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571-272-7822

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY, INC.,
Petitioner,

v.

YANGTZE MEMORY TECHNOLOGIES COMPANY, LTD.,
Patent Owner.

IPR2024-00788
IPR2024-00909
Patent 10,658,378 B2

Held: September 4, 2025

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

APPEARANCES:

ON BEHALF OF THE PETITIONER:

JARED BOBROW, ESQ.
PARTH SAGDEO, ESQ.
Orrick, Herrington & Sutcliffe LLP.
1000 Marsh Road
Menlo Park, CA 94025
(650) 614-7400
jbobrow@orrick.com
psagdeo@orrick.com

ON BEHALF OF THE PATENT OWNER:

CHRIS BONNY, ESQ.
ANDREW RADSCH, ESQ.
Ropes & Gray
525 University Ave, 8th Floor
Palo Alto, CA
(650) 617-4000
Christopher.Bonny@ropesgray.com
Andrew.Radsch@ropesgray.com

ALLEN S. CROSS, ESQ.
Ropes & Gray
2099 Pennsylvania Avenue, NW
Washington, D.C. US20006
(202) 508-4600
Allen.Cross@ropesgray.com

The above-entitled matter came on for hearing on September 4, 2025, commencing at 10:00 a.m., via video teleconference.

1 P R O C E E D I N G S
2 - - - - -
3 JUDGE CYGAN: Good morning. This is Judge Cygan. Judges
4 McGraw and Kokoski are present. We'll now hear argument in case
5 numbers IPR2024-00788 and IPR2024-00909, between Petitioner, Micron
6 Technology, and Patent Owner, Yangtze Memory Technologies, concerning
7 U.S. Patent Number 10,658,378.
8 Counsel for the party starting with Petitioner, please introduce
9 yourself.
10 MR. BOBROW: Yes. Good morning, Your Honors. My name is
11 Jared Bobrow, Orrick, Herrington & Sutcliffe. I am backup counsel for
12 Petitioner, Micron Technology. And with me is Parth Sagdeo.
13 JUDGE CYGAN: Thank you. Patent Owner?
14 MR. RADSCH: Good morning, Your Honors. My name is
15 Andrew Radsch, from Ropes & Gray. Nice to see you again. Joining me
16 today is my colleague, Chris Bonny, so is Allen Cross this afternoon, and
17 with us from YMTC, Mr. Weihua Cheng.
18 JUDGE CYGAN: Thank you, and welcome to the Board. For our
19 hearing order, each party is provided with 60 minutes of oral argument.
20 Parties need not use the entirety of that time. Petitioner will argue first and
21 may reserve time for rebuttal. Patent Owner will respond to Petitioner's
22 argument and may reserve time for a surrebuttal. We have the
23 demonstratives for each party.
24 Please remember to identify yourself when speaking and please

1 mute yourself when not speaking. Also, please be sure to identify the slide
2 you're on, since we're all in person. It's not as critical as when we're by
3 video. But it will be helpful for us in following along in our personal copies.
4 Petitioner, how much time would you like to reserve for rebuttal?
5 MR. BONNY: Fifteen minutes, Your Honor.
6 JUDGE CYGAN: Okay. And you may begin when ready.
7 MR. BOBROW: All right. Thank you, Your Honors. And may it
8 please the Board, I'll be addressing both of the petitions for inter parties
9 review, the 788, and the 909, as it relates to the '378 patent.
10 Okay. There it goes. I'm sorry about that. So as Your Honors are
11 aware, there are three grounds that are before the Board, the Toyama ground,
12 the Mushiga ground, and the Mushiga and Makala ground. Toyama, as you
13 know, is really in a sense two grounds because we're relying upon two
14 different embodiments in Toyama. One of them is called the first exemplary
15 structure, and the other is the second modification of the fourth exemplary
16 structure. I'm going to spend most of my argument today on what we call
17 Ground 1A of Toyama. As time permits, I'll try to address the other grounds
18 as well. But I'm going to focus on Ground 1A.
19 As Your Honors are aware, turning to Slide 3, the '378-1 petition
20 involves certain challenge claims which are being challenged on all of the
21 grounds, Grounds 1A, B, 2, and 3, Whereas in the '378-2 IPR, the only
22 grounds at issue are the Toyama Grounds 1A.
23 So let me turn then, as I said, to Ground 1A, and turning to Slide 7
24 just as a road map. Essentially, Toyama, of course, there's no dispute that it

1 qualifies as prior art. There also is no dispute that Toyama teaches and
2 discloses most -- nearly all of the limitations that are set forth in the
3 challenged claims. It's the 3D NAND memory. It discloses of course a
4 substrate, a stacked array, a staircase structure through array contacts. All of
5 those are disclosed, and there's no dispute.
6 What the disputes focus on are two limitations set forth in the
7 independent claims and one limitation that appears in dependent Claim 18,
8 which depends from Claim 15. Those limitation, the first one relates to
9 isolation structures, the second one relates to the dielectric structure on the
10 isolation structure, and the third relates to local contacts and channel
11 structures. So let me take those three in turn.
12 And I will preface all of that by saying that for the most part, the
13 parties disputes -- not entirely, but I'd say in the main focus on claim
14 construction disputes -- there's really no dispute that if the Petitioner's claim
15 constructions are adopted, that Toyama 1A teaches, discloses, and renders
16 obvious all of the challenged claims. I would submit, however, that the trial
17 proceeding has shown that even under the Patent Owner's incorrect
18 constructions, the claims are nonetheless rendered obvious. And I will try to
19 go through those points with you today.
20 So turning to the first set of limitations in Claim 1 and 15, this is
21 where the isolation region of a substrate and a substrate with an isolation
22 structure limitations are found. Again, as I mentioned, there's really -- a big
23 part of the focus here is a Claim Construction Dispute. The Petitioner
24 contends that these terms should simply take their plain and ordinary

1 meaning. They are essentially prepositional phrases that we're fighting over,
2 words like 'of' and 'this' and 'with.'
3 The Patent Owner contends, in contrast, that those limitations, the
4 words 'of' and 'with' should be narrowed and mean only part of. But as the
5 trial record has shown, the Patent Owner's construction finds no basis in the
6 record, adopting it would really be importing limitations from the
7 specification, and it would be essentially giving up on the plain and ordinary
8 meaning in the absence of any lexicography or disclaim.
9 As the Board is aware, turning to Slide 10, the Board preliminarily
10 rejected the Patent Owner's part of construction. And we submit that the
11 trial record shows that the Board should continue to reject that construction.
12 So let me begin turning to Slide 11. The plain meaning here, we're
13 talking about the word 'with.' That word, plain meaning is not limited to
14 'part of.' There is evidence that we cite in the record, which included in the
15 lead reply declaration -- cited in our reply brief on the broad meaning of the
16 word 'with,' to include things like presence and accompaniment. That's a
17 normal usage of the word 'with.' 'of' of course is also broad, suggesting a
18 possessive relationship. But in no cases are those words limited to one thing
19 being part of another, as set forth in our briefs. If 'part of' were the only
20 meanings of these words, it would lead to nonsensical results.
21 The Patent Owner has not identified a disclaimer or lexicography
22 that would warrant narrowing the meaning of these words. To the contrary,
23 the Patent Owner relies upon an embodiment of the isolation structure,
24 which is Element 233 in the patent, the shallow trench isolation region. And

1 they base their argument on that. But the patent itself rejects the idea that
2 there is any limiting disclosure as it relates to that element. In fact, the
3 patent says that the isolation structure 233, quote, "is exemplary and is not
4 limiting." And it also says, quote, "other isolation structures can be used."
5 That's at column 10, lines 33 to 34 of the '378 Patent.
6 Moreover, the patent in that same paragraph that I just alluded to
7 says that the formation of the isolation region on top of a substrate and
8 filling that with dielectric is, quote, "by weight of example and not
9 limitation," column 10, lines 36 to 40. That is a nonlimiting description of
10 that embodiment, to be sure.
11 The Patent Owner's construction, turning to Slide 12, would also
12 exclude, disclose, embody. And one of those embodiments is having the
13 shallow trench isolation region on -- it says on the substrate. There are many
14 things that can be on a substrate without being part of the substrate. And
15 again, common usage in English -- and we've illustrated some of that in our
16 brief in here -- would show that part of limitation would lead to absurd
17 results.
18 Now, in their sur-reply, turning to Slide 13, the Patent Owner cites
19 some narrower meanings of the words 'with' and 'of', taken from the same
20 dictionaries that also include the broader meanings of the words 'with' and
21 'of'. It is improper to simply cherry pick those definitions and say that the
22 words 'with' and 'of' are limited to the narrow meanings and exclude the
23 broad ratings. These words, their normal English words, are entitled to their
24 normal broad and full meaning.

1 Now, under the Petitioner's construction, as I mentioned at the
2 outset, there's no dispute that the isolation region or the substrate has an
3 isolation region that is with it; also, it is of the substrate. So you can see
4 that, for example, in Figure 13A, on Slide 14. You can see that there is an
5 isolation structure. It's highlighted there in yellow. Sorry, it's -- in white in
6 the middle. Apologies.
7 The substrate is highlighted, and it's to the left. That isolation
8 region contacts the substrate, it touches it. It's formed by removing a portion
9 of the substrate, and it electrically isolates the TACs, the through array
10 contacts that are later formed and that are embedded in that isolation
11 structure. So the isolation structure, plainly, is with and it is of the substrate.
12 And under the Petitioner's construction, there really is no dispute as to that.
13 We submit, however, that even under the Patent Owner's
14 construction, even under that erroneous construction, the isolation structure
15 is with and it is of the substrate. And that is clear because under the broad
16 meaning of the word substrate that is set forth in the '378 Patent
17 specification, essentially that combination of the substrate and the isolation
18 region is itself a substrate. And we depict that in Figure 17A. But it's really
19 clear when you look at the language from the specification.
20 Turning to Slide 16, the specification says that a layer can be a
21 region of homogeneous or inhomogeneous continuous structure. And of
22 course, it says that a substrate can be a layer. That's at column 4, lines 41 to
23 50; and 5, lines 4 to 6 of the '378 Patent. So when you look at those words
24 in the specification together, it's clear that a substrate can be a layer. And a

1 layer can be inhomogeneous and continuous.
2 When you look at Figure 17A or if -- turning back to Slide 14 and
3 Figure 13A, it's clear that that combined structure meets the definition. You
4 can draw a continuous line, a plane as it were, through this structure, going
5 through the substrate directly into the isolation region, and then again
6 directly into the substrate. That is a continuous layer, a continuous portion
7 of the device. And therefore, it constitutes itself a substrate. Therefore, the
8 isolation structure is part of the substrate.
9 Now, Patent Owner then in its briefing asserts -- I believe this is in
10 their sur-reply -- they assert that this structure, this isolation structure, can't
11 be part of the substrate because it extends through the substrate. And you
12 can see that it extends slightly through the substrate by looking and turning
13 back to Slide 15. You can see that the region extends somewhat below the
14 bottom of the substrate. But really, that's neither here nor there.
15 Because once again, under the plain and ordinary English usage of
16 these words, there's no issue with a structure extending through another
17 structure and still being part of that structure. A wick is certainly part of a
18 candle, even though it extends all the way through it and it goes through the
19 top of it and sticks out the top of it. That's still -- that wick is still part of the
20 candle. And that's just as true here, with the isolation structure being part of
21 the substrate. It may extend beyond it, but it is still part of it.
22 I believe the final issue may be that the Patent Owner asserts that
23 this alternative mapping, you're your mapping the isolation structure under
24 the Patent Owner's incorrect construction, is a new argument. But as set

