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Transcript of Eric Bretschneider, Ph.D.

Date: July 16, 2025

Case: BOE Technology Group Co., LTD -v- Optronix Sciences LLC

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

Transcript of Eric Bretschneider, Ph.D.
Conducted on July 16, 2025

1 (1 to 4)

<p>1 UNITED STATES PATENT AND TRADEMARK OFFICE</p> <p>2 BEFORE THE PATENT TRIAL AND APPEAL BOARD</p> <p>3</p> <p>4 BOE TECHNOLOGY GROUP CO., : 5 LTD., : Inter Partes Review 6 Petitioner, : No. 7 vs. : IPR2024-01132 8 OPTRONIC SCIENCES LLC, : U.S. Patent No. 9 : 7,586,121 10 Patent Owner. : 11 -----X</p> <p>12</p> <p>13 VIDEOTAPED DEPOSITION OF ERIC BRETSCHNEIDER, Ph.D.</p> <p>14 Via Zoom Videoconference</p> <p>15 Wednesday, July 16, 2025</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22 Stenographically Reported by: 23 JUSTYNE N. JOHNSON 24 RPR, CSR. No. 14301 25 Job No. 590499 26 Pages 1 - 85</p>	<p>1 APPEARANCES:</p> <p>2</p> <p>3 FOR PETITIONER</p> <p>4 DLA PIPER, LLP (US)</p> <p>5 BY: ALAN A. LIMBACH, ESQ.</p> <p>6 Attorney at Law</p> <p>7 3203 Hanover Street</p> <p>8 Suite 100</p> <p>9 Palo Alto, California 94304-1123</p> <p>10 Alan.limbach@us.dlapiper.com</p> <p>11</p> <p>12</p> <p>13 FOR PATENT OWNER</p> <p>14 RUSS, AUGUST & KABAT</p> <p>15 BY: JEFFERSON CUMMINGS, ESQ.</p> <p>16 Attorney at Law</p> <p>17 12424 Wilshire Boulevard</p> <p>18 12th Floor</p> <p>19 Los Angeles, California 90025</p> <p>20 Jcummings@raklaw.com</p> <p>21</p> <p>22 ALSO PRESENT:</p> <p>23 Harut Akopyan, Videographer</p> <p>24</p> <p>25</p>
<p>1 The Deposition of ERIC BRETSCHNEIDER, Ph.D., was taken</p> <p>2 on behalf of Petitioner, all parties appearing remotely</p> <p>3 via Zoom videoconference, beginning at 9:00 a.m., Pacific</p> <p>4 time, on July 16, 2025, before JUSTYNE JOHNSON, RPR,</p> <p>5 Certified Shorthand Reporter No. 14301.</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p>1 INDEX</p> <p>2 WITNESS EXAMINATION</p> <p>3 ERIC BRETSCHNEIDER, Ph.D.</p> <p>4 BY MR. LIMBACH.....7</p> <p>5 BY MR. CUMMINGS.....83</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>

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2 (5 to 8)

5			7		
1	EXHIBITS		1	THE STENOGRAPHER: And my California	
2	EXHIBIT	DESCRIPTION PAGE	2	certification number is 14301.	
3	EXHIBIT 1001	United States Patent	3	Dr. Bretschneider, can you raise your right hand,	
4		Number US 7,586,121 B2,	4	please?	
5	EXHIBIT 2005	Declaration of Eric	5		
6		Bretschneider, Ph.D.	6	ERIC BRETSCHNEIDER, Ph.D.,	
7	EXHIBIT 2010	An excerpt from Wiley	7	having first been sworn by the Certified Shorthand	
8		Electrical and Electronics	8	Reporter, was examined and testified as follows:	
9	EXHIBIT 1	United States Patent	9	THE WITNESS: I do.	
10		Number US 7,226,801 B2,	10	THE STENOGRAPHER: Go ahead, Counsel.	
11	EXHIBIT 2	Application Publication	11	MR. LIMBACH: Thank you.	
12		Number US 2007/0002212 A1,	12		
13	EXHIBIT 3	United States Patent	13	EXAMINATION	
14		Application Publication	14	BY MR. LIMBACH:	
15		Number US 2009/0272977 A1,	15	Q Good morning, Dr. Bretschneider.	
16		dated November 5, 2009	16	How are you this morning?	
17	WITNESS INSTRUCTED NOT TO ANSWER		17	A Good. And you?	
18	(None)		18	Q I'm doing fine. Thank you.	
19			19	So we'll be operating under the same ground rules	
20			20	that we went over in yesterday's deposition regarding the	
21			21	'509 patent IPR. Is that okay?	
22			22	A Yes.	
23			23	Q Is there any reason you cannot give full and	
24			24	complete testimony today?	
25			25	A No.	

6			8		
1	July 16, 2025 9:00 a.m.		1	Q Do you have any printed materials with you today?	
2			2	A I have a clean hard copy of my declaration.	
3			3	Q Anything else?	
4	THE VIDEOGRAPHER: Here begins media number one		4	A That's it.	
5	in the videotaped deposition of Dr. Eric Bretschneider in		5	Q Do you have any applications open on your	
6	the matter of BOE Technology Group Co., LTD., v. Optronics		6	computer other than the Zoom window?	
7	Sciences LLC, in the United States Patent and Trademark		7	A There's an antiviral application that runs in the	
8	Office before the Patent Trial and Appeal [sic] Board,		8	background.	
9	Case Number IPR2024-01132.		9	Q Okay. How did you prepare for today's	
10	Today's date is July 16, 2025. The time on the		10	deposition?	
11	video monitor is 9:00 a.m., Pacific time. The		11	A I reviewed my declaration and also reviewed	
12	videographer today is Harut Akopyan, representing Planet		12	portions of the prior art references.	
13	Depos. All parties of this video deposition are attending		13	Q Did you meet with counsel?	
14	remotely.		14	A Last week, yes.	
15	Would counsel please voice identify themselves		15	Q Approximately how long did you meet with counsel?	
16	and state whom they represent, starting with the taking		16	A There's a series of four IPRs, and we met daily	
17	attorney.		17	for, I believe, it was four -- it was three or four days	
18	MR. LIMBACH: My name is Alan Limbach with DLA		18	last week. So it was spread out in time. It's difficult	
19	Piper. I represent BOE, the petitioner.		19	for me to say exactly how long for each IPR.	
20	MR. CUMMINGS: Jefferson Cummings with Russ,		20	Q Did you review any documents that are not listed	
21	August & Kabat, representing Optronics Sciences, patent		21	in your declaration in preparation for today's deposition?	
22	owner.		22	A No, I did not.	
23	THE VIDEOGRAPHER: The court reporter today is		23	MR. LIMBACH: Putting in the chat room	
24	Justyne Johnson, representing Planet Depos. The witness		24	Exhibit 2005, which is your declaration.	
25	will now be sworn.		25	(Exhibit 2005 was marked for identification by	

Conducted on July 16, 2025

<p>9</p> <p>1 the Certified Shorthand Reporter and is attached</p> <p>2 hereto.)</p> <p>3 BY MR. LIMBACH:</p> <p>4 Q Let me know when you have that downloaded and</p> <p>5 open.</p> <p>6 A Okay.</p> <p>7 Q Can you scroll through and confirm that this is a</p> <p>8 correct copy of your declaration for IPR of U.S. patent</p> <p>9 7,586,121?</p> <p>10 A It appears to be.</p> <p>11 Q For today, I'll be referring to that as the</p> <p>12 '121 patent. Is that all right?</p> <p>13 A Yes.</p> <p>14 Q And I'll refer to IPR2024-01132 as the</p> <p>15 '121 patent IPR. Is that all right?</p> <p>16 A Yes.</p> <p>17 Q Did you prepare this declaration?</p> <p>18 A Yes. There is a section on applicable legal</p> <p>19 standards that counsel drafted for me and I reviewed to</p> <p>20 gain an understanding of those legal standards.</p> <p>21 Q For the rest of the sections, were those written</p> <p>22 using your own words?</p> <p>23 MR. CUMMINGS: Objection. Form.</p> <p>24 THE WITNESS: There were some minor edits,</p> <p>25 but yes.</p>	<p>11</p> <p>1 Q Can you describe the order of that review?</p> <p>2 MR. CUMMINGS: Objection. Form.</p> <p>3 THE WITNESS: The review started many months ago.</p> <p>4 So it's difficult for me to say the exact order.</p> <p>5 BY MR. LIMBACH:</p> <p>6 Q Did you review the '121 patent first?</p> <p>7 MR. CUMMINGS: Objection. Form.</p> <p>8 THE WITNESS: I -- I don't recall.</p> <p>9 BY MR. LIMBACH:</p> <p>10 Q What document could you possibly have reviewed</p> <p>11 before the '121 patent?</p> <p>12 MR. CUMMINGS: Objection. Form.</p> <p>13 THE WITNESS: I'm trying to answer precisely.</p> <p>14 Because paragraph 5, I state, "I have reviewed the papers</p> <p>15 and exhibits filed in this proceeding," which I understand</p> <p>16 is this IPR. And there are -- there's parallel matter in</p> <p>17 district court that -- that's why I can't say the precise</p> <p>18 order. There's the -- what I reviewed for district court</p> <p>19 versus in this matter.</p> <p>20 BY MR. LIMBACH:</p> <p>21 Q Is there a document that you would have -- strike</p> <p>22 that.</p> <p>23 Did you review the '121 patent before being</p> <p>24 engaged?</p> <p>25 MR. CUMMINGS: Objection. Form.</p>
<p>10</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q Who was involved in drafting this declaration</p> <p>3 other than you?</p> <p>4 MR. CUMMINGS: Objection. Form.</p> <p>5 THE WITNESS: Myself and Mr. Cummings.</p> <p>6 BY MR. LIMBACH:</p> <p>7 Q As far as you know, is the declaration accurate?</p> <p>8 A There's always, inevitably, some typographical</p> <p>9 errors, but as far as I know, yes, other than that.</p> <p>10 Q When were you retained by Optronics [sic] for</p> <p>11 this IPR?</p> <p>12 A Specifically for the IPR, it's difficult for me</p> <p>13 to recall. I will say the matter between Optronics and</p> <p>14 BOE, I believe, was the end of last year.</p> <p>15 Q Do you believe you were retained sometime at the</p> <p>16 end -- near the end of last year?</p> <p>17 A Yes.</p> <p>18 Q If you can, turn to paragraph 5, please.</p> <p>19 A Okay.</p> <p>20 Q Are you there?</p> <p>21 It states, "I have reviewed the papers and</p> <p>22 exhibits filed in this proceeding as of the date of my</p> <p>23 declaration -- as of the date my declaration is signed."</p> <p>24 Do you see that?</p> <p>25 A Yes.</p>	<p>12</p> <p>1 THE WITNESS: I don't recall.</p> <p>2 BY MR. LIMBACH:</p> <p>3 Q When you consider being engaged by a law firm to</p> <p>4 render opinions, do you typically read the patent first in</p> <p>5 order to determine that you are the right candidate to do</p> <p>6 it?</p> <p>7 MR. CUMMINGS: Objection. Form.</p> <p>8 THE WITNESS: Usually, there's a complaint of</p> <p>9 some sort that is filed first, by the time I'm retained,</p> <p>10 that has summary information that gives me an</p> <p>11 understanding of the technology and issues involved. In</p> <p>12 case of an IPR, if one side has already filed a petition,</p> <p>13 then the petition, I might review first or read the</p> <p>14 expert's declaration.</p> <p>15 BY MR. LIMBACH:</p> <p>16 Q And you do that before being retained; is that</p> <p>17 right?</p> <p>18 MR. CUMMINGS: Objection. Form.</p> <p>19 THE WITNESS: I will say it's not uncommon.</p> <p>20 Again, it's been several months since I was retained in</p> <p>21 this matter.</p> <p>22 BY MR. LIMBACH:</p> <p>23 Q If you could, go to paragraph 66 of your</p> <p>24 declaration, please.</p> <p>25 A Okay.</p>

