

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INNOSCIENCE (ZHUHAI) TECHNOLOGY COMPANY, LTD
AND INNOSCIENCE AMERICA, INC.,
Petitioner,

v.

EFFICIENT POWER CONVERSION CORPORATION
Patent Owner.

IPR2023-01381
Patent 8,350,294 B2

Record of Oral Hearing
Held: December 18, 2024

Before JON B. TORNQUIST, JEFFREY W. ABRAHAM, and KIMBERLY
McGRAW, *Administrative Patent Judges*.

APPEARANCES:

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P R O C E E D I N G S

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JUDGE TORNQUIST: Please be seated. Just a second here to set up our computers. All right, welcome. We're here today for an argument in Innoscience (Zhuhai) Technology Co., Limited, and Innoscience America, Inc., versus Efficient Power Conversion Corp addressing patent 8,350,294.

I am Judge Tornquist, and with me is Judge Abraham in the hearing room and Judge McGraw is appearing remotely. Who do we have from Petitioner?

MR. LAVENUE: Good morning, Your Honors, Lionel Lavenue from Finnegan for Petitioner. With me also is Dr. Carlos Duarte-Guevara. He will be arguing today under the LEAP program. Today is his first argument ever in any hearing or courtroom.

And also with me is Kara Specht, also on the LEAP, who is in the first row. Thank you.

JUDGE TORNQUIST: Okay, welcome. And Patent Owner?

MR. DAVIS: Good morning, Your Honor, Walter Davis, on behalf of Patent Owner. I'll be doing the argument today on behalf of us, and with me is Dipu Doshi, Jon England, Steve Soffen, and Mark Mashack, and our paralegal, Abraham Senital (phonetic).

JUDGE TORNQUIST: Okay. Welcome. Per our oral hearing Order, each side will have 75 minutes of argument time today. Petitioner, you mentioned you have a LEAP practitioner, so you'll have 15 additional minutes for argument today.

1 Petitioner, bearing the ultimate burden of proof will go first. And you
2 can address both the grounds on the original challenged claims as well as the
3 motion to amend.

4 You can also reserve a short -- or some time for rebuttal. And then
5 we'll hear from Patent Owner, who may also reserve a short time for
6 rebuttal.

7 Then we'll hear the rebuttal and surrebuttal arguments. We have a
8 long hearing today, so we'll see how everyone's doing, but maybe we'll take
9 a break after Patent Owner's original discussion.

10 We have the parties' demonstratives, but as you go through, please be
11 clear on what page or slide you're on so that the record is clear and we can
12 follow along later on.

13 With that, Petitioner, when you're ready. And please just let us know
14 how much time you'd like to reserve for rebuttal. And we'll try to track
15 along.

16 DR. DUARTE-GUEVARA: Could we reserve, sir, 15 minutes?

17 JUDGE TORNQUIST: 15?

18 DR. DUARTE-GUEVARA: Yes.

19 JUDGE TORNQUIST: All right.

20 DR. DUARTE-GUEVARA: Good morning, Your Honors. My name
21 is Carlos Duarte-Guevara. I'm here on behalf of the Petitioner. And to start
22 the discussion, to start the morning, I want to just give a big overview of the
23 patent and some of the prior art that is at issue in the case.

24 So I'm going to start with my demonstratives in Slide Number 5. And
25 here we have the cover of the patent. Today, we are going to be talking
26 about the gallium nitride transistors.

1 That's going to be the topic for discussion today. In Slide Number 6,
2 I have the admitted prior art in Figure 1, and then in the right side is one of
3 the embodiments in the patent.

4 And the message here is that the patent, at least most elements, were
5 known or conventional. The only modification and the whole topic for
6 discussion is going to be in the cap layer.

7 That is that layer that is in the red square on the top of the device.

8 In Slide Number 7, I have again that admitted prior art now
9 comparing to the claim. Because as you see, the prior art already has most
10 of the elements.

11 It has the substrate, the transition, the buffer, the barrier, and the gate
12 contact. The only issue that we're going to be focusing on is from the
13 compensated layer.

14 In Slide 8, I have the claims that are at issue. So here, we're talking
15 about Claims 1-3, and then 7-9. The other claims were cancelled in Patent
16 Owner's Noncontingent Motion to Amend.

17 And what I wanted to highlight from this slide is that most elements,
18 including the limitations in the dependent claims, are undisputed.

19 So we're going to be focusing on two elements, the compensated layer
20 in Claim 1 and the semi-insulating layer in Claim 7.

21 With that, let's talk about the invalidity grounds. So in Slide 10, I
22 have a summary of the invalidity grounds that were instituted. We have two
23 invalidity grounds. One of them has three parts.

24 All the three references that we're going to be talking about are
25 undisputed prior art. All of them are talking about gallium nitride
26 transistors.

1 But let me just review them relatively quickly. In Slide 11, I have a
2 summary of Smith, and Smith is one of the references. Smith discloses
3 gallium nitride transistors, and it has all the conventional layers that we were
4 talking about before that were in the prior art, including a cap layer that we
5 will argue can be compensated or semi-insulating, meeting all the disputed
6 limitations in the claims.

7 In Slide 12, I have Uemoto. That is the other reference that we use in
8 our invalidity grounds. Uemoto discloses gallium nitride transistors, too.

9 It also discloses all the conventional layers. And Uemoto has
10 highlighted 15b that you're going to be hearing a lot today. That layer is
11 highlighted in purple here in Slide 12.

12 And that layer is hydrogen passivated. The hydrogen, there's
13 hydrogen that gets diffused from one layer into layer 15b, so that it's
14 compensated. And we argue that can be also made semi-insulating.

15 JUDGE TORNQUIST: Could I ask just a quick question as a
16 background? I believe the Petitioner put in the ITC Commission report.
17 This reference was before the ITC, but without Smith, correct?

18 DR. DUARTE-GUEVARA: Correct.

19 JUDGE TORNQUIST: And was Smith at all involved in the ITC as
20 you have it here?

21 DR. DUARTE-GUEVARA: Not at the hearing, Your Honor. It was
22 at issue in our contentions, but what we presented to the ITC was Uemoto by
23 itself --

24 JUDGE TORNQUIST: Okay.

25 DR. DUARTE-GUEVARA: -- without --

1 JUDGE TORNQUIST: So the ITC never resolved or addressed just
2 Smith by itself, your first three grounds, your 1a, b, and c?

3 DR. DUARTE-GUEVARA: Correct, it never addressed that.

4 JUDGE TORNQUIST: Okay. Thank you.

5 DR. DUARTE-GUEVARA: Let me continue to Slide Number 13,
6 and that is Kigami, the last piece of prior art in the invalidity elements. And
7 Kigami discloses a technique for the specific issue of locally introducing
8 hydrogen in GaN transistors and to passivate dopants and increase
9 resistivity.

10 This is a Japanese publication and it's teaching a technique. That's
11 what we're taking, Kigami, or the teaching that we want from Kigami, is
12 that hydrogenation that is used in the transistors.

13 So with that, Your Honors, I'm going to move to the first issue that I
14 would like to discuss today, and that is claim construction before we move
15 into the invalidity arguments.

16 There are three issues in claim construction. The first one is this term
17 compensated GaN layer. The second one is the construction for Element 1f
18 that is a gate contact above the compensated GaN layer, and the last issue is
19 the interpretation that Patent Owner is proposing to the enhancement mode.

20 So let me start with the first one. And here in Slide 16, I have the
21 claim term, compensated GaN layer, and the two constructions that the
22 parties proposed.

23 In the middle is Petitioner. We have -- we are proposing construction
24 with a step that is based on the patent. Patent Owner has a different
25 construction.

1 But I here I want to give two highlights, because the commission, the
2 ITC, issued a commission opinion in December 5 where they construed this
3 term. So I want to talk about it.

4 Because what the ITC did is similar to what the board did at
5 institution. They rejected EPC's proposal to restrict the compensated
6 gallium layer to be gate material.

7 So there's an agreement between the board and the commission on not
8 using gate material. What the commission did do is they defined
9 compensated GaN layer in a broader term.

10 They took the portion that is in green from EPC and that's how they
11 went for their construction. So they ended up with a broader construction.

12 And because it's broader, it covers more and it's easier to map to the
13 prior art.

14 In Slide 17, I just want to quickly point out where the commission
15 adopted the construction. And it's in Exhibit 1049, Pages 16-17.

16 They define compensated GaN layer as a GaN layer in which one type
17 of impurity cancels electrical effects of other type of impurity.

18 In Slide 18, I have the portion of the commission opinion where the
19 commission rejected EPC's proposal to use the gate material that was in
20 their construction.

21 So in Slide 19, I have the three constructions that have been proposed
22 or adopted for the term compensated GaN layer. And here what I want to
23 show by comparing the different constructions is that the ITC construction
24 uses canceled electrical effects, like EPC, but is broader, because they
25 remove the gate material and they also didn't use our step to passivate.

1 So they ended up with this broader construction. In Slide 20, I have a
2 brief excerpt of the board's institution decision just to position ourselves on
3 where we are here in claim construction.

4 So here, at institution, the board, like the ITC, rejected EPC's
5 construction incorporated gate material. And here, I have the quote. It's in
6 Paper 11.

7 That's the institution decision where the board explained that we do
8 not construe compensated GaN layer to require compensated GaN gate
9 material.

10 In Slide 21, I have another conclusion that happened at institution.
11 Because at institution, the board didn't adopt an expressed construction,
12 finding the grounds that we proposed met compensated GaN under any
13 construction for purposes of institution.

14 JUDGE TORNQUIST: So what are you asking us to construe now?
15 We have the ITC and we have what you put forward with the step. What do
16 you think we should do?

17 DR. DUARTE-GUEVARA: Let me jump to my Slide 24, because
18 that's where I have the conclusion of what we think should happen in this
19 case. We think that as the ITC and the board already concluded an
20 institution, the board should not restrict compensated GaN layer to gate
21 material. So that's the first part.

22 The second part is that we think that like the institution, express
23 construction is only required if necessary. But here, the grounds meet
24 compensated GaN layer under any construction, so there is no need to
25 expressly construe.

1 JUDGE TORNQUIST: Okay. So that means your Smith ground,
2 hydrogen that's naturally present would be sufficient under any
3 construction?

4 DR. DUARTE-GUEVARA: So Smith is going to be, just by itself,
5 Smith is going to meet EPC's construction and the IPC's. For the step
6 portion, that's where the Kigami and the Uemoto combinations come into
7 play, to make clear that you have an affirmative step for the passivation.

8 Because we have in our construction a step.

9 JUDGE TORNQUIST: Right, and your ground with Smith, at least
10 one piece of it, is just to say hydrogen is naturally there when these are laid
11 down.

12 DR. DUARTE-GUEVARA: That is correct, yes.

13 JUDGE TORNQUIST: But would that cover your construction?

14 DR. DUARTE-GUEVARA: No, Petitioner would have the position
15 that it will be within the person of ordinary skill to modify how you're going
16 to layer and that account as a step.

17 But the way we have for sure a step that's in our construction will be
18 with one of the combinations, either Kigami or Uemoto.

19 JUDGE TORNQUIST: Okay.

20 DR. DUARTE-GUEVARA: And maybe just to point out, I'm going
21 back to Slide 23, oh, I just got a note that should we wait for Judge
22 McGraw? We lost her connection.

23 JUDGE TORNQUIST: Oh, thank you for letting us know. Let's see
24 here. I will pause this. Now can you see if Judge McGraw is on?

25 JUDGE TORNQUIST: Yes. I just mentioned to IT now about it.

26 JUDGE TORNQUIST: Let's just give her a second here.

1 DR. DUARTE-GUEVARA: Of course.

2 JUDGE TORNQUIST: Thank you for letting us know, because we
3 can't see behind us now. Hey, Judge McGraw, can you hear us?

4 JUDGE MCGRAW: I can now.

5 JUDGE TORNQUIST: Okay, great. Okay, then let's go ahead and --
6 sorry about that.

7 DR. DUARTE-GUEVARA: Okay. No, no. Thank you.

8 JUDGE MCGRAW: I apologize for the technical issues.

9 DR. DUARTE-GUEVARA: Of course. No. Thanks. So let me go
10 now to slide -- I understand your questions about the compensated GaN
11 layer. I'm going to move to the second claim construction issue.

12 In Slide 25 of my demonstratives, I have the other construction issue
13 that's for Element 1f that is a gate contact above the compensated GaN
14 layer.

15 We don't think that that term needs to be construed, that is plain and
16 ordinary meaning. The Patent Owner proposed a construction of a gate
17 comprised of a gate contact and a compensated GaN layer.

18 We think that is incorrect because EPC is asking to rewrite 1f
19 attempting again to limit compensated GaN layer to be part of a gate. And
20 we don't think that is correct.

21 But you don't have to hear it from me because the ITC already gave
22 us direct guidance about it. As I note in the slide, the ITC already declined
23 to limit compensated GaN layer to be part of a gate, finding there's nothing
24 in disclosure that supports such a narrow construction.

1 And in the slide, I have again the commission's opinion in Exhibit
2 1049 where they say there's nothing in that disclosure that requires the
3 compensated GaN layer to be part of a gate contact.

4 They also point out in one of the figures you have the compensated
5 GaN layer, 38, as a separate structure than the gate contact, 37.

6 So they concluded it would be improper to limit the invention, as EPC
7 argues. Because the patent does not provide support for their narrowing
8 construction.

9 Instead, this term has a plain and ordinary meaning because we all
10 know what is above.

11 So I have a few slides on this, but because the ITC already put it so
12 eloquently, I'm going to go to the last issue on claim construction, unless
13 there are any questions.

14 So let me move to Slide 34. And the last issue we have on claim
15 construction is whether these Claims 1-3 should be limited to enhancement
16 mode devices.

17 Now this one is a little bit weird to me because there's no construction
18 of any claim term. EPC is just arguing for an interpretation of the claims
19 without really telling us what term is pointing to their interpretation.

20 So without them to define any term to construe, EPC proposes to limit
21 the claims to enhancement mode devices. But again, Your Honors, the ITC
22 already helped us with this issue and they declined to do so.

23 The ITC declined EPC's enhancement mode interpretation because it
24 would be one of the cardinal sins of claim construction. And here what we
25 have is the judge, the admin law judge opinion in Exhibit 2022, where he
26 says, to limit Claim 1 to enhancement mode transistor on this record will

1 commit one of the cardinal sins of patent law, reading the limitation from the
2 written description into the claims.

3 I plan to do so. We think the board also should incline to do so,
4 because there's nothing in the claim that should limit these devices to
5 enhancement mode.

6 JUDGE TORNQUIST: Enhancement mode was sort of the point of
7 the patent, wasn't it?

8 DR. DUARTE-GUEVARA: I wouldn't say so, Your Honor.

9 JUDGE TORNQUIST: Okay.

10 DR. DUARTE-GUEVARA: Because there's also embodiments about
11 depletion mode. So the point of the patent is a compensated layer, but that
12 doesn't have to be enhancement or depletion.

13 And we can talk more about that issue, but this interpretation that
14 they're proposing will actually contradict some of the embodiments that are
15 in the patent.

16 And primarily, it just doesn't have any support in the claim itself.

17 JUDGE TORNQUIST: Okay. If we were to go with Patent Owner, we
18 also have to decide whether the preamble was limiting?

19 DR. DUARTE-GUEVARA: That is correct, Your Honor. I think --

20 JUDGE TORNQUIST: I think that is where, well, and maybe I'm
21 jumping because that is in the amended claims.

22 DR. DUARTE-GUEVARA: In the amended claims, that's correct,
23 yes.

24 JUDGE TORNQUIST: It seems like it's the same general approach
25 here.

1 DR. DUARTE-GUEVARA: Issue, yes, and you're correct. The
2 preamble for claims doesn't have any enhancement mode, and that's telling.
3 Now they're wanting the enhancement mode, so they put it in the preamble.
4 But in the original claims, that was not part of the preamble.

5 JUDGE TORNQUIST: Okay.

6 DR. DUARTE-GUEVARA: So again, I have a few slides about this,
7 but I'll ask if there's any questions because I want to cover other ground.
8 I'm going to jump to Ground 2. That is the first ground that I want to
9 discuss.

10 So I'm going to jump to Slide 40. And in Slide 40, we start with
11 Ground 2. In Slide 41, this is addressing one of your questions, Your Honor.

12 In Slide 41, well, first, I asked the question, why are we starting with
13 Ground 2? And the reason is because, unlike Smith, invalidity based on
14 Uemoto was litigated by the ITC, and the ITC already made some
15 determinations.