1 forth in the briefs and as the Apple case holds, when a claim construction is
2 offered in a Patent Owner response, the Petitioner has the right to reply to it
3 and to address it. And that's exactly what we did here. This claim
4 construction was not proposed in the preliminary -- the Patent Owner's
5 preliminary response. But even if it had been, we submit that it would still
6 be proper and allowable for us to address it, as we did.
7 So with that, unless the Board has questions, I will move on to the
8 second disputed term in the patents, at least in the independent claims. And
9 that relates to the limitation that you have a dielectric structure on an
10 isolation region; or in the case of Claim 15, it's called an isolation structure.
11 Turning to Slide 20, this really, I think, sets forth the heart of the
12 party's dispute. Essentially, the Petitioner's position is that these words, "a
13 dielectric structure on the isolation," they can be met or they can be satisfied
14 by an integral or a unitary structure. There is nothing in these words that
15 requires that separate elements meet those limitations. In contrast, the Patent
16 Owner says that these limitations require that those structures in the patent
17 be separately deposited. And essentially, that they're separate and distinct
18 features, and so you need two different elements to meet them rather than an
19 integral or a unitary element to satisfy them.
20 And the reason that this comes up with respect to Embodiment 1A
21 of Toyama is that the -- this dielectric fill portion is what 1A is -- if we read
22 -- if Petitioner reads 1A on that fill structure for the isolation region, the
23 lower portion of it which is in contact with the substrate and the upper
24 portion of it for the dielectric structure which -- and that structure is in

1 contact with the alternating spec.
2 So as I -- to note at the outset, with respect to this issue, once
3 again, the Board, preliminarily, in its Institution Decision rejected the Patent
4 Owner's position. It explained that neither the claims nor the specification
5 indicate that the dielectric structure and the isolation structure need to be
6 separately formed structures. And in reaching that preliminary conclusion,
7 the Board identified three aspects of the specification which I will note here.
8 The first aspect of the specification of the '378 Patent is that in that
9 patent, the isolation structure and the dielectric structure are made of the
10 same material. The Board noted that they're both composed of silicon
11 dioxide. So you have a common material between these two. Second, the
12 Board noted that those structures, the isolation structure and the dielectric
13 structure, are aligned with each other. They're in contact with each other.
14 And in a sense, they give the appearance of being, as it were, a single
15 column of the same material, that is silicon dioxide.
16 And finally, the Board noted that the '378 Patent describes that in
17 forming the dielectric structure, there can be an over etch situation, where
18 when you are etching through the staircase you can over etch into the
19 isolation structure. And the patent's remedy for that is simply to fill that
20 portion back up with the dielectric structure. Why? Because it's all silicon
21 dioxide. And so even though you've overetched, meaning now you probably
22 have some exposed portions of the substrate that are no longer isolated, you
23 can simply fill those up with the dielectric structure when you deposit that.
24 And that led the Board to say that this signals the '378 patent's

1 indifference to the exact boundary between the dielectric structure and the
2 isolation structure. That the material that I just went over is set forth in
3 Slides 21 and 22. So essentially, the specification of the patent shows
4 indifference to having separate structures. Even some portion of the
5 isolation structure, in a sense, is formed by the deposition and creation of the
6 dielectric structure.
7 Now, the evidence that has been adduced through this trial shows
8 all the more that the Board's preliminary conclusion is correct. The
9 specification of the patent, as shown on Slide 23, notes that the boundaries
10 of the various functional building blocks in the patents and certainly the
11 isolation structure and the dielectric structure are such functional building
12 blocks. The patent says that they have been, quote, "arbitrarily defined
13 herein for convenience in description." And it goes on to say that alternate
14 boundaries can be defined so long as the specified functions and
15 relationships thereof are appropriately performed. That's at the '378 Patent,
16 column 23, lines 1 to 5.
17 So once again, you have a situation where the building blocks of
18 the specification is saying that the borders, the lines, the boundaries, they're
19 arbitrary and you can simply do other things. You're not confined to that.
20 You do need to meet the functional element, however. And the patent does
21 say that, that you -- that those -- the alternate boundaries need to meet the
22 functional requirements. But that's certainly true here, as I'll demonstrate
23 soon.
24 Now, with respect -- going on still to Slide 25, as it relates to claim

1 construction, the Federal Circuit's Retractable Technologies case we submit
2 is on point here. And that case held that a single integral structure could
3 satisfy two distinct claim limitations, where the intrinsic record, the claims
4 and the specification, quote, "lacked the clarity required to exclude from the
5 scope of the claims distinct portions of a single structure." And in
6 Retractable, the court essentially held that you could have a unitary
7 structure, but it could nonetheless satisfy multiple claim elements.
8 And one of the things that the court did there was it looked at the
9 specification of the patent at issue in Retractable. And in that specification,
10 it described ways that you could couple or connect these two elements
11 together. And essentially, that's signaled to the court that the elements could
12 be formed as an integral structure in the first instance. And that, once again,
13 is really the case here in the specification. By showing that you could
14 actually replace a portion of the isolation structure with a portion of the
15 dielectric structure shows that you could essentially create these two things
16 together in the first instance.
17 Now in its sur-reply, the Patent Owner relies upon the Gaus
18 decision at 363 F.3rd 1284 from the Federal Circuit. But that case we
19 submit is distinguishable. Because in that case, the court looked at the
20 specification and looked at the claims and didn't find anything that suggested
21 that they could be connected together. And in fact, if you connected the
22 elements together that were the subject of that patent, it would create
23 problems in connection with that. So the Gaus case is quite distinguishable
24 from the Retractable case. The Retractable case we submit is on point here.

1 And so turning then to Slide 27, Petitioner submits there's no
2 dispute that under the Petitioner's construction there's -- again, no dispute
3 that these limitations are met by Toyama and by the so-called dielectric fill
4 material portion of 430. So 430 sat at the top portion of it. It satisfies the
5 dielectric structure, as shown on Slide 27. It abuts the alternating stack, all
6 of those various layers of the alternating stack, and it's going to insulate the
7 TACs that are going to go through that region, as the subsequent
8 embodiment -- or as the embodiment, as it continues to be formed, shows.
9 So it performs the function that is performed by the element of the dielectric
10 structure.
11 Same holds true for the isolation structure, the lower portion of the
12 dielectric fill portion 430, that satisfies the isolation structure. Once again,
13 it's contacting the substrate, it abuts it, and that portion of the dielectric fill
14 material insulates the TACs through array contacts from the substrate. So
15 you have a situation where the -- under the Petitioner's construction, that
16 structure, that integral structure, satisfies the limitations of the upper portion
17 by being in contact with the alternating stack, the lower portion by being in
18 contact with the substrate.
19 Now, even under the Patent Owner's incorrect construction, we
20 submit that, nonetheless, the claim is obvious under -- the challenged claims
21 are obvious under Toyama. And that's because of Toyama's Embodiment 3.
22 And a portion of Embodiment 3 is shown on Slide 29. So Toyama
23 Embodiment 1 that we've been going through so far shows that you can form
24 the isolation structure and the dielectric structure in one deposition step.

1 You can simply etch it out, and then you can fill it with dielectric material.
2 An equally known way of accomplishing these objectives was to
3 form the isolation structure first. That's what Embodiment 3 of Toyama
4 does. And that's shown on Slide 29 as Element 15. So you can form that
5 first. And then after that, you can then proceed to form the dielectric on top
6 of that and perform your etches on the rest. So these were known ways of
7 accomplishing the same objective, that is to isolate the stack from the TACs
8 and to isolate the substrate from the TACs. Both were known and both lead
9 to predictable results. And that was explained, as we show on Slide 30 in
10 our petition for the '378-1 case at 47 to 48.
11 You have one known process, which in the 30 -- sorry, the third
12 embodiment is forming the isolation structure before you form the dielectric,
13 and then you have an equally well-known process of forming them at the
14 same time. That's the -- essentially, the first embodiment. So all you're
15 doing is replacing one well-known technique with another technique. They
16 lead to the predictable result that the TACs are isolated from the adjoining
17 structures. And that renders the claim obvious -- or the claim is obvious.
18 Now in the sur-reply, the -- essentially, the Patent Owner suggests
19 that, well, the petition and the accompanying papers didn't provide an
20 adequate motivation to combine Toyama's first embodiment with its third.
21 But we submit in response to that two points. Point number one is that a
22 motivation in this context isn't required. And the Supreme Court's KSR
23 decision makes that clear. We've extracted some of the relevant portions
24 that are in the briefing at Slide 32; essentially, where you have substitutes or

1 you take one known thing and a known substitute, and they lead to
2 predictable results. Motivation to combine is a required.
3 Of course, KSR stands for the proposition. And actually the major
4 holding of it rejected the idea that you needed to have some teaching
5 suggestion or motivation to combine the so-called TSM test from back in the
6 day. But regardless, there is motivation to combine. The motivation to use
7 the third embodiment, again, is to insulate the through array contacts from
8 the adjoining stack. The Patent Owner says, well, that's already
9 accomplished in Embodiment 1. But that's really neither here nor there.
10 The point is that once you have -- once you're building this structure, you
11 need to isolate the TACs. And these are simply substitutable, well-known
12 ways of doing that.
13 Now, the Patent Owner also says that through its expert Dr. Yang,
14 that, well, a person of ordinary skill would be dissuaded from making this
15 combination -- again, assuming a motivation to combine were needed
16 -- would be dissuaded from making the combination due to some
17 unspecified complexity. But I would urge the Board to read that testimony.
18 The testimony is entirely conclusory. It is not supported by any extrinsic
19 evidence. And I think most importantly, it is not tied to the specifics of
20 Toyama.
21 The key to remember about Toyama is that in the third
22 embodiment, the isolation structure is made of silicon dioxide. And in
23 Toyama's first embodiment where these two were put together, the dielectric
24 fill is also made of silicon dioxide. And so even if you have an overetched

1 situation where you might etch the isolation structure, you're going to be
2 depositing silicon dioxide on top of that in the combination, both structures
3 are silicon dioxide.
4 Dr. Yang doesn't address that point. He essentially makes a broad
5 statement about how you'd have to do another etch. But he doesn't address
6 and ignores the fact that the materials that you're dealing with are the same
7 material, not different materials. So the absence of any corroborating
8 support and the absence of any specificity really renders the opinion of no
9 weight whatsoever.
10 Certainly, the record includes substantial evidence that these
11 techniques were known, that etching techniques, selected etching techniques
12 were well known. I refer the Board to Exhibit 1003, Petitioner's expert, Dr.
13 Lee, paragraph 55 describes well-known techniques, including selective
14 etching. Selective etching means you're etching one material and not
15 disturbing or etching another material. So these were well-known
16 techniques. And Dr. Yang's testimony simply doesn't provide any support or
17 any evidence for the idea that there would be any reason not to make this
18 combination.
19 The third element then to -- the third limitation to address in 1A is
20 the -- is an element from dependent Claim 18. This language is not found in
21 the independent Claim 15. It appears only in Claim 18. And the language
22 refers to an etch stop plug interposed between each local contact of the local
23 contacts and each channel structure of the channel structures. So this relates
24 only to the -- what we call the '378-2 case, which I believe the last three

