

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY, INC.,
Petitioner,

v.

YANGTZE MEMORY TECHNOLOGIES COMPANY, LTD.,
Patent Owner.

IPR2024-00789
Patent 10,861,872 B2

Record of Oral Hearing
Held: July 29, 2025

Before: JO-ANNE M. KOKOSKI, KIMBERLY MCGRAW, and
MICHAEL T. CYGAN, *Administrative Patent Judges*.

APPEARANCES:

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P R O C E E D I N G S

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JUDGE KOKOSKI: Good afternoon. Today, we will hear arguments in IPR2024-00789 concerning U.S. Patent Number 10,861,872. I am Judge Kokoski, and I'm joined today by Judge McGraw and Judge Cygan. Let's start with appearances, beginning with Petitioner.

MR. LANG: Good afternoon, Your Honors. Jason Lang on behalf of Micron.

JUDGE KOKOSKI: Thank you. Patent Owner?

MR. DAVIS: Good afternoon, Your Honor. James Davis and Andrew Radsch of Ropes & Gray for the Patent Owner YMTC. And along with us is Allen Cross from our firm, as well as Daniel Chan from YMTC.

JUDGE KOKOSKI: Okay, thank you. Welcome, everyone. Before we begin, I'd just like to remind the parties that we each have a copy of the demonstratives that you provided. During your argument, please identify clearly and specifically the demonstrative referenced by slide or screen number so that everyone can follow along, and to ensure clarity and accuracy of the court reporter's transcript.

As set forth in our hearing order, each party has 60 minutes to present their arguments. Petitioner will proceed first and may reserve time for rebuttal. How much time would you like to reserve for your rebuttal?

MR. LANG: Fifteen minutes, Your Honor.

JUDGE KOKOSKI: Fifteen? Okay. Patent Owner will then have 30 minutes -- 60 minutes, sorry, to present your case and you may also reserve time for a surrebuttal. How much time would you like to reserve?

1 MR. DAVIS: I would like to reserve 20 minutes.

2 JUDGE KOKOSKI: Twenty? Okay. Great.

3 MR. DAVIS: And whenever, Your Honor, it's convenient, I had
4 one administrative matter to address but happy to take that up after you're
5 finished.

6 JUDGE KOKOSKI: I think you can go ahead and address that
7 now.

8 MR. DAVIS: Okay. Thank you, Your Honor. And with our
9 apologies, this morning we noticed that one of the exhibits, which is the
10 deposition transcript, was a transcript for another proceeding. It's Exhibit
11 2008. Under 37 CFR 42.53, the correct deposition transcript has to be
12 submitted for this matter. I believe both parties had access to it. We
13 communicated with Mr. Lang this morning. We don't intend to cite any
14 additional portions of the transcript. We just intend to put in the corrected
15 transcript into the record to swap out Exhibit 2008 as currently filed with the
16 correct Exhibit 2008. We have paper copies of that, if that would be helpful
17 to Your Honors. I'm not sure that it's going to impact the proceedings today,
18 but with apologies, we did note that this morning.

19 JUDGE KOKOSKI: Okay. Yeah, that should be fine. I presume
20 the Petitioner doesn't have any objections.

21 MR. LANG: No objections. I think it was just a clerical error on
22 the filing.

23 JUDGE KOKOSKI: Okay. Great. I don't think we need paper
24 copies. Yeah, we're fine without the paper copies, but I appreciate you
25 bringing those.

1 MR. DAVIS: All right. Thank you, Your Honor. On the topic of
2 paper copies, if you would like a paper copy of the demonstratives, we have
3 those as well, but happy to keep it electronic if that's preferable.

4 JUDGE KOKOSKI: I think we're okay with those, too.

5 MR. DAVIS: Thank you.

6 JUDGE KOKOSKI: All right. Thank you. Okay. With that,
7 Petitioner, you can proceed when you're ready.

8 MR. LANG: And will this screen be on or no?

9 JUDGE KOKOSKI: It should -- I think it can be on.

10 THE CLERK: Your Honor, we're working on it right now.

11 JUDGE KOKOSKI: Okay.

12 MR. LANG: And, Your Honors, I should say Kenneth Luong,
13 who, also on behalf of Micron, is here with me as well today.

14 JUDGE KOKOSKI: Thank you. Welcome.

15 MR. LANG: And, Your Honors, if you'd like me to proceed
16 without -- if you have the copies and they're adequate in front of you, I can
17 proceed.

18 JUDGE KOKOSKI: I think that's fine with us, yes, if you'd like to
19 go ahead.

20 MR. LANG: Okay. I'm ready when you are, Your Honors.

21 JUDGE KOKOSKI: Okay. Go ahead.

22 MR. LANG: Your Honors, I'm just going to provide a summary of
23 the grounds real quick. There is two grounds in this petition, Tessariol
24 Ground. And that ground, the Board issued a preliminary construction on
25 dummy source structure. And under that preliminary construction, there's no

1 dispute that Tessariol is a dummy source structure. There's just one
2 argument left for Claim 1, and that is whether the dummy source structure in
3 Tessariol comprises a conductive contact. There's one argument against
4 Claims 3 and 4 relating to a nominally equal distance requirement, and
5 nominally is an important word there that I'll get into.

6 For the Park ground, preliminarily, the Board found that it did not
7 satisfy this construction because the common source lines that we're pointing
8 to indeed do function as a source. Further, there was the issue of whether it
9 met the surrounding limitation. So for that ground, I'm going to touch on
10 those two issues, but I want to focus on Tessariol today.

11 Turning to Slide 6. So we're going to talk a lot about this
12 conductive contact today. Then, in summary, the specification is very clear.
13 You see it there on the left. A source structure may comprise a conductive
14 contact. And then right after that, it says, in some embodiments, this dummy
15 source structure functions as interconnect.

16 What the dispute boils down today is Patent Owner's construction
17 is, effectively, an interconnect. That is an optional embodiment. I'm going
18 to go through in detail the specification's descriptions, but, as you see there
19 in the middle, the conductive contact is the metal fill in the dummy source
20 hole. It provides a pathway from the top of the stack into the stack. Indeed,
21 when the process for forming the conductive contact is described, the last
22 step, it says, you put the metal into the dummy source hole, and you have a
23 contact. There's nothing about you have to add some type of adjoining
24 structure.

25 Turning to Slide 8. The petition established that Tessariol

1 discloses, for example, four of these dummy source structures surrounding a
2 staircase contact. There is no dispute that that's a staircase contact and those
3 are dummy source structures. Indeed, I should have put a picture of the '872
4 patent up. If you rotate that 45 degrees, that is the identical arrangement.

5 The dispute centers around this conductive contact. The petition
6 demonstrated that Tessariol discloses it, because it discloses a dummy
7 source hole filled with conductive contact with a metal material. Indeed,
8 here's a portion from the specification. In some embodiments, dummy
9 source structure includes dummy source hole filled with conductive
10 materials as a contact 179. As I get to the file history, the file history
11 actually correlates this contact 179 with the conductive contact.

12 A separate issue today is the petition also demonstrated, it would
13 be obvious to put this adjoining structure on top of these dummies, the
14 dummy as in Tessariol. It reduces processing time and cost. There's been
15 further developments in the trial, where both experts talk about this
16 repeating pattern, why you repeat or fabricate repeating patterns in
17 semiconductors.

18 JUDGE CYGAN: Counselor, this is Judge Cygan. Can I ask you
19 a couple of questions on that slide?

20 MR. LANG: Yes, Your Honor.

21 JUDGE CYGAN: In your quote of the '872 patent, the holes are
22 filled with conductive materials, but it's filled with them in a certain way,
23 right? "As a contact." Isn't that a bit of a difference than just any hole filled
24 with conductive materials?

25 MR. LANG: It doesn't say that, Your Honor. And as I can get

1 into, they're filled in exactly the same way. The point of the '872 patent is
2 that that may be a non-functional contact. It may have a dead end
3 somewhere. And so, this portion of the specification doesn't say anything
4 about the insulation layer.

5 JUDGE CYGAN: So what does it mean that it says as a contact?

6 MR. LANG: Yeah, the contact is traveling through the stack.

7 And, as the file history confirms, the fact that it's metal or conductive
8 material is the contact. It provides a pathway through the stack.

9 JUDGE CYGAN: So you're saying that "as a contact" it doesn't
10 tell us anything further about the structure of the hole?

11 MR. LANG: It travels through the stack, yes.

12 JUDGE CYGAN: Well, a hole filled with conductive materials
13 travels through the stack, right? But does it necessarily have to be a contact?
14 That says that's being filled as a contact.

15 MR. LANG: I think, certainly, the way the specification defined it
16 was a dummy source hole through the stack filled with metal materials is the
17 contact. When they draw the arrow to 179, they point right to the
18 conductive core.

19 JUDGE CYGAN: So if you have a dummy source hole that's
20 filled with conductive materials and travels through the stack, does it matter
21 whether or not it extends to the surface or whether or not it can touch
22 anything? If it's completely buried within, is it still a contact?

23 MR. LANG: I would say, with respect -- I would say yes, because
24 the embodiments of the '872 patent, as Dr. Kuhn admitted, the Patent Owner
25 makes a lot of the exposed surface on top. That's either going to be

1 connected to a peripheral device or it's going to be capped. That's why they
2 show it exposed. There's two options there. They never do show it
3 connected to a peripheral device, but certainly, you could connect it to a
4 peripheral device or it could be a dummy, as the claim term we're talking
5 about. In all the evidence we submitted, dummy usually means an electrical
6 inoperable structure.

7 I would say further, Your Honor, Tessariol, they make those liners
8 for the -- as we described in the petition, the liners for the dummies and the
9 vias are made exactly at the same time. And so, even if you look at their
10 annotations, they annotate yellow, the liner. They do not annotate a yellow
11 liner on top, because the active vias and the dummy vias, the insulating liner
12 is exactly the same. On the bottom, it's removed for the dummies, just like
13 the actives, and it directly hits the substrate. So, even if there was some type
14 of distinction about the insulating liner, I don't see that in any of the
15 specification or the file history. The Tessariol is the same as the '872 patent.

16 JUDGE CYGAN: I'm still trying to understand if there's any
17 meaning to the word contact that you'd like to give to us here.

18 MR. LANG: Certainly. A contact could be -- as Dr. Kuhn
19 admitted, and I'll go through her testimony -- a contact provides a
20 passageway, and it can connect two things. When it does form those two
21 connections, it's functioning as an interconnect. Okay, or it could be an
22 electrically inoperable contact and, as Dr. Kuhn said, sometimes you
23 fabricate those. She did it in her own work. It's helpful to a layout
24 sometimes. So, it's a contact because it's providing that path through. Now,
25 you could connect something on top, and it functions as interconnect or not.

1 JUDGE CYGAN: So a contact may touch something else, it may
2 not touch something else, it may conduct to something else, it may not
3 conduct to something else.

4 MR. LANG: Correct. If you're operating it functionally,
5 electrically, it becomes a -- and the patent's word functions as interconnect.

6 JUDGE CYGAN: So the interpretation you're asking us to take is
7 that the conductive contact has to be conductive material extending through
8 the stack.

9 MR. LANG: Correct.

10 JUDGE CYGAN: Okay. Let's move to your second point on
11 there, the obviousness. So on your slide, you say it would have been
12 obvious for the dummy vias to include the same structure as the active vias
13 to reduce processing time and cost. How does that square with your
14 construction of what a dummy structure is?

