1 UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD
2
3 KANGXI COMMUNICATIONS TECHNOLOGIES (SHANGHAI) CO., LTD., Petitioner,) IPR2024-001456 U.S. Patent No. 9,450,579
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vs.
7 SKYWORKS SOLUTIONS, INC., Patent Owner.) IPR2024-01457 U.S. Patent No. 9,148,194
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16 The virtual deposition of LAWRENCE E.
17 LARSON, Ph.D., called by the Patent Owner for
18 examination, pursuant to agreement, and pursuant to
19 the applicable rules, taken stenographically by
20 Sandra L. Rocca, CSR, CRR, via Zoom, on the 18th of
21 September, 2025, at the hour of 9:16 a.m.
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23
24
25 Certification No. 084-003435, 1245

Skyworks Ex 2003
Kangxi v. Skyworks
IPR2024-01457

1 APPEARANCES:

2
DUANE MORRIS LLP
3 By: CHRISTOPHER J. TYSON
901 New York Avenue NW, Suite 700 East
4 Washington, D.C. 20001
202.776.7851
5 cjtyson@duanemorris.com

6 appeared on behalf of the
Petitioner;
7

8
WILMERHALE
9 By: DANIEL PERRY
1225 17th Street, Suite 2600
10 Denver, CO 80202
720.598.3439
11 danny.perry@wilmerhale.com

12 -and-

13 WILMERHALE
By: JUNGYEON (JOHN) KIM
14 2600 El Camino Real, Suite 400
Palo Alto, CA 94306
15 650.600.5081
john.kim@wilmerhale.com
16
appeared on behalf of the
17 Patent Owner.

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1 I N D E X

WITNESS PAGE
2
LAWRENCE E. LARSON, Ph.D.
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EXAMINED BY
4
Mr. Perry 5
5 Mr. Tyson 133

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E X H I B I T S

8
NUMBER PRESENTED
9
Exhibit 1001 U.S. Patent No. 9,148,194 131
10
Exhibit 1001 U.S. Patent No. 9,450,579 130
11
Exhibit 1003 L. Larson declaration in
12 IPR2024-01457 re
U.S. Patent No. 9,148,194 11
13
Exhibit 1003 L. Larson declaration in
14 IPR2024-01456 RE
U.S. Patent No. 9,450,579 10
15
Exhibit 1005 U.S. Patent Publication
16 2011/0254614 50
17 Exhibit 1006 Japanese Patent Publication
2006-121217 120
18
Exhibit 1007 English translation of
19 Japanese patent 2006-121217 111
20 Exhibit 1011 "Fully Integrated Switch-LNA
Front-End IC Design in
21 CMOS: A Systemic Approach
for WLAN" A. Madan 123
22
Exhibit 1013 United States Patent
23 Application Publication
2004/0251952 73
24

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1 E X H I B I T S
(continued)
2

3 NUMBER		PRESENTED
4 Exhibit 1024	"Solid State RF/Microwave Switch Technology: Part 2" R. Cory	126
6 Exhibit 1026	United States Patent Application Publication 2011/0260773	99
8 Exhibit 1029	"Single-Pole Double-Throw CMOS Switches for 900MHz and 2.4GHz Applications on p□ Silicon Substrates" FJ Huang	127

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1 LAWRENCE E. LARSON, Ph.D.,
2 having been first duly sworn, was examined and
3 testified as follows:
4 CROSS EXAMINATION
5 BY MR. PERRY:
6 Q Good morning, Dr. Larson. Could you please
7 state and spell your name for the record?
8 A Yes. Lawrence Ernest Larson,
9 l-a-w-r-e-n-c-e, e-r-n-e-s-t, l-a-r-s-o-n.
10 Q And have you ever been deposed before?
11 A Yes, I have.
12 Q So you understand that you are providing
13 testimony under oath just the same as if we were in
14 a court of law, right?
15 A I do understand that, yes.
16 Q Okay. And you understand that even though
17 there's not a judge in front of you, you are still
18 obligated to give truthful answers, right?
19 A Yes, correct.
20 Q Okay. And then you understand that you're
21 obligated to answer my questions and that your
22 counsel may object to my questions, but you're still
23 obligated to answer unless counsel instructs you not
24 to answer. Does that all make sense?
25 A That makes sense, yes.

1 Q So I just want to run through a couple
2 ground rules. And so since this is an online
3 deposition, there's a couple more I want to go
4 through. But if at any point you have difficulty
5 hearing me, can you please just let me know right
6 away so we can sort that out quickly?
7 A Yes.
8 Q And then since we're online, please let me
9 finish asking my question before you begin
10 answering. Okay?
11 A Okay.
12 Q And then equally important, I'll make sure
13 to wait for you to finish your answer before I ask
14 you the next question. But if I accidentally start
15 to speak before you're finished, please just let me
16 know. All right?
17 A Okay. Will do.
18 Q And then please just remember that all of
19 your testimony is being transcribed today so all
20 answers need to be verbal, nodding or other gestures
21 won't be reflected on the record. Does that make
22 sense?
23 A Yes, I understand.
24 Q Okay. And then finally, just if you need a
25 break at any point, please just let me know and we

1 can take a break at any point today as long as a
2 question's not pending. Is that all okay?
3 A Yes, that's fine.
4 Q And so --
5 MR. TYSON: This is -- Chris, I'll try to
6 take a break about every hour.
7 MR. PERRY: Yeah, I also will try to take
8 breaks about every hour, but if I go long, please
9 just let me know.
10 BY MR. PERRY:
11 Q Okay. Dr. Larson, so where are you
12 testifying from today?
13 A I'm here at my house in Okatie, South
14 Carolina.
15 Q And is anyone else in the room with you?
16 A Mr. Tyson is in the room with me. My wife
17 may come in from time to time because we're doing
18 this in my dining room.
19 Q Understood. Can you confirm that your phone
20 is off during this deposition?
21 A Yeah, I'll turn it off right now.
22 Q And just can you also confirm that you have
23 nothing open on your computer other than this video
24 call and -- yeah, sorry -- other than this video
25 call?

1 A Yes, sir. Everything is closed on my
2 computer.
3 Q Okay.
4 A Except for this.
5 Q And you have copies of exhibits in the room
6 with you, correct?
7 A Correct.
8 Q And those are original copies, they are not
9 annotated in any way, right?
10 A That's correct. They have no markings
11 whatsoever on them.
12 Q Do you have any separate notes on paper in
13 the room with you?
14 A I have a small sheet of paper with a few
15 typos regarding my -- one of my declarations.
16 That's all.
17 Q I'll put a pin in that and we'll come back
18 to some of those notes.
19 So if we were in the room together, I would
20 be able to view whether you were communicating with
21 anyone. And so since we're online, I just ask that
22 you don't send or receive any communications during
23 the deposition outside of the breaks.
24 Does that make sense?
25 A Yes, that makes sense.

1 Q Okay. Is there any reason that you may not
2 be able to provide complete and truthful answers
3 today?
4 A No, none whatsoever.
5 Q And you're not taking any medications that
6 might interfere with your ability to communicate
7 truthfully or completely?
8 A Oh, no, none whatsoever.
9 Q So you understand that you are here to
10 testify regarding the declarations that you
11 submitted in support of the petition filed in
12 IPR2024-01456 and IPR2024-01457, right?
13 A Correct, yes.
14 Q And those IPRs or those petitions for inter
15 partes review were filed by Kangxi Communication
16 Technologies, is that correct?
17 A I believe that's correct, yes. The
18 pronunciation is a little unclear for me, but I
19 think that's correct, yes.
20 Q I also struggle with the pronunciation if
21 I'm being honest.
22 A Yes.
23 Q So if I use the term "KCT," would you
24 understand then that I'm referring to Kangxi
25 Communication Technologies?

1 A Yes, I will understand that.
2 Q And had you heard of KCT before you were
3 retained to submit declarations in these IPRs?
4 A I don't believe so, no.
5 Q All right. So what I'd like to do -- and
6 Mr. Kim, if you could please share your screen to
7 bring up Exhibit 1003 in the 1456 IPR.
8 And Dr. Larson, this should be your
9 declaration.
10 (Document marked previously as
11 Exhibit 1003 in IPR2024-01456 was
12 presented.)
13 A So you've shared it -- oh, I see you're
14 bringing it on the screen. Very good.
15 Q So I just want to confirm, here we're
16 showing the cover page and this is the declaration
17 that you submitted in the 1456 IPR, right?
18 A No, actually this is the '579 patent
19 declaration.
20 Q Correct. So this declaration is for the
21 '579 patent, but if you look at the, I guess second
22 line of the text from the bottom, the IPR number is
23 the one in ends in 1456. Do you see that?
24 A Oh, yes, I'm sorry. Thank you.
25 Q And so if we turn to paragraphs 2 and 3 of

1 declaration, here it says that you have been
2 retained by KCT to provide opinions regarding U.S.
3 Patent Number 9,450,579, right?
4 MR. TYSON: Just to verify you said pages 2
5 and 3.
6 A Yes. You must mean exhibit.
7 Q Sorry. I'm referring to paragraphs 2 and 3
8 on page 11 of the Exhibit 1003 of the 1456 IPR.
9 MR. TYSON: Sorry for interrupting you.
10 A Mr. Perry, I'm sorry. Could you ask the
11 question again?
12 Q No problem. So looking at these paragraphs,
13 KCT retained you to provide opinions regarding
14 U.S. Patent Number 9,450,579 for this IPR, right?
15 A Correct.
16 Q And so if I refer to the 9,450,579 patent as
17 the '579 patent, will you understand what I'm
18 referring to?
19 A Yes, I will.
20 MR. PERRY: And then just briefly, Mr. Kim,
21 if you could also now bring up the 1457 IPR and
22 Exhibit 1003 which is Dr. Larson's declaration in
23 that IPR. Thank you.
24 ///
25 ///

1 (Document marked previously as
2 Exhibit 1003 in IPR2024-01457 was
3 presented.)
4 BY MR. PERRY:
5 Q So we're now showing Exhibit 1003 in the
6 1457 IPR. And this is the declaration that you
7 submitted in that IPR, right?
8 A That's correct.
9 Q And once again, if we turn to, I think it's
10 page 11 again, paragraphs 2 and 3 for this
11 declaration, KCT retained you to provide opinions
12 regarding U.S. Patent Number 9,148,194, right?
13 A That's correct.
14 Q Okay. And so then if I refer to U.S. Patent
15 Number 9,148,194 as the '194 patent, will you
16 understand what I mean?
17 A Yes.
18 Q And so, Mr. Kim, if you could go to near the
19 end of this declaration, I believe it's starting on
20 page 122, there's Appendix A.
21 And this appendix lists all the materials
22 that you considered in formulating your opinions for
23 your declaration in the 1457 IPR, is that correct?
24 A Yes, these are the materials that I relied
25 on for this declaration.

1 Q And did you read all of these materials?
2 A Yes, I did.
3 Q And are there any materials that you asked
4 for that were not provided?
5 A No, none.
6 Q And then, Mr. Kim, if you could go back to
7 the Exhibit 1003 in the 1456 IPR and turn now this
8 time to page 121. All right.
9 So page 121 also shows Appendix A, which is
10 the list of materials you relied upon in the 1456
11 IPR, is that right?
12 A That's correct.
13 Q And if we were to put these side-by-side, is
14 it the same list of materials you considered in this
15 -- the 1456 and 1457 IPRs?
16 A Well, let me take a quick look. I have --
17 I'll be referring to my paper copies, Mr. Perry, if
18 that's okay.
19 Q Understood. Yes. That's perfectly fine.
20 A So they're nearly the same, Exhibits 1037
21 and 1038 are different in the two cases. And I
22 believe that's referring to the patent prosecution
23 history of the '579 patent. But other than that,
24 they're the same.
25 Q Great, thank you, Dr. Larson. Mr. Kim, you

1 can take down the declarations for now.
2 So, Dr. Larson, you understand that Skyworks
3 Solutions owns the '579 and '194 patents, right?
4 A I think that's correct, yeah. They -- yeah,
5 it's their patents, yes.
6 Q And so do you understand that if I say
7 Skyworks, that I'm referring to Skyworks Solutions?
8 A Yes, I do. I understand that.
9 Q And had you heard of Skyworks before these
10 IPRs?
11 A Yes, I have.
12 Q And in what context?
13 A Skyworks is a very famous RF components
14 company. I think it actually came out of Rockwell
15 many, many years ago. And you know, they were --
16 they're just a very famous company. They make all
17 kinds of great products and they're, you know,
18 well-known in the industry.
19 So you know, when I was at UC San Diego, you
20 know, they were a supporter of the Center for
21 Wireless Communications, which I was a member of.
22 So I have worked with Skyworks in the past many,
23 many years ago and they're very, very -- as I said,
24 they're famous.
25 Q Are you aware that there is parallel

1 litigation between Skyworks and KCT in a form called
2 the International Trade Commission?
3 A I had heard about that, yes.
4 Q And are you aware that there is parallel
5 litigation between Skyworks and KCT in the Central
6 District of California?
7 A I was aware of that, yes.
8 Q Did you review any materials from those
9 litigations?
10 A I don't believe so, no.
11 Q Did you review any of the invalidity
12 contentions in the ITC investigation?
13 A No, I don't think so.
14 Q And what about any materials related to
15 claim construction?
16 A Are you referring to claim construction in
17 the ITC case?
18 Q Correct. Let me clarify.
19 Did you review any materials regarding claim
20 construction in the International Trade Commission
21 investigation?
22 A No, I do not believe so.
23 Q And so when were you retained by KCT?
24 A It was -- I couldn't give you the exact
25 date. It was roughly a year ago, maybe a little

1 more than a year ago.
2 Q So sometime around August or September
3 of 2024?
4 A Yeah, it might have even been July.
5 Q And how did you come to be retained by KCT?
6 A Well, counsel contacted me and asked if I
7 would be interested in providing my -- you know, my
8 expertise on this case. And after some discussions,
9 I said yes, that would be fine.
10 Q Have you communicated with anyone from KCT
11 or just KCT's counsel?
12 A I met the KCT -- I think it was the CTO when
13 I visited Duane Morris last year in the D.C. area.
14 So that's the only person I've met.
15 Q And do you recall if KCT's CTO is named Huan
16 or Steve Zhao?
17 A I don't recall his name at all. I'm sorry.
18 Q And approximately when did that meeting take
19 place?
20 A Might have been -- it was in the fall. And
21 once again, I cannot give you an exact date, but I
22 would say November or December of 2024.
23 Q When you were retained by KCT, what were you
24 asked to do?
25 A Well, I was asked to, you know, review the

1 patents and, you know, try to understand these
2 patents in the context of existing prior art and
3 what was known in the field at the time of their
4 invention. And you know, the IPR process was kind
5 of explained to me and how my declaration would be
6 used in support of an IPR process.
7 Q And aside from these IPRs, have you been
8 asked to provide any other opinions on behalf of
9 KCT?
10 A No, not that I can recall.
11 Q Have you worked with KCT for any other
12 cases?
13 A No, not at all.
14 Q Do you have anyone else that is working with
15 you or under your direction on this case?
16 A No, not at all.
17 Q So you were approached by KCT sometime in
18 the middle of last year, July or August.
19 Approximately how long did it take you to reach your
20 opinion that the challenged claims of the '579
21 patent are invalid?
22 A Well, you know, we started, as I said, last
23 summer sometime, July or August, let's say. And
24 then, you know, I think we submitted these
25 declarations in December. So it took about six

1 months, you know, from beginning to end.
2 Q And so I understand that it took that long
3 to prepare the declarations to support the
4 petitions, but somewhere in that time frame, you
5 must have reached your opinion that the claims were
6 invalid and I suspect it was sometime before you
7 submitted the declarations. And so I'm wondering
8 how long did it take, you know, reviewing the
9 patents for you to reach your opinion that the
10 claims were invalid?
11 A Well, yeah. I mean, it's -- I could not at
12 all give you an exact answer there, you know.
13 Somewhere probably kind of in the middle of that
14 time frame would be my best guess.
15 Q And you address two different patents in
16 these IPRs, the '579 patent and the '194 patent.
17 Did you reach your conclusions at the same time or
18 did you analyze one of the patents before the other?
19 MR. TYSON: Object to the form.
20 A Yeah, I mean I would say that I reached them
21 approximately at the same time.
22 Q Approximately how much time in total did you
23 spend preparing the declaration that supports the
24 1456 IPR?
25 A Well, a little hard to say, you know, once

1 again. You know, all told -- could you clarify your
2 question a bit? And I think I'm struggling with do
3 you mean from like beginning to end or just in the
4 preparation of the declaration itself I guess is my
5 question.
6 Q Yeah. So let me clarify my question. I'm
7 asking about the actual drafting of the declaration.
8 So how much time did you spend drafting the
9 declaration for the 1456 IPR?
10 A Yeah, you know, once again, I couldn't give
11 you an exact number. I would say 40 to 80 hours
12 approximately.
13 Q And did you spend a similar amount of time
14 preparing the declaration for the 1457 IPR?
15 A Well, I would have to say that they were --
16 there's quite a bit of similarity between them and
17 so maybe, you know -- and of course, they're being
18 drafted together. So I would say, you know, perhaps
19 an additional 10 or 20 hours in order for both of
20 them to be completed.
21 Q That actually leads me to my next question
22 which is, did you prepare one of the declarations
23 before the other or were you preparing them at the
24 same time?
25 A Yeah, they were -- they were being prepared

1 at the same time.
2 Q And you rely on the same prior art for each
3 of the declarations, right?
4 MR. TYSON: Object to form.
5 A Yeah, if by prior art you mean the exhibits
6 that I cite in my declaration, then apart from the
7 difference that I just mentioned, they're the same.
8 Q And did you write your own declarations?
9 A You know, I drafted them together with
10 counsel. You know, I would draft some stuff and
11 then, you know, I'd receive some responses and then
12 we would go back and forth and back and forth for
13 many weeks. And so it was a -- I mean, I drafted
14 them, but with help of or with -- along with Duane
15 Morris and we worked together on it. But I drafted
16 everything.
17 Q And then what did you do to prepare for this
18 deposition?
19 A I reviewed the patents. I reviewed my
20 declaration. I reviewed the exhibits. I reviewed
21 the prosecution history. I reviewed the IPR
22 petitions. I think that's -- and then Mr. Tyson and
23 I have reviewed in person yesterday and for half of
24 the day previously.
25 Q So the material you just identified was all

1 material that you had reviewed before you drafted
2 your declarations in the 1456 and 1457 IPRs, right?
3 A Yes. It's the same material.
4 Q You did not review any new material,
5 correct?
6 A I did not review any new material in
7 preparation for this deposition.
8 Q And you said you met with Mr. Tyson
9 yesterday, correct?
10 A Correct.
11 Q And you said you also met with him the day
12 before for about a half-day. Did I get that right?
13 A Correct. I would say Tuesday afternoon.
14 Q So in total, you met with Mr. Tyson for
15 approximately 12 hours to prepare for this
16 deposition?
17 A That's correct.
18 Q And did you speak with anyone other than
19 Mr. Tyson to prepare for your deposition today?
20 A No, no one else.
21 Q And so you did re-review your declarations
22 in preparation for today's deposition, right?
23 A Yes, I reviewed my -- both of my
24 declarations in preparation for the deposition
25 today.