16 The ITC resolved some of the key issues that we have with Uemoto,
17 and that's going to streamline some of the issues that we have here.

18 In this slide, I have the summary of the different grounds of invalidity,
19 to point out that the ITC did not opine about Smith but it did opine about
20 Uemoto by itself without Smith, and only for Claims 1-3, because those
21 were the claims that were at issue at the ITC.

22 In Slide 42, and before we go into show you what happened at the
23 ITC, I just want to show what has happened here and what's disputed and
24 not disputed.

1 In Slide 43, I have all the elements of Claims 1-3 to point out that the
2 dispute here centers from two elements, 1e and 1f. 1e is a compensated
3 layer. 1f deals with the position of the compensated layer.

4 In Slide 45, I again have the elements that these stand for, Claims 7-9,
5 to point out that here the issue is in 7e. That's the semi-insulating limitation.
6 There's no dispute about the other issues or the other limitations.

7 So with that brief introduction, and just to point out what is in dispute
8 here, let me go to talk about what the ITC did. So in Slide 47, I started a
9 section on the ITC opinion about Uemoto.

10 And let me go to Slide 48. Again, here, just to point out what we're
11 going to be talking about Ground 2, because that's where Uemoto and
12 Smith, the ITC, talk about Uemoto by itself.

13 In Slide 49, I have a brief summary of what happened at the ITC with
14 Uemoto. So Uemoto found -- excuse me, the ITC found that Uemoto by
15 itself anticipated -- they did an anticipation analysis -- anticipated all
16 elements in Claim 1-3 but for 1b, but for the set of III-N transition layers.

17 For all the other elements, the ITC found that Uemoto meets those
18 elements. In Slide 50, I have a brief summary of what the ITC concluded
19 about this issue of the transition layers.

20 They concluded that applying a clear and convincing standard,
21 Uemoto by itself did not meet the set of III-N transition layers. That was
22 their conclusion in the ITC.

23 However, here Ground 2 is different, because it's not Uemoto by
24 itself. Here we have Uemoto plus Smith, and we actually use Smith to hold
25 multiple transition layers.

1 So that his going to address the ITC judge's concern about this
2 specific issue.

3 JUDGE TORNQUIST: Can I ask a question?

4 DR. DUARTE-GUEVARA: Yes.

5 JUDGE TORNQUIST: It looked like, reading the most recent report,
6 that you put in recently, that Smith was originally part of the ITC proceeding
7 and then dropped out. Why was that?

8 DR. DUARTE-GUEVARA: Your Honor, in the ITC, we have the
9 benefit of contentions, and Element 1b was not disputed in their contentions
10 for validity. So we have very limited time in the ITC to present our
11 invalidity case.

12 So we decided to rely on Uemoto by itself because our expert kept
13 telling us this was really obvious, this was really obvious. You don't need a
14 second reference. Everybody was doing this.

15 And based on those time constraints, that was the reason that at trial
16 we only presented Uemoto by itself without Smith.

17 JUDGE TORNQUIST: Okay, so it was your decision, not something
18 from the ITC or the like?

19 DR. DUARTE-GUEVARA: No, correct, correct. It was our decision
20 based on time constraints during hearing time that we didn't have enough
21 time to go through all the motivation to combine Uemoto and Smith.

22 JUDGE TORNQUIST: Okay. I just want to make sure that I
23 understand the procedural background behind it.

24 DR. DUARTE-GUEVARA: No, that's correct. It was because the
25 contentions. So moving to Slide 52, here we're comparing the ITC opinion
26 about Uemoto by itself against the disputed issues for Ground 2.

1 So the ITC found Uemoto failed to anticipate or meet only one
2 element, Element 1b. But 1b here is undisputed in the Uemoto and Smith
3 combination.

4 And I forgot to mention before, here that combination is not disputed.
5 EPC does not argue this combination will be correct, so we don't have any
6 issue with the combination.

7 So the only element that the ITC found an issue with, 1b, is not
8 disputed here. On the flip side, the two elements that Patent Owner disputes
9 here were found to be anticipated at the ITC.

10 So with that, let me quickly review the combinations that we're
11 proposing between Uemoto and Smith. So let me go to Slide 54. And here
12 is a summary of the first combination that we're proposing.

13 And this is the one that's going to address the IT judge's concern,
14 because we're adding multiple transition layers from Smith in this
15 combination that again is undisputed.

16 We're modifying Uemoto to include the strain balancing transition
17 layers that Smith describes. And in our petition, we will explain why we do
18 that.

19 It has to do with preventing cracking and reducing stress. That's the
20 purpose of the transition layers. But again, this -- happy to answer any
21 questions, but again, this is not disputed.

22 In Slide 55, we have a summary of the different arguments that we
23 made in our petition of why there's motivation to combine under the case of
24 rationales.

25 But I don't want to go into too much detail. Unless there are any
26 questions, I'll keep going.

1 JUDGE TORNQUIST: No, I think it does look like you are going to
2 address, but I'd like to hear about Claim 7.

3 DR. DUARTE-GUEVARA: Yes.

4 JUDGE TORNQUIST: The combination.

5 DR. DUARTE-GUEVARA: So for Claim 7, Uemoto does not have
6 semi-insulating layers. Instead, it has the compensated layer. But Smith
7 does teach to have semi-insulating layers in a process that he calls co-
8 doping.

9 So the combination there would be applying the Smith's co-doping to
10 Uemoto.

11 JUDGE TORNQUIST: What part of Uemoto?

12 DR. DUARTE-GUEVARA: To Layer 15.

13 JUDGE TORNQUIST: All of it? 15a and b are all going to be co-
14 doped?

15 DR. DUARTE-GUEVARA: Correct, that's what we're proposing in
16 the combination. The combination is undisputed. The reason we would do
17 that is because Smith teaches that it minimizes variations between
18 processing runs.

19 And again, I have some slides on the actual mapping of the claim, but
20 here, I'm just talking about the combination. In Slide 57 I have a summary
21 again of the reasons that you will combine Uemoto with Smith's co-doping.
22 And again, this combination is not disputed.

23 So let me move to what's disputed. I mentioned a bunch of times how
24 there was a lot of -- there's no disputes a lot about issues, why it's at issue
25 still.

1 I think there's three issues that we still need to resolve for Ground 2.
2 The first one is does Uemoto's Layer 15b, the purple layer that I showed
3 before, meet the compensated gallium layer?

4 This is something that ITC already resolved. The second issue is does
5 Uemoto meet the position requirement of gate contact above the
6 compensated layer?

7 Again, this is something that the ITC already resolved. And the final
8 issue, and this is what you're asking, Your Honor, so I can -- let me say, so
9 the final issue would be does Uemoto Smith combination disclose the Smith
10 -- the semi-insulating layer? And we think the answer result is going to be
11 yes.

12 As I note in the slide, issues 1 and 2 that I have in Slide 59 were
13 addressed at the ITC. And there's a couple of points that I would like to
14 highlight.

15 But if Your Honors prefer, I can jump straight to Claim 7.

16 JUDGE TORNQUIST: At least in my thinking, up to Claim 7, it
17 seems like the claim construction issues almost -- how we go on that is
18 going to decide this piece. Whether it has to be part of the gate, the resistant
19 region and the like.

20 DR. DUARTE-GUEVARA: For Claim 1, Your Honor, I --

21 JUDGE TORNQUIST: Yes, up to Claim 7, it seems, I know some of
22 these have dropped out as well, but it seems like the claim construction is
23 going to dictate what we do with Claim 1.

24 DR. DUARTE-GUEVARA: In the Uemoto ground, yes.

25 JUDGE TORNQUIST: Yes.

1 DR. DUARTE-GUEVARA: In the Uemoto ground, yes, that's
2 correct.

3 JUDGE TORNQUIST: Okay, so it seems like, just to understand the
4 positions, Claim 7's the most important one, for me to understand what's
5 going on with your actual combination.

6 DR. DUARTE-GUEVARA: Got it.

7 JUDGE TORNQUIST: And it seems like the big question is, what is
8 Smith actually teaching about co-doping --

9 DR. DUARTE-GUEVARA: Okay.

10 JUDGE TORNQUIST: -- with its incorporation of Saxler.

11 DR. DUARTE-GUEVARA: Okay.

12 JUDGE TORNQUIST: Is that correct?

13 DR. DUARTE-GUEVARA: Yes.

14 JUDGE TORNQUIST: Okay.

15 DR. DUARTE-GUEVARA: I can address the issue. Let me move to
16 slides.

17 JUDGE TORNQUIST: And obviously, that's my question. If you
18 want to bring the whole presentation that you want, you're welcome to
19 proceed however you want.

20 DR. DUARTE-GUEVARA: Okay. No, let's talk about that issue.
21 So, we're going to be talking about the last issue that is Uemoto's
22 combination, which means does it do the semi-insulating layer?

23 So as I was mentioning before, Your Honor, Uemoto does not
24 disclose the semi-insulating layer, but Smith does. And you're asking me
25 what is Smith teaching about this co-doping?

1 So in Paragraph 85, Smith teaches that you can form these cap layers
2 using a technique called co-doping. And in that very same paragraph, he
3 incorporated the reference, another document that we labeled Saxler 874,
4 and that is Exhibit 1016.

5 So what it's teaching about it is that you can form the cap layer in co-
6 doping and that that makes the layer semi-insulating. The reason you want
7 to do that, Your Honor, is because that's, as I was mentioning before,
8 improved the predictability of the layer and reduces process by variations.
9 So that is the reason you want to do that.

10 The co-doping that we're talking about is putting two different
11 dopants. For example, one is magnesium. The other one is iron. And what
12 Smith and Saxler, which we're arguing that they should be treated as the
13 same reference, is teaching that that co-doping is building a semi-insulating
14 layer.

15 JUDGE ABRAHAM: Counselor, in Smith, Paragraph 85, can that
16 co-doping also refer to just different concentrations of the same dopant
17 throughout the region? Or does it have to refer to different dopants?

18 DR. DUARTE-GUEVARA: I don't think it has to -- it can refer to
19 both, I believe. What is very clear is that the co-dopant that is being
20 described, for example, in Saxler 874, is a combination of dopants that I just
21 discussed.

22 To the question of whether it can be different concentrations, I don't
23 think it's necessarily that, but what is for sure in part in the reference is that
24 co-doping with two dopants.

25 JUDGE ABRAHAM: You're saying that's what for sure in the
26 Saxler reference that's incorporated in Smith.

1 DR. DUARTE-GUEVARA: Correct.

2 JUDGE ABRAHAM: Okay. When I'm reading Smith itself, it says
3 that, this is Paragraph 85, it says some embodiments of the present
4 invention, the cap layer has a dopant incorporated throughout the cap layer.

5 In such a case, a doped region may be provided by a region of
6 increased dopant concentration over the concentration of dopant in the
7 remainder of the cap layer.

8 That language suggests to me that they're talking about the same
9 dopant but just different concentrations in that cap layer. Would you agree
10 with that?

11 DR. DUARTE-GUEVARA: I agree with that, and I believe he's
12 talking about something called delta doping or something along those lines
13 in that paragraph. I don't remember that exact line.

14 But, Your Honors, the fact that Saxler 874 is incorporated by
15 reference means that Smith will be teaching both, at least.

16 JUDGE ABRAHAM: Okay. Thank you.

17 DR. DUARTE-GUEVARA: In Slide 31, I talk about the
18 combination. We already talked about it so I don't want to belabor it, but
19 here in Slide 71 is where we have expert testimony from Dr. Shealy
20 explaining why it would do that.

21 And it has to, what I described before, form a stable semi-insulating
22 layer that will be advantageous to Uemoto. And again, Your Honors, that
23 combination is not disputed.

24 What is disputed is that EPC argues that Smith and Saxler have two
25 different co-dopings. So these may be addressing what Judge Abraham was
26 talking about.

1 They point out -- so the fact that Saxler teaches co-doping that results
2 in semi-insulating cannot be disputed. It's kind of black and white in the
3 reference.

4 What they argue is that EPC believes that Saxler 874 will need to be
5 combined with Smith, but we think that is incorrect. And let me talk about
6 why.

7 And it is because Saxler and Smith are the same reference. Saxler and
8 Smith cannot disclose different co-doping because they are the same.

9 There is no need to modify Smith with Saxler for a semi-insulating
10 cap because Smith is incorporating by reference Saxler. And here I have
11 this case of Paice versus Ford Motor , that explains that incorporation by
12 reference provides a method to have the reference document effectively part
13 of the whole document as if it were explicitly contained therein.

14 So Your Honors, the Smith itself is teaching the co-doping with the
15 two dopants that is resulting in the semi-insulating layer.

16 And moving to Slide 74, here again I have the list of elements of
17 Claims 7-9. And because Smith is expressly teaching, that is what the case
18 was telling us, that Smith is expressly teaching co-doping with the two
19 dopants that results in a semi-insulating layer.

20 And there's no dispute about the application of Smith to Uemoto.
21 Uemoto and Smith combination meets the only disputed limitation for these
22 claims.

23 JUDGE TORNQUIST: Does Smith teach increasing dopant
24 concentrations within the same layer? I mean, different doping
25 concentrations within the layer? Like you said, a delta.

26 DR. DUARTE-GUEVARA: Yes. I think Smith teaches that, too.

1 JUDGE TORNQUIST: And how about Saxler?

2 DR. DUARTE-GUEVARA: No. I think Saxler is focusing on
3 mixing the dopants to increase the resistivity.

4 JUDGE TORNQUIST: And I think that's why we might be catching
5 up here, because, yes, it's incorporated by reference. It's there. But if co-
6 doping can mean different things, maybe the co-doping they're actually
7 talking about is in the sentence before, which is the delta doping.

8 DR. DUARTE-GUEVARA: But Your Honor, it will need to be both
9 of them at least. Because what the case was telling us is that Smith is telling
10 us -- Smith is basically telling us that the cap layer can be formed with co-
11 doping. Look at Saxler as one way to do that.

12 And that incorporation is bringing the disclosure of Saxler that you
13 can have two dopants to form the semi-insulating layer. So even if Smith is
14 teaching doping with different levels within the cap layer, the fact that it's
15 incorporating by reference Saxler, it's also teaching to meet the cap layer
16 with that specific technique.

17 And this is not an incorporation by reference like at the beginning of
18 the patent or some random place. It is specifically for the cap layer.

19 So we need to -- we need to understand that Smith is telling us, look at
20 -- excuse me, Smith is telling us look at Saxler on how to make this cap
21 layer, and Saxler is undisputedly teaching to use co-doping, two dopants for
22 a semi-insulating layer.

23 JUDGE TORNQUIST: Okay.

24 DR. DUARTE-GUEVARA: So with that, Your Honors, in Slide 75, I
25 have a summary of the different issues that we're discussing. But before we

1 go there, and I think I have time to do that, I want to show -- I do want to
2 highlight one thing, because otherwise this slide is not going to make sense.

3 So let me go to Slide 61. The thing that I want to highlight to Your
4 Honors is this portion of the ITC hearing where EPC's expert admitted the
5 following:

6 Layer 15b is gallium nitride. Excuse me, he's talking about Uemoto,
7 okay? So EPC's expert at the ITC was talking about Uemoto and he
8 admitted the following:

9 Layer 15b is gallium nitride. Contains magnesium and hydrogen. It's
10 passivated and is non-conductive. So in that sense, it means the claim term
11 compensated gallium nitrate.

12 I believe EPC is going to try to struggle with this, arguing that, no,
13 that 15b is not compensated GaN, but this is the exchange that their expert
14 had with the judge at the ITC.

15 And the reason I wanted to highlight it is because the judge used this
16 admission in his decision.

17 And let me also go to Slide 69. Because EPC's also going to tell you
18 that I agree with Your Honor that their argument is based on the claim
19 construction of the GaN gate material.

20 I just wanted to point out that the judge at the ITC also declined that
21 issue. He found that these functional gate distinctions that EPC is going to
22 argue, they are not persuasive.

23 In his opinion, he wrote that Figure 7 of Uemoto shows that a Layer
24 20 is located on a higher plane than Layer 15b, and the two layers are
25 basically in contact.

1 So he declined to address -- no, sorry, not declined to address, he
2 declined to adopt EPC's arguments about the position requirement for the
3 claim.

4 So now let me go back to the summary slide. So that is Slide 75.
5 Because these three issues that we have for Ground 2, so does Uemoto meet
6 the compensated GaN layer?

7 The answer is yes, and the reason I wanted to show you that portion of
8 the ITC here in cross-script is to explain why even EPC's expert admitted
9 that Layer 15b is a compensated GaN layer.

