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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION,

Petitioner,

v.

BESANG, INC.,

Patent Owner.

Case No. IPR2023-00991

U.S. Patent No. 7,378,702

VIDEOTAPED DEPOSITION OF DR. CARL SECHEN

APPEARING REMOTELY

July 10, 2024

9:05 a.m.

Reported by: Eileen Mulvenna, CSR/RMR/CRR/RDR

DIGITAL EVIDENCE GROUP

1730 M Street, NW, Suite 812

Washington, D.C. 20036

(202) 232-0646

1 REMOTE VIDEOTAPED DEPOSITION of
2 DR. CARL SECHEN, a witness on behalf of the
3 Petitioner in the above-titled action, held on
4 Wednesday, July 10, 2024, commencing at
5 approximately 9:05 a.m., before Eileen Mulvenna,
6 CSR/RMR/CRR/RDR, Certified Shorthand Reporter,
7 Registered Merit Reporter, Certified Realtime
8 Reporter, Registered Diplomate Reporter, and Notary
9 Public of the State of New York.

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1 A P P E A R A N C E S:

2

3 Attorneys for Petitioner Intel:

4 PERKINS COIE

5 2901 N. Central Avenue

6 Suite 2000

7 Phoenix, Arizona 85012-2788

8 By: Tyler R. Bowen, Esq

9 Phil Morin, Esq.

10

11 Attorneys for Patent Owner BeSang:

12 ARMOND WILSON LLP

13 13785 Research Blvd

14 Suite 125

15 Austin, Texas 78750

16 By: Michelle Armond, Esq.

17

18

19 Present:

20

21 Henry Marte, Videographer

22 Prithivi Vijayamohan, Summer Associate

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1 I N D E X

2 WITNESS EXAMINATION BY PAGE

3

4 DR. CARL SECHEN

5

6 MS. ARMOND 6

7

8 E X H I B I T S

9 PAGE

10

11 Exhibit 1007 No Bates Numbers, Lee 21

12 Publication 2002

13 Exhibit 1037 No Bates Numbers, Reply 11

14 Declaration of Dr. Carl

15 Sechen, Patent No.

16 7,378,702

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1 THE VIDEOGRAPHER: We are now on the
2 record.

3 My name is Henry Marte, videographer
4 on behalf of Digital Evidence Group.

5 Today's date is July 10, 2024. And
6 the time is 9:05 a.m.

7 This deposition is being held in the
8 matter of Intel Corporation versus BeSang,
9 Inc.

10 The deponent today is Dr. Carl Sechen.

11 All parties to this deposition are
12 appearing remotely and have agreed to the
13 witness being sworn in remotely.

14 Counsel, please identify themselves
15 for the record, after which the court
16 reporter will administer the oath to the
17 witness.

18 MR. BOWEN: Tyler Bowen of Perkins
19 Coie, on behalf of petitioner, Intel
20 Corporation.

21 MS. ARMOND: Michelle Armond from
22 Armond Wilson for patent owner, BeSang.

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1 And, Tyler, you have extra people on
2 the record. Are they going to introduce
3 themselves?

4 MR. BOWEN: I'll just mention that
5 quickly. So we have Phil Morin, also of
6 Perkins Coie in the San Diego office, and
7 Prithivi Vijayamohan, who is a summer
8 associate in Washington, D.C.

9 CARL SECHEN,
10 having been duly sworn by Eileen Mulvenna,
11 a Notary Public of the State of New York,
12 was examined and testified as follows:

13 EXAMINATION

14 BY MS. ARMOND:

15 Q. Good morning.

16 A. Good morning.

17 Q. Would you please state and spell your
18 full name for the record?

19 A. Carl Sechen. C-A-R-L for the first
20 name. And last name is S-E-C-H-E-N.

21 Q. Have you been deposed before?

22 A. Yes.

1 Q. Have you been deposed before in this
2 case?

3 A. Yes.

4 Q. Do you understand how a deposition
5 works?

6 A. I do.

7 Q. If you don't understand anything about
8 any of my questions today, will you please let me
9 know?

10 A. Okay, sure.

11 Q. Do you understand that you're under
12 oath today?

13 A. Yes.

14 Q. Is there any reason why you would not
15 be able to give truthful and accurate testimony
16 today?

17 A. No.

18 Q. Where are you located this morning?

19 A. Dallas, Texas.

20 Q. And where specifically in Dallas,
21 Texas?

22 A. At Perkins Coie's offices.

1 Q. Are you in a conference room?

2 A. Yeah.

3 Q. Is there anyone else in the room with
4 you?

5 A. Yes, Tyler and Phil are in the room.

6 Q. And who's Tyler?

7 A. Tyler Bowen.

8 Q. Is he representing you today?

9 A. Yes.

10 Q. And he's -- strike that.

11 And who else is in the room with you?

12 A. Phil Morin.

13 Q. And who's Phil?

14 A. He's also with Perkins Coie.

15 Q. Okay. Do you have any documents with
16 you today?

17 A. Yes. Let's see. There's, of course,
18 my two declarations, the original and the reply.

19 And then a copy of the petition. And then a variety
20 of the pertinent references, like Lee and so forth,
21 that was relied on for my declarations. They're all
22 unmarked.

