

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 TEXAS INSTRUMENTS INC.
6 and NXP USA, INC.,
7 Petitioners,

8 v.

9 PARKERVISION, INC.,
10 Patent Owner.

11 IPR2024-00935 & IPR2024-00936
12 Patents 7,865,177 B2 & 9,118,528 B2

13
14 Videotaped Deposition of

15 DR. JAMES DICKENS

16 Conducted Virtually

17 Friday, July 18, 2025

18 1:03 p.m. EST

19
20 Job No.: 592285

21 Pages: 1 - 76

22 Reported By: Kadi A. Harmon

Transcript of Dr. James Dickens
Conducted on July 18, 2025

2

1 Deposition of DR. JAMES DICKENS, conducted
2 virtually by videoconference. All parties
3 attended remotely.

4
5
6
7
8
9
10 Pursuant to notice, before Kadi A. Harmon,
11 Court Reporter and Notary Public in and for the
12 State of New York.

13
14
15
16
17
18
19
20
21
22

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

A P P E A R A N C E S

ON BEHALF OF PETITIONERS:

ROBERT S. MAGEE, ESQUIRE

BLUE PEAK LAW GROUP LLP

3790 El Camino Real, PMB 846

Palo Alto, California 94306

(281) 972-3036

JOSHUA A. GRISWOLD, ESQUIRE

RISHI GUPTA, ESQUIRE

CELIA LEWIS, ESQUIRE

YAO WANG, ESQUIRE

FISH & RICHARDSON P.C.

1717 Main Street, Suite 5000

Dallas, Texas 75201

(214) 747-5070

A P P E A R A N C E S C O N T I N U E D

ON BEHALF OF PATENT OWNER:

JASON CHARKOW, ESQUIRE

STEPHANIE MANDIR, ESQUIRE

DAIGNAULT IYER LLP

8229 Boone Boulevard, Suite 450

Vienna, Virginia 22182

(202) 270-5666

ALSO PRESENT:

Micah Hardin, Videographer

C O N T E N T S

EXAMINATION OF DR. JAMES DICKENS	PAGE
By Attorney Charkow	8
By Attorney Magee	72

E X H I B I T S

(Attached to the Transcript.)

DICKENS DEPOSITION EXHIBIT	PAGE
Exhibit 1 2011 IPR2024-00935	19
Exhibit 2 2011 IPR2024-00936	20
Exhibit 3 Exhibit Plot 2	25
Exhibit 4 Exhibit Plot	31
Exhibit 5 2022 IPR2024-00935	42
Exhibit 6 2022 IPR2024-00936	42
Exhibit 7 2010 IPR2024-00936	44
Exhibit 8 2010 IPR2024-00935	44

Transcript of Dr. James Dickens
Conducted on July 18, 2025

6

1	P R O C E E D I N G S	13:03:17
2	THE VIDEOGRAPHER: Here begins Media	13:03:17
3	Number 1 in the videotaped deposition of Dr. James	13:03:26
4	Dickens, in the matter of Texas Instruments	13:03:29
5	Incorporated v. ParkerVision, Inc., in the United	13:03:32
6	States Patent and Trademark Office, before the	13:03:37
7	Patent Trial and Appeal Board; Case Numbers	13:03:40
8	IPR2024-00935 and IPR2024-00936.	13:03:44
9	Today's date is July 18th, 2025. The time	13:03:52
10	on the video monitor is 1:03 p.m., Eastern	13:03:55
11	Standard Time.	13:04:00
12	The remote videographer today is Micah	13:04:00
13	Hardin representing Planet Depos. All parties of	13:04:05
14	this video deposition are attending remotely.	13:04:06
15	Would Counsel please voice-identify	13:04:08
16	themselves and state whom they represent?	13:04:11
17	ATTORNEY CHARKOW: Jason Charkow and	13:04:13
18	Stephanie Mandir of the Daignault Iyer firm on	13:04:19
19	behalf of ParkerVision.	13:04:22
20	ATTORNEY MAGEE: Robert Magee of Blue Peak	13:04:23
21	Law Group on behalf of Texas Instruments. Also	13:04:27
22	attending today are Josh Griswold, Yao Wang, Rishi	13:04:27

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

Transcript of Dr. James Dickens
Conducted on July 18, 2025

7

1	Gupta, and Celia Lewis of Fish & Richardson.	13:04:30
2	THE VIDEOGRAPHER: The Court Reporter	13:04:34
3	today is Kadi Harmon, representing Planet Depos.	13:04:36
4	The witness will now be sworn.	13:04:37
5	THE COURT REPORTER: Okay. First, will	
6	Counsel please stipulate that in lieu of formally	
7	swearing in the witness, the Reporter will instead	
8	ask the witness to acknowledge that their	
9	testimony will be true under the penalties of	
10	perjury, that Counsel will not object to the	
11	admissibility of the transcript based on	
12	proceeding in this way, and that the witness's	
13	identity has been verified?	
14	Do you both agree?	13:05:02
15	ATTORNEY CHARKOW: Agree.	13:05:02
16	ATTORNEY MAGEE: Yes.	13:05:02
17	THE COURT REPORTER: Thank you.	
18	Next I'll ask the witness: Do you	
19	acknowledge that your testimony today will be true	
20	under the penalties of perjury?	
21	THE WITNESS: Yes. I do.	13:05:14
22	THE COURT REPORTER: Thank you.	13:05:15

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

Transcript of Dr. James Dickens
Conducted on July 18, 2025

8

1	Whenever you're ready, Counsel.	13:05:15
2	E X A M I N A T I O N	13:05:18
3	BY ATTORNEY CHARKOW:	
4	Q Please state your name.	13:05:19
5	A James Claude Dickens.	13:05:21
6	Q Okay. Have you been deposed before?	13:05:23
7	A Yes. I have.	13:05:27
8	Q How many times?	13:05:27
9	A Probably more than two dozen.	13:05:28
10	Q Is there any reason you can't give	13:05:31
11	truthful and accurate testimony sitting here	13:05:37
12	today?	13:05:39
13	A No.	13:05:39
14	Q Have you ever heard of Dr. Ian Galton?	13:05:40
15	A No. I don't believe I have.	13:05:45
16	Q Okay. Are you aware that Dr. Galton	13:05:47
17	provided an expert declaration in the IPR related	13:05:50
18	to the '177 patent?	13:05:54
19	A I'm aware of various declarations, so I'd	13:05:56
20	have to go and review that particular name, and	13:06:00
21	who gave that deposition -- or, gave that	13:06:03
22	declaration.	13:06:06

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

1	Q All right. So you're not aware, sitting	13:06:07
2	here right now, that Dr. Galton provided an expert	13:06:09
3	declaration in the '177 patent IPR, correct?	13:06:14
4	A Well, I -- I don't know him, but I	13:06:17
5	recognize the name as being someone who has some	13:06:19
6	documents in this case.	13:06:22
7	Q Okay. Are you aware of whether Dr. Galton	13:06:23
8	provided an expert declaration in the IPR related	13:06:25
9	to the '528 patent?	13:06:29
10	A Again, I'd have to go and look. I recall	13:06:31
11	his name, and recall reading parts of that, but I	13:06:34
12	don't remember which case it was, it was for both	13:06:41
13	or individually.	13:06:42
14	Q Okay. Have you ever talked to Dr. Galton	13:06:43
15	about any of his opinions that he provided in the	13:06:46
16	IPR related to the '177 patent?	13:06:49
17	A No. I have not.	13:06:49
18	Q Okay. And have you ever talked to	13:06:50
19	Dr. Galton about any of the opinions he provided	13:06:52
20	in the IPR related to the '528 patent?	13:06:55
21	A No. I have not.	13:06:58
22	Q Okay. In your expert declaration, you did	13:06:59

1	not list Dr. Galton's declarations as something	13:07:01
2	you considered, right?	13:07:04
3	A That's correct.	13:07:05
4	Q Okay. And at the time you prepared and	13:07:06
5	submitted your declaration for the '177 patent,	13:07:08
6	you did not review Dr. Galton's declaration and	13:07:11
7	opinions related to the '177 patent, correct?	13:07:14
8	A That's correct.	13:07:16
9	Q And at the time you prepared and submitted	13:07:17
10	your declaration for the '528 patent, you did not	13:07:20
11	review Dr. Galton's declaration related to the	13:07:23
12	'528 patent and his opinions, correct?	13:07:26
13	A I don't believe so.	13:07:29
14	Q Okay. So you didn't make sure that all of	13:07:30
15	your positions in your declaration for the '177	13:07:33
16	patent were consistent with Dr. Galton's positions	13:07:36
17	that he took in his declaration, correct?	13:07:41
18	A I'm not aware -- yeah. That would be a	13:07:43
19	correct statement.	13:07:46
20	Q Okay. And you didn't make sure that all	13:07:46
21	of your positions in your declaration for the '528	13:07:47
22	patent were consistent with the positions that	13:07:51

Transcript of Dr. James Dickens
Conducted on July 18, 2025

11

1	Dr. Galton took in his declaration, correct?	13:07:54
2	A Yes. That would be a correct statement.	13:07:56
3	Q Okay. And the declaration in the '528 IPR	13:07:58
4	says it's a supplemental declaration.	13:08:02
5	Are you aware of that?	13:08:05
6	A Yes.	13:08:05
7	Q Okay. Why is it a supplemental	13:08:06
8	declaration?	13:08:09
9	A My understanding is it's supplemental	13:08:10
10	because there was already a declaration provided	13:08:12
11	in this case by another expert, or some other	13:08:16
12	entity, and so this would be a supplemental	13:08:21
13	declaration to that proceeding.	13:08:24
14	Q Okay.	13:08:26
15	A That's the reason.	13:08:27
16	Q Sorry. Go ahead.	13:08:28
17	A That's my understanding of why it was --	13:08:30
18	why we titled it that way.	13:08:35
19	Q Okay. I just want to make sure I'm not	13:08:35
20	missing any of your -- your declarations.	13:08:38
21	Supplemental implies that maybe you had an	13:08:41
22	earlier declaration for each of the '528 or '177	13:08:43

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

1	patents, but that's not the case, correct?	13:08:47
2	You don't have any other declarations?	13:08:49
3	ATTORNEY MAGEE: Objection.	13:08:51
4	Objection. Form.	13:08:53
5	A Yes. I do not have any other declarations	13:08:53
6	besides the two that were -- were signed here.	13:08:56
7	Q Okay. And were you asked to look at or	13:08:58
8	did you look at any of the prior art references	13:09:01
9	related to the '177 patent IPR?	13:09:04
10	A No. Not at all.	13:09:07
11	Q Were you asked to look at, or did you look	13:09:09
12	at, any of the prior art references related to the	13:09:11
13	'528 patent IPR?	13:09:15
14	A No. Not at all.	13:09:15
15	Q Okay. What is signal to noise ratio, or	13:09:16
16	SNR?	13:09:25
17	A So the noise ratio is basically just as it	13:09:26
18	says. It's the ratio of signal to noise. And so	13:09:28
19	obviously you want a better signal to noise ratio.	13:09:31
20	It has to do with, you know, noise within a	13:09:37
21	system. There's different ways of viewing that --	13:09:39
22	that noise and looking at. But in general, it's	13:09:42

1	simply the ratio of how large the signal is to how	13:09:44
2	large the noise score is.	13:09:50
3	Q And what is receiver sensitivity?	13:09:52
4	A That is basically how small or how low of	13:09:54
5	a signal you can resolve and successfully	13:09:59
6	demodulate.	13:10:03
7	Q Okay. So is receiver sensitivity the	13:10:04
8	minimal signal strength that can be detected by	13:10:09
9	the receiver and demodulated?	13:10:10
10	ATTORNEY MAGEE: Objection to form.	13:10:13
11	A That's one -- in a high-level sense,	13:10:14
12	that's one way of looking at it. And you know,	13:10:17
13	I'd have to caveat that, that different systems	13:10:18
14	measure differently, and there's different ways of	13:10:22
15	looking at it. But your statement, I would	13:10:23
16	generally agree with from a high level.	13:10:26
17	Q Okay. And what is dynamic range?	13:10:28
18	A Dynamic range is -- is the range at which	13:10:30
19	the power that comes into the -- whatever device	13:10:33
20	you're interested in, that it operates in its	13:10:37
21	normal regime over this range. So it goes from	13:10:42
22	very small to a very large signal.	13:10:46

1	Obviously as you get too small, you can't	13:10:47
2	resolve it anymore. You're below the sensitively	13:10:50
3	level. And as you get too large, you start to	13:10:52
4	usually turn on protection diodes, you start	13:10:56
5	limiting, and then you -- basically you don't get	13:10:57
6	anymore output power as you put more input power	13:11:00
7	in.	13:11:02
8	Q Okay. Is dynamic range generally the	13:11:02
9	ability to handle a range of signal strengths,	13:11:05
10	like the ability of a device to handle a range of	13:11:09
11	signal strengths?	13:11:11
12	A Again, at a high level, that's basically	13:11:11
13	describing --	13:11:14
14	ATTORNEY MAGEE: Objection to form.	13:11:14
15	A -- basically describing what I -- what I	13:11:16
16	was just describing.	13:11:18
17	(Reporter clarification.)	13:11:45
18	BY ATTORNEY CHARKOW:	13:11:45
19	Q All right. So Dr. Dickens, just take a	13:11:46
20	breath after my -- my question, before you -- just	13:11:50
21	like you're going to jump into a pool. Take a	13:11:53
22	breath before you jump in. Okay?	13:11:56

1	A Understood.	13:11:56
2	Q Okay. Thanks.	13:11:57
3	Okay. You ready?	13:11:59
4	A I'm ready.	13:12:03
5	Q Okay. Signal to noise ratio, receiver	13:12:04
6	sensitivity, and dynamic range are metrics for	13:12:08
7	evaluating the performance of commercial wireless	13:12:11
8	devices, correct?	13:12:14
9	A Yeah. In general, those are all metrics	13:12:16
10	of measure, amongst others. But those three are	13:12:20
11	exactly as you said. They are used as metrics for	13:12:25
12	describing the goodness, if you will, of a	13:12:28
13	particular RF receiver.	13:12:32
14	Q Okay. And a higher signal to noise ratio	13:12:33
15	indicates that the desired signal is stronger	13:12:39
16	relative to the noise, correct?	13:12:42
17	A Yes. That's correct.	13:12:43
18	ATTORNEY MAGEE: Objection to form.	13:12:45
19	ATTORNEY CHARKOW: That was Bobby's fault.	13:12:49
20	Strike that.	
21	BY ATTORNEY CHARKOW:	13:12:55
22	Q In your declaration, you discussed that	13:12:55

1 the Eddie device being tested by Boeing does not
2 output a differential signal.