1 Q And I believe you said earlier that you
2 noticed a few mistakes in your declarations when you
3 re-reviewed it. Correct?
4 A Yes. I would characterize them as typos.
5 Q And so can we please walk through the
6 mistakes that you noticed or typos in your
7 declaration?
8 A Yes. And I have the -- a piece of paper
9 here. So on page 79 --
10 Q And sorry to interrupt you, Dr. Larson, but
11 is this page 79 of the 1456 declaration or the 1457
12 declaration?
13 A Yes, I apologize. This is the 1457. And on
14 page 79 -- let's see. So in paragraph 126, it says,
15 "it was well-known tp POSITAs that, in using SOI
16 technology" -- so the "tp" should be a "to." So I
17 don't know how that -- I guess O and P are next to
18 each on the keyboard. So a "tp" should be a "to."
19 And, Mr. Perry, I'll just go through them one by one
20 if that's okay.
21 Q Yeah, that sounds good.
22 A Then at 7 -- on page 70 in that same
23 declaration, the very last line on the page in
24 paragraph 101, it says the word "routing use of
25 Huang's blocking capacitors." That should be

1 routine use of Huang's blocking capacitors. Then on
2 page 81, paragraph 129, it says package -- sorry,
3 this is in paragraph -- page 81, paragraph 129, the
4 last sentence has the word -- in parentheses it
5 says, "(e.g., in a packages RF switch module.)"
6 That should be in a packaged RF switch module. And
7 then finally, on page 109 -- sorry -- paragraph 188
8 -- sorry, paragraph 188, yes, so page 109,
9 paragraph 188 at the very top of the page, there's a
10 missing period after the word "above." And that's
11 all.
12 Q And so does that address all of the notes
13 you have on the paper in the room with you?
14 A It does. Yes, I also have like a menu for
15 yesterday's lunch written here, but that's all
16 that's on the paper.
17 Q Are there similar typos in the 1456
18 declaration?
19 A No. Not as far as I can see.
20 Q Are there any opinions in either of your
21 declarations in the 1456 or 1457 IPR that you would
22 like to change?
23 A No, none.
24 Q So are you equally confident in each of the
25 opinions you've offered in your declarations in each

1 IPR?
2 A Yes.
3 Q If you had to pick one argument so that the
4 challenged claims are obvious over Huang or that the
5 challenged claims are obvious over Seshimo, which
6 one would you pick?
7 A Wow, Mr. Perry, that's a really -- kind of a
8 hypothetical question and I actually would rather
9 not just kind of speculate. I think my declaration
10 kind of stands for itself. The arguments on all the
11 claims are all very strong and not one in particular
12 jumps in my mind as being the strongest and I would
13 hesitate to have kind of a speculation at this
14 point.
15 Q So you're equally confident in your opinion
16 that the challenged claims are obvious over Huang as
17 you are in your opinion that the challenged claims
18 are obvious over Seshimo?
19 A Well, I think that they're all strong claims
20 and, you know, your question about equally
21 confident, I'm not quite sure if I would even be
22 comfortable speculating. They're all very, very
23 strong.
24 Q And you don't believe that one argument is
25 stronger than the other?

1 A I can't think of any relative strengths of
2 any of these arguments. And I think that that would
3 be somewhat speculative honestly.
4 Q Well, you prepared these arguments, right?
5 A I did, yes.
6 Q And I'm guessing that you -- strike that.
7 Did you come up with other opinions that you
8 did not include in the petitions?
9 A Interesting question. No, none that I can
10 think of.
11 Q So these were the only two arguments that
12 you identified that the claims were invalid over the
13 prior art, right?
14 MR. TYSON: Objection to form.
15 A Well, I'm not sure what you mean by the only
16 two arguments. I mean, the -- you know, these
17 declarations contain, you know, lots of -- lots of
18 arguments regarding each claim, you know, and each
19 element of every claim. So there's a whole set of
20 arguments here that are included.
21 Q Let me rephrase. So there are two grounds
22 that you present that the claims are obvious over
23 the prior art, the first ground is that they're
24 obvious in view of Huang in view of the general
25 knowledge and creativity and skill of a person of

1 ordinary skill in the art; and the second ground is
2 that the claims are obvious over Seshimo in view of
3 the general knowledge, skill and creativity of a
4 person of ordinary skill in the art, right?
5 A Well, let me review my declaration very
6 quickly. I think you're asking me to kind of
7 characterize my opinions here. I just want to be
8 sure that that's consistent with what I wrote.
9 Q To help you, Dr. Larson, I might direct you
10 to your Table of Contents for each of the
11 declarations. And you can see there are subheadings
12 there that identify ground 1 and ground 2.
13 A You know, I might -- I'm trying to get to
14 your question here and I think maybe like on page 3
15 of my declaration I talk about, you know, claims 1
16 through 11 of the '194 patent would be obvious
17 because of what you called the Huang patent, I
18 understand that, and in view of the knowledge, skill
19 and creativity of a person of ordinary skill in the
20 art.
21 And then I go on to say, claims 1 through 11
22 of the '194 patent would also be obvious over the
23 Japanese patent, which I think you called Seshimo.
24 That's good. I recognize that. And once again, in
25 the view of knowledge, skill and creativity of a

1 person of ordinary skill in the art. So those are
2 the two publications upon which I based my opinions
3 of obviousness.
4 Q And so let's actually stay in that
5 paragraph. And apologies, Dr. Larson. Could you
6 remind me, you're on page 11 of the 1456 IPR, is
7 that correct?
8 A I'm sorry. Yes. And I apologize. I'm very
9 1457 IPR. Is that what you were -- did you want to
10 start there? I'm sorry if I got the wrong one.
11 Q No. Mr. Kim, could you please share your
12 screen and let's start with the 1456 IPR.
13 A Okay.
14 Q And look at page 13, which is paragraph 8.
15 And I'll give Mr. Kim a moment to pull that up. So
16 Mr. Kim, I'd like to go to page 13. I think it's
17 paragraph 8.
18 A Yes, it's paragraph 8.
19 Q I think these are the two bullet points that
20 you're reviewing, Dr. Larson, but I just want to be
21 clear.
22 So the twos opinions that you offer in this
23 declaration are that, first, a POSITA would have
24 found claims 1 through 3, 7 through 9, and 13
25 through 15 of the '579 patent to be obvious over

1 U.S. Patent Publication Number 2011/0254614 to
2 Chun-Wen, Huang et al., (Huang) in view of the
3 knowledge, skill, and creativity of a POSITA.
4 Did I read that correct?
5 A Yes, you did.
6 Q Okay. And so that is your first opinion
7 regarding the challenged claims of the '579 patent,
8 right?
9 A Correct.
10 Q So then if we go to the next bullet point in
11 paragraph 8, you state that a POSITA would have
12 found claims 1 through 3, 7 through 9, and 13
13 through 15 of the '579 patent to be obvious over
14 Japanese Patent Publication Number 2006-121217 to
15 Seshimo, et al., in view of the knowledge, skill,
16 and creativity of a POSITA.
17 Did I also get that correct?
18 A Yes, you did.
19 Q So your second opinion for the 1456 IPR is
20 that the challenged claims are obvious over Seshimo
21 in view of the knowledge, skill, and creativity of a
22 POSITA, right?
23 A Yes, that's just reading that bullet point,
24 correct.
25 Q Are you familiar with the difference between

1 anticipation and obviousness?
2 A Well, you know, I'm not a lawyer, so my
3 understanding is more of a common sense one, you
4 know, based on, you know, my non-legal expert
5 understanding of the meaning of those two terms.
6 Q And what is your understanding regarding
7 whether or not a prior art reference anticipates a
8 claim?
9 MR. TYSON: Object to the form.
10 A Well, you know, I haven't mentioned
11 anticipation at all in my declaration. And so I
12 don't have a, you know -- I haven't mentioned it at
13 all in my declaration so I haven't really prepared
14 for a discussion of anticipation today. But
15 basically anticipation would just mean from a common
16 sense perspective if, you know, like something
17 basically identical, you know, perfectly identical
18 is -- exists already. But as I said, I haven't
19 really prepared an anticipation discussion today.
20 And I'm not -- you know, the legal definition is not
21 something I'm prepared to discuss.
22 Q Mr. Kim, if you could actually bring back up
23 paragraph 8 with the two bullet points there.
24 So I just want to confirm here, Dr. Larson,
25 you're not offering an opinion that Huang

1 anticipates claims 1 through 3, 7 through 9, and 13
2 through 15 of the '579 patent, right?
3 MR. TYSON: Objection.
4 A Yeah, my argument is solely one of
5 obviousness and I have no opinion on anticipation.
6 Q Is it fair to say that a claim is
7 anticipated only if each and every element as set
8 forth in the claim is described either expressly or
9 inherently in a single prior art reference?
10 MR. TYSON: Object to the form.
11 A You know, once again, Mr. Perry, you're
12 asking me about anticipation. And I don't have any
13 basis to, you know -- I can tell you my
14 understanding of what it means for a claim to be
15 obvious, but I'm not sure I can tell you what it
16 means for a claim to anticipate -- to have been
17 anticipated.
18 Q And so you haven't offered an opinion that
19 Huang discloses each and every element of the
20 challenged claims of the '579 patent, right?
21 MR. TYSON: Object to the form.
22 A Well, you know, if you go through my -- I'm
23 not quite sure I understand your question. But if
24 you go through my, you know, declaration, I do talk
25 about each and every claim of, you know, in this

1 case the '579 patent, and each and every element of
2 every claim and from the perspective of obviousness.
3 And that's -- that's what I've done in my
4 declaration.
5 Q Right. But you didn't go through each and
6 every element of the claim, opine that Huang
7 discloses each and every element and then reach the
8 conclusion therefore that Huang anticipates the
9 challenged claims, right?
10 MR. TYSON: Object to the form.
11 A Yeah, I have no opinion on anticipation in
12 my declaration. My declaration only covers issues
13 of obviousness.
14 Q So then you relied on -- and I'm quoting
15 here -- "the knowledge, skill, and creativity of a
16 POSITA" to fill in the gaps of Huang, right?
17 MR. TYSON: Object to the form.
18 A Well, I'm not sure what you mean by "fill in
19 the gaps." I don't think there are any gaps, to be
20 honest, so I'm not quite sure what you're -- what
21 particular gaps you're referring to. If maybe you
22 could point some out to me I could be more specific,
23 but I'm not aware of any gaps in Huang or in
24 Seshimo.
25 Q I'm curious then, if there are no gaps in

1 Huang and Huang discloses each and every element of
2 the challenged claims, why you didn't ultimately
3 conclude that the challenged claims are anticipated
4 by Huang?
5 MR. TYSON: Objection.
6 A Well, I mean, it's such a strong case from
7 an obviousness perspective that -- just such a
8 strong case already, I think the declaration speaks
9 for itself. It's an overwhelmingly strong case from
10 an obviousness perspective.
11 Q Right. But not from an anticipation
12 perspective?
13 MR. TYSON: Object to the form.
14 A Yeah, as I've said before, I have no opinion
15 about anticipation.
16 Q And so you rely on the knowledge, skill, and
17 creativity of a POSITA -- and POSITA is short for
18 person of ordinary skill in the art, right?
19 A Yes, correct.
20 Q And so if I say a POSITA, you'll understand
21 that's what I'm referring to?
22 A I will, yes. Thank you.
23 Q And so in your declaration for the 1456 IPR,
24 you have a section titled "State of the Art and the
25 General Knowledge of a POSITA." Right?

1 A Yes. So that's Section VI(B) in my
2 declaration, page 37.
3 Q And that section describes the knowledge,
4 skill, and creativity of a POSITA at the time of
5 filing of the '579 patent, right?
6 MR. TYSON: Object to form.
7 A Well, you know, I guess -- I'm sorry, could
8 you repeat the question?
9 Q So that section describes the knowledge,
10 skill, and creativity of a POSITA at the time of
11 filing of the '579 patent, right?
12 A Well, I think it describes the background --
13 what I say is the, you know, the background
14 knowledge of a POSITA at that time in 2012.
15 Q Is it fair to say then that this would be
16 the knowledge and the skill and the creativity that
17 a POSITA would have at the time?
18 A And by "this," do you mean the things that I
19 describe in this section?
20 Q Correct, Section VI(B).
21 A Yeah, so VI(B) describes generally the -- I
22 think what you called the state of the art, general
23 knowledge, and creativity of a POSITA at that time.
24 Q And if you look at this section, you
25 identify numerous different references, right?

1 A Yeah, there are lots of references in this
2 section for sure.
3 Q And these references would have been
4 available to a POSITA, right?
5 A Yes, I believe all of them were in the
6 public domain or well-known textbooks at the time.
7 Q Looking back at paragraph 8 of your
8 declaration, you didn't propose any specific
9 combination of Huang and any of the references that
10 you cite in your State of the Art and General
11 Knowledge of a POSITA section, right?
12 A So -- sorry, let me return to Section 8
13 here. And I'm sorry. Could you ask your question
14 again?
15 Q Yeah. No problem. And Mr. Kim's now
16 sharing the screen too if it helps.
17 A Yes. Both are helpful. Thank you.
18 Q So turning back to your opinions in the
19 bullet points in paragraph 8, you haven't offered an
20 opinion that the challenged claims are obvious over
21 the combination of Huang and any of the references
22 that you identify in your section about that State
23 of the Art and the General Knowledge of a POSITA,
24 right?
25 MR. TYSON: Object to the form.