10 For the second issue of does Uemoto meet the position requirement of
11 the gate contact of both the compensated GaN, the answer also is yes,
12 because electrode 20 is plainly above 15b.

13 Your Honors, I don't know if you remember, we had a cartoon of the
14 prepositions of place that has a table and a bowl, and it's showing how you
15 can have the bowl on the table, over the table, or above the table.

16 Because above has a plain meaning that is just higher than. It doesn't
17 have to have alignment or to be directly on top.

18 JUDGE TORNQUIST: But it wouldn't matter in this case because it
19 is touching, right?

20 DR. DUARTE-GUEVARA: Correct. That's correct, yes.

21 JUDGE TORNQUIST: Okay.

22 DR. DUARTE-GUEVARA: Now, for the final issue of does the
23 Uemoto and Smith combination disclose the semi-insulating layer in
24 Element 7e of the claims, the answer is also yes, because we were
25 discussing, we have Smith teaching to make cap layers that are compensated
26 with co-doping.

1 There's no issue with the combination. There's no dispute about this
2 combination that we're proposing, and that yields the semi-insulating layer
3 in Element 7e in Ground 2 of Uemoto and Smith.

4 JUDGE TORNQUIST: Just remind me, we're on Uemoto Smith, this
5 issue for Claim 7 is going to be the same for the Smith grounds, correct?
6 Basically, what is Smith actually teaching with that incorporation by
7 reference?

8 DR. DUARTE-GUEVARA: That is correct, yes.

9 JUDGE TORNQUIST: Okay. So whatever we do with 7 in Uemoto,
10 we need to align that with what do we do with Smith in those claims?

11 DR. DUARTE-GUEVARA: Yes, I think that is fair, Your Honor.

12 JUDGE TORNQUIST: Okay.

13 DR. DUARTE-GUEVARA: But with that, I'm going to move on to
14 Slide 76 and start talking about Ground 1, unless Your Honors have any
15 questions about Ground 2.

16 Okay. I think I will step in a little bit, but here we have all the
17 elements in Slide 77. We have all the elements of Claims 1-3. Again, to
18 point out that the only dispute is on Element 1e.

19 Moving to Slide 79, in Claims 7-9, we also have only one dispute, and
20 that is on Element 7e. And in Slide 81, I have a summary of the three
21 different parts that we have for Ground 1.

22 So part 1a is Smith by itself, 1b is Smith and Kigami, and 1c is Smith
23 and Uemoto. The reason we had all these different variations is because we
24 wanted to make sure that we cover all the possible constructions for
25 compensated GaN layer, including EPC's.

1 In Ground 1a, there's no issue with the position requirement because
2 as you can see in Slide 81, the gate 32 is just directly above cap layer 34.

3 So there's no issue with this position requirement. And also, as we
4 were discussing before, Your Honor, we were talking about how the cap
5 layer as grown has hydrogen.

6 We have a few different exhibits explaining that as grown layers will
7 be hydrogen passivated, and those layers that are hydrogen passivated as
8 grown is going to meet EPC's instruction of one type of impurity cancelled
9 the electrical effects of the other type of impurity.

10 Of course, Ground 1a, if Your Honors decide to go with the ITC
11 construction, that also meets the ITC construction, because again, the
12 construction in the ITC is broader than EPCs.

13 It removed the gate material and the layer by itself is going to be as
14 grown. Excuse me, the layer as grown is going to be hydrogen passivated.

15 JUDGE TORNQUIST: Okay, now, you've argued that a compensated
16 GaN layer is a product-by-process limitation, right?

17 DR. DUARTE-GUEVARA: That's our construction.

18 JUDGE TORNQUIST: And was that rejected? That was rejected by
19 the ITC, correct?

20 DR. DUARTE-GUEVARA: Yes, Your Honor.

21 JUDGE TORNQUIST: Okay, but you're still maintaining that here?

22 DR. DUARTE-GUEVARA: Yes.

23 JUDGE TORNQUIST: Okay.

24 DR. DUARTE-GUEVARA: And because we still maintain that here,
25 that's relevant to the order of two grounds, 1b and 1c, because in our

1 construction, we need this affirmative step as part of the process to make the
2 layer.

3 So we get the step in 1b from Kigami's hydrogenation, because you're
4 pushing hydrogen into the layers. In 1c, we get the step from you seen
5 where model's resistive regions.

6 But just to be efficient with my time, I just want to address a couple
7 points with 1a. If there's any questions, the Board did have some questions
8 about 1b about the combination.

9 I believe we address those in Paper 26. It has to do with a sweet spot.
10 That's why you will do that passivation after doping, because you want to
11 control like in a very precise way where you want to have that level of
12 doping. That's the reason you will combine those two.

13 So, but if there's any questions, I'm happy to address those. But if
14 not, I just want to make a couple points.

15 JUDGE TORNQUIST: We'll definitely address 1a. I think the one
16 question I have is, in our decision to institute, we said, hey, it looks like it's
17 optional to need to drive that hydrogen out of there.

18 I believe they put forward evidence from the Chinese dispute or the
19 Chinese panel who said the evidence showed that you need to drive the
20 hydrogen out every time.

21 So what does the evidence look like? What's our record?

22 DR. DUARTE-GUEVARA: In our record, Your Honor, the reference
23 itself contradicts EPC's mandatory expulsion of hydrogen, because the
24 reference itself is talking about an optional process.

25 That's what Your Honor pointed out in the institution decision. The
26 reference itself also contradicts the required expulsion because that layer 34,

1 it's non-conductive, and the hydrogen expulsion, or activation is what it's
2 called, is normally for conductive layers. So the record here shows that you
3 don't have to do the activation step.

4 JUDGE TORNQUIST: Okay. Can you walk us through the
5 arguments? Obviously, where we said it looks like it's potentially optional,
6 they said, no, you've misread that piece of the reference. We're actually
7 talking about a passivization layer.

8 And that just doesn't resolve the question. So what's the answer to
9 that?

10 DR. DUARTE-GUEVARA: When they point out to an activation
11 process, that activation is not talking about the layer that we're concerned
12 with. That is talking about a different layer.

13 So they are saying, this can be active. It was known to activate these
14 layers. But they have a couple issues. The first one is that the board pointed
15 out that it's optional.

16 And the fact that it's optional means that it can be -- it can or cannot
17 be done. It is not necessary. And the fact that it is for a different layer, it's
18 also important, because let me go to Slide 88, the fact that Smith specifying
19 that a cap layer is not conductive means that you wouldn't not activate.

20 If you want a layer that is nonconductive, you don't activate the layer.
21 When they're talking about the activation is for a different layer, and not
22 only that, it's also an optional process.

23 JUDGE TORNQUIST: Okay, but the hydrogen that's there will bond
24 with the magnesium doping in that cap layer 40, that's on layer 34, correct?

1 DR. DUARTE-GUEVARA: Correct, the hydrogen that is present
2 when the layer is as grown is going to be complexing, is the word, is going
3 to be attaching to magnesium.

4 JUDGE TORNQUIST: Okay, so your way of looking at it is Smith
5 already knew that, so the amount of magnesium they were putting in was
6 understanding that there was going to be some hydrogen present naturally in
7 these as grown layers.

8 DR. DUARTE-GUEVARA: That is correct, yes.

9 JUDGE TORNQUIST: Okay.

10 DR. DUARTE-GUEVARA: And maybe the only thing to point out
11 here, and I think the board already saw this based on the institution decision,
12 is that what we would discuss, that someone will know that there's going to
13 be some hydrogen in those layers, was known since '92. And here, I have
14 the paper from Dr. Nakamura. He was the Nobel Prize winner in 2014,
15 where he's saying that as grown GaN films are hydrogen passivated.

16 So that was known.

17 JUDGE TORNQUIST: Is that even disputed now? It seems like their
18 dispute is more that you would inevitably anneal these .

19 DR. DUARTE-GUEVARA: I think that is correct, Your Honor.

20 JUDGE TORNQUIST: Okay.

21 DR. DUARTE-GUEVARA: I think there's no dispute now that the
22 layer as grown is compensated, particularly with their definition. Their only
23 argument is that they speculate that you will have to do a new process for the
24 activation process.

25 We don't think that is correct, and the reference is optional. In the
26 reference, the layer is non-conductive. That points to the other side that you

1 wouldn't do that. So we don't think you have to do that. There's no support
2 for that speculation that they have.

3 JUDGE TORNQUIST: Okay.

4 DR. DUARTE-GUEVARA: Okay. So I think I want to go now to
5 the end. Unless there's some questions about Grounds 1b and 1c, I think
6 I'm ready to go to the end of my presentation for the petition for the original
7 claims.

8 JUDGE TORNQUIST: Well, I think there's certainly a dispute on 1b,
9 right?

10 DR. DUARTE-GUEVARA: Yes.

11 JUDGE TORNQUIST: Whether you would bring that in.

12 DR. DUARTE-GUEVARA: Yes.

13 JUDGE TORNQUIST: Okay.

14 DR. DUARTE-GUEVARA: I'm happy to address that.

15 JUDGE TORNQUIST: Yes, I mean, I think that's one of the spots
16 where we --

17 DR. DUARTE-GUEVARA: Okay.

18 JUDGE TORNQUIST: -- have some concerns of why you would put
19 magnesium in and then go ahead right away and put hydrogen in, complex
20 this.

21 DR. DUARTE-GUEVARA: Sounds good, Your Honor. Let me go
22 to Slide 102. Because, Your Honors, you did ask that question in the
23 institution decision.

24 You asked us why would you dope and then passivate? The answer to
25 this is that you want to control the level of doping. And a mechanism to do
26 that is what Kigami is teaching, of using hydrogen.

1 And actually, Kigami said this is very nice because that allows you to
2 adjust how much hydrogen you want to put in. That's why you will do it,
3 because you want both what you wanted and you want to break it down into
4 the region that you want.

5 JUDGE TORNQUIST: Is there any evidence that starting with Smith
6 you were worried about going over?

7 DR. DUARTE-GUEVARA: Yes.

8 JUDGE TORNQUIST: Okay, and what's that evidence?

9 DR. DUARTE-GUEVARA: Let me go to Slide 104. So the evidence
10 is in Paragraph 87 where Smith is saying that in the cap layer, particularly
11 when it's P-type doped, the level of the doping should be sufficiently high,
12 but then not so high.

13 So he wants to be in that range.

14 JUDGE TORNQUIST: And Smith gives us the range of magnesium
15 doping, correct?

16 DR. DUARTE-GUEVARA: Smith gives you the range of doping
17 concentration.

18 JUDGE TORNQUIST: Yes.

19 DR. DUARTE-GUEVARA: They give a ratio of 10^{16} and 10^{22} , I
20 believe. Now, that is a little bit different from the active level of doping.
21 Because you can dope something, but if it's not active, you're not going to
22 go -- it isn't going to contribute to the conductivity of the layer.

23 And that is what Smith wants. Let me show why. Because when
24 Smith is talking about the level of doping, he's talking about conductivity.

1 He's talking about the dominant and non-dominant state in the layer.
2 So he's talking about the active dopants, the ones that are actually making it
3 conductive.

4 And what Smith is saying is that this level of doping needs to be
5 sufficiently high to become the dominant or non-dominant state. And here
6 in Slide 105, I have a cartoon that's showing or breaking apart what Smith is
7 saying, that you have the level of doping and you have one threshold on the
8 bottom that is dominant or non-dominant.

9 You want to be above that. And then you have another threshold that
10 is conductive or non-conductive, and you want to be below that.

11 So here in the slide, I have green and a red line. You want to be
12 between those two for the level of doping. That is what Dr. Shealy called
13 the sweet spot.

14 And that's why you don't want to be above the red line. The
15 passivation helps you move below the red line.

16 JUDGE TORNQUIST: Yes, I think I'm still struggling with this
17 because Smith must have known he had the as grown layers, so he had
18 hydrogen there.

19 He gives a certain amount of dopant, and there's no suggestion of
20 coming back with hydrogen in that reference, correct?

21 DR. DUARTE-GUEVARA: Correct.

22 JUDGE TORNQUIST: So it doesn't seem like that's actually a
23 problem. And the only reason Kigami's doing it is to do something else.
24 Well, potentially do something else.

25 I feel like these references are in conflict.

1 DR. DUARTE-GUEVARA: No, they agree in the following, Your
2 Honor. They agree that both of them want to have a layer that is doped but
3 not conductive.

4 Both of them have that same goal. If you look at Kigami, he's also
5 telling you you want to have some dopants but not too many because it has
6 different reasons on why you want to have something that is doped and non-
7 conductive.

8 Here, as it is showing in Slide 105, you want the same thing. You
9 want something that is doped, above the green line, but not conductive,
10 below the red line.

11 So both references are aligned in that sense that they want to have
12 these layers that are doped but not conductive.

13 JUDGE TORNQUIST: Even if that's true, doesn't Smith already tell
14 you how to do it? Isn't that what Smith is saying here? The level of doping
15 should be sufficient.

16 We have high, but not so high, and then give you the range that they
17 want you to use. So why do you even need to go to another reference?

18 DR. DUARTE-GUEVARA: We have one reason, Your Honor, is
19 because what Kigami is giving you, and Dr. Shealy explains this in more
20 detail, it allows you to go back and change things if things didn't work.

21 So Kigami is teaching a technique where you can put hydrogen after
22 you fabricate the device, so it will allow you to, for example, you fabricate
23 the device with Smith's teachings, then you realize, hey, this is conductive.

24 What you can do next is use the technique like Kigami's to bring that
25 conductivity below. So that's what we have. We have expert testimony
26 supporting that rationale.

1 But more importantly -- sorry.

2 JUDGE ABRAHAM: Sorry, didn't mean to interrupt you. Is there
3 any indication in Smith or elsewhere that Smith wouldn't work and you start
4 going into that conductive range based on Smith's teachings? That you
5 would have to go to the next reference?

6 DR. DUARTE-GUEVARA: Not in Smith, necessarily, no. Smith is
7 just giving you a range. It's a very large range. So the argument, though, is
8 that the person of ordinary skill, when looking at the different references,
9 they will find this combination obvious.

10 So even if Smith is not telling you that you have to go back, the fact
11 that there's another reference that tells you you can, that is enough for the
12 case rationales.

13 JUDGE ABRAHAM: Well, can and would are two different things.

14 DR. DUARTE-GUEVARA: Correct, and we have --

15 JUDGE ABRAHAM: Where's the would do it as opposed to can do
16 it?

17 DR. DUARTE-GUEVARA: We have a couple of different reasons of
18 why you would do it, but the one that comes first to mind, Your Honor, is
19 Kigami itself, because the reference itself, Kigami, is giving you the
20 teaching suggestion motivation that is described in Case R. Because what
21 Kigami is saying is if you use my technique in devices that use magnesium,
22 like Smith's, then you have a better device.

23 So that's a would, is that the reference itself and the language is
24 actually pretty good, saying that the present inventions on this technique is
25 particularly useful in situations in which magnesium is used as a P-type
26 impurity.

1 Well, guess what? Smith is one of those situations. So this reference
2 tells you why a POSITA would try to use Kigami into Smith.

3 JUDGE TORNQUIST: So maybe we can step back. Maybe we can
4 just talk about Kigami.

5 DR. DUARTE-GUEVARA: Yes.

6 JUDGE TORNQUIST: My understanding, I'll just go through my
7 understanding and you can tell me where I'm wrong, Kigami said it's
8 difficult to control magnesium concentrations throughout a bulk.

9 And so dope the whole bulk with magnesium and then you can control
10 on the top layer, you can reduce the level of conductivity, or it's not
11 conductive, but you can reduce that by putting hydrogen in the top part of
12 that layer.

13 And the benefit is, is now because you've got magnesium all the way
14 through it, you're not going to get magnesium diffusing from other layers
15 because it's all there, but now you're being able to control the top.

16 DR. DUARTE-GUEVARA: Right.

17 JUDGE TORNQUIST: That seems quite different than what you're
18 telling us you want to use it for here.

19 DR. DUARTE-GUEVARA: It's a different objective, but same
20 method that will result in what we need in Smith.

21 JUDGE TORNQUIST: Okay, and so I think what Judge Abraham is
22 saying is, is there any reference that uses it that way? Because you're not
23 using Kigami the way Kigami was being done. You're sort of saying, hey,
24 we knew hydrogen could be used, so it would be obvious to do this.

25 And it seems like your proof is the expert, but not another reference
26 that does that.

1 DR. DUARTE-GUEVARA: We do have for example what I have in
2 Slide 109. And that's the paper from Nakamura. Because again, what you
3 want in Smith is to be below the red line.

