual total quantity Mr. LaMotta relies on?

A. Right. So those are the two bars to the right, but if we start at the left-hand side, the blue one would be the count from the ASUSTek spreadsheet you've seen, and that's roughly 600 million -- a little bit over 600 million, or .6 billion.

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Mr. LaMotta used approximately 1.5 billion, or a number that's two and half times what's in the database. And then we've just touched on this a little bit, but his high end, which -- and hopefully remember this goes back to his $6.8 million number, his high end was 7.7 billion accused products versus the database which said about 600 million.

Q. So based on his high-end estimate of 7.7 billion MOSFETs, Mr. LaMotta concluded the damages figure should be $6.8 million. Correct?

A. So -- yes. So when he's using the red bar at the right and the high-end estimate, he derived a number of $6.8 million as claimed royalty damages.

Q. And have you heard any supports in these proceedings for Mr. LaMotta's decision to multiply the low-end estimate by five to arrive at a high-end estimate number?

A. No, not at all.

Q. And the damages figure presented by Mr. LaMotta today, isn't it even higher than the damages figure that he proposed based on his high-end estimate?

A. Yes. So the damages figure he presented, he called it in his report sort of an alternative approach, and that yielded a number, I think it was 20.1 million, which obviously is bigger than 6.8 and 1.4 million.

Q. 20.1, is that almost three times the 6.8?

A. Correct.

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MR. CHEN: Mr. Buck, please display DDX 8.11.

Q. (BY MR. CHEN) Dr. Ugone, have you assessed how the difference in the number of MOSFET units impact Mr. LaMotta's claimed royalty damages?

A. Right. So the answer is yes.

Q. And please explain your assessment.

05:16 A. So what I'm showing here in simplified form is if I just take Mr. LaMotta's model, so I just take the calculations that he did, and instead of putting in his -- frankly, his low-end estimate, which is too high in terms of the royalty base, and you just plug in the ASUSTek count from their spreadsheet but

05:17 you keep his same royalty rates, you get a number of $548,417. So this would be an example of where his, like, $1.4 million number, just making the royalty base change, comes down to about $550,000. And you can also compare this to the $6.8 million number when he uses that five times the royalty base figure, but you put in the actual numbers from the ASUSTek

05:17 spreadsheet, again that comes down to $548,417.

Q. How does this figure, the adjusted figure of $548,417, compare with your opinion, sir?

A. This is where it's a little interesting. My opinion, if you recall from an earlier chart, was approximately $615,000,

05:18 and what I'm saying here and recognizing is that if I just take Mr. LaMotta's model but fix what's called the royalty base, it's actually a little bit less it's $550,000 when I was

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saying $615,000. But to me it was kind of like that validates, you know, the two numbers. We're talking about a range that's very similar. We're not talking about a range that's, you know, far off.

Q. The similar range that you're referring to, Dr. Ugone, that's the royalty rate?

05:18 A. Well, I'm talking about even the final number, I was saying, when you do those multiplications. But yes, he's got different royalty rates than what I use, but what I was trying to say is when it's all said and done, even though we got there in slightly different ways, on this portion of the analysis, the numbers are pretty close.

Q. The primary difference maker is the royalty base or the component count or the slot count.

A. That's correct.

05:19 MR. CHEN: Mr. Buck, please display DDX 8.12.

Q. (BY MR. CHEN) Dr. Ugone, what are we looking at here for DDX 8.12?

A. So what Mr. LaMotta did in his first two analyses was to derive some royalty rates, and he ended up coming up with a royalty rate for each of the seven accused components, and you can see that they range from very low numbers to, you know,

05:19 higher numbers. And, you know, it's always difficult with all these zeros here to say exactly what it is, but that's like 7/100th, you know, of a cent versus 1.8 cents. But that's the

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range of royalty rates to which he opined. So that's what this represents. And then I also looked at this and did some analysis.