1 Q. So let's back up. So you have a copy
2 of your initial declaration in this IPR
3 Exhibit 1003; correct?

4 A. Yes.

5 Q. Okay. And then you said you have a
6 copy of your reply declaration in this case,
7 Exhibit 1037; correct?

8 A. Yes.

9 Q. And then you have a copy of the
10 petition in this IPR; correct?

11 A. Yes.

12 Q. Then you said you have a copy of the
13 Lee publication, which is Exhibit 1007 in this IPR?

14 A. Actually, it's the Lee patent, which
15 is Exhibit 1007. Let's see. Is that -- oh, there's
16 two Lees, actually. Yeah, that's true.

17 Well, okay, I also have a copy of the
18 941, which is Exhibit 1005. Oh, okay.

19 I'm sorry. The Lee I mentioned was
20 actually the 702 patent, which is Exhibit 1001. So
21 I have the two patents being challenged here, the
22 702, which also incorporates the 941 and which I

1 have. So Exhibits 1001 and 1005. And then the Lee
2 reference that I use as Exhibit 1007, and I have
3 that.

4 Q. Okay. So you told me that you have
5 Exhibit 1001, 1005, and 1007 in front of you.

6 Do you have --

7 A. Yes.

8 Q. -- any other exhibits from this IPR
9 with you today, besides the ones we've already
10 talked about there?

11 A. There's a few more. Exhibit 1008, by
12 Kim, 1009, 1010, 1011, 1016, 1031, and 1055.

13 Q. Do you have any other exhibits with
14 you today besides the ones you just identified?

15 A. No.

16 Q. So besides the documents we've already
17 talked about today, which is the petition, your
18 declarations, and that collection of exhibits, do
19 you have anything else with you in the conference
20 room today?

21 A. No, I do not.

22 Q. Are there any notes or markings on any

1 of the documents you have with you in the conference
2 room today?

3 A. No.

4 Q. All right. So, Dr. Sechen, we're
5 doing this deposition remotely. You understand
6 that?

7 A. Yes.

8 Q. So we have electronic copies that
9 we're going to put on the screen and show to you
10 today, and then those will be the official exhibits
11 for the deposition. So you're welcome to use those,
12 or if you want to use the paper copies in front of
13 you, it's fine. Whatever is your preference.

14 Does that work for you?

15 A. Yes.

16 Q. Okay. So can we turn to Exhibit 1037.

17 Let me know when you have a copy of
18 that, Dr. Sechen.

19 (Exhibit 1037, No Bates Numbers, Reply
20 Declaration of Dr. Carl Sechen, Patent No.
21 7,378,702, received and marked.)

22 THE WITNESS: Okay, I have it.

1 BY MS. ARMOND:

2 Q. Okay. So if we can go to the very
3 last page, which is marked on the page 37. Tell me
4 when you're there.

5 A. I'm there.

6 Q. So on page 37 of Exhibit 1037, is that
7 your signature there?

8 A. It is.

9 Q. And you signed your declaration on
10 June 5, 2024?

11 A. Correct.

12 Q. And Exhibit 1037 is your reply
13 declaration in this IPR; correct?

14 A. Yes.

15 Q. And we already talked about this a
16 little bit, but you previously submitted another
17 declaration in this IPR; correct?

18 A. Yes.

19 Q. Exhibit 1003 is your initial
20 declaration in this IPR; correct?

21 A. Yes.

22 Q. Are Exhibits 1003 and 1037 a complete

1 statement of your opinions that you've offered in
2 this IPR?

3 MR. BOWEN: Objection, form.

4 THE WITNESS: Certainly at the time
5 they were signed, yes.

6 BY MS. ARMOND:

7 Q. Do you have any additional opinions
8 that you haven't expressed in this case?

9 MR. BOWEN: Objection, form.

10 THE WITNESS: It would be hard to --
11 it would be hard to say. But the one thing I
12 can definitively say is that at the time I
13 signed each of these, that was the set of
14 opinions I wished to express at that time.
15 You know, obviously one's knowledge, you
16 know, increases over time, but I don't
17 know -- I don't know how to answer that.

18 BY MS. ARMOND:

19 Q. So when you signed Exhibit 1003, that
20 was a complete statement of your opinions on that
21 date; correct?

22 A. Probably. At least I addressed the

1 issues that were brought to my attention.

2 Q. Is there anything in Exhibit 1003 that
3 is not accurate?

4 A. I don't recall anything.

5 Q. As of June 5, 2024, when you signed
6 your reply declaration, Exhibit 1037, was that a
7 complete statement of your opinions offered in the
8 case as of that date?

9 MR. BOWEN: Objection, form.

10 THE WITNESS: With regard to the
11 issues that I was -- yeah, that I either
12 addressed or it was suggested to me to
13 address certain topics, that was fairly
14 complete in that regard.

