

Transcript of R. Jacob Baker, Ph.D.

Date: August 15, 2024
Case: NXP USA, Inc. -v- Bell Semiconductor, LLC (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NXP USA, INC.,

Petitioner,

V.

BELL SEMICONDUCTOR, LLC,

Patent Owner.

IPR2024-00168

Patent 7,345,245 B2

REMOTELY CONDUCTED DEPOSITION OF

R. JACOB BAKER, PH.D.

THURSDAY, AUGUST 15, 2024

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REPORTED BY: KARISA EKENSEAIR, CCR RPR RMR

DEPOSITION OF R. JACOB BAKER, CONDUCTED VIA ZOOM VIDEOCONFERENCE.

Pursuant to notice, before Karisa J. Ekenseair, Certified Shorthand Reporter in and for the States of Arkansas, Oklahoma, Missouri, Illinois, Tennessee, Georgia, Washington, New Mexico, and California; National Registered Professional Reporter; National Registered Merit Reporter; Notary Public.

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T A B L E O F C O N T E N T S

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PREVIOUSLY MARKED EXHIBITS

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P R O C E E D I N G S

R. JACOB BAKER

of lawful age, being first duly sworn, deposes and says in reply to the questions propounded as follows:

EXAMINATION

BY MR. SHAPIRO:

Q Good morning, Dr. Baker. My name is Jason Shapiro. I'm with the Devlin Law Firm. We represent the patent owner.

MR. SHAPIRO: I'm getting an echo.

Hello? Okay. It's gone.

Q The Devlin Law Firm represents the patent owner, Bell Semiconductor, in inter partes review 2024-00168, involving U.S. Patent Number 7,345,245.

Could you please state your full name for the record?

A Russel, R-U-S-S-E-L. Jacob, J-A-C-O-B. Baker, B-A-K-E-R.

Q Thank you, Dr. Baker.

So I see from your CV that you've been

deposed before in an inter partes review; is that correct?

A Yes.

Q Even though you've done this before, I'd like to go over some ground rules for the deposition so that we're all on the same page.

Is that okay?

A Yes.

Q During this deposition I'm going to ask you a series of questions. My questions and your answers will be recorded by the court reporter. And to help the court reporter do their job, it's important that we don't talk over each other. I'll try to stop and listen to you while you're speaking, and I'd ask that you do the same for me.

Is that okay?

A Yes.

Q It's also important that you speak up and answer my questions orally because the court reporter can't record nonverbal responses such as nodding or shaking your head. Okay?

A Yes.

Q If you don't understand one of my questions for any reason, just let me know and I'll try to ask it a different way.

Is that okay?

A Yes. That's okay.

Q Then your attorney may object after I ask a question. If that happens, you must still answer the question, unless your attorney instructs you not to answer on the basis of privilege.

Do you understand that?

A I understand.

Q And I'll try to take a break every hour or so. If you want to take a break at some other time, just let me know and we'll take one. The only exception to that is if I've already asked you a question, I'd like to get your answer to that question before we take the break.

Is that understood?

A Yes.

Q Okay. You may not consult with or confer with your attorney regarding the substance of the

deposition at any time during the deposition including any breaks.

Do you understand?

A Yes, I do.

Q And you understand that you're under oath and that you're, therefore, legally obligated to give truthful testimony during this deposition, correct?

A Yes.

Q Finally, is there any reason, medical or otherwise, why you cannot testify fully, truthfully, and accurately today?

A No.

Q Great. Do you understand that you're being deposed in connection with inter partes review Number IPR2024-00168 of U.S. Patent No. 7,345,245?

A I don't remember the exact IPR number, but that sounds right. The patent I'm here to talk about is the '245 patent.

MR. SHAPIRO: Brian, can you bring up the first exhibit and mark it -- it's 2024-05-08 10

Decision.

REMOTE TECHNICIAN: Stand by. And this one I'll go ahead and mark as Jacob 1.

MR. SHAPIRO: Baker. Let's do Baker 1.

REMOTE TECHNICIAN: That's right. Thank you, sir.

(Exhibit 1 marked for identification.)

Q Dr. Baker, I'm sharing with you a document that's being marked Baker 1. Can you confirm that this document is the institution decision in IPR2024-00168 regarding U.S. Patent No 7,345,245?

A Yes. Baker 1 says on the first page: Decision granting institution of Inter Partes Review 35 United States Code paragraph 314 -- or Section 314.

Q And if I refer to this inter partes review or this IPR or this proceeding, you understand that I'm referring to Inter Partes Review No. IPR2024-00168?

A Yes.

Q Did you review the institution decision?

A I looked at it briefly, but I did not read

it thoroughly.

Q Did you -- do you disagree with any parts of the institution decision?

MR. TAYLOR: Objection, form.

A I didn't read the decision thoroughly, but the parts I reviewed I don't recall being -- having any disagreements with any of the decisions. But again, I didn't thoroughly look at the document, and I didn't actually think about whether I agreed or disagreed with any parts. But again, what I did look at I think was fine, and I didn't have any issues with.

Q Can you turn to page 20 of the institution decision, please? And can you read lines 6 through 13 on page 20 of the decision?

A You want me to read it to myself or out loud?

Q You can read it to yourself. That's fine.

A Okay. May we scroll up a little bit so I can read the beginning of the paragraph?

Okay. I read that paragraph.

Q Do you agree with the institution decision

that, "The '245 patent does not a teach that recognition of the problems with these 'existing solutions' were known in the art"?

MR. TAYLOR: Objection, form.

A I don't think I agree with this. The -- I mean, there needs to be some context about what's being talked about. I don't think it would be reasonable for someone to attempt to patent something and then admit that what they're patenting is already known.

But I do think what I cited in my declaration as what was already known in the art is pretty clear and, from that point of view, supportable that it was known.

Q Do you address in your declaration whether or not the problems with the "existing solutions" in the '245 patent were known?

MR. TAYLOR: Objection, form.

A Yes. I mean, that's the point of my declaration is showing that what's claimed in the '245 patent was already known and, therefore, it wasn't -- it was obvious and/or anticipated in

view of a person of ordinary skill in the art.

Q Do you understand what the board is referring to when it refers to "existing solutions"?

MR. TAYLOR: Objection, form.

A I think they're addressing the words in what's disclosed in the specification specifically. For example, it says, "The '245 patent does not teach that recognition of problems with these existing solutions were known in the art."

But again, they're trying to patent something that was a solution to the problem, and so I wouldn't expect that they would say, Well, this problem is already known. That's what my declaration discusses, how it was known. And what I cited in the admissions of applicant admitted prior art in my declaration were simply to support my opinion.

Q But you agree that the '245 patent is silent as to whether the problems with the "existing solutions" were known in the art,

correct?

MR. TAYLOR: Objection, form.

A I wouldn't agree with that. I wouldn't say "silent." I think there's discussion of -- of what was known in the art. Again, I don't think it would be reasonable to claim something as inventive and then turn right around in the specification and say, Well, while I'm claiming this is inventive, it was already known. I would expect them not to say that in fact.

So, I mean, the point that they're silent on some aspect of what they're claiming or that they may not have addressed it head-on is not really surprising. It's expected. That's why I did the analysis in my declaration and pointed to what I pointed to as teaching what was claimed was known.

Q Dr. Baker, you're not answering my question.

MR. TAYLOR: Objection, form.

Q Let's -- let's take a look at -- I'd like to share with you Exhibit 1001.

REMOTE TECHNICIAN: Stand by. Let me put a sticker on this, sir.

MR. SHAPIRO: No. You don't need a sticker. It's already marked Exhibit 1001.

REMOTE TECHNICIAN: Okay. Stand by.

On screen.

(Exhibit 1001 previously marked for identification.)

Q Okay. Dr. Baker, I'm sharing with you a document marked Exhibit 1001. Is this document U.S. Patent No. 7,345,245?

A Yes.

Q If I refer to the '245 patent, do you understand that I'm referring to U.S. Patent 7,345,245?

A Yes.

Q Did you review the background of the invention of the '245 patent?

A May we go to roughly page 6 of the patent?

Okay. Page 7?

Yes, I reviewed the background of the invention that starts in Column 1 on page 7 of the

'245.

Q Okay. In the first full paragraph of Column 2, does the '245 patent discuss two existing solutions to overcoming problems with the prior art?

A Can we go to the bottom of the previous column?

Can we go back to the top of the Column 2?

This first full paragraph on Column 2 at the top discusses a couple of solutions to a problem of cracking in high-stress regions. I don't think that it's -- it's not saying that these are the only two solutions. These are just examples it's giving in the background.

