

JOINT EXHIBIT OF RELEVANT EXCERPTS FROM:

Force MOS Technology Co., Ltd. (“Force MOS”) v. *ASUSTeK Computer, Inc.* (“ASUSTeK”)
Case No. 2:22-cv-00460-JRG; U.S. District Court,
Eastern District of Texas, Marshall Division

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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

SHAWN McROBERTS, RMR, CRR
100 E. HOUSTON STREET
MARSHALL, TEXAS 75670
(903) 923-8546
shawn_mcroberts@txed.uscourts.gov

Shawn M. McRoberts, RMR, CRR
Federal Official Court Reporter

A P P E A R A N C E S

FOR THE PLAINTIFF: DICKINSON WRIGHT, PLLC
607 W. 3RD STREET, SUITE 2500
AUSTIN, TEXAS 78701
(512) 777-4200
BY: MR. CHRISTOPHER HANBA

DICKINSON WRIGHT, PLLC -
MICHIGAN
2600 W. BIG BEAVER ROAD
SUITE 300
TROY, MICHIGAN 48084
(313) 223-3084
BY: MS. ARIANA PELLEGRINO

HALTOM & DOAN
6500 SUMMERHILL ROAD
CROWN EXECUTIVE CENTER
SUITE 100
TEXARKANA, TEXAS 75503
(903) 255-1000
BY: MR. JOSHUA THANE

FOR THE DEFENDANTS: LUMENS LAW GROUP, PLLC
8501 N. MACARTHUR BLVD.
SUITE 631009
IRVING, TEXAS 75063
(214) 627-9955
BY: MR. LI CHEN

BENESCH, FRIEDLANDER,
COPLAN & ARONOFF
71 SOUTH WACKER, SUITE 1600
CHICAGO, ILLINOIS 60606
(872) 302-6466
BY: MR. CHARLES McMAHON
MS. KATHLEEN LYNCH
MR. TRON FU

GILLAM & SMITH, LLP
102 N. COLLEGE, SUITE 800
TYLER, TEXAS 75702
(903) 934-8450
BY: MR. TRAVIS UNDERWOOD

OFFICIAL REPORTER: SHAWN M. McROBERTS, RMR, CRR
100 E. HOUSTON STREET
MARSHALL, TEXAS 75670
(903) 923-8546

Shawn M. McRoberts, RMR, CRR
Federal Official Court Reporter

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

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

01:17 4 THE COURT: Please come around, Dr. Shanfield; have
5 a seat on the witness stand.

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

8 THE COURT: Let's distribute those, please.

01:17 9 All right. Mr. McMahon, you may proceed with direct
10 examination when you're ready.

11 MR. McMAHON: Thank you, Your Honor.

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

01:17 16 THE COURT: You have leave to use it in the same
17 manner it's been used earlier in the trial.

18 MR. McMAHON: Thank you, Your Honor.

19 THE COURT: All right. Let's proceed.

20 STANLEY SHANFIELD, Ph.D.,
21 having been first duly sworn, testified under oath as follows:

22 DIRECT EXAMINATION

23 BY MR. McMAHON:

24 Q. Good afternoon, Dr. Shanfield.

25 A. Good afternoon.

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1 He says there's no records on the batteries. It turned
2 out there was no transistors, no MOSFETs in the batteries.
3 I'm sorry. There was three transistors in the batteries,
4 three MOSFETs that Mr. Diep reported.

5 The motherboard, I don't know what's meant by improper
02:31 6 records. He had not only himself but two other people in his
7 team do the counts to make sure they were accurate. And they
8 came out with the same number which was somewhat miraculous,
9 but it was to me a reassurance that they'd done the accounting
10 right. So I don't understand this presentation.

11 Q. And do you recall what Mr. Diep found in the power
12 supplies that he counted?

13 A. Yes.

02:31 14 Q. What did he find?

15 A. He found zero MOSFETs, not no records.

16 Q. Okay. Let's turn to invalidity, Dr. Shanfield. Have you
17 had a chance to consider -- and I want to be clear for
18 invalidity, we're focusing on just one claim. Right?

19 A. Right.

20 Q. Which claim is that?

21 A. That's the -- in the 409, claim 1[g].

22 Q. And so let's -- we've already looked at the '409 Patent.
02:32 23 Did you reach a conclusion as to whether claim 1 of the '409
24 Patent is invalid?

25 A. Yes.

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1 Q. What's your conclusion?

2 A. That it is invalid.

3 Q. Why?

4 A. As I'll hopefully can get a chance to show, there was
5 prior art in another patent that -- and it didn't surprise me
6 given at the time there was a lot -- so much work being done
02:32 7 in the area of the trench MOSFETs, but in any case Kobayashi
8 did the exact same thing, but he did it before the '409
9 Patent.

10 MR. McMAHON: Can we please bring up JX 24?

11 Q. (BY MR. McMAHON) Dr. Shanfield, what are we looking at
12 here?

13 A. Well, this is the Kobayashi patent I am talking about.

14 Q. And is Kobayashi prior art to the '409 Patent?

15 A. Yes, it is.

16 Q. How do you know that?

02:33 17 A. Well, the date of the patent is May 3rd, 2005, and that's
18 before the date of the '409 Patent.

19 Q. And I believe you testified earlier that the application
20 for the '409 Patent was in December 2006. Is that correct?

21 A. Yes, that's right.

22 Q. So Kobayashi was more than a year earlier?

23 A. Right.

24 Q. Okay. Can you -- we'll follow your direction. If you
25 would walk us through what you found in terms of disclosure in

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1 Kobayashi that you found to be relevant to the validity
2 analysis.

02:33 3 A. Sure. Probably the best figure to start with is figure
4 5A, I believe. Yes. So Kobayashi is -- shows this cross
5 section of a trench MOSFET with all the elements that the '409
6 Patent describes. The bottom layer there, I think it's
02:34 7 labeled 1, is the substrate. The next layer labeled 2 is the
8 epitaxial layer, and the body layer is labeled 9.

9 The source contact labeled 17, and it's up above. And
10 the gates and the gate oxides, all of that is -- matches all
11 of the elements that the '409 describes.

02:34 12 Q. And the '409 Patent is the rounded corners patent.
13 Right?

14 A. Right.

15 Q. Do we see any rounded corners here in figure 5A?

16 A. Not in this figure, no.

17 Q. Where did you find rounded corners in Kobayashi?

18 A. If you look, I think it's figure 6A, B, C, D, if I
19 remember correctly. Yeah.

20 Q. So what do we see in figure 6A through D?

21 A. Well, they're showing a sequence of fabrication for the
02:35 22 trenches that have the gates in them, and the 6A shows the --
23 what I was talking about, the substrate and the epitaxial
24 layers.

25 6B shows the trenches being dug. I won't bore you with

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1 the details in how that's done.

2 6C is significant here. This is showing now the rounding
02:35 3 of the trenches. And if you look at this diagram alone, what
4 you see is it's rounded at the bottom of the trench but not at
5 the top.

6 Q. Is there some disclosure in Kobayashi about rounding the
7 corners at the top?

8 A. Yes. So if you can take me there.

9 MR. McMAHON: If we could go column 6, line 46 to
10 67.

02:36 11 THE WITNESS: Perfect. So it says -- it's talking
12 about this -- oh, okay. This is the description of what I
13 just pointed out in THE figure 5A. This doesn't have the
14 description of what happens when you etch the opening and get
15 a rounding at the top and that's what I was looking for.

16 Q. (BY MR. McMAHON) My apologies, Dr. Shanfield. I led you
02:37 17 astray. One moment.

18 A. I can find it in here, if you want.

19 Q. You have a copy of the patent in your binder, there, sir.

20 A. Yeah.

21 MR. McMAHON: If we can please go to column 7, line
02:37 22 57.

23 THE WITNESS: So that's -- this is now talking about
24 this figure I just showed with the cross section and the
25 rounded corners in the bottom, and what it says, "next

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1 referring to figure 6C, after the composite film is removed by
2 etching" and that's the masking, "Corners of each trench at
3 the bottom are rounded." And that's what the diagram shows.

02:37 4 "In this event, corners of each trench 6 at the opening
5 portion may also be rounded." So what they're talking about
6 is the -- if you imagine digging a trench in wet sand, what
7 happens when you dig the sand out, you don't get sharp
8 corners; you get rounded corners because of the act of
9 digging. It's analogous to that, that the etching that's
02:38 10 being done is not only rounding the bottom because you have
11 rounding in the bottom of the wet sand, but at the top there's
12 rounding as well. And he's essentially explicitly saying that
13 it's present there.

14 If you look at that view of the sand from the top, and
15 you do a plan view, so called, from the top, what you see if
16 it was a square that you dug out is the square's corners are
02:38 17 rounded. There's the piles of -- I mean, there's sloped sand
18 everywhere, including at the corners. And the profile of that
19 is rounded.

20 So, in effect, what he's saying is it's a square pattern
21 that with rounded corners, exactly what the '409 is
22 describing.

23 Q. Dr. Shanfield, could we please look at figure 3A? Two
24 questions for you here, sir. What do we see here and why
02:39 25 don't we see rounded corners?

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1 A. So this is now pointing out what is the view from the top
2 for the -- I think it's prior art, if -- I'm not sure. I'd
3 have to look at the reference again. But basically this is
4 the source contact in the middle, 112. And 106, that's where
02:39 5 the gate is. So that's where the trenches, I'm talking about,
6 that's the place where if it's rounded, if you dug trenches in
7 a cross pattern, it would be rounded at the top, and that ends
8 up making, when you look down on it, rounding of the corners.
9 And I guess this is a good way -- good place to show that.

10 MR. McMAHON: And if we could go back to the text of
02:40 11 the patent, please, column 7, line 57.

12 Q. (BY MR. McMAHON) Dr. Shanfield, why did we not see the
13 rounded corners in the diagram itself?

14 A. It's an option in the patent. So it's -- if you choose,
15 you can have rounded corners, but they didn't necessarily
16 illustrate it.

17 Q. Dr. Shanfield, based on your analysis of the Kobayashi
18 reference as you've just described it, have you come to a
02:41 19 conclusion as to the validity of claim 1 of the '409 Patent?

20 A. Yes.

21 Q. What's that conclusion?

22 A. My conclusion is that Kobayashi anticipates, which means
23 has every single element of the '409 Patent and, therefore,
24 claim 1 of the '409 Patent is invalid.

25 MR. McMAHON: Your Honor, now is the time when I was

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1 going to use the easel briefly. May I approach?

2 THE COURT: You certainly may.

3 MR. McMAHON: Thank you. May I place it right there
02:41 4 so the jury can see?

5 THE COURT: That will be fine.

02:42 6 Q. (BY MR. McMAHON) Dr. Shanfield, I think your view of
7 this might be somewhat obstructed.

8 A. Yeah, it is a little bit, but I can look around.

9 MR. McMAHON: If we could bring up the Kobayashi
10 checklist on the screen, we can look at it at the same time.

11 THE WITNESS: That's better.

12 Q. (BY MR. McMAHON) Dr. Shanfield, I'd like to ask you, can
13 you walk through these limitations and just tell me if you've
14 found that feature in Kobayashi, and if so, where?

02:42 15 A. Sure. The first one that's called Pre at the top a
16 trenched semiconductor power device --

17 THE COURT: Slow down, please.

18 THE WITNESS: Sorry. "A trenched semiconductor
19 power device comprising a plurality of trenched gates
20 surrounding a plurality of transistor cells formed in a
21 semiconductor substrate."

22 If you recall, that plan view of the squares shows
02:42 23 exactly that. This plurality means a multiple number. It
24 shows the -- that it's being formed or describes it's being
25 formed in a semiconductor substrate.

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1 Q. (BY MR. McMAHON) And which figures should -- can I
2 create a checkmark for that?

3 A. Sure.

4 Q. And which figures would you point to?

5 A. I think it's 3A, the one we showed.

6 Q. Any others?

7 A. There's some other ones. I think 4A. Maybe I should get
02:43 8 it out. It looks like I don't have the --

9 MR. McMAHON: Can we bring up the figure 5A?

10 Q. (BY MR. McMAHON) Is this one of the figures you're
11 referencing?

12 A. Yes, that's what I was looking for.

13 Q. Okay. The next limitation, sir?

14 A. All right. That is the 1[a], "Said trench gates
02:43 15 surrounding said transistor cells as closed cells constituting
16 substantially square-shaped cells with rounded corners."

17 And that's what I went through in this description that
18 you looking in that plan view, you see the square. It says
19 that there's rounded corners. So what you will view is closed
20 cells around each source and the rounded corners that are
02:44 21 being described here. They're substantially square; they have
22 rounded corners.

23 Q. Can I create a checkmark?

24 A. Yes.

25 Q. And that was the plan view, figure 3[a]?

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1 A. Yes.

2 Q. And the text you were talking about, is that column 7?

3 A. Yes, that's right.

4 Q. Column 7, line 58.

5 Okay. The next one, can we create a check box there?

02:44 6 A. All right. That one is, "Each of said closed cells
7 further includes a circular trench contact." That's the thing
8 in the center, the source contact, what you saw in the plan
9 view. "Disposed substantially in a central portion of said
10 closed cells" in the center, which it was, "Penetrating
11 through a source region surrounding said trenched gates and
12 extending into a body region encompassing said source
13 region."

02:45 14 And then in figure 5[A], it shows that, the penetration,
15 where it's placed in the body region, and how it looks
16 relative to the gates.

17 Q. Checkmark?

18 A. Yep.

19 Q. Next one, sir?

20 A. 1[c] is "Said circular trench contact comprises a hole
21 opened up from a top surface of said semiconductor substrate
22 and filled with a contact metal plug." And, once again,
23 figure 5[A] shows exactly that.

02:46 24 Q. Checkmark?

25 A. Yep.

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1 Q. Thank you, sir. Next one?

2 A. "Wherein sidewalls of said hole are surrounded by and in
3 contact with said source and body regions." Once again, in
4 figure 5[A], it shows the body and source regions against the
5 source contact, just like is being described here.

6 Q. 5[A], you said?

7 A. Yes.

02:46 8 Q. Checkmark?

9 A. Yes.

10 Q. Thank you. Next one?

11 A. That's 1[e], "And said circular trench contact is
12 separate from said trenched gates with said source region and
13 body region disposed between a gate oxide lining of trenched
14 gates and all circumferential points of the circular trench
15 contact."

16 Once again, figure 5[A], it shows the oxide, it shows the
02:46 17 trenched gates, it shows a body region, and the source, and it
18 says -- shows what's disposed in between, exactly like this
19 describes.

20 Q. Checkmark is okay?

21 A. Yes.

22 Q. And the last limitation?

23 A. That's 1[f] "Said contact metal plug connected to a
24 source metal disposed on top of said circular trench
25 contact." And if you look again at figure 5[A], it shows the

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02:47 1 source metal on top of the source plugs. So it makes that
2 connection that's being described exactly as it says here.
3 Q. Checkmark?
4 A. Yep.
5 Q. So based on this chart that we've just created,
6 Dr. Shanfield, what is your opinion about the validity of
7 claim 1 of the '409 Patent?
8 A. Like I said, the fact that there is a -- Kobayashi
9 anticipates this patent means that it's invalid and the claim
10 1 is invalid.
02:47 11 Q. You said the word 'anticipates'. What does that mean?
12 A. That's a legal term that means every element is exactly
13 the same as what's in the patent that's in question.
14 Q. Did you have any other opinion regarding invalidity of
15 claim 1 of the '409 Patent?
16 A. Yes.
17 Q. And what is that?
18 A. Well, if you want like another -- or a combination of
02:48 19 patents to also show that this has all been done before in
20 other patents, I found another patent. It's called Hshieh.
21 And Hshieh plus Kobayashi also anticipates -- doesn't
22 anticipate; it's obvious that those two would be put together
23 by someone with skill in the art and would give you what's
24 shown in '409.
25 MR. McMAHON: Mr. Buck, could you bring up JX 25,

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1 please?

2 Q. (BY MR. McMAHON) Dr. Shanfield, is this the Hshieh
3 reference you mentioned?

02:48 4 A. Yes.

5 Q. What's the date of this patent?

6 A. It was issued June 9th, 1998.

7 Q. Was that before or after the application for the '409
8 Patent?

9 A. It was way before.

10 Q. What did you find relevant in the Hshieh reference?

11 A. Well, I guess the drawing I think is most relevant is
12 8[A] in this patent. And what it shows is substantially
02:49 13 square -- the gate trench from the -- looking from the top
14 looks like this as substantially square with rounded corners.
15 So exactly what's being described in the '409.

16 Q. And how might one of ordinary skill in the art have
17 considered combining these two references, Kobayashi and
18 Hshieh?

19 A. Sure. I actually personally know that. I was always
02:49 20 keeping my eye on patent literature, and these are both trying
21 to solve the same problem. They are again looking at in
22 Hshieh and also Kobayashi that punch-through problem, the
23 device burning out because it's being driven too hard, and
24 that's the ruggedness question they are trying to address.

25 So it's the same subject matter, it's the same kind of

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1 device, and it would be very reasonable that someone of skill
2 in the art would combine these.

02:50 3 MR. McMAHON: I have another board, Your Honor. May
4 I?

5 THE COURT: You may.

6 Q. (BY MR. McMAHON) Dr. Shanfield, here we have another
7 checklist. There's a column for Kobayashi. Do you see that?

8 A. Yeah.

9 Q. Is that any different than the column we just put all the
10 checkmarks into?

11 A. No. You can put checks all the way down that one.

02:50 12 Q. Okay. Not a very good checkmark drawer.

13 And what about the Hshieh column? Which of these
14 features do you find relevant disclosure in Hshieh for?

15 A. So, in Hshieh, they have the trenched semiconductor power
16 device comprising a plurality of trenched gates surrounding a
17 plurality of transistor cells formed in the semiconductor
18 substrate. So that one you can give a checkmark to, as I
02:51 19 described. And --

20 Q. I'm sorry, sir. Go ahead.

21 A. Well, I was going to again show that figure 8[A], but I
22 don't think we need to.

23 And then "Said trenched gates surrounding said transistor
24 cells as closed cells constituting substantially square-shaped
25 cells with rounded corners," that was also visible in figure

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1 8[A] where you see those squares with the rounded corners.

02:51 2 Q. And can we just go back to figure 8[A] of Hshieh. Is
3 this what you were talking about?

4 A. Yes, right.

5 Q. So should I write figure 8[A]?

6 A. Yes, please.

7 Q. For both of these?

8 A. Let me just look back at the first one if you wouldn't
9 mind. That's in the description, and I'd have to -- I don't
02:52 10 seem to have the paper in front of me, but there is a
11 description of a plurality of trenched gates. It does show a
12 plurality of trenched gates in figure 8[A].

13 It doesn't say it's, you know, from the picture that it's
14 formed in a semiconductor substrate, but in the language of
15 the patent it says that.

16 MR. McMAHON: And if we could go, please, to the
17 abstract on the cover of the Hshieh reference.

02:53 18 Q. (BY MR. McMAHON) Is this what you were referring to,
19 Doctor?

20 A. Yes, that was it.

21 Q. What do you see here?

22 A. They are talking about a power transistor, a trenched
23 MOSFET or at least trenched gate MOSFET, and with all those
24 elements that were described in 1[a].

25 Q. So the figure you would refer to here was 8[A]?

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1 A. Yes.

2 Q. For both.

3 A. Yes.

02:53 4 Q. Dr. Shanfield, there is a video that the Court shows and
5 showed to the jury about the patent system. Are you familiar
6 with that video?

7 A. Yes.

8 Q. Do you recall -- I don't expect you to quote it, but do
9 you recall what that video says about patent validity?

10 A. Yes. Would you like me to explain.

11 Q. Yes. What do you recall?

12 A. Well, I mean, the part that stuck in my head -- it's on
02:53 13 YouTube, by the way -- is that if -- that the Patent Office
14 has people reviewing patent applications and they are very
15 busy, and that occasionally one of them can make a mistake.

16 I can clearly see that in this situation because there's
17 so much coming in in semiconductor devices, and it's hard to
18 keep up with it all. But the patent -- the person that
02:54 19 reviewed the patent may have overlooked a reference that was
20 applicable here, and that's apparently what happened because
21 of Kobayashi being in this description.

22 And that, I believe, is why it was originally awarded, or
23 at least claim 1, and there already was art that showed it.

02:54 24 Q. Dr. Shanfield, do you know whether the examiner who
25 examined the '409 Patent application considered either

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1 Kobayashi or Hshieh?

2 A. I know that they didn't.

3 Q. Does that inform your opinion at all with respect to
4 validity?

5 A. It does, because it explains why if -- I mean, if they'd
6 seen it, they would have realized it's already been done.

02:55 7 Q. And one last thing I'd like to do here, Dr. Shanfield,
8 for the jury's convenience will just identify those two
9 exhibits, Kobayashi.

10 MR. McMAHON: If we could bring up Exhibit JX 24.

11 Q. (BY MR. McMAHON) That's the Kobayashi reference. Right?

12 A. Yes.

13 Q. So I'll just write JX 24.

14 MR. McMAHON: And please bring up JX 25, Mr. Buck.

15 Q. (BY MR. McMAHON) That's the Hshieh reference?

16 A. Yes.

02:55 17 Q. JX 25?

18 A. Same guy that did the '409.

19 Q. Same inventor?

20 A. Yep.

21 Q. Thank you, Dr. Shanfield.

22 MR. McMAHON: Your Honor, I'll pass the witness.

23 THE COURT: All right. If you'll take your boards
24 down.

25 Ladies and gentlemen, we're going to take a short recess

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1 before we proceed with cross examination of Dr. Shanfield.
2 You can simply close and leave your notebooks in your chairs,
3 follow all any instructions, and we'll be back shortly to
4 proceed with cross examination.

02:56 5 The jury's excused for recess.

6 (Whereupon, the jury left the courtroom.)

7 THE COURT: The Court stands in recess.

8 (Brief recess.)

02:56 9 THE COURT: Be seated.

03:20 10 Mr. Hanba, are you prepared to cross-examine the witness?

11 MR. HANBA: Yes, Your Honor.

12 THE COURT: All right. Am I correct that any cross
13 examination binders have been distributed?

03:20 14 MR. HANBA: Your Honor, they have.

15 THE COURT: All right. Then you may go to the
16 podium, and let's bring in the jury, please.

17 (Whereupon, the jury entered the courtroom.)

18 THE COURT: Please be seated, ladies and gentlemen.

03:21 19 We'll proceed with cross examination of the witness by
20 counsel for the Plaintiff.

21 Mr. Hanba, you may proceed when you're ready.

22 MR. HANBA: May it please the Court.

23 CROSS EXAMINATION

24 BY MR. HANBA:

25 Q. Good afternoon, Dr. Shanfield. How are you?

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1 consider JX 7. Right?

2 A. Could you give a little more detail?

3 Q. Yeah. If I were to provide an estimate of component
4 counts, I would use information like JX 7. Right?

04:09 5 A. The ASUS summary of slots, yes.

6 Q. And you would combine Mr. Diep's analysis and look at Mr.
7 Diep's analysis in comparison to JX 7. Right?

8 A. Yes.

04:10 9 Q. You're not here to opine that claims 1 through 3 are
10 invalid. Right? Excuse me, of the '634 Patent.

11 A. No.

04:10 12 Q. But you provided testimony today as to the fact that you
13 believe that claim 1 of the '409 Patent is invalid. Right?

14 A. That's correct.

15 Q. And as I understand your testimony, you first testified
16 regarding the opinion that claim 1 is invalid as anticipated
17 by Kobayashi. Right?

18 A. Yes.

19 Q. And this is because in your opinion, Kobayashi 196
20 teaching each and every limitation of claim 1 of the '196
21 Patent. Correct?

04:10 22 A. That's correct.

23 Q. Specifically, you first testified regarding your opinion
24 that claim 1 is -- is anticipated, and then you said that
25 claim 1 is obvious by combining Kobayashi with Hshieh. Right?

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1 A. Yes.

2 Q. And is this because in your opinion despite Kobayashi not
3 teaching or disclosing a limitation of claim 1, it would have
4 been obvious to modify Kobayashi to include these missing
04:11 5 limitations based on the teachings of Hshieh?

6 A. Could you repeat that?

7 Q. Sure. You're using Kobayashi and Hshieh as an
8 obviousness reference because you're not sure that the jury
9 will think that Kobayashi shows all of the limitations of the
10 '409 Patent. Right?

11 A. No.

12 Q. So you're not combining Kobayashi with Hshieh because
13 there's a missing element?

04:11 14 A. No.

15 MR. HANBA: So if we could, could we go to figure 3
16 of the Kobayashi '196 Patent, please? Is that Kobayashi?
17 Yes.

18 Q. (BY MR. HANBA) So the squares of figure 3 are not closed
19 cells constituting substantially square-shaped cells with
20 rounded corners. Right?

04:12 21 A. No.

22 Q. And you're not saying that the squares in figure 3 of
23 Kobayashi have rounded corners. Right?

24 A. No.

25 MR. HANBA: So if we could go to figure 4?

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1 Q. (BY MR. HANBA) And figure 4 has some hexagons, right,
2 and six-sided figures?

3 A. Right.

4 Q. And you didn't show these to the jury. Right?

5 A. No, I didn't.

6 Q. This is a teaching in Kobayashi. Right?

7 A. Yes.

04:12 8 Q. And hexagons, six-sided figures, are not squares. Right?

9 A. Right.

10 Q. And you're not going to tell the jury -- you did not tell
11 the jury that hexagons are squares with rounded corners.
12 Right?

13 A. No.

14 Q. Okay.

15 MR. HANBA: Can we go to the next figure, please?

04:13 16 Q. (BY MR. HANBA) And, sir, rather than -- excuse me.

04:13 17 MR. HANBA: Could you go to figure 6, please?

18 Q. (BY MR. HANBA) And, sir, you're not saying that the
19 trenched bottoms here show rounded corners, are you?

20 A. I believe Kobayashi says that, yes. I am saying --

21 Q. You are saying that.

22 A. In figure 6C.

23 Q. In figure 6C, just to be clear, your opinion is that
04:14 24 this -- these trenched corners show -- excuse me. These
25 trenches show rounded corners.

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1 A. At the bottom I believe you said. Right?

2 Q. Your -- let me re-ask that.

3 A. Okay.

4 Q. Is it your opinion that the bottoms of the trench show
5 rounded corners that meet the limitations of the '409 Patent?

6 A. No.

7 Q. Okay.

04:15 8 MR. HANBA: So let's go to the Hshieh patent,
9 please. If we could go to figure 8[A].

04:15 10 Q. (BY MR. HANBA) And so under this obviousness position,
11 you claim it would have been obvious to modify Kobayashi by
12 altering the shapes of the cells into substantially
13 square-shaped cells with rounded corners based on the
14 teachings of Hshieh. Correct?

15 A. Yes.

16 Q. And specifically modifying these to these. Correct?

04:15 17 A. Modifying the image here? I'm sorry.

18 Q. Let me re-ask -- let me re-ask that question. I'm sorry.

19 THE COURT: Gentlemen, one at a time, please. The
20 court reporter cannot write accurately when two people are
21 talking at the same time. So, please, make sure you don't
22 talk over the other person.

23 Let's continue, counsel.

04:16 24 Q. (BY MR. HANBA) And the Hshieh '914 Patent teaches
25 various cell layouts including a non-orthogonal parallelogram,

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1 regular square, rectangular, and orthogonal shapes. Right?

2 A. Yes.

3 Q. And is it your position, sir, that figure 8[A] meets the
4 cells with substantially rounded corners limitation of the
5 '409 Patent?

6 A. Yes.

04:17 7 Q. And so if we could go to the abstract of this patent.
8 And beginning non-orthogonal?

04:17 9 THE WITNESS: You want me to read this?

10 Q. (BY MR. HANBA) I'm going to have Mr. --

11 MR. HANBA: The word non-orthogonal, would you
12 please highlight that? Thank you.

13 Q. (BY MR. HANBA) And this says here, constitutes
14 non-orthogonal parallelograms. Right?

15 A. Yes.

04:17 16 Q. A square is not a non-orthogonal parallelogram. Right?

17 A. A square can be a non-orthogonal parallelogram, yes.

18 MR. HANBA: If we could go to column 4:18 through
19 22, please.

04:18 20 Q. (BY MR. HANBA) And you would agree with the patent that
21 the figures 8 -- 8[A] which we showed earlier shows a
22 non-orthogonal parallelogram. Right?

04:18 23 A. Yes.

24 MR. HANBA: No further questions, Your Honor.

25 THE COURT: You pass the witness.

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1 MR. HANBA: Pass the witness.

2 THE COURT: Is there redirect, Mr. McMahon?

3 MR. McMAHON: Yes, sir.

4 THE COURT: All right. Proceed with redirect
5 examination.

6 MR. McMAHON: Thank you, Your Honor.

7 Mr. Buck, could you please bring up PX 27.

8 REDIRECT EXAMINATION

9 BY MR. McMAHON:

04:19 10 Q. Dr. Shanfield, Mr. Hanba asked you about this image and
11 asked you, I believe, if it shows rounded corners, and I think
12 you said, yes, it does. Am I correct?

13 A. Yes.

14 Q. Is there anything else you'd like to add about your
15 opinion regarding this particular image?

16 A. Yes, there is.

17 Q. What is that?

04:19 18 A. The rounded corners, I believe, were due to the very
19 aggressive etching that was done on the sample which attacked
20 the gates and removed them completely in the black lines,
21 those black holes, and on the surface of the silicon that
22 surrounds it. So it formed rounded corners, but that is, in
23 my opinion, a consequence of the aggressive etch.

04:20 24 Q. What, if anything, Dr. Shanfield, do we know about the
25 shape of these cells before the aggressive etch?

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1 A. Yes.

2 Q. And what was your answer?

3 A. Yes.

4 Q. Are SEMs useful in all semiconductor investigations?

5 A. No.

6 Q. Why not?

7 A. They are limited in particular, just as Dr. Neikirk said,
8 you can't tell what doping is, can't tell the type, you can't
9 measure it with an SEM.

04:24 10 Q. And regarding invalidity toward the end of the cross
11 examination, Mr. Hanba asked you about Kobayashi and about
12 Hshieh. Do you recall that?

13 A. Yes.

14 Q. And where in Kobayashi did you find disclosure of round
15 corners?

16 A. In the text. There's a description of figure 6C.

17 MR. McMAHON: Could we please bring up column 7 of
18 Kobayashi? That's PX 24.

19 Q. (BY MR. McMAHON) Is this the text you're referring to?

20 A. Yes.

21 Q. And where in this text do you see the suggestion you were
22 just talking about?

04:25 23 A. In the sentence, In this event corners of each trench 6
24 at an opening portion may also be rounded.

25 MR. McMAHON: Let's turn to Hshieh, PX 24. I'm

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1 sorry. I misstated that. PX 25, the Hshieh reference.

04:25 2 Q. (BY MR. McMAHON) Dr. Shanfield, where in Hshieh did you
3 find disclosure of rounded corners?

4 A. In the text associated with figure 8[C].

5 Q. 8[A]?

6 A. 8[A]. I'm sorry.

7 MR. McMAHON: If we could go to figure 8[A]. Sorry.
8 Could we just go to fig 8[A], please?

9 THE WITNESS: This is also the text.

10 Q. (BY MR. McMAHON) What is it about this figure that
11 suggests it teaches rounded corners?

04:26 12 A. That, along with the description, but you can just see
13 it. It's obvious those are rounded corners.

14 Q. Why, if Kobayashi also teaches rounded corners, why did
15 you decide to combine these two references?

16 A. To create an obviousness argument.

17 Q. And why do that in addition to the anticipation argument
18 you presented on Kobayashi?

19 A. I look it like a belt-and-suspenders. Kobayashi
04:26 20 anticipated, but if there is any doubt, and here is a drawing
21 that shows the exact structure of rounded corners, essentially
22 where they have rounded corners.

23 Q. Mr. Hanba asked you on cross if you conducted any SEM
24 analysis. Remember?

25 A. Yes.

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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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Shawn M. McRoberts, RMR, CRR
Federal Official Court Reporter

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 12, 2025
Defendant. (8:30 A.M.

VOLUME 4

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

SHAWN McROBERTS, RMR, CRR
100 E. HOUSTON STREET
MARSHALL, TEXAS 75670
(903) 923-8546
shawn_mcroberts@txed.uscourts.gov

Shawn M. McRoberts, RMR, CRR
Federal Official Court Reporter

1 All right, counsel. You may proceed with direct
2 examination.

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

5 DEAN NEIKIRK, Ph.D,
6 having been previously duly sworn, testified further under
7 oath as follows:

8 DIRECT EXAMINATION

9 BY MR. HANBA:

10 Q. Welcome back and good morning, Dr. Neikirk.

11 A. Good morning.

12 Q. And why are you here today?

13 A. I'm here to provide my opinions about the validity of the
14 '409 Patent.

15 Q. And were you in the courtroom yesterday when
16 Dr. Shanfield provided his invalidity opinions?

17 A. I was.

18 Q. And have you analyzed that same prior art that
19 Dr. Shanfield analyzed?

20 A. I have.

21 Q. And what is your conclusion?

22 A. That prior art does not disclose the features required by
23 claim 1 of the '409 Patent, so the '409 Patent is valid.