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IPR2024-01132 - BOE

Exhibit 1015 - Page 4

Conducted on July 16, 2025

<p>13</p> <p>1 Q Paragraph 66 reads, "In my opinion, the term</p> <p>2 passivation layer has a plain and ordinary meaning. It is</p> <p>3 a layer of a material that renders the surface layer below</p> <p>4 chemically passive or unreactive, especially by tying up</p> <p>5 dangling bonds."</p> <p>6 Do you see that?</p> <p>7 A Yes.</p> <p>8 Q Do -- in your opinion, do all passivation layers</p> <p>9 meet this definition?</p> <p>10 MR. CUMMINGS: Objection. Form.</p> <p>11 THE WITNESS: If we're talking about</p> <p>12 semiconductors, yes. There's a description in the</p> <p>13 paragraph about some of the issues that at the edges of</p> <p>14 the surface, you have dangling bonds. There's electrons</p> <p>15 that are in an bonding orbital that's not actually</p> <p>16 occupied. So it's free to react in one way or another.</p> <p>17 With semiconductors, you also have to worry about</p> <p>18 electrons and false charge carriers. These dangling bonds</p> <p>19 act like a surface version of an electron or a wholly</p> <p>20 charged carrier. So there can be electrical leakage,</p> <p>21 basically a small short circuit.</p> <p>22 And, also, any free dangling bonds are more</p> <p>23 reactive chemically. So passivation -- the term</p> <p>24 "passivation" literally comes from passivating surface</p> <p>25 states.</p>	<p>15</p> <p>1 THE WITNESS: I believe they would understand.</p> <p>2 But you reduced the ability or propensity for the surface</p> <p>3 to react. If I want to be more technical, you've reduced</p> <p>4 the activity coefficient. It's impossible to make</p> <p>5 something completely unreactive, even noble gases, which</p> <p>6 at the entry level of chemistry, are taught as unreactive,</p> <p>7 can be made to react under certain extreme conditions.</p> <p>8 But you've done your best to keep it from reacting.</p> <p>9 You've significantly reduced the ability for it to</p> <p>10 chemically react.</p> <p>11 You could say it's inert, but, again, there's --</p> <p>12 there's a footnote to that. Anything can be made to react</p> <p>13 under extreme conditions.</p> <p>14 BY MR. LIMBACH:</p> <p>15 Q So is there any difference in your definition</p> <p>16 between chemically passive and chemically unreactive? Are</p> <p>17 they kind of synonym -- synonyms of the same thing?</p> <p>18 MR. CUMMINGS: Objection. Form.</p> <p>19 THE WITNESS: I believe that's what I was</p> <p>20 stating. There -- it's different words for the same</p> <p>21 thing.</p> <p>22 BY MR. LIMBACH:</p> <p>23 Q Okay.</p> <p>24 A You don't want a chemical reaction happening.</p> <p>25 Q In your definition, you say, "especially by tying</p>
<p>14</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q So if I understand your testimony, when it comes</p> <p>3 to semiconductors, all passivation layers meet your</p> <p>4 definition; is that right?</p> <p>5 MR. CUMMINGS: Objection. Form.</p> <p>6 THE WITNESS: That would be the understanding of</p> <p>7 a person of ordinary skill in the art.</p> <p>8 BY MR. LIMBACH:</p> <p>9 Q What does "chemically passive" mean in your</p> <p>10 definition?</p> <p>11 MR. CUMMINGS: Objection. Form.</p> <p>12 THE WITNESS: It's, I believe, fairly</p> <p>13 self-explanatory. As I state, "Surface layer below is</p> <p>14 chemically passive or unreactive." So passive and un --</p> <p>15 it's passive or unreactive, you can switch those terms</p> <p>16 around.</p> <p>17 BY MR. LIMBACH:</p> <p>18 Q Okay. What does "unreactive" mean other than</p> <p>19 passive? Unreactive, meaning it doesn't react to</p> <p>20 something else. If the --</p> <p>21 A I--</p> <p>22 Q -- jury or -- or the board wants to know what</p> <p>23 unreactive means, what would you tell them?</p> <p>24 A I--</p> <p>25 MR. CUMMINGS: Objection. Form.</p>	<p>16</p> <p>1 up dangling bonds." But I don't see that -- the dangling</p> <p>2 bonds in your -- in the definition that you quote from</p> <p>3 Exhibit 2010 at 556. You -- you quote that definition</p> <p>4 there, but it doesn't mention dangling bonds.</p> <p>5 Why did you include dangling bonds in your</p> <p>6 definition?</p> <p>7 MR. CUMMINGS: Objection. Form.</p> <p>8 THE WITNESS: It's a clarification for how it</p> <p>9 renders the material underneath the surface chemically</p> <p>10 passive and unreactive. Also, the field of art is</p> <p>11 semiconductors, and, again, those dangling bonds are</p> <p>12 surface electrical states.</p> <p>13 BY MR. LIMBACH:</p> <p>14 Q Is tying up dangling bonds required for a layer</p> <p>15 to be a passivation layer?</p> <p>16 MR. CUMMINGS: Objection. Form.</p> <p>17 THE WITNESS: It's a strange question because, if</p> <p>18 they're still dangling bonds, they're still surface</p> <p>19 states. It's still chemically reactive -- more reactive</p> <p>20 than the bulk material.</p> <p>21 BY MR. LIMBACH:</p> <p>22 Q I don't understand why you think it's a strange</p> <p>23 question.</p> <p>24 I'm just asking you, if I -- do all passivation</p> <p>25 layers have to tie up dangling bonds?</p>

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<p>17</p> <p>1 MR. CUMMINGS: Objection. Form.</p> <p>2 THE WITNESS: I'm trying to be precise because</p> <p>3 the general field of technology is semiconductors and</p> <p>4 semiconductor processing here. So in that context, that's</p> <p>5 what passivation layers do.</p> <p>6 Now, if you want to talk about a passivation</p> <p>7 layer in some other field of technology, I can't answer</p> <p>8 that. So, again, I'm trying to be as precise as possible.</p> <p>9 BY MR. LIMBACH:</p> <p>10 Q For a passivation layer -- for a layer to be a</p> <p>11 passivation layer in the field of semiconductor devices,</p> <p>12 does that layer have to tie up dangling bonds?</p> <p>13 MR. CUMMINGS: Objection. Form.</p> <p>14 THE WITNESS: If it doesn't, it hasn't passivated</p> <p>15 the surface underneath. So if -- by definition, it</p> <p>16 wouldn't be a passivation layer.</p> <p>17 BY MR. LIMBACH:</p> <p>18 Q So I believe the answer would be yes to my</p> <p>19 question?</p> <p>20 MR. CUMMINGS: Objection. Form.</p> <p>21 THE WITNESS: Correct.</p> <p>22 BY MR. LIMBACH:</p> <p>23 Q In paragraph 66, I believe you were -- you just</p> <p>24 quoted language in the middle of that paragraph, but you</p> <p>25 talk about dangling bonds on the surface of semiconductor</p>	<p>19</p> <p>1 that ties up the dangling bonds of the metal, you'd call</p> <p>2 that a passivation layer; is that right?</p> <p>3 MR. CUMMINGS: Objection. Form.</p> <p>4 THE WITNESS: Yes.</p> <p>5 BY MR. LIMBACH:</p> <p>6 Q How about if I form the metal layer -- I'm sorry.</p> <p>7 How about if I form the passivation layer first and then I</p> <p>8 deposit the metal on top of it? Is -- is that layer</p> <p>9 passivating the metal?</p> <p>10 MR. CUMMINGS: Objection. Form.</p> <p>11 THE WITNESS: I haven't considered that. And,</p> <p>12 again, your -- where I have an issue is you're defining a</p> <p>13 passivation layer by itself. That's where I'm struggling.</p> <p>14 You -- you call it a passivation layer, but there's</p> <p>15 nothing that it's -- it's tying up anything with. So</p> <p>16 then, by definition, it can't be a passivation layer. So</p> <p>17 the -- the process sequence is more than strange and</p> <p>18 unusual.</p> <p>19 BY MR. LIMBACH:</p> <p>20 Q Let me try and clarify.</p> <p>21 If I have a metal and I put down a layer of</p> <p>22 material that passivates that metal, do you call it a</p> <p>23 passivation layer; correct?</p> <p>24 MR. CUMMINGS: Objection. Form.</p> <p>25 THE WITNESS: Yes.</p>
<p>18</p> <p>1 crystals.</p> <p>2 Do you recall that?</p> <p>3 A Yes.</p> <p>4 Q Does a layer have to contact the semiconductor</p> <p>5 crystal surface in order to be a passivation layer?</p> <p>6 MR. CUMMINGS: Objection. Form.</p> <p>7 THE WITNESS: Passivation layers apply to</p> <p>8 polycrystalline and amorphous materials as well. It</p> <p>9 doesn't have to be a semiconductor either. In some cases,</p> <p>10 it could be used for metals.</p> <p>11 BY MR. LIMBACH:</p> <p>12 Q Is it possible to form a passivation layer --</p> <p>13 strike that.</p> <p>14 In the context of semiconductor devices, is it</p> <p>15 possible to form the passivation layer first and then the</p> <p>16 layer that's being passivated second?</p> <p>17 MR. CUMMINGS: Objection. Form.</p> <p>18 THE WITNESS: Just trying to analyze that</p> <p>19 logically, if I deposit a layer -- I can't call it a</p> <p>20 passivation layer if the material that's passivated isn't</p> <p>21 present. That's why it's a strange question.</p> <p>22 BY MR. LIMBACH:</p> <p>23 Q Let me -- let me try and clarify.</p> <p>24 If I have a metal and then I put down a -- what</p> <p>25 you believe is a passivation layer, you put a layer on it</p>	<p>20</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q If I take that same layer that was the</p> <p>3 passivation layer and I form that first and then I put the</p> <p>4 metal on top of it, would it passivate the metal and be --</p> <p>5 and fit your definition of passivation layer?</p> <p>6 MR. CUMMINGS: Objection. Form.</p> <p>7 THE WITNESS: I'm going to say I haven't</p> <p>8 considered that. But at the beginning of paragraph 66, my</p> <p>9 definition, "a layer of material that renders the surface</p> <p>10 layer below." So now you're talking about a surface layer</p> <p>11 above. So there's a contradiction with my definition.</p> <p>12 But I'll say I haven't considered this scenario.</p> <p>13 So I can't really express an opinion on that.</p> <p>14 BY MR. LIMBACH:</p> <p>15 Q Okay. And where I'm going with this is, is the</p> <p>16 passivation -- the science of the passivation part of the</p> <p>17 formation process? In other words, when you're depositing</p> <p>18 the layer on top of the metal, is it that process that is</p> <p>19 tying up the dangling bonds? Or is it just because</p> <p>20 they're in physical contact with each other?</p> <p>21 MR. CUMMINGS: Objection. Form.</p> <p>22 THE WITNESS: Excuse me. In paragraph 71, I talk</p> <p>23 more about passivation layers, specifically inorganic</p> <p>24 ones. They're either formed in situ or deposited by a</p> <p>25 sputtering or evaporation process, which, essentially,</p>

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Conducted on July 16, 2025

<p style="text-align: right;">21</p> <p>1 bombards a surface with free atoms or clusters of atoms 2 that react to form the passivation layer on the surface. 3 BY MR. LIMBACH: 4 Q Right. And I was looking at that paragraph, and 5 I was trying to figure out if the passivation -- the 6 science of the passivation that's happening is because the 7 material that's being passivated is formed first and the 8 formation or deposition of the layer on top of it, that 9 process is what makes it a passivation layer. 10 MR. CUMMINGS: Objection. Form. 11 THE WITNESS: There has to be an interaction 12 between the atomic bombs at the surface. And the reason 13 your prior question about the sequence is extremely 14 complicated is what's happened in between. Okay? If I've 15 deposited a layer, for example, silicon nitride, what have 16 I done before I put something else on it? 17 But this clarification, I think, is fairly clear. 18 You have to have interaction between atoms and surface 19 states, dangling bonds, or clusters of atoms. You have to 20 be able to form -- there's actually a -- a reaction that 21 occurs at the surface -- at the -- sorry -- at the 22 interface. 23 BY MR. LIMBACH: 24 Q And does that reaction depend upon which of those 25 two layers is formed first?</p>	<p style="text-align: right;">23</p> <p>1 Do you recall that? 2 A Yes. 3 Q The second sentence says, "used, for instance, to 4 protect from oxidation, contamination, and other perils of 5 harsh environments." 6 Do you see that? 7 A Yes. 8 Q To protect from harsh environments, is it 9 required that the passivation layer render the surface 10 layer below chemically passive or unreactive? 11 MR. CUMMINGS: Objection. Form. 12 THE WITNESS: If the layer below is chemically 13 reactive, then there's going to be an issue with reactions 14 in potentially any environment. 15 BY MR. LIMBACH: 16 Q So to protect from harsh environments, is it 17 required that the passivation layer tie up dangling bonds? 18 MR. CUMMINGS: Objection. Form. 19 THE WITNESS: The dangling bonds are what make 20 the surface chemically reactive. The question doesn't 21 make sense from that point. If you don't tie up the 22 dangling bonds, it's chemically reactive. If it's not 23 chemically reactive, you've tied up the dangling bonds. 24 BY MR. LIMBACH: 25 Q Can the prediction that's in this definition be</p>
<p style="text-align: right;">22</p> <p>1 MR. CUMMINGS: Objection. Form. 2 THE WITNESS: The best I can say is it depends on 3 a lot of things. There's an enormous number of ways to 4 deposit films. That's, again, where your question gets 5 complicated. You just say, well, I put down the metal 6 second. Well, how you put it down is going to have an 7 effect on a lot of things. The typical process in 8 semiconductors is the passivation layer is applied 9 afterwards and it passivates the surface underneath. 10 BY MR. LIMBACH: 11 Q I'm putting in the chat room Exhibit 2010, the 12 Wiley Dictionary cited in your declaration. When you 13 get -- please download it, open that, and let me know when 14 you're ready to go. 15 (Exhibit 2010 was marked for identification by 16 the Certified Shorthand Reporter and is attached 17 hereto.) 18 THE WITNESS: Okay. 19 BY MR. LIMBACH: 20 Q If you go to the -- see, page fif- -- 556 and 21 find the definition of passivation. It's on the left 22 column about halfway down, I believe. 23 A Okay. 24 Q This is a definition you cited in support of your 25 construction.</p>	<p style="text-align: right;">24</p> <p>1 provided simply by the fact that the layer covers the 2 surface layer below to prevent exposure from harsh 3 environments? 4 MR. CUMMINGS: Objection. Form. 5 THE WITNESS: There's a problem. If you nearly 6 cover the layer, doesn't -- you can think of channeling 7 effects. If there's not a chemical bond, something could 8 get between the layers. It can continue diffusing at that 9 interface, and you can't restrict it or control it. 10 BY MR. LIMBACH: 11 Q So you believe that when this definition says 12 "protect from harsh environments," you do not believe that 13 that encompasses a layer that serves as a barrier to those 14 harsh environments. Is that fair? 15 MR. CUMMINGS: Objection. Form. 16 THE WITNESS: The issue is if I just put a layer 17 down, there's edges somewhere, and you're supposed to make 18 the surface chemically unreactive. If I cover it, it's 19 still reactive. Again, we're talking about 20 semiconductors. If I cover it and I haven't tied up those 21 dangling bonds, now I still have electrically active 22 surface states. I've basically built short circuits, 23 electrical short circuits into my device or potentially 24 done that. So -- 25 ///</p>