Q Does the background of the invention of the '245 patent discuss disadvantages associated with these two existing solutions described in Column 2?

MR. TAYLOR: Objection, form.

A It uses the word "disadvantage," yes, to discuss the two solutions that it's talking about. There's advantages and disadvantages to any

solution. It's just a design choice of what you select.

Q Okay. Let's go back to the institution decision at page 20, which is Exhibit Baker 1.

Looking again at lines 6 to 13 on page 20 of the institution decision, do you agree that the '245 patent does not teach that recognition of the problems with these "existing solutions" were known in the art?

MR. TAYLOR: Objection, form.

A I mean, maybe at some point. I mean, the problem is, it's talking about all packaging technologies. And when you are trying to come up with a solution, it depends on a specific design that you're working on.

Again, I agree in Column 2 that there is some discussion of disadvantages. But, I mean, I would expect that given that patentee is trying to say that what they're doing is novel.

I clearly don't agree that it is. I discuss that in detail in my -- in my declaration. I think I've answered your question.

I think they're -- in the background section or in the patent, they're talking about the existing technologies for all packaging solutions and talking about the disadvantages. But I don't agree that, I mean, at a fundamental level that's what's claimed in the '245 is -- is inventive, I guess is what I'm getting at.

Q Dr. Baker, I didn't ask you whether what's claimed in the '245 is inventive.

I'm asking you about the existing solutions that are discussed at Column 2, lines 3 through 15, of the '245 patent. And with respect to the existing solutions that are discussed at Column 2, lines 3 through 15, of the '245 patent, is there any indication in the '245 patent that those existing solutions were known in the art?

MR. TAYLOR: Objection --

Q I'm sorry, let me restate that.

With respect to the first and second existing solutions that are described at Column 2 lines 3 through 15 of the '245 patent, is there any indication in the '245 patent that recognition

of the problems with those existing solutions were known in the art?

MR. TAYLOR: Objection, form.

A The '245 patent characterizes what you've cited there as background information in trying to motivate the reader to understand what it's claiming to be inventive.

Q So do you disagree or agree with the statement in the institution decision on page 20 at lines 6 through 13?

MR. TAYLOR: Objection, form.

A I don't -- I don't disagree with what the APJs had written there, but I don't necessarily agree. I think they're simply saying that the '245 patent is saying here's some background solution. Here's what we're going to do to be inventive, and I don't disagree that's the way they're characterizing and writing there because, I mean, it's information from the background section of the patent.

And I think that's answered your question. It's like, I don't disagree that it's background

information what they've cited, but I obviously do disagree that -- that they're trying to point to or somebody is saying the background solutions are -- are not teaching some way of solving the problem, and the patent is claiming that there's another way that's better. I just don't agree with that.

Q Let -- let's limit this to -- on page 20, lines 6 through 8, do you agree with the board that the '245 patent does not teach that recognition of the problems with these existing solutions were known in the art?

MR. TAYLOR: Objection, form.

A I agree with the board that's what the '245 patent is saying in the background section as motivation for their invention. So from that point of view, I agree that that information is in the background section of the '245 patent.

Q Okay. Thank you. Dr. Baker, you submitted two declarations in this proceeding, correct?

MR. TAYLOR: Objection, form.

A I believe I've only submitted one declaration in IPR2024-00168.

If you remind me of the other one, maybe that will jar my memory.

Q You submitted a first declaration with the petition and a declaration on June 28th, 2024; is that correct?

A May I take a quick look at that document if it's an exhibit?

Q Do you -- you don't -- sitting here today, you don't recall submitting a second declaration?

A Well, it may have been really short, so I may have done it and I don't remember doing it, but no, I don't remember the second declaration right off the top of my head.

Q I'd like to share with you a document marked Exhibit 1002.

(Exhibit 1002 previously marked for identification.)

Is this document the first declaration you submitted in this proceeding?

A This document is the declaration I

submitted when the IPR was filed. Yes.

Q And if I refer to your declaration or the declaration, you understand that I'm referring to the declaration that you submitted with the petition in this proceeding?

A Would you mind repeating that? If you're --

Q Yeah. Let me make it simpler.

So if I refer to your declaration or the declaration, you understand that I'm referring to this declaration, Exhibit 1002, correct?

A Yes.

Q Okay. Let's go to paragraph 15 of your declaration.

In paragraph 15 of your declaration, you refer to your curriculum vitae which was submitted as Exhibit 1003, correct?

A Yes.

(Exhibit 1003 previously marked for identification.)

Q Is the information provided in Exhibit 1003 a complete list of your

qualifications relevant to this proceeding?

MR. TAYLOR: Objection, form.

A Probably not. I mean, I -- if I started listing all of the things I've done, the length of the CV would get really large.

I mean, for example, in my lab at the university, I have a -- I have a setup for doing packaging which -- of electronic devices and mounting chips to printed circuit boards and things along that nature, and I probably didn't write anything about that in my CV.

But I have a link to a web page for my students to learn how to use the wire bonder and what materials to use for gluing the chip to the board or for solder reflow or things along that nature. So I don't think I listed -- I know I didn't list everything.

Q Okay. Now let's go to paragraph 8 of your declaration.

So in paragraph 8 of your declaration, you mention: Industry experience working with Freedom Photonics on packaging and testing of numerous

chips fabricated in both CMOS and SiGe technologies.

Correct?

A Can we scroll down a little bit?

Yes. Those were, for example, some -- we designed the chips, and then packaged them up in our lab and then sent them over to Freedom for characterization.

Q What did the packaging of those chips entail?

MR. TAYLOR: Objection, form.

A Depends. It -- if -- it depends on the type of chip.

If it was something that we had to get an optical signal into, it might be of -- might have got a package with an open -- opening or even maybe a lens on the top or we might have taken and connected them to a carrier that could go inside a socket or we might have glued them directly to the printed circuit board and wire bonded or soldered them to the -- to the carrier to the board.

I mean, if my students, the student thesis

and dissertations, there's lots of examples of chips mounted in various different ways in those.

Q And when did -- when did this work for Freedom Photonics take place?

A I guess that particular work was over the last ten years. But before that, I worked with them in the same areas.

These were startups out of UC Santa Barbara, a company called Atollo. And then before that, a company -- so they're all starting up. The company before that ended up selling some array of lasers that could generate incoherent infrared light to FLIR, F-L-I-R.

I don't remember. I mean, I've been doing this stuff since 1985, so they kind of blend together after a while honestly.

Q Did any of your industry experience involve fabricating integrated circuits?

A Yeah. That's my main thing.

Q Can you give me an example of one of your industry experiences that involve fabricating integrated circuits?

A I led the development of DDR memory in micron in the late '90s, the change from mounting the chips on lead frames and wire bonding from the middle of the chip to flip chip technology. I led the development of the delay lock loop while I was a professor at the University of Idaho there. I'm the sole author of one of the best-selling books ever written in chip design.

I mean, I've got an extensive background in chip design. I can probably talk for the next two hours on things that I've done.

Q Okay. Well, we won't make you do that.

But let's go to paragraph 17 of your declaration.

MR. SHAPIRO: Okay. Can you scroll through paragraph 17 for Dr. Baker, please?

A All right. Can we scroll down a little bit? Okay.

Q Is the list of materials in paragraph 17 of your declaration a complete list of the materials you reviewed in forming the opinions expressed in your declaration?

MR. TAYLOR: Objection, form.

A I tried to make it a complete list. If I cited something else in my declaration and didn't include it, then that would be included in the list. There is -- this jars my memory.

There is -- I was working on two IPRs related, and I made a typo in one of -- listing the priority date for a person of ordinary skill in the art. I think I listed it as -- from memory, October 2006, and it should have been -- I'm sorry, April 2006, and it should have been October 2003, or something.

It's a pretty obvious typo. Just wanted to make sure I mention that when I was thinking about it.

Q Okay. And, Dr. Baker, do you understand the difference between anticipation and obviousness in patent law?

MR. TAYLOR: Objection, form.

A I mean, that question, I'm sure at some level the answer is no.

But, I mean, as far as writing my report,

it was explained to me and I understand the difference from an expert point of view. I mean, I'm not a lawyer if you're going to ask me some very pointed question about RAM factors or something like that.

I mean, I think the general answer is yes.

Q You don't offer any opinions on anticipation in your declaration, correct?

MR. TAYLOR: Objection, form.

A I believe that's the case.

May I look at my declaration here and take a quick look to jog my memory?

Q Sure.