3 Do you recall that?

4 A Yes. I do.

5 Q Okay. And in your declaration, you state:
6 I know that -- strike that.

7 In your declaration, you state: I note
8 that the coaxial measurement does not indicate a
9 differential signal; whereas here, the Boeing
10 report does not mention the use of a balun.

11 Do you recall that?

12 A Yes. I do.

13 Q What is a balun?

14 A A balun is a device that takes two signals
15 and can -- or, one signal and make two signals.
16 Basically it creates a 180-degree phase shift, and
17 that balun allows you to drive a differential or
18 receive a differential signal.

19 Q Okay. Is a balun like what I have in my
20 house, like a cable, coaxial cable connectors.
21 Like, two -- two connectors on one side and
22 another connector on the other side, and a little

1 box in the middle?

2 A No. That --

3 ATTORNEY MAGEE: Objection to form.

4 A That -- that would be a combiner or a
5 splitter, is what you're referring to. A balun is
6 something different.

7 Q Okay. And why would you use -- why would
8 the use of a balun indicate a differential signal?

9 A Because that's what a balun does, is it
10 takes in -- as I said, it can take in a
11 differential signal and give you a single-ended
12 output, or it can take a single-ended input and
13 give you a differential output. That's the
14 function of a balun.

15 Q So are you saying that if the Boeing
16 report showed two lines or two coaxial cables
17 coming out of the Eddie device being tested, that
18 would indicate a differential signal to you?

19 A No. No. What I saw there is a coax cable
20 is always a single-ended -- or, I shouldn't say
21 always -- but generally, a coax cable is a
22 single-ended, you know, you have your ground on

13:14:02

13:14:02

13:14:03

13:14:07

13:14:10

13:14:11

13:14:14

13:14:18

13:14:22

13:14:27

13:14:29

13:14:31

13:14:32

13:14:36

13:14:43

13:14:45

13:14:45

13:14:54

13:14:56

13:14:57

1 the outside and your signal on the inside. So it 13:14:59
2 has just what we call single-ended. 13:15:03

3 Q Right. But I'm saying if you had two -- 13:15:06
4 if Boeing report showed two coaxial cables as the 13:15:08
5 output of the Eddie device, then that would 13:15:12
6 indicate to you that there's a differential 13:15:18
7 signal? 13:15:20

8 A No. Not necessarily. 13:15:20

9 Q When you say -- what do you mean, not 13:15:21
10 necessarily? 13:15:23

11 A Well, you have -- for that, you would have 13:15:23
12 to have a differential input/differential output. 13:15:26
13 You would have to know how to drive that, and 13:15:30
14 that's -- that's not in the Boeing report, and 13:15:32
15 then that's certainly not in any of the schematics 13:15:34
16 I've seen. 13:15:36

17 And so in general, you would have to 13:15:38
18 have -- in a balun, you have a single coax. And 13:15:46
19 your measurement instrument, like your power 13:15:50
20 meter, or your spectrum analyzer, it has a single 13:15:53
21 input. It's a single-ended input into the 13:15:54
22 spectrum analyzer.

1 And so to drive that with a differential, 13:15:57
2 you would require a balun to come in, if you had a 13:16:00
3 differential, to combine that to get it to go into 13:16:04
4 your spectrum analyzer. Otherwise, you're making 13:16:08
5 two singled-ended measurements. 13:16:11

6 Q Okay. And can you -- can you describe 13:16:12
7 what a balun looks like? 13:16:14

8 A There's -- there's an infinite number of 13:16:17
9 ways of making various baluns, but generally it 13:16:20
10 can be made on a special type of kind of circuit 13:16:25
11 board. For higher frequencies, you can use some 13:16:28
12 type of transformers. Mini circuits makes 13:16:32
13 transformers. There's different types of baluns 13:16:35
14 at different frequency ranges, all the way up to, 13:16:37
15 you know, gigahertz down to megahertz and below. 13:16:39

16 Q Okay. So you base -- strike that. 13:16:43

17 You base your opinion on how the Eddie 13:16:48
18 device works on the fact that the capacitors -- 13:16:49
19 well, strike that. 13:16:52

20 I'm going to give you a -- two documents. 13:16:53

21 (Dickens Deposition Exhibit 1 marked for
22 identification and attached to the transcript.)

1 (Dickens Deposition Exhibit 2 marked for
2 identification and attached to the transcript.)

3 BY ATTORNEY CHARKOW:

4 Q I just put two documents into chat. Just 13:17:04
5 let me know when you have them, and then I'll... 13:17:11

6 A I'm saving them now. 13:17:11

7 Q All right. 13:17:17

8 A Okay. I have them. 13:17:18

9 Q Okay. So you've been provided with 13:17:19
10 Exhibit 1 to your deposition. 13:17:23

11 Exhibit 1 is Exhibit 2011 in the 935 IPR, 13:17:32
12 which is the -- in the 935 IPR. 13:17:31

13 And you've also been provided with 13:17:35
14 Exhibit 2 to your deposition, which is also 13:17:38
15 Exhibit 2011, but in the 936 IPR. 13:17:44

16 Do you have those in front of you? 13:17:51

17 A I do. 13:17:52

18 Q Okay. So you can look at them. Just make 13:18:04
19 sure they're the same, and then I'm just going to 13:18:10
20 ask you questions about, you know, Exhibit 2011 to 13:18:12
21 the IPRs. 13:18:17

22 A I have it up, and I can zoom in and see 13:18:18

1	everything.	13:18:23
2	Q Okay. Great.	13:18:23
3	Strike that.	13:18:24
4	You base your opinion on how the Eddie	13:18:25
5	device works on the fact that [REDACTED]	13:18:29
6	[REDACTED] shown in Exhibit 2011, are [REDACTED]	13:18:32
7	[REDACTED], correct?	13:18:38
8	A Yes. I analyzed this -- this circuit.	13:18:44
9	That's correct. [REDACTED]	13:18:48
10	[REDACTED]. That's correct.	13:18:52
11	Q Okay. And [REDACTED], you	13:18:53
12	calculated the impedance of [REDACTED]	13:18:57
13	[REDACTED], correct?	13:19:00
14	A That's correct.	13:19:01
15	Q Okay. And [REDACTED] to	13:19:01
16	calculate impedance, your opinion is that the	13:19:07
17	impedance of [REDACTED] is lower than	13:19:09
18	the impedance for [REDACTED]	13:19:14
19	[REDACTED], correct?	13:19:19
20	A Yes. They'd be much, much lower -- lower	13:19:22
21	magnitude. That's correct.	13:19:26
22	Q And because of this, your opinion is that	13:19:26

1	all the input signals coming into the Eddie device	13:19:28
2	[REDACTED],	13:19:33
3	correct?	13:19:39
4	A Yes. [REDACTED]	13:19:39
5	[REDACTED]	13:19:44
6	[REDACTED]	13:19:48
7	[REDACTED]	13:19:50
8	[REDACTED]	13:19:52
9	[REDACTED]	13:19:56
10	Q Okay.	13:19:56
11	A [REDACTED]	13:19:57
12	[REDACTED]	13:20:00
13	[REDACTED]	13:20:02
14	Q So basically, [REDACTED]	13:20:02
15	[REDACTED]	13:20:06
16	[REDACTED]	13:20:10
17	[REDACTED]	13:20:13
18	[REDACTED]	13:20:18
19	[REDACTED], right?	13:20:20
20	A [REDACTED], the way they have	13:20:20
21	it drawn here, that's correct.	13:20:24
22	Q Okay. And based on [REDACTED]	13:20:26

1 [REDACTED], you view -- strike that. 13:20:28

2 Based on the [REDACTED] 13:20:32

3 [REDACTED], your view is that the device shown in 13:20:35

4 Exhibit 2011 would not work at all, right? 13:20:37

5 A That's correct. With the values in here, 13:20:40

6 I don't -- I don't believe that it would work, 13:20:42

7 certainly not as [REDACTED] in the [REDACTED] test 13:20:45

8 report. 13:20:49

9 Q If the impedance of [REDACTED] -- strike 13:20:49

10 that. 13:20:52

11 If the impedance of the [REDACTED] 13:20:52

12 [REDACTED] were higher than the impedance for [REDACTED] 13:20:57

13 [REDACTED], then the [REDACTED] 13:21:02

14 [REDACTED] 13:21:08

15 [REDACTED], correct, or left of the exhibit? 13:21:13

16 A So let me -- I heard your question. I'm 13:21:15

17 not sure I quite heard the first part, so let 13:21:20

18 me -- 13:21:24

19 Q Why don't I just -- you can just ask me to 13:21:24

20 restate a question if you don't get -- some of 13:21:26

21 these questions may be a little long, so it's fine 13:21:28

22 if you say: Hey, can you just restate it. 13:21:31

1	A Can you restate it? I appreciate it.	13:21:33
2	Q If the impedance of [REDACTED]	13:21:36
3	were higher than the impedance for [REDACTED]	13:21:43
4	[REDACTED]	13:21:48
5	[REDACTED] that's on the left of	13:21:55
6	Exhibit 2011, correct?	13:22:00
7	A Yes. I can agree with that. Basically,	13:22:02
8	if the capacitors were much smaller, their	13:22:04
9	impedance would be higher, and then you would be	13:22:07
10	able to get a signal into [REDACTED].	13:22:11
11	Q Okay. And if the [REDACTED]	13:22:14
12	weren't there, then the [REDACTED]	13:22:17
13	[REDACTED] on the	13:22:21
14	left-hand side of Exhibit 2011, correct?	13:22:25
15	A Yes. If they weren't there at all,	13:22:28
16	that -- that would allow that signal to definitely	13:22:32
17	get in there. That's correct.	13:22:35
18	Q Okay. And in the schematic of	13:22:36
19	Exhibit 2011, you see [REDACTED],	13:22:38
20	correct?	13:22:43
21	A Yes. I do.	13:22:44
22	Q Okay. And in the schematic of	13:22:44

1	Exhibit 2011, you see [REDACTED],	13:22:48
2	correct?	13:22:54
3	A Yes. I do.	13:22:54
4	Q Okay. And if you were testing the chip	13:22:56
5	and connected it up, you would you have [REDACTED]	13:22:59
6	[REDACTED]	13:23:01
7	[REDACTED], correct?	13:23:03
8	A Yes. The way they -- the way it's	13:23:07
9	described, the way it's drawn here.	13:23:20
10	Q All right. You can put that aside.	13:23:12
11	(Dickens Deposition Exhibit 3 marked for	13:23:22
12	identification and attached to the transcript.)	
13	BY ATTORNEY CHARKOW:	
14	Q So you've been provided with Exhibit 3 to	13:23:22
15	your deposition, and it's just labeled Exhibit	13:23:26
16	Plot 2. Just let me know when you have that open.	13:23:30
17	A I have it open.	13:23:52
18	Q In your work, have you ever seen a type of	13:23:53
19	chart like this before?	13:23:57
20	A A Smith chart? Yeah. Yes. I have.	13:23:58
21	Q And this is -- this type of plot is known	13:24:01
22	as a Smith chart, correct?	13:24:05

1	A That's correct.	13:24:06
2	Q Okay. And a Smith chart, like the one	13:24:06
3	shown here, is used visualize impedance values,	13:24:09
4	correct?	13:24:18
5	A That's correct.	13:24:18
6	Q What is impedance?	13:24:18
7	A Impedance is basically the resistance to	13:24:19
8	the flow of current. If its complex impedance,	13:24:23
9	you can have imaginary and real parts to your	13:24:28
10	overall impedance.	13:24:34
11	Q And one component of impedance is	13:24:38
12	resistance, correct?	13:24:42
13	A That's correct.	13:24:44
14	Q And what's the other part of impedance?	13:24:44
15	Reactants?	13:24:47
16	A Reactants. That's correct.	13:24:48
17	Q And that's the difference between	13:24:49
18	resistance and impedance, really, is that	13:24:51
19	there's -- impedance has a reactance portion to	13:24:54
20	it, correct?	13:24:58
21	A Yeah. It has a complex -- impedance has a	13:24:59
22	complex number instead of completely real.	13:25:01

1	Q All right. And that's why you have things	13:25:03
2	like a Smith chart to visualize that?	13:25:04
3	A Yes. Amongst other things, that's	13:25:07
4	correct.	13:25:09
5	Q So lets look at the Smith chart, which is	13:25:09
6	Exhibit 3. And on the upper right-hand side, you	13:25:13
7	see a couple of numbers under -- labeled 1.	13:25:17
8	Do you see that?	13:25:20
9	A Yes. I do.	13:25:21
10	Q So we see [REDACTED]	13:25:21
11	[REDACTED].	13:25:29
12	Do you see that?	13:25:36
13	A Yes. I do.	13:25:36
14	Q Okay. Now, the Smith chart shows that --	13:25:37
15	so what's shown here is that for a -- sorry.	13:25:42
16	Strike that.	13:25:48
17	Strike that.	13:25:49
18	The megahertz, or the MHZ, would be the	13:25:59
19	frequency of the input signal for the circuit or	
20	device being tested, correct?	13:26:05
21	A Yes. In general, that's correct.	13:26:09
22	Q Okay. And the ohms is the input impedance	13:26:11

1 for the circuit or device being tested, correct?