15 BY MS. ARMOND:

16 Q. So your opinions are fairly complete
17 in Exhibit 1037; correct?

18 A. Well, with respect to what I was asked
19 to address.

20 Q. Do you have any mistakes or errors you
21 want to correct in your declaration, Exhibit 1037?

22 MR. BOWEN: Objection, form.

1 THE WITNESS: Well, outside of the
2 citations not being right, I'm not aware of
3 anything else right now.

4 BY MS. ARMOND:

5 Q. And you're confident in the opinions
6 you expressed in your declarations, Exhibit 1003 and
7 1007?

8 A. Yes.

9 MR. BOWEN: Did you mean to say 1037
10 instead of 1007?

11 MS. ARMOND: I did, Tyler. Thank you.
12 Let's try that again.

13 BY MS. ARMOND:

14 Q. Are you confident in the opinions you
15 expressed in your declarations in this IPR,
16 Exhibits 1003 and 1037?

17 A. Yes.

18 Q. Who did you work with in preparing
19 your reply declaration, Exhibit 1037?

20 A. Let's see. I was asked to develop a
21 first draft, and I did develop a very complete first
22 draft with correct citations. And I know I

1 discussed it on numerous occasions with Phil Morin.

2 I'm not sure who else was involved.

3 Q. So you worked with Phil Morin at
4 Perkins Coie in preparing your declaration,
5 Exhibit 1037; correct?

6 A. That's true, yeah.

7 Q. Did you work with anyone else at
8 Perkins Coie in preparing your declaration,
9 Exhibit 1037?

10 A. I think there -- well, let's see. I
11 think there were others involved, but they went
12 through Phil. So I never really knew who it was.

13 Q. Did you work with anyone at Intel in
14 preparing your declarations, Exhibit 1003 and 1037?

15 A. I did not personally, no.

16 Q. Did you speak to anyone at Intel about
17 your declarations in this IPR, Exhibit 1003 and
18 1037?

19 A. No.

20 Q. Did anyone at Intel review your
21 declarations that were submitted in this IPR?

22 A. I'm not sure. I wouldn't have that

1 knowledge.

2 Q. Can we look at paragraph 5 of
3 Exhibit 1037?

4 Let me know when you're there,
5 Dr. Sechen.

6 A. Okay, I'm there.

7 Q. Paragraph 5 lists the materials you
8 considered in preparing the opinions you express in
9 your reply declaration, Exhibit 1037; correct?

10 A. Yes.

11 Q. Is that a complete list of the
12 materials you considered in forming the opinions in
13 Exhibit 1037?

14 MR. BOWEN: Objection, form.

15 THE WITNESS: I think there were other
16 things that I looked at, but for the most
17 part, the ones listed were given the most
18 consideration probably.

19 BY MS. ARMOND:

20 Q. Did you consider any other materials
21 that are identified in paragraph 5 of Exhibit 1037?

22 MR. BOWEN: Objection, form.

1 THE WITNESS: If I cited something
2 that's not in the list, then the answer to
3 that would be yes. I don't recall such
4 instances. Certainly I looked at other
5 things in general in searching for things
6 like prior art, and if I did not use any
7 statements from a particular, for example,
8 prior art, then I did not list it.

9 BY MS. ARMOND:

10 Q. So all the materials that you relied
11 upon in forming your opinions in Exhibit 1037 are
12 either listed in this exhibit or this paragraph 5 or
13 cited in your declaration, Exhibit 1037; correct?

14 A. Well, yeah, I'm not sure the legal
15 ramifications of the word or phrase "rely on." It's
16 like when I write a paper, I mean, if I feel it's
17 appropriate and necessary -- and/or necessary to
18 cite a document when I'm preparing a paragraph, then
19 I do. If I don't feel it's appropriate to cite
20 something, then I don't include it on the list. So
21 it's kind of how I proceeded.

22 Q. In your reply declaration,

1 Exhibit 1037, if you relied on a document, you would
2 have mentioned it either here in paragraph 5 or
3 cited it somewhere; right?

4 MR. BOWEN: Objection, form.

5 THE WITNESS: Yeah, again, I'm not
6 sure I fully understand the phrase "rely on,"
7 because I think that's a legal phrase,
8 particularly.

9 So, you know, as an academic, when we
10 review things, you might review a paper and
11 it's very interesting, you learn a lot, but
12 it's just not pertinent to a paragraph or
13 paragraphs that I'm writing. And so you
14 don't cite to it, but -- it's certainly added
15 to my knowledge base, but it just wasn't
16 pertinent to the point I was trying to make.

17 BY MS. ARMOND:

18 Q. Did you mention all of the materials
19 that you considered that you thought were pertinent
20 in your reply declaration, Exhibit 1037?

21 A. I think so.

22 Q. Let's turn to Exhibit 1037,

1 paragraph 16.

2 Let me know when you're there.

3 A. I am there.

4 Q. You see in paragraph 16 of your reply
5 declaration, Exhibit 1037, you state, "Lee also
6 discloses stacking"?

7 A. Yes.

8 Q. And then in that paragraph, to support
9 that, you cite Lee, Exhibit 1007, at paragraphs 107,
10 259, and 294; correct?

11 MR. BOWEN: Objection, form.

12 THE WITNESS: I see what it says
13 there. And I think you have faithfully read
14 it. Let's see. If there's a question
15 pending, I'm not aware of what it is.

16 BY MS. ARMOND:

17 Q. Okay. I was just asking, if you look
18 at paragraph 16 of your reply declaration,
19 Exhibit 10,000 -- 1037 -- you're there with me;
20 right?

21 A. 1007 or 37?

22 Q. All right. Let's start again.

1 Okay. So my question was: In
2 paragraph 16 of your reply declaration, you have an
3 opinion that Lee discloses stacking, and you support
4 that by citing Exhibit 1007, Lee, at paragraphs 107,
5 259, and 294; correct?