MR. SHAPIRO: Brian, can you give him control over the document?

REMOTE TECHNICIAN: Doctor, just click your screen and control is yours.

A I believe the answer is yes.

Q Okay. Well, let me -- for the record, let me ask the question again and then give me your answer, and I'll simplify it a little bit.

Did you offer any opinions on anticipation

in your declaration?

A I believe all of the grounds are based on obviousness.

Q When offering an opinion regarding obviousness of a patent claim, is it necessary to construe the claim?

MR. TAYLOR: Objection, form.

A If I understand the question -- maybe I don't understand the question because it seems -- the answer is, yeah, you have to know what the claim is claiming. But maybe I don't understand what you're asking.

Are you trying to ask something about the specific terms in doing claim construction? Or maybe it's an easy question and the answer is just, yeah, you have to construe what the claim means?

Q Well, did you construe the claims when forming the opinions expressed in your declaration?

MR. TAYLOR: Objection, form.

A I may not be understanding the question

because, I mean, it seems obvious I would have to construe the claims to -- to understand what's claiming. But if I'm missing something, please let me know.

Q Well, with respect to claim 1 of the '245 patent, how did you construe the limitation, "..wherein none of the signal spaces of bottom routing layer are located over ball pads of the ball pad layer which are disposed in an area within two ball pad pitches of the corner of the die..."?

MR. TAYLOR: Objection, form.

A I construed it according to what the words say, its meaning, explain an ordinary meaning of what the words are saying.

Q And what is the plain and ordinary meaning of the limitation I just read to you?

MR. TAYLOR: Objection, form.

A It's the words of the claim itself. Here, I'll go read those.

Q Would you like us to pull up Exhibit 1001 again so you can see the claims?

A No. I can get them out of my declaration. Maybe I can't. Yeah. Can you pull up claim -- or the claim 1 in --

REMOTE TECHNICIAN: Just click the next tab over to the left, sir, Exhibit 1001.

THE WITNESS: Hold on a sec. There's a little bit of a delay. It's not bad but...

A Yeah. I'm looking at what I've labeled D on page 60 of the PDF, paragraph 103. That term you asked me about, I construed it using the words of the claim or what it's claiming.

And that is: None of the signal traces of the bottom routing layer are located over ball pads of the ball pad layer which are disposed in an area within two ball pad pitches of the corner of the die.

So the plain words.

Q So can you explain to me in layman's terms what this means?

Let me restate that.

MR. TAYLOR: Objection, form.

Q Doctor -- Dr. Baker, can you explain to me

what the plain and ordinary meaning of limitation D in claim 1 of the '245 patent means?

MR. TAYLOR: Objection, form.

A The plain meaning is given by the words themselves. There aren't any signal traces on the bottom routing layer that are located over ball pads of the ball pad layer within two ball pad pitches of the corner of the die.

I mean, the words themselves define what the claim means. There's nothing -- we don't need to look to the specification or anything else for a construction of what this term means. It's plain and ordinary meaning. The words themselves teach what it means.

Q Okay. Let's take a look at -- let's look at paragraph 63 of your declaration, Dr. Baker.

A I'm there.

Q So with respect to limitation B of claim 8 of the '245 patent, how did you construe the limitation, "...said die having a corner defining a surrounding area of increased stress..."?

A So this is the typo I was talking about, I

believe. April of 2006 should be October 2003.

So the term, a top layer having a die mounted there on said die having a corner defining a surrounding area of increased stress, I defined it as ordinary just plain meaning.

Q What is the plain and ordinary of the limitation, "...said die having a corner defining a surrounding area of increased stress..."?

A A die is mounted on the semiconductor package. A corner of that die is an area of increased stress, and that corner or the increased stress area is the corner defining that surrounding area of the corner.

I mean, it's just the plain words. I mean, it's just what the words say. That's what the claim claims.

Q What is the -- Dr. Baker, in claim 8 of the '245 patent, what does the term "surrounding area of increased stress" mean?

A Did you mean to say claim 7? Maybe I heard incorrect, but I thought you said claim 8. Are you assuming we're looking at claim 8?

Because it depends on claim 7, going back to claim 7.

Q Right. We can -- we can discuss it with respect to claim 7. But you're aware that claim 7 has been disclaimed, correct?

A I believe that's the case. Yes.

Q Okay. So with respect to claim 7 and 8, what does the term, "surrounding area of increased stress" mean?

A I'm going to go back to the '245 patent. And let's take a look at -- I mean, without citing anything, just answering your question, it means the signal traces are routed away from the corner because corner has stress. I looked at -- if you look at -- if we need to cite something, we can look at paragraph 76 of my declaration and the annotated Figure 5. And there, I've just given an example with the circle. Of course, that's not limiting, of the -- an area where we're not routing signals through.

MR. TAYLOR: Counsel, it's been an hour. Is it okay to take a break at this point?

MR. SHAPIRO: I think that's fine. Let's take -- let's take a ten-minute break.

MR. TAYLOR: Excellent. Thank.

MR. SHAPIRO: Okay. Thank you.

(Whereupon a break was had.)

BY MR. SHAPIRO:

Q Dr. Baker, did you confer with your attorneys during the break?

A I spoke with them but not about the substance of my testimony.

Q Okay. Thank you. The -- we were talking about the language of claim 8 of the '245 patent.

Can you tell me what the term "area of increased stress" in claim 8 of the '245 patent means?

A May we go back to the PDFs? With my declaration I want to point to the language in claim 7 which is, as I talked about earlier, the plain and ordinary meaning.

REMOTE TECHNICIAN: Control is yours, Doctor.

A So the area of stress is defined by the

corner of the die as indicated here in paragraph 69 on page -- PDF page 42 of my declaration.

Q So it's your position that paragraph 69 of your declaration provides the plain and ordinary meaning of the term, area of increased stress?

MR. TAYLOR: Objection, form.

A No. The claim language E that is bolded right above paragraph 70 defines what an area of increased stress is. The term -- the claim term is its ordinary and customary meaning. It's just plain language.

Q So you can't provide me with the plain and ordinary meaning of the term "area of increased stress" in claim 7 and 8 of the '245 patent?

MR. TAYLOR: Objection, form.

A I have provided a definition. It literally says, defined by the corner of the die. I mean, the plain language is -- I mean, the words of the claim element teach what it means.

Q And you have nothing further to say about the meaning of area of increased stress in claims

7 and 8 of the '245 patent?

MR. TAYLOR: Objection, form.

A Well, I mean, I talk about that in detail in my declaration. If we look at the annotated image in paragraph 70 on page 42 of my declaration, I've annotated a high-stress zone, and the takeaway looking at that image is that the signal traces are routed away from that corner.

Now, if you're looking for, you know, a specific definition beyond the corner of the die, it's going to be a design choice for a POSITA. Because, for example, if a chip was thinner, you might have a bigger area, where if it's thicker, it might be a smaller area. It's just -- it's just that the corner of the die would be where the area of increased stress is defined.

Q Does the '245 patent explain what's meant by the term "area of high stress"?

MR. TAYLOR: Objection, form.

A Yes. It literally says, defined by the corner of the die.

It says: The area of increased stress

defined by the corner of the die. And I'm just reading directly from the claim in the '245.

Q Does the '245 patent talk about the meaning of areas of high stress anywhere else?

MR. TAYLOR: Objection, form.

A I mean, just from memory doesn't it talk about that in several other places, for example, the prior art?

Q Are you talking about the background of the invention of the '245 patent?

A Talking about the prior art that's discussed. I mean, if it would be useful, I can open the patent and skim it and look for areas that are related to the areas of stress in the corner of the die. I mean, I give in paragraph 70 an example of Figure 3 showing a corner of a die from one of the prior art references.

But I can look in the patent and skim it and look for more discussion. But, I mean, I may not be following because it's very clearly defined where the area of stress is by the claim language. It says, defined by the corner of the die.

Q Let's take a look at Exhibit 1001, Column 1, at line at line 57.

Does the ''245 patent at Column 1, lines 57 to 60 explain that areas of high stress are associated with the die corner 38A and, in particular, the ball pads which are positioned under the area surrounding the die corner 38A?

MR. TAYLOR: Objection, form.

A I can read that sentence into the record. But yes, it discusses areas of high stress.

Q Is there any reason to believe that the term, area of high stress, in the claims should be construed differently than it's described in Column 1, lines 58 through 60 of the '245 patent?

MR. TAYLOR: Objection, form.

A I mean, to the extent we're not changing what's claimed, I think it's fine to point to the die corner and the -- if there are balls underneath the die corner, stresses from the balls. But there's no requirement that the -- that ball pads be present in claim -- in the claim.

