Transcript of Daniel Patrick Foty, Ph.D.

Date: June 24, 2024
Case: Mianyang BOE Optoelectronics Tech. Co., et al -v- Samsung Display Co. (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MIANYANG BOE OPTOELECTRONICS TECHNOLOGY CO., LTD.; WUHAN CHINA STAR OPTOELECTRONICS SEMICONDUCTOR DISPLAY TECHNOLOGY CO., LTD.; TIANMA MICROELECTRONICS CO. LTD.; AND VISIONOX TECHNOLOGY, INC.

Petitioner,

v.

SAMSUNG DISPLAY CO., LTD.

Patent Owner.

Case No. IPR2023-00941

U.S. Patent No. 7,414,599

Deposition of DANIEL PATRICK FOTY, PH.D.

Conducted Virtually

Monday, June,24, 2024

9:04 a.m. EDT

[redacted]

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Reported by: Judith E. Bellinger, RPR, CRR

Deposition of DANIEL PATRICK FOTY, PH.D., conducted virtually.

Pursuant to notice, before Judith E. Bellinger, Registered Professional Reporter, Certified Realtime Reporter, and Notary Public in and for the State of Maryland.

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ALSO PRESENT:
Jesse Castro, Videographer
Paul Kaminski, Planet Depos Technician

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PROCEEDINGS

THE VIDEOGRAPHER: Here begins Media Number 1 in the videotaped deposition of Dr. Daniel Foty in the matter of Mianyang BOE Optoelectronics Technology Co., et al., v. Samsung Display Co., PTAB, in the United States Patent and Trademark Office before the Patent Trial and Appeal Board, Case Number IPR2023-00941-0987-0988-1075.

Today's date is June 24th, 2024. The time on the video monitor is 9:04 a.m.

The remote videographer today is Jesse Castro, representing Planet Depos. All parties of this video deposition are attending remotely.

Would counsel, please, voice-identify themselves and state whom they represent.

MR. FRISCH: Jared Frisch of Covington & Burling, representing Patent Owner. With me is my colleague David Garr.

MR. JENSEN: This is Travis Jensen for petitioner, from the firm Orrick, Herrington & Sutcliffe. And also attending remotely with me is Hans Hsu.

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THE VIDEOGRAPHER: The court reporter today is Ms. Judy Bellinger, also representing Planet Depos.

The witness may now be sworn.

DANIEL PATRICK FOTY, PH.D.,
being first duly sworn, was examined and testified as follows:

EXAMINATION BY COUNSEL FOR THE PATENT OWNER
BY MR. FRISCH:

Q Good morning, Dr. Foty.

A Good morning, Counselor. And when you were reading your name you were a little bit faint, so I don't know if you need to adjust the microphone or whatever is picking up your voice.

Q Can you hear me okay now?

A I can hear you, but you're fainter than everyone else, so.

Q Let me try to adjust my microphone here.

Can you hear me better now?

8

A That's a little better. I'll advise if I don't hear. As I said, you're a little fainter than everyone else for some unknown reason.

Q Okay. If you're having trouble hearing me, let me know; otherwise, we'll continue.

A Sounds like a plan.

Q Okay. Great.

Can you, please, state your full name for the record.

A My name is Daniel Patrick Foty.

Q You've been deposed before, including in this proceeding, correct?

A That is correct.

Q I'm just going to go through a few of the basics today since I know you've been through this before.

During the deposition I'll be asking questions. If you don't understand one of my questions, can you, please, let me know and I'll try to clarify?

A As usual, thank you.

Q And if you answer a question, I'm going

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1 to assume that you understood it.
2 Is that fair?
3 MR. JENSEN: Objection.
4 **A Sorry. Go ahead, Travis.**
5 MR. JENSEN: Object to form.
6 **A That sounds fair.**
7 Q We're taking this deposition remotely
8 today. You understand, however, that this
9 deposition is treated the same as if you were in
10 person with me, correct?
11 **A I understand that, yes.**
12 Q And where are you taking the deposition
13 from today?
14 **A I'm at my residence in Fletcher,**
15 **Vermont.**
16 Q Is there anyone else there with you?
17 **A Other than cats, no.**
18 Q Do you have any communication utilities
19 open on your computer aside from the Zoom platform
20 that we're using for the deposition?
21 **A No, I do not. And in the interest of**
22 **courtesy, I've disabled the Voice over IP and my**

10

1 **mobile phone is off, so we shouldn't be**
2 **interrupted by anything other than weather or an**
3 **electronics problem.**
4 Q I appreciate that. Thank you.
5 Do you have any folders saved on your
6 computer with documents for today's deposition?
7 **A Well, I have my files for the whole**
8 **matter, but I don't have anything open right now.**
9 **I have paper copies of all the documents, so to**
10 **make this easier for us today, and a little pad of**
11 **blank sticky notes in case I need to use**
12 **bookmarks.**
13 Q When you say you've got "paper copies
14 of all the documents," which documents are you
15 talking about?
16 **A The exhibits from the petition last**
17 **year and the exhibits with my declaration that was**
18 **filed on, I believe it was May 31st.**
19 Q Okay. And as I use exhibits today,
20 I'll have them both put in the chat box, so you
21 can download them, and we'll try to put them on
22 the screen as well. But you should feel free to

11

1 use hard copies as well.
2 Is that okay?
3 **A Yes. I'll use hard copies, as much as**
4 **I can, to make this easier. Of course if there's**
5 **something that has not been -- I don't have, I**
6 **can't pull that up out of thin air, obviously.**
7 Q Sure. And the hard copies that you
8 have, do they have any notes on them or are they
9 clean copies?
10 **A They are clean copies. Like I said, I**
11 **just have a pile of sticky notes to put in, as**
12 **needed, so I can find pages rather than put pens**
13 **in and have them fall all over the floor.**
14 Q And during the deposition today, I
15 would ask that you not engage in communications
16 with anyone else other than through the Zoom
17 session, okay?
18 **A That's my understanding of the general**
19 **rules and that's the way we'll be operating today.**
20 Q Thank you.
21 Is there any reason you cannot give
22 full and accurate testimony today?

12

1 **A No. None that I'm aware of.**
2 Q What did you do to prepare for today's
3 deposition?
4 **A I reviewed the documents that have been**
5 **involved in this matter, which goes back over a**
6 **year now, and had a meeting with counsel last**
7 **week.**
8 Q And who attended that meeting?
9 **A Mr. Jensen and Mr. Hsu.**
10 Q How long was that meeting?
11 **A We met for about three and a half hours**
12 **on last Thursday, and about four, four and a half**
13 **hours on Friday.**
14 Q So, about seven to eight hours total?
15 **A My guess, if you add them up, yes.**
16 **That's on top of my own reviews.**
17 Q In preparation for today's deposition,
18 did you speak with anyone other than counsel?
19 **A No, I did not.**
20 Q Did you review your supplemental
21 declaration in preparation for today?
22 **A Yes, I did.**

13

1 Q I'd like to start out by looking at
2 your supplemental declaration, which was
3 Exhibit 1029.
4 (Exhibit 1029 previously marked for
5 identification and attached to the transcript.)
6 **A I have a paper copy of that to my left.**
7 THE WITNESS: And just for the
8 videography folks, I'm aware if I try to talk and
9 turn too far to my left, that can cause problems
10 for the audio, so I'll try to turn back to speak.
11 MR. FRISCH: If we could have
12 Exhibit 1029 dropped in the chat as well, I'd
13 appreciate it.
14 PLANET DEPOS TECHNICIAN: Okay. Thank
15 you.
16 Q If we could put Exhibit 1029 on the
17 screen as well, and go to the last page.
18 PLANET DEPOS TECHNICIAN: One second.
19 I'm having trouble opening it.
20 Q Dr. Foty, do you see a signature on the
21 last page here?
22 **A Yes, I do.**

14

1 Q And this is page 62?
2 **A It's not showing on my screen, but in**
3 **my copy, this is listed as being page 62.**
4 **Okay. There we go. I see the page**
5 **number now.**
6 Q Great.
7 Is that your signature?
8 **A Yes, it is.**
9 Q And was your declaration signed on
10 May 31st, 2024?
11 **A That's correct, yes, it was.**
12 Q Is that when you finished working on
13 your declaration?
14 **A Yes, it was, and that was the due date**
15 **and it was filed on that date.**
16 Q When did you start working on your
17 supplemental declaration?
18 **A I don't recall exactly when because I**
19 **believe we first got the POR sometime in March.**
20 **So I started studying and pulling things together**
21 **not too long after you folks filed your POR, and**
22 **then worked on it in various degrees of intensity**

15

1 **up until the filing date.**
2 Q How much time would you say you spent
3 working on this declaration?
4 **A I'd have to go check my invoice**
5 **records, but maybe 60 hours. That's a rough**
6 **guess, but it's something on that. I'd have to go**
7 **pull up my invoice records to see the exact**
8 **number.**
9 Q Did you write your declaration
10 yourself?
11 **A Yes, I did.**
12 Q Were there any parts of the declaration
13 that were written by anyone else?
14 **A I received help from counsel for legal**
15 **issues and, of course, there was some**
16 **back-and-forth on that, but I wrote my**
17 **declaration.**
18 Q I'd like to introduce another document
19 here, paper number 41.
20 MR. FRISCH: If we can put that in the
21 chat as well.
22 **A Before we leave that, Counsel, there's**

16

1 **one typo I wanted to correct because it's kind of**
2 **embarrassing to me as an engineer. It's just a**
3 **typo. There were several typos, but there was**
4 **just one that I found embarrassing and I wanted to**
5 **correct.**
6 MR. FRISCH: While we put paper
7 number 41 in the chat, why don't you tell me which
8 typo you would like to correct.
9 **A In paragraph 39, the fourth line,**
10 **there's actually, I translated a term from**
11 **engineer speak to plain English, in the fourth**
12 **line, it's in brackets and it says "amorphous**
13 **polysilicone." That should read amorphous**
14 **silicon. In the original reference, the phrase**
15 **used, which was cryptic, in which I tried to**
16 **translate it, it's a-Si, a-Si, which is engineer**
17 **lingo for amorphous silicon. Sometimes the As,**
18 **instead of a Latin letter A, a Greek letter alpha**
19 **is used. So that should read amorphous silicon,**
20 **not amorphous polysilicon as there really is no**
21 **such thing as amorphous polysilicon. It's a**
22 **contradiction of physics.**

17

1 Q Okay. I see it here.
2 So in paragraph 39 on four lines down?
3 **A Yes. As I said, this was -- this is**
4 **completely correct in the reference I was citing.**
5 **In the translation from engineer to English, I**
6 **botched it. It should just be amorphous silicon.**
7 Q Did you mention there are other typos
8 that you're aware of?
9 **A There may be a few, but they're not**
10 **material. Just the usual typos you see of**
11 **spellings and things like that.**
12 Q Is there anything else that you'd like
13 to correct?
14 **A Not at this time, no.**
15 Q Paper 41 is a copy of Petitioner's
16 reply brief.
17 Is that a document you've seen before?
18 **A By "reply brief," do you mean the POR?**
19 Q No.
20 Do you have a copy?
21 **A Oh, sorry, yes. I got confused there**
22 **for a moment.**

18

1 **Yes, this is the petitioner's reply**
2 **brief and my declaration accompanies this, and**
3 **I've seen this, I've reviewed it, and I also have**
4 **a paper copy of that here with me.**
5 Q Okay. Great.
6 And when have you seen this document?
7 **A I obviously saw it after it was filed**
8 **on May 31st, and I saw it during its preparation.**
9 Q Did you see this document before you
10 began working on your declaration?
11 **A I don't think that was possible because**
12 **I started working on my declaration as soon as we**
13 **had your POR, so I was already working on my**
14 **declaration as this document began to be prepared,**
15 **since we're talking early March or some time like**
16 **that.**
17 Q Did you draft or edit any portions of
18 this document?
19 **A I did not draft or edit this.**
20 **Obviously, I was co-working with counsel as both**
21 **my declaration and the reply brief were being**
22 **prepared.**

19

1 Q Okay. I would like to go back to your
2 declaration, Exhibit 1029. And if we look at the
3 front page of your declaration, it lists out four
4 petitioners that you were working for in this
5 proceeding, correct?
6 **A Yes, that is correct.**
7 Q And those petitioners are Mianyang BOE,
8 China Star Optoelectronics, Tianma and Visionox,
9 correct?
10 **A That's what it states, correct.**
11 Q Did you have any discussions with
12 anyone at these companies in connection with this
13 supplemental declaration?
14 **A No, I did not.**
15 Q Did you have -- so, just to be clear,
16 did you have any discussion with anyone at BOE in
17 connection with this declaration?
18 **A No, I did not.**
19 Q I would like to move, now, to Section 3
20 of your supplemental declaration that starts on
21 page 3.
22 If you could let me know when you're

20

1 there.
2 **A It's not on the screen, but I have --**
3 **I'm there in my paper copy to my left.**
4 Q Okay. Well, you can use your paper
5 copy, although if you need it up on the screen as
6 well and we're not there, just let me know.
7 PLANET DEPOS TECHNICIAN: It is on the
8 screen, is it not?
9 MR. FRISCH: On my screen it's showing
10 page 1, but we're looking for page 3.
11 PLANET DEPOS TECHNICIAN: Oh, okay.
12 One moment.
13 MR. FRISCH: Great. Thank you.
14 Q So, Dr. Foty, are you with me at
15 page 3, Section 3 of your report or your
16 supplemental declaration?
17 **A Yes, I am. And of course, this table**
18 **continues on to next page.**
19 Q Section 3 is your section on materials
20 considered for the supplemental declaration,
21 right?
22 **A Yes, that's what this section**

21

1 **describes.**
2 Q It starts with paragraph 10, and in
3 paragraph 10 you say that you've reviewed and
4 considered Patent Owner's response and its
5 accompanying exhibits, right?
6 **A Sorry, you faded out there, I didn't**
7 **get the last of that.**
8 Q Sure.
9 So in paragraph 10 it says that you've
10 reviewed and considered Patent Owner's response
11 and its accompanying exhibits?
12 **A Yes, as it says there, it says what I**
13 **reviewed and, of course, I reference I'm**
14 **incorporating the materials reviewed in the**
15 **original declaration from over a year ago.**
16 Q Okay. And you've also listed a number
17 of exhibits in the table that you pointed out goes
18 from page 3 to 4?
19 **A That is correct.**
20 Q And as part of reviewing Patent Owner's
21 response, did you also review Dr. Wolfe's expert
22 declaration that was in support of that response?