24 Q. And sir, let's start with Dr. Shanfield's anticipation
25 theory, if you will.

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1 Dr. Neikirk, can you remind the jury what anticipation
2 requires?

3 A. My understanding is that anticipation requires that a
4 single piece of prior art shows or teaches each and every
5 element of the claim. It has to be clearly taught, it can't
6 simply be something that you infer. It has to be there.

7 MR. HANBA: Mr. Doyle, would you please pull up JX
8 3.12 and zoom in on claim 1?

9 Q. (BY MR. HANBA) This is the '409 Patent, I believe.

10 And, Dr. Neikirk, do you agree with Dr. Shanfield's
11 conclusion that claim 1 of the '409 Patent is anticipated by
12 Kobayashi?

13 A. No, I do not.

14 Q. Dr. Neikirk, will you please identify which claim
15 limitation of claim 1 you opine that Kobayashi does not
16 disclose?

17 A. Well, I focused on the claim element that Dr. Shanfield
18 focused on, which is the closed cells constituting
19 substantially square-shaped cells with rounded corners.

20 Q. And just to clarify, what in claim 1 has to be rounded?

21 A. The square-shaped cells have to have rounded corners.

22 MR. HANBA: And so, Mr. Doyle, would you please put
23 up JX 24.7? And I believe that's figure 6 of Kobayashi. Or,
24 excuse me, figure 6C of Kobayashi. And if you would, would
25 you please put it next to JX 24.6, and then it's column 7,

1 line 57 to column 8, line 4, please.

2 Q. (BY MR. HANBA) And, Dr. Neikirk, do you remember
3 Dr. Shanfield discussing these parts of Kobayashi?

4 A. I do.

5 Q. In your opinion, what do they describe?

6 A. Well, both the figure and the text, the text refers to
7 the figure, are describing what the trenches look like in a
8 side view.

9 Q. And so -- but what does claim 1 require?

10 A. Claim 1 refers to the substantially square-shaped cell
11 and the requirement that it has rounded corners. That would
12 be something you would observe from a top view.

13 Q. And, Dr. Neikirk, what is your opinion regarding whether
14 these passages relied on by Dr. Shanfield satisfy that
15 substantially square-shaped cells with rounded corners
16 limitation?

17 A. They do not.

18 Q. Dr. Neikirk, do you have a demonstrative that you've
19 prepared to show the jury on this issue?

20 A. I have.

21 MR. HANBA: Mr. Doyle, could you please bring up PDX
22 5.1? Thank you.

23 Q. (BY MR. HANBA) Dr. Neikirk, what does this show?

24 A. Well, on the left is the Kobayashi figure, and on the
25 right the text from Kobayashi. The text does refer to

1 corners, but it's the corners of the trench. And as we can
2 see, it is referring to the corners as seen from the side.

3 So I believe there are circles here that would point out
4 two bottom corners and blue circles that would point to top
5 corners. That's on the left.

6 On the right is figure 3 from the '409 Patent. As an
7 illustration of one of the embodiments of the '409 that
8 reflects the substantially square-shaped cells with rounded
9 corners.

10 Q. Just to be clear, sir, you're not comparing the prior art
11 of Kobayashi to the figure in '409 -- in the '409 Patent.
12 Right?

13 A. No, I'm not. I'm comparing it to the claim language.

14 Q. And so what is the right side supposed to illustrate?

15 A. Well, one of ordinary skill has to understand what all
16 this means in terms of that claim language, and they would
17 look to the figures in trying to understand what the claim
18 language was trying to convey. So I've used the figure to
19 illustrate that, but I have to compare the prior art to the
20 claim language.

21 Q. And so turning to the image on the left, that figure 6C
22 of Kobayashi, what are the red and blue circles located in
23 context of -- excuse me. Where are the red and blue circles
24 located in context of Kobayashi's device?

25 A. Yes. The red and blue circles, the red circles, the

1 blue, those are what you can see when you look at this from
2 the side and look at the trench.

3 Q. And also to be clear, who added the red and blue circles
4 to figure 6 at those places?

5 A. Dr. Shanfield did.

6 Q. We didn't see this yesterday. What do you mean
7 Dr. Shanfield did?

8 A. Well, I believe this is copied directly from his report.
9 I don't think I -- I didn't see this with circles on it
10 yesterday.

11 Q. And what passage of Kobayashi was Dr. Shanfield using the
12 annotations to illustrate?

13 A. He referred to Kobayashi at column 7, lines 57 through
14 60, which is this section of text right here in the box.

15 Q. And so, sir, what is your opinion as to whether
16 Dr. Shanfield's annotated version of figure 6C of the
17 Kobayashi patent shows substantially square-shaped cells with
18 rounded corners as recited in claim 1 of the '409 Patent?

19 A. It does not. That figure in this text doesn't show
20 substantially square-shaped cells and it certainly doesn't
21 indicate that the corners of such a square-shaped cell has
22 rounded corners.

23 Q. And, sir, what is your opinion as to whether Kobayashi
24 anticipates claim 1 of the '409 Patent?

25 A. It does not.

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Federal Official Court Reporter

1 Q. So let's turn to Dr. Shanfield's obviousness theory.

2 MR. HANBA: Mr. Doyle, if you would, could you
3 please pull up side by side JX 24.1, which is the
4 Kobayashi '196, and JX 25.1, which is the Hshieh '914
5 reference.

6 Q. (BY MR. HANBA) Dr. Neikirk, do you agree with
7 Dr. Shanfield's conclusion that claim 1 of the '409 Patent is
8 obvious over a combination of Kobayashi and Hshieh '914?

9 A. I do not.

10 Q. Dr. Neikirk, what is a motivation to combine?

11 A. Well, as I understand it, a motivation to combine is
12 something that would motivate one of ordinary skill to take
13 one piece of art and use it with another. There needs to be
14 something there that would motivate that person to do it. Not
15 just simply a random selection of components from each -- from
16 one and random selection from another.

17 Q. So it has to be a reason for the combination. Is that
18 right?

19 A. That's my understanding, yes.

20 Q. Can you give an example kind of an everyday example to
21 the jury of this concept?

22 A. Well, I -- for instance, my wife's favorite old car was a
23 VW Beetle. If my truck needs a new engine, I wouldn't look to
24 take the engine out of her old VW Beetle. Just because
25 they're both automobiles is not motivation to try to use an

1 engine in my truck that wouldn't fit and probably wouldn't get
2 me up the hill.

3 Q. For a motivation -- for proper motivation to combine, is
4 it enough to just say THAT the references are in the same
5 field?

6 A. No, it's not.

7 Q. Can they just say that for a proper motivation it's
8 enough to say that the references address similar problems?

9 A. No, that's not sufficient, either.

10 Q. What's your opinion as to whether Dr. Shanfield
11 articulated yesterday a proper motivation to combine those two
12 references?

13 A. He did not.

14 Q. And why?

15 A. Well, as I recall, he simply said they're in the same
16 field. In my analogy, just because two things are cars
17 doesn't mean you take the engine out of one and put it in the
18 other.

19 Q. And what's your opinion regarding whether a person of
20 ordinary skill in the art at the time of the '409's filing
21 date would be motivated to combine Kobayashi and Hshieh in the
22 manner of claim 1?

23 A. They would not.

24 Q. If there's no motivation to combine, then what happens to
25 obviousness?

1 A. Then the obviousness argument fails.

2 MR. HANBA: Mr. Doyle, would you please put up JX
3 25.1 and zoom in on the abstract of Hshieh?

4 Q. (BY MR. HANBA) So, Dr. Neikirk, what is Hshieh focused
5 on?

6 A. Well, Hshieh is focused on power transistor cells, but in
7 particular, and, yes, the phrase does show I've highlighted in
8 yellow -- well, I think actually there's an even better
9 section right here. Hshieh is focused on the use of
10 non-orthogonal parallelograms. The portion that's highlighted
11 down there at the bottom is sort of explaining why Hshieh is
12 so interested in this kind of shape.

13 Q. And what does orthogonal mean?

14 A. Orthogonal means at a right angle, so if the angle
15 between two things is 90 degrees, those two things are
16 orthogonal.

17 Q. Is a square orthogonal?

18 A. A square has four sides of equal length and the angle
19 between two adjacent sides is 90 degrees, so, yes, it uses
20 orthogonal sides.

21 Q. What other kinds of shapes are orthogonal?

22 A. Rectangles are orthogonal. They have opposite sides of
23 equal length, but the angle between each pair of sides is
24 still 90 degrees.

25 MR. HANBA: Mr. Doyle, you can just keep that front

1 page, if you would. And maybe zoom in on the bottom -- excuse
2 me. There you go. The figure there.

3 Q. (BY MR. HANBA) Sir, can squares be non-orthogonal
4 parallelograms like you just circled?

5 A. No. A square is not a non-orthogonal parallelogram, it
6 is an orthogonal parallelogram. By putting the non in front,
7 you exclude squares.

8 Q. So a square can't be just a non-orthogonal parallelogram
9 and an orthogonal parallelogram. Right?

10 A. No.

11 Q. It's an either/or?

12 A. Yes.

13 MR. HANBA: And, Mr. Doyle, please pull up JX 11,
14 figure 8, of Hshieh there. And please put up next to it JX
15 25.17, column 5, lines 23 through 28 of Hshieh.

16 Q. (BY MR. HANBA) Sir, were you here when Dr. Shanfield
17 said that figure 8 of Hshieh on the left has
18 substantially -- is substantially square with rounded corners?

19 A. I was.

20 Q. What does Hshieh say is shown in figure 8A?

21 A. Well, as we can see from this extract from Hshieh, it
22 clearly states that figure 8A is about non-orthogonal
23 parallelogram cells, not squares.

24 Q. And, sir, do you agree with Dr. Shanfield that figure 8A
25 depicts substantially square-shaped cells with rounded

1 corners?

2 A. No, it does not.

3 Q. What part of this passage did Dr. Shanfield show the jury
4 yesterday?

5 A. I don't recall exactly where -- what he quoted from in
6 terms of the specification.

7 Q. Was it this passage?

8 A. It wouldn't surprise me. That looks familiar, but I
9 can't remember right off the top of my head whether this was
10 the exact citation.

11 Q. And are you familiar with the concept of teaching away?

12 A. I am.

13 Q. What does that mean?

14 A. Well, teaching away means if you looked at two
15 references, two pieces of prior art, and you looked to one to
16 tell you to pick some shape, it tells you to pick squares, and
17 you go to another piece of art looking for something else but
18 that piece of art says, oh, don't ever use squares, use
19 triangles, well, that second piece of art is teaching away
20 from the very squares that you selected, saying don't use
21 those. That's teaching away.

22 MR. HANBA: Mr. Doyle, would you please bring up JX
23 25, pages 15 to 16 with column 2, line 64 through column 3,
24 line 5.

25 Q. (BY MR. HANBA) Dr. Neikirk, how does this inform your

1 opinion regarding whether there is a motivation to combine?

2 A. Well, in this piece of art, it's specifically telling you
3 that you should use non-orthogonal parallelograms as opposed
4 to squares. All the squares it shows are listed as prior art.
5 It then goes on and says don't use those because if you use
6 non-orthogonal squares -- they're not squares, non-orthogonal
7 parallelograms, you can increase the packing density. And
8 Hshieh is primarily about showing away to increase packing
9 density so that's -- this teaches away from the use of
10 squares, which is what the other reference was about.

11 Q. So you say teaches away. Does it say, don't use squares?

12 A. It does.

13 Q. Did Dr. Shanfield show the jury this passage?

14 A. I don't think so.

15 Q. Dr. Neikirk, does the Hshieh say anything about why it is
16 rounding corners?

17 A. No, it doesn't. Oh, no, I'm sorry. It does. It does
18 have a description of why it would suggest rounding two of the
19 corners of the non-orthogonal parallelogram.

20 MR. HANBA: Mr. Doyle, would you please bring up JX
21 25.7, columns 5, lines 3 through 17, please.

22 Q. (BY MR. HANBA) Dr. Neikirk, how does this inform your
23 opinion as to whether one would be motivated to combine
24 Hshieh's rounded corners with Kobayashi?

25 A. So this text talks about a thing called -- he called

1 corner vulnerability, but specifically that at sharp corners
2 there can be what's called a three-dimensional diffusion
3 effect. And then he goes on to discuss figure 6A and 6B that
4 do have blunted or rounded corners, but it is to deal with
5 this three-dimensional diffusion effect. At least that's what
6 Hshieh explains.

7 Q. You say this three-dimensional diffusion effect. How
8 does that relate to, if it does, the paralytic drain or
9 avalanche that's described in the '409 Patent?

10 A. At best it would be very indirect. This is looking at a
11 problem where the dopants look -- are arranged differently in
12 the device near the corners is relative to other locations in
13 the device.

14 Q. Did Dr. Shanfield show this passage to the jury
15 yesterday?

16 A. No, I don't believe he did.

17 Q. Did Dr. Shanfield explain at all why Hshieh uses
18 rounding?

19 A. I don't recall that he did.

20 Q. And so let's go back to the beginning of your analysis.
21 When you're doing an analysis on invalidity -- strike
22 that. Excuse me.

23 What is your opinion as to whether the combination of
24 Hshieh and Kobayashi invalidate as obvious claim 1 of the '409
25 Patent?

1 A. That combination does not render claim 1 of the '409
2 invalid as obvious.

3 Q. Now let's go back to the beginning of your analysis.

4 When you start your analysis, when doing an invalidity
5 analysis, what are the presumptions that you must start with?

6 A. I always have to assume that the claim is valid.

7 Q. And why is that?

8 A. Because the USPTO has issued the claim and the assumption
9 is that they were correct in issuing that claim.

10 Q. What opinions did Dr. Shanfield present yesterday that
11 rebutted that presumption of validity?

12 A. I don't believe he presented any valid opinion that
13 rebutted that.

14 Q. And, sir, just to wrap this up, what is your opinion as
15 to whether Dr. Shanfield has shown that claim 1 of the '409
16 Patent is invalid?

17 A. It is not invalid. He has not shown that it is invalid.

18 Q. Thank you, Dr. Neikirk.

19 MR. HANBA: I pass the witness.

20 THE COURT: All right. Cross examination by the
21 Defendant.

22 You may proceed when you're ready, Mr. McMahon.

23 MR. McMAHON: Thank you, Your Honor. May it please
24 the Court.

25

CROSS EXAMINATION

BY MR. McMAHON:

Q. Dr. Neikirk, good morning.

A. Good morning, sir.

Q. You and I have not always agreed on everything in this case. Fair?

A. Fair.

Q. And I think it's also fair to say that you and Dr. Shanfield have not always seen eye-to-eye on every issue. Right?

A. Yes.

Q. Okay. I'd like to focus right now on the issues on which we do agree. Okay? Is that okay?

A. Yes, sir.

Q. Okay. We agree that the two prior art references that Dr. Shanfield talked about and that you just talked about, those are the Kobayashi patent and the earlier Hshieh patent. The Patent Office did not consider either of those prior art patents when examining the '409 Patent. Correct?

A. To the best of my knowledge, that is correct.

Q. And we know that from the face of the '409 Patent itself. Right?

A. Yes. That would certainly be part of it.

MR. McMAHON: Mr. Buck, could you please bring up the '409 Patent cover? And on the left side, you see there's

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1 a heading -- scroll down just a little bit -- a heading that
2 says reference cited -- references cited.

3 Q. (BY MR. McMAHON) Do you see that, Dr. Neikirk?

4 A. I do.

5 Q. And if we look, there are three of them listed there, and
6 that list continues on the top of the next column where there
7 are, if I count correctly, nine more references. Correct?

8 A. Yes.

9 Q. So that's 12 references that -- 12 prior art references
10 that the examiner considered when deciding whether to grant
11 the '409 Patent and its claims. Correct?

12 A. Yes. The star is I think to make it clear that those
13 were cited by the examiner, and all those have a star, so yes.

14 Q. That's right. And the star is there to distinguish
15 references that were cited by the applicant. Right?

16 A. Yes, sir.

17 Q. So if I am reading this correctly, all 12 have a star.
18 Correct?

19 A. Correct.

20 Q. Which means the examiner cited all 12 of these. Right?

21 A. Yes.

22 Q. The applicant did not cite any references. Correct?

23 A. That would appear to be -- yes, correct.

24 Q. And the applicant was the inventor Fwu Iuan Hshieh.
25 Right?

1 A. Yes.

2 Q. And that's the same inventor listed on the Hshieh '914
3 Patent. Right?

4 A. Oh, yes.

5 Q. Which was not cited to the Patent Office.

6 A. Yes.

7 MR. McMAHON: Mr. Buck, you can take that down.
8 Thank you.

9 Your Honor, I'd like to return to the boards that we
10 looked at yesterday. May I have leave to bring the easel back
11 out?

12 THE COURT: You may.

13 MR. McMAHON: Thank you, sir.

14 Q. (BY MR. McMAHON) Dr. Neikirk, do you recall this claim
15 checklist that Dr. Shanfield testified about?

16 A. I do.

17 Q. And I understand, sir -- can you see the whole board?

18 A. Well, I can see the checkmarks and the figures written,
19 and I can see the rest of the claim on my monitor. So I can
20 see it.

21 Q. Okay. We'll keep the claim on the monitor so that you
22 can refer to it as needed.

23 A. Thank you.

24 Q. And I'd like to return to discussing the points on which
25 we agree.

1 So if we start at that first limitation 1.pre -- I'll
2 just read that -- "a trenched semiconductor power device
3 comprising a plurality of trenched gates surrounding a
4 plurality of transistor cells formed in a semiconductor
5 substrate, wherein." Did I read it correctly?

6 A. Yes, sir.

7 Q. You have not offered any opinion that Kobayashi does not
8 teach that feature. Right?

9 A. That's correct.

10 Q. Okay. We'll skip 1[a] for now. We'll come back to that,
11 but let's go to 1[b]. "Each of said closed cells further
12 includes a circular trench contact disposed substantially in a
13 central portion of said closed cells, penetrating through a
14 source region surrounding said trenched gates and extending
15 into a body region encompassing said source region."

16 You have not disputed Dr. Shanfield's opinion that
17 Kobayashi teaches that feature. Correct?

18 A. Correct.

19 Q. The next one is 1[c], "Said circular trench contact
20 comprises a hole opened from a top surface of said
21 semiconductor substrate and is filled with a contact metal
22 plug."

23 Dr. Neikirk, you have not disputed Dr. Shanfield's
24 opinion that Kobayashi teaches that feature. Right?

25 A. Correct.

1 Q. Next limitation, 1[d], "Wherein sidewalls of said hole
2 are surrounded by and in contact with said source and body
3 regions." You have not disputed Dr. Shanfield's opinion that
4 Kobayashi teaches that feature. Right?

5 A. Yes.

6 Q. Yes, you have not disputed him. Correct?

7 A. Yes, I have not disputed it.

8 Q. Thank you for clarifying.

9 1[e], "And said circular trench contact is separate from
10 said trenched gates with said source region and body region
11 disposed between a gate oxide lining of said trenched gates
12 and all circumferential points of the circular trench contact,
13 and".

14 Dr. Neikirk, you have not disputed Dr. Shanfield's
15 opinion that Kobayashi teaches that feature. Right?

16 A. Yes, that is correct. I have not disputed it. Excuse
17 me.

18 Q. No dispute.

19 A. No dispute.

20 Q. Thank you.

21 The last limitation here, 1[f], "Said contact metal plug
22 connected to a source metal disposed on top of said circular
23 trench contact."

24 You have no dispute with Dr. Shanfield's opinion that
25 Kobayashi teaches that feature. Right?

1 A. I do not have a dispute --

2 Q. Thank you.

3 A. -- with Dr. Shanfield.

4 Q. Thank you.

5 So your disputes, as you presented this morning, are
6 focused on limitation 1[a]. Right?

7 A. Yes.

8 Q. And particularly the language 'substantially
9 square-shaped cells with rounded corners.' Am I right?

10 A. Yes.

11 Q. Thank you.

12 The claim says substantially square-shaped. Right?

13 A. It does.

14 Q. So the claim doesn't require specifically a square.
15 Correct?

16 A. That's correct. It does not require an exact square,
17 yes.

18 Q. Thank you.

19 MR. McMAHON: Mr. Buck, could we please go to figure
20 3 of the '409 Patent?

21 Q. (BY MR. McMAHON) Dr. Neikirk, you would agree this is
22 the example that the '409 Patent provides of that
23 shape--substantially square-shaped cell with rounded corners.
24 Correct?

25 A. I don't recall whether this is the only example, but it

1 is certainly an example it provides.

2 Q. An example. We agree on that?

3 A. Yes.

4 Q. Thank you.

5 And we see this from the top looking down. Correct?

6 A. Yes.

7 Q. This is a top-view image.

8 A. Yes.

9 Q. And from the top view, we see the opening of the trench.
10 Right?

11 A. Well, to be precise, no.

12 Q. In this -- this is a two-dimensional image so we don't
13 actually -- can't see any depth. There's no actual trench to
14 look down into in this image. Correct, sir?

15 A. Correct.

16 Q. But if we were looking at an actual device before the
17 trench had been filled from this perspective, we would be
18 looking down into the trench opening. Correct?

19 A. Yes.

20 MR. McMAHON: Mr. Buck, let's go to JX 24, the
21 Kobayashi reference, please, column 7, line 59.

22 Q. (BY MR. McMAHON) Dr. Neikirk, I want to just be clear
23 that you and I agree on what the words are on this page.
24 Starting with the second sentence of this paragraph, it reads,
25 "In this event, corners of each trench 6 at an opening portion

1 may also be rounded." Agreed?

2 A. Agreed.

3 Q. Thank you.

4 Let's go on to the obviousness combination. This is the
5 one that Dr. Shanfield testified he believes claim 1 is obvious
6 in view of Kobayashi plus Hshieh. Right?

7 A. Yes.

8 MR. McMAHON: Your Honor, may I bring up the second
9 board?

10 THE COURT: You may.

11 Q. (BY MR. McMAHON) Dr. Neikirk, this is the board that
12 Dr. Shanfield testified about yesterday?

13 A. It looks like it, yes.

14 Q. And it includes the same checkmarks that he provided for
15 each of the features in the Kobayashi column?

16 A. It does.

17 Q. As well as two checkmarks that he provided for those
18 first two features in the Hshieh column. Right?

19 A. I did not provide those checkmarks.

20 Q. I'm sorry. If I said you did, I didn't mean to.
21 Dr. Shanfield provided those checkmarks.

22 A. That's -- well, yes, I understand he said, please put the
23 checkmarks there.

24 Q. Okay.

25 MR. McMAHON: Could we go, Mr. Buck --

1 Q. (BY MR. McMAHON) Dr. Shanfield pointed to figure 8A.
2 Right, Dr. Neikirk?

3 A. From Hshieh, yes, he did.

4 MR. McMAHON: Mr. Buck, let's go to figure 8A of the
5 Hshieh reference, JX 25.

6 Q. (BY MR. McMAHON) This is the figure that Dr. Shanfield
7 pointed at. Correct?

8 A. I believe it is, yes.

9 Q. Now, if I heard you correctly a few minutes ago, you said
10 that Hshieh taught rounding two corners. Right?

11 A. I believe I did.

12 Q. And when you said that, you were referring actually to a
13 different figure which is figure 6A. Right?

14 A. Yes, you are correct.

15 Q. We'll look at that in a moment, but would you agree that
16 figure 8A actually shows rounding all four corners?

17 A. Yes, I would.

18 Q. Okay.

19 MR. McMAHON: Let's go to figure 6A, please.

20 Q. (BY MR. McMAHON) This is what actually -- I'm sorry.
21 Not 6A. 6B. My mistake, Dr. Neikirk. This is the figure you
22 were referring to when you said rounding two corners.
23 Correct?

24 A. Yes, it is.

25 Q. Okay.

1 MR. McMAHON: Mr. Buck, can we please go to column
2 4, lines 8 to 11?

3 Q. (BY MR. McMAHON) Dr. Neikirk, this is the part of the
4 patent text that describes figure 6A and 6B. Right?

5 A. It does.

6 Q. And it reads, "Figure 6A and 6B show the transistor cells
7 with poly silicon openings have the sharp corners blunted and
8 rounded, respectively, to remove punch-through vulnerable
9 points at the sharp corners of the parallelogram cells."

10 Did I read that correctly, sir?

11 A. Yes, sir.

12 Q. So the rounded corners are to remove punch-through
13 vulnerable points at the sharp corners of the parallelogram
14 cells.

15 A. Yes.

16 Q. Okay.

17 MR. McMAHON: Mr. Buck, can we move down a little
18 bit to lines 18 to 22 in that same column?

19 Q. (BY MR. McMAHON) Dr. Neikirk, this is the portion of the
20 text in the Hshieh '914 prior art reference that describes
21 figures 8 and B. Correct?

22 A. Yes.

23 Q. And it reads, "Figures 8A and 8B show the transistor cell
24 arrangement, respectively, in parallelogram, centered at
25 lattice points of a hexagonal lattice and parallelogram

1 centered at lattice points of a parallelogram, lattice
2 configurations of the rounded sharp-corner parallelogram
3 cells." Did I read that correctly?

4 A. Yes, sir.

5 Q. Thank you.

6 MR. McMAHON: You can take that down, Mr. Buck.
7 Thank you.

8 Q. (BY MR. McMAHON) Dr. Neikirk --

9 MR. McMAHON: Actually, Mr. Buck, do you have
10 Dr. Neikirk's demonstrative? Could we bring that back up,
11 please?

12 Q. (BY MR. McMAHON) Dr. Neikirk, this is the demonstrative
13 you discussed earlier today. Right?

14 A. It is.

15 Q. And you've put a big not equal sign here to indicate your
16 opinion that the Kobayashi reference does not teach rounded
17 corners. Correct?

18 A. Yes.

19 Q. Okay. You did not provide any graphic like this for the
20 Hshieh reference. Correct?

21 A. I did not.

22 Q. Because we agree that Hshieh does teach rounded corners.
23 Right?

24 A. It does.

25 Q. Thank you, sir.

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1 MR. McMAHON: Your Honor, pass the witness.

2 THE COURT: All right. Is there redirect from the
3 Plaintiff?

4 MR. HANBA: Briefly, Your Honor.

5 THE COURT: All right. Mr. McMahon, you'll need to
6 take your boards down and move the easel back.

7 Go ahead, Mr. Hanba.

8 MR. HANBA: If it please the Court.

9 REDIRECT EXAMINATION

10 BY MR. HANBA:

11 Q. Mr. McMahon showed you page 1 of the '409 Patent. Do you
12 recall?

13 A. Yes.

14 Q. And so I believe -- you went through the references that
15 were cited by the examiner. Right?

16 A. Yes.

17 Q. I think you-all agreed that the ones with the star, those
18 are patent examiner cited references?

19 A. Yes. Well, yes, cited by examiner.

20 Q. Yeah. And the patent examiner, I think you-all agreed
21 that the patent examiner searched a number of sources for
22 those references. Is that right?

23 A. I assume that's how they come up with the references.

24 Q. And probably including the Patent Office's own library of
25 patents?

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1 A. I would certainly expect so.

2 Q. And, sir, what country issued Kobayashi and Hshieh -- the
3 Kobayashi and Hshieh patents?

4 A. They're U.S. patents.

5 Q. Just like the '409 Patent?

6 A. Yes.

7 MR. HANBA: Mr. Doyle, can we go to column 4:18
8 through 22? I think it's describing figure 8A.

9 Q. (BY MR. HANBA) And we just saw this passage, and I've
10 always found this passage a little bit misunderstanding.
11 Could you please maybe describe in layman's terms for the jury
12 just why the Kobayashi patent is problematic and just cannot
13 anticipate?

14 A. This is from Hshieh. I'm sorry, so --

15 Q. I'm sorry. Yes.

16 MR. HANBA: Can you drop that down? I'm sorry.
17 It's still -- I'll strike that because I was going to comment.

18 Q. (BY MR. HANBA) If you could, why is it that the
19 Kobayashi patent cannot anticipate claim 1 of the '409 Patent
20 in -- for the jury in layman's terms?

21 A. So Kobayashi makes reference to rounding of the trench
22 and specifically shows it in cross section. It does make
23 reference to rounding the bottom corners and the top corners,
24 but it never makes reference to the four corners of the
25 square. And, in fact, the description there does not

1 necessarily tell you that the corners of a square or rectangle
2 would be rounded.

3 Q. Is there an everyday example that you could provide the
4 jury?

5 A. I don't know. I think the simplest one is that tabletop
6 over there. I've been making furniture for 50--no, that's a
7 terrifying thought--45 years, and that tabletop, if you looked
8 at it from the side, you'd see that the tabletop has -- that's
9 a fancier edge shape than just a simple rounding, but it's
10 rounded.

11 And if you looked at the ends, so look at it this way,
12 you'd see the rounding. If you look that way, the ends, you'd
13 see it's rounded. But if you just look at the corner, it's
14 not rounded at all. In fact, if anything, it's sharper than
15 it probably was before that router bit was used to shape the
16 edges.

17 So just because you shape the edges doesn't mean that the
18 corner, of the rectangle in that case, but the corner of the
19 square would be rounded at all.

20 MR. HANBA: No further questions. Pass the witness.

21 THE COURT: All right. Any additional cross
22 examination?

23 MR. McMAHON: Nothing further, Your Honor. Thank
24 you.

25 THE COURT: You may step down, Dr. Neikirk.

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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

10/12/2025

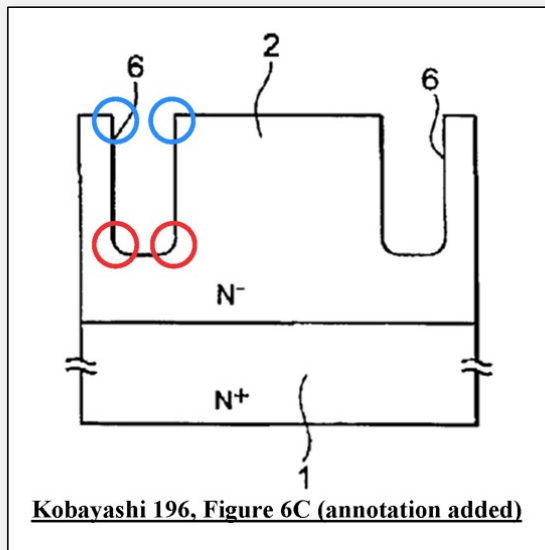
DATE

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Kobayashi vs. '409 Patent

Kobayashi: Rounded Gate Trenches

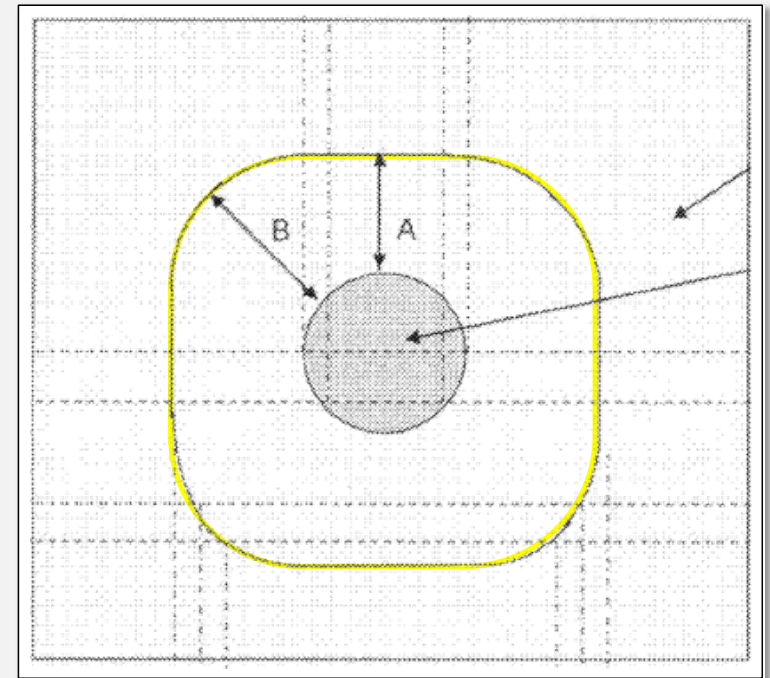


JX-24 (Kobayashi '196) at Fig. 6C (annotation added)

Next referring to FIG. 6C, after the composite film is removed by etching, corners of each trench 6 at the bottom are rounded. In this event, corners of each trench 6 at an opening portion may also be rounded. In order to round the

JX-24 (Kobayashi '196) at 7:57-60

'409 Patent: Substantially square-shaped cells with rounded corners



JX-3 ('409 Patent) at Fig. 3 (cropped)

PDX-5.1

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 13, 2025
Defendant. (8:30 A.M.