I mean, the claim defines what the area of stress is, and I don't think it would be honest or reasonable to change what the area of high stress is defined as in the claim.

Q What about claim 1 of the '245 patent? What is -- what does the term "...ball pads of the ball pad layer which are disposed in an area within two ball pad pitches of the corner of the die..." mean?

MR. TAYLOR: Objection, form.

A Would you mind repeating the question so I know I'm looking at the correct element?

Q In element D of claim 1, what does the term. "...ball pads of the ball pad layer which are disposed in an area within two ball pad pitches of the corner of the die..." mean?

MR. TAYLOR: Objection, form.

A That term is using the distance of two ball pad pitches to teach where none of the signal traces on the bottom routing layer are located.

Q Can there be ball pads in that area within two ball pad pitches of the corner of the die?

MR. TAYLOR: Objection, form.

A I mean, that's not claimed and that's not required, but as long as the signal routing layer doesn't go over the ball pads, I don't think it would be a problem to have the ball pads in there, but it's not a claim requirement.

The claim in the discussion of the two ball pad pitches is used just to give a distance. But, I mean, there doesn't have to be ball pads in that corner.

Q So what then is the meaning of, "...ball pads of the ball pad layer which are disposed in an area within two ball pad pitches of the corner of the die..."?

MR. TAYLOR: Objection, form.

A I mean, the claim claims that none of the signal traces on the bottom routing layer are located over ball pads or the ball pad layer which are disposed in an area within two ball pad pitches of the corner of the die.

I think why you don't have to have ball pads in there, if there were ball pads in there,

it's saying you can't route the signal traces over them.

Q Let's go paragraph 27 of your declaration.

In paragraph 27 of your declaration, you admit that none of the annotations you made to Figures 1 through 5 of the '245 patent are to scale, correct?

MR. TAYLOR: Objection, form.

A Correct. I say: Further note that none of the annotations of Figures 1 through 5 are drawn to scale, and that my -- and that any annotations made thereto are based upon '245 patent-related description.

Q Let's go to page 36 of your declaration, which is page 42 of the PDF.

Is the circular shaped high-stress zone that was added to Figure 3 of Devnani to scale?

MR. TAYLOR: Objection, form.

A I mean, it's to scale to the extent that it shows that signal traces are routed away from the corner. That's what I was trying to show there.

Q Did you draw the circular shape high-stress zone in Figure 3 on page 42 of your declaration?

A I don't recall. I don't think I did but I don't recall clearly.

I generally do the annotations with a PowerPoint and then cut and paste them into my declarations to make sure that the points are reflected -- that my opinions are reflected correctly, but I don't recall doing it for this one.

Q What's the size of the circular-shaped high-stress zone that was added to Figure 3 of Devnani on page 42 of your declaration?

MR. TAYLOR: Objection, form.

A Whatever it would need to be to meet whatever the design goals were.

There's no specific size. I mean, the key takeaway is that you're just trying to route signals away from that corner.

Q What's the size of the circular-shaped high-stress zone in annotated Figure 3 of

Devnani -- strike that.

So how large is the high-stressed zone in the annotated version of Figure 3 of Devnani?

MR. TAYLOR: Objection, form.

A I mean, it would be whatever size it needs to be. I was just highlighting the corner of the chip, or the die, to show that's where the high-stress region was.

It would depend on size of the die, the thickness of the die. It's -- the whole point of the circle was just to show the corner of the die, which is where the claim requires or defines the high -- increased area of high stress or area of increased stress.

And so, I mean, I could shrink it, and I don't think it would change my opinion. It's just I wanted to show the signals were routed away from that corner.

Q Is the radius of the alleged high-stress zone in the annotated version of Figure 3 of Devnani two ball pad pitches?

MR. TAYLOR: Objection, form.

A I think that radius is larger than two ball pad pitches. It's a bigger area, but I mean, I could adjust the size.

Q What do you consider two ball pad pitches?

A May we open Devnani? Or I think I could probably find it in my declaration if you don't want to open Devnani.

Q We can.

MR. SHAPIRO: Let's -- let's -- let's share Exhibit 1005 with Dr. Baker.

(Exhibit 1005 previously marked for identification.)

Q Is the document marked Exhibit 1005 that I'm sharing with you, U.S. Patent Application Publication 2003/0183919 to Devnani?

A Yes.

Q If I refer to Devnani, do you understand that I'm referring to Exhibit 1005?

A Yes.

Q Okay. And I'd asked you: How large is the alleged high-stress zone in the annotated version of Figure 3 of Devnani?

A I already -- I think I already answered that.

I said it's -- in the annotation, it's larger than two ball pad pitches. And then if you look at 302 and 303, in Figure 3 of Devnani, the annotated Figure 3 on page -- PDF page 42, paragraph 70, that shows a couple of bumps there.

If you go down and you look at the relative distance in the first page of Devnani of the 302, 303 relative to the -- the bumps 401, you know, that image may not be to scale. They show a similar or a little bit longer pitch or distance.

Q So you're measuring ball pad pitch from flip chip pads 302 and 303 of Devnani; is that correct?

MR. TAYLOR: Objection, form.

A Not exactly. The 302 and 303 are the bumps on the chip when they show a specific distance. And then the ball pads would be -- let me just see what Devnani calls them.

Yeah. Devnani calls them balls. Those would be the 401.

Q Are the balls 401 in Devnani located under the vias such as 306 and 307 in Figure 3?

MR. TAYLOR: Objection, form.

A I mean, there's no requirement that they are generally because you can look at that the 306 and 307 and see that they're not in the regular array.

I think in general you would say no. The ball pads are underneath the vias. They could be but it's not required. It's not necessary.

THE REPORTER: Is the word via and acronym? I don't see it.

THE WITNESS: Via is V-I-A and it just means a path that goes through --

THE REPORTER: Is it like the word "via"?

THE WITNESS: Yes.

THE REPORTER: Okay. Thank you.

BY MR. SHAPIRO:

Q So when you just told me the alleged high-stress area that was drawn in annotated Figure 3 of Devnani is more than two ball pad pitches, you're referring to ball pad pitches

between elements 302 and 303 of Figure 3, correct?

MR. TAYLOR: Objection, form.

A No. I didn't testify to that.

I said that if you look at Devnani and you look at -- I pulled it up in paragraph 40 of my declaration. And you look at the 302, 303, and the ball pad layer with the soldered balls 401, that there are similar distances there in this cross-sectional view.

And so in Devnani what we're pointing to, or the taking in Devnani and how I annotated that was -- and now I'm in the annotated Figure 3, which is what we discussed earlier but now I'm looking at the one in paragraph 41, is that the signal traces are routed away from the corner because the corner is the high-stress zone.

That's the point of me annotating that image, Figure 3 of Devnani, is to show that a person of ordinary skill in the art would understand that you want the signal traces to be routed away from a corner.

Q Are there any ball pads under the alleged

high-stress zone in the annotated version of Figure 3 of Devnani?

MR. TAYLOR: Objection, form.

A I -- I don't know.

I do know there's no signal traces routed there, and that's what the claim is requiring. So the signal traces be routed away from the high-stress corners.

Q How come you don't know whether there's ball pads under the alleged high-stress zone in the annotated version of Figure 3 of Devnani?

MR. TAYLOR: Objection, form.

A The ball pads are 401, and I don't see 401 in Figure 3.

Q So you're not sure where the ball pads are in the -- in Figure 3 of Devnani?

MR. TAYLOR: Objection, form.

A Since the claim doesn't require ball pads be present in the high-stress corner, I don't recall looking further into a disclosure of where those 401 are in this particular image.

Q Let's go back to Exhibit 1005 Devnani.

And can you please take a look at Figure 8 of Devnani, Dr. Baker?

Does Figure 8 of Devnani show a full grid array?

MR. TAYLOR: Objection, form.

A What do you mean by full grid array?

Q Well, let me ask you -- let me ask you that question.

Do -- do you know what a full grid array is? Let me restate that.

Do you know what a full ball grid array is?

A I -- I need some context to answer that question. I -- I have a general idea, but in one particular example I have in my head, it would be different from another example I have. So I don't know what context you're coming from.

And I -- as you see on the screen, I just did a search for full and the word "full" is not mentioned in the -- unless it's not searchable in the '245 patent.

Q Do you know what a partial ball grid array

is?

MR. TAYLOR: Objection, form.

A I mean, it's same answer. I need some context. I have an idea of what that might meant -- or mean.