1 numbers are 909. So that is the petition in which Claim 18 is challenged.
2 So what is the dispute? Really, the dispute centers on that
3 language, about what each local contact of the local contacts means. Each
4 local contact of the local contacts, somewhat of a mouthful. But I've turned
5 to Slide 35, and illustrated there is a portion of Figure 2 of the '378 Patent.
6 And I think it sort of helps to illustrate this. Petitioner's construction is that
7 what this limitation means is that you need to have an etch stop, which is
8 depicted there in Figure 2, on Slide 35. You need to have an etch stop plug
9 between the local contacts for the channel structures and the channel
10 structures themselves. So you have a local channel structure contact, then
11 you have the etch stop plug, and then you have a channel structure.
12 The Patent Owner says, no, that's not what the language means.
13 What the language actually means is that you need to have an etch stop plug
14 between not only the channel structure local contacts and the -- and each
15 channel structure, but you also need to have an etch stop plug between the
16 slit local contact structures and each channel structure. The slit local
17 contacts in Figure 2 are depicted as Element 238 and slit is 226. Those are
18 depicted to the right of the channel structure, the channel contact, and the
19 etch plug. And as you can see from this figure, there's no etch stop plug
20 between the slit structure and the slit contact, nor is there any etch stop plug
21 between the slit contact and the channel structure.
22 But nonetheless, the Patent Owner makes this proposal. But in
23 doing so, we submit that it is erroneous as a matter of law. Why? Because it
24 reads out every embodiment of the patent. And let me demonstrate that for

1 you, if I may. So turning to Slide 37, walking through these pieces in a bit
2 more detail. So again, you have Figure 2, a partial -- just a portion of it.
3 And you can see there that you have the channel structure over to the left
4 which is Element 216, on top of that is etch stop plug, Element 224. And on
5 top of that is the channel structure, local contact, 236. Sometimes in the
6 patent, those are called manned string contacts. And the local -- and that's
7 the local contact for the channel structure.
8 And essentially, in -- throughout the patent, the patent exclusively
9 describes these etch stop plugs as being between the channel structure local
10 contacts, 236, and the channel structures. And why is that the case? You
11 want to have that etch stop plug there so that when you do your etch, you
12 don't etch into the channel structure. It's essentially a damage prevention
13 step. You're trying to prevent damage to the channel structure. So in all of
14 the embodiments, the only place where an etch stop plug is ever shown is
15 between the channel structure and the local contact for that channel
16 structure.
17 In contrast, when you look at the slit structures and the slit local
18 contacts, there is never an etch stop plug between the slit structure local
19 contacts, 238, and the slit structures themselves, 236. And that, of course,
20 makes sense because the slit structures themselves are conductive materials.
21 And therefore, you don't need to have an etch stop plug on top of them. So
22 essentially, in all cases, there is no etch stop plug between the etch stop local
23 contact, 238, and the slit structure. But even more importantly, there's no
24 etch stop plug between the slit local contact, 238, and the channel structures.

1 And that's summarized here on Slide 39. You can see that the etch
2 stop plug is interposed between the channel structure local contacts and the
3 channel structure, but never interposed between the slit structure local
4 contact, 238, and the channel structure, 216. Again, these structures in the
5 patent of course are different structures with different functions. The
6 channel structure, that's where essentially you are storing the bits for the -- in
7 the memory. And the slit structure serves a different function of essentially
8 providing electrons. So you wouldn't connect the two together at all events.
9 Now, in response to our showing, the Patent Owner came back and
10 said, well, wait a minute, you can read the slit structure local contact
11 limitation onto the bit lines. There are bit lines in the -- that are disclosed in
12 the '378 Patent. And they assert that those bit lines are essentially the slit
13 structure local contacts. But there are multiple reasons why this argument
14 makes no sense and must fail. Let's start with an easy one, which is that the
15 bit lines are not local contacts.
16 The bit lines, as you can see on Slide 41, at the top, the bit lines in
17 the '378 P patent are labeled 250. They are multiple levels above the
18 channel structures. And the patent defines a local contact as being, quote,
19 "indirect contact with the memory array structures," such as the slit
20 structures. That's in the '378 Patent, column 11, lines 15 to 24. The bit lines
21 are not in contact with the slit structures. They're not in contact with the
22 channel structures. They're not in contact with any structure that the patent
23 describes as a memory array structure. They are multiple levels above the
24 memory array structures.

1 And the patent actually calls them interconnect structures and says
2 that the contacts at the top of the device, those are interconnect connect
3 structures. And it describes things like the slit structure, the channel
4 structures, those are the memory array structures. And that's how the patent
5 describes them in column 11. So the bit lines are simply not local contacts.
6 They simply don't meet the definition.
7 But number two, whether the bit lines are or aren't local contacts,
8 it's still -- the construction that the Patent Owner is proposing would still
9 read out every embodiment. Why is that the case? Because the construction
10 they're proposing is that there needs to be an etch stop plug between each
11 local contact. In other words, all the local contacts for the channel structures
12 and all the local contacts for the slit structures.
13 And even if the bit lines were to be local contacts for the slit
14 structures -- and they're not -- you still have Element 238 in Figure 2. That
15 is the local contact for the slit structure. And under the Patent Owner's
16 construction, it would need to have an etch stop plug between it and the
17 channel structure. And none is shown. So the construction simply can't
18 work for the reason, again, that it excludes all of the embodiments.
19 Now the patent -- the third reason that the Patent Owner's
20 argument doesn't work is because of the Patent Owner reliance on Element
21 248, which is described in the patent as an interconnect structure. And in
22 sur-reply, the Patent Owner says that that interconnect contact, 248, is also a
23 bit line. Well, once again, the bit lines are irrelevant because they're not in
24 direct contact with the memory array structures. They're not in direct

1 contact with the slit structure.
2 But regardless, Element 248 is not a deadline. As you can see
3 from Figure 2, Element 248, it's above contact, which in turn contacts 238,
4 which is the slit structure local contact. And that in turn is in contact with
5 the slit structure, the source. It is not in contact with the channel structure in
6 any way, shape, or form. So once again, because it's not in direct contact, it
7 can't be the bit line. But even if it were, it's irrelevant because it still doesn't
8 solve the problem of the fact that there's no etch stop plug between split
9 local contact, 238, and any channel structure.
10 So under the Petitioner's construction, which is shown on Slide 44,
11 there's really no dispute that the -- under that reading that Toyama 1A meets
12 the requirements. There is an etch stop plug between each local channel
13 structure and each channel structure. And there's really no dispute about
14 that. Now, even under the incorrect construction that the Patent Owner
15 offers, which is that the bit lines of a device can be the split structure local
16 contacts, Toyama makes the same disclosure as the '378 Patent.
17 Again, this is an erroneous theory. But if it were to be adopted,
18 Toyama still teaches and discloses this limitation, and that's shown on Slide
19 45 with reference to Figure 17B. What we're looking at now, unlike Figure
20 2 of the patent which is a cross section through one sliver of the device
21 -- this is a top-down view, looking at sort of a bird's eye view, looking down
22 onto the device. And what this includes in blue are the slit structures.
23 They're kind of like trenches, and they're labeled in blue. And then over to
24 the right, you can see circled some examples of channel structures. Those

1 are sort of cylindrical structures that are formed in the device. And then
2 overlying both of those are bit lines, and those have been designated in that
3 purple box.
4 Essentially, the Toyama says that there are bit lines running -- I'll
5 call it in the north-south direction -- in Figure 17B, and those bit lines will
6 be over both the channel structures and those slit structures. So to the extent
7 that the fact that there are bit lines in the '378 Patent that overlie and that run
8 across the device and run across the split structure and that that satisfies the
9 claim, well, then Toyama meets that as well because you have bit lines that
10 run across both the channel structures and the slit structures. So those are
11 the -- essentially, the elements that are in dispute with respect to
12 Embodiment 1A.
13 I have just a few minutes remaining. And if I might, what I would
14 like to do is move on to Ground 1B. Once again, in Ground 1B, there is
15 actually a lot of overlap with Ground 1A. The isolation structure dispute is
16 substantially the same. The etch stop plug dispute is substantially the same.
17 The portion of this that I'd like to focus on has to do with the limitation in
18 dispute about the through array contacts extending vertically through
19 dielectric structures. So let me skip ahead to that. Okay. Yeah, I think I
20 found it. Sorry about that.
21 So we have claim Limitation 1D, you have one or more through
22 array contacts extending vertically through the dielectric structure and the
23 isolation region. I'll pause on that. There's no dispute that Toyama version
24 1b, which has the -- essentially, the dielectric sleeves and you form the

1 TACs in those dielectric sleeves or liners. It clearly meets this language.
2 There's no dispute. Why? Because the claim language says that you could
3 have just one TAC going through the dielectric structure. And Toyama
4 clearly has one TAC going through a dielectric structure, even under Patent
5 Owner's construction. So there's no dispute that that claim Element 1 is met
6 by Toyama's Embodiment 1B.
7 The dispute is to 15H, which says that you have to have through
8 array contacts in the plural that extend through the dielectric structure. And
9 what the dispute is about, really, is whether you can have multiple dielectric
10 structures, one or more dielectric structures, and have the TACs extend
11 through those; or whether the claim is limited to having only one dielectric
12 structure, which is the Patent Owner's position, and all the TACs have to go
13 through that one dielectric structure. And the claim language -- I should say,
14 really, you know, the antecedent basis for the dielectric structure that's in
15 this limitation is the phrase a dielectric structure.
16 And a dielectric structure, turning to Slide 55, that supports the
17 meaning of one or more. A dielectric structure means one or more. And the
18 law is clear on that. We cited the Baldwin case, and I don't really think
19 there's any dispute about that. Where the dispute centers is on the Patent
20 Owner's reliance on the Finjan case. And essentially, what their argument
21 is, is that when you have an antecedent that says a dielectric structure and
22 then the subsequent limitation says the dialect structure, there needs to be,
23 according to the Patent Owner, one and only one dielectric structure to
24 satisfy those limitations. But that is not the law, and that's really not what

1 Finjan, et al. said.
2 So when the claim says and what Finjan was about was a claim
3 that said, essentially, you perform a function by a computer -- quote, "by a
4 computer" -- and then the later limitation says -- said that you perform
5 another distinct requirement by the computer. And the Patent Owner in that
6 case, in the Finjan case, was saying, well, the accused product has two
7 computers, and one computer is performing functions -- I'm making this up
8 -- A, B, and C, some number of the functions, and a different computer
9 performs functions -- again, making it up, sorry -- C, D, and E or E, F, and
10 G. So you have one computer forming one function, and then another
11 computer performing a different set of functions.
12 And the in that case, the Appellee really set up the issue for the
13 Federal Circuit. And the Appellee said that no -- said that -- the Appellee
14 was arguing that, quote, "even if the reference to a computer may mean one
15 or more computers," close quote, the subsequent reference to, quote, "the
16 computer can only be satisfied by the same one or more computers that
17 satisfy the first limitation." And the Federal Circuit said, we agree with the
18 Appellee.
19 So what that's saying is that, yes, if you have something that says a
20 computer, you can have two computers meet that limitation, but they need to
21 -- those same computers need to satisfy all the limitations of the computer
22 limitation. So all the functions need to be performed by those. That's what
23 Finjan stands for. And it even goes on to say that you can have the -- part of
24 the holding of the case was that you need to have at least one of the