4 And here what Nakamura was saying is that the poor hydrogenation,
5 you have a low resistivity, so high conductivity. After hydrogenation, it
6 became more resistive.

7 So this idea of using hydrogen to reduce the conductivity of a of a
8 layer that has been doped was around for many years.

9 But the Kigami technique is very nice in that it allows you to tailor
10 how much you put in. Because let me go to the next slide. He's talking
11 about how as needed, the region into which -- excuse me, this is Slide 110 --
12 as needed, the region into which the hydrogen atoms are to be introduced,
13 the concentration dissolution of the hydrogen atoms to be introduced and the
14 like can be adjusted.

15 So he has a different advice structure, but he's teaching a technique.
16 The technique itself, which is what we are applying, was very useful for the
17 goals that Smith has with the sweet spot level of doping.

18 JUDGE TORNQUIST: I understand that, and that's where I'm going
19 to have to grapple with, because it does seem like there's a little bit of
20 hindsight potentially coming in as how we're using these.

21 But I also understand your argument. We'll just have to look at the
22 expert testimony.

23 DR. DUARTE-GUEVARA: Okay. Okay, Your Honors, so then let
24 me go to Slide 134. And we have this conclusion to go back to all the things
25 that we're discussing.

1 So all the different issues for the petition, the easiest one is Ground
2 Number 2 because the ITC already resolved the key issues for Claims 1-3.

3 So we're calling that a layup for finding for invalidity, because again,
4 the only disputed -- the element that ITC found not to be anticipated is
5 undisputed here. So that's the reason we're calling that a layup finding of
6 invalidity.

7 For Grounds 1, we still like them because it covers all the possible
8 constructions, and that's what we were discussing. And for the claim
9 construction, because the ITC already rejected all of EPC's proposals, and to
10 be fair, they also rejected our proposal, but they came up with this better
11 construction that is broader and is easier to map to the prior art references.

12 So that is where I wanted to end that part of the presentation. And I'm
13 ready to move to the opposition to the motion to amend.

14 JUDGE TORNQUIST: Okay. So for us, we don't need to go to the
15 Smith grounds in your position if we adopt basically what the ITC
16 construction was.

17 DR. DUARTE-GUEVARA: That is correct.

18 JUDGE TORNQUIST: Okay, and if we adopt Patent Owner's
19 construction, do we need to go to Smith?

20 DR. DUARTE-GUEVARA: It depends on what you consider gate
21 material. As you noted, Uemoto is to have contact between 15b and gate 20.
22 So that can be gate material. And that's the argument that we put in our
23 petition.

24 But for sure, this need is going to cover EPC's grounds because
25 there's no issue with the position of the gate.

1 JUDGE TORNQUIST: Okay. So it seems to me like, I understand
2 they have tried to construe the gate material, but it seems like the
3 construction. . . Smith is for your construction, it seems.

4 DR. DUARTE-GUEVARA: Smith, yes, particularly 1b. 1b and 1c is
5 for our construction, yes.

6 JUDGE TORNQUIST: Okay, I just wanted to make sure I
7 understand.

8 DR. DUARTE-GUEVARA: Yes, that's correct.

9 JUDGE TORNQUIST: Okay.

10 DR. DUARTE-GUEVARA: All right, so let's move to the opposition
11 to the motion to amend. I am on Slide 135. In Slide 136, I have the new
12 claims, and they have new similar limitations.

13 The one that we wanted to highlight is that the new limitations are
14 mixing requirements for semi-insulating layer comprising a compensated
15 layer and then this has to be enhancement mode.

16 So there's the language for that is no two-dimensional electron gas or
17 2DEG can be present at zero volts. Those are the -- those are -- I'm
18 highlighting those limitations because that's where we believe there's an
19 issue for enablement and obviousness and written description.

20 But let me go to Slide 137 where we have a summary of the four
21 arguments that we are putting against these new claims. Something to point
22 out is that if the board finds any of these issues to be true, the claims cannot
23 issue and the motion to amend should be denied.

24 So there's two issues under Section 112. That is lack of enablement
25 and then written description. And there's also two issues under 103 that is
26 obviousness based on a couple of references.

1 And Your Honors, we are going to talk about how in our opinion, if
2 the claims comply with Section 112, and if the claims are enabled and
3 properly supported by the patent, they have to be obvious because the prior
4 art teaches more than the patent.

5 But let's start with enablement. And in Slide 139, we start from a
6 common ground. As Your Honors pointed out, there is going to be a lot of
7 factual issues for enablement.

8 But we start from the common ground that the patent itself is not
9 enabling. Even EPC admits that experimentation beyond the specification
10 disclosure is required to make its disclosure enabling.

11 So then the question is, is the patent providing sufficient for
12 experimentation? And our argument is going to be no, because let me go to
13 Slide 140.

14 Because the direction that is in the patent doesn't teach how to make a
15 device that has at the same time the competing requirements of a semi-
16 insulating layer and no 2DEG. We see those as opposite requirements.

17 And in Slide 141, I explain why, or better, our expert explains why.
18 So Dr. Doolittle went into a lot of detail about this issue in his expert
19 declaration.

20 These are two figures that he put together where he was explaining
21 how to make these devices how to work as required in the claim, you will
22 need to know things like the thickness, like the doping concentration,
23 resistivity to the concentration and active dopant.

24 And the patent is not giving direction on any of these parameters on
25 how to do that. Dr. Doolittle had these complicated graphs with different
26 moving pieces.

1 So in Slide 142, I tried to simplify that for us to discuss. So in Slide
2 142, I have the active dopant concentration in an axis, and they continue,
3 low on the left, high on the right, to point out that the claim is requiring
4 something that is semi-insulating that requires low concentration of dopants.

5 So it puts you in the low end of this. And then the claim also requires
6 no 2DEG or enhancement mode, but that puts you at the other spectrum in
7 the high end.

8 So Your Honors, that is a conflicting limitation. Those two
9 limitations are conflicting. And the patent does not provide direction on
10 how to make a device that meets both these things that is semi-insulating and
11 no 2DEG exists.

12 I'm going to move to Slide 143, because without anything in the
13 patent teaching how to make the device new claims, then what EPC tells us
14 is that the claims are nonetheless enabled because there was this routine
15 procedure that a person of ordinary skill could have used to make these
16 devices.

17 And they also talk about we are misunderstanding the science and
18 have these two energy gains theories that we think isn't correct, but let me
19 start talking about those.

20 In Slide 144, I point out how EPC argues that the patent conveys a
21 goal that can be achieved with the routine procedure of just increasing P-
22 type.

23 In the slide, I have Paper 31 that's EPC's response to the position to
24 the motion to amend where they say that the patent is conveying a goal of
25 sufficiently high conductivity.

1 To be clear, Your Honors, that is not in the patent, but they just claim
2 that a POSITA will understand it. And then they say, well, you can get there
3 with this routine procedure of increasing doping.

4 In Slide 145, we explain why that is incorrect. Because merely
5 increasing doping will not allow meeting of any claims because it will make
6 the layer conductive, and that is the opposite of semi-insulating.

7 So you have here in Slide 145 the active dopant spectrum that we
8 were talking about before. Increasing doping will push you to the right to be
9 conductive.

10 And that is the opposite of what the claim is telling you, that you need
11 to be semi-insulating. Those two terms are opposites or contrary.

12 In Slide 146, we explain why, well, EPC's arguing that a POSITA
13 will appreciate that expected concentration needs to be sufficiently high to
14 deplete the 2DEG.

15 But, Your Honors, stating a goal is not enablement, because this is
16 leaving open many questions, like how high is sufficiently high? How can a
17 POSITA know when something is sufficiently high? Or how can something
18 be sufficiently high but not conductive?

19 The patent is just silent about all those issues. And that is important,
20 because as I point in Slide 147, this is more like a research assignment.

21 Basically EPC is saying a person of ordinary skill could go and figure
22 it out, what is sufficiently high. Recently, in Amgen v. Sanofi, the Supreme
23 Court told us that that is not enablement.

24 They said that these research assignments were not providing the right
25 guidance, is not enablement. And our argument is the sufficiently high that

1 EPC proposes will be just a research assignment that is not meeting the
2 enablement requirement.

3 JUDGE ABRAHAM: Counsel, here it is not just saying that
4 concentration just needs to be sufficiently high, they're saying it needs to be
5 sufficiently high to achieve something, and that's depleting the 2DEG, right?

6 So there is an endpoint there. They're telling people who know how
7 to increase the concentration and they're telling you the endpoint. So where
8 is the complication coming here?

9 DR. DUARTE-GUEVARA: Let me go back to Slide 145. The
10 complication is on the opposite side of the spectrum. Because the claim is
11 not only requiring you to have the depletion, it also asks you to be semi-
12 insulating, and that's the research assignment.

13 JUDGE ABRAHAM: So are you saying it's not possible to have both
14 at the same time?

15 DR. DUARTE-GUEVARA: We think it's not, but what matters for
16 the patent is that it's not teaching how to do it.

17 JUDGE ABRAHAM: And it's not just a matter of increasing the
18 concentration until you've reached the point you want to get to?

19 DR. DUARTE-GUEVARA: No, Your Honor, because then you're
20 not semi-insulating.

21 JUDGE ABRAHAM: Okay.

22 DR. DUARTE-GUEVARA: That's a fundamental issue, yes. If you
23 just start increasing dopants, then you go to conductive. And this claim is
24 requiring something different.

25 It's requiring both semi-insulating and depletion, and those are
26 conflicting.

1 JUDGE TORNQUIST: But at the same time, you have an obvious
2 argument that it would be obvious to do this.

3 DR. DUARTE-GUEVARA: Yes.

4 JUDGE TORNQUIST: Which is always a problem when someone
5 runs an enablement and an obviousness argument at the same time.

6 DR. DUARTE-GUEVARA: Right.

7 JUDGE TORNQUIST: And that's going to be difficult to overcome
8 when you're saying one who is skilled in the art knew the enhancement
9 mode, they knew how to get there, and they knew if they had too much to
10 bring it down. How is that not in conflict with what you just said to us?

11 DR. DUARTE-GUEVARA: So the reason it's not in conflict is
12 because we're thinking about it, first, if the claims are enabled, the claims
13 are necessarily obvious, but the sequence is what resolved the conflict that
14 you just pointed out.

15 So our argument, let me see if I can go to that slide, it's Slide 165.
16 What we're pointing out, Your Honors, is that if you find what the patent
17 tells is enough for enablement, then it has to be obvious because the patent
18 provides less details than the prior art.

19 And here we have that comparison. So as you know, we're talking
20 about the cap layer, right? The cap layer is the important layer.

21 That's what was not in the prior art and that's where we focus our
22 attention. So here is Slide 165. We compare what the prior art is teaching
23 about that cap layer versus what the patent is teaching about the cap layer.

24 So for example, the thickness, the prior art gives us a range. The
25 patent does not provide any information. For doping region, same thing.

1 The prior art is giving us some information about it. The patent
2 doesn't provide anything about it. Same thing for doping concentration.

3 The prior art is giving us ranges. The patent is not providing anything
4 about it. And for this critical issues that Judge Abraham was pointing to,
5 that we need to have a balance between these two, between the high active
6 level of doping, so you're depleting the 2DEG, versus the low level of
7 doping, so you're semi-insulating, the prior art at least is telling us these
8 adjustable methods to tailor the level of hydrogen in the layer and have
9 selectively inactivating impurities.

10 The patent doesn't provide any information about it. It is only saying
11 exposes to ammonia at a high temperature without any teaching on how to
12 be selective.

13 So Your Honors, we think the claims are not enabled, but if Your
14 Honors find that they are enabled, they have to be obvious. Because the
15 issue that EPC has is that they have to rely on extrinsic evidence and the
16 routine procedure, the energy gains theories, and they will need to apply also
17 to the prior art.

18 Their enablement theory is not on the patent. It's on the pursuit of
19 knowledge on the routine procedure. So that also has to apply to the prior
20 art.

21 And that is telling because as I have in Slide 166, while enablement
22 requires practicing the full scope, the patent was supposed to tell us how to
23 practice the full scope, obviousness only requires you to show one
24 embodiment that meets the claims.

25 And here the prior art disclosure is much more robust than the patent.
26 So either patent is enabling the full scope with the limited disclosure.

1 As I showed you before, it doesn't provide a lot of the key details for
2 the cap layer. The prior art must at least teach an embodiment within the
3 new claims, rendering them obvious.

4 So let me go to one slide, because I have a cartoon that maybe helps
5 see that. In Slide 182, the argument, Your Honors, is that inverse
6 enablement, because the routine procedure is enabling the claims, they are
7 obvious over the prior art because the prior art teaches more.

8 And I didn't have time to go to it, but we also addressed their
9 arguments that one of the references has to be depletion mode. We don't
10 think that's true.

11 That's why, Your Honors, so I agree there's a tension, of course,
12 between enablement and obviousness, like always, but here, our argument,
13 we think it's not enabled. But if enabled, it has to be obvious.

14 JUDGE TORNQUIST: Can I just ask a question, because there is a
15 lot of arguments about what came in on the surreply about energy levels and
16 the like. Let's just use your 169.

17 DR. DUARTE-GUEVARA: Yes.

18 JUDGE TORNQUIST: You could have been on any of these, but I
19 just needed 169. Where is the 2DEG formed in the combination?

20 DR. DUARTE-GUEVARA: Below the barrier layer.

21 JUDGE TORNQUIST: So between the barrier layer and the channel.

22 DR. DUARTE-GUEVARA: Correct.

23 JUDGE TORNQUIST: Okay. So the barrier layer for the dopants on
24 the top, to affect it, something has to come -- the electrons have to come to
25 the barrier layer.

26 DR. DUARTE-GUEVARA: No, Your Honor.

1 JUDGE TORNQUIST: Well, that's obviously what you're stuff was
2 saying. And the question now is what does that barrier layer do? And that's
3 the dispute.

4 I'm trying to frame the dispute with this energy piece.

5 DR. DUARTE-GUEVARA: Okay.

6 JUDGE TORNQUIST: They said the magnesium would soak up the
7 electrons from the 2DEG.

8 DR. DUARTE-GUEVARA: Right.

9 JUDGE TORNQUIST: And your argument is no, the 2DEG is below
10 the barrier layer or right at that interface, therefore, the electrons can't cross
11 to it.

12 DR. DUARTE-GUEVARA: Right.

13 JUDGE TORNQUIST: Is that fair to say?

14 DR. DUARTE-GUEVARA: Yes.

15 JUDGE TORNQUIST: That's what the dispute is.

16 DR. DUARTE-GUEVARA: Yes.

17 JUDGE TORNQUIST: Okay.

18 DR. DUARTE-GUEVARA: Yes, and if -- I'm running out of time,
19 but let me go to that section. Maybe that will eat a little bit of my time for
20 rebuttal.

21 JUDGE TORNQUIST: Sure.

22 DR. DUARTE-GUEVARA: But let's go to 149. So the issue with
23 the energy levels is going to get messy. They're going to say we don't
24 understand the science.

25 We're going to say, you're defying the physics of the device. And I
26 just have a minute, but I do want to make a couple points on that. That is, as

1 we dive through all this stuff, I invite the board to ask the question, is
2 anything obvious in the patent? And the answer is always going to be no.

3 None of this is in the patent. Remember, the patent had the job of
4 telling us how this worked for enablement, and there's nothing of that.

5 So with that prelude, I'm going to take a few minutes off of my
6 rebuttal. Let me talk about the issues of how the devices is working.

7 So EPC is arguing that the acceptors in the p-GaN layer accept
8 electrons from the 2DEG. So if you look at the figure that is here in Slide
9 149, the 2DEG is in the green portion, light green.

10 They are saying that the electrons will go through the barrier, that's
11 the light blue, into the p-GaN. We argue that it defies the laws of physics
12 because there's a barrier in between, and the barrier has an electric field that
13 is pushing electrons down.

14 So that can't happen. Instead, the papers that we showed in our
15 surreply explained that the depletion comes from fixed negative charge
16 that's going to push away electrons from the 2DEG.

17 I believe EPC is going to come and say that we're incorrect, but the
18 references showed what I'm telling you. For example, in Slide 150, we have
19 a book that is Exhibit 1043, and that's where we got the language that the
20 2DEG is not depleted because the electrons get sucked up.

21 That's not how this works. It's because there's a fixed negative
22 charge that depletes the channel. They're going to present some attorney
23 argument saying, hey, this is kind of consistent with what I was saying
24 before. It is not, Your Honors. Their references do not support what EPC is
25 saying.

1 And in Slide 151, I have testimony from Dr. Doolittle. Dr. Doolittle
2 was the expert that testified for us at the ITC. He was explaining how the
3 electrons can't cross the barrier.