But I -- I don't know specifically how that relates to the '245 patent or what we're talking about. So I need some context before I could give an answer that's useful.

Q How about the term, full area ball array?

MR. TAYLOR: Objection, form.

Q Do you know what that -- what the term, full area ball array means?

A I mean, I have an idea what it would mean to me sitting here in isolation, but I don't know how it relates to this matter or what the context is.

So if you could point me to something in one of the prior art references that uses the term and I could see how they're using it, then maybe I can provide a more useful answer, but I don't know what the context is.

So, I mean, for example, if a partial grid array means that an area in the middle is empty and the rest is populated to some degree, or it could mean that only, you know, one side has got solder bumps and the other side doesn't if that's what we're talking about in the context of solder bumping a package to a printed circuit board. I -- I just don't know what the context is.

Q Does the '245 patent talk about full area ball arrays or full array packages or partial or full array -- or dispersing ball pads in a partial or full array format?

MR. TAYLOR: Objection, form.

A Okay. I see it in Column 1, the partial or full array format. And that references Figure 2.

Q Is Figure 2 -- does Figure 2 of the '245 patent show a partial array or a full array?

MR. TAYLOR: Objection, form.

A So I'm looking at Figure 2. And I see an array and I don't see it zoomed out, whether it's full or partial in my mind, what that would mean.

Q Let's look at Figure 4 of the '245 patent.

Would you consider Figure 4 of the '245 patent as showing a full or partial array of ball pads?

MR. TAYLOR: Objection, form.

A If there was nothing else outside of those solder bumps, it would look like a full array.

Let's look at what the description of Figure 4 is.

It doesn't say full or partial.

It looks like the patent is agnostic to full or partial array format.

Q Going back to Devnani, Exhibit 1005, does Figure 3 of Devnani show a full or partial array of ball pads?

MR. TAYLOR: Objection, form.

A I don't know. I think this is the same question you asked me earlier. I don't see the -- the 401 there, but give me a second and I'll see if there's some other distinguishing characteristic.

I don't know. It doesn't show what kind

of array is used there in Figure 3.

Q Does Figure 4 of Devnani show a partial grid array of ball pads?

MR. TAYLOR: Objection, form.

A I don't know. I -- this is just a rendering of signal flow, so I don't know what type of array is used there. I -- I doubt four bumps are used for this type of packaging but -- I mean, it's just representing how signals go from the solder bumps 302, for example, down to the printed circuit board. It's not showing any specific mechanical layout of the bumps for bumping -- I'm sorry -- the solder balls for soldering a package to the printed circuit board. It's just a representation of signal flow.

Q In Figure 3 of Devnani, is the die mounted in a clear area devoid of ball pads?

MR. TAYLOR: Objection, form.

A I don't recall if that's disclosed in Devnani. I think it could be. But if you point me to where it is in Devnani, I'll take a look.

MR. SHAPIRO: Let's take a -- let's take a

five-minute break.

THE WITNESS: Okay.

MR. TAYLOR: All right.

MR. SHAPIRO: Thank you.

(Whereupon a break was had.)

BY MR. SHAPIRO:

Q Okay, Dr. Baker. Let's -- let's go back to Exhibit 1005 Devnani, and Figure 3.

A Okay.

Q Well, let's -- let's go to the actual Exhibit 1005 Devnani, Figure 3.

A Okay.

Q Can you draw on Figure 3 of Devnani what two ball pad pitches would be?

MR. TAYLOR: Objection, form.

Q Let me ask it.

Can you identify in Figure 3 of Devnani two ball pad pitches?

MR. TAYLOR: Objection, form.

A I think you already asked me if I knew where the ball pads were in Figure 3 and I testified no, I don't know. So no, I can't sketch

the ball pad pitch on there. It would be whatever the chip was designed to -- to interact with or to connect to.

Q Let's look at Figure 4.

Can you illustrate for me in Figure 4 of Devnani what two ball pad pitches would look like?

MR. TAYLOR: Objection, form.

REMOTE TECHNICIAN: It would be under comments, sir.

THE WITNESS: I clicked on that and -- okay.

A So again, as I testified earlier, this is a representation of how the signal from the bump, say 302, would go down to a solder ball 401 but -- so there's no -- it's not necessarily -- the image isn't to scale. It's just representative signal flow.

But two ball pad pitches would be -- a pitch is the difference or the distance between like points in an array. And so I picked the middle of the ball. And so one ball pad pitch would be the middle of that ball to the adjacent

ball. And two ball pad pitches would be the middle of one ball to a ball that's two away in a repeating array.

But again, the image isn't to scale. It's not -- that's not what this is showing.

Q In the annotated Figure 4 of Devnani that you just created, are the two ball pad pitches between the two lines that you just drew?

MR. TAYLOR: Objection, form.

A With all the caveats of this isn't to scale, yes. If I change the color here and I go back to red, because I was back at yellow -- oops, that's not what I wanted to do. Let me deselect and then change the color. Let's go with blue, and then let's draw the blue horizontal line.

It's not that I'm -- I'm shaking with coffee here. It's just there's a big delay between when I move the cursor and when I can see what's going on that I'm not used to.

So anyway, I'm going to go take that blue line that I've drawn at the bottom between the two 401s. So I'm going to copy it. I'll paste it.

And then I'll just pull it up here between, like, the 302, 303 which I think there is reference to that in one of the earlier images. But again, these -- I mean, it's not to scale so I don't think it's very useful.

Q Okay. Can we save this annotated image as Exhibit Baker 2, please?

MR. SHAPIRO: I suppose, Brian, you take care of that?

REMOTE TECHNICIAN: Yes, I'll do that. So this will be Baker 2. Yes.

(Exhibit 2 marked for identification.)

BY MR. SHAPIRO:

Q And just to be clear and the -- the distance between the red lines in annotated Figure 4 of Devnani is what you consider two ball pad pitches, correct?

MR. TAYLOR: Objection, form.

A Yeah. The blue horizontal line that I tried to draw between the two vertical red lines would be two ball pad pitches with the caveat that the 401 are more representative of the signal flow

and not representative of a grid array. It's just showing how signals go through a -- from the chip down through a package to the printed circuit board.

Q Dr. Baker, what -- what has more stress, a corner with ball pads under it or a corner without ball pads under it?

MR. TAYLOR: Objection, form.

A I mean, it depends on the thickness of the chip and the size. But, I mean, it could be the one with ball pads underneath the corner. But, I mean, if you went with a different size or material or thickness, it could be the other case where there aren't ball pads underneath it.

Q Well, all other things being the same, would a corner with ball pads under it define a higher stress area than a corner without ball pads under it?

MR. TAYLOR: Objection, form.

A If I understand what you're asking, I think the answer is yes, you would have more stress in a corner with ball pads than one

without. However, it's very -- it just depends on the -- you know, the sizes and the thicknesses and all that. But, I mean, in general I would say yes, but not always.

Q Okay. Let's go back to your declaration, Dr. Baker.

In paragraph 65 of your declaration, you identify the layer routing signal trace 201 in Figure 4 of Devnani as being a bottom routing layer, correct?

MR. TAYLOR: Objection, form.

A Would you mind repeating the question?

Q In paragraph 65 of your declaration, you identify the layer routing signal trace 201 in Figure 4 of Devnani as being bottom routing layer; is that correct?

MR. TAYLOR: Same objection.

A So again, this figure -- to answer your question, yes, that's what I identified. But this figure is conceptual. And so what I've tried to do is show the horizontal portions of the figure as the bottom routing layer. In this particular

horizontal portion, 201 would be on the same layer as, say, 206 and the vias would be the vertical portion. And so again, it's not showing all of the connections through the various layers. It's simply showing the signals go from the chip or the die down to the printed circuit board. So it's not meant to -- to show that, for example, 206 is at a different level than 20 -- 201. Those are just different signals.

Q Well, in the same paragraph of your declaration, you cite to paragraph 23 of Devnani for the, "A plurality of layers under the top layer said plurality of layers comprising a bottom-routing layer having signal traces 201 thereon."

Is that correct?

MR. TAYLOR: Objection, form.

A Yes. The point there -- and I'll try to be more concise with my answer, is that 201 represents a signal in the bottom routing layer.

Q Isn't it true that that quote in paragraph 65 of your declaration is not taken from

Devnani?

MR. TAYLOR: Objection, form.

A Did I make a typo there? Is that what you're saying?

Q That's what I'm asking.

Is the quote in paragraph 65 of your declaration actually language from claim 7 of the '245 patent that you've modified to include a reference number from Devnani?