6 A. That is there, yes.

7 Q. Okay.

8 MS. ARMOND: So let's introduce
9 Exhibit 1007, which is the Lee publication.

10 (Exhibit 1007, No Bates Numbers, Lee
11 Publication 2002, received and marked.)

12 BY MS. ARMOND:

13 Q. Do you recognize Exhibit 1007,
14 Dr. Sechen?

15 A. I do.

16 Q. Okay. Can you turn to paragraph 259
17 of Exhibit 1007?

18 MS. ARMOND: Oh, I'm sorry, Henry,
19 that's actually the wrong -- I'll tell you
20 the PDF page.

21 Henry, go to PDF 111. PDF page 111,
22 please.

1 BY MS. ARMOND:

2 Q. Okay. So let me ask that again
3 because we are having some technical difficulties.

4 Will you turn to paragraph 259 of the
5 Lee publication Exhibit 1007, Dr. Sechen? And let
6 me know when you're there.

7 A. Yes, I am there.

8 Q. Paragraph 259 in Lee is describing
9 Lee's Figure 52; correct?

10 A. Could you repeat the question, please?

11 Q. Paragraph 259 in Lee is describing
12 Lee's Figure 52; correct?

13 A. Yeah, I believe that's right.

14 Q. And Figure 52 shows a monolithic
15 three-dimensional array; correct?

16 MR. BOWEN: Objection, form.

17 THE WITNESS: Well, it says that it
18 can be formed by packaging two-dimensional
19 arrays that are formed separately to form a
20 non-monolithic memory device in the last
21 sentence of paragraph 259. So it can be
22 either way.

1 BY MS. ARMOND:

2 Q. Do you see the third-to-last sentence
3 in paragraph 259 of Lee, it says, "The array of
4 nonvolatile memory devices 4400 comprises a
5 monolithic three dimensional array of memory
6 devices"?

7 A. Yes, if you ignore the complete
8 teaching of that paragraph, so outside the scope of
9 its teaching, then yeah, that's one aspect of the
10 teaching only.

11 Q. So your opinion is that paragraph 259
12 in Lee teaches a monolithic three-dimensional array
13 and then something else?

14 A. It also teaches forming
15 two-dimensional arrays separately and then packaging
16 them together to form a non-monolithic memory
17 device.

18 Q. So paragraph 259 of Lee says, "The
19 array of nonvolatile memory devices 4400 comprises a
20 monolithic three dimensional array of memory
21 devices"; correct?

22 A. You read one sentence in that

1 paragraph.

2 Q. And I read it accurately; right?

3 A. Yes, that sentence is there.

4 Q. Okay. And then the next sentence in
5 paragraph 259 of Lee says, "The term 'monolithic'
6 means that layers of each level of the array were
7 deposited on the layers of each underlying level of
8 the array"; correct?

9 A. That sentence is there, as well.

10 Q. And then the next sentence says, "In
11 contrast two dimensional arrays may be formed
12 separately and then packaged together to form a
13 non-monolithic memory device"; correct?

14 A. That's correct.

15 Q. So your opinion is that that discloses
16 both a monolithic device and a stacked device in
17 contrast; correct?

18 MR. BOWEN: Objection, form.

19 THE WITNESS: Lee teaches a POSITA
20 both options, both a non-monolithic memory
21 device, as well as a monolithic memory
22 device.

1 BY MS. ARMOND:

2 Q. And your opinion is based on
3 paragraph 259 of Lee; correct?

4 A. Not exclusively. Also, I believe it's
5 108, at least, and I think there's other places, but
6 at least 108 -- I'm sorry, 107. 107 is what I
7 meant.

8 Q. Okay. So you never referred to
9 Figure 52 for the fifth preferred embodiment of Lee
10 in your opening declaration in this IPR; correct?

11 A. That's right. I primarily used up to
12 Figure 35.

13 Q. And now your opinion is that Lee
14 taught stacking based on the fifth preferred
15 embodiment shown in Figure 52 of Lee; correct?

16 A. No, because it's also taught in
17 paragraph 107, which is, you know, very early on in
18 the Lee patent.

19 Q. You never referred to paragraph 107 in
20 your opening declaration; did you?

21 MR. BOWEN: Objection, form.

22 THE WITNESS: I know I was deposed

1 regarding that. I don't remember, honestly,
2 if it's in my opening report. I would think
3 it was, but I don't recall.

4 BY MS. ARMOND:

5 Q. Let's turn to Lee's paragraph 294.

6 Let me know when you're there,

7 Dr. Sechen.

8 A. Yeah, I'm there.

9 Q. Paragraph 294 in Lee refers to Lee's
10 Figure 69; correct?

11 A. Yes.

12 Q. And Figure 69 shows a monolithic
13 three-dimensional array; correct?

14 MR. BOWEN: Objection, form.

15 THE WITNESS: Not necessarily, no. I
16 would not agree with that -- or not strictly,
17 because it also can -- that figure can also
18 represent what you would get after packaging
19 together two-dimensional arrays that are
20 formed separately arriving at a
21 non-monolithic memory device, as
22 paragraph 294 explains.