4 But, so you have a less biased source. Exhibit 1044 explains it, too.
5 That exhibit is saying that the Al-GaN barrier is employed to keep electrons
6 contained in a two-dimensional electron gas.

7 And this portion of the reference is important. It is that the device
8 ability to effectively regulate electron mobility is made possibility by this
9 confinement.

10 Our position, Your Honors, is that if the barrier was not a barrier, then
11 there wouldn't be a transistor. The current would be fined from source to
12 drain. It just wouldn't work.

13 In their slides they have a quote that they say, we're being too rigid.
14 But it is not, Your Honors, because that's how the devices work, the pieces
15 of the devices.

16 And I wanted to make a point, and it is that the POSITA here is
17 someone with a bachelor's degree and a couple of years' experience. So
18 while we go through all these issues, just keep that in mind that the POSITA
19 was not a genius, right?

20 It didn't have that deep level of education or experience. So this is
21 confusing, and that's the point that I have in Slide 152. It's not enabled
22 because the critical issue, so better, the board doesn't need to resolve what
23 the actual mechanism for 2DEG.

24 The legal question is a little bit easier. Because the legal question is,
25 is this patent enabling the new claims? And if what EPC is going to tell you
26 about the two energies is what is enabling the claims, the patent failed.

1 Because these two area gains where EPC is incorrect to the depletion
2 mechanism is completely absent in the patent. Again, if the energy gains is
3 what allows the POSITA to make the new claims, the patent fails to meet the
4 enablement requirements.

5 And let me finish with Slide 153. Or no, I have two more slides. In
6 Slide 153, I explain why that is important. And again, we're recording from
7 Amgen v. Sanofi.

8 Because the Court reminded us that there's a basic statutory
9 requirement that a patent specification described invention in such full,
10 clear, and exact terms, as to enable any person of ordinary skill in the art to
11 make and use.

12 Well, Your Honors, if this two energy gain stuff, if EPC's theories
13 about two negative electrons going through the barrier, that's what allowed a
14 POSITA to understand this invention, the patent failed.

15 The last slide that I have is on the Wands factors on 154. In Slide
16 154, we go through the eight Wands factors. Our position is that all of them
17 point to non-enablement, because without any guidance, factors one through
18 eight point to non-enablement assuming the full scope for the new claims
19 will require undo experimentation.

20 They are going to be talking about one of the dopants, magnesium.
21 What about all the others? It doesn't exist because we think the theory is
22 crazy. But it's not enabling the full scope.

23 In factors two and three, the patent provides no direction, so that's
24 also pointing to non-enablement. And Your Honors, for factors four and
25 seven, the fact that the expert disagrees does demonstrate that this is a
26 complex invention in nature and there's operator inability.

1 Indeed, even EPC, in one of their papers, was saying that the
2 invention was entirely unexpected. Now they want us to believe that the
3 invention was routine, that it could be done with a routine procedure.

4 Before, they were saying that it was entirely unexpected. We think
5 that what they said before was more accurate and these factors also point to
6 non-enablement.

7 And with that I'm going to stop.

8 JUDGE TORNQUIST: Okay. I'd just like to ask one question. We
9 have secondary considerations put up. It wouldn't matter for your
10 enablement. But for obviousness.

11 I mean, the inventor did win an award here for the first enhancement
12 mode gallium nitride transistor, correct? Doesn't that -- at least one award.
13 Doesn't that suggest that this was something unique?

14 DR. DUARTE-GUEVARA: For the secondary considerations, we
15 think no, because what is in evidence is that they got an award because they
16 were the first ones to put together a supply chain or they were the first ones
17 to figure out how to have a factory in China coming up with the transistors.

18 What is in evidence is not related to the claims. So that's why we
19 don't think secondary considerations would matter.

20 JUDGE TORNQUIST: Okay, and we had one reference come in that
21 did have an enhancement mode device. I think it was SUH, S-U-H. Is that
22 correct? I think it was Suh 2006. It might have been a reference that did
23 have enhancement mode.

24 I was wondering, did that one have a compensated layer in it?

25 DR. DUARTE-GUEVARA: No, I believe there's a reference called
26 Sheu, S-H-E-U.

1 JUDGE TORNQUIST: Maybe I'm mispronouncing it, I don't know.

2 DR. DUARTE-GUEVARA: Yes.

3 JUDGE TORNQUIST: Or maybe I'm misremembering it.

4 DR. DUARTE-GUEVARA: Yes, but no, that one doesn't specify
5 depletion for enhancement mode. The device that we have that is
6 enhancement mode and with a compensated layer is Uemoto. Uemoto does
7 have that --

8 JUDGE TORNQUIST: Okay.

9 DR. DUARTE-GUEVARA: -- combination.

10 JUDGE TORNQUIST: Okay.

11 DR. DUARTE-GUEVARA: And our argument is that Smith is not
12 limited to depletion mode. It can be enhancement mode.

13 JUDGE TORNQUIST: Okay, and obviously, there's a lot of dispute
14 about that.

15 DR. DUARTE-GUEVARA: Right.

16 JUDGE TORNQUIST: About the cap layer coming all the way
17 across to the contacts.

18 DR. DUARTE-GUEVARA: Right.

19 JUDGE TORNQUIST: And we'll just have to rely on the briefs, I
20 guess. At least on your side here.

21 DR. DUARTE-GUEVARA: Yes.

22 JUDGE TORNQUIST: Unless you want to keep going. It's always
23 sometimes more useful to hear the direct than it is the rebuttal.

24 DR. DUARTE-GUEVARA: Well, yes, let me go to that point
25 quickly. That's on Slide 138. So the point that we wanted to make here,

1 Your Honors, is that this mid cap layer has the same structure that was
2 known for enhancement mode devices.

3 And the way I want to show that is by comparing these three different
4 structures. So the one on the left is Hu. It's Exhibit 1014. That is the first
5 p-GaN enhancement mode transistor.

6 That is from 2001. It is the original one. The one in the middle is
7 Smith. And we're using something that EPC did to modify that reference.

8 And the one on the right is the patent. Our point, Your Honors, is that
9 Smith has that very same structure for enhancement mode device as Hu.

10 So just like Hu, the cap layer that is purple is on top of the barrier that
11 is blue and there's a gate. Note that the gate is narrower than the cap layer.

12 That is the same structure they have in Smith where you have the cap
13 layer on top of the barrier and then a gate on the top. There is no reason why
14 these two should be considered different.

15 And to be clear, Smith never talks about depletion mode. If you
16 control F, if you try to find depletion mode operation in Smith, that is not
17 required.

18 Our position is Smith can work both as an enhancement or as a
19 depletion mode.

20 JUDGE TORNQUIST: Okay, and their argument is that this doped
21 layer is so large that you're going to deplete the 2DEG almost over the entire
22 range, and therefore you're going to have to put an enormous voltage on
23 this?

24 DR. DUARTE-GUEVARA: Yes.

25 JUDGE TORNQUIST: Do you believe that's correct?

26 DR. DUARTE-GUEVARA: No.

1 JUDGE TORNQUIST: Or is it just that you feel that the voltage
2 would be acceptable?

3 DR. DUARTE-GUEVARA: There are two answers to that question.
4 First, that's a cartoon, so you can -- what we have in evidence is that there
5 are, for example, there is, for example, a thesis that tells you how you can
6 modify the dimensions of a cap layer.

7 So there's no need for the cap layer to be super wide. What we think
8 the person of ordinary skill to make it narrower. So that's one answer.

9 And the second answer is that they believe that the 2DEG is only
10 depleted right below the gate. That is incorrect, because the electric field is
11 not limited to just below the gate. It can go other places.

12 And for example, look at Hu. Hu is also a device where the cap layer
13 is wider than the gate, and still that worked. Of course, the first device.

14 So two answers to the question is that you can modify it, you are
15 within the scope of a POSITA to do that, to resolve those issues, and also
16 they are incorrect about how the device will operate.

17 JUDGE TORNQUIST: Okay.

18 DR. DUARTE-GUEVARA: Thank you very much.

19 JUDGE TORNQUIST: Thank you. So you're going to have about, a
20 little -- 5 and a half minutes.

21 DR. DUARTE-GUEVARA: Okay.

22 JUDGE TORNQUIST: To come back and rebuttal.

23 MR. DAVIS: Your Honors, actually, while I'm setting up here, I
24 wonder if we can have about a two-minute bio break.

25 JUDGE TORNQUIST: Sure.

26 MR. DAVIS: Yes.

1 JUDGE TORNQUIST: That would be fine.

2 MR. DAVIS: I would appreciate that. Thank you.

3 JUDGE TORNQUIST: While you're doing that, I'm going to setup
4 the timer. How much time do you think you're going to reserve?

5 MR. DAVIS: I plan on reserving 10 minutes.

6 JUDGE TORNQUIST: Ten? Okay.

7 (Recess)

8 JUDGE TORNQUIST: Okay. Thank you. So Patent Owner, when
9 you are ready.

10 MR. DAVIS: Thank you, Your Honor. May it please the Board.
11 We've now heard from the Petitioner as to why they believe that the
12 challenged claims, the '294 Patent, aren't patentable.

13 But the reality is that the claims of the '294 Patent are directed to a
14 groundbreaking invention that has had a huge impact on the GaN industry.

15 Petitioner laments its failure to prove the '294 Patent is invalid in the
16 parallel ITC investigation. And one way in which the Petitioner does that is
17 to point to several ITC findings that they find favorable and implicitly
18 suggests that the board should simply follow those.

19 But as the board is aware, the board is under no obligation to follow
20 what the ITC has decided. So let's get into the presentation of it.

21 I'm going to go into the technology a little bit here. Slide 3, at the top
22 of the screen, you see we mentioned depletion mode and enhancement
23 mode.

24 Those are two different types of GaN transistors. Depletion mode
25 transistor is normally on. It's normally on at zero volts. Enhancement mode
26 transistor, on the other hand, is normally off.

1 Returning to depletion mode, in order for that normally on transistor
2 to turn off, a negative voltage needs to be applied to the gate.

3 In enhancement mode, in order for that normally off transistor to be
4 turned on, a positive voltage needs to be applied to the gate. That concept
5 will come into play later, as Your Honors know.

6 But the '294 Patent is all about enhancement mode transistors, and at
7 the bottom of Slide 3 here, we have on the left hand side, the admitted prior
8 art, Figure 1 of the '294 Patent, that's the righthand side, which is the
9 invention compensated GaN layer embodiment of the '294 Patent. The
10 admitted prior art, which is Figure 1, has an activated, conductive p-GaN as
11 part of the gate.

12 And let me be clear about something here. The gate -- when I say
13 gate, I'm talking about that entire structure. Not just the gate metal, not just
14 the gate contact, but that entire structure that has the gate and the p-GaN.

15 I'm sorry, the gate electrode and the p-GaN. That's the gate, the gate
16 structure. Activated conducted p-GaN, prior art, they had problems with
17 high gate leakage and it had high capacitance as well, gate capacitives, that
18 is.

19 The invention of the '294 Patent and the compensated GaN
20 embodiment has a compensated GaN layer as part of the gate, as part of the
21 gate.

22 You have your gate contact above the compensated GaN layer. And
23 what that did, even though it seems super simple, nobody thought about this
24 before because it was completely counterintuitive. That enabled the
25 inventors to build a device that had low gate leakage and reduced gate
26 capacitives compared to the prior art.

1 Going on to Slide 4, I'm not going to belabor the point here. I will
2 point out here on the righthand side of Slide 4, we have two cartoons, if you
3 will.

4 The one at the top, that's the one that would correspond to the prior
5 art from Slide 3. And what I wanted to just show you here, Your Honors, is
6 the concept of the gate leakage.

7 That's that yellow arrow there, and it's hard to read, but that
8 highlighted text that says leakage current. And that's the leakage current
9 that was occurring in the prior art, and the problem that the inventors of the
10 '294 Patent were able to solve.

11 And you'll see that that leakage current goes through the bulk crystal,
12 if you will, all the way down to the buffer layer.

13 The other concept I wanted to point out here is the concept of the two-
14 dimensional electron gas, which I'll call the 2DEG from here on out.

15 Those are those red dashes that you see in the buffer layer. And here
16 we know these are enhancement mode transistors, so they're normally off.

17 So this is zero volts applied gate bias right now. It's off. You have
18 the interruption of the 2DEG. So you know it's off.

19 Slide 5, this is the same sort of thing. It's a larger cartoon. This is an
20 enhancement mode transistor that is off. You'll see that the p-type dopants -
21 - or it actually specifically says magnesium -- magnesium dopants and the p-
22 GaN layer there and the GaN layer, they have sucked up electrons from the
23 2DEG.

24 The next several slides just get into what the claims are at issue here.
25 I don't need to go over these again other than to say that Claims 1-3, those
26 are claims that are also in the parallel ITC investigation.

1 You have Claims 7-9, Slide 7, and then you have the claims that are
2 part of the motion to amend. That's Claims 13 and 14 on Slides 8 and 9.

3 These are grounds for challenge. I think the Petitioner did a sufficient
4 job of explaining what those are.

5 So landing on Slide 13, I'm going to skip over the written description
6 argument for now. If I have time, I'll come back to it. But what I would like
7 to do is actually touch on the issue of enablement.

8 Enablement. As we heard from Petitioner, they have an argument that
9 the amended claims, and this pertains to the amended claims, Claims 13 and
10 14, that they are not enabled. Specifically, that one of ordinary skill in the
11 art would have to get through undue experimentation to figure out how to
12 have a compensated GaN there that would deplete the 2DEG.

13 Another way of saying that is that the doping passivation has
14 competing effects on the ability of the p-GaN layer to deplete the 2DEG.

15 These snapshots here, these paragraphs, these are from Dr. Shealy,
16 that is Petitioner's expert, from Dr. Shealy's supplemental declaration
17 related to the motion to amend.

18 There's a quote here from Paragraph 44 of Exhibit 1039, which is the
19 supplemental declaration. Higher levels of relative passivation decrease the
20 ability of the p-GaN to deplete the 2DEG and thus make it more difficult to
21 achieve in enhancement mode device.

22 That's an example of what Dr. Shealy has said. Fast forward to Slide
23 19. He says something similar in Paragraph 51 of Exhibit 1039. For a given
24 thickness and total doping concentration, increased passivation reduces the
25 amount of active acceptor type atoms and thus reduces the ability of the p-
26 GaN layer to deplete electrons from the 2DEG.

1 So that's the doping piece of it. There's a passivation piece, if we go
2 back to Slide 18. This is Paragraph 46 from Exhibit 1039. A thicker layer is
3 more difficult to passivate with hydrogen, as claimed in Claims 13-14, and
4 thus more difficult to arrive at a compensated state.

5 At the end of the day, though, the specification, the '294 Patent
6 specification, absolutely is enabling. It's absolutely enabling. The '294
7 Patent provides adequate guidance as to the direction of experimentation.

8 Looking at Slide 25, we have some excerpts from the '294 Patent.
9 Column 3, Lines 10-21, as well as Column 1, Lines 47-50. Reading the
10 portion from Column 3, Lines 10-21: advantageously, the higher doping
11 level of compensated layer, 38, leads to enhancement mode devices.

12 Right? One of ordinary skill in the art would understand from that
13 language that the -- sorry -- that the -- this is the wrong slide. There we go.
14 That the magnesium acceptor concentration must be sufficiently high to
15 deplete the 2DEG.

16 Increasing the p-type doping concentration is a routine procedure. It's
17 a routine procedure. It's no undue experimentation there.

18 And one of ordinary skill in the art would, from this language, know
19 that they need to increase the doping concentration until the 2DEG is
20 completed or depleted.

21 Going to Slide 26, here's the other side of it. There's doping and
22 there's passivation. The '294 Patent also describes what passivation is
23 needed.

24 One of ordinary skill in the art would understand the passivation
25 necessary to make a compensated GaN layer can be passivation using

1 hydrogen to create a device with low gate leakage and reduced gate
2 capacitances compared to the prior art.

3 Here are some examples, here on the righthand side of Slide 26.
4 Column 3, Lines 43-52. The critical step in the above process that
5 differentiates the device of the present invention from the prior art device is
6 the passivation of a p-type impurity using hydrogen.

7 Down below, Column 3, Lines 37-39, an additional hydrogen
8 passivation can be performed by exposing the device to ammonia or
9 hydrogen plasma at a high temperature.

10 So one of ordinary skill in the art is going to know what they need to
11 do in order to passivate, in order to actually compensate. Those are the two
12 pieces.

13 Also, how much passivation? Well, through routine experimentation,
14 one of ordinary skill in the art is going to know that they need something
15 that's low gate leakage.