15 MR. LANG: Okay. Because the dummy structure, we've
16 decided, as Tessariol itself says, has a dead end. Okay. And what you could
17 do, if you want to connect it to a peripheral device --

18 JUDGE CYGAN: I'm sorry, let me redirect you. Your
19 construction of a dummy source structure is the structure that results from
20 the gate replacement, correct?

21 MR. LANG: Oh. That's our construction of a dummy source
22 structure, correct.

23 JUDGE CYGAN: Okay. And so, if the only meaning for a
24 dummy source structure is the structure that results from filling in the hole
25 from a gate replacement, why does it matter if it should have the same

1 structure as active vias?

2 MR. LANG: Well, our construction is that, basically, the dummy
3 source hole, that is, of course, the source of where the gate replacement
4 process happens, and the '872 patent describes performing the gate
5 replacement through that hole. And so our construction is really saying that
6 this structure is located where that occurs. The fact then, separately, the
7 claim requires a conductive contact, and the conductive contact is what goes
8 in that hole. So the conductive contact is what's going into the hole, the hole
9 is being used for the gate replacement process.

10 JUDGE CYGAN: When you are defining your dummy source
11 structure as something which fills the holes during the gate replacement, so
12 your dummy source structure is that which is being used to fill in the holes
13 from the gate replacement structure, how is that different from the active
14 vias? Aren't they also filled during the gate replacement?

15 MR. LANG: I don't think the '872 patent ever describes that the
16 source structures are used for the gate replacement process. I believe it
17 consistently refers to the dummy source holes. I believe in every instance
18 that they're talking about the dummy source holes, they're using those for the
19 gate replacement process.

20 JUDGE CYGAN: Dr. Banerjee, in Exhibit 1003, said the '872
21 patent discusses the traditional gate replacement process. The alternating
22 stack is first constructed using sacrificial gate layers. Subsequently, the
23 sacrificial layers are etched away and replaced with conductive layers to
24 form gate layers, also known as word lines. So aren't the word lines being
25 created by etching away the sacrificial layers and refilling them with

1 conductive layers?

2 MR. LANG: Right. And that happens through the dummy source
3 holes.

4 JUDGE CYGAN: Okay. Well, your dummy source hole, explain
5 to me how your dummy source hole construction is different than what's
6 being -- how is that being distinguished from the active vias?

7 MR. LANG: I would say our construction would embrace that you
8 can have a dummy source structure, whether that is just a contact that has a
9 dead end or a contact that is an active contact. Both of those could be the
10 dummy structure.

11 JUDGE CYGAN: Okay. So is that what's behind your
12 obviousness statement? Is that since the dummy source structures are
13 essentially the same as the active structures, then it would be obvious to do
14 them the same way, to reduce processing time and cost? Is that the point
15 you're making?

16 MR. LANG: The point we're making is that if you see -- I could
17 have a better figure, there's an irregular pattern on the Tessariol in Figure 16
18 where there's an irregular space. Even Dr. Kuhn said it's an irregular space,
19 because they're not putting an interconnect 82 on each of the dummy vias.
20 And Tessariol basically says you may not put that on there. And our
21 obviousness point is that, in semiconductor processing, if you don't have a
22 repeating pattern, there's unpredictability in the lithography, there's
23 unpredictability in the etching rates. So if you just make it a consistent
24 pattern by putting 82 on every one of those, then you take that
25 unpredictability out. You don't have to mitigate that unpredictability in all

1 of those different cases, and it's easier to process. Dr. Kuhn's testimony said,
2 yes, repeating patterns are common. You know, their case is always finding
3 a red herring for a general basic truth isn't always true. But as Dr. Kuhn
4 said, her testimony, I had it in one of the slides, she said even in her own
5 personal work, for a contact pad, yeah, we don't always use it, but
6 sometimes it's just more convenient for the layout to put it there. And that's
7 what we're saying, is that it would be easier to put, like, 82 on each one of
8 those.

9 JUDGE CYGAN: Thank you, Counsel.

10 MR. LANG: So I want to briefly highlight three points the Board
11 made in its institution decision because, throughout the trial, nothing's been
12 disturbed with these three points. In fact, they've been reinforced. And,
13 starting with the first point, this in some embodiments language, in some
14 embodiments, they're in direct contact with the substrate and may provide
15 interconnect. Thus, it follows that, in some embodiments, it may not. And,
16 indeed, I'm sure you're aware of that Guardant case directly on point here.
17 They've cited no law to the contrary on that. The second point --

18 JUDGE MCGRAW: Excuse me. What slide are you on?

19 MR. LANG: I'm sorry. Slide 10.

20 JUDGE MCGRAW: Thank you. If you could update the panel
21 when you switch slides for those of us not in the room, that would be
22 appreciated. Thank you.

23 MR. LANG: Sure. The second point, the Board had preliminarily
24 found this was permissive language. Indeed, Patent Owner now has
25 confirmed that "may function" means "may" or "may not". And the third

1 point is important. The Board said, well, you haven't found any express
2 intent to require dummy structures comprising a contact to physically
3 contact another structure. Indeed, what's become clear is that they
4 effectively need to point to some definitional or disclaimer, because Dr.
5 Kuhn is admitting their construction reads out various types of contacts,
6 including contacts in her personal work. And, yet, there is no definitional
7 language or disclaimer that's been pointed to.

8 I'll turn to Slide 13, and I just want to start with -- that Patent
9 Owner's positions have been internally inconsistent. You know, when
10 they're just describing a dummy, as the word suggests, it functions as a
11 mechanical support member. All the evidence that we submitted on dummy
12 is all that is electrically inoperable. That's what dummy typically means. It
13 may have an electrical dead end. But then when they try to distinguish
14 Tessariol, turning to Slide 14, they come up with a construction that says
15 that it's a conductive structure that permits current flow with an adjoining
16 conductive structure.

17 Now, this is basically, they're saying, it has to be an interconnect.
18 Why? If you have a dead end, current doesn't flow. If you cut the wire,
19 current doesn't flow. So if you're permitting current to flow, you have a real
20 circuit.

21 Now, turning to Slide 15, and Your Honor had asked about this,
22 absolutely, it's saying contact 244 -- and I blew that up because it's not
23 pointing to the top, it's not pointing to the bottom, it's pointing to the middle.
24 It can be formed by depositing conductive materials into the dummy source
25 hole. Okay. And it says over the spacer. It doesn't say any details on the

1 spacer. Then it says a dummy source structure including spacer 242 and
2 contact 244 is thereby formed. It is thereby formed. It doesn't go on to talk
3 about adjoining structure. Anytime it talks about adjoining structure, it says
4 in some embodiments it may connect to a peripheral device.

5 Indeed, when it walks through the process -- sorry, Your Honor.
6 I'm turning to Slide 16. Indeed, when it walks through the process of
7 making this, it describes a step. You've got your hole. You fill it with
8 metal. Now, you've got this metal path through the stack. And what does it
9 say? Form of contact. It's been done. There's no description now or step of
10 putting a peripheral contact device on top because it's only in some
11 embodiments. That's not the contact.

12 Turning to Slide 17. Again, this is just -- oh, I've already went
13 over the top excerpt. The bottom excerpt, I've never understood their
14 argument on this, but they do agree now that "may function" means "may"
15 or "may not" function. So when conductive materials are used to fill the
16 dummy source hole, e.g. contact 244, it may or may not function as an
17 interconnect.

18 And I want to get to, turning to Slide 18, the file history because
19 the file history here is very telling. Now, keep in mind, they added this
20 conductive contact to overcome the prior art. And they distinguish this
21 Jeong reference, and they say they start with Jeong. Jeong does not disclose
22 dummy source structures but simply discloses dummy pillars. The dummy
23 pillars in Jeong are different from the claimed dummy source structures as
24 amended, that's referring to this conductive contact, because the dummy
25 pillars do not include conductive contacts.

1 Now, here's where it's important. So what do they point to in
2 Jeong? Jeong explains the construction of the dummy pillars, and it goes on
3 and it lists all the materials. Okay. There's no discussion about whether that
4 thing connects to a peripheral device or whether current is flowing. Instead,
5 they now contrast it with the '872 patent. Applicant continues. By contrast,
6 Figure 1D, reproduced below, illustrates the example of a dummy source
7 structure, including contact 179. They also point to Figure 2L and contact
8 244. Nothing in Jeong's pillar is a conductive contact, as that pillar consists
9 of insulating layers, a semiconductor pattern, and a charged storage layer.

10 By contrast, as explained at Paragraph 57 of the present invention,
11 in some embodiments, dummy source structure includes a dummy source
12 hole filled with conductive materials as a contact 179. There is no mistaking
13 that they said the conductive contact 179 is the conductive contact. It is the
14 material that has filled the hole. And that is different than Jeong because
15 what Jeong fills the hole with is not conductive material.

16 Indeed, it goes on. What does it talk about next? Dummy source
17 structure 178 further can include a spacer 177. Further can include. Made
18 of any suitable dielectric materials. And what does that do? That separates
19 the surrounding conductive layers and the memory stack. As a result,
20 dummy source structure can laterally separate the device into multiple
21 regions. It's just talking about its structure. It can divide the memory into
22 regions because it has an electric liner on the outside.

23 Turning to Slide 20. Now, here is your point, Your Honors, in
24 your decision about the '872 patent doesn't express an intent to limit itself.
25 Dr. Kuhn started with contact is an unusually broad word. Okay. And I

1 asked her about her work and if she ever worked with a contact pad. Okay.
2 She said, and I asked her, do they always have adjoining structure, Patent
3 Owner's construction, touching. She said, well, maybe not at first, maybe
4 they do later on. So, right there, it's a contact, even if something were to
5 touch it later on. But there's more. Then she volunteered, or they may not.
6 It's a conductive structure, may never touch it. There may never be
7 adjoining structure touching it. It just happens to be helpful to the layout to
8 have a contact pad in that location. Sometimes, when you fabricate things,
9 as even Dr. Kuhn's other testimony that I'll get to says, is you just repeat a
10 pattern.

11 And, Your Honor, I think one of your earlier questions about the
12 dummy source hole, you do the gate replacement process with it. So you
13 have all these holes that you're doing the gate replacement process. And
14 you're right, you're filling those with metal, and what the -- or tungsten or
15 whatever the gate layer may be. And what the '872 patent says is,
16 sometimes, you just let it keep filling, and then it fills up the hole, and there's
17 your contact. So you end up with all these contacts.

18 Now, do you use them all? The '872 patent says, in some
19 embodiments, you use some to connect to peripheral devices. But it's not
20 surprising you don't use all of them, because you've just created all these
21 holes for the gate replacement process.

22 Turning to Slide 21. So there's more that they're excluding. I
23 asked Dr. Kuhn, does your construction of conductive contact in your
24 second declaration include within its scope a Schottky contact? That's a
25 metal on semiconductor contact. She said it may or may not. So they're

1 excluding contacts. It's not even from their definition of contact. It's not
2 even clear when they're excluding them. And she continues, but there are
3 contacts that simply do not float current at all for a variety of reasons, of
4 which no doping happens to be one. So this just confirms that they would
5 need some type of definitional or disclaimer to carve out all these contacts
6 that they're carving out from their -- that their construction carves out.