22

1 **A Yes, I reviewed his declaration.**
2 Q And did you review the exhibits that he
3 cited in his declaration?
4 **A Yes, I did.**
5 Q Now, with that understanding, is what
6 is described in this section of your supplemental
7 declaration a complete list of materials you
8 considered?
9 **A Yes, it is, along with my own**
10 **knowledge, of course.**
11 Q I want to take a look at the documents
12 that are listed, particularly in the table.
13 Did you locate all the documents that
14 are in the table yourself or were some of them
15 provided to you?
16 **A Some were located and provided to me,**
17 **some I located myself.**
18 Q Do you recall which of these you
19 located yourself?
20 **A Exhibits 1026 and 1027, I located**
21 **myself. And Exhibits 1031 through 1033, I located**
22 **myself.**

23

1 Q At various places in your declaration
2 you reference an active matrix display.
3 What's your understanding of what an
4 active matrix display is?
5 **A Again, you faded out at the end there,**
6 **Counselor, I didn't get the last part of that**
7 **question.**
8 Q Yeah. I'll repeat it. I said at
9 various places in your supplemental declaration
10 you reference an active matrix display.
11 What is your understanding of what an
12 active matrix display is?
13 **A My understanding, I think this came up**
14 **in my prior deposition as well, in February, my**
15 **understanding is an active matrix display is**
16 **called active because individual pixels can be**
17 **addressed rather than just, say, an entire row of**
18 **pixels. That's my understanding of how active**
19 **matrix is defined.**
20 Q What allows the individual pixels in an
21 active matrix display to be addressed?
22 **A Basically, the circuitry allows you to**

24

1 **do that, in this particular case, because of the**
2 **transistors and you have wiring to them and so**
3 **forth and so on.**
4 Q And so an active matrix display uses
5 pixel circuits for each pixel?
6 **A An active matrix display does use pixel**
7 **circuits. Since you brought that up, just one**
8 **thing I want to clarify is, until recently, in**
9 **this matter, it seemed like it was just a given**
10 **that a pixel circuit is the small circuit**
11 **associated with the pixel emitter and its**
12 **controller, such as described in the '599 patent**
13 **and also in Kimura. '599 only shows that one**
14 **embodiment, and I believe Kimura's circuit**
15 **embodiments are all pixel circuits. At his**
16 **deposition, Dr. Wolfe started referring to a pixel**
17 **cell circuit, or something to that effect, and at**
18 **one point he said something to the effect that**
19 **what we've been calling a pixel circuit, he was**
20 **calling a pixel cell circuit. And what he was**
21 **calling a pixel circuit encompassed other things**
22 **around it, like peripherals.**

25

Just for clarity, anytime I mention in my materials, or today, a pixel circuit, I'm referring to what is, essentially, the Figure 3 embodiment in '599 and the circuit embodiments in Kimura, just the circuits associated with the pixels, not the peripherals around it. Unless I say otherwise, I just wanted to point that out. I don't know why Dr. Wolfe used that different definition, but he did, so I have to address it briefly there to keep us clear.

Q Just to be clear, when you say "pixel circuit," you're referring to the transistors and capacitor that turn on a particular OLED element, correct?

A Yes, I'm referring to the, as I said, the scale of what's described in '599, the single Figure 3 embodiment. And as I said, Kimura, I know Kimura discusses peripheral circuits, but I don't think he has a circuit embodiment that's more than the pixel circuit, so I just wanted to point that out because Dr. Wolfe introduced, at his deposition, that terminology.

26

Q Are you similarly familiar with passive matrix displays?

A I'm familiar with them in general because they preceded active matrix displays, obviously, and have been around for a long time.

Q What is your understanding of the difference between passive matrix and active matrix displays?

A My understanding, as I said earlier, the passive matrix types of displays don't address individual pixels, they merely address rows in the typical scan, the typical row scan that goes down the screen, basically, has been done in displays since at least as far back as when television was first developed, I believe back in the 1930s.

Q So passive matrix displays don't have what you were just describing as a pixel circuit, correct?

A Well, they would have some way of controlling the pixels, but they don't have the electronics to let you address individual pixels in particular ways.

27

Q And the electronics to address the individual pixels, in certain ways, are the transistors and capacitors that you were talking about that you would see in the figures, for instance, in the '599 patent?

A That's fair. You have circuitry involving transistors and capacitors, that typical stuff that's used to control individual pixels.

Q You have that in active matrix displays, right?

A Sorry, I didn't get that, you faded out again.

Q What you just described, you said, "That's fair. You have circuitry involving transistors and capacitors."

You were talking about active matrix displays there, correct?

A You have circuitry, of course, in any display, but the circuitry that makes it active lets you address the individual pixels, regardless of the circuitry. That's what defines active matrix, is the ability to address individual

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pixels.

Q You would agree with me that computer architecture, video research, and multimedia are fields addressing technical issues that are significantly different from those in pixel circuits, active matrixes display designs and electroluminescence, correct?

A You faded out again, Counsel. Let me turn my speaker up a little bit since this is a running problem.

PLANET DEPOS TECHNICIAN: Counsel, can you go into the sound settings on Zoom and see if you can increase the microphone level?

MR. FRISCH: Why don't we go off the record for a moment and I'll see if I can address it.

THE VIDEOGRAPHER: We are going off the record. The time is 9:27 a.m.

(Recess taken.)

THE VIDEOGRAPHER: We are going back on the record. The time is 9:30 p.m. -- a.m.

29

1 BY MR. FRISCH:
2 Q Welcome back, Dr. Foty. I think,
3 hopefully, I've fixed the audio issues here, and
4 let me re-ask the question that I asked right
5 before we went off the record.
6 You would agree with me that computer
7 architecture, video research, and multimedia are
8 fields addressing technical issues significantly
9 different from those in pixel circuits, active
10 matrix display designs, and electroluminescence,
11 correct?
12 MR. JENSEN: Object to form.
13 **A Yes, that's what I stated in paragraph**
14 **16, that those are not necessarily going to**
15 **require expertise in pixel circuits. Active**
16 **matrix displays and electroluminescence, to finish**
17 **my answer, as quoting paragraph 16.**
18 Q And actually, looking at paragraph 16,
19 I don't believe you said those are not necessarily
20 going to require those items. If we look at
21 paragraph 16, you say "Finally, I note that
22 computer architecture, video research, and

30

1 multimedia are fields addressing technical issues
2 significantly different from those in pixel
3 circuits, active matrix, display designs, and
4 electroluminescence," correct?
5 **A Yes, that is correct. And what I'm**
6 **just saying there is those fields are not -- the**
7 **fields, themselves, are significantly different**
8 **than the items I listed there.**
9 Q What is your understanding of computer
10 architecture?
11 **A Computer architecture is extremely high**
12 **level. When you do computer architecture, you're**
13 **doing -- we're doing things involving, we have a**
14 **microprocessor here, we have memory over there,**
15 **and you can do that at a very high block level,**
16 **for example, and not even deal with circuits at**
17 **all.**
18 Q Could circuits be part of work on
19 computer architecture?
20 **A That's an interesting question. My**
21 **understanding of the architecture level is it's**
22 **very high level. As I said, you generally work at**

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1 **the high block level diagram, not at the circuit**
2 **level. That's my understanding of computer**
3 **architecture.**
4 Q Is it possible that somebody working in
5 computer architecture would have two to
6 three years of circuit design and analysis
7 experience?
8 **A It's possible but, again, it would**
9 **depend on the individual, not on the general --**
10 **the general listing of the terms. Someone could,**
11 **someone couldn't, but that depends on the**
12 **individual.**
13 Q So you'd agree that if a person with
14 two to three years of circuit design analysis
15 experience has only worked on computer
16 architecture, they would not necessarily
17 understand technical issues related to pixel
18 circuits, correct?
19 MR. JENSEN: Object to form.
20 **A Well, again, the computer architecture**
21 **doesn't deal, in general, with circuit-level**
22 **functionalities. So computer architecture, alone,**

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1 **does not imply someone has that knowledge and**
2 **experience. An individual could have a computer,**
3 **could work in computer architecture but separately**
4 **have circuit experience. But computer**
5 **architecture, itself, does not deal with the**
6 **circuit level at the transistor level.**
7 Q And two to three years of circuit
8 design analysis experience wouldn't necessarily
9 mean that that person has an understanding of
10 technical issues related to pixel circuits, right?
11 MR. JENSEN: Object to form.
12 **A Well, again, I didn't say circuit**
13 **analysis and circuit design and analysis here.**
14 **That's a separate topic. I was referring, here,**
15 **to, as I said, computer architecture, video**
16 **research, and multimedia. And those fields, in**
17 **and of themselves, do not involve circuit design**
18 **and analysis. The fields themselves or the topics**
19 **themselves.**
20 Q I'm actually asking a separate
21 question, though.
22 Would somebody with two to three years

33

1 of circuit design analysis experience necessarily
2 have an understanding of pixel circuits?
3 MR. JENSEN: Object to form.
4 **A Someone with typical two to three years**
5 **of experience following education in circuit**
6 **design and analysis, in my opinion, would be able**
7 **to understand pixel circuits because they're basic**
8 **circuits.**
9 Q So I think that's a slightly different
10 question you're answering.
11 I'm asking you if somebody with two to
12 three years of circuit design analysis
13 experience -- let me re-ask my question, actually.
14 **A Thank you.**
15 Q Would somebody with two to three years
16 of circuit design analysis experience have
17 experience with pixel circuits, necessarily?
18 MR. JENSEN: Object to form.
19 **A Someone would, with that kind of**
20 **experience, would be able to look at a pixel**
21 **circuit and understand it because a pixel circuit**
22 **is not a unique circuit. It's, basically, a**

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1 **typical analog circuit. So someone with circuit**
2 **design experience would be able to understand a**
3 **pixel circuit, whether or not they had worked on**
4 **one previously.**
5 Q So are you saying that everyone with
6 two to three years of circuit design experience
7 would have experience with pixel circuits?
8 MR. JENSEN: Object to form.
9 **A Well, again, someone may not have**
10 **worked explicitly on pixel circuits, but the**
11 **transistors, the capacitors, the**
12 **electroluminescence, and how things are hooked up**
13 **and used is a generalized type of circuit**
14 **knowledge and experience. So someone could look**
15 **at a pixel circuit and understand its**
16 **functionality.**
17 Q In your proposed definition for a
18 person of ordinary skill in the art, in the '599
19 patent, is a bachelor's degree in electrical
20 engineering, or a similar discipline, along with
21 two to three years of circuit design analysis
22 experience, and you say a master's or Ph.D. in a

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1 relevant field may substitute for some work
2 experiences, vice versa, correct?
3 MR. JENSEN: Object to form.
4 **A That's correct. That's my asserted**
5 **definition of a POSITA.**
6 Q Now, if we look at paragraph 11 of your
7 supplemental declaration, on page 4.
8 Let me know when you're there.
9 **A I have that open to my left here in the**
10 **paper copy.**
11 Q If you look about halfway down through
12 that paragraph, you say that a person of ordinary
13 skill in the art should be familiar with the
14 functionalities of FETs, the design and analysis
15 of analog and digital circuits comprised of FETs,
16 and the operational behavior of light-emitting
17 devices, such as LEDs, and the context of pixel
18 circuits of a display, correct?
19 **A That's what I say, yes.**
20 Q Do you continue to agree with that
21 statement?
22 **A Yes, I do. I've been consistent**