VOLUME 5

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

SHAWN McROBERTS, RMR, CRR
100 E. HOUSTON STREET
MARSHALL, TEXAS 75670
(903) 923-8546
shawn_mcroberts@txed.uscourts.gov

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1 before I bring in the jury.

2 Once the jury is in the courtroom and in the jury box, I
3 don't want any movement, I don't want any talking, I don't
4 want any whispering, I don't want anything that could be a
08:27 5 disruption or interruption to the process. And for goodness
6 sake, I don't want any electronic devices making noises. So
7 make double sure that you're well positioned with regard to
8 any devices you might have.

9 All right. Counsel, do you have anything for me before I
10 bring in the jury and proceed with the Court's final
11 instructions?

12 MR. HANBA: No, Your Honor.

13 MR. McMAHON: No, Your Honor.

14 THE COURT: All right. Let's bring in the jury,
15 please.

08:28 16 (Whereupon, the jury entered the courtroom.)

17 THE COURT: Good morning, ladies and gentlemen.

08:28 18 Please be seated. Welcome back.

19 Ladies and gentlemen of the jury, you've now heard all
20 the evidence in this case, and I'm now going to instruct you
21 on the law that you must apply.

22 I want you to understand that these final instructions
23 I'm giving you orally this morning are also going to be
08:28 24 represented by a printed copy of the same instructions in
25 writing. And I have prepared eight individual copies of these

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1 I'll now instruct you about the rules you must follow in
09:04 2 deciding whether or not ASUSTek has proven that claim 1 of the
3 '409 Patent is invalid. An issued United States patent is
4 accorded a presumption of validity based on the presumption
5 that the United States Patent and Trademark Office acted
6 correctly during the issuance of the patent. This presumption
7 of validity extends to all issued United States patents.

09:04 8 And in order to overcome this presumption, ASUSTek must
9 establish by clear and convincing evidence that a claim is
10 invalid. Like infringement, invalidity is determined on a
11 claim-by-claim basis, and you must determine separately for
12 claim 1 of the '409 Patent whether that claim is invalid.

13 Now, claims are construed in the same way for determining
09:05 14 infringement as for determining invalidity, and you must apply
15 the claim language consistently and in the same manner for the
16 issues of infringement as for the issues of invalidity. And
17 in making your determination as to invalidity, you must
18 consider each claim separately.

19 Now, the parties in this case do not dispute the validity
20 of the '634 Patent.

21 As I've explained earlier, ladies and gentlemen, a
09:05 22 previous device, system, method, publication, or patent that
23 predates the claimed invention is generally called prior art
24 and may include items that were publicly known or that have
25 been used or offered for sale, or references, such as

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1 publications or patents, that disclose the claimed invention
2 or elements of the claimed invention.

09:06 3 To be prior art, the item or reference must have been
4 known or used in the United States, or filed as a patent
5 application or published in the United States or a foreign
6 country before the priority date of the patent. And the
7 parties in this case agree that the priority date for the '634
8 Patent is February the 23rd, 2008, and the priority date for
9 the '409 Patent is December the 4th, 2006.

09:06 10 Now, prior art may be authored or created by anyone. In
11 evaluating the prior art to determine whether an invalidity
12 defense has been proven by clear and convincing evidence, you
13 must consider whether that prior art was or was not -- you may
14 consider whether that prior art was or was not before the
15 Patent and Trademark Office, which you've heard referred
16 throughout the case simply as the PTO, or as the Patent
17 Office.

09:07 18 I'm now going to instruct you on how to determine whether
19 claim 1 of the '409 Patent is invalid as being anticipated by
20 U.S. Patent No. 6,888,196, which you've heard referred to
21 throughout the trial as Kobayashi. In order for someone to be
22 entitled to a patent, the invention must actually be new, and
23 the inventor must not have lost his or her rights by delaying
09:07 24 the filing of an application claiming the invention. In
25 general, ladies and gentlemen, inventions are new when the

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1 identical product has not been used or disclosed before.

2 ASUSTek contends that claim 1 of the '409 Patent is
3 invalid because its claimed invention is not new. In other
4 words, ASUSTek contends that the claim is anticipated by the
09:08 5 prior art. Anticipation requires that all of the requirements
6 of a patent claim be disclosed in a single prior art
7 reference.

8 Also, a single prior art reference must disclose all
9 elements of the claim arranged or combined in the same way as
10 in the claim, and as the claim has been construed or
11 interpreted by the Court. ASUSTek must prove by clear and
12 convincing evidence that an asserted patent claim was
09:08 13 anticipated by the prior art reference. Anticipation must be
14 determined on a claim-by-claim basis.

15 To anticipate the invention, the prior art does not have
16 to use the same words as the claim, but all the requirements
17 of the claim must have been disclosed, either stated expressly
18 or implied, to a person of ordinary skill in the art in the
19 technology of the invention, so that looking at that one
09:09 20 reference, that person could make and use the claimed
21 invention.

22 Keep in mind that ASUSTek may not establish anticipation
23 by arguing that the accused products practice the prior art,
24 or by comparing the accused products to a prior art reference.
25 An item of prior art may anticipate without explicitly

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09:09 1 disclosing a feature of the claimed invention if that missing
 2 characteristic is necessarily present, or inherent, in the
 3 single anticipating reference.

 4 Separately, ASUSTek contends that claim 1 of the '409
 5 Patent is obvious in light of Kobayashi in combination with
 6 U.S. Patent No. 5,763,914, which you've heard of as Hshieh.
09:10 7 And it's pronounced Hshieh, but it's spelled H-S-H-I-E-H. And
 8 I'll now instruct you on how to determine whether claim 1 of
 9 the '409 Patent is invalid as being obvious.

 10 Even though an invention may not have been identically
 11 disclosed or identically described in a single prior art
 12 reference before it was made by an inventor, in order to be
 13 patentable the invention must also not have been obvious to a
 14 person of ordinary skill in the field of the technology of the
09:10 15 patent at the time the invention was made.

 16 ASUSTek has the burden of establishing obviousness by
 17 showing by clear and convincing evidence that the claimed
 18 invention would have been obvious to persons having ordinary
 19 skill in the art at the time the invention was made and in the
 20 field of the technology of the patent.

 21 Now, in determining whether a claimed invention is
09:11 22 obvious, you must consider the level of ordinary skill in the
 23 field that someone would have had at the time the invention
 24 was made, the scope and content of the prior art, and any
 25 differences between the prior art and the claimed invention.

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1 Keep in mind, ladies and gentlemen, that the existence of
2 each and every element of the claimed invention in the prior
3 art does not necessarily prove obviousness. Most, if not all,
4 inventions rely on the building blocks of prior art. The
09:11 5 skill of the actual inventor is not necessarily relevant
6 because inventors may possess something that distinguishes
7 them from persons having ordinary skill in the art.

8 Now, in considering whether the claimed invention was
9 obvious, you must first determine the scope and content of the
10 prior art. The scope and content of the prior art for
09:12 11 deciding whether the invention was obvious includes at least
12 prior art in the same field as the claimed invention. It also
13 includes prior art from different fields that a person of
14 ordinary skill in the art would have considered when trying to
15 solve the problem that is addressed by the invention.

16 Further, teachings, suggestions, and motivations may be
17 found within the knowledge of a person of ordinary skill in
18 the art, including inferences and creative steps that a person
09:12 19 of ordinary skill in the art would employ. A person of
20 ordinary skill in the art may be able to fit the teachings of
21 multiple pieces of prior art together like pieces of a puzzle.
22 The person of ordinary skill in the art would have the
23 capacity of understanding the scientific and engineering
24 principles applicable to the pertinent art.

25 In considering whether a claimed invention is obvious,

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09:13 1 you may, but you are not required, to find obviousness if you
2 find that at the time of the claimed invention there was a
3 reason that would have prompted a person having ordinary skill
4 in the field to combine the known elements in a way that the
5 claimed invention does, taking into account such factors as:

6 1. Whether the claimed invention was merely the
7 predictable result of using prior art elements according to
8 their known function;

09:13 9 2. Whether the claimed invention provides an obvious
10 solution to a known problem in the relevant field;

11 3. Whether the prior art teaches or suggests the
12 desirability of combining elements in the claimed invention;

13 4. Whether the prior art teaches away from combining
14 elements in the claimed invention;

15 5. Whether it would have been obvious to try the
16 combination of elements in the claimed invention, such as when
09:14 17 there is a design need or market pressure to solve a problem,
18 and there are a finite number of identified, predictable
19 solutions; and

20 6. Whether the change resulted more from design
21 incentives or other market forces.

22 To find the invention obvious, you must find that the
23 prior art provided a person having ordinary skill in the field
24 a reasonable expectation of success. Obvious to try is not
09:15 25 sufficient in unpredictable technologies.

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1 Now, in determining whether the claimed invention was
2 obvious, consider each claim separately, and do not use
3 hindsight; consider only what was known at the time of the
4 invention. In other words, you should not consider what a
5 person of ordinary skill in the art would know now or what has
6 been learned from the teachings of the '409 Patent.

09:15 7 In making these determinations, a person of ordinary
8 skill uses simple common sense and can rely on the inferences
9 and creative steps that a person of ordinary skill in the art
10 would employ. Also, ASUSTek does not need to show that one of
11 ordinary skill would actually have combined the physical
12 structures of two references; one need only combine the
13 teachings.

09:15 14 Remember, as stated earlier, prior art is not limited to
15 patents and published materials, but includes the general
16 knowledge that would have been available at the time to one of
17 ordinary skill in the field of the invention. If you find
18 that ASUSTek has proven the obviousness of a claim by clear
19 and convincing evidence, then you must find that that claim is
20 invalid.

09:16 21 If you find that ASUSTek has infringed a valid claim of
22 the asserted patents, you must then consider what amount of
23 money damages, if any, to award to the plaintiff Force MOS.

24 I'll now instruct you, ladies and gentlemen, about the
25 measure of damages. But by instructing you on damages, I am

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1 closing argument.

2 MR. HANBA: May it please the Court.

09:26 3 First, I want to thank you for your service as jurors.
4 We appreciate your time and attention this week, and I'm eager
5 to share Force MOS's closing presentation with you. So let's
6 start at the beginning which was opening statements last
7 Friday. Opening statements are like promises and previews, so
8 let's see who kept our promises.

9 When you deliberate, you'll fill out the verdict forms.
09:26 10 I've organized this presentation to match the questions you'll
11 be asked to answer. First, ownership of the '409 Patent, then
12 infringement, willfulness, validity, and damages.

13 And as I talk about each of these topics, I'll reference
14 the instructions the Court's given you and you'll apply those
15 to the evidence that you've seen at this trial.

09:27 16 So ASUS has argued that Force MOS doesn't own the '409
17 Patent. To hear ASUS tell it, the inventor and one of the
18 founders of Force MOS, Dr. Hshieh, intended to assign the '409
19 Patent to a company that doesn't exist.

20 And let's remember what the dispute is here. Instead of
21 referring to Force MOS Company, LTD., the 2006 assignment
09:27 22 signed by Dr. Hshieh inadvertently referred to Force MOS
23 Technology Corporation.

24 Now, we heard testimony from Mr. Rafael Chung that this
25 simple mistake was nothing more than a matter of translation.

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09:42 1 were infringing the '409 Patent and the '634 Patent, that ASUS
2 did nothing. Remember we saw this earlier. Did ASUS show the
3 SEMs to Force MOS? No. Did ASUS show the SEMs to you, the
4 jury? No. Did ASUS have Dr. Shanfield take SEMs and show
5 you, the jury? No. ASUS said, Just tell them we don't
6 infringe. ASUS said, Criticize Mr. Diep's work; those are bad
7 SEM images. Just criticize Dr. Neikirk's work. That's what
8 they said.

09:43 9 Mr. Fu also told us that Force MOS sent letters detailing
10 infringement to ASUS -- that after Force MOS's letters, ASUS
11 didn't test any MOSFET from Panjit, didn't create or even have
12 a third party create any SEM images of accused products, and
13 didn't do any analysis of the accused products.

14 Ask yourself: Why would a party accused of patent
15 infringement not do any analysis of the accused products?
09:43 16 Well, Mr. Fu's excuse was that ASUS, one of the largest
17 computer companies in the world, doesn't know how to do that.
18 You heard that ASUS, after receiving notice of the
19 infringement, never changed what it was doing. ASUS is
20 deliberately and willfully infringing.

21 So when you fill out that verdict form and reach Question
22 4, whether Force MOS has proven ASUS's willful -- excuse me,
09:44 23 ASUS's infringement is willful, I trust that, based on the
24 evidence, you'll see why the answer is yes.

25 So let's talk about validity. An issued United States

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1 patent is presumed valid based on the presumption that the PTO
2 acted correctly in issuing the patent. And this presumption
3 of validity extends to all issued U.S. patents, all of them.

09:44 4 As you heard from His Honor's instructions, to meet their
5 burden of proof, ASUS must show by clear and convincing
6 evidence, meaning ASUS's proof must establish an abiding
7 conviction, abiding conviction, in the truth of the matter.
8 So let's start with ASUS's anticipation position.

9 ASUS says Kobayashi anticipates claim 1 of the '409
10 Patent, meaning that every single element in the claim is
09:45 11 found in a single one reference. But let's look at what the
12 evidence actually shows. Dr. Shanfield admitted, he admitted,
13 that the figures in Kobayashi don't show square-shaped cells
14 with rounded corners.

15 And what did he do next? Well, he showed you this figure
16 and pointed to what he said were rounded corners. But what he
17 didn't tell you was that this was talking about a completely
18 different part of the MOSFET--the gate. It was talking about
09:45 19 the gate, not the cell as required by the claim. A gate is a
20 completely different structure than the square-shaped cells
21 with rounded corners as claimed in the '409 Patent. It's
22 apples to oranges.

23 And Dr. Shanfield knows this, which is why he had that
24 back-up position or that's the obviousness position. But,
25 again, where is their proof? ASUS had to show you clear and

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09:46 1 convincing evidence that a person of ordinary skill would have
2 combined Kobayashi and Hshieh. Dr. Shanfield provided
3 absolutely no motivation to combine. ASUS had to provide a
4 real reason. ASUS can't use hindsight to piecemeal two
5 unrelated random documents.

6 So not only has ASUS failed to provide a motivation to
7 combine, but as Dr. Neikirk explained, the prior art actually
8 teaches away just like that example that you wouldn't put an
09:46 9 engine from a Volkswagen into a pickup truck. But these
10 references don't belong together. The Hshieh patent does not
11 use squares. In fact, the entire point of the Hshieh patent
12 is to avoid using squares. Dr. Shanfield is not only not
13 obvious; the evidence tells you not to do this.

14 So where does that leave us? ASUS bears the burden to
09:47 15 prove invalidity by clear and convincing evidence.

16 THE COURT: 21 minutes have been used.

17 MR. HANBA: And what they actually show, well, a
18 combination of documents that teach you not to combine the
19 features. A reference that doesn't disclose all the claim
20 limitations. This is not clear and convincing evidence. This
21 is not an abiding conviction. That's not even close.

22 So when you fill out that verdict form and reach Question
09:47 23 3 on invalidity, whether ASUS has proven by clear and
24 convincing evidence that claim 1 of the '409 Patent is
25 invalid, I trust that based on the evidence you'll see why the

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1 answer is no.

2 Thank you.

3 ASUS gets to present their closing argument now. I look
4 forward to talking to you again when they're done.

5 THE COURT: All right. Defendant may present its
6 closing argument at this time.

09:48 7 Mr. Underwood, would you like a warning on your time?

8 MR. UNDERWOOD: Yes, Your Honor. May I have
9 warnings at -- when I've used 15 minutes and when I've used 20
10 minutes.

11 THE COURT: You may. I'll give you those warnings.

12 MR. UNDERWOOD: Thank you, Your Honor.

13 THE COURT: Let's proceed with Defendant's closing
14 argument when you're ready.

15 MR. UNDERWOOD: Thank you. May it please the Court,
16 counsel.

17 Ladies and gentlemen, the very first I would like to do
18 is thank each and every one of you for your service. I know
09:48 19 it's been a long week, beginning last Friday. I know we've
20 had long days. I know you've been away from your
21 responsibilities, from your jobs, from your families. I know
22 now you've had to drive through the rain to get here. You've
23 had to stay late. And so I want to thank you very much for
24 your service, because this is a very important case.

25 It's a case that at its surface is about patents. The

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1 You have 17 minutes remaining, Mr. McMahon. Would you
2 like a warning on your time?

3 MR. McMAHON: Yes, Your Honor, at 10 and 3 minutes
4 remaining.

10:11 5 THE COURT: 10 minutes and 3 minutes remaining.

6 MR. McMAHON: Thank you, sir.

7 THE COURT: You may proceed.

8 MR. McMAHON: Thank you, Mr. Underwood.

9 May it please the Court.

10 Good morning, ladies and gentlemen. I'm going to pick up
11 with where Mr. Underwood left off and talk about the component
12 counts. I told you on Friday to watch the counts. I
13 previewed that the MOSFET counts would affect credibility, and
14 they did.

15 Since then, you've heard a lot about those MOSFET counts.
10:12 16 You've heard a lot of criticism of those MOSFET counts,
17 suggestions that those numbers are bad. They're not bad.
18 They can't be because you can't fit hundreds of MOSFETs into a
19 device that doesn't have hundreds of slots. It's impossible,
20 as Mr. Hung said.

21 Now, this is something -- there is something that I
22 thought Mr. Hanba might say this morning and maybe he still
23 will. I thought he might say that our data is flawed because
10:12 24 of three specific MOSFETs. Mr. Diep found them in the battery
25 controller--two from Ubiq, one from LRC. Not hundreds, just

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1 legally accurate. The Patent Office doesn't check anything
2 that's recorded there, either. It's just for public notice
3 purposes.

4 So the question is, has Force MOS met its burden of
5 proving to you that it actually owns this patent that it
6 brought to court to enforce? If not, then you don't need to
10:16 7 answer any other questions about the '409 Patent. You're done
8 with that one. But I'm going to talk to you about the other
9 questions anyway so that you have the information that you
10 need to decide the issues in this case.

11 On Friday morning, you-all watched a video from the
12 Federal Judicial Center about the patent system. For some of
13 you, that might have been your very first introduction to
14 patents. In that video you heard the judge say that sometimes
15 the Patent Office makes a mistake. We all do.

10:17 16 For example, sometimes the Patent Office does not have
17 all of the information it needs such as prior art that the
18 examiner did not consider or locate. This is one of those
19 cases. We are here to defend ourselves against Force MOS's
20 allegations, and we have a right to challenge the '409 Patent
21 in court. It will be your job to decide whether the claimed
22 rounded corners were already known.

10:17 23 You heard Dr. Neikirk admit that the patent examiner who
24 allowed the '409 Patent did not consider the Kobayashi or
25 Hshieh prior art references. Both of them described rounded

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1 corners. The patent examiner undisputedly did not consider
2 those references.

3 Now, remember this is a topic on which Dr. Shanfield and
4 Dr. Neikirk actually have a lot of agreement, a lot of common
10:17 5 ground. Remember this checklist? We did this on the board
6 when Dr. Shanfield was testifying, and I actually asked
7 Dr. Neikirk about it, too. I'm showing it to you on the
8 screen so you can see it a little bit better now.

9 Dr. Shanfield presented this, and the checklist documents
10 where every feature of the '409 Patent claim 1 had already
11 been described in the Kobayashi prior art. Just yesterday
12 Dr. Neikirk said he has no dispute with Dr. Shanfield on all
10:18 13 but one of those features. There is no dispute that Kobayashi
14 described every feature that you see highlighted here on the
15 screen. The only feature that Dr. Neikirk disputes is
16 substantially square-shaped cells with rounded corners.

17 So let's take a closer look at that one. Figure 3A of
18 Kobayashi shows a top view of cells that are undisputedly
19 square. No question about that.

20 THE COURT: Ten minutes remaining.

21 MR. McMAHON: Thank you, Your Honor.

10:18 22 Figure 6C shows the side view. Dr. Neikirk admitted that
23 from the top view, we are looking down into the trench
24 openings, and the Kobayashi text says that the corners of each
25 trench at an opening portion may also be rounded. It's

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1 optional. So Kobayashi doesn't show it in the figures, but
2 the text of that sentence is pretty clear--the corners at the
3 opening may be rounded.

4 Now, Force MOS now argues that the gates are not the
5 cells, but the gates surround the cells. If the corners of
10:19 6 the gates are rounded, then so are the corners of the cells.
7 Dr. Neikirk says Kobayashi does not describe substantially
8 square-shaped cells with rounded corners. Is that credible?

9 Now, maybe you want to see a drawing of the rounded
10 corners. That's fine. Dr. Shanfield showed you that, too.
11 In the Hshieh prior art, here we see figure 8a and even
12 Dr. Neikirk agreed in that figure all four corners are
13 actually rounded. Dr. Shanfield told you that it would have
10:19 14 been obvious to add the rounded corners to Kobayashi's square
15 cells? Why? Dr. Shanfield spoke from personal knowledge. He
16 said that it would have been obvious to combine Hshieh's
17 rounded corners with Kobayashi's square cells to make the
18 device more rugged and avoid punch-through. That's exactly
19 what the Hshieh prior art says.

20 It's also exactly the same problem that the '409 Patent
21 set out to solve.

10:20 22 Now, we'll show you a photo of the checklist that--if we
23 go to the next slide--that Dr. Shanfield used to show the
24 combination of these references. So have we proven by clear
25 and convincing evidence that claim 1 of the '409 Patent is

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1 invalid? That's one of the questions for you to decide.

2 As you consider that question, remember Dr. Shanfield is
3 the only expert you heard from who has designed and built
4 trench MOSFETs.

5 Now, I'd like to turn to the question of infringement on
10:20 6 which Force MOS bears the burden of proof. Remember that
7 Dr. Neikirk showed you a lot of images. We can see one here.
8 In most of them, Dr. Neikirk chose to paint over the SEM with
9 lots of colors. Dr. Neikirk added those colors. The painted
10 colors did not come from the SEM machine and neither did Force
11 MOS's fancy animations.

12 What came from the SEM machine is the black-and-white
13 image that we see here. When we removed the paint and looked
14 at that, we saw that the MOSFET devices had been aggressively
10:21 15 etched with hot acid. Mr. Hanba reminded you during opening
16 that a picture is worth a thousand words. It sure is. This
17 picture shows you that Force MOS destroyed the samples.

18 Even Dr. Neikirk admitted that the process is destructive
19 and alters the device. He admitted it. How can images of
20 altered samples be credible?

21 Dr. Shanfield walked us through image after image after
22 image. Every one of them included those telltale black
10:22 23 patches indicating that the damage caused by the hot acid just
24 like the image that Mr. Hanba showed you today. Those black
25 patches are voids. The material that was there has been

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1 about your service in this case. But at that point you will
2 be completely free, if you choose to, to talk with anyone of
3 your choosing about your service as jurors in this case. At
4 that point it will be 100 percent your own individual
5 decision.

6 I'm now going to hand eight printed copies of these final
7 jury instructions and one clean copy of the verdict form to
10:50 8 the Court Security Officer to deliver to you in the jury room.

9 Ladies and gentlemen of the jury, you may now retire to
10 the jury room to deliberate upon your verdict.

10:50 11 (Whereupon, the jury left the courtroom.)

12 THE COURT: Counsel, you are welcome to wait here in
13 the courtroom. If you choose to wait off premises, don't be
14 far away, and make sure that your cell phones are on so that
15 when we call you you can get back here quickly in the event we
10:50 16 either get a note or a question from the jury or when we
17 receive the return of their verdict.

18 Awaiting either a note from the jury or the return of
19 their verdict, we stand in recess.

20 (Jury deliberates.)

21 THE COURT: Be seated, please.

12:31 22 All right, counsel. I've received the following note
23 from the jury. I'll read it into the record. I'll then hand
24 the original to the Courtroom Deputy, and I also have a copy
25 for each of the trial teams which you can approach and get

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1 after I've read it into the record.

12:31 2 Their note reads -- the jury's note reads as follows:
3 "We would like to see pictures of Kobayashi '196 and Hshieh
4 '914 Patents." Then there's a space, and it continues. "Does
5 the JX 7 represent global sales or U.S. sales?" And it's
6 signed by Ms. Neal, Juror No. 7 as the foreperson. That's the
7 entirety of the note.

12:31 8 I'll hand the original to the Courtroom Deputy, and then
9 I have a copy for each Plaintiff and Defendant, if you want to
10 approach and get that.

11 I have already asked the Courtroom Deputy to pull JX 24
12 and 25, which are the two references they asked for in the
13 first part of the note.

12:32 14 I will read you what I have tentatively prepared as a
15 response with regard to JX 7 and then I'll be glad to hear
16 your comments.

17 The written response I have at present says, "Members of
18 the jury, in response to Jury Note No. 1, I am sending you the
19 following: 1, Exhibit JX 24, which is the Kobayashi '196
12:32 20 Patent/reference, and 2, Exhibit JX 25, which is the Hshieh
21 '914 Patent/reference.

22 "As to JX 7, this lengthy spreadsheet, a small portion of
23 which was shown to you during the trial, does not expressly
24 show either U.S. or global sales. It identifies the various
25 MOSFETs that relate to various accused products."

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1 Now, I'll be happy to hear from both Plaintiff and
12:33 2 Defendant as to this proposed response and whether there are
3 any problems or objections with regard to what I've suggested.

4 MR. HANBA: Your Honor, no objection to Kobayashi or
5 Hshieh. And JX 7 actually is U.S. sales. It includes the
6 slots, but it is -- also includes a column for U.S. sales.

7 THE COURT: Well, I think both sides recognize that
12:33 8 JX 7 in its entirety is a very, very large document, and I am
9 not at all sure that either side benefits by sending the
10 entirety of that document to the jury. And I think everybody
11 will agree a small portion of that was shown during the trial,
12 and there is probably a disagreement between the parties as to
13 what it is and what it means.

12:34 14 So I'm happy -- the jury note -- the note from the jury
15 does not ask for a copy of JX 7; it just simply asks does JX 7
16 represent global sales or U.S. sales.

17 Mr. McMahon, what comments or observations can you offer?

18 MR. MCMAHON: Your Honor, I was inclined to go along
19 with your original proposal, quite frankly.

12:34 20 THE COURT: What's your problem with the original
21 proposal, Mr. Hanba?

22 MR. HANBA: We showed the sales portion of that
23 spreadsheet in the damages presentation, Your Honor, with
24 Mr. LaMotta.

25 THE COURT: I'm trying to recall whether it was

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1 clearly identified as either U.S. sales or global sales, and
2 I don't have any clear recollection of that. That's the
12:35 3 question they asked. It seems like to me the spreadsheet in
4 its entirety is really not just U.S. sales or clearly all
5 global sales; it seems it really is more a spreadsheet that
6 ties the various MOSFETs to the various accused products.
7 So --

8 MR. HANBA: But Your Honor, the right column
9 includes the sales data, and so that's the column -- it was
10 produced in response to document requests as to U.S. sales,
12:35 11 so -- but we showed that right column that had the sales data
12 as part --

13 THE COURT: I don't see either of the IT people in
14 the courtroom. I guess there's no way somebody could put part
15 of the spreadsheet up on the monitor so we could all have the
16 benefit of seeing it. Anybody present got that capability?

12:36 17 Let's go off the record while we see what we can and
18 can't do.

12:36 19 (Pause in proceedings.)

20 THE COURT: All right. Let's go back on the record.

12:39 21 Based on discussions had with counsel off the record
22 during which each side indicated to the Court they agreed JX 7
23 represents U.S. sales, I am modifying the Court's proposed
24 written response to Juror Note No. 1 to read as follows:
25 "Members of the jury, in response to Jury Note No. 1, I am

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1 sending you the following: 1, Exhibit JX 24, which is the
12:39 2 Kobayashi '196 Patent/reference, and 2, Exhibit JX 25, which
3 is the Hshieh '914 Patent/reference.
4 "As to JX 7, the parties agree that JX 7 represents U.S.
5 sales."
6 Dated and signed.
7 Any objection to that from the Plaintiff?
8 MR. HANBA: No objection, Your Honor.
9 THE COURT: Any objection to that from the
10 Defendant?
11 MR. McMAHON: No objection, Your Honor.
12:39 12 THE COURT: All right. I have JX 24 and JX 25, and
13 I'll put the signed original of that written response with it.
14 I'll deliver it to the Court Security Officer and instruct him
12:40 15 to deliver it to the jury, and I'll hand a duplicate signed
16 original of that written response to the Courtroom Deputy for
17 the Court's files.
18 Now, awaiting either another note from the jury or return
19 of their verdict, we stand in recess.
12:40 20 (Deliberations continue.)
21 THE COURT: Be seated, please.
01:52 22 Counsel, I've received the following message from the
23 jury. "We have a verdict." Signed by Juror No. 7, Ms. Neal,
24 as the foreperson.
25 I'll hand the original message to the Courtroom Deputy,

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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

02/13/2025

DATE

SHAWN McROBERTS, RMR, CRR
FEDERAL OFFICIAL COURT REPORTER

Shawn M. McRoberts, RMR, CRR
Federal Official Court Reporter

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

FORCE MOS TECHNOLOGY CO., §
LTD., §

Plaintiff, §

v. §

ASUSTEK COMPUTER, INC., §

Defendant. §

CASE NO. 2:22-CV-00460-JRG

VERDICT FORM

In answering the following questions and completing this Verdict Form, you are to follow all the instructions that I have given you in the Court's Final Jury Instructions. Your answers to each question must be unanimous. Some of the questions contain legal terms that are defined and explained in detail in the Final Jury Instructions. You should refer to and consider the Final Jury Instructions as you answer the questions in this Verdict Form.

As used in this Verdict Form, the following terms have the following meanings:

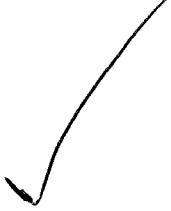
- “**Force MOS**” refers to Plaintiff Force MOS Technology, Co., Ltd.
- “**ASUSTeK**” refers to Defendant ASUSTeK Computer, Inc.
- The “**’634 Patent**” refers to U.S. Patent No. 7,629,634.
- The “**’409 Patent**” refers to U.S. Patent No. 7,812,409.
- The “**Asserted Patents**” refers collectively to the ’634 and ’409 Patents.
- “**Dr. Hshieh**” refers to Dr. Fwu-Iuan Hshieh who is the inventor of the ’409 Patent.

IT IS VERY IMPORTANT THAT YOU FOLLOW THE
INSTRUCTIONS PROVIDED IN THIS VERDICT FORM

READ THEM CAREFULLY AND ENSURE THAT YOUR
VERDICT COMPLIES WITH THEM

QUESTION NO. 1

Did Force MOS prove by a preponderance of the evidence that it acquired all rights in the '409 Patent from Dr. Hshieh?

Yes:  _____ No: _____

If you answered “NO” to Question No. 1, DO NOT answer any other questions concerning only the '409 Patent. Specifically, if you answered “NO” to Question No. 1 then DO NOT answer Question Nos. 2B and 3.

Only answer Question Nos. 2B and 3 if you answered “YES” to Question No. 1.

QUESTION NO. 2A

Did Force MOS prove by a preponderance of the evidence that ASUSTeK infringed any of Claims 1–3 of the '634 Patent?

Yes: ✓ No: _____

QUESTION NO. 2B

Did Force MOS prove by a preponderance of the evidence that ASUSTeK infringed Claim 1 of the '409 Patent?

Yes: ✓ No: _____

QUESTION NO. 3

Did ASUSTeK prove by clear and convincing evidence that Claim 1 of the '409 patent is invalid?

Yes: _____

No: ✓

Only answer Question Nos. 4 and 5 if you found that at least one of the Asserted Patents is infringed and is not invalid.

If you answered “NO” to both Question Nos. 2A and 2B, you SHOULD NOT answer Question Nos. 4 and 5.

If you answered (1) “NO” to Question No. 2A, (2) “YES” to Question No. 2B, and (3) “YES” to Question No. 3, you SHOULD NOT answer Question Nos. 4 and 5.

However, if you answered (1) “NO” to Question No. 2A, (2) “YES” to Question No. 2B, and (3) “NO” to Question No. 3, you MUST answer Question Nos. 4 and 5.

Finally, if you answered “YES” to Question No. 2A, then, regardless of how you answered Question Nos. 2B and 3, you MUST answer Question Nos. 4 and 5.

QUESTION NO. 4

Did Force MOS prove by a preponderance of the evidence that any infringement you have found was willful?

Yes: ✓ No:

QUESTION NO. 5

What sum of money, if paid now in cash, has Force MOS proven by a preponderance of the evidence would compensate it for its damages as to any infringement you have found?

Answer in United States Dollars and Cents, if any:

\$ 10,500,000.00

FINAL PAGE OF THE JURY VERDICT FORM

You have now reached the end of the Verdict Form and you should review it to ensure it accurately reflects your unanimous determinations. The Jury Foreperson should then sign and date the Verdict Form in the spaces below. Once this is done, notify the Court Security Officer that you have reached a verdict. The Jury Foreperson should keep the Verdict Form and bring it when the jury is brought back into the courtroom.

