

1 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD

3 Case No. IPR2024-01187

4 Patent No. 9,257,492

5
6 SAMSUNG DISPLAY CO., LTD.,
7 Petitioner,

8
9 v.

10 PICTIVA DISPLAYS INTERNATIONAL LTD.,
11 Patent Owner.

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14
15 REMOTE DEPOSITION OF
16 ALEX Z. KATTAMIS, PH.D., P.E.
17 9:05 a.m. to 1:48 p.m.
18 May 7, 2025

19
20
21
22
23
24 Job No. 7336769

25 REPORTED BY: Rhonda D. Tuck, RPR, CRR

Page 1

1 Deposition of ALEX Z. KATTAMIS, PH.D., P.E.,
2 taken and transcribed on behalf of the Patent Owner,
3 by and before Rhonda D. Tuck, RPR, CRR, Notary
4 Public in and for the Commonwealth of Virginia at
5 large, commencing at 9:05 a.m., May 7, 2025, via
6 remote videoconference.

7
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I N D E X

TESTIMONY OF: ALEX Z. KATTAMIS, PH.D., P.E.
Examination by Attorney Warrick.....4

E X H I B I T S

Exhibit 1001.....17
Patent Number 9,257,492 B2 (Ingle)
SDC EX. 1001-1/19 through SDC EX. 1001-19/19
Exhibit 1003.....7
Declaration of Alex Z. Kattamis, Ph.D., P.E.
SDC EX. 1003-1/122 through SDC EX. 1003-122/122
Exhibit 1005.....54
Translation of Ingle Patent
SDC Ex. 1005-1/40 through SDC Ex. 1005-40/40
Exhibit 1007.....72
Translation of Hasei Patent
SDC Ex. 1007-1/10 through SDC Ex. 1007-10/40
Exhibit 1008.....107
Patent Number 5,691,877 (Hanamura)
SDC Ex. 1008-1/14 through SDC Ex. 1008-14/14
Exhibit 1028.....12
Curriculum Vitae
SDC Ex. 1028-1/8 through SDC Ex. 1028-8/8

REPORTER'S NOTE: All quotations from exhibits are reflected in the manner in which they were read into the record and do not necessarily indicate an exact quote from the document.

* * * * *

1 (9:05 a.m., May 7, 2025)

2 (Witness sworn.)

3

4 ALEX Z. KATTAMIS, PH.D., P.E.,

5 having been duly sworn, testified as follows:

6 E X A M I N A T I O N

7 BY ATTORNEY WARRICK:

8 Q. Good morning, Dr. Kattamis.

9 A. Good morning.

10 Q. Can we start by having you state your
11 full name for the record, please?

12 A. Yeah. My full name is Alexis Zenon,
13 Z-E-N-O-N, Kattamis, K-A-T-T-A-M-I-S.

14 Q. Dr. Kattamis, is this your first time
15 being deposed?

16 A. No.

17 Q. About how many times have you been
18 deposed before?

19 A. I'd have to look, but it's 12 or 13,
20 something like that.

21 Q. Have you testified at trial before?

22 A. No, I have not.

23 Q. Given the fact that you've been deposed
24 several times, I assume you know generally how this
25 works, but let's go over a couple of the basics as a

1 refresher. Please give me time to ask my questions.
2 If there's any part of my question you don't
3 understand, could we agree that you'll ask me for
4 clarification?

5 A. Yes.

6 Q. Is there any reason that you cannot give
7 full and truthful testimony today?

8 A. No.

9 Q. Dr. Kattamis, is anyone in the room with
10 you today?

11 A. Yes.

12 Q. Who is that?

13 A. Scott Weidenfeller and Scott Burger.

14 Q. This is, of course, a remote deposition,
15 so you have a computer in front of you. Do you have
16 any messaging windows or email applications or
17 anything of that sort open on your computer?

18 A. No. Only the Exhibit Share and this
19 window.

20 Q. And you understand that any
21 communications we have on the record with you and
22 anyone else should be spoken on the record. So no
23 use of such apps or notes for anything of that
24 nature. Do you understand that?

25 A. Yeah. I'm not using any apps.

1 Q. All right. Well, we're going to hedge
2 up into this. If at some point you need a break,
3 just let me know. The only thing I'll ask is that
4 you answer any questions that may be pending at the
5 time.

6 A. Understood.

7 Q. Dr. Kattamis, you've been hired as an
8 expert in this proceeding; is that right?

9 A. Yes.

10 Q. And you were hired on behalf of Samsung
11 Display Company?

12 A. Yeah. I believe that's accurate. I
13 have my declaration in front of me.

14 Q. Okay. Let me ask, do you have anything
15 else in front of you today other than your
16 declaration?

17 A. Exhibits from this matter.

18 Q. And does your declaration have any notes
19 or markings?

20 A. No.

21 Q. What about the other exhibits that you
22 have in front of you from the proceeding?

23 A. No.

24 Q. And maybe this would be a good time to
25 introduce your declaration as an exhibit.

1 (Exhibit 1003 was marked for
2 identification.)

3 BY ATTORNEY WARRICK:

4 Q. If I've done this right, that should
5 show up in your Exhibit Share.

6 A. I am going to hit refresh. Yeah, I see
7 it now.

8 Q. This exhibit, which is marked
9 Exhibit 1003, do you recognize this document?

10 A. One sec. I'll open it.

11 Yeah, I do.

12 Q. What is Exhibit 1003?

13 A. It's my declaration.

14 Q. And you personally drafted this
15 declaration?

16 A. I drafted it with assistance from
17 counsel, so some back and forth, but all the
18 opinions here are mine.

19 Q. It's fair to say you at least read
20 everything contained in your declaration,
21 Exhibit 1003?

22 A. Yes.

23 Q. And there's nothing that you disagree
24 with in that document?

25 A. No.

1 Q. How much are you being compensated for
2 your work in this matter?

3 A. That's on Page 5, I think. Yeah.
4 Exponent charges \$550 per hour. This is at the time
5 I wrote this. Exponent now compensates me \$575 an
6 hour.

7 Q. Approximately how many hours have you
8 spent working on this matter?

9 A. I could look to get an accurate number.
10 On the order of 100, maybe.

11 Q. So approximately 100 hours. Is that in
12 total for all work on this particular matter?

13 A. Yes, something on that order. It could
14 be a little bit more, but yeah.

15 Q. Do you know, of those approximately 100
16 hours, how many you spent preparing this
17 declaration?

18 A. I would be guessing. If that's okay, I
19 can do that.

20 Q. Sure. The best estimate you can give.

21 A. Yeah, 70 percent-ish.

22 Q. What other work have you done on this
23 matter, aside from preparing this declaration?

24 A. Let me rephrase, to understand your
25 question. Preparing this declaration, in my mind,

1 versus reviewing prior art, let's say? I don't
2 bucket those in the same, and maybe your question
3 meant for me to do that.

4 Q. Well, it may be better for me to ask a
5 different question, which is, can you generally
6 describe the work that you have performed for
7 Samsung Display Company in this matter?

8 A. Sure. I reviewed the patent in
9 question. I reviewed prior art. I performed prior
10 art searches, reviewed references in the form of
11 papers and textbooks. So those would be the main
12 things that went into preparing the declaration.

13 Q. Any other work on this matter, in
14 addition to the work you just described, in
15 connection with preparing the declaration?

16 A. Reviewing for the depo. That's it.

17 Q. When you say reviewing for the depo, are
18 you referring to preparation for today's deposition?

19 A. Preparation for today's deposition, my
20 review of all the documents, this declaration,
21 et cetera.

22 Q. Approximately how much time did you
23 spend preparing for the deposition today?

24 A. Two days or so, over the course of the
25 past few weeks.

1 Q. And did you meet with anyone as part of
2 that preparation?

3 A. Sure. I met with counsel.

4 Q. Who, specifically?

5 A. I met with a few attorneys. Scott,
6 who's on here now, Scott Burger. And Jared Frisch,
7 I believe.

8 Q. Did you have discussions with anyone
9 else as part of your prep for today's deposition?

10 A. Sure. There were other attorneys that
11 were in the room. I can't remember all their names.
12 David Garr, I think was one, and there were a few
13 others.

14 Q. Any non-attorneys?

15 A. No, I don't think so.

16 Q. I think you mentioned you reviewed some
17 documents in preparation for the deposition; is that
18 right?

19 A. Yeah, all the documents, my declaration,
20 and then the documents that I cited, so the prior
21 art, and then the additional extrinsic references
22 that I cited in the declaration.

23 Q. Did you review any additional documents
24 in preparation for today?

25 A. I looked at the report of Pattison as

1 well.

2 Q. You mentioned that your declaration
3 cites various references. Are those references
4 documents that you discovered on your own, or did
5 someone provide those to you?

6 A. If I -- do you mind if I look at the
7 list, real quick?

8 Q. Sure.

9 A. I believe all these additional ones are
10 ones I introduced to counsel, and a lot of them I'm
11 just familiar with from, historically, from doing
12 the work at that time.

13 Q. When you talk about these documents, are
14 you referring to the table on Pages 4 to 5 of your
15 declaration?

16 A. Yeah. It starts on Exhibit 1014, and
17 down to 1024.

18 Q. Understood. And so am I understanding
19 correctly that you personally identified all of
20 these documents, 1014 through 1024?

21 A. I remember searching for these, and I
22 can't say a hundred percent that none of them
23 were -- I was pointed to any of them, but many of
24 them I can tell right now are things that I've been
25 familiar with for a long time.

1 (Exhibit 1028 was marked for
2 identification.)

3 BY ATTORNEY WARRICK:

4 Q. Dr. Kattamis, I've just introduced
5 another exhibit, which you should be able to see if
6 you refresh. This one is marked as Exhibit 1028.

7 A. I see it. My CV.

8 Q. So you recognize this document as your
9 CV, correct?

10 A. Yes.

11 Q. And do you understand this CV was
12 provided as part of the file for this matter by
13 counsel for Samsung?

14 A. Yes.

15 Q. Dr. Kattamis, in your declaration,
16 Exhibit 1003, in Paragraph 4, you make a reference
17 to your CV, and you note that it includes a list of
18 matters where you previously provided expert
19 testimony. Do you recall that?

20 A. What page?

21 Q. Page 5, Paragraph 4, of Exhibit 1003.

22 A. I'm sorry. Could you repeat that page?

23 Q. Page 5, Paragraph 4, of Exhibit 1003,
24 your declaration.

25 A. There are two page numbers here. I'm

Page 12

1 sorry. I see it now. There's a page number in the
2 corner, and sometimes there's a page number in the
3 middle, but I found it. I see it.

4 Q. Okay. I see the confusion. Just to go
5 back to the question, do you recall here in your
6 declaration, Paragraph 4, saying that your CV
7 includes a list of matters where you previously
8 provided expert testimony?

9 A. Yeah. Correct. It does say that, and
10 that was my intention.

11 Q. If I'm reading this correctly,
12 Exhibit 1028, your CV, does not include that list?

13 A. No, it does not. Yes.

14 Q. Do you maintain a list of matters where
15 you've previously provided expert testimony?

16 A. Yes, I do.

17 Q. And if asked, is that something you
18 could provide?

19 A. Yes, I can.

20 Q. Dr. Kattamis, do you know if your expert
21 testimony has ever been challenged formally?

22 A. Yeah. I do know it has.

23 Q. Can you describe the circumstances?

24 A. Sure. There was an installation of
25 conductors called bus ducts that had epoxy coatings

1 on them for insulation, and the insulation had
2 cracked. I testified that the material was
3 defective, and the judge agreed that I could say
4 that the material was defective, but what I couldn't
5 say was that it was out of spec with the contract.
6 He said that interpretation of the contract was up
7 to the jury. So that was the instance, where they
8 allowed me to say it was defective but not out of
9 spec.

10 Q. So the judge limited your testimony?

11 A. In that aspect, yes.

12 Q. Do you know if your testimony has ever
13 been excluded?

14 A. I don't believe so. No. I know that I
15 wasn't allowed to discuss that aspect of the
16 contract.

17 Q. Are you aware of your status as an
18 expert ever been challenged in any of the
19 proceedings where you provided expert testimony?

20 A. I don't believe so. No.

21 Q. And in these prior matters where you
22 provided expert testimony, did any of those matters
23 involve Samsung?

24 A. Yes. I have been deposed for Samsung in
25 the past. Yeah.

1 Q. Approximately how many matters have you
2 provided expert testimony on behalf of Samsung?

3 A. I think only one.

4 Q. One in addition to this one, of course?

5 A. Correct.

6 Q. Do you recall what matter that was?

7 A. Polaris v Samsung.

8 Q. Dr. Kattamis, could you describe for me
9 briefly any experience that you have personally with
10 the production of capacitors?

11 A. Sure. I think one of my first papers
12 was producing semiconductor capacitors, thin-filmed
13 capacitors on flexible substrates. That's one
14 example, but then throughout my career, I mean,
15 creating capacitors in thin films is something I've
16 worked on quite extensively.

17 Q. And is it correct that you have
18 experience in the manufacturing of OLED display
19 devices as well?

20 A. I have manufactured OLEDs in conjunction
21 with the backplanes that drive them. So to the
22 extent that I'm, you know, following a well-known
23 recipe as proofs of concept to show that my
24 foundation, the transistors and the pixel
25 capacitors, et cetera, braided properly, yes.

1 Q. I assume you understand that this
2 proceeding relates to a patent that's owned by
3 Pictiva Displays International?

4 A. Yeah. That is my understanding.

5 Q. That's U.S. Patent Number 9,257,492,
6 correct?

7 A. Yes. Correct.

8 Q. If I refer to that as the '492 Patent,
9 you'll understand that that's the patent I'm
10 referencing?

11 A. Yes.

12 Q. The '492 Patent names an inventor,
13 Andrew Ingle. Do you know this person?

14 A. No, I don't know them personally or at
15 all.

16 Q. Have you heard of Andrew Ingle prior to
17 your work on this matter?

18 A. No, I have not.

19 Q. And the '492 Patent lists the applicant
20 as OSRAM OLED GmbH. Have you previously heard of
21 that organization?

22 A. I just want to look at it real quick.
23 This is Exhibit 1001. And your question is had I
24 heard of OSRAM before?