13:26:15

2 A Generally, yes. This is an incomplete

13:26:28

3 picture on this. I can't quite tell anything.

13:26:34

4 But in general, that's -- that's a correct

13:26:38

5 statement.

13:26:39

6 Q All right. So what -- what this

13:26:39

7 particular Smith chart shows is that for a [REDACTED]

13:26:41

8 megahertz signal, for the device being tested, the

13:26:48

9 input impedance of that device is [REDACTED],

13:26:53

10 correct?

13:26:59

11 ATTORNEY MAGEE: Objection to form.

13:26:59

12 A And a complex minus [REDACTED] ohms. There's two

13:27:00

13 numbers there.

13:27:08

14 Q Okay. But I was correct in what I said,

13:27:08

15 at least?

13:27:11

16 Well, strike that.

13:27:13

17 Is it correct that Exhibit 3, which is the

13:27:13

18 Smith chart, shows that for a [REDACTED] megahertz

13:27:18

19 signal, that the device under test has a [REDACTED]

13:27:26

20 ohm impedance; is that factually correct or

13:27:33

21 incorrect?

13:27:37

22 A That's not factually correct.

13:27:37

1	ATTORNEY MAGEE: Objection. Form.	13:27:38
2	A That's not factually correct, because	13:27:39
3	you're leaving off the complex part. So the	13:27:45
4	impedence on the Smith chart gives this in ohms	13:27:49
5	like that. You have to keep both parts. So --	13:27:50
6	Q Okay.	13:27:52
7	A -- what you said is accurate, that that's	13:27:53
8	the real part only.	13:27:55
9	Q Okay. So let me re-ask the question.	13:27:57
10	So as we go through this, and as get your	13:28:01
11	questions, I'll be able to readjust it and to	13:28:04
12	answer them -- and to ask them better. Let me ask	13:28:07
13	it again.	13:28:09
14	Strike that.	13:28:10
15	So Exhibit 3 shows that for a [REDACTED]	13:28:10
16	megahertz signal, that the device under test will	13:28:18
17	have a real -- strike that.	13:28:22
18	Sorry. Just give me a minute.	13:28:37
19	When you say real part, what do you mean?	13:28:58
20	A Well, remember you talked -- you had asked	13:29:00
21	me a few questions about impedance, and impedance	13:29:04
22	contains a real part and an imaginary part, and so	13:29:07

1 it's a complex number. And so this represents 13:29:11
2 what we see here, it's [REDACTED] ohms real, and a 13:29:12
3 complex of [REDACTED] imaginary. 13:29:14
4 Q So for a [REDACTED] megahertz signal, 13:29:20
5 Exhibit 3 shows that a device under test would 13:29:27
6 have a [REDACTED] ohm real part, correct? 13:29:33
7 ATTORNEY MAGEE: Objection. Form. 13:29:39
8 A That's a correct statement. 13:29:41
9 Q See, I told you I would get it. 13:29:44
10 Strike that.
11 (Reporter clarification.) 13:30:00
12 Q So for a [REDACTED] megahertz signal, 13:30:00
13 Exhibit 3 shows that a device under test would 13:30:20
14 have a [REDACTED] ohm input impedance. Strike that. 13:30:14
15 For a -- strike that. 13:30:21
16 Exhibit 3 shows that for a [REDACTED] 13:30:23
17 megahertz signal, the device under test would have 13:30:30
18 a [REDACTED] ohm input impedance real part, correct? 13:30:38
19 ATTORNEY MAGEE: Objection. Form. 13:30:47
20 A Yes. That's correct. The real part would 13:30:49
21 be -- is [REDACTED]. That's correct. And the 13:30:52
22 imaginary is the [REDACTED]. 13:30:55

1	Q All right. So you can put that one aside.	13:30:58
2	You can put that exhibit aside.	13:31:01
3	A Okay.	13:31:03
4	(Dickens Deposition Exhibit 4 marked for	
5	identification and attached to the transcript.)	
6	BY ATTORNEY CHARKOW:	13:31:21
7	Q You've been provided Exhibit 4 to your	13:31:21
8	deposition. Exhibit 4 is just labeled exhibit	13:31:26
9	plot, and you can let me know when you have that	13:31:30
10	open.	13:31:33
11	A Okay. I have it open.	13:31:36
12	Q Okay. And so Exhibit 4 is another Smith	13:31:38
13	chart, correct?	13:31:41
14	A Yes. It is.	13:31:42
15	Q All right. And on the right side, you see	13:31:43
16	three -- three sets of values.	13:31:53
17	Do you see that, on the upper right-hand	13:31:55
18	side?	13:31:58
19	A Yes. I see those.	13:31:58
20	Q Okay. And the first set of values shows	13:32:00
21	that for a [REDACTED] megahertz input signal, the device	13:32:03
22	under testing has a [REDACTED] ohm input impedance	13:32:11

1 real part, correct? 13:32:20

2 A Yes. That's correct. The real part is 13:32:22

3 approximately [REDACTED] ohms. 13:32:24

4 Q Okay. And in Exhibit 4, under the second 13:32:27

5 set of values, it shows that for [REDACTED] 13:32:33

6 megahertz input signal, the input impedance of the 13:32:40

7 device under test, the real part, is [REDACTED] ohms, 13:32:48

8 correct? 13:32:54

9 A Yes. That's correct. The real part is 13:32:55

10 [REDACTED]. 13:32:59

11 Q And if we look at the third set of numbers 13:32:59

12 in Exhibit 4, it shows that for [REDACTED] megahertz 13:33:03

13 input signal, that the input impedance is [REDACTED] 13:33:10

14 ohms, the real part is -- that's the value of the 13:33:17

15 real part, correct? 13:33:20

16 A That's correct. The real part is [REDACTED]. 13:33:21

17 Q Okay. We discussed Exhibit 3, which was 13:33:47

18 the previous exhibit. And we talked about [REDACTED] 13:33:50

19 megahertz signal. You understood that to be the 13:33:54

20 input signal, correct, to the device under test? 13:33:58

21 A Yes. My understanding was, on that plot, 13:34:01

22 that was the input signal. 13:34:04

1 Q Okay. If the input impedance of the Eddie
2 device that was being tested was [REDACTED] ohms, then
3 that would tell you that [REDACTED]
4 [REDACTED] as shown in
5 the schematic, correct?

13:34:06

13:34:11

13:34:16

13:34:20

13:34:30

6 ATTORNEY MAGEE: Objection to form.

13:34:31

7 A If this was connected directly on there
8 without any matching network or anything like
9 that, that would tell me that that is the input
10 impedance that was measured on that particular
11 board.

13:34:32

13:34:35

13:34:38

13:34:42

13:34:44

12 Q Right. So let me just ask the question
13 again. My question was a little more than that.

13:34:46

13:34:50

14 Strike that.

13:34:52

15 If the input impedance of the Eddie device
16 was about [REDACTED] ohms, then that would tell you that

13:34:52

13:34:55

17 [REDACTED]
18 [REDACTED], correct?

13:34:59

13:35:05

19 ATTORNEY MAGEE: Objection to form.

13:35:10

20 Outside the scope.

13:35:12

21 A The -- the real part being that, that we
22 keep focusing on the real part, that really is not

13:35:23

13:35:27

1 quite accurate because the capacitor doesn't show 13:35:30
2 up in the real part. It shows up in the imaginary 13:35:34
3 part. So, you know, I got to caveat that from 13:35:39
4 what you said. You know, your question isn't 13:35:42
5 quite right in terms of asking that. 13:35:45

6 Q Okay. So if the input impedance of the 13:35:47
7 Eddie device was, the imaginary part, was [REDACTED] 13:35:51
8 [REDACTED], then that would tell you that the 13:35:55
9 capacitors in the Eddie device were [REDACTED] 13:36:02
10 [REDACTED] as shown in the schematic, correct? 13:36:08

11 ATTORNEY MAGEE: Objection to form. 13:36:10

12 Outside the scope. 13:36:11

13 A I haven't done that calculation, but I 13:36:12
14 would expect the number to be larger. I mean, if 13:36:16
15 it was [REDACTED], I would expect it to be a smaller 13:36:19
16 number than [REDACTED], but I haven't done analysis to find 13:36:23
17 out what that would represent. I just analyzed 13:36:27
18 the circuit that was provided. 13:36:30

19 Q Again, I'm just asking you, you know, if 13:36:31
20 you had a -- if the Eddie device had an input 13:36:34
21 impedance, if you were looking at Smith chart and 13:36:40
22 it had an input impedance of about [REDACTED] ohms, real 13:36:44

1 part and [REDACTED], imaginary part, you

13:36:52

2 then know, without doing calculations, that the

13:36:57

3 [REDACTED]

13:36:59

4 [REDACTED], right?

13:37:04

5 ATTORNEY MAGEE: Objection to form.

13:37:08

6 Outside the scope.

13:37:10

7 A Again, I haven't done the calculation, but
8 I would expect it to be -- to be lower.

13:37:11

13:37:13

9 Q What would you expect to be lower?

13:37:16

10 A The -- the imaginary number.

13:37:18

11 Q Sorry. Sorry. You would expect [REDACTED]

13:37:24

12 [REDACTED] to have a lower value?

13:37:27

13 A No. No. I'm sorry. I expect the
14 impedance to be measured to be lower than [REDACTED] ohms,
15 minus [REDACTED] imaginary is what I'm saying.

13:37:32

13:37:35

16 If it was [REDACTED] and they did that test with
17 this exact circuit, I would expect that input on
18 [REDACTED] to be smaller than the number that I see that
19 you just asked me about.

13:37:45

13:37:49

13:37:52

20 Q Right. But I'm asking what would that
21 tell you about the capacitors? So you're telling
22 me about the signal that's coming in, and I'm

13:37:53

13:37:57

13:38:00

1 asking about the capacitors. So let me ask the 13:38:02
2 question again. Strike that. 13:38:05
3 If the -- if a Smith chart showed that you 13:38:06
4 had a [REDACTED] ohm input impedance for the Eddie device 13:38:12
5 that was being tested, and a [REDACTED] ohm 13:38:20
6 imaginary part, then the Eddie device, the 13:38:26
7 schematics that you saw, you would not expect that 13:38:34
8 [REDACTED], correct? 13:38:37
9 A Yes. 13:38:42
10 ATTORNEY MAGEE: Objection to form. 13:38:42
11 Outside the scope. 13:38:44
12 A That would be a correct statement. 13:38:47
13 Q Okay. And -- sorry. I'm just trying to 13:38:50
14 formulate a question. Give me a second. 13:39:01
15 Strike that. 13:39:03
16 If a Smith chart showed you that -- strike 13:39:04
17 that. 13:39:12
18 If a Smith chart showed you a [REDACTED] ohm 13:39:12
19 real part, and a [REDACTED] kilohm imaginary 13:39:21
20 part for the input impedance of the Eddie device 13:39:31
21 that was being tested, then the Eddie device, the 13:39:38
22 schematic that you saw, you would not expect the 13:39:43

1	[REDACTED], correct?	13:39:46
2	ATTORNEY MAGEE: Objection to form.	13:39:51
3	Outside the scope.	13:39:53
4	THE WITNESS: I'd have to do my	13:39:56
5	calculation to make sure, because I haven't	13:39:58
6	calculated what the impedance would be at [REDACTED]	13:40:01
7	[REDACTED]	13:40:05
8	[REDACTED]. I just haven't done that calculation.	13:40:10
9	Sorry.	
10	BY ATTORNEY CHARKOW:	13:40:12
11	Q Sorry. But regardless of -- you don't	13:40:12
12	need to do a calculation to know that if you have	13:40:16
13	an input impedance, a real value input impedance	13:40:20
14	of [REDACTED] ohms, and an imaginary	13:40:22
15	part of [REDACTED]	13:40:28
16	[REDACTED], you don't need to do a calculation to	13:40:38
17	know that the capacitor, that that's the input	13:40:42
18	impedance, that the capacitor in the Eddie chip	13:40:45
19	would not be [REDACTED] microfarads, correct?	13:40:46
20	ATTORNEY MAGEE: Objection to form.	13:40:51
21	Outside the scope.	13:40:52
22	A Again, yeah. You do have to do a	13:40:53

1 calculation, because knowing the impedences is 13:40:57
2 dependant upon frequency. So the one or the two I 13:40:59
3 see, I haven't done that in my head even yet, so 13:41:02
4 I'm trying to do it just quickly, so I have -- 13:41:05
5 because the calculation would be 2 pi times 50 13:41:08
6 times 10 to the 6, and then that [REDACTED] 13:41:12
7 [REDACTED], and 1 over all that. And I can't -- I'm 13:41:17
8 not that great at doing it in my head. 13:41:22

9 I would expect it to be, just now I'm
10 thinking about it, that's going to be -- I would 13:41:23
11 expect that to be less than kilohms for the 13:41:25
12 imaginary part, at [REDACTED] microfarad if this Smith 13:41:28
13 chart you're representing to me is the Smith chart 13:41:32
14 looking into the actual input of the chip. That's 13:41:35
15 not the output. Because they had some output and 13:41:41
16 input graphs, and I'd have to go back and review. 13:41:43

17 But you're looking at this in isolation 13:41:45
18 here. I believe that if this is the input 13:41:46
19 impedance [REDACTED] microfarad, I wouldn't expect that 13:41:51
20 imaginary part to be less than [REDACTED] kilohms, doing 13:41:52
21 a quick back of the envelope calculation in my 13:41:56
22 head. 13:41:59

Transcript of Dr. James Dickens
Conducted on July 18, 2025

39

1 Q Well, why don't you -- you have a
2 calculator somewhere, either on your computer in
3 front of you. Why don't you do the calculation
4 of -- for -- so this is the exhibit that I
5 provided to you. I think it was exhibit --
6 probably the last exhibit I provided to you.