Signed this 13 day of February, 2025.

Jury Foreperson

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
) MARCH 31, 2025
Defendant. (8:30 A.M.

BENCH TRIAL

BEFORE THE HONORABLE RODNEY GILSTRAP
UNITED STATES CHIEF DISTRICT JUDGE

SHAWN McROBERTS, RMR, CRR
100 E. HOUSTON STREET
MARSHALL, TEXAS 75670
(903) 923-8546
shawn_mcroberts@txed.uscourts.gov

Shawn M. McRoberts, RMR, CRR
Federal Official Court Reporter

1 the witness stand.

08:43 2 All right, Mr. Li. You may proceed with direct
3 examination.

4 MR. LI: Thank you, Your Honor.

5 During the jury trial we qualified Dr. Shanfield as an
6 expert in the field of design fabrication and analysis of
7 semiconductor devices, including trench MOSFET, without
8 objection, Your Honor, and here we move to qualify him as an
9 expert in the same field.

10 THE COURT: Any objection?

11 MR. GARSSON: No, Your Honor.

12 THE COURT: All right. The witness is so qualified.

13 MR. LI: Thank you, Your Honor.

14 STANLEY SHANFIELD, PH.D.,

15 testified on direct examination by Mr. Li as follows:

16 Q. Good morning, Dr. Shanfield.

17 A. Good morning.

08:44 18 Q. I am showing you Joint Exhibit No. 2, the '634 Patent,
19 and specifically this figure 2G. Can you tell us what figure
20 2G discloses?

21 A. Sure. What you're seeing here is a cross section of the
22 device. It's a conventional trench MOSFET where I'm first
23 depicting with a blue arrow where the current flows from its
08:44 24 source contact through the MOSFET channel and then the JFET
25 region, as they call it, into the drain 213, and the source

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08:58 1 A. Well, I think to me it's clear that if the examiner were
2 to have been aware of Hshieh '384, he would have understood
3 that the defining characteristics of the '634 was already
4 disclosed in '384, and in my opinion he would not have allowed
5 the '634 Patent.

08:58 6 Q. Now, let's move to the '409 Patent. Please look at this
7 slide. It shows the '409 Patent, Joint Exhibit No. 3, and
8 figure 1A again labeled as prior art on the left and figure 3
9 on the right.

10 Could you explain what are the differences between those
11 two figures?

08:59 12 A. Yes. In the '409 Patent--and again, this is
13 Dr. Hshieh--he's representing what the prior art is on the
14 left in figure 1A as having -- when you're looking from the
15 top onto the wafer, essentially, of the trench MOSFET, a
16 source contact that is square and also a trench gate that's
17 labeled No. 20--the source contact is labeled 15--the trench
18 gate is -- also has a square shape relative to the source
19 contact.

08:59 20 What the distinguishing characteristic of the '409 Patent
21 is is shown on the right where, essentially, the source
22 profile is round instead of square, and the corners -- rather,
23 it's essentially square region that I'm calling a trench gate
24 or that's labeled trench gate 210 in this diagram is now given
25 truncated corners, so it starts as a square but the corners

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09:00 1 are truncated, and with the distance A and B becoming more
2 equal.
3 Q. Okay. And you said both of them are a view from a --
4 looking from the top?
5 A. That's correct.
6 Q. Do you have a slide explaining the side view or
7 cross-sectional view?
8 A. Yes. That's the next slide.
9 Q. Okay. So the next slide shows figure 1C of '409 Patent
10 on the left again as prior art, and figure 3A on the right.
09:00 11 What are the differences between the -- of these two
12 figures?
13 A. The two figures actually are explaining the same
14 structure. It has all the same elements of a conventional
15 trench MOSFET.
16 Q. Okay. And what do you mean by 'conventional trench
17 MOSFET'?
18 A. That is what I described previously with the green labels
09:01 19 that everybody who made power trench MOSFETs at the time of
20 the invention did it with these elements present.
21 Q. Okay. And, you know, earlier you also mentioned that the
22 alleged new point in this '409 Patent is the round corners of
23 square cell. Was that new, though?
24 A. No, it wasn't.
25 Q. Are you aware of any prior art disclosing rounded corners

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1 or truncated corners of square cells?

2 A. Yes, I am.

09:02 3 Q. Do you recall who was the inventor of that prior art
4 reference?

5 A. Once again, it was Dr. Hshieh.

6 Q. Okay. I'm looking at the next slide. It is Joint
7 Exhibit No. 25, Hshieh '914, and it shows figure 8A, figure 8B
8 of the '914 on the left, and on the right side it shows some
09:02 9 excerpts which is from Column 5, line 3 to 8, and Column 2,
10 line 19 to 22.

11 Do you recognize this exhibit?

12 A. Yes.

13 Q. Explain to us how do they relate to the rounded corners
14 or truncated corners of square cells.

15 A. Yes. Well, figure 8A, again, is looking from the top of
16 the design of a trenched MOSFET. Again, it's got the
17 conventional cross section, but it has -- and I'm reading now
09:02 18 from the red part: In order to prevent corner vulnerability
19 where punch-through weak points may be formed at sharp corners
20 due to a three-dimensional diffusion effect similar to that
21 discussed by Patent '831 by Yilmaz, the sharp corners of the
22 polysilicon openings can be either blunted or rounded. So he
23 is talking in that case about the rounded outer ring.

09:03 24 And the three-dimensional diffusion effect, the point
25 there he actually -- in referring to this patent, if you go to

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1 the Yilmaz patent, the last sentence in the paragraph that
2 I've taken says, "The three-dimensional diffusion effect,
3 which often leads to vulnerable punch-through weak points in
4 the corners of a square cell, is circumvented by blunting the
5 sharp corners in the square cells."

09:03 6 This is paragraph -- actually Column 2, lines 19 through
7 22. And the point being that it doesn't matter whether it's
8 three-dimensional diffusion or a sharp corner; whatever
9 creates a protrusion between the source and the gate, that's
10 going to cause a weak point, as he describes it, and the weak
11 point is what's being eliminated. How it's being eliminated
09:04 12 or what caused it is not -- he's naming one possible
13 cause--the three-dimensional diffusion effect. There's other
14 reasons like sharp points that also would create the same
15 problem. That sharp point will create a punch-through problem
16 in the device, and he's looking to alleviate that.

17 Q. Thank you.

18 So just to be clear, could you please use, you know,
19 plain English, a couple of sentence, to tell us what is the
09:04 20 advantage of this type of rounded corners for square cells?

21 A. Yes. As I explained, if there are any protrusions
22 between the gate and the source and that protrusion is either
23 caused by a three-dimensional diffusion effect, a sharp
24 corner--and there are other effects; there's several that can
25 cause -- effectively cause protrusions--that protrusion leads

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09:05 1 to a punch-through in the device, an early punch-through, and
2 that is the effect you want to avoid in running these power
3 devices.

4 Q. Okay. What would a skilled person in the art do if they
5 know this advantages of rounded corners in square cells?

6 A. Well, I think it would be pretty clear they'd want to use
7 this idea together with some conventional trenched MOSFET

09:05 8 prior art to make a better more robust device.

9 Q. And what would they expect in that?

10 A. Well, they end up with a device that was more tolerant to
11 avalanche. In other words, it wouldn't have a punch-through
12 effect under high power the way a device that didn't have this
13 feature would.

14 Q. Okay. Have you reviewed the file history of the '409
15 Patent?

16 A. Yes.

09:06 17 Q. Okay. So let's talk about the advantages disclosed here.
18 And my question is, are you aware of any prior art references
19 discussed in the '409 file history disclosing the advantages
20 of rounded corners?

21 A. Yes.

22 Q. Let me ask you again. So are you aware of any prior art
23 discussed in the file history of the '409 Patent discussing
24 about the advantages of the rounded corners?

25 A. No.

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1 Q. Okay. Sorry. Your answer is inconsistent. Can you
09:06 2 explain like --
3 A. Yes. What -- I didn't hear you the first time, so I had
4 to change my answer, as the file history of the '409 Patent
5 has discussion of a patent that has rounded -- shows rounded
6 corners, but there's no explanation in that reference of why
09:07 7 it would be of value, what benefit would be in any regards;
8 it's just there. So that is why. And in the rest of the
9 history there's no discussion at all. So that is why I answer
10 no.
11 Q. Okay. And the next slide show, claim 1 of the '409
12 Patent, and again, there's one element highlighted in orange.
13 It is "said trenched gates surrounding said transistor cells
14 as closed cells constituting substantially square-shaped cells
09:07 15 with rounded corners," and every other element is in green.
16 Tell us, how is the red element related to the
17 undisclosed Hshieh reference we just discussed, the '914
18 reference?
19 A. The -- the red section is the element that exists and was
20 identified -- and the manufacturing procedure was identified
21 in the Hshieh reference I just showed. So it's going to have
09:08 22 closed cells constituting substantially square-shaped cells
23 with rounded corners.
24 Q. Okay. And the remaining elements are in green. Why they
25 are in green?

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1 A. Once again, that's the conventional elements of a
2 trenched MOSFET at the time of the invention.

3 Q. Okay. Now I'm showing Kobayashi Joint Exhibit 24 on the
4 left. Do you recall you provided opinions regarding Kobayashi
5 in light of the '409 Patent during the jury trial? Do you
6 remember that?

7 A. Yes, I do.

8 Q. What was your opinion?

09:09 9 A. My opinion was that Kobayashi had all the elements of --
10 that are in green in the '409 Patent.

11 THE COURT: Just a minute.

12 MR. GARSSON: Objection, Your Honor. This is
13 outside the scope of Dr. Shanfield's expert report.
14 Dr. Shanfield did not opine a combination including Kobayashi
15 was 'but-for' material for ASUS's inequitable conduct claim.

16 THE COURT: What's your response, Mr. Li?

09:09 17 MR. LI: Our response is both in his expert report
18 and during trial Dr. Shanfield provide opinion regarding how
19 Kobayashi in combination with Hshieh will make this claim
20 invalid under an obviousness theory. And by doing that, we
21 already disclosed the invalidity theory and there's nothing
22 new here.

23 THE COURT: Mr. Garsson?

09:09 24 MR. GARSSON: Your Honor, this matter has to do with
25 materiality. In his inequitable conduct section he did not

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1 discuss Kobayashi at all, did not incorporate anything from
2 his obvious analysis into that, and, Your Honor, all -- it was
3 discussing the '914 as being material. There's nothing in the
4 inequitable conduct section in which Kobayashi was discussed
5 at all.

6 MR. LI: Your Honor, may I respond?

7 THE COURT: You may.

8 MR. LI: Thank you, Your Honor.

9 So I guess here we have two issues, and the number one is
09:10 10 what we're alleging here as being material. And it is clear
11 that is the undisclosed Hshieh '114 [sic] Patent. And the
12 reason it is material is because we have an invalidity theory
13 disclosed in the expert report that renders the patent
14 invalid.

15 THE COURT: I understand. You apparently don't
16 dispute Mr. Garsson's assertion that in the inequitable
17 conduct section of the report this is really not discussed.
09:10 18 Your point is that it's in the report but it's in the context
19 of the invalidity defenses?

20 MR. LI: Let me check the report, because I think we
21 made a reference -- give me one second. I can check the
22 expert report.

23 THE COURT: All right.

09:11 24 (Pause in proceedings.)

25 MR. LI: Oh, yeah. So paragraph 665. Here is what

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1 Dr. Shanfield said: "As set forth in section 11G, I have
2 reviewed Hshieh '114 as part of any invalidity opinion for
3 '409." That's how it is discussed.

09:11 4 THE COURT: All right. Well, this is before the
5 Court. I'll certainly look at the reports as a part of
6 considering the evidence today. I'll carry the objection, but
7 let's proceed with the testimony.

8 MR. LI: Thank you, Your Honor.

09:12 9 Q. (BY MR. LI) And I just want to make sure you finish your
10 answer, and your answer is that still opinion that this
11 Kobayashi Joint Exhibit 24 in combination with Hshieh '914
12 render claim 1 of '409 obvious. Is that your opinion today?

13 A. That's correct; the same as I said earlier in my report.

14 Q. Thank you.

15 And let's go back to slide 15 we just saw here. Again,
16 looking at the disclosure of Hshieh '914 again, what is your
09:12 17 opinion regarding the materiality of this reference during the
18 examination of '409 Patent?

19 A. I think here in the same way the examiner that was aware
20 of the Hshieh '914 reference and the fact that the Hshieh '914
21 reference explains the benefit of the rounded corners, that
22 that in combination with a reference like Kobayashi, or
09:13 23 Kobayashi itself, he would have not allowed the '409 Patent.

24 Q. Thank you, Dr. Shanfield.

25 MR. LI: And Your Honor, just for Your Honor's

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1 record regarding the objection, we just mentioned the expert
2 report paragraph No. 665. Now I have another paragraph, 669,
3 just for the record. It mentions combining the Hshieh '914
4 with other prior art.

5 THE COURT: There also appears to be a reference to
6 Kobayashi in paragraph 660 in the inequitable conduct section.

7 MR. LI: Thank you, Your Honor.

8 THE COURT: These matters are before the Court and,
9 as I said, I'm going to review the expert reports on both
10 sides as a part of arriving at any final decision, so I don't
11 want to draw -- I don't want to delay the proceedings this
12 morning.

13 MR. LI: Thank you, Your Honor.

09:14

14 THE COURT: Let's continue.

15 MR. LI: Your Honor, we reserve -- I didn't keep
16 track of time, but we reserve about five to ten minutes for
17 redirect.

18 THE COURT: All right, sir. You're passing the
19 witness at this juncture?

20 MR. LI: Thank you, Your Honor.

09:14

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

23 MR. THANE: May I approach, Your Honor?

24 THE COURT: You may.

25 All right, counsel. Proceed with cross examination.

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09:15 1 MR. GARSSON: This is Ross Garsson for Plaintiff.

2 CROSS EXAMINATION

3 BY MR. GARSSON:

4 Q. Good morning, Dr. Shanfield.

5 A. Good morning.

6 Q. Now, you're the technical expert retained by ASUS in this

7 matter. Correct?

8 A. That's right.

9 Q. And you provided opinions on whether Hshieh '384 and

10 Hshieh '914 are material to the patents-in-suit. Correct?

11 A. I have provided -- yes, I provided opinions on that.

12 Q. Okay. And those are the only patents you're here today

13 to testify about regarding materiality. Correct?

09:15 14 A. Could you repeat your question?

15 Q. Sure.

16 A. The earlier question.

17 Q. Yeah. The Hshieh '384 and Hshieh '914 Patents, your

18 testimony today is regarding the materiality of those patents

19 for the issues today. Correct?

20 A. Well, in combination with a conventional trench MOSFET

21 which Kobayashi was one.

22 Q. Yes. But you're not here to talk today about materiality

09:16 23 with regard to any other patents and with regard to the prior

24 art for the '409 Patent and the '634 Patent. Correct?

25 A. Yes.

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1 Q. Okay. Now, let's first talk about Hshieh '914. The only
2 limitation in the '409 Patent claims that you've opined is
3 disclosed in Hshieh '914 is the square-shaped cells with
4 rounded corners. Is that correct?

09:16 5 A. That's not the exact language, but yes.

6 Q. Okay. But Hshieh '914 discloses non-orthogonal shaped
7 cells, not square-shaped cells; correct?

8 A. No, not correct.

9 Q. So 914 doesn't disclose -- let me understand. Can you --

10 MR. GARSSON: Mr. Collins, can you please put up
09:17 11 figure 8A of Hshieh '914?

12 Q. (BY MR. GARSSON) Just looking at figure 9A to the right,
13 are you saying that --

14 A. You mean figure 8A?

15 Q. 8A. Excuse me. Figure 8A on the right-hand side, that
16 is from Hshieh '914. Correct?

17 A. Yes.

18 Q. Okay. Are those non-orthogonal shaped cells?

09:18 19 A. They are what were substantially square shapes that were
20 truncated at the corners.

21 Q. Okay. Okay. You've reviewed the prosecution history of
22 the '409 Patent. Correct?

23 A. Yes.

24 Q. Okay. When doing so, you read the office actions from
25 the USPTO on the claims of the '409 Patent?

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1 A. Yes.

2 Q. And you understand that Pfirsch '703 was used in multiple
09:18 3 rejections by the examiner for teaching square-shaped cells
4 with rounded corners. Correct?

5 A. Yes.

6 MR. GARSSON: Okay. Mr. Collins, can you please put
7 up JX 6, 90 and 91 side by side?

8 Q. (BY MR. GARSSON) Okay. Now, Dr. Shanfield, is it true
9 -- it shows the examiner actually examined and put an image of
10 figure 2 of Pfirsch '703 into the office action. Correct?

11 A. Yes.

12 Q. And you would agree that Pfirsch '703 disclosed
09:18 13 square-shaped cells with rounded corners. Correct?

14 A. Yes. Without an explanation of what the benefit was.

15 Q. Now, you also saw that during the prosecution there was
16 no dispute that Pfirsch '703 taught square-shaped cells with
17 rounded corners. Correct?

18 A. Yes.

19 Q. Okay. And when reviewing the patent file history, you
09:19 20 saw that Pfirsch '703 was distinguished from the claims of the
21 '409 Patent because Pfirsch '703 source contacts were not
22 circular. Correct?

23 A. You'll have to show me where.

24 Q. Okay.

09:19 25 MR. GARSSON: Can you bring up JX 679 first? I just

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1 want to show there at the bottom.

2 THE WITNESS: Yes, I see.

3 Q. (BY MR. GARSSON) It says that Pfirsch has a closed cell
4 with square trenched gate with rounded corners and square
5 contact with rounded corners as shown in figure 2, 5, and 6 of
6 Pfirsch. Correct?

7 A. Yes.

8 Q. Okay. And that was a remark section that was admitted to
09:20 9 by -- okay. Then --

10 A. So the combination of Kobayashi and Pfirsch--I'm
11 sorry--and Hshieh there's rounded -- there's round sources in
12 the Kobayashi reference.

13 Q. Right. And it's that rounded -- the rounded center part
14 that you are saying comes from Kobayashi. Is that correct?

15 A. Yes.

16 Q. So that was not part of -- what you're saying, that is
17 not disclosed in 'Pfirsch '703. Correct?

09:21 18 A. Right.

19 Q. And it also isn't shown in Hshieh '914. Correct?

20 A. Correct.

21 Q. Okay. So you provided no opinion that Hshieh '914
09:21 22 discloses a circular trench contact. Isn't that correct?

23 A. That's correct.

24 Q. Okay. And you haven't opined that Hshieh '914 discloses
25 any limitation of claim 1 of the '409 Patent that isn't

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1 already disclosed in Pfirsch '703. Correct?

09:21 2 A. Could you repeat that question?

3 Q. You haven't opined that Hshieh '914 discloses any
4 limitation of claim 1 of the '409 Patent that isn't disclosed
5 in Pfirsch '703.

6 A. Yes, correct.

7 Q. Okay. And as I understand, it's your opinion that Hshieh
8 '914 is not cumulative to Hshieh '703 because Pfirsch '703
09:22 9 does not contain disclosures about a MOSFET structure that
10 contributes to device ruggedness. Is that correct?

11 A. That's one way of putting it. There's no explanation;
12 the roundness is just there. But it's -- there's no reason
13 and no motivation to combine with another reference because --
14 of a POSITA because they would not understand what the benefit
15 was.

16 Q. But in the file history of the '409 Patent, wasn't the
09:22 17 examiner combining Pfirsch '703 with all the other prior art
18 in the file that was disclosed before the Patent Office?

19 A. Yes, he considered that, yes.

20 Q. He was combining it so it was already being combined with
21 the art of record during prosecution, wasn't it?

22 A. Yes.

23 Q. Okay. And the word 'ruggedness', that's not a claim
24 limitation in claim 1 of the '409 Patent, is it?

25 A. There needs to be a motivation to combine, so that's the

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1 point I'm making.

09:23 2 Q. But the examiner was already combining Pfirsch '703.
3 Isn't that correct?

4 A. I guess you have to explain what you mean by 'he was
5 already combining'. Maybe you could give me some detail on
6 that.

7 Q. During the prosecution, the examiner was not having any
8 issue with taking the Pfirsch '703 and combining it with the
9 other prior art of record. Correct?

09:23 10 A. Well, you need to show me where is that stated that he
11 had no issue.

12 Q. Was the examiner combining Pfirsch '703 with the other
13 prior art of record?

14 A. I'm asking you to show me where --

15 THE COURT: Dr. Shanfield, you need to answer his
16 question as best you can, and if from what he's presented you
17 can't answer or you don't know, you need to say so.

18 THE WITNESS: Okay. I can't answer.

19 THE COURT: He's here to direct you; you're not here
20 to direct him.

21 THE WITNESS: Understood.

22 THE COURT: Go ahead, counsel.

09:24 23 MR. GARSSON: Okay. Mr. Collins, can you put up
24 Pfirsch '703, which is JX 29? And go to the abstract.

25 Q. (BY MR. GARSSON) Okay. Now, Dr. Shanfield, do you see

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09:24 1 that it says in the abstract that the goal of Pfirsch '703 is
2 preventing breakdown currents and latch-up effects?

3 A. Yes.

4 Q. Okay. You don't dispute that breakdown currents and
5 latch-up effects relate to device ruggedness?

6 A. No, I don't dispute that.

7 MR. GARSSON: Mr. Collins, can you please put up
8 figure 2 of JX 29, which is Pfirsch '703, and figure 8 of
9 JX 25, which is the Hshieh '914 side by side.

09:25 10 Q. (BY MR. GARSSON) So Dr. Shanfield, looking at these
11 figures there, your opinion is that the examiner would have
12 allowed the claims if Hshieh '914 was disclosed even though he
13 had already specifically considered Pfirsch '703 with its
14 figure 2 and its disclosure of square-shaped cells with
15 rounded corners. Correct?

16 A. Could you repeat that?

17 Q. Your opinion, Dr. Shanfield, is that the examiner would
09:25 18 not have allowed the claims if Hshieh '914 was disclosed, even
19 though he already had specifically considered Pfirsch '703
20 with its figure 2 and its disclosure of square-shaped cells
21 with rounded corners. Correct?

22 A. Yes.

23 Q. And your opinion is that Hshieh '914 is material when
24 combined with Kobayashi. Correct?

25 A. Yes.

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09:26 1 Q. But you're aware that Kobayashi was not of record during
2 prosecution of the '409 Patent. Correct?

3 A. Yes.

4 Q. So looking at Hshieh '914 with just that prior art of
5 record but not including Kobayashi, under that circumstance is
6 Hshieh '914 material?

7 A. Yes.

8 Q. And it's material because of the disclosure of
9 ruggedness?

09:26 10 A. It's material because a person of skill in the art would
11 understand from the explanation given about the benefit of the
12 rounded corners, that that was something they would want to
13 include in a conventional trench MOSFET. Kobayashi
14 represented the conventional trench MOSFET, so there is
15 motivation to combine, and that's the point that I'm making.

09:27 16 Q. Okay. Now, again, Kobayashi is not a patent of
17 Dr. Hshieh, is it?

18 A. No.

19 Q. Okay. And Kobayashi, which is related to the '643 [sic]
20 Patent, that was filed by an attorney in the '643 Patent.

09:28 21 Correct?

22 A. I think I need some more detail on that.

23 Q. Okay. Do you have any knowledge as to whether Dr. Hshieh
24 was aware of Kobayashi?

25 A. Yes.

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1 Q. And that is because of the prosecution of the '643

2 Patent. Correct?

3 A. Well, and other patents, too.

4 Q. Well, what other patents did you review that you saw
5 Kobayashi?

09:28 6 A. I'm aware that he cited Kobayashi at times, or
7 Kobayashi's been cited for him at times in other patents.

8 Q. Right. But from a timing point of view, do you know at
9 what point in time -- do you know, yes or no, or not -- was
10 Dr. -- did Dr. Hshieh or anyone involved in the patent
11 prosecution aware of the Kobayashi reference at the time --

12 A. Yes.

13 Q. -- the patent was filed --

14 A. Yes, I believe so.

15 Q. -- the '409 Patent was filed.

09:28 16 Okay. And the Kobayashi -- it was the '634 Patent, which
17 has to do with Kobayashi, that was filed two years after the
18 '409 Patent was filed. Correct?

19 A. Yes, that's right.

20 Q. But you have no knowledge of -- at all as to what
21 Dr. Hshieh was aware of with regard to Kobayashi. Correct?

09:29 22 A. No, I disagree.

23 Q. Okay. It's your opinion that the '914 -- Hshieh '914
24 becomes material to the '409 Patent when it's combined with
25 Kobayashi, even though Kobayashi was not prior art of record.

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1 Is that correct?

2 A. That's correct.

09:29 3 Q. Okay. Let's turn now to the '634 Patent--okay?--and
4 Hshieh '384.

5 Now, you've relied on Hshieh '384's P+ region 128 to
6 argue that it was material to the lateral contact layer of
7 claim 1 of the '634 Patent. Correct.

8 A. Yes.

9 Q. You also opine the same P+ region in Hshieh '384
10 satisfies the base contact limitation of claim 1 in the '634
11 Patent. Correct?

09:30 12 A. Would you mind bringing up the diagram?

13 MR. GARSSON: Can you please bring up -- it's in

09:30 14 JX --

15 Q. (BY MR. GARSSON) Which diagram do you want me to bring
16 up? Oh, the Hshieh '384?

17 A. Yes.

18 MR. GARSSON: That's JX 23. Can you please bring
09:31 19 up -- okay. That's -- apologies.

20 Q. (BY MR. GARSSON) If you turn to tab 23 in the notebook
21 that has JX 23, and I believe that you are pointing to in your
22 direct testimony -- was it figure 3 --

23 A. Yes.

24 Q. -- that you were pointing to?

25 A. That's right.

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1 Q. And do you see that in every single one of those the
2 references were cited by the examiner?

3 A. Yes. You're right.

09:47 4 Q. So in this patent of yours, there was no prior art that
5 was disclosed to the Patent Office by the applicant. Correct?

6 A. It would appear so, yes.

7 Q. Okay. But it wasn't your intent to deceive the Patent
8 Office during prosecution by not disclosing prior art, was it?

9 A. No.

09:47 10 Q. And Dr. Shanfield, have you had some of your patent
11 applications abandoned?

12 A. Yes.

13 Q. Okay. And when they're abandoned, have they ever been
14 abandoned for reasons other than the fact that the Patent
15 Office has rejected the claims?

16 A. Yes.

17 Q. Okay.

18 MR. GARSSON: Pass the witness, Your Honor.

19 THE COURT: All right. Is there redirect?

20 MR. LI: Thank you, Your Honor. We have a very
21 short redirect.

22 REDIRECT EXAMINATION

23 BY MR. LI:

09:48 24 Q. So let's talk about the '409 Patent first.

25 Do you recall when you discuss the shapes disclosed in

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1 the '914 Patent, they are square and parallelogram. Do you
2 remember that?

3 A. Yes.

4 Q. Would POSITA confuse those two shapes?

5 A. No.

6 Q. And remember we also talked about the reference discussed
09:48 7 in the '409 file history called Pfirsch Joint Exhibit No. 6.
8 And my question is, do you see anything in this reference --
9 in this Pfirsch reference teaching reason to combine based on
10 the advantage of the rounded corners?

11 A. No; none whatsoever.

12 Q. Okay. And does Pfirsch teach anything about the rounded
09:49 13 corners in terms of their relationship to the -- to a latch-up
14 or avalanche?

15 A. No, none.

16 Q. Okay. But Pfirsch did discuss something about latch-up.
17 Is that correct?

18 A. Yes.

19 Q. Okay. That's not relevant to the rounded corner
20 features, isn't it?

21 A. That's correct; it's not relevant.

22 Q. Okay. And do you see anything in the file history of the
23 '409 Patent where examiner find a motivation to combine the
24 rounded corner with admitted prior art?

09:49 25 A. No.

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1 Q. Okay. Now, let's look at the '634 Patent. You discussed
2 the concept of P* with Force MOS's counsel earlier. What does
3 -- what concept does P* convey here?

09:50 4 A. P* means that the doping level -- P doping level is at a
5 value that's in between the body value, which is lower value,
6 and the P+ value, which is the material underneath the source
7 contact.

8 Q. Is that concept disclosed by the undisclosed Hshieh
9 reference there?

10 A. Yes.

09:50 11 Q. Okay. And do you recall the shape of the sidewall of the
12 Hshieh reference we discussed for the '634 Patent, the shape?

13 A. Yes, I do.

14 Q. What is the shape?

15 A. It's conical shape, so it's like a cone.

16 Q. Okay. Do you recall Force MOS's expert Dr. Neikirk
17 provided some testimony regarding that shape during the jury
18 trial? Do you recall that?

19 A. Yes, I do.

20 Q. Can you briefly summarize what he said about that shape
21 during jury trial?

09:51 22 A. He explained that the sloped sidewalls will receive less
23 doping per unit volume than the doping level at the bottom of
24 the cone, conical shape trench, so he's essentially relaying
25 what Hshieh also discloses.

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09:53 1 inventor an over 30 U.S. patents directed towards MOSFETs.

2 THE COURT: Do you have the run time for this
3 deposition clip?

4 MR. DaMARIO: About five minutes, Your Honor.

5 THE COURT: Mr. Thane?

6 MR. THANE: Your Honor, I would note that there were
7 objections to certain testimony. I believe those were
8 submitted. I don't know if Your Honor wants to hear argument
9 on those or just to consider it when the Court's taking up the
10 evidence.

11 THE COURT: I'll take it into account when I
12 consider all the evidence.

13 Let's proceed with the deposition.

14 KAOWAY TU

15 BY VIDEO DEPOSITION

09:54 16 Q. And then the same question, if you can turn to the next
17 page of the '914 Patent, comparing 8A, 8B to figures 2 and 3
18 of the '409 Patent. Do these -- the sets of figures you're
19 looking at, 8A and 8B of the '914 Patent, they exhibit rounded
20 corners in much the same way as they're shown in figures --
21 figure 3 of the '409 Patent?

22 A. Yes.

09:54 23 Q. Okay. So you -- you would agree with me that the '914
24 Patent is showing rounded corners in figures 8A and B.
25 correct?

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1 A. Yes.

2 Q. And it doesn't have to be with respect to this patent,
3 Dr. Tu, but just in your experience in this industry for as
4 many years and in your patents and so forth, can you explain
5 for the record what the concept of avalanche is with trenched
6 MOSFETs?

09:55 7 A. The concept of avalanche in MOSFET is that it would turn
8 on the parasitic transistor under the condition when there is
09:55 9 a large current so that this device will burn.

10 Q. So you want -- the concept is to avoid this large
11 current. Is that correct?

12 A. To avoid the current from being over-concentrated.

13 Q. So can I turn your attention to figure 3 of the '384
14 application--I'm sorry--'384 publication.

15 Dr. Tu, do you see what's labeled as 145 on kind of the
09:56 16 upper right portion of the figure?

17 A. Yes.

18 Q. Is that the source body trench contact?

19 A. One moment.

20 Yes.

21 Q. Okay. All right. And so you would agree with me looking
22 at this figure that the P+ region covers the sidewalls and
23 bottom of the source body trench contact 145. Correct?

24 A. Yes.

25 Q. All right. Can I turn your attention to paragraph 28 of

09:56 1 the '384 application. Do you see, Dr. Tu, about five lines in
2 to paragraph 28 it says: "The P+ doped region is formed to
3 enhance avalanche current before triggering parasitic N+/PN
4 bipolar, i.e., the N+ source 130 with a P body and the N
5 epitaxial layer."

6 Do you see all that?

7 A. Yes.

8 Q. Okay. And I'm sorry. I should have done this first, but
09:56 9 right before it it says, "For contacting a P+ doped region 128
10 surrounding the source-body trenched contact."

11 Do you see that?

12 A. Yes.

13 Q. Okay. So what it's saying is that the P+ doped region
14 surrounding this trench contact would enhance avalanche
15 current. Correct?

16 A. Yes, that's what it means, based on what's written here.

17 Q. Okay. So just to be clear on that, the '384 application
18 is directed to avalanche improvement, and the '634 Patent is
09:57 19 also directed at avalanche improvement. Correct?

20 A. Yes.

21 Q. In figure 3 of the '384 publication, you see how the P+
22 region covers the sidewalls and bottom of the trench contact.
23 Correct?

24 A. Yes.

25 Q. And then if you look at figure 2G of the '634 Patent, do

1 you see how 208 and 209 cover the sidewalls and bottom of the
2 trench contact?

09:57 3 A. Yes, I see it.

4 Q. And in both of those figures from the '384 publication
5 and the figure 2G of the '634 Patent, what we just looked at
6 is directed to improving avalanche. Correct?

7 A. Yes.

8 Q. So you would agree with me, then, that the '384
9 publication, particularly figure 3 and the related discussion
09:58 10 about covering the sidewalls, would be relevant to what is
11 disclosed in figure 2G of the '634 Patent. Correct?