Q. So to be clear, every single rate on this demonstrative 8.12 is from Mr. LaMotta. Correct?

A. Yes. These are Mr. LaMotta's royalty rates that he applies to the accused components.

Q. Sir, what is the difference between the highest rate proposed by Mr. LaMotta and the lowest rate that he proposed?

A. Yeah. If you take the highest rate and divide it by the lowest rate, it's 25 times higher.

Q. Based on your analysis, is Mr. LaMotta's claimed royalty damages or alternative damages, are either one of those reliable measures of damage if the jury finds the patents to be valid and infringed?

A. No.

MR. CHEN: Mr. Buck, let's display DDX 8.13.

Q. (BY MR. CHEN) Sir, let's move to your next issue with Mr. LaMotta's analysis, the alternative approach. Could you give the jury a high-level summary of your evaluation of that approach?

A. Right. So the alternative approach is the $20 million number that Mr. LaMotta came up with, and I list four reasons why I believe that approach is unreliable. And we'll talk through each of these, but Mr. LaMotta took the position

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that--and it's right in his report--that you only go to the alternative approach if you don't have reliable data. But we've seen we do have reliable data from ASUSTek, so it's kind of a contradiction there. And that's sort of item number one.

But he's also relying on Dr. Neikirk's overstated estimates. And we saw some comparisons to ASUSTek and also to Microtech, so we've got some overstated numbers there that he's actually still using, so that's problematic.

He also, instead of using a royalty rate approach, he basically takes a hundred percent of the price of the MOSFETs to ASUSTek, and that's almost like saying a hundred percent -- or it is like saying a hundred percent royalty rate on the products -- the accused components.

And then also, you know, if you really think about it, something we really haven't gotten into is this is a culmination of a negotiation between the parties, that if they had gotten together to negotiate a royalty rate for the patents-in-suit--they didn't, but there's something called a hypothetical negotiation, which is what we use--but if you kind of use that to simulate what the parties would have done, there's some -- usually some sharing of the gains from that sort of exchange. But he does not do any of that sharing at all.

You can kind of think about, you know, why should I do anything -- why should I make a trade if the other guy gets

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all the gains from the trade. That doesn't make any sense. You wouldn't do the trade because then there's no benefit to you because all of the gains had been taken away. That's what he is doing in the analysis as well.

MR. CHEN: Mr. Buck, let's display DDX 8.14.

Q. (BY MR. CHEN) Dr. Ugone, let's discuss the analysis you performed for your reasonable royalty opinion.

05:23 Can you share with the jury, what is a hypothetical negotiation?

A. Okay. So I kind of introduced this, but the whole idea is that you want to come up with a reasonable royalty, so we're talking about royalty damages for the use of patented technology; in other words, what should have been paid if the patents are valid and infringed. And that's usually a licensing arrangement. And a licensing arrangement comes about from a negotiation.

05:24 Well, that didn't happen between ASUSTek and Force MOS, so what you have to do is use this hypothetical negotiation construct where you -- this is going to sound weird, but you pretend as if they had negotiated. So you imagine a situation where they go into a room, they've got a table there, and they start negotiating, and you try to look at all the economic considerations that the parties would consider, and then

05:24 ultimately derive what a reasonable royalty would be.

Q. Did you perform your analysis using the hypothetical

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negotiation framework?
A. Yes.
Q. Did Mr. LaMotta also use a hypothetical negotiation framework?
A. Yes.
Q. Were there any issues with Mr. LaMotta's approach to the hypothetical negotiation?
A. Well, he ultimately -- while we have some fundamental
05:25 required assumptions that are the same where he goes astray, in a sense, is on sort of his tiered reasonable royalty rates, but also the royalty base. He's assuming that ASUSTek would have agreed to the royalty base to which to apply the royalty rate, and that doesn't make any sense in light of the data we've seen.
Q. Sir, do you agree that the hypothetical negotiation date would have been on or around April of 2012?
05:25 A. Yes. That would have been the date of the first alleged product that used the claimed patented technology, so that sets the date.
MR. CHEN: Mr. Buck, let's display DDX 8.15.
Q. (BY MR. CHEN) Dr. Ugone, have you heard Mr. LaMotta discuss the *Georgia-Pacific* factors?
A. Yes.
Q. And is that also the framework in which you conducted your analysis?