7 Yeah. Exhibit 4.

8 So for -- why don't you calculate for a [REDACTED]
9 megahertz signal with a [REDACTED] ohm real part, and
10 a [REDACTED] kilohm imaginary part.

11 Why don't you do the calculation?

12 A I did --

13 ATTORNEY MAGEE: Objection to form.

14 A I did it just now.

15 ATTORNEY MAGEE: I'm going to object to
16 form and also to scope.

17 Q And what was the number that you got?

18 A Less than [REDACTED], complex impedance.

19 So yes. This -- it would be much smaller.
20 Yes. To your question -- to answer your question
21 accurately, yes. I would be smaller. I would
22 expect it to be smaller.

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

1 Q So if the input impedance of the Eddie 13:43:04
2 device was about [REDACTED] -- what did you say? 13:43:08
3 Sorry. 13:43:14
4 A About -- about [REDACTED] of complex 13:43:15
5 impedance magnitude. 13:43:21
6 Q So if the input impedance of the Eddie 13:43:23
7 device was about [REDACTED] complex impedance 13:43:27
8 magnitude, then that would tell you that the 13:43:35
9 [REDACTED] 13:43:35
10 [REDACTED], as shown in the schematics, correct? 13:43:38
11 ATTORNEY MAGEE: Objection to form. 13:43:41
12 Outside the scope. 13:43:44
13 A It would indicate that, or there was a 13:43:44
14 matching network in between I guess. I think that 13:43:48
15 it would indicate to me that that [REDACTED] is not there, 13:43:53
16 or was different. 13:43:58
17 Q Okay. And can you look at the second set 13:43:59
18 of values, and do the same calculation and tell me 13:44:04
19 what number you get for that? 13:44:08
20 So this is Exhibit 4. The second part 13:44:12
21 says: [REDACTED] is the 13:44:13
22 imaginary part, and for [REDACTED] megahertz signal. 13:44:17

1 A So [REDACTED] megahertz -- 13:44:20

2 (Reporter clarification.) 13:44:30

3 ATTORNEY MAGEE: Yeah. Objection to form. 13:44:30

4 Outside of the scope. 13:44:30

5 Thanks.

6 THE WITNESS: For number [REDACTED] 13:44:32

7 [REDACTED], I don't have to redo the calculations. 13:44:35

8 It's proportional, so it's going to be 13:44:36

9 approximately [REDACTED] milliohms. [REDACTED] megahertz would 13:44:38

10 be the input impedance of that [REDACTED] 13:44:46

11 capacitor. 13:44:47

12 BY ATTORNEY CHARKOW: 13:44:48

13 Q So if the input impedance of the Eddie 13:44:48

14 device was about [REDACTED] then that would 13:44:52

15 tell you that the capacitor in the Eddie device -- 13:44:58

16 [REDACTED] 13:45:02

17 [REDACTED], correct? 13:45:07

18 A Can you -- I think your question, you 13:45:09

19 asked it wrong, maybe. 13:45:10

20 (Reporter clarification.) 13:45:25

21 Q Okay. So if the input impedance of the 13:45:25

22 Eddie device was about [REDACTED], complex 13:45:28

1	impedance, then that would tell you that the	13:45:33
2	capacitors in the Eddie device were [REDACTED]	13:45:41
3	[REDACTED], correct?	13:45:46
4	A No. That's -- that's incorrect. That	13:45:47
5	would tell me that [REDACTED].	13:45:49
6	Q For [REDACTED]?	13:45:53
7	A For [REDACTED]. That's what you had me	13:45:55
8	calculate, [REDACTED], is the	13:45:58
9	input impedance, complex input impedance, [REDACTED]	13:46:05
10	[REDACTED].	13:46:12
11	Q Okay. And if the input impedance of the	13:46:12
12	Eddie device was -- strike that.	13:46:14
13	All right. I'm going to give you -- you	13:46:14
14	can put that document aside. I'm going to give	13:46:29
15	you some other documents.	13:46:33
16	(Dickens Deposition Exhibit 5 marked for	
17	identification and attached to the transcript.)	
18	(Dickens Deposition Exhibit 6 marked for	
19	identification and attached to the transcript.)	
20	BY ATTORNEY CHARKOW:	13:47:04
21	Q So -- strike that.	13:47:04
22	You've been provided with Exhibit 5 to	13:47:05

1	your deposition. Exhibit -- Exhibit 5 to your	13:47:08
2	deposition is the Boeing -- well, strike that.	13:47:15
3	You've been provided Exhibit 5 to your	13:47:23
4	deposition. Exhibit 5 to your deposition is	13:47:26
5	Exhibit 2022 in IPR2024-00935.	13:47:28
6	You've also been provided Exhibit 6 to	13:47:36
7	your deposition. Exhibit 6 to your deposition is	13:47:39
8	also an Exhibit 2022, but that's for the 936 IPR.	13:47:44
9	Do you have both of those in front of you?	13:47:51
10	A Yes. I do.	13:47:54
11	Q Okay. You seen this document before,	13:47:54
12	correct?	13:47:57
13	A Yes. I have.	13:47:58
14	Q And this is Exhibit 2022 to the IPRs,	13:47:59
15	correct?	13:48:03
16	A Yes.	13:48:04
17	Q Okay. And these are some notes related to	13:48:05
18	testing of the ParkerVision's Eddie device,	13:48:10
19	correct?	13:48:13
20	A Yes. That's my --	13:48:14
21	ATTORNEY MAGEE: Objection to form.	13:48:14
22	A Sorry. That's my understanding.	13:48:14

1	Q Okay. And in forming your opinions in	13:48:19
2	this case, did you review every page and every	13:48:22
3	diagram of -- of these notes?	13:48:24
4	A Yes. I believe I did.	13:48:26
5	Q Okay. All right. You can put that aside	13:48:29
6	for right now.	13:48:33
7	(Dickens Deposition Exhibit 7 marked for	
8	identification and attached to the transcript.)	
9	(Dickens Deposition Exhibit 8 marked for	
10	identification and attached to the transcript.)	
11	BY ATTORNEY CHARKOW:	
12	Q Let me know when you have the documents	13:48:47
13	that I put up.	13:48:50
14	A What exhibit is it? Can -- is it 2010?	13:49:07
15	2010?	13:49:09
16	Q 2010, yes. There's two --	13:49:09
17	A Okay.	13:49:10
18	Q There's two of them.	13:49:10
19	A Yeah. I'm just getting so many files,	13:49:13
20	when I save them, I lose track of which one I just	13:49:14
21	saved, so...	13:49:20
22	I have it up now.	13:49:21

1	Q Wait. Hold on. I think I've got a	13:49:22
2	problem. Just give me a second.	13:49:29
3	Okay. Strike that.	13:49:30
4	So Exhibit 7 to your deposition is the --	13:49:31
5	is the IPR Exhibit 2010, for the 936 IPR.	13:49:37
6	And Exhibit 8 to your deposition is the	13:49:45
7	same exhibit number, Exhibit 2010, but that's for	13:49:50
8	the 935 IPR.	13:49:53
9	Do you have those in front of you?	13:49:57
10	A Yes. I do.	13:49:58
11	Q Okay. And you've seen these documents	13:49:59
12	before, correct?	13:50:01
13	A Yes. I have.	13:50:02
14	Q And Exhibit 2010 is the [REDACTED] test report	13:50:02
15	of ParkerVision's Eddie chip, correct?	13:50:08
16	A Yes.	13:50:12
17	Q Okay. And in forming your opinions in	13:50:12
18	this case, did you review every page and every	13:50:15
19	diagram of the Boeing report?	13:50:20
20	A Yes. I did.	13:50:21
21	Q Okay. So let's discuss the testing of	13:50:22
22	Parkervision's Eddie chip, okay, or Eddie device,	13:50:26

1 all right? You ready?

13:50:31

2 A I am. I'm sorry. Yes.

13:50:34

3 Q Okay. So let's go back first to -- this
4 was Exhibit 5 and 6 of your deposition, which is
5 Exhibit 2022 of the IPR. So this was the previous
6 pair of exhibits that I gave you.

13:50:36

13:50:45

13:50:48

13:50:54

7 A Yes. I'm there.

13:50:56

8 Q Okay. Can you turn to Page 3 of
9 Exhibit 2022?

13:50:57

13:51:03

10 A I'm there.

13:51:07

11 Q Okay. And on Page 3 is a [REDACTED],
12 correct?

13:51:08

13:51:12

13 A Yes.

13:51:12

14 Q Does it look familiar?

13:51:13

15 A Yes. It does.

13:51:15

16 Q Okay. It's the [REDACTED] we discussed
17 previously, right?

13:51:16

13:51:20

18 A Right. But when we discussed it
19 previously, I thought you were saying it was the
20 input, and this appears to be the measure -- [REDACTED]

13:51:21

13:51:23

13:51:25

21 [REDACTED], is being made, it
22 appears to be on this, at the [REDACTED]. And

13:51:29

13:51:33

1 that's the [REDACTED] that would match up 13:51:36
2 with this, not the input. 13:51:38

3 Q Okay. Did you look at this [REDACTED] in 13:51:40
4 detail when you were providing your opinions? 13:51:44

5 A Yes. I did. 13:51:47

6 Q Okay. 13:51:48

7 A Sorry. I looked at the whole report. But 13:51:50
8 in particular, this [REDACTED] absolutely is part 13:51:53
9 of it. 13:51:56

10 Q Okay. All right. So if you can go back 13:51:57
11 to [REDACTED], which was Exhibit 2010 to 13:52:04
12 the IPRs? 13:52:08

13 A I'm there. 13:52:09

14 Q All right. So if you turn to Page 16. 13:52:10
15 So when I refer to pages, I'm referring to 13:52:16
16 pages that are the IPR pages, so they're always in 13:52:19
17 the bottom left-hand corner, so Page 16 of 17. 13:52:24

18 A I understand that. There's a Smith chart 13:52:30
19 on that page as well, and another plot. 13:52:32

20 Q Okay. So did you look at the -- strike 13:52:35
21 that. 13:52:38

22 When forming your opinions, did you look 13:52:38

1 at the details shown in Figure 7-3 when providing 13:52:43
2 your opinions? 13:52:48

3 This is the [REDACTED] on the bottom of
4 the page. 13:52:48

5 A Yes. I did. And in fact, this one you 13:52:48
6 can say that [REDACTED] 13:52:51
7 [REDACTED], on -- on 13:52:56
8 the Eddie device here. 13:52:57

9 Q Okay. So is this showing an input -- 13:52:59
10 strike that. 13:53:04

11 So this [REDACTED] on Page 16 of 13:53:04
12 Exhibit 2010 is showing a -- the input to the 13:53:08
13 Eddie device, correct? 13:53:13

14 A One of the inputs, yes. That's correct. 13:53:15

15 Q All right. And you did not consider 13:53:23
16 Figure 7-3, or factor that in when you were 13:53:28
17 providing your opinions, did you? 13:53:32

18 ATTORNEY MAGEE: Objection. Form. 13:53:33

19 Q That there was a [REDACTED] 13:53:34
20 [REDACTED]? 13:53:41

21 ATTORNEY MAGEE: Objection to form. 13:53:43

22 A So I considered it, because that's what I 13:53:43

1 was trying to reconcile with the Board, the 13:53:47
2 schematics that were provided to me to analyze. 13:53:47
3 And so I did notice that in the Eddie report, in 13:53:50
4 this report, whatever Eddie device they were using 13:53:55
5 here, they were able to get a signal out. 13:54:00

6 I would not expect to get a signal out of 13:54:01
7 the Eddie device that was provided to me. And so
8 that's when I realized that there must have been a 13:54:09
9 difference between these. There wasn't -- this 13:54:10
10 report here doesn't seem to be about the Eddie 13:54:10
11 device that was provided to me for analysis, that 13:54:14
12 circuitry. 13:54:18

13 Q Okay. Well, let's just say that based on 13:54:18
14 what you're seeing here for [REDACTED], that 13:54:24
15 either the [REDACTED] 13:54:26
16 [REDACTED] 13:54:32
17 [REDACTED], correct? 13:54:38

18 That's what this Smith chart shows you? 13:54:42

19 ATTORNEY MAGEE: Objection to form. 13:54:46

20 A I -- I can't agree with that statement. 13:54:47
21 That's too narrow. I mean, all it tells me is 13:54:50
22 that the impedance is different and they appear to

1 be different circuits. I couldn't tell you if 13:54:52
2 it's that particular capacitor did that, or what 13:54:54
3 they changed. It's not clear. It would be total 13:54:57
4 speculation. I mean, just guessing. 13:55:01

5 Q Right. But you know looking at the [REDACTED] 13:55:05
6 [REDACTED] on Page 16 of Exhibit 2010, that [REDACTED] 13:55:10
7 [REDACTED], that's what was being 13:55:16
8 tested here, they couldn't be there. This 13:55:20
9 wouldn't -- this chart wouldn't exist if [REDACTED] 13:55:24
10 [REDACTED] were there? 13:55:28