1 A Well, I don't -- let me take as an example
2 one of my -- one of my claims. So let's take a look
3 at -- I'm sorry, let me just review my claim
4 analysis. So I'm not sure I understand what you
5 mean by combining Huang with something else in my
6 analysis. You know, for example, like on
7 paragraph 84 in line 69 of my declaration -- page 69
8 of my declaration, paragraph 84, you know, I give --
9 you know, I say here, you know, to the extent that
10 the Patent Owner doesn't explicitly disclose
11 components formed on a semiconductor substrate, it
12 would have been obvious for a POSITA to do it. And
13 this was kind of well-known and well-understood.
14 And then I give lots of examples from my exhibits.
15 So I'm not quite sure -- when you use the
16 word "combination," I'm not quite sure. I mean, to
17 me, this is -- this is supporting my opinion. Is
18 that a combination in your definition? I don't
19 understand. Anyway, that's what -- this is how I'm
20 relying on my exhibits to support my arguments.
21 Q Apologies, Dr. Larson. I didn't mean to
22 interrupt you there.
23 A No, no. I'm done.
24 Q I just want to clarify. So if we look at
25 that, the actual grounds that are up on the screen,

1 it's Huang in view of just the general knowledge and
2 skill and creativity of a POSITA. You're not
3 opining that it's Huang in combination with, say,
4 Exhibit 1018 that renders claims 1 through 3, 7
5 through 9 and 13 through 15 obvious, right? You
6 have not identified any specific combinations of
7 references?
8 A So if you're asking if I've identified any
9 specific combinations of my references with the
10 prior art, Huang for example, in my analysis of each
11 of the claims and the claim elements, I don't
12 believe so. And that's -- I'm not going through
13 every claim element here, but I believe I have not
14 relied on that particular combination that you're
15 referring to.
16 Q Okay. And you didn't offer any opinions
17 regarding a motivation to combine Huang and a
18 specific reference to arrive at a specific
19 combination of prior art references that render the
20 claims obvious, right?
21 MR. TYSON: Object to the form.
22 A Once again, I used -- I think -- I think to
23 me it seems like you asked the same question. I've
24 used Huang -- you know, for example, in the Huang
25 section of this declaration, I've used Huang as an

1 obvious, you know, piece of prior art. And then
2 there are no other specific combinations with other
3 exhibits in any particular claim element or claim
4 that I'm aware of.
5 Q Okay. Taking just one step back, you have
6 submitted declarations in over 20 other IPR
7 proceedings? Does that sound about right?
8 A Yeah, it sounds about right. Maybe I didn't
9 realize it was that many, but that's maybe about
10 right.
11 Q I think some of them might be duplicated
12 which is why the number might seem higher than you
13 thought it was.
14 A Yes. Yeah, yeah. But if you told me that,
15 I would not be surprised. I wouldn't dispute it, I
16 guess.
17 Q Did the patents at issue in any of those
18 proceedings relate to RF switches that have improved
19 intermodulation distortion performance?
20 MR. TYSON: Object to the form.
21 A I do not believe so.
22 Q In general, what did the technology for the
23 other IPRs that you've worked on relate to?
24 MR. TYSON: Object to scope.
25 A Yeah. Well, I'm a, you know -- my field of

1 research and study is radio frequency
2 microelectronics. And there are -- I think all of
3 the patents that I've submitted IPR declarations on
4 are in that area. And microelectronics is a very
5 broad field that includes switches, which is kind of
6 what we're talking about today, but it also includes
7 amplifiers and mixers and frequency up-conversion
8 and frequency down-conversion. And so all of those
9 others are in those other areas, generally speaking.
10 Q Would you consider yourself an expert in
11 radio frequency microelectronics -- sorry, strike
12 that.
13 So you said that the field of radio
14 frequency microelectronics is broad and it covers
15 many different things, including switches and
16 amplifiers and up- and down-conversion. Is there
17 any one specific area you would consider yourself
18 more an expert in?
19 A No, not really. I think I'm actually kind
20 of an expert in all of those areas.
21 Q Were you deposed in the proceedings in which
22 you submitted declarations?
23 A Yes. I believe I was; not every time, but a
24 few of those times.
25 Q And do you recall approximately how many

1 times you've been deposed?
2 A Overall or just in the IPR cases?
3 Q Let's go overall first, please.
4 A Yeah, once again, I can't give you an exact
5 number; somewhere between 8 and 12.
6 Q And then how about in the IPR context?
7 A I would say two or three times previously.
8 But once again, I'm not -- I don't have an exact
9 memory.
10 Q Are you aware of your opinions ever being
11 excluded by a board?
12 A As far as I know, they have never been
13 excluded by a board.
14 Q Has a board ever discredited your testimony?
15 A I don't believe a board has ever discredited
16 my testimony.
17 Q Has a board --
18 A At least I'm not aware of it.
19 Q I'll phrase the questions that way.
20 Are you aware if a board has ever found your
21 opinions conclusory?
22 A I'm not aware of that.
23 Q Are you aware if a board has ever found your
24 testimony insufficient?
25 A I'm not aware.

1 Q And finally --
2 A I'm sorry. By board, do you mean the PTAB
3 board.
4 Q Correct.
5 A Yes, yes, yes. And my answer is the same
6 with that clarification.
7 Q And then finally in the board context, has a
8 board ever found you less credible than the opposing
9 expert?
10 A I have no idea.
11 Q So you said you also testified outside of
12 the IPR context. Was that in a district court case?
13 A Well, I'm not sure to be honest the various
14 courts. I think probably, but the exact, like,
15 title of the court doesn't come to my memory at this
16 time.
17 Q In any of those cases, were you offering
18 opinions regarding, say, infringement or validity?
19 A So I have testified on infringement and I
20 have testified on validity, yes, in both -- so the
21 answer I think to your question is yes, in both
22 cases.
23 Q And are you aware if a court has ever
24 excluded any of your opinions on those topics?
25 A I don't believe a court has ever excluded my

1 opinions on those topics.
2 Q All right. Mr. Kim, if you could bring up
3 Exhibit 1003 in the 1457 declaration, at page 3.
4 And apologies, Dr. Larson. I should have
5 done this when we were talking about these bullet
6 points earlier, but I just want to confirm that your
7 opinions are the same for the 1457 declaration as
8 the 1456 declaration?
9 A And -- yes, they are the same.
10 Q I mean you are relying on the same prior
11 art, Huang and Seshimo, and your opinion is that the
12 challenged claims here in the '194 patent are
13 obvious over Huang in view of the knowledge, skill,
14 and creativity of a POSITA, as well as obvious over
15 Seshimo in view of the knowledge, skill, and
16 creativity of a POSITA, is that right?
17 A That's right. You're just reading from
18 those paragraphs and that's correct.
19 Q And those are the same two grounds that you
20 -- formed the basis of your opinion in the 1456 IPR,
21 right?
22 A Correct. Different claim numbers, but the
23 same opinions.
24 Q Different claim numbers and different
25 patents, correct?

1 A Correct.
2 Q And once again, for the 1457 IPR, you're not
3 offering an opinion regarding whether Huang or
4 Seshimo anticipate any of the challenged claims of
5 the '194 patent, right?
6 A That's right. I have no opinion on
7 anticipation for this -- for the 1457 as well.
8 Q And for the 1457, you have not identified a
9 specific combination of prior art references that
10 render the claims obvious, correct?
11 A I have no -- there's no combination over and
12 above the pieces of prior art that I cite here,
13 yeah, which are also discussed at length in my
14 declaration.
15 Q So I'd like to -- since the grounds are the
16 same in each declaration, for most of today, I'd
17 like to focus on the 1456 declaration if that's all
18 right with you.
19 A Yes, sure. Fine.
20 Q So there are a couple inconsistent
21 statements in your 1456 declaration that I'm hoping
22 you can help clarify.
23 So Mr. Kim, if you could go to page 69 of
24 the 1456 declaration. And this is paragraph 82.
25 Do you see this paragraph, Dr. Larson?

1 A Yes.
2 Q And so here you state that to the extent the
3 preamble is limiting, in my opinion, Huang discloses
4 a semiconductor die, including a semiconductor
5 substrate on which the components of the disclosed
6 single-pole-dual-throw or SPDT transmit-receive
7 switch are formed, to a POSITA.
8 Did I get that right?
9 A Yes, you did. You read it correctly.
10 Q And then if you'd just jump down a little
11 bit on that page to paragraph 84, you then say, "To
12 the extent Patent Owner asserts that Huang does not
13 explicitly disclose that SPDT switch 200 components
14 are formed on a semiconductor substrate of a
15 semiconductor die, in my opinion, it would have been
16 obvious to POSITAs to do so" and then the sentence
17 goes on.
18 Did I get that right also?
19 A Yes, you've read it correctly.
20 Q So in your opinion, does Huang explicitly
21 disclose that the SPDT switch components are formed
22 on a semiconductor substrate of a semiconductor die?
23 A Well, I think that they -- I think Huang
24 does -- I think you used the word "explicitly." But
25 I would just say I think Huang does disclose this

1 and does it, you know, for the reasons I described
2 in paragraph 83. Huang states, you know, the
3 invention relates to high-power semiconductor
4 switches and, you know, these switches -- and such
5 high-power semiconductor-based transmitter switches
6 and then they, you know, include and can be SOI
7 switches. So Huang talks about switches that are on
8 a semiconductor substrate I think in the document.
9 Q So then you would agree that Huang does
10 explicitly disclose that the SPDT switch are formed
11 on a semiconductor substrate of a semiconductor die?
12 A Yes, Huang does disclose this. The
13 semiconductor switches are formed on a semiconductor
14 substrate.
15 Q So if it is your opinion that Huang does
16 disclose this, why did you offer the alternative
17 opinion that it would have been obvious to a POSITA
18 to implement these components on a semiconductor
19 substrate of a semiconductor die?
20 A Well, I think the -- you know, the key
21 phrase there is -- first sentence of 84, "to the
22 extent that the Patent Owner asserts" that they --
23 that they don't, I think it would have been obvious
24 to do so. I mean, so if there's any -- I think what
25 we sort of mean there, you know, if there's any

1 assertion that the disclosure of the switches
2 doesn't explicitly -- if there's some feeling that
3 it doesn't, if there's some assertion that it
4 doesn't, then it simply would have been obvious for
5 a person of ordinary skill in the art to -- to do
6 this. So it's simply a -- I don't know. It's just
7 sort of like, well, if -- you know, it's my opinion
8 that it's clear that it is disclosed. But if you
9 feel it's not disclosed, then I provide lots of
10 examples that would have led a person of ordinary
11 skill in the art to do it. And that's described
12 kind of in paragraph 84.
13 Q This is kind of your way of hedging, right?
14 MR. TYSON: Object to the form.
15 A Well, I'm not sure that I would call it
16 hedging. I would simply say that it's -- if an
17 alternative perspective is presented, then here's a
18 reason why it would have been obvious to a person of
19 ordinary skill in the art.
20 Q And so then are you not confident that Huang
21 discloses that the SPDT switch is formed on a
22 semiconductor substrate?
23 A I'm sorry. Could you repeat the question?
24 Q Yeah. So if you were confident that Huang
25 discloses this limitation, you wouldn't need to

1 supplement and say it would have been obvious to a
2 person of ordinary skill in the art to the extent it
3 doesn't disclose it. And so my question is then,
4 you know, are you not confident that Huang discloses
5 this claim element?
6 A No, I'm very confident that Huang discloses
7 it.
8 Q So I won't repeat this throughout your
9 declaration, but this comes up a number of times
10 where you state that Huang discloses element XYZ and
11 then to the extent that Huang does not disclose it,
12 it would be obvious.
13 Is your analysis the same there as it was
14 for this claim element, that it's your opinion that
15 Huang doesn't disclose it, but you're leaving open
16 the possibility of I guess it being obvious to the
17 extent that it does not disclose that particular
18 element?
19 MR. TYSON: Object to the form and
20 mischaracterizes testimony.
21 A Yeah, I think, you know, I would just kind
22 of, you know -- kind of repeat what I said in the
23 declaration here on paragraphs 83 and 84. You know,
24 disclosing semiconductors -- I'm very confident in
25 the argument that disclosing semiconductor switches

1 discloses the use of a semiconductor substrate for
2 those switches. But if I say in paragraph 84 the
3 Patent Owner disagrees, then okay. But it's obvious
4 to a person of ordinary skill in the art, based on
5 all the references that I provide, that it would
6 contain a semiconductor substrate. And I don't know
7 if I make that same identical argument throughout
8 the document, but I certainly made it here. If
9 you'd like to go through the others, we can do that
10 as well.
11 Q That's helpful context. Thank you,
12 Dr. Larson. What I'd like to do is briefly
13 transition to page 34 of the declaration and this is
14 paragraph 47. And I'll wait for Mr. Kim to bring
15 that up.
16 This is the first paragraph in a section
17 called "Claim Construction," right?
18 A Yes. Section 5.
19 Q And here, you've been informed that claim
20 terms should be given their plain and ordinary
21 meaning, right?
22 A Yes.
23 Q And you have applied a plain and ordinary
24 meaning for each of the claim terms in the '597
25 [sic] patent, right?

1 A I've applied those to the '579. I think you
2 said '597.
3 Q Sorry, the '579 patent. Thank you.
4 Please let me know if you'd like to see the
5 corresponding paragraph for the '194 patent
6 declaration, but I'll represent to you that it's the
7 same for that and you also --
8 A That's fine.
9 Q -- applied plain and ordinary meaning for
10 each of the claim terms in the '194 patent, right?
11 A I believe that's correct, yes, yes. I'm
12 just reading the -- yes. Yes, this is the standard
13 I used. The terms should have their plain and
14 ordinary meaning as understood by a POSITA.
15 Q And you did not propose any constructions
16 for any claim terms in the '579 patent, right?
17 A Well, let's see here. So you know, as I
18 write in like paragraph 49 of my declaration on
19 page 35, no specific construction of any term is
20 required because the relied-upon prior art meets
21 each of the claim terms under any proper
22 construction. So there's no specific construction
23 of any term. And I guess, the PTAB has not
24 constructed any -- construed any terms either.
25 Q And the same is true for the '194 patent,

1 right? You did not propose any constructions for
2 any claim terms in the '194 patent?
3 A Yes, let me just review very quickly. I
4 applied the same analysis in -- yeah, in the 1457
5 also, '194.
6 Q Were there any terms that you did not
7 understand in the '579 patent?
8 MR. TYSON: Object to form.
9 A I understood all of the terms in the patent.
10 Q And were there any terms that you did not
11 understand in the '194 patent?
12 A No, there are no terms that I did not
13 understand in the '194 patent.
14 Q And you would consider yourself a POSITA for
15 each of the '579 and '194 patents, right?
16 A Yes, I consider myself a POSITA for these
17 patents.
18 Q And so a POSITA would be able to understand
19 all the terms in the '579 patent, right?
20 MR. TYSON: Object to the form.
21 A Yeah, I believe so. I believe a person of
22 ordinary skill in the art at that time would
23 understand the terms in the patent.
24 MR. PERRY: Now might be a good time for a
25 10- or 15-minute break, Dr. Larson and Mr. Tyson, if

1 that's good for you all?
2 MR. TYSON: Yeah, that's fine.
3 (Short recess.)
4 BY MR. PERRY:
5 Q All right. Dr. Larson, I'd like to switch
6 gears a little bit and turn to Exhibit 1005 of the
7 1456 IPR which is the Huang reference, right?
8 A Okay.
9 (Document marked previously as
10 Exhibit 1005 was presented.)
11 MR. PERRY: And, Mr. Kim, maybe you could
12 share the cover page of Exhibit 1005 to make sure
13 we're all looking at the same thing.
14 BY MR. PERRY:
15 Q All right. Dr. Larson, so on the screen now
16 is Exhibit 1005 and this is the Huang reference,
17 right?
18 A That's correct.
19 Q And you are very familiar with this
20 reference, right?
21 A I'm familiar with it, yes.
22 Q How many times do you think you've read this
23 reference?
24 A Oh, gosh, Mr. Perry, I couldn't say; you
25 know, six to twelve.

1 Q And you've read every word, right?
2 A I've read every word of it, yes.
3 Q Front to back?
4 A I have read every word of this many, many
5 times.
6 Q And so the title of Huang is -- and here
7 this is the top of page 1 of Exhibit 1005, "A system
8 and method of transistor switch biasing in a
9 high-power semiconductor switch." Right?
10 A Yes, that's the title.
11 Q And in the abstract on the right-hand side
12 of this page, it states, "A system and method are
13 provided for biasing transistor switches in a
14 semiconductor-based high-power switch." Right?
15 A Yes, that's correct.
16 Q And so taking just a brief step back, you
17 are a professor of electrical engineering at Brown,
18 right?
19 A Correct.
20 Q And you teach several electrical engineering
21 classes at Brown currently, right?
22 A Yes, correct.
23 Q And you have taught classes at Brown
24 historically, right?
25 A Correct.

1 Q Are any of those classes related to, you
2 know, fundamental electrical engineering concepts?
3 A Yes, I have historically taught actually
4 introduction to electrical engineering class at
5 Brown which teaches fundamental electrical -- pardon
6 me -- electrical engineering concepts.
7 Q And is one of those fundamental electrical
8 engineering concepts transistor switches?
9 A Well, you know, in electrical engineering,
10 we build upon an early foundation and then we get
11 more and more complex as we get higher and higher in
12 our education. And you know, the concept of
13 transistor switches is briefly introduced in that
14 introductory course, but then explained more
15 completely in later courses.
16 Q What's the context in which transistor
17 switches are introduced in those introductory
18 courses?
19 A Well, you know, when we start to teach
20 electrical engineering, we -- you know, we teach
21 step responses of circuits. You know, you have a
22 resistor connected to a capacitor through a switch
23 and the resistor has a voltage on it and it charges
24 up the capacitor. And we, you know, calculate the
25 time response of that switch.