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1 **throughout on that definition.**
2 Q And how is it that you came to the
3 conclusion that a person of ordinary skill in the
4 art, with respect to the '599 patent, should have
5 those particular understandings?
6 **A I came to that conclusion when I**
7 **examined the circuit because this is, essentially,**
8 **an analog type of circuit. Things like threshold**
9 **voltage compensation have long been known in the**
10 **art, and I provided a reference in that regard, in**
11 **this matter, going back to 1988, showing that. So**
12 **someone who understood how capacitors work, how**
13 **transistors work, and how an electroluminescence**
14 **element worked would understand how a pixel**
15 **circuit works because the basis of the pixel**
16 **circuit were all -- are all well-known in the art**
17 **and have been for some time.**
18 Q So, your definition of person of
19 ordinary skill in the art does not say anything
20 about familiarity with the functionalities of
21 FETs, correct?
22 **A Sorry, what was that question again? I**

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1 **think it might be backwards from what I have in**
2 **here.**
3 Q Well, I was asking, your definition of
4 a person of ordinary skill in the art does not say
5 anything about having familiarity with the
6 functionality of FETs, correct?
7 **A Actually, I say that a person of**
8 **ordinary skill in the art should be familiar with**
9 **the functionalities of FETs.**
10 Q So I'm actually asking about your
11 definition that we went over earlier, right?
12 So you proposed a definition that was,
13 for a person of ordinary skill in the art, you
14 said that they should have a bachelor's degree in
15 electrical engineering or a similar discipline,
16 along with two to three years of circuit design
17 analysis experience, and then you said that a
18 master's or Ph.D. degree in a relevant field may
19 substitute for some work experience and vice
20 versa, right?
21 **A Yes, that's what I stated in the quote**
22 **at the end of that paragraph, and that was based**

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1 **on what I said above and what I regard as being**
2 **circuit design analysis experience with respect to**
3 **understanding a pixel circuit.**
4 Q So, when your definition says two to
5 three years of circuit design analysis experience,
6 you're reading into that, that a person of
7 ordinary skill in the art with that experience
8 should also be familiar with the functionalities
9 of FETs, the design and analysis of analog and
10 digital circuits comprised of FETs, and the
11 operational behavior of light-emitting devices,
12 such as LEDs, in the context of pixel circuits in
13 the display.
14 **A I regard that as being compatible, what**
15 **I condensed down to two to three years of circuit**
16 **design analysis experience, someone with that**
17 **education and experience would understand the**
18 **things above. That's why I condensed it down to**
19 **circuit design analysis experience.**
20 Q And you agree that a person of ordinary
21 skill in the art for the '599 patent would also
22 understand the operation of a driving transistor?

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1 **A Yes. Because, again, that's something**
2 **that's been known in the analog art for 35 or so**
3 **years, at least.**
4 Q And so, that's assumed within your two
5 to three years of circuit design analysis
6 experience?
7 **A Yes, it is, the expectation that**
8 **someone would understand the things listed above**
9 **is what someone with that kind of experience would**
10 **have.**
11 Q You agree that a person of ordinary
12 skill in the art would understand the impact of
13 shared signal lines on aperture ratio?
14 **A A person of ordinary skill in the art**
15 **would understand that the number of signal lines**
16 **can impact circuit size. That's, again,**
17 **well-known in the art for some time.**
18 Q That's something that you're, again,
19 assuming within the two to three years of circuit
20 design analysis experience?
21 **A Yes. Again, these are things that were**
22 **not unique to the '599 patent. They were known in**

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1 **the art beforehand.**
2 Q And you believe that a person of
3 ordinary skill in the art would understand the
4 initialization of the pixel circuit?
5 **A Yes. Because, again, initialization**
6 **of -- which is part of threshold voltage**
7 **compensation, has been known in the art for at**
8 **least as far back as 1988, as that reference I**
9 **included to show that point indicates.**
10 Q And so that's something that you're
11 also including within the two to three years of
12 circuit design analysis experience?
13 **A Yes. It would be part of the tool kit**
14 **of someone with that kind of education and**
15 **experience.**
16 Q And you agree that a person of ordinary
17 skill in the art, as described in the '599 patent,
18 would understand threshold voltage compensation
19 and its relation to image quality?
20 **A Yes, someone would understand that**
21 **because, as I said earlier, this was known in the**
22 **art as far back as 1988 and it involves, in the**

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1 **art, involves, essentially, current copying or**
2 **setting particular current values and providing a**
3 **particular current exactly to an LED will produce**
4 **a particular brightness. That, again, is known in**
5 **the art, both of those.**
6 Q And that's included, again, just in
7 your definition here that says two to three years
8 of circuit design analysis experience?
9 **A Yes, it is.**
10 Q And in fact, if we go down to paragraph
11 14 of your declaration, which spans pages 5 to 6.
12 **A I have the paper copy in front of me**
13 **now.**
14 Q Okay. If we look at the second line in
15 paragraph 14, you say "For example, Dr. Wolfe
16 stated that a person of ordinary skill in the art
17 wouldn't understand the operation of a driving
18 transistor, threshold voltage compensation, its
19 relationship to image quality, the impact of
20 shared signal lines on aperture ratio, and the
21 initialization, for example, discharge of a
22 capacitor of a pixel circuit." And then the next

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1 line you say "I agree that a person of ordinary
2 skill in art would know all of these things,"
3 right?
4 **A Yes. As I said, Dr. Wolfe listed those**
5 **things, and those are things that I regard as**
6 **being known. Someone who has circuit design**
7 **analysis and experience would know these things,**
8 **and the literature backs that up.**
9 Q And you talk about image quality here.
10 What do you mean by image quality?
11 **A Well, again, the issue that '599 and**
12 **some of the other references are addressing, I**
13 **mentioned four other references in my opening**
14 **declaration, involve that, as I said earlier, that**
15 **it's been long-known in the art that a light**
16 **emitter, be it a LED or laser diode, which is a**
17 **type of LED, the light emission, the LI curve, it**
18 **looks like a forward-biased diode because that's**
19 **what it is.**
20 **So the brightness of the LED is a very**
21 **strong function of the current being put through**
22 **the device.**

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1 **So, the '599 patent and other**
2 **references are using threshold voltage**
3 **compensation in order to tune the current to be --**
4 **to be able to have the ability to have the same**
5 **current flowing through different branches in**
6 **order to have the brightness of an LED not be**
7 **impacted by threshold variations between different**
8 **transistors.**
9 **And, again, this is something that's**
10 **long been known in the analog art, at least as far**
11 **back as 1988.**
12 Q Do you think that a single LED can
13 create an image?
14 **A I guess someone could define a single**
15 **light as being an image. But in a display, you**
16 **have, obviously, a matrix of emitters that are**
17 **producing the image. Any pixel-based system,**
18 **going back to when television was first developed,**
19 **creates a larger image, such as the ones we're**
20 **looking at today, just by providing that image to**
21 **a large number of pixels in order to have the**
22 **human eye see it as an image.**

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1 Q So image quality actually depends on
2 how you turn on all of the particular
3 light-emitting elements in a matrix, correct?
4 **A That's one of the image quality issues.**
5 **Of course there are -- there's -- there are issues**
6 **involving the type of display. Obviously, what**
7 **we're looking at today is better than 1950s**
8 **television. The particular issue that's come up**
9 **in '599 and the related art is, how do you**
10 **fine-tune the current so that you can fine-tune**
11 **the brightness coming out of an LED so it does the**
12 **LED variability -- sorry, the LED brightness**
13 **variability is not varying when it's supposed to**
14 **be the same because of threshold voltage**
15 **variations between different transistors.**
16 **Threshold voltage variation between transistors**
17 **has long been known in the analog art, it's a big**
18 **problem for current mirrors and, again, at least**
19 **as far back as 1988, using a technique to address**
20 **the same issues has been known.**
21 Q And your opinion is that all these
22 types of image quality issues that you're

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1 discussing would be known by anyone with two to
2 three years of circuit design analysis experience?
3 **A Someone with that experience, reading**
4 **the '599 patent or similar art, would be able to**
5 **understand what's going on and why. And again,**
6 **it's because the ideas have been known in the**
7 **analog art for some time.**
8 Q I just want to clarify your opinion.
9 Is your opinion that somebody with two to
10 three years of circuit design analysis experience
11 would have this type of experience or would be
12 able to analyze a document and understand that
13 document?
14 MR. JENSEN: Object to form.
15 **A Well, as I said earlier, someone with**
16 **that kind of background, reviewing this patent,**
17 **would understand what the patent is teaching, '599**
18 **is teaching or attempting to teach. That's the**
19 **background you need, which is the one I described.**
20 Q Do you think somebody with two to
21 three years of experience would, themselves, have
22 those experiences already, for instance,

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1 experience with image quality?
2 **A Well, as I said earlier, we're trying**
3 **to define a POSITA and someone who would not**
4 **explicitly work on images would recognize the same**
5 **problem with current, what I've called current**
6 **copying, it's been long-known in the analog art**
7 **and it's been a major pain in the neck in the**
8 **analog art for a long time. So it's the same**
9 **issue that has been dealt with. So someone, even**
10 **if they had not explicitly worked on image quality**
11 **in a display, would understand that the**
12 **current-copying techniques that have been used in**
13 **analog design are the ones that are being used**
14 **here for that purpose.**
15 Q But you'd agree with me that somebody
16 with two to three years of circuit design
17 experience would not necessarily have experience
18 working on image quality in the display, correct?
19 MR. JENSEN: Object to form.
20 **A Well, as per my definition, I don't**
21 **think it's explicitly necessary because, as I said**
22 **earlier, the circuit design analysis experience**

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1 **would be more than sufficient to understand the**
2 **same problem occurring with image quality in pixel**
3 **circuits and displays, as occurs already in the**
4 **analog art with mismatch between, for example,**
5 **threshold voltage of transistors in a current**
6 **mirror.**
7 Q I don't think you're answering my
8 question, though. My question is, would a person
9 of ordinary skill in the art with two to
10 three years -- well, let me re-ask it.
11 Would a person, according to your
12 definition, person of ordinary skill in the art
13 with two to three years of circuit design analysis
14 experience necessarily have experience working on
15 image quality in a display?
16 MR. JENSEN: Object to form.
17 **A Well, as I've been saying, I don't**
18 **regard whether or not they have that experience as**
19 **material to defining a POSITA since the problem**
20 **being addressed is the same as one that's**
21 **well-known to the art already.**
22 Q So I'm not asking you, though, whether

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1 or not you think it's material. I'm just asking
2 you whether a person with two to three years of
3 circuit design analysis experience necessarily has
4 experience working on image quality in a display?
5 MR. JENSEN: Object to form.
6 **A Well, again, they may not have that**
7 **experience, but they would clearly understand the**
8 **patent, is what I'm saying.**
9 Q But you agree with me that they may not
10 have that experience, correct?
11 MR. JENSEN: Object to form.
12 **A They may not have that experience, but**
13 **I don't regard that particular experience as**
14 **material to defining a POSITA.**
15 Q Okay. Let's go to paragraph 20 of your
16 supplemental declaration. Starts on page 8.
17 **A Sorry. I'm there now. I have it open**
18 **in front of me.**
19 Q And in this -- well, actually, can you
20 explain to me what it is you're discussing in
21 paragraph 20?
22 **A Well, give me a moment to read it,**

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1 first, of course. I've read through it.
2 Can you please, for clarity, just
3 repeat the question so I answer the question you
4 asked?
5 Q I was just asking you if you could
6 explain to me what it is you're discussing in
7 paragraph 20?
8 A I believe all I'm pointing out here is
9 that the '599 patent does not discuss any of the
10 issues I listed there. There's nothing -- no
11 discussion of carrier mobility being an issue, no
12 discussion of leakage, and no discussion of
13 transistor sizing.
14 Q What is transistor leakage, as you're
15 describing it here?
16 A Well, this is an interesting question
17 because there's transistor leakage for an
18 operating technology. And in my prior deposition,
19 we went through a figure I had in my June, last
20 year, declaration describing the understanding of
21 leakage that a POSITA would have reading something
22 like this.