7 And here's, I think, a critical point, Your Honors. I asked Dr.
8 Kuhn, we were talking about when two things connect, and I said -- or you
9 could say interconnect because it's connecting those two things. She says,
10 and the interconnect is better. That's the language this patent uses, the patent
11 uses. Indeed, it does. I have the '872 on Slide 22, a quote, in some
12 embodiments, dummy source structures may function as interconnects to
13 connect 3D memory device with other peripheral devices. So, the '872
14 patent uses interconnect when you're talking about connecting two
15 structures. This adjoining structure in Patent Owner's construction, you're
16 connecting two structures, that would be an interconnect. Dr. Kuhn, their
17 own expert, agrees with that. She agrees with it that that's what -- the
18 language of the patent.

19 Legally, when a patentee knows how to use a word, could have
20 claimed that it comprises an interconnect, could have claimed it functions as
21 an interconnect. But when there's a clear intention here not to do that, to use
22 contact instead, we cite the law in our papers that it would be legal error to
23 then construe contact effectively as interconnect as they're doing. But it's
24 even worse because the specification here says, in some embodiments, this is
25 functioning as an interconnect.

1 JUDGE CYGAN: Counselor, are you arguing that there is a
2 different structure when it's functioning as an interconnect than the different
3 embodiments when it's not functioning as an interconnect?

4 MR. LANG: When it functions as an interconnect, that's when it
5 connects to a peripheral device. That's the second device that it connects to.

6 JUDGE CYGAN: Yes, but that doesn't say anything about the
7 structure of the dummy source structure itself.

8 MR. LANG: The difference in the structure is just that something
9 comes and connects to it, makes physical contact with it.

10 JUDGE CYGAN: But there's no difference in the structure itself?

11 MR. LANG: Of the contact?

12 JUDGE CYGAN: Right.

13 MR. LANG: Absolutely not.

14 JUDGE CYGAN: Okay. So it really doesn't -- the fact that it can
15 function as an interconnect or it may not function as an interconnect doesn't
16 really give it structure, right?

17 MR. LANG: Exactly. Exactly, Your Honor. And that's the
18 principal problem with Patent Owner's construction. The adjoining structure
19 is not part of the contact. The adjoining structure might be a peripheral
20 device that then could be connected to the contact. And that's why I've been
21 saying that they're effectively construing this as an interconnect because
22 they've required the adjoining structure, which is not part of the contact. It's
23 never described in the specification as part of the contact. In fact, it's not
24 even shown. It says it is thereby formed before there's any adjoining
25 structure. The process is completed, and the process says contact. There's

1 not this adjoining structure. They've literally incorporated a different
2 structure that's not the contact into the construction of contact.

3 Turning to Slide 23. And Patent Owner's extrinsic evidence does
4 not support his position. Indeed, they actually cite a definition in 2011 for
5 electrical contact. Dr. Kuhn admitted that's interconnect. It's a type of
6 contact. It's a type of contact. There's no support that there was some
7 intention, some definition, some disclaimer to limit contact to this
8 functioning electrical contact. Indeed, it's the opposite.

9 When we looked at the file history, you didn't see a disclaimer.
10 You saw a direct comparison to the core, what's inside that hole, to what's
11 inside the Jeong hole.

12 I find 2009 and 2010 is interesting, because it says -- the 2009, for
13 example, says a port or a port of a device by which such connection is made.
14 And I think this goes to some of your earlier questions in that the contact is
15 through the stack. That is by which a connection can be made and is made if
16 you put it to use as an interconnect. But it's just the part. Now, you can
17 connect things to it or not. But to your point, it doesn't change that the
18 contact is the metal fill in the dummy source hole extending through the
19 stack. Indeed, one of their own definitions even says that port may or may
20 not act with another port or a device.

21 Now, I do want to -- Patent Owner's arguments in Claim 1 against
22 Tessariol are totally reliant on their claim construction. But I do want to
23 point out on Slide 26 how they frame their argument, because it lays bare,
24 really, what they're getting to with their construction. They start off, this
25 conductive contact enables the dummy source structure to function as an

1 interconnect to 3D memory devices. Well, they took out the main function.
2 They took out in some embodiments. And then they say Petitioner has not
3 shown the dummy source structure in Tessariol is a conductive structure that
4 permits current flows with the adjoining structure. The only way you're
5 permitting current flow is if you have a real circuit. And so, again, they
6 have whatever semantics they want to use. Their construction boils down to
7 adjoining structure that I guess is a peripheral device, and then they're saying
8 that it's an interconnect.

9 And I want to get into this briefly on Slide 27. Tessariol describes
10 precisely exactly what is called the conductive channel and the '872 patent.
11 Again, I already went over the language that the specification says contact
12 244 is thereby formed once the metal goes in. Dr. Kuhn repeatedly,
13 repeatedly said, I don't exactly know what's under that thing in the substrate.
14 Okay. So, seemingly, they've shifted course to saying that it has some type
15 of exposed top, and that's on the right-hand side. Well, Tessariol discloses
16 the exact same thing. It makes the active vias, it makes the dummy vias. It
17 makes the liner the same way. It has the exposed top. The dummy does
18 during manufacturing. Now, when they decide to not connect it to a
19 peripheral device, they dead-end it. It has a dead end on top.

20 But that is exactly what the '872 patent is showing.

21 And then, briefly, I'll go into this ever-changing construction they
22 have. Dr. Kuhn said, well, it could include if there was a block of doping
23 underneath the conductive contact. And I want to just pause here and say,
24 Your Honors, this really does lay bare that their construction has no support
25 in the specification. Like, where is this block of doping in the specification

1 describe that creates it and turns it into a conductive contact? There is none,
2 because Dr. Kuhn said at length, it doesn't describe it. But somehow they've
3 come up with a construction that you need a little bit of block of doping
4 underneath it. Well, Tessariol has that. Its dummies land onto the substrate.
5 That substrate is conductively doped. Indeed, current is flowing in that
6 region because that is a common source, as Dr. Banerjee described. And so,
7 unless they're saying that, yes, that's the Schottky contact but my
8 construction also excludes that type of contact, it just again lays bare that
9 their construction is improper to exclude -- I guess what they're doing is
10 trying to exclude every type of contact that Tessariol would have.

11 Turning to Slide 30. They make much ado about this liner because
12 the petition described -- the liner is on the sides, the bottom is removed, just
13 like the bottom of the active vias, they do use yellow highlighting on the
14 liner. They don't have intent to try to draw it on the top or the bottom in
15 various phases because, just like the active vias, the bottom of it, of course,
16 has to be removed. It is true that you'd have it down there at first, just like
17 the active vias, but then it gets removed.

18 Turning to the obviousness grounding of petition, and I was asked
19 a little bit about this earlier. But what that is saying is that, if you look at the
20 top there, and I'll get to Dr. Kuhn's testimony, you have four of those 82
21 interconnects on top, and then you have an irregular space. And even Dr.
22 Kuhn called that an irregular space. And what the petition explained was
23 that you can save -- you have these processing benefits, if you were to just
24 put 82 on each one.

25 Now, they came back and said you may have some manufacturing

1 defects by doing this because you're creating more of them, but that just
2 doesn't make any sense because these are dummies anyway. The reason
3 you're doing it is because you have a consistent pattern, and Dr. Banerjee
4 explained in detail, you know, the benefits on lithography, the benefits on
5 etching. And, not surprisingly, these are basic semiconductor principles.
6 Not surprising, this is Dr. Kuhn, their own expert, you know. I asked her, is
7 it helpful to fabricate a repeating pattern? It is common in the art to have a
8 structure fabricated repeatedly. And here's what's notable. She said because
9 it assists parts of the process. Polish, for example, is very fond of having
10 multiple replicas of a structure, some of which may not be functional. So
11 you even create a repeating pattern if some of them are not going to be
12 functional. It makes the design easier because, once you make a one copy of
13 it, you can just basically copy and paste if it's a repeating pattern. And, as I
14 said earlier, she agreed that, as presented, Tessariol had an irregular space,
15 so it would not have these benefits of the repeating pattern.

16 And I just wanted to go back to this because it was so notable.
17 Again, she was testifying about her own work, her own personal experience,
18 and she even said, yeah, sometimes you just put these contact pads in that
19 location, it's helpful to a layout even if you're never going to use them. Even
20 if they're never going to make contact with the peripheral device.

21 I do want to get to Claims 3 and 4, Your Honors, and turn to Slide
22 36. So these claims require that the staircase contacts be nominally equal
23 distance. And there's something critical about the claim. It's not talking
24 about a finished product, it's not talking about precise proportions or
25 dimensions of the finished product. It says nominally refers to a desired or

1 target value set during the design phase. This is the design, together with the
2 ranges above and below. So, notably, one, design phase. Two is just a
3 range.

4 So when you look at Tessariol, there is its design. And the Board
5 is familiar with the law on this. From simple observation, you can tell that
6 design has equal distance. It's the design, not to mention the spec said
7 there's margins, you know, there's a range. And if the specification certainly
8 confirms that here, I would submit the figures alone is enough, but you have
9 much more. Tessariol says that these structures are arrayed, that is in an
10 order series, in straight lines, in columns.

11 So, Patent Owner's law, you know, and they keep harping about
12 this in the sur-reply, that *Hockerson* case is well known for talking about
13 precise proportions, particular sizes. You're talking about a finished, you
14 know, product and, like, these precise, you know, 0.30 millimeters, that type
15 of things. I'm sure the Board is familiar with the law on this, but there's a
16 good case, *Ex Parte Jurek*, J-U-R-E-K, Appeal 2018-006215, PTAB, April
17 17th, 2019, that basically puts these cases like the *Hockerson*-type case in
18 one bucket, and the other cases where, yeah, you can make a simple
19 observation and tell things. Does this shaft go up to this height, that type of
20 thing. And that's all these claims require.

21 With the time that I have left, I want to briefly go to Slide 56 and
22 make a point. Now they're coming back, this is the whole debate about what
23 does a dummy source structure do, can it function as a source. They have a
24 Slide 42 where they now say that this is connecting -- that the dummy source
25 structure is connecting to the channel structures and it's sending current to

1 the channel structures. If that is the case, that means it's functioning as a
2 source. So they have now said, and I guess they're presenting today, that in
3 some embodiments, the dummy source structure is permitting current to go
4 to the channel structures. It's electrically coupled to the channel structures.
5 And if that's the case, then they finally have agreed with us that, in some
6 embodiments, the dummy source structure, indeed, may function as a
7 source.

8 And so, for the Park Grounds, I'll keep it short, because there's just
9 two issues. One is can the dummy source structure function as a source. We
10 pointed out that, because it says in some embodiments it can't, we think that
11 in some embodiments it should be able to. When it's talking about
12 connecting to the channel structures, that's an electrical connection. The
13 Patent Owner seems to be saying it now in Slide 42.

14 And then I want to make one point, and I'll just likely go over here
15 my time by a minute or two, if I may. The '872 patent is just one of these
16 patents where they try not to limit anything. Okay. We have in our papers
17 that they have not limited surround. They said it could be more or less than
18 four. They said, in fact, let me just real quick go to 66, any suitable number
19 can surround, more or less. The Patent Owner is saying in surreply, it's
20 about the number. It's not. The spec doesn't say it's about the number. The
21 spec also said that these dummy source structures, turning to Slide 64, could
22 be these long members, long parallel members. We have that in our papers.

23 So, in my view, it's undoubtedly that the '872 patent has defined
24 surround to include the case, as the Board has found, when two structures
25 are between you. And the reason is this. If I'm standing in the middle of

1 this room and I have a dummy source structure or a basketball in each
2 corner, okay, that's the embodiment of '872 patent. And it says that those
3 surround me. Okay. One in each corner. Now, if I took two on each side
4 and just elongated them, so now that I have just two structures, I have to be
5 surrounded. I might be between those structures, but I have to be
6 surrounded. Surrounded, after all, means encircled. Okay? It's not fully
7 encircled clearly in the '872 patent. But to what degree? If I instead have
8 two structures instead of four, but they are connected, I look there, I see a
9 structure. I look there, I still see a structure. I look there, look there, I still
10 see it. I look over here now, I see a structure. I'm more so encircled than I
11 was just with the four structures.