MR. TAYLOR: Objection, form.

A Yes. The quoted portion is the claim language, and I just -- I shouldn't have put 201 in the claim language, but that's what I'm pointing to in the following sentence.

So the quoted portion is the claim language itself, and I should have removed the 201 and just had it in the following sentence, show that Devnani signal 201 is the -- meets this from the claim language.

Q You can see where that could be misleading.

A Right. It should have been in quotes or

something like that to make sure that it wasn't part of like a -- a cite. Maybe a quotes and a paragraph and Devnani, yeah. I can see that would be misleading.

Q I think you already mentioned this, but isn't it true Devnani discloses another routing layer, 206, between the layer you identified as the bottom routing layer and the interconnection balls?

MR. TAYLOR: Objection, form.

A That's not what I testified.

The 201 is a signal, as is 206. Let me pull those up. It's not -- that Figure 4 is not showing that 201 and 204 are different levels -- I'm sorry, 201 and 206 are different levels. It's simply showing a routing of signals from the IC die down to the printed circuit board.

Q Go to paragraph 67 of your declaration, Dr. Baker.

A I'm there.

Q In paragraph 67 of your declaration, do you identify elements 401 in Figure 4 of Devnani

as ball pads?

A Yes. It says, in part: Said ball pad layer having a plurality of ball pads 401 dispersed thereon.

Q And let's pull up Devnani Exhibit 1005, and take a look at paragraph 23.

A Okay.

Q Isn't it true that in paragraph 23 of Devnani, element 401 is described as an interconnection ball and not a ball pad?

MR. TAYLOR: Objection, form.

A I mean, you have to have a ball pad where there's an interconnection ball.

I mean, you can't take an interconnection ball and have it present on an insulator simply because it will be mechanically unstable.

Q That being said, there's no mention of ball pads in paragraph 23 of Devnani, correct?

MR. TAYLOR: Objection, form.

A I don't see the word "pad" in paragraph 23, but I don't think it would be reasonable for -- under any position to say

there's a ball pad but no ball -- I'm sorry, an interconnection ball but no ball pad.

They -- they have to go together. It's inherent. There has to be a ball pad if there's an interconnection ball. Mechanically, the system would be unstable if there wasn't a ball pad underneath an interconnection ball or above, depending on your orientation.

Q And Figure 4 of Devnani doesn't show ball pads either, correct?

MR. TAYLOR: Objection, form.

A This is -- again, it's a representation of signal flow. But, yes, correct. There are no ball pads.

But, again, it wouldn't be reasonable to take a position that a ball pad or a 401 isn't connected to a ball pad. I mean...

Q Is that why in your declaration you state that you were asked to assume that Devnani does not disclose a plurality of ball pads dispersed on a ball pad layer under the bottom routing layer?

A Not sure why I was asked that, but I mean,

paragraph 67 just is consistent and reiterates what I just testified.

I assume you're in paragraph 68. Give me a second to digest that because I don't recall why I was asked to assume that.

I mean, this is just saying that if you've got a ball -- ball, you need to have a ball pad. I -- I don't -- I don't -- again, I don't think it's reasonable to say that that's not true. But I don't know why they asked me to make that assumption, I guess maybe to cover all basis -- I don't --

Q Where in your declaration do you say that in order to have a ball, you have to have a ball pad?

A I kind of say it in paragraph 67. Says that if you have a -- ball pads 401, there has to be a ball pad layer.

Q But, of course, in paragraph 67 of your declaration, you mistakenly identified the ball pads as element 401, correct?

A Yes. Yeah. There are -- the ball pads

are -- I'm sorry, the balls are 401, and the ball pads layers would be what they sit on. Yeah.

It's -- if you've ever tried to solder -- if you try to solder to something non metallic, like an insulator or whatever, the solder will not -- there would be no adhesion. And if you had two devices between a solder ball that isn't adhered to one side, it would not make a good mechanical connection.

So you have to have a -- there's a solder ball, you have to have a solder pad for mechanical stability.

Q Well, let's -- let's go back to Exhibit 1001, the ''245 patent.

Do you agree the purpose of the '245 patent is to solve the problem of signal traces cracking in areas of high stress associated with ball pads which are positioned under area surrounding the die corner?

MR. TAYLOR: Objection, form.

A Did you just read claim language or is there something in the background that you read?

I'm not following and that was quite long. I probably need the question --

MR. SHAPIRO: Can you read -- can you read my question back to Dr. Baker, please?

(Whereupon the requested question was read.)

A I think in some instance that could be true, but I mean, you don't have to have ball pads in the corners. I mean, that's not claimed. It's high-stress areas of the corners where the signals go.

So, I mean, I could agree that that's, you know -- I mean, but it's kind of a subset of what's claimed is -- what's claimed is keep the signals out of the corners.

Q Okay. Let's look at the bottom of Column 1 of the '245 patent, beginning at line 65.

Take a look at that through the top of Column 2.

A Yes, I see that.

Q Isn't it true that the '245 patent at Column 1 line 65, to Column 2 line 2, discusses a problem if traces are routed or other metal

structures are provided on layer L8 over the ball pads 34 associated with the die corner 38A, cracks can extend through the traces 36 and cause failures due to trace cracks under cycled stress conditions, unquote?

MR. TAYLOR: Objection, form.

A I think you read it correctly.

Q And isn't it true that the -- the next sentence in Column 2 is, "One existing solution to overcoming this problem...", isn't -- is that accurate?

MR. TAYLOR: Objection, form.

A Column 2 line 3, says: One existing solution to overcoming this problem is to...yes.

Q And the problem that the '245 patent is referring to in Column 2 line 3, is that cracks can extend through traces 36 if traces are routed over ball pads associated with the die corner, correct?

MR. TAYLOR: Objection, form.

A If the signal traces go through the corner over balls, they can cause tracks -- cracks. Yes,

it's -- but I mean, the key takeaway is what it teaches is to keep the signal traces out of the corners.

Q We talked earlier about the existing solutions that are described in Column 2 of the '245 patent.

Do you recall?

A I recall us discussing that. Yes.

Q The second existing solution is to define a circular shaped area with a one-millimeter radius centered on the corner of the die and to make sure signal traces are not routed within the circular-shaped area, correct?

A Yes.

Q And then the background of the invention in the '245 patent also identifies a disadvantage of having a one-millimeter radius region under the die corner.

Is that also correct?

MR. TAYLOR: Objection, form.

A It talks about the disadvantages of the specific one-millimeter radius. Yes.

Q And at Column 2 lines 11 to 15, the '245 patent explains that the disadvantage of having a one-millimeter region under the die corner is that it isn't sufficient to avoid trace cracks in the bottom routing layer under temperature cycling conditions for all packaging technologies; is that correct?

A That's what it says. I think you read that somewhat correctly.

Q Okay. And in your opinion, what does the '245 patent mean when it says that the second existing solution is not sufficient for all packaging technologies?

MR. TAYLOR: Objection, form.

A Well, I mean, this goes back to what I discussed earlier. I mean, for example, you have different thicknesses of chips. You have different types of packages.

I mean, you might have -- you know, if the chip has a -- a bump, a pitch of -- I mean, the pads on the chip might be anywhere from 50-microns to 100-microns. You might look at that and say I

want an order of magnitude bigger for the bumps, so .5 millimeter to 1 millimeter. It's just the chips and packaging vary.

It's like there's not -- one millimeter is just an example. It's not a limiting -- it's not a limiting number. It just depends on the type of package and the thickness of the chip.

Q Are there any other factors that would go into why that might not be sufficient?

MR. TAYLOR: Objection, form.

A I mean, instead of focusing on why it may be insufficient, I mean, it clearly says that it is sufficient for some packaging technologies. So, I mean, I -- I don't -- I would need to see specifically what we're talking about because saying that one millimeter isn't sufficient for all packaging technologies means that it is sufficient for some packaging technologies, and I need to know specifics.

Q Well, you mentioned that it might be due to differences in thickness, might be due to, I think you said, size of the bumps.

Are there any other factors that might play into whether or not the one millimeter is sufficient?

A The material of the chip, the material of the package.

Q Anything else?

A These are all just -- a person of ordinary skill in the art would have design choices.

I mean, what I tried to point to in my declaration at a real high level is it was well known to not route signals near the corner of the chip.

And then how far out you route them would depend on, you know, the type of chip and maybe the, you know, the temperature range you wanted it to operate at reliably. There's just a lot to reliable packaging that you'd have to consider. It's not just picking one millimeter and saying, well, that won't work sometimes. I mean. I don't think that's very useful.