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1 A POSITA would understand leakage, as I
2 testified about it in February, what I called here
3 nuisance leakage, which is inherent in any
4 transistor because there's going to be some amount
5 of current when the transistor is off.
6 Unless you operate the transistor to
7 absolute zero, then there's going to be some
8 off-state leakage. The off-state leakage tends to
9 be very small and I showed that. There's -- some
10 issues have come up with leakage in the POR and
11 Dr. Wolfe's declaration involving leakage that
12 would be regarded by a POSITA as, essentially, a
13 failure mechanism; that's a different type of
14 leakage. So there's many, many, types of leakage,
15 and all I'm pointing out here is '599 never
16 discussed leakage issues at all. So a POSITA
17 would understand, which is not a problem.
18 Q You just noted off-state leakage.
19 Is that the leakage that would go from
20 the source to drain or drain to source in a
21 transistor when it's off?
22 A Yes, and this is something, if you look

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1 at the figure I had in my February declaration, I
2 had a nice figure of log(ID) versus VG at room
3 temperature. When you turn the transistor off as
4 the current decreases logarithmically, I guess it
5 decreases exponentially, but on a log scale it's a
6 straight line, and at some point, that line will
7 intersect zero gate voltage or whatever the off
8 voltage is that you're using. And that's the
9 typical off-state leakage, and this is inherent in
10 all transistors and it's a nuisance, but you have
11 to cope with it. But it's not a catastrophic
12 failure.
13 Q When you talk about transistor leakage,
14 you're not talking about leakage from the gate,
15 right, it's from the source drain?
16 A Yes, the generic assumption in the
17 transistor art, particularly back in 2003, is that
18 the dielectric material between the gate and the
19 substrate is sufficient to prevent any leakage
20 that is large enough to be a concern. The
21 off-state leakage I described in my original
22 declaration and testified about back in February

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1 is the usual leakage you expect in any
2 field-effect transistor because it's inherent in
3 operating technology at temperatures above
4 absolute zero.
5 Q And in paragraph 20, you talk about the
6 admitted prior art, it's right there in the first
7 sentence.
8 Do you see that?
9 A Yes, I see that.
10 Q And what are you referring to when you
11 say the admitted prior art?
12 A This appears to be referring to '599,
13 and something pointed to his prior art in '599
14 patent. I'd have to pull up the '599 patent to
15 see what that's referring to.
16 (Exhibit 1001 marked for identification
17 and attached to the transcript.)
18 Q Okay. And why don't we put the '599
19 patent in the chat box. I think that's
20 Exhibit 1001. You can obviously feel free to look
21 at your hard copy.
22 A I have my paper copy here. My desk is

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1 **getting cluttered but I'll do my best.**
2 Q I note in paragraph 20 of your
3 supplemental declaration when you talk about the
4 admitted prior art, I notice that you cite
5 Figure 1 of the '599 patent.
6 Is that what you're referring to as the
7 admitted prior art?
8 **A Yes. The '599 patent shows Figure 1**
9 **and it says, literally, says facially prior art.**
10 Q And looking at Figure 1 of the '599
11 patent, am I correct that, in that particular
12 circuit, T14 is the drive transistor?
13 **A With the caveat that I haven't studied**
14 **this embodiment in great detail, that would seem**
15 **to qualify as being a driving transistor, but I**
16 **would, of course, want to review the -- that prior**
17 **art reference a little more closely before I made**
18 **that identification.**
19 Q So despite the fact that you talk about
20 this particular figure in your supplemental
21 declaration, you haven't reviewed it in great
22 detail?

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1 **A What I have reviewed is the paragraph I**
2 **cite in the '599 patent, where I note that none --**
3 **leakage is not mentioned in that section.**
4 Q Okay. We'll get to that in a moment.
5 But looking at paragraph 20 of your supplemental
6 declaration, the first line, you say, "Relatedly,
7 the admitted prior art comprises pMOS transistors,
8 including transistors coupled to the capacitor
9 (and thus performing a similar function as the
10 third transistor e.g., T33 of the '599 patent or
11 TFT 3309 of Kimura)," right?
12 Do you see where you said that?
13 **A Yes, I'm referring to the use of pMOS**
14 **transistors in a pixel circuit and noting that**
15 **this prior art reference, as quoted by the '599**
16 **patent, makes no mention of leakage as an issue.**
17 **That's all I'm noting.**
18 Q When you say here, "including
19 transistors coupled to the capacitor and thus
20 performing a similar function as the third
21 transistor," for example, T33, which transistors
22 coupled to the capacitor are you referring to?

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1 **A I suppose I'm referring to T14 because**
2 **T14 and T15 would be required to provide a leakage**
3 **path if the capacitor is discharging, just by**
4 **basic circuit topology, assuming transistor T13**
5 **has a reasonably good gate dielectric, that**
6 **capacitor can only discharge out the top and the**
7 **discharge would go either to VDD or to VSS. If it**
8 **goes to VSS, it has to go through T14 and T15, and**
9 **T14 is pMOS.**
10 **So if the -- if T15 didn't have a**
11 **leakage issue because it's nMOS and T14 had a**
12 **leakage issue because it's pMOS, then you'd have a**
13 **problem there.**
14 Q So you're not talking about a leakage
15 issue at the bottom terminal of the capacitor
16 going through the gates of T13 or T14, you're
17 talking about a leakage issue on the other side of
18 the capacitor going through, for example, T14 and
19 T15?
20 MR. JENSEN: Object to form.
21 **A Well, again, assuming -- I think it's a**
22 **reasonable assumption in the technology that the**

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1 **gates of T13 and T14 don't have any -- have no**
2 **leakage or are absolutely trivial because it's a**
3 **dielectric layer. If it's a good gate dielectric,**
4 **then the only way the capacitor could discharge**
5 **would be out its top anode back into that line on**
6 **the right side of this figure.**
7 Q And one of the things you brought up
8 earlier is, as you say here in paragraph 20, you
9 say that the '599 patent does not identify any
10 concern with respect to transistor leakage, right?
11 **A Yes. '599 doesn't mention any concerns**
12 **about leakage at all.**
13 Q Why, in your mind, is that important?
14 **A In my mind, it matters because, as I**
15 **said earlier, a person of skill in the art would**
16 **understand the kind of nuisance leakage that I**
17 **described in my original declaration, in my**
18 **testimony back in February. So someone would**
19 **understand, they'd expect that nuisance leakage.**
20 **So if this topic is not discussed, it means that a**
21 **POSITA would understand that it's not an issue or,**
22 **as I described in my testimony, it's something**

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1 **that can be coped with any properly functioning**
2 **transistor technology by adjusting the threshold**
3 **voltage. That's the level that someone would**
4 **understand this to be describing.**
5 Q So in your opinion, a person of
6 ordinary skill in the art would not look to
7 address leakage current in that circuit, absent
8 some identified concern regarding leakage current?
9 MR. JENSEN: Object to form.
10 **A A person of skill in the art would --**
11 **reading this, would understand what I described in**
12 **my original declaration and in February, in my**
13 **testimony, that there would be leakage present**
14 **because that's inherent in any field-effect**
15 **transistor operating at a temperature higher than**
16 **absolute zero and, therefore, they would**
17 **understand that that leakage would be there, but**
18 **it would not be something that would be material**
19 **for causing the circuit not to work. They'd**
20 **expect that you'd have a working FET technology,**
21 **as I described and, therefore, the circuit would**
22 **function in a way that the capacitor, for the time**

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1 **of relevance to its use, would retain the charge**
2 **to keep the voltage on the gate of the transistor**
3 **constant over that period of time.**
4 Q So in your opinion, if transistor
5 leakage were material concern, a reference would
6 discuss it?
7 **A It would receive discussion simply**
8 **because a POSITA reading would assume that you**
9 **have a functioning process, which produces good**
10 **transistors, not transistors that have a failure**
11 **mechanism type of leakage.**
12 Q At the end of paragraph 20, the last
13 line, you say "Instead, the '599 patent only
14 identifies the problem remedied using threshold
15 voltage compensation," right?
16 **A That's what the '599 patent teaches, is**
17 **using a threshold voltage compensation technique**
18 **in a pixel circuit.**
19 Q And you point to column 3, lines 19
20 through 40, for that?
21 **A Yes, I refer to those lines in the '599**
22 **patent.**

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1 Q I'd like to take a look at those.
2 MR. FRISCH: Actually, if we could put
3 Exhibit 1001 up on the screen and go to column 3,
4 lines 19 through 40.
5 We're looking to go to column 3.
6 **A I have the paper copy in front of me,**
7 **by the way.**
8 Q If it's easier for you to look at the
9 paper copy. Sometimes, for my weary eyes, it
10 helps to be up.
11 **A Mine are older than yours, Counselor.**
12 Q You may be right.
13 Can you explain to me what that section
14 of the patent is discussing?
15 **A Yes. This actually is very close to**
16 **what I described earlier, that it's actually**
17 **explicitly stated here that the Figure 1 prior art**
18 **uses a current mirror, and this is a problem**
19 **long-known in the analog art, that if you have two**
20 **transistors, even if they're the same type, in**
21 **close proximity to each other, there will be some**
22 **difference in the threshold voltage between them.**

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1 **A mismatch is a long-running problem in analog**
2 **circuitry, digital circuitry. If you have two or**
3 **three millivolts of variation between threshold**
4 **voltage and transistors, it doesn't matter in**
5 **digital design's course. However, analog, that's**
6 **enough to cause the current in the two branches of**
7 **the current mirror, which are supposed to be**
8 **identical, to vary enough to cause problems in the**
9 **way the circuit behaves.**
10 **And so, this -- these paragraphs**
11 **discuss that problem in the same way, that there's**
12 **some variability between the threshold voltages**
13 **across different transistors in a circuit and**
14 **the -- like the current mirror, the pixel circuits**
15 **are subject to the same problem, minor threshold**
16 **variations lead to changes in the current between**
17 **two branches that are supposed to be identical**
18 **and, therefore, the brightness of the two LEDs**
19 **next to each other, which is supposed to be the**
20 **same, won't be, unless you do something to address**
21 **that problem, which is what's being discussed**
22 **here.**

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1 Q So, in the current mirroring that it's
2 discussing, that you see in Figure 1, you've got
3 the two transistors, T13 and T14, and T14 is the
4 drive transistor we looked at earlier, and what
5 you're saying is that the threshold voltages
6 between those two transistors won't necessarily be
7 the same, which causes an issue.
8 Is that right?
9 **A Well, it's actually twofold. One is**
10 **T13 and T14 won't have an exact threshold match,**
11 **that's known in the art. And then, of course, the**
12 **macro picture is that if you have more than one**
13 **instance of a circuit of this type, if you have**
14 **multiple circuits with multiple T14s, the**
15 **different instances of T14 will differ, the**
16 **threshold voltage will differ somewhat from**
17 **each -- one to the other. And again, they're**
18 **intended to be identical when you draw the**
19 **circuits on paper. But in practice, you have that**
20 **small amount of threshold voltage variability**
21 **between them which, in certain applications, is a**
22 **big problem. Current mirrors certainly, but,**

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1 **obviously, pixel circuits, you're trying to have**
2 **current copying and the current copying is not**
3 **copying 100 percent effectively because of this.**
4 Q So the '599 patent moves away from the
5 current mirroring scheme, right?
6 **A They teach a different circuit.**
7 **They're treating that as invented material, as**
8 **using a different approach to the problem, a**
9 **different circuit. But the idea is, basically,**
10 **the same one, that you're trying to deal with this**
11 **current disturbance, the current's not matching in**
12 **supposedly identical transistors because the**
13 **threshold voltages just don't match up.**
14 Q The different circuits of the '599
15 patent teaches, in its operation, as current flow
16 through the drive transistor during both the
17 programming phase and the emission phase to
18 eliminate the threshold voltage deviation, right?
19 MR. JENSEN: Object to form.
20 **A Well, actually, the threshold voltage**
21 **compensation is addressed solely during the**
22 **programming phase. You're programming the voltage**

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1 **on the gate of the drive transistor. The idea**
2 **there being you could have multiple instances of**
3 **pixel circuits, with multiple instances of a drive**
4 **transistor, and you're able to, what I said in my**
5 **earlier declaration, it's not the gate voltage**
6 **that matters to make the current the same, it's**
7 **what's called the overdrive voltage, which is VG**
8 **minus Vth minus, the gate bias minus the threshold**
9 **voltage. So you're using this technique to make**
10 **sure the overdrive voltage across the different**
11 **instances of the drive transistor are the same by**
12 **making the overdrive voltages all the same. And,**
13 **therefore, when you turn on, say, two pixel**
14 **circuits where the threshold voltage in the drive**
15 **transistor varies, one from across two different**
16 **instances, you've washed that out, the overdrive**
17 **voltages are the same, and the current,**
18 **essentially, will be a copy in each of the two**
19 **instances in order to make the brightness of the**
20 **two adjacent LEDs be the same, rather than have**
21 **them vary on the variability of the threshold**
22 **voltages.**

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1 Q Then, if we look at column 8 of the
2 patent it has an equation at the top, and that
3 equation shows the current that's going to be
4 provided from that drive transistor to the OLED,
5 right?
6 MR. JENSEN: Object to form.
7 **A This equation, as I described in my**
8 **original declaration, is well-known in the art.**
9 **It's been known since the Moss transistor first**
10 **appeared on the scene in the 1960s. It's known as**
11 **the Schichman Hodges model.**
12 **This basically tells us the current you**
13 **would get through the drive transistor. When you**
14 **turn on pixel circuit to emit light, there's three**
15 **transistors in the path to the light-emitting**
16 **device. The other two are run in extremely low**
17 **resistance states, so the resistance in the**
18 **circuit is completely provided by the drive**
19 **transistor, hence, what this shows, as I described**
20 **in my initial declaration, is using threshold**
21 **voltage compensation to ensure that the overdrive**
22 **voltage will be the same across the two**