1 computers needs to satisfy all the limitations, at least one, which means one
2 or more.
3 JUDGE CYGAN: Counsel, I have a question for you on how
4 you're applying that in this case. So in Claim 15, we have a substrate and
5 then we have a dialectric structure and we have isolation structure. And
6 your argument is that any of those can be plural, right?
7 MR. BOBROW: 'A', yes, right.
8 JUDGE CYGAN: So 'A' can be one or more. We could have one
9 or more substrates, one or more dielectric structures, one or more isolation
10 structures. But the last limitation is that through array contacts are extending
11 vertically through those structures. How are you rearranging something
12 which has to go through the dielectric and the isolation structures? It seems
13 like that's still saying that those through array contacts have to extend
14 through each one of those.
15 I'm not sure how you're getting to the fact that each of them can be
16 multiple, that it means that they could each be going through different ones.
17 Can you explain that a little bit?
18 MR. BOBROW: Sure. So I have before you Slide 59, which
19 depicts Figure 49 of Toyama. And you can see there in orange, those are the
20 dielectric structures. We would submit that, collectively, they form one
21 structure. But individually, they're structures as well. And when it says a
22 dielectric structure and then it refers back to the TACs going through the
23 dielectric structures, that means that you can have one or more dielectric
24 structures. And as long as you have a plural number, two or more TACs that

1 go through those one or more, then you've met the limitation.
2 And here you have that. You have one of the TACs going through
3 the structure on the left, you have one of the TACs going through the
4 structure in the middle, and one of the TACs going through the structure on
5 the right. So you have a plurality of TACs, and you have them going
6 through the dielectric structures. In this case, again, because those structures
7 can be one or more. So they -- it meets that limitation. And, of course,
8 those TACs extend through the dielectric and they extend into the isolation
9 region, as shown.
10 JUDGE CYGAN: I think Patent Owner's as argument is, though,
11 in the context of the final limitation of Claim 15, that "through the dielectric
12 and isolation structures," the plural in the "structures" is really referring to
13 the fact that you have both a dielectric and an isolation structure, not, I think,
14 as you're reading it is that through the dielectric structures and the isolation
15 structures. If you read it that way, which I think is how you're reading it,
16 then it would be fine for through array contacts to go through either one of
17 them.
18 But I think Patent Owner's reading, if I understand it, is that
19 because it's -- the way you would understand the specification to support the
20 language diametric and the isolation structures, it means that you really
21 -- the structures refers to both. And through array contacts have to go
22 through both of them, not multiple through away contacts going through
23 different ones but the same through -- each of the through array contacts
24 going through both of them. Why is that an incorrect reading based on the

1 specification?
2 MR. BOBROW: Well, I don't think the specification is limiting in
3 that regard. The specification doesn't provide any limitations and says once
4 again that all of the boundaries and whatnot are arbitrarily drawn. So none
5 of that is in fact limiting. Those are just examples of how they're shown in
6 the patent.
7 But as it applies plain meaning of the claim a dielectric structure,
8 because that can be one or more, Finjan as well as Baldwin stand for the
9 proposition that as long as you have -- as long as the structures that you're
10 pointing to, the two or more dielectric structures meet the function that is
11 later claimed -- and here, the function is, are there multiple TACs that are
12 going through the dielectric structures -- we have multiple TACs going
13 through the dielectric structures. So we submit that it's not.
14 JUDGE CYGAN: I think in your other arguments you've been
15 able to point to the specification so it supports your reading no matter which
16 way you would do it -- it would make sense, no matter which way you
17 would do it. You sort of made that, I think, earlier with your etch stop
18 contentions. Is there a reading of the patent where a through array contact
19 would go through a dielectric structure but not also the same -- the isolation
20 structure?
21 MR. BOBROW: Where it would go through the dielectric
22 structure and not go through the isolation structure?
23 JUDGE CYGAN: Right.
24 MR. BOBROW: I don't think -- I think that -- well, number one, I

1 think the Toyama clearly shows that, right? That's in Figure 49, it's going
2 through the dielectric structure and it's going through the isolation region.
3 It's certainly met as it relates to Toyama. And that can be seen in that -- on
4 Slide 59, that green region is the isolation region, and you can see the TACs
5 in yellow go through it. And they also go through those dielectric slit, so
6 they go through both.
7 So an isolation structure and isolation region, that can be one or
8 more. In this case, in Toyama case, we have one. A dielectric structure that
9 can be one or more. In this case, we have more than one. And we have the
10 claim requirement of having multiple TACs going through those is met.
11 And you can see the three TACs being shown in Toyama's Figure 49 going
12 through the dialectic structures and through the isolation structure.
13 JUDGE CYGAN: Thank you, Counsel. Do you plan to bite into
14 your rebuttal time? Did you want to wrap up or --
15 MR. BOBROW: Your Honor, I think I've covered things for now.
16 So unless the Board has more questions, I'll rest at this point. Thank you.
17 JUDGE CYGAN: Thank you, Petitioner.
18 Patent Owner, how much time would you like for surrebuttal?
19 MR. RADSCH: Thank you, Your Honors. We would like to
20 reserve 15 minutes, please.
21 JUDGE CYGAN: Okay.
22 MR. RADSCH: Good morning, Your Honors. May it please the
23 Board, again, I am Andrew Radsch for the Patent Owner, Yangtze Memory.
24 Just to orient the Board for the course of argument this morning, I will be

1 addressing -- and so we have here on Patent Owner's demonstrative number
2 9 the disputed issues. We have two slides of dispute issues, this Slide 1.
3 Slide 10 is the second of proving the disputed issues.
4 I will be focusing on -- oh, Your Honors, the clock is not yet
5 started. Thank you. I will be focusing on the first claim construction issues,
6 as well as the last one shown on Slide 9, as they relate to Toyama's first
7 exemplary structure which is Ground 1A. My colleague, Mr. Bonny, will be
8 addressing Toyama's second modification, which the parties have referred to
9 as Ground 1B, as well as Grounds 2 and 3, time permitting.
10 So let me turn to Patent Owner's Slide number 12 and start with the
11 first claim construction issue. And this has to do with the requirements in
12 Claims 1 and 15, when Claim 1 recites an isolation region of the substrate;
13 Claim 15 recites a substrate with an isolation region. So both of claims are
14 expressing and reciting a particular relationship between the isolation region
15 or isolation structure and the substrate. It's not simply claiming both an 'and'
16 between them. It's claiming them with a particular structural relationship.
17 Turning to Slide number 13, it's undisputed, I believe, at least
18 -- perhaps it's not undisputed, but I will get to why it should be. Every
19 disclosed embodiment describes and depicts the isolation region or structure
20 as being part of the substrate. Here we have in Figure 2 -- shown here on the
21 Slide 13, '378 Patent, Figure 2, that shows the isolation structure within the
22 substrate, not extending above and not extending below. There is no figure
23 or depiction anywhere in the patent that shows anything different from that.
24 Now, Patent Owner has referenced a portion of the specification at

1 columns 10, starting line 36, where it describes Figure 2 and it states that
2 STI structure, 233, is formed on a top portion of substrate, 202, latching on
3 to that statement about 'on' Patent Owners argued that that allows the
4 isolation structure to be outside of the substrate that's not in our -- we would
5 submit a fair reading of that portion, the specification which describes
6 Figure 2. It would make no sense for an STI, a shallow trench isolation, to
7 be formed outside of the substrate. The shallow trench is a trench. It is
8 trenched into the substrate and filled with isolating material, the dielectric.
9 And so that's what's meant by an STI structure, and it's shown here
10 in Figure 2. There's no other embodiment that shows the structure extending
11 all the way through the substrate such that there's no more substrate there, let
12 alone extending above the substrate such that it's no longer acting in concert
13 with a substrate to perform its function.
14 The bottom Slide 13 is a statement from the specification that
15 describes what a substrate is. It describes the platform-like function of the
16 substrate. As '378 Patent says at column 4, lines 41 to 43, as used here in the
17 term substrate, it refers to a material onto which subsequent material layers
18 are added or otherwise disposed, providing that structural platform-like
19 function for building other elements of the device.
20 Now, in the Board's institution decision, it referred to that
21 statement about the specifications disclosure of forming the trench or the
22 isolation region on the substrate. And respectfully, I think it may have
23 misunderstood the meaning of 'on' in that context, as we show in Slide 18.
24 This is at the bottom of Slide 18. This is a quote from the '378 Patent, and

1 this is undisputed by Petitioner. I think they agreed to it. As used in the
2 '378 Patent, 'on' means above another component in the Z direction when the
3 substrate is positioned in the lowest plane of the semiconductor device.
4 So to have -- to understand what 'on' means it is on something
5 when the substrate is positioned in the lowest level. So if you've rotated the
6 device, for example, 90 degrees, so the substrate is now on the right rather
7 than on the bottom, and an item that is -- that was otherwise next to it is not
8 then on top of the substrate. So the 'on' is always with reference to the
9 substrate when it is in the lowest plane, and 'on' is with reference to the Z
10 direction.
11 So moving back to Slide 13, again, every embodiment discloses
12 that the substrate, the -- again, that this isolation region is in the substrate.
13 Now, during its argument, Patent Owner argued that there is an other
14 disclosure of the isolation structure being formed on the substrate. But that's
15 a different language than the claim uses. The claim uses the language that
16 the substrate is -- sorry, that the isolation region is of the substrate. I'll go
17 back to the claim language, isolation region of the substrate or substrate
18 within isolation structure.
19 And if you look at Claim 9, for example, of the '378 Patent, which
20 is not at issue here, Claim 9 does refer to forming an isolation structure on a
21 substrate. So that uses different language than the language we find in
22 Claims 1 and 15. So even if the Board were to understand the specification
23 passage at column 21, referring to forming an isolation structure on a
24 substrate, as permitting it to be formed outside of the substrate, that would

1 not be the claimed embodiments of 1 and 15. That would be within the
2 scope of Claim 9, which is not at issue in this proceeding. And that's a
3 method claim. And that's what the reference in column 21 is as well is to a
4 method of formation. Claims 1 or 15 is to a method.
5 JUDGE CYGAN: Counselor, are you -- you're not arguing there's
6 any difference in the construction of Claims 1 and 15 for this, correct?
7 MR. RADSCH: There's no difference in the construction, I think,
8 of the understanding of a person of ordinary skill in the art in this context.
9 So if you're talking about an isolation region that is of the substrate or
10 substrate with an isolation structure, that's discussing a particular structural
11 relationship. You can't just have an isolation region over here, outside of the
12 substrate, and then find on the chip a substrate in some other region and just
13 say, well, now you have a substrate and an isolation structure in the same
14 chip; therefore, you meet the claimed language. That's not what it's referring
15 to.
16 In both cases, person of ordinary skill would understand that this is
17 talking about and claiming the isolation structure as part of the substrate,
18 which is depicted in Figure 2. And it cooperates, right, with the substrate. It
19 continues to have the substrate provide that mechanical support function a
20 substrate does. You see at the bottom of the shallow trench isolation, the
21 substrate remains. It continues to perform that mechanical support function.
22 If you trenched all the way through it and you completely removed
23 the substrate, you no longer have a substrate there. You replace it with
24 something else, that's no longer the substrate. The substrate no longer

1 provides a mechanical support function in that region.
2 JUDGE CYGAN: Counsel, can I follow up on your comparison to
3 Claim 9?
4 MR. RADSCH: Yes.
5 JUDGE CYGAN: You earlier mentioned that this specification
6 discusses the STI as an example. Are you drawing a distinction between
7 Claim 9 as not talking about a shallow trench because it can be on it, but
8 Claim 1 or 15 are cabined to a shallow trench?
9 MR. RADSCH: So I do not believe that they're cabined to a
10 shallow trench. My point is only -- I think the right way to read the
11 specification language about forming the isolation structure on the substrate
12 or on the top portion of the substrate, given the disclosure and given the
13 point of the isolation structure as being isolating the bottom portion of those
14 TACS from the substrate that is within the substrate at the top region, as
15 shown in Figure 2.
16 But if the Board were to understand that disclosure in this
17 specification of forming 'on' meaning it just has to be somewhere above the
18 substrate -- which doesn't make sense for the purpose of this isolation region
19 -- but if the Board were to understand the specification in that manner, then
20 that would not be a claimed embodiment for Claims 1 and 15. That would
21 instead be within the scope of Claim 9 that's not at issue.
22 JUDGE CYGAN: And when Petitioner was agreeing with the
23 construction of 'on' that was with respect to not a substrate with an isolation
24 structure, but they were focused on the dielectric structure on the isolation