12 So, we submit that what they're trying to do is effectively limit the
13 '872 patent, the surrounding, to really the express embodiments of four being
14 on each corner. But you have to look at to what degree you're encircled,
15 because that's what surrounding means.

16 With that, Your Honor, if you have no further questions, I'll
17 reserve my remaining time.

18 JUDGE KOKOSKI: Okay. Thank you. Patent Owner, you can
19 begin when you're ready. And please just remember to cite which slide
20 you're on so that Judge McGraw can keep up with the argument.

21 MR. DAVIS: Yes, Your Honor, will do.

22 JUDGE KOKOSKI: Thank you very much.

23 MR. DAVIS: And may it please the Board, Jim Davis again. Mr.
24 Radsch, actually, is going to be addressing Ground 2, the Tessariol Ground,
25 and I'll be planning on addressing Ground 1, the Park Ground. Given,

1 really, the focus of Petitioner's argument and how the vast majority of it was
2 focused on Tessariol, we'll start there, unless Your Honor would prefer to
3 start in a different order. And I'll come back later and address Park very
4 briefly.

5 JUDGE KOKOSKI: Okay.

6 MR. DAVIS: All right. Thank you, Your Honor.

7 MR. RADSCH: Good afternoon, Your Honors. Andrew Radsch
8 for the Patent Owner. As Mr. Davis mentioned, I will start with the Ground
9 2 Tessariol Grounds, and I'd like to start with the claim construction issues
10 with respect to conductive contact. And I will -- if we could turn to Slide
11 33, please. This is actually slide, sorry, Slide 32 of Patent Owner's
12 demonstratives.

13 So I'd like to make three points with respect to Slide 32. Again,
14 this is of Patent Owner's demonstratives. Firstly, contact in the context of
15 conductive contact must be given meaning. Patent Owner's construction
16 does that. I submit that Petitioner's construction does not do that.

17 Secondly, and I think this is a very important point, it came up in
18 Petitioner's argument. In fact, I think it was one of the first things it said.
19 Our construction, Patent Owner's construction, is not effectively an
20 interconnect. We are not construing conductive contact to be an
21 interconnect or to require an interconnect. Our construction is a conductive
22 structure which permits current flow with an adjoining conductive structure.

23 An interconnect, as the '872 patent explains, and as their own
24 expert, Dr. Banerjee, explains in his declaration, Exhibit 1003 at Paragraph
25 58, an interconnect connects two other structures, as the word interconnect

1 suggests. Our proposed construction doesn't require that the conductive
2 contact connect two other structures. It could have, for example, an
3 operative dead end on one end of it but permit current flow on the other end.
4 In that circumstance, it would not be an interconnect, but it would still
5 satisfy our proposed construction.

6 So, most of the premise of Petitioner's argument is that our
7 construction is improperly synonymous with interconnect. And I submit
8 that's incorrect, and I will get into that a little bit further in my remarks.

9 And then the third point I would make is that Petitioner's
10 construction clearly cannot be correct. As we put it, what we understand
11 their construction to be here on Slide 32, and this is straight from their
12 Petitioner reply brief, at Pages 16 and 17 in particular. At Page 16,
13 Petitioner writes that the '872 patent uniformly describes a contact as merely
14 the vertical member through the stack. Then, on Page 17, goes on to state
15 this construction interprets contact to be a conductive vertical member
16 extending through the stack that may function as an interconnect, if put to
17 that use.

18 So that's their proposed construction, and I make three points about
19 why that cannot be correct. Firstly, the only other reference to contact in
20 this patent is as to the staircase contact, and that's referenced both in the
21 claims and the specification. The staircase contact does not extend through
22 the stack. It extends through dielectric and lands on top of the staircase. So
23 the only other contact referenced in this patent, the '872 patent, would not
24 satisfy this construction.

25 The other point I would make is -- turning now to Slide 33 where

1 we illustrate Figure 2L of the '872 patent. The middle structure, that is the
2 conductive contact that's black. The structures on the side are similarly
3 extending, vertical members extending through the stack, and those are
4 never referred to as a contact. The elements on the left, those are the dummy
5 channel structures, never referred to as a contact. The element on the far
6 right, that is the memory string, again, never referred to as a contact. So,
7 again, we know that their construction is incorrect.

8 The last point I would make is that, even under their proposed
9 construction, and I'll get to this later, Tessariol does not meet it because it
10 cannot function as an interconnect. It is surrounded by insulating material.

11 So turning to the intrinsic evidence and how that supports Patent
12 Owner's proposed construction. As we see here from Figure 2L of the '872
13 patent, that conductive contact is shown as extending through the insulating
14 layer. So when that contact is filled, and actually, let me turn to Slide 34,
15 and I think this is a question you brought up, Your Honor, about what it
16 means to have conductive materials as a contact, filled as a contact. I think
17 this is important. So on 34, this is a statement from the file history, which
18 Petitioner discussed. It also appears in the specification at lines 11, 37
19 through 39, and it states that the dummy source structure 178 includes a
20 dummy source hole filled with conductive materials as a contact. It's not
21 just filled with conductive materials, as Petitioner's arguments would have.
22 It has to be filled in a particular way as a contact. So it must be more than
23 just depositing conductive material into that opening. It has to be in such a
24 manner that it would permit current flow within adjoining structure.

25 And a construction doesn't require actual current flow, but it would

1 have to permit it. It would have to be the conditions -- the structure would
2 have to have the conditions such that the interface between this structure and
3 an adjoining structure would permit current flow.

4 JUDGE CYGAN: So, Counselor, what makes it be as a contact?

5 MR. RADSCH: So I think the specification explains that, and it
6 illustrates that. Firstly, the specification explains, for example, this is at
7 column 5, lines 37 through 43, that, in some embodiments, the dummy
8 source structure can contact the substrate and may provide interconnect with
9 peripheral devices. So we know that, and there's express disclosure, and this
10 is the '872 patent, of this structure being in contact with this substrate in such
11 a way that there is electrical connection. And so there would have to be, as
12 Dr. Kuhn explained, metal landing on a properly doped substrate. A
13 POSITA would know how to create that, and there's expressed discussion of
14 that in the '872 patent. That is, it connects to the substrate, contacts the
15 substrate, and provides for interconnect.

16 JUDGE CYGAN: And in Figure 2L, the substrate is 202, correct?

17 MR. RADSCH: Let me just go back. That is correct.

18 JUDGE CYGAN: So your point is that what makes it a contact is
19 not the part at the top of the figure, it's the part of the -- it's at the bottom of
20 the figure.

21 MR. RADSCH: So, Your Honor, it can be both or it can be either.
22 So if it serves as an interconnect, for example, to peripheral devices,
23 between the memory device and the peripheral devices, then, presumably,
24 both ends would be in conductive contact. That is, the bottom would be in
25 conductive contact with the substrate. That is, the substrate would be

1 properly doped, and the top would be adjoining another structure, perhaps a
2 metal layer.

3 But the patent doesn't necessarily require that. It can be solely the
4 bottom that is in conductive contact with the substrate, or it could be solely
5 the top that is in conductive contact with an upper layer, which is the reason
6 why I think that 2L illustrates that conductive contact extending through the
7 insulating layer.

8 JUDGE CYGAN: So what you're saying is that Figure 2L shows a
9 top contact, but not necessarily a bottom contact, because it doesn't show a
10 doped area at the bottom of the substrate or an electrical connection in the
11 substrate on that figure, correct?

12 MR. RADSCH: I don't think that's quite correct because I don't
13 think you can really look at 2L in isolation. What the specification says is
14 that there are embodiments and circumstances where it is in contact,
15 physical contact, with the substrate -- again, this is at column 5 -- and may
16 provide interconnect to the 3D memory device and peripheral devices. So a
17 POSITA would understand that to mean that it is in electrical connection
18 with the substrate to provide that interconnect. And so, 2L standing alone, if
19 you took that in isolation, may not show that. But when you read the patent,
20 of course, in its entirety, and '872 discusses that it may be in contact with
21 substrate to provide that interconnect. So we understand that there is
22 appropriate doping to allow that to occur.

23 JUDGE CYGAN: And Figure 2L is part of that embodiment
24 where it functions as the interconnect?

25 MR. RADSCH: That would be an example where it could,

1 certainly, if the right conditions are present.

2 The other point I think is important is that, you know, even when
3 it's providing interconnect, right, and this goes to what the Patent Owner was
4 -- Petitioner was arguing earlier, that does not mean it's providing source.
5 Right? So it can interconnect between the memory device and peripheral
6 devices, but that does not mean that it's providing source to the memory.
7 And that really speaks to their allegation that our constructions are somehow
8 inconsistent. They are not. Our construction would permit an interconnect
9 for this device to function as an interconnect without providing source.

10 So, this is Slide 35, again, we've illustrated here are some of the
11 dictionary definitions that have supported our construction to give meaning
12 to the word contact. I would submit that they are all essentially identical in
13 that they require a contact, particularly a conductive one or electric one, to
14 have the ability to permit current to flow to another conducting adjoining
15 part. So it's consistent with our proposed construction, and I would submit
16 that Petitioner's construction gives no meaning to the word contact.

17 If we could turn to Petitioner's Slide 10.

18 JUDGE CYGAN: Counselor, can I ask you a question on this --

19 MR. RADSCH: Yes.

20 JUDGE CYGAN: -- Slide 35? Which of these definitions are you
21 relying upon for a single member? Because at least two of these definitions
22 require multiple parts, right?

23 MR. RADSCH: I would say that none of these require it to be an
24 interconnection, to connect other circuitry. Each of these requires that there
25 be a physical contact that permits current flow between conducting parts.

1 For example, the first one. That would be the -- for example, in the '872
2 patent, the dummy source structure itself, right, that comprises the
3 conductive contact. There'll be conductive coupling to another member. It
4 doesn't have to serve as an interconnect. None of these, I think,
5 constructions require that the conductive member be an interconnect
6 between other conducting portions.

7 JUDGE CYGAN: But the first definition talks about the contact in
8 the sense of two things touching, correct? And the Wiley definition talks
9 about the junction of two things coming together. Neither of those are
10 exactly what you want, I think, for yours. Are you really looking at the one
11 that's highlighted in the New Oxford American Dictionary, a part or device
12 by which such connection is made?

13 MR. RADSCH: I would submit that each of these support the
14 construction in the sense that the construction proposed is that the device,
15 that the contact, permit the current to flow to an adjoining structure, which I
16 think each of these supports. I don't think any of these is read to require
17 there be two separate parts on either end of that conductive contact that are
18 separate elements that themselves be joined together.

19 JUDGE CYGAN: Why doesn't the Wiley definition require that?

20 MR. RADSCH: Because in this example, in the '872, for example,
21 one of the conductors is the conductive contact itself. The other would be
22 whatever adjoining structure there is. So the interconnect, you could think
23 there would be perhaps three conductors. There would be --

24 JUDGE CYGAN: How many things are you claiming in Claim 1
25 as a contact?

1 MR. RADSCH: Well, the contact itself refers to the structure that
2 has the properties to permit current flow. So it could be a single structure. It
3 could be, potentially, multiple structures. But so it has, like, the properties
4 that would allow current to flow.