25 Q. Correct.

1 A. Yes, I had.

2 Q. What do you know about OSRAM?

3 A. Not too much. I remember them being
4 present at various conferences I used to go to,
5 working in the OLED space.

6 Q. During what time period was that?

7 A. 2001 to 2007-ish.

8 Q. Is OSRAM, in your view, an innovative
9 company?

10 A. I don't think I can answer that. I
11 don't know enough about them.

12 (Exhibit 1001 was marked for
13 identification.)

14 BY ATTORNEY WARRICK:

15 Q. Dr. Kattamis, just so we have it on
16 record and we may reference it later, I have
17 introduced Exhibit 1001. Do you see that in Exhibit
18 Share?

19 A. I do. I also have it in front of me.

20 Q. Great. And you recognize that as the
21 '492 Patent that we've been discussing?

22 A. Yes.

23 Q. Had you seen this patent prior to your
24 work on this matter?

25 A. No.

1 Q. What's your understanding of the
2 invention of the '492 Patent?

3 ATTORNEY WEIDENFELLER: Objection.

4 THE WITNESS: I think I cover it in my
5 declaration. The subject matter is for
6 producing a passive electronic component. A
7 method for producing an optoelectric assembly
8 and as a component. And then it lists out
9 what these components can be.

10 BY ATTORNEY WARRICK:

11 Q. What do you understand to be the
12 advantage of the invention of the '492 Patent over
13 what had previously existed in the art?

14 ATTORNEY WEIDENFELLER: Objection.

15 THE WITNESS: It discloses what it calls
16 different methods of deposition, including
17 structured deposition. You have situations
18 where you're avoiding using photolithography,
19 let's say, and etching, and just applying
20 material where you want it in the end.

21 BY ATTORNEY WARRICK:

22 Q. That's what the '492 Patent describes as
23 applying a layer in a structured manner; is that
24 right?

25 A. I think that's one instance. Yes.

1 Q. And I believe in your declaration, you
2 describe that approach as an additive approach; is
3 that right?

4 A. Would you mind pointing me to where, if
5 possible?

6 Q. It may help if you look at Paragraph 99
7 of your declaration.

8 A. Sure. Yes.

9 Q. And you refer to something called
10 additive techniques, correct?

11 A. Correct.

12 Q. And the technique described in the '492
13 Patent, applying layers in a structured manner, is
14 one such additive technique, correct?

15 A. Yes. Well, "additive" was a term that
16 we were using back then to imply adding material
17 only where you need it.

18 Q. And is that in contrast to the
19 conventional approach that was used prior to
20 additive techniques?

21 ATTORNEY WEIDENFELLER: Objection.

22 THE WITNESS: I think that depends on
23 the time and the technology we're describing.

24 BY ATTORNEY WARRICK:

25 Q. In the context of the technology

1 described in the '492 Patent around 2012, is it
2 correct that these additive techniques were an
3 alternative to conventional techniques?

4 ATTORNEY WEIDENFELLER: Objection.

5 THE WITNESS: I think it depends on
6 whether we're discussing -- you know, what
7 aspects are we discussing. Are we discussing
8 OLED fabrication? Are we discussing
9 inorganic semiconductor fabrication? They're
10 not the same. So I think those terms would
11 probably be used differently.

12 BY ATTORNEY WARRICK:

13 Q. Okay. Can we start with OLED
14 fabrication?

15 A. Okay.

16 Q. The same question. Around 2012, in that
17 technical context, is it correct that an additive
18 technique such as the applying layers in a
19 structured manner, so described in the '492 Patent,
20 was an alternative to conventional techniques for
21 applying such layers?

22 ATTORNEY WEIDENFELLER: Objection.

23 THE WITNESS: I think it's describing
24 that in the context of the '492, which is
25 really about making the foundation, the

1 backplane, or at least parts of the
2 backplane. So I think that's accurate in
3 that context.

4 BY ATTORNEY WARRICK:

5 Q. Let's take a step back. What other ways
6 could one apply layers of an OLED device, for
7 example, other than an additive technique?

8 A. Well, I think in that context, it's
9 additive in that you're putting down a layer. I
10 think the difference is the processes that you could
11 use. Photolithography, for example, was avoided,
12 because of damage to organic layers.

13 Q. Photolithography was the conventional
14 approach?

15 ATTORNEY WEIDENFELLER: Objection.

16 THE WITNESS: Photolithography was the
17 conventional approach for inorganic
18 materials, so for film transistors,
19 et cetera.

20 BY ATTORNEY WARRICK:

21 Q. What about the inorganic layers of an
22 OLED display device? Was photolithography the
23 conventional approach for those as well?

24 ATTORNEY WEIDENFELLER: Objection.

25 THE WITNESS: There may have been

1 layers. I'd have to look, but I believe no.
2 Photolithography was avoided.

3 BY ATTORNEY WARRICK:

4 Q. Am I correct in characterizing
5 photolithography as a subtractive technique?

6 A. Yeah, I think that's fair. Yes.

7 Q. And can you describe for me what it
8 means generally to use a subtractive technique to
9 apply a layer in an electronic device?

10 ATTORNEY WEIDENFELLER: Objection.

11 THE WITNESS: I would say you create
12 features in a material via photoresist,
13 masking, exposure, and then subsequent
14 etching to create features.

15 BY ATTORNEY WARRICK:

16 Q. So for example, you would first apply a
17 layer across the entirety of a substrate, for
18 example, and then you could subtract the portions of
19 the layer necessary to create a particular
20 structure; is that right?

21 A. Could you repeat that question?

22 Q. Sure. So you could use a subtractive
23 technique by first applying a layer across, for
24 example, the entirety of a substrate and then
25 subtract the portions of the layer necessary to

1 create a particular structure; is that right?

2 A. One could do that. Yes.

3 Q. Is that generally what is being referred
4 to as a subtractive technique?

5 A. I think a subtractive technique requires
6 etching of some kind, removal of material.

7 Q. Just to make sure we're on the same
8 page, in a subtractive technique, you initially
9 would apply a layer, and then you would remove some
10 of the layer to create a desired structure. Is that
11 more accurate?

12 A. Yeah.

13 Q. And that is in contrast to an additive
14 technique, where you create the structure by only
15 applying --

16 A. I don't think additive is the right
17 word. I think the right word is structured.

18 Q. Okay. What do you understand is the
19 difference between an additive and a structured
20 technique?

21 A. I'd have to look back and think about
22 how it was used at the time. So I'd have to look
23 back at the prior references that I cited, but I
24 don't think it has a single meaning.

25 Q. Which term do you believe does not have

1 a single meaning?

2 A. Additive.

3 Q. Additive?

4 A. Uh-huh.

5 Q. Okay. I believe we covered earlier that
6 the applying of layers in a structured manner
7 described in the '492 Patent is at least an example
8 of an additive technique. Do you agree with that?

9 A. Yes.

10 Q. And we've been talking today -- or,
11 rather, you've referenced a relevant time period.
12 What was the time period you used as your frame of
13 reference for your analysis in Exhibit 1003?

14 A. I have to look at the priority date.
15 2012, September.

16 Q. Is that what you understand to be the
17 priority date of the '492 Patent?

18 A. Yes.

19 Q. Going back to photolithography, that's a
20 fabrication technique that you've described as
21 subtractive, correct?

22 ATTORNEY WEIDENFELLER: Objection.

23 THE WITNESS: Yes.

24 BY ATTORNEY WARRICK:

25 Q. And photolithography is a traditional

1 approach to creating certain electronic devices?

2 ATTORNEY WEIDENFELLER: Objection.

3 THE WITNESS: I don't know if I'd use
4 the term "traditional." It depends again on
5 what you're making.

6 BY ATTORNEY WARRICK:

7 Q. Dr. Kattamis, if I could refer you to
8 Paragraph 94 of your declaration, Exhibit 1003, that
9 paragraph references an alternative to traditional
10 photolithography.

11 A. Yes.

12 Q. Am I reading that paragraph correctly
13 that you're characterizing photolithography as a
14 traditional technique?

15 A. I'd have to look at Kahn real quick, if
16 that's okay.

17 Q. Sure.

18 A. I'd have to find the term. I can't say
19 right now if Kahn referred to it as -- you know,
20 traditional photolithography -- I'll give you an
21 example -- doesn't necessarily mean that the
22 photolithography is traditional. For example, there
23 are different types of photolithography, and then
24 there are different types of masks that you can use,
25 different types of etching chemistries.

1 I think the point of the statement is
2 that there are alternatives to removing material
3 post deposition.

4 (Court reporter clarification.)

5 BY ATTORNEY WARRICK:

6 Q. By that I assume you're referring to the
7 deposition of the layer and not today's dialogue?

8 A. That's correct. Yes.

9 Q. I'm sorry. Can't help myself.

10 In Paragraph 94 of Exhibit 1003, you're
11 saying that an alternative to traditional
12 photolithography of some sort is additive
13 fabrication techniques, which are the techniques
14 we've been discussing today, correct?

15 A. Correct. Yeah.

16 Q. You mentioned earlier that
17 photolithography has drawbacks. Did I understand
18 that correctly?

19 A. Sure. Yeah.

20 Q. Can you describe some of those
21 drawbacks?

22 A. Equipment costs, damage to materials, to
23 underlying layers. Let's see what else. I think
24 those are the biggest. Material waste.

25 Q. Nonetheless, photolithography is a

1 standard for manufacturing integrated circuits; is
2 that right?

3 ATTORNEY WEIDENFELLER: Objection.

4 THE WITNESS: In 2012? It depends on
5 what integrated circuits we're describing.

6 BY ATTORNEY WARRICK:

7 Q. For at least some integrated circuits,
8 photolithography was the standard, correct?

9 A. Yes.

10 Q. And would that include capacitors, for
11 example?

12 A. Again, it would just be application
13 dependent.

14 Q. What about OLED display devices?

15 A. No. I think in OLED display devices,
16 you're considering other methods to avoid
17 photolithography. So I would say not necessarily.

18 Q. Is it possible to fabricate an OLED
19 display device using photolithography?

20 ATTORNEY WEIDENFELLER: Objection.

21 THE WITNESS: That's a broad
22 hypothetical. I don't -- yeah, you could
23 potentially get something to -- that wouldn't
24 work properly.

25

1 BY ATTORNEY WARRICK:

2 Q. Are you aware of anyone having created
3 OLED display devices using photolithography?

4 A. Photolithography may be used for certain
5 layers.

6 Q. Are you aware of anyone using
7 photolithography to fabricate all of the layers of
8 an OLED display device?

9 A. Not as I sit here right now, no.

10 Q. Are you aware of anyone using
11 subtractive techniques to fabricate all the layers
12 of an OLED display device?

13 A. For all the layers? I don't think I can
14 answer that. I don't know.

15 Q. In the timeframe of 2012, what would you
16 describe as the conventional approach to fabricating
17 the layers of an OLED display device?

18 ATTORNEY WEIDENFELLER: Objection.

19 THE WITNESS: I think it depends on what
20 aspects of the device that we're talking
21 about, whether we're talking about backplane
22 or OLED.

23 BY ATTORNEY WARRICK:

24 Q. So for example, the active layers of an
25 OLED display device.

1 A. What's the question?

2 Q. Well, what would have been the
3 conventional approach for applying the active layers
4 of an OLED display device in 2012?

5 ATTORNEY WEIDENFELLER: Objection.

6 THE WITNESS: I think it depends on what
7 the application is, how large the display is.
8 You know, one could do it through a shadow
9 mask.

10 BY ATTORNEY WARRICK:

11 Q. Am I correct that OLED display devices
12 also include at least a pair of electrodes commonly
13 known as the anode and the cathode?

14 A. Sure.

15 Q. What was the conventional approach for
16 fabricating those layers of an OLED display device
17 in 2012?

18 ATTORNEY WEIDENFELLER: Objection.

19 THE WITNESS: I think, again, it depends
20 on the application.

21 BY ATTORNEY WARRICK:

22 Q. So in 2012, is it your testimony that
23 there was not a conventional approach for applying
24 the layers of an OLED display device?

25 A. No. It would leave it up to the person

1 who's doing the integration to use whatever approach
2 they were using at the time. So however they had
3 designed the OLED, for example, what materials they
4 were using, they would use those techniques.

5 So I think conventional can change
6 depending on the context and that conventional may
7 be different for different size displays,
8 conventional, really meaning depositing the layers,
9 to a point where it's a common recipe, where people
10 knew this is what I'm going to build, this stack.

11 Q. I'm not sure I understand what you mean
12 by common recipe. Can you explain?

13 A. Sure. I mean as recipes get developed,
14 there can come a time where more people are using
15 them, because they're tried and true. And so
16 whatever techniques are used to manufacture that
17 could be considered I think conventional, but it
18 really depends on the application and how it's
19 conventionally manufactured, what are the methods
20 that work, you know, knowing that photolithography
21 can damage surfaces and materials.

22 Q. Are there drawbacks to using additive
23 techniques, as opposed to photolithography?

24 A. I mean, I think that's kind of open
25 ended, because with all techniques, there are really

1 pros and cons, and you try to get the best of both
2 to get the best application or to get the best
3 product.

4 Q. Well, you did describe generally
5 drawbacks of using subtractive techniques, correct?

6 A. Sure. There are drawbacks in both.

7 Q. So I'm asking, what are some of the
8 drawbacks of the additive techniques?

9 A. It depends on what additive technique
10 we're describing. Depending on which one, I could
11 list some potential drawbacks.

12 Q. What about applying layers of an
13 electronic device in the structured manner described
14 in the '492 Patent?

15 ATTORNEY WEIDENFELLER: Objection.

16 THE WITNESS: Your question is what are
17 the drawbacks?

18 BY ATTORNEY WARRICK:

19 Q. Correct.

20 A. Yeah. I mean, tailoring the equipment,
21 whatever is -- the mechanisms that are controlling
22 any printing equipment, the nozzle size, all of
23 these things have to be tailored, so that there
24 would be a lot of work that has to go into that, as
25 opposed to -- so issues with tolerance. Of course

1 those issues also exist in subtractive methods, and
2 I think it all comes down then to what is the --
3 what are the margins and how big are these devices.

4 Q. So when you talk about the size, the
5 margins, am I correct in understanding that to mean
6 that a subtractive or an additive technique may be
7 better for certain size devices?