Q Is ball pad pitch a factor that might impact whether or not the one millimeter solution

is sufficient?

MR. TAYLOR: Objection, form.

A I don't know. Maybe.

Q You're not sure? You're not sure?

MR. TAYLOR: Objection, form.

A It's just too many variables.

I mean, for example, what's the temperature range? What's the material system? I mean, it's just you would need look at a particular chip. You know, is it a power semiconductor? Or is it -- I mean, I just don't know. These are all vague generalities.

I just -- I do know that saying one millimeter would work some of the times, and a person of ordinary skill in the art would know to -- to route signals away from the corner. I mean, that's pretty much common sense.

Q Is size of the die a factor that would affect whether or not the second existing solution would be sufficient?

MR. TAYLOR: Objection, form.

A Maybe. I mean, if you, for example, had

a -- a small die, you know, couple millimeters by a couple millimeters, what I fabricate with my students generally but it was a power semiconductor, you -- you might likely have a lot more stress on the corners where the materials come together than you would have in a much larger die where the semiconductor or the heating is localized in the one area of the chip. I just don't know. I mean, I'd need some specific details to form opinions.

Q Dr. Baker, is a high-stress zone shown in Figure 4 and 5 of the '245 patent?

A Is there a corner shown in those figures? I think if there is, then the answer is yes because that's what the '245 patent defines as a high-stress zone. So, yes. For example, in -- I annotated it in my report, but you can see the corner of the chip in Figure 4, for example.

Q Which reference number or reference numbers refer to the high-stress zone in Figure 4 of the '245 patent?

A So I've annotated the -- the chip and the

stress zones in -- on Figure 4 of the ''245 patent on page 15 of my declaration which is PDF page 21, for example.

Q Is a high-stress zone in Figure 4 of the '245 patent denoted by reference numeral 58?

A One of them is, yes.

Q How would you describe the shape of the high-stress zone 58 in Figure 4 of the '245 patent?

MR. TAYLOR: Objection, form.

A I mean, at a high level, it's a trapezoid. I mean, it's not what I -- it's -- it's a figure from the patent itself.

Q And in Figure 5, how would you describe the shape of the high-stress zone 58?

MR. TAYLOR: Objection, form.

A I'm looking at the annotated Figure 5 on page -- PDF page 22 of my declaration, Exhibit 1002. And at a high level, what they've drawn there on the figure is a trapezoid for a layer -- or for the high-stress zone in Figure 5 of the '245 patent labeled as 58.

Q Why is the high-stress zone 58 in Figures 4 and 5 known as a trapezoid?

A That's not exactly what I testified. I said the shape at a high level is trapezoidal. I didn't testify the '245 patent taught that those shapes were trapezoids. I think the point of those high-stress areas is they're just trying to show that the corner of the die experiences high stress.

Q Okay. Would you agree that the shape of the high-stress zone 58 in Figures 4 and 5 is polygonal?

MR. TAYLOR: Objection, form.

A Is that maybe -- is that what they call it in the patent and I just don't recall?

Q I'm asking you if you think it would be fair to characterize the shape that's shown in Figures 4 and 5 as polygonal?

MR. TAYLOR: Objection, form.

A I don't recall what that word means. Are you talking polygonal?

Q Yeah.

A Oh. Yeah. I think so.

Q Is the high-stress zone in any embodiment of the ''245 patent described as circular shaped?

MR. TAYLOR: Objection, form.

A I mean, in the applicant admitted prior art it's described as -- it can be circular. But, I mean, also if you look at the claim language and you go to the corner of the die and you go two ball pad pitches, that could be circular as well. I don't know if they use the word circular.

Did the icon for doing a scan get lost here or am I just missing it?

REMOTE TECHNICIAN: Check down here in the More Tools.

THE WITNESS: I don't know why it would disappear.

Q While you're looking let me ask another question.

THE WITNESS: Right here. Okay. Thank you.

Q Why -- why do you think the high-stress zone 58 in Figures 4 and 5 of the ''245 patent is

polygonal in shape?

MR. TAYLOR: Objection, form.

A That wasn't my testimony. You asked if it could be described as polygonal and I said, yeah, I think that might be a good --

Q Okay. But -- but that's not what I'm asking. Let me -- let me restate it.

Why do you think the high-stress zone 58 in Figures 4 and 5 of the '245 patent is shown as a polygon?

MR. TAYLOR: Objection, form.

A If a polygon is a shape that has four sides and each of the opposite sides are parallel, then I don't think it's a polygon. But, I mean, you're stressing my memory to 1978 or '79 when I took geometry. I don't remember the specific definitions of what a polygon is. I remember a trapezoid, I think, is a shape like what is shown in the figure.

But again, I -- I don't know why they drew those -- those -- those shapes the way they did. I don't have an opinion whether I know that's a

polygon or not. I mean, I'm just trying to answer your questions. I think it might be, but I don't know.

Q But you agree that the high-stress zone 58 in Figures 4 and 5 of the '245 patent is not a circular shape?

A What they've labeled there for 58 and 60 are not circles, no.

Q Okay.

MR. SHAPIRO: Let's take a -- let's take another -- let's take a ten-minute break, if that's okay.

THE WITNESS: Yeah.

MR. TAYLOR: You want to do lunch after the next break then?

MR. SHAPIRO: I mean -- yeah. Let me -- let me just see how much more I have and then --

MR. TAYLOR: Okay.

MR. SHAPIRO: Okay.

(Whereupon a break was had.)

BY MR. SHAPIRO:

Q I'd like to share Exhibit 1006 with Dr. Baker.

REMOTE TECHNICIAN: Stand by.

(Exhibit 1006 previously marked for identification.)

Q When it comes up, Dr. Baker, take a look at Exhibit 1006.

Okay. Is this document U.S. Patent Application Publication 2003/0003705 to Chung, et al?

A Yes.

Q And if I refer to Chung, do you understand that I am referring to Exhibit 1006?

A Yes.

Q In paragraph 130 of your declaration, do you describe Chung as disclosing an assembly including an integrated circuit in an IC package consisting of a vertical package section 304 and a horizontal package section 306?

A Give me just one sec. I was in the wrong PDF file.

Sorry, would you mind repeating the

question?

Q Yeah. In paragraph 130 of your declaration, you acknowledge that Chung discloses an assembly including an integrated circuit and an IC package consisting of a vertical package section 304 and a horizontal package section 306, correct?

A Can you break that down for me? There was a lot in there, and I tried to follow. If you're reading from some place, let me know, but --

Q Okay. Okay. I -- I'm paraphrasing.

So does Chung disclose an assembly including an integrated circuit and an IC package consisting of vertical package section 304 and a horizontal package section 306?

A Figure 3 of Chung shows a vertical package section 304, yes. There is a die in Chung that has a corner. And there's a horizontal package section 306, yes.

Q And the layers of the vertical package section in Chung are oriented perpendicular to the horizontal package section, correct?

MR. TAYLOR: Objection, form.

A Yeah. The portion that is made up of the vertical package section 304 is perpendicular to the horizontal packaging Section 306.

Q Okay. I'm going to share with you the document marked Exhibit 1008.

(Exhibit 1008 previously marked for identification.)

A Okay.

Q Is this document the Mobile Intel Celeron Processor 0.13 micron in Micro-FCBGA and Micro-FCPGA packages datasheet?

A Yes.

Q If I refer to Celeron, do you understand that I'm referring to Exhibit 1008?

A Yes.

Q In your declaration, you're not alleging that Celeron includes a vertical package section and a horizontal package section; is that correct?

MR. TAYLOR: Objection, form.

Q Let me ask it a different way.

Is it your opinion that Celeron discloses

a vertical package section and a horizontal package section?

MR. TAYLOR: Objection, form.

A The answer is no, but give me a second to refresh my memory.

Right. So I discuss -- so to answer your question, Chung -- I mean, Celeron does not disclose what's disclosed in Chung. That's why a person of ordinary skill in the art would be motivated to combine Chung and Celeron together because one teaches things that aren't taught in the other.

Q Would the combination of Chung and Celeron include a vertical package section and a horizontal package section?

MR. TAYLOR: Objection, form.

Q Let me restate that.

Does the combination you propose in paragraph 141 of your declaration include a vertical package section and a horizontal package section?

A You said 144?

Q 141.

A So just to be clear, when you package chip with a multilayer package, there is a vertical component to the package for routing the signals from the top of the chip down to the printed circuit board. There's also a horizontal component where the signals are routed horizontally perhaps on one of the layers of the package.