12 A. Yes.

13 Q. Let me ask you some other questions regarding the
14 patents-in-suit or the asserted patents. Okay?

15 Did you draft any of the asserted patents?

16 A. No.

17 Q. Are you an inventor on any of the asserted patents?

09:58 18 A. No.

19 THE COURT: Does that complete this witness by
20 deposition?

21 MR. DaMARIO: It does, Your Honor.

22 THE COURT: Call your next witness, please.

23 MR. DaMARIO: Thank you, Your Honor.

24 At this time ASUSTeK would like to move for admission of
25 various exhibits and other items into the record.

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1 DEAN NIEKIRK, PH.D.,

2 testified on direct examination by Mr. Garrison as follows:

10:03 3 Q. Good morning, Dr. Neikirk. Can you remind the Court of
4 your role in this case?

5 A. I was qualified as an expert and I testified at the jury
6 trial in this case.

7 Q. Okay. And what are you here to testify about today?

8 A. I'm here today to discuss two Hshieh references and their
9 materiality in this case.

10 Q. Okay. And were you here in the courtroom during the
11 hearing today to hear Dr. Shanfield's opinion?

12 A. I was.

13 Q. Okay. In preparing for your opinions for this trial,
14 what did you review?

10:04 15 A. I reviewed my own report, specifically my invalidity
16 reports and the documents that I cited within that. I
17 reviewed the two patents at issue, the '409 and the '634,
18 their file histories, as pointed out in my previously filed
19 reports, various interrogatory responses and so on.

20 Q. And what standard did you apply in determining whether a
21 reference is material?

10:04 22 A. I applied the 'but-for' standard, which my understanding
23 is 'but-for' is a standard that relates to the situation where
24 a reference would have caused an examiner to declare a given
25 claim invalid.

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1 with your opinions regarding infringement?

2 A. Yes, they are.

3 Q. Can you please explain?

4 A. In my infringement analysis, I wasn't just looking at a
5 figure; I had actual products. I had specifications for those
6 products that gave a variety of specific numbers for them;

10:15 7 threshold voltages just as an example. I had cross-sectional
8 SEMs that have been injunctions. So I had a great deal of
9 evidence that I could consider in order to try to determine
10 that the sidewalls were less doped--that was easy--but that,
11 in fact, they satisfied the P* requirement that they were not
12 P+.

10:15 13 Q. Okay. Now, let's turn to the '409 Patent and the Hshieh
14 '914.

15 What is your opinion with -- as to whether Hshieh '914
16 was material to the '409 Patent?

17 A. In my opinion, it is not.

18 Q. Okay. So you disagree with Dr. Shanfield?

19 A. I do.

20 Q. Okay. What led you to that conclusion?

21 A. Well, in looking at the 914, the only thing that seems to
22 be pointed to is a disclosure of rounded corners. The '914
10:15 23 clearly teaches away from using squares. It teaches to use
24 non-orthogonal parallelograms. But the only corners that are
25 rounded are shown in that figure. It doesn't show a rounded

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1 center contact. There was art before the examiner that more
2 clearly showed a square-shaped cell with rounded corners.

3 Q. Okay.

4 MR. GARSSON: Mr. Collins, can you please bring up
5 JX 6, the prosecution history of the '409 Patent, and turn to
6 pages 90 and 91?

10:16 7 Q. (BY MR. GARSSON) Okay. Dr. Neikirk, how did the
8 prosecution history of the '409 Patent inform your analysis?

9 A. This is the discussion of the Pfirsch reference, and it
10 clearly shows in this case an actual square-shaped cell with
11 rounded corners. So the examiner had prior art in front of
12 them that showed exactly this feature. It was clearly
13 discussed.

14 MR. GARSSON: Okay. Now Mr. Collins, could you
10:16 15 please turn to page 79 of JX 6?

16 Q. (BY MR. GARSSON) Dr. Neikirk, during prosecution was
17 there a dispute about Pfirsch '703 discloses rounding corners?

18 A. No, there was not. The inventor admitted that it did.

19 Q. Okay.

20 MR. GARSSON: Mr. Collins, can you please put up
21 side by side figure 2 of JX 29, which is the Pfirsch '703, and
22 put that side by side to figure 8 of JX 25, which is Hshieh
23 '914.

10:17 24 Q. (BY MR. GARSSON) Now, Dr. Neikirk, what is your opinion
25 as to whether Hshieh '914 or Pfirsch '703 is more relevant to

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1 the patentability of the '409 Patent?

2 A. Well, the Pfirsch reference is clearly more relevant. It
3 actually shows a square-shaped cell with rounded corners. I
4 believe figure 8A is described as being a non-orthogonal
5 parallelogram, so my understanding is figure 8A is not a
6 square at all. But regardless, Pfirsch on the left, which the
10:17 7 examiner had, is square-shaped with rounded corners, and it
8 was agreed that it was.

9 Q. Okay.

10 MR. GARSSON: Mr. Collins, can you put up Hshieh
11 '914, JX 25, at Column 2, line 6, through Column 3, line 5?

12 Q. (BY MR. GARSSON) Okay. Dr. Neikirk, does this inform
13 your analysis regarding materiality of Hshieh '914?

10:18 14 A. It does. This section points out -- let's see. In this
15 particular section I don't believe it actually -- well, it
16 does mention square cells, but it points out that those are
17 commonly used. But the whole point of this patent is to not
18 use square cells; use non-orthogonal parallelograms. And
19 there's several things that are mentioned there. It mentions
20 packing density is increased. So it teaches away from using
10:19 21 square cells, although I would agree it mentions square cells.

22 Q. What is your opinion of Dr. Shanfield's comparison of
23 Hshieh '914 to Pfirsch '703 and His analysis?

24 A. I don't believe that the Pfirsch '914 [sic] is material.

25 Q. And why is that?

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1 A. It's just -- it's simply cumulative of the Pfirsch
2 reference, for instance.

10:19 3 MR. GARSSON: Mr. Collins, can you put up JX 29,
4 which is the Pfirsch '703 at paragraph 3?

5 Q. (BY MR. GARSSON) Now, Dr. Neikirk, how does this inform
6 your opinion as to cumulativeness?

7 A. Well, in this paragraph -- let's see. This is from
8 Pfirsch. Correct? I'm sorry. Yes. So it specifically
9 points out that cell corners typically form areas of
10 particularly high electrical field strength and that that can
10:19 11 result in breakdown currents and that the device may not have
12 adequate long-term stability. So he's pointing out that the
13 corners matter right there. The rest of the teaching of this
14 -- of Pfirsch is round the corners. So reliability was
15 clearly discussed in Pfirsch.

16 Q. Okay.

17 MR. GARSSON: Mr. Collins, can you please go back to
18 JX 6, the prosecution history of the '409 Patent, and go back
19 to pages 90 and 91?

20 Q. (BY MR. GARSSON) During prosecution, what, if anything,
10:20 21 did ruggedness have to do with why the '409 Patent was allowed
22 over Pfirsch '703?

23 A. I don't believe that the prosecution history mentioned
24 ruggedness with respect to this allowance. It instead
25 discussed the shape of the source contact, which is required

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1 to be round in the '409 Patent, and the examiner agreed that
2 it's not round in Pfirsch.

10:20 3 Q. Okay. What is your opinion as to whether -- were you
4 here with regard to Dr. Shanfield's testimony with regard to
5 Kobayashi earlier this morning?

6 A. I was.

7 Q. Okay. What is your opinion as to whether the Kobayashi
8 reference disclosed square-shaped cells with rounded corners?

9 A. I don't believe it does.

10 Q. Okay. And what is your opinion as to whether a person of
11 ordinary skill in the art would have found it obvious to
12 combine Kobayashi with Hshieh '914 to arrive at the claimed
13 invention of the '409 Patent?

14 A. I don't believe one of ordinary skill would, given that
10:21 15 Hshieh '914 -- that Hshieh reference teaches away from using
16 squares and Kobayashi is only disclosing squares. I don't
17 think that the two would ever be combined by one of ordinary
18 skill.

19 Q. Okay. Dr. Neikirk, can you summarize your conclusions
20 regarding materiality?

21 A. It is my opinion that the two Hshieh references that have
22 been discussed are not material to the '409 or the '634. They
23 have not shown that any claims of those two patents would have
10:21 24 been disallowed had the examiner had the other two Hshieh
25 references.

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1 MR. GARSSON: I pass the witness, Your Honor.

2 THE COURT: All right. Cross examination by the
3 Defendant, please.

4 Proceed when you're ready, Mr. McMahon.

5 MR. McMAHON: Thank you, Your Honor. Charles
6 McMahon for Defendant ASUSTeK.

7 CROSS EXAMINATION

10:22 8 BY MR. McMAHON:

9 Q. Good morning, Dr. Neikirk.

10 A. Good morning.

11 Q. Both of the patents direct -- in this case are directed
12 to MOSFETs. Right?

13 A. They are.

14 Q. And we've talked about this before, but prior to this
15 case you've never done any work on trench MOSFETs. Correct?

16 A. On trench MOSFETs I have not.

17 Q. In your academic career you've never done any work on
18 trench MOSFETs.

19 A. That is correct. I'm trying to remember whether we did
20 any -- I don't think we ever did anything with a trench gate
10:22 21 and a trench source, no.

22 Q. And you've never designed or built the trench MOSFET.
23 Correct?

24 A. I have not.

25 Q. I want to go back to another topic we talked about

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1 ions?

2 A. Boron or BF₂, yes.

3 Q. Thank you.

10:35 4 And figure 9G shows that boron ion implantation covering
5 both the bottom and the sidewalls of the source contact
6 trench. Right.

7 A. Yes; resulting in a P⁺ doping.

8 Q. Okay. So it's your opinion that even though the
9 sidewalls are sloped and, therefore, receiving less ion
10 implantation, they are still P⁺?

10:35 11 A. Well, that's what this reference teaches is you continue
12 to do the implant until it is.

13 Q. So would you agree with me that using that ion
14 implantation on the bottom of the trench and on the sidewalls,
15 that the sidewalls will result in a lower doping
16 concentration?

17 A. It certainly would be lower on the side than it would be
18 on the bottom.

19 Q. Thank you.

20 MR. McMAHON: Let's turn to the '409 Patent, please.

21 Q. (BY MR. McMAHON) Dr. Neikirk, you disagree with
10:36 22 Dr. Shanfield's conclusion that Hsieh '914 is material to
23 the patentability of the '409 Patent. Correct?

24 A. I do.

25 Q. In particular, you disagree that a person of ordinary

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1 skill in the art would have been motivated to combine Hshieh
2 '914 with other art like Kobayashi '196. Is that right?

3 A. Well, I certainly do disagree with that, yes.

4 Q. Okay. And to be clear, we discussed this at the jury
10:36 5 trial. You agree that Kobayashi '196 discloses every feature
6 of '409 Patent, claim 1, except for substantially
7 square-shaped cell with rounded corners. Is that right?

8 A. And I don't recall whether we discussed the shape of the
9 source contact, but certainly I agree that it disclosed -- it
10 did not -- it did not disclose square-shaped with rounded
10:37 11 corners. I don't recall whether we talked about the shape of
12 the center contact.

13 Q. And do you recall whether in your report you disputed
14 that Kobayashi '196 discloses a round source contact shape?

15 A. I don't recall. It wouldn't surprise me if I focused on
16 the lack of the rounded corners to the square-shaped cell.

17 Q. And are you aware that Kobayashi '196 does disclose round
18 source contact shape?

19 A. I think only for a hexagonal cell.

10:37 20 Q. Put a pin in that.

21 Let's look at the '409 Patent.

22 MR. McMAHON: Mr. Bupp, would you please bring up
23 figure 1 of the '409 patent alongside the text from Column 1,
24 lines 4 to 13?

25 Q. (BY MR. McMAHON) Dr. Neikirk, in figure 1, Dr. Hshieh

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1 told the Patent Office that prior art trenched MOSFETs had
2 square corners. Right?

3 A. He did.

4 Q. And in Column 1, Dr. Hshieh explained that his novel
10:38 5 and improved cell structure provided improved ruggedness with
6 truncated corners. Right?

7 A. Yes.

8 MR. McMAHON: Mr. Bupp, would you please bring up
9 the '409 Patent text at column 1, lines 48 to 53, and let's
10 keep figure 1 on the right.

11 Q. (BY MR. McMAHON) Here, Dr. Neikirk we see that
12 Dr. Hshieh told the Patent Office that prior art trenched
13 MOSFETs had weak points at the four corners that result in
14 reduced device redactions due to the parasitic N+/PN latch-up.
15 Right?

10:38 16 A. Yes. It is important to continue with the rest of the
17 sentence, though. The rest of the physics is in the last
18 clause.

19 Q. And that .7 volts is because we're dealing with silicon.
20 Right?

21 A. Yes.

22 Q. Okay. Dr. Hshieh prior to the '409 Patent had already
23 disclosed trenched MOSFET cells with round corners. Correct?

10:39 24 A. So -- I'm sorry. Could you repeat the question?

25 Q. Sure. Prior to the '409 Patent, Dr. Hshieh had already

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1 disclosed trenching MOSFET cells with rounded corners. Right?

2 A. I don't remember the dates, honestly, so the -- the -- I
3 don't recall what reference that you're speaking of.

10:39 4 Q. Okay. I'm talking about Hsieh '914. But do you agree,
5 Dr. Neikirk, that Hsieh '914 predates the '409 Patent?

6 A. That I believe it does.

7 Q. And do you agree that Hsieh '914 disclosed trenching
8 MOSFET cells with rounded corners?

9 A. It disclosed a certain shape of cell with rounded
10 corners, yes.

11 Q. Okay. Before we get to Hsieh '914, I have a question
12 about the prosecution history.

10:40 13 The examiner initially rejected the '409 Patent claims
14 based, in part, on the first reference. Right?

15 A. I believe that's correct, yes.

16 Q. You discussed that earlier.

17 A. I did.

18 Q. And you've reviewed Pfirsch. Right?

19 A. Yes, I have.

20 Q. Would you agree that Pfirsch does not describe the
21 benefits of rounded corners?

22 A. No, I don't think I'd agree with that.

23 Q. Would you agree that Pfirsch in its text never mentions
10:40 24 rounded corners?

25 A. I don't recall that -- it references its figures which

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1 have rounded corners. It may not have said -- and it also
2 elucidates what the advantages are reading the entirety of the
3 specification and their associated figures. I think one of
4 ordinary skill would understand that it was indicating those
5 rounded corners had an impact on redactions.

10:41 6 THE COURT: The question was from the text.

7 THE WITNESS: From the text alone I don't recall. I
8 wouldn't dispute that it may not say the words 'rounded
9 corners' in the text.

10 Q. (BY MR. McMAHON) Okay. So I just want to be clear with
11 that question and answer. You agree that Pfirsch -- the text
12 of Pfirsch does not mention rounded corners.

13 A. Could I -- I wouldn't dispute it may not use the word
14 'rounded corners'. I'm not sure that there's no discussion
10:42 15 that isn't associated with that.

16 Q. Fair enough.

17 You would agree that Pfirsch does not provide any
18 motivation to combine rounded corners with, for example,
19 Kobayashi '196.

20 A. Well, I don't know why you would -- so Pfirsch Hardy
10:42 21 shows square with rounded corners. I don't know what aspect
22 of Kobayashi, the combination, would be attempting to
23 accomplish.

24 Q. Well, let me ask it broadly. Would you agree that
25 Pfirsch does not provide any motivation to combine rounded

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1 corners with any aspect of Kobayashi '196?

2 A. Again, I don't recall why you would do the combination.

10:42 3 You have to be -- you would do it for some reason. Kobayashi
4 did not have rounded corners, and I don't -- well, actually I
5 think that Pfirsch's overall teaching that rounded corners
6 have been benefit might have motivated that combination. I
7 don't know. I haven't thought about that combination.

8 Q. To the extent the Pfirsch mentions rounded corners in the
9 text at all. Right?

10:43 10 A. To the extent that that concept is discussed. But again,
11 I don't dispute that he may not use the word 'rounded
12 corners'.

13 Q. Okay. We can move on.

14 MR. McMAHON: Mr. Bupp, can you please bring up
15 JX 25, the Hshieh '914 reference, at Column 2, lines 24 to 34?

16 Q. (BY MR. McMAHON) Dr. Neikirk, Hshieh '914 specifically
17 addresses the problem of weak points in the corners of square
18 cells. Right?

19 A. Yeah. Actually it's even more specific than that. It
20 talks about three-dimensional diffusion effects, which are
10:43 21 movements of dopants.

22 Q. That result in weak points at the corners. Correct?

23 A. Only for certain kinds of dopant processes.

24 Q. Well, they certainly resulted in weak points as far as
25 Hshieh was concerned -- Dr. Hshieh was concerned in the '914

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1 reference. Right?

2 A. I believe there's a little bit more context to this. I
3 don't know whether this is -- there's a reference to another
4 article. I don't recall whether it's in this paragraph.

5 Q. Let me just read this part from Hshieh '914. And let me
10:44 6 know if I've read it correctly. "The three-dimensional
7 diffusion effect which often leads to vulnerable punch-through
8 weak points in the corners of a square cell is circumvented by
9 blunting the sharp corners in the square cells."

10 Dr. Neikirk, did I read that correctly.

11 A. You did.

12 Q. Okay. And Hshieh '914, as we just read, suggests
13 addressing that problem of the weak points by blunting the
14 sharp corners. Right?

10:44 15 A. Well, it -- Hshieh is talking about, in terms of the
16 redactions, certain issues recalled to latch-up, I believe. I
17 don't know that Hshieh talks about three-dimensional
18 diffusion.

19 THE COURT: I doubt that it helps for you to argue
20 with him, Dr. Neikirk.

21 THE WITNESS: Sorry, Your Honor.

22 THE COURT: A lot of your testimony seems to be you
23 want to argue with what counsel's asking you. Try to respond
10:45 24 to the questions asked, understanding that Mr. Garsson's going
25 to get to clean up anything he thinks he needs to clean up

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1 okay.

2 THE WITNESS: Yes, Your Honor; apologies.

3 THE COURT: Let's go forward, counsel.

4 MR. McMAHON: Thank you, Your Honor.

5 Mr. Bupp, please bring up figure 6A and 6B of Hshieh '914
6 together with the text from column5, lines 3 to 9.

7 Q. (BY MR. McMAHON) Dr. Neikirk, here we see Dr. Hshieh in
8 Hshieh '914 showed rounding sharp corners to prevent the
9 corner vulnerably earn and weak points in the corners. Right?

10 A. Yes.

11 MR. McMAHON: Mr. Bupp, please bring up figures 8A
10:45 12 and 8B from the Hshieh '914, along with the text from Column
13 5, lines 23 to 25.

14 Q. (BY MR. McMAHON) Dr. Neikirk, in figures 8A and 8B,
15 Hshieh '914 showed rounding all four corners of each cell.
16 Right?

17 A. Yes.

18 Q. Now, you've emphasized the discussion in Hshieh '914 of
19 the three-dimensional diffusion effect. Right?

20 A. Oh, yes. I'm sorry. Yes.

10:46 21 Q. And you contend that the corner rounding in Hshieh '914
22 is not applicable to trenched MOSFETs because trenched MOSFETs
23 have vertical channels. Am I right?

24 A. Well, the -- I'm sorry. Could you repeat the question?

25 Q. Sure. And maybe I misunderstood you.

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1 But the question is, you have -- you contend that the
2 corner rounding in Hshieh '914 is not applicable to trenched
10:46 3 MOSFETs because trenched MOSFETs have vertical channels. Is
4 that right.
5 A. I don't think I said that.
6 Q. Okay. I may have misunderstood.
7 Would you agree that Hshieh '914 disclosed trenched
8 MOSFETs with vertical channels?
9 A. Absolutely.
10 Q. Okay. Thank you.
11 All trenched MOSFETs have vertical channels. Right?
12 A. That's the definition of a trenched MOSFET, yes.
10:47 13 MR. McMAHON: Mr. Bupp, hold please.
14 THE COURT: Where are we, Mr. McMahon?
15 MR. McMAHON: I'm trying to figure out how much we
16 get to short circuit through my outline because of the answer.
17 THE COURT: Take the time you need.
18 MR. McMAHON: Thank you.
10:47 19 Q. (BY MR. McMAHON) Dr. Neikirk, I'd like to move on to
20 another topic.
21 You are also an inventor. Right?
22 A. I am.
23 Q. And you filed at least 24 patent applications, if I'm
24 right?
25 A. I have been a co-inventor on -- well, 24? I don't

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1 wished to make, so with regard to what's shown in -- excuse
10:50 2 me. Can you please characterize what this paragraph on the
3 left is saying about the figure 1?

4 A. Well, I think that figure 1 -- I mean, the text is a word
5 description of what is illustrated by figure 1 to represent an
6 example of prior art. Technically everything it says there is
10:51 7 correct. I think that's all it shows.

8 Q. Okay. And just to be clear, do you see any -- in the
9 passages that are highlighted, is there anything inaccurate
10 with regard to what they say with respect to figure 1?

11 A. No. I think that that is an accurate description of
12 figure 1.

13 Q. Okay.

14 MR. McMAHON: Then, Mr. Collins, can you also please
10:51 15 put up Column 1 of JX 3 in the '409 Patent and also the
16 paragraph on lines 40 through 57 describing this figure 1D?

17 Q. (BY MR. GARSSON) Okay. Do you see that paragraph there?

18 A. I do.

19 Q. Does that accurately describe what is -- or is in figure
20 1D?

10:52 21 A. Yes. The technical points that are being made in that
22 text I believe are an accurate description of what is shown in
23 figure 1D, which is indicated in figure 1D as being prior art.

24 Q. Okay. And there were other figures 1A through 1C that
25 also were described in the body of the '409 Patent. Correct?

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1 A. Yes.

2 Q. And do you believe that the statements made in those
3 paragraphs were accurately describing what was in figures 1A
4 through 1D?

5 A. Yes, I believe they were.

10:53 6 Q. Now, during the -- we'll go back to the '634.

7 During the discussion of it, ASUS's counsel asked you to
8 make some assumptions with regard to the understanding of what
9 the broadest reasonable interpretation is. Correct?

10 A. I recall that.

11 Q. Okay. Do you agree with what ASUS's counsel was having
12 you assume the broadest reasonable interpretation?

13 A. No, I do not.

14 Q. Can you explain why?

10:53 15 A. Well, in the '634 Patent, it repeatedly refers to that
16 lateral contact region as being P*. It further tells you one
17 of the reasons why that P* shouldn't -- should not, be cannot
18 be P+, and that's to prevent the threshold voltage from
19 increasing. That is a problem that I've seen in other pieces
10:53 20 of art where it discusses how the extra doping, if it's not,
21 for instance, far enough away, will cause a problem by using
22 P*, the '634 clearly says you avoid that problem. That's the
23 case when P* is not P+.

24 Q. Okay. Now, there also was some discussions, were there
10:54 25 not, with regard to Mr. -- ASUS's counsel had with regard to

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1 the description that was in the Hshieh '914 Patent. Do you
2 recall -- excuse me. The Pfirsch '703.

3 A. I do.

4 Q. Okay. And with regard to that and -- that is behind on
10:54 5 tab 29--excuse me--JX 29 in your notebook. And if you recall,
6 there were some discussions with regard to the discussion of
7 whether or not rounded corners was discussed in Pfirsch '703.
8 Correct?

9 A. I do recall that discussion.

10 Q. Okay. Can you please explain what you would understand
11 that a person of ordinary skill having read the '703 --
12 Pfirsch '703 would understand about the corners that were
10:55 13 shown in figure 2 of the Pfirsch '703?

14 A. Well, in, for instance, paragraph 55 on page 5, it begins
15 the discussion of preferred embodiments, and at that point it
16 specifically references figure 2. I think one of ordinary
17 skill looking at figure 2 will immediately recognize that that
18 is essentially square, but it has rounded corners regardless
10:55 19 of whether the words 'rounded corners' are used in the text.
20 It says -- the text says "the transistor cell 12 in figure 2
21 is formed in a square shape which is surrounded by closed
22 trench." And the overall closed trench it labels as being 2.
23 The figure it points to has very clearly rounded corners.

24 Q. Okay. Is there any reason to believe that the examiner
10:56 25 did not understand that figure 2 had rounded corners?

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1 A. No. I believe the examiner actually copied this figure
2 in and then the discussion was related to that exact topic.

3 Q. And was there any issue with regard to the examiner
4 combining the substantially -- the figure 2 characteristics
5 with the other prior art of record in the '409 Patent?

10:56 6 A. I don't believe so, because the examiner cited this. In
7 the end, the examiner allowed the claims based on the shape of
8 the central source contact and agreeing that the prior art
9 didn't have that, so I think he was looking at all the art
10 before him.

11 MR. GARSSON: Pass the witness, Your Honor.

12 THE COURT: All right. Anything further from your
13 side, Mr. McMahon?

14 MR. McMAHON: No, Your Honor.

15 THE COURT: Then you may step down, Dr. Neikirk.

16 THE WITNESS: Thank you, Your Honor.

10:57 17 THE COURT: You're welcome.

18 Plaintiff, call your next witness.

19 MR. GARSSON: We rest, Your Honor.

20 THE COURT: All right. Both sides having rested,
21 we'll turn to closing argument.

22 And let me hear first from the Defendants.

10:57 23 MR. McMAHON: Your Honor, before I forget --

24 THE COURT: What is it, Mr. McMahon?

25 MR. McMAHON: I just want to request the Court's

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1 permission that Dr. Shanfield be released as a witness.

2 THE COURT: Without objection, Dr. Shanfield's
3 released. So is Dr. Neikirk.

4 Let's hear closing arguments.

5 MR. McMAHON: Thank you, Your Honor. May it please
10:58 6 the Court.

7 We began the jury trial a few weeks ago with testimony
8 from Mr. Rafael Chung talking about this conference room that
9 we see here in this photo and Force MOS's emphasis on the
10 number of U.S. patents that they had. We see them lining the
11 walls here. Mr. Chung said that this provided a point of
12 pride for Force MOS and a distinguishing feature compared to
13 its competitors. It also provided a motive for Force MOS to
14 get as many patents as it could.

10:59 15 We heard earlier about the statistics to which the
16 parties have stipulated in this case. In opening we went
17 through these numbers. Dr. Hshieh, while at Force MOS, had 27
18 abandoned U.S. applications, 23 of them rejected over his own
19 prior art. In 21 of those cases, it was on his own
20 undisclosed prior art. That's more than 85 percent. They'd
10:59 21 been issued 83 patents to Dr. Hshieh at Force MOS. Only three
22 of those has Dr. Hshieh filed an IDS citing his own prior art.
23 That's less than four percent.

24 Patterns matter. Here is a quote from the *Luv 'N' Care*
25 case--we cited this in our trial brief--in which the Federal

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1 Circuit acknowledged that when you may have individual events
2 that on their own are per se not unreasonable, but when
3 considered together they can represent repeated attempts to
10:59 4 avoid playing fair and square collectively, support a finding
5 of deceptive intent. The Court referred to serial misconduct
6 in considering the collective whole. That is what we urge the
7 Court to do here.

8 I want to talk briefly about a few standards of
9 materiality. The Federal Circuit also explained in *Therasense*
10 that in looking at inequitable conduct, the court should apply
11 the standards that the Patent Office would apply during
12 examination. That is broadest reasonable interpretation of
13 the claims and a preponderance of the evidence on the
14 patentability question.

11:00 15 I also want to point out that, as the Court well knows,
16 the jury several weeks ago found that we had not proven by
17 clear and convincing evidence that claim 1 of the '409 Patent
18 was invalid, but as the Federal Circuit explained in *American*
19 *Calcar*, that does not bear on or preclude the court from
20 finding inequitable conduct here based on materiality of that
21 same prior art, precisely because of the different standards
22 the Court must apply in applying -- in looking to inequitable
23 conduct.

11:00 24 And finally, the default standard for materiality is
25 'but-for'--we've heard that discussed here--but not always.

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1 In cases of egregious misconduct before the Patent Office,
2 including but not limited to the submission of false
3 affidavits, there can be a lower standard of materiality that
4 does not require 'but-for'.

5 THE COURT: There's no evidence of false affidavits
6 here, is there?

7 MR. McMAHON: Not affidavits, no; that's correct,
8 Your Honor.

9 THE COURT: I didn't mean to interrupt. Go ahead
10 with your closing.

11 MR. McMAHON: No problem. Thank you, Your Honor.

12 And then, finally, I'd like to point to this section of
11:01 13 the MPEP. There's been much discussion of citing prior art in
14 the background. According to Patent Office standards, that's
15 not the way things are supposed to work. The MPEP says when
16 you disclose prior art, you should put it in an IDS, and the
17 listing of references in the specification is not a proper
18 information disclosure statement. That's MPEP section 609,
19 paragraph 6.49.06, eighth edition.

20 THE COURT: Please slow down just a little bit.

21 MR. McMAHON: Will do, Your Honor.

22 So turning to the inequitable conduct for the '634
11:01 23 Patent. Dr. Hshieh concealed his own material Hshieh '384
24 reference, and he egregiously mischaracterized the prior art
25 in the background section of the '634 Patent. I'd like to

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11:05 1 examiner called the lateral contact layer, Kobayashi '196, the
2 P+ region at the bottom of the source contact trench, the
3 examiner said it covers only a portion of the trench sidewall
4 within the lateral contact layer and, therefore, allowed the
5 claims of the '634 Patent.

6 Hshieh '384, as we see here in figure 9G, the sidewalls
7 -- the -- that P+ area covers the entire sidewalls within the
11:05 8 body region of the MOSFET. So for that reason, Hshieh '384
9 would have overcome the examiner's reasons for allowing the
10 claims of the '634 Patent.

11 Now, turning to the '409 Patent, again, Dr. Hshieh
12 concealed his own material '914 reference, and he egregiously
13 mischaracterized, again, the content of the prior art in the
14 background section of the patent.

15 Focusing on the background section, Dr. Hshieh described
16 figure 1A as the prior art in the background of the '409
11:06 17 Patent, and he said prior art cells had square corners.

18 Second, in the field of the invention section, the very
19 first paragraph of the text of the patent, Dr. Neikirk --
20 Dr. Hshieh said that he was providing a novel and improved
21 cell structure with improved ruggedness with truncated
22 corners. That is how Dr. Hshieh characterized the prior art
23 in the background of the '409 Patent. Both of those
24 statements were false, as shown by his own undisclosed Hshieh
11:06 25 '914 reference.

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1 Hshieh '914 provided this material disclosure. It
2 disclosed cells with rounded corners. That's undisputed at
3 this point. And we see that in figures 8A and 8B, as well as
4 in Hshieh '914 at Column 5, lines 23 to 25.

5 Hshieh '914 also disclosed blunting or rounding corners
6 to improve ruggedness at the weak points of the corners in
7 square cells and parallelogram cells. I want to pause on that
11:07 8 for just a minute because there's been much emphasis on the
9 parallelograms in Hshieh '914, but if you look at Column 2,
10 lines 24 to 27, Hshieh '914 also addressed the weak points in
11 the corners of a square cell being circumvented by blunting
12 the sharp corners in the square cells. So Hshieh '914's
13 teachings were not limited to rounding the corners of
14 parallelograms; he also addressed square cells.

11:07 15 Now, unlike the cited Pfirsch reference, Hshieh '914
16 provided reasons for rounding the corners of the cell. You
17 heard Dr. Neikirk testify about Pfirsch, and he says it shows
18 rounded corners, but he couldn't point to anything in the text
19 of Pfirsch that described rounded corners at all, much less
20 their benefits. And I urge the Court to look at the reference
21 itself to see if there's any mention of rounded corners. I
22 submit that there is not.

11:08 23 Force MOS's chief technology officer testified--we heard
24 his testimony earlier today by video--and he agrees on the
25 materiality and relevance of these references. He said Hshieh

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1 '384 and the '634 Patent are both directed to avalanche
2 improvement by increasing the doping concentration along the
3 sidewalls of the source contact trench.

4 He also said that like the '409 Patent, Hshieh '914
5 previously disclosed rounding the corners of the cells.

11:08 6 That's Dr. Kaoway Tu, Force MOS's chief technology officer.

7 The prosecuting attorney for the '409 Patent also agreed.
8 In 2022 Force MOS sued Dr. Bo-In Lin for malpractice when he
9 failed to pay the maintenance fees on the '409 Patent. In his
10 answer to Force MOS's complaint, Dr. Lin alleged that the '409
11 Patent is invalid based on two references--Kobayashi '196
12 alone or in combination with Hshieh '914. We provide
13 citations here to the Lin deposition transcript--that will
11:09 14 come in separately by paper--as well as citations to DX 36 and
15 DX 37. Those are the malpractice complaint and Dr. Lin's
16 answer to that complaint.