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A. Yes. So there's something called the *Georgia-Pacific* factors. Those come from a famous court case called *Georgia-Pacific* where it was outlined by the court in terms of some suggestions of what you should look at when you're trying to evaluate reasonable royalty damages, and the court identified 15 considerations which are known as *Georgia-Pacific* factors.

Now, they're not exclusive. You use what's important to the case, but the -- so these are just guidance. You use some you, don't use some; if there's something else that's important, you bring that in. But this is guidance.

But No. 15 is the hypothetical negotiation. So it's almost like factors 1 through 14, depending how many you use, ultimately are inputs into the negotiation, the hypothetical negotiation. I've highlighted in yellow the ones that had more importance in this case.

Q. And what are the assumptions you make when you use a hypothetical negotiation framework to calculate a reasonable royalty?

A. If we go back to the prior slide, we've got them listed on the left-hand side. But as I said, you know, the same assumption that all damage quantifiers have to make, which is that the patents-in-suit are valid and infringed--you have to assume that; that the two parties are willing to negotiate to come to a licensing agreement; but they're also prudent

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business people and they have reasonable knowledge and expectations. In other words, you do your homework, you go in smart, you're negotiating an important licensing contract. So you get all the information you need, you're prudent, you're making right decisions you can negotiate.

But a big difference between regular negotiations and the hypothetical negotiation is that because guidance has to be given to the jury, an agreement has to be reached. Nobody can go storming out of the room, you know, You're asking for too much, or I only want to pay too little; you have to come to a determination. So that's the difference between the real world and the hypothetical world, this hypothetical negotiation.

But these are the kind of required assumptions when you do this sort of analysis.

Q. Sir, do you recall the phrase "all the cards on the table" being used early on?

A. Yeah. Cards face-up, yes.

Q. And would Force MOS and ASUSTek in the hypothetical negotiation both know that ASUSTek does not track the MOSFETs used in its products?

A. Yes.

Q. Given that knowledge, would ASUSTek and Force MOS agree to royalties for that required ASUSTek to track each model of MOSFETs?

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A. Well, one of the parts -- so the answer is no, to answer your question, and I can explain why.

Q. Please do.

A. So if you think about it, again, these are prudent business people, and they're not going to make a contract that -- how would you monitor it? How would you enforce it? Why would you have, you know, something that they don't even keep track of because it comes from an independent vendor? How could that be a royalty base?

So that's all -- and I should say one more thing. There's something in economics called, you know, transaction costs. In other words, sometimes enforcing a contract is costly. You got to monitor it, you might have to reveal confidential information that you don't want to reveal. So all of that goes into the decision-making process at all.

But at the end of the day, yeah, we're looking at the accused components times a royalty rate, so that's where we are, but to -- where this is problematic is once you come up with -- like Mr. LaMotta actually had 19 different royalty rates of which I've showed you seven, and that would be extremely difficult to monitor, and you'd get into disputes every time you make a new product or you get a new accused component, you know, what's the differential royalty rate to apply to it. So there's all these complexities that were not taken into account in his negotiating session.

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Q. Are these complexities present if you have a single royalty rate for every MOSFET?

05:30 A. That greatly reduces the monitoring and everything else.

Q. Sir, can you explain what type of agreements the parties would have found common ground on at the hypothetical negotiation?

A. Yes. So it would have been something called, you know, a freedom to operate; so you get a license to the technology and then you can use that technology however you want. So that's

05:31 called a freedom to operate. And it's a U.S.-only license agreement because we're talking about U.S. patents. And it's also something called, you know, a bare license agreement. In other words, there isn't any technology; you just get the ability to use what's in the patent, but it's not like Force MOS is giving you any know-how or any technology and telling you how to do it. You still have to figure that all out yourself.