1 And actually in the classes that I teach, I
2 always use a cardiac defibrillator as a great
3 example of this because that's essentially what you
4 do, you take a capacitor, you charge it up to a very
5 high voltage and then you discharge it into
6 someone's chest who is having a cardiac event. So
7 yeah, we talk about transistor switches in the
8 introductory class. We go into more detail in later
9 classes, but it is, yeah, brought up in the
10 introductory class as well.
11 Q So you start with, you know, basic circuit
12 components like resistors and capacitors and how to
13 model those components and how those components
14 react to say a step function, right?
15 A That's a great example. There could be
16 other components, conductors and could be a sine
17 wave, step function, triangle wave, but I think your
18 basic description of the process is correct.
19 Q And then you add additional building blocks
20 like transistors and I'm assuming then you build up
21 to maybe something like an amplifier or operational
22 amplifier and start to analyze how those circuits
23 operate. Is that generally right?
24 A Yeah, you're describing the path through the
25 a typical electrical engineering curriculum in a

1 university. You start with the basics and then you
2 get more and more complicated and more and more
3 sophisticated in later courses.
4 Q What are the examples of transistor switches
5 that you teach in these classes? Are you teaching
6 about something called MOSFETs, which I think you're
7 familiar with, or BJTs? Could you let me know sort
8 of what types of transistors are taught in those
9 introductory classes?
10 A Yeah, in the introductory class, which I've
11 taught many, many times, we just teach MOSFET
12 switches. And we do that because that's a wonderful
13 gateway into digital circuits. And as I mentioned
14 before, I use this cardiac defibrillator as a great
15 example of the use of a MOSFET switch. And then in
16 later courses, we introduce additional types of
17 devices, BJTs, and then we talk even in later
18 courses about gallium arsenide devices and we talk
19 about pHEMTs and HPTs, so we cover them all
20 eventually.
21 Q At what point in the education life-cycle do
22 you talk about biasing MOSFETs and how to bias those
23 to control the operation of a transistor switch?
24 A Well, I cover it very briefly in that
25 introductory class, just enough to kind of allow the

1 students to see maybe the challenge and, you know,
2 why it's important and to introduce some techniques.
3 And that's a sophomore course at Brown and at most
4 places. And then I also teach a junior course where
5 we get into great, great detail about the biasing
6 issues on MOSFETs or switches and amplifiers and
7 other, you know, circuits.
8 Q And so I heard you say when you were talking
9 about your sophomore course that you introduce it
10 and talk about the challenges of biasing and why
11 it's important to bias a MOSFET transistor. I'd
12 like to just break those down and briefly touch on
13 those.
14 Why is it important to bias a transistor at
15 the right point?
16 A Well, you know, a transistor is either on or
17 it's off. And whether it's on or it's off, you
18 know, depends on basically the bias voltage that
19 it's -- that you've applied to it. So that's kind
20 of, like, the most lowest level consideration.
21 And then the next level consideration might
22 be, well, you want to use it as an amplifier, then
23 it has to have a certain current flowing through it
24 and it has to have a certain voltage across it in
25 order to be in its highest gain region. So for like

1 a transistor amplifier, that's where that's
2 important.
3 So you know, the bias -- the DC bias will
4 usually have a big impact on the performance of the
5 device, you know, whether it works or doesn't work
6 at the simplest level. And then, you know, then
7 once it's working, how well does it work. And the
8 bias can affect that too. That's one of the things
9 that can affect the performance of a circuit.
10 Q And I should have asked this at the
11 beginning of this. How is a MOSFET biased?
12 A Well, a MOSFET has three terminals, a gate,
13 a drain, and a source. The relative values of those
14 voltages determine its bias, determine whether it's
15 on or off. And voltages, I mean DC voltages. So
16 these DC voltages determine whether the transistor
17 is on or off. They determine, you know, how much
18 gain it has if it's used as an amplifier. So you
19 bias it by applying appropriate voltages to those
20 three terminals.
21 Actually -- I'm sorry. Let me give you a
22 complete answer which is there's a fourth terminal
23 which is known as the bulk. And sometimes that is
24 explicitly -- not explicitly. Sometimes that's DC
25 biased as well in order to have, you know, other

1 changes in performance.
2 Q And if you could just help educate me a bit,
3 Dr. Larson. You keep saying DC voltages and DC
4 bias. What does DC stand for?
5 A Yes, DC stands for direct current. And
6 basically it's -- in electrical engineering, we make
7 a distinction between something that's unchanging,
8 which we call a DC bias, and the signal which we
9 might -- which is changing and has information on
10 it. And that signal, sometimes we call it AC;
11 Sometimes we just call it, you know, a signal. And
12 so DC is a voltage or current that is soon to be
13 unchanging for all time.
14 Q Got it. So AC stands for -- I think it's
15 short for alternating current and so it changes over
16 time. Did I get that right?
17 A Yes, alternating current changes over time.
18 Q And then DC doesn't change over time and
19 that's what distinguishes it from AC?
20 A Yes, yes. The assumption is that DC does
21 not change ever.
22 Q Okay.
23 A Of course that's an assumption that is
24 sometimes violated in the real world and it's not
25 always true, but it's a good starting assumption for

1 a design.
2 Q And so an AC signal, for example, could be
3 represented with something like a sinusoidal wave
4 that changes over time, right?
5 A Yes. An AC wave could be representative of
6 sinusoidal wave that goes up and down with time and
7 has a certain frequency.
8 Q And so in contrast, a DC signal, since it
9 doesn't change over time, would just be like a flat
10 voltage, let's say, like 2.5 volts?
11 A Yeah, the assumption would be that a DC
12 voltage does not change over time for initial
13 analysis of a circuit.
14 Q And then just a couple to help educate me
15 questions. You said that AC wave could go up and
16 down with time and have a certain frequency.
17 Frequency is just the, I guess, time it takes for
18 one period of the wave to complete, right? It's, I
19 guess, one cycle of a sinusoidal wave?
20 A The frequency of the wave is how many times
21 per second that cycle -- that signal repeats.
22 Q Okay.
23 A How many times per second.
24 Q And so I guess an AC signal with shorter
25 waves would be a higher frequency, right?

1 A What I would say is that a higher frequency
2 wave would have a shorter time between each
3 repeatable cycle.
4 Q And a DC signal has no frequency because
5 it's flat, it doesn't change with time as you said,
6 right?
7 A DC doesn't change with time. Sometimes
8 people might say DC is equivalent to 0 hertz and
9 sometimes you'll see that in the literature, but
10 it's essentially unchanging with time.
11 Q Okay. And so then you said when you're
12 biasing these MOSFET transistors, you want to bias
13 them with a DC bias signal, right?
14 A You have to bias them with DC, yes.
15 Q So that's just in contrast -- sorry, excuse
16 me. I didn't mean to interrupt you.
17 A I'm just sort of thinking because you're
18 kind of probing at this notion of DC. And like in
19 our introductory courses, we say that DC is like
20 unchanging with all time. But as you get to more
21 advanced courses, especially like in RF, sometimes
22 you'll say, well, that's like a DC and -- that
23 frequency is like a DC, so we don't have to consider
24 it. And like, so sometimes -- like in RF design,
25 sometimes you'll used the word "DC" to just refer to

1 a frequency that's like really, really low, like way
2 lower than a signal frequency. And so -- and like
3 so there's a little bit of kind of, you know -- it's
4 not like a -- it's not like black or white with DC.
5 Especially in the RF context, it can be a little bit
6 of a gray area, DC. And in an RF context, it would
7 just refer to something that's, like, at such a low
8 frequency it's way below the signal of interest.
9 And similarly, AC doesn't always have to
10 refer to, like, a sine wave. Sometimes like we
11 might say it's a square wave or a triangle wave.
12 It's just something that's moving but it doesn't
13 have to be a sine wave.
14 But once again, like those -- like if an RF
15 signal has a lot of distortion in it, it won't be
16 just a pure sine wave. It will have all these other
17 weird things in it, but we still kind of refer to it
18 as AC.
19 So I just wanted to clarify that there's --
20 especially in the RF world where there's so much --
21 so much different frequencies running around, that
22 these terms are a little more fluid than like what
23 we teach in an introductory class.
24 Q What about in the contrast of biasing any
25 transistor such as a MOSFET when you're referring to

1 DC bias there, that really is a constant bias,
2 right?
3 A Yeah, I mean, I think it's -- when you're
4 talking about like a DC bias of a transistor to
5 provide a certain, let's say, gate voltage for an
6 amplifier, that would be, like, pretty much of a
7 constant voltage. And once again, like in RF, it's
8 a little -- it's a little fluid, but that's for a
9 like an introductory level course which is what
10 we're talking about here. This is a good -- this is
11 a good rule.
12 Q And so, Mr. Kim, if we could turn back to
13 Exhibit 1005 in Huang at the beginning the cover
14 page, please.
15 So just to reorient us before we got off on
16 that side tangent, Huang is talking about here in
17 the abstract a system and method are provided for
18 biasing transistor switches in a semiconductor-based
19 high power switch, right?
20 A That's what it says, yes.
21 Q So I'd like to turn to Figures 3A and 3B for
22 Huang. So Mr. Kim, if you could please turn to
23 page 4, I believe.
24 Dr. Larson, are you with me? You see
25 Figures 3A and 3B?

1 A I do. Yes. Thank you. Yeah, I'm sorry.
2 My display's a little -- blinked there for a second,
3 but I see it now. Thank you.
4 Q Understood. And so starting I guess with
5 Figure 3A, Huang uses 3A as sort of a schematic
6 representation of the circuit in 3B, right?
7 MR. TYSON: Objection, scope.
8 A Well, I guess kind of -- I'm assuming sort
9 of what you mean here is that Figure 3A is very
10 similar to the stuff that's in figure -- I'm sorry.
11 Could you repeat your question, Mr. Perry? I'm very
12 sorry.
13 Q No problem.
14 A I was looking at the figure.
15 Q So Huang uses Figure 3A as sort of a
16 schematic or a symbolic representation of the
17 circuit elements in Figure 3B, right?
18 MR. TYSON: Object to the scope.
19 A Yeah, well, hold on one second here. Let me
20 just take a look. So, Mr. Perry, I guess what I
21 would say is that 3B -- 3B and 3A are the same. 3B
22 is like a more detailed drawing of what 3A is.
23 Q I agree with you, Dr. Larson.
24 A Thank you.
25 Q I think 3A is just a shorthand way of

1 writing Figure 3B so that, you know, these circuits
2 can be drawn on a single page and Figure 3B does not
3 have to be drawn out every time. Is that a fair
4 assumption, would you say?
5 A Yes. Yes. I think that's a fair
6 assumption. Yes, in other words, 3A and 3B are the
7 same. It's just easier to draw 3A.
8 Q Correct. So we're on the same page there.
9 Figure 3A does not show sort of what's
10 thought of as a traditional MOSFET, right?
11 A Excuse me. Figure 3A?
12 Q Correct.
13 A Well, I mean, I guess as we said before,
14 it's a kind of a -- I think you might have used the
15 word "shorthand" version for what's going on in 3B.
16 So Figure 3B shows the MOSFET. 3A is a shorthand
17 representation of that.
18 Q And Figure 3B does not show just one MOSFET.
19 It shows here in this case, I guess, four MOSFETs
20 and they're labeled here as 324 that are tied
21 together in series, right?
22 MR. TYSON: Object to the form.
23 A Yeah, those MOSFETs, that's kind of like a
24 circuit. There are four MOSFETs there that are
25 labeled 324.

1 Q And then Figure 3B shows a resistor and
2 they've just labeled them all it looks like as 328
3 connected to the gates of each of those MOSFETs,
4 right?
5 A Yes, those are connected to the gates, and
6 then they're connected to a common terminal labeled
7 321.
8 Q And so then on one side of the chain of
9 MOSFETs is what's labeled -- and this is the left
10 side -- the drain 323, right?
11 A The drain is labeled 323, yes.
12 Q And then on the right side is a source 325,
13 right?
14 A Right. The source is labeled 325.
15 Q And then in between the drain and the source
16 is what Huang calls an R bridge 326. Do you see
17 that?
18 A Yes, I see that R bridge.
19 Q And that bridge connects the drain and the
20 source of the series connected MOSFETs 324, right?
21 A Correct.
22 Q And Huang labels the node in between the two
23 resistors in that resistor bridge as the
24 source/drain bias 327, right?
25 A Correct.

1 Q And so as we already discussed, Huang is
2 directed to biasing high-power semiconductor
3 switches, right?
4 MR. TYSON: Object to the form.
5 A I guess the abstract says, "A system and
6 method are provided for biasing transistor switches
7 in a semiconductor-based high-power switch."
8 Q So I'll represent to you, you know,
9 unsurprisingly, if you search for "bias" within
10 Huang, it shows up over 350 times. Does that
11 surprise you?
12 A That does not surprise me.
13 Q And so the bias that Huang is referring to
14 is how to bias this combination of MOSFETs shown
15 here on Figure 3B, right?
16 A I'm sorry. Could you repeat the question?
17 Q Actually, let me ask a different question
18 first.
19 So this whole structure disclosed here in
20 Figure 3B, Huang refers to as -- I think it's a
21 multi-gate MOSFET, is that right?
22 A Let me check.
23 Q Let me direct you to paragraph -- sorry.
24 Let me direct you to paragraph 40, Dr. Larson.
25 A Sure.

1 Q So there in the middle of paragraph 40 it
2 states, "Utilizing a single or a series of connected
3 MOSFETs and/or multi-gate FETs."
4 Do you see that?
5 A Yes, I see that, yes.
6 Q And so is it your understanding that Huang's
7 using this series of connected MOSFETs and
8 multi-gate FETs or MuGFET term interchangeably?
9 A Yeah, I mean, they refer here to multi-gate
10 FETs and then they say parenthetically MuGFETs, so I
11 think those are the same.
12 Q Mr. Kim, if you could scroll down. And
13 then, Dr. Larson, if I could direct you to
14 paragraph 46. Paragraph 46 is describing figures 3A
15 and 3B. And it states in the first sentence,
16 "Referring now also to Figure 3A and Figure 3B, the
17 MuGFETs employed in the embodiments described here,
18 such as MuGFET 222 of Figure 2, will be described."
19 Do you see that?
20 A Yes.
21 Q And so then if we turn back to Figures 3A
22 and 3B, these figures are showing the multi-gate FET
23 or what Huang refers to as the MuGFET, correct?
24 A I'm sorry. Could you ask the question
25 again? I was just reading this paragraph.

1 Q No problem. So Figures 3A and 3B are
2 showing a multi-gate FET or what Huang refers to as
3 the MuGFET, correct?
4 A Yes, 3A and 3B show that MuGFET.
5 Q So then let's turn to Figure 2. So if we
6 could scroll up a page, Mr. Kim, and we might need
7 to rotate it. Thank you.
8 So it looks like Figure 2 here shows eight
9 of these various MuGFETs used in a SPDT switch,
10 right?
11 A Yes. Correct, that's a SPDT switch.
12 Q And it's Figure 2 that forms the basis for
13 your opinion regarding the challenged claims are
14 obvious in view of Huang, right?
15 MR. TYSON: Object to the form.
16 A Let me just review it very quickly. Right.
17 So like if you go to my declaration on page 71, yes,
18 I have a nice picture here from Exhibit 1005 and
19 it's Figure 2. So yes, I'm using Figure 2 for my
20 declaration.
21 Q And apologies, Dr. Larson. Is that page 71
22 of the 1456 declaration?
23 A Yes, that's page 71 of the 1456 declaration.
24 Q Okay. So Figure 2 here shows these MuGFETs
25 being used in the SPD switch of Huang, right?

1 A Yes, this is from Huang, Figure 2.
2 Q All right. And so looking at Figure 2 a
3 little bit closer, you see that the resistor bridge,
4 the node in between the resistors in any one of
5 those MuGFETs, for example MuGFET 222, has a
6 resistor bridge with a node. Do you see that?
7 A Yes, I do.
8 Q And then that is what is referred to in
9 Figure 3B as the source/drain bias node, right?
10 A Are you -- I'm sorry. Are you pointing to a
11 particular MuGFET within Figure 2?
12 Q So I'm just going to take one, for example.
13 We'll confirm that they're all configured in the
14 same way, but let's just do one as an example.
15 So let's look at the pair of MuGFETs on the
16 top left side of Figure 2. Are you with me,
17 Dr. Larson?
18 A And are those labeled 220?
19 Q Correct. They are labeled 220.
20 A Okay. Yes, I see those.
21 Q And so you see each of them -- so first off,
22 220 consists of two MuGFETs, correct?
23 A Correct. One is labeled 222.
24 Q And then each of those MuGFETs has a
25 resistor bridge across its drain and source

1 terminals, right?
2 A Yes, that's correct. Yeah, those are kind
3 of at the top there.
4 Q And then in between the resistor bridge is
5 what Huang refers to as the source/drain bias node
6 of the MuGFET, right?
7 A Yeah, let me just go back to Huang quickly.
8 Q No problem. If you go to Figure 3B, I
9 believe it's 327.
10 A Correct, yes. So yeah, so now returning to
11 Figure 2 of Huang, yeah, those -- that node -- thank
12 you. That node -- anyway, it's at the top left
13 there where the two source drains come together is
14 what Huang has labeled source/drain bias.
15 Q And so the source/drain bias for each of
16 these MuGFETs are tied together in an unlabeled
17 node, right?
18 A That's right. They're tied together and the
19 node is not labeled.
20 Q And then if we follow the trace for that
21 node all the way around to the right, it looks like
22 eventually it goes and it is connected to CRx1,
23 which is called out as 274. Do you see that?
24 A Uh-huh, I do.
25 Q And so if we go to the specification, 274 in

1 paragraph 54, near the bottom is described as a
2 secondary bias output 274 of the receive bias
3 controller 270. And I'll pause for a minute for you
4 to read that.
5 A So I'm sorry. You're in paragraph 54, is
6 that correct? I'm sorry.
7 Q Correct. Paragraph 54.
8 A So let me read the whole paragraph. Thank
9 you for expanding it. Okay. I'm sorry. I read
10 paragraph 54 now and I'm sorry, what was your
11 question?
12 Q Yeah. So at the bottom of paragraph 54 --
13 and I'll read the sentence into the record. It
14 states, "A primary bias output 272 of the receive
15 bias controller 270 is coupled to the gate of the
16 second series FET group switch 230 and is also
17 coupled to the gate of the first shunt FET group
18 switch 240, while a secondary bias output 274 of the
19 receive bias controller 270 is coupled to the
20 source/drain bias connection of the first series FET
21 group switch 220 and is also coupled to the source
22 drain bias of the second shunt FET group switch
23 250."
24 Did I read that correct?
25 A You did, yes.