11 ATTORNEY MAGEE: Objection to form. 13:55:29

12 A Right. I mean, that's one way to state 13:55:31
13 it. But also you have to remember that this -- 13:55:34
14 this chart may not look this way if [REDACTED] 13:55:36
15 [REDACTED] were removed. So it would be necessary 13:55:39
16 for [REDACTED] to be removed to get even 13:55:42
17 closer to this, but this doesn't -- that alone 13:55:45
18 doesn't tell me I would get this here at all. 13:55:47

19 And in fact, the impedance is smaller. If 13:55:50
20 you go back to the -- to the schematic, they show 13:55:52
21 that [REDACTED] 13:55:55
22 [REDACTED]. And so if I just 13:56:02

1 look to [REDACTED], I still 13:56:07
2 wouldn't get that plot, because I have impedances 13:56:11
3 now that are [REDACTED] ohms, and we don't have that [REDACTED] 13:56:15
4 ohm. It was out of there, it says in that 13:56:18
5 schematic. So I don't know how they're getting [REDACTED] 13:56:19
6 ohms without [REDACTED]. So again, I just 13:56:22
7 can't say one way or another. I'd be speculating. 13:56:24

8 Q Okay. In preparing your opinions, did you 13:56:31
9 do anything to conform that the Eddie device that 13:56:33

10 [REDACTED] 13:56:36

11 [REDACTED] -- strike that. 13:56:38

12 In preparing your opinions in this case, 13:56:41
13 or in the IPRs, did you do anything to confirm 13:56:43
14 that [REDACTED] 13:56:47

15 [REDACTED] shown in Exhibit 2011, 13:56:49
16 which is the schematic. 13:56:53

17 ATTORNEY MAGEE: Objection to form. 13:56:55

18 A No. I didn't do any of that. I mean, I 13:57:00
19 was told that that was the schematic, so I was 13:57:03
20 asked to analyze that. I didn't -- I didn't try 13:57:06
21 to analyze -- I didn't hypothesize what -- what 13:57:09
22 circuit they might have been using. 13:57:13

1 No. I didn't do that. 13:57:16

2 Q Okay. So let's see. If you can turn to 13:57:17

3 Page 7 of [REDACTED], which is Exhibit 2010 13:57:20

4 to the IPRs. 13:57:26

5 A I'm there. 13:57:29

6 Q Okay. And Page 7 at the top -- well, I 13:57:35

7 guess at the middle, says: [REDACTED]. 13:57:43

8 Do you see that? 13:57:47

9 A Oh. Down below. Yes. I see it. Below 13:57:47

10 Figure 2-2. [REDACTED]. I see that. 13:57:50

11 Q Okay. So this -- strike this. 13:57:53

12 If you look to the right, underneath, it 13:57:55

13 says: [REDACTED] 13:57:59

14 [REDACTED]. 13:58:05

15 Do you see that? 13:58:13

16 A Yes. I do. 13:58:13

17 Q Okay. So you understand that in the 13:58:14

18 [REDACTED], the input signal, at least for 13:58:15

19 this test, was [REDACTED], correct? 13:58:19

20 A Yes. I understand that. 13:58:23

21 Q Okay. So now if you scroll down to the 13:58:25

22 next page, so now we're on Page 8 of Exhibit 2010, 13:58:28

1 you see a chart on the top labeled Figure 2-3, [REDACTED] 13:58:34
2 [REDACTED]. 13:58:43
3 Do you see that? 13:58:44
4 A Yes. I see that. 13:58:44
5 Q Okay. And you've seen charts like that 13:58:45
6 before, correct? 13:58:47
7 A Yes. I've seen [REDACTED], 13:58:48
8 yes. 13:58:51
9 Q Okay. And the [REDACTED] report shows that 13:58:51
10 the frequency -- strike that. 13:58:54
11 Figure 2-3, which is [REDACTED], 13:58:58
12 shows that [REDACTED] 13:59:06
13 [REDACTED], correct? 13:59:09
14 A Yes. I see that. 13:59:16
15 Q Okay. And so what we see here on the 13:59:17
16 [REDACTED] test is that the [REDACTED] for the 13:59:25
17 Eddie device under testing is [REDACTED] 13:59:30
18 [REDACTED], correct? 13:59:34
19 ATTORNEY MAGEE: Objection to form. 13:59:38
20 A It's the [REDACTED]. You know, it's a 13:59:44
21 [REDACTED]. So yes. I understand that. 13:59:47
22 Q You agree with what I just said? 13:59:51

1	A Yes. I agree with what you just said.	13:59:54
2	Q Okay. And so what [REDACTED] shows	13:59:56
3	is that when you look at the, [REDACTED]	13:59:59
4	[REDACTED]	14:00:03
5	[REDACTED]	14:00:07
6	[REDACTED] being tested performs down	14:00:14
7	conversion, correct?	14:00:18
8	A Yes.	14:00:19
9	ATTORNEY MAGEE: Objection to form.	14:00:20
10	A Yes. I would agree with that.	14:00:22
11	Q All right. So if you could turn to --	14:00:24
12	back to Page 7 of exhibit -- IPR Exhibit 2010,	14:00:30
13	please, the same report?	14:00:35
14	A I'm there.	14:00:37
15	Q Okay. And let's go back up again to where	14:00:38
16	it says [REDACTED]	14:00:42
17	[REDACTED].	14:00:47
18	Okay?	14:00:48
19	A Okay.	14:00:49
20	Q All right. So what we see here is a	14:00:50
21	[REDACTED], right?	14:00:53
22	A That's correct.	14:00:59

Transcript of Dr. James Dickens
Conducted on July 18, 2025

55

1	Q So according to this, [REDACTED]	14:01:00
2	[REDACTED]	14:01:04
3	[REDACTED], correct?	14:01:08
4	A Yes. That's correct.	14:01:12
5	Q And just for the record, DBM is decibel	14:01:13
6	milliwatts, correct?	14:01:19
7	A Yes. That's -- that's an accurate	14:01:22
8	statement.	14:01:23
9	Q And -- strike that.	14:01:24
10	[REDACTED],	14:01:26
11	correct?	14:01:31
12	A Yes.	14:01:32
13	ATTORNEY MAGEE: Objection to form.	14:01:32
14	A Sorry. I would consider that [REDACTED]	14:01:33
15	[REDACTED], yes.	14:01:37
16	Q It's a [REDACTED], right?	14:01:37
17	A Yes. I would consider that --	14:01:40
18	ATTORNEY MAGEE: Sorry. Objection to	14:01:45
19	form.	14:01:46
20	Go ahead.	14:01:47
21	A Yes. I would consider that [REDACTED]	14:01:47
22	[REDACTED].	14:01:50

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

1	Q Okay. So the [REDACTED]	14:01:50
2	[REDACTED] -- strike that.	14:01:53
3	[REDACTED]	14:01:55
4	[REDACTED]	14:02:01
5	[REDACTED], correct?	14:02:01
6	ATTORNEY MAGEE: Objection to form.	14:02:05
7	A For [REDACTED], yes.	14:02:06
8	They ran it at [REDACTED]. That's	14:02:11
9	correct.	14:02:11
10	Q And negative 100 DBM is at the very outer	14:02:11
11	range of signals that can be detected by	14:02:17
12	commercial Wi-Fi receivers, correct?	14:02:21
13	ATTORNEY MAGEE: Objection to form.	14:02:24
14	A Commercial -- it's a -- it can go a little	14:02:30
15	better than that. If you're talking consumer	14:02:33
16	grade, yes. But commercial, higher-end	14:02:36
17	commercial, you can get a little -- you can get	14:02:39
18	better than that.	14:02:40
19	Q Okay. So let me -- it seems -- I got it.	14:02:41
20	So you use commercial in a very specific	14:02:44
21	way. So let me do consumer because I think -- I	14:02:47
22	think you seem to distinguish between consumer	14:02:48

1	grade, like my iPhone, as opposed to commercial	14:02:52
2	grade, like Verizon cell phone towers or something	14:02:53
3	like that, right?	14:02:56
4	A That's a correct statement.	14:02:56
5	Q Okay. So let me -- let me re-ask the	14:02:57
6	question on consumer.	14:03:00
7	Okay. So strike that.	14:03:01
8	Negative 100 DBM is at the very outer	14:03:03
9	range of signals that can be detected by consumer	14:03:09
10	Wi-Fi receivers, correct?	14:03:10
11	A That's a generally reasonable range. I	14:03:12
12	would agree with that. It's around that number.	14:03:15
13	ATTORNEY MAGEE: Objection to form.	14:03:18
14	A I couldn't say it's exactly minus 100, but	14:03:19
15	it's in that range.	14:03:23
16	Q Okay. So [REDACTED]	14:03:23
17	[REDACTED]	14:03:26
18	[REDACTED]	14:03:27
19	[REDACTED], correct?	14:03:30
20	A Pretty close to that.	14:03:32
21	ATTORNEY MAGEE: Objection to form.	14:03:35
22	A They were testing the signal to noise	14:03:35

1	ration, yes, at a [REDACTED]	14:03:36
2	[REDACTED]. That's	14:03:39
3	correct.	14:03:41
4	Q Right. But I'm just trying to explain	14:03:41
5	that this like -- just practically, [REDACTED]	14:03:44
6	[REDACTED]	14:03:46
7	[REDACTED]	14:03:49
8	[REDACTED]	14:03:52
9	[REDACTED], right?	
10	That's what this test is doing?	14:03:58
11	ATTORNEY MAGEE: Objection to form.	14:04:00
12	A [REDACTED]	14:04:01
13	[REDACTED]. I	14:04:03
14	understand what you're saying, and it would be --	14:04:06
15	[REDACTED]	14:04:09
16	[REDACTED]	14:04:13
17	Q Right. [REDACTED]	14:04:14
18	[REDACTED]	14:04:16
19	[REDACTED]	14:04:19
20	[REDACTED] this is -- that's -- that's the	14:04:22
21	level we're talking?	14:04:26
22	[REDACTED]	14:04:27

1	[REDACTED]	14:04:31
2	[REDACTED] correct?	14:04:34
3	A That's one --	14:04:36
4	ATTORNEY MAGEE: Objection to form.	14:04:36
5	A That's one potential scenario, yes.	14:04:37
6	Q Okay. And so [REDACTED]	14:04:39
7	[REDACTED]	14:04:44
8	[REDACTED]	14:04:46
9	[REDACTED] ?	14:04:50
10	ATTORNEY MAGEE: Objection to form.	14:04:52
11	A Well, these tests are sort of a standard	14:04:55
12	test that's done on -- on receiver-type devices,	14:05:00
13	and so I would agree with that statement in	14:05:02
14	general that way, that that's a reasonable	14:05:05
15	statement. But caveat that, you know, this is a	14:05:06
16	battery of tests that -- that basically give you	14:05:11
17	the performance, if you will, level of this	14:05:13
18	receiver, and these are standard measurements.	14:05:17
19	Q Okay. And if -- let's turn to Page 8 of	14:05:19
20	exhibit -- of IPR Exhibit 2010. Okay?	14:05:24
21	A I'm there.	14:05:30
22	Q Okay. So what we see here, this -- I'm	14:05:31

1 looking at the top diagram, Figure 2-3, [REDACTED] 14:05:36

2 [REDACTED]. 14:05:41

3 Okay? Are you with me? 14:05:42

4 A Yes. 14:05:43

5 Q Okay. And the peak signal is about 14:05:44

6 [REDACTED], correct, that's what shown? 14:05:47

7 A That's what's shown here. 14:05:53

8 Q And the -- in Figure 2-3 on Page 18, 14:05:55

9 and 2-3 where it says: [REDACTED] 14:06:00

10 [REDACTED] 14:06:05

11 [REDACTED], correct? 14:06:09

12 (Reporter clarification.) 14:06:46

13 A So there's not a scale on this. 14:06:46

14 Q Look at the top left. I think it'll let 14:06:56

15 you cheat a little bit. 14:07:01

16 A Well, it gives me a [REDACTED] relative 14:07:02

17 level. 14:07:08

18 Q Sorry. In the chart, it says: [REDACTED] kind 14:07:08

19 of on the face of the chart. 14:07:11

20 And it says [REDACTED] 14:07:13

21 [REDACTED]? 14:07:17

22 A Right. At that spot, and so -- but I 14:07:17

Transcript of Dr. James Dickens
Conducted on July 18, 2025

61

1	don't see where the marker is on here. I see the	14:07:21
2	hand drawn, but I don't see the marker.	14:07:24
3	Normally there's a -- a dot somewhere, so	14:07:28
4	I can't see where that's being measured at on	14:07:30
5	this -- on this plot here.	14:07:33
6	Like, if you go over on the other Smith	14:07:35
7	chart plots, theres little X's or a dot. In here,	14:07:36
8	I don't see where that's at anywhere on here.	14:07:39
9	That's why I'm trying to figure out exactly what	14:07:42
10	that marker was, you know, because they draw a	14:07:45
11	[REDACTED] here by hand.	14:07:48
12	ATTORNEY CHARKOW: Okay. Let's take a	14:07:51
13	break. We've been going for about an hour.	14:07:53
14	THE WITNESS: Sounds great.	
15	ATTORNEY CHARKOW: Okay.	
16	THE WITNESS: How long of a break?	14:08:00
17	ATTORNEY CHARKOW: Let's go off the record	
18	and then we'll talk.	14:08:01
19	THE VIDEOGRAPHER: Going off the video	14:08:01
20	record. The time is 2:08 p.m.	14:08:02
21	(Recess from 2:08 p.m. until 2:20 p.m.)	14:08:06
22	THE VIDEOGRAPHER: Back on the video	14:20:07

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

1 record. The time is 2:20 p.m.