5 JUDGE CYGAN: Okay. Looking at Claim 1, how does Wiley
6 help us with that?

7 MR. RADSCH: How does claim -- oh, I think I understand your
8 question. So Wiley would suggest, I think that supports this notion, though,
9 that, for a conductive contact, it has to permit the flow of current. We're not
10 saying that, in our construction, there must be the presence of any particular
11 adjoining structure, but it certainly has to allow the current to flow and the
12 interface with an adjoining structure. So I'd submit that the first, the
13 McGraw-Hill Dictionary, which is the first one we've cited, is probably the
14 most apt. But I think they're all consistent in that they have to require
15 current to flow with another conductive structure, which sets this claimed
16 element apart from Tessariol, which is surrounded by insulator and so would
17 not permit, could not permit, current to flow to any adjoining structure.

18 I would like, if I might, to turn to Petitioner's Slide 10, where they
19 have discussed the intrinsic evidence. In particular, I would suggest that
20 they have misread that intrinsic evidence, in part because they have
21 confused, again, interconnect with Patent Owner's proposed construction of
22 conductive contact. So if we start with the top sub-bullet, where it says in
23 some embodiments -- this is from column 5, lines 37 to 43 of the '872 patent.
24 In some embodiments, one or more dummy structures are in contact with the
25 substrate and may provide interconnect between the 3D memory device and

1 the peripheral devices. This is the point I was making earlier, is that our
2 construction does not require an interconnect, but it certainly permits that
3 structure to act as an interconnect because our construction requires that the
4 flow of current must be -- that the property must exist. So I would say
5 nothing with that statement, that permissive language, is inconsistent with
6 Patent Owner's proposed construction. Again, we do not require it to be
7 interconnected. It can be conductive on only one side.

8 Again, the same is true for the second passage cited from the '872
9 specification. That's at line 16, 63 through 66. Again, this says when
10 conductive materials are used to fill a dummy source hole at 212, an
11 example of which is contact 244, the dummy source structure may function
12 as an interconnect and may do that to connect particular devices, memory
13 device 100, with peripheral devices. But nothing about that statement
14 suggests that a conductive contact can be something that doesn't conduct,
15 that it can be something completely surrounded by insulator. It simply says
16 that it may serve as an interconnect and, particularly, may serve as a
17 particular type of interconnect, one that joins the 3D memory device with
18 peripheral devices.

19 So even under that reading, that is entirely consistent with Patent
20 Owner's proposed construction because, for it to serve as an interconnect,
21 there needs to be at least one side that is capable of or permits current flow
22 within adjoining structure. So these permissive statements about the
23 conductive structure being capable of being an interconnect are entirely
24 consistent with the construction we have put forth.

25 JUDGE CYGAN: So, Counselor, following up on that, if we go to

1 your Slide 34.

2 MR. RADSCH: Yes.

3 JUDGE CYGAN: And let's say that we're talking about a situation
4 where it only contacts through the top and not the bottom, and you said that
5 would meet your definition of contact. What if that was your device, and
6 you shrink-wrapped it to send it someplace? So once it was shrink-wrapped
7 with something non-conducting, it would no longer be a contact. Then once
8 you took the shrink-wrap off, it would be a contact again, correct?

9 MR. RADSCH: I think you have to look at the design of it, right.
10 It's designed, and the specification states, that it would be designed as a
11 contact, and so one would understand that that's the way it's designed. But
12 in that circumstance, I suppose that one could view that as being designed to
13 be a conductive contact, if that was the design of it.

14 JUDGE CYGAN: So regardless of whether or not you have the
15 shrink-wrap on it, it would still be a contact because that's the structure of it
16 in its surroundings.

17 MR. RADSCH: That's correct.

18 JUDGE CYGAN: Thank you.

19 MR. RADSCH: I'd like to turn just back briefly to the Patent
20 Owner's arguments about the prosecution history since we're on the
21 prosecution history here. They made an argument in their Slides 18 and 19
22 about the Jeong reference and how it was distinguished because Jeong did
23 not include any conductive fill. That does not speak to this issue at all. The
24 fact that Jeong, the prior art, did not include any conductive material means,
25 necessarily, it can't be a conductive contact. So that's a necessary condition.

1 It's not a sufficient condition to be a conductive contact. And nowhere in the
2 fact file history discussion of Jeong did they say it is simply enough to have
3 conductive material to be a contact. Rather, they said you have to fill
4 conductive materials as a contact. So that discussion of Jeong, the fact that
5 it has no conductive materials and, therefore, has none of the conditions to
6 be a conductive contact, I don't think helps their position.

7 We should turn, I think, as well, to the notion that our construction
8 requires some disclaimer. It does not. The claim term isn't just contact. The
9 fact that our construction would omit certain types of contacts is inherent in
10 the fact that the claim is to a particular type of contact, principally a
11 conductive contact. So their argument is that certain types of contacts are
12 excluded. Well, certainly non-conductive contacts are excluded from the
13 construction of conductive contact. And as Dr. Kuhn explained without
14 rebuttal, there are certain types of contacts that are nonconductive. So the
15 fact that a construction excludes those, again, does not help them. It's
16 inherent in the language of the claim itself, that is a conductive contact.

17 Turning, if we could, to Petitioner's Slide 20. This is where you
18 spend quite a few instances talking about Dr. Kuhn's deposition testimony.
19 There's a few points on this. Firstly, the fact that contact is an unusually
20 broad word. She was simply making the point that it can be a noun,
21 adjective, or verb. Here, in the patent, it is being used as a noun; and so the
22 fact that it can be used in different ways is irrelevant to the proper
23 construction.

24 Next, they talk about her testimony about a contact pad. That's not
25 the term we're talking about in the context of the '872 patent. So whatever a

1 contact pad can be or can have is irrelevant to the understanding of a
2 conductive contact.

3 Moreover, all she says is that there are instances where a
4 conductive structure never touched a contact pad. The term she was
5 discussing was not a conductive contact pad. So, again, that testimony about
6 a contact pad from Dr. Kuhn, which has nothing to do with a conductive
7 contact, does not help them either.

8 Next, on Slide 23, the top bullet --

9 JUDGE McGRAW: I'm sorry. Before you move on, I just want to
10 confirm what you said. So in regard to Petitioner Slide 20, the testimony
11 here only refers to a contact pad, not to a conductive contact?

12 MR. RADSCH: Correct.

13 JUDGE McGRAW: So, in other words, are you saying that
14 contact pad here is not a conductive contact? Is that what you had said?

15 MR. RADSCH: The line of questioning, if you look at the
16 transcript, was about instances in which Dr. Kuhn had manufactured a test
17 chip with contact pads. That's what the question is, or the answer is, which
18 is in the fourth line. While in a test chip, the contact pads do not have a
19 conductive structure touching them at the time they are made. So what she's
20 talking about is contact pads, which is a different term from a conductive
21 contact. So her testimony was not about a conductive contact and what that
22 means and whether she had built conductive contacts.

23 JUDGE McGRAW: Thank you.

24 MR. RADSCH: So, briefly, on Slide 23, top bullet, I encourage
25 the Board to look at the actual testimony of Dr. Kuhn. She did not admit

1 that the dictionary definition of electrical contact is an interconnect. She
2 stated that an interconnect is an example of an electrical contact. So, again,
3 our construction does not treat those things as synonymous. She did not
4 treat those as synonymous.

5 She said it was an example.

6 So let me now, with that, I think, understanding of the claim
7 language and what is required and actual conductive contact, and the
8 construction it gives meaning to, both pieces of that claim language, I'd like
9 to turn to the Tessariol Ground, and this would be Patent Owner's Slide 37.
10 So just to orient the Board, I think the petition set forth two theories, both
11 that the conductive vias 58 and the dummy structure 60 of Tessariol satisfy
12 the dummy source structure comprising a conductive contact. Of course,
13 those conductive vias do not surround what they allege is a staircase contact,
14 so they abandon reliance upon the conductive vias 58 in their Patent Owner
15 response. So all we are dealing with for Tessariol is whether dummy
16 structures 60 comprise conductive contacts. And I would submit they do
17 not.

18 And just before jumping into evidence for a moment, I think it's
19 important to orient ourselves on what the ground was as presented in the
20 petition. First, there was a ground where they alleged that there was
21 expressed disclosure of this element by Tessariol with respect both to its
22 dummy structures and conductive vias. They allege it was met simply
23 because there is conductive material in its dummy structure.

24 They then argue, well, it would have been obvious to add a
25 connection to the top. If it requires some kind of conductive connection, it

1 would have been obvious to add something to the top.

2 So that was the grounds, the two petition grounds that we are
3 dealing with.

4 Nowhere in Tessariol is there any express disclosure of the dummy
5 structure 60 being in any sort of electrical connection with any other
6 element. In fact, Tessariol describes that there's an insulated lining
7 wrapping the conductive pillar, and there's insulated material 86 on top.

8 JUDGE CYGAN: Counselor, is Petitioner relying on insulated
9 material 86 for anything else?

10 MR. RADSCH: Is Petitioner relying upon insulated material?

11 JUDGE CYGAN: Is that part of the teaching it's relying upon
12 from Tessariol?

13 MR. RADSCH: With respect to this claim element, they certainly
14 have cited to the fact that it has insulated lining as part of the structure of the
15 dummy source structure that is claimed. So I'd say, yes, that's part of what
16 they're relying upon. They point to the entirety of that structure for reading
17 the Claim 1 elements.

18 So we turn to Patent Owner's Slide 40. In the Petitioner reply
19 brief, they introduce a new argument and, for the first time, they argue, well,
20 there's disclosure of this element because Tessariol's dummy vias do not just
21 land on substrate, they land on conductively-doped substrate. That's a new
22 argument, and I think it should be rejected for that reason alone. That was
23 not presented in the petition. But even if it was considered, it does not either
24 expressly or inherently disclose any sort of ability for there to be current
25 flow within adjoining structure. Again, they're not relying upon obviousness

1 for this argument. They're only asserting express disclosure for this bottom
2 connection.

3 So, firstly, they make no showing that the conductive core portion
4 of the Tessariol's dummy via, that that makes any even physical contact with
5 the substrate of Tessariol. Again, we talk about it being wrapped with a
6 liner. And as Dr. Banerjee, their own expert, explained, when you deposit
7 these types of liners, it would extend to the bottom and wrap the bottom of
8 that via. And Petitioner's Counsel stated multiple times that that insulating
9 liner at the bottom of Tessariol's dummy via would be removed. But
10 Tessariol says that nowhere. And you'll notice that there's no cite for that on
11 any Slide, there's no citation to any statement in Tessariol where Tessariol
12 says that the liner at the bottom of that dummy via is removed.

13 So, again, there's clearly no express disclosure, and there's
14 certainly no inherent disclosure, particularly given Dr. Banerjee's own
15 admission that there's liner at that bottom of that via. And, certainly, there's
16 no, again, express disclosure of any physical contact with that dummy via
17 with the substrate. But even if there was some disclosure of physical contact
18 between that via and the substrate, as Dr. Kuhn explained -- this is on Slide
19 42 -- simply landing on a conductively-doped source material is insufficient
20 to demonstrate that dummy structure 60 in Tessariol is a conductive
21 structure that permits current flow. As she explains, the substrate has to be
22 doped in a particular way.

23 And, again, I come back to the fact that they're not relying upon
24 obviousness for this argument. They're relying only upon disclosure.
25 There's no express disclosure of any conductive contact with the substrate.