1 Q So then if we turn back to Figure 2, what
2 paragraph 54 is describing is that the bias
3 controller 270 is connected to the source/drain bias
4 of the MuGFET group and is used to bias that MuGFET
5 group, correct?
6 A Well, controller 270 actually supplies bias
7 to two MuGFET groups, one labeled 220, the other
8 labeled 250.
9 Q Correct. So --
10 A And I think I'm just repeating what the
11 sentence that you read said.
12 Q So the controller 270 biases MuGFET
13 group 250 and it biases MuGFET group 220, right?
14 A Correct.
15 Q And then in the middle of the page, bias
16 controller 260 biases MuGFET group 230 and MuGFET
17 group 240, right?
18 A Controller 260 biases MuGFET group 230 and
19 240, I believe that's correct.
20 Q And we know this based on the description of
21 these signals in paragraph 4 and the fact that Huang
22 calls these terminals of the MuGFET the source/drain
23 bias terminal, right?
24 MR. TYSON: Object to the form.
25 A Well, I mean, Huang calls each of those

1 little center connections the source/drain terminal,
2 I believe. Once again, let me just check. Yeah,
3 source/drain bias is what Huang calls them.
4 Q And the focus of Huang is how to
5 individually bias each of these MuGFET groups to
6 improve the performance of the SPDT switch, right?
7 MR. TYSON: Object to the form.
8 A Well, I mean, Huang certainly talks an awful
9 lot about that. I think generally, you know, the
10 purpose of Huang is to, you know, basically build a
11 better switch. But certainly a lot of -- a lot of
12 design goes into the bias of these switches in this
13 patent.
14 Q Are you familiar with how a patent is
15 generally structured?
16 A Kind of a vague question. I'm not sure what
17 you mean by that.
18 Q So let me break it down. So are you aware
19 that a patent generally has a title, an abstract,
20 some sort of description of the technology or
21 background, brief description of the invention, a
22 detailed description and then finally, the claims?
23 A Yes, I'm familiar with that.
24 Q And you've reviewed dozens of patents in
25 your work as an expert, right?

1 A Yes. And I also have quite a few patents
2 myself.
3 Q And so are you aware that a patent generally
4 will have some sort of background of the invention
5 section that describes the problems the inventor
6 recognized at the time?
7 A Yes, I think that's maybe kind of like in a
8 specification section. Is that a fair
9 characterization? I'm just trying to map my
10 understanding into what you're telling me. So...
11 Q And a patent specification also might have
12 some sort of summary of the invention section at the
13 beginning that describes how the inventor solved the
14 problems that it recognized in the prior art, right?
15 A Correct. Yes, I'm aware of that.
16 Q Okay. So you reviewed U.S. Patent
17 Publication Number 2004/0251952 to -- I cannot
18 pronounce it -- Nakatsukka, right? And to help you,
19 let me direct you to page 121 of the 1563
20 declaration. And Mr. Kim, if you could bring that
21 up, the material cited.
22 (Document marked previously as
23 Exhibit 1013 was presented.)
24 A Sorry, this is in the material cited?
25 Q Correct.

1 A Do you have an exhibit number that this
2 would correspond to?
3 Q Yeah. So this will correspond to
4 Exhibit 1013.
5 A Okay. Thank you. Nakatsuka. I have here
6 in front of me.
7 Q Do you recall reviewing this reference?
8 A Yes, I do.
9 Q And so I'd like to turn to this reference.
10 And, Mr. Kim, if you could turn to paragraph 17 of
11 Exhibit 1013.
12 To help orient you, Dr. Larson, paragraph 14
13 is in the Background of the Invention section of
14 Nakatsuka, right?
15 A Yes. Paragraph 14?
16 Q Correct.
17 A Okay, yes. Yes, that's -- I see it.
18 Q I'm sorry. We're going to actually turn to
19 paragraph 17.
20 So paragraph 17 is in the Background of the
21 Invention section of Nakatsuka, right?
22 A Yes, this is in the background section.
23 Q And if you look in the Background of the
24 Invention section, there's -- paragraph 1 says,
25 "Field of the invention," right?

1 A I see that.
2 Q And paragraph 3 says "Prior Art." Right?
3 A Uh-huh, I see that.
4 Q And so now let's turn now to paragraph 17.
5 And here, in paragraph 17, Nakatsuka starts with "As
6 described above in the prior art." So here
7 paragraph 17 is talking about the prior art, right?
8 A They're mentioning the prior art here, yes.
9 Q I'll direct you to the end of paragraph 17
10 which states, "There is a problem of resulting in
11 the increase of current consumption." Right?
12 A I see that.
13 Q And so one of the problems that Nakatsuka is
14 trying to solve is the problem of increased current
15 consumption, right?
16 A That's what it says here.
17 MR. TYSON: Object to the scope.
18 A It says here, "There is a problem resulting
19 in the increase of current consumption."
20 Q And so, Dr. Larson, if you could now turn to
21 the next paragraph, paragraph 18, Nakatsuka says
22 that to avoid these problems, a Japanese prior art
23 reference, here I think it says Japanese Laid-Open
24 Patent Application 2002-232278, has proposed a
25 method wherein a capacitor is inserted between the

1 high-frequency signal input/output terminal and the
2 switch circuit section so that they are separated
3 with respect to DC. Right?
4 A I see that, yes.
5 Q Then if you could turn to the next page and
6 in particular, paragraph 21.
7 A Let me read to the end of paragraph 18,
8 please, and then I'll turn to 21. I want to go back
9 and just look at paragraph 17 a second as well.
10 Okay. I'm sorry. I just wanted to review some of
11 the earlier paragraphs. You asked me to go to
12 paragraph 21, I think?
13 Q Correct. We're now at paragraph 21.
14 A Okay, so I'm there.
15 Q And the setup for paragraph 21 is that it's
16 talking about the present invention of Nakatsuka,
17 right?
18 A Yes, I believe that's correct. Yes, this
19 invention.
20 Q And the next sentence states, "In a series
21 circuit of a plurality of field-effect transistors,
22 one ends of resistor elements are respectively
23 connected individually to the connection points
24 (source/drain) of the field-effect transistors and a
25 predetermined voltage is applied to the other ends

1 of the resistor elements." Right?
2 A That's what it says.
3 Q And Nakatsuka goes on to say that with this
4 configuration, the device can handle power larger
5 than that of the prior art. Furthermore, the
6 current consumption can be reduced. Right?
7 A Yes, I see that.
8 Q And then I'd also like you now to turn to
9 paragraph 24 of the Nakatsuka. And this is still
10 talking about the present invention when
11 paragraph 24 states, "With this configuration, the
12 potentials at the intermediate connection points of
13 the plurality of field-effect transistors can be
14 prevented from lowering. As a result, the power
15 that can be handled can be increased in comparison
16 with that of the prior art and the current
17 consumption can be reduced in comparison with that
18 of the prior art."
19 Is that what paragraph 24 says?
20 A That's what paragraph 24 says, yes.
21 Q So then is it fair to say that Nakatsuka is
22 about the voltage potentials at the connection
23 points between the FETs in series?
24 MR. TYSON: Object to the scope and form.
25 A Is about. So you said is Nakatsuka about.

1 Nakatsuka -- I mean, I don't think I'd put it the
2 way quite you put it. Nakatsuka's about increasing
3 the power handling capability of a FET switch. And
4 so you know, they -- and you know, yeah, they add a
5 bunch of resistors around the biasing of the device
6 to improve the power handling performance. But I
7 guess I'm not sure that I would say that it's about
8 biasing. I would say it's about making the switch
9 perform at a higher power level.
10 Q Well, if you look at the first sentence of
11 paragraph 24, you know, Nakatsuka does say that with
12 this configuration, the potential is that the
13 immediate connection points of the plurality of
14 field-effect transistors can be prevented from
15 lowering, right?
16 A I'm sorry. What paragraph were you
17 referring to?
18 Q This is the paragraph we just read,
19 paragraph 24.
20 A 25 -- 24, sorry. I mean, yeah, that's what
21 it says, the potentials at the intermediate
22 connection points of the plurality of field-effect
23 transistors can be prevented from lowering. Yes,
24 that is what it says. But you know, I might point
25 out, you know, like if you go to paragraph 19, it

1 says that the object of the present invention is to
2 provide a high-frequency switching device and a
3 semiconductor device capable of handling power
4 larger than that of the prior art. So I kind of see
5 that as the point of the invention, purpose of the
6 invention.
7 Q So the alleged benefit of the invention in
8 Nakatsuka is providing lower current consumption or
9 power consumption compared to the prior art, right?
10 MR. TYSON: Object to the scope and form.
11 A They mention that as one of the benefits of
12 one of the -- yeah. You know, they mention the
13 prior art has an increase in the current
14 consumption.
15 Q And so to achieve that benefit, one of the
16 ways Nakatsuka discloses as doing that is to prevent
17 the potentials at the intermediate connection points
18 of the plurality of field-effect transistors from
19 lowering, right?
20 MR. TYSON: Object to the scope and form.
21 A I think that that's what they say maybe in
22 paragraph -- yeah, in paragraph 24 that's what it
23 says. "With this configuration, the potentials at
24 the intermediate connection points of the plurality
25 of field-effect transistors can be prevented from

1 lowering." And that is shown in various, you know,
2 figures in the patent. Yeah.
3 Q And is potential in this context another
4 word for voltage?
5 A Yes. I believe in this case they're --
6 voltage and potential are equivalents.
7 Q And so here, Nakatsuka is talking about
8 preventing the voltage between -- at the connection
9 points between the nodes from lowering, right?
10 MR. TYSON: Object to the scope and form.
11 A Well, I'll just read to you what 24 says,
12 you know. "With this configuration, the potentials
13 at the intermediate connection points of the
14 plurality of field-effect transistors can be
15 prevented from lowering. As a result, the power
16 that can be handled can be increased."
17 Q And Nakatsuka's referring to a DC voltage
18 here, right?
19 MR. TYSON: Object to the scope and form.
20 A Well, it's a little -- it's a little
21 complicated. The DC voltage will be -- will be --
22 let's see here. The DC voltage will be prevented
23 from lowering in this case with this particular
24 configuration. Now, you know, this configuration's
25 not the same as in Huang, these resistors. So it's

1 a little bit different. But -- it's somewhat
2 different, but the same kind of effect is occurring.
3 Q Okay. And I understand Huang is different,
4 but my question here Nakatsuka, which is here,
5 Nakatsuka is preventing the DC voltage from
6 lowering, right?
7 MR. TYSON: Object to the scope.
8 A Yeah, I believe one effect of these
9 resistors would be to affect the lowering of the DC
10 voltage in this configuration with these FETs.
11 Q And so then is it fair to say that Nakatsuka
12 is about the DC aspects of the switch device?
13 MR. TYSON: Object to the scope and form.
14 A No, I don't think it would actually because
15 the -- well, this -- I don't think that's correct.
16 And the reason that I say that is that with RF
17 devices in particular, you know, the RF signal
18 affects the DC bias and vice-versa, the DC bias can
19 affect the RF. So Nakatsuka has this resistor
20 network that they've added to, you know -- it
21 affects the DC and the RF simultaneously and it kind
22 of says that, right. It says that there's more
23 power handling capability and lower DC consumption.
24 So there's both an RF and a DC effect.
25 Q Okay. Could we, Dr. Larson, turn back to

1 paragraph 18?
2 A Yes.
3 Q And paragraph 18, if you recall, is talking
4 about a Japanese prior art that had proposed a
5 method of inserting a capacitor between the
6 high-frequency signal input/output terminal appear a
7 switch circuit section. Do you see that?
8 A I see that, yes.
9 Q And then paragraph 18 ends with "If a
10 capacitor formed in a semiconductor process is
11 directly connected to the high-frequency signal
12 input/output terminal, there are problems of
13 significantly degrading ESD withstand voltage" and
14 then in parentheses, "(electrostatic discharge
15 withstand voltage) and increasing the area of a
16 semiconductor chip incorporating the capacitor."
17 Do you see that?
18 A Yes, I do.
19 Q And so Nakatsuka is stating that there is a
20 problem with having a capacitor connected directly
21 between an antenna and a switch for RF signals,
22 right?
23 MR. TYSON: Objection to the scope and form.
24 A Well, Nakatsuka, yes, is mentioning the
25 potential problem of a capacitor formed, you know,

1 because of this ESD issue. Although, I have to say
2 that baffles me because there's a very easy and
3 well-understood fix which I think is actually --
4 Huang actually mentions it, but it's utterly
5 well-known and trivial. So I don't understand that
6 statement. It's, in my opinion, not a significant
7 problem.
8 Q Nevertheless, Nakatsuka does state that it
9 is a problem, correct?
10 MR. TYSON: Objection to the scope.
11 A Nakatsuka says there are problems of
12 significantly degrading ESD withstand voltage. I
13 don't necessarily agree with it, but that's what it
14 says.
15 Q Another problem that Nakatsuka recognizes is
16 that adding the capacitor will increase the area of
17 the semiconductor chip incorporating the capacitor,
18 right?
19 MR. TYSON: Object to the scope and form.
20 A So in the last -- yeah, the last few words
21 of that paragraph 18 it says, "increasing the area
22 of a semiconductor chip incorporating the
23 capacitor." So yeah, it says that too. Once again,
24 this patent is from 2004, and I don't think it's
25 referring to MOSFETs. I think it's referring to,

1 say, a PMFET. And so that's -- it's true that it
2 does say that. But once again, you know, I'm not
3 sure that I agree with it in the context of like a
4 MOSFET switch. I'm just not sure I would agree with
5 that statement, I mean, if a MOSFET switch were
6 being considered, for example.
7 Q Okay. Let's go ahead, Mr. Kim, and turn
8 back to Huang.
9 And, Mr. Larson, we can go back to that
10 which is Exhibit 1005. And if we could please go to
11 paragraph 4. So do you see here in paragraph 4, and
12 we're I believe in the Background of the Invention
13 section of Huang, it starts out by saying, "An
14 example of such a prior art approach, explained in
15 Nakatsuka, et al., U.S. Patent Number 7,199,635, is
16 presented in Figure 1A."
17 Do you see that?
18 A Yes.
19 Q And I'll represent to you that U.S. Patent
20 Number 7,199,635 to Nakatsuka is the issued patent
21 for the Nakatsuka reference which is Exhibit 1013
22 that we just reviewed. Okay?
23 A Okay. That's fine with me. I believe you.
24 Q So here in the background, Huang's talking
25 about Nakatsuka. And if we turn to paragraph 9,

1 Huang states that an example of a second prior art
2 approach according to Nakatsuka, et al., is depicted
3 in Figure 1B, right?
4 A So let's see here now. So Figure 1B must
5 correspond to something in Nakatsuka. And it's
6 redrawn, so that's why I'm a little hesitant. Could
7 you point me somewhere in Nakatsuka where that
8 figure occurs? And I'm not disagreeing with you. I
9 just want to make sure that we're consistent.
10 Q Let's make sure we're on the same page.
11 Mr. Kim, is it possible to bring up Huang Figure 1B
12 next to Nakatsuka Figure 2?
13 And I'll direct you to those two figures,
14 Dr. Larson.
15 A Sorry. Okay. Let's take a look.
16 Q All right. Dr. Larson, do you now see on
17 the screen Figure 1B of Huang, which is described as
18 prior art, next to Figure 2 of Nakatsuka?
19 A I do. And they look -- I don't see any
20 differences. Of course they're labeled differently,
21 but the -- yeah, very good. The -- I think the
22 resistors are all the same. So now which -- in
23 Nakatsuka, which figure is that?
24 Q This is Figure 2 of Nakatsuka.
25 A Okay.

1 Q And so you would agree that the circuits are
2 the same?
3 A Oh, I see it. I'm sorry. I missed it.
4 Q But the labels and callouts differ?
5 A Yes, I would agree. Yes, the circuit
6 elements, resistors, capacitors, yes, are the same.
7 Q It might be easiest if we leave these
8 figures up on the screen and you turn to your paper
9 copy of Huang. But going back to paragraph 9 now of
10 Huang, that starts with "An example of a second
11 prior art approach according to Nakatsuka, et al.,
12 is depicted in Figure 1B."
13 A I see that, yes.
14 Q And so if we continue in on paragraph 9,
15 Huang states, "At a junction between the first
16 input/output terminal 152 and the first FET group
17 switch 160 is a connection coupled through a third
18 FET group switch 180 and a blocking capacitor 182 to
19 ground."
20 Do you see that?
21 A Okay. So you started that halfway down
22 paragraph 9 or a third of the way?
23 Q Correct.
24 A I'm sorry. Let me just reread it. Junction
25 between the first input/output terminal 152 and the

first FET group switch 160 is a connection coupled through a third FET group switch 180 and a blocking capacitor 182 to ground 184. So I think you stopped there, is that correct?