1 BY MS. ARMOND:

2 Q. So you're relying on the sentence that
3 says, "In contrast, two dimensional arrays may be
4 formed separately and then packaged together to form
5 a non-monolithic memory device," to support your
6 opinion that Figure 69 also shows a non-monolithic
7 device?

8 A. Yes.

9 Q. You never referred to Figure 69 of Lee
10 in your opening declaration; correct?

11 A. I don't think I did, because I only
12 relied on and needed to rely on up to Figures 35,
13 and paragraph 107 teaches the same thing effectively
14 as 294.

15 Q. Your opening declaration only referred
16 to Lee's figures up to 35; correct?

17 A. I think so.

18 Q. Let's go to your reply declaration,
19 Exhibit 1037, at paragraph 16.

20 Let me know when you're there.

21 A. I am there.

22 Q. Do you see the second sentence in

1 paragraph 16, where you opine that, "Lee further
2 discloses that Figure 35's array can have
3 self-aligned configurations and contemplates using
4 the techniques at Exhibit 1007, Paragraphs 203
5 through 281 with SOI technology, including "wafer
6 bonding"? [sic]

7 Do you see that?

8 A. Yes.

9 Q. Did I read that correctly?

10 A. I think so.

11 Q. Do you see where you started to put
12 the words "wafer bonding" in quotes, but you omitted
13 the close quotation mark?

14 A. Yes, that was an error or a typo.

15 Q. So did you intend for "wafer bonding"
16 to be in quotation marks?

17 A. Yes. Well, either -- I don't recall
18 my thinking at the time, but either there needs to
19 be two quotes or none. Either one would be
20 acceptable.

21 Q. So you're not sure whether you
22 intended to quote the words "wafer bonding" or not?

1 A. Yeah, I don't recall exactly which way
2 I wanted that to go at that time.

3 Q. So for your opinion that Lee discloses
4 wafer bonding in paragraph 16 of your reply
5 declaration, you're citing to Lee's paragraphs 113,
6 115, 117, 208, and 211 through 212; correct?

7 A. Well, also, I have to check, but it --
8 let's see. But certainly anything -- let's see. I
9 can search for the specific paragraph that cites
10 "wafer bonding" if you'd like, but it would be
11 encompassed by all those paragraph numbers that you
12 see on three consecutive lines there, starting with
13 the -- one, two, three -- fifth line, the fifth
14 line, sixth line, and seventh line. Among all those
15 paragraphs, one or more of them have the phrase
16 "wafer bonding" in them.

17 Q. Isn't that just what I read,
18 Dr. Sechen, those paragraph numbers?

19 A. I thought you read a subset, like
20 maybe from line 6, but -- let's see.

21 Q. Okay. Exhibit 1003 is your opening
22 declaration. Do you see that in paragraph 16?

1 A. Oh, yes. Okay.

2 Q. Okay. So let's try again. I want to
3 make sure we're on the same page here.

4 For your opinion in paragraph 16 that
5 Lee discloses wafer bonding, you're citing Lee
6 Exhibit 1007 at paragraphs 113, 115, 117, 208, and
7 211, and 212; correct?

8 A. Also, 110 and 111, I believe.

9 Q. Well, are you citing 110 to 111 for
10 saying that they disclose driver circuits, like
11 those in Figure 35?

12 A. Let me check. Yeah, you might be
13 right on that.

14 Yeah, you are correct about that.
15 110, 111 pertains to driver circuits.

16 Q. Okay. So let's -- I'd like to just
17 make sure we're on the same page, Dr. Sechen. Okay?

18 So you have an opinion that Lee
19 discloses wafer bonding, and to support that opinion
20 in paragraph 16 of your reply declaration, you're
21 citing certain paragraphs in Lee; correct?

22 A. Yes.

1 Q. For your opinion that Lee discloses
2 wafer bonding, you are citing to Lee's
3 paragraphs 113, 115, 117, 208, 211, and 212;
4 correct?

5 A. Well, I think the range 203 to 281 is
6 also pertinent, as it's quoted there, as well. So I
7 would not rule that out.

8 Q. But you are relying on paragraphs 113,
9 115, 117, 208, and 211 to 212 for your opinion that
10 Lee discloses wafer bonding in paragraph 16 of your
11 declaration; correct?

12 A. Well, I'm also at this point including
13 paragraphs 203 to 281, as cited there.

14 Q. So what you said in your declaration
15 is that Lee further discloses that Figure 35's array
16 can have self-aligned configurations and
17 contemplates using the techniques at Lee
18 paragraphs 203 to 281 with SOI technology, including
19 wafer bonding.

20 Do you see that?

21 A. Yes.

22 Q. So you're saying that paragraphs 203

1 to 281 show wafer bonding?

2 A. In that range, there is reference to
3 wafer bonding.

4 Q. Okay. So let's -- I'm looking at
5 paragraph 16 of your reply declaration.

6 Are you with me?

7 A. Yes.

8 Q. Okay. So you have an opinion that Lee
9 discloses wafer bonding; yes?

10 A. Yes.

11 Q. Okay. And the support for that is you
12 cite to Lee, paragraph 113, 115, 117, 208, 211, and
13 212; correct?

14 A. Well, as I sit here, I would say it
15 also includes the paragraph range 203 to 281.

16 Q. Okay. And that's your support for
17 your opinion that Lee discloses wafer bonding;
18 correct?

19 A. Yeah, all the citations you read, as
20 well as paragraphs 203 to 281, that encompasses --
21 well, I would say, also -- you know, even
22 paragraph 107, 259, 294, also are pertinent to

1 teaching a POSITA that wafer bonding is something
2 that Lee teaches.