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Conducted on July 16, 2025

<p>25</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q So --</p> <p>3 A -- it's not going to be passivated.</p> <p>4 Q So for the definition of "passivation layer," it</p> <p>5 has to be complete passivation -- complete protection from</p> <p>6 the harsh environment? Is that your testimony?</p> <p>7 MR. CUMMINGS: Objection. Form.</p> <p>8 THE WITNESS: No. There has to be a reaction at</p> <p>9 the surface to tie up dangling bonds. I already said, in</p> <p>10 a harsh enough environment, anything will react. Well,</p> <p>11 outside normal expectations, I can throw things into a</p> <p>12 plasma furnace and burn everything up, everything reacts.</p> <p>13 The temperature gets high enough, everything reacts.</p> <p>14 The passivation is intended for certain</p> <p>15 conditions. There are harsh environments that are</p> <p>16 realistic and expected, and then there are the extreme</p> <p>17 that I can make anything react.</p> <p>18 BY MR. LIMBACH:</p> <p>19 Q The last sentence of the definition says, "Two</p> <p>20 common techniques are glassivation and oxide passivation."</p> <p>21 Do you see that?</p> <p>22 A Yes.</p> <p>23 Q What is glassivation?</p> <p>24 MR. CUMMINGS: Objection. Form.</p> <p>25 THE WITNESS: There's a relationship there.</p>	<p>27</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q What is oxide passivation?</p> <p>3 MR. CUMMINGS: Objection. Form.</p> <p>4 THE WITNESS: It's deposition of a passivation</p> <p>5 layer that's an oxide material.</p> <p>6 BY MR. LIMBACH:</p> <p>7 Q So any time you form an oxide on silicon, it</p> <p>8 would passivate the silicon?</p> <p>9 MR. CUMMINGS: Objection. Form.</p> <p>10 THE WITNESS: There would be some caveats to</p> <p>11 that. It would depend upon the thickness, the coverage,</p> <p>12 the way it's being formed.</p> <p>13 BY MR. LIMBACH:</p> <p>14 Q Is it possible to deposit an oxide on silicon and</p> <p>15 not have it passivate the si- -- silicon?</p> <p>16 MR. CUMMINGS: Objection. Form.</p> <p>17 THE WITNESS: I haven't formed an opinion on</p> <p>18 that.</p> <p>19 MR. LIMBACH: You see the -- can we go off the</p> <p>20 record for a second?</p> <p>21 THE VIDEOGRAPHER: Off the record at --</p> <p>22 THE WITNESS: Fine with me.</p> <p>23 THE VIDEOGRAPHER: -- 9:36 a.m.</p> <p>24 (Off the record.)</p> <p>25 THE VIDEOGRAPHER: Back on record at 9:36 a.m.</p>
<p>26</p> <p>1 Glasses can be formed in different ways, but you're</p> <p>2 basically using a glassy material.</p> <p>3 BY MR. LIMBACH:</p> <p>4 Q You're forming a glassy material over the layer</p> <p>5 that you're passivating; is that right?</p> <p>6 MR. CUMMINGS: Objection. Form.</p> <p>7 THE WITNESS: Well, a -- there's a glass material</p> <p>8 and a part of where -- there's some redundancy. Glass is</p> <p>9 an oxide. It's primarily silicon dioxide. You can add</p> <p>10 different materials to it to change some of the</p> <p>11 properties, but it's still primarily an oxide.</p> <p>12 BY MR. LIMBACH:</p> <p>13 Q And so you're forming -- so glassivation is the</p> <p>14 formation of glass over the surface layer that you're</p> <p>15 passivating. Is that fair?</p> <p>16 A I'm just pointing out that if I say "oxide</p> <p>17 passivation," that includes glass.</p> <p>18 Q But to answer my question, glassivation is</p> <p>19 forming glass over the surface area that you're -- over</p> <p>20 the surface layer that you're passivating; is that right?</p> <p>21 MR. CUMMINGS: Objection. Form.</p> <p>22 THE WITNESS: To a large extent, it's different</p> <p>23 terms for the same basic process. I may be using</p> <p>24 something other than silicon oxide. Oxide passivation</p> <p>25 includes something other than silicon dioxide.</p>	<p>28</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q Are you familiar with the term "thermal</p> <p>3 oxidation"?</p> <p>4 MR. CUMMINGS: Objection. Form.</p> <p>5 THE WITNESS: Yes.</p> <p>6 BY MR. LIMBACH:</p> <p>7 Q My understanding of it -- and you can correct</p> <p>8 me -- is that you thermally grow the oxide on, say,</p> <p>9 silicon.</p> <p>10 Is that accurate at a high level?</p> <p>11 MR. CUMMINGS: Objection. Form.</p> <p>12 THE WITNESS: There's dry oxidation and wet</p> <p>13 oxidation processes.</p> <p>14 BY MR. LIMBACH:</p> <p>15 Q If you perform thermal oxidation on silicon, does</p> <p>16 that always passivate the silicon?</p> <p>17 MR. CUMMINGS: Objection. Form.</p> <p>18 THE WITNESS: Again, it would depend on the</p> <p>19 specifics of the process.</p> <p>20 BY MR. LIMBACH:</p> <p>21 Q Is it possible to form a thermal oxide and not</p> <p>22 passivate the silicon?</p> <p>23 MR. CUMMINGS: Objection. Form.</p> <p>24 THE WITNESS: Again, the best I can say, it</p> <p>25 depends on the process conditions.</p>

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Conducted on July 16, 2025

<p style="text-align: right;">29</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q So is it possible to set the process conditions</p> <p>3 so that the silicon is not passivated?</p> <p>4 MR. CUMMINGS: Objection. Form.</p> <p>5 THE WITNESS: I'll try to back out at a high</p> <p>6 level. The way thermal oxidation works is you start with</p> <p>7 a clean or a hydrogen-terminated silicon surface. You</p> <p>8 start introducing an oxygen species. It could be oxygen.</p> <p>9 It could be a plasma, or it could be water. Most -- two</p> <p>10 most typical are oxygen or water. That's the dry versus</p> <p>11 the wet. And those oxygen-containing species start</p> <p>12 reacting at the surface and forming silicon dioxide --</p> <p>13 silicon oxide, if you will.</p> <p>14 The layer grows, but at some point at the initial</p> <p>15 stage, the layer hasn't even coalesced. It's not even</p> <p>16 uniform in that case or, to the surface, don't have</p> <p>17 anything on them. It's also a necessary requirement, the</p> <p>18 conditions have to be suitable to allow oxygen to</p> <p>19 penetrate to further react at that oxide-silicon</p> <p>20 interface.</p> <p>21 So, again, without reviewing the process</p> <p>22 conditions, you can't say. But that's how thermal</p> <p>23 oxidation works, and that's why it's complicated.</p> <p>24 If I do a one-second thermal oxidation, I may not</p> <p>25 have any oxide on the surface. If I do ten hours, then</p>	<p style="text-align: right;">31</p> <p>1 A Yes.</p> <p>2 Q Okay. Any other textbooks?</p> <p>3 A That's one I know I looked at. There's others</p> <p>4 I'm -- might have looked at, but I'm hesitant to say</p> <p>5 because I'm not sure if I did.</p> <p>6 Q And going back to dictionaries, do you recall</p> <p>7 doing any searching for other dictionary definitions other</p> <p>8 than the Wiley Dictionary?</p> <p>9 MR. CUMMINGS: Objection. Form.</p> <p>10 THE WITNESS: The Wiley Dictionary's pretty on</p> <p>11 with the understanding of a person of ordinary skill in</p> <p>12 the art, anyone who's familiar with semiconductor</p> <p>13 processing.</p> <p>14 BY MR. LIMBACH:</p> <p>15 Q So you had a comfort level with the Wiley</p> <p>16 Dictionary, and you did not search for any other</p> <p>17 dictionaries; is that fair?</p> <p>18 MR. CUMMINGS: Objection. Form.</p> <p>19 THE WITNESS: I don't recall specifically</p> <p>20 searching other dictionaries. But, again, passivation is</p> <p>21 a technical term. So the Wiley Dictionary was</p> <p>22 appropriate.</p> <p>23 BY MR. LIMBACH:</p> <p>24 Q Going back to your declaration, second -- third</p> <p>25 line -- well, technically, fourth line from the bottom of</p>
<p style="text-align: right;">30</p> <p>1 there's another story. Somewhere in between, that's where</p> <p>2 there's the condition. That's why your question doesn't</p> <p>3 really have a -- a firm answer, is it depends. If I don't</p> <p>4 put down a complete layer, then I can't have passivated</p> <p>5 the surface. It also depends on what the silicon is. Is</p> <p>6 it crystal and silicon? Is it polycrystalline? Is it</p> <p>7 amorphous? Is it pour silicon?</p> <p>8 BY MR. LIMBACH:</p> <p>9 Q Did you find the Wiley Dictionary yourself? Or</p> <p>10 was that provided to you?</p> <p>11 MR. CUMMINGS: Objection. Form.</p> <p>12 THE WITNESS: I believe this is my copy. At the</p> <p>13 bottom, I -- the tabs I have from other citations I use</p> <p>14 frequently, other definitions I've used frequently.</p> <p>15 BY MR. LIMBACH:</p> <p>16 Q Did you search other dictionaries for the</p> <p>17 definition of passivation?</p> <p>18 MR. CUMMINGS: Objection. Form.</p> <p>19 THE WITNESS: I don't recall other dictionaries.</p> <p>20 I do recall looking at some textbooks.</p> <p>21 BY MR. LIMBACH:</p> <p>22 Q Do you remember which textbooks those were?</p> <p>23 A The Sze reference -- I don't know if I cited that</p> <p>24 here. S-z-e.</p> <p>25 Q S-z-e; is that right?</p>	<p style="text-align: right;">32</p> <p>1 paragraph 66, you say, "In other words, a passivation</p> <p>2 layer forms chemical bonds with the surface."</p> <p>3 Do you see that?</p> <p>4 A Yes.</p> <p>5 Q How does forming chemical bonds with the surface</p> <p>6 differ, if at all, with your definition of rendering the</p> <p>7 surface layer below chemically passive or unreactive?</p> <p>8 MR. CUMMINGS: Objection. Form.</p> <p>9 THE WITNESS: If you've formed chemical bonds</p> <p>10 with the surface, you've tied up dangling bonds.</p> <p>11 BY MR. LIMBACH:</p> <p>12 Q Paragraph 66, next sentence, "In my opinion, this</p> <p>13 definition is consistent with the '121 patent's disclosure</p> <p>14 of a passivation silicon nitride layer."</p> <p>15 Do you see that?</p> <p>16 A Yes.</p> <p>17 Q And there you cite Exhibit 1001, column 5, lines</p> <p>18 34 through 36.</p> <p>19 Do you see that?</p> <p>20 A Yes.</p> <p>21 Q Why did you select just that portion of the</p> <p>22 '121 patent and not any others?</p> <p>23 MR. CUMMINGS: Objection. Form.</p> <p>24 THE WITNESS: I don't recall. But passivation</p> <p>25 silicon nitride layer is what it is. A person of ordinary</p>