8 A. Sure. There are tradeoffs in both ways,
9 I'd say, and it depends on the application.

10 Q. Does the word "resolution" mean anything
11 to you in the context of these additive and
12 subtractive techniques?

13 A. Sure. It's the same as a resolution of
14 a, you know, in photolithography, so how accurate
15 can you make a certain feature.

16 Q. Is resolution a consideration when
17 deciding between a subtractive versus an additive
18 technique for fabricating an electronic device?

19 A. I would say it depends again on what the
20 electronic device is, but that could be a
21 consideration.

22 Q. Is the resolution of the technique an
23 important consideration when fabricating an OLED
24 display device?

25 A. Resolution will be a consideration.

1 Yeah.

2 Q. In what way?

3 A. It depends on your final product and the
4 resolution that your tool allows for, whatever your
5 technique allows for.

6 Q. Generally speaking, do subtractive
7 techniques provide better or worse resolution than
8 additive techniques?

9 A. You know, I think that really depends on
10 the additive technique and, for example, the design
11 of the printer, et cetera, or the design of a shadow
12 mask.

13 Q. Would you agree there are situations in
14 which a subtractive technique will provide better
15 resolution than an additive technique?

16 A. I can't say there will never be that
17 situation. Sure. Like I said, it's dependent on
18 what you're trying to make.

19 Q. Am I understanding correctly that the
20 resolution of the additive or subtractive technique
21 is dependent on the device you're trying to make?

22 A. It's dependent on the requirements of
23 the device you're trying to make, what are the
24 minimum feature sizes.

25 Q. But isn't the resolution inherent to the

1 particulars of the technique, rather than the
2 requirements of the device you're trying to make?

3 A. Yeah, but you would choose -- you could
4 choose and tailor that technique depending on your
5 design constraints.

6 Q. Understood. And is it generally the
7 case that this resolution feature of subtractive
8 techniques is more accurate than additive
9 techniques, as of 2012?

10 ATTORNEY WEIDENFELLER: Objection.

11 THE WITNESS: I think the issue I'm
12 coming into is are we talking about an
13 experimental printer that, you know, highly
14 tuned, as a comparison to something that's
15 going to be used on a manufacturing scale.

16 I don't think I can sit -- if the
17 question is generally could features be made
18 smaller and more controlled, so better
19 resolution, I think, again, it depends on
20 whether we're describing an experimental
21 printer that has great resolution, as
22 compared to traditional or photolithography,
23 where we're using masks.

24 I don't think I can answer that for sure
25 that one would always be better.

1 BY ATTORNEY WARRICK:

2 Q. To be clear, I'm not asking about
3 necessarily something experimental in 2012, but more
4 so just the prevailing standards at the time. And
5 in 2012, is it generally the case that you could
6 achieve greater resolution with subtractive
7 techniques relative to additive techniques?

8 A. I think on a very high level, generally
9 the techniques that were used for photolithography,
10 you know, are at that time much more advanced than
11 printing methods. So probably yes.

12 Q. Is that because people had been
13 practicing those photolithography methods for a
14 longer period of time than the additive techniques?

15 A. I'd have to think about that, whether
16 there's like a fundamental limitation in fronting
17 resolution, and that continued to mature. So it
18 really depends on -- again, I go to feature size and
19 what the requirements were for that product.

20 Q. Would you agree that the ability to
21 fabricate very small features was important to the
22 fabrication of OLED display devices in 2012?

23 A. I think that we'd need more to define
24 the term "very small," specifically if we're
25 comparing OLEDs to integrated circuits or to

1 nanoelectronics.

2 Q. So if we are making that comparison, is
3 your answer that yes, the ability to fabricate very
4 small features was important to fabricating OLEDs?

5 A. It depends on how you define "small."
6 Traditionally these are larger electronic devices
7 than integrated circuits. So you have to define
8 "small."

9 Q. In 2012, would it be important to
10 have -- strike that.

11 In 2012, would it be important to
12 utilize a high-resolution technique to fabricate the
13 layers of an OLED display device?

14 A. It depends on what you mean by high
15 resolution and what size are we talking about, as
16 far as minimum features, because the minimum
17 features of an OLED are larger than that of an
18 integrated circuit.

19 Q. What type of integrated circuit are you
20 referring to?

21 A. A processor. Flash memory.

22 Q. You would agree that for any given
23 project, the resolution of the technique chosen to
24 apply the layers of an electronic device is an
25 important consideration, correct?

1 ATTORNEY WEIDENFELLER: Objection.

2 THE WITNESS: Only if it's getting close
3 to your minimum feature size for that
4 application. If your feature sizes are very
5 large, then no. It becomes less of an issue.

6 BY ATTORNEY WARRICK:

7 Q. When you're choosing a technique to
8 apply a layer of an electronic device in 2012, is
9 the material being applied also a relevant
10 consideration?

11 A. When you say the material applied, do
12 you mean the chemistry, or what do you mean?

13 Q. Sure. The chemistry of the material
14 that will form that particular layer of the
15 electronic device.

16 A. And, I'm sorry, your question is whether
17 selecting that material is important?

18 Q. We can start there. Sure.

19 A. Well, sure. I mean, it all comes with
20 what are the electrical and material requirements,
21 and then what recipes are being used to create it,
22 and then modifying those recipes.

23 Q. And that's because different materials
24 have different chemical properties, for example?

25 A. Sure. They have different chemical,

1 electrical, mechanical properties.

2 Q. Are some materials more conducive to an
3 additive fabrication technique?

4 A. I think that's a fairly broad question.
5 I think a lot of it has to do with what research was
6 being done and what the focus was, what were the
7 materials that people were trying to do via
8 printing, for example. Those maybe had more
9 attention paid to.

10 Q. And just so we're clear, when you refer
11 to printing, you're referring to an additive
12 technique, correct?

13 A. Yes. It's one of.

14 Q. So in 2012, were there materials that
15 could not be applied using additive techniques?

16 A. Sure. I mean, I'm sure there were some
17 materials that couldn't be or were not studied.
18 Yeah.

19 Q. And if one were choosing between a
20 subtractive and additive technique for fabricating
21 an electronic device in 2012, the material of a
22 given layer could be relevant to choosing the
23 appropriate technique, correct?

24 A. I think there's more that goes into that
25 selection, but that would be one thing to consider

1 for sure.

2 Q. Dr. Kattamis, earlier this morning, you
3 referenced Dr. Pattison.

4 A. Yes.

5 Q. And you understand that Dr. Pattison is
6 the patent owner's expert in this proceeding?

7 A. Yes.

8 Q. Do you know Dr. Pattison?

9 A. No.

10 Q. I believe you mentioned that you
11 reviewed Dr. Pattison's declaration in connection
12 with your preparation for today's deposition?

13 A. Yes.

14 Q. Have you also reviewed Dr. Pattison's
15 CV?

16 A. No.

17 Q. Do you have any reason to question
18 Dr. Pattison's qualifications to provide expert
19 testimony in this matter?

20 A. I have no reason either way. No.

21 ATTORNEY WARRICK: We've been going
22 about an hour. If this is a good time to
23 take a break, I'm happy to do that.
24 Otherwise, I'm happy to keep going.

25 THE WITNESS: Sure. Let's take five.

1 Thanks.

2 (Break in proceedings.)

3 BY ATTORNEY WARRICK:

4 Q. Dr. Kattamis, welcome back.

5 A. Thanks.

6 Q. Did you have any discussions during our
7 break?

8 A. No.

9 Q. Earlier this morning, we were talking
10 about the '492 Patent and its description of
11 fabricating electronic devices using different
12 fabrication techniques; is that right?

13 A. Yes.

14 Q. And am I correct that one of the stated
15 advantages of the invention of the '492 Patent is
16 the application of certain layers using structured
17 techniques and others using subtractive techniques?

18 ATTORNEY WEIDENFELLER: Objection.

19 THE WITNESS: Yeah, it depends on what
20 we're talking about within the embodiments,
21 but it does have an extensive focus on
22 depositing via structured means.

23 BY ATTORNEY WARRICK:

24 Q. The '492 Patent requires that certain
25 layers of an electronic device be fabricated using a

1 structured technique, in particular, correct?

2 ATTORNEY WEIDENFELLER: Objection.

3 THE WITNESS: Sure, in the claims. Yes.

4 BY ATTORNEY WARRICK:

5 Q. And that includes the fabrication of an
6 OLED display device, correct?

7 ATTORNEY WEIDENFELLER: Objection.

8 THE WITNESS: I'd have to look at that
9 section. One sec.

10 BY ATTORNEY WARRICK:

11 Q. To clarify my question, the '492 Patent
12 requires the use of a structured technique to
13 fabricate certain layers of an OLED display device;
14 is that correct?

15 A. I don't know if it calls out display,
16 but an optoelectronic device.

17 (Court reporter clarification.)

18 BY ATTORNEY WARRICK:

19 Q. In the invention of the '492 Patent, the
20 fabrication of an optoelectronic device requires the
21 fabrication of particular layers using a structured
22 technique. Yes?

23 A. That's what it claims, yes. It claims
24 certain layers. It claims how to deposit certain
25 layers, and some of those are structured, via

1 structured technique.

2 Q. Are you aware of anyone prior to the
3 priority, the '492 Patent, fabricating an
4 optoelectronic device using structured techniques
5 for those particular layers as described in the '492
6 Patent?

7 A. I'm sure devices were manufactured that
8 included structured deposition steps for
9 optoelectronic devices.

10 Q. Well, I'm asking specifically about
11 fabricating an optoelectronic device wherein you use
12 the structured technique for the particular layers
13 for which it is required in the '492 Patent. Were
14 you aware of anyone doing that prior to the '492
15 Patent?

16 ATTORNEY WEIDENFELLER: Objection.

17 THE WITNESS: If you're asking the
18 layers that are called out in the claims,
19 being done in that way, I'm not sure. I
20 don't know. I'm not aware.

21 BY ATTORNEY WARRICK:

22 Q. And your declaration, Exhibit 1003,
23 doesn't identify anyone having fabricated an
24 optoelectronic device using that particular
25 approach, correct?

1 ATTORNEY WEIDENFELLER: Objection.

2 THE WITNESS: When you say the
3 particular approach, you mean according to
4 the claims?

5 BY ATTORNEY WARRICK:

6 Q. Correct. Your declaration doesn't
7 identify anyone who fabricated an optoelectronic
8 device using the claimed method of fabricating
9 certain layers in a structured manner as described
10 in the '492 Patent?

11 A. Yes.

12 Q. Just to be clear, yes, your declaration
13 does not identify any such example of --

14 A. Correct.

15 Q. Is it fair to say if you were aware of
16 such an example of prior fabrication according to
17 the claim techniques in the '492 Patent, you would
18 have included it in your declaration?

19 ATTORNEY WEIDENFELLER: Objection.

20 THE WITNESS: I think it depends on
21 whether it would be a written publication or
22 just knowledge of somebody building something
23 like that in a lab somewhere.

24 BY ATTORNEY WARRICK:

25 Q. But to be clear, you're personally not

1 aware of anyone having fabricated such a device in
2 the claimed manner prior to the '492 Patent,
3 correct?

4 A. Correct.

5 Q. Dr. Kattamis, are you familiar with the
6 concept of a person of ordinary skill in the art?

7 A. Yes, I am.

8 Q. And that person is sometimes referred to
9 as a POSITA. Have you heard that acronym before?

10 A. Yes.

11 Q. Your declaration, Exhibit 1003, includes
12 a proposed definition for a POSITA in the context of
13 the '492 Patent, at Paragraph 46. Correct?

14 A. Yes. Correct.

15 Q. Now, would you consider yourself a
16 POSITA, according to that definition?

17 A. Yeah. Sure. Yeah, as a very low
18 minimum. Yeah.

19 Q. And would you consider yourself a POSITA
20 in 2012, according to this definition?

21 A. Yeah. The same answer. Yes.

22 Q. Did you personally craft this definition
23 of a POSITA, or did someone else provide it to you?

24 A. There may have been some back and forth
25 with counsel, but I do believe I helped draft it.

1 I've done it in the past for other cases. So it's
2 something I did consider.

3 Q. Would you agree that the fabrication of
4 optoelectronic devices was a cross-disciplinary
5 field in 2012?

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: I mean, I think if I go
8 back to grad school times, there was -- it
9 was cross-disciplinary in the sense that we
10 were electricals operating in a semiconductor
11 type of environment where we learned a lot
12 about material science, for example, and
13 fabrication techniques. So, yeah, there's an
14 interdisciplinary nature to it. So I think
15 that's accurate.

16 BY ATTORNEY WARRICK:

17 Q. And 2012, fabricating electronic devices
18 would also require expertise in chemistry, for
19 example?

20 ATTORNEY WEIDENFELLER: Objection.

21 THE WITNESS: So as I think with most
22 systems like this, there are a lot of
23 different backgrounds that go into
24 fabricating a device. So you have some
25 chemistry knowledge, of course, for how to

1 deposit things, how they adhere, mechanical
2 backgrounds, just to understand how thin
3 films work and whether they'll break, and
4 then electrical to understand how to make the
5 device function.

6 So you would have a little bit of
7 expertise in all of those fields, and then I
8 think it would depend on a little bit more of
9 the focus, right, are you a person that's
10 developing recipes, et cetera, or are you a
11 person that's working more on tailoring
12 electrical properties of materials. So I
13 think that really depends.

14 BY ATTORNEY WARRICK:

15 Q. Dr. Kattamis, we've talked a little bit
16 about capacitors today as well. Could you describe
17 for me generally what it is that defines a
18 capacitor?

19 A. A capacitor is a device that has the
20 ability to hold charge.

21 Q. In 2012, if one wanted to fabricate a
22 capacitor, was there a conventional approach to
23 doing so?

24 A. I mean, I think again it depends on the
25 application. If we're talking about pixels versus

1 sensor arrays, so pixels for displays versus sensor
2 arrays, your selection of the dielectric and/or
3 insulator selection of geometry. So I think it's
4 highly dependent on what the application is.

5 Q. Sure. So let's assume we're not talking
6 about optoelectronic display devices, as we were
7 earlier, but just for capacitors generally, to start
8 over, at high level, you need to have two electrodes
9 with some type of dielectric or insulator in
10 between; is that right?