3 Q. But you don't cite that after your
4 opinion sentence on wafer bonding; correct?

5 A. It's in this paragraph, and that's
6 what this paragraph is about.

7 Q. So --

8 A. So, yeah, I should say that "wafer
9 bonding" should be in quotes. Because, you know,
10 we're now saying here at this portion of 16 that
11 it's that particular phrase we're looking at.

12 Q. Okay. So let's go to Lee,
13 paragraph 113.

14 Tell me when you're there.

15 A. Okay.

16 Q. Lee's paragraph 113 doesn't mention
17 wafer bonding; correct?

18 A. Yeah, it's sort of leading into what's
19 going to follow. So that's sort of an introductory
20 paragraph.

21 Q. Is that no, Lee, paragraph 13 does not
22 mention wafer bonding?

1 Is that your answer?

2 MR. BOWEN: Objection, form.

3 THE WITNESS: The word or phrase

4 "wafer bonding" is not in that paragraph.

5 BY MS. ARMOND:

6 Q. So wafer bonding is not in Lee's
7 paragraph 113; correct?

8 MR. BOWEN: Objection, form.

9 THE WITNESS: Lee teaches that wafer
10 bonding can be used to form some of these
11 configurations identified in paragraph 113.

12 BY MS. ARMOND:

13 Q. Does paragraph 113 of Lee mention
14 wafer bonding, Dr. Sechen?

15 A. That phrase is not in the paragraph,
16 per se.

17 Q. Okay. Let's look at Lee's
18 paragraph 115.

19 Let me know when you're there.

20 A. I am there.

21 Q. Paragraph 115 of Lee does not mention
22 wafer bonding; correct?

1 A. The phrase is not in that paragraph.

2 Q. Let's turn to paragraph 117 of Lee.

3 Let me know when you're there.

4 A. I am there.

5 Q. Paragraph 117 of Lee does not mention

6 wafer bonding; correct?

7 A. That phrase is not in that paragraph.

8 Q. Let's turn to Lee paragraph 208.

9 Let me know when you're there.

10 A. I have found it.

11 Q. Now, paragraph 208 of Lee does mention

12 wafer bonding; correct?

13 A. Yes.

14 Q. In fact, paragraph 208 says, "The

15 silicon-on-insulator substrate or a ceramic

16 substrate" -- oh, hold on. Let's try that again.

17 So strike that.

18 Do you see in the middle of

19 paragraph 208, Carl Sechen, there's a sentence that

20 starts "The silicon-on-insulator substrate"?

21 A. Yes.

22 Q. Lee, paragraph 208 says, "The

1 silicon-on-insulator substrate may be formed by any
2 conventional method, such as wafer bonding,
3 Separation by Implantation of Oxygen (SIMOX), and
4 formation of an insulating layer on a silicon
5 substrate"; correct?

6 A. Yes.

7 Q. The silicon-on-insulator substrate
8 referred to in Lee's Paragraph 2008 is a starting
9 point for memory array; correct?

10 MR. BOWEN: Objection, form.

11 THE WITNESS: Yeah, like with respect
12 to Figure 35, it's like the layer 3105.

13 BY MS. ARMOND:

14 Q. And that silicon-on-insulator
15 substrate includes the peripheral or driver
16 circuitry for the memory array; correct?

17 A. Yes.

18 Q. Paragraph 2008 then says, "After the
19 peripheral circuitry is completed, an interlayer
20 insulating layer 4003 is conformally deposited over
21 the circuitry as shown in Figure 37."

22 Did I read that correctly?

1 A. Yes.

2 Q. So the insulating layer is deposited
3 over the silicon-on-insulator substrate with the
4 peripheral or driver circuitry after it's formed;
5 correct?

6 A. Well, as it's stated here, I'll just
7 stick with that. So, you know, after the peripheral
8 circuitry is completed, then an interlayer
9 insulating layer 4003 is conformally deposited over
10 that circuitry.

11 Q. So you agree that the insulating layer
12 is deposited over the silicon-on-insulator substrate
13 that includes the peripheral or driver circuitry
14 after it's formed; correct?

15 A. As it states there, I agree with what
16 it says.

17 Q. Okay. So let's turn to Lee's
18 paragraph 209.

19 Let me know when you're there.

20 A. I'm there.

21 Q. Paragraph 209 is describing Lee's
22 Figures 37 to 44; correct?

1 A. Yeah, it's hard to say how many
2 figures it -- forward it refers to after 37 without
3 reading this for a while.

4 Q. Dr. Sechen, why don't you look at
5 paragraph 2007, and I'll ask my question again.

6 A. 2007?

7 Q. Yeah, that might help you.

8 A. Okay.

9 Q. Okay. So I want to ask that question
10 again.

11 Paragraph 209 is describing Figures 37
12 to 44; correct?

13 A. Well, some subset -- some subset of
14 those figures are addressed in paragraph 209.

15 Q. Now, let's look at paragraphs 211 to
16 212 of Lee?

17 A. Yeah.

18 Q. Paragraphs 211 through 212 are also
19 describing Figures 37 to 44; correct?

20 MR. BOWEN: Objection, form.

21 THE WITNESS: Well, 212 also
22 identifies that wafer bonding is a teaching

1 by Lee here, because you cannot create single
2 crystal SOI substrate without using wafer
3 bonding.