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Conducted on July 16, 2025

<p>33</p> <p>1 skill in the art understands, if you say it's a</p> <p>2 passivation silicon nitride layer, they know the material,</p> <p>3 they know what it's supposed to do.</p> <p>4 MR. LIMBACH: Putting in the chat room</p> <p>5 Exhibit 1001, which is U.S. Patent Number 7,586,121.</p> <p>6 (Exhibit 1001 was marked for identification by</p> <p>7 the Certified Shorthand Reporter and is attached</p> <p>8 hereto.)</p> <p>9 BY MR. LIMBACH:</p> <p>10 Q Let me know when you have that open -- downloaded</p> <p>11 and opened.</p> <p>12 A Okay.</p> <p>13 Okay.</p> <p>14 Q If you can go to column 5, lines 34 through 36,</p> <p>15 which you quoted, it says, "a layer of passivation silicon</p> <p>16 nitride" and then in parentheses "(SiN) 212 formed over</p> <p>17 ILD 208 and second metal patterns 210A and 210B."</p> <p>18 That's the quoted language from your declaration;</p> <p>19 is that right?</p> <p>20 A Yes.</p> <p>21 Q What is ILD?</p> <p>22 MR. CUMMINGS: Objection. Form.</p> <p>23 THE WITNESS: I think it would stand for</p> <p>24 interlayer dielectric.</p> <p>25 ///</p>	<p>35</p> <p>1 MR. CUMMINGS: Objection. Form.</p> <p>2 THE WITNESS: Again, I haven't formed an opinion</p> <p>3 on that.</p> <p>4 BY MR. LIMBACH:</p> <p>5 Q So you can't tell me sitting here today?</p> <p>6 MR. CUMMINGS: Objection. Form.</p> <p>7 THE WITNESS: Trying to be specific. Just</p> <p>8 haven't formed an opinion on that.</p> <p>9 BY MR. LIMBACH:</p> <p>10 Q If you look at nitride layer 212, it's also</p> <p>11 formed on the second metal patterns 210A and 210B; is that</p> <p>12 right?</p> <p>13 MR. CUMMINGS: Objection. Form.</p> <p>14 THE WITNESS: Yes, that's what's in the passage I</p> <p>15 cited.</p> <p>16 BY MR. LIMBACH:</p> <p>17 Q Is the silicon nitride 212 rendering the metal</p> <p>18 below chemically passive or unreactive?</p> <p>19 MR. CUMMINGS: Objection. Form.</p> <p>20 THE WITNESS: I don't think I expressed an</p> <p>21 opinion on that.</p> <p>22 BY MR. LIMBACH:</p> <p>23 Q Sitting here today, can you tell me?</p> <p>24 MR. CUMMINGS: Objection. Form.</p> <p>25 THE WITNESS: Again, I'd have to review the</p>
<p>34</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q And what is an "interlayer dielectric"?</p> <p>3 MR. CUMMINGS: Objection. Form.</p> <p>4 THE WITNESS: It's a dielectric between -- seeing</p> <p>5 here -- the most common right -- here it is -- in between</p> <p>6 the electrodes of capacitor.</p> <p>7 BY MR. LIMBACH:</p> <p>8 Q Can you give me some examples of materials that</p> <p>9 it used as ILD?</p> <p>10 MR. CUMMINGS: Objection. Form.</p> <p>11 THE WITNESS: Silicon nitride tends to be</p> <p>12 preferred because it has a high dielectric constant.</p> <p>13 BY MR. LIMBACH:</p> <p>14 Q It's u- -- it's an insulating material?</p> <p>15 MR. CUMMINGS: Objection. Form.</p> <p>16 THE WITNESS: More particularly, it's a</p> <p>17 dielectric material.</p> <p>18 BY MR. LIMBACH:</p> <p>19 Q Does the passivation silicon nitride 212</p> <p>20 passivate the ILD?</p> <p>21 MR. CUMMINGS: Objection. Form.</p> <p>22 THE WITNESS: I don't think I've formed or</p> <p>23 expressed an opinion on that.</p> <p>24 BY MR. LIMBACH:</p> <p>25 Q Sitting here today, do you know?</p>	<p>36</p> <p>1 patent and consider the situation.</p> <p>2 BY MR. LIMBACH:</p> <p>3 Q Does the silicon nitride 212 tie up dangling</p> <p>4 bonds of the metal patterns 210A, 210B?</p> <p>5 MR. CUMMINGS: Objection. Form.</p> <p>6 THE WITNESS: Could you repeat the question?</p> <p>7 BY MR. LIMBACH:</p> <p>8 Q Sure. Does the silicon nitride 212 tie up</p> <p>9 dangling bonds of the metal patterns 210A and 210B?</p> <p>10 MR. CUMMINGS: Objection. Form.</p> <p>11 THE WITNESS: I, again, haven't formed an opinion</p> <p>12 on that. Silicon nitride can be used to passivate metal</p> <p>13 surfaces, but in the context of the patent, I haven't</p> <p>14 reviewed that and haven't formed an opinion.</p> <p>15 BY MR. LIMBACH:</p> <p>16 Q If you go to the bottom of the same page, 24,</p> <p>17 paragraph 67, please.</p> <p>18 A Okay.</p> <p>19 Q 67 says, "In my opinion, the plain and ordinary</p> <p>20 meaning of the term 'capping layer,' as it is used in the</p> <p>21 '121 patent, is a layer of hard material to protect a</p> <p>22 layer underneath."</p> <p>23 Do you see that?</p> <p>24 A Yes.</p> <p>25 Q Does the '121 patent say the capping layer is</p>

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IPR2024-01132 - BOE

Exhibit 1015 - Page 10

Conducted on July 16, 2025

<p>37</p> <p>1 made of hard material?</p> <p>2 MR. CUMMINGS: Objection. Form.</p> <p>3 THE WITNESS: Silicon nitride's a hard material.</p> <p>4 BY MR. LIMBACH:</p> <p>5 Q So as --</p> <p>6 A (Indiscernible.)</p> <p>7 Q Oh, I'm sorry. Didn't mean to interrupt.</p> <p>8 A It -- it's a ceramic.</p> <p>9 Q So it gives an example of a hard material, but it</p> <p>10 doesn't say it's a hard material; is that right?</p> <p>11 MR. CUMMINGS: Objection. Form.</p> <p>12 THE WITNESS: It's what they list as an exemplary</p> <p>13 capping material.</p> <p>14 BY MR. LIMBACH:</p> <p>15 Q Now, the -- the passivation layer's also silicon</p> <p>16 nitride; yes?</p> <p>17 MR. CUMMINGS: Objection. Form.</p> <p>18 THE WITNESS: Yes.</p> <p>19 BY MR. LIMBACH:</p> <p>20 Q So is the passivation layer also a capping layer?</p> <p>21 MR. CUMMINGS: Objection. Form.</p> <p>22 THE WITNESS: The passivation layer's not on top.</p> <p>23 So there's a difference in the '121 patent. They're</p> <p>24 distinct components.</p> <p>25 ///</p>	<p>39</p> <p>1 THE WITNESS: No. The passivation layer is a</p> <p>2 passivation layer.</p> <p>3 BY MR. LIMBACH:</p> <p>4 Q Is it also a capping layer?</p> <p>5 MR. CUMMINGS: Objection. Form.</p> <p>6 THE WITNESS: I don't think a person of ordinary</p> <p>7 skill in the art would consider it to be a capping layer.</p> <p>8 BY MR. LIMBACH:</p> <p>9 Q Why not?</p> <p>10 MR. CUMMINGS: Objection. Form.</p> <p>11 THE WITNESS: Among other things, the device</p> <p>12 isn't done. I -- I can't stop halfway through and say I'm</p> <p>13 capping things when I'm not even done.</p> <p>14 BY MR. LIMBACH:</p> <p>15 Q Well, you're not done when you put the capping</p> <p>16 layer down; right?</p> <p>17 MR. CUMMINGS: Objection. Form.</p> <p>18 THE WITNESS: What's above the capping layer are</p> <p>19 the organic layers for light emission. So you're done</p> <p>20 with the active matrix part.</p> <p>21 BY MR. LIMBACH:</p> <p>22 Q So are you saying that the capping layer is</p> <p>23 limited to the active matrix part?</p> <p>24 MR. CUMMINGS: Objection. Form.</p> <p>25 THE WITNESS: I'm saying what it's capping.</p>
<p>38</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q When you say that "the passivation layer is not</p> <p>3 on top," it's on top of other layers; yes?</p> <p>4 MR. CUMMINGS: Objection. Form.</p> <p>5 THE WITNESS: It's on top of other layers, yes.</p> <p>6 BY MR. LIMBACH:</p> <p>7 Q And there are layers on top of the capping layer;</p> <p>8 correct?</p> <p>9 MR. CUMMINGS: Objection. Form.</p> <p>10 BY MR. LIMBACH:</p> <p>11 Q Feel free to go to page 10 of your declaration.</p> <p>12 You have a colorized version of figure 2 that assists your</p> <p>13 review.</p> <p>14 A I'm just making sure the numbers, but thank you.</p> <p>15 Q Not a memory contest.</p> <p>16 A There are other layers on top, yes.</p> <p>17 Q Okay. So the capping layer and the passivation</p> <p>18 layer are kind of in the middle of the layer stack, as</p> <p>19 shown in figure 2; right?</p> <p>20 MR. CUMMINGS: Objection. Form.</p> <p>21 THE WITNESS: There are layers above and below</p> <p>22 both of them.</p> <p>23 BY MR. LIMBACH:</p> <p>24 Q So is the passivation layer a capping layer?</p> <p>25 MR. CUMMINGS: Objection. Form.</p>	<p>40</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q Well --</p> <p>3 A It has -- it has a function and purpose.</p> <p>4 Q Well, the function and purpose in your definition</p> <p>5 is "a layer of hard material to protect the layer</p> <p>6 underneath."</p> <p>7 Isn't the -- isn't the passivation layer made of</p> <p>8 hard material?</p> <p>9 MR. CUMMINGS: Objection. Form.</p> <p>10 THE WITNESS: It is.</p> <p>11 BY MR. LIMBACH:</p> <p>12 Q And doesn't it protect the layers underneath?</p> <p>13 MR. CUMMINGS: Objection. Form.</p> <p>14 THE WITNESS: That's not its function. It has</p> <p>15 other layers on top of it. So, again, you're trying to</p> <p>16 split apart a component. And that's not appropriate if</p> <p>17 you're trying to define these terms to figure out their</p> <p>18 function.</p> <p>19 BY MR. LIMBACH:</p> <p>20 Q So in order to determine if a layer's a capping</p> <p>21 layer, you have to consider its function?</p> <p>22 MR. CUMMINGS: Objection. Form.</p> <p>23 THE WITNESS: You've been talking about a</p> <p>24 dielectric layer, that it serves as a dielectric. That's</p> <p>25 its purpose, its function. If you only want to look at</p>

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Conducted on July 16, 2025

<p style="text-align: right;">41</p> <p>1 the composition of layers and try to determine the</p> <p>2 function without looking at the entire structure, I would</p> <p>3 say you're probably going to make some mistakes.</p> <p>4 BY MR. LIMBACH:</p> <p>5 Q So in order to determine whether a layer is a</p> <p>6 capping layer, you have to look at the entire structure</p> <p>7 and all the functions of each layer to make that</p> <p>8 determination?</p> <p>9 MR. CUMMINGS: Objection. Form.</p> <p>10 THE WITNESS: I'm going to say, if you look at a</p> <p>11 layer out of the context of the device structure, you're</p> <p>12 not going to understand the purpose of a layer. You will</p> <p>13 know the layer, you will know the composition, but if you</p> <p>14 take it out of context, it's like anything, if you take it</p> <p>15 out of context, you're likely to make mistakes.</p> <p>16 BY MR. LIMBACH:</p> <p>17 Q So what context do you have to consider to come</p> <p>18 to the conclusion that the passivation layer is not also a</p> <p>19 capping layer?</p> <p>20 MR. CUMMINGS: Objection. Form.</p> <p>21 THE WITNESS: It's the purpose of the layer.</p> <p>22 It's a passivation layer.</p> <p>23 BY MR. LIMBACH:</p> <p>24 Q Is it not --</p> <p>25 A It's --</p>	<p style="text-align: right;">43</p> <p>1 MR. LIMBACH: How hard.</p> <p>2 THE WITNESS: It would depend on the</p> <p>3 requirements. But if you want a capping layer, you want</p> <p>4 something that's reasonably durable or capable of</p> <p>5 protection.</p> <p>6 BY MR. LIMBACH:</p> <p>7 Q Would the '121 patent tell us how hard the</p> <p>8 material has to be to be the capping layer?</p> <p>9 MR. CUMMINGS: Objection. Form.</p> <p>10 THE WITNESS: It gives an example of silicon</p> <p>11 nitride and states the purpose of the layer, that it's a</p> <p>12 capping layer.</p> <p>13 BY MR. LIMBACH:</p> <p>14 Q But does the capping layer, in your opinion, have</p> <p>15 to be at least as hard as silicon nitride?</p> <p>16 MR. CUMMINGS: Objection. Form.</p> <p>17 THE WITNESS: I haven't formed an opinion on</p> <p>18 that. And I think I expressed that in my declaration, and</p> <p>19 I don't believe that was in the petition either.</p> <p>20 BY MR. LIMBACH:</p> <p>21 Q Is the hardness that is required by the capping</p> <p>22 layer relative to the hardness of the material it's</p> <p>23 protecting?</p> <p>24 MR. CUMMINGS: Objection. Form.</p> <p>25 THE WITNESS: I would say it's relative to its</p>
<p style="text-align: right;">42</p> <p>1 Q -- (indiscernible)?</p> <p>2 A It -- it's job is to passivate.</p> <p>3 Q If it also protects, does it also -- can it also</p> <p>4 be capping layer? Can it be both?</p> <p>5 MR. CUMMINGS: Objection. Form.</p> <p>6 THE WITNESS: I'm just struggling because the</p> <p>7 patent clearly defines it -- refers to it as a passivation</p> <p>8 layer. It doesn't say it passivates and caps. So it's a</p> <p>9 peculiar question.</p> <p>10 BY MR. LIMBACH:</p> <p>11 Q I'm trying to think.</p> <p>12 A It seems to be outside the scope and teachings of</p> <p>13 the patent.</p> <p>14 Q Well, I'm just trying to figure out if that layer</p> <p>15 meets your definition of capping layer.</p> <p>16 MR. CUMMINGS: Objection. Form.</p> <p>17 BY MR. LIMBACH:</p> <p>18 Q And I think the answer is "no."</p> <p>19 A It's a passivation layer, is all I can say.</p> <p>20 Q How hard must the material be for a layer to be a</p> <p>21 capping layer?</p> <p>22 MR. CUMMINGS: Objection. Form.</p> <p>23 THE WITNESS: That --</p> <p>24 THE STENOGRAPHER: Counsel, did you say "how</p> <p>25 far"?</p>	<p style="text-align: right;">44</p> <p>1 ability to serve as a capping layer.</p> <p>2 BY MR. LIMBACH:</p> <p>3 Q The capping layer hardness has to be harder than</p> <p>4 the material that it's protecting?</p> <p>5 MR. CUMMINGS: Objection. Form.</p> <p>6 THE WITNESS: If it's softer than the material</p> <p>7 it's protecting, then I will say it would seem obvious</p> <p>8 that it would not do a very good job protecting.</p> <p>9 BY MR. LIMBACH:</p> <p>10 Q It has to be harder than the material it's</p> <p>11 protecting?</p> <p>12 MR. CUMMINGS: Objection. Form.</p> <p>13 THE WITNESS: That is related to the function.</p> <p>14 The scenario you presented, though, if I put a soft</p> <p>15 material over a hard material, does the soft material --</p> <p>16 is it capable of protecting? Again, that's just a very</p> <p>17 peculiar one. The hardness of material is related to the</p> <p>18 function serving as a capping layer. That's the best I</p> <p>19 can state.</p> <p>20 BY MR. LIMBACH:</p> <p>21 Q Can you go back up to figure 2 on page 10 of your</p> <p>22 declaration?</p> <p>23 A Okay.</p> <p>24 Q Capping layer is the black layer that is 2- --</p> <p>25 it's hard to read -- 2- -- is that 216?</p>