14:20:14

2 BY ATTORNEY CHARKOW:

14:20:17

3 Q During the break, did you have any
4 discussions with any of the lawyers, just yes or
5 no?

14:20:17

14:20:19

14:20:21

6 A No. No discussions. No conversations
7 with anybody.

14:20:21

14:20:24

8 Q Okay. Great.

14:20:25

9 So if you could -- let's go back to --
10 this is Page 7 of the [REDACTED] report, which is
11 Exhibit 2010.

14:20:26

14:20:29

14:20:34

12 A Okay. I'm on 2010. What page again?

14:20:38

13 Seven, you said?

14:20:41

14 Q Seven. The bottom left-hand corner of the
15 page.

14:20:42

14:20:46

16 A Yeah.

14:20:46

17 Q So just to make this easier, rather than
18 making you look at the charts, why we don't just
19 look at SNR at output on that page?

14:20:46

14:20:50

14:20:51

20 And under that, it says: [REDACTED]

14:20:54

21 [REDACTED].

14:20:58

22 Do you see that?

14:21:03

1	A Yes. I see that.	14:21:03
2	Q Okay. So what we see is that [REDACTED]	14:21:06
3	[REDACTED]	14:21:07
4	[REDACTED],	14:21:12
5	correct?	14:21:19
6	A Yes. On that -- on this, that's what that	14:21:19
7	represents.	14:21:22
8	Q Okay. And then [REDACTED]	14:21:23
9	[REDACTED]	14:21:27
10	[REDACTED]	14:21:30
11	[REDACTED], correct?	14:21:38
12	A Yes. I see that.	14:21:39
13	Q Okay. And [REDACTED] SNR, or signal to	14:21:40
14	noise ratio, means that the signal, the signal	14:21:50
15	that you're interested in, is [REDACTED]	14:21:50
16	[REDACTED], correct?	14:21:54
17	A Yes. Approximately.	14:22:05
18	Q Okay. And in your experience, [REDACTED]	14:22:06
19	[REDACTED]	14:22:15
20	[REDACTED]	14:22:20
21	[REDACTED], correct?	14:22:29
22	A Yes. For a [REDACTED] like this,	14:22:31

1	yes. I would agree that that's...	14:22:35
2	Q And this level of signal to noise ratio	14:22:38
3	suggests that the receiver preserved the signal	14:22:42
4	with high fidelity, correct?	14:22:47
5	ATTORNEY MAGEE: Objection to form.	14:22:50
6	A I don't think I could say if fidelity is	14:22:56
7	quite the right word, because fidelity has other	14:23:02
8	connotations when it comes to receivers,	14:23:08
9	distortion and stuff like that, that's not part of	14:23:10
10	noise. That's part of distortion. So that's --	14:23:11
11	that's a little deceiving, or, you know, not quite	14:23:13
12	accurate. I guess. Let me state it that way.	14:23:14
13	Q How would you make it more accurate?	14:23:16
14	A Well --	14:23:18
15	ATTORNEY MAGEE: Objection to form.	14:23:18
16	A Basically the [REDACTED] of	14:23:20
17	dynamic range, or of signal noise ratio, I'm	14:23:26
18	sorry, means that you can measure fairly, or you	14:23:30
19	can receive fairly small signals out of the noise,	14:23:33
20	and that noise floor, and it has good performance	14:23:36
21	from a signal to noise ratio standpoint. That's	14:23:39
22	what that means. But the fidelity is much more	14:23:43

1 complex than that. That's -- that's what I would
2 leave it at.

3 Q A [REDACTED] DB signal to noise ratio output for
4 a [REDACTED] DBM signal -- so that's input --
5 demonstrates that [REDACTED]

6 [REDACTED]
7 [REDACTED], correct?

8 ATTORNEY MAGEE: Objection to form.

9 A No. I can't agree necessarily with that.
10 And the problem is, again, you -- when you look at
11 the circuit, [REDACTED]

12 [REDACTED]
13 [REDACTED]
14 appears to have reasonable performance, good
15 performance.

16 But your statement goes further because
17 it's including all the way to the spectrum
18 analyzer. You have this filter, plus the two
19 other amplifiers. So all of that together would
20 represent a fairly good receiver chain, if you
21 will.

22 It doesn't necessarily tell you in terms

14:23:48

14:23:49

14:23:49

14:23:53

14:24:00

14:24:01

14:24:05

14:24:07

14:24:08

14:24:14

14:24:17

14:24:20

14:24:23

14:24:27

14:24:29

14:24:29

14:24:33

14:24:35

14:24:36

14:24:39

14:24:43

14:24:43

1 of receiver performance, receiving a weak signal,
2 the Eddie device by itself. Now, what it does
3 tell me is [REDACTED]
4 [REDACTED], is what it tells me.

5 Q Okay. And you -- I believe you just said
6 that the Eddie device by itself appears to have a
7 reasonable performance, correct?

8 A On this -- on this chart right here, what
9 these numbers tell me, that would be a reasonable
10 performance, because they go down and they [REDACTED]
11 [REDACTED], and they give
12 you all of the [REDACTED] throughout the report
13 when I analyzed it, and that's where I'm getting
14 that from, and not just from this right here.

15 Q Okay. But, like, when you put a chip into
16 a consumer device, that consumer device, similar
17 to what's being tested here, would also have
18 amplifiers and filters, correct?

19 ATTORNEY MAGEE: Objection to form.

20 A Well, presumably, yes, depending on the
21 type of device and how you might use that. So
22 it's much more than just the Eddie device. It's

14:24:48

14:24:52

14:24:56

14:24:57

14:25:00

14:25:02

14:25:03

14:25:06

14:25:09

14:25:13

14:25:16

14:25:19

14:25:22

14:25:25

14:25:27

14:25:29

14:25:33

14:25:37

14:25:39

14:25:40

14:25:43

14:25:45

1 all the circuitry that goes around that device,
2 right.

3 Q So this test that [REDACTED] conducting is
4 really sort of trying to get close to mimicking
5 what would be in some sort of consumer device,
6 correct?

7 ATTORNEY MAGEE: Objection to form.

8 A No. They're testing as much to a greater
9 level than what you would do for a consumer
10 device, putting this [REDACTED] in
11 and stuff like that. They wouldn't -- they
12 wouldn't -- these [REDACTED] are probably the tail
13 that wags the dog, if you will, in terms of cost.
14 So they're much more expensive than, you know,
15 probably the chip was.

16 Q Okay. So a [REDACTED] signal to noise ratio
17 output for a [REDACTED] DBM signal input
18 demonstrates that the Eddie device has good
19 sensitivity, correct?

20 ATTORNEY MAGEE: Objection to form.

21 A This in and of itself doesn't tell me
22 that, but in looking at the rest of the report, I

1	believe they had a table that showed its output	14:27:02
2	performance, its gain, versus different inputs.	14:27:05
3	So if you wanted to look at that, but this by	14:27:08
4	itself doesn't really tell you quite what you're	14:27:12
5	asking.	14:27:14
6	Q When you say the gain, what are you	14:27:15
7	referring to?	14:27:19
8	A Well, you put in a certain amount of	14:27:19
9	signal level, and out of your device, after you	14:27:22
10	mix down, it's called a conversion loss or	14:27:25
11	conversion gain, if it's an active or passive	14:27:28
12	device. And so that's what you're looking at for	14:27:32
13	your conversion efficiency, if you will, and	14:27:36
14	sensitivity comes into play, as well as signal to	14:27:41
15	noise ratio. So it's all of those taken together,	14:27:45
16	you have to consider when you're looking at	
17	sensitivity, not just signal to noise.	14:27:45
18	Q Okay. And where did you see that?	14:27:46
19	A In other parts of [REDACTED] documents in the	14:27:48
20	report. Let me go -- they did a [REDACTED],	14:27:52
21	and that [REDACTED] gives you indication of the	14:28:02
22	[REDACTED]. That's also gives you	14:28:08

1 information about the [REDACTED]

14:28:12

2 [REDACTED] as well.

14:28:15

3 And that's throughout the document. I'm
4 trying to find it. It is -- it was not in that
5 report. It's in the hand notes I believe.

14:28:16

14:28:17

14:28:36

6 Q Okay. You have the hand notes in front of
7 you, right?

14:28:40

14:28:42

8 A I have...

14:28:42

9 Right here on Page 10 of 39 on document
10 2022.

14:28:47

14:28:58

11 Q And what did you say this -- what did you
12 say this test is testing?

14:29:04

14:29:08

13 A Well, you can see here, you have the
14 signal generator coming in, and your spectrum
15 analyzer, after they have this buffer, you know,
16 goes through. And they have [REDACTED] megahertz they're
17 mixing with, and so then they get the signal
18 level.

14:29:10

14:29:12

14:29:16

14:29:19

14:29:22

14:30:00

19 And so you can see, like, at [REDACTED] DBM,
20 it's [REDACTED] DBM already in compression there. At
21 [REDACTED] DBM, at the top, they get [REDACTED], or
22 you know, basically [REDACTED], from the

14:29:23

14:29:26

14:29:48

14:29:35

1 middle. So that's kind of your conversion loss,
2 if you will.

3 Q Okay. Sorry. Just give me one second.

4 Okay. So if we go to -- so if we go back
5 to exhibit -- [REDACTED]?

6 A Okay. I'm there.

7 Q All right. If we go back to [REDACTED]

8 [REDACTED] and we look at [REDACTED]

9 [REDACTED],
10 that indicates that this is, you know, something
11 that could be used, or that's like the level that
12 could be used for a -- a consumer wireless device
13 in 1998 to 2000 time frame, correct?

14 ATTORNEY MAGEE: Objection to form.

15 A Yes. In general, I would agree with that
16 statement. That's correct.

17 Q Okay. So the -- let's go to Page 4 of --
18 sorry. Just give me a second.

19 ATTORNEY CHARKOW: You know, can we take a
20 break? I just want to go through -- I don't think
21 I'm far from ending.

22 So can we just take a -- can we do a

Transcript of Dr. James Dickens
Conducted on July 18, 2025

71

1	10-minute break?	14:32:12
2	I may have a few more questions, but it's	14:32:14
3	not going to be much longer.	14:32:19
4	THE WITNESS: No problem.	14:32:22
5	ATTORNEY CHARKOW: I just want to organize	14:32:23
6	a little bit.	14:32:25
7	THE VIDEOGRAPHER: Stand by.	14:32:26
8	We're going off the record. The time is	14:32:28
9	2:32 p.m.	14:32:37
10	(Recess from 2:32 p.m. until 2:43 p.m.)	14:32:39
11	THE VIDEOGRAPHER: Back on the video	14:43:12
12	record. The time is 2:43 p.m.	14:43:13
13	ATTORNEY CHARKOW: No further questions at	14:43:17
14	this time.	14:43:19
15	ATTORNEY MAGEE: Okay. Can we take just	14:43:19
16	maybe two/three minutes for me to look at my notes	14:43:21
17	to see if I have a redirect?	14:43:26
18	ATTORNEY CHARKOW: Okay.	14:43:30
19	ATTORNEY MAGEE: I don't want to waste	14:43:30
20	everyone's time, but...	14:43:32
21	THE VIDEOGRAPHER: Stand by.	14:43:32
22	Going off the record. The time is	14:43:33

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

Transcript of Dr. James Dickens
Conducted on July 18, 2025

72

1 2:43 p.m.

14:43:37

2 (Recess from 2:43 p.m. until 2:47 p.m.)

14:43:39

3 THE VIDEOGRAPHER: Back on the video
4 record. The time is 2:48 p.m.

14:48:22

14:48:24

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

14:48:29

6 BY ATTORNEY MAGEE:

7 Q Dr. Dickens, if I can direct you to
8 Exhibit 2010. I believe this was the [REDACTED]
9 testing document for the Eddie chip.

14:48:31

14:48:34

14:48:36

10 A I'm there.

14:48:39

11 Q Okay. In reviewing this document, were
12 you able to determine the circuit, schematic for
13 the circuit, that was actually tested by [REDACTED]?

14:48:40

14:48:44

14:48:46

14 ATTORNEY CHARKOW: Objection. Form.

14:48:50

15 A No. No. They didn't provide a schematic
16 of the actual test, device under test in the
17 report.

14:48:52

14:48:56

14:48:59

18 Q Okay. And you also reviewed the notes
19 that are marked Exhibit 2022; is that correct?

14:49:00

14:49:04

20 A Yes. That's correct.

14:49:11

21 Q Okay. And from reviewing Exhibit 2022,
22 were you able to determine the circuit, schematic

14:49:12

14:49:16

PLANET DEPOS

888.433.3767 | WWW.PLANETDEPOS.COM

ParkerVision Exhibit 2043
TI and NXP v. ParkerVision - IPR2024-00936

1	of the circuit that was tested by [REDACTED]?	14:49:18
2	ATTORNEY CHARKOW: Objection to form.	14:49:20
3	A No. Not -- not of the Eddie circuit.	14:49:25
4	They did provide in that document some matching	14:49:28
5	components. But no, I could not.	14:49:32
6	Q Okay. If I can just direct you to	14:49:35
7	Exhibit 2011, which I believe was Exhibit 1 to	14:49:39
8	this deposition.	14:49:45
9	A I'm there.	14:49:46
10	Q Okay. And based on your review of this	14:49:47
11	schematic and the [REDACTED] documents, can you	14:49:51
12	determine if this was the circuit that was tested	14:49:53
13	by [REDACTED]?	14:49:57
14	ATTORNEY CHARKOW: Objection to form.	14:49:58
15	A In my opinion, I don't believe this --	14:49:59
16	this circuit was the one that was actually tested,	14:50:04
17	that was represented to be, but I don't think it	14:50:06
18	was. And this looks to me, maybe an early version	14:50:10
19	or something. But I would just be speculating. I	14:50:15
20	don't know.	14:50:18
21	ATTORNEY MAGEE: Okay. I don't have any	14:50:18
22	further questions.	14:50:19

Transcript of Dr. James Dickens
Conducted on July 18, 2025

74

1	ATTORNEY CHARKOW: No further question.	14:50:19
2	ATTORNEY MAGEE: All right. We'll read	14:50:20
3	and sign.	14:50:21
4	THE VIDEOGRAPHER: Stand by to go off the	14:50:23
5	video record.	
6	This marks the end of the video deposition	14:50:23
7	of Dr. James Dickens. The time is 2:50 p.m.	14:50:25
8	(The videotaped deposition of DR. JAMES	14:50:33
9	DICKENS was adjourned at 2:50 p.m.)	
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC

2
3 I, Kadi A. Harmon, Certified Reporter and
4 Notary Public within and for the State of New York
5 do hereby certify:

6 That Dr. James Dickens, the witness whose
7 deposition is hereinbefore set forth, was duly
8 sworn by me before the commencement of such
9 deposition and that such deposition was taken
10 before me and is a true record of the testimony
11 given by such witness.