So from that point of view, the use of vertical and horizontal packages where you route signals up and down and left to right was present in all of the prior art that -- that I discussed.

So my combination, though, is still using the routing of signals up and down and left and right in the packaging. So from that point of view there is a vertical and horizontal packaging. It's just not exactly like stacking chips next to each other and routing the signals of stacked chips; or, you know, left to right and then stacking chips and going up and down, if I'm making any sense.

Q Right. So where do you explain this in your declaration?

MR. TAYLOR: Objection, form.

A I didn't explain what I just said.

Q In paragraph 141 of your declaration, you state that, "A person of ordinary skill in the art would have been motivated to combine the multiple routing layers of Chung with the clear area of Celeron."

Where would the clear area of Celeron be located in the assembly of Chung?

MR. TAYLOR: Objection, form.

A So, for example, if we look at Figure 5 on page 69 or page 75 of the PDF, the clear area would be into the page, for example, because we're just taking a slice of the -- the 3D view and the clear area would go inside -- inside the 3D view --

Q Well, can --

A -- into the page.

Q Let's -- let's open up Chung Exhibit 1006 again, and have you draw on Figure 5 where the

clear -- where you're proposing to position the clear area.

A On Figure 5?

Q Well, isn't that -- isn't that where -- isn't that where you were proposing to position the clear area from Celeron?

A Yes.

That would be the clear area in the middle of Figure 2 on prior art. Let me go to Figure 5 and try to draw on it.

Let me try Figure 4 first. And then if that doesn't make sense, I'll try to do it on Figure 5. The problem with Figure 5 is it's a cross-sectional view. So to see the clear area, we'd have to go into the page to see it.

So I'll try that and if it doesn't work, we'll switch, and I'll try it on the Figure 5.

Q Okay. So, Dr. Baker, you're drawing -- you're drawing a clear area in Figure 4 of Chung as -- to reflect what you're -- what you're proposing in paragraph 141 of your declaration; is that correct?

MR. TAYLOR: Objection, form.

A Not exactly. I'm drawing -- you asked where the clear area was. Clear area was under the die in my combination. That's what I understood.

I mean, I'm trying to draw that on the top view where you can see the top or layout view of the die. And then I said if that doesn't make sense, then I can try to draw on Figure 5.

The problem with Figure 5 is that it's a cross-sectional view. So you'd have to go into the page to see the area under the die where there aren't any ball pads or any connections.

So let me try annotating Figure 4 and if that doesn't make sense, we'll go to Figure 5, and I'll -- I don't know how I'll do it, but I'll try.

And I'm doing the best I can given there's a delay here.

So this is the top view. And then below the chip is a -- I guess I could draw it a little bit bigger if I needed to, to match Celeron. But I'm trying to show the area under the die as

taught in Celeron doesn't have ball pads.

Do you want me to try it on the --

Q Well, so explain to me what you've drawn on Figure 4 of Chung.

A I'm trying to draw a clear area underneath the die and -- like is taught in Celeron. And I am on page -- PDF page 77 of my declaration, and so that's an angled view.

If I go back to Chung and I go to Figure 5, I'm trying to draw an area underneath the chip that's -- I don't know how to do it, that's cleared out from connections, from the ball pad connections.

So let me try on this. Let's say I go draw a line right straight down here and a line straight down here and then these ball pad connections underneath are not there and then all of the connections -- I'm drawing circles now -- on the left and the right are there.

Q Okay. So you -- in Figure 5, you've drawn two vertical lines. And between those two blue vertical lines, you've -- you've placed an X to

indicate that there's no ball pads between the two vertical lines. And then you've -- you've drawn circles to the left and to the right of the vertical lines and indicated that the -- all the ball pads would be in those areas that are circled; is that correct?

MR. TAYLOR: Objection, form.

A Yes.

Q Okay.

MR. SHAPIRO: Let's save this exhibit as -- what are we up to? Baker 3, Exhibit Baker 3?

REMOTE TECHNICIAN: Yes. Baker 3.

(Exhibit 3 marked for identification.)

Q And would the combination proposed in paragraph 141 of your declaration include ball pads within two ball pad pitches of the corner of the die?

MR. TAYLOR: Objection, form.

Q Well, let's start here.

Does Celeron disclose ball pads within two ball pad pitches of the corner of the die?

A I'm getting a little confused. My understanding is the claim requires signal traces, not be located within --

Q I'm not -- I'm not asking about the -- the claim. I'm asking about what the prior art discloses.

So now we have two questions sitting out there. Let's start with the first question.

Does Celeron disclose two -- does Celeron disclose ball pads within two ball pad pitches of the corner of the die?

A There aren't dimensions on what is claimed there, so I don't know. I mean, depends how far away -- I'm going to look at Celeron Figure -- I'm on page 77 of my declaration, and there's an annotated figure there of a clear area and there aren't dimensions.

And so I don't know, for example, what the pitch of the ball pads are in the bottom view of the package, so I can't answer yes or no to that question.

I mean, if it was related to the claim

language, I might have looked into that.

Q But you did specify dimensions for the clear area in the die in your declaration, correct?

A I specified it at the level of two ball pad pitches, but I didn't give a number if I recall.

I mean, if you point me to it, maybe it will jog my memory.

Q Well, given what you've just told me, do you know whether the combination proposed in paragraph 141 would include ball pads within two ball pad pitches of the corner of the die?

MR. TAYLOR: Objection, form.

A Okay. I stand corrected. I see on the top of page -- PDF page 78, there are some dimensions of ball pads.

So in paragraph 171 -- and I did do an analysis there. I had forgotten.

Q Are you still thinking, Dr. Baker?

A I said I mistakenly didn't remember the dimensions in the table; and that I did do an

analysis to show the two ball pad pitches and I thought I answered your question, but maybe I didn't.

Q Okay. Well, now that you've refreshed your memory, does Celeron disclose ball pads within two ball pad pitches of the corner of the die?

A Celeron discloses that there are no ball pads -- ball pad layer disposed within the two ball pad pitches of the corner of the die as I wrote in paragraph 140.

Q And does the combination proposed in paragraph 141 of your declaration include ball pads within two ball pad pitches of the corner of the die?

MR. TAYLOR: Objection, form.

A The ball pads in the combination are not within two ball pad pitches of the corner of the die. They would be outside the corner of the die as I discussed in paragraphs 140 and 141.

Q Okay.

MR. SHAPIRO: That's all I have for now.

I'm going reserve the rest of my time for recross if you're -- if there's going to be redirect.

MR. TAYLOR: No redirect.

MR. SHAPIRO: Okay. Then that will -- that will conclude our deposition.

I appreciate you taking the time to speak with us today, Dr. Baker.

THE WITNESS: Thank you.

MR. SHAPIRO: Karisa, do you -- you have our order, right?

THE REPORTER: I do have your order.

Mr. Taylor, I do not have orders for you.

MR. SHAPIRO: In other words, do you want a rough draft? Do you want expedited delivery of the transcript?

MR. TAYLOR: No.

THE REPORTER: Do you want to order the transcript for regular delivery? Would you like a copy of the transcript?

MR. GARLICK: Yeah. Let's look at the draft first.

(Off-the-record discussion.)

THE REPORTER: Okay. The rough will come to you this afternoon and then we'll just -- I'll have the final -- I'll just make a note for final in regular regular time. And if you do change your mind, you can just contact Planet and then they can change it up for you.

MR. GARLICK: Yeah. Thank you. Appreciate it.

(Whereupon the proceedings were concluded at 2:45 p.m. CST)

CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC

I, Karisa Ekenseair, Certified Reporter and Notary Public within and for the State of Arkansas do hereby certify: That R. JACOB BAKER, the witness whose deposition is hereinbefore set forth, was duly sworn by me before the commencement of such deposition and that such deposition was taken before me and is a true record of the testimony given by such witness.

I further certify that the adverse party, Petitioner was represented by counsel at the deposition.

I further certify that the deposition of R. JACOB BAKER, occurred virtually on August 15, 2024, commencing at 11:09 a.m. to 2:45 p.m. CST.

I further certify the inspection, reading and signing of said deposition was not waived on the record by agreement of all parties.

I further certify that I am not related to any of the parties to this action by blood or marriage, I am not employed by or an attorney

to any of the parties to this action, and that I am in no way interested, financially or otherwise, in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal this 18th day of August, 2024.
My commission expires: 6-18-2028



Karisa Ekenseair, CCR, RPR RMR LS #802
Notary Public in and for
Pulaski County, Arkansas
Commission No. 12704567

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