4 MS. ARMOND: I'm going to move to
5 strike that as nonresponsive.

6 BY MS. ARMOND:

7 Q. My question is: Paragraphs 211 to 212
8 are describing Figures 37 to 44; correct?

9 A. 211 and 212 address one or more
10 figures of that range of Figures 37 to 44. Probably
11 only one figure.

12 Q. And you never referred to any of
13 Figures 37 to 44 of Lee in your opening declaration,
14 Exhibit 1003; correct?

15 MR. BOWEN: Objection, form.

16 THE WITNESS: I don't think they were
17 relied upon for my first declaration.

18 MS. ARMOND: So, Tyler, I'm going to
19 move to a new subject right now. Do you want
20 to take a break, or do you want to keep
21 going?

22 MR. BOWEN: It's up to Dr. Sechen.

1 THE WITNESS: Yeah, let's take a
2 break.

3 MR. BOWEN: Do you want to take a
4 break?

5 THE WITNESS: Yeah.

6 MS. ARMOND: Okay.

7 THE VIDEOGRAPHER: Okay. I'm going to
8 get us off the record.

9 The time is 9:57 a.m. Off the record.

10 (Recess from the record.)

11 THE VIDEOGRAPHER: Okay. The time is
12 10:08 a.m. We are back on the record.

13 BY MS. ARMOND:

14 Q. Dr. Sechen, let's go to paragraph 17
15 of your reply declaration, Exhibit 1037.

16 Let me know when you're there.

17 A. 17, was it?

18 Q. Yes.

19 A. I am there.

20 Q. Okay. Do you see in paragraph 17, you
21 have a sentence that starts, "In fact"?

22 A. Yes.

1 Q. In paragraph 17 of your reply
2 declaration, you say, "Lee teaches that potential
3 implementations involving SOI technology and wafer
4 bonding 'increase array density and decrease die
5 size and cost.'"

6 Did I read that correctly?

7 A. Yes.

8 Q. And for that opinion, you cite Lee,
9 Exhibit 1007, at paragraphs 204, 207 through 212,
10 and 110 through 112; correct?

11 A. Yes.

12 Q. Let's turn to Lee, Exhibit 1007, at
13 paragraph 204.

14 Let me know when you're there.

15 A. Okay, I'm there.

16 Q. So do you see five lines up from the
17 bottom in Lee's paragraph 204, it says, "The fully
18 aligned cell structure increases array density and
19 decreases die size and cost."

20 Did I read that correctly?

21 A. Yes.

22 Q. And that's the sentence you're quoting

1 in paragraph 17 of your declaration; correct?

2 A. Yes.

3 Q. So Lee says that the fully aligned
4 cell structure increases array density and decreases
5 die size and cost; correct?

6 A. Yeah, among all its teachings, right.
7 And self aligned is part of it.

8 Q. Paragraph 204 doesn't mention SOI
9 technology or wafer bonding; correct?

10 MR. BOWEN: Objection, form.

11 THE WITNESS: However, that's what the
12 teaching altogether is all about. I mean,
13 Lee does state -- I think it's paragraph --
14 let's see here.

15 Yeah, like in 117, it just says that
16 any feature of any embodiment described below
17 may be used in any other embodiment. So it's
18 clearly saying that things like wafer bonding
19 and SOI technology is incorporatable and has
20 advantages for all the embodiments described.

21 MS. ARMOND: I'm going to move to
22 strike that as nonresponsive.

1 BY MS. ARMOND:

2 Q. Dr. Sechen, you understand I'm asking
3 about paragraph 204; correct?

4 A. And I did respond to it.

5 Q. Do you understand I'm asking you about
6 Lee's paragraph 204?

7 A. Yes.

8 Q. Lee's paragraph 204 does not mention
9 SOI technology or wafer bonding; correct?

10 MR. BOWEN: Objection, form.

11 THE WITNESS: It's implicitly there,
12 but the explicit words are not.

13 BY MS. ARMOND:

14 Q. So you don't see any mention of SOI
15 technology or wafer bonding in Lee's paragraph 204;
16 correct?

17 MR. BOWEN: Objection, form.

18 THE WITNESS: The -- SOI technology
19 underline -- is the foundation upon which
20 everything Lee is doing is based, and wafer
21 bonding is part of it, as well. So you could
22 not possibly separate it out.

1 BY MS. ARMOND:

2 Q. So your opinion is that Lee's
3 paragraph 204 mentions SOI technology and wafer
4 bonding?

5 A. A POSITA --

6 MR. BOWEN: Objection, form.

7 THE WITNESS: A POSITA would
8 understand that SOI technology is the
9 foundation upon which Lee is based, and wafer
10 bonding was one of the options to achieve its
11 objectives, which indeed were decreasing die
12 size and cost.