1 structure, where 'on' was actually in the claim, correct?
2 MR. RADSCH: That's correct. But it's the -- this is definitional
3 language in the specification about how the term 'on' is used. So in the
4 specification, for example, it uses, you know, a dielectric -- or sorry, an
5 isolation formed on the substrate. And you have -- let me just turn now to
6 the mapping of the prior art.
7 JUDGE CYGAN: I guess my question there is that the
8 specification can help us to construe a claim term. But can it help us
9 construe a term that's not in the claim?
10 MR. RADSCH: It can if -- I think it can in the sense that I think in
11 the institution decision and based upon Patent Owner's arguments -- now on
12 Patent Owner's Slide 36 -- there was an argument that the region they're
13 pointing to as the isolation structure is on the substrate. Because if this
14 device is rotated, for example, by 90 degrees, then it appears that that
15 isolation structure is above the substrate when rotated. And that's not an
16 accurate understanding of what 'on' means in this specification. So it's not
17 on the substrate.
18 JUDGE CYGAN: But again, that goes to dielectric structure on
19 the isolation structure. That doesn't really specifically go to substrate with
20 an isolation structure.
21 MR. RADSCH: It doesn't directly go to it, but I do think it goes to
22 their argument about why this isolation structure in the prior art would meet
23 the limitation of having an isolation structure being on the substrate. So I
24 think their argument is sort of twofold. One, they're reading the claim

1 language to permit the isolation structure to be on the substrate, as Claim 15
2 and Claim 1's requirements that it be part of the substrate. It doesn't really
3 have to mean on.
4 JUDGE CYGAN: Weren't they interpreting the 'with limitation'
5 somewhat differently? I know that they -- Petitioner had pointed to the
6 dictionary definition. One of the dictionary definition terms certainly -- I
7 believe that there was mention there was 'on'. But specifically, they were
8 pointing to some different language this morning.
9 MR. RADSCH: I'm on Petitioner Slide 11 now on the screen, this
10 may be what you're referring to in terms of their definitional language of
11 'with' and 'of'. Now, I would submit that the definition of 'of' that they have
12 used entirely supports our construction. 'Of' is a function in order to indicate
13 belonging or possessive relationship. They would have the Board believe
14 that the art or the proper construction would be met if the isolation region is
15 entirely separate from the substrate.
16 That's not what even their own definition says. It's a belonging or
17 possessive relationship. That's entirely consistent with Patent Owner's
18 construction, which is that the isolation structure must be part of the
19 substrate. Now, it is true that 'with' is a broad term in many different
20 contexts. I can have a salad with my steak, and I can have that even as an
21 appetizer. That's not what we're talking about here. We're talking about
22 how a person of ordinary skill in the art would understand the claim
23 language in the context of the claims and specification. And every
24 embodiment discloses that the isolation structure is formed within the

1 substrate.
2 JUDGE CYGAN: Doesn't that language work a bit against you,
3 though, if the specification is using a separate word 'within' to indicate that
4 something is inside, as opposed to 'with'? Isn't that showing -- making a
5 distinction there?
6 MR. RADSCH: I don't think so. I think what the specialization
7 describes is, for example, that the STI is formed on the top portion. It says
8 'of the' substrate, and that's in connection -- that's a column 10, in connection
9 with Figure 2. And back to Figure 2, again, that shows -- this is on Patent
10 Owner Slide 13, that shows, again, the STI region is within the substrate. As
11 I say 'within', it says formed on a top portion of the substrate. The
12 specification doesn't use that word 'within' in that context. But the person of
13 ordinary skill in the art would understand, given this disclosure and given
14 the function of the isolation structure which is isolating the bottom portion
15 of that of that TAC region, of those TACs, to require it to be within the
16 substrate.
17 And what's important is that as part of the substrate -- so it's acting
18 in concert with the substrate to continue to perform the substrate's function.
19 Again, the substrate is that it provides a mechanical support function for the
20 formation of other layers and other elements. And when you have it -- if
21 you have the isolation structure entirely outside or at least partially outside,
22 it can no longer provide that mechanical support function because you do
23 not no longer have a plane on which to form other structures.
24 And so if we go to the mapping, if you go to Patent Owner Slide

1 36, this is the mapping that Petitioner relies upon. And there's two problems
2 with this, but let me just get to the first problem which is that the isolation
3 structure here is not part of the substrate. The substrate is entirely removed.
4 It's where the isolation -- the purported isolation structure is formed. The
5 isolation structure is an isolation structure there, it's an entirely separate
6 structure. It's next to the isolation -- sorry, it's next to the substrate. It's not
7 part of the substrate. In fact, they're entirely separate materials as well.
8 There's no allegation or evidence that there's been any bonding at the edges,
9 right? So they're completely separate elements.
10 Because of that, at the middle there where the isolation structure is,
11 the substrate can no longer provide that mechanical support function that a
12 substrate performs for the building of other material. Because all you have
13 there is a substrate -- sorry, all you have in the middle there is the isolation
14 dielectric, and it's not in any way bonded at the edges to the substrate. So
15 substrate's removed, a separate structure in Toyama is added, and that's no
16 longer a structure.
17 Now, they've made an argument that, well, there's still -- it's still a
18 single layer. But the claims don't refer to an isolation layer -- sorry, a
19 substrate layer. It refers to a substrate, a structure. And you have
20 completely removed the substrate structure in Toyama and replaced it with
21 something else altogether, a separate structure next to the substrate. And
22 that's not what the claims encompass.
23 JUDGE MCGRAW: How many substrates would you say are
24 shown in Toyama's figure there?

1 MR. RADSCH: There has been a -- there is a single substrate
2 that's been cleaved into two. And so you can refer that either as, you know,
3 two sides of a substrate or now two substrates with an isolation region in
4 between. But in either case, there is no substrate in the middle, it is
5 completely removed and replaced with a different structure that performs a
6 different function that does not participate in an electronical support function
7 because it is not the substrate.
8 JUDGE CYGAN: Doesn't Toyama's substrate still provide its
9 mechanical support function?
10 MR. RADSCH: Not where the dielectric has removed it. And I
11 think -- sorry, not where the substrate is removed. And that's one of the
12 advantages of the '378 Patent's disclosure of having the -- in claiming of
13 having the isolation structure part of the substrate. The substrate still
14 remains where the isolation region is. It continues to provide the mechanical
15 support function for building other layers. That's the opposite of what
16 occurs in Toyama, where the substrate is removed, replaced with something
17 else, so --
18 JUDGE CYGAN: So your mechanical support argument is that
19 the partially etched substrate, which has the isolation structure sitting above
20 it, is providing mechanical support for the layers which are on either side of
21 it, not for the materials that are placed in the isolation structure itself?
22 MR. RADSCH: So in the context of the '378 Patents, that's your
23 question?
24 JUDGE CYGAN: Yes.

1 MR. RADSCH: Right. When you have the shallow trench, you
2 still have the substrate underneath, so you still have the mechanical support
3 for building all of the rest of the layers in the chip, including the alternating
4 stack on top.
5 JUDGE CYGAN: Because Toyama also has an alternating stack,
6 it seems like it provides some mechanical support sufficient to hold the
7 alternating stack and the other materials. Are you pointing to something that
8 having that remaining substrate on -- in the trench portion provides some
9 additional mechanical support? Is that something that's mentioned in the
10 patent, or is this something from your expert?
11 MR. RADSCH: I mean, I think it's discussed. I think it's in the
12 '378 Patent's description of what a substrate is, right? It's the region on
13 which other elements are formed. And it's -- I think a person of ordinary
14 skill in the art understand that that's what a substrate is. That's the purpose
15 of subject. And our point is that -- and in this really goes to what I think
16 patent -- Petitioner has argued at their Slide number 14, which I now turn to.
17 I mean, they argue, right -- this is at the second -- or the first sub-bullet,
18 under the second bullet, that the Toyama in the '378 Patent disclosed
19 materially identical isolation structures.
20 But that's just not the case. There's a significant difference
21 between a shallow trench -- trenching into the substrate while the substrate
22 remains underneath to continue to provide a uniform mechanical support.
23 That's materially different from removing the substrate altogether and
24 replacing it with a different material. There's only going to be mechanical

1 adhesion at the sides, right? There's not -- there's no bonding at the sides
2 from one uniform or even, you know, in nonuniform, single structure.
3 They're now separate structures.
4 JUDGE CYGAN: I also have one more question about the
5 difference between a structure which goes all the way through the substrate
6 and one which only extends partway through it. I think you had described
7 the Toyama insulation portion as merely abutting the substrate.
8 MR. RADSCH: That's correct.
9 JUDGE CYGAN: Why is that different from the patents? Why
10 couldn't you characterize the isolation structure or isolation region of the
11 substrate, which is -- as the argument that you have made in your briefing is
12 that substrate is -- part of it's removed, it's filled in with the second material?
13 Why wouldn't you also be able to fairly characterize that as that new
14 material is abutting the sides of the substrate?
15 MR. RADSCH: It certainly is abutting sides, but it's also within
16 the substrate. It's part of the substrate. And we know that because the
17 substrate remains underneath. It hasn't been completely removed. So you
18 have one uniform plane on the top, and the substrate remains below. So it's
19 true that you can have -- oftentimes do have something that's part of another
20 thing also abuts that thing. But if you've completely removed the substrate
21 and added a different structure there, then you no longer have those, that's
22 the claimed relationship, which is that the isolation has to be part of the
23 substrate.
24 I would like to turn to the alternative argument that Petitioner has

1 raised, and namely that you can just arbitrarily draw a box around the
2 isolation structure and call that the substrate, together with the regions on the
3 side, and then say, well, now the isolation structure is part of the substrate.
4 First of all, that's -- that sort of arbitrary drawing departs from the petition,
5 the petition ground, which was not that line drawing exercise. In any event,
6 still, with that arbitrary line drawing exercise, the isolation structure does not
7 -- is not itself a substrate, right? It's not providing that mechanical support
8 function on which other elements are formed. And we know that.
9 So, again, we know that the -- so this is under Petitioner's
10 construction. They say you can just draw a line from both the isolation
11 structure and the substrate. But recall that the substrate requires -- let me go
12 back to Petitioner's Slide 13 -- as patent states, substrate refers to a layer or
13 material onto which subsequent material layers are added. That's not the
14 case in their alternative mapping for the lower portion.
15 Recall that in Toyama, that entire central pillar is filled all at one
16 time, right? That's a single etch in a single-filled process. So the part they're
17 circling as an isolation structure isn't performing that function of being a
18 substrate. It is not a material onto which subsequent layers are added. It's
19 one single pillar.
20 JUDGE CYGAN: Counsel, with respect to your Retractable TACs
21 argument, Retractable TACs, the distinction that you were drawing seems to
22 be that in Retractable TACs there were distinct portions of the retainer
23 member in the needle holder. And so in retractable TACs, it was -- it didn't
24 really make a difference whether or not they were formed integrally because