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1 **transistors in my example. So that the current**
2 **will be the same, and as the current -- the light**
3 **coming out of an LED is a strong function of the**
4 **current, by making that the same -- sorry, then**
5 **you'll get the same light emitted by the LEDs.**
6 MR. FRISCH: We've been going for a
7 little over an hour. Why don't we take our first
8 break here.
9 THE WITNESS: Sounds good.
10 THE VIDEOGRAPHER: We are going off the
11 record. The time is 10:14 a.m.
12 (Recess taken.)
13 THE VIDEOGRAPHER: We are going back on
14 the record. The time is 10:26 a.m.
15 BY MR. FRISCH:
16 Q Dr. Foty, before we took a break, we
17 were talking about leakage current, and I want to
18 continue that discussion.
19 Can you look at paragraph 45 in your
20 supplemental declaration. That's on page 22.
21 **A Just give me a moment to clean up my**
22 **desk a little bit here.**

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1 **Sorry, what paragraph was that,**
2 **Counselor?**
3 Q Paragraph 45 on page 22.
4 **A It's on the screen, and I have the**
5 **paper copy in front of me as well.**
6 Q And this is a different paragraph than
7 we were looking at earlier, but the first sentence
8 says "First, it should be noted that the '599
9 patent makes no mention of leakage and neither
10 does Kimura."
11 Do you see that?
12 **A I see that, yes.**
13 Q And is the leakage, that you're
14 discussing here, the same type of leakage current
15 we were previously discussing?
16 MR. JENSEN: Object to form.
17 **A Well, earlier, we were discussing what**
18 **I called the nuisance leakage you expect in an**
19 **FET, and I also mentioned leakages that are**
20 **regarded as failure mechanisms. And so, neither**
21 **type of leakage is detailed in '599 or Kimura.**
22 **Leakage, simply, is not discussed.**

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1 Q And you say "This alone indicates the
2 leakage is simply not a fundamental issue or a
3 problem in polysilicon-based TFTs" and in
4 parentheses you say "(at least by the time of
5 Kimura and the '599 patent)," right?
6 **A Yes. And elsewhere I provide some**
7 **references for that, to support that assertion.**
8 Q Is there something in the '599 patent
9 that says that it is using polysilicon
10 transistors?
11 **A I would have to do -- excuse me, let me**
12 **come back to the mic. I would have to do a**
13 **search. It may not list that. However, one of**
14 **the reasons polysilicon TFTs were a good thing**
15 **when the manufacturing technology was figured out**
16 **is because they're sufficiently fast to allow you**
17 **to do some things like active matrix displays,**
18 **whereas, the older amorphous silicon technology**
19 **was 300 times slower, or something to that effect.**
20 Q Well, if we look at claim 1, for
21 instance, in the '599 patent, that starts on
22 column 8.

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1 **A I see -- I have claim 1 here. It's a**
2 **little awkward because this binder is large, so**
3 **I'll do my best here.**
4 Q If you look through the claim 1, is
5 there anything in the claim 1 in the '599 patent
6 that limits it to polysilicon-based TFTs?
7 **A Claim 1 merely refers to transistor**
8 **without any further specification in the claim.**
9 Q And now, you also talked about Kimura
10 in this paragraph. Is it your opinion that Kimura
11 is limited to using polysilicon-based TFTs?
12 **A Sorry, can I have the question again?**
13 **Were you asking about the claims of Kimura, just**
14 **so I give you a clear answer?**
15 Q No. I'm just talking about the Kimura
16 reference. It has a number of circuits that you
17 discussed in your various declarations.
18 In your opinion, are those circuits
19 limited to polysilicon-based TFTs?
20 **A That's an interesting question. Kimura**
21 **doesn't restrict them, and there's no reason that**
22 **you couldn't use one of these circuits with some**

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1 other system, like amorphous silicon. Kimura
2 actually brings up that issue at paragraph 357 and
3 358 of why polysilicon TFTs are preferred because
4 they're faster. But he also notes that they tend
5 to have more variability problems because of the
6 grain boundary conduction.
7 So he does address the issue of
8 polysilicon versus amorphous.
9 Q So I'm trying to understand, then, if
10 neither the '599 patent nor Kimura is limited to
11 polysilicon-based TFTs, why is it that you believe
12 that the fact that they don't reference leakage
13 indicate that leakage is simply not a fundamental
14 issue or problem in polysilicon-based TFTs?
15 MR. JENSEN: Object to form.
16 A Well, again, if the teachings of both
17 Kimura and '599, particularly Kimura because he
18 addresses the issue, clearly apply to
19 polysilicon-based TFTs, and as he discusses why he
20 wants to use polysilicon-based TFTs, for a variety
21 of reasons, but he doesn't discuss leakage, that
22 would imply that leakage is not a problem with

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1 polysilicon FETs when they're properly
2 constructed.
3 Q Well, maybe I'm misunderstanding. Are
4 you saying that leakage current is a problem in
5 amorphous silicon-based TFTs, but not in
6 polysilicon-based TFTs?
7 A No, I don't address amorphous silicon
8 because the reason for the developments in --
9 certainly in Kimura, he's explicit about it, is
10 why it's better to use polysilicon TFTs, and he's
11 addressing the problem with uniformity because of
12 grain boundary conduction causing uniformity
13 issues, which is what he addresses.
14 I didn't consider amorphous silicon,
15 but as amorphous silicon was used in displays,
16 there had to have been manufacturing processes
17 where leakage was manageable and not a failure
18 mechanism but, again, was down to nuisance
19 leakage, otherwise, you couldn't have made
20 functioning products.
21 Q So around the same time period that
22 you're talking about here, where you say at least

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1 by the time of Kimura and the '599 patent, you
2 don't believe that leakage current would be a
3 fundamental issue or a problem in amorphous
4 silicon-based TFTs?
5 A As they've been around longer, I'm left
6 to assume that any leakage current was certainly
7 not enough to prevent products from being
8 manufactured. Leakage is always a nuisance
9 problem, but not to the degree of a failure
10 mechanism, otherwise you would not be able to
11 produce working products.
12 Q When you say "at least by the time of
13 Kimura and the '599 patent," what time period are
14 you talking about?
15 A I believe the -- well, I'd have to look
16 at what the priority dates are. The priority date
17 on -- Kimura lists a filing date of October 30th,
18 2002, and '599 claims priority to a Korean
19 application, which is dated July 7th, 2003, so
20 that's, roughly, the time frame we're talking
21 about for both Kimura and '599 patent.
22 Q Okay. So by around the time period in

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1 2002 to 2003, it's your opinion that leakage
2 current was not a fundamental issue or a problem
3 in either polysilicon-based TFTs or amorphous
4 silicon-based TFTs?
5 A Well, it depends, again, what you mean
6 by "problem." Leakage current always exists to
7 some degree. The question is, is there sufficient
8 leakage to cause the circuitry to not function
9 properly. And in particular, with the
10 polysilicon-based TFTs, products were made and the
11 literature shows that the leakage current was --
12 the nuisance leakage current, as I described it,
13 was sufficiently low to not be a problem.
14 So there is leakage, but it's not
15 determinate to being able to damage product
16 performance.
17 Q Can we look at paragraph 24 of your
18 declaration, that starts on page 11.
19 A I have that in front of me now. It's
20 not on the screen yet, but I do have the paper
21 copy, if you'd like to proceed. Now it's on the
22 screen, so we're good.

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1 Q And in paragraph 24, I guess after
2 paragraph 24, you have an annotated version of
3 Figure 15D of Kimura, right?
4 **A Yes, that's an annotated version in**
5 **paragraph 24 of Figure 15D of Kimura.**
6 Q And you say that Figure 15D shows a
7 device after CMOS manufacturing process steps?
8 **A Yes. This is a cross-section showing**
9 **that both nMOS and pMOS transistors have been made**
10 **on the same substrate, which is a CMOS**
11 **manufacturing process, not an arch -- a circuit**
12 **architecture explicitly, but is the result of**
13 **what's known as a CMOS manufacturing process.**
14 Q You go on to say, however, Figure 15D
15 shows a single-species pixel circuit alongside a
16 CMOS driving circuit, right?
17 **A Yes, this is comparing 14D above, which**
18 **shows both N and P, and 15D, which shows, at least**
19 **in this cross-section, shows only a single species**
20 **of pixel circuit transistors.**
21 Q And you're drawing the conclusion that
22 it's single-species based on the crosshatching

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1 that's used in the semiconductor layers in the
2 figure, right?
3 **A That's what Kimura shows. He**
4 **represents, he says, a switching TFT of which**
5 **there are many in a pixel circuit, more than one,**
6 **and a single driving TFT. He shows these as both**
7 **being the same species, even though they come out**
8 **of a CMOS manufacturing process because,**
9 **obviously, in the driving circuit portion on the**
10 **left, there's both N and P in both 14D and 15D.**
11 Q But what I'm trying to figure out is,
12 if you look at that Figure 15D image for the
13 switching TFT and driving TFT, it doesn't say, in
14 words, whether those are nMOS or pMOS, you're
15 determining that based on the crosshatching,
16 correct?
17 **A Yes. Kimura uses gray scale, or, I**
18 **guess, black-and-white annotations, one is --**
19 **they're just crosshatched differently. But the**
20 **different cross-hatching, I've highlighted in**
21 **color to make that a little clearer.**
22 Q This is what you explain in paragraph

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1 23 of your declaration, right, that, in your
2 opinion, Kimura's using unidirectional
3 cross-hatching for nMOS, you put that in a red
4 box, and it's using bidirectional crosshatching
5 for pMOS, and you put that in a green box, right?
6 **A It's a little hard on the eyes, but I**
7 **believe that's the convention that Kimura used to**
8 **denote N and P, since the Patent Office hasn't**
9 **updated to using color yet. At least 2002, '3.**
10 Q But you've added the color boxes to
11 help distinguish between the two, right?
12 **A Yes, the annotations that were added**
13 **are the colored boxes, to make that a little**
14 **clearer.**
15 Q And using your annotation method here,
16 where all the switching TFTs and the driving TFTs,
17 shown in Figure 15D, are surrounded with a red
18 box, that means all of those are nMOS transistors,
19 right?
20 **A In this particular depiction, he's**
21 **showing nMOS transistors for the switching TFT --**
22 **sorry, nMOS -- yeah, there's two nMOS transistors**

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1 **under switching TFT, those are nMOS red, and then**
2 **the one on the right, the driving TFT, in 15D, is**
3 **also nMOS transistor, single species.**
4 Q And the single species here is all
5 nMOS, correct?
6 **A In this particular instance, he's**
7 **showing all nMOS, yes.**
8 Q And in paragraph 25, you note that
9 Figures 14 and 15 only show cross-sections of a
10 portion of the circuit, right?
11 **A Yes. That's what I say there.**
12 Q It's not the entirety of the circuit,
13 it's just a portion of it?
14 **A It's a cross-section that shows a**
15 **single driving TFT, which is what Kimura's**
16 **embodiments have, and it shows two switching TFTs**
17 **rather than a larger number.**
18 Q And many of Kimura's embodiments have a
19 larger number switching TFTs, correct?
20 **A Yes, they do. They have, typically,**
21 **five, six, transistors, something like that.**
22 Q And since this only shows three

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1 transistors, you can't actually tell if the
2 entirety of the circuit is single species, right?
3 **A I'd have to -- let me -- I'd have to**
4 **see what he says because these are exemplary of**
5 **his manufacturing process. So what I'm trying to**
6 **point out here is that he shows both dual species,**
7 **at the top, and single species at the bottom. So**
8 **he may not be showing an individual circuit here.**
9 **I would have to see -- one of these figures are to**
10 **explain a manufacturing process.**
11 **Sorry, cat wrestling there.**
12 **I would say these are exemplary of his**
13 **general manufacturing process, showing that you**
14 **can make the different types of transistors in the**
15 **pixel portion and they can be nMOS or pMOS. I**
16 **think that's the bottom line there.**
17 Q Let's look at paragraph 36 of your
18 declaration.
19 **A I have it up in paper, if you want to**
20 **proceed, Counsel.**
21 Q All right. And in paragraph 36, you
22 cite to a reference that I will try to pronounce,

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1 but apologies if I butcher the name. Takabatake
2 reference, it's T-A-K-A-B-A-T-A-K-E.
3 **A Not bad, Counselor. That was pretty**
4 **good. Yes, I cite that Takabatake reference, yes.**
5 (Exhibit 1026 marked for identification
6 and attached to the transcript.)
7 Q Okay. And let's take a look at that
8 reference, which is Exhibit 1026.
9 MR. FRISCH: If we could have that
10 dropped into the chat, I would appreciate it.
11 **A Yes. And I was off screen because I**
12 **was digging out my paper copy of that. I had to**
13 **find the binder. But I have this in front of me**
14 **now.**
15 Q Great.
16 And what is the Takabatake reference
17 discussing?
18 **A Well, the title is CMOS Circuits for**
19 **Peripheral Circuit Integrated Poly-Si TFT LCD**
20 **Fabricated at Low Temperature Below 600 degrees**
21 **Celsius, or centigrade, whichever you prefer.**
22 Q It says -- the title of the reference

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1 indicates this is a paper directed to LCDs,
2 correct?
3 **A Yes. Because, at that time, LED**
4 **displays had not been invented yet.**
5 Q And is this a paper that you found or
6 was it provided to you?
7 **A I found this paper.**
8 Q Now, I want to take a look at the
9 second paragraph under the introduction, starts
10 with "we previously."
11 Do you see that?
12 **A I see that, yes.**
13 Q And it says "We previously reported
14 that it is possible to integrate peripheral
15 circuits by using only n-channel TFTs fabricated
16 at low temperature below 600 degrees Celsius on a
17 glass substrate," right?
18 **A Yes, that's what it says. And it's**
19 **describing something that's fairly well-known in**
20 **the art, as we'll get to eventually, I'm sure.**
21 Q And that would be a single-species
22 design because they said only n-channel TFTs?