1 There certainly is no inherent disclosure. And their expert does not dispute
2 what Dr. Kuhn says, that is that the substrate would have to be appropriately
3 doped for there to be any sort of conductive coupling with a metal that lands
4 on top of it. So for those reasons, their disclosure argument, based upon
5 Tessariol, fails.

6 JUDGE CYGAN: Counselor, let me make sure I understand you.
7 So if a metal is touching a conductively-doped source material, it's not
8 necessarily in conductive contact with that?

9 MR. RADSCH: That's correct. As Dr. Kuhn explains, it has to be
10 doped at the right level with the appropriate species to match the work
11 function of the metal. That technical description by Dr. Kuhn of what is
12 required for there to be a conductive coupling between a metal and a
13 semiconductor, that's not disputed by their expert or anyone else in the
14 record. And, again, there's no description in Tessariol of the dummy via
15 being -- even a generic statement -- of it being in conductive contact with the
16 substrate. In fact, if you if you actually look at Tessariol, it doesn't actually
17 even show direct contact with the substrate. What it shows is that it contacts
18 the top portion of -- or sorry -- the very bottom portion of the stack.

19 Let me see if I have that on a slide. If you look at Petitioner's Slide
20 28, for example, the contact is shown -- the dummy via is shown landing at
21 element 55, which the specification, as Tessariol describes, is the bottom of
22 that alternating stack of materials above it. The substrate is below that level,
23 and so Tessariol doesn't describe it as contacting the substrate, let alone
24 contacting the substrate that is appropriately doped to match the work
25 function of the conductive material of that dummy via.

1 So going back to Patent Owner's slides, there's no express
2 disclosure in Tessariol, and there's no inherent disclosure. So we have to
3 then turn to their arguments for obviousness. That's on Patent Owner's Slide
4 43. They make a single argument. The argument is that it would have been
5 obvious to add these, to add on top of Tessariol's dummy structure those
6 interconnects that Petitioner talked about earlier. But their own expert
7 admits -- this is on Slide 43. This is declaration at paragraph 216, where he's
8 talking about Tessariol. It says, interconnects 82, the things that they say
9 could be put on top of the dummy structures, he says, they are simply not
10 made on the dummy structures because there is no need for them to connect
11 to upper-level devices. So he says there's no need for those in Tessariol.

12 So then, when Petitioner proposes adding those to Tessariol, we know
13 that we're squarely within the realm of hindsight here. There's no reason to
14 do it. They're only saying to do it because that's what the claims of the '872
15 patent would require.

16 Now, he says, in his declaration, his testimony, is that one could
17 connect the dummy source structures to upper-level interconnects. They can
18 be connected. Of course, that's not the test for obviousness. This is clear
19 from the Federal Circuit and PTAB decisions cited on Slide 44. Just
20 because something could be done doesn't mean it would be done. The
21 would be done is the standard. Dr. Banerjee's only explanation and the only
22 explanation from Petitioner of why there would have been some motivation,
23 is because it, apparently, reduces processing time and cost. But nowhere is
24 there any explanation of how adding those additional structures would do
25 that. They don't point to any steps in Tessariol that would be removed. It

1 wouldn't. You're still building the same insulated liner on top. They don't
2 say how costs would be reduced, in what way. And so it's entirely
3 conclusory testimony. Petitioner's Counsel refers to benefits to polishing.
4 Tessariol does not talk about polishing at all at those layers. It doesn't
5 mention polishing at all; so, that's just conjured out of thin air.

6 But I think, perhaps, most importantly of all, is -- let's actually look
7 at -- what Petitioner is proposing is -- we don't have to bring up on here, but
8 if we could look at their Slide 31. This is, again, Petitioner's Slide 31.
9 They're arguing to put these interconnect structures, you see on the slide,
10 those interconnect structures 82 above the dummy vias of Tessariol, arguing
11 that that would create a regular pattern. And this is a blow-out from, you
12 can see, a reference to Figure 16 of Tessariol. Well, Figure 16, you can see
13 the line 15 through 15 in the middle of that. So line 15 through 15 shows a
14 cross-section at which Figure 15 of Tessariol is taken.

15 So if you switch back to, I just want to orient the Board here, if we
16 switch back to Patent Owner's demonstratives. It's at Slide 46. We have
17 shown Figure 15, so this is a top-down view of the cross-section that they
18 rely upon showing those interconnects. Those interconnects are colored in
19 orange. Now, if you created a repeating pattern, which is their theory here,
20 of those interconnects, so repeated the pattern that exists there to connect the
21 dummy structures that are in purple, you would have a nightmare of
22 interconnecting interconnects. It would be chaos. You'd probably short out
23 the entire chip. So they've ignored what the topography is of these
24 interconnects that are disclosed in Tessariol, arguing for this repeating
25 pattern. You take the pattern that is there, and you repeat that to the left and

1 to the right to ensure that the dummy structures are connected, and you have
2 wires just crisscrossing each other and likely shorting out the system.

3 So far from simplifying anything, repeating this pattern would
4 create processing difficulties, as Dr. Kuhn explained. It would complicate
5 the circuit design, because additional features would need to be deposited
6 above dummy source structures, and it would significantly complicate the
7 design. So their obviousness theory of adding the same interconnects
8 already present in a repeating pattern just doesn't make any sense, and Dr.
9 Banerjee does not explain how that would be accomplished, given what
10 Tessariol discloses.

11 Let me then briefly turn to the dependent claims of the '872 patent.
12 Claims 3 and 4, they're not shown to be met. I think it's important to go
13 back to what the petition grounds are again. The petition, this is at pages -- I
14 apologize. I don't have the page numbers, but the petition itself, all it has is
15 a color-annotated copy of Tessariol's Figure 15. There's no explanation.
16 There's no explanation of how one would understand, if at all, the relative
17 distances. So they rely entirely on Figure 15 of Tessariol.

18 I'll note the second sub-bullet refers to Figure 1. That should be
19 Figure 15. That's just a typo.

20 The *Hockerson* case is directly on point. *Hockerson* dealt with this
21 exact issue of relative dimensions. In particular, the *Hockerson* case dealt
22 with the relative size of a shoe groove as compared to a shoe fin, and
23 whether one was shown as wider than the other. And the Court said it is
24 error to rely upon the sizing of the figures for that relative dimension and
25 stated that figures in a patent are not drawn to scale unless otherwise

1 indicated. That's at 222 F.3d 956. I'll note that Petitioner referenced this *Ex*
2 *Parte Jurek* case. That's nowhere cited in the briefing. That wasn't provided
3 to us before the hearing. That's a new case cited by them, and we've not had
4 the opportunity to review it. I think that the total argument should be
5 rejected. But *Hockerson* is directly on point that it's error to rely upon those
6 dimensions.

7 Now, Petitioner makes a new argument in its reply brief, arguing
8 that there are -- this is on their slide, if we could turn to Slide 37. Again, it's
9 error to rely upon drawings when there's no indication of the dimensions or
10 scale. So they argue, well, Tessariol specification confirms this regular
11 spacing. This is on Petitioner's Slide 37. What they point to is a statement
12 that the openings 54 and 56 may be in straight lines, rows, and columns. But
13 the fact that those are straight lines says nothing about their relative distance
14 to what they allege is the staircase contact. And what the claims require is
15 that they are equally spaced, those openings, relative to the staircase contact.
16 The fact that those openings are straight says nothing about their relative
17 placement, vis-a-vis those staircase contacts. And so there's nothing they
18 can point to in Tessariol that says that those drawings are to scale or
19 provides any dimensions of those drawings. And it is error as a matter of
20 law then to rely upon those figures, which is the only thing that the petition
21 relies upon.

22 And then, lastly, I'll just note, on their slide, they argue relative
23 dimensions are properly decipherable from the figures, and that's exactly the
24 opposite of what *Hockerson* cites or holds. You'll note they've not cited a
25 case on this slide. They've cited a case in their briefing. As we pointed out,

1 that's a synopsis case that has absolutely nothing to do with their argument.
2 And if, I think, correctly, dropped any reliance on that synopsis case. There
3 is no law to support that second bullet on Petitioner's Slide 38.

4 So with that, I see we're somewhat at our rebuttal time. Let me
5 hand it over to Mr. Davis to address any questions with respect to Ground 1
6 and the dummy source structure.

7 JUDGE CYGAN: Counselor, can I ask you one question before
8 you switch over?

9 MR. RADSCH: Absolutely.

10 JUDGE CYGAN: So on your Slide 42, you'd mentioned certain
11 constraints on what a conductively-doped source material must have to
12 permit current flow. Is that providing an additional requirement to the
13 electrical contact definitions you gave us in your construction? Because in
14 the New Oxford definition, one of the possible definitions was a one-way
15 electrical contact between a metal and a semiconductor. I mean, should that
16 be a one-way electrical contact between a metal and a semiconductor such
17 that there is ohmic current flow, or are we putting additional limitations onto
18 that?

19 MR. RADSCH: No, I don't think so. I think it's a one-way
20 conductive contact. There has to be a conductive coupling. That's what I
21 think Dr. Kuhn is explaining, that just because metal contacts substrate, or
22 even semiconductor-doped substrate, does not mean there's formed a
23 conductive coupling. It has to be doped at the right species, at the right
24 level, to allow any current to flow.

25 JUDGE CYGAN: In Dr. Kuhn's -- in the sections that's being

1 cited in Kuhn 1, 39 to 54, I believe Dr. Kuhn is talking about different types
2 of electrical contacts, and that metal semiconductor contacts are typically not
3 ohmic. But what I'm understanding from you is that there's no requirement
4 for your construction that it be an ohmic contact. As long as it's an electrical
5 contact, it meets your definition, right?

6 MR. RADSCH: So long as it would permit the flow of current, it
7 would meet our construction. And there are certain contacts that would not
8 permit the flow of current.

9 JUDGE CYGAN: Thank you.

10 MR. RADSCH: Okay. You're welcome.

11 MR. DAVIS: May it please the Board. And, apologies, Your
12 Honor. We've gone a couple minutes over. If I might indulge, I just have a
13 couple quick points on Park. As Your Honors are aware, the Board, both in
14 the institution decision here, as well as the institution decision in the
15 IPR2024-00910, as well as the request for a rehearing decision in that
16 proceeding, all rejected Petitioner's arguments here as to the construction of
17 both dummy source structure and surround, those same issues are really
18 present here, and those arguments should be rejected for exactly the same
19 reasons. I understand why Petitioner has now sequenced their arguments
20 where they've taken Ground 1, the Park Ground, and they've, I think, allotted
21 maybe two minutes to their argument here and also deprecated it in their
22 briefing, as well, and appear to be backing away from those grounds during
23 the argument.

24 With respect to dummy source structure, Petitioner briefly brought
25 up the point and alleged that somehow Patent Owner is backing away from

1 its construction. That's not the case whatsoever. On Slide 9, as we set forth
2 in our construction, and we've never varied from it, it is a structure that does
3 not function as a source to memory cells, as that term, dummy, of course,
4 implies. I would note, however, that Petitioner does appear to be
5 abandoning its construction for dummy source structure that it put forth in
6 its briefing where it argued that it was a structure that occupies the void that
7 was used for the gate replacement process, as we've briefed, that reads in a
8 whole limitation and process to the claims that would just be inappropriate,
9 and they don't seem to be forwarding that argument here.