1 you had some teaching of two different portions. Whereas in Toyama, there
2 was no -- there's no reason to treat those as two different portions, except
3 through hindsight. Is that the argument you're making?
4 MR. RADSCH: I think there's -- I think that's part of the
5 argument, Your Honor. That's certainly part of it, that their line drawing
6 exercise is an effort to match the claim language. There is nothing, you
7 know, at the time of Toyama that would have suggested that line drawing
8 there, right? So it is a hindsight driven.
9 But I think that the other point we are trying to make is that I think
10 -- you know, so I'm on Slide 19 of Petitioner's -- Patent Owner's
11 demonstratives. I think that the Gaus case we have here in Retractable
12 Technologies should be read to be entirely consistent and are entirely
13 consistent with each other. The issue in Retractable Technologies was
14 whether a retainer member and a needle holder must be separately molded
15 pieces. And the Court held, no, they need not be separately molded. They
16 can be molded together. That was based upon the claim language that
17 specifically described them as being part of each other, as well as
18 specification passage.
19 But the critical language from that case is that when -- is where the
20 Court said -- and let me turn actually to Patent Owner's Slide 25. So I think
21 they actually admit some of the critical language because they're quoting
22 Retractable Technologies at the top of their slide. What the Courts held was
23 that, ultimately, inventors statement on its own lacks the clarity required to
24 exclude from the scope of the claims a needle holder and a retainer member

1 that form distinct portions of a single structure. So what the Court held was,
2 yes, they can be integrally formed, but you still have to identify distinct
3 portions in order to meet the distinct claimed limitations.
4 And that's precisely what the Gaus case stands for as well, and
5 that's on Slide 19. When there are elements separately recited, the clear
6 implication is that they are directed to distinct components. So what
7 Retractable Technologies did not hold is that you don't have to show distinct
8 components. It simply held that so long is so long as you can identify
9 distinct components to satisfy the distinct claim limitations, it could be a
10 device made of a single mold.
11 Now, this case is very different than what we're dealing with here.
12 What we're dealing here is a claim language that recites a dielectric structure
13 on an isolation structure. So there's a distinct structural relationship, one has
14 to be on the other, which is very different from Retractable Technologies in
15 any event which discussed that the different -- two different members -- you
16 can remember needle holder could be formed together. So it requires a
17 distinct structural relationship here.
18 In any event, to Your Honor's point, their arbitrary line drawing
19 exercise -- let me turn now to Slide 39 -- this arbitrary line drawing exercise
20 is hindsight driven. But in any event, there is no distinct portions that can be
21 separately identifiable as an isolation structure and a dielectric structure.
22 And that's what Retractable Technologies requires, the (INDISCERNIBLE)
23 drawn the line, it's only separately identifiable because it added this line that
24 doesn't exist anywhere in the device.

1 JUDGE CYGAN: Just so I understand, if Toyama had integrally
2 formed its portion 430, as it currently does, but it had identified two separate
3 portions, you're saying that would be a different situation?
4 MR. RADSCH: I don't think it would. I mean, just because you
5 may call regions separately, it does not, I think, meet the task of what's set
6 forth in Retractable Technologies in Gaus. They have to be distinct
7 portions, distinctly identifiable portions. And that's what we have even in
8 the '437 (sic) Patent itself. You have a distinct isolation structure formed
9 separately and in different processing steps from the dielectric structure
10 above.
11 Now, it's true they can be the same material, and even crediting
12 Patent Owner's -- or Petitioner's argument, rather, that the precise boundary
13 may not matter. Nevertheless, they're in the boundary between those
14 elements. Even if they're made of the same structure, even if the boundary
15 can be slightly up or down, still, there is a boundary. They are distinctly
16 identifiable components in both the '378 Patent and as law would require
17 distinctly claimed components. That is missing from their Ground 1A
18 argument.
19 JUDGE CYGAN: And you're contending that they're distinct in
20 name but not in structure?
21 MR. RADSCH: Even in even in Toyama they're not distinct in
22 name. I think just calling something a different name doesn't satisfy what
23 Retractable Technologies is talking about. It has to be distinct components.
24 The language they have is distinct portions, not distinct names but distinct

1 portions that are identifiable. And that's missing from this unitary structure
2 of Toyama. It is one unitary structure. There is no distinct portions.
3 So I think, you know, they recognize the weakness of the
4 argument, right? And so then they have their backup obviousness argument
5 based upon Toyama's third modification. And they argue that, well, Toyama
6 in its third modification discloses this two -- a two-stage formation of the
7 isolation structure followed by a dielectric structure.
8 That is incorrect. And I think it's worth looking at what they point
9 to. So now on Patent Owner's Slide 29. This is their obviousness argument,
10 their backup argument because they think they understand that the single
11 column cannot satisfy the claim language. They say, well, there's a -- they
12 argue that there has been a teaching in this embodiment of separately
13 forming the isolation structure and then the dielectric structure.
14 That's false. All they have here is the isolation structure. There's
15 no teaching anywhere of forming the isolation structure and then forming a
16 dielectric structure. And so when they say it's this known process of
17 forming them serially, they have no support for that in Toyama. There is
18 only the isolation structure.
19 And the problem is that they try to combine this embodiment with
20 the first embodiment, but this is a completely different arrangement of
21 components. They do not discuss at all Element 141 there, which is above
22 the isolation structure, which is this -- we referred to it as a moat, trench
23 filled portion. And I think it's worth looking at Toyama's figures to
24 understand what that is.

1 And let me turn to -- we were just looking at Figure 24A of
2 Toyama, which is what they rely upon, Element 151. It looks like it's like 15
3 over 1, but that's Element 151 as the isolation region. And Element 141 are
4 these pillars above it. If we go to 24B, we see what those pillars are, it's
5 141. It's this moat. They don't explain how you address this separate
6 structure if you wanted to then create a dielectric. I think their whole
7 argument is, frankly, a little bit nonsensical. Because if you look back at
8 what Toyama discloses, I'm here on Slide 38, with respect to the first
9 embodiment they're relying upon, you're patterning through the entire
10 dielectric structure -- sorry, you're patterning through the entire array, right,
11 the alternating structure.
12 And so there's -- it doesn't make any sense to form these in
13 separate portions. In fact, I don't even know how one would do that in this
14 context. You'd have to form a pattern all the way through. For some reason,
15 you would then fill it only partially, stop for some reason, and then fill it
16 again with additional dielectric. None of that's explained why you would do
17 that. And that's our point on the motivation.
18 You have here on Toyama's first embodiment -- it's basically a
19 single etch and fill process. They argue, well, it would've been obvious to
20 do this in two separate steps. Why? Well, they say, well, you can isolate the
21 TACs. They're already isolated. So why would you modify this single
22 process effectively, right, a single etch followed by a single fill informant
23 and do that and send in two separate steps. That's not answered there. And
24 the word motivation, I will note in this section is found nowhere in their

1 petition. They argue that a motivation need not be shown. That's not what
2 KSR stands for. KSR stands for the proposition that the needs not be in the
3 expressed disclosure of a motivation.
4 If you go to Petitioner Slide 32, they've quoted KRS. And that's
5 expressly what KRS says, right? You do not have to show an express TSM
6 teaching suggestion or motivation. There still has to be a reason to make the
7 claimed modification or their proposed modification. And their only
8 offering of that in their responsive briefing is that it would provide electrical
9 -- it would basically, you know, insulate those material -- those features that
10 are already being insulated. But the petition is to avoid any discussion of
11 motivation. So if the Board were to find this round -- this backup argument
12 supportable, it would somehow have to make up a motivation that's been
13 nowhere explained in the petition.
14 JUDGE MCGRAW: This is Judge McGraw. My question,
15 though, is isn't Petitioner arguing it's just a simple substitution of one known
16 element for another with predictable results?
17 MR. RADSCH: They have argued a simple substitution. But as
18 I've just explained, right, they don't show a two-step process. In Toyama
19 there is no two-step process. There's only a single isolation structure that
20 embodiment they rely upon. But even putting that aside, there has to be a
21 reason to make that modification. There has to be a reason to do that. You
22 can't just go pick a known element and find another known element in the art
23 and say, well, both those elements are known, so I'm going to put them
24 together. There has to be a reason to do that.

1 And I don't think KSR distinguishes at all. What KRS stands for is
2 that you don't need an expressed motivation. There still has to be a reason to
3 do it. And it did not set forth that reason with any legitimate explanation.
4 JUDGE CYGAN: Counsel, did Dr. Yang speak to this question
5 of motivation?
6 MR. RADSCH: Yeah, he did. The very points -- let me turn to
7 -- he did to this very -- and I can get you a citation on rebuttal. But he
8 explained that the purported motivation providing electrical isolation, that's
9 already being performed by Toyama's embodiment, right? So there's no
10 reason to change a single-step process into two to achieve electrical isolation
11 of the TACs because that's already being performed. That is the single
12 structure that they alleged meets the dielectric and the trench that function.
13 Let me just turn briefly then to the last issue, and this has to do
14 with the -- each of the local contacts. I just want to make a -- really focus on
15 the claim construction issue here, the claim requirement -- well, first, this is
16 Claim 18, which depends on Claim 15. Claim 15 recites local contacts
17 disposed on the channel structure and the substructures. There's two things
18 that the local contacts cover.
19 The Claim 18 refers to each local contact. And that refer -- that
20 necessarily refers to the antecedent -- sorry, each local contact of the local
21 contacts. The local contacts refers back to what Limitation 15G recites,
22 which is the local contacts disposed on the channel structures and the slit
23 structures. I don't think there's any dispute that the plain and ordinary
24 meaning of each. As the Federal Circuit is held - as we show on Slide 32

1 -- each means each and every. Each doesn't mean some.
2 JUDGE CYGAN: Counsel, how does that interplay with the term
3 'between'?
4 MR. RADSCH: I think -- I'm not sure that they are necessarily
5 dependent upon each other. It's just that you have to show a relationship that
6 there has to be one structure in between two other elements, but each is
7 modifying the local contacts.
8 JUDGE CYGAN: So does Claim 18 require an etch stop plug
9 between each of the multiple local contacts, that each of the multiple local
10 contacts has to be separated by an etch stop plug?
11 MR. RADSCH: So each local contact relied upon -- for Limitation
12 15G, for each of those, whatever they're pointing to, they need to point to an
13 etch stop plug interposed between each of those local contacts and then each
14 channel structure. So whatever they're relying upon, right, whatever one
15 points to for those local contacts, it doesn't mean all of them has to be all of
16 the ones you've mapped to fit Element 15G. And that's where their
17 argument falls apart.
18 But I would just note their entire claim construction argument is
19 really a Section 112 argument. There's no basis in the law to read each to
20 mean sum, which is what they're doing. And they're essentially saying
21 -- they're making it to you a 112 written description argument. That's an
22 argument for district court, not for the PTAB, asking the Board to rewrite the
23 claims because they contend there's lack of written description to support
24 our construction. That's incorrect. As we've shown in the briefing, there is a