16 They need something that is reduced capacitances. They would know
17 how to measure that and figure out whether or not they have arrived at a
18 compensated state.

19 Petitioner mentioned this energy gain theory, as they put it, that Patent
20 Owner has. And I'm going to go back to Slide 20 at this point. And let me
21 make a point here, a clarification.

22 Patent Owner's position is not that these specific energy gains need to
23 be in the patent, not that this energy gain theory needs to be in the patent.

24 Rather, Petitioner's misunderstanding of the science here is what led
25 them to the wrong conclusion, and that's the point here. If they understood
26 this point, if they understood the science, then they would know you actually

1 wouldn't need much description-wise in order to arrive at the claimed
2 invention.

3 It is energetically more favorable for magnesium acceptors in the p-
4 GaN to accept an electron from the conduction band than to bind to a
5 hydrogen atom.

6 And as a result, the magnesium acceptors in the p-GaN will
7 preferentially deplete the 2DEG, and the remaining magnesium acceptors
8 would be passivated with hydrogen.

9 This energy difference is critical. Because of that, when one of
10 ordinary skill in the art reads the specification and sees that you need
11 sufficiently high doping to deplete the 2DEG and does that, it doesn't really
12 matter when the passivation comes in.

13 That p-GaN wants those electrons from the 2DEG, and then the
14 remaining acceptors are passivated with the hydrogen and that gets you to
15 the compensated GaN layer.

16 That's the point. Slides 21, 22, 23, even 24 -- yes, 21-24, which gets
17 into sort of the nuts and bolts of the energy gain that Dr. Schubert talked
18 about in his supplemental declaration, it's there for your reference.

19 I need not go into it now. But it's not information that needs to be in
20 the patent. That's not the position.

21 JUDGE TORNQUIST: Okay, so this issue came in, if I remember
22 right, on a reply/sur-reply, so we don't have as much information from
23 references, necessarily..

24 MR. DAVIS: Correct.

25 JUDGE TORNQUIST: They're saying scientifically, you just can't
26 do this.

1 MR. DAVIS: Right.

2 JUDGE TORNQUIST: The electrons can't get out, so what's the
3 answer to that?

4 MR. DAVIS: So this, actually, I'm going to address that now.

5 JUDGE TORNQUIST: If you're going to address that, that's fine.

6 MR. DAVIS: Right now on Slide 27.

7 JUDGE TORNQUIST: Okay.

8 MR. DAVIS: So Petitioner has argued that our energy gain theory is
9 incorrect because the barrier layer prevents the p-GaN layer from accepting
10 electrons from the 2DEG.

11 And essentially, they're saying, well, it's a barrier. It's a barrier. It
12 can't go through. Nothing can go through. They rely on trial testimony
13 from Dr. Doolittle, who was their non-infringement expert at the parallel
14 ITC investigation.

15 They also rely on several new exhibits. None of this, of course, is
16 backed up by Dr. Shealy's testimony. This is all part of their surreply.

17 So here's one point. Their theory that electrons are not sucked up, if
18 you will, from the 2DEG, it just defies logic. It defies logic because of the
19 concept of gate leakage.

20 Prior art transistors suffered from excessive gate leakage current. And
21 what's gate leakage? It's current that consists of charge carriers that move
22 from the gate electrode through the Al-GaN barrier to the electron channel.

23 If those carriers could not flow through the barrier, there would be no
24 gate leakage. That wouldn't be a thing. So that alone shows the Petitioner's
25 theory must be wrong.

1 But in addition, Petitioner pointed to Dr. Doolittle's ITC testimony.
2 Well, we have some testimony of our own from Dr. Schubert, who was
3 Patent Owner's expert during the parallel ITC investigation as well as the
4 expert we are using in this IPR proceeding.

5 And going to Slide 29 and Slide 30, Dr. Shealy -- sorry, Dr. Schubert
6 discussed, this is Dr. Schubert's trial testimony, he discussed the testimony
7 of Innoscience Employee Mr. Zhou.

8 And what Mr. Zhou said, I'll focus on Slide 30 for a second here, is he
9 said things that are wholly consistent with Patent Owner's view of the
10 universe in this regard, that the electrons are being sucked up from the
11 2DEG into the p-GaN.

12 And we can see it here, Exhibit 2015 at Page 440, Lines 7-19. Dr.
13 Schubert's answer to this question, I ask him to please continue, if we move
14 the hole from A to B then we move it the same time, an electron from B to
15 A.

16 And we can say that if we move a hole from the magnesium acceptor
17 to the 2DEG, we have an electron from the 2DEG to the acceptor.

18 And Mr. Zhou was asked to confirm this step. He was asked, an
19 equivalent and necessary counterpart of that is that electrons are moving up
20 through the 2DEG from the 2DEG through the aluminum gallium nitride
21 into the p-GaN, correct?

22 And Mr. Zhou answered affirmatively. He said, based on what I have
23 learned from the semi-conductor books and textbooks, this is the movement
24 of holes.

25 So Mr. Zhou, Innoscience's own employee, agrees that it's the
26 electrons that come up from the 2DEG into the p-GaN. Moving on to Slide

1 31 and 32, I'm not going to go into this so much, but this is just some
2 additional testimony that Dr. Schubert provided during the ITC hearing as to
3 the mechanisms by which electrons go from the 2DEG across the barrier
4 there on Slides 31 and 32.

5 The next several --

6 JUDGE TORNQUIST: Just let me ask --

7 MR. DAVIS: Yes.

8 JUDGE TORNQUIST: -- do we have to resolve this issue? Or is this
9 more of a, this is how it works and this is why we would be able to tune this?

10 MR. DAVIS: Correct, that's --

11 JUDGE TORNQUIST: I'm trying to figure out what we need to
12 decide here.

13 MR. DAVIS: This is, again, it's an explanation of the science and
14 more of an explanation as to how Petitioner came to the wrong conclusion.

15 At the end of the day, it's what's inside the four corners of the
16 specification of the '294 Patent. It's enough. The reason why it's enough is
17 because of this underlying science.

18 But one of ordinary skill in the art doesn't even need to be aware of
19 that science when they're trying to make the invention. They just need to
20 know they need sufficiently high doping to deplete the 2DEG and that they
21 need to passivate with hydrogen, or maybe even additional passivation.
22 That's it.

23 JUDGE TORNQUIST: Okay.

24 MR. DAVIS: Okay? Thank you. The next several slides I won't --
25 I'm not going to touch on them. At this point, what these are, Slides 33, 34,
26 35, 36, 37, and 38, those are Exhibits 1043-1048.

1 Those are the exhibits that Petitioner included with its surreply related
2 to the motion to amend and their corresponding responses.

3 What I'd prefer to do now is get to some more broadly relevant issues:
4 claim construction. There are a few claim construction issues in this
5 proceeding.

6 And the first one I'll touch on is gate contact above the compensated
7 GaN layer. Patent Owner's construction is a gate comprised of a gate
8 contact and the compensated GaN layer.

9 Petitioner doesn't have a construction. It's plain and ordinary
10 meaning. That's Petitioner's view.

11 Slide 40, Petitioner has argued that there is no legal authority, if you
12 will, for the concept that you would look to the goals of the invention in
13 order to help construe the claims.

14 But contrary to that argument, it's absolutely appropriate to do. These
15 goals of low gate leakage and reduced gate capacitance, it's in the spec. It's
16 in the specification. That's intrinsic evidence. It's absolutely highly
17 relevant to claim construction.

18 And these '294 Patent excerpts on Slide 40 and 41 include -- it shows
19 examples of those goals. And on Slide 40, using a compensated semi-
20 conductor layer, 38, leads to low gate leakage.

21 The insulating nature of compensated layer, 38, reduces the gate
22 capacitance of the device. A similar excerpt on Page -- or Slide 41. The
23 only way to achieve those goals is if the compensated GaN layer is part of
24 the gate structure, part of the gate.

1 And again, the gate is not just the gate contact, it's the entire structure.
2 It's the gate contact and the compensated GaN layer. The gate is that entire
3 thing.

4 In addition, the compensated GaN layer is only disclosed in
5 specification and drawings as being part of the gate, part of the gate
6 structure.

7 This entire invention, that's what it is. That's what it relates to,
8 having a compensated GaN layer of being a part of the gate.

9 Slide 43 gets a bit into a capacitance. Sorry, I won't explain this too
10 much. It's there for your reference. Capacitance is Q over V . That's charge
11 over voltage in the gate capacitance. It's capacitance between the gate and
12 the 2DEG.

13 Okay? And it's only by having the compensated GaN layer be part of
14 the gate that you would be able to reduce the gate capacitance. Something
15 that's passivated that's outside of the gate structure is going to have no effect
16 on the gate capacitance.

17 Compensated GaN layer, Slide 44. I don't have too much here.
18 Compensated GaN layer, the construction of it, and you see our construction
19 here.

20 It's semi-conductor GaN gate material, which one type of impurity,
21 for example, donor, cancels the electrical effects of the other type of
22 impurity, for example, acceptor.

23 This construction issue was, as Petitioner indicated, it was -- there was
24 a big fight about it at the ITC. The ITC did not agree with Patent Owner's
25 construction.

1 The ITC did not agree with the Petitioner's construction. They went
2 with the third door: the staff's construction. We believe that the ITC was
3 incorrect, but I'm not going to get into the details. That's in our paper.

4 One point I would like to make on Slide 45 --

5 JUDGE TORNQUIST: Can I go back -- can we just go back --

6 MR. DAVIS: Yes.

7 JUDGE TORNQUIST: -- to that slide for a second, just to make sure
8 I understand. The only difference between the ITC and what you have here
9 is they took out the gate material piece, right?

10 MR. DAVIS: I would agree with that, Your Honor.

11 JUDGE TORNQUIST: Okay, just wanted to make sure.

12 MR. DAVIS: Correct. Slide 45, this is the one point I would like to
13 make about compensated GaN layer, and this goes to an argument that
14 Petitioner is making here as well as part of the basis of the ITC's decision.

15 And that is, the Petitioner and ITC said that there's -- well, there is
16 disclosure in the '294 Patent and compensated GaN; that's not necessarily
17 part of a gate.

18 And they focused on this figure, Figure 7. But Figure 7 is the
19 intermediate processing step. It's not a transistor. Absolutely not a
20 transistor.

21 There's no gate. There's no source. There's no drain. Intermediate
22 processing step. This does not establish that compensated GaN layer and a
23 transistor exists outside the gate in the '294 Patent.

24 We can even look at the brief description of drawings of the '294
25 Patent, which I'm not going to put on the screen. You can look at it at one
26 time, but I'll read to you what it says.

1 Figure 7. Figure 7 is a cross-sectional view at a stage of processing
2 subsequent to that shown in Figure 6. Stage of processing. How about
3 Figure 2? That's what we believe is a transistor, the figure that we always
4 say, hey, this is a compensated GaN layer embodiment.

5 Figure 2, this is the description for Figure 2. Figure 2 is a transistor.
6 According to an embodiment described here, transistor, stage of processing,
7 two completely different things.

8 Petitioner missed it. ITC missed it.

9 Slide 46, moving on to a different claim construction issue. I don't
10 want to spend much time here, but we do have an argument that Claims 1-3
11 are connected to enhancement mode transistor.

12 That, I believe, Your Honor, even appreciated this compensated GaN
13 layer invention is all about enhancement mode transistors, and we believe
14 that the intrinsic evidence supports an interpretation that Claims 1-3 are
15 directed to an enhancement mode.

16 One point I'd like to make on Slide 47, Petitioner, during his --
17 Petitioner's attorney during his presentation this morning mentioned that
18 there's an embodiment that goes to depletion mode that discloses its
19 depletion mode.

20 That's true. It's right here. Column 4, Lines 41-60. But that's not the
21 compensated GaN embodiment. That's this so-called third embodiment.

22 The figure that corresponds to that third embodiment is Figure 14,
23 also here on Slide 47. No compensated GaN layer there. What it's showing
24 there is what the patent described as a semi-insulating layer, 39, which has a
25 different type of doping in it.

1 So, with respect to the compensated GaN layer embodiment, only
2 described as enhancement, not depletion. Just wanted to be --

3 JUDGE TORNQUIST: Can we go back?

4 MR. DAVIS: Yes, Your Honor.

5 JUDGE TORNQUIST: I guess it's your Slide 46.

6 MR. DAVIS: Yes.

7 JUDGE TORNQUIST: But I'm looking more at your response at 22,
8 about Claims 2 and 3. It seems like what you're saying, you've put down
9 that anything that's passivated with hydrogen would result in enhancement
10 mode device.

11 But that requires it to be under the gate, correct?

12 MR. DAVIS: That would.

13 JUDGE TORNQUIST: Okay, so it really still wrapped up -- your
14 argument about 2 and 3 are still wrapped up in the argument about whether
15 it has to be part of the gate.

16 MR. DAVIS: I think they're related. I don't think they're the same
17 argument. But it's not a surprise that a lot of the arguments come back to
18 gate, because that is the invention, having compensated GaN layer as part of
19 the gate.

20 JUDGE TORNQUIST: But if we said no, the claims don't say it has
21 to be part of the gate, then your arguments on 2 and 3 that that has to be
22 enhancement mode device because it's compensated wouldn't be correct,
23 right?

24 Because Uemoto would be enhancement mode.

1 MR. DAVIS: I would disagree with that, Your Honor, only because
2 the only thing that the specification describes with respect to the
3 compensated GaN layer is enhancement mode.

4 But other than that, I understand your point.

5 JUDGE TORNQUIST: Okay. I just wanted to make sure I
6 understood how these all --

7 MR. DAVIS: Yes. Yes. I got it. Thank you. So that takes us, Your
8 Honors, to the prior art. These next several slides are an overview of the
9 prior art.

10 Instead of going through these slides individually, I'll just address the
11 references as they come up. So that will take us to Slide 52, Uemoto
12 grounds.

13 Uemoto. Uemoto uses a primary reference with respect to Claims 1-
14 3, which are the same claims that were in the parallel ITC investigation.

15 And I'd like to orient ourselves here, just for a second. What
16 Petitioner is accusing as being the compensated GaN layer is region 15b.

17 That's the high resistive region that's outside of the structure of the
18 gate there in Figure 7 of Uemoto. Region 15a is called the control region by
19 Uemoto, and that is a p-doped conductive region.

20 So let's keep that in mind. And with that, I'm going to skip ahead just
21 a bit here before I come back. I'd like to show us Slide 59. Right here, this
22 is an important illustration.

23 I think it will really help us. We can see, looking at Slide 59 of
24 Uemoto, Figure 7 on the left, Figure 1 of the '294 Patent on the right, Figure
25 1b in the admitted prior art. Uemoto and the admitted prior art, very similar.

1 They both have activated p-GaN below the gate contact. That's what
2 they both are. So Uemoto's just like the admitted prior art, which the '294
3 Patent explicitly distinguished itself over.

4 By extension, Uemoto, two completely different things. Let's get into
5 some more details. Slide 53, important concept to understand as well.

6 Region 15a, as disclosed by Uemoto, has no 2DEG underneath it. No
7 2DEG underneath it. That's what these excerpts from Paragraphs 33 and 38
8 of Uemoto tell us, as well as Figure 2a.

9 Slide 54, Region 15b, the high resistive region, on the other hand, has
10 2DEG underneath, has 2DEG present. That's what the excerpts from
11 Paragraph 33 and 51 from Uemoto teach us, as well as Figure 2b.

12 So whatever Region 15b is, if you're thinking about in terms of what
13 the '294 Patent actually describes, if you will, with respect to the
14 compensated GaN layer, it's something different.

15 Region 15b is something different than the compensated GaN layer of
16 the '294 Patent because that's an enhancement mode device. We know
17 there's no 2DEG underneath.

18 Slide 15, no gate contact above the compensated GaN layer. Region
19 15a, as I indicated, that's the region that's underneath the gate contact.

20 It would be fair to say the gate contact is above Region 15a, but that's
21 not Region 15b, which is being accused as the compensated GaN layer.

22 Region 15a is referred to as the control region, the control region,
23 throughout this specification. That's because it helps control the on/off
24 function of the transistor.

25 Region 15b has nothing to do with it. Region 15a is in the path of
26 current, in the path of current. And that's, we get that from Petitioner's

1 invalidity expert, which -- a Dr. Lebby, first time hearing his name today,
2 from the parallel ITC investigation.

3 Region 15b, conversely, one of ordinary skill in the art would not
4 consider the gate contact to be above Region 15b. And let me be clear about
5 this one second here, Your Honors. Right now, this last slide, and this slide,
6 this argument applies whether or not we're talking about plain and ordinary
7 meaning or applying Patent Owner's claim construction. Okay? For both.