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<p style="text-align: right;">45</p> <p>1 A 216. That's described in paragraph 30.</p> <p>2 Q And then it's formed mostly on layer 212;</p> <p>3 correct?</p> <p>4 A In this view?</p> <p>5 Q Yes.</p> <p>6 A In this cross section, yes. Sorry. I was</p> <p>7 confirming.</p> <p>8 Q Is the capping layer serving to protect the</p> <p>9 passivation layer of 212?</p> <p>10 MR. CUMMINGS: Objection. Form.</p> <p>11 THE WITNESS: I think a person of ordinary skill</p> <p>12 in the art would understand that among other things that</p> <p>13 it's protecting ITO pattern 214C.</p> <p>14 BY MR. LIMBACH:</p> <p>15 Q Okay. But I was asking about passivation</p> <p>16 layer 212.</p> <p>17 Does the capping layer provide protection for</p> <p>18 cap -- for passivation layer 212?</p> <p>19 MR. CUMMINGS: Objection. Form.</p> <p>20 THE WITNESS: I haven't considered that. My</p> <p>21 declaration is primarily responsive to Dr. -- I believe --</p> <p>22 is it Neikirk or Neikirk? I want to get his name</p> <p>23 correct --</p> <p>24 BY MR. LIMBACH:</p> <p>25 Q I think it's Neikirk.</p>	<p style="text-align: right;">47</p> <p>1 MR. CUMMINGS: Objection. Form.</p> <p>2 THE WITNESS: That's what I state.</p> <p>3 MR. LIMBACH: I think now would be a good time</p> <p>4 for a break. We can go off the record.</p> <p>5 THE WITNESS: Okay.</p> <p>6 THE VIDEOGRAPHER: Going off the record at</p> <p>7 10:11 a.m.</p> <p>8 (Off the record.)</p> <p>9 THE VIDEOGRAPHER: We are back on record at</p> <p>10 10:20 a.m.</p> <p>11 BY MR. LIMBACH:</p> <p>12 Q Welcome back, Dr. Bretschneider.</p> <p>13 A Thank you.</p> <p>14 Q Did you speak with anyone or communicate with</p> <p>15 anyone during the break?</p> <p>16 A No.</p> <p>17 Q Let's resume at paragraph 68, please, of your</p> <p>18 declaration.</p> <p>19 A Okay.</p> <p>20 Q The second sentence of 68 says, "in my</p> <p>21 opinion" -- strike that.</p> <p>22 This section is where you address Challenge 1</p> <p>23 based on the Anzai reference.</p> <p>24 Does that sound right?</p> <p>25 A Yes.</p>
<p style="text-align: right;">46</p> <p>1 A -- Dr. Neikirk's declaration. And he didn't</p> <p>2 express an opinion on that. So I didn't consider it and</p> <p>3 haven't formed an opinion on it.</p> <p>4 Q Don't blame me if it turns out it's Neikirk, by</p> <p>5 the way.</p> <p>6 Okay. If you could go back to paragraph 67, in</p> <p>7 line 3, it says, "It may be thought of as similar to a</p> <p>8 hard cap that can be worn to protect the head."</p> <p>9 Do you see that?</p> <p>10 A Yes.</p> <p>11 Q Are all caps worn by the head hard?</p> <p>12 MR. CUMMINGS: Objection. Form.</p> <p>13 THE WITNESS: Again, I'm -- sorry, not again.</p> <p>14 Trying to just offer an analogy. If you have a hard hat,</p> <p>15 that's protecting your head. That's similar to the</p> <p>16 function of a capping layer.</p> <p>17 BY MR. LIMBACH:</p> <p>18 Q Not all caps that you wear on your head are hard.</p> <p>19 Fair?</p> <p>20 MR. CUMMINGS: Objection. Form.</p> <p>21 THE WITNESS: There are caps that are not hard.</p> <p>22 BY MR. LIMBACH:</p> <p>23 Q So that's why you didn't say it -- it's not as</p> <p>24 similar as a cap on the head; you had to put in the word</p> <p>25 "hard" in front of cap to qualify it; correct?</p>	<p style="text-align: right;">48</p> <p>1 Q And you say, "In my opinion, these references</p> <p>2 fail to disclose the limitations regarding planarization</p> <p>3 layer and capping layer, which are relevant to Claim 3."</p> <p>4 Do you see that?</p> <p>5 A Yes.</p> <p>6 Q And when you say "these references," I'm assuming</p> <p>7 that's this reference?</p> <p>8 A Yes.</p> <p>9 Q Not trying to nitpick on type. I just want to</p> <p>10 make sure that I understand what you're referring to. It</p> <p>11 was pretty obvious to me.</p> <p>12 So if you go down to 71, paragraph 71, it says,</p> <p>13 "The planarizing film may have an organic resin, if not a</p> <p>14 passivation layer."</p> <p>15 Do you see that?</p> <p>16 A Yes.</p> <p>17 Q Is your opinion based upon the fact that the</p> <p>18 material's organic or because it's a resin or both?</p> <p>19 MR. CUMMINGS: Objection to form.</p> <p>20 THE WITNESS: The Anzai reference only talked</p> <p>21 about organic resins, and that's where there are issues.</p> <p>22 An organic resin doesn't act to passivate a surface.</p> <p>23 BY MR. LIMBACH:</p> <p>24 Q Is your opinion that the organic resin of Anzai</p> <p>25 does not passivate because it's made of an organic</p>

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<p style="text-align: right;">49</p> <p>1 material?</p> <p>2 MR. CUMMINGS: Objection. Form.</p> <p>3 THE WITNESS: Again, organic resins don't react.</p> <p>4 They don't tie up dangling bonds at the surface. And,</p> <p>5 therefore, they don't passivate.</p> <p>6 BY MR. LIMBACH:</p> <p>7 Q Do any organic compounds passivate?</p> <p>8 MR. CUMMINGS: Objection. Form.</p> <p>9 THE WITNESS: I haven't considered that, and I</p> <p>10 don't think Dr. Neikirk gave any opinions on that. I</p> <p>11 think he was paraphrasing here. It's an insulating</p> <p>12 material. So it's a passivation layer. I'd have to</p> <p>13 review his declaration to make sure, but that was the --</p> <p>14 my recollection.</p> <p>15 BY MR. LIMBACH:</p> <p>16 Q If the same organic material in Anzai was formed</p> <p>17 but not in resin form, would your opinion change?</p> <p>18 MR. CUMMINGS: Objection. Form.</p> <p>19 THE WITNESS: Anzai's material is a resin. So if</p> <p>20 you're saying it's not in resin form, then it's not</p> <p>21 Anzai's material.</p> <p>22 BY MR. LIMBACH:</p> <p>23 Q Correct. I'm asking you, if the material were</p> <p>24 not in resin form, would it passivate?</p> <p>25 MR. CUMMINGS: Objection. Form.</p>	<p style="text-align: right;">51</p> <p>1 THE WITNESS: I haven't considered that, and I</p> <p>2 don't think Dr. Neikirk did either. He just assumed that</p> <p>3 Anzai's material worked.</p> <p>4 BY MR. LIMBACH:</p> <p>5 Q So you have no opinion on whether organic</p> <p>6 coatings have to be in resin form at any time?</p> <p>7 MR. CUMMINGS: Objection. Form.</p> <p>8 THE WITNESS: Again, as we discussed, my</p> <p>9 declaration is responsive to Dr. Neikirk. Dr. Neikirk</p> <p>10 pointed to an organic resin material. That's what's</p> <p>11 taught by Anzai. So your question's outside of the realm</p> <p>12 of what I've considered and formed opinions on.</p> <p>13 BY MR. LIMBACH:</p> <p>14 Q You're unwilling to render that opinion now?</p> <p>15 MR. CUMMINGS: Objection. Form.</p> <p>16 THE WITNESS: It would take a significant amount</p> <p>17 of time to review and consider.</p> <p>18 BY MR. LIMBACH:</p> <p>19 Q Starting at line 2 -- in the middle of line 2, it</p> <p>20 says, "The chemical compounds that form organic resin are</p> <p>21 organic molecules that do not have any free or unbonded</p> <p>22 electrons capable of reacting with and passivating the</p> <p>23 surface."</p> <p>24 Do you see that?</p> <p>25 A Yes.</p>
<p style="text-align: right;">50</p> <p>1 THE WITNESS: So you're asking, if the material</p> <p>2 wasn't the material, would it passivate? Is that a fair</p> <p>3 paraphrase of your question?</p> <p>4 BY MR. LIMBACH:</p> <p>5 Q Let me ask you this: What's a resin?</p> <p>6 MR. CUMMINGS: Objection. Form.</p> <p>7 THE WITNESS: It's a liquid material that</p> <p>8 hardens.</p> <p>9 BY MR. LIMBACH:</p> <p>10 Q So if there was a way to form the organic</p> <p>11 material in hard form without being a resin first, would</p> <p>12 that change your opinion?</p> <p>13 MR. CUMMINGS: Objection. Form.</p> <p>14 THE WITNESS: Where I'm struggling, the material</p> <p>15 is applied as a resin. It's a liquid material. It's easy</p> <p>16 to spread. When a resin cures, there is chemical</p> <p>17 reactions between the molecules of the resin. If it's not</p> <p>18 a resin, then it's already a hard material, and I have no</p> <p>19 way to coat it. So I'm kind of stuck at that -- that's</p> <p>20 where -- when you say it's not a resin form, well, if it's</p> <p>21 not a resin form, the rest of your question's irrelevant</p> <p>22 because it can't be applied as a coating.</p> <p>23 BY MR. LIMBACH:</p> <p>24 Q Are all organic coatings formed as a resin?</p> <p>25 MR. CUMMINGS: Objection. Form.</p>	<p style="text-align: right;">52</p> <p>1 Q So it's the organic molecules themselves that</p> <p>2 don't have the capability to passivate a surface? Am I</p> <p>3 understanding that correctly?</p> <p>4 MR. CUMMINGS: Objection. Form.</p> <p>5 THE WITNESS: It's the components of the resins.</p> <p>6 BY MR. LIMBACH:</p> <p>7 Q And you talk about the organic molecules. So the</p> <p>8 organic molecules of a resin are incapable of passivating</p> <p>9 the surface. Is that fair?</p> <p>10 MR. CUMMINGS: Objection. Form.</p> <p>11 THE WITNESS: As I state, "The chemical compounds</p> <p>12 that form organic resins are organic molecules and do not</p> <p>13 have any free or unbonded electrons capable of reacting</p> <p>14 with and passivating the surface." It's a molecule.</p> <p>15 The -- it's not a network solid. A "molecular solid"</p> <p>16 would be the more correct term.</p> <p>17 BY MR. LIMBACH:</p> <p>18 Q But it's your opinion that no matter what organic</p> <p>19 material Anzai selects for that planarization layer, the</p> <p>20 material cannot serve as a passivation layer?</p> <p>21 MR. CUMMINGS: Objection. Form.</p> <p>22 THE WITNESS: It's my opinion that the teachings</p> <p>23 of Anzai and the understanding and opinions expressed by</p> <p>24 doc -- by Dr. Neikirk say those materials are not -- you</p> <p>25 can't call them passivation layers.</p>