Q. What are the key factors Force MOS would have considered at the hypothetical negotiation?

05:32 A. Yeah. So on one side of the table you've got Force MOS. And, of course, you know, as we've heard from the various testifiers and the technical experts, and there's a little bit of a debate over this, but Force MOS's position would be that there are certain benefits from using the technology. They were talking about increased ruggedness. That's one

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example--more of a resistance to failure. So those would be
05:32 -- that would sort of be the position of the technical side that Force MOS would be taking.
Q. And what factors would ASUSTek have considered?
A. Well, ASUSTek would be saying a lot of things, like, Okay, Force MOS, you didn't invent the MOSFET, and you didn't invent, you know, trench MOSFETs, and so really what we're talking about is a small kind of incremental increase in technology at best, not the whole trench MOSFET itself.
05:32 But the other thing, think about companies like ASUSTek that do a lot of, you know, R&D, do a lot of developing of products, do a lot of marketing, and they'd be sitting at the table saying, The reason why we've made all these sales is not because of your MOSFET; it's because we've got good displays or we've got really good computers and we market well and we figured out that it would look really good if we got one of
05:33 these to go up in space or to the top of Mt. Everest and they use that for marketing, but they're able to help facilitate demand for their own products.
And so that would be on the other side of the table. They'd be saying, Why should we pay you much for the MOSFETs when ASUSTek through their capabilities and contributions are creating those sales.
Q. Sir, did you also do a quantitative analysis?
A. I did --

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Q. Quantitative.
05:33 A. Yes. I'm not quite sure exactly what you're asking, but yes, there was numbers in what I was doing.
Q. Could you describe to the jury what quantitative analysis you performed?
A. Yes. So I really kind of looked at two different things. One, and we heard a little bit of this from the technical experts, that, you know, we've got these MOSFETs, but if we kind of go in reverse, you know, you start out with a
05:34 waiver -- a wafer, and on the wafer you ultimately get dies from that wafer, and then those dies are then packaged into a MOSFET. And so in terms of sort of economic values and looking at the data we had, data had been provided on what's the profitability associated with the dies.
And the reason why you're looking at that is my
05:34 understanding is that the technology of the patents-in-suit is embedded on the dies. Remember we have a wafer that has a lot of dies; cut up the dies, go into with the MOSFET, but the technology is on the dies. So how much profit are people making on the dies? That would be a topic of discussion.
Q. And did you do a per-die analysis of profits?
A. Yes.
05:35 Q. Can you remind us about -- how did you determine the value the parties would consider based upon the dies?
A. Well, because we've got -- we got some profitability

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numbers from a dies supplier, and we know from one of the MOSFET suppliers how many dies go into a MOSFET, and so I put all of that together and said, Okay, what was the profitability associated with all of the dies that are essentially being accused here.

MR. CHEN: Mr. Buck, can you display Exhibit DX 5?

Q. (BY MR. CHEN) Dr. Ugone, is this one of the documents you considered?

A. Yes.

Q. And what is this document?

A. This document is showing how many dies per MOSFET. So it turns out it's not just one die that goes into one MOSFET; there can be as much as two. I assumed two in my analysis, to be conservative, but that's what this document is telling us.

MR. CHEN: Mr. Buck, can you pull DX 14?

Q. (BY MR. CHEN) Dr. Ugone, can you -- is this also one of the documents you considered?

A. Yes.

Q. And what is DX 14?

A. So ultimately you get the profitability associated with the dies from this document here.

MR. CHEN: And Mr. Buck, please display DX 18. Could you enlarge the top -- yeah. Thank you.

Q. (BY MR. CHEN) Dr. Ugone, do you recognize this document?

A. So I believe obviously, you know, I can't read the top

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line, but this has some of the data as well that you would look at, yes.