Q That's correct, yes.

A Okay, so yes, I see that. And I see it on the drawing as well.

Q So then turning to Figure 1B, capacitor 182 is the capacitor on the left side in between the FET group switch 180 and ground 184, right?

A Yes, and it's labeled 182, yes. Yes, that -- yes, that is this capacitor.

Q And in Figure 1B, 151 corresponds to the antenna, right?

A Yes, it's in the middle there, 151. That's the antenna.

Q And nodes 152 and 153, if you look at paragraph 9 of Huang, are referred to as -- so 152 is referred to as the first input/output terminal and 153 is referred to as the second input/output terminal. Do you see that?

A Yes, I do.

Q And so 152 could be thought of as the transmit or receive node, right?

A In a TR switch connected to an antenna, yes,

1 that would be referred to as a transmit or receive
2 node.
3 Q And then 153 in a TR switch would be the
4 opposite of whatever 152 is, right?
5 A That's correct. It would be either a
6 receive or a transmit.
7 Q And so looking now at the switch group 180
8 and capacitor 182, those switches and that capacitor
9 are not on the signal path between the antenna and
10 either of the transmit or receive nodes, right?
11 MR. TYSON: Objection.
12 A I'm sorry. Could you repeat that question?
13 Q So looking at the group of switches we've
14 been discussing on the bottom left, I think it's 180
15 and capacitor 182, that group of switches and
16 capacitor 182 are not on either of the signal paths
17 between the antenna node and either of the
18 input/output terminal nodes, right?
19 A Well, I guess I don't quite understand your
20 question. I mean, 180 is connected directly to 152,
21 I think, which is an input/output node. And so
22 let's say that there's a power amplifier, you know,
23 there. It's certainly connected to the signal path
24 if there's -- if there's a power amplifier there.
25 And if there's a receiver there, it's certainly

1 connected to the receive signal path. So it is
2 connected in parallel through the shunt.
3 Q And sorry. Just to clarify, you said it's
4 connected in parallel to the signal path, right?
5 A I think I said shunt. But it's connected to
6 the signal path through the shunt connection. And
7 you know, let me just re-clarify. You know, node
8 152 is an input or an output and it's -- that's a
9 signal path and 180 is in that signal path through a
10 shunt connection through capacitor 182 to ground
11 184.
12 Q And then there's an identical circuit on the
13 right side of Figure 1B with a FET group switch 190
14 and a capacitor 192, right?
15 A Yes, I see that as well on the right-hand
16 side.
17 Q And if you compare claim Figure 1B with
18 Nakatsuka Figure 2, capacitor 182 in Huang
19 corresponds to capacitor 301 in Nakatsuka, right?
20 A Yes, I think they're positioned in the same
21 place.
22 Q And then similarly, capacitor 192 in Huang
23 corresponds to capacitor 302 in Nakatsuka, right?
24 A Yes, they're in the same place.
25 Q And since --

1 MR. PERRY: Do you want to take a break?
2 MR. TYSON: We're a little over one hour,
3 ten, so when you get to a natural stopping point.
4 MR. PERRY: We could take one now. We're
5 going to be talking about Huang for a while, I
6 think.
7 (Short recess.)
8 BY MR. PERRY:
9 Q Ready, Dr. Larson?
10 A I'm ready.
11 Q All right. Mr. Kim, if you could bring back
12 up Huang Figure 1B and Nakatsuka Figure 2, please.
13 And before I ask questions about this, I just want
14 to confirm, Dr. Larson, did you discuss your
15 testimony with counsel at all during the break
16 today?
17 A No, not at all.
18 Q All right. So where we left off is we had
19 just established that capacitor 182 in Huang
20 corresponds to capacitor 301 in Nakatsuka, right?
21 A Right. I guess --
22 MR. TYSON: Object.
23 A Right. I think these are both describing
24 the same drawing from Nakatsuka.
25 Q And then similarly, capacitor 192 in Huang

1 corresponds to capacitor 302 in Nakatsuka, right?
2 A These appear to be the same, yes.
3 Q And so then looking at Figure 1B of Huang,
4 you would agree that 180, that transistor group
5 there, forms a shunt arm or a shunt switch, right?
6 MR. TYSON: Object to the form.
7 A Yeah, I would say 180 is a shunt with a
8 single path that is like -- like labeled 152. So
9 that's -- part 180 is part of a shunt arm.
10 Q And you would agree that capacitor 182 is
11 placed between shunt arm 180 and ground, right?
12 MR. TYSON: Object to the form.
13 A Well, it's placed in series with that -- I
14 guess Huang called it a MuGFET. And so it's -- 182
15 is between that multi-gate FET labeled 180 and
16 ground.
17 Q And then you would also agree that the
18 transistor block 190 on the right side is also part
19 of a shunt arm, right?
20 A Yeah, 190 is part of a shunt arm, a shunt to
21 ground. And 153 is the signal node.
22 Q And then you would also agree that capacitor
23 192 is connected in series between that transistor
24 block 190 and ground, right?
25 A It's connected in between 190 and ground.

1 Capacitor 192 is connected in between 190 and
2 ground.
3 Q So in Figure 1B of Huang, capacitors 182 and
4 192 are placed between the shunt switch and ground,
5 right?
6 A Yeah, they're between the -- those
7 multi-gate FETs which are in shunt and ground.
8 Q So then if we could turn just to Huang
9 Figure 2. And so --
10 A Do you want to bring that up on the screen?
11 Q Bring that up on the screen. We're now
12 showing Huang Figure 2, right, Dr. Larson?
13 A Yes, correct.
14 Q And if you look at Huang Figure 2, on the
15 top right is a pair of MuGFETs labeled 240. Do you
16 see that?
17 A Yes, I see that 240, a pair of MuGFETs.
18 Q And 240 is part of the shunt arm in Figure 2
19 of Huang, right?
20 A It's part of a shunt arm in Figure 2 of
21 Huang.
22 Q Which leads me to my next question which is
23 250, which is another MuGFET pair, is part of
24 another shunt arm in Figure 2 of Huang, right?
25 A Yes, 250 is another shunt arm -- part of

1 another shunt arm in Figure 2 of Huang.
2 Q And in between MuGFET pair 240 and ground
3 281 is a capacitor 214 connected in series, right?
4 A 214 is connected in series between 240 and
5 ground labeled 281.
6 Q And then similarly, capacitor 218 is
7 connected in series between 250 and ground which
8 here is labeled 282, right?
9 A 218 is in series between 250 and 282.
10 Q And is it fair to say that capacitors 214
11 and 218 of Figure 2 are connected in the same way as
12 capacitors 182 and 192 of Figure 1B?
13 A Well, they're both connected in series with
14 multi-gate FETs and they're both connected in
15 between those multi-gate FETs and ground, if that's
16 what you mean. And that's the same as in Figure 1B.
17 Q So in Figure 1B, capacitor 182 is connected
18 between a switch block and ground, right?
19 A 182 is connected in between switch block 180
20 and ground, yeah.
21 Q And in Figure 1B, capacitor 192 is connected
22 between a different switch block and ground, right?
23 A Capacitor 192 is connected in between
24 switches labeled 190 and ground.
25 Q And then turning to Figure 2, capacitor 214

1 is connected between switches labeled 240 and
2 ground, right?
3 A 214 is connected in between 240 and ground.
4 Mr. Perry, did we lose you?
5 Q Oh, I'm still here. We might have lost you,
6 Mr. Larson.
7 A I'm here still. Did I answer your question?
8 Perhaps you didn't hear my answer or I didn't answer
9 your question. I apologize.
10 Q Sorry. I did not hear your answer. It
11 might have cut out on my end.
12 A Could you please repeat your question?
13 Q So turning to Figure 2, capacitor 214 is
14 connected between switches labeled 240 and ground,
15 right?
16 A 214 is connected between 240 and ground
17 labeled 281.
18 Q And then lastly, capacitor 218 is connected
19 between switches 250 and ground 282, right?
20 A 218 is connected between 250 and 282 ground.
21 Q And so is it fair to say that the
22 configuration of Huang for this particular aspect of
23 the SPDT switch is the same as the configuration in
24 Nakatsuka?
25 MR. TYSON: Object to the form.

1 A Well, I think I would say that they both
2 show shunt arms connected to the transmit or receive
3 node with a capacitor in between the FET switches
4 that are part of those shunt arms and ground. In
5 that sense, they're similar.
6 Q And then is it also fair to say, looking at
7 Figure 2, that Huang added capacitors -- and I'll
8 walk through these -- 211, which is between the
9 antenna node and switch block 220? Let's start with
10 that one. So actually, strike that.
11 Is it fair to say, looking at Figure 2, that
12 Huang added capacitor 211 which is between the
13 antenna node and switch block 220?
14 MR. TYSON: Object to the form.
15 A Capacitor 211 does not appear in -- or its
16 equivalent does not appear in Figure 1B in that
17 location.
18 Q And then similarly, is it fair to say that
19 capacitor 215, which is between the antenna node and
20 switch block 230, was not in Nakatsuka?
21 A Capacitor 215 does not appear in Nakatsuka
22 in that location.
23 Q And then turning to the middle of Figure 2,
24 there are two capacitors, 212 and 213. Is it fair
25 to say that Huang added capacitors 212 and 213 to

1 Nakatsuka?
2 MR. TYSON: Object to the form.
3 A Well, capacitors, or the equivalent of
4 capacitors 212 and 213, does not appear in
5 Nakatsuka.
6 Q And then finally, capacitors 216 and 217 at
7 the bottom of Figure 2 of Huang, is it fair to say
8 that Huang added capacitors 216 and 217 to
9 Nakatsuka?
10 MR. TYSON: Object to the form.
11 A Capacitors 216 and 217 don't appear in
12 Nakatsuka in those locations.
13 Q Huang calls all of capacitors 211, 212, 213,
14 214, 215, 216, 217, and 218 blocking capacitors,
15 right?
16 A Could you point out to me in the -- in Huang
17 where he uses that language?
18 Q Sure. Mr. Kim, could you please pull up
19 paragraph 45 of Huang? I will direct you to this
20 paragraph, Dr. Larson, where Huang states, "The
21 antenna 201 is coupled to a blocking capacitor 211."
22 And then the next line states "blocking capacitor
23 212." You can keep tracing through this paragraph,
24 but all of capacitors 211 through 218 are called
25 blocking capacitors, right?

1 A Yes, I see that. Thank you.
2 Q And capacitors 214 and 218 are the
3 capacitors that came from Nakatsuka, right?
4 MR. TYSON: Object to the form.
5 A Well, 214 and 218 were in the same location
6 as capacitors 182 and 192 from Nakatsuka which is in
7 Figure 1B.
8 Q And Huang labels capacitors 214 and 218 as
9 blocking capacitors, right?
10 A Let's see. Yes, that's correct. Both are
11 labeled as blocking capacitors.
12 Q I think you mentioned this when you were
13 going over your list of materials cited, but some of
14 the materials you considered were the prosecution
15 history of the '579 patent, right?
16 A That's correct, yes.
17 Q And you reviewed the prosecution history of
18 the '579 patent in full, right?
19 A Yes, I reviewed it in full. I'm not an
20 attorney, so some of the -- some of the legal jargon
21 I didn't quite understand, but I have reviewed it in
22 full.
23 Q And you've reviewed the communications from
24 the Patent Office to the applicant, right? Those
25 are commonly referred to as Office Actions or

1 rejections?
2 A Yes, I have -- I've reviewed those too,
3 yeah.
4 Q And you reviewed the applicant's responses
5 to those Office Actions, right?
6 A Yes, I've reviewed them as well.
7 Q Did you review the references cited in the
8 Office Actions?
9 A Let's see. I think I -- could you point me
10 to -- to those references in the Office Actions?
11 And I know what you're talking about, but I'm not
12 sure that I could find them in the correspondence.
13 And if you could help me find that, I could I think
14 answer.
15 Q Yeah. Mr. Kim, could you pull up
16 paragraph 44 of the declaration in the 1453 IPR?
17 Here, Dr. Larson, you state, "All
18 independent claims were rejected as obvious in view"
19 -- and then you list a couple of --
20 A Oh, thank you, yes.
21 Q -- prior art references.
22 A Yes. So Granger-Jones I have reviewed. And
23 let me check Yasuda as well. Yes, I've reviewed
24 both Yasuda and Granger-Jones.
25 Q And Granger-Jones is Exhibit 1026 in the

1453 IPR, right?
MR. TYSON: Object to the form.
A Yeah, it's Exhibit 26. That's correct, yes. I'm sorry. I'm just looking through my books here. Yes, correct.
MR. PERRY: So, Mr. Kim, if we could please pull up Exhibit 1026.
(Document marked previously as Exhibit 1026 was presented.)
BY MR. PERRY:
Q And, Dr. Larson, we're showing you here now the cover page of Exhibit 1026. Do you recognize it as the Granger-Jones reference?
A Yes, I do.
Q And then, Mr. Kim, if we could please turn to paragraph 33, please. So paragraph 33 starts with the sentence, "The stacked FET switch 30 may include a DC blocking device, such as first capacitor 58."
Is that correct?
A Yes, that's correct.
Q And then if you go a couple sentences down, Granger-Jones states, "A DC blocking device, such as a second capacitor 60, is coupled between the bottom of resistor Rds1 and a grounded terminal, right?

1 A Correct, a grounded Terminal 61.
2 Q And then Granger-Jones states, "The first
3 capacitor 58 and the second capacitor 60 may hold
4 the bias applied by the control circuit 48 so that
5 the source contacts, S, and drain contacts, D, of
6 the first FET device (Q1) and the middle FET devices
7 Q2 through Q4 are biassed appropriately." Correct?
8 MR. TYSON: Object to the form.
9 A Yes, I see that sentence.
10 Q Granger-Jones then says, "The second
11 capacitor 60 also operates to block the bias applied
12 by the control circuit 48 and in this manner, the
13 source contact, S, of the fifth FET device Q5
14 experiences no or very little biasing of the control
15 circuit 48." Right?
16 A Yes, that's what it says.
17 Q And so Granger-Jones is talking about
18 blocking DC signals with capacitors 58 and 60,
19 right?
20 MR. TYSON: Object to the form.
21 A Yeah, I'm sorry. You know, Granger-Jones
22 refers to this capacitor as a DC blocking device.
23 That's not all it's doing, but it's certainly doing
24 that.
25 Q That's the only function that Granger-Jones

1 identifies that capacitors 58 and 60 are performing,
2 right?
3 MR. TYSON: Object to the form.
4 A Well, I'm not sure -- I'm not sure I quite
5 understand your question. I mean, Granger-Jones is
6 just labeling these a DC blocking device. That
7 doesn't mean it doesn't do other things, but it
8 certainly does that.
9 Q Right. But here looking at paragraph 33,
10 Granger-Jones is not describing that this capacitor
11 is doing any other things, right?
12 A Yeah, there's nothing -- although other
13 things could be done, there's nothing else described
14 here.
15 Q Granger-Jones only describes capacitors 58
16 and 60 as DC blocking capacitors, right?
17 MR. TYSON: Object to the form.
18 A The words that they use there are DC
19 blocking devices.
20 Q And so then if we turn to paragraph 40,
21 please. At the top here of paragraph 40,
22 Granger-Jones refers to each capacitors 58 and 60.
23 Do you see that?
24 A Oh, I do see that, yes. "As discussed
25 above, the first capacitor 58 and second capacitor

1 60 are configured to block the bias controlled by
2 the control circuit."
3 Q And here Granger-Jones is referring to
4 blocking the DC bias of the control circuit, right?
5 A That's correct. I think the wording that
6 they use here is, you know, the capacitor is
7 configured to block the bias applied by the control
8 circuit which is what all capacitors do.
9 Q And then if you could turn to paragraph 49,
10 please. About halfway through paragraph 49,
11 Granger-Jones continues to discuss capacitors 58 and
12 60 stating, "The first capacitor 58 and second
13 capacitor 60 operate as DC blocks." Correct?
14 A It does. Although, you know, the end of
15 that sentence says "and may help evenly distribute
16 the time-variant input signal 42." So that's kind
17 of a good example of some of the other things the
18 capacitors are doing in this case.
19 Q And then finally, if you could turn to
20 paragraph 63, which I think is on the next page.
21 Paragraph 63 unfortunately is very long, but about
22 12 lines or so down is a sentence that starts with
23 "The stacked FET switch 30 in Figure 2 already has
24 the first capacitor 58 coupled in series between the
25 input terminal 40 and the first end 38 to help

1 distribute the time-variant input signal 42 more
2 evenly across the FET device stack 38 [sic]."
3 Did I read that correctly?
4 A You did read it correctly. I'm sorry, I'm
5 reviewing Figure 2 here just to -- I see. So that's
6 -- 58 is at the top. Okay. I see that sentence,
7 yes, "The stacked FET switch 30 in Figure 2 already
8 has the first capacitor 58 coupled in series between
9 the input terminal 40 and the first end 38 to help
10 distribute the time-variant input signal 42 more
11 evenly across the FET device stack 34." I see that.
12 Q And you agree that's what Granger-Jones
13 says?
14 A Yes, this is from Granger-Jones.
15 Q I'd like to turn back to Huang and look at
16 the abstract again. So if, Mr. Kim, you could bring
17 up Exhibit 1005 on page 1.
18 And we've looked at this before, Dr. Larson,
19 but to refresh your recollection, the abstract
20 states that off-state VGSD biasing for the off
21 transistor switches is based upon acceptable levels
22 of spurious harmonic levels in linearity, correct?
23 A That's what it says, yes.
24 Q And VGSD in this context stands for the gate
25 source/drain voltage, right?