10 Unless there's any questions on that construction, I'll turn to the
11 surround issue very briefly. The Petitioner brought up the question of what
12 about the situation where there is less than four dummy source structures
13 that surround, and I'm going to turn to Slide 21 where we address that in the
14 lower bullet there. Petitioner had raised that argument pointing to that
15 language, but as the Board properly observed in its Institution Decisions,
16 both here and in the 910 proceeding, the dispute is not whether there are
17 fewer than four -- e.g. three -- dummy structures can surround something.
18 What Petitioner has relied on here and both sides, I think agree on this, is
19 just two. And as the specification repeatedly makes clear by distinguishing
20 between the words between when it's describing just two other structures
21 and surround when it's describing, it sometimes talks about four or six or
22 eight; it uses very different terminology for those two different terms.
23 Whether three is or is not covered isn't an issue that the panel needs to
24 address.

25 Unless there's any further questions on the Park Ground, we'll

1 reserve the remaining time for rebuttal.

2 JUDGE CYGAN: Counselor, I do have one question on that.

3 How can we be sure that between isn't a special case of surrounding; that if
4 you if you have two things on either side of you, you're certainly between
5 them, but you might also be surrounded by them, but the specification just
6 may mention that you're between them because it's a more specific way of
7 surrounding. Is there really anything in the specification that lets us know
8 that two is only between and it's not covered within the scope of
9 surrounding?

10 MR. DAVIS: Your Honor, in the specification itself, and this is on
11 Slide 19, the claims repeatedly distinguish between these concepts, one
12 being surround when there's listing it here four or more and, when it uses the
13 term between, it is consistently referring to just two other structures. That
14 same goes for the specification, and we've cited on Slide 20 a bunch of
15 examples of that. It really continues throughout. Whenever those terms are
16 being used, they're being used consistently in that manner, conveying to a
17 person of ordinary skill in the art, and really consistent with the plain and
18 ordinary meaning that, when there's just two structures, it's not surrounding;
19 but when there's four or more and the Board doesn't need it need to reach the
20 issue whether there's three, that would satisfy surrounding.

21 Thank you, Your Honors.

22 JUDGE KOKOSKI: Thank you. Petitioner, with the questioning
23 that we already did with you earlier, we're going to go ahead and give you
24 the whole 15 minutes that you had originally reserved.

25 MR. LANG: Oh, great. Thank you, Your Honor.

1 JUDGE KOKOSKI: You can begin when you're ready.

2 MR. LANG: Sure. I want to start with just kind of taking a step
3 back, and just remembering that we have to base claim construction, of
4 course, in the intrinsic record. Patent Owner had said they're not arguing
5 that this has to be interconnect, and then, literally, like 15 seconds later, he
6 said Tessariol can't function as an interconnect. I mean, it was, like, within
7 the same minute or two. And so you ask yourself, you ask yourself, well,
8 what is this adjoining structure they're talking about? And you had asked
9 some questions about it, and Counsel said, well, it could be on top. He said,
10 it could be to a metal layer.

11 Where is that described in the '872 patent? It's not. He said it
12 could be on the bottom. And then to try to distinguish Tessariol, he said, oh,
13 it's got to be some type of really special doping. Where is that described in
14 the '872 patent? It's not. I must have asked Dr. Kuhn that 15 times. No
15 doping underneath there.

16 So what is this adjoining structure that we're talking about? I still
17 don't know. What we're left with is, universally, that contact in the middle,
18 179, there's an arrow pointing to the middle of it, and it's described as the
19 conductive materials as the contact. Okay? It's because there is metal
20 material, it goes in there, and we did not propose a construction, a formal
21 construction, because none is necessary. All that needs to be found is that it
22 doesn't require adjoining structure. And we would submit, there is no
23 support anywhere in the intrinsic record that, for that to be a contact, you
24 would have to add some adjoining structure. They said it's a metal thing on
25 top. Not described. They say it's some doping underneath. Not described.

1 What is described is that you can connect it to something, and you
2 can connect it to a peripheral device, and then it functions as an interconnect.
3 And I think Your Honor's question was on point when you said, well, if you
4 wrapped it in, you know, wrapping or whatnot, would it still be a contact?
5 Absolutely, it would be, because it's described, 179, that's the contact.
6 Okay? You could cap it, and not use it, and there's your dead end, and it's
7 still a contact. This whole adjoining structure thing is made out of whole
8 cloth, and you didn't hear a lot of discussion about the '872 patent.

9 They brought up this point about the staircase contact. Yes, that's
10 a different type of contact. We're not talking about the staircase contact.
11 We're talking about the conductive contact of the dummy source structure.
12 We're talking about the conductive contact that was added to the claim that
13 was described in the file history. And to say -- I beg of the Court to go back
14 and look at that portion of the file history and ask yourself, is it describing
15 something behaving as a contact? All it does is say, here's what's inside of
16 Jeong, here's what's inside of the '872 patent dummy source hole, and it's a
17 metal material. Well, it's a contact. And then they describe it separates the
18 array. There's no discussion of something behaving as a contact. And -- I'm
19 sorry?

20 JUDGE CYGAN: To that point, what was added to the claim?
21 Was it added contact or conductive contact?

22 MR. LANG: Conductive contact.

23 JUDGE CYGAN: And there's no argument that Jeong wasn't
24 conductive. So the conductive part of it could have been the part that
25 overcame Jeong, right?

1 MR. LANG: Well, I would say that they correlated -- they didn't
2 break up the two words. They correlated the conductive contact with contact
3 179. With Jeong, I guess you could -- yes, it's hard to say because they
4 correlated the two words together and they compared what was inside each
5 structure.

6 JUDGE CYGAN: Okay.

7 MR. LANG: You know, with respect to the extrinsic evidence,
8 absolutely, the first construction requires three parts. It says, a physical
9 contact that permits current flow between conducting parts. So you're
10 between two different parts. The next one is, you know, from one thing to
11 another. But the important thing about these definitions, the last one being
12 the type of contact, electrical contact, is again, is that is what this structure,
13 contact 179, can do if you connect it to other structures.

14 And the point about Dr. Kuhn's testimony on contact pad; no, she
15 was not talking about a conductive contact. The point is is that you can have
16 a contact that's either functional or not functional. After all, we're talking
17 about a dummy source structure. As we said in our paper, dummy usually
18 means inoperable. And so there's your contact. If you make it a functional
19 contact, then it connects with other structures.

20 The Slide 38, it's interesting because we had just talked about,
21 well, there could be an adjoining structure on top. Well, there could be on
22 top of there, too. But, again, it's just like putting the Saran wrap on top, it's
23 still a contact. And in regards to the bottom, it's just not correct. They said
24 it goes to 55. Well, at the bottom, 55 is the bottom of the stack, just like the
25 other ones go down to. The bottom is conductively doped. We do explain

1 in the petition, I think at 89, that the via and dummy are made at the very
2 same time. And as you can see, in their highlighting, they show the
3 insulating liner not at the top; it's exposed. Now, it wasn't put to use, so just
4 in the case of the contacts of the '872 patent that aren't connected to
5 peripheral, you know, they're just capped.

6 I want to point out here, just, Your Honor, the *Axonics v.*
7 *Medtronic* case 75 F.4th 1374, Fed. Circuit, 2023, absolutely says when the
8 Patent Owner proposes a construction during the POR, which was done here,
9 they brought up this adjoining structure, the Petitioner absolutely has the
10 right to say that it's structure, the Tessariol dummy via, meets that. That
11 case is just directly on point.

12 And just briefly, Dr. Banerjee, he was discussing, just in general,
13 sure, when you make a liner, it's formed on the bottom, then you remove the
14 bottom part. And because Tessariol, as the petition said, is making that liner
15 both for the via and active via at the same time, you're removing both
16 bottoms. It's shown in the figures, as well.

17 I think 42, this slide, is telling. So this is their whole argument to
18 distinguish Tessariol from their adjoining structure of creation. Okay.
19 Where in the '872 patent does it talk about any of this? It doesn't. Even Dr.
20 Kuhn admitted, it says nothing about the bottom being doped. But they've
21 created this adjoining structural creation to try to distinguish the reference.
22 The patent doesn't say anything about it. But how could Tessariol not -- if
23 that bottom thing is adjoining structure in the '872 patent, how could
24 Tessariol not need it? Well, it goes down there, it goes to 55, the bottom, as
25 they said. It's just like the active via, it goes bottom. Tessariol, in fact,

1 unlike the '872 patent, says that that's conductively doped. Conductively
2 doped. So, somehow, landing on conductively doped substrate is not an
3 adjoining structure.

4 None of this distinction they're trying to make is found anywhere
5 in the '872 patent. Ohmic contact, not found in there. How you make metal
6 contact semiconductor, not in there.

7 And, again, to clarify Dr. Banerjee's testimony, yes, he's saying
8 that the interconnects are not absolutely necessary because they're dummies.
9 What he explained, and he did say you can do it, and then he explained how
10 you do it. They made a point that he was talking about -- let me find it here
11 -- polish. That was Dr. Kuhn's testimony. And the important thing in Dr.
12 Kuhn's testimony on that polish was, what she was saying is that sometimes
13 you add a structure even though you don't need it, and she gave the example
14 of it makes polishing easier. The two examples Dr. Banerjee explained in
15 detail with the lithography and the etching.

16 And this is just a --

17 JUDGE McGRAW: Would you mind saying what slides you're
18 looking at? I believe you were pointing at 43 and 44.

19 MR. LANG: Yes --

20 JUDGE McGRAW: I don't know where you are.

21 MR. LANG: -- I apologize, Your Honor. I am on 44 now. And
22 just to close the point that, after Dr. Banerjee explained that you could do
23 this, then he explained why, and in detail.

24 Turning to Slide 46, they make this point about -- a real device,
25 obviously, doesn't look like a semiconductor chip with wires coming above

1 there. As we've shown, the interconnects 82 are a connection down to the
2 dummy via in Tessariol. You could further connect that to another 82, and
3 that's what they've done here. And this would be perhaps in a metal layer.
4 Obviously, things aren't going like that. The obvious combination just
5 repeats the 82 in that layer for the consistent pattern.

6 So I just want to close on, I think we have to stay grounded here in
7 the '872 patent. Throughout their presentation, you saw very little citation to
8 the '872 patent itself. You kept hearing about this adjoining structure.
9 Okay? They gave an example of a metal layer, but they didn't point to the
10 specification, and described how the metal layer contacted the supposed
11 dummy source structure. They talked about, there could be some doping.
12 Dr. Kuhn described it had to be super, you know, special doping. They
13 didn't point to a specification for that.

14 What you're left with is a constant description from the file history,
15 from the specification, from the flow charts, and the manufacturing process.
16 When you fill the hole, they call it a contact.

17 They did it in the specification. They did it in the file history.

18 With that, Your Honors, if you have no further questions.

19 JUDGE KOKOSKI: Thank you very much.

20 MR. LANG: Thank you. And I guess I'll be seeing you all
21 tomorrow.

22 JUDGE KOKOSKI: Patent Owner, we're also going to give you
23 15 minutes' rebuttal time to give you back a little bit of the time we took for
24 questioning.

25 MR. RADSCH: Thank you, Your Honors, and I hope not to take

1 all of it. So just a few points. One is that I believe I heard Petitioner's
2 Counsel say on a couple of occasions that, because there's no express
3 description, at least in Figure 1D, of particular adjoining structures, and
4 whether there is -- there is a description of this contact being in physical
5 contact with the substrate, which differentiates it from Tessariol, which
6 lands above the substrate. But putting that aside, Petitioner's Counsel said
7 there's no support for that element being a contact, but that's what the claim
8 is. You have to give meaning to the word contact, it has to be a conductive
9 contact, and the construction that Petitioner has proposed does not give any
10 meaning to the notion of a contact, let alone a conductive contact.