8 So just looking at that term, plain and ordinary meaning, one of
9 ordinary skill in the art would not consider the gate contact to be above
10 Region 15b for several reasons, and most of them have to do with the fact
11 that Region 15b has nothing to do with turning the transistor on or off.

12 And when you see this phrase, that's what one of ordinary skill in the
13 art is going to think. Well, is it part of the gate? Is it helping to turn the
14 transistor on and off?

15 And the little sliver, if you will, of 15b that is shown in Figure 7, at
16 least, to be contacting gate electrode 20, gate contact 20, that's not part of
17 the gate structure.

18 It's not helping to turn the transistor on and off. Why?

19 JUDGE TORNQUIST: Would you agree that 15b is compensated?
20 They intentionally put hydrogens in that layer, right?

21 MR. DAVIS: I would agree with this: as Dr. Schubert, Patent
22 Owner's expert in the IPR proceeding as well as the ITC proceeding,
23 testimony that Petitioner pointed to showed that when you look at Region
24 15b in a vacuum, if you will, it's -- I forget how he put it. Something like
25 that's the compensated GaN that we're looking for, or something like that.

1 And in a vacuum, Region 15b appears to be compensated, but we
2 can't be in a vacuum here. We have to look at everything, and what
3 everything is telling us is that Region 15b is absolutely in the wrong
4 location.

5 And that's part of what Dr. Schubert said. He also said that by itself,
6 it's not the compensated GaN there, for the reason I mentioned before about
7 there's 2DEG underneath.

8 That brings me back to the point I was about to make about this sliver.
9 It has nothing to do with the control feature. Why? How do we know that
10 definitively?

11 There's 2DEG underneath it. There's 2DEG underneath it. So
12 applying that positive voltage to the gate contact, that sliver has nothing to
13 do with it.

14 Also, this part that -- I'm not great with my colors -- it looks like it's a
15 magenta, I guess, of the part of the gate contact on Slide 57 that's shaded in
16 magenta, that's not part of the functional gate.

17 One of ordinary skill in the art is not going to understand that part of
18 Item 20 to be part of the gate contact because it has nothing to do with
19 turning the device on or off.

20 JUDGE TORNQUIST: But is it above 15b? Is 20 above 15b?

21 MR. DAVIS: You mean is it -- it's certainly higher than. I would
22 argue that when you look at this turn gate contact above the compensated
23 GaN layer, it is not.

24 It doesn't meet that for the reasons I'm talking about, the on and off
25 function. And that's plain, ordinary meaning. We can talk about applying
26 the construction as well, which I don't believe that Petitioner has a dispute.

1 When applying the construction, Petitioner, looking at Slide 58, they
2 don't dispute that Uemoto fails to disclose a gate contact above the
3 compensated GaN layer. It's not there.

4 What corroborates that as well for the amended claims, Claims 13 and
5 14, which include within the body of the claim the concept of the gate
6 comprising the gate contact, compensated GaN layer.

7 They didn't use Uemoto as a reference, a primary reference, at all.

8 JUDGE TORNQUIST: When you say they don't contest it --

9 MR. DAVIS: Yes.

10 JUDGE TORNQUIST: -- you're saying they don't contest it under
11 your construction.

12 MR. DAVIS: Correct. That's right. Yes. That's what I'm saying.

13 JUDGE TORNQUIST: Yes, I mean, I see it here, but the way you
14 said it on the record, it sounded like you were saying they didn't even
15 contest it.

16 MR. DAVIS: Then I misspoke.

17 JUDGE TORNQUIST: Or I misheard.

18 MR. DAVIS: Yes.

19 JUDGE TORNQUIST: I just want to make sure I understand,
20 because it seems like to me --

21 MR. DAVIS: Yes, when applying Patent Owner's construction, they
22 don't contest.

23 JUDGE TORNQUIST: Okay.

24 MR. DAVIS: I'm sorry if I did misspeak. So the gate, Uemoto's
25 gate, does not comprise a gate contact in the alleged compensated GaN
26 layer, which is Region 15b.

1 So if Your Honors agree with Patent Owner's claim construction, then
2 the challenge based on Uemoto fails.

3 JUDGE TORNQUIST: Okay, and this is the same question I asked
4 Petitioner. It seems like the Uemoto ground is really a question about the
5 claim construction.

6 Because everyone seems to agree where things are, it's just how to do
7 construction.

8 MR. DAVIS: I would put it this way, Your Honor. Preparing for this,
9 I certainly thought that this will rise or fall on the claim construction, but I
10 also believe under the plain and ordinary meaning, as I've been trying to
11 explain today, and as we explain in our papers as well, that the challenge
12 should fail.

13 But certainly, it appears the easiest path is through claim construction.
14 I hope that helps.

15 JUDGE ABRAHAM: Let me pause you real quick. I just want to
16 make sure I understand. So the claim language is a gate contact above a
17 compensated GaN layer.

18 MR. DAVIS: Right.

19 JUDGE ABRAHAM: And if you go to your Slide 57, your argument
20 is that there is no gate contact because that portion that's in pink is not part
21 of the gate contact because it just doesn't operate --

22 MR. DAVIS: Correct. Correct, under the plain and ordinary
23 meaning. Correct, and when you apply construction on Slide 58, anywhere,
24 Petitioner doesn't dispute.

1 That takes us back to Slide 59, where I was before. Showing Uemoto
2 Figure 7 compared to the admitted prior art. Those are similar. Very, very
3 similar.

4 Both different than the claims of the '294 Patent. One additional point
5 here on Slide 60, one of the arguments that Petitioner has, is that moving
6 could be obvious to shift, to move, Region 15b so that it actually was part of
7 the gate, so that it actually was below the gate electrode.

8 And that fails because moving that region in that manner would run
9 counter to the stated objective of having a controlled region below the gate,
10 below its resistivity.

11 Shifting 15b is going to raise the resistivity. How do we know that?
12 Again -- well, a couple things. One, it's passivated, as we've said, but also it
13 has that 2DEG underneath.

14 There's just no motivation to do that. Slide 61, this just shows
15 Petitioner's inconsistent position in China, and the China invalidity request
16 or proceeding where they failed to invalidate the Chinese counterpart to the
17 '294 Patent.

18 They actually argued that it was Region 15a. Region 15a was
19 compensated, and now it's based on sort of inherency argument that did not
20 work in China.

21 Slide 62 brings us to the Smith grounds. Smith grounds. So the
22 Smith grounds pertains to both Claims 1-3, which are the same claims from
23 the ITC proceeding, as well as Claims 13 and 14, which are part of the
24 motion to amend.

1 Uses a primary reference in both. And as we saw from the
2 Petitioner's presentation, they use Smith in a myriad of ways. They use
3 Smith as a single reference, 103.

4 They combine Smith with Kigami. They combine Smith with
5 Uemoto. But also, importantly, they argue that hydrogen is naturally present
6 when you use an MOCVD process.

7 And Smith admittedly says that you can use an MOCVD process. But
8 -- and here's the thing: what's that argument? That's an inherency
9 argument.

10 That's an inherency argument. Petitioner has not called it that, but
11 that's what it is. It must be there, it must be compensated, because the
12 hydrogen is part of the MOCVD process. That's what they're arguing.

13 And what do we know about inherency? It must be there. If there's
14 another option, if it could be something else, if it could maybe not result in
15 compensated, can't be inherent.

16 This is inherency. Here's this argument here, that the mere presence
17 of hydrogen is not enough to establish a cap layer 34 as a compensated GaN
18 layer.

19 That's an argument that we've been making throughout this
20 proceeding. Throughout.

21 I'd like to point out some additional testimony. We heard earlier
22 about some of the things that Dr. Shealy said with regards to enablement.

23 We'll go back to Slide 18 here. Paragraph 46 of Exhibit 1039. A
24 thicker layer is more difficult to passivate with hydrogen and thus more
25 difficult to arrive at a compensated state.

1 Let me read that again. A thicker layer is more difficult to passivate
2 with hydrogen and thus more difficult to arrive at a compensated state.

3 What are they saying? What is Dr. Shealy saying? Dr. Shealy is
4 saying, well, if you have a really thick layer, even though there might be
5 some hydrogen present, you may or may not arrive at the compensated state.
6 That's what he's saying.

7 This supports Patent Owner's position all along that the mere presence
8 of hydrogen alone is not enough to tell you you have compensated GaN
9 layer. There are other factors that come into play. This is an example of one
10 of them. But, move back.

11 JUDGE TORNQUIST: So as you're doing that, let me ask, they put
12 in some pretty strong evidence that as grown gallium nitrides do have
13 hydrogen in them, unless you do something, you act to remove it.

14 Do you have anything to suggest that it wouldn't be inherent?

15 MR. DAVIS: Yes, that evidence right there from Dr. Shealy, their
16 own expert.

17 JUDGE TORNQUIST: That's why they're compensated. I'm just
18 saying, whether hydrogen is present.

19 MR. DAVIS: Yes, so the argument is, our argument is, that the mere
20 presence of hydrogen, the mere presence of hydrogen is not enough to tell
21 you that you have compensated GaN layer.

22 As to the general idea that MOCVD involves hydrogen, we agree with
23 that. It does involve hydrogen, but that doesn't mean that if you use an
24 MOCVD process and you -- let's say you don't anneal; that still doesn't
25 mean that you definitively have compensated GaN layer.

1 You have to take other things into consideration amongst those
2 factors. Thickness of the layer. And unless they can point to definitive
3 evidence that what Smith discloses is compensated based on all the factors
4 involved, then they're not there.

5 It's the mere presence, just the simple fact that hydrogen is being used
6 in MOCVD that hydrogen is naturally present. Not enough. Their own
7 expert said that. That's the argument.

8 JUDGE TORNQUIST: Sorry.

9 MR. DAVIS: Sorry.

10 JUDGE TORNQUIST: Let me ask a question.

11 MR. DAVIS: Yes, Your Honor.

12 JUDGE TORNQUIST: I'm going back to Slide 18.

13 MR. DAVIS: Would you like me to go back there?

14 JUDGE TORNQUIST: If you want. Either way, I can read what I'm
15 thinking. It's talking about layer thickness plays a role. It says a thick layer
16 is more difficult to passivate and thus more difficult to arrive at.

17 But I thought you just agreed that you're going to have hydrogen in
18 that layer. So even though it might be more difficult to passivate with
19 hydrogen, but isn't there going to be hydrogen in there?

20 MR. DAVIS: Your Honor, I was not disputing that there could be
21 some hydrogen in there. What I'm disputing is that, hey, just because you
22 have hydrogen in there, that doesn't mean that you have a compensated
23 state.

24 JUDGE TORNQUIST: Right, but you pointed to this language --

25 MR. DAVIS: Yes.

1 JUDGE TORNQUIST: -- as your evidence of the fact that the
2 inherency argument fails.

3 MR. DAVIS: Correct.

4 JUDGE TORNQUIST: I guess I'm having difficulty understanding
5 why this language here supports your position that inherency fails. It seems
6 like he's saying that it's just going to be more difficult to passivate with
7 hydrogen, but it seems like you've already passivated with hydrogen just by
8 the way you grow it.

9 MR. DAVIS: The whole -- let me back up. The whole -- the context,
10 of course, of this language here from Dr. Shealy was in the context of
11 enablement where he was trying to explain that the specification is not
12 enablement.

13 That specification is not explaining how you would arrive at the
14 compensated state. And there are portions directed to doping and there's
15 also this discussion on passivation.

16 And what Dr. Shealy is saying here is that, well, just because the
17 patent tells you how to, or tells you to passivate with hydrogen, that doesn't
18 mean that you'll arrive at a compensated state.

19 You have to take into account other things, like the layer of thickness.
20 You could have -- if you have a thick layer that has some hydrogen in there,
21 you're not necessarily compensated. You're not necessarily compensated.

22 That's what I believe this sentence fairly says.

23 JUDGE TORNQUIST: Okay. I understand.

24 MR. DAVIS: Okay.

25 JUDGE ABRAHAM: How does that work with your claim
26 construction? If we take what the ITC did, which is just your piece about it

1 being the gate, out, it just says the dopant imperfection partially cancels the
2 electrode effects of another type of dopant.

3 There's no amount in there. So wouldn't that be sort of satisfied by
4 10 hydrogens bonding to the magnesium?

5 MR. DAVIS: Well, first of all, Your Honor, our construction is not
6 partially. That was an initial position that was taken in the ITC that was
7 later dropped, and that was addressed in the Patent Owner's response.
8 There's no term partially in there.

9 I can take us to the -- just, I want to make sure we're all looking at it
10 correctly.

11 JUDGE ABRAHAM: Okay. Okay.

12 MR. DAVIS: Well, instead of finding the slide that has the
13 construction on it, I'll represent that that's the case unless somebody can
14 assist me. So the term partially is not in there.

15 JUDGE ABRAHAM: Okay.

16 MR. DAVIS: Now, Petitioner has set forth this inherency argument.
17 All right? And the base of that inherency argument is that hydrogen is
18 present.

19 Yes, I would disagree that MOCVD necessarily results in passivated.
20 I do agree that MOCVD has hydrogen involved in the process, so there
21 would be some hydrogen present.

22 And the question is whether or not you arrive at that final
23 compensated state, because that's the claim term, compensated GaN layer.

24 I have a point I can make even -- well, no, I'll --

25 JUDGE TORNQUIST: Well, I'll --

26 MR. DAVIS: Yes.

1 JUDGE TORNQUIST: Maybe I'll -- the language I was reading was
2 what Petitioner had written in a petition of your position, so I get it.

3 MR. DAVIS: Correct.

4 JUDGE TORNQUIST: But now looking at your position in the
5 Patent Owner response, you say it should be construed of a semi-conductor
6 gate material in which one type of impurity, for example, donor, cancels the
7 electrical effects of the other type of impurity.

8 It can't be completely canceled, correct?

9 MR. DAVIS: We're not -- you mean to say that every single acceptor
10 is canceled out?

11 JUDGE TORNQUIST: Yes.

12 MR. DAVIS: That's not our position.

13 JUDGE TORNQUIST: So how much needs to be canceled out to be
14 compensated?

15 MR. DAVIS: Well, we can look at the intrinsic evidence of the '294
16 Patent. We're going to need something that is low gate leakage and reduce
17 gate capacitance, by way of example.

18 JUDGE TORNQUIST: But that's not in your construction.

19 MR. DAVIS: That is not in the construction. That is correct.

20 JUDGE TORNQUIST: Okay.

21 MR. DAVIS: But let's take construction out of it just for a second
22 and just use the term compensated GaN layer. That adds it. No, we do think
23 our construction meets that language.

24 But what Dr. Shealy admitted was then to arrive at a compensated
25 state, hydrogen wasn't enough. And that's informative. And hopefully, that

1 provides some guidance to Your Honors as you're deciding the claim
2 construction issues and what applies and what doesn't.

3 JUDGE TORNQUIST: Okay.

4 MR. DAVIS: Okay? Okay. Slide 63, I can skip for now. I'm
5 actually going to move forward a bit to Slide 73. We've been discussing
6 compensation, compensated GaN layer and Patent Owner's position that the
7 alleged compensated GaN layer is not, in fact, compensated.

8 Petitioner also has several arguments with respect to modifying that
9 cap layer, modifying that alleged compensated GaN layer to become
10 compensated.

11 They do that based on Smith by itself as well as Smith with Kigami,
12 Smith with Uemoto. And what Smith really discloses is just p-type dopants
13 in its cap layer, and those dopants, they're there to segregate to those
14 locations in the cap layer in order to reduce gate leakage in all those
15 locations.

16 To compensate when there's dopants would render the Smith device
17 inoperable for its stated purpose. And that point, that applies to whether or
18 not you're talking about a single reference, 103, whether or not you're
19 talking about Smith combined with Kigami, also Smith combined with
20 Uemoto.

21 It knocks all those references out for that reason. Going back to Slide
22 64, we have a series of slides on no enhancement mode. And this relates to
23 both Claims 1-3 as well as amended claims 13 and 14.

24 One point of clarification on Claims 13-14, because Your Honor
25 mentioned something about preamble and whether or not it's limited.

1 Regardless of whether or not the preamble of Claims 13 and 14 are
2 viewed as limiting, we know that we're directed to an enhancement mode
3 transistor there because the body of the claim itself explicitly states no
4 2DEG below the gate.

5 JUDGE TORNQUIST: Okay, so we don't have to decide whether it's
6 enhancement mode or not. We need to decide whether there's no 2DEG,
7 and one would end up getting the same result. But that's our question.