11 A. Yeah. You need separation of two
12 conductive surfaces.

13 Q. Why is that?

14 A. To establish the electric field and
15 store the charge in the capacitor.

16 Q. And it's important that the electrodes
17 not be permitted to touch, correct?

18 A. Yes. That would be a design
19 consideration. Of course.

20 Q. Because that would create a short
21 circuit, right?

22 A. Yeah. You wouldn't have a capacitor
23 then.

24 Q. Is it important that the distance
25 between the electrodes be uniform across the

1 capacitor?

2 A. I would say that that's a consideration.
3 It depends on the design of the entire structure.

4 Q. In what way would you consider the
5 uniformity of the distance between the electrodes to
6 be important in the design of a capacitor?

7 A. The net uniformity will impact the
8 capacitance of the final device.

9 Q. So if the distance between the
10 electrodes has greater uniformity, does that lead to
11 more or less capacitance in the device?

12 A. Capacitance is set by the area of the
13 electrodes.

14 Q. What properties of a capacitor would be
15 impacted by the uniformity of the distance between
16 the electrodes?

17 A. There are many. Breakdown voltage, and
18 now thinking back, of course capacitance is also
19 dependent on the separation of the plates, so the
20 area and the separation, so that would impact the
21 net capacitance of the device.

22 Q. When you say the separation of the
23 plates, are you referring to the distance between
24 the electrodes?

25 A. Correct. Yeah.

1 Q. So if a capacitor does not have a
2 uniform distance between the electrodes, am I
3 understanding you correctly that there could be
4 negative consequences for the final device?

5 ATTORNEY WEIDENFELLER: Objection.

6 THE WITNESS: No. It depends on the
7 entire device, and generally you can design
8 that distance or whatever it is to get your
9 expected capacitance. So not inherently, no.

10 BY ATTORNEY WARRICK:

11 Q. I think I heard you testify earlier that
12 uniformity of the distance between the electrodes is
13 a relevant consideration in the fabrication of a
14 capacitor.

15 A. Yeah, because it will affect the
16 capacitance.

17 Q. Does greater uniformity lead to more or
18 less capacitance?

19 A. When we talk about uniformity, it really
20 depends on, you know, are we talking about
21 uniformity on the microscale? I think it's
22 situation -- it's dependent on the situation.

23 Q. Generally speaking, is it important to
24 have a uniform distance between the electrodes in a
25 capacitor?

1 A. I think it depends on the capacitor
2 design. You'll have some capacitors that the
3 distance may not be constant throughout, but in the
4 end you'll have the capacitance that's desired. So
5 it's all about tailoring the rest of that -- or all
6 that geometry so that the whole thing -- to get the
7 desired capacitance.

8 Q. Can a lack of uniformity in the distance
9 between the electrodes of a capacitor lead to
10 reliability problems?

11 A. Again, that really depends on what we're
12 talking about. How gross is the uniformity. How
13 big is the separation. What type of dielectric
14 material and/or insulator is being used.

15 Q. In at least some situations, though,
16 you'd agree that a lack of uniformity in the
17 distance between the electrodes and the capacitor
18 can lead to reliability problems, right?

19 ATTORNEY WEIDENFELLER: Objection.

20 THE WITNESS: Perhaps in an edge case,
21 where you have no dielectric and you have a
22 short. I'm just saying these are things that
23 can be designed and manipulated based on the
24 geometry of the device and the final
25 capacitance, the goal capacitance or target

1 capacitance.

2 BY ATTORNEY WARRICK:

3 Q. All other things being equal, when
4 you're fabricating a capacitor, would you want to
5 have greater or lesser uniformity in the distance
6 between the electrodes?

7 A. I think it depends on what we're
8 discussing for uniformity, again, if it's a
9 microscale uniformity change, a macroscale. What
10 I'm trying to say is there are tolerances you can
11 change to still achieve that same goal of X
12 capacitance.

13 Q. You understood what -- I'm just saying,
14 all other things being equal, if you were designing
15 a capacitor, would you want to have more uniformity
16 or less uniformity in the distance between the
17 electrodes?

18 A. Again, I think it depends on the
19 application. You know, we're trying to make a
20 capacitor, and we're governed by the area and the
21 distance. Depending on the requirements, those
22 changes in uniformity may not affect the
23 capacitance, right? It depends on what scale of
24 differences we're talking about in thickness.

25 So I don't think I can answer that, just

1 as that hypothetical.

2 Q. Are you aware of a situation where
3 having greater uniformity in the distance between
4 the electrodes would have an adverse effect on a
5 capacitor?

6 A. I mean, it depends on so many other
7 things, like what is the thickness, and what are
8 potential defects in the dielectric that could cause
9 shorts within the capacitor itself. That has to be
10 considered.

11 It depends on the material that we're
12 putting down. Is it something that's prone to
13 defects. Is it something that can be applied in a
14 thin, good thin coating that is not prone to defects
15 that could create shorts between the two electrodes.

16 Q. All right. So I understand that there
17 are a lot of considerations that would go into the
18 design of a capacitor. What I'm asking you is,
19 given all of these parameters, are you aware of a
20 situation where having greater uniformity in the
21 distance between the electrodes has an adverse
22 effect on the capacitor device?

23 A. Not in that hypothetical, no. Greater
24 uniformity should not create problems, assuming
25 everything else has been managed properly.

1 Q. If you do not have a uniformed distance
2 between the electrodes and the capacitor, would you
3 agree that in at least some situations, it's
4 possible you could have regions of the capacitor
5 that have a higher electric field?

6 A. Yeah, of course. If you bring the two
7 electrodes closer, the field will be higher. Again,
8 it depends on what can be tolerated by -- what can
9 be tolerated to still get the required capacitance.

10 Q. And if that higher electric field in
11 certain regions of the capacitor is too great, would
12 you agree that could result in breakdown of the
13 dielectric or insulator layer?

14 A. Yeah, but if you're designing it with
15 that methodology, you would ensure that your layers
16 and separations are large enough to prevent
17 breakdown.

18 Q. And that's because if there was
19 breakdown of the dielectric or insulator, you could
20 potentially have a failure or a short-circuiting of
21 the capacitor, right?

22 A. Yeah, of course. If you have a short
23 between the two electrodes, you no longer have a
24 functioning capacitor.

25 ATTORNEY WARRICK: I'd like to introduce

1 another exhibit.

2 (Exhibit 1005 was marked for
3 identification.)

4 BY ATTORNEY WARRICK:

5 Q. Hopefully now you should be able to see
6 Exhibit 1005.

7 A. Yes.

8 Q. Do you recognize this document?

9 A. Yes. Ingle.

10 Q. Specifically, Exhibit 1005 is a
11 translation of an Ingle reference that you
12 referenced that you relied upon in your declaration,
13 correct?

14 A. Yes.

15 Q. I believe it's your understanding, based
16 on your declaration, that there are some
17 similarities between Ingle and the '492 Patent; is
18 that right?

19 A. The authors, you're saying?

20 Q. You're saying there's a common inventor,
21 Mr. Ingle?

22 A. Yes.

23 Q. But in the disclosures of Ingle, I
24 believe it's your position that there are several
25 similarities between the '492 Patent and the

1 disclosure of Exhibit 1005; is that right?

2 A. Yes. Yeah. Yeah. I find in the
3 limitation analysis.

4 Q. What do you understand to be the
5 differences between the '492 Patent and this Ingle
6 reference, Exhibit 1005?

7 ATTORNEY WEIDENFELLER: Objection.

8 THE WITNESS: Not a lot.

9 BY ATTORNEY WARRICK:

10 Q. Well, earlier we were talking about both
11 capacitors and optoelectronic devices needing to
12 have a pair of electrodes, an anode and a cathode;
13 is that right?

14 A. Sure. Yes. Yeah.

15 Q. And at least I believe in your
16 description of the '492 Patent in your declaration,
17 you refer to the topmost electrode layer as the
18 cathode layer for either a capacitor or an
19 optoelectronic device; is that right?

20 A. Yes. Yes.

21 Q. And would you agree that the '492 Patent
22 describes the technique for applying the cathode
23 layer for an electronic device?

24 A. For a device, yes.

25 Q. Specifically, the '492 Patent describes

1 applying a cathode layer in a structured fashion,
2 correct?

3 A. Yeah. I can't remember off the top of
4 my head the exact method. I'd have to look at the
5 patent.

6 Q. You should have Exhibit 1001 available
7 to you, if it helps to take a look at that.

8 A. Yes. In Figure 7, for example.

9 Q. And in your declaration, you describe
10 claim limitations which require applying what you
11 call the cathode layer in a structured fashion,
12 correct?

13 A. Yes.

14 Q. Does Ingle, Exhibit 1005, describe how
15 one should apply such a cathode layer?

16 A. No. I believe it leaves that open.

17 Q. So Ingle was not --

18 A. It teaches -- it teaches throughout the
19 use of structured techniques, but I believe then it
20 leaves it open to the user to create an
21 optoelectronic device on that backplane.

22 Q. So Ingle itself does not teach using a
23 structured technique to apply the cathode in an
24 optoelectronic device, right?

25 ATTORNEY WEIDENFELLER: Objection.

1 THE WITNESS: Ingle describes producing
2 an OLED on its backplane, which would require
3 a cathode.

4 BY ATTORNEY WARRICK:

5 Q. But Ingle does not teach applying that
6 cathode in a structured manner, does it?

7 ATTORNEY WEIDENFELLER: Objection.

8 THE WITNESS: No. Ingle teaches to use
9 structured methods throughout the invention.
10 It remains silent on what method to use with
11 respect to the OLED.

12 BY ATTORNEY WARRICK:

13 Q. Now, Ingle does describe fabricating
14 other layers of electronic devices on a substrate,
15 correct?

16 A. Yes.

17 Q. And it does not describe applying all of
18 those layers in a structured manner, does it?

19 ATTORNEY WEIDENFELLER: Objection.

20 THE WITNESS: This is kind of what we
21 were discussing earlier. It depends on what
22 the motivation is for each layer and what is
23 that layer, can it tolerate photolithography,
24 et cetera.

25

1 BY ATTORNEY WARRICK:

2 Q. I just wanted to make sure I understood.
3 You referenced earlier that applying layers with a
4 structured technique was taught throughout Ingle,
5 but we can agree that Ingle does not describe using
6 the structured technique for every layer of an
7 electronic device, right?

8 A. No. It just says that now you can
9 produce an OLED, and with all the teaching of the
10 structured application, I think it makes sense that
11 one would do that. It's not spelled out in Ingle.
12 I mean, that's why it's -- it leaves it open.

13 Q. Maybe to ask a little bit differently,
14 Ingle doesn't teach applying every layer of
15 electronic device using an additive technique, does
16 it?

17 ATTORNEY WEIDENFELLER: Objection.

18 THE WITNESS: No. In its embodiments,
19 it doesn't describe each layer as being
20 structured deposition.

21 BY ATTORNEY WARRICK:

22 Q. And in fact, for some layers of the
23 electronic devices disclosed in Ingle, Ingle
24 describes using a subtractive process; isn't that
25 right?

1 A. In some of the embodiments, yes.

2 Q. For example, Ingle describes the
3 technique called laser ablation. Do you recall
4 that?

5 A. Yeah. It sounds familiar. Do you have
6 a page?

7 Q. So for example, on Page 9.

8 A. Yeah.

9 Q. Is laser ablation a subtractive or
10 additive technique?

11 A. No. It's subtractive. It's removing
12 material.

13 Q. And Ingle describes using the
14 subtractive laser ablation technique to fabricate at
15 least some layers of the electronic devices in its
16 embodiments, correct?

17 A. Yes.

18 Q. In fact, there's no embodiment described
19 in Ingle wherein every layer is fabricated using an
20 additive technique; is that right?

21 A. Sure. In the process, it describes not
22 every layer is additive. I think that that's true.

23 Q. If we could look specifically at Page 7
24 of Exhibit 1005.

25 A. Okay.

1 Q. So again we have dueling page numbers.
2 So page 7 is Page 10 of Exhibit 1005, which is also
3 identified as Page 7 of Ingle.

4 A. Yes.

5 Q. Okay. And in the paragraph beginning
6 around line 20, the second sentence reads, "Since
7 each layer of the component can be applied
8 individually and, if necessary, structured according
9 to desire or purpose (as can be seen from the
10 following further developments of the method),
11 time-consuming coating or application steps can thus
12 be avoided and (often expensive) material can also
13 be saved."

14 Did I read that correctly?

15 A. Yes.

16 Q. And this is a disclosure of Ingle that
17 you reference in your declaration, correct?

18 A. Yes.

19 Q. In this sentence on Page 10 of
20 Exhibit 1005, the reference to structuring an
21 individual layer, that's not necessarily describing
22 the application of the layer in a structured manner
23 as we've been discussing today, is it?

24 A. No. I think it is -- if necessary,
25 structured according to desire or purpose.

1 Time-consuming coatings can thus be avoided.

2 So I think it could mean not a full
3 coating.

4 Q. Well, what I'm trying to ask is, this
5 sentence says reference to a layer being structured.
6 That does not exclusively refer to structuring
7 through additive techniques, does it?

8 A. I think it allows for it.

9 Q. And it also allows for structuring
10 through subtractive techniques, correct?

11 A. Sure. I mean, one of the techniques
12 that's described later is laser ablation. So yes.

13 Q. Going back to the '492 Patent, which is
14 Exhibit 1001, if we look at Column 1, there is -- I
15 apologize.

16 Column 2 of Exhibit 1001, which is the
17 '492 Patent, starting at line 5, there's a reference
18 to planar application of layers and subsequent
19 structuring of those layers. Do you see that?

20 A. Yes. Give me one moment.

21 Correct. Yes.

22 Q. That sentence is describing what we've
23 been referring to as a subtractive fabrication
24 technique, right?

25 A. Sure. In this context, it's saying

1 subsequent structure of the layers, for example, in
2 a photolithographic method.

3 Q. Then in the paragraph immediately prior
4 which starts at the bottom of Column 1 and finishes
5 at the top of Column 2 of Exhibit 1001, there's
6 reference to the dielectric and/or the electrode
7 layer and/or subsequently further layers or
8 materials being applied in a structured fashion.

9 A. Yes.

10 Q. And that is referring to an additive
11 fabrication technique as we've discussed today,
12 correct?

13 A. Yeah, structured deposition.

14 Q. And Ingle, Exhibit 1005, does not
15 include this language, does it?

16 ATTORNEY WEIDENFELLER: Objection.

17 THE WITNESS: I think the difference is
18 in the '492 -- yeah, it clearly says that the
19 area to be coated is coated in partial
20 regions, but I still think that the paragraph
21 that we're looking at in Ingle doesn't
22 preclude structured deposition because of the
23 line describing coating.