17 I'd like to go through a timeline here just to provide
18 framework and context for the timing of disclosures here.

19 The earliest date that's relevance here is the issuance
20 of Hshieh '914. That was on June 9th, 1998. Hshieh '384 was
11:09 21 published on December 7th, 2006. Dr. Hshieh applied for the
22 '634 Patent in February of 2008. And he cited -- he filed an
23 IDS. This was a rare IDS filing for Dr. Hshieh among his 110
24 patent applications for Force MOS. He did file an IDS and he
25 cited the Kobayashi '196 reference in connection with the '634

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1 Patent. He did not cite his own Hshieh '384; not in an IDS,
11:10 2 did not describe it in the background section of the '634
3 Patent.

4 Dr. Hshieh discussed Kobayashi '196 in an examiner
5 interview for the '634 Patent in July 15th, 2009. That's for
6 the '634 Patent, not for the '409. I'll come back to that in
7 a moment.

8 The '634 Patent issued in December of 2009 with
9 Dr. Hshieh never having disclosed Hshieh '384 during
10 prosecution.

11 Now, if we go back in time a little bit, we see Kobayashi
11:10 12 '196 issued in May of 2005. And that's relevant because
13 Dr. Hshieh applied for the '409 Patent and filed no IDS in
14 December 2006; no IDS filed at any time during prosecution of
15 that patent.

16 That patent issued -- the '409 Patent issued in October
17 of 2010. Dr. Hshieh never disclosed Hshieh '914, not in an
18 IDS, not in the background section. Notably, he also did not
11:11 19 disclose Kobayashi '196. He did cite that in an IDS for the
20 '634 Patent, as we see here, in May of 2008. He did not cite
21 Kobayashi '196 or describe it in any way in connection with
22 the '409 Patent. That's the timeline as we have it and the
23 relevant facts that we think support inequitable conduct.

24 With that, Your Honor, I would reserve the rest of my
25 time for rebuttal.

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1 THE COURT: All right. Let me hear closing from the
2 Plaintiff, please.

11:12 3 MR. GARSSON: Your Honor, a few hours ago in my
4 opening statement I told you that ASUS will not and cannot
5 meet the demanding standard of proof by clear and convincing
6 evidence for both materiality and intent as required by
7 *Therasense*. I also said you will hear no direct evidence and
8 no direct -- no documented evidence and no witness testimony
9 that Dr. Hshieh knew Hshieh '384 and '914 were material or
11:12 10 that Dr. Hshieh deliberately withheld these with specific
11 intent to mislead the examiner. And that's exactly what
12 happened.

13 Addressing intent first, what did the evidence show?
14 Dr. Bo-In Lin the prosecuting attorney for the '409 Patent by
15 deposition testified that he requested prior art at the first
16 time he communicates with the inventors. On page 47, lines 8
17 through 11 of his deposition, he was asked, "What do you do if
18 an inventor does not send you prior art?"

11:12 19 Dr. Lin responded on line 17 through 22, "I need the
20 prior art to write the application, so I would request it
21 again."

22 Dr. Lin described the patent searches he performs and
23 the fact he reminds the inventor of his duty of candor. When
24 asked what he would do if an inventor didn't give him the
25 prior art, on page 60, line 22, he said, "That didn't happen

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1 to me."

2 Then he was asked specifically about Dr. Hshieh on page
11:13 3 66, from lines 15 through 22: "So how did Dr. Hshieh approach
4 you about the '409 Patent?"

5 Answer: "Just as usual. He sent me the information
6 about his invention. I talked to him. I go through the
7 regular process of disclosure of the existing art so I can
8 write a background, I can then write -- I can write a patent
9 application for him, and then he reviews it and we submit it."

10 And Dr. Lin told us his regular process of disclosure is
11:13 11 to disclose the prior art in the body of the application. In
12 fact, Dr. Lin pointed to the exact background section in prior
13 art figure 1A in the '409 Patent showing where he did so.

14 Now, ASUS ignores this testimony and instead focuses on
15 statements from Dr. Lin's affirmative defenses from when he
16 later was sued by Force MOS. The problem with this is that
17 Dr. Lin explained that those were not his own opinions and
11:14 18 beliefs; rather, these were statements from ASUS's own
19 allegations against Force MOS from this very case that had
20 just -- was just tried in the courtroom a month ago. Dr. Lin
21 testified that the affirmative defenses and counterclaims were
22 based upon the allegations ASUS had made in this case.

23 When asked to explain, on page 273, line 7 to page 274,
24 line 21, Dr. Lin testified: Answer: "For instance, some of
25 the counterclaims that the '409 Patent are invalid based on

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11:14 1 some prior patents, that those were cited from other earlier
2 counterclaims against F-MOS."

3 Question: "And you asserted those affirmative defenses
4 based upon your reliance on other pleadings in other cases?"

5 Answer: "Correct."

6 The evidence not only fails to show that the single most
7 reasonable inference is that Dr. Hshieh had specific intent to
8 deceive the examiner; it instead reveals that Dr. Hshieh
9 intended to disclose what he believed to be the material prior
11:15 10 art to the examiner and the specification, specifically in the
11 background of the invention section and the figures. And
12 nothing that you've heard disputes, because we have not heard
13 anything from Dr. Hshieh as to what his intent was. It's all
14 just what he should have known is the arguments that the --
15 that ASUS is making here today.

16 As the parties have stipulated, in the 83 Hshieh patents
11:15 17 assigned from Hshieh to Force MOS, every single one discloses
18 prior art generally. 82 also include at least one labeled
19 figure showing the prior art, and 72 additionally identified
20 one or more specific prior art reference by name and/or
21 number. In 13 of those patents, Dr. Hshieh identified his own
22 prior art, such as shown in Hshieh '382. This was similarly
23 done for the Hshieh patent applications.

11:16 24 Now, turning to Dr. Shanfield's testimony as it relates
25 to intent, what did we learn? Dr. Shanfield followed the same

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11:21 1 Asus has failed to show by clear and convincing evidence
2 that the Patent Office would not have granted the claims of
3 the '634 Patent had they considered Hshieh '384.

4 Moving on to the '409 patent, dr. Shanfield contents that
5 the Hshieh '914 is 'but-for' material based solely on a single
6 limitation--square-shaped cells with rounded corners. That
7 assertion is not supported by the evidence. In fact, it's
8 plainly contradicted by it.

11:21 9 Dr. Neikirk walked us through figure 2 of Pfirsch '703, a
10 reference the examiner actually considered during prosecution.
11 Everyone agrees that Pfirsch '703 discloses square-shaped
12 cells with rounded corners. If that reference wasn't
13 'but-for' material, Pfirsch '914, which doesn't even show
14 square-shaped cells, certainly isn't. In fact, Hshieh '914
15 goes so far as to criticize square-shaped cells, instead,
11:22 16 disclosing non-orthogonal, non-square configurations.

17 Dr. Shanfield himself admitted that Dr. Hshieh
18 distinguished Pfirsch '703 during prosecution of the '409
19 Patent even though it disclosed the same square shells with
20 rounded corners.

21 Based on these facts, there is no plausible argument that
22 the Patent Office would have granted the '409 Patent after
23 considering Hshieh '914.

24 Asus attempts to salvage its position by now asserting
11:22 25 Kobayashi, a reference that wasn't cited to the Patent Office

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1 during the prosecution of the '409 Patent. Kobayashi was
2 cited in a separate prosecution two years after the filing of
3 the '409 Patent by the patent prosecutor who was not involved
4 in the '409 Patent. This does not establish that Dr. Hshieh
5 or Dr. Lin had knowledge of any materiality. And regardless,
6 Dr. Neikirk explained why the combination of Hshieh '914 and
11:23 7 Kobayashi would still not render the '409 Patent unpatentable.

8 Your Honor, the law requires clear and convincing
9 evidence of materiality and specific intent to deceive. ASUS
10 has shown neither.

11 Thank you.

12 THE COURT: All right. Mr. McMahon, I'll give you
13 the final word.

11:23 14 MR. McMAHON: Thank you, Your Honor.

15 I'd like to begin by pointing out that Force MOS's
16 argument that Dr. Hshieh's background sections accurately
17 describe the figures begs the question. They were both
18 misleading, the description and the figures, because they both
19 left the patent examiner unaware of what Dr. Hshieh's own
20 prior art disclosed.

21 Force MOS emphasizes that we bear the burden--and we
22 certainly do, I acknowledge that--by clear and convincing
11:24 23 evidence. I'd like to just inventory the evidence that we
24 have presented to the Court.

25 Sorry. Now I know why my IT guy wanted my attention.

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1 the prior art in the background section of the '634 Patent.

2 12. Hshieh '914 in combination with Kobayashi '196
3 renders obvious claim 1 of the '409 Patent.

4 13. Dr. Kaoway Tu, again, chief technology officer,
5 admits that Hshieh '914 is relevant to the '409 Patent.

6 14. Dr. Hshieh did not cite Hshieh '914 in an IDS for
7 the '409 Patent.

11:26 8 15. Nor did he cite it in the background section of the
9 '409 Patent.

10 16. Dr. Hshieh cited Kobayashi '196 in an IDS for the
11 '634 Patent, but he did not cite it in an IDS for the '409
12 Patent.

13 17. Dr. Hshieh again egregiously mischaracterized the
14 prior art in the background section of the '409 Patent,
15 misleading the examiner about the scope of the prior art.

16 18. In both the '634 and '409 Patents, Dr. Hshieh
11:26 17 selectively described prior art showing the problem but
18 concealed his own prior art showing the solution to that
19 problem.

20 19. Dr. Hshieh is named as an inventor on at least 480
21 patents and published patent applications.

22 20. Dr. Hshieh has signed hundreds of oaths
23 acknowledging his duty to disclose material information.

24 21. Despite those hundreds of reminders, Dr. Hshieh
25 continued to conceal his own material prior art throughout his

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11:27 1 10-plus years at Force MOS.

2 Circumstantial evidence, undoubtedly. Direct evidence of
3 deceptive intent is extremely rare in inequitable conduct
4 cases. But if we look at Lady Justice and place those 21
5 factors on one of her scales, it tips pretty heavily in favor
6 of clear and convincing evidence of inequitable conduct. The
7 question is what's on the other side of the scale.

8 Force MOS has offered no alternative inference. They
9 allege that we are offering speculation. They've offered
11:27 10 nothing but speculation. They haven't provided any
11 explanation from Dr. Hshieh or from anyone else as to why
12 these references were not disclosed to the Patent Office.

13 With that, Your Honor, we submit that we've met our
14 burden of proving inequitable conduct as to both the '634
15 Patent and the '409 Patent by clear and convincing evidence.

16 Thank you, Your Honor.

17 THE COURT: Thank you, counsel.

11:28 18 As I indicated, I'm going to consider the various matters
19 identified in the parties' joint submission as well as the
20 arguments and presentations this morning during the bench
21 trial. I'm going to order both sides to draft and submit to
22 the Court proposed findings of facts and conclusions of law
23 and I want those delivered to my staff in Word format within
11:28 24 the next 10 days.

25 With that, these matters are under submission. I'll

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

FORCE MOS TECHNOLOGY CO., LTD.,	§	
	§	
<i>Plaintiff,</i>	§	
	§	
v.	§	CIVIL ACTION NO. 2:22-CV-00460-JRG
	§	
ASUSTEK COMPUTER, INC.,	§	
	§	
<i>Defendant.</i>	§	FILED UNDER SEAL

FINDINGS OF FACT AND CONCLUSIONS OF LAW

The Court held a bench trial in the above-captioned civil action on March 31, 2025. During the bench trial, the Court heard evidence and argument from Plaintiff Force MOS Technology, Co., Ltd. (“Force MOS” or “Plaintiff”) and Defendant ASUSTeK Computer, Inc. (“ASUSTeK” or “Defendant”) (collectively, the “Parties”) on Defendant’s equitable defenses and counterclaims of inequitable conduct as to U.S. Patent No. 7,629,634 (the “’634 Patent”) and U.S. Patent No. 7,812,409 (the “’409 Patent”) (the “Asserted Patents”).

The Court makes these findings of fact and conclusions of law pursuant to Fed. R. Civ. P. 52.¹ The Court’s findings of fact are based on the admissible evidence.² For the reasons set forth below, the Court concludes that Defendant has not established by clear and convincing evidence the required elements of its inequitable conduct defenses and counterclaims. Accordingly, the Court finds that Plaintiff’s ’634 and ’409 Patents are enforceable, and Defendant should take nothing by way of its inequitable conduct defenses and counterclaims.

¹ Any finding of fact that could also be considered a conclusion of law should be treated as such. Any conclusion of law that could also be considered a finding of fact should be treated as such.

² Prior to the bench trial, the Parties filed a “Joint Submission in Advance of Bench Trial,” that, *inter alia*, asks the Court to take judicial notice of several points of authority. (Dkt. No. 387.) The Court has considered all the matters contained therein and taken judicial notice of the points of authority as requested by the Parties.

I. FINDINGS OF FACT

A. The Parties

[FF 1.] Plaintiff Force MOS is a limited company organized and existing under the laws of Taiwan and located 24F, No. 555, Siyuan Road, Xinzhuang District, New Taipei City, Taiwan (R.O.C.). (Second Amended Complaint, Dkt. No. 144 at ¶ 1.)

[FF 2.] Defendant ASUSTeK is a corporation organized and existing under the laws of Taiwan, with a principal place of business at No. 15, Li-Te Road, Beitou District, Taipei 112, Taiwan. (Answer, Dkt. No. 172 at ¶ 2.)

B. The Lawsuit

[FF 3.] On November 28, 2022, Force MOS filed its original complaint in this case. (Dkt. No. 1.) In the complaint, Force MOS alleged that certain ASUSTeK products infringed U.S. Patent Nos. 7,629,634 and 7,847,346 (the “’346 Patent”). (*Id.* at 1.)

[FF 4.] On March 7, 2023, Force MOS filed its first amended complaint in this case. (Dkt. No. 13.) In its First Amended Complaint, Force MOS alleged that certain ASUSTeK products also infringed U.S. Patent No. 7,812,409. (*Id.* at 1.)

[FF 5.] Force MOS withdrew its claims related to the ’346 Patent on the eve of trial. (Dkt. No. 412 at ¶ 1.) The Court dismissed with prejudice all claims and counterclaims asserted between the Parties concerning the ’346 Patent on February 7, 2025, the ruling of which the Court memorialized on February 10, 2025. (Dkt. No. 353.)

C. The Asserted Patents

[FF 6.] On February 23, 2008, Dr. Fu-Yuan Hsieh³ filed U.S. Patent Application No. 12/036,243 (the “’243 Application”). (JX-2 at Cover Page.) On December 8, 2009, the United States Patent and Trademark Office (“USPTO”) issued U.S. Patent No. 7,629,634 (the “’634 Patent”), which is entitled, “Trenched MOSFET with Trenched Source Contact,” from the ’243 Application. (*Id.*) Dr. Hsieh is listed as the named inventor on the ’634 Patent. (*Id.*)

[FF 7.] The invention of the ’634 Patent generally “relates to a trenched MOSFET with trenched source contact and, in particular, to provide a lateral contact layer in the MOSFET for avalanche improvement.” (*Id.* at 1:6-8.)

[FF 8.] On December 4, 2006, Dr. Hsieh filed U.S. Patent Application No. 11/633,366 (the “’366 Application”). (JX-3 at Cover Page.) On October 12, 2010, the USPTO issued U.S. Patent No. 7,812,409 (the “’409 Patent”) entitled, “Trenched MOSFET with Cell Layout, Ruggedness, Truncated Corners,” from the ’366 Application. (*Id.*) Dr. Hsieh is listed as the named inventor of the ’409 Patent. (*Id.*)

[FF 9.] The invention of the ’409 Patent generally “relates to a novel and improved cell structure, device configuration and improved process for fabricating a trenched semiconductor power device with improved ruggedness with truncated corners.” (*Id.* at 1:9-13.)

[FF 10.] Plaintiff Force MOS is the owner of the Asserted Patents. (JX-2 at Cover Page; JX-3 at Cover Page; Dkt. No. 358 at 4.)

³ At times, “Fu-Yuan Hsieh” is also spelled as “Fwu-Iuan Hshieh.” (*See* Joint Pre-Trial Order, Dkt. 276 at 18.) As the Parties agree that both spellings refer to the same person, the Court will refer to him hereafter as “Dr. Hsieh” for clarity in the record. (*Id.*)

D. Jury Trial

[FF 11.] On February 7-13, 2025, the Court held a jury trial on Force MOS’s infringement claims. During the trial, Force MOS accused various ASUSTeK electronics—including laptops, motherboards, and graphic cards—of incorporating Metal–Oxide–Semiconductor Field-Effect Transistors (“MOSFETs”) that infringe the patent claims at issue. The patent claims at issue were Claims 1-3 of the ’634 Patent, and Claim 1 of the ’409 Patent (the “Asserted Claims”). (Dkt. No. 358 at 5.) The jury also heard ASUSTeK’s patent defenses, which included non-infringement of the Asserted Patents and invalidity of the ’409 Patent. (*See* Dkt. Nos. 369-373.)

[FF 12.] On February 13, 2025, the jury found that ASUSTeK willfully infringed all the Asserted Claims and that the Asserted Claims are valid. (*Id.* at 8.) The jury awarded \$10,500,000 as damages in the form of a reasonable royalty. (*Id.* at 9.)

E. Bench Trial

[FF 13.] On March 31, 2025, the Court held a bench trial on ASUSTeK’s inequitable conduct defenses and counterclaims. (*See e.g.*, Bench Trial Tr., Dkt. No. 409.)

F. Inventor Dr. Hsieh

[FF 14.] Dr. Hsieh is the sole inventor of the Asserted Patents. (JX-2 at Cover Page; JX-3 at Cover Page; Dkt. No. 397 at 1.) Dr. Hsieh is also the sole inventor or co-inventor of approximately 480 patents and published patent applications, of which approximately 83 of those patents are assigned to the Plaintiff, Force MOS. (Stip. Facts, Dkt. No. 397 at ¶¶ 1, 11.)

[FF 15.] There was no testimony from Dr. Hsieh during the jury trial or the bench trial. (*See generally* Dkt. Nos. 369-73; *see also* Bench Trial Transcript, Dkt. No. 409.) He did not appear in person or by deposition.

[FF 16.] The Parties agree that during the prosecution of 73 of the 83 issued patents assigned to Force MOS, Dr. Hsieh did not file an Information Disclosure Statement (“IDS”). (Dkt. No. 397 at ¶ 2.)

G. Patent Attorney Grace Lee Huang

[FF 17.] Grace Lee Huang (“Ms. Huang”) is the patent prosecution counsel for Plaintiff Force MOS that prosecuted the ’634 Patent. (JX-2 at Cover Page.)

[FF 18.] There was no testimony from Ms. Huang during the jury trial or the bench trial. (*See generally* Bench Trial Transcript, Dkt. No. 409.) She did not appear in person or by deposition.

[FF 19.] There was no testimony of anyone during the jury trial or the bench trial that was involved with the prosecution of the ’634 Patent. (*See id.*)

H. Patent Attorney Dr. Bo-In Lin

[FF 20.] Bo-In Lin (“Dr. Lin”) is the patent prosecution counsel for Plaintiff Force MOS that prosecuted the ’409 Patent. (JX-3 at Cover Page.)

[FF 21.] Dr. Lin is the only person who testified during the bench trial that was involved with the prosecution of the ’409 Patent. Dr. Lin is the only witness who provided testimony and who had first-hand knowledge of the prosecution of any patents and/or patent applications to which Dr. Hsieh was an inventor. (Bench Trial Tr. at 8:12-14, 105:12-14.)⁴

⁴ ASUSTeK submitted hardcopies of its deposition designations to the Court following the Bench Trial, which the Court accepted into evidence. (*See* Dkt. 409 (Bench Trial Tr.) at 56:23-59:3; *see also* Dkt. 387 at 1-2, 6.) Copies of those deposition designations were also filed on the docket. (*See* Dkt. Nos. 412-1 through 412-5.)

I. Force MOS Testifying Employees

[FF 22.] Testimony was presented during the bench trial from three employees of Force MOS, namely Ming-Tao Chung (“Dr. Ming-Tao Chung”), Rafael Chung (“Mr. Rafael Chung”) and Kaoway Tu (“Dr. Tu”). (*Id.* at 5:8-12, 52:21-53:1, 98:7-14.)

[FF 23.] Neither Dr. Ming-Tao Chung, Mr. Rafael Chung, nor Dr. Tu were involved with the prosecution of either of the Asserted Patents. (*See id.* at 5:8-12, 52:21-53:1, 98:7-14.)

[FF 24.] Dr. Ming-Tao Chung, Mr. Rafael Chung, and Dr. Tu testified via video deposition through the aid of an interpreter. (*See* Bench Trial Tr. at 53:14-56:18 (deposition taken in Chinese); *see also* R. Chung Dep. Tr. (deposition taken in Chinese); M. Chung Dep. Tr. (deposition taken in Chinese).)

[FF 25.] None of these three Force MOS employees—Dr. Ming-Tao Chung, Mr. Rafael Chung, and Dr. Tu—were recognized as experts during the bench trial. (*See generally* Bench Trial Transcript, Dkt. No. 409.)

J. ASUSTeK’s Expert Dr. Stanley Shanfield

[FF 26.] ASUSTeK’s technical expert witness, Dr. Stanley Shanfield, was qualified in the jury trial and the bench trial as an expert in the field of design fabrication and analysis of semiconductor devices, including MOSFET. (Dkt. No. 409, Bench Trial Tr. at 11:5-12.)

K. Force MOS’s Expert Dr. Dean Neikirk

[FF 27.] Force MOS’s technical expert witness, Dr. Dean Neikirk, was qualified in the jury trial and the bench trial as an expert on semiconductors, electronic devices, and integrated circuit fabrication. (Bench Trial Tr. at 59:18-23.)

L. Inequitable Conduct

[FF 28.] In its pleadings, ASUSTeK contended that the ’634 Patent was unenforceable due to inequitable conduct based upon the alleged failure by Dr. Hsieh and others involved in the

prosecution to disclose U.S. Patent Publication No. 2006/0273384 (“Hsieh ’384”) (JX-23) to the USPTO during prosecution of the ’634 Patent. (Dkt. No. 172 at 19-22.)

[FF 29.] In its pleadings, ASUSTeK contended that the ’409 Patent was unenforceable due to inequitable conduct based upon the alleged failure by Dr. Hsieh and others involved in the prosecution to disclose U.S. Patent No. 5,763,914 (“Hsieh ’914”) (JX-25) to the USPTO during prosecution of the ’409 Patent. (*Id.* at 22-24.)

[FF 30.] During the bench trial, ASUSTeK limited its accusations of inequitable conduct to the conduct of Dr. Hsieh, and not to any other individuals involved in the prosecution of the Asserted Patents. (Bench Trial Tr. at 5:7-7:9.)

M. Materiality

1. Alleged “But For” Materiality of Hsieh ’384 to the Claims of the ’634 Patent

[FF 31.] ASUSTeK contends the ’634 Patent is unenforceable due to inequitable conduct based upon the alleged failure by Dr. Hsieh to disclose Hsieh ’384 to the USPTO during prosecution of the ’634 Patent. (Dkt. No. 409, Bench Trial Tr. at 100:22-24.)

[FF 32.] Specifically, ASUSTeK contends that Dr. Hsieh’s description of the prior art in the Background section of the ’634 Patent includes three false statements and constitutes an egregious mischaracterization of the actual state of the prior art to the ’634 Patent, and also that disclosing prior art via general description in the Background section of the ’634 Patent is not a proper disclosure. (*See e.g.*, Dkt. No. 389 at 8; *see also* Dkt. No. 409, Bench Trial Tr. at 100:22-101:2.)

[FF 33.] Dr. Hsieh did not disclose Hsieh ’384 via an IDS to the USPTO. (*See* JX-02.)

[FF 34.] Hsieh ’384 is not mentioned by application number, publication number, or inventor name in the text of the ’634 Patent nor is it listed under “References Cited.” (*See id.*)

[FF 35.] ASUSTeK did not present any invalidity case regarding the '634 Patent at the jury trial in this action. (*See* Dkt. No. 371, Jury Trial Tr. at 803:16-818:21.)

[FF 36.] ASUSTeK did not present any evidence or argument regarding Hsieh '384 at the jury trial in this action. (*Id.*)

[FF 37.] During the bench trial, and in its trial brief, ASUSTeK did not present a limitation-by-limitation comparison of Hsieh '384 with each limitation of any claim of the '634 Patent. Rather, ASUSTeK only compared Hsieh '384 to the “lateral contact layer” and “base contact layer” limitations of Claim 1 of the '634 Patent. (*See* Dkt. No. 389 at 4, 6-8; Bench Trial Tr. at 16:11-19:5.)

[FF 38.] For example, ASUSTeK did not prove, or attempt to show, that Hsieh '384 discloses “a bottom metal layer formed on the lower surface of said semiconductor region” as recited in claim 1 of the '634 Patent. (*Id.*)

[FF 39.] During the bench trial, and in its trial brief, ASUSTeK did not present any evidence or argument of a motivation to combine Hsieh '384 with any other prior art reference. For example, ASUSTeK did not present any motivation to combine Hsieh '384 with the admitted prior art of the '634 Patent. (*Id.*)

[FF 40.] Thus, ASUSTeK has not advanced a *prima facie* anticipation or obviousness theory for Hsieh '384. Since “but-for” materiality requires a showing that the claim would have not issued (*i.e.*, that it would have been rendered anticipated or obvious if the non-disclosed reference would have been provided to the USPTO) if the reference had been disclosed, ASUSTeK has failed to show Hsieh '384 is but-for material to any claim of the '634 Patent. Nevertheless, the Court will also explain why the theories that ASUSTeK did present for Hsieh '384 fail.

[FF 41.] Since ASUSTeK has not disclosed in its trial brief, or any place prior to the bench trial, any specific alternative construction of “lateral contact layer” under the broadest reasonable interpretation standard, ASUSTeK has forfeited any argument that the term “lateral contact layer” in claim 1 of the ’634 Patent has a different claim construction under the “broadest reasonable interpretation” standard than the construction adopted in the Court’s claim construction order. (Dkt. Nos. 132, 389.)

[FF 42.] Even if ASUSTeK had not forfeited such argument, the Court would conclude that the broadest reasonable interpretation of “lateral contact layer” would require P* doping (*i.e.*, doping between P and P+) as the broadest reasonable interpretation consistent with the specification because the specification of the ’634 Patent uses the definitional language “[a]ccording to the present invention” before describing the lateral contact layer as having P*-type doping, (*i.e.* doping between P and P+). (JX-2 (’634 Patent) at 2:1-11.)

[FF 43.] Hsieh ’384, however, discloses that the sidewalls of the source contact trenches have P+ doping. (JX-23 (Hsieh ’384) at Figs. 3-4, 5-7, 9G-9J, 9G’, [0028]-[0030], [0032]-[0033], [0035]-[0036] (elements 128, 228); Bench Trial Tr. at 39:1-40:14, 43:10-44:3, 64:20-65:15, 66:6-22 (“In the ’384 Hshieh, nonetheless, always calls this P+. It’s very clear that the entire region should be P+. In my opinion, that means it’s not a lateral contact layer as required by the ’634 Patent.”); 82:17-83:12.) Other than the description of the sidewalls of the source contact trenches as having P+ doping, Hsieh ’384 contains no further details regarding the doping concentration for such regions, or the dosages used for creating those regions. (*Id.*)

[FF 44.] The disclosures in Hsieh ’384 are consistent with the ion implantation process resulting in a uniformly high dosage of positive dopants, such that both the sidewalls and bottom of the source contact trenches have P+ doping (*i.e.*, such that there is a single doped P+ region

rather than a P+ region at the bottom and P+ region at the sidewalls). (*Id.*) ASUSTeK has presented no persuasive evidence or argument that would indicate to one of skill in the art otherwise.

[FF 45.] Dr. Neikirk's trial testimony that the accused MOSFETs have P* doping at the source contact trench sidewalls was based on a variety of sources having more details than those disclosed in Hsieh '384, not simply that the accused MOSFETs have tapered sidewalls. (Bench Trial Tr. at 66:23-67:12; Jury Trial Tr. at 293:24-294:10, 300:19-301:9, 327:11-17, 329:11-19, 350:20-351:3, 360:4-9, 374:8-15, 397:20-298:15, 409:12-416:15, 560:6-19, 564:7-17.)

[FF 46.] Since the sidewalls of the source contact trenches in Hsieh '384 have P+ doping, and because P+ is not less than P*, Hsieh '384 fails to disclose P* doping at the sidewalls of the source contact trenches and thus fails to disclose a "lateral contact layer" as claimed in claim 1 of the '634 Patent. (JX-23 (Hsieh '384) at Figs. 3-4, 5-7, 9G-9J, 9G', [0028]-[0030], [0032]-[0033], [0035]-[0036] (elements 128, 228); Bench Trial Tr. at 39:1-40:14, 43:10-44:3 ("And there's no teaching; it never mentions P* anywhere within the disclosure of the Hshieh '384 Patent. Correct? A. I disagree. Q. Does it mention the word P* -- A. No."), 64:20-65:15 ("What is your opinion as to whether Hshieh P+ doped region 128 satisfies the broadest reasonable interpretation of 'lateral contact layer'? A. In my opinion, it does not. The '634 Patent repeatedly refers to P*. It gives examples of why that P* should not be P+--I just gave one; the threshold voltage--as opposed to this disclosure where it always says that the sidewalls are P+; always. Q. So how does this affect the materiality of Hshieh '384? A. In my opinion, it is not material because it simply does not disclose a lateral contact layer as required by the '634 Patent."), 66:6-22, 82:17-83:12.)

[FF 47.] Hsieh '384 consistently describes and depicts the source contact trench sidewalls as having a single doped region (i.e. elements 128 or 228) surrounding the bottom and sidewalls

of the source contact trenches. (JX-23 (Hsieh '384) at Figs. 3-4, 5-7, 9G-9J, 9G', [0028]-[0030], [0032]-[0033], [0035]-[0036] (elements 128, 228); Bench Trial Tr. at 38:5-40:14.)

[FF 48.] ASUSTeK and Dr. Shanfield have identified that single doped region surrounding the bottom and sidewalls of the source contact trenches in Hsieh '384 (i.e. elements 128 or 228) as satisfies both the “base contact layer” and the “lateral contact layer” limitations of claim 1 of the '634 Patent. (Bench Trial Tr. at 38:3-39:7.)

[FF 49.] By contrast, claim 1 of the '634 Patent separately recites having both a “lateral contact layer” and a “base contact layer.” (Bench Trial Tr. at 38:3-39:7.) Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct components of the patented invention. *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010); *Regeneron Pharms., Inc. v. Mylan Pharms. Inc.*, 130 F.4th 1372, 1378-84 (Fed. Cir. 2025). ASUSTeK has not presented any evidence or argument that these limitations of the '634 Patent should be interpreted differently.

[FF 50.] Accordingly, Hsieh '384's P+ region (i.e., elements 128 or 228) cannot satisfy both the “lateral contact layer” and “base contact layer” limitations of claim 1 of the '634 Patent, and thus cannot anticipate or render obvious claim 1 of the '634 Patent. (*Id.*; see Bench Trial Tr. at 63:24-64:18, 65:18-66:5.)

[FF 51.] Furthermore, during prosecution of the '634 Patent, the examiner performed a search of Dr. Hsieh's prior art, and did not cite Hsieh '384 or any other art of Dr. Hsieh as being material. (JX-5 (634 File History) at JX05-035; Bench Trial Tr. at 44:13-21.)

[FF 52.] The Court finds that, based on the totality of the record before it, ASUSTeK has failed to establish that Hsieh '384 is but-for material to any of the claims of the '634 Patent.

2. Alleged Misrepresentations in the Specification of the '634 Patent

[FF 53.] Prior to its trial brief, ASUSTeK did not disclose any theory of inequitable conduct based on alleged misrepresentations in the specification of the '634 Patent or egregious misconduct. (Dkt. Nos. 172 at 19-30; *see also* Dkt. Nos. 390, 395.) Accordingly, such theories are waived. Nonetheless, the Court will make alternative findings in the event it is determined on appeal that such theory is not waived.

[FF 54.] A person of ordinary skill in the art would understand the portion of the specification of the '634 Patent at column 1, lines 33-45 as discussing the particular prior art example illustrated in Figure 1 of the '634 Patent rather than advancing representations regarding every trenched MOSFET in the prior art. (JX-2 at 1:18-41; Bench Trial Tr. 75:19-24, 93:21-95:5.)

[FF 55.] Dr. Neikirk is the only expert witness who testified regarding the accuracy of these representations in the '634 Patent. It is unrebutted that the representations regarding Figure 1 of the '634 Patent are accurate and do not contain any misrepresentations. (*Compare* Bench Trial Tr. at 11:14-52:15, *with* Bench Trial Tr. at 75:19-76:24, 93:21-95:5.)