1 A Yes, VGSD means the -- between the gate and
2 the source/drain.
3 Q And so the system and method provided in
4 Huang are for biasing transistor switches, right?
5 A Huang certainly talks about biasing
6 transistor switches, as it says in the abstract, you
7 know, based upon acceptable levels of spurious and
8 harmonic emissions and linearity.
9 Q So if we look at the background of Huang in
10 paragraph 2, Huang states, "Figures of merit for
11 signal quality of such a transmit-receive switch are
12 switch linearity and spurious harmonic emission
13 levels." Right?
14 A I see that, yes. This is the final sentence
15 in paragraph 2.
16 Q And so switch linearity and spurious
17 harmonic emission levels are metrics to measure
18 signal quality, right?
19 A Yes, those are traditional measures of
20 signal quality.
21 Q And so then if you can look at the next
22 paragraph, please. And in particular, I'd like to
23 focus on the last sentence of paragraph 3. That
24 sentence states that a general approach moreover
25 does not simply turn the FETs on and off by

1 utilizing only a voltage at the gate, but instead
2 biases both the gate and the source/drain in a
3 forward and reverse manner to turn the FETs full on
4 and full off respectively. Correct?
5 A That's what it says, yes.
6 Q And so Huang is focused on biasing the gate
7 and the source/drain to fully turn on and fully turn
8 off the FETs, right?
9 MR. TYSON: Object to the form.
10 A Well, I wouldn't put it that way. I mean,
11 what Huang -- one of the things Huang talks about is
12 optimizing the VGSD of the devices in the ON and OFF
13 states to get the best performance possible. So
14 it's -- and I think this was stated in the abstract
15 as well.
16 Q And so to clarify that, optimizing VGSD,
17 does that refer to setting the bias voltage of the
18 FETs?
19 A Yeah, optimizing the VGSD is about -- what
20 Huang talks about is, yeah, the DC bias of the gate
21 and source/drain regions in order to, you know,
22 optimize switch performance.
23 Q And so, Mr. Kim, if you could please turn to
24 the detailed description of the preferred
25 embodiments and I think that starts around

1 paragraph 39.
2 So Dr. Larson, do you now see paragraphs 39
3 and 40, which are the first two paragraphs of the
4 Detailed Description of the Preferred Embodiments of
5 Huang?
6 A Yes, I see paragraphs 39 and 40.
7 Q And paragraph 39 ends with the statement,
8 "The particular voltages chosen for OFF-state VGSD
9 and ON-state VGSD of the FETs within the switch."
10 Right?
11 A Yes, that's what it says.
12 Q Okay. And so as you said, Huang is focused
13 on optimizing the VGSD for the OFF-state and
14 ON-states of the FETs, right?
15 MR. TYSON: Object to the form and
16 mischaracterizes testimony.
17 A Yeah, I mean, one of the things Huang talks
18 about is optimizing these voltages.
19 Q And if you go to the next paragraph on 40,
20 the sentence in that paragraph states that one of
21 the benefits of optimizing VGSD is improved signal
22 quality is obtained from biasing the FETs at a level
23 other than at the largest possible bias, right?
24 MR. TYSON: Objection.
25 A I'm sorry. Where are you? Oh, I'm sorry.

1 This is in paragraph 40?
2 Q Correct.
3 A The last sentence. I guess it's only one
4 sentence. Yes, the sentence -- the end of sentence
5 just reads, "improved signal qualities obtained from
6 biasing the FETs at a level other than at the
7 largest possible bias within the
8 reliability/breakdown limits of operation."
9 Q And so Huang improves signal quality by
10 appropriately biasing the FETs, right?
11 MR. TYSON: Object to the form.
12 A Well, that's one of the things that they --
13 that they do, yeah. They speak about biasing the
14 FETs at a level other than largest possible bias.
15 That's what they're talking about here in this
16 paragraph.
17 Q And according to Huang, biasing the FETs at
18 a level other than the largest possible bias can
19 lead to improved signal quality, right?
20 A I'm sorry. Could you say that question
21 again?
22 Q Yeah. And so according to Huang, biasing
23 the FETs at a level other than the largest possible
24 bias can lead to improved signal quality, right?
25 A Yeah, that's their -- their assertion is

1 that a bias other than the highest level can in some
2 cases lead to improved signal quality.
3 Q Then if we could go down a couple paragraphs
4 now to paragraph 43, the second paragraph -- or the
5 second sentence of paragraph 43 states, "With the
6 2.5 volt SOI technology, 2.0 to 2.5 volts of
7 ON-state VGSD was found to exhibit a very low
8 insertion loss and good linearity." Right?
9 A That's what it says, yes. 2 to 2.5 of
10 ON-state VGSD was found to exhibit a very low
11 insertion loss and good linearity.
12 Q And so here, what Huang is referring to is
13 setting the DC bias of the FETs in order to obtain
14 low insertion loss and good linearity, right?
15 MR. TYSON: Object to the form.
16 A Well, you know, what they're referring to
17 here is, you know, choosing the bias. 2 to 2.5
18 volts of VGSD was found to exhibit low insertion
19 loss and good linearity. That's not the only thing
20 that they're doing to improve the linearity, but
21 certainly that was one thing they did that seemed to
22 have a big impact, seemed to have a good impact.
23 Q Right. So here paragraph 43 is describing
24 that impact, which is that setting the DC bias
25 between 2 and 2.5 volts can improve or can lead to

1 low insertion loss and good linearity, right?
2 MR. TYSON: Object to the form.
3 A Paragraph 43 is focused on this issue of
4 appropriate VGSD biasing and how choosing the right
5 voltage can lead to good linearity.
6 Q And so it's the selection of the right DC
7 bias that leads to the good linearity here, right?
8 MR. TYSON: Objection.
9 A Well, the selection of the right DC bias is
10 one of the things that you do to achieve good
11 linearity, not the only thing. But it's -- it's a
12 -- it's an effect that they've noted and are
13 optimizing.
14 Q The DC bias though is the only thing that
15 Huang describes here though, right?
16 MR. TYSON: Object to the form.
17 A Sorry. Paragraph 43 is focused on the DC
18 biasing.
19 Q So then if we could turn to paragraph 56
20 then as another example. Here, Dr. Larson, I'll
21 direct you to the last sentence of paragraph 56
22 which states that in order to reduce spurious
23 harmonic emissions and to improve linearity,
24 ON-state VGSD is chosen to be at a level between
25 2.0 volts and 2.5 the volts while OFF-state VGSD is

1 chosen to be at a level between 1.1 volts and
2 1.5 volts." Right?
3 A That's what that sentence says, yes. 2.0 to
4 2.5 in the ON-state and 1.1 to 1.5 in the OFF-state.
5 Q And so here, Huang is describing that
6 selecting a DC bias level between 2.0 volts and
7 2.5 volts can reduce spurious harmonic emissions,
8 right?
9 A Well, just reading the sentence, Huang is --
10 in paragraph 56, Huang is talking about two things:
11 Choosing between 2.0 and 2.5 in the ON-state and 1.1
12 and 1.5 in the OFF-state. So those two are
13 described together in this paragraph.
14 Q And so just to be clear, the 2.0 volts and
15 2.5 volts is the DC bias voltage for the switches in
16 the ON-state, right?
17 A What they're describing here in 56 is the
18 gate to source/drain bias voltage. If it's 2.0 to
19 2.5, it's in the ON-state. If it's 1.1 to 1.5, it's
20 in the OFF-state.
21 Q So this sentence is describing the VGSD
22 voltage in both the ON and the OFF states, right?
23 A Yeah, the sentence in paragraph 56 is
24 talking about the DC bias gate to source/drain
25 voltage in the ON and OFF states.

1 Q And this sentence explains that the level of
2 DC bias in the ON-state between 2.0 volts and
3 2.5 volts and the level of DC bias in the OFF-state
4 between 1.1 volts and 1.5 volts was chosen to reduce
5 spurious harmonic emissions, right?
6 MR. TYSON: Object to the form.
7 A Well, I'm just going to read the sentence.
8 It says, "In order to reduce spurious harmonic
9 emissions and to improve linearity." So both are
10 improved in this case with this particular, you
11 know, biasing.
12 Q All right. I'd like to now turn to the
13 other prior art reference that you analyzed in
14 detail and that's Seshimo.
15 So if, Mr. Kim, if you could pull up
16 Exhibit 1007 which is Seshimo.
17 (Document marked previously as
18 Exhibit 1007 was presented.)
19 BY MR. PERRY:
20 Q All right. Dr. Larson, we're now showing
21 you the cover page for Seshimo. Are you familiar
22 with this reference?
23 A Yes, I am.
24 Q And like Huang, have you studied it many
25 times?

1 A Yes, I've read it many times.
2 Q Okay. And this is an English translation of
3 a Japanese patent application, right?
4 A That's correct.
5 Q And you reviewed the translated version of
6 Seshimo, right?
7 A Right. Exhibit 7 is a translated version of
8 Exhibit 6 which I believe is the Japanese original.
9 Q And you cannot read Japanese, right?
10 A No, I cannot.
11 Q So if I use the translated version and refer
12 to Seshimo as Exhibit 1007, you'll understand which
13 one I'm talking about?
14 A Yes, I will.
15 Q Okay. So I'd like to turn to page 12 of
16 Seshimo and that shows Figures 1, 2, 3 and 4. Do
17 you see those figures?
18 A I'm sorry. Yes, I see them. Thank you.
19 Q So I'd like to compare Figures 1 and
20 Figures 3. Okay?
21 A Okay.
22 Q So let's start with Figure 1. Do you see
23 there's a capacitor C1 between RF_1 and transistor
24 T1?
25 A Capacitor C1 is in series between RF_1 and

1 the source or drain of T1.
2 Q And then turning to Figure 3, do you see
3 that there's a capacitor C3 in series with RF_COM
4 and transistor T2?
5 A Yes, C3 is in series -- I'm sorry. Could
6 you repeat your question? I'm sorry.
7 Q So in Figure 3, capacitor C3 is in series
8 between node RF_COM and transistor T2, right?
9 A C3 is in series between RF_COM and the
10 source or drain of T2.
11 Q And so the function of transistor C1 in
12 Figure 1 is the same as the function of -- sorry,
13 strike that.
14 The function of capacitor C1 in Figure 1 is
15 the same as the function of capacitor C3 in
16 Figure 3, right?
17 MR. TYSON: Object to the form.
18 A Well, they -- I'm not quite sure what you
19 mean by the same. I mean, capacitors -- you know, I
20 talk about this in my declaration. Capacitors block
21 low frequency signals, including DC. And I guess
22 they do what all capacitors do, C1 and T3, they both
23 do what all capacitors do, which is what I said.
24 Q But the role of capacitor C3 as opposed to
25 say capacitor C6 in Figure 3 is the same as

1 capacitor C1 in Figure 1?
2 MR. TYSON: Object to the form.
3 A I mean, I didn't quite understand your
4 question. Are you asking is C3 accomplishing the
5 same function as C6 in Figure 3?
6 Q No. So that was a very, very poorly worded
7 question. Let me try again.
8 So C3 is connected in a similar manner as C1
9 in Figure 1, right?
10 A Are you referring to Figure 3?
11 Q C3 in Figure 3, yep.
12 A Okay. You said Figure 1, I think. So you
13 said C3 in Figure 3 -- I'm sorry. Mr. Perry, I
14 apologize. C -- you're comparing C3 in Figure 3 to
15 C1 in Figure 1. Is that correct?
16 Q That's correct, yes.
17 A Thank you. Well, you know, they both do
18 what capacitors do. They block DC and they block
19 low frequency signals. So in that sense, they both
20 perform the same function.
21 Q And they're connected in the same way, which
22 is between, you know, an RF node or an antenna and a
23 transistor switch that eventually goes to an input
24 or output node, right?
25 A So both C3 and C1 are connected on their

1 lefts to a signal and on their rights to a
2 source/drain of a transistor.
3 Q Okay. Similarly, if we look at C2 in
4 Figure 1 and C2 in Figure 3, those capacitors are
5 also connected in the same way between a receive
6 node and a transistor that's connected to an output
7 node, right?
8 A So C2 in Figure 3 -- I'm sorry. Which
9 capacitor in Figure 3 are you referring to again?
10 Sorry.
11 Q You're fine. Capacitor C2 in both Figure 3
12 and in Figure 1.
13 A So capacitor C2 in both figures -- capacitor
14 C2 in both figures are connected to an RF signal
15 line on one terminal and the other terminal is
16 connected to a source/drain region of a FET at the
17 other terminal.
18 Q Excuse me. Actually my comparison is
19 incorrect there.
20 So they're comparing C2 in Figure 3. It's
21 actually C2 in Figure 2 that are connected the same,
22 right?
23 A So you're comparing C2 in Figure 2 to C2 in
24 Figure 1?
25 Q No. I would like to compare C2, the

1 connection of C2 in Figure 2 to the connection of C2
2 in Figure 3.
3 A Oh. Okay. So let me -- so C2. So,
4 Mr. Perry, I'm going to write this down because
5 there are too many 2s and 3s and I'm getting
6 confused. So you want me to compare C3 in Figure 3?
7 Q No, C2 in Figure 3 and C2 in Figure 2.
8 A And C2 in Figure 2. So C2 in both Figures 2
9 and 3.
10 Q Correct.
11 A I just wrote it down on my little pad here.
12 So C2 is in both cases connected to a signal line on
13 one side. And on the other side, it's connected to
14 a source/drain of a transistor. And the one small
15 difference is that C2 in Figure 2 is also connected
16 to an inductor, L1. I'm not sure that that's an
17 important difference, but that is a difference in
18 this case.
19 Q So aside from inductor L1, C2 in Figure 2 is
20 connected in the same way as C2 in Figure 3, right?
21 A Well, they're both, you know, as I said,
22 connected to signals on one side and source drains
23 on the other side.
24 Q So then, Mr. Kim, could we please turn to
25 paragraphs 13 and 14 of Seshimo?

1 So paragraph 13, Dr. Larson, the first line
2 there says that it's referring to Embodiment 1. Do
3 you see that?
4 A I'm sorry. Are you referring to
5 paragraph 13?
6 Q Correct. Paragraph 13, the first line under
7 paragraph 13 says that this paragraph is referring
8 to Embodiment 1. Do you see that?
9 A I do see that, yes.
10 Q And then paragraph 3 goes on to describe
11 Figure 1. Do you see that?
12 A Yes, I see that.
13 Q And so then if you turn to paragraph 14,
14 Seshimo explains that capacitors C1 and C2 for DC
15 component removal. Do you see that?
16 A Yes, I see that.
17 Q And so then -- so that means capacitors C1
18 and C2 are performing DC blocking, right?
19 MR. TYSON: Object to the form.
20 A Well, they -- they certainly -- you know, as
21 I've said before, capacitors always remove any DC
22 component. They do many other things as well. But
23 that's what's referred to in this particular
24 sentence.
25 Q Okay. And if we turn to paragraphs 33 and

1 35 of Seshimo. So starting with paragraph 33, the
2 first line under paragraph 33 says Embodiment 2.
3 Do you see that, Dr. Larson?
4 A Yes, I do see it.
5 Q And then the sentence below begins with
6 "Figure 2s is a diagram depicting a configuration."
7 Right?
8 A I see that, yes.
9 Q And then if we skip a couple paragraphs to
10 the long paragraph, paragraph 35, paragraph 35
11 states that capacitors C1 and C2 for DC component
12 removal. Is that correct?
13 A Yeah, it says, "Capacitors C1 and C2 for DC
14 component removal." That's what that sentence says.
15 Q And similarly, if you go down a line,
16 Seshimo states that capacitors C3 and C4 for DC
17 component removal. Right?
18 A Oh, yes, that sentence says, "capacitors C3
19 and C4 for DC component removal."
20 Q So then I'd like to jump ahead, please,
21 Mr. Kim, to paragraph 90.
22 And here just above paragraph 90, do you see
23 that Seshimo states, "Description of Codes"?
24 A I see that.
25 Q And by "codes," I believe Seshimo is

1 referring to the labels in the figures, right?
2 A I believe that's correct, yes.
3 Q And then in paragraph 90, for C1 to C8,
4 Seshimo is referring to component removal capacitor
5 T1 to T4. Do you see that?
6 MR. TYSON: Object to the form.
7 A Yeah. First of all, I think you're -- I've
8 read this many times, Mr. Perry. I don't think
9 you're interpreting it quite right. I think the
10 patent is -- when they say component removal
11 capacitor, they're referring to C1 to C8, not T1 to
12 T4. And the T1 to T4 refers to enhancement
13 n-channel MOSFETs. There are no commas here which
14 may be because it's a translation, they're not
15 included. But I believe component removal
16 capacitors refer to the C1 to C8 which is coming
17 before it. And you know, that doesn't really say DC
18 component. I've kind of stared at that while for a
19 while. I note that it doesn't say DC component
20 removal.
21 Q Thank you for that clarification. And let
22 me ask the question then to make sure I get it
23 right.
24 So here it states that C1 to C2 are
25 component removal capacitors, right?