24 BY ATTORNEY WARRICK:

25 Q. Well, my question is about what Ingle

1 discloses, as opposed to what it forecloses. And am
2 I correct that Ingle, Exhibit 1005, does not have a
3 disclosure of applying the electrode layer and/or
4 subsequently further layers or materials in a
5 structured fashion as we find in the '492 Patent?

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: I have to look at Ingle
8 real quick.

9 BY ATTORNEY WARRICK:

10 Q. Please do.

11 A. It doesn't have the same sequence of
12 terms, saying which layers can be or can't be
13 structurally deposited, but it does talk about
14 regions being preselected. You know, it's not set
15 forth in the same words, in one sentence, but I
16 think there's a lot that describes it.

17 Q. Can you point me to anything in Ingle
18 that specifically describes forming the electrode
19 layer or any subsequent layers using an additive
20 technique?

21 A. So Ingle, at 6/19.

22 Q. Are we talking about the page number at
23 the top of the page or --

24 A. Yeah, let's use the top of the page.

25 Q. Okay.

1 A. Described a situation where the
2 structuring of the first and second conductive --
3 electrically conductive layers are structured by
4 deposition. For example, printing.

5 Q. And this paragraph on Page 6 of Ingle,
6 beginning around line 19, is specifically talking
7 about the first and second electrically conductive
8 layers, right?

9 A. Yes, which then, depending on your
10 application, could form electrodes.

11 Q. But in the context of Ingle and the '492
12 Patent, the first and second electrically conductive
13 layers do not form the cathode of an electronic
14 device, do they?

15 ATTORNEY WEIDENFELLER: Objection.

16 THE WITNESS: No. They form an
17 electrode, though. And then the '492 says
18 electrode layer. The question was -- the way
19 I read it or the way I understood it was is
20 there similar language to this sentence at
21 Column 1, the bottom of Column 1 of '492, and
22 though there isn't an explicit sentence like
23 that, there are places throughout that
24 describe other layers throughout Ingle that
25 describe other layers being deposited in a

1 structured fashion.

2 BY ATTORNEY WARRICK:

3 Q. So Ingle here is describing applying
4 what you in your declaration refer to as the anode
5 layer in a structured fashion, right?

6 A. Yeah. I think that's fair.

7 Q. But there's no disclosure in Ingle of
8 applying the cathode layer in a structured fashion,
9 correct?

10 A. No. Ingle leaves that open for how to
11 complete the optoelectronic device.

12 Q. Now, if we could turn to Page 22 of
13 Ingle, Page 22 on the top of the page, it's Page 25
14 of Exhibit 1005, the paragraph at the top of the
15 page reads, "For this purpose, the semiconducting,
16 light-emitting organic layers and the second
17 electrode layer, for example a cathode layer, are
18 vapor-deposited onto the substrate layer in
19 subsequent processing steps, for example in a
20 vacuum."

21 Did I read that correctly?

22 A. Sure. Yes. Yeah.

23 Q. The reference to vapor-deposited, does
24 that in your opinion refer specifically to an
25 additive fabrication technique?

1 ATTORNEY WEIDENFELLER: Objection.

2 THE WITNESS: It can restructure, for
3 sure, through shadow masking.

4 BY ATTORNEY WARRICK:

5 Q. But it could also be a subtractive
6 technique, correct?

7 ATTORNEY WEIDENFELLER: Objection.

8 THE WITNESS: Could it be? Yes. Though
9 with organic light-emitting layers, I would
10 tend to avoid that. So my expectation and my
11 experience is that that, in this timeframe,
12 would be through some sort of mask.

13 BY ATTORNEY WARRICK:

14 Q. Can we agree that this paragraph of
15 Ingle, by referencing a layer being vapor-deposited,
16 does not specify either an additive or a subtractive
17 fabrication technique, does it?

18 A. No, I don't think it specifies in so
19 many terms, but mentioning the term "light-emitting
20 organic layers," to me, would indicate that
21 photolithography would be avoided.

22 Q. If you could turn, Dr. Kattamis, to the
23 immediately prior page, with the number 21 at the
24 top of the page. This is Page 24 of Exhibit 1005.

25 The paragraph at the bottom of the page

1 says that, "The electronic component, for example an
2 OLED, can now be produced on the substrate layer
3 prepared in this way using a conventional process."

4 Do you see that?

5 A. Yes.

6 Q. What is your understanding of Ingle's
7 reference to a conventional process in this
8 sentence?

9 A. Conventional technique for fabricating
10 an OLED.

11 Q. I seem to recall earlier you testified
12 that you're not aware of a conventional technique
13 for producing an OLED display device; is that right?

14 ATTORNEY WEIDENFELLER: Objection.

15 THE WITNESS: No. I think what I'm
16 saying is that a conventional technique -- if
17 I think about 2012, the conventional
18 technique of selecting the chemistry of each
19 of the layers, the different layers of the
20 stack, conventional could mean what is the
21 most efficient that day.

22 But when I'm talking about making an
23 entire device, including cathode and anode,
24 my tendency would be to say there is no --
25 you would avoid the photolithographic step at

1 the end and the cathode would be deposited
2 via a structured fashion, whether a printing
3 or a shadow mask, something that doesn't
4 require follow-on lithography.

5 BY ATTORNEY WARRICK:

6 Q. So in your view, a conventional process
7 would not use a subtractive fabrication technique
8 for the cathode of an OLED?

9 ATTORNEY WEIDENFELLER: Objection again.

10 THE WITNESS: Yeah. I think in general,
11 once the OLED structure is down, you do not
12 want to perform photolithography, at least in
13 that time period. Shadow masking or another
14 method of deposition would tend to be used to
15 avoid damage to the OLED layers, to the
16 organics.

17 BY ATTORNEY WARRICK:

18 Q. I believe you testified earlier that as
19 of the 2012 priority date of the '492 Patent, you're
20 not personally aware of anyone fabricating an OLED
21 in that particular manner; is that right?

22 ATTORNEY WEIDENFELLER: Objection.

23 THE WITNESS: Fabricating OLED in what
24 particular manner?
25

1 BY ATTORNEY WARRICK:

2 Q. The manner we've just described, wherein
3 the cathode layer is applied as what the '492 Patent
4 calls is a structured fashion.

5 A. No. I must have misspoken or not
6 understood. I do not expect the top layer of an
7 OLED to have any subsequent photolithography
8 performed at that time. We would do it through
9 shadow masks.

10 Q. So you are aware of, personally aware
11 of, someone fabricating an OLED device prior to 2012
12 in which the cathode layer is applied in a
13 structured manner as the '492 Patent describes it?

14 A. Yes. Yeah. I mean, this is something
15 I've worked on.

16 Q. Did you identify any such examples in
17 your declaration, Exhibit 1003?

18 A. Where the OLED was -- where the top
19 cathode of the OLED was put in a structured fashion?
20 Yes. Hasei, I think, describes that.

21 Q. It's your opinion that Hasei describes
22 the fabrication of an OLED device? I apologize.

23 It's your opinion that Hasei describes
24 the fabrication of the OLED device in which the
25 cathode layer is applied in a structured fashion?

1 A. Yes. I have to review Hasei, but I do
2 believe that's the case.

3 Q. Okay. We'll come back to Hasei in a
4 little bit.

5 A. Okay.

6 Q. While we're still looking at Ingle,
7 Exhibit 1005, could we look at Figure 1I?

8 A. Yes.

9 Q. In your view, just looking at what is
10 expressly depicted in Figure 1I, and not some of the
11 annotations that were added in your declaration,
12 does Figure 1I disclose a capacitor device?

13 A. No, Figure 1I does not in and of itself
14 disclose a capacitor device. Disembodiment does
15 not -- this picture does not show that.

16 Q. Am I correct that, for example, the --
17 you see the part of the figure identified by the
18 Number 9, and I believe that refers to a dielectric;
19 is that right?

20 A. Yeah, I believe so. I just want to
21 confirm. Yes. Dielectric. Yes.

22 Q. Right. And that extends downward
23 between -- into, rather, a gap between electrically
24 conductive layers on both the left and the right,
25 correct?

1 ATTORNEY WEIDENFELLER: Objection.

2 THE WITNESS: That's what's illustrated
3 here, of course keeping in mind that -- the
4 relevant thicknesses of the layers. It's not
5 to scale, but that's what it shows. Yes.

6 BY ATTORNEY WARRICK:

7 Q. So looking at Figure 1I, the
8 electrically conductive layers on either side of the
9 dielectric, Number 9, why does that combination not
10 form a capacitor such that you have electrodes on
11 either side of the dielectric?

12 A. I think, again, it's a scaling issue.
13 If we look at layer 1 as being a substrate, then
14 this isn't really to scale, because what it's
15 showing me is the metal layers, or the conductive
16 layers 3 and 5, are of similar thickness.

17 So you would have a very, very tiny
18 surface area for any capacitor. So I wouldn't
19 consider it a capacitor, nor would it be something
20 you could easily tailor to adjust capacitance.

21 So it's a capacitor in the same way as
22 if I hold two pieces of metal across from each other
23 with an air gap, there's theoretically a capacitance
24 there, but it's not something you can tailor unless
25 you make extremely thick films.

1 Q. And that's because of the small surface
2 area, you testified?

3 A. That's one aspect. Sure.

4 ATTORNEY WARRICK: It's 11:26 now.
5 Would now be a good time for another short
6 break?

7 THE WITNESS: That works.

8 ATTORNEY WARRICK: Five minutes?

9 THE WITNESS: Sure.

10 (Break in proceedings.)

11 BY ATTORNEY WARRICK:

12 Q. Welcome back again, Dr. Kattamis.

13 A. Thanks.

14 Q. I'd ask again, did you have any
15 discussions with anyone during our most recent
16 break?

17 A. No.

18 (Exhibit 1007 was marked for
19 identification.)

20 BY ATTORNEY WARRICK:

21 Q. Dr. Kattamis, I've introduced another
22 exhibit. You should be able to access it. It's
23 labeled as Exhibit 1007.

24 A. Yes.

25 Q. Do you recognize Exhibit 1007?

1 A. Yes.

2 Q. What is it?

3 A. Translation of a Japanese patent, ending
4 in 610, Hasei.

5 Q. And this is the Hasei reference that you
6 rely upon in your declaration, correct?

7 A. Yes.

8 Q. Would you look, please, at Figure 3 of
9 Hasei?

10 A. Yes.

11 Q. What's your understanding of what's
12 depicted in Figure 3 of Hasei?

13 A. According to Hasei, it's an organic EL
14 device.

15 Q. So you understand that Figure 3 depicts
16 an OLED display device?

17 A. Yeah. It describes three OLEDs.

18 Q. Is it possible those three OLEDs are
19 sub-pixels?

20 ATTORNEY WEIDENFELLER: Objection.

21 THE WITNESS: I'd have to review to see
22 if that term is used, but from what I can
23 tell, it's a device showing me three
24 pixels -- I'm sorry. Three OLEDs, that each
25 have a different color, if I remember

1 correctly.

2 BY ATTORNEY WARRICK:

3 Q. So in Figure 3, the depicted OLED
4 display device, can you identify what you describe
5 as the cathode layer?

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: I think on Page 76 of the
8 report, or my declaration, I labeled it as
9 layer 50, which is described as the negative
10 electrode in Hasei.

11 BY ATTORNEY WARRICK:

12 Q. Before the break, you referenced Hasei
13 as an example of an optoelectronic device wherein
14 the cathode is disclosed as being applied in a
15 structured manner, correct?

16 A. Yes, I did.

17 Q. Looking at Figure 3 of Hasei, do you see
18 any structure in layer 50?

19 ATTORNEY WEIDENFELLER: Objection.

20 THE WITNESS: In looking in this one
21 embodiment, which is a cross-section, I have
22 no plan view. Right here in this embodiment,
23 it shows a layer that's continuous, for 50,
24 but there is a disclosure clearly in the
25 patent that says that negative electrode may

1 be formed by droplet discharge method.

2 BY ATTORNEY WARRICK:

3 Q. Can you point me to any embodiment in
4 Hasei that includes a structured cathode layer for
5 an optoelectronic device?

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: I mean, it's disclosed
8 here on this page. When you say
9 "embodiment," do you mean a drawing? Because
10 at Paragraph 37, it says droplet -- that the
11 negative electrode may be formed by droplet
12 discharging method depicted in a description
13 of S1 in Figure 1 which share its patterning
14 using just liquid discharging method. So to
15 me, that's structured; at least, can be.

16 BY ATTORNEY WARRICK:

17 Q. Well, so when we say "structured," are
18 we on the same page that means that the layer is not
19 continuous across the entire device?

20 A. It has -- you apply it where you want
21 it, and so in this case, it's telling me that I can,
22 via structured deposition method, apply the metal
23 negative electrode 50.

24 Q. Well, it says you can use the droplet
25 discharge.

1 A. That's what it points to. Yes. Droplet
2 discharge method. It just says you can apply it to
3 the process for the negative electrode 50.

4 Q. And Hasei discloses that this droplet
5 discharge method could be used to deposit material
6 only on the portions of the substrate where you
7 desire, correct?

8 ATTORNEY WEIDENFELLER: Objection.

9 THE WITNESS: Sure. Yeah. It's a means
10 to form the features you desire by printing.

11 BY ATTORNEY WARRICK:

12 Q. Right. So in your view, if I understand
13 correctly, the droplet discharge method of Hasei can
14 be used to apply a layer in a structured manner, as
15 the '492 Patent says, because it could be used to
16 apply a layer in some regions but not in others for
17 a particular layer, right?

18 ATTORNEY WEIDENFELLER: Objection.

19 THE WITNESS: Yeah, I think that's what
20 it's saying. Yes.

21 BY ATTORNEY WARRICK:

22 Q. Could you also use a droplet discharge
23 method to apply a layer across the entire substrate?

24 A. So I think you've got to distinguish
25 could from would you. Sure, depending on the size

1 and application, one could do that. It just doesn't
2 seem that one would. It would be a lot slower than
3 certain techniques.

4 Q. But you said --

5 A. Application dependent.

6 Q. Understood. But you could use the
7 droplet discharge method to apply a continuous layer
8 across a given device. Yes?