<p>53</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q No matter what organic material is selected; is</p> <p>3 that right?</p> <p>4 MR. CUMMINGS: Objection. Form.</p> <p>5 THE WITNESS: You're saying no matter what</p> <p>6 organic material, but Anzai talks about using organic</p> <p>7 resins, which is a much smaller range of selection of</p> <p>8 materials.</p> <p>9 BY MR. LIMBACH:</p> <p>10 Q Okay.</p> <p>11 A So you're -- you're asking kind of an unbalanced</p> <p>12 question. It has --</p> <p>13 Q You mean --</p> <p>14 A -- to be an organic resin that can be applied in</p> <p>15 its film formation. It's a resin. It's a liquid</p> <p>16 that's -- at a very high level, you'd pour it on the</p> <p>17 surface and let it flow out. A little more complicated,</p> <p>18 but that's the basic science. Pour a liquid and let it</p> <p>19 spread.</p> <p>20 Q Let me rephrase my question, then.</p> <p>21 It doesn't matter what organic resin material</p> <p>22 Anzai selects; it cannot passivate; is that right?</p> <p>23 MR. CUMMINGS: Objection. Form.</p> <p>24 THE WITNESS: Anzai didn't give any examples of</p> <p>25 materials that would function for passivation, and you're</p>	<p>55</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q Sitting here today, you can't answer my question?</p> <p>3 MR. CUMMINGS: Objection. Form.</p> <p>4 THE WITNESS: Sitting here today, I haven't</p> <p>5 considered the question and haven't formed an opinion.</p> <p>6 BY MR. LIMBACH:</p> <p>7 Q Do you recall, earlier, I asked you about</p> <p>8 searching dictionary definitions for passivation layer?</p> <p>9 A Yes.</p> <p>10 Q Did you also research -- do any research on the</p> <p>11 use of passivation layer by POSITAs in the field of</p> <p>12 semiconductor manufacturing?</p> <p>13 MR. CUMMINGS: Objection. Form.</p> <p>14 THE WITNESS: Again, my declaration's responsive</p> <p>15 to Dr. Neikirk.</p> <p>16 BY MR. LIMBACH:</p> <p>17 Q So you didn't do any --</p> <p>18 A He didn't -- he didn't propose any materials. I</p> <p>19 didn't have a reason to do work outside the scope of my</p> <p>20 task.</p> <p>21 MR. LIMBACH: Placing into the chat room what I</p> <p>22 will mark as Exhibit 1, which is U.S. patent 7,226,801.</p> <p>23 (Exhibit 1 was marked for identification by the</p> <p>24 Certified Shorthand Reporter and is attached hereto.)</p> <p>25 ///</p>
<p>54</p> <p>1 saying, no matter what they select, but Anzai didn't</p> <p>2 select. Anzai said it's an organic resin. And Anzai's</p> <p>3 not even using it for passivation. It's for</p> <p>4 planarization, which puts even more constraints on. I</p> <p>5 want something that flows very well. It's a low</p> <p>6 viscosity.</p> <p>7 BY MR. LIMBACH:</p> <p>8 Q When you rendered an opinion that the Anzai</p> <p>9 organic resin cannot passivate, that would include all</p> <p>10 organic resins that POSITAs could possibly have selected</p> <p>11 using the teachings of Anzai; correct?</p> <p>12 MR. CUMMINGS: Objection. Form.</p> <p>13 THE WITNESS: I'm unaware of an organic resin</p> <p>14 used as a planarization film that would serve as a</p> <p>15 passivation layer. Dr. Neikirk did not give any specific</p> <p>16 examples. He took a very large leap of faith.</p> <p>17 BY MR. LIMBACH:</p> <p>18 Q Is it possible to form a layer of organic</p> <p>19 material, not in resin form, that passivates?</p> <p>20 MR. CUMMINGS: Objection. Form.</p> <p>21 THE WITNESS: You're asking a question that's</p> <p>22 outside the scope of my declaration, Dr. Niekler's [sic]</p> <p>23 opinions, and also the Anzai reference. So I haven't</p> <p>24 considered that.</p> <p>25 ///</p>	<p>56</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q Please download the patent, and let me know when</p> <p>3 you have it available.</p> <p>4 A Yes, sir.</p> <p>5 Okay.</p> <p>6 Q Do you recognize this patent?</p> <p>7 A This patent's the subject of another IPR in this</p> <p>8 matter.</p> <p>9 Q And you rendered an opinion for this patent in</p> <p>10 that matter?</p> <p>11 A Yes.</p> <p>12 Q And if you go down on the left-hand side, do you</p> <p>13 see where it says the assignee is AU Optronics Corp.</p> <p>14 [sic]?</p> <p>15 A Yes.</p> <p>16 Q And that's the same original assignee as the</p> <p>17 '121 patent; correct?</p> <p>18 MR. CUMMINGS: Objection. Form.</p> <p>19 THE WITNESS: It appears to be.</p> <p>20 BY MR. LIMBACH:</p> <p>21 Q And you've rendered opinions on the '801 patents</p> <p>22 in this other IPR proceeding that included both claim</p> <p>23 obstruction, anticipation, and obviousness.</p> <p>24 Do you recall that?</p> <p>25 MR. CUMMINGS: Objection. Form.</p>

<p>57</p> <p>1 THE WITNESS: I believe I did. But this is</p> <p>2 outside the scope of my declaration, what I prepared for,</p> <p>3 and Dr. Neikirk did not consider this as well.</p> <p>4 BY MR. LIMBACH:</p> <p>5 Q Is it fair to say that you're familiar with this</p> <p>6 patent?</p> <p>7 MR. CUMMINGS: Objection. Form.</p> <p>8 THE WITNESS: I've spent time reviewing it.</p> <p>9 BY MR. LIMBACH:</p> <p>10 Q If we go to column 2, line 47, please.</p> <p>11 A Okay.</p> <p>12 Q So it says, "Any predetermined material layer,</p> <p>13 such as a silicon nitride layer 242, is formed on the TFT</p> <p>14 array substrate 232, serving as a passivation layer.</p> <p>15 Alternatively, the passivation layer can be -- can</p> <p>16 comprise silicon oxynitride, silicon oxide, organic</p> <p>17 dielectric layer, or a combination thereof."</p> <p>18 Do you see that?</p> <p>19 A Yes.</p> <p>20 Q So, here, they're saying the -- an organic</p> <p>21 dielectric layer can serve as a passivation layer; right?</p> <p>22 MR. CUMMINGS: Objection. Form.</p> <p>23 THE WITNESS: I have to point out, the language</p> <p>24 here is organic dielectric, not organic resin. And,</p> <p>25 again, this is outside the scope of my declaration. This</p>	<p>59</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q Can an organic resin be an organic dielectric</p> <p>3 layer?</p> <p>4 MR. CUMMINGS: Objection. Form.</p> <p>5 THE WITNESS: In general, organic materials could</p> <p>6 be used as a dielectric, but they have a lower dielectric</p> <p>7 constant than inorganic materials. There's a reason</p> <p>8 silicon nitride's preferred, and that's related to its</p> <p>9 high dielectric constant.</p> <p>10 BY MR. LIMBACH:</p> <p>11 Q So is the answer to my question "yes"?</p> <p>12 MR. CUMMINGS: Objection. Form.</p> <p>13 THE WITNESS: Could you repeat the question?</p> <p>14 BY MR. LIMBACH:</p> <p>15 Q Sure. Can an organic resin be an organic</p> <p>16 dielectric layer?</p> <p>17 A It could serve that purpose.</p> <p>18 Q Did you research any other patents assigned to</p> <p>19 AU Optronics Corp. [sic] on the issue of passivation</p> <p>20 layer?</p> <p>21 MR. CUMMINGS: Objection. Form.</p> <p>22 THE WITNESS: The references I reviewed in</p> <p>23 relations to this matter are listed in my declaration.</p> <p>24 BY MR. LIMBACH:</p> <p>25 Q Did you search any patents assigned to</p>
<p>58</p> <p>1 is a --</p> <p>2 BY MR. LIMBACH:</p> <p>3 Q What is a --</p> <p>4 A -- separate matter.</p> <p>5 Q Isn't an organic resin an organic dielectric?</p> <p>6 MR. CUMMINGS: Objection. Form.</p> <p>7 THE WITNESS: Not necessarily. And, again, this</p> <p>8 is outside the scope of the opinions in my declaration,</p> <p>9 outside the scope of Dr. Neikirk's declaration as well.</p> <p>10 BY MR. LIMBACH:</p> <p>11 Q Did you consider this passage when forming your</p> <p>12 opinion on the meaning of passivation layer?</p> <p>13 MR. CUMMINGS: Objection. Form.</p> <p>14 THE WITNESS: This is, again, not within the</p> <p>15 scope for the IPR we're discussing today. That's a</p> <p>16 separate matter, and I believe there is another time to</p> <p>17 discuss that.</p> <p>18 BY MR. LIMBACH:</p> <p>19 Q Is the answer "no"?</p> <p>20 MR. CUMMINGS: Objection. Form.</p> <p>21 THE WITNESS: Again, my declaration and opinions</p> <p>22 are responsive to Dr. Neikirk. And Dr. Neikirk did not</p> <p>23 consider this reference. So I did not, in this matter,</p> <p>24 have a reason to consider that patent.</p> <p>25 ///</p>	<p>60</p> <p>1 AU Optronic Corp. for this issue?</p> <p>2 MR. CUMMINGS: Objection. Form.</p> <p>3 THE WITNESS: Again, the references I considered</p> <p>4 are listed in my declaration.</p> <p>5 BY MR. LIMBACH:</p> <p>6 Q I'm not asking you about what you considered.</p> <p>7 I'm asking whether you performed the search in the first</p> <p>8 place.</p> <p>9 MR. CUMMINGS: Objection. Form.</p> <p>10 THE WITNESS: You're asking a question that,</p> <p>11 again, is outside the scope of my stated opinions.</p> <p>12 BY MR. LIMBACH:</p> <p>13 Q I believe they are within the scope of your</p> <p>14 stated opinions because you did certain -- you reviewed</p> <p>15 certain materials.</p> <p>16 I'm asking if you searched for certain materials</p> <p>17 to render the opinions in your -- related to passivation</p> <p>18 layer.</p> <p>19 MR. CUMMINGS: Objection. Form.</p> <p>20 THE WITNESS: I can state I did not do a search</p> <p>21 on patents originally assigned to AU Optronics [sic],</p> <p>22 which is, I believe, your question.</p> <p>23 BY MR. LIMBACH:</p> <p>24 Q Do you have any reason to dispute the inventors</p> <p>25 of the '801 patent when they say that an organic</p>

Conducted on July 16, 2025

<p>61</p> <p>1 dielectric layer can be a passivation layer?</p> <p>2 MR. CUMMINGS: Objection. Form.</p> <p>3 THE WITNESS: Again, we're here talking about a</p> <p>4 different IPR and related to the '121 patent, and that's</p> <p>5 what I'm prepared to discuss today. That's what I</p> <p>6 prepared for.</p> <p>7 BY MR. LIMBACH:</p> <p>8 Q Do you have any reason to believe that the</p> <p>9 statement that the passivation layer can be an organic</p> <p>10 dielectric layer in the '801 patent is wrong?</p> <p>11 MR. CUMMINGS: Objection. Form.</p> <p>12 THE WITNESS: Again, my opinions related to the</p> <p>13 '121 patent are stated in my declaration. And, again,</p> <p>14 you're asking about something that Dr. Neikirk didn't</p> <p>15 consider. And I will reiterate, my declaration was</p> <p>16 responsive to Dr. Neikirk. So the fact that Dr. Neikirk</p> <p>17 didn't do something, I had no reason to base any opinions</p> <p>18 on something he didn't consider.</p> <p>19 BY MR. LIMBACH:</p> <p>20 Q I'm asking you, sitting here today, do you have</p> <p>21 any reason to believe that the statement in the</p> <p>22 '801 patent that the passivation layer can be an organic</p> <p>23 dielectric layer is wrong?</p> <p>24 MR. CUMMINGS: Objection. Form.</p> <p>25 THE WITNESS: Sitting here today, I'm stating I'm</p>	<p>63</p> <p>1 BY MR. LIMBACH:</p> <p>2 Q The name is the same, but the address is -- or</p> <p>3 the location is a little different?</p> <p>4 A It looks like it. So I can only point that out.</p> <p>5 I can't comment. There's a slight difference.</p> <p>6 Q Can you please turn to paragraph 22, and let me</p> <p>7 know when you have that on your screen.</p> <p>8 A Okay.</p> <p>9 Q The last sentence -- this is the last three</p> <p>10 lines. It says, "A thick passivation layer 350 is formed</p> <p>11 to cover the surface of the insulating layer 340,</p> <p>12 preferably an organic layer with a thickness of 3 to</p> <p>13 4 microns."</p> <p>14 Do you see that?</p> <p>15 A Yes.</p> <p>16 Q So, here, they're saying that an organic layer</p> <p>17 can be a passivation layer; correct?</p> <p>18 MR. CUMMINGS: Objection. Form.</p> <p>19 THE WITNESS: It's not clear because you've read</p> <p>20 one sentence out of a patent I don't recall seeing before</p> <p>21 today. So I'm not sure of the exact context.</p> <p>22 BY MR. LIMBACH:</p> <p>23 Q Is an organic resin an organic layer?</p> <p>24 MR. CUMMINGS: Objection. Form.</p> <p>25 THE WITNESS: An organic resin is an organic</p>
<p>62</p> <p>1 prepared to discuss my opinions related to the '801 patent</p> <p>2 on the -- during the deposition from the '801 patent.</p> <p>3 MR. LIMBACH: Just uploaded to the chat room</p> <p>4 Exhibit -- what I'll mark as Exhibit 2. It's U.S. patent</p> <p>5 publication 20070002212.</p> <p>6 (Exhibit 2 was marked for identification by the</p> <p>7 Certified Shorthand Reporter and is attached hereto.)</p> <p>8 BY MR. LIMBACH:</p> <p>9 Q Please le- -- let me know when you have this</p> <p>10 downloaded and up -- and opened.</p> <p>11 A Okay.</p> <p>12 Q Do you recall seeing this document before?</p> <p>13 A It doesn't look familiar.</p> <p>14 Q On the cover page, do you see who the assignee</p> <p>15 is?</p> <p>16 A Kun-Hong Chen, Taipei County, Taiwan.</p> <p>17 Q Who does the inventor -- I was asking about the</p> <p>18 assignee.</p> <p>19 A Oh, sorry. AU Optonics Corporation [sic].</p> <p>20 Q Okay. And that's the same original assignee as</p> <p>21 the '121 patent?</p> <p>22 MR. CUMMINGS: Objection. Form.</p> <p>23 THE WITNESS: I would say, presumably. There is</p> <p>24 a slight difference. This one says "Hsinchu 300," as</p> <p>25 opposed to just Hsinchu, Taiwan.</p>	<p>64</p> <p>1 material.</p> <p>2 BY MR. LIMBACH:</p> <p>3 Q An organic layer?</p> <p>4 MR. CUMMINGS: Objection.</p> <p>5 THE WITNESS: An organic -- an organic resin is</p> <p>6 an organic material. That's the precise answer to your</p> <p>7 question. What shape it has, I have no idea. If it's</p> <p>8 sitting in a jug, no.</p> <p>9 BY MR. LIMBACH:</p> <p>10 Q There are --</p> <p>11 A If there was a solid chunk or a ball, no.</p> <p>12 Q Is the organic resin in the Anzai reference an</p> <p>13 organic layer?</p> <p>14 A Yes.</p> <p>15 Q Do you have any reason to believe, without</p> <p>16 reviewing the rest of the patent, that this sentence in</p> <p>17 the '212 patent saying that the passivation layer can be</p> <p>18 organic layer is wrong?</p> <p>19 MR. CUMMINGS: Objection. Form.</p> <p>20 THE WITNESS: I have no reason to offer any</p> <p>21 opinion on the patent I haven't seen before a few minutes</p> <p>22 ago. Again, Dr. Neikirk didn't consider this, and my</p> <p>23 opinions and declaration are responsive to his</p> <p>24 declaration.</p> <p>25 MR. LIMBACH: I am uploading another document</p>