13 BY MS. ARMOND:

14 Q. So your opinion is that Lee's
15 paragraph 204 mentions SOI technology and wafer
16 bonding?

17 MR. BOWEN: Objection, form.

18 THE WITNESS: A POSITA would
19 understand that those -- that's the
20 foundation upon which 204 is based.

21 BY MS. ARMOND:

22 Q. Let's look at paragraph 38 of your

1 reply declaration, Exhibit 1037.

2 Let me know when you're there.

3 A. I am there.

4 Q. Do you see right above paragraph 38
5 you reproduced Lee's Figure 25A?

6 A. Yeah.

7 Q. So in paragraph 38 of your reply
8 declaration, you state, "The vertical memory cells
9 in Figure 25A lack a conductor at the top of
10 Level 2's memory cells."

11 Did I read that correctly?

12 A. Yes.

13 Q. As you reproduced Figure 25A in your
14 declaration, without that conductor on top to create
15 a circuit, no current can flow through the top NPN
16 structure in Figure 25A; correct?

17 A. That's true.

18 Q. So the top NPN structure in Figure 25A
19 could not store or retrieve a charge, as shown in
20 Figure 25A of Lee; correct?

21 A. Yeah, this is a partial fabrication.

22 So, yeah, that's -- that's true.

1 Q. Let's turn to Lee's Figure 26 in
2 Exhibit 1007. And then I'm going to ask you also
3 about Lee's paragraph 166 about that figure.

4 So let me know when you have Figure 26
5 and paragraph 166 of Lee.

6 A. Okay.

7 Q. So Figure 26 in Lee shows a top view
8 of the same structure shown in Lee's Figure 25A;
9 correct?

10 A. Yes. It's the top view of one pillar,
11 yes.

12 Q. If you look at Lee's paragraph 166, it
13 states that, "Each pillar on the first level
14 includes a separate floating gate and control gate
15 on each face of the pillar for a total of four
16 independently controllable charge storage regions as
17 shown in Figure 26."

18 Do you see that?

19 A. Yes.

20 Q. So Lee is teaching that each memory
21 cell in Figure 25A can hold four independently
22 controllable charges; correct?

1 A. Each pillar could store four charges.
2 There are technically four memory cells in each
3 pillar.

4 Q. So each NPN structure in Lee's
5 Figure 25A is actually four memory cells; correct?

6 A. Yeah, of course, they have to have a
7 certain amount of gate width to get an amount of
8 current that the sense amp could distinguish as
9 having a zero or a one. So there is a certain
10 minimum size requirement for each side of that
11 pillar.

12 The more circular one, which I think
13 is Figure 27, you obviously have a lot more gate
14 width area. So you get a much stronger signal. So
15 there's clearly a tradeoff with the signal integrity
16 and how many memory cells you're getting out of each
17 pillar.

18 Q. Do you agree that each NPN structure
19 in Lee's Figure 25A is actually four memory cells;
20 correct?

21 MR. BOWEN: Objection, form.

22 THE WITNESS: It can be. The pillar

1 has to be possibly bigger in size in order to
2 get enough surface area for each control
3 gate.

4 BY MS. ARMOND:

5 Q. But given sufficient size, Lee is
6 showing that each NPN structure in Figure 25A is
7 actually four memory cells; correct?

8 MR. BOWEN: Objection, form.

9 THE WITNESS: It teaches that as one
10 potential embodiment among others.

11 MS. ARMOND: No further questions.

12 MR. BOWEN: All right. We don't have
13 any questions either.

14 MS. ARMOND: Okay. Thank you.

15 Thank you, Dr. Sechen.

16 THE WITNESS: Okay.

17 THE VIDEOGRAPHER: The time is
18 10:20 a.m. Going off the record.

19 (Examination concluded.)

20

21

22

1 STATE OF NEW YORK)

2 ss:

3 COUNTY OF WESTCHESTER)

4 I, EILEEN MULVENNA, CSR/RMR/CRR, a
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6 Certified Realtime Reporter, and Notary Public in
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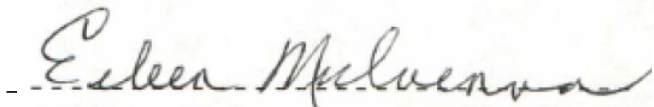
8 That I reported the taking of the
9 deposition of the witness, DR. CARL SECHEN,
10 commencing on the 10th day of July, 2024, at the
hour of 9:05 a.m.

11 That prior to being examined, the witness
was duly sworn by me to testify to the truth, the
12 whole truth, and nothing but the truth.

13 That I thereafter transcribed my said
shorthand notes into typewriting and that the
14 typewritten transcript of said deposition is a
complete, true and accurate transcription of my
15 said shorthand notes taken down at said time, and
that a request has been made to review the
transcript.

16 I further certify that I am not a relative
or employee of an attorney or counsel of any of the
17 parties, nor a relative or employee of any attorney
or counsel involved in said action, nor a person
18 financially interested in the action.

19 IN WITNESS WHEREOF, I have hereunto
set my signature this 12th day of July, 2024.

20 
21 EILEEN MULVENNA, CSR/RMR/CRR/RDR
22

1 Dr. Carl Sechen, c/o

PERKINS COIE

2 2901 N. Central Avenue, Suite 2000

Phoenix, Arizona 85012-2788

3

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Date of deposition: July 10, 2024

5 Deponent: Dr. Carl Sechen

6

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