9 ATTORNEY WEIDENFELLER: Objection.

10 THE WITNESS: Maybe in some experimental
11 setting, you could get something to work that
12 way. To me, it seems inappropriate,
13 depending on, of course, the scale of the
14 device, is this a small thing or a big thing.

15 BY ATTORNEY WARRICK:

16 Q. And if you did so, if you used the
17 droplet discharge method to apply a layer, a
18 continuous layer across the entire device, that
19 would not be a structured layer, would it?

20 ATTORNEY WEIDENFELLER: Objection.

21 THE WITNESS: Sure. If I coat an entire
22 workpiece using that method, it would be
23 continuous.

24 BY ATTORNEY WARRICK:

25 Q. And it would not be structured, would

1 it?

2 A. One could do that, yes. It would not be
3 structured, but I think generally it would be
4 considered a structured method, and there's other
5 disclosure, like in Step 1 of Hasei, which is also
6 pointing to a patterning. So I think it's pretty
7 clear that it can be used for structured deposition.

8 Q. Right. My point is that it could also
9 be used for unstructured deposition, correct?

10 ATTORNEY WEIDENFELLER: Objection.

11 THE WITNESS: Yes. It's a very weird
12 case, and it would be very application
13 dependent and very slow, depending on what
14 you're trying to do.

15 BY ATTORNEY WARRICK:

16 Q. So for example, if we go back to
17 Figure 3 of Hasei, if we look at -- layer 42 is
18 described as the positive electrode, or I think you
19 might refer to it as an anode in your declaration,
20 would you describe that as having been applied in a
21 structured manner?

22 A. Well, looking at that figure alone, I
23 don't think we know whether it was deposited in a
24 structured manner.

25 Q. Sure, but it is structured, whether that

1 was done additively or subtractively, correct,
2 because it's not continuous across the device?

3 ATTORNEY WEIDENFELLER: Objection.

4 THE WITNESS: Sure. There's a pattern
5 there. Whether that was there right after
6 deposition or after subsequent processing, I
7 don't think you know just looking at
8 Figure 3. You need to look at the rest of
9 Hasei, or I would need to.

10 BY ATTORNEY WARRICK:

11 Q. In contrast, in Figure 3 of Hasei, the
12 negative electrode or cathode layer 50 does not
13 include any structuring; it is continuous across the
14 device, correct?

15 ATTORNEY WEIDENFELLER: Objection.

16 THE WITNESS: In this cross-sectional
17 view, so not taking into account any change
18 of, you know, in a planar view, and for these
19 three OLEDs, yes, it's continuous along this
20 figure.

21 BY ATTORNEY WARRICK:

22 Q. So going back to an earlier question,
23 can you point me to anything else in Hasei that
24 allegedly discloses the application of a structured
25 cathode layer in an optoelectronic device?

1 A. I'd have to review all of Hasei, but I
2 do know that in this instance, it clearly does say
3 that the negative electrode can be deposited by --
4 excuse me -- by droplet discharge method.

5 Q. But as we discussed earlier, that does
6 not necessarily imply that the cathode was applied
7 in a structured manner, correct?

8 ATTORNEY WEIDENFELLER: Objection.

9 THE WITNESS: I think it does, because
10 it references Step 1, in Figure 1.

11 BY ATTORNEY WARRICK:

12 Q. Go ahead.

13 A. So the entire quote says, "The negative
14 electrode 50 is a metal electrode made of aluminum
15 magnesium, gold, silver, and the like. The negative
16 electrode may be formed by droplet discharging
17 method depicted in the description of Step 1 in
18 Figure 1 or may be formed by photolithography or
19 etching."

20 So it's not just saying droplet
21 discharge. It's also discussing patterning.

22 Q. Well, it says that that could be done,
23 right?

24 A. Sure. It's giving options. Yes.

25 Q. But what I was asking earlier is whether

1 Hasei actually discloses any embodiments where the
2 cathode is structured, either for an additive or
3 subtractive technique.

4 ATTORNEY WEIDENFELLER: Objection.

5 THE WITNESS: I mean, it discloses it at
6 Paragraph 37. When you say "embodiments," do
7 you mean there's no image of it?

8 BY ATTORNEY WARRICK:

9 Q. Well, let me ask this. Is there
10 anything else you could point to, other than this
11 language we've been discussing in Paragraph 37 of
12 Hasei, that in your opinion discloses a cathode
13 layer that has been structured, either through an
14 additive or subtractive technique?

15 A. These are the two that I can see right
16 now. I'd have to review everything to see if there
17 were others that were specific to the cathode.
18 Generally, the patent is describing the use of
19 structured techniques throughout and then points to
20 it here, at Paragraph 37.

21 Q. Could you identify any other disclosures
22 in Hasei, in your declaration in this matter, that
23 would in your opinion disclose a cathode layer of an
24 optoelectronic device that has been structured
25 through any fabrication technique?

1 ATTORNEY WEIDENFELLER: Objection.

2 THE WITNESS: No. It's here in my
3 report.

4 BY ATTORNEY WARRICK:

5 Q. Now, Hasei's specific fabrication
6 technique, as we've been discussing, it calls a
7 droplet discharging method. Are you familiar with
8 that specific fabrication technique?

9 A. In my mind, it's a printing technique,
10 where you apply a material that needs to be
11 processed, from heat maybe, to make -- or in a
12 vacuum, to create a layer or to create a pattern.

13 Q. Could the droplet discharging method of
14 Hasei be used to apply any type of material?

15 ATTORNEY WEIDENFELLER: Objection.

16 THE WITNESS: So I believe in Hasei,
17 they described different metal layers that
18 can be deposited by this method, as well as
19 other materials, including ITO.

20 (Court reporter clarification.)

21 BY ATTORNEY WARRICK:

22 Q. Are you aware of materials that could
23 not be applied using this droplet discharging method
24 of Hasei?

25 A. Not off the top of my head. I'm sure

1 there are materials that cannot be. I just know the
2 ones that are listed here that can be.

3 Q. You mentioned ITO. Am I correct that
4 that material is transparent?

5 ATTORNEY WEIDENFELLER: Objection.

6 THE WITNESS: Yeah, ITO is a transparent
7 conductor, or is referred to that.

8 BY ATTORNEY WARRICK:

9 Q. And the various metals referenced in
10 Paragraph 37 of Hasei are not transparent, are they?

11 ATTORNEY WEIDENFELLER: Objection.

12 THE WITNESS: I'd say generally no. It
13 depends on thicknesses.

14 BY ATTORNEY WARRICK:

15 Q. In your declaration, in Paragraph 53 of
16 Exhibit 1003, you say that Hasei illustrates the,
17 quote, conventional process, unquote, for forming
18 the OLED contemplated in Ingle.

19 Can you please explain what you meant by
20 that statement?

21 A. I'm trying to get there. One second.

22 So I used Hasei for the teaching of an
23 OLED structure, and that was the point. It's a
24 conventional structure of materials that create
25 light, and that convention can change depending on

1 the priority or when the patent was authored.

2 So if you look at Hasei -- so Hasei was
3 filed in 2002, and then we have years from 2002 to
4 '12 or so of development of OLEDs, and so really the
5 purpose of that is to show that it was a known OLED
6 design that could be transferred and used with
7 different backplanes really. Because what's shown
8 here in Figure 3 of Hasei is three light-emitting
9 diodes, not a display.

10 Q. Okay. But in Paragraph 53 of your
11 declaration, you don't refer to a conventional
12 structure. You specifically refer to a conventional
13 process for forming the OLED contemplated in Ingle.

14 So what I'm asking you is, what did you
15 mean by that conventional process?

16 A. So for example, a use of ITO as one of
17 the layers. I'm just trying to see some more...

18 So it has examples of the different
19 layers, the materials, so the process for
20 manufacturing those, and it talks about using
21 discharge method. Let me see here.

22 Yeah. The process of making all these
23 layers so that you have an OLED that functions.

24 Q. If you could turn back to Hasei,
25 Exhibit 1007, and specifically look at Paragraph 3.

1 A. Yes.

2 Q. Paragraph 3 describes a conventional
3 method of providing a conductive pattern.

4 Do you see that?

5 A. Sure. I do.

6 Q. And you agree that Paragraph 3 is
7 describing a conventional method that involves a
8 subtractive fabrication technique and not the
9 application of layers in a structured manner?

10 ATTORNEY WEIDENFELLER: Objection.

11 THE WITNESS: Sure. I mean, it's using
12 the term "conventional" in 2002 to describe
13 photolithography as being conventional at
14 that time.

15 BY ATTORNEY WARRICK:

16 Q. And do you disagree that
17 photolithography was conventional in 2012?

18 ATTORNEY WEIDENFELLER: Objection.

19 THE WITNESS: It depends on the context.

20 BY ATTORNEY WARRICK:

21 Q. In the context of forming a passable
22 electronic component?

23 ATTORNEY WEIDENFELLER: Objection.

24 THE WITNESS: So for passable electronic
25 components in integrated circuits, I would

1 say yes, or in -- let me rephrase that. In
2 inorganic semiconductors, yes.

3 BY ATTORNEY WARRICK:

4 Q. What about in the context of an
5 optoelectronic device, in 2012?

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: It depends. I mean, it
8 depends. Optoelectronic device? You're
9 meaning organic?

10 BY ATTORNEY WARRICK:

11 Q. More broadly.

12 ATTORNEY WEIDENFELLER: Objection.

13 THE WITNESS: I mean, conventional
14 techniques for making inorganic LED are
15 different than conventional techniques for
16 organic light-emitting diodes.

17 BY ATTORNEY WARRICK:

18 Q. Okay. Well, Hasei was discussing the
19 fabrication of an OLED display device, in your view,
20 correct?

21 ATTORNEY WEIDENFELLER: Objection.

22 THE WITNESS: Could you rephrase that?

23 BY ATTORNEY WARRICK:

24 Q. In your opinion, does Hasei disclose
25 fabrication techniques for an OLED display device?

1 A. Yes.

2 Q. And Hasei describes a conventional
3 method of providing conductive patterns as being a
4 subtractive technique and not an additive technique,
5 correct?

6 A. Yes.

7 Q. And you had said earlier that that was
8 the case in 2002, but I'm asking you, in your
9 opinion, was that the case in 2012?

10 ATTORNEY WEIDENFELLER: Objection.

11 THE WITNESS: I think between 2002 and
12 '12, there was a lot of research and
13 development that went into using
14 non-photolithographic methods, including what
15 we've been discussing here today, so
16 structured depositions of materials. And in
17 2003, Hasei is describing the deposition of
18 these types of materials using droplet method
19 as being something new, right, in 2002.

20 BY ATTORNEY WARRICK:

21 Q. I'm not sure you answered my question.
22 My question is whether what is described in Hasei as
23 the conventional method of providing a conductive
24 pattern in an OLED display device was still
25 considered conventional in 2012, in your view?

1 A. Yeah, I would say the conventional --
2 the term "conventional" here is applying to
3 photolithographic techniques, whereas I don't think
4 that is describing the OLED, per se. It's talking
5 about using printing for different layers that was
6 not commonplace then.

7 Q. Well, if we look at the exact language
8 of Paragraph 3, it talks about the conventional
9 method of providing a conductive pattern.

10 A. Yes.

11 Q. And I'm just asking whether that
12 conventional method was still considered
13 conventional in 2012, in the context of forming an
14 OLED display device.

15 ATTORNEY WEIDENFELLER: Objection.

16 THE WITNESS: I would say that in 2002,
17 the statement of Hasei that this is
18 conventional is true. And I would say in
19 2012, for OLED devices, the application of
20 these specifically conductive layers would be
21 done by other means, specifically other
22 structured methods.

23 BY ATTORNEY WARRICK:

24 Q. Okay. I'd like to revisit the question
25 I had before, because I think we had gotten a couple

1 different answers. What I'd like to know is whether
2 you are personally aware of anyone fabricating an
3 OLED display device wherein they applied the cathode
4 layer, using an additive technique, prior to the
5 '492 Patent in 2012.

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: Other than Hasei, I know
8 that we did this kind of stuff when we were
9 applying cathodes to OLED displays for
10 different substrates, but I don't have a
11 publication that would show that.

12 BY ATTORNEY WARRICK:

13 Q. So for purposes of your expert opinion
14 in this particular matter, the only evidence you
15 point to as disclosing in your view the structured
16 application of the cathode layer of an OLED display
17 device prior to 2012 is Hasei, correct?

18 A. Yes. That's correct. That's why I
19 signed to it. Yes.

20 Q. Does Hasei disclose fabricating a
21 capacitor?

22 A. I think the term "capacitor" doesn't
23 appear in Hasei, but it does disclose active matrix
24 displays, which would require a capacitor and a
25 pixel.

1 Q. But to be clear, Hasei does not describe
2 the fabrication of a capacitor, does it?

3 ATTORNEY WEIDENFELLER: Objection.

4 THE WITNESS: I think that's correct.
5 It doesn't describe the steps.

6 BY ATTORNEY WARRICK:

7 Q. Are you aware of anyone using a
8 transparent electrode to form a capacitor?

9 ATTORNEY WEIDENFELLER: Objection.

10 THE WITNESS: Not off the top of my
11 head, but I'm sure it's doable. I'd have to
12 review pixel architectures to see, but it's
13 possible. It's physically possible.

14 BY ATTORNEY WARRICK:

15 Q. Let's turn back to your declaration,
16 Exhibit 1003, if we could. And I'd specifically
17 like to look at Page 69 of your declaration, which
18 is Page 73 of Exhibit 1003.

19 A. I have it open.

20 Q. Okay. On the top of that page, you've
21 included annotated versions of Hasei Figure 3 and
22 Ingle Figure 1I, correct?

23 A. Yes.

24 Q. And specifically I'd like to ask you
25 about the modified Figure 1I of Ingle, and I guess

1 I'd start by clarifying that the grayish purple
2 layers that you described as the electrically
3 conductive electrode layer, those are not depicted
4 in Ingle itself, are they?

5 A. No. Ingle does not describe the
6 subsequent processes to make the devices it
7 discloses after making the base.

8 Q. And that's also true of the yellow
9 region, which I believe represents the active OLED
10 layers, on the right?

11 ATTORNEY WEIDENFELLER: Objection.

12 THE WITNESS: Yes.

13 BY ATTORNEY WARRICK:

14 Q. Now, the gray layers that you have added
15 to Ingle Figure 1I, am I correct that those are the
16 cathodes that you are opining someone could add to
17 Ingle?