Q. Okay. And is this part of the documentation you considered in reaching your agreement?

A. Yes.

05:38 Q. Why are the profits per die earned by the manufacturers something that Force MOS and ASUSTek would consider?

A. So the way to think about it is the technology is on the die, and you would think, then, and this is an assumption I'm making, that if that technology is more valuable, it would be 05:38 embedded in the price and the profitability of those dies that then go into the MOSFET which are accused. So that's why you're looking at as a consideration --

So I'm not saying it's the only consideration, but I'm saying one consideration would be the parties would recognize, Okay, the technology is on the die, you know, what's the profitability associated with the dies, because the value of that technology would also be in the die price.

05:38 MR. CHEN: Mr. Buck, let's display DDX 8.16.

Q. (BY MR. CHEN) Dr. Ugone, can you explain your calculation of the total profits per die?

A. We're finally back to an easier chart. But the far left box gives us the per-die profits. The middle is the number of dies. Now, you see a number 1.2 billion. So let me explain that.

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Remember from the accused products there were 615 million MOSFETs, and so if there's two dies per MOSFET, that gives you the 1.2 billion dies. Multiplying it by the range of profits gives you the profitability associated with the -- with those dies, and it ranged from roughly $340,000 to $628,000 is the range.

Q. Would this range of values be an important indicator of value the parties would consider at the hypothetical negotiation?

A. So it would be an indicator of value. It would be something they would consider. Now, I'm not saying it's the only one, I'm not saying it's determinative, but it's one of the considerations. That's how I'm using it.

THE COURT: Counsel, approach the bench, please. And Mr. Hanba and Mr. McMahon join me up here, please.

(The following was had outside the hearing of the jury.)

THE COURT: Mr. Chen, you're about 15 minutes over your 50 minute estimate. How much longer in your direct do you think you have? It's 20 minutes until 6:00.

MR. CHEN: Definitely less than 10; possibly five, your Honor.

THE COURT: Okay. So you're getting close.

MR. CHEN: Yes.

THE COURT: All right. I don't intend to hold the

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jury for cross examination tonight. We'll do that in the morning.

Now, what can you tell me, Mr. Hanba, about a rebuttal case? I assume you are going to call Dr. Neikirk.

MR. HANBA: Yes, Your Honor. It will be less than 45 minutes. And we have two video depositions, each about seven and a half apiece.

THE COURT: So about an hour total?

MR. HANBA: Max. We're probably looking at 45 minutes.

THE COURT: In light of that, do you have any kind of a ballpark estimate on cross?

MR. McMAHON: Ballpark would be 30 or less.

THE COURT: Okay. And your cross on this witness is what?

MS. PELLEGRINO: Approximately 30 minutes.

THE COURT: Okay. So basically two hours, more or less, tomorrow.

MR. CHEN: Yes, Your Honor.

THE COURT: All right. Take your five more minutes and finish up with the direct. Okay?

MR. CHEN: Yes, Your Honor.

(The following was had in the presence and hearing of the jury.)

THE COURT: All right. Let's proceed.

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MR. CHEN: Thank you, Your Honor.

05:42 MR. CHEN: Mr. Buck, please display DDX 8.17.

Q. (BY MR. CHEN) Dr. Ugone, we saw this earlier, but can you briefly remind us what the issues you found with Mr. LaMotta's claimed royalty rates?

A. Well, so what Mr. LaMotta opined to in his report was a

05:42 range of royalty rates, depending on the accused component, and you can see what that range is here. We've got seven different accused components, and you can see the corresponding royalty rates. So that's what this chart shows.