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IPR2024-01132 - BOE

Exhibit 1015 - Page 17

Conducted on July 16, 2025

<p>65</p> <p>1 marked as Exhibit 3. This is U.S. patent publication 2 20090272977. 3 (Exhibit 3 was marked for identification by the 4 Certified Shorthand Reporter and is attached hereto.) 5 BY MR. LIMBACH: 6 Q If you could please download and open that 7 document, please, it would be great. 8 A Okay. 9 Q Have you seen this document before? 10 A It doesn't look familiar. 11 Q On the left-hand side, do you see who the 12 original assignee was? 13 A Yes. 14 Q And who is that? 15 A AU Optronics Corporation [sic]. 16 Q And that's the same original assignee as the 17 '121 patent? 18 MR. CUMMINGS: Objection. Form. 19 THE WITNESS: Presumably. 20 BY MR. LIMBACH: 21 Q If you could please go to paragraph 30, and let 22 me know when you have that on your screen. 23 A Okay. 24 Q It says, "As shown in figures 1 and 2G, a 25 passivation layer 130 is formed over the substrate 100 to</p>	<p>67</p> <p>1 resin could contain organic compounds. The issue is their 2 resin is a mixture. So it's not a compound. 3 BY MR. LIMBACH: 4 Q Is it possible that the references by these 5 AU Optronics patents with respect to a passivation layer, 6 could they simply be referring to a physical barrier for 7 protection without the use of any chemical bonding? 8 MR. CUMMINGS: Objection. Form. 9 THE WITNESS: Again, I can't provide an opinion 10 of documents I haven't seen before or had a chance to 11 review. 12 BY MR. LIMBACH: 13 Q Did you, in forming your opinions in this case, 14 see any dictionary definitions that define passivation 15 layer as one that was providing envi- -- environmental 16 protection without chemical bonding? 17 MR. CUMMINGS: Objection. Form. 18 THE WITNESS: Not that I recall. 19 BY MR. LIMBACH: 20 Q If you could, go to paragraph 77 of your 21 declaration. 22 A Okay. 23 Q This is where you begin offering an opinion that 24 there's no motivation to combine Anzai and Yamazaki as it 25 relates to Challenge 2 and, in particular, Claim 4; is</p>
<p>66</p> <p>1 cover the aforementioned structures. In one preferred 2 embodiment, the passivation layer 130 is fabricated from a 3 material, including silicon oxide, silicon nitride, 4 silicon oxynitride, or an organic compound, for example." 5 Do you see that? 6 A Yes. 7 Q Do you have any reason to believe that that is 8 inaccurate? 9 MR. CUMMINGS: Objection. Form. 10 THE WITNESS: Again, I can't offer any opinions 11 on the document I haven't seen before other than to state 12 I haven't seen it. I haven't reviewed it. Apparently, 13 Dr. Neikirk hasn't seen it or reviewed it. Or if he did, 14 he didn't think it was relevant. 15 BY MR. LIMBACH: 16 Q Is a layer of organic resin, as contemplated by 17 Anzai, an organic compound? 18 MR. CUMMINGS: Objection. Form. 19 THE WITNESS: That question doesn't have a clear 20 answer, not a yes-or-no answer. 21 BY MR. LIMBACH: 22 Q Can a layer of organic resin, as contemplated by 23 Anzai, be an organic compound? 24 MR. CUMMINGS: Objection. Form. 25 THE WITNESS: The best I could say is that the</p>	<p>68</p> <p>1 that right? 2 A Yes. 3 Q And, specifically, you opine that it would not 4 have been obvious to use silicon nitride for one of the 5 planarization layers 17 and 19 of Anzai. 6 Is that your opinion? 7 A Yes. I state -- I note that Anzai explicitly 8 teaches that planarization layer is an organic resin. And 9 I've stated, "would have realized that this was a suitable 10 material for the purposes of Anzai's teachings. In other 11 words, a POSITA would not have looked for alternate 12 materials for planarization layer 17." 13 And then Dr. Neikirk is relying on hindsight in 14 reaching his conclusion. 15 Q Okay. Well, let's start with layer 17, because 16 Claim 4 says just one of the two layers have to be silicon 17 nitride; is that right? 18 MR. CUMMINGS: Objection. Form. 19 THE WITNESS: Claim 4, reading from the patent, 20 states, "the device of Claim 3, wherein at least one of 21 the passivation layer and the capping layer is comprised 22 of silicon nitride." 23 BY MR. LIMBACH: 24 Q So if we go to your -- well, let's -- let's start 25 with layer 17. That's the Anzai. That's the organic</p>

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Conducted on July 16, 2025

<p style="text-align: right;">69</p> <p>1 resin; correct?</p> <p>2 A That's... organic -- I state, Anzai teaches using</p> <p>3 a silicon nitride film elsewhere in its structure but</p> <p>4 explicitly teaches using an organic resin material for</p> <p>5 planarization layer 17.</p> <p>6 Q So that was a direct --</p> <p>7 A I don't see a direct -- I don't see a direct</p> <p>8 quote from Anzai, but just stating what's there.</p> <p>9 Q So your opinion is that Anzai teaches</p> <p>10 planarization layer 17 is made out of an organic resin; is</p> <p>11 that fair?</p> <p>12 A That's what Anzai explicitly teaches, yes.</p> <p>13 Q Why wouldn't you use silicon nitride for</p> <p>14 planarization layer 17?</p> <p>15 MR. CUMMINGS: Objection. Form.</p> <p>16 THE WITNESS: There's no reason to change. Anzai</p> <p>17 teaches that an organic resin is suitable. The literal</p> <p>18 way -- there's a few different ways, depending on the size</p> <p>19 of the display, what you're putting planarization on, that</p> <p>20 you could do it.</p> <p>21 On a silicon wafer, it's a -- basically, around</p> <p>22 substrate. So you drop some on and spin it. It's</p> <p>23 literally spin coating. It's that simple.</p> <p>24 For displays which have a rectangular format,</p> <p>25 there are a few different options for doing it. You could</p>	<p style="text-align: right;">71</p> <p>1 MR. LIMBACH: Is it cheaper, easier, and higher</p> <p>2 yield? Absolutely.</p> <p>3 BY MR. LIMBACH:</p> <p>4 Q So if you wanted to improve upon the flatness of</p> <p>5 the organic resin technique, you would look to silicon</p> <p>6 nitride as a solution?</p> <p>7 MR. CUMMINGS: Objection. Form.</p> <p>8 THE WITNESS: If you want to improve on the</p> <p>9 flatness of a planarization layer, then you didn't create</p> <p>10 a planarization layer.</p> <p>11 BY MR. LIMBACH:</p> <p>12 Q Let's talk about layer 19.</p> <p>13 Why would it not have been obvious to use silicon</p> <p>14 nitride for layer 19?</p> <p>15 MR. CUMMINGS: Objection. Form.</p> <p>16 THE WITNESS: Reviewing briefly the section, both</p> <p>17 Anzai and Yamazaki talk about using organic materials.</p> <p>18 Yamazaki talks about use of spin-coating or ink jet</p> <p>19 printing. These take advantage of the liquid state of</p> <p>20 resin materials. Again, what you're doing for silicon</p> <p>21 nitride is a much more sophisticated and expensive</p> <p>22 process.</p> <p>23 The organic resin materials 17 is going to be a</p> <p>24 softer, less durable material than silicon nitride. So if</p> <p>25 I have a rigid ceramic over a soft material and, during</p>
<p style="text-align: right;">70</p> <p>1 still spin it, but there's a -- kind of a squeegee</p> <p>2 operation that you could do as well to spread it and get</p> <p>3 the film uniform.</p> <p>4 It's simple and easy and depositing -- attempting</p> <p>5 to deposit a uniform flat film of silicon nitride would be</p> <p>6 more than difficult over a large area because you have to</p> <p>7 do a separate process for it to function for</p> <p>8 planarization.</p> <p>9 So Anzai teaches a simple spin it on versus let</p> <p>10 me go into a vacuum chamber, deposit silicon nitride, let</p> <p>11 me do a chemical-mechanical polish, double-check, and then</p> <p>12 say, "Why would I change that process?" I have no</p> <p>13 motivation to do it unless I want to spend money and have</p> <p>14 a lower yield in the process.</p> <p>15 BY MR. LIMBACH:</p> <p>16 Q How effective is organic resin in providing a</p> <p>17 planar surface?</p> <p>18 MR. CUMMINGS: Objection. Form.</p> <p>19 THE WITNESS: In general, if you're using the</p> <p>20 material, then it's designed for that function. So it's</p> <p>21 very effective.</p> <p>22 BY MR. LIMBACH:</p> <p>23 Q Is it more effective than depositing silicon</p> <p>24 nitride followed by CNP?</p> <p>25 MR. CUMMINGS: Objection. Form.</p>	<p style="text-align: right;">72</p> <p>1 chemoco -- chemical-mechanical polishing, you have to</p> <p>2 apply pressure and a sheer force, you're -- it's similar,</p> <p>3 if you're familiar with how telescope mirrors are ground.</p> <p>4 You have a -- a spinning -- something spinning and</p> <p>5 applying pressure, whether it's the substrate or something</p> <p>6 on top of it -- I'll leave that out. That's a process</p> <p>7 variation. But pressure and sheer force is being applied.</p> <p>8 So if I'm doing that to something hard and rigid</p> <p>9 over something soft, I don't know that I'm going to get</p> <p>10 something flat. I don't know that I'm not going to crack</p> <p>11 it. I don't know that it's not going to flake and peel</p> <p>12 off. So if 19's an organic material, I know I can do</p> <p>13 that.</p> <p>14 BY MR. LIMBACH:</p> <p>15 Q Are you done?</p> <p>16 A Yes.</p> <p>17 Q Okay. Didn't want to cut you off.</p> <p>18 Now, Anzai doesn't give an example of the</p> <p>19 material on -- for layer 19; is that right?</p> <p>20 MR. CUMMINGS: Objection. Form.</p> <p>21 THE WITNESS: In the annotated figure below</p> <p>22 paragraph 78, I state that it's undisclosed.</p> <p>23 BY MR. LIMBACH:</p> <p>24 Q You have called it a planarization layer; is that</p> <p>25 right?</p>