18 A. Electrodes, yes. Yes.

19 Q. Am I correct that those electrodes are
20 what you refer to in your declaration as the cathode
21 layer?

22 A. Yes.

23 Q. Ingle doesn't disclose any particular
24 location for the application on the cathode layer,
25 does it?

1 ATTORNEY WEIDENFELLER: Objection.

2 THE WITNESS: No, but a person looking
3 at it would understand that that would be
4 required depending on what devices you make,
5 among other things, an optoelectronic
6 component or a capacitor.

7 BY ATTORNEY WARRICK:

8 Q. But the specific location of where one
9 might apply such a cathode layer is not disclosed in
10 Ingle, is it?

11 A. That's correct. Yes.

12 Q. And Ingle also does not disclose any
13 particular shape for a cathode layer that one might
14 apply to the structure disclosed in Ingle, correct?

15 A. I'm just pulling it up. One moment.
16 That's correct.

17 Q. This modified Figure 1I of Ingle, on
18 Page 69 of your declaration, my understanding is
19 that you have depicted the formation of an
20 optoelectronic device on the right-hand side and a
21 capacitor on the left-hand side; is that right?

22 A. Yes.

23 Q. And since Ingle doesn't disclose the
24 size or location of a hypothetical cathode layer
25 that one could apply to the structure that is

1 disclosed, how did you decide on the particular
2 shape and location for these gray cathode layers in
3 your modified figure?

4 A. I would say that knowing that capacitors
5 and OLEDs are often formed together in pixels, for
6 example, for able led applications, which Hasei
7 describes, this allows to use the base of Ingle to
8 form both those devices, as Ingle describes, to
9 allow for a functional capacitor and OLED on the
10 base structure of Ingle.

11 Q. So you created these hypothetical
12 cathode layers based on what you understood would be
13 required for a functional capacitor and a functional
14 OLED? Do I understand that correctly?

15 ATTORNEY WEIDENFELLER: Objection.

16 THE WITNESS: That's part of it. We
17 know we're going to need, right, an electrode
18 on top of optoelectronic device. Similarly,
19 on the capacitor, we're going to need that as
20 well. So this is -- they both fit on this
21 base structure, you know, to allow for a
22 passive component and -- not a passive
23 component. To allow for a capacitor and an
24 OLED to be on the same surface.

25

1 BY ATTORNEY WARRICK:

2 Q. I'd like to ask you some questions
3 specifically about what you're describing as a
4 capacitor formed on top of Ingle's structure, on the
5 left side of your modified Figure Y.

6 A. Okay.

7 Q. And to start with, we discussed
8 capacitors generally earlier today, and do you
9 recall we discussed that the capacitor generally
10 involves two electrodes with a dielectric in
11 between?

12 A. Yes.

13 Q. So in this alleged capacitor, could you
14 explain -- I see we have the dielectric in pink, but
15 what do you contend are the two electrodes on either
16 side of that dielectric to form the capacitor?

17 A. I would say the electrically conductive
18 electrode layer, which is gray, and layer 5.

19 Q. When you say layer 5, are you referring
20 to all of the green color-coded regions of the
21 figure or just the leftmost green region?

22 A. It's labeled "first contact region,"
23 that area.

24 Q. The "first contact region," just for
25 clarity, is that referring to that leftmost green

1 region in the modified figure?

2 A. Yes.

3 Q. Now, it appears to me that your
4 hypothetical cathode layer, in gray, does not extend
5 over the first contact region, the leftmost green
6 region. Am I correct?

7 ATTORNEY WEIDENFELLER: Objection.

8 THE WITNESS: No. Apologies. It does,
9 just a little, and then that's why I had the
10 conversation in 167 which describes that you
11 could change that distance by tailoring both
12 the dielectric and -- the overall size of the
13 dielectric and the electrode layer.

14 BY ATTORNEY WARRICK:

15 Q. The dielectric figure is disclosed in
16 original Ingle Figure 1I, correct?

17 ATTORNEY WEIDENFELLER: Objection.

18 THE WITNESS: It's disclosed without
19 bounds on the size. For example, this is --
20 as we kind of mentioned earlier, the scale --
21 this is not to scale, what we're looking at
22 in Ingle, and we can see that clearly from
23 the substrate and the relative thicknesses of
24 layers 3 and 5.

25 So I don't consider that dielectric to

1 be representative of how far over it goes
2 over the first contact region, and that's
3 what I'm trying to explain in Paragraph 167,
4 that it could be tuned depending on the area
5 of the conductive layer.

6 BY ATTORNEY WARRICK:

7 Q. But to be clear, Ingle itself does not
8 disclose forming a cathode over the first contact
9 region, does it?

10 ATTORNEY WEIDENFELLER: Objection.

11 THE WITNESS: Ingle discloses a
12 backplane that you can build capacitors on
13 and optoelectronic components on, though. So
14 one using that would know at some point an
15 electrode would be required for either of
16 those components.

17 BY ATTORNEY WARRICK:

18 Q. My question is whether Ingle discloses
19 applying a cathode over the first contact region.

20 ATTORNEY WEIDENFELLER: Objection.

21 THE WITNESS: I think no, other than the
22 fact that it teaches you to build these other
23 structures on that backplane, and those would
24 require electrodes.

25

1 BY ATTORNEY WARRICK:

2 Q. Going back to your hypothetical cathode
3 in gray, it's your view that it does extend over the
4 first contact region, but would you agree with me
5 that that overlap is very minimal?

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: I think there is an
8 overlap, and I don't think I could quantify
9 minimal, but I do have the disclosure that
10 does explain how it can be extended.

11 BY ATTORNEY WARRICK:

12 Q. I think you would have to agree with me,
13 though, that the majority of the hypothetical
14 cathode in gray does not overlap the first contact
15 region, right?

16 ATTORNEY WEIDENFELLER: Objection.

17 THE WITNESS: Yeah. As drawn here, with
18 that explanation, that it can be -- this is
19 just like an initial representation and that
20 it can be extended.

21 BY ATTORNEY WARRICK:

22 Q. Why did you choose to add this
23 hypothetical cathode in gray in a manner that,
24 according to you, somewhat overlaps the first
25 contact region?

1 A. Because I could do it in conjunction
2 with the statement that it can be extended in 167.
3 I thought it would be enough to elucidate the point.

4 Q. My question is, why depict it as
5 overlapping the first contact region at all?

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: Because Hasei tells me I
8 can make a capacitor -- sorry. Because Ingle
9 tells me I can make a capacitor. Hasei
10 describes an active matrix device, and it's a
11 way to make a capacitor on that structure, on
12 that backplane.

13 BY ATTORNEY WARRICK:

14 Q. Well, let me ask this then. If your
15 hypothetical cathode layer in gray does not extend
16 over the first contact region, in your view would
17 that not be a functional capacitor?

18 ATTORNEY WEIDENFELLER: Objection.

19 THE WITNESS: In the hypothetical of no
20 overlap and large distance between the
21 plates, it wouldn't have the capacitance or
22 it wouldn't provide the capacitance necessary
23 for a functional display. And that's why I
24 say that the degree to which both the pink
25 dielectric and the conductive layer gray can

1 extend over the first contact region, that
2 should be adjusted or can be adjusted to
3 allow for the desired capacitance.

4 BY ATTORNEY WARRICK:

5 Q. So if I'm understanding you correctly,
6 the electrodes that in your view define the
7 capacitor of this modified Figure 1I are the first
8 contact region, which is the leftmost green region,
9 and the portion of the hypothetical gray cathode
10 layer that supposedly overlaps that region, those
11 two in combination with the pink dielectric and
12 between are what defines the capacitor, in your
13 opinion?

14 ATTORNEY WEIDENFELLER: Objection.

15 THE WITNESS: Yeah. I mean, the
16 capacitor is defined, as I say, right by the
17 plates.

18 BY ATTORNEY WARRICK:

19 Q. Well, what I'm asking, this hypothetical
20 gray cathode layer extends quite some way to the
21 right of other structures, but in terms of having a
22 capacitor, in your view, I just want to make sure I
23 understand, it's specifically the portion of the
24 gray layer that supposedly overlaps the first
25 contact region, along with the dielectric in

1 between, it's that combination that forms the
2 capacitance, not the other portions of the gray
3 cathode layer. Am I right?

4 ATTORNEY WEIDENFELLER: Objection.

5 THE WITNESS: Yeah. The rest connects
6 to a second contact region. So it connects
7 to a metal in layer 3.

8 BY ATTORNEY WARRICK:

9 Q. And I'm correct, am I not, that you
10 cannot extend this gray cathode layer to the point
11 that it extends beyond the pink dielectric layer,
12 correct?

13 ATTORNEY WEIDENFELLER: Objection.

14 THE WITNESS: Sure. It can't contact or
15 run risk of contacting layer 5, the first
16 contact region. And so the dielectric would
17 have to be extended, as I explained.

18 BY ATTORNEY WARRICK:

19 Q. And Ingle doesn't include any expressed
20 disclosure of extending the dielectric layers of its
21 embodiments, does it?

22 ATTORNEY WEIDENFELLER: Objection.

23 THE WITNESS: No, but it also doesn't
24 tell you how big to make it either. Right.

25

1 BY ATTORNEY WARRICK:

2 Q. Well, at least in Figure 1I of Ingle,
3 Ingle does disclose a particular shape for the
4 dielectric. Yes?

5 ATTORNEY WEIDENFELLER: Objection.

6 THE WITNESS: It discloses a shape, but
7 it does not appear to be to scale. As I
8 mentioned earlier, specifically looking at
9 layers 3 and 5 in the context of layer 1, so
10 I think it's there to give a sense of some
11 geometry, but it's not giving you specific
12 measurements, by any means.

13 BY ATTORNEY WARRICK:

14 Q. Because your hypothetical gray cathode
15 layer follows the curvature of the pink dielectric
16 layer, am I correct that the spacing between the
17 cathode in gray and the first contact region in
18 green would not be uniform?

19 ATTORNEY WEIDENFELLER: Objection.

20 THE WITNESS: I'm sorry. Could you
21 repeat that? Somebody walked in.

22 BY ATTORNEY WARRICK:

23 Q. Sure.

24 A. Thanks.

25 Q. So in your modified Ingle Figure 1I,

1 because your hypothetical cathode in gray follows
2 the curvature of the dielectric in pink, it
3 naturally follows that the spacing between that
4 cathode and the first contact region in green would
5 not be uniform; is that right?

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: I think, again, it falls
8 back to the -- how scale or how out of scale
9 this drawing is, Figure 1I, and what is the
10 final F curvature of the dielectric material.
11 It doesn't describe how long you heat treat
12 it, how much it's supposed to flow. So I
13 think there's a lot of room in there for that
14 curvature to potentially be different.

15 This is what I'm trying to explain in
16 167, is that that could be changed, or what
17 we're seeing here is not necessarily the
18 extent to which that dielectric would flow.

19 BY ATTORNEY WARRICK:

20 Q. To the extent that the dielectric is
21 curved and to the extent this hypothetical cathode
22 follows that curvature, I am correct that the
23 spacing between the cathode and the first contact
24 region would not be uniform, due to that curvature,
25 correct?

1 ATTORNEY WEIDENFELLER: Objection.

2 THE WITNESS: Yeah. It would not be
3 uniform, in that there would be some gradient
4 in the separation distance, right, between
5 the two plates. Still a capacitor, you know,
6 with the same things we discussed earlier to
7 be avoided. Right.

8 ATTORNEY WARRICK: I'm at what's
9 probably a natural point where we could take
10 a break. I guess a question for you,
11 Dr. Kattamis. It's about 12:30 now.
12 Assuming -- are you here in D.C.?

13 THE WITNESS: Yes, I am.

14 ATTORNEY WARRICK: So it's roughly
15 lunchtime. We could pause and take a break,
16 or we could take a short break and come back.
17 I don't have a lot more material to cover,
18 and by that, I mean I think I have less than
19 an hour of additional questions. I'll leave
20 it up to you whether you prefer we break for
21 lunch and come back or we take a shorter
22 break and try to wrap things up.

23 THE WITNESS: Are you okay with like a
24 30-minute lunch?

25 ATTORNEY WARRICK: Yeah, we could do

1 that.

2 THE WITNESS: Okay.

3 ATTORNEY WARRICK: So around 1:10.

4 (Break in proceedings.)

5 BY ATTORNEY WARRICK:

6 Q. Welcome back from lunch, Dr. Kattamis.
7 Again, I'll just ask, during the lunch break, did
8 you discuss the substance of your testimony with
9 anyone?

10 A. No.

11 Q. If we could turn back to your
12 declaration, Exhibit 1003. I'd like to go to
13 Paragraph 276, which is on Page 109 of your
14 declaration, which is Page 113 of Exhibit 1003.

15 A. 109, 276.

16 Q. Yes. Paragraph 276. In that paragraph,
17 you address Claim 3 of the '492 Patent, and you say,
18 "Claim 3 of the '492 Patent requires that the
19 resistance region have a particular geometrical
20 design," which you go on to describe.

21 And then if you turn to the next page,
22 you reproduce Figure 9 from the '492 Patent, which I
23 believe is reflecting that particular geometrical
24 design required by Claim 3; is that correct?

25 A. Correct.

1 Q. Then if we go to the next paragraph,
2 Paragraph 278, you say that, "There are technical
3 reasons a POSITA would need to consider while
4 designing the geometry of a resistor. Therefore,
5 the choice of building the resistor as shown in the
6 '492 Patent is a simple design choice which would be
7 obvious to a POSITA based on the teachings of
8 Egitto."

9 I want to ask you what you mean by the
10 words "simple design choice."

11 A. So I think in the background, I describe
12 the idea of trimming resistors, and what I'm trying
13 to say here is that a POSITA that is looking at --
14 this is in combination with Hanamura -- is looking
15 at Egitto for methods, ways, and geometries to
16 produce resistors. Then Egitto gives a few choices
17 as to how to do that.

18 And that's my point here, is that a
19 person of ordinary skill looking at Egitto would
20 have a few choices and would design, you know, or at
21 least try, try them.

22 Q. Why, in your view, would a person of
23 ordinary skill look to Egitto in particular for this
24 design choice, as you call it?