Q. Sir, tell us again, why is it appropriate to focus on the lowest royalty rate that's shown in this chart?

A. Right. So what I ended up doing in my analysis, taking

05:42 into account everything I've been talking about, I ended up using, frankly, the lower end of the royalty rate that -- but for different reasons, that Mr. LaMotta had also opined to. In other words, I wasn't disagreeing with the lower end of this. I think the higher end has some problems with that in terms of whether the companies would agree to that, but if you look at the lowest and if you look at the next to lowest, you

05:43 know, frankly, they round -- if you round up, to about a 10th of a cent. And, frankly, if you take an average of the first four, you roughly get a 10th of a cent. And so that in combination with everything I've talked about previously, I came to the determination that a 10th of a cent per MOSFET

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would be the appropriate royalty rate.

MR. CHEN: Mr. Buck, let's display DDX 8.18.

05:43 Q. (BY MR. CHEN) Sir, based on the entirety of the analyses you have conducted, what is your opinion as to the amount of money that would adequately compensate Force MOS for ASUSTek's alleged infringement, if infringement and validity is found?

A. So using a 10th of a cent royalty rate times the accused component or -- yeah, accused components from the ASUSTek

05:44 database of 615 million units gives you reasonable royalty damages of $615,596, with a proviso in the red there--assuming that the patents-in-suit are found to be valid and infringed.

Q. Sir, did you hear Mr. LaMotta's comment that the value of

05:44 the MOSFET is not defined by the price of the MOSFET; that -- strike that.

Mr. LaMotta's comment that the price of the MOSFET does not capture the value of the MOSFET.

A. Yeah. I think he was mixing -- yes, I did hear him say that, yes.

Q. And what do you think about that comment?

A. Yeah. The -- here's an important distinction that I think Mr. LaMotta was missing. To an economist, and frankly,

05:45 to everybody in the world, value is measured by prices. Right? The prices of a product is how you determine its value. And here Mr. LaMotta was saying that the value was greater than the price.

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Now, here is how you might think about that. You might own a car and think it's worth a real lot, to you at least. Okay? But if you ever tried to sell that car, you could only get the market price. So there might be implicit values to you, but the ultimate value is measured by market price, and that was a confusion that -- perhaps inadvertently that Mr. LaMotta confused those concepts.

MR. CHEN: We pass the witness, Your Honor.

THE COURT: All right. Ladies and gentlemen of the jury, it's a quarter until 6:00 and I'm not going to keep you any later this evening. We'll go forward with cross examination by the Plaintiff tomorrow morning.

05:46 If you will, take your notebooks as you leave the courtroom and leave them closed on the jury room table. Please remember to follow all my instructions. We're getting close to finishing the evidence, so please don't communicate with anyone in any way about this case, including the eight of yourselves.

Thank you for being prompt even with the rainy weather this morning. Please do the same thing tomorrow, and be prepared to start at 8:30. Travel safely to your homes, have

05:46 a good evening, and you're excused until tomorrow morning.

(Whereupon, the jury left the courtroom.)

THE COURT: Counsel, is there anything either side needs to raise with me before we recess for the evening?

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MR. HANBA: No, Your Honor.

MR. McMAHON: No, Your Honor.

THE COURT: I have received your updated submissions on the charge and verdict form. I am studying those and will continue to do so.

And you can expect that we'll cover 50(a) practice and the charge conference process tomorrow. My plan at present is to begin my final instructions of the jury first thing Thursday morning. All right?

With that we stand in recess.

(The proceedings were concluded at 5:47 p.m.)

05:47

Shawn M. McRoberts, RMR, CRR
Federal Official Court Reporter

I HEREBY CERTIFY THAT THE FOREGOING IS A CORRECT TRANSCRIPT FROM THE RECORD OF PROCEEDINGS IN THE ABOVE-ENTITLED MATTER. I FURTHER CERTIFY THAT THE TRANSCRIPT FEES FORMAT COMPLY WITH THOSE PRESCRIBED BY THE COURT AND THE JUDICIAL CONFERENCE OF THE UNITED STATES.

S/Shawn McRoberts 02/11/2024

_____DATE_____

SHAWN McROBERTS, RMR, CRR
FEDERAL OFFICIAL COURT REPORTER

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