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1 **A Yes, because these are the peripheral**
2 **circuits. And so, what he's describing, what is**
3 **long-known in the art, is nMOS logic, which had --**
4 **didn't have the CMOS architecture of an N and a P,**
5 **it had two Ns, and that architecture was**
6 **long-known in the art to have an issue that**
7 **current will flow when the transistor is off**
8 **because of the nature of the architecture. And**
9 **so, what he's describing here is, basically, that**
10 **the problem that conventional nMOS logic had that**
11 **CMOS architecture was able to solve, it got rid of**
12 **this current by being able to integrate both N and**
13 **P on the same substrate.**
14 Q And the problems that you're talking
15 about are what he identifies in the next sentence,
16 where he talks about the shortcomings of large
17 power consumption and low maximum operation
18 frequency?
19 **A Yes. These were well-known in the art**
20 **of, this was back in the 1980s, I believe, where**
21 **nMOS logic was commonly used but, it had this**
22 **problem of a current flowing in the off-state, and**

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1 **CMOS was -- is a better architecture because it**
2 **only consumes power during a switching event. So**
3 **what he's describing here, in terms of circuit**
4 **architecture, was something that was already**
5 **well-known in the art.**
6 Q So he solved those problems by
7 switching to CMOS circuitry?
8 **A What he's describing here is**
9 **something -- again, this is -- this is why CMOS**
10 **architecture displaced nMOS architecture in**
11 **digital logic, because of the problems he**
12 **describes here. That's why even by -- this paper**
13 **is 1991, mainstream silicon CMOS had taken over as**
14 **an architecture and displaced the nMOS**
15 **architecture. So he's describing trying to do the**
16 **same here. Why would you integrate N and P on the**
17 **same substrate for peripheral circuits in**
18 **polysilicon-based TFTs, and that's what he**
19 **describes there.**
20 (Exhibit 1002 marked for identification
21 and attached to the transcript.)
22 Q I want to go back to Kimura for a

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1 little. That's Exhibit 1002.
2 MR. FRISCH: Do we have that to drop in
3 the chat? If that wasn't uploaded, I can drop a
4 copy.
5 **A I have to rummage around to find things**
6 **now, but I do have the paper copy of Kimura in**
7 **front of me, if you wish to proceed. Or if you**
8 **want to wait until it's dropped in the chat,**
9 **that's fine.**
10 PLANET DEPOS TECHNICIAN: I don't have
11 that exhibit.
12 MR. FRISCH: Sure. Let me drop it in
13 the chat, just so that everyone on -- I just want
14 to make sure everyone has a copy.
15 **A And if I look off screen and laugh,**
16 **it's not because any human is here, it's cat**
17 **antics.**
18 Q Understood.
19 I dropped Exhibit 1002 Kimura in the
20 chat for those who are following along.
21 Well, in particular, I want to turn to
22 Figure 21 of Kimura. I want to look at Figure 21A

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1 in particular.
2 **A I have that in front of me.**
3 Q And this is a circuit you've analyzed
4 for your opinions in this proceeding?
5 **A Yes, I have. I'm trying to find, in my**
6 **declaration, where I have that discussion.**
7 **Okay. So I have Kimura in front of me,**
8 **open to this Figure 21 page.**
9 Q Okay. If we're looking at Figure 21A,
10 that circuit there, am I correct that TFT 2105 is
11 the driving transistor?
12 **A I don't know if Kimura calls it that.**
13 **But for purposes here, current is passed from a**
14 **high rail through 2105, through the light emitter**
15 **2106, on its way to the low rail -- or the rail**
16 **2110, whatever that connection is, and lights up**
17 **the LED. So I can agree, for now at least, that**
18 **that can be called the drive transistor.**
19 Q And what is line 2109?
20 **A Kimura's language is a little strange,**
21 **but it's a high-voltage rail. It's a high-signal**
22 **rail, for example. It's a high-voltage, not**

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1 **low-voltage.**
2 Q And where is it, in Kimura, that it
3 discusses 2109?
4 And I should say, I don't mean for this
5 to be a trick question. I don't know of any
6 place, other than the figure, where it talks about
7 2109.
8 So I'm asking, essentially, where is
9 it, in Kimura, that it provides the information
10 that you're using to understand that 2109 is a
11 high-voltage line?
12 **A Yes, I remember this, this issue.**
13 **Basically, 21 is a derivative of 20,**
14 **and he identifies 2007, in Figure 20, as being a**
15 **high rail, or a high voltage.**
16 Q And where does it say that Figure 21 is
17 a derivative of Figure 20?
18 **A Kimura's description of Figure 20, as**
19 **it is at his paragraph 352, where he describes, he**
20 **refers to an electric current supply line, which**
21 **is his lingo for a high-voltage line, and he**
22 **briefly describes 21A at paragraph 404. And he**

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1 **indicates, in 352, that 20 is the general**
2 **structure and that at 404, he seems to continue**
3 **from there. And given that and the similarity**
4 **between 20 and 21, it's reasonable to assume that**
5 **2109 is like 2007, with his definition. An**
6 **electric current supply line, which is his lingo**
7 **for a high rail.**
8 Q So where, in 404, does it say that
9 Figure 21 is coming off of Figure 20?
10 MR. JENSEN: Object to form.
11 **A He doesn't say that, explicitly, in**
12 **404, but 20, he presents as being a general**
13 **circuit, and then 21 appears after it and is**
14 **clearly a modified version of 20.**
15 **So, it's reasonable to assume that 2109**
16 **is the same rail as in 2007, in Figure 20.**
17 Q But he never actually says that the
18 line 2109 is the same as the one -- sorry, he
19 never -- Kimura never says that line 2109, in
20 Figure 21A, is the same as the line 2007, in
21 Figure 20, correct?
22 **A He never says that explicitly, but it's**

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1 **certainly not an unreasonable assumption, given**
2 **the structure of 21A and its proximity to 20, it's**
3 **being identified as a general circuit.**
4 Q You would agree, though, that 21A shows
5 a circuit that's different than Figure 20, right?
6 **A It's a different circuit, but it's very**
7 **similar to 20. It's 20 with some additions made**
8 **to it.**
9 Q But those additions may require other
10 changes to the circuit, right?
11 **A Figure 21 is the same as 20, except**
12 **he's added transistor 2106. He's renumbered all**
13 **the other ones for this figure. But the only**
14 **change is that he's taken 20 and added 2106 to the**
15 **same circuit.**
16 Q Can you walk me through how Figure 21A,
17 how that circuit works?
18 MR. JENSEN: Object to form.
19 **A Well, basically, it works as the other**
20 **circuits in Kimura work. 2106 functions as a**
21 **reset transistor or razor transistor,**
22 **initialization transistor. And what it does is it**

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1 **recessed the voltage on the node connected to the**
2 **gate of 2105 to the erased value before it's**
3 **programmed.**
4 **And then, the voltage on the capacitor**
5 **is programmed in by a transistor 2104, which**
6 **charges up the capacitor or, I should say, sends**
7 **some voltage to the capacitor at some level, and**
8 **then emission occurs through 2105, the current --**
9 **the program -- the gate voltage is programmed to**
10 **current level 2105, and 2105 sends current through**
11 **the light emitter 2108, the light, and then that**
12 **process is repeated.**
13 Q You said transistor 2104 charges up the
14 capacitor; is that right?
15 MR. JENSEN: Object to form.
16 **A It appears, looking at this, this**
17 **format, excuse me, visitor. This -- again, this**
18 **is comparing 20, Figure 20 and Figure 21. In**
19 **Figure 20, there is no dedicated reset transistor**
20 **and he's added that here. So it appears, from**
21 **looking at this, that 2106 resets the capacitor**
22 **voltage, 2104 programs it, and then, 2105 is the,**

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1 **essentially, the driving transistor where current**
2 **is allowed -- a selected current, based on the**
3 **programming, flows through to illuminate the LED,**
4 **the light-emitting device, which is 2108.**
5 Q Transistor 2106 resets the capacitor to
6 turn off transistor 2105?
7 MR. JENSEN: Object to form.
8 **A Actually, it doesn't turn it off, it**
9 **turns it on, is the way this thing is architected.**
10 **Because a 2109 is a high rail and, therefore, it**
11 **pulls when you re- -- when the capacitor, when**
12 **2106 opens, it connects the node to the gate of**
13 **2105 to the rail 2109 and that actually turns the**
14 **transistor on, 2105 on. So that's how that**
15 **circuit operates.**
16 Q And that's with the assumption that
17 2109 is the high rail at all times.
18 **A Again, based on 20 being -- 21 being a**
19 **modification of 20, where 2106, that transition**
20 **has been added, it's reasonable to assume that**
21 **2109 is also a high rail.**
22 Q Is there anything in Kimura that says

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1 that 2109 is a high rail?
2 MR. JENSEN: Object to form. Asked and
3 answered.
4 **A As I said earlier, he doesn't**
5 **explicitly describe what 2109 is. He simply**
6 **doesn't say anything about it. And so, again, the**
7 **reasonable thing to do is the previous Figure 20**
8 **is the precursor because it's the same circuit**
9 **with one transistor added. It's reasonable to**
10 **assume it functions in the same way and is**
11 **operating in the same way.**
12 Q Are you aware that in January 2024,
13 that Petitioner submitted a motion to supplement
14 information in this proceeding?
15 MR. JENSEN: Object to form.
16 Go ahead.
17 **A I'm aware of that, yes.**
18 Q Are you aware that that motion was
19 denied?
20 MR. JENSEN: Object to form. Beyond
21 the scope.
22 **A I'm aware of that, yes.**

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1 Q Go to Section 6 of your report, which
2 is at -- it starts at the bottom of page 55.
3 Apologies, I said your report, but I mean your
4 supplemental declaration.
5 **A I figured that out. In other**
6 **depositions, people have been referring to**
7 **declarations, I don't think anyone's gotten lost**
8 **yet.**
9 Q I'm glad you understand when I
10 mistakenly say your report, I mean your
11 declaration.
12 **A Assuming you mean my declaration that**
13 **was filed on May 31st, I have it open at the**
14 **bottom of page 55 in front of me -- I have page 55**
15 **in front of me.**
16 Q I do mean that. We will stick to that
17 declaration.
18 So, if we go to page 55 at the bottom,
19 you start at Section 6 that says "Samsung's
20 secondary considerations fail," right?
21 **A Yes, I see that.**
22 Q If we go to paragraph 106 on page 57,

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1 that's in this section, right?
2 **A I have that in front of me, yes.**
3 Q Can you explain to me what opinion
4 you're providing in paragraph 106?
5 **A Well, all I'm pointing out here is,**
6 **again, something I mentioned earlier, that**
7 **threshold voltage compensation was known in the**
8 **art. The four references I cited, in my original**
9 **declaration last year, all are prior to '599 and**
10 **shows the use of threshold voltage compensation**
11 **and pixel circuits. I just added here, for**
12 **completeness, another reference from 1988 in the**
13 **general analog art.**
14 **What I'm just pointing out here is that**
15 **threshold voltage compensation, alone, is used in**
16 **circuits and it's used in pixel circuits, it**
17 **doesn't seem to provide the basis for the**
18 **conclusion Samsung is trying to reach here.**
19 (Exhibit 1031 marked for identification
20 and attached to the transcript.)
21 Q The reference that you said you added,
22 is that the Daubert reference, Exhibit 1031?