1 disclosure of local contacts that meet this requirement of being over both of
2 the claimed structures with an etch stop layer interposed between.
3 So I do want to just -- I just want to end there and leave some time
4 for Mr. Bonny to address the other grounds. But the key point, again, is that
5 they're arguing a written description argument in order to change the plain
6 and ordinary meaning. The plain and ordinary meaning of each is each and
7 every.
8 JUDGE MCGRAW: Under your proposed construction, can you
9 identify an embodiment in '378 Patent that meets that construction?
10 MR. RADSCH: Yes, we have, which is shown in Figure 1. There
11 are bit lines which are local contacts, as that term is used in this
12 specification, is in contact -- direct contact with array structures that cross
13 both of the channel structures and these slit structures and interposed. Let
14 me move down to the --
15 JUDGE MCGRAW: Is that Element 246? I'm trying to
16 remember.
17 MR. RADSCH: Well, if move to the -- let me show you in the
18 cross-sectional view. So in their mapping in Toyama, you see no bit lines in
19 their alternative mapping above the slit structure. That's in contrast to the
20 '378 Patent, Figure 2. There is a bit line over the slit structure. I mean,
21 there's also the etch stop shown there interposed between as well. That's a
22 single bit line that passes over both slit structures and channel structures.
23 And that's -- that element is missing from Toyama, and that's the
24 key distinction here in what they rely upon. In Toyama, they rely upon a

1 top-down view. It doesn't show what's underneath. But when you see the
2 cross-sectional configuration, there is no bit line which they -- in their
3 alternative mapping is the local contact over the slit structure.
4 JUDGE MCGRAW: If you can go back to Figure 2, what
5 structure is the bit line directly in contact with?
6 MR. RADSCH: The bit line is 246 -- sorry, 248. It's small in here.
7 And that's in direct contact with array structures.
8 JUDGE MCGRAW: 246?
9 MR. RADSCH: 246. And here as well, 238, and that element in
10 between, which I believe, yes, that's 246. So that is an array structure. It's in
11 the array.
12 JUDGE MCGRAW: Thank you.
13 MR. RADSCH: If there are no further question --
14 JUDGE CYGAN: And Counselor, are you also contending that
15 the etch stop plugs need to be interposed between the local contacts of the
16 slit structures and the channel structures?
17 MR. RADSCH: It doesn't have to be interposed because it's slit
18 structures. It's only the channel structures, according to the claim language.
19 JUDGE CYGAN: So looking at the claim language, how many
20 local contacts does Petitioner need to show to meet that claim?
21 MR. RADSCH: It needs to show -- it's not a prescribed number.
22 It depends upon what they're mapping as the local contacts.
23 JUDGE CYGAN: It can't be one, though, correct?
24 MR. RADSCH: They need to show, I think, more than one.

1 JUDGE CYGAN: They need to have more than one. But it
2 doesn't have to include the local contacts in the slit structures, correct?
3 MR. RADSCH: You have to for the local contacts of the slit
4 structure. It has to be interposed between the local contact of the slit
5 structure and the channel region, according to the claim language. And
6 that's what's missing from Toyama.
7 JUDGE CYGAN: So looking at the claim language, Petitioner
8 would meet the local contacts limitation and Claim 15 by pointing to two
9 local contacts in the prior art that are disposed on channel structures,
10 correct?
11 MR. RADSCH: No. Not if it's -- not if they're not disposed in
12 between the local contact of the slit structure, which is what's missing from
13 Toyama.
14 JUDGE CYGAN: You're talking about Claim 18. I'm talking
15 about Claim 15. How many local contacts do -- does Petitioner have to
16 show to meet the claim limitation, local contacts disposed on the channel
17 structures in Claim 15? And you said it can't be one? Can it be two?
18 MR. RADSCH: It could be -- you could rely upon for the local
19 contacts of Claim 15. Let me just refresh my -- let's look at the language.
20 You could have a single local contact, so long as that local contact is in
21 contact with both. But it depends upon what you're mapping into. If you're
22 mapping it to several, then each of those have to have the relationship, Claim
23 18, of the etch stop interposed underneath.
24 JUDGE CYGAN: So long as Petitioner can point to each of the

1 local contacts that they are relying upon in Toyama for 15 as having an etch
2 plug interposed between them and the channel structure, then that's going to
3 meet the limitations of Claim 18, correct?
4 MR. RADSCH: If they -- if in between each of the -- each of the
5 separate contacts they point to. And they point to different contacts in their
6 mapping for Toyama, our on Slide 41. This is their mapping. They rely
7 upon the contacts that are there shown in 88. That's their mapping.
8 JUDGE CYGAN: Thank you.
9 JUDGE MCGRAW: And just so I can make sure I understand, are
10 you saying that each etch stop plug has to be in between a local contact or a
11 channel structure as well as a local -- the local contact for a stretch -- slit
12 structure?
13 MR. RADSCH: Yes. So their local contacts in Claim 15 cover
14 both the channel structures and the substructures.
15 JUDGE MCGRAW: So one etch stop plug has to be a -- the local
16 contact for both -- I'm sorry, each etch stop plug have to be in between both
17 local contracts for both a channel and the slit structure?
18 MR. RADSCH: I believe that's correct, Your Honor.
19 MR. BONNY: So I know we've started to cut into our rebuttal
20 time, so I'll probably take, hopefully around four minutes just to address one
21 last issue. So there's a couple issues that Mr. Radsch has already addressed
22 that are very similar for Grounds 1B and Grounds 2 and 3. For example, the
23 first issue, so I won't rehash that issue. But I did want to touch on the
24 second issue relating to Limitation 15H, which is the TACs extending

1 vertically through the dielectric and isolation structures. So turning ahead to
2 Slide 48 in Patent Owner's demonstratives, Toyama's second modification
3 -- and for a similar reason, actually, Mushiga in Grounds 2 and 3 -- does not
4 meet the limitation of TACs extending vertically through the dielectric
5 isolation structures.
6 I'll start with the claim construction issue. So turning back to Slide
7 21 -- and I apologize for jumping around -- Limitation 15H, as you know,
8 recites TACs extending vertically through the dielectric and the isolation
9 structures, which under our construction is referring to the dielectric
10 structure and the isolation structure. And the antecedent terms are what
11 dictate this construction.
12 As you can see on Slide 21, 15A recites a substrate with an
13 isolation structure, and 15C recites a dielectric structure. And then when
14 you get to Claim 15 -- or Limitation 15H, because there are two structures,
15 an isolation structure and a dielectric structure, 15H then refers to the
16 dielectric and the isolated structures. And that's the reason why that's plural
17 there, and it's -- the scope of that is dictated by this -- the antecedent terms
18 that are shown on this Slide.
19 JUDGE MCGRAW: How many TACs are required by Claim 15?
20 Do they have more than one?
21 MR. BONNY: More than one, correct, Your Honor.
22 And turning to Slide 22, the next step of this, the claims require
23 that the TACs extend through the same dielectric structure. And that's the
24 Finjan case that we cite in our briefing. And I do want to spend a bit of time

1 addressing Finjan. And I know that counsel for Petitioner raised that in their
2 opening presentation. So Petitioner has argued that the claims recite a
3 dielectric structure. This means one or more. When he was up here earlier,
4 he argued that the dispute is about whether you can only have one dielectric
5 structure. But respectfully, that's actually not the dispute. A device having
6 multiple dielectrics can still meet the claim. And we don't dispute that.
7 The requirement is that you still need TACs, plural, that extend
8 through the same dielectric structure. There can be other dielectrics
9 elsewhere in the device, that's fine. But this is the requirement that comes
10 from Finjan. And so all of -- under Finjan, all of the limitations that are
11 applicable to that claimed 'a dielectric structure' must be met with respect to
12 the same dielectric structure.
13 And Petitioner also pointed to a statement in Finjan that it argued
14 permits multiple computers working together. This is similar to what they
15 argued in their briefing, that the case left open the possibility of different
16 computers that could perform different portions of the relevant claim
17 limitations. But that's actually the very argument that Finjan rejected. So in
18 Finjan, at page 973, Finjan argued that multiple computers, quote, 'in
19 combination' could infringe.
20 The Federal Circuit considered and rejected that argument. And
21 you see this on page 975 of the case, where they expressly state that Claim 1
22 of the ARB Patent requires that the same computer perform each of the
23 claimed steps. And that's the Finjan Holding and Petitioner's entire
24 argument, it's based on a misunderstanding of that line of cases.

1 If there's no further questions, we'll save the remaining portion of
2 our time for rebuttal.
3 JUDGE CYGAN: If Petitioner is correct that a dielectric structure
4 can be one or more dielectric structures, is that permit their prior art reading
5 of the last one? Is that dispositive?
6 MR. BONNY: So actually, even if you did read Finjan or the
7 claims as permitting more than one dialectric structure, the way we read the
8 claim, you would still -- they still say that there must be TACs, plural,
9 extending through -- if you read it that way -- the dialectric structures. And
10 so we would submit that that means that each of those TACs would need to
11 extend through all of those same dielectric structures. And so under that
12 reading, under that interpretation, Toyama and Mushiga still would not be
13 the claim.
14 JUDGE MCGRAW: Where does the claim require that the TACs
15 have to go through a single dielectric structure, when the language of Claim
16 15 I'm not sure has that requirement? If you could kind of walk me through
17 it. I'm not quite --
18 MR. BONNY: Sure. So this claim -- turning back to the claim
19 language, Claim 15A -- or 15C, rather, Limitation 15C introduces a
20 dielectric structure. And this thing is exactly like the claim in Finjan, where
21 it recited a computer, and then the claim went on to refer back to that same
22 computer. And so just like in Finjan, here we have a reference back to a
23 dielectric structure. And that's referring to the same a dielectric structure.
24 Yes, there can be other dialectric structures in the device. The

1 claim doesn't preclude that. And that's why its "a"in "a dielectric structure"
2 does not preclude other dialectic structures. But the reference back to "the"
3 dielectric structure, it's referring to same one. And that's what the Finjan
4 case is about.
5 JUDGE CYGAN: But if Petitioner is saying you can have
6 multiple dielectric structures and you're also agreeing there can be multiple
7 dielectric structures, the claim doesn't say that the through array contacts
8 have to -- each through array contact extends through a respective dielectric
9 structure. I think that seems to be how you're reading the claim, that each
10 through array contact has to have -- or I guess multiple -- a set of through
11 array contacts has to extend through a single dielectric structure.
12 MR. BONNY: So the way we're reading the claim is, again,
13 entirely based on this finding Federal Circuit precedent in Finjan, that when
14 you have an earlier limitation that recites a component, like a computer in
15 Finjan or a dielectric structure here, any subsequent limitations in the claim
16 are applicable to that same component. Even if you have other components,
17 it's applicable to that same one. So that's really the basis here for that
18 interpretation.
19 JUDGE CYGAN: In Finjan, wasn't the computer taking all the
20 actions?
21 MR. BONNY: That is correct. But that's similar to the situation
22 you have here, where, like, in Finjan you had these steps that are performed
23 by the computer, so it's further limitations applied to the computer. Here
24 you have further limitation applied to the dielectric structure. And it's

1 worded differently, but it's still a limitation applied to that structure. Here,
2 it's the TACs extending through that dielectric structure.
3 JUDGE CYGAN: But in this limitation, it's the TACs which are
4 performing the action, you know, not the dielectric structures. So I'm not
5 sure it's completely, you know, on all fours with it. But I wanted to make
6 sure we understood your point in how you're reading the claim.
7 MR. BONNY: Yes, Your Honor. And there's really no basis in
8 the case law to make a distinction based on what is performing an action.
9 We don't read Finjan or its companion case that we also cited as being
10 dependent on that particular nuance. Thank you, Your Honor.
11 JUDGE CYGAN: Thank you, Counsel.
12 Petitioner, I have you with nine minutes remaining, and Patent
13 Owner with five minutes remaining.
14 MR. BOBROW: Nine minutes, Your Honor, for Petitioner?
15 Thank you. And Your Honors, may I proceed please?
16 JUDGE CYGAN: Please.
17 MR. BOBROW: Okay. I just wanted to make sure the clock had
18 been done. Thank you, Your Honor. In the limited time remaining, I'll try
19 to address a number of the arguments. Obviously, I can't get to them all.
20 But let me start with the argument relating to the isolation structure. And we
21 heard time over time from Patent Owner's counsel that if a structure -- for
22 example, this -- the dielectric structure, the bottom portion of which is the
23 isolation structure that would have -- oh, there it goes, that this structure
24 extends through.