12 I further certify that the adverse party,
13 Texas Instruments Incorporated, was represented by
14 counsel at the deposition.

15 I further certify that the deposition of
16 Dr. James Dickens occurred remotely via Zoom on
17 Friday, the 18th day of July, 2025 commencing at
18 1:03 p.m. to 2:50 p.m.

19 I further certify that I am not related to any
20 of the parties to this action by blood or
21 marriage, I am not employed by or an attorney to
22 any of the parties to this action, and that I am

1 in no way interested, financially or otherwise, in
2 the outcome of this matter.

3
4 IN WITNESS WHEREOF, I have hereunto set my hand
5 this 20th day of July, 2025.

6
7 My commission expires:

8 December 18, 2026
9

10 
11 -----

12 NOTARY PUBLIC IN AND FOR THE
13 STATE OF NEW YORK
14
15
16
17
18
19
20
21
22

Transcript of Dr. James Dickens
Conducted on July 18, 2025

77

A	adverse 75:12	alone 50:17	9:19, 11:20, 12:2, 12:5,
ability 14:9, 14:10	after 14:20, 58:2, 68:9, 69:15	already 11:10, 69:20	12:8, 12:12, 18:15, 22:19,
able 24:10, 29:11, 49:5, 72:12, 72:22	again 9:10, 14:12, 29:13, 33:13, 34:19, 35:7, 36:2, 37:22, 51:6, 54:15, 62:12, 65:10	also 4:11, 6:21, 20:13, 20:14, 39:16, 43:6, 43:8, 50:13, 66:17, 68:22, 72:18	33:8, 51:10, 51:14, 51:18, 62:3, 62:4, 73:21, 75:19, 75:22
about 9:15, 9:19, 20:20, 29:21, 32:18, 33:16, 34:22, 35:19, 35:21, 35:22, 36:1, 38:10, 40:2, 40:4, 40:7, 41:14, 41:22, 49:10, 52:19, 54:3, 55:3, 60:5, 60:10, 61:13, 69:1	agree 7:14, 7:15, 13:16, 24:7, 49:20, 53:22, 54:1, 54:10, 57:12, 59:13, 64:1, 65:9, 70:15	alto 3:7	anybody 62:7
absolutely 47:8	ahead 11:16, 55:20	always 17:20, 17:21, 47:16	anymore 14:2, 14:6
according 55:1	all 2:2, 6:13, 9:1, 10:14, 10:20, 12:10, 12:14, 14:19, 15:9, 19:14, 20:7, 22:1, 22:16, 23:4, 24:15, 25:10, 27:1, 28:6, 31:1, 31:15, 38:7, 42:13, 44:5, 46:1, 47:10, 47:14, 48:15, 49:21, 50:18, 54:11, 54:20, 65:17, 65:19, 66:12, 67:1, 68:15, 70:7, 74:2	amongst 15:10, 27:3	anything 28:3, 33:8, 51:9, 51:13
accurate 8:11, 29:7, 34:1, 55:7, 64:12, 64:13	allow 24:16	amount 68:8	anywhere 61:8
accurately 39:21	allows 16:17	amplification 58:2, 67:10	appeal 1:3, 6:7
acknowledge 7:8, 7:19	almost 58:8	amplifier 67:12	appear 49:22
action 75:20, 75:22		amplifiers 65:11, 65:19, 66:11, 66:18	appears 46:20, 46:22, 65:14, 66:6
active 68:11		analysis 34:16, 49:11	appreciate 24:1
actual 38:14, 72:16		analyze 49:2, 51:20, 51:21	approximately 32:3, 41:9, 53:13, 54:5, 63:17
actually 72:13, 73:16		analyzed 21:8, 34:17, 66:13	around 37:14, 57:12, 58:16, 60:10, 63:4, 67:1
additional 67:10		analyzer 18:20, 18:22, 19:4, 46:21, 48:6, 53:7, 65:18, 69:15	art 12:8, 12:12
adjourned 74:9		another 11:11, 16:22, 31:12, 47:19, 51:7, 58:17	aside 25:10, 31:1, 31:2, 42:14, 44:5
admissibility 7:11		answer 29:12, 39:20	asked 12:7, 12:11, 29:20, 35:19, 41:19, 51:20
		any 8:10, 9:15,	asking 34:5, 34:19, 35:20, 36:1,

Transcript of Dr. James Dickens
Conducted on July 18, 2025

78

68:5 attached 5:9, 19:22, 20:2, 25:12, 31:5, 42:17, 42:19, 44:8, 44:10 attended 2:3 attending 6:14, 6:22 attorney 5:4, 5:5, 6:17, 6:20, 7:15, 7:16, 8:3, 12:3, 13:10, 14:14, 14:18, 15:18, 15:19, 15:21, 17:3, 20:3, 25:13, 28:11, 29:1, 30:7, 30:19, 31:6, 33:6, 33:19, 34:11, 35:5, 36:10, 37:2, 37:10, 37:20, 39:13, 39:15, 40:11, 41:3, 41:12, 42:20, 43:21, 44:11, 48:18, 48:21, 49:19, 50:11, 51:17, 53:19, 54:9, 55:13, 55:18, 56:6, 56:13, 57:13, 57:21, 58:11, 59:4, 59:10, 61:12, 61:15, 61:17, 62:2, 64:5, 64:15, 65:8, 66:19, 67:7, 67:20, 70:14, 70:19, 71:5, 71:13, 71:15, 71:18, 71:19, 72:6, 72:14, 73:2,	73:14, 73:21, 74:1, 74:2, 75:21 aware 8:16, 8:19, 9:1, 9:7, 10:18, 11:5 away 58:6 B b2 1:13 back 22:7, 38:16, 38:21, 46:3, 47:10, 50:20, 54:12, 54:15, 61:22, 62:9, 70:4, 70:7, 71:11, 72:3 balun 16:10, 16:13, 16:14, 16:17, 16:19, 17:5, 17:8, 17:9, 17:14, 18:18, 19:2, 19:7 baluns 19:9, 19:13 base 19:16, 19:17, 21:4, 57:18, 58:7, 58:9 based 7:11, 22:22, 23:2, 49:13, 73:10 basically 12:17, 13:4, 14:5, 14:12, 14:15, 16:16, 22:14, 24:7, 26:7, 59:16, 64:16, 69:22 battery 59:16 because 11:10, 17:9,	21:22, 22:18, 29:2, 34:1, 37:5, 38:1, 38:5, 38:15, 48:22, 51:2, 56:21, 61:10, 64:7, 65:16, 66:10 been 7:13, 8:6, 20:9, 20:13, 25:14, 31:7, 42:22, 43:3, 43:6, 49:8, 49:16, 51:22, 61:13 before 1:3, 2:10, 6:6, 8:6, 14:20, 14:22, 25:19, 43:11, 45:12, 53:6, 57:18, 75:8, 75:10 begins 6:2 behalf 3:3, 4:3, 6:19, 6:21 being 9:5, 16:1, 17:17, 27:20, 28:1, 28:8, 33:2, 33:21, 36:5, 36:21, 46:21, 50:7, 53:12, 54:6, 59:8, 61:4, 65:5, 66:17 believe 8:15, 10:13, 23:6, 38:18, 44:4, 66:5, 68:1, 69:5, 72:8, 73:7, 73:15 below 14:2, 19:15, 52:9	besides 12:6 better 12:19, 29:12, 56:15, 56:18 between 26:17, 40:14, 49:9, 56:22, 58:19, 59:1, 65:12 bit 60:15, 71:6 blood 75:20 blue 3:5, 6:20 board 1:3, 6:7, 19:11, 33:11, 49:1 bobby's 15:19 boeing 16:1, 16:9, 17:15, 18:4, 18:14, 23:7, 43:2, 45:14, 45:19, 47:11, 51:10, 51:14, 52:3, 52:18, 53:9, 53:16, 54:2, 55:1, 56:1, 56:3, 57:16, 59:6, 62:10, 63:3, 63:9, 68:19, 70:5, 70:7, 72:8, 72:13, 73:1, 73:11, 73:13 boeing's 67:3 boone 4:7 both 7:14, 9:12, 29:5, 43:9 bottom 47:17, 48:3,
--	---	---	--

Transcript of Dr. James Dickens
Conducted on July 18, 2025

79

62:14 boulevard 4:7 box 17:1, 22:15 break 61:13, 61:16, 62:3, 70:20, 71:1 breath 14:20, 14:22 buffer 69:15 buildings 58:19	can't 8:10, 14:1, 28:3, 38:7, 49:20, 51:7, 61:4, 65:9 capacitor 23:1, 23:2, 34:1, 37:17, 37:18, 41:11, 41:15, 48:19, 49:15, 50:2, 51:1, 51:6, 51:10, 51:15 capacitors 19:18, 21:5, 21:12, 21:17, 23:9, 23:11, 24:2, 24:8, 24:11, 33:3, 33:17, 34:9, 35:3, 35:21, 36:1, 40:9, 41:16, 42:2, 50:7, 50:10, 50:15, 50:16 case 6:7, 9:6, 9:12, 11:11, 12:1, 44:2, 45:18, 51:12 caveat 13:13, 34:3, 59:15 celia 3:12, 7:1 cell 57:2 certain 68:8 certainly 18:15, 23:7 certificate 75:1 certified 75:3 certify 75:5, 75:12, 75:15, 75:19	chain 65:20 changed 50:3 charkow 4:4, 5:4, 6:17, 7:15, 8:3, 14:18, 15:19, 15:21, 20:3, 25:13, 31:6, 37:10, 41:12, 42:20, 44:11, 61:12, 61:15, 61:17, 62:2, 70:19, 71:5, 71:13, 71:18, 72:14, 73:2, 73:14, 74:1 chart 25:19, 25:20, 25:22, 26:2, 27:2, 27:5, 27:14, 28:7, 28:18, 29:4, 31:13, 34:21, 36:3, 36:16, 36:18, 38:13, 46:11, 46:16, 47:3, 47:8, 47:18, 48:3, 48:11, 49:14, 49:18, 50:6, 50:9, 50:14, 53:1, 60:18, 60:19, 61:7, 66:8 charts 53:5, 53:7, 62:18 chat 20:4 cheat 60:15 chip 21:19, 22:8, 22:14, 23:14, 24:5, 24:13, 25:4, 37:18,	38:14, 45:15, 45:22, 51:1, 66:15, 67:15, 72:9 chips 59:8 circuit 19:10, 21:8, 27:19, 28:1, 34:18, 35:17, 51:22, 65:11, 72:12, 72:13, 72:22, 73:1, 73:3, 73:12, 73:16 circuitry 22:16, 22:19, 49:12, 67:1 circuits 19:12, 50:1 clarification 14:17, 30:11, 41:2, 41:20, 60:12 claudé 8:5 clear 50:3 clock 46:22, 47:1 close 57:20, 67:4 closer 50:17 coax 17:19, 17:21, 18:18 coaxial 16:8, 16:20, 17:16, 18:4 coefficient 22:6, 22:12 combine 19:3, 66:10 combiner 17:4 come 19:2
C			
cable 16:20, 17:19, 17:21 cables 17:16, 18:4, 25:6, 25:7 calculate 21:16, 39:8, 42:8 calculated 21:12, 37:6 calculates 63:10 calculation 34:13, 35:7, 37:5, 37:8, 37:12, 37:16, 38:1, 38:5, 38:21, 39:3, 39:11, 40:18 calculations 35:2, 41:7 calculator 39:2 california 3:7 call 18:2 called 68:10 camino 3:6			