[FF 56.] ASUSTeK has failed to show that the portion of the specification of the '634 Patent at column 1, lines 33-45 mischaracterizes the prior art example of Figure 1 of the '634 Patent. (*Id.*)

[FF 57.] ASUSTeK has failed to show that Figure 1 of the '634 Patent or the text in column 1, lines 33-45 of the '634 Patent do not constitute accurate descriptions of at least one example of the prior art. (*Id.*)

[FF 58.] Additionally, the '634 Patent identifies its improvement over the prior art as the lateral contact layer, which it describes as having dopant sufficient to achieve ohmic contact but not so high as to significantly affect threshold voltage. (JX-2 ('634 Patent) at 1:6-8, 2:5-11, Figs. 1, 2G.) Read in the context of the '634 Patent as a whole (including column 1, lines 33-45), the

specification reasonably describes the invention as presenting a new structure for sidewalls with an intermediate degree of doping between P⁺ and P, which is not disclosed in Hsieh '384. (*Id.*; JX-2 ('634 Patent) at 1:18-2:33; Bench Trial Tr. at 65:4-11, 95:7-23.)

[FF 59.] Thus, even if one interpreted column 1, lines 33-45 of the '634 Patent as concerning representations of the prior art as a whole, the statements in that passage are reasonably accurate in the context of the '634 Patent as a whole such that they could not rise to the level of egregious misconduct. (*Id.*)

[FF 60.] The Court finds that, based on the totality of the record before it, ASUSTeK has failed to establish that any statements in the specification of the '634 Patent include a misrepresentation.

3. Alleged “But For” Materiality of Hsieh '914 to the Claims of the '409 Patent

[FF 61.] ASUSTeK contends the '409 Patent is unenforceable due to inequitable conduct based upon the alleged failure by Dr. Hsieh to disclose Hsieh '914 to the USPTO during prosecution of the '409 Patent. (Bench Trial Tr. at 103:11-12; *see also* Dkt. No. 172 at 22-24.)

[FF 62.] Dr. Hsieh filed U.S. Patent Application No. 895,507 (the “'507 Application”) on July 16, 1997. (JX-25 (Hsieh '914) at Cover Page.) The USPTO issued the '507 Application as U.S. Patent No. 5,763,914 (“Hsieh '914”) on June 9, 1998, with the title “CELL TOPOLOGY FOR POWER TRANSISTORS WITH INCREASED PACKING DENSITY.” (*Id.*)

[FF 63.] Hsieh '914 issued more than eight years before Dr. Hsieh applied for the '409 patent. Hsieh '914 is therefore prior art to the '409 patent under Pre-AIA 35 U.S.C. § 102(b).

[FF 64.] Hsieh '914 was not disclosed in an IDS to the USPTO. (*See generally* JX-06.) Hsieh '914 is not mentioned by application number, publication number, or inventor name in the text of the '409 patent, nor is Hsieh '914 listed under “References Cited.” (*See generally*, JX-03.)

[FF 65.] Hsieh '914 is directed to MOSFETs with non-orthogonal parallelogram cells. (JX-25 (Hsieh '914) at Abstract, Figs. 4A-8B, 10A, 2:64-3:24, 3:46-50, 4:32-5:51, 6:39-7:25, 7:39-44, 8:6-23, claims 1, 8, 12, 21, 26, 30; Bench Trial Tr. at 67:15-68:2; Jury Trial Tr. at 952:4-953:12 (“[Hsieh '914] is focused on the use of non-orthogonal parallelograms.”))

[FF 66.] Hsieh '914 teaches that MOSFETs with non-orthogonal parallelogram cells are advantageous over MOSFETs with square-shaped cells, as non-orthogonal parallelogram cells have better packing density compared to typical square cells while maintaining the same total channel width. (JX-25 (Hsieh '914) at Abstract, 2:34-53, 2:64-3:5, 3:47-50, 4:32-5:2, 5:12-17; Jury Trial Tr. at 953:13-955:12.)

[FF 67.] The specification of Hsieh '914 does not describe or depict any embodiment with trenched gates and cells having rounded or truncated corners. (JX-25 (Hsieh '914) at Figs. 4B, 10A-10B; Bench Trial Tr. at 32:19-23, 67:21-68:2 (“The '914 clearly teaches away from using squares. It teaches to use non-orthogonal parallelograms. But the only corners that are rounded are shown in that figure. It doesn't show a rounded center contact.”))

[FF 68.] Hsieh '914 does not disclose any embodiment with trenched source contacts (*i.e.*, trenched contacts that penetrate into the surface of the semiconductor so as to contact the source and body regions). (JX-25 (Hsieh '914) at Figs. 4B, 10B; Bench Trial Tr. at 32:19-23, 67:21-68:2.)

[FF 69.] Hsieh '914 discloses using parallelogram-shaped source contacts. (JX-25 (Hsieh '914) at Figs. 4A, 5A, 7A-7B, 8A-8B, 10A, claims 20, 33; Bench Trial Tr. at 67:22-24.) Hsieh '914 does not disclose any embodiment with circular source contacts. (Bench Trial Tr. at 32:21-23.)

[FF 70.] ASUSTeK has not shown that Hsieh '914 anticipates any claim of the '409 Patent.

a. Hsieh '914 Combined with Art of Record of the '409 Patent

[FF 71.] ASUSTeK's position of materiality of Hsieh '914 is based solely upon the combination of Hsieh '914 with Kobayashi '196. (*Id.* at 35:23-25, 37:23-38:2.)

[FF 72.] Dr. Shanfield testified that Hsieh '914 became material to the patentability of the claims of the '409 Patent when combined with U.S. Patent No. 6,888,196 ("Kobayashi '196") (JX-24) even though Kobayashi '196 was not prior art of record for the '409 Patent. (*Id.*)

[FF 73.] Kobayashi '196 was not art of record during prosecution of the '409 Patent. (JX-3 at Cover Page; Bench Trial Tr. at 36:1-3.)

[FF 74.] ASUSTeK has not advanced an obviousness theory for Hsieh '914 alone, or for Hsieh '914 in combination with any of the prior art of record during prosecution of the '409 Patent. (JX-3 at Cover Page; Bench Trial Tr. at 36:1-3.)

[FF 75.] ASUSTeK has failed to demonstrate that Hsieh '914, whether alone, or in combination with any other prior art of record during prosecution of the '409 Patent, would have rendered any claims of the '409 Patent obvious.

b. Hsieh '914 Was Cumulative Prior Art That Is Non-Material

[FF 76.] U.S. Patent Publication No. 2002/0006703 ("Pfirsch '703") (JX-29) was repeatedly cited and applied by the examiner in issuing rejections during prosecution of the '409 Patent. (JX-6 (409 File History) at JX06-049 to JX06-059, JX06-062, JX06-090 to JX06-098, JX06-132 to JX06-137, JX06-505 to JX06-510, JX06-544 to JX06-552, JX06-577 to JX06-587, JX06-885 to JX06-890, JX06-924 to JX06-932, JX06-957 to JX06-967.)

[FF 77.] As the examiner recognized during prosecution of the '409 Patent, Pfirsch '703 discloses trench gate MOSFETs having substantially square-shaped cells with rounded corners.

(JX-6 (409 File History) at JX06-132 to JX06-133; JX-29 (Pfirsch '703) at Fig. 2; Bench Trial Tr. at 31:12-14, 68:4-69:8.)

[FF 78.] During prosecution of the '409 Patent, the patentee did not dispute that Pfirsch '703 disclosed substantially square-shaped cells with rounded corners. Rather, the patentee distinguished the Pfirsch '703 reference based on Pfirsch '703 failing to disclose circular trench contacts. (JX-6 (409 File History) at JX06-079 (“[T]he amended claims 1 and 13 have different top view of closed cells from that of Pfirsch which has a closed cell with square trench gate with rounded corner and square contact with rounded corner as shown in Fig. 2, 5 and 6 in Pfirsch.”); Dkt. No. 132 at 26 (“The Court [found that] the patentee distinguished Pfirsch because it included a ‘square contact with rounded corner,’ which was distinguishable from a ‘circular trench contact.”); Bench Trial Tr. at 31:15-32:7.)

[FF 79.] Pfirsch is concerned with addressing issues of ruggedness of MOSFET cells, and in particular, the issues of breakdown currents and latch-up effects, especially at the corners of the MOSFET cells. (Bench Trial Tr. at 33:7-15, 34:23-35:6, 70:3-15; JX-29 (Pfirsch '703) at Abstract, [0003], [0004], [0014], [0024], [0058]-[0059].)

[FF 80.] ASUSTeK has not identified any disclosure in Hsieh '914 as material to the claims of the '409 Patent that is not also present in Pfirsch '703. (Bench Trial Tr. at 33:3-6.)

[FF 81.] Hsieh '914 is cumulative to the prior art references cited during prosecution of the '409 Patent, including at least the Pfirsch '703 reference. (*Id.*; Bench Trial Tr. at 69:22-70:15.)

[FF 82.] Furthermore, during prosecution of the '409 Patent, the examiner performed two separate searches of Dr. Hsieh's prior art, and did not cite Hsieh '914 (but did cite other Hsieh prior art) as being material. (JX-06 ('409 File History) at JX06-140 (search ref. nos. L1, L3, L4), JX06-166 (search ref. nos. S1, S3, S4), JX06-488 (search refs. Nos. S1, S3, S4), JX06-513 (search

refs. Nos. L1, L3, L4), JX06-868 (search refs. Nos. S1, S3, S4), JX06-893 (search ref. nos. L1, L3, L4); Bench Trial Tr. at 45:2-46:5.)

[FF 83.] The Court finds that, based on the totality of the record before it, Hsieh '914 is not material and is cumulative of the prior art of record in the '409 Patent.

c. Hsieh '914 Combined with Art not of Record of the '409 Patent

[FF 84.] Prior to its trial brief, ASUSTeK did not disclose any theory of inequitable conduct based on Hsieh '914 being material based upon its combination with the Kobayashi '196 reference, another reference not of record of the '409 Patent, which ASUSTeK contended during the bench trial should have been disclosed during prosecution of the '409 Patent. (Dkt. Nos. 172 at 19-30; *see also* Dkt. Nos. 390, 395.) Accordingly, such theory is waived. Nonetheless, the Court will make alternative findings in the event it is determined on appeal that such theory is not waived.

[FF 85.] At the jury trial, the only motivation to combine argument that ASUSTeK or Dr. Shanfield advanced for combining Hsieh '914 and Kobayashi '196 was that they were the same subject matter, same kind of device, and trying to solve the same problem. (Jury Trial Tr. at 814:16-815:2; 950:6-952:1.) That argument is inadequate to demonstrate a motivation to combine. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”)).

[FF 86.] At the bench trial and in its trial brief on inequitable conduct, ASUSTeK did not present any new or additional evidence or argument regarding any motivation to combine regarding Hsieh '914.

[FF 87.] The Court finds that, based on the totality of the record before it, ASUSTeK has failed to establish that a POSITA would have been motivated to combine Hsieh '914 with Kobayashi '196 (or any other reference) in the manner claimed by any claim of the '409 Patent. (Jury Trial Tr. at 950:6-957:2.)

[FF 88.] The jury rejected ASUSTeK's invalidity defense that Claim 1 of the '409 Patent was obvious over Kobayashi '196 and Hsieh '914. (Dkt. No. 358 at 6.)

[FF 89.] ASUSTeK has failed to demonstrate that Hsieh '914, whether alone or in combination with any other reference or disclosure, would have rendered any claims of the '409 patent obvious.

[FF 90.] The Court finds that, based on the totality of the record before it, ASUSTeK has failed to establish that Hsieh '914 is but-for material to any of the claims of the '409 Patent even if Kobayashi '196, prior art not of record during prosecution of the '409 Patent, was considered.

d. Kobayashi '196

[FF 91.] Prior to its trial brief, ASUSTeK did not disclose any theory of inequitable conduct based on alleged non-disclosure of Kobayashi '196. (Dkt. Nos. 172 at 19-30; *see also* Dkt. Nos. 390, 395.) Accordingly, such theory is waived. Nonetheless, the Court will make alternative findings in the event it is determined on appeal that such theory is not waived.

[FF 92.] At the jury trial, ASUSTeK and Dr. Shanfield asserted that Kobayashi '196 anticipates claim 1 of the '409 Patent, and in particular, that the side-view visible rounded disclosed by Kobayashi '196 at Figure 6C and column 6, lines 57 to 60 to disclose "closed cells constituting substantially square-shaped cells with rounded corners" as recited in claim 1 of the '409 Patent. (Jury Trial Tr. at 804:24-810:24.)

[FF 93.] The Court finds that ASUSTeK's anticipation theory for Kobayashi '196 is not persuasive, as "closed cells constituting substantially square-shaped cells with rounded corners" is directed to the shape of the *cells*, while Kobayashi '196's disclosures regarding rounding of the trench *gate*'s opening and bottoms do not result in a substantially square shape with rounded corners (*i.e.*, a shape essentially like that shown in Figure 3 of the '409 Patent). (JX-24 (Kobayashi '196) at Fig. 6C, 6:57-60; JX-3 ('409 Patent), Fig. 3, cl. 1; Jury Trial Tr. at 946:10-949:25 ("And, Dr. Neikirk, do you agree with Dr. Shanfield's conclusion that claim 1 of the '409 Patent is anticipated by Kobayashi? A. No, I do not," then explaining that Kobayashi does not disclose the "closed cells constituting substantially square-shaped cells with rounded corners" limitation).)

[FF 94.] ASUSTeK has not shown that Kobayashi '196 anticipates any claim of the '409 Patent.

[FF 95.] ASUSTeK has failed to demonstrate that a POSITA would have been motivated to combine Kobayashi '196 with any other reference in the manner claimed by any claim of the '409 Patent. (Jury Trial Tr. at 950:6-957:2.)

[FF 96.] ASUSTeK has failed to demonstrate that Kobayashi '196, whether alone or in combination with any other reference or disclosure, would have rendered any claims of the '409 patent obvious.

[FF 97.] Under the USPTO's patent prosecution guidelines, an examiner may rely on admissions regarding the prior art by the applicant in the specification in issuing anticipation or obviousness rejections. *See Riverwood Int'l Corp. v. R.A. Jones & Co.*, 324 F.3d 1346, 1354 (Fed. Cir. 2003); *Constant v. Advanced Micro-Devices Inc.*, 848 F.2d 1560, 1570 (Fed. Cir. 1988)).

[FF 98.] Figures 1A-1D of the '409 Patent contain applicant-admitted prior art that the examiner is presumed to have considered when allowing the '409 Patent. (JX-3 ('409 Patent) at Figs. 1A-1D, 1:20-42, 3:12-16.)

[FF 99.] The admitted prior art of Figures 1A-1D of the '409 Patent disclose a trenched semiconductor power device comprising a plurality of trenched gates surrounding a plurality of transistor cells formed in a semiconductor substrate. (JX-3 ('409 Patent) at Figs. 1A, 1C (trenched gate at element 20 surrounding square-shaped closed cell), Bench Trial Tr. at 19:6-20:20.)

[FF 100.] The admitted prior art of Figures 1A-1D of the '409 Patent disclose trenched gates surrounding transistor cells as closed cells constituting substantially square-shaped cells. (*Id.*)

[FF 101.] The admitted prior art of Figures 1A-1D of the '409 Patent disclose that each of said closed cells further includes a trench contact disposed substantially in a central portion of said closed cells, penetrating through a source region surrounding said trenched gates and extending into a body region encompassing said source region. (JX-3 ('409 Patent) at Figs. 1A, 1C (element 15 in top-view center of cell, and in side view, extending from source metal layer, penetrating into n⁺ source and p body regions), Bench Trial Tr. at 19:6-20:20.)

[FF 102.] The admitted prior art of Figures 1A-1D of the '409 Patent disclose that the trench contact comprises a hole opened from a top surface of said semiconductor substrate and is filled with a contact metal plug wherein sidewalls of said hole are surrounded by and in contact said source and body regions and said trench contact is separate from said trenched gates with said source region and body region disposed between a gate oxide lining of said trenched gates and all points around the trench contact. (*Id.*)

[FF 103.] The admitted prior art of Figures 1A-1D of the '409 Patent disclose that the contact metal plug is connected to a source metal disposed on top of the trench contact. (*Id.*)

[FF 104.] With the exception of trench contacts, which are circular, each claim limitation of the '409 Patent that ASUSTeK contends is disclosed by Kobayashi '196 is also disclosed by the admitted prior art in Figures 1A, 1B, 1C and 1D of the '409 Patent. (*Id.*; Jury Trial Tr. at 809:12-813:10; Bench Trial Tr. at 24:11-25:10.)

[FF 105.] During prosecution of the '409 Patent, the examiner found that the Imam reference (US Patent No. 6,867,083) (the "Imam Reference") disclosed a circular trench contact. (JX06 (409 File History) at JX06-091.)

[FF 106.] During prosecution of the '409 Patent, the patentee did not dispute that the Imam Reference disclosed a circular trench contact but rather argued that the Imam Reference did not disclose (and taught away from) the trench contact being disposed at a distance from the gate oxide lining and all circumferential points of the circular trench contact hole. (JX06 (409 File History) at JX06-120 to JX-06-121.)

[FF 107.] Thus, Kobayashi '196 is cumulative to the prior art of record during the prosecution of the '409 Patent.

[FF 108.] The Court finds that, based on the totality of the record before it, ASUSTeK has failed to establish that Kobayashi '196 is material to any claim of the '409 Patent.

4. Alleged Misrepresentations in the Specification of the '409 Patent

[FF 109.] Prior to its trial brief, ASUSTeK did not disclose any theory of inequitable conduct based on alleged misrepresentations in the specification of the '409 Patent or egregious misconduct. (Dkt. Nos. 172 at 19-30; *see also* Dkt. Nos. 390, 395.) Accordingly, such theories are waived. Nonetheless, the Court will make alternative findings in the event it is determined on appeal that such theory is not waived.

[FF 110.] A person of ordinary skill in the art would understand the portion of the specification of the '409 Patent at column 1, lines 3-13 as discussing the particular prior art example illustrated in Figure 1 of the '409 Patent, rather than advancing representations regarding every trenched MOSFET in the prior art. (JX-3 ('409 Patent) at 1:7-3:3; Bench Trial Tr. at 84:22-86:6, 94:14-95:5.)

[FF 111.] Dr. Neikirk is the only expert witness who testified regarding the accuracy of these representations in the '409 Patent. It is un rebutted that the representations regarding Figure 1 of the '409 Patent are accurate and do not contain any misrepresentations. (*Compare* Bench Trial Tr. at 84:22-86:6, 94:14-95:5 *with* Bench Trail Tr. at 11:16-52:17.)

[FF 112.] ASUSTeK has failed to show that the portion of the specification of the '409 Patent at column 1, lines 3-13 mischaracterizes the prior art example of Figure 1 of the '409 Patent.

[FF 113.] ASUSTeK has failed to show that the disclosed or claimed embodiments of the '409 Patent are not novel or an improvement over the prior art. In particular, ASUSTeK has failed to identify any one prior art reference with rounded (or truncated) corners and circular trench contacts. (*See* [FF69]; [FF92-FF93].)

[FF 114.] ASUSTeK has failed to show that the disclosed or claimed embodiments of the '409 Patent do not improve ruggedness.

[FF 115.] ASUSTeK has failed to show that Figure 1 of the '409 Patent or the text in column 1, lines 3-13 of the '409 Patent do not constitute accurate descriptions of at least one example of the prior art.

[FF 116.] Additionally, the '409 Patent identifies its improvement over the prior art as a MOSFET cell configuration having more uniform space between the contact metal and the

trenched gate. (JX-3 ('409 Patent) at Abstract, 1:28-2:23.) Read in the context of the '409 Patent as a whole (including column 1, lines 3-13), the specification reasonably describes the invention as presenting a new cell structure formed from the combination of a circular contact and a closed cell with rounded or truncated corners so as to have more uniform distances between the contact and the gate trench surrounding the cell. Such combination is not disclosed in Hsieh '914 or Kobayashi '196. (*Id.*; Jury Trial Tr. at 335:9-336:18.)

[FF 117.] Thus, even if one interpreted column 1, lines 3-13 of the '409 Patent as concerning representations of the prior art as a whole, the statements in that passage are reasonably accurate in the context of the '409 Patent as a whole such that they could not rise to the level of egregious misconduct. (*Id.*)

[FF 118.] The Court finds that, based on the totality of the record before it, ASUSTeK has failed to establish that any statements in the specification of the '409 Patent include a misrepresentation.

5. Alleged Acts Regarding Other Hsieh Patents

[FF 119.] Dr. Shanfield's testimony was directed to materiality of the prior art for the Asserted Patents. Dr. Shanfield did not provide any testimony reading materiality regarding any of Dr. Hsieh's other 480 patents and patent applications. (Bench Trial Tr. at 29:9-25.)

[FF 120.] There has been no expert analysis presented to the Court regarding any of Dr. Hsieh's other 480 patents and patent applications. There has been no expert analysis presented to the Court regarding anything that transpired during the prosecution of Dr. Hsieh's other 480 patents and patent applications. (*See generally* Bench Trial Tr.; *see also id.* at 8:21-9:4.)

[FF 121.] For each of these other 480 patents and patent applications of Dr. Hsieh, ASUSTeK has failed to identify any specific prior art that was material to patentability that was

not disclosed to the USPTO during prosecution of that patent/patent application. (*See generally* Bench Trial Tr.)

[FF 122.] For each of these other 480 patents and patent applications of Dr. Hsieh, ASUSTeK has not identified any misrepresentations (material or otherwise) that were made in the patent/patent application or during its prosecution. (*See generally* Bench Trial Tr.)

[FF 123.] Based upon the totality of the circumstances, ASUSTeK has failed to demonstrate any wrongdoing by Dr. Hsieh (or anyone else) during prosecutions of these other 480 patents and patents applications of Dr. Hsieh. Thus, ASUSTeK has failed to demonstrate any pattern of wrongdoing by Dr. Hsieh, or anyone else involved in the prosecution of Dr. Hsieh's patents (including the '634 and '409 Patents).

[FF 124.] There is no egregious conduct, affirmative or otherwise, by Dr. Hsieh or anyone involved with the prosecution of the Asserted Patents any of the other 480 patents and patents applications of Dr. Hsieh that occurred during the prosecutions.

N. Intent

1. ASUSTeK Has Failed to Present Evidence of Intent

a. Hsieh '384

[FF 125.] While Dr. Hsieh, as the inventor of Hsieh '384, knew of Hsieh '384, ASUSTeK has failed to demonstrate that Dr. Hsieh knew that Hsieh '384 was material to any claims to the '634 Patent. Dr. Hsieh's knowing of the existence of a prior art reference, even his own, is not evidence that he had actual knowledge of its materiality.

[FF 126.] There is no direct evidence from Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent that anyone of them had actual knowledge that Hsieh '384 was material to patentability of any claims of the '634 Patent.

[FF 127.] There is no documentary evidence that Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent had knowledge that Hsieh '384 was material to patentability. (*See generally* Bench Trial Tr.)

[FF 128.] There is no witness testimony from anyone that Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent had knowledge that Hsieh '384 was material to patentability. (*Id.*)

[FF 129.] Accordingly, ASUSTeK has failed to demonstrate that Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent had actual knowledge of any materiality of Hsieh '384 during prosecution of the '634 Patent. (*Id.*)

[FF 130.] ASUSTeK has further failed to present evidence that Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent made a deliberate decision to withhold Hsieh '384 during prosecution of the '634 Patent to mislead the examiner into allowing the claims of the '634 Patent. (*Id.*)

[FF 131.] There is no direct evidence from Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent that any one of them made a deliberate decision to withhold Hsieh '384 during prosecution of the '634 Patent to mislead the examiner into allowing the claims of the '634 Patent. (*Id.*)

[FF 132.] There is no documentary evidence that Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent made a deliberate decision to withhold Hsieh '384 during prosecution of the '634 Patent to mislead the examiner into allowing the claims of the '634 Patent. (*Id.*)

[FF 133.] There is no witness testimony from anyone that Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent made a deliberate decision to

withhold Hsieh '384 during prosecution of the '634 Patent to mislead the examiner into allowing the claims of the '634 Patent. (*Id.*)

[FF 134.] Accordingly, ASUSTeK has failed to demonstrate that Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent made a deliberate decision to withhold Hsieh '384 during prosecution of the '634 Patent to mislead the examiner into allowing the claims of the '634 Patent. (*Id.*)

b. Hsieh '914

[FF 135.] While Dr. Hsieh, as the inventor of Hsieh '914, knew of Hsieh '914, ASUSTeK has failed to demonstrate that Dr. Hsieh knew that Hsieh '914 was material to any claims of the '409 Patent. (*See generally* Bench Trial Tr.) Dr. Hsieh's knowing of the existence of a prior art reference, even his own, is not evidence that he had actual knowledge of its materiality.

[FF 136.] There is no direct evidence from Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent that anyone of them had actual knowledge that Hsieh '914 was material to patentability. (*Id.*)

[FF 137.] There is no documentary evidence that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent had knowledge that Hsieh '914 was material to patentability of any claims of the '409 Patent. (*Id.*)

[FF 138.] There is no witness testimony from anyone that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent had knowledge that Hsieh was material to patentability. (*Id.*)

[FF 139.] Accordingly, ASUSTeK has failed to demonstrate Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent had actual knowledge of any materiality of Hsieh '914 during prosecution of the '409 Patent.

[FF 140.] ASUSTeK has further failed to present evidence that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent made a deliberate decision to withhold Hsieh '914 during prosecution of the '409 Patent to mislead the examiner into allowing the claims of the '409 Patent.

[FF 141.] There is no direct evidence from Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent that anyone of them made a deliberate decision to withhold the Hsieh '914 during prosecution of the '409 Patent to mislead the examiner into allowing the claims of the '634 Patent. (*Id.*)

[FF 142.] There is no documentary evidence that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent made a deliberate decision to withhold Hsieh '914 during prosecution of the '409 Patent to mislead the examiner into allowing the claims of the '409 Patent. (*Id.*)

[FF 143.] There is no witness testimony from anyone that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent made a deliberate decision to withhold Hsieh '914 during prosecution of the '409 Patent to mislead the examiner into allowing the claims of the '409 Patent. (*Id.*)

[FF 144.] Accordingly, ASUSTeK has failed to demonstrate that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent made a deliberate decision to withhold Hsieh '914 during prosecution of the '409 Patent to mislead the examiner into allowing the claims of the '409 Patent.

c. Kobayashi '196

[FF 145.] Kobayashi '196 is involved in the theories of inequitable conduct that ASUSTeK presented at the bench trial for the '634 Patent and the '409 Patent. (*See, e.g., Bench*

Trial Tr. at 14:16-15:1 (providing opinions on Kobayashi, prior art of record in '634 Patent prosecution, in relation to inequitable conduct claim for the '634 Patent), 25:3-10 (providing opinions on Kobayashi in relation to inequitable conduct claim for the '409 Patent).)

[FF 146.] With respect to the '409 Patent, as raised for the first time in ASUSTeK's Trial Brief, ASUSTeK contends that that Kobayashi '196 should have been disclosed during prosecution of the '409 Patent. (Dkt. No. 389 at 7-8; Bench Trial Tr. at 35:23-38:2)

[FF 147.] With respect to the '634 Patent, Kobayashi '196 was disclosed in an Information Disclosure Statement ("IDS"); however, ASUSTeK contends that Force MOS should also have disclosed Hsieh '384 during prosecution of the '634 Patent. (JX-5 ('634 Patent File History), at JX05-43; Bench Trial Tr. at 35:23-38:2.)

[FF 148.] The IDS was filed by Ms. Huang in the '634 Patent in 2008, which was about two years after the filing of the '409 Patent. (*Compare* JX-5 ('634 Patent File History) at JX05-43 (dated May 19, 2008), *with* JX-3 ('409 Patent) at Cover Page (filed December 4, 2006).) Ms. Huang was not involved in the prosecution of the '409 Patent; rather Dr. Lin was the patent prosecution counsel for the '409 Patent. (JX-3 ('409 Patent), at Cover Page.)

[FF 149.] Unlike Hsieh '384 and Hsieh '914, Kobayashi '196 is not a patent or patent application for which Dr. Hsieh was an inventor. (JX-024 (Kobayashi '196) at Cover Page; *see also* JX-2 ('634 Patent) at Cover Page; JX-3 ('409 Patent) at Cover Page.)

[FF 150.] ASUSTeK has failed to demonstrate that Dr. Hsieh or anyone associated with the prosecution of the '409 Patent had knowledge of the contents of Kobayashi '196 or to what extent, if any, Dr. Hsieh or anyone associated with the prosecution of the '409 Patent had reviewed Kobayashi '196 at that, or any other, time.

[FF 151.] There is no evidence that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent knew Kobayashi '196 was material to the '409 Patent. (*See generally* Bench Trial Tr.) Even if Dr. Hsieh knew of the existence of Kobayashi '196, knowing the existence of a prior art reference (including one submitted to the USPTO in an IDS in another patent application of Dr. Hsieh) is not evidence that Dr. Hsieh had actual knowledge of materiality of that prior art reference to the '409 Patent.

[FF 152.] Accordingly, ASUSTeK has failed to demonstrate that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent had actual knowledge of any materiality of Kobayashi '196 during prosecution of the '409 Patent.

[FF 153.] ASUSTeK has further failed to demonstrate that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent made a deliberate decision to withhold Kobayashi '196 during prosecution of the '409 Patent to mislead the examiner into allowing the claims of the '409 Patent.

2. Dr. Hsieh's Acts of Disclosure

[FF 154.] In each of the applications submitted by Dr. Hsieh, he acknowledged his duty of disclosure by submitting a signed oath. (MPEP, 8th ed., § 602; *see also* JX-05 at FORCE-MOS0000121–23 (Dr. Hsieh's signed oath in the '634 patent file history); JX-06 at FORCE-MOS0000246–47 (Dr. Hsieh's signed oath in the '409 patent file history).

[FF 155.] At the bench trial, Dr. Lin was the only witness who testified about the prosecuting of Dr. Hsieh's patents and patent applications. (*See* Bench Trial Tr. at 105:12-15.)

[FF 156.] Dr. Hsieh was requested by his patent prosecution counsel to provide the prior art that Dr. Hsieh believed to be material the first time they communicated about his invention. This request occurred specifically because the patent prosecution counsel needed and

required such prior art from Dr. Hsieh to write and prepare the application. (Lin Dep. Tr. at 47:5-6, 47:8-18, 47:20-24, 59:22-24, 60:1-5.)

[FF 157.] Further, if Dr. Hsieh did not send the prior art, the patent prosecution counsel would request it again, until Dr. Hsieh provided the prior art to patent prosecution counsel. (*Id.* at 47:17-18, 47:20-24.)

[FF 158.] Moreover, there was never a time when Dr. Hsieh failed to provide the prior art requested by his patent prosecution counsel. (*Id.* at 60:18-20, 60:22-24.)

[FF 159.] Throughout this time, the patent prosecution counsel would perform searches and remind Dr. Hsieh of his duty of candor under 37 C.F.R. § 1.56. (*Id.* at 48:4-48:4-16, 48:18, 59:22-24, 60:1-5, 60:10-12.)

[FF 160.] The patent prosecution counsel would then disclose the prior art provided to the patent prosecution counsel by Dr. Hsieh in their “regular process of disclosure,” which was to disclose the prior art in the body of the patent application that was being drafted. (*Id.* at 66:15-22.)

[FF 161.] The 83 Hsieh patents owned by Force MOS that ASUSTeK identified in the stipulated facts confirm Dr. Hsieh’s regular practice of disclosure of the prior art. Of these 83 Hsieh patents, every single one disclosed prior art generally in the Background section, 82 (*i.e.*, all but one) included at least one labeled figure showing the “prior art,” and 72 of these Hsieh patents additionally identified one or more specific prior art references by name and/or number. (Stip. Facts, Dkt. No. 397 at Fact No. 6.) In 13 of these 83 patents, Dr. Hsieh identified his own prior art. (*Id.* at Fact No. 7.)

[FF 162.] Such disclosures were similarly done in the additional 27 Hsieh patent applications owned by Force MOS that ASUSTeK identified in the stipulated facts. (Stip. Facts, Dkt. No. 397 at Fact Nos. 8-9.)

[FF 163.] For the patents issued to Dr. Hsieh that he assigned to Force MOS, Dr. Hsieh did not file an IDS in 73 of the 83 applications. (Stip. Facts, Dkt. No. 397 at Fact No. 2.) Dr. Hsieh filed an IDS identifying his own prior art in 3 of the 83 issued patents that he assigned to Force MOS. (*Id.* at Fact No. 3.)

[FF 164.] An examiner located and cited Dr. Hsieh's own prior art in connection with 57 of the 83 patents, despite Dr. Hsieh not disclosing his prior art via an IDS. (*Id.* at Fact No. 4.)

[FF 165.] The Asserted Patents were prosecuted consistent with Dr. Hsieh's regular process of disclosure. (*Compare* JX-2 ('634 Patent), at 1:10-45, JX-3 ('409 Patent), at 1:14-63, *with* Lin Dep. Tr. at 67:15-22.) Both included a Background Section that included a discussion of the prior art generally, as well as one or more figures showing the prior art. (JX-2 ('634 Patent) at 1:10-45, Fig. 1; JX-3 ('409 Patent), at 1:14-63, Figs. 1A-1D.)