8 MR. DAVIS: Correct. If, by what you mean is you don't need to
9 decide whether it's enhancement mode, you don't need to necessarily decide
10 whether or not the preamble is limited, correct.

11 JUDGE TORNQUIST: Okay.

12 MR. DAVIS: Said either way.

13 JUDGE TORNQUIST: I mean, we have a lot of issues to decide but -
14 -

15 MR. DAVIS: Yes.

16 JUDGE TORNQUIST: -- the main one is there's no 2DEG.

17 MR. DAVIS: That is correct. That is correct. So Smith has said
18 depletion mode transistor. It's depletion mode transistor. There's no
19 teaching that there's no 2DEG that exists below the gate zero volt to supply
20 gate voltage.

21 See the last bullet point I have on Slide 64 is that it's unable to work
22 as an enhancement mode transistor. One point on this, this is not an
23 argument that the Smith reference is not enabling.

24 That's not the point here. This is evidence. Right? Well, we know
25 that if it's unable to work as enhancement mode, it must be depletion mode.

1 And that's the entire point of this argument, and that is the argument
2 we see on Slide 65, 66, 67. Going back to Slide 65, the portion on the right
3 there, Exhibit 2010 and Page 54, that's from Petitioner's post-hearing initial
4 brief.

5 And essentially, what they have said there, and you can go and read
6 that brief, is that they agreed that if you have a device that is attempting to
7 work as enhancement mode where you have that p-GaN layer extending
8 from the source to drain, the entire 2DEG would be depleted.

9 That's why you don't see dashes coming all the way across. And they
10 also agree looking at Slide 66 that when you apply a positive voltage to the
11 gate, that's that plus V in the upper right-hand corner on the right side, that
12 it's only generally underneath the gate that's going to be replenished.

13 That's what they said. That's what their invalidity expert in the ITC
14 case, Dr. Lebby said, as well. Slide 67 is just pointing out that you'd have
15 the same issue even if you had a small gap.

16 And Your Honor put it in a nice way. He said, it's because you have
17 that cap layer to use the language of the Smith reference; it's so much wider
18 than the gate contact.

19 That's a problem. That's a problem. And going back to Slide 66, if
20 you were to apply the voltage to Smith, the 2DEG would replenish only
21 under the gate area in general and the device would not turn on.

22 So we know we're talking about depletion mode. Staff from the ITC
23 as well as the CNIPA agreed with that. We see that on Slide 68 through 69.

24 Just to let you know, D1 upon Slide 69, that corresponds to the Smith
25 reference, which Petitioner will agree with and you can figure out by looking
26 at Exhibits 2018 and 2019.

1 Slide 71, there's no motivation to modify Smith to enhancement
2 mode. One of the things that Dr. Lebby, Petitioner's invalidity expert said at
3 the ITC case trial was that, well, sure, okay, if you apply a normal voltage to
4 the gate, 2DEG could only replenish underneath the gate, but I could force it
5 to where it could guide by a lot of voltage, but it would not be an ideal
6 device and it'd have lots of leakage, and that's precisely why there's no
7 motivation to modify in that sense.

8 Dr. Shealy, Petitioner's expert in this IPR matter, has testified that if
9 the cap layer with p-dopant contacted, they'll make contacts. It'll be a
10 disaster, and he just doesn't know how to build something like that.

11 Again, goes to a lack of motivation. I touched on this already on Slide
12 73, compensating the dopants, as Smith would render the device as
13 inoperable for its stated purpose, and not box out the single reference 103 as
14 well as combining with Uemoto and Kigami.

15 Slide 75 and 76 provides some additional reasons for lack of
16 motivation. That's covered in our papers.

17 And Slide 78, again, compensating dopants. This is Smith with
18 Uemoto, compensating the dopants would render the Smith device
19 inoperable, consistent reason, but there are additional reasons as well why
20 one of ordinary skill in the art would not be motivated to combine Smith
21 with Uemoto.

22 That's covered on Slide 79 and 80 as well as our papers. Slides 81
23 and 82 go into the -- or 81 goes into the differing leakage currents, which is
24 again part of the additional reasons why one of ordinary skill in the art
25 would not be motivated to combine Smith with Uemoto.

1 And looking at -- what I'll do now is, Slide 82 has some additional
2 reasons for Smith and Uemoto, but I'd like to move on to the Sheu grounds.

3 And the Sheu grounds, this relates to just Claims 13 and 14 from the
4 motion to amend. And first and foremost, Sheu discloses the depletion
5 mode transistor.

6 This is Figure 4 from Sheu. And this chart here, or graph, this shows
7 us, we're talking about depletion mode. Why is that? As voltage gets more
8 negative, gate leakage current increases.

9 That is a relationship that is indicative of a depletion mode transistor.
10 Well, why is that? We covered earlier. What's depletion mode? It's
11 normally on.

12 It's normally on. Negative voltage has to be applied in order to turn it
13 off. Negative voltage, and it's when a transistor is off, that is when you're
14 concerned with -- that is when you're concerned with gate leakage, when it's
15 off.

16 So this, Figure 4 here, which shows gate leakage coming on and
17 increasing when a negative voltage is applied, that's showing its depletion
18 mode.

19 That's showing its depletion mode. I'd like to make an additional
20 point here. Petitioner did not go over this particular slide in their
21 presentation, but there is a slide in the demonstratives that they submitted
22 that they filed that talks about Sheu Figure 4.

23 Well, and they even said it to a paper. If you look at those pages,
24 you'll see that they never actually addressed Sheu Figure 4. But even if they
25 did, it's just attorney argument.

1 Our Sheu Figure 4 argument is backed by Dr. Schubert in his
2 supplemental declaration. Staff from the ITC as well as CNIPA, Slides 84,
3 85, they agree, depletion mode.

4 Slide 85, D3 there, that's referenced from the CNIPA, that is the Sheu
5 reference, which Exhibits 2018 and 2019 will inform you.

6 Within Sheu, the compensated GaN layer is accused or -- yes, accused
7 of being the -- sorry, let me start over. The gate insulating layer of Sheu is
8 accused as being the compensated GaN layer.

9 What the gate insulating layer actually is, is it's just a dopant layer,
10 looking at Slide 87. It's just a dopant layer. That's all that Sheu at 10
11 describes, it has a dopant.

12 And that dopant enhances the resistance value. It enhances the
13 resistance value, compensating the gate insulating layer, it would negate the
14 desired effects of Sheu's dopants.

15 Sticking with Slide 87, again, the dopant is there to enhance the
16 resistance value. Compensating it would frustrate that purpose. It doesn't
17 even really matter what enhanced resistance value is, whether it's reduced or
18 increased.

19 If you try to compensate it, right, you're going to negate those side
20 effects of those dopants. Also, no motivation to combine with respect to
21 Kigami, Sheu and Kigami, for the reasons on Slide 89 and our paper.

22 And what I'd like to do with the last little bit of remaining time I have
23 here is I'd like to go to the Petitioner's slides -- a couple of slides that they
24 presented.

25 Here's Slide 25 from Petitioner's demonstratives. Here's where they
26 discuss what the ITC said about the compensated GaN layer. And the ITC

1 was trying to say, well, hey, look, the '294 Patent itself talks about
2 compensated GaN layer not necessarily being part of the gate.

3 That's Petitioner's argument. Let's look at what the ITC said a little
4 more carefully. They say, this is the highlighted portion, there is nothing in
5 that disclosure that requires a compensated GaN layer to be a part of the
6 gate contact.

7 And then further, Figure 2 shows compensated GaN layer 38 and gate
8 contact 37 as separate and distinct structures. Well, a couple things. Yes,
9 they're distinct.

10 Gate contact and compensated GaN layers, absolutely distinct. That
11 wasn't patent owner's argument. This first sentence, there's nothing in that
12 disclosure that requires a compensated GaN layer to be part of the gate
13 contact.

14 That reveals the ITC's error. They thought we were arguing that the
15 compensated GaN layer has to be part of the gate contact. That's not it.

16 The compensated GaN layer must be part of the gate, the gate
17 structure. That gate structure includes the gate contact and the compensated
18 GaN layer.

19 So the ITC just got it wrong there. The other slide, it was Slide 154,
20 that addressed the Wands factors. I'll just submit that those factors were
21 included in their sur-reply.

22 We believe they should have been included in the opposition. It's just
23 attorney argument. It's late. And one last point on Slide -- their Slide 178, I
24 believe it was. Let me see. That's right.

25 The show the Hu reference here. I don't believe they've ever
26 discussed that before in their papers. One thing I would point out, though,

1 when you look at that reference compared to Smith, again, this is that issue
2 where, well, in that reference, the p-GaN is not that much wider than the
3 gate contact.

4 And that's the basis of the issue with respect to the Smith reference
5 and why it work as enhancement mode device. And with that, I will reserve
6 the rest of my time.

7 JUDGE TORNQUIST: Okay, thank you very much.

8 MR. DAVIS: Thank you.

9 JUDGE TORNQUIST: It looks like we only have about 15 minutes,
10 so let's just go ahead and if that's okay, we'll hear the rebuttals. So
11 Petitioner, when you're ready.

12 DR. DUARTE-GUEVARA: Thank you, Your Honors. I want to add
13 these three points. One on claim construction -- actually, four points. One
14 on claim construction, one on Uemoto ground, one on Smith, and then to go
15 with the lack of enablement issue.

16 Claim construction, this is the point that I want to make. I mean, my
17 Slides Number 31, you heard EPC talking about goals of invention, and how
18 goals of invention is going to be important for the claim construction of term
19 1f and how the ITC got it wrong.

20 Your Honors, what they're proposing contradicts the law. This is a
21 case from the Federal Circuit that says claim construction is a function of the
22 words of the claim, not the purpose or, as EPC would put it, the goal of the
23 invention.

24 That type of construction is violating nearly every tenet of claim
25 construction. They're trying to import limitations from the specification into
26 theclaim.

1 The claim language does not support this gate comprised of the gate
2 material. There is nothing there that will support that construction.

3 They're relying on goals from the invention. The Federal Circuit
4 already told us that that is incorrect.

5 I move to 61. Oh, sorry. Sorry. Actually, it's Slide 67. Because
6 they're talking about how a person of ordinary skill will not understand their
7 15b to be below 20, under the plain and ordinary meaning.

8 Your Honors, their expert disagrees with that. Because here I wanted
9 to show you a portion of the ITC hearing where Dr. Schubert was again
10 talking about Uemoto, and he was saying if we look at the structure, the gate
11 electrode is above a small region of layer 15b.

12 Now, we will say that it is just above because the claim doesn't have
13 any requirement on how much above you need to be; it's just above.

14 And here, EPC's expert is admitting that 20 is above 15b. His whole
15 issue was we did narrative support. He was saying, I don't see narrative
16 support.

17 But Your Honors, it's well settled, going back even to CBA and into
18 MPEP that features shown in prior art drawings need not be described in the
19 specification to be a prior art disclosure. And here, reporting from the
20 MPEP Section 2125.

21 Going to go to Slide 86 now. And there was a lot of talk about how
22 Dr. Shealy had a portion in his declaration addressing the issue of
23 enablement and whether or not that's going to be compensated or what
24 needs to be done.

1 Your Honors, look at the construction. Because what the construction
2 says is one type of impurity cancels electrical effects of another type of
3 impurity.

4 And Smith by itself, as grown, that means it's going to have hydrogen
5 that is canceling the dopant effect. So with the construction, Smith's cap
6 layer as grown is a layer using one type of impurity, the hydrogen that
7 comes naturally to these layers, cancels electrical effects of another type of
8 impurity.

9 That's going to be the dopant that gets passivated. That's what's
10 shown in the references. That's what's shown in the record throughout.

11 And in the last couple minutes, I want to address the issue of
12 enablement. Your Honors, they go through a few different references and
13 talk about the energy levels.

14 The first point that I want to make, the exhibits that they show for the
15 enablement issue, they have nothing to do with transistors. They deal with
16 LEDs or something else.

17 These 3.4 electron volts and 2 millielectron volts, all that stuff is not
18 about transistors. That is critical, because in those, there's no barrier. In
19 LEDs, there's no barrier.

20 So all that stuff that they were trying to rely on is not supported for
21 their theory about how these devices that are transistors will operate.

22 JUDGE TORNQUIST: So I'll ask the same question, do we need to
23 resolve this scientific question?

24 DR. DUARTE-GUEVARA: I think the answer is no if it's not
25 enabled. But if it's enabled, Your Honors will be deciding with that because
26 that's how they get to enablement.

1 So if you find enablement because their theory of the two energy
2 gains, then you do need to resolve the issue of the mechanism, because you
3 will need to find that that theory is correct.

4 But for the legal question of enablement, you wouldn't need to do it if
5 you do not find the claims enabled.

6 JUDGE TORNQUIST: If we found there wasn't a need for undue
7 experimentation, we don't need to get into the scientific principle, right,
8 which is why they want them to get there?

9 DR. DUARTE-GUEVARA: No, because you will need to -- for there
10 to be, I guess, routine experimentation or not undue experimentation. We
11 will need to admit that what EPC is saying about the mechanism is correct
12 because otherwise, there couldn't be the competing limitation of where it
13 was causing before.

14 So let me put it more straightforward. The way EPC gets to
15 enablement is by saying that the two electrons get sucked up into the p.
16 That's how they get to enablement. So for that, if Your Honors are going to
17 find for enablement, that needs to be true. So for that reason, you will need
18 to find, resolve the issue of the two mechanisms. You will need to find that
19 that is true.

20 If you don't find for enablement, you don't have to reach the issue
21 because then it's a simple legal question. It's in the papers of the patent.

22 Regardless of what was done before, the patent is not teaching how to
23 do it.

24 JUDGE TORNQUIST: Okay. You're out of time, but we'll give you
25 just another minute to hit your points and wrap up.

26 DR. DUARTE-GUEVARA: So just to wrap up then --

1 JUDGE TORNQUIST: Okay.

2 DR. DUARTE-GUEVARA: -- we are saying this would be enabled
3 because this happens by itself. The two electrons just get sucked up into the
4 p-GaN. We disagree with that, but if you find for that, then the claims have
5 to be obvious.

6 Because what I was mentioning before, the patent -- the prior art
7 provides more information than the patent about it. If this is truly going to
8 be done by itself, and that duration, you don't have to have description in the
9 patent, then the new claims specifically will need to be obvious. Thank you.

10 JUDGE TORNQUIST: Okay, thank you.

11 MR. DAVIS: Thank you, Your Honor. I'll start with the last point
12 that Petitioner's counsel just made. It doesn't matter whether or not the
13 prior art says more about those levels in the '294 Patent.

14 What matters is whether or not one of ordinary skill in the art would
15 have been motivated to make the modification or combination. And they
16 wouldn't. That has not been established. I'd like to address, they brought
17 up element 1f, right, which is gate contact above compensated GaN layer.
18 Just so Your Honors are clear, during the parallel ITC investigation, Patent
19 Owner did not propose the construction that we are proposing here. That did
20 not start until this proceeding.

21 Everything in the ITC was based on plain and ordinary meaning, if
22 you will. I'd like to talk a bit more about the naturally present hydrogen
23 issue, if you will.

24 And it seems that at least some of what Petitioner is relying on, it was
25 in their Slide 84, which I put up here, as grown GaN films are hydrogen
26 passivated, that is the language that they highlighted.

1 What they didn't highlight is right before, which reads, it is speculated
2 that as grown GaN films are hydrogen passivated. So this concept, per this
3 article, this was speculation.

4 I'll also submit that Patent Owner is not agreeing that just because
5 there is perhaps some hydrogen present in Smith that it would be hydrogen
6 passivated. Not at all. Not at all.

7 That passivation term, that's a loaded term, certainly. There very well
8 may be some hydrogen present because we know there's hydrogen involved
9 in MOCVD.

10 We're not agreeing that it's hydrogen passivated. It's essentially
11 another way of saying it's compensated. We completely disagree with that
12 for the reasons that were mentioned during the initial argument.

13 I actually think those are the main points I wanted to make, Your
14 Honors.

15 JUDGE TORNQUIST: Okay, perfect.

16 MR. DAVIS: Thank you.

17 JUDGE TORNQUIST: Thank you. Okay, seeing no other questions,
18 thank you very much. Thank you to both parties. This was an excellent and
19 helpful argument today.

20 And LEAP practitioner, thank you, and this is the first time I've seen
21 a LEAP practitioner go all the way through. Very impressive.

22 With that, this hearing is adjourned.

23 (Whereupon, the proceedings at 11:53 a.m. were concluded.)

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