11 Petitioner's Counsel tried to distinguish the staircase contact,
12 saying lots of different kinds of contact that we're not talking about, but the
13 point remains that their only description of what a contact means in the '872
14 patent is a vertical member through the stack, and they have to acknowledge,
15 a staircase contact is not that. It does not pass through the stack.

16 So it's their burden to set forth the bases for why they allege these
17 claims are unpatentable in their petition. They can't even set forth a
18 construction of that term that would satisfy the requirements of the '872
19 patent.

20 They also mentioned that the conductive contact could be a dead
21 end on both sides. I think Petitioner's Counsel said that in his rebuttal
22 remarks. That is again inconsistent with the written description of the '872
23 patent.

24 And Petitioner's Counsel makes much of the fact that there's no
25 specific description of any particular type of doping in the substrate of the

1 '872 patent. I think what they're doing is they're conflating issues. They're
2 conflating written description and enablement for purposes of the '872 patent
3 for what is required for an express or inherent disclosure in prior art because,
4 again, they're relying upon Tessariol's teaching of its dummy via, at least as
5 to the bottom portion, are only relying upon what it discloses. The only
6 obviousness theory is putting something on top.

7 And the '872, they repeatedly say that it does not disclose or that
8 we are trying to require Tessariol to disclose more than the '872 does. Well,
9 that's not the case. The '872 expressly says, on multiple occasions, that the
10 dummy source structure comprising conductive contact in the '872 can
11 function as an interconnect. They can do that when it is in contact with the
12 substrate. And so there is description of this element serving as a conductive
13 contact, that it is an electrical connection with other elements. It is that
14 description that is absent from Tessariol anywhere. Nowhere can he point
15 you to, can the Petitioner's Counsel point you to, any statement in Tessariol
16 that its dummy via is in electrical contact with some other element.

17 So what do they argue? Well, he says, okay, Tessariol describes
18 that the dummy and via may be made at the same time, but it nowhere says
19 that in the dummy structure of Tessariol that the insulating liner, which he
20 acknowledges is the bottom of that via, is patterned away. That's merely
21 attorney argument. There's nothing in Tessariol that says that.

22 If we turn then to Slide 38, this is where he was talking about, the
23 Petitioner's Counsel was talking about -- this is Patent Owner's Slide 38
24 -- how, in Tessariol, the dummy vias and operative vias can be made at the
25 same time. We actually, though, turn to Petitioner's Slide 30, if we could,

1 please. So here we see Figure 9. It's a similar figure from Tessariol. And as
2 Dr. Kuhn explains in her declaration, this is Exhibit 2007 at paragraph 194,
3 this image shows that the 14 -- which is part of the substrate -- that those
4 areas are isolated where the operative conductive vias go through. So the
5 operative conductive via is here on element 58, on, if you can see, it's on
6 Figure 9, is isolated from other regions of the substrate. So we know that
7 there are necessarily different processing occurring as between the operative
8 and dummy vias.

9 We also know that because Tessariol also describes, for example,
10 at paragraph 39, that the operative vias, not the dummy vias, but the
11 operative vias electrically couple to electronic components below. So we
12 know that there's additional processing that happens for the operative vias
13 that don't occur for those dummy vias. And, again, as Dr. Kuhn explains in
14 paragraph 194 of her declaration, those different areas of the substrate,
15 particularly where they are isolated from each other, where the dummy
16 structure lands on a different portion of the substrate, then the operative
17 conductive vias, they don't necessarily have to be doped with the same
18 material or properties. And there's no discussion, again, in Tessariol of how
19 that substrate is doped, where it is doped, if it's localized doping or not. So,
20 again, no express disclosure and no inherent disclosure of that feature in
21 Tessariol.

22 We could then move back to Patent Owner's Slide 40. So, again,
23 they argue that they should be able to make a new argument in reply. Again,
24 they've cited some case law, cited nowhere in the briefing, not provided us
25 copies of the case law that they have cited. But, again, going to the merits of

1 that argument, so there is no description in Tessariol of how that liner
2 specifically is formed. What Banerjee was describing were, these are the
3 common ways it's formed. And so there's really no dispute that, in Tessariol,
4 there is going to be insulating liner at the bottom of the dummy via. And
5 you heard Petitioner's Counsel admit to that multiple times and had to argue
6 that it would be patterned away without pointing to anything in Tessariol
7 that does say that that bottom portion is patterned away.

8 So, and then, going to Slide, -- to 42, and this, you know, back to
9 the point that, you know, again, I don't think it is disputed by their expert
10 anywhere that, again, a metal to semiconductor does not form a conductive
11 coupling unless the semiconductor is appropriately doped. And, again, they
12 come back to harping on the notion that there's no discussion in the '872 of a
13 particular doping. But, again, what there is discussion in the '872 of is the
14 conductive contact. It can be an interconnect to serve as a connection
15 between the peripheral devices and the memory device. So there is actual
16 description of those peripheral devices, to which that conductive contact can
17 make a communicative electrical connection with. And that's what's missing
18 from Tessariol. It only ever describes its dummy structures with respect to
19 the insulating lining and the conductive fill that's nowhere exposed to any
20 other structure.

21 JUDGE McGRAW: Counselor, excuse me. I have a question.
22 What would the purpose be to dope a semiconductor other than making it
23 conductive?

24 MR. RADSCH: Well, it may be doped to be conductive with
25 particular elements, right, but you have the, for example, the operative vias.

1 But it may not be appropriately doped for, in that same region where the
2 conductive -- sorry -- the dummy vias land.

3 So if we again go back to that figure from Tessariol that was on,
4 when we looked at Petitioner's slide, again, this is Figure 9 of Tessariol.
5 Right? There are different regions of the substrate. There's some where the
6 operative conductive vias land, and there are different portions isolated from
7 that where the dummy structures land. And there's no discussion anywhere
8 in Tessariol of how, if at all, the portion under the dummy structure is doped.
9 There's no discussion at all of how it's doped anywhere, but there would be
10 no reason to dope it in a manner that would even permit electrical
11 conduction with that dummy structure because, A, it's wrapped in insulator,
12 and it's not said anywhere that that's patterned away, and nowhere is the
13 dummy structure said to be functioning as or capable of being functioning as
14 an interconnect.

15 Now, again, I think the Petitioner had said multiple times that
16 nowhere does the '872 describe any adjoining structures. But it does that
17 multiple times, again, when it says that the conductive contact may serve as
18 an interconnect. It says that throughout the specification.

19 JUDGE CYGAN: But, Counselor, it does say that the
20 semiconductor is conductively-doped source material, right?

21 MR. RADSCH: In the Tessariol.

22 JUDGE CYGAN: Right.

23 MR. RADSCH: It does say that it can be conductively-doped
24 source material. It doesn't say the type of doping. It doesn't say anything
25 about the level of doping. And, again, they're not making an obviousness

1 argument. It has to be expressed or inherent disclosure. That is for the
2 connection of Tessariol's dummy via to the substrate. They rely upon only
3 disclosure. Their only obviousness theory is adding something on top.

4 JUDGE CYGAN: So, under their 103 grounds, because Tessariol
5 teaches a conductively-doped source material, they have active vias and
6 dummy vias. Are those filled with the same material or different materials
7 in Tessariol?

8 MR. RADSCH: Well, they describe that they can be formed at the
9 same time. They don't say whether that they are the same or different
10 materials. So, I believe it's silent as to that question. So, again, there's no
11 express disclosure of that.

12 JUDGE CYGAN: Well, are they doing gate replacement in
13 Tessariol?

14 MR. RADSCH: I don't believe there's any allegation of that.

15 JUDGE CYGAN: Okay.

16 MR. RADSCH: And, again, I think they acknowledge that, even
17 under their construction of dummy source structure that does require gate
18 replacement, that Tessariol would not meet their construction. So I don't
19 think there's any allegation of that.

20 JUDGE CYGAN: Let me get to my other question, which was
21 that Dr. Kuhn's testimony -- I'm looking at Exhibit 2001, paragraph 43. The
22 argument that Dr. Kuhn is making is that not all situations in which the
23 physical structure is in contact with would meet the conditions necessary to
24 provide interconnect. But I think you said earlier that you're not requiring
25 interconnect. You're just requiring conductive contact, which is what's

1 claimed. Right?

2 But doesn't Dr. Kuhn go a little bit further in the requirements to
3 appropriately serve as an interconnect? It seems that that's what paragraph
4 47 was telling us. Paragraph 47 has a graph which shows that you could
5 have ohmic, which has to be a straight line on an IV plot, but you could also
6 have a Schottky one. The Schottky one is not going to be good enough to
7 serve as an interconnect because it's not ohmic, basically. But the Schottky
8 one, I mean, doesn't that meet your conditions from your definition?
9 Because the definitions that you gave us earlier, and you clarified that it only
10 requires the current may flow, and I don't think you require that it only flow
11 under certain voltage conditions. And, certainly, the Schottky will permit
12 voltage to flow under some voltage conditions.

13 So I'm a little concerned, and I wanted you to be able to speak to it
14 while you're in front of us about whether or not you're limiting the contact to
15 be an interconnect or whether it's just more broadly to be a conductive
16 contact and how Dr. Kuhn's testimony plays into that.

17 MR. RADSCH: Sure. So we are not requiring, our construction
18 would not require conductive contact to be an interconnect. I think the way
19 to read the testimony both in paragraph 47 and the other testimony you've
20 cited here and quoted here in Slide 42 is that one cannot, and she says, you
21 know -- so this is beginning of paragraph 47 of her declaration, Exhibit
22 2001, to make sure we're in the same place.

23 Typically, a contact between two dissimilar materials needs to be
24 an ohmic contact in order to be capable of serving as an interconnect in the
25 circuit. Now, again, you have to have a conductive contact to be able to

1 serve as an interconnect, so I don't read that as saying, my construction, Dr.
2 Kuhn's construction, Patent Owner's construction requires an interconnect.
3 It certainly cannot serve as an interconnect if it has no conductive contacts.
4 So I think that's a proper way to understand that.

5 And as to the issue of the Schottky contact, you know, I would
6 submit that there's going to be cases where the operating voltage or the
7 ability for current to flow with that Schottky contact will be outside the
8 operating parameters of the device. And so it could not, in that completed
9 device, and Claim 1 is to a 3D memory device, in that completed device to
10 which Claim 1 is directed, it would not permit current to flow under certain
11 conditions. And I'm not talking about, again, Claim 1 has to be read in its
12 entirety. It is to a 3D memory device. And so, in those parameters, it has to
13 permit current to flow.

14 And I think that also goes to the point about what Petitioner's
15 Counsel was making. You could have a shrink-wrapped, partially-
16 constructed device. That's not what Claim 1 is to. Claim 1 is to a
17 completed, it's to a 3D memory device.

18 And then lastly, as a last point --

19 JUDGE KOKOSKI: Counselor, I'm sorry. You're out of time.

20 MR. RADSCH: Oh, thank you. I am. Thank you. Thank you,
21 Your Honors.

22 JUDGE KOKOSKI: Okay. Thank you all for being here, for
23 taking the time to come in and giving us these arguments. The case is now
24 submitted to the panel for determination and preparation of the final written
25 decisions. I presume we will see at least some, if not all, of you tomorrow.

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- 1 Have a good evening, and we are adjourned.
- 2 (Whereupon, the above-entitled matter went off the record at 3:14
- 3 p.m.)

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