[FF 166.] Dr. Lin specifically pointed to the Background section and the figures of the '409 Patent to show that this application was drafted consistent with this regular process of disclosure. (Lin Dep. Tr. at 69:2-10, 69:12-19, 69:21-24.)

[FF 167.] As the examiner is expected to consider the prior art disclosed in the specification, such disclosure by Dr. Hsieh shows that he was disclosing prior art consistent with his obligations under 37 C.F.R. § 1.56. (Lin Dep. Tr. at 69:2-10, 69:12-19, 69:21-24.)

[FF 168.] Though ASUSTeK has cited to allegations Dr. Lin made in his pleading against Force MOS in another case (not before this Court) involving a dispute between Force MOS and Dr. Lin, that pleading and the allegations therein are not persuasive evidence of any issue at

the bench trial. (DX-37 (Dr. Lin's pleading *against* Force MOS in *Force MOS Technology Co., Ltd. v. Bo-In Lin*, Case No. 5:22-cv-8938, Dkt. No. 68 at ¶ 447).) Dr. Lin's allegations were made in a pleading in a case filed adverse to Force MOS, so these are not admissions by Dr. Lin as an agent of Force MOS. (*Id.*) Moreover Dr. Lin testified that his allegations in his pleading were made by copying those of ASUSTeK in the present lawsuit, and that Dr. Lin had no independent basis to support the allegations in his complaint. (Lin Dep. Tr. at 271:21-25, 272:5-10, 272:14-273:9, 273:11-13, 273:15-21.) It is reasonable that Dr. Lin was copying these allegations as he testified to preserve his affirmative defenses based upon ASUSTeK's allegations in its pleadings in this case, to which Dr. Lin did not have personal knowledge. Accordingly, the Court gives no weight to such allegations in Dr. Lin's pleadings.

[FF 169.] ASUSTeK has failed to provide a persuasive motivation for Dr. Hsieh to withhold any material prior art. Both Dr. Hsieh and Force MOS had numerous issued patents before prosecution of the Asserted Patents, and thus there is no reason to conclude that Dr. Hsieh would be motivated to cause the claims of the Asserted Patents to improperly issue.

[FF 170.] In summary, the single most reasonable inference is Dr. Hsieh intended to disclose what he believed to be the material prior art to the patent office during prosecution of the Asserted Patents by providing it to patent prosecution counsel, and letting patent prosecution counsel disclose the material prior art to the patent office. Even if the Court were to conclude that Dr. Hsieh withheld any material prior art reference, the most reasonable explanation would be that Dr. Hsieh did not believe such prior art to be material.

[FF 171.] It is not the single most reasonable inference that Dr. Hsieh or anyone else associated with the prosecution of the Asserted Patents specifically intended to deceive the examiner by withholding material prior art.

3. ASUSTeK's Attorney Argument Is Not Evidence

[FF 172.] ASUSTeK's case of intent is grounded in attorney argument, rather than evidence. (*See* Bench Trial Tr. at 114:14-117:16.)

[FF 173.] There is no established pattern of deceit by Dr. Hsieh.

[FF 174.] To show a pattern of deceit, ASUSTeK must show the acts of deceit, which ASUSTeK has failed to do.

[FF 175.] ASUSTeK contends there is a pattern based upon 83 U.S. patents and 27 abandoned patent applications owned by Force MOS. (*Id.* at 5:7-6:10 (referencing Stip. Facts (Dkt. No. 397))).

[FF 176.] ASUSTeK's evidence is a small number of stipulated facts regarding 83 patents and 27 patent applications owned by Force MOS and invented by Dr. Hsieh. These stipulated facts regard the number of IDSs filed in these 110 patents and patents applications, the rejections of the applications, *etc.*, from which ASUSTeK then provides attorney argument, not expert testimony, that there is a pattern of deceit. (*Id.*)

[FF 177.] ASUSTeK has isolated a narrow subset of facts concerning a subset of Dr. Hsieh's 480 patents and patent applications, ignoring more than three-quarters of Dr. Hsieh's entire patent portfolio and over 20 percent of Force MOS's patents and patent applications. (Stip. Facts (Dkt. No. 397) at Fact Nos. 1, 11, 12.)

[FF 178.] ASUSTeK failed to provide a fact witness with knowledge of these 110 patents and patent applications or any of the other 480 Hsieh patents/patent applications. (*See generally* Bench Trial Tr.) ASUSTeK likewise failed to provide an expert witness to provide any opinions on these 110 patents and patent applications or on what transpired during their prosecution. (*Id.*)

[FF 179.] These stipulated facts regarding IDSs and abandonment of patent applications evidence very little, if anything, as to what actually transpired in these 110 Hsieh patents and patent applications or any of the other 480 patents of Dr. Hsieh. These stipulated facts do not evidence or support that there was any deceit at all during prosecution of any of Hsieh's 480 patents and patent applications, including the 110 Hsieh patents and patent applications focused upon by ASUSTeK.

[FF 180.] An examiner is expected to consider prior art disclosed in the specification, so the lack of an IDS in some of the 110 patents and patents applications is not sufficient to establish any deceptive intent. (*See* [CL3].)

[FF 181.] ASUSTeK's attorney argument is that Dr. Hsieh should have known of something in his own patent portfolio to turn over to the examiner. (*Id.* at 5:7-6:10, 98:5-106:25, 114:14-117:16.) ASUSTeK has not identified what specific Hsieh prior art should have been disclosed in each of the 110 patents and patent applications. ASUSTeK has further not provided any evidence that Dr. Hsieh actually knew such specific Hsieh prior art was material and has not provided any evidence that Dr. Hsieh acted with an intent to mislead the examiners issuing those patents by deliberately withholding such specific prior art.

[FF 182.] There is no evidence as to the reasons why the 27 applications of Dr. Hsieh were abandoned in these 110 patents and patent applications. (*See* Stip. Facts (Dkt. No. 397), at Fact Nos. 8-9; *see generally* Bench Trial Tr.) ASUSTeK's attorney argument speculating as to the reasons for their abandonment is not evidence.

[FF 183.] ASUSTeK has failed to identify any wrongful act in any of these 110 patent and patent applications. (*See* Bench Trial Tr. at 98:5-106:25, 114:14-117:16.)

[FF 184.] There is no evidence that there were any false affidavits or false submissions made to the patent office during the prosecution of the Asserted Patents or any of Dr. Hsieh's 480 patents and patent applications.

[FF 185.] Reviewing the totality of the circumstances, the Court finds no pattern of deceit by Dr. Hsieh or others involved with the prosecution of the Hsieh patents and patent applications.

[FF 186.] Reviewing the totality of the circumstances, the Court finds no egregious behavior (affirmative or otherwise) by Dr. Hsieh or anyone involved with the prosecution of the Hsieh patents and patent applications.

[FF 187.] Reviewing the totality of the circumstances, the Court finds no intent to deceive the patent office into allowance of each of the Asserted Patents.

4. ASUSTeK's Theories Regarding Alleged Misrepresentations in the Specifications of the Asserted Patent and Alleged Egregious Misconduct Fail

[FF 188.] Prior to its trial brief, ASUSTeK did not disclose any theory of inequitable conduct based on alleged misrepresentations in the specifications of the Asserted Patents or egregious misconduct. (Dkt. Nos. 172 at 19-30; *see also* Dkt. Nos. 390, 395.) Accordingly, such theories are waived. Nonetheless, the Court will make alternative findings in the event it is determined on appeal that such theory is not waived.

[FF 189.] ASUSTeK has failed to demonstrate that Dr. Hsieh, Ms. Huang, Dr. Lin, and any others involved in the prosecution of the Asserted Patents made misrepresentations to the USPTO in the Asserted Patents or otherwise. ASUSTeK has failed to demonstrate that any of the statements in the Asserted Patents are false. (*Compare* Bench Trial Tr. at 75:19-76:24, 93:21-95:7 *with* Bench Trial Tr. at 11:16-52:17.)

[FF 190.] ASUSTeK has failed to demonstrate that Dr. Hsieh, Ms. Huang, Dr. Lin, or any others involved in the prosecution of the Asserted Patents and others made any misrepresentations with the intent to mislead the examiner into allowing the claims of the Asserted Patents. ASUSTeK has provided no evidence that Dr. Hsieh, Ms. Huang, Dr. Lin, or any others involved in the prosecution of the Asserted Patents, intended to make any misrepresentations in the specifications of the Asserted Patents and did so with the intention to mislead the examiner into allowing the claims of the Asserted Patents.

[FF 191.] ASUSTeK has failed to demonstrate that there was any egregious behavior (affirmative or otherwise) by Dr. Hsieh, Ms. Huang, Dr. Lin, or any others involved in the prosecution of the Asserted Patents during prosecution of the Asserted Patents.

[FF 192.] ASUSTeK has failed to demonstrate that there was any egregious behavior by Dr. Hsieh, Ms. Huang, Dr. Lin, or any others involved in the prosecution of any Dr. Hsieh's 480 patents and patent applications, including the 110 patents and patents applications of Dr. Hsieh owned by Force MOS that ASUSTeK has focused upon.

[FF 193.] ASUSTeK has provided no evidence that Dr. Hsieh, Ms. Huang, Dr. Lin, or any others involved in the prosecution of the Asserted Patents had the intent to perform egregious behavior (affirmative or otherwise) during prosecution of the Asserted Patents or any of Dr. Hsieh's other 480 patents and patent applications.

[FF 194.] Based upon the totality of the circumstances, ASUSTeK has failed to demonstrate that there was any egregious behavior (affirmative or otherwise) to support any of ASUSTeK's claims or theories of inequitable conduct for the Asserted Patents.

II. Conclusion Of Law

A. Patent Examiners

[CL 1.] The examiner is presumed to act from the viewpoint of a person having ordinary skill in the art. *In re Sang Su Lee*, 277 F.3d 1338, 1345 (Fed. Cir. 2002).

[CL 2.] Patent examiners are presumed to do their job correctly. *Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 97 (2011).

[CL 3.] “[P]rior art described in the specification[] is expected to be considered by the Examiner.” *Polaroid Corp. v. Eastman Kodak Co.*, 641 F. Supp. 828, 833 (D. Mass. 1986).

B. Inequitable Conduct

[CL 4.] “Because inequitable conduct renders an entire patent . . . unenforceable, as a general rule, the doctrine should only be applied in instances where the patentee’s misconduct resulted in the unfair benefit of receiving an unwarranted claim.” *Therasense, Inc. v. Beckton Dickinson & Co.*, 649 F.3d 1276, 1292 (Fed. Cir. 2011) (en banc).

[CL 5.] “To prevail on the defense of inequitable conduct, the accused infringer must prove that the applicant misrepresented or omitted material information with the specific intent to deceive the PTO.” *Id.* at 1287.

[CL 6.] A finding of inequitable conduct requires the accused infringer to prove both elements—materiality and intent to deceive—by clear and convincing evidence. *See id.*

[CL 7.] Intent and materiality are separate requirements. *Id.* A district court should not use a “sliding scale,” where a weak showing of intent may be found sufficient based on a strong showing of materiality, and vice versa. *Id.*

[CL 8.] If the accused infringer meets its burden, then the Court “must weigh the equities to determine whether the applicant’s conduct before the PTO warrants rendering the entire patent unenforceable.” *Id.*

[CL 9.] To show materiality, “as a general matter, the materiality required to establish inequitable conduct is but-for materiality.” *Id.* at 1291. “[I]t must be shown that the PTO would not have allowed the claim but for the nondisclosure or misrepresentation.” *In re Rousvastatin Calcium Patent Litig.*, 703 F.3d 511, 519 (Fed. Cir. 2012).

[CL 10.] A reference is not material when the information is cumulative to information already of record in the Application. 37 C.F.R. § 1.56(b) (2008); M.P.E.P. § 2001.05 (R-07.2022) (“[T]here is no duty to disclose [the cumulative] information to the Office.”).

[CL 11.] In making the decision of whether the PTO would have allowed the claim, courts use the preponderance of the evidence standard and give claims their broadest reasonable construction. *Therasense*, 649 F.3d at 1291-92.

[CL 12.] To show specific intent, “the accused infringer must prove by clear and convincing evidence that the applicant knew of the reference, knew that it was material, and made a deliberate decision to withhold it.” *Id.* at 1290. A district court may not infer intent solely from materiality; instead, a court must weigh the evidence of intent to deceive independent of its analysis of materiality. *Id.* at 1297.

[CL 13.] The Court may not “infer intent to deceive from non-disclosure of a reference solely because that reference was known and material.” *Navico Inc. v. Garmin Int’l, Inc.*, No. 2:16-CV-00190-JRG-RSP, 2017 WL 3701189, at *2 (E.D. Tex. Aug. 7, 2017) (quoting *Ist Media, LLC v. Elec. Arts, Inc.*, 694 F.3d 1367, 1372-73 (Fed. Cir. 2012)), *report & recommendation adopted*, No. 2:16-CV-00190-JRG-RSP, 2017 WL 3676787 (E.D. Tex. Aug. 25, 2017).

[CL 14.] Proving that the applicant knew of a reference, should have known of its materiality, and decided not to submit it to the USPTO does not prove specific intent to deceive. *See Star Scientific Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1366 (Fed. Cir. 2008) (“[T]he

fact that information later found material was not disclosed cannot, by itself, satisfy the deceptive intent element of inequitable conduct.”); *Therasense*, 649 F.3d at 1290.

[CL 15.] “Because neither mere nondisclosure of prior art references to the PTO nor failure to mention prior art references in an affidavit constitutes affirmative egregious misconduct, claims of inequitable conduct that are based on such omissions require proof of but-for materiality.” *Therasense*, 649 F.3d at 1292-93.

[CL 16.] “When the patentee has engaged in affirmative acts of egregious misconduct, such as the filing of an unmistakably false affidavit, the misconduct is material.” *Id.* (citing *Rohm & Haas Co. v. Crystal Chem. Co.*, 722 F.2d 1556, 1571 (Fed. Cir. 1983)).

[CL 17.] “Intent to deceive may be found only if specific intent to deceive is ‘the single most reasonable inference able to be drawn from the evidence.’” *Transweb, LLC v. 3M Innovative Props. Co.*, 812 F.3d 1295, 1304 (Fed. Cir. 2016) (quoting *Therasense*, 649 F.3d at 1290). Thus, “[w]hen there are multiple reasonable inferences that may be drawn, intent to deceive cannot be found.” *Therasense*, 649 F.3d at 1290-91.

[CL 18.] Since ASUSTeK bears the burden of proof, Force MOS, as the patentee, “need not offer any good faith explanation unless the accused infringer first . . . prove[s] a threshold level of intent to deceive by clear and convincing evidence. The absence of a good faith explanation for withholding a material reference does not, by itself, prove intent to deceive.” *Therasense*, 649 F.3d at 1291 (internal citations omitted). The evidence “must be sufficient to require a finding of deceitful intent in light of all the circumstances.” *Id.* at 1290.

C. ASUSTeK’s Failure of Proof

[CL 19.] “[A]ttorney argument is not evidence’ and cannot rebut other admitted evidence.” *Elbit Sys. of Am., LLC v. Thales Visionix, Inc.*, 881 F.3d 1354, 1359 (Fed. Cir. 2018) (quoting *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017)).

[CL 20.] Based on the findings of fact and applicable legal standards discussed above, the Court finds that the ASUSTeK has not carried its burden of establishing the defenses of inequitable conduct for each of the Asserted Patents by clear and convincing evidence—both because the references ASUSTeK alleges should have been disclosed to the USPTO were not but-for material to the patentability of any claim in the Asserted Patents, and because, even if they had been material, the evidence does not establish that the single most reasonable inference to draw from the failure to disclose such references was an intent to deceive the USPTO. *See Therasense*, 649 F.3d at 1290; [FF31-FF124]; [FF125-F194].

D. ASUSTeK’s Failure of Proof on the Issue of Materiality

1. “But For” Materiality of Hsieh ’384 to the Claims of the ’634 Patent

[CL 21.] The Court holds that ASUSTeK has not proven that Hsieh ’384 satisfies the “but-for” test for materiality for the ’634 Patent as required under Federal Circuit precedent.

[CL 22.] ASUSTeK has not advanced a prima facie anticipation or obviousness theory for Hsieh ’384. Since “but-for” materiality requires a showing that the claim would have not issued (*i.e.*, that it would have been rendered anticipated or obvious if the non-disclosed reference would have been provided to the USPTO) if the reference had been disclosed, ASUSTeK has failed to show Hsieh ’384 is but-for material to any claim of the ’634 Patent. [FF31-FF52]; *Therasense*, 649 F.3d at 1291.

[CL 23.] The broadest reasonable interpretation of “lateral contact layer” requires P* doping (*i.e.*, doping between P and P+), which is consistent with the specification of the ’634 Patent that uses the definitional language “[a]ccording to the present invention” before describing the lateral contact layer as having P*-type doping, (*i.e.* doping between P and P+). (JX-2 (’634 Patent) at 2:3-11; [FF41-FF44].) *Therasense*, 649 F.3d at 1291-92.

[CL 24.] Accordingly, the broadest reasonable interpretation of “lateral contact layer” is the same interpretation as the Court’s claim construction for that term. [FF41-FF44].

[CL 25.] Hsieh ’384’s P+ region (*i.e.*, elements 128 or 228) cannot satisfy both the “lateral contact layer” and “base contact layer” limitations of Claim 1 of the ’634 Patent, and thus cannot anticipate or render obvious Claim 1 of the ’634 Patent. [FF43-FF50].

[CL 26.] ASUSTeK has failed to prove that Hsieh ’384 anticipates any claim of the ’634 Patent. [FF37-FF38]; [FF39-FF50].

[CL 27.] ASUSTeK has failed to prove that Hsieh ’384, whether alone or in combination with any other reference, would have rendered any claims of the ’634 Patent obvious. [FF39-FF50]

[CL 28.] The Court holds that, based on the totality of the record before it, ASUSTeK has failed to establish that Hsieh ’384 is but-for material to any of the claims of the ’634 Patent. [FF52].

2. Alleged Misrepresentations in the Specification of the ’634 Patent and Alleged Egregious Misconduct

[CL 29.] ASUSTeK has not proven that there were any misrepresentations in the specification of the ’634 Patent that satisfies the “but-for” test for materiality for the ’634 Patent as required under Federal Circuit precedent.

[CL 30.] ASUSTeK has failed to show by clear and convincing evidence that there were any statements in the specification of the ’634 Patent that were misrepresentations. Thus, ASUSTeK has failed to show that there were any misrepresentations in the ’634 Patent that satisfied the “but for” test for materiality as required under Federal Circuit precedent. [FF53-FF60]; *Therasense*, 649 F.3d at 1291-92.

[CL 31.] ASUSTeK has failed to show by clear and convincing evidence that there were any egregious conduct (affirmative otherwise) during prosecution of the ’634 Patent (or elsewhere). ASUSTeK has failed to show that there was any egregious conduct (affirmative

otherwise) that satisfies materiality as required under Federal Circuit precedent. [FF58-FF60]; [FF119-124]; *Therasense*, 649 F.3d at 1291-92.

3. “But For” Materiality of Hsieh ’914 to the Claims of the ’409 Patent

[CL 32.] The Court holds that ASUSTeK has not proven that Hsieh ’914 satisfies the “but-for” test for materiality of the ’409 Patent as required under Federal Circuit precedent.

[CL 33.] ASUSTeK has not shown nor argued that Hsieh ’914 anticipates any claim of the ’409 Patent. [FF61-FF70].

[CL 34.] ASUSTeK has failed to demonstrate that Hsieh ’914, whether alone, or in combination with any other prior art of record during prosecution of the ’409 Patent, would have rendered any claims of the ’409 patent obvious. [FF71-FF75].

[CL 35.] Hsieh ’914 is cumulative of Pfirsch ’703, which was before the USPTO during prosecution of the ’409 Patent. Pfirsch ’703 disclosed substantially square-shaped cells with rounded corners, which is the same feature of Claim 1 of the ’409 Patent to which ASUSTeK contends Hsieh ’914 is material. ASUSTeK has not identified any disclosure in Hsieh ’914 as material to the claims of the ’409 Patent which is not also present in Pfirsch ’703. [FF76-FF83]. This is a further reason why Hsieh ’914 is not material to the claims of the ’409 Patent.

4. “But For” Materiality of Hsieh ’914 Combined with Art Not of Record to the Claims of the ’409 Patent

[CL 36.] Prior to its trial brief, ASUSTeK did not disclose any theory of inequitable conduct based on Hsieh ’914 being material based upon its combination with the Kobayashi ’196 reference, another reference not of record of the ’409 Patent, which ASUSTeK contended during the bench trial should have been disclosed during prosecution of the ’409 Patent. Accordingly, the Court holds that such theory is waived. [FF84].

[CL 37.] ASUSTeK has not proven that Hsieh '914, even when combined with Kobayashi '196, satisfies the “but-for” test for materiality of the '409 Patent as required under Federal Circuit precedent.

[CL 38.] ASUSTeK has failed to prove that Hsieh '914, whether alone or in combination with any other reference or disclosure such as Kobayashi '196, would have rendered any claims of the '409 Patent obvious. [FF85-FF90].

[CL 39.] The Court holds that, based on the totality of the record before it, ASUSTeK has failed to establish that Hsieh '914 is but-for material to any of the claims of the '409 Patent, even if Kobayashi '196 were to be considered in the analysis. [FF90]; *Therasense*, 649 F.3d at 1291-92.

5. “But For” Materiality of Kobayashi '196 to the Claims of the '409 Patent

[CL 40.] ASUSTeK has not proven that Kobayashi '196 satisfies the “but-for” test for materiality of the '409 Patent as required under Federal Circuit precedent.

[CL 41.] ASUSTeK has not proven that Kobayashi '196 anticipates or renders obvious any claims of the '409 Patent. [FF91-FF108].

[CL 42.] Based on the totality of the record before it, ASUSTeK has failed to establish that Kobayashi '196 is material to any claim of the '409 Patent. [FF91-FF108]; *Therasense*, 649 F.3d at 1291-92.

6. Alleged Misrepresentations in the Specification of the '409 Patent and Alleged Egregious Misconduct

[CL 43.] ASUSTeK has not proven that there were any misrepresentations in the specification of the '409 Patent that satisfies the “but-for” test for materiality for the '409 Patent as required under Federal Circuit precedent.

[CL 44.] ASUSTeK has failed to show by clear and convincing evidence that there were any statements in the specification of the '409 Patent that were misrepresentations. ASUSTeK has

failed to show that there were any misrepresentations in the '634 Patent that satisfied the “but for” test for materiality as required under Federal Circuit precedent. [FF109-FF118]; *Therasense*, 649 F.3d at 1291-92.

[CL 45.] ASUSTeK has failed to show by clear and convincing evidence that there were any egregious conduct (affirmative otherwise) during prosecution of the '409 Patent (or elsewhere). ASUSTeK has failed to show that there was any egregious conduct (affirmative otherwise) that satisfies materiality as required under Federal Circuit precedent. [FF116-FF118]; [FF119-124]; *Therasense*, 649 F.3d at 1291-92.

7. Other Hsieh Patents

[CL 46.] Based on the totality of the record before it, ASUSTeK has failed to establish materiality regarding any of Dr. Hsieh's other 480 patents and patent applications as required under Federal Circuit precedent.

[CL 47.] ASUSTeK has failed to show by clear and convincing evidence that, for each of the 480 patents and patent applications of Dr. Hsieh, any specific prior art was material to patentability that was not disclosed to the USPTO during prosecution of that patent/patent application. [FF119-F124].

[CL 48.] ASUSTeK has failed to show by clear and convincing evidence that, for each of the 480 patents and patent applications of Dr. Hsieh, there were any misrepresentations (material or otherwise) that was made in the patent/patent application or during its prosecution. [FF119-F124].

[CL 49.] ASUSTeK has failed to show by clear and convincing evidence that there is any pattern of any wrongdoing by Dr. Hsieh (or anyone else) during prosecutions of these 480 patents and patents applications of Dr. Hsieh. [FF119-F124].

E. ASUSTeK's Failure of Proof on the Issue of Intent

[CL 50.] ASUSTeK has failed to show that Dr. Hsieh, Ms. Huang, or anyone else associated with the prosecution of the '634 Patent "knew that [Hsieh '384] was material [to the '634 Patent], and made a deliberate decision to withhold it" during prosecution of the '634 Patent. *Therasense*, 649 F.3d at 1290; [FF125-FF134]; *see also* [FF162-FF187].

[CL 51.] ASUSTeK has failed to show that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent "knew that [Hsieh '914] was material [to the '409 Patent], and made a deliberate decision to withhold it" during prosecution of the '409 Patent. *Therasense*, 649 F.3d at 1290; [FF135-FF144]; *see also* [FF172-FF187].

[CL 52.] ASUSTeK has failed to show that Dr. Hsieh, Dr. Lin, or anyone else associated with the prosecution of the '409 Patent "knew that [Kobayashi '196] was material [to the '409 Patent], and made a deliberate decision to withhold it" during prosecution of the '409 Patent. *Therasense*, 649 F.3d at 1290; [FF145-FF153].

[CL 53.] Dr. Hsieh told his patent prosecution counsel, Dr. Lin what he believed to be the material prior art, and then Dr. Lin would disclose the material prior art to the Patent Office by including it in the body of the patent application. Dr. Lin's testimony reveals that Dr. Hsieh intended to disclose what he believed to be the material prior art to the examiner in the specification, specifically in the background of the invention section and the figures. Defendant thus fails to prove that "the specific intent to deceive [is] 'the single most reasonable inference to be drawn from the evidence.'" *Navico Inc.*, 2017 WL 3701189 at *2 (quoting *Larson Mfg.*, 559 F.3d at 1340); [FF154-FF171].

[CL 54.] ASUSTeK's case of intent is grounded in attorney argument which provides no evidence that Dr. Hsieh actually knew any reference naming Dr. Hsieh as inventor was material

the '634 Patent or the '409 Patent, nor that Dr. Hsieh acted with an intent to mislead the examiner into issuing the patents. *Elbit Sys.*, 881 F.3d at 1359 [FF172-FF187].

[CL 55.] Since “there are multiple reasonable inferences that may be drawn, intent to deceive cannot be found.” *Therasense*, 649 F.3d at 1290-91.

[CL 56.] Accordingly, ASUSTeK has failed to prove by clear and convincing evidence that Dr. Hsieh or anyone associated with the prosecution of the '634 Patent had the specific intent to deceive the PTO, as required for its inequitable conduct defense and counterclaim. *See Therasense*, 649 F.3d at 1290.

[CL 57.] Likewise, ASUSTeK has failed to prove by clear and convincing evidence that Dr. Hsieh or anyone associated with the prosecution of the '409 Patent had the specific intent to deceive the USPTO, as required for its inequitable conduct defense and counterclaim. *See Therasense*, 649 F.3d at 1290.

III. CONCLUSION

1. Accordingly, ASUSTeK's inequitable conduct defense and counterclaim directed to the '634 Patent fails. *Therasense*, 649 F.3d at 1290.

2. Likewise, ASUSTeK's inequitable conduct defense and counterclaim directed to the '409 Patent fails. *Therasense*, 649 F.3d at 1290.

3. For the reasons set forth above, the Court concludes that ASUSTeK has failed to meet its burden of clear and convincing evidence to show that the Asserted Patents should be unenforceable under the equitable theory of inequitable conduct during the prosecution of the '634 and '409 Patents.

4. Accordingly, it is **ORDERED, ADJUDGED, AND DECREED** that Force MOS prevails as to each of ASUSTeK's defenses and counterclaims of inequitable conduct, and that ASUSTeK's requests for declaratory judgment of inequitable conduct are therefore **DENIED**. Judgment will be entered consistent herewith.

So ORDERED and SIGNED this 10th day of June, 2025.



RODNEY GILSTRAP
UNITED STATES DISTRICT JUDGE

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

FORCE MOS TECHNOLOGY CO., LTD.,	§	
	§	
<i>Plaintiff,</i>	§	
v.	§	CIVIL ACTION NO. 2:22-CV-00460-JRG
	§	
ASUSTEK COMPUTER, INC.,	§	
	§	
<i>Defendant.</i>	§	

AMENDED FINAL JUDGMENT

On June 11, 2025, the Court entered its Final Judgment (Dkt. No. 421) herein. However, due to inadvertence, the Judgment provided that Plaintiff Force MOS Technology, Co., Ltd. (“Force MOS”) would recover a reasonable royalty from Defendant ASUSTeK Computer, Inc. (“ASUSTeK”) in the form of a lump sum. The Judgment should have held that the reasonable royalty recovered by Force MOS from ASUSTeK would be in the form of a running royalty and not a lump sum. This Amended Final Judgment is entered for the sole purpose of correcting this error. Accordingly, the Court enters this Amended Final Judgment as follows:

A jury trial commenced in this case on February 7, 2025. On February 13, 2025, the jury returned a unanimous verdict (Dkt. No. 358) finding that: Force MOS had acquired all rights in U.S. Patent No. 7,812,409 (the “’409 Patent”) from Dr. Fu-Yuan Hsieh; that ASUSTeK infringed Claims 1-3 of U.S. Patent No. 7,629,634 (the “’634 Patent”) and Claim 1 of the ’409 Patent asserted by Force MOS; that Claim 1 of the ’409 Patent was not invalid; that ASUSTeK’s infringement was willful; and that Force MOS should recover a reasonable royalty of \$10,500,000.00 for ASUSTeK’s infringement.¹

¹ The Court notes that during the Formal Charge Conference Force MOS and ASUSTeK confirmed on the record that any reasonable royalty awarded herein should properly be in the form of a running royalty and not a lump sum. (Dkt. No. 372, Trial Tr. at 1018:2-17.)

On March 31, 2025, the Court conducted a bench trial regarding ASUSTeK's inequitable conduct defense. On June 10, 2025, the Court issued Findings of Fact and Conclusions of Law, wherein the Court held that ASUSTeK had not established by clear and convincing evidence the required elements of its inequitable conduct defenses and counterclaims, and consequently, that Force MOS's '634 and '409 Patents are enforceable, and that ASUSTeK should take nothing by way of its inequitable conduct defenses and counterclaims.

Pursuant to Rule 58 of the Federal Rules of Civil Procedure, and in accordance with the jury's unanimous verdict and the entirety of the record, the Court hereby **ORDERS** and **ENTERS FINAL JUDGMENT** as follows:

1. Force MOS acquired all rights to the '409 Patent from Dr. Fu-Yuan Hsieh;
2. ASUSTeK has infringed Claims 1, 2, and 3 of the '634 Patent;
3. ASUSTeK has infringed Claim 1 of the '409 Patent;
4. Claim 1 of the '409 Patent is not invalid;
5. ASUSTeK's infringement was willful;
6. Force MOS is awarded damages and shall have and recover from and against ASUSTeK the sum of \$10,500,000.00 U.S. Dollars as a reasonable royalty in the form of a running royalty for ASUSTeK's above infringement of the '634 and '409 Patents;
7. Notwithstanding the jury's finding of willfulness, the Court having considered the totality of the circumstances together with the material benefit of having presided throughout the jury trial and having seen the same evidence and heard the same arguments as the jury, and mindful that enhancement is generally reserved for "egregious cases of culpable behavior,"² concludes that enhancement of the

² *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 579 U.S. 93, 106 (2016).

compensatory award herein is not warranted under 35 U.S.C. § 284 and consequently, the Court elects not to enhance the damages awarded herein;

8. Pursuant to Federal Rule of Civil Procedure 54(d), Local Rule CV-54, and 28 U.S.C. § 1920, Force MOS is the prevailing party in this case and shall recover its costs from ASUSTeK. Accordingly, Force MOS is directed to file its Bill of Costs;
9. Pursuant to 35 U.S.C. § 284 and Supreme Court guidance that “prejudgment interest should ordinarily be awarded absent some justification for withholding such an award,”³ the Court awards pre-judgment interest applicable to all sums awarded herein, calculated at the 5-year U.S. Treasury Bill rate, compounded quarterly, from the date of infringement through the date of entry of this Judgment;⁴
10. Pursuant to 28 U.S.C. § 1961, the Court awards post-judgment interest applicable to all sums awarded herein, at the statutory rate, from the date of entry of this Judgment until paid; and
11. This Amended Final Judgment shall be and is effective for all purposes as of June 11, 2025, being the date of entry of the original Final Judgment herein.

All other requests for relief now pending and requested by either party but not specifically addressed herein are **DENIED**.

So ORDERED and SIGNED this 12th day of June, 2025.



RODNEY GILSTRAP
UNITED STATES DISTRICT JUDGE

³ *Gen. Motors Corp. v. Devex Corp.*, 461 U.S. 648, 657 (1983).

⁴ *Nickson Indus., Inc. v. Rol Mfg. Co.*, 847 F.2d 795, 800 (Fed. Cir. 1988).