1 And according to Patent Owner's attorney, that means that it no
2 longer provides structural support. I heard them say it no longer provides
3 mechanical support. I heard them say that it has to provide uniform
4 mechanical support. That's all entirely new argument. None of this is in the
5 papers or in the expert declaration. So this is a new point that they're
6 making. But it's a new point that has no evidentiary support.
7 There are structures, as Toyama shows, that can go through a
8 substrate. That doesn't mean the device collapses. These structures are
9 continuous to each other. They're in contact with each other. They're
10 connected to each other. In many cases, they bond to each other. So the fact
11 that something goes through one mechanical structure doesn't mean that the
12 existing mechanical structure or the existing structure loses all mechanical
13 support. There's simply no evidence to support that.
14 I'd also refer the Board to Figure 17B of Toyama. Figure 17B of
15 Toyama is a plan view -- again, kind of a bird's eye view, looking down.
16 And you can see that in effect, the dielectric structure, the bottom portion of
17 it, that's the isolation structure, that bottom portion of it is, in effect,
18 surrounded by the substrate. It's just one segment of the substrate that is
19 removed and then is filled with this material. The material that then isolates
20 the other parts of the substrate from the TACs that are subsequently formed
21 and are -- and go into that isolation region. So the mechanical support
22 argument is new. It finds no support. It's certainly not even supported by
23 the definition of substrate that's in the specification of column 4, lines 41 to
24 43.

1 Also on this isolation structure point, for a minute we heard that
2 the words 'with' and 'of' connote what I wrote down was a, quote, "particular
3 structural relationship." That's simply false. The word 'with' does not
4 connote a particular structural relationship. The word 'of' does not connote a
5 particular structural relationship. They are words of association. They can
6 be words of possession. They can be words of belonging, words of
7 accompaniment. That doesn't mean that there is a particular structural
8 relationship. All we really heard was that the Patent Owner wants to read in
9 the shallow trench isolation embodiment that's shown in one of the figures.
10 But we know that's improper because the specification says it's improper.
11 The specification says that that example is not limiting.
12 Let me now turn to the argument about the dielectric structure on
13 the isolation structure and turning to the Retractable case and the argument
14 made there. I now have Slide 27 up. This structure, 430, the Patent Owner
15 argued doesn't meet, it says, and is an integral component. But you can't
16 read it on two elements because it says that the portions of it are not distinct,
17 I think, is the word that I heard being argued.
18 We submit just to the contrary that the evidence shows that they
19 are distinct portions. Why? Because, number one, they are isolating distinct
20 and very different portions of the device from the TACs. The upper portion
21 is isolating the TACs from the conductive layers that are in the stack, in that
22 staircase stack structure. That's what's being isolated. In the isolation
23 region, the TACs are being isolated from something quite different. What's
24 quite different? The substrate, the semiconductor substrate is being isolated

1 from the TACs as opposed to the conductive layers in the staircase structure.
2 So you have a staircase structure, one portion of the of the
3 dielectric fill is isolating that. The other portion of it is isolating, again, a
4 very different portion, namely the substrate, the silicon substrate -- or
5 semiconductor substrate, I should say so.
6 JUDGE CYGAN: So Counsel, are you agreeing with Patent
7 Owner that Toyama needs to indicate some distinctness of these different
8 portions?
9 MR. BOBROW: No. I don't think Retractable stands for that
10 proposition that there's some bright line of distinctiveness. But I'm saying
11 that there are portions here that you can clearly identify and that from a
12 person of ordinary skill -- looking, for example, at Figure 15A -- can see that
13 those portions are distinct portions. They're different portions, and they
14 provide -- and part of the reason why is because they provide different
15 functions and are spatially in different regions, elevationally, of the device.
16 JUDGE CYGAN: Is this an argument that was presented in the
17 briefing?
18 MR. BOBROW: Well, certainly the Retractable discussion was
19 presented in the briefing and the argument on how the different portions
20 meet Retractable was the briefing to say that, again, they -- that this integral
21 structure is in contact with and isolates the TACs from different things in the
22 device, in different regions or different portions of the device.
23 JUDGE CYGAN: Right. But to the extent that it's important that
24 one looking at Toyama would understand that different portions are distinct

1 because they're performing different structural functions, was that in the
2 briefing?
3 MR. BOBROW: Yes. Yeah, exactly, the different functions being
4 performed by those different portions is in the briefing, yes.
5 So moving then on from the argument of Toyama -- sorry, to --
6 JUDGE MCGRAW: Before you move on, the '378 Patent defines
7 a substrate as -- is the material on which subsequent layers are added, what
8 are the subsequent layers that are added onto the isolation structure in
9 Toyama?
10 MR. BOBROW: Under the isolation structure or onto the
11 substrate?
12 JUDGE MCGRAW: Well, if you're defining the substrate is
13 including the isolation layer, I'm interested in what layers are added on top
14 of the isolation.
15 MR. BOBROW: I see. So that is an -- yes, that is our alternative
16 argument to meet the Patent Owner's construction. And as Your Honor is
17 aware, if you look at Figure 15A, you have the region at the top where it
18 says -- above 430, it says 400. There are multiple materials that get built up
19 upon the device after this dielectric region is formed. You have various
20 local contacts, various contacts, various interconnect structures. And those
21 are all on that. And so, yeah, those overlay it.
22 JUDGE MCGRAW: But you're not arguing that 430 is the part of
23 the dielectric structure above the isolation structure is a separate layer that's
24 added. You're not making that argument, correct?

1 MR. BOBROW: It is formed at the -- it is formed immediately
2 following the fill of the isolation range. In other words, this is formed in a
3 continuous process that builds up the layer upon layer upon layer, and then
4 you reach the top of the structure. So it is formed in that way.
5 So in the -- I see I have less than a minute left. So let me then turn
6 to the argument about Finjan. And once again, Counsel -- this relates to 1B
7 now, not 1A. And Counsel is misreading the Finjan case. Finjan dealt, as
8 Your Honor alluded to, with a claim that says a computer that performs
9 certain functions. And then it looks back and it says doing another one of
10 those functions by the computer. And what Finjan says is that you can
11 -- when it says a computer, that can be multiple computers. You just can't
12 read those multiple computers on different limitations.
13 And that's what the plaintiff in that case was trying to do. And
14 that's not -- repeat, not -- what we're doing here. We're saying that you have
15 a plurality of dielectric structures and you can -- and those same dielectric
16 structures satisfy all of the remaining functional requirements in the clam
17 directed to those dielectric structures.
18 And I see with that, I'm slightly over time. So unless Your Honors
19 have other questions, I'll rest at this point. Thank you, Your Honors.
20 JUDGE CYGAN: Thank you. Patent Owner, you may proceed
21 when ready.
22 MR. RADSCH: Thank you, Your Honors. I know my time is
23 brief, so I'll make basically three main points, starting with Finjan
24 encouraged the Board to make the decision. I think it's clear that even if one

1 relies upon one or more computers as being the requirements, there still must
2 be at least one that performs all the claimed functions. There can also be
3 more than one that performs all the claimed functions. But there needs to be
4 at least identifiable one that does that.
5 And that's different from what they're arguing here for their
6 Ground 1B, that there are multiple different TACs, each one going through
7 what they allege are different structures. So in no case do you have, plural,
8 TACs rule a dielectric structure. So that Finjan is on point, and their
9 mapping would violate the principles of Finjan.
10 Turning back to Ground 1A, the argument that Petitioner made in
11 the briefing based upon Retractable Technologies was that there need not be
12 any separately identifiable portions, that it was sufficient for one unitary
13 structure to satisfy the claimed limitation. That was the argument presented
14 in the briefing.
15 There was no argument that because there is some separate
16 function between the bottom portion and the top portion, they are therefore
17 separately identifiable or -- as the Retractable Technologies case term it
18 -- distinct portions. There's never argument that the bottom isolation
19 structure portion that they allege at 430 of Toyama is a distinct portion from
20 the top portion. So that's a new argument about these separate functions
21 rendering that unitary block, 430, as having distinct portions.
22 In any event, it is the same function. It's providing an insulating
23 function. It's one column of insulating material that insulates in Toyama the
24 same, exact structure, the TAC, what they allege to be the TAC. So there

1 isn't a separate function between the bottom of that and the top of that. So
2 not only is that a new argument, but I would submit it's an argument without
3 merit. The entire unitary stack forms the same function of isolating
4 -- electrically isolating or insulating those TACs.
5 Then just as a final point I would make, they had asked about
6 whether -- Your Honor had asked about whether the bottom portion -- or
7 contending that the isolation structure in -- of Toyama's Figure 15A qualifies
8 as a substrate based upon how the Patent '387 uses that term. It referred to
9 all sorts of materials being made above it, other -- but if you have Toyama's
10 -- your 15A, there's nothing formed above the isolation structure. There may
11 be later elements formed above the unitary structure 430. But their
12 argument seems to be that as long as you can point to anything above some
13 other layer in the device, that lower layer qualifies as a substrate. But that's
14 not a fair reading.
15 The bottom portion isolation structure is formed at the same time
16 as the top portion, a dielectric structure, with a -- label as a dielectric
17 structure in Toyama. That's one unitary uniform column. And that when
18 that bottom portion is formed, it's not acting as a substrate for anything else.
19 Perhaps under their argument, the top portion is. But as the claim would
20 require, the isolation structure has to be -- as we would submit -- part of the
21 substrate, and it doesn't perform that function. It is not part of the substrate.
22 JUDGE MCGRAW: How would you respond to that argument,
23 that the upper portion of 430 is formed after -- deposited after the isolation
24 structure?

1 MR. RADSCH: Well, there's -- first of all, there's just no evidence
2 of that. They didn't make that evidentiary showing that it's patterned sort of
3 in that way. It's all just filled at the same time, right? It's basically -- if it's
4 etched, then you have one process that fills it with material. I would
5 imagine what really happens is a bunch of -- there's a bunch of informal
6 deposition on the side, and then there's material that fills all around. But
7 there's sort of this, like, layered -- layer cake filling that was nowhere shown
8 or alleged.
9 Unless Your Honors have any further questions, I've exceeded my
10 20 seconds. Thank you.
11 JUDGE CYGAN: Thank you, Counsel.
12 I'd like to thank Counsel for both parties for your attendance in
13 person and your presentations. We appreciate the level preparedness of
14 counsel and your thorough command of the record, which is very helpful for
15 the Board. Also, the demonstrative exhibits were extremely helpful in us
16 following the arguments. A final decision will be issued in due course. That
17 concludes this hearing.
18 (Whereupon, the above-entitled matter went off the record at 12:08
19 p.m.)

PETITIONER:

Jeremy Lang
K. Herman
Travis Jensen
Parth Sagdeo
ORRICK, HERRINGTON & SUTCLIFFE LLP
ptabdocketjjl2@orrick.com
p52ptabdocket@orrick.com
t61ptabdocket@orrick.com
ptabdocketp2s7@orrick.com

PATENT OWNER:

Christopher M. Bonny
Andrew Radsch
Allen S. Cross
ROPES & GRAY LLP
Christopher.Bonny@ropesgray.com
Andrew.radsch@ropesgray.com
Allen.Cross@ropesgray.com