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Conducted on July 16, 2025

<p style="text-align: right;">73</p> <p>1 A I have to review Anzai to make sure that's what 2 19 corresponds to, but that sounds correct. 3 Q So in your opinion, what would have been obvious 4 to use for the materials of layer 19? 5 A Again, following -- following the teachings and 6 trying to combine Anzai and Yamazaki, you use an organic 7 resin material. 8 Q If we go to paragraph 82, please. 9 A Okay. 10 Q Actually -- actually, go to 81. 11 That says, "Further, I note, Yamazaki teaches a 12 wide range of possible materials," and then you've quoted 13 that list of materials. 14 Do you see that? 15 A Yes. 16 Q And then in 82, you say, "Dr. Neikirk offers no 17 reasoning for selecting silicon nitride from Yamazaki's 18 list of materials for use in planarization layer 17 and 19 19 of Anzai." 20 Do you see that? 21 A Yes. 22 Q And your opinion applies to planarization 23 layer 19, which is what we're talking about here; is that 24 right? 25 A Yes.</p>	<p style="text-align: right;">75</p> <p>1 of -- based on the list's length? 2 A My understanding is there's supposed to be a 3 motivation for the combination. You don't start with the 4 claim and say, a-ha. They say, a material, so I'm going 5 to use it some place it wasn't recommended for use. 6 There's no motivation. He didn't state a motivation. He 7 said, "Do this." I gave reasons why a POSITA would be 8 motivated not to do that. That is my understanding of the 9 way the process is supposed to be. 10 So, no, it's not obvious. It would make it more 11 difficult. No one -- no sane engineer would consider it, 12 but this is obvious. No, it's not that. You provide the 13 motivation. He didn't. He jumped to a conclusion. He 14 took a shortcut. 15 BY MR. LIMBACH: 16 Q If you go to paragraph 85 of your declaration, 17 this is in your section dealing with Challenge 3, they -- 18 the -- based on the obviousness opinions regarding 19 Yamazaki and Anzai. And in particular, the -- the 85 is 20 in the section no -- "no motivation to add a layer." 21 Do you see that? 22 A Yes. 23 Q So, here, you're rebutting Dr. Neikirk's opinion 24 that it would have been obvious to add a second 25 planarization layer to Yamazaki; right?</p>
<p style="text-align: right;">74</p> <p>1 Q When a POSITA is provided with a list of 2 exemplary materials, as was done in Yamazaki, is it your 3 opinion it would not have been obvious to select any one 4 of them -- 5 MR. CUMMINGS: Objection. Form. 6 BY MR. LIMBACH: 7 Q -- from the list? 8 MR. CUMMINGS: Objection. Form. 9 THE WITNESS: Yamazaki's talking about an 10 insulating material, not a planarization layer. 11 BY MR. LIMBACH: 12 Q But I believe you -- your opinion is there's a 13 list and it would not have been obvious to select one of 14 the materials from the list. 15 That's your opinion; right? 16 MR. CUMMINGS: Objection. Form. 17 THE WITNESS: I need to review Yamazaki, but the 18 context -- just because I say you -- or just because a 19 reference says you could use a material -- a type of 20 material in one part of a structure, doesn't mean it's 21 obvious or you'd be motivated to use it anywhere in the 22 structure. 23 BY MR. LIMBACH: 24 Q So you're not faulting Dr. Neikirk from selecting 25 one from the list just because there's the list -- because</p>	<p style="text-align: right;">76</p> <p>1 A Specifically, the motivation Dr. Neikirk gave was 2 add another planarization layer to further improve the 3 flattening purpose of a planarization layer. So if I need 4 to improve the flatness of a planarization layer, I didn't 5 create a planarization layer. It's that simple. I 6 don't -- you can't put a plane -- say you put a 7 planarization layer on a planarization layer because that 8 means the first layer wasn't a planarization layer. If it 9 was planarized, it was planarized. You're done. 10 Q Doesn't Anzai directly contradict what you just 11 said? 12 MR. CUMMINGS: Objection. Form. 13 BY MR. LIMBACH: 14 Q Doesn't Anzai put down a planarization layer 17 15 and then put a planarization, that layer 19, on 16 planarization 17? 17 MR. CUMMINGS: Objection. Form. 18 THE WITNESS: I need to review the reference. 19 But I believe -- this is going from memory -- that there 20 were other structures that were put on top of the 21 planarization layer so that the surface actually wasn't 22 planar. So you're not just putting a planarization layer 23 on a planarization layer. I've added other structures. 24 And what you're describing is completely contrary 25 to what Dr. Neikirk said, that "I want to improve the</p>

<p>77</p> <p>1 flatness of my planarization layer." 2 BY MR. LIMBACH: 3 Q If we go up to page 12 of your declaration. 4 A Okay. 5 Q So the top of -- and this is figure 2A of 6 Anzai -- the top of layer 17 is planar; correct? 7 A In this portion of the structure, but this is 8 figure 2A. And, again, from memory, there are other cross 9 sections of the structure that show something is between 10 17 and 19, which is a different scenario from 11 Dr. Neikirk's hypothetical "I need to improve the flatness 12 of my planarization layer." 13 Q Did you consider other structures in the 14 combination that Dr. Neikirk proposed in forming your 15 opinion? 16 MR. CUMMINGS: Objection. Form. 17 THE WITNESS: Could you be more specific? 18 BY MR. LIMBACH: 19 Q Well, let me go back to your blanket question. 20 You would never put a planarization layer on a 21 planarization layer. But there's a caveat to that, and 22 that is, if the planarization layer is not planar with 23 other areas because of underlying topology. 24 Is that your opinion? 25 MR. CUMMINGS: Objection. Form.</p>	<p>79</p> <p>1 Q So is it your opinion that if someone calls 2 something a planarization layer, its top surface is 3 perfectly plane? Is that your opinion? 4 MR. CUMMINGS: Objection. Form. 5 THE WITNESS: No. My opinion is that Dr. Neikirk 6 gave a ridiculous motivation to add a second layer. 7 BY MR. LIMBACH: 8 Q Okay. 9 A It -- it literally makes no sense. There's no 10 way a person of ordinary skill in the art would follow 11 that because he's talking about improving the flattening 12 purpose of a layer. He's not talking about compensating 13 for other things on top of it. He says, I have a 14 planarization layer. Let me put another planarization 15 layer on top of it to make it better. That means it's not 16 a planarization layer. The bottom layer is not a 17 planarization layer. It's plain and simple. 18 (Indiscernible.) 19 Q My question to you was: Are all planarization 20 layers perfectly flat? 21 MR. CUMMINGS: Objection. Form. 22 THE WITNESS: I haven't offered an opinion on 23 that. And your question requires careful consideration 24 because, if the planarization layer, if it's -- if it is a 25 planarization layer, it has met requirements for being</p>
<p>78</p> <p>1 THE WITNESS: You stated -- you stated it was a 2 question first. It was an opinion. And it's responsive 3 to Dr. Neikirk, who would say I want to improve the 4 surface-flattening properties of one film. So I'm going 5 to put another one on it. So he's literally saying, I put 6 down a planarization layer that wasn't planar. So I'm 7 going to put down another planarization layer. 8 If you accept that a planarization layer doesn't 9 work, it's not called a -- it shouldn't be called a 10 planarization layer. And if a planarization layer is put 11 down and it's not planar, then why on Earth would you 12 suspect that trying a second time would fix it? It didn't 13 work the first time. Why would you do it twice? Then do 14 you do a third? Then do you do a fourth? Then do you do 15 a fifth? When do you stop? 16 So his whole scenario just makes no sense. He's 17 the one who stated, "I want to improve" -- I believe it 18 was "the flattening properties"? 19 There's no reason to improve the flattening 20 properties of a planarization layer unless it's not a 21 planarization layer. Again -- 22 BY MR. LIMBACH: 23 Q So if I -- 24 A -- that -- that's his motivation, and it just 25 doesn't make any sense.</p>	<p>80</p> <p>1 planar. 2 BY MR. LIMBACH: 3 Q What requirements are you referring to when you 4 say "requirements to be planar." 5 MR. CUMMINGS: Objection. Form. 6 THE WITNESS: There are specifications for all 7 the layers. There's expectations for performance for all 8 metrics. Where I am getting stuck is, when you say is it 9 perfectly flat, nothing can be perfectly flat. Everything 10 is made of atoms. There's a technique called atomic force 11 microscopy that you can actually see difference in height 12 because -- are you measuring on top of an atom or a space 13 in between two adjacent atoms? 14 So if you want to go to the limit, we can't make 15 a surface perfectly flat. If it's a planarization layer, 16 it has met planarization requirements. It's met the 17 flatness requirements. There's no reason to improve on 18 meeting the requirements. You don't -- 19 BY MR. LIMBACH: 20 Q Is it -- 21 A -- get extra credit. 22 Q Is it possible to meet the flatness requirements 23 to do as a two-layer step to get you there? 24 MR. CUMMINGS: Objection. Form. 25 THE WITNESS: There's no reason to do that.</p>

Conducted on July 16, 2025

<p style="text-align: right;">81</p> <p>1 Again, we're talking about motivation and obviousness. If</p> <p>2 I wanted to try and put down ten layers, I could. I would</p> <p>3 get fired from any fad facility I tried to implement that</p> <p>4 in. If you're doing a planarization layer, you do it, and</p> <p>5 you're done.</p> <p>6 BY MR. LIMBACH:</p> <p>7 Q So in your experience, a POSITA would never</p> <p>8 propose using two layers to achieve a planar surface to</p> <p>9 meet the requirements of a particular spec? Is that your</p> <p>10 opinion?</p> <p>11 MR. CUMMINGS: Objection. Form.</p> <p>12 THE WITNESS: In my opinion, Dr. Neikirk utterly</p> <p>13 failed to give adequate motifica- -- motivation for the</p> <p>14 modification you've proposed.</p> <p>15 BY MR. LIMBACH:</p> <p>16 Q Yeah. But my question was: Is it your opinion</p> <p>17 that a POSITA would never consider achieving the flatness</p> <p>18 requirement using two layers?</p> <p>19 MR. CUMMINGS: Objection. Form.</p> <p>20 THE WITNESS: In the context of my declaration</p> <p>21 and Dr. Neikirk's declaration and opinion, that's far</p> <p>22 outside of it. The issue at hand is I put down a</p> <p>23 planarization layer. Do I need to put down another</p> <p>24 planarization layer to improve the flatness properties?</p> <p>25 If I need to improve the flatness properties, I don't have</p>	<p style="text-align: right;">83</p> <p>1 borders on asking would you keep an incompetent engineer</p> <p>2 around who just wants to add process steps because they</p> <p>3 can't do things right?</p> <p>4 BY MR. LIMBACH:</p> <p>5 Q In your experience in the field, have you ever</p> <p>6 seen a process flow where the flatness requirement was met</p> <p>7 using a two-layer technique?</p> <p>8 MR. CUMMINGS: Objection. Form.</p> <p>9 THE WITNESS: For a single layer, no.</p> <p>10 MR. LIMBACH: Let's take a short break. Maybe</p> <p>11 five minutes.</p> <p>12 THE WITNESS: Okay.</p> <p>13 THE VIDEOGRAPHER: Off the record at 11:21 a.m.</p> <p>14 (Off the record.)</p> <p>15 THE VIDEOGRAPHER: We're back on record at</p> <p>16 11:28 a.m.</p> <p>17 MR. LIMBACH: I have no further questions.</p> <p>18</p> <p>19 EXAMINATION</p> <p>20 BY MR. CUMMINGS:</p> <p>21 Q All right. Dr. Neikirk, I just have a few short</p> <p>22 questions.</p> <p>23 A Dr. Bretschneider.</p> <p>24 Q Oh. Sorry. Yes.</p> <p>25 A That's a new mispronunciation.</p>
<p style="text-align: right;">82</p> <p>1 a planarization layer. It's the circular argument that is</p> <p>2 what makes it ridiculous.</p> <p>3 Now, if the first layer isn't a planarization</p> <p>4 layer, then it makes sense to put down a planarization</p> <p>5 layer. But the issue has been why would I just put a</p> <p>6 planarization layer on top of a planarization layer to</p> <p>7 improve the properties? If I need to do that, I didn't</p> <p>8 put down a planarization layer. So the argument falls</p> <p>9 apart.</p> <p>10 Now, if the first layer isn't a planarization</p> <p>11 layer, the argument again falls apart. There are two</p> <p>12 outcomes, and neither one of them makes sense. You don't</p> <p>13 put -- you -- you don't planarize a planarization layer</p> <p>14 because you didn't have a planarization layer. If you did</p> <p>15 have a planarization layer, you don't need to planarize</p> <p>16 it. It's planar by definition.</p> <p>17 BY MR. LIMBACH:</p> <p>18 Q That wasn't my question.</p> <p>19 My question was: Would a POSITA ever consider</p> <p>20 achieving the flatness requirement specification using a</p> <p>21 two-layer technique?</p> <p>22 MR. CUMMINGS: Objection. Form.</p> <p>23 THE WITNESS: I haven't considered that. And,</p> <p>24 again, what I've stated many times, I'm trying to struggle</p> <p>25 as to why anyone would consider doing that. The question</p>	<p style="text-align: right;">84</p> <p>1 Q My question for you is: Do you recall being</p> <p>2 asked is an organic resin an organic layer?</p> <p>3 A Yes.</p> <p>4 Q Do you recall responding an organic resin is an</p> <p>5 organic material?</p> <p>6 A Yes.</p> <p>7 Q Are all organic materials organic resins?</p> <p>8 A No.</p> <p>9 Q Are all organic layers organic resins?</p> <p>10 A No.</p> <p>11 MR. CUMMINGS: I have no further questions.</p> <p>12 MR. LIMBACH: I do not have any follow-up.</p> <p>13 THE VIDEOGRAPHER: Okay. This marks the end of</p> <p>14 the deposition of Dr. Eric Bretschneider. We're going off</p> <p>15 the record at 11:29 a.m.</p> <p>16 (Time noted: 11:29 a.m.)</p> <p>17</p> <p>18</p> <p>19 ---o0o---</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>

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Transcript of Eric Bretschneider, Ph.D.
Conducted on July 16, 2025

22 (85 to 88)

85

1)
STATE OF CALIFORNIA)

2)
3 CERTIFICATE OF REPORTER

4 I, JUSTYNE N. JOHNSON, Certified Reporter and
Notary Public within and for the State of California
5 do hereby certify:

That ERIC BRETSCHNEIDER, Ph.D., the witness
6 whose deposition is hereinbefore set forth, was duly
sworn by me before the commencement of such deposition
7 and that such deposition was taken before me and is
a true record of the testimony given by such witness.

8 I further certify that the adverse party, BOE
TECHNOLOGY GROUP CO., LTD., was represented by counsel
9 at the deposition.

I further certify that the deposition of
10 ERIC BRETSCHNEIDER, Ph.D., occurred virtually on
Wednesday, July 16, 2025, commencing at 9:00 a.m. to
11 11:29 a.m.

I further certify that I am not related to any
12 of the parties to this action by blood or marriage,
I am not employed by or an attorney to any of the
13 parties to this action, and that I am in no way
interested, financially or otherwise, in the outcome
14 of this matter.

IN WITNESS WHEREOF, I have hereunto set my
15 hand and affixed my signature this 21st day of
July, 2025.

16
17 *Justyne Johnson*

18
19 JUSTYNE N. JOHNSON, CSR NO. 14301
20
21
22
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