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1 **A Yes, unfortunate name for your**
2 **profession, but I don't believe this is the**
3 **Daubert who is famous for other reasons. This is**
4 a different gentleman, Sonder (phonetic) Daubert,
5 who I believe is from Quebec somewhere, he did his
6 graduate work with Yannis Tsividis at Columbia and
7 he's the chief author on this paper.
8 Q I think you may be right, that these
9 are separate Dauberts.
10 Specifically, when you talk about
11 Exhibit 1031, you were pointing out that it uses
12 diode-connected transistors?
13 **A Yes, I said that paper shows the use of**
14 **diode-connected transistors to perform threshold**
15 **voltage compensation in an analog circuit.**
16 Q Is it your opinion that persons of
17 ordinary skill in the art would have known that,
18 in a pixel circuit, if you connect the driving
19 transistor in the form of a diode, that that
20 circuit would compensate for threshold voltage
21 deviations of the drive transistor?
22 **A Again, it's more than just the**

93

1 **diode-connected configuration, it's a particular**
2 **circuit architecture for executing threshold**
3 **compensation that was clearly known in the art for**
4 **a very long time before '599.**
5 Q When you say "it's a particular circuit
6 architecture," what are you referring to?
7 **A I'm referring to the use of a**
8 **diode-connected -- what's called a diode-connected**
9 **configuration of a transistor, where the gate and**
10 **the drain are connected, and that's used in order**
11 **to charge up a capacitor, and then the circuit --**
12 **the drive transistor turns itself off and turns**
13 **off the programming, at some point, if enough time**
14 **is allowed for the capacitor to charge up.**
15 Q Could you go to the next paragraph,
16 paragraph 107, right at the bottom of page 57.
17 **A Oh, paragraph 107 begins, briefly, on**
18 **57 and continues, actually, all the way to**
19 **page 59. So it's a long paragraph.**
20 Q But you're at paragraph 107?
21 **A Yes, I am. I'm on page 57. Sorry**
22 **about that. Yes, I have it in front of me.**

94

1 Q Okay. If we look at the first sentence
2 here it says, "Regarding aperture ratio, I
3 understand that Patent Owner in another IPR
4 proceeding attributed aperture ratio achieved by
5 Galaxy smartphones to unrelated patents on pixel
6 layout."
7 Do you see that?
8 **A Yes, I see that.**
9 Q Where does that understanding come
10 from?
11 **A That understanding comes from my**
12 **discussion with counsel of the matter.**
13 Q And what did counsel tell you about
14 that, that you're relying on here in paragraph
15 107?
16 **A Just what it says, that to my -- I'm**
17 **not surprised that this would be the case because**
18 **layout is the actual physical design of something**
19 **where you place things. And so, if you're able to**
20 **have a better way of laying out any circuit, a**
21 **pixel, a circuit, pretty much anything, you can**
22 **put more things in the same amount of substrate**

95

1 **real estate with better layout techniques. So**
2 **that doesn't surprise me, that that exists.**
3 Q What is the case number for the other
4 IPR proceeding that you're referencing there?
5 **A It looks like I don't provide a**
6 **reference number for that.**
7 Q Were you shown any documents from that
8 other IPR proceeding?
9 **A I don't believe that I was, no.**
10 Q You don't list any documents from
11 another IPR proceeding in your list of materials
12 considered, correct?
13 **A No, I do not, that's correct.**
14 Q So you're relying solely based on what
15 was told to you by counsel, for this particular
16 opinion?
17 **A I guess, yes, I am. However, I do**
18 **analyze Dr. Wolfe's description of this below, in**
19 **that paragraph.**
20 Q Well, you analyzed Dr. Wolfe's
21 description of a Yoo paper, but not his discussion
22 from another proceeding, correct?

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1 **A Yes. That is correct. It leads into**
2 **what I said below about conventional reduction of**
3 **sizes of transistors lets you make things smaller.**
4 **That's, essentially, Moore's law, effectively**
5 **being used in the TFT world.**
6 Q You reviewed Patent Owner's response,
7 right? We talked about that earlier.
8 **A Yes, I did.**
9 Q And you understand that Patent Owner's
10 response, Patent Owner has said that they believe
11 that there's been widespread copying of their
12 pixel circuits that embody the inventions in the
13 '599 patent, right?
14 **A I'm aware of that assertion, yes.**
15 Q And why don't we take a look at paper
16 number 34, which is the Patent Owner's response --
17 I apologize, I think it's paper number 33.
18 MR. FRISCH: If we could have that
19 dropped in chat for folks as well.
20 **A Does that have an exhibit number,**
21 **Counselor? Sorry to ask you that.**
22 Q I don't believe it has an exhibit

97

1 number. I think it only gets a paper number.
2 It's paper number 33, Patent Owner's response.
3 There's the front of it on the screen
4 right now, if that helps you find it in your paper
5 copies.
6 A I think I found it. It's referred to
7 as sealed POR.
8 Q That's right. And this is a good time
9 to note that we're going to be talking about some
10 confidential information, so we should mark the
11 transcript as containing protective order material
12 and then CP information.
13 A I had a binder failure, but I believe I
14 have this in front of me now. Hopefully the pages
15 are still in order after 16 of them fell on the
16 floor. They're all here.
17 Q Okay. If we go to page 61 of this
18 document, there are a number of teardown images
19 that were provided for different companies,
20 including, for example, MobileSentrix, Mengtor and
21 Phone LCD Parts.
22 Do you see that?

98

1 A On page 61, which I have in front of
2 me, yes, I see those.
3 Q If we go on to page 62, you see more of
4 those images, one from Mobile Defenders, one for
5 Injured Gadgets, one for Parts4LCD and one for
6 SourcelyPlus, right?
7 A Yes, those are on page 62, and I have
8 that in front of me as well.
9 Q You reviewed these images as part of
10 your analysis in this proceeding?
11 A Yes, I did.
12 Q Do you know who manufactures the
13 devices that are shown here from MobileSentrix,
14 Mengtor, Phone LCD Parts, Mobile Defenders,
15 Injured Gadgets, Parts4LCD and SourcelyPlus?
16 A My understanding is at least some of
17 them do not manufacture displays themselves.
18 Q Do you know who manufactures any of
19 those displays?
20 A No, I do not.
21 Q How many manufacturers, in your
22 understanding, make displays for mobile devices?

99

1 MR. JENSEN: Object to form.
2 A Well, obviously, there are at least
3 two, Samsung and BOE.
4 Q Are you aware of any others?
5 A I'm aware that LG manufactures
6 displays, whether or not they make them for mobile
7 devices, I'm not exactly sure, but I do know they
8 make displays.
9 Q Are you aware of anyone else?
10 A Not off the top of my head.
11 Q Now, you've put in a declaration on
12 behalf of four petitioners, we talked about them
13 earlier, BOE, China Star Optoelectronics, Tianma,
14 and Visonox.
15 Do you know if each of those four
16 petitioners manufactures displays?
17 A I know that BOE does, I'm not entirely
18 sure about the others, if they manufacture their
19 own displays or not, or if they're secondary as
20 users of BOE's displays.
21 Q Did you ask BOE if they manufactured
22 any of the displays shown here for MobileSentrix,

100

1 Mengtor, Phone LCD Parts, Mobile Defenders,
2 Injured Gadgets, Parts4LCD, or SourcelyPlus?
3 A No, I did not.
4 Q Why not?
5 A Well, I examined these photos and they
6 differ from each other, and there are differences
7 from the Samsung layout. So, all I needed to look
8 at was these and see that there are differences.
9 So if these were slavishly copied, not just copied
10 but slavishly copied, I would expect them to be
11 closer in their discrepancies. And all I needed
12 to see that there were discrepancies because I was
13 addressing the assertion that these provide
14 evidence of copying. And seeing differences, I
15 don't think that succeeds in showing that they
16 were slavishly copied.
17 Q Do you think the evidence shows that
18 they were copied?
19 A I don't think that conclusion can be
20 drawn from these images; that's all I'm saying.
21 There's enough differences that I don't think it
22 has been shown that they were slavishly copied or

101

1 **copied at all, I can't tell.**
2 Q Well, I was asking you a slightly
3 different question.
4 You keep saying "slavishly copied," but
5 I was asking, have you analyzed whether or not you
6 think these images show that these products have
7 been copied?
8 **A I don't think what's shown here is**
9 **sufficient to say that they were copied, they're**
10 **different enough that I don't think you can**
11 **conclude, just from these images, that they were**
12 **copied.**
13 Q But you didn't ask BOE whether they
14 manufactured any of these displays, right?
15 **A No, I did not. Again, I was seeing**
16 **enough differences. I was merely addressing the**
17 **assertion provided by Patent Owner and Dr. Wolfe,**
18 **that these were evidence for copying, and I**
19 **disagree that that conclusion could be drawn from**
20 **these images.**
21 Q If BOE was the manufacture of one of
22 these displays, would it have been relevant to

102

1 your analysis how they came up with their display
2 concept?
3 MR. JENSEN: Object to form.
4 **A I don't believe it would because**
5 **there's enough differences across the table here,**
6 **in these displays, that, again, I was responding**
7 **to the assertion that you can just look at those**
8 **and it's obvious there's copying, and I disagree**
9 **with that because there's enough differences**
10 **between and among these images that I don't think**
11 **it shows -- it could be regarded as evidence of**
12 **copying.**
13 Q You don't think it would be pertinent
14 to your understanding of whether there was copying
15 to look at how a manufacturer came up with any of
16 these designs?
17 MR. JENSEN: Object to form.
18 **A Again, I'm merely responding to the**
19 **assertion that, oh, look at these, it's obvious**
20 **they're copied. And it's not obvious because**
21 **there are differences between them. So if there**
22 **are differences between and among these images**

103

1 **that -- that indicates that these can't be --**
2 **these don't provide, you know, prima facie**
3 **evidence of copying. If they're copied, why are**
4 **they different? That's all.**
5 Q Can you go up to page 54 of the Patent
6 Owner response.
7 **A I have to move my guest out of the way.**
8 **Page 54, you said?**
9 (Exhibit 2018 marked for identification
10 and attached to the transcript.)
11 Q Yes. And I'm looking at the second
12 paragraph on page 54.
13 And in particular, do you see that it
14 references an Exhibit 2018?
15 **A On page 54, I see Exhibit 2106, 2107,**
16 **and 2008 -- oh, there it is. Sorry.**
17 **Exhibit 2018. Yeah, I see there's a claim chart**
18 **from -- there.**
19 Q Exhibit 2018 is the Galaxy S21 claim
20 chart, right?
21 **A That's what it says, right.**
22 Q And you reviewed Exhibit 2018 in

104

1 forming your opinions?
2 **A At some point I did, yes.**
3 Q Let's take a look at Exhibit 2018.
4 MR. FRISCH: If we could have that put
5 into the chat.
6 **A This appears to not be in my binder for**
7 **some reason.**
8 Q Okay.
9 MR. FRISCH: Well, can we have
10 Exhibit 2018 put into the chat?
11 Q That should be in the chat now, if you
12 want to download a copy of that to look at. And
13 we can put it up on the screen as well.
14 **A If I click on the blue arrow, is**
15 **that -- I guess that's a technical question, I**
16 **guess, probably for the court -- for the**
17 **videographer.**
18 Q I believe it's there. If it's easier,
19 too, I'm going to focus, largely, on one page. So
20 we can put it up on the screen, if that's easier
21 for you to look at.
22 **A Given how many things go wrong in these**

105

1 things, let me put this somewhere where I can move
2 it later.
3 I'll open it in a moment. My PC
4 insists on scanning it for viruses.
5 Q Hopefully it comes back clean.
6 A Okay.
7 Q Okay. I want to look at page 2.
8 A Okay.
9 Q Are you there?
10 A Yes. I am having to multitask here
11 between having this on my own screen here, but
12 that's -- let me take a look at this.
13 Okay. I have -- I have page 2 up in
14 front of me. Let me try to come back to the --
15 our meeting here.
16 Okay. I have this page here locally
17 and I have it here in front of me in the shared
18 screen, so I think we can proceed.
19 Q Page 2 has two images on it, right,
20 there's one on the left, with the teardown image
21 of the pixel circuit for the Galaxy S21, and on
22 the right is a circuit diagram for the pixel

106

1 circuit of the Galaxy S21?
2 A Yes, it has a teardown image and it has
3 a circuit image. The circuit image doesn't say if
4 the circuit image was taken directly from the
5 teardown on the left or if it was provided
6 independently, for whatever that's worth.
7 (Exhibit 2019 marked for identification
8 and attached to the transcript.)
9 Q Actually, if we look under the pixel
10 circuit it says it was taken from Exhibit 2019
11 which is a [redacted], right?
12 A Yes, it appears, from this, that that
13 was taken from a circuit diagram, was not derived
14 directly from the image on the left.
15 Q And you would have looked at
16 Exhibit 2019 in forming your opinions, right?
17 A At some point, yes.
18 Q If we focus on that circuit diagram,
19 that circuit has seven transistors and one
20 capacitor, right?
21 A It appears it has seven transistors and
22 one capacitor and one light emitting -- actually,

107

1 just two capacitors.
2 Q Is the second capacitor, that you're
3 referencing, the one that's indicating a capacitor
4 to the OLED on the bottom right?
5 A Yes, that's probably to indicate -- may
6 indicate a parasitic capacitance and it may
7 indicate an actual capacitance, but there is a
8 second capacitor there, for what it's worth.
9 Q Just to clarify for when we read the
10 transcript later, the two capacitors that you're
11 referencing, one has a label that's [redacted] that's in
12 the top left, and then, in the bottom right is the
13 capacitor you were just discussing and it does not
14 have a label on it, right?
15 A Yes, that's correct. When you said it
16 had one capacitor, I just had to note it did have
17 two.
18 Q And this pixel circuit uses the same
19 structure as the circuit shown in the '599 patent,
20 with the addition of that seventh transistor, and
21 then the capacitor that you're identifying,
22 whether that's a parasitic capacitance or an