1 MR. TYSON: Objection.
2 A Yeah, it says, "C1 to C8: Component removal
3 capacitors."
4 Q Okay. Third time --
5 A I note it doesn't say DC. Third time's the
6 charm. We'll get it.
7 Q C1 to C8 are component removal capacitors,
8 right?
9 A That's what it says, C1 to C8 component
10 removal capacitors. No mention of DC here.
11 MR. PERRY: And so, Mr. Kim, if we could
12 turn to Exhibit 1006.
13 (Document marked previously as
14 Exhibit 1006 was presented.)
15 BY MR. PERRY:
16 Q Dr. Larson, do you recognize 1006 as the
17 Japanese version of Seshimo?
18 A I believe that's correct, yes.
19 Q Okay. And so I understand you can't read
20 Japanese and so I'm not going to ask you any
21 questions about the Japanese characters, but I'd
22 like to turn to paragraph 90, please.
23 So paragraph 90 here is the same description
24 of codes. And if we go down two lines, do you see
25 where it says C1 through C8?

1 A I see that.
2 Q And then what are the next letters after C1
3 and C8?
4 A DC.
5 Q So fair to say that a more accurate
6 translation for capacitors C1 to C8 is DC component
7 removal capacitor?
8 A Well, you know, I wish I knew Japanese,
9 Mr. Perry. So your question about more accurate is
10 -- would be kind of hard for me to speculate about.
11 But certainly that hints that DC should have been
12 included in the -- perhaps it should have been
13 included in the English translation. As I said, I'm
14 not a Japanese expert, so I kind of hesitate to
15 opine.
16 Q So then would you -- is it fair to say that
17 capacitors C1 through C8 in Seshimo are DC component
18 removal capacitors?
19 MR. TYSON: Object to the form.
20 A You know, all capacitors are DC removal
21 capacitors, so but of course, that's not all they
22 do. They have a variety of functions in any
23 circuit. But certainly one of the things they do is
24 remove a DC component.
25 Q As a person of ordinary skill in the art,

1 would you agree that the phrase "DC component
2 removal capacitor" is the same as DC blocking
3 capacitor?
4 A I don't see any substantial difference
5 between those two and I think a person of ordinary
6 skill in the art would view those as essentially the
7 same.
8 Q If you could, Mr. Kim, turn to paragraph 7
9 of the English translation of Seshimo which is
10 Exhibit 1007.
11 And here it's in the section titled
12 "Disclosure of the Invention, Problem to be Solved
13 by the Invention." Right?
14 A I see that, yes.
15 Q And paragraph 7 states, "In view of the
16 foregoing, an object of the present invention is to
17 provide a semiconductor switching circuit capable of
18 improving the maximum permissible input power while
19 suppressing an increase in ON resistance." Right?
20 A Yes, that's what it says.
21 Q So the objective of Seshimo's invention is
22 to improve allowable input power in the switch
23 circuit, right?
24 MR. TYSON: Object to the form.
25 A Well, I think it says here just very

1 clearly, you know, the object is to provide a
2 switching circuit capable of improving the maximum
3 permissible input power while suppressing an
4 increase in ON resistance which is kind of the same
5 thing or it can be related I would have to say
6 maybe.
7 MR. PERRY: All right. Now would be a good
8 time to go off the record.
9 (Short recess.)
10 MR. PERRY: All right. Mr. Kim, could you
11 please pull up Exhibit 1011?
12 (Document marked previously as
13 Exhibit 1011 was presented.)
14 MR. PERRY: We're going to go off the record
15 for a second and I'll confirm that John is back.
16 (Short recess.)
17 BY MR. PERRY:
18 Q All right. Dr. Larson, we're showing on the
19 screen Exhibit 1011, which is an article titled
20 "Fully Integrated Switch-LNA Front-End IC Design in
21 CMOS: A Systematic Approach for WLAN."
22 Do you recognize this exhibit?
23 A Yes, I do.
24 Q And this exhibit was part of the list of the
25 materials you considered, right?

1 A True, yes.
2 Q So if you could please turn to page 2616,
3 which is page 4 of the PDF. So Dr. Larson, I'd like
4 to direct your attention to the end of the second
5 paragraph. And here it says, "This geometry
6 optimizes the performance of the RF switches at
7 2.5 gigahertz. Since cross biasing is used to bias
8 the series arm and shunt leg, on-chip DC blocking
9 MIM capacitors are required as shown in Figure 4."
10 Right?
11 A Yes, that's what it says.
12 Q And so this article refers to the capacitors
13 as DC blocking MIM capacitors, right?
14 MR. TYSON: Object to the form.
15 A Yeah, the sentence says -- this particular
16 sentence says, "on-chip DC blocking on MIM
17 capacitors are required."
18 Q Okay. And then if I could direct your
19 attention, please, to the next page which is PDF
20 page 5 or page 2617 of the article, there is a
21 figure in the middle of this page, Figure 8. Do you
22 see that?
23 A Yes, I do see Figure 8.
24 Q And the description under Figure 8 is that
25 this is a die micrograph of the FEIC, right?

1 A That's correct. That's what it says.
2 Q And so the paragraph right below Figure 8
3 describes this micrograph and it states, "A
4 micrograph of the fabricated die is shown in
5 Figure 8. The chip dimensions are 0.8 millimeters
6 by 0.8 millimeters, including on-chip DC blocking
7 and decoupling MIM capacitors." Right?
8 A That's what it says.
9 Q And so this article describes the on-chip
10 capacitors as DC blocking and decoupling MIM
11 capacitors, right?
12 MR. TYSON: Object to the form.
13 A That's how it describes -- that's how this
14 sentence describes the capacitors on the chip.
15 Q And you don't disagree with this description
16 of the capacitors, right?
17 A No. You know, I think, you know, DC
18 blocking, we talked about that extensively. You
19 know, that blocks DC and also blocks, you know,
20 higher frequency signals as well. Decoupling caps
21 are a different thing. They are connected to power
22 supplies typically and prevent noise on a power
23 supply line from getting into a circuit. So I think
24 both of these characterizations are very traditional
25 in the literature.

1 MR. PERRY: All right. So then let's turn
2 to Exhibit 1024, please, Mr. Kim.
3 (Document marked previously as
4 Exhibit 1024 was presented.)
5 BY MR. PERRY:
6 Q So Exhibit 1024 is an article. It's titled
7 "Solid State RF/Microwave Switch Technology:
8 Part 2." And it's written by a couple of Skyworks
9 employees. Do you recognize this exhibit?
10 A Yes, I do.
11 Q This is one of the exhibits you relied on in
12 forming your opinions in the 1453 and 1454 IPRs,
13 right?
14 A That's correct.
15 Q So if you turn to Figure 9, which is on
16 page 3 of this article.
17 A Okay.
18 Q And maybe, Mr. Kim, you can zoom in.
19 Perfect. Thank you.
20 So Figure 9 is a figure of a single FET SPST
21 switch, right?
22 A That's correct, yes.
23 Q In this particular switch, there is a
24 capacitor between the source/drain -- sorry. Strike
25 that.

1 In this particular switch, there is a
2 capacitor between the source and an RF node, right?
3 A Yes, on the left.
4 Q And on the right, there is a capacitor
5 between the drain and a different RF node, right?
6 A Correct, that's on the right.
7 Q And the article describes each of these
8 capacitors as a DC block, correct?
9 A That's correct.
10 MR. PERRY: Okay. Mr. Kim, if we could turn
11 to Exhibit 1029.
12 (Document marked previously as
13 Exhibit 1029 was presented.)
14 BY MR. PERRY:
15 Q Exhibit 1029 is another article, right?
16 A This is a paper in the IEEE Journal of Solid
17 State Circuits.
18 Q And this paper is titled "Single-Pole
19 Double-Throw CMOS Switches for 900 megahertz and
20 2.4 gigahertz Applications on p-minus Silicon
21 Substrates." Right?
22 A That's correct.
23 Q And this is another paper that you relied on
24 in forming your opinions in the 1453 and 1454 IPRs,
25 [sic] right?

1 MR. TYSON: Object to the form.
2 A Yes, I've used this particular paper in both
3 IPRs.
4 Q And excuse me. I misspoke. This is the
5 1456 and 1457?
6 A 57.
7 Q Thank you.
8 A Yes, I used it for both the 1456 and the
9 1457.
10 Q So I'd like to look at Figure 2 of this
11 paper, which is on PDF page 2. And Figure 2 is
12 described as a microphotograph of the 0.35
13 micrometer 900 megahertz SPDT switch, right?
14 A Yes.
15 Q And this microphotograph shows various
16 components of the SPDT switch, right?
17 A Well, it shows various transistors and
18 various capacitors.
19 Q It labels, it looks like, an antenna node, a
20 transmit node, and an RX node, right?
21 A Yes, those are both labeled there.
22 Q And so if you go to the first full
23 paragraph below Figure 2, Dr. Larson, that
24 paragraph starts with "Figure 2 is a microphotograph
25 of the 0.35 micrometer SPDT switch." Do you see

1 that?
2 A I do see that, yes.
3 Q Okay. And then if you go down further in
4 this paragraph -- Mr. Kim, I'm sorry. I want to go
5 up a paragraph.
6 So the paragraph immediately below the
7 figure, there is a -- the first full sentence
8 states, "This switch also integrates two 20
9 picofarad capacitors, CB1 and CB2, which allow DC
10 biasing of the TX and RX nodes of the switch."
11 Do you see that?
12 A I do, yes. Sorry. I'm just bringing up my
13 paper copy as well.
14 Q So this paper describes using these two
15 capacitors to allow for DC biasing of the TX and RX
16 nodes of the switch, right?
17 MR. TYSON: Object to the form.
18 A Yeah, the sentence says, "Allows DC biasing
19 of the TX and RX nodes of the switch" and of course
20 that's what capacitors do.
21 Q All right. So then, let's turn to the '579
22 patent which is the patent at issue in the 1456 IPR.
23 It's being shown on the screen now.
24 ///
25 ///

1 (Document marked previously as
2 Exhibit 1001, U.S. Patent No.
3 9,450,579 was presented.)
4 BY MR. PERRY:
5 Q You recognize this patent, right,
6 Dr. Larson?
7 A I do, yes.
8 Q And I'd like to direct your attention to
9 column 2, please.
10 A I'm just bringing up the paper copy also.
11 Okay. I'm there. Thank you.
12 Q And so in column 2, there is a
13 paragraph that starts around line 19 with "In some
14 embodiments, the semiconductor die can be a
15 silicon-on-insulator (SOI) die."
16 Do you see that paragraph?
17 A Yes, I do.
18 Q And then it says in the next sentence, "In
19 some embodiments, the capacitor can be part of the
20 same semiconductor die as the FETs." Right?
21 A That's what it says.
22 Q And then the next sentence says, "In some
23 embodiments, the capacitor can be part of a second
24 die mounted on the packaging substrate." Right?
25 A It says that, yes.

1 Q And the final sentence in that
2 paragraph states that in some embodiments, the
3 capacitor circuit can be disposed at a location
4 outside of the semiconductor die. Right?
5 A That's what it says, yes.
6 Q And so the '579 patent discloses that the
7 capacitor could be part of the same die, on a
8 different die, or outside of a semiconductor die,
9 right?
10 A Yes. You know, and as I discussed in my,
11 you know, declaration, that's a pretty common
12 partition decision that people make when they're
13 putting together these wireless systems.
14 Q So then I'd like to just turn to the '194
15 patent which is Exhibit 1001 of the 1457 IPR. And
16 it's up on the screen now, Dr. Larson.
17 (Document marked previously as
18 Exhibit 1001, U.S. Patent No. 9,148,194
19 was presented.)
20 BY MR. PERRY:
21 Q Do you recognize this document as the '194
22 patent?
23 A Yes, I do.
24 Q If we turn to column 2 again, here in
25 column 2, there is a paragraph beginning around

1 line 16. And looking at the three sentences in that
2 paragraph it states, "In some embodiments, the
3 capacitor can be part of the same semiconductor die
4 as the FETs. In some embodiments, the capacitor can
5 be part of a second die mounted on the packaging
6 substrate. In some embodiments, the capacitor
7 circuit can be disposed at a location outside of the
8 semiconductor die." Right?
9 A Yeah, this is what it says. You know, as I
10 said in my declaration on this IPR, this is a pretty
11 standard kind of design decision that an engineer
12 would make as part of putting together a wireless
13 system or wireless, you know, device.
14 Q And so like the '579 patent, the '194
15 discloses that the capacitor can be on the same die
16 as the FETs, on a different die, or at a location
17 outside of the semiconductor die, right?
18 A I'm sorry, could you give me those three
19 cases again?
20 Q Let me ask the question again.
21 So like the '579 patent, the '194 patent
22 discloses that the capacitor can be on the same die
23 as the FETs, part of a different die mounted on the
24 package substrate or at a location outside of the
25 semiconductor die, right?

1 A Yes. I'm just reading the last two
2 sentences in that paragraph. It almost seems like
3 those last two sentences are sort of saying the same
4 thing. And, Mr. Perry, maybe I could just say that,
5 you know, the capacitor could be on the
6 semiconductor die or not on the semiconductor die.
7 And that's a well-understood choice.
8 Q So let me ask it that way then.
9 So the '194 patent discloses that the
10 capacitor could be on the same die as the FETs or
11 not on the same die as the FETs, right?
12 A Yes, and as I said, that's a well-understood
13 -- very well-understood at the time choice that an
14 engineer would make.
15 MR. PERRY: All right. I have no further
16 questions.
17 MR. TYSON: Just a couple questions.
18 REDIRECT EXAMINATION
19 BY MR. TYSON:
20 Q Dr. Larson, sitting here today, following
21 the deposition and all the questions that you've
22 been asked and answers you've provided, do you stand
23 by the opinions that you gave in both of the
24 declarations in these two IPRs?
25 A Yes, absolutely. No changes at all.

1 Q And specifically one question. If we refer
2 to Exhibit 1007, which was the translation of
3 Seshimo in either IPR. Let me know when you're
4 there.
5 A I'm there.
6 Q And if we can turn to paragraph 90, 9-0.
7 A Yes.
8 Q Do you recall having a discussion with
9 Mr. Perry about within this paragraph the difference
10 in translation and Exhibit 1006 which was the
11 original Japanese language version of this document?
12 A Yes, I remember that conversation.
13 Q Dr. Larson, if paragraph 90 in Exhibit 1007,
14 the Japanese translation, had said C1 to C8: DC
15 component removal capacitors, would that have
16 changed your opinions at all that you submitted in
17 your declarations in these IPRs?
18 A No, not in the slightest. And we discussed
19 this at great length today.
20 MR. TYSON: No further questions.
21 MR. PERRY: I have no further questions.
22
23 (Time off record 1:31 p.m.)
24
25

1 C E R T I F I C A T E
2
3 I, Sandra L. Rocca, CSR, RMR, RDR, CRR, a
4 Certified Court Reporter within and for the States
5 of Illinois and Florida, do hereby certify:
6 That LAWRENCE E. LARSON, Ph.D., the witness
7 whose deposition is hereinbefore set forth, was duly
8 sworn by me and that such deposition is a true
9 record of the testimony given by such witness.
10 I further certify that I am not related to
11 any of the parties to this action by blood or
12 marriage; and that I am in no way interested in the
13 outcome of this matter.
14 IN WITNESS WHEREOF, I have hereunto set my
15 hand this 19th of September, 2025.
16
17
18
19 Sandra L. Rocca
20 Sandra L. Rocca, CSR, RMR, RDR, CRR
21
22
23 IL License 084-003435
24 Florida 1245
25 Illinois, D.C. and Florida Notary

1 LAWYER'S NOTES

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1 CERTIFICATE OF DEPONENT
2
3 I hereby certify that I have read the
4 foregoing pages of my deposition testimony in
5 this proceeding, and with the exception of
6 changes and/or corrections, if any, find them to
7 be a true and correct transcription thereof.
8
9 _____
10 Deponent
11
12 _____
13 Date
14
15 NOTARY PUBLIC
16 Subscribed and sworn to before me this
17 _____ day of _____, 20___.
18 _____
19 Notary Republic
20 My Commission Expires:_____
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1 INSTRUCTIONS TO WITNESS
2
3 Please read your deposition over carefully
4 and make any necessary corrections. You
5 should state the reason in the appropriate
6 space on the errata sheet for any corrections
7 that are made.
8 After doing so, please sign the errata
9 sheet and date it.
10 You are signing same subject to the changes
11 you have noted on the errata sheet, which
12 will be attached to your deposition.
13 It is imperative that you return the
14 original errata sheet to the deposing
15 attorney within thirty (30) days of
16 receipt of the deposition transcript by
17 you. If you fail to do so, the deposition
18 transcript may be deemed to be accurate
19 and may be used in court.
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1 ERRATA SHEET

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