25 A. So we have the teachings in Hanamura

1 that describes using -- or potentially including a
2 resistor with the capacitor. And Egitto has a
3 description of circuitized substrates and how to
4 build those resistors, and so it's a way a POSITA
5 could design those resistors to meet whatever
6 specifications the application required.

7 Q. Would you agree there are many, many
8 ways that one could design the geometry of a
9 resistor?

10 ATTORNEY WEIDENFELLER: Objection.

11 THE WITNESS: There are, and then there
12 are issues with control and ensuring proper
13 tolerance on those resistors. So there are,
14 as with many processing steps, domineering
15 conditions to consider pros and cons with
16 different techniques.

17 BY ATTORNEY WARRICK:

18 Q. Would you also agree that there are many
19 references describing varied geometries for resistor
20 designs?

21 A. There are, but these two disclosed by
22 Egitto have the benefits as described in Egitto,
23 control being one of them, and I'd have to look at
24 Egitto in depth and open it again to remember the
25 other advantages of using an architecture like that.

1 Q. Does Egitto have any disclosures
2 regarding OLED display devices?

3 A. No, I don't believe so.

4 (Exhibit 1008 was marked for
5 identification.)

6 BY ATTORNEY WARRICK:

7 Q. If you go to Exhibit Share, I've shared
8 another exhibit, labeled Exhibit 1008.

9 A. Hanamura?

10 Q. Correct. And is Exhibit 1008 the
11 Hanamura reference that you rely upon in your
12 declaration?

13 A. Yes.

14 Q. If you could turn to Column 5, there's a
15 sentence starting on line 15 of Exhibit 1008.

16 A. Yes, I see it.

17 Q. And the next sentence reads, "In use,
18 the chip type capacitor having the above-described
19 structure is mounted on a suitable portion of a
20 circuit board and bonded thereto by soldering."

21 Do you have an understanding of what
22 type of device is being described in that sentence?

23 A. As it says, the formation of a chip type
24 capacitor.

25 Q. How is that different than the

1 structures disclosed in the '492 Patent?

2 A. I'm not sure the manufacturing steps are
3 very different. I guess it involves shadow
4 deposition of materials, conductors, and
5 dielectrics. So from the adept standpoint, they're
6 very similar.

7 Q. In what ways are they different?

8 A. Well, the Hanamura is disclosing a way
9 to make a capacitor and a resistor on a substrate.
10 Could the substrate be a different thickness?
11 Perhaps. But I can't think of any real differences
12 in manufacturing techniques between the two.

13 Q. Let me ask about a different portion of
14 Hanamura. If we go to Column 2, starting at
15 line 39, the sentence reads, "Another object of the
16 present invention is to provide a chip type thick
17 film capacitor which additionally incorporates a
18 resistor having a reliably adjusted resistance."

19 Do you see that?

20 A. I'm sorry. What was the column again?

21 Q. Column 2, lines 39 to 41.

22 A. Yes, I see it.

23 Q. Do you have an understanding of what the
24 Hanamura reference means by a resistor having a
25 reliably adjusted resistance?

1 A. A resistance whose value could be
2 modified, quote, "reliably," as they define it.

3 Q. And I guess to clarify, when you say a
4 resistance whose value could be modified, how would
5 you modify the resistance of a given resistor?

6 A. By changing its dimensions. I mean,
7 that's one way. By changing the material
8 properties. So there are a few ways.

9 Q. I guess I'm most curious about the
10 "reliably" portion of the quote. What, is your
11 understanding, as of Hanamura's reference to a
12 reliably adjusted resistance?

13 A. The tolerances of the device, so being
14 able to manufacture consistently, with consistently
15 the same value.

16 Q. If you could turn to Figure 4 of
17 Exhibit 1008, Hanamura.

18 A. Yes, I see it.

19 Q. In Figure 4, I believe Hanamura refers
20 to it as four distinct electrodes: 13, 20, 14, and
21 12. Is that your understanding?

22 A. Sure. That's how it labels it. Yes.

23 Q. And electrodes 13 and 20 are adjacent to
24 each other, correct?

25 ATTORNEY WEIDENFELLER: Objection.

1 THE WITNESS: I'm just trying to find
2 how it discloses it.

3 Would you restate the question?
4 Apologies.

5 BY ATTORNEY WARRICK:

6 Q. Sure. So having reviewed Hanamura
7 Exhibit 1008, and looking specifically at Figure 4,
8 do you agree that electrodes 13 and 20 are adjacent
9 to each other?

10 ATTORNEY WEIDENFELLER: Objection.

11 THE WITNESS: I would say what the
12 patent says, which is 20 overlaps or is on
13 13.

14 BY ATTORNEY WARRICK:

15 Q. Do you disagree that electrodes 13 and
16 20 are adjacent to each other?

17 ATTORNEY WEIDENFELLER: Objection.

18 THE WITNESS: I'm trying to understand
19 what you mean by adjacent, because we're
20 looking at a cross-section here, and I can
21 tell that right here, portions of electrode
22 20 are on top of 13. So 20 is over parts of
23 13.

24 (Court reporter clarification.)
25

1 BY ATTORNEY WARRICK:

2 Q. Would you agree that at least portions
3 of electrode 20 are adjacent to electrode 13?

4 ATTORNEY WEIDENFELLER: Objection.

5 THE WITNESS: In this cross-section,
6 yes, portions of them. Portions of layer 20
7 are at the same level as 13.

8 BY ATTORNEY WARRICK:

9 Q. Would you agree in Figure 4 that
10 portions of electrode 20 lie in the same horizontal
11 plane as electrode 13?

12 A. Yeah. That's shown here.

13 Q. Would you also agree then in Figure 4 of
14 Hanamura, the majority of electrode 14 lies in the
15 same horizontal plane as electrode 12?

16 ATTORNEY WEIDENFELLER: Objection.

17 THE WITNESS: Yeah. Electrode 14
18 partially overlaps on first lead of electrode
19 12. Similar to 13 and 20.

20 BY ATTORNEY WARRICK:

21 Q. To clarify, the majority of electrode 14
22 lies in the same horizontal plane as electrode 12,
23 correct?

24 ATTORNEY WEIDENFELLER: Objection.

25 THE WITNESS: Yeah. After deposition,

1 it's at the same level, parts of it.

2 BY ATTORNEY WARRICK:

3 Q. And so you would agree that parts of
4 electrode 14 are adjacent to electrode 12, in
5 Figure 4?

6 ATTORNEY WEIDENFELLER: Objection.

7 THE WITNESS: I mean, it comes over 12,
8 and then part of it is next to.

9 BY ATTORNEY WARRICK:

10 Q. What's your understanding of an
11 electrically conductive layer in the context of a
12 capacitor?

13 A. A layer that's used to form one of the
14 electrodes of the capacitor.

15 Q. Looking at electronic devices generally,
16 how would you define the layers of the device?

17 A. One way could be a specific deposition
18 step.

19 Q. Are you aware of any general industry
20 understanding of what it means for something to be a
21 layer within an electronic device?

22 A. I can't think of any industry standard.
23 No.

24 Q. What about the term "trench"? Does that
25 have any established meaning to you in the context

1 of electronic devices?

2 A. Not really.

3 Q. In Figure 4 of Hanamura, the four
4 electrodes, 13, 20, 14 and 12, are applied using an
5 additive fabrication technique, correct?

6 A. Sure. They're structured by a shadow
7 mask, 22, 21 as well.

8 Q. Hanamura discloses that there is what is
9 called a predetermined spacing between electrodes 20
10 and 14; is that right?

11 A. Yes.

12 Q. What does that term mean to you,
13 "predetermined spacing," in the context of Hanamura?

14 A. As it says, it's considering the
15 position between -- a space between the position
16 14 -- or the electrode 14 and the auxiliary
17 electrode 20, that space.

18 Q. If you look, for example, at Column 5 of
19 Hanamura, lines 55 to 57. It says, "Thus, the
20 predetermined spacing D1 is reliably provided
21 between the first capacitor electrode 14 and the
22 auxiliary electrode 20."

23 And it goes on to say, "Even if the
24 second screen 22 positionally deviates slightly
25 relative to the previously formed lead electrodes

1 12, 13."

2 And in the context of that disclosure,
3 do you have an understanding what is meant for a
4 predetermined spacing to be reliably provided
5 between electrodes 20 and 14?

6 A. It means that the deposition steps with
7 the structured application create the spacing, D1.

8 Q. Do you know why it would be important
9 for the spacing between electrodes 20 and 14 to be
10 predetermined and reliably provided?

11 A. They're two electrodes. So they don't
12 touch.

13 Q. So to me, that would indicate that there
14 has to be space between them. Is there any
15 significance to you that there would be a
16 predetermined spacing that's reliably provided?

17 A. I don't know if predetermined means
18 anything more than designed for that space.

19 Q. Would you agree that no portion of
20 electrode 13 is adjacent to that predetermined space
21 between electrodes 20 and 14?

22 ATTORNEY WEIDENFELLER: Objection.

23 THE WITNESS: The space has to exist,
24 though, in 13 and 12 for -- for no connection
25 between the two electrodes, no electrical

1 connection.

2 BY ATTORNEY WARRICK:

3 Q. What I'm asking, though, is whether you
4 agree that in Figure 4 of Hanamura, no portion of
5 electrode 13 is adjacent to the predetermined space
6 between electrodes 20 and 14.

7 ATTORNEY WEIDENFELLER: Objection.

8 THE WITNESS: As shown here in this
9 cross-section, it doesn't show it going over
10 to that line that we're talking about.

11 BY ATTORNEY WARRICK:

12 Q. And the same is true for electrode 12,
13 correct?

14 ATTORNEY WEIDENFELLER: Objection.

15 THE WITNESS: Both 12 and 13 have to be
16 separated to separate the electrodes. We're
17 looking at a certain cross-section, so it's a
18 similar situation to 13 and 20.

19 BY ATTORNEY WARRICK:

20 Q. So again, to clarify, though, in
21 Figure 4 of Hanamura, no -- the electrode 12 is not
22 adjacent to the gap between electrodes 20 and 14?

23 ATTORNEY WEIDENFELLER: Objection.

24 THE WITNESS: Yeah. In this
25 representation, that's true.

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ATTORNEY WARRICK: I appreciate your time, Dr. Kattamis. I don't have anything further at this moment.

ATTORNEY WEIDENFELLER: Why don't we take a short break, a five-minute break, and rejoin.

ATTORNEY WARRICK: Works for me.

(Break in proceedings.)

ATTORNEY WEIDENFELLER: We have no redirect. Thank you for your time, Dr. Kattamis.

THE WITNESS: Thank you.

THE COURT REPORTER: Does anyone need a rough draft or an expedited transcript?

ATTORNEY WARRICK: The normal process should be fine on my end, but a rough draft would be helpful. Thanks.

ATTORNEY WEIDENFELLER: The same for us. Thanks.

(Deposition adjourned at 1:48 p.m.)

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DEPOSITION ERRATA SHEET

Job No. 7336769

Case Caption: SAMSUNG DISPLAY CO., LTD. -vs-
PICTIVA DISPLAYS INTERNATIONAL LTD.

Deposition Date: May 7, 2025

DECLARATION UNDER PENALTY OF PERJURY

I declare under penalty of perjury that I
have read the entire transcript of my Deposition
taken in the captioned matter or the same has been
read to me, and the same is true and accurate, save
and except for changes and/or corrections, if any,
as indicated by me on the DEPOSITION ERRATA SHEET,
hereof, with the understanding that I offer these
changes as if still under oath.

Signed on the __ day of _____, 20__.

ALEX Z. KATTAMIS, PH.D., P.E.

1 COMMONWEALTH OF VIRGINIA AT LARGE, to wit:

2 I, Rhonda D. Tuck, RPR, CRR, Notary Public in
3 and for the Commonwealth of Virginia at Large, and
4 whose commission expires on May 31, 2028, do certify
5 that the aforementioned appeared before me, via
6 remote videoconferencing, was sworn by me, and was
7 thereupon examined by counsel; and that the
8 foregoing is a true, correct, and full transcript of
9 the testimony adduced.

10 I further certify that I am neither related to
11 nor associated with any counsel or party to this
12 proceeding, nor otherwise interested in the event
13 thereof.

14 I further certify that the deponent's right to
15 review the transcript was reserved.

16 Given under my hand and notarial seal in
17 Fluvanna County, Virginia, this 21st day of May,
18 2025.

19

20

21



22

Rhonda D. Tuck, RPR, CRR

23

Notary Public Registration No. 224847

24

Commonwealth of Virginia at Large

25

Job No. 7336769

1 PHILIP WARRICK, ESQ.

2 pwarrick@irell.com

3 May 22, 2025

4 RE: Samsung Display Co., LTD. v. Pictiva Displays
International LTD.

5 5/7/2025, Alex Z. Kattamis, Ph.D., P.E., (#7336769).

6 The above-referenced transcript has been
7 completed by Veritext Legal Solutions and
8 review of the transcript is being handled as follows:

9 — Per CA State Code (CCP 2025.520 (a)-(e)) - Contact Veritext
10 to schedule a time to review the original transcript at
11 a Veritext office.

12 — Per CA State Code (CCP 2025.520 (a)-(e)) - Locked .PDF
13 Transcript - The witness should review the transcript and
14 make any necessary corrections on the errata pages included
15 below, notating the page and line number of the corrections.
16 The witness should then sign and date the errata and penalty
17 of perjury pages and return the completed pages to all
18 appearing counsel within the period of time determined at
19 the deposition or provided by the Code of Civil Procedure.
20 Contact Veritext when the sealed original is required.

21 — Waiving the CA Code of Civil Procedure per Stipulation of
22 Counsel - Original transcript to be released for signature
23 as determined at the deposition.

24 — Signature Waived - Reading & Signature was waived at the
25 time of the deposition.

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1 ___ Federal R&S Requested (FRCP 30(e)(1)(B)) - Locked .PDF
2 Transcript - The witness should review the transcript and
3 make any necessary corrections on the errata pages included
4 below, notating the page and line number of the corrections.
5 The witness should then sign and date the errata and penalty
6 of perjury pages and return the completed pages to all
7 appearing counsel within the period of time determined at
8 the deposition or provided by the Federal Rules.
9 _X_ Federal R&S Not Requested - Reading & Signature was not
10 requested before the completion of the deposition.

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[apply - available]

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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