108

1 additional capacitor?
2 MR. JENSEN: Object to form.
3 A It's not drawn in exactly the same way,
4 but it appears, other than that additional
5 capacitor and the seventh transistor, to be
6 topologically the same as the '599 patent circuit.
7 Q What is labeled as T1, that's the drive
8 transistor?
9 A I believe that's the case, yes.
10 Q And the gate and drain of that driving
11 transistor are connected by transistor T3, right?
12 A Yes, they're connected by T3.
13 Q T3 is the threshold compensation
14 transistor?
15 A It's the diode-connected transistor
16 that's used to perform threshold voltage
17 compensation, as discussed in '599.
18 Q The gate of transistor T3 is connected
19 to that signal, [redacted]
20 A Yes, it is.
21 Q And so, [redacted] is a signal that turns on
22 transistor T3, which would allow it to create a

109

1 diode connection for that drive transistor T1?
2 **A Okay. I'm pulling up '599 on Figure 3**
3 **so I can more clearly see, if you're going to link**
4 **it to that, what's going on.**
5 Q To be clear, my question didn't link it
6 to the '599, but if it helps you to look at the
7 '599, I'm happy to have you do so.
8 **A The reason I'm doing that is you -- you**
9 **discuss functionalities rather than just the**
10 **structures. So I just want to --**
11 MR. JENSEN: I'm going to object to
12 scope, or beyond the scope of his reply
13 declaration, this whole line of questions.
14 MR. FRISCH: I disagree. I think this
15 is one of the items that was considered as part of
16 his discussion on secondary considerations.
17 MR. JENSEN: Is there a paragraph or
18 something you could point me to, Mr. Frisch, where
19 he discusses Exhibit 2019? It's possible I
20 overlooked something.
21 MR. FRISCH: So, I'm not sure if he
22 discusses 2019, per se, but he definitely

110

1 discusses Samsung Galaxy S21 and the features of
2 it, as to how it relates to secondary
3 consideration analysis, for example, in paragraph
4 104.
5 I believe he testified already that he
6 looked at this exhibit as part of his
7 understanding of the Galaxy S21, in terms of the
8 secondary consideration analysis.
9 MR. JENSEN: I'm going to maintain the
10 objection. I don't see any reference to
11 Exhibit 2018 or any opinions that he rendered on
12 Exhibit 2018 or 2019. You can continue to ask the
13 question, I just wanted to make sure the objection
14 is noted, in the record, that this is beyond the
15 scope.
16 MR. FRISCH: Okay. Understood.
17 **A Where in my declaration -- you pointed**
18 **me to a paragraph where I referenced 2018, and I'm**
19 **flipping back and forth, trying to find that.**
20 Q I think we were looking at the Patent
21 Owner response earlier, that you were responding
22 to, if that's the reference that you're

111

1 discussing.
2 If it helps, one of the items we were
3 discussing earlier was paper 33, which is the
4 Patent Owner response. Then we were looking at
5 the bottom of page 54. I'm not entirely sure
6 that's what you're looking for, but that was one
7 of the things we looked at earlier.
8 **A Okay. I don't explicitly mention 2018**
9 **in my declaration. That wasn't mine.**
10 Q I'm sorry, you're trailing off a little
11 bit because I think you're not --
12 **A I'm sorry. My desk is getting crowded,**
13 **so I'm having to bob and weave to read all this**
14 **stuff that's piled up in front of me here.**
15 **So, I don't explicitly mention 2018 in**
16 **my declaration. It appears in the Patent Owner**
17 **response.**
18 Q Okay. But Exhibit 2018 was an item
19 that you considered in putting together your
20 opinions for your supplemental declaration,
21 correct?
22 **A At some point, I did, yes. So, sorry,**

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1 **I was wandering around chasing references. I know**
2 **there was a question pending. If you can re-ask**
3 **it, I might be able to get us on track here.**
4 Q Let me go back and try to find it
5 myself.
6 **A Oh, dear.**
7 Q I think I was asking you, there's a
8 signal shown in the circuit that we're looking at
9 on page 2 of Exhibit 2018, there's a signal shown
10 that's [redacted] it's connected to the gate of P3.
11 MR. JENSEN: Object to form and scope.
12 Q Do you see that signal?
13 **A Yes, I do. I see the signal [redacted]**
14 **in brackets around it.**
15 Q I was just asking you whether that was
16 the signal that turns on T3 to diode connect the
17 drive transistor T1?
18 MR. JENSEN: Same objections.
19 **A That appears to be the line, again,**
20 **looking at Figure 3 in the '599 patent, of what**
21 **turns on T2 and T3 to initiate the program with**
22 **the capacitor to program the drive -- the gate**

113

1 **voltage or the drive transistor T1.**
2 Q That's what allows a circuit to
3 compensate for threshold voltage deviations of the
4 drive transistor?
5 THE WITNESS: Go ahead, Travis.
6 MR. JENSEN: Same objections.
7 **A That's the signal that turns on T3 and**
8 **T2, which serves to activate the path that lets**
9 **current charge the capacitor up, the capacitor**
10 **charges up until transistor T1 turns off.**
11 Q What's the significance of transistor
12 T1 turning off?
13 **A When transistor T1 is turned off,**
14 **threshold voltage compensation has been completed**
15 **for the particular cycle. Again, that assumes**
16 **there's enough time available for the capacitor to**
17 **charge up to the point that transistor T1 turns**
18 **off.**
19 Q Do you know whether that's the case?
20 MR. JENSEN: Object to form and scope.
21 **A All I can see is the circuit**
22 **architecture of -- it doesn't have any operating**

114

1 **details associated with this figure. It's just,**
2 **I'm noting the similarity to the '559 Figure 3 and**
3 **addressing it as if it is the same circuit as '599**
4 **Figure 3.**
5 Q Would you need to simulate it to
6 understand how it works?
7 MR. JENSEN: Object to form and scope.
8 **A I don't think you'd need to simulate to**
9 **see the basic idea of how the circuit works. What**
10 **would be the only missing piece would be is the**
11 **amount of time available required to charge up the**
12 **capacitor, since the threshold voltage**
13 **compensation will not complete unless there's time**
14 **for the capacitor to charge up to the point that**
15 **transistor T1 turns off.**
16 (Exhibit 2008 marked for identification
17 and attached to the transcript.)
18 Q Take a look at Dr. Wolfe's declaration,
19 Exhibit 2008.
20 **A Before we do that, Counsel, I just need**
21 **30 seconds. It just started raining. I just need**
22 **to lower windows. We don't need to go off the**

115

1 **record. I'll be back in 30 seconds.**
2 **Okay. Sorry about that rain delay in**
3 **the deposition.**
4 MR. FRISCH: We can put Exhibit 2008 in
5 the chat as well.
6 **A Okay. I have my paper copy of**
7 **Dr. Wolfe's declaration in front of me. So let me**
8 **get back, I'm looking at a local copy of**
9 **Exhibit 2018, so I'm back with you guys now, so...**
10 Q And just to be clear, you're looking at
11 a paper copy of Exhibit 2008?
12 **A 2008. I was calling it Dr. Wolfe's**
13 **declaration to remove any numerical misspeaking.**
14 Q And if we go to -- and Dr. Wolfe's
15 declaration is something you considered in putting
16 together your opinions, right?
17 **A Yes, it was.**
18 Q And if we can go down to paragraph 136
19 of his declaration, which I believe starts on
20 page 72.
21 **A I'm at page 72 and I see a paragraph**
22 **136, which appears to be entirely contained on**

116

1 **page 72.**
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1 [redacted]
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8 MR. FRISCH: Okay. Why don't we take a
9 break here.
10 THE WITNESS: Come back in ten?
11 MR. FRISCH: Let's go off the record
12 first.
13 THE WITNESS: Oh, sure.
14 THE VIDEOGRAPHER: We're going off the
15 record. The time is 11:56 a.m.
16 (Recess taken.)
17 THE VIDEOGRAPHER: We are going back on
18 the record. The time is 12:15 p.m.
19 BY MR. FRISCH:
20 Q Dr. Foty, I just have a few more
21 questions for you. If we could look back at your
22 supplemental declaration, if you could go to

126

1 paragraph 47 on page 23.
2 **A Yes, I have that in front of me now, on**
3 **paper.**
4 Q Can you explain what you're discussing
5 here in paragraph 47?
6 **A What I'm discussing here is something I**
7 **explained in my February testimony, that the kind**
8 **of nuisance leakage I described earlier, where you**
9 **have the exponential current decay issue turn the**
10 **transistor off, if something is amiss there, that**
11 **it's a little too high, you can increase the**
12 **threshold voltage to reduce it. That's all I was**
13 **explaining there is for leakage and properly**
14 **functioning transistor product.**
15 Q In there you say the adjustment can be
16 made, for example, a manufacturing process tweak.
17 Can you explain what you mean by
18 "manufacturing process tweak"?
19 **A Yes, it's very simple. You increase**
20 **the doping in the substrate by a little bit, in**
21 **any type of field-effect transistor, and you can**
22 **increase the threshold by a little bit. So you**

127

1 **actually, the threshold voltage, I think students**
2 **often are not taught this, the threshold voltage**
3 **isn't just something that happens, it's actually**
4 **something you tune and adjust in the process. You**
5 **pick threshold voltages for the devices that meet**
6 **the needs of what the process is going to be used**
7 **for and you can adjust the threshold voltage in**
8 **manufacturing to be part of the product. This, I**
9 **said, assumed it's the typical leakage associated**
10 **with properly functioning transistors.**
11 Q And was that known, in the time period
12 around 2002 to 2003, by persons of ordinary skill
13 in the art?
14 **A Yes, it's been known, I don't know for**
15 **how long, but I certainly knew about it as a cub**
16 **engineer back around 1990.**
17 MR. FRISCH: I have no further
18 questions at this time. I'll pass the witness.
19 MR. JENSEN: I have no questions.
20 MR. FRISCH: Okay. Before we go off
21 the record, just as a matter of housekeeping, so I
22 marked the transcript, earlier, as confidential

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1 because we discussed a number of documents that
2 were marked as confidential.
3 My understanding, Counsel, is that the
4 only confidential information comes from Patent
5 Owner. If that's your understanding as well, then
6 we can take a look at and see if any redactions
7 are necessary and provide a redacted copy.
8 MR. JENSEN: That would be appreciated.
9 MR. FRISCH: Okay. And that's your
10 understanding, right, there's no confidential
11 information from Petitioners?
12 MR. JENSEN: I don't think there is. I
13 can double-check, but nothing jumped out to me.
14 But I reserve the right to double-check is all.
15 MR. FRISCH: Sure. I'm just trying to
16 make sure we're on the same page.
17 Okay. We'll take a look, then, and
18 provide a redacted copy, if necessary.
19 MR. JENSEN: Thank you.
20 THE VIDEOGRAPHER: All right. This
21 marks the end of the deposition of Dr. Daniel
22 Foty. On the monitor, the time is 12:19 p.m.

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1 THE STENOGRAPHER: Do you both have
2 standing orders?
3 MR. JENSEN: Just our regular
4 turnaround is fine.
5 PLANET DEPOS TECHNICIAN: And the
6 exhibits that were presented, do you want those
7 attached to the transcript?
8 MR. FRISCH: I'm sorry, I didn't hear
9 the end of that.
10 PLANET DEPOS TECHNICIAN: The exhibits
11 that were presented, do you want those attached to
12 the transcript?
13 MR. FRISCH: I don't think they need to
14 be attached, Travis, if that's okay with you,
15 they're already of record.
16 MR. JENSEN: Yeah, whatever you want.
17 It's your depo. I'm fine either way.
18 MR. FRISCH: I don't think they need
19 to -- actually, sure, you know what, why don't you
20 attach a copy, that's fine.
21 THE VIDEOGRAPHER: Did anybody want a
22 copy of the video?

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1 MR. JENSEN: Not for Petitioner.
2 MR. FRISCH: Whatever our standing
3 order requests. I have to admit I don't know off
4 the top of my head.
5 THE VIDEOGRAPHER: Understood.
6 (Off the record.)
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1 CERTIFICATE OF REPORTER - NOTARY PUBLIC
2 I, JUDITH E. BELLINGER, RPR, CRR, CSR,
3 the officer before whom the foregoing deposition
4 was taken, do hereby certify that the foregoing
5 transcript is a true and correct record of the
6 testimony given; that said testimony was taken by
7 me and thereafter reduced to typewriting under my
8 direction; that reading and signing was not
9 requested; and that I am neither counsel for,
10 related to, nor employed by any of the parties to
11 this case and have no interest, financial or
12 otherwise, in its outcome.
13 IN WITNESS WHEREOF, I have hereunto set
14 my hand and affixed my notarial seal this 9th day
15 of July, 2024.
16 My Commission Expires: November 3, 2024
17
18
19 Judith E. Bellinger
20
21 E-NOTARY PUBLIC IN AND FOR
22 THE STATE OF MARYLAND

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