Transcript of Dr. James Dickens
Conducted on July 18, 2025

80

comes 13:19, 64:8, 68:14 coming 17:17, 22:1, 35:22, 69:14 commencement 75:8 commencing 75:17 commercial 15:7, 56:12, 56:14, 56:16, 56:17, 56:20, 57:1 commission 76:7 completely 26:22 complex 26:8, 26:21, 26:22, 28:12, 29:3, 30:1, 30:3, 39:18, 40:4, 40:7, 41:22, 42:9, 65:1 component 26:11 components 73:5 compression 69:20 computer 39:2 conducted 1:18, 2:1 conducting 67:3 confirm 51:13 conform 51:9 connected 21:6, 22:17, 25:5, 25:6, 33:7 connection 57:19	connectivity 58:9 connector 16:22 connectors 16:20, 16:21 connotations 64:8 consider 48:15, 55:14, 55:17, 55:21, 68:16 considered 10:2, 48:22 consistent 10:16, 10:22 consumer 56:15, 56:21, 56:22, 57:6, 57:9, 59:8, 66:16, 67:5, 67:9, 70:12 contains 29:22 conversations 62:6 conversion 54:7, 68:10, 68:11, 68:13, 70:1 corner 47:17, 62:14 cost 67:13 could 35:3, 54:11, 57:17, 62:9, 64:6, 70:11, 70:12, 73:5 couldn't 50:1, 50:8, 57:14 counsel 6:15, 7:6, 7:10, 8:1, 75:14 couple 27:7 court 2:11, 7:2, 7:5,	7:17, 7:22 creates 16:16 current 26:8 D daignault 4:6, 6:18 dallas 3:16 date 6:9 day 75:17, 76:5 db 63:11, 63:13, 63:18, 64:16, 65:3, 67:16, 70:8 dbm 52:14, 54:21, 55:3, 55:5, 55:10, 56:10, 57:8, 60:6, 60:11, 60:16, 60:20, 62:21, 63:4, 63:20, 65:4, 67:17, 69:19, 69:20, 69:21, 70:9 deceiving 64:11 december 76:8 decibel 55:5 declaration 8:17, 8:22, 9:3, 9:8, 9:22, 10:5, 10:6, 10:10, 10:11, 10:15, 10:17, 10:21, 11:1, 11:3, 11:4, 11:8, 11:10, 11:13, 11:22, 15:22, 16:5,	16:7 declarations 8:19, 10:1, 11:20, 12:2, 12:5 definitely 24:16 degree 16:16 demodulate 13:6 demodulated 13:9 demonstrates 59:7, 65:5, 67:18 dependant 38:2 depending 66:20 depos 6:13, 7:3 deposed 8:6 deposition 1:16, 2:1, 5:11, 6:3, 6:14, 8:21, 19:21, 20:1, 20:10, 20:14, 25:11, 25:15, 31:4, 31:8, 42:16, 42:18, 43:1, 43:2, 43:4, 43:7, 44:7, 44:9, 45:4, 45:6, 46:4, 73:8, 74:6, 74:8, 75:7, 75:9, 75:14, 75:15 describe 19:6 described 25:9 describing 14:13, 14:15, 14:16, 15:12
---	---	---	---

Transcript of Dr. James Dickens
Conducted on July 18, 2025

81

desired 15:15 detail 47:4 details 48:1 detect 65:6 detected 13:8, 56:11, 57:9 determine 72:12, 72:22, 73:12 device 13:19, 14:10, 16:1, 16:14, 17:17, 18:5, 19:18, 21:5, 22:1, 23:3, 27:20, 28:1, 28:8, 28:9, 28:19, 29:16, 30:5, 30:13, 30:17, 31:21, 32:7, 32:20, 33:2, 33:4, 33:15, 33:18, 34:7, 34:9, 34:20, 35:3, 36:4, 36:6, 36:20, 36:21, 40:2, 40:7, 40:9, 41:14, 41:15, 41:16, 41:22, 42:2, 42:12, 43:18, 45:22, 48:8, 48:13, 48:20, 49:4, 49:7, 49:11, 51:9, 51:14, 53:12, 53:17, 53:18, 54:6, 56:2, 56:4, 58:6, 59:9, 65:5, 65:13, 66:2, 66:3, 66:6,	66:16, 66:21, 66:22, 67:1, 67:5, 67:10, 67:18, 68:9, 68:12, 70:12, 72:16 devices 15:8, 59:12 diagram 44:3, 45:19, 60:1 dickens 1:17, 2:1, 5:3, 5:11, 6:4, 8:5, 14:19, 19:21, 20:1, 25:11, 31:4, 42:16, 42:18, 44:7, 44:9, 72:7, 74:7, 74:9, 75:6, 75:16 difference 26:17, 49:9 different 12:21, 13:13, 13:14, 17:6, 19:13, 19:14, 40:16, 49:22, 50:1, 68:2 differential 16:2, 16:9, 16:17, 16:18, 17:8, 17:11, 17:13, 17:18, 18:6, 18:12, 19:1, 19:3 differently 13:14 diodes 14:4 direct 72:7, 73:6 directly 22:2, 33:7 discuss 45:21 discussed 15:22, 32:17,	46:16, 46:18 discussions 62:4, 62:6 distance 58:22 distinguish 56:22 distortion 64:9, 64:10 document 42:14, 43:11, 69:3, 69:9, 72:9, 72:11, 73:4 documents 9:6, 19:20, 20:4, 42:15, 44:12, 45:11, 68:19, 73:11 dog 67:13 doing 35:2, 38:8, 38:20, 58:10 done 34:13, 34:16, 35:7, 37:8, 38:3, 59:12 dot 61:3, 61:7 down 19:15, 52:9, 52:21, 54:6, 66:10, 68:10 dozen 8:9 dr 1:17, 2:1, 5:3, 6:3, 8:14, 8:16, 9:2, 9:7, 9:14, 9:19, 10:1, 10:6, 10:11, 10:16, 11:1, 14:19, 72:7, 74:7, 74:8, 75:6, 75:16 draw 61:10	drawn 22:21, 25:9, 61:2 drive 16:17, 18:13, 19:1 duly 75:7 during 62:3 dynamic 13:17, 13:18, 14:8, 15:6, 64:17, 69:1 E each 11:22 earlier 11:22 early 73:18 easier 62:17 eastern 6:10 eddie 16:1, 17:17, 18:5, 19:17, 21:4, 22:1, 33:1, 33:4, 33:15, 33:17, 34:7, 34:9, 34:20, 35:3, 36:4, 36:6, 36:20, 36:21, 37:18, 40:1, 40:6, 40:9, 41:13, 41:15, 41:16, 41:22, 42:2, 42:12, 43:18, 45:15, 45:22, 48:8, 48:13, 48:20, 49:3, 49:4, 49:7, 49:10, 51:9, 51:14, 53:17, 54:6,
--	---	--	---

Transcript of Dr. James Dickens
Conducted on July 18, 2025

82

56:2, 56:4, 59:8, 65:5, 65:13, 66:2, 66:3, 66:6, 66:22, 67:18, 72:9, 73:3 edge 58:8 efficiency 68:13 either 39:2, 49:15 el 3:6 employed 75:21 end 74:6 ending 70:21 entity 11:12 envelope 38:21 equals 52:13, 62:20 equivalent 58:13 esquire 3:4, 3:10, 3:11, 3:12, 3:13, 4:4, 4:5 est 1:20 evaluating 15:7 even 38:3, 50:16, 65:6 ever 8:14, 9:14, 9:18, 22:18, 25:18 every 44:2, 45:18 everyone's 71:20 everything 21:1	exact 35:17 exactly 15:11, 57:14, 61:9 examination 5:3 exhibit 5:11, 5:12, 5:13, 5:14, 5:15, 5:16, 5:17, 5:18, 5:19, 19:21, 20:1, 20:10, 20:11, 20:14, 20:15, 20:20, 21:6, 22:15, 23:4, 23:15, 24:6, 24:14, 24:19, 25:1, 25:11, 25:14, 25:15, 27:6, 28:17, 29:15, 30:5, 30:13, 30:16, 31:2, 31:4, 31:7, 31:8, 31:12, 32:4, 32:12, 32:17, 32:18, 39:4, 39:5, 39:6, 39:7, 40:20, 42:16, 42:18, 42:22, 43:1, 43:3, 43:4, 43:5, 43:6, 43:7, 43:8, 43:14, 44:7, 44:9, 44:14, 45:4, 45:5, 45:6, 45:7, 45:14, 46:4, 46:5, 46:9, 47:11, 48:12, 50:6, 51:15, 52:3, 52:22, 54:12, 59:20, 62:11, 70:5, 72:8,	72:19, 72:21, 73:7 exhibits 46:6 exist 50:9 expect 34:14, 34:15, 35:8, 35:9, 35:11, 35:13, 35:17, 36:7, 36:22, 38:9, 38:11, 38:19, 39:22, 49:6 expensive 67:14 experience 63:18 expert 8:17, 9:2, 9:8, 9:22, 11:11 expires 76:7 explain 58:4 extremely 22:13 F face 60:19 fact 19:18, 21:5, 48:5, 50:19 factor 48:16 factually 28:20, 28:22, 29:2 fairly 64:18, 64:19, 65:20 familiar 46:14 far 58:6, 58:22, 70:21 farthest 58:15	fault 15:19 few 29:21, 71:2 fidelity 64:4, 64:6, 64:7, 64:22 figure 23:15, 48:1, 48:16, 51:11, 52:10, 53:1, 53:11, 54:4, 60:1, 60:8, 61:9 files 44:19 filter 65:12, 65:18, 66:11 filters 66:18 financially 76:1 find 34:16, 69:4 fine 23:21 firm 6:18 first 7:5, 23:17, 31:20, 46:3 fish 3:14, 7:1 floor 60:10, 63:3, 63:9, 64:20 flow 26:8 focusing 33:22 form 12:4, 13:10, 14:14, 15:18, 17:3, 28:11, 29:1, 30:7, 30:19, 33:6, 33:19, 34:11, 35:5, 36:10,
--	--	---	---

Transcript of Dr. James Dickens
Conducted on July 18, 2025

83

37:2, 37:20, 39:13, 39:16, 40:11, 41:3, 43:21, 48:18, 48:21, 49:19, 50:11, 51:17, 53:19, 54:9, 55:13, 55:19, 56:6, 56:13, 57:13, 57:21, 58:11, 59:4, 59:10, 64:5, 64:15, 65:8, 66:19, 67:7, 67:20, 70:14, 72:14, 73:2, 73:14 formally 7:6 forming 44:1, 45:17, 47:22 forms 22:12 formulate 36:14 forth 75:7 four 25:5 frame 70:13 frequencies 19:11 frequency 19:14, 27:19, 38:2, 47:1, 53:10, 53:16, 53:18 friday 1:19, 75:17 front 20:16, 39:3, 43:9, 45:9, 69:6 function 17:14 further 65:16, 71:13,	73:22, 74:1, 75:12, 75:15, 75:19 furthest 57:17 G gain 68:2, 68:6, 68:11 galton 8:14, 8:16, 9:2, 9:7, 9:14, 9:19, 11:1 galton's 10:1, 10:6, 10:11, 10:16 gave 8:21, 46:6 general 12:22, 15:9, 18:17, 27:21, 28:4, 59:14, 70:15 generally 13:16, 14:8, 17:21, 19:9, 28:2, 57:11 generator 52:13, 54:16, 54:21, 69:14 getting 44:19, 51:5, 66:13 gigahertz 19:15 give 8:10, 17:11, 17:13, 19:20, 29:18, 36:14, 42:13, 42:14, 45:2, 59:16, 66:11, 70:3, 70:18 given 75:11 gives 29:4, 60:16,	68:21, 68:22 go 8:20, 9:10, 11:16, 19:3, 22:2, 23:14, 24:5, 24:13, 29:10, 38:16, 46:3, 47:10, 50:20, 54:15, 55:20, 56:14, 61:6, 61:17, 62:9, 66:10, 68:20, 70:4, 70:7, 70:17, 70:20, 74:4 goes 13:21, 65:16, 67:1, 69:16 going 14:21, 19:20, 20:19, 38:10, 39:15, 41:8, 42:13, 42:14, 58:12, 61:13, 61:19, 71:3, 71:8, 71:22 good 64:20, 65:14, 65:20, 67:18 goodness 15:12 grade 56:16, 57:1, 57:2 graphs 38:16 great 21:2, 38:8, 61:14, 62:8 greater 67:8 griswold 3:10, 6:22 ground 17:22, 21:7, 22:2, 22:11 group 3:5, 6:21	guess 40:14, 52:7, 64:12 guessing 50:4 gupta 3:11, 7:1 H hand 61:2, 61:11, 69:5, 69:6, 76:4 handle 14:9, 14:10 hardin 4:12, 6:13 harmon 1:24, 2:10, 7:3, 75:3 harmonic 53:21 head 38:3, 38:8, 38:22 heard 8:14, 23:16, 23:17 here 6:2, 8:11, 9:2, 12:6, 16:9, 22:21, 23:5, 25:9, 26:3, 27:15, 30:2, 38:18, 48:8, 49:5, 49:10, 49:14, 50:8, 50:18, 53:15, 54:20, 59:22, 60:7, 61:1, 61:5, 61:7, 61:8, 61:11, 66:8, 66:14, 66:17, 69:9, 69:13 hereby 75:5 hereinbefore 75:7
---	---	--	---

hereunto 76:4 hertz 60:11, 60:21, 62:21, 63:4 hey 23:22 high 13:16, 14:12, 22:12, 22:13, 64:4 high-level 13:11 higher 15:14, 19:11, 23:12, 24:3, 24:9, 53:17 higher-end 56:16 hold 45:1 hour 61:13 house 16:20 huge 59:1 hypothesize 51:21 I ian 8:14 identification 19:22, 20:2, 25:12, 31:5, 42:17, 42:19, 44:8, 44:10 identity 7:13 imaginary 26:9, 29:22, 30:3, 30:22, 34:2, 34:7, 35:1, 35:10, 35:15, 36:6, 36:19, 37:14, 38:12, 38:20,	39:10, 40:22 impedance 21:16, 21:17, 21:18, 23:9, 23:11, 23:12, 24:2, 24:3, 24:9, 26:3, 26:7, 26:8, 26:10, 26:14, 26:18, 28:9, 28:20, 29:21, 30:14, 30:18, 31:22, 32:6, 32:13, 33:1, 33:10, 34:6, 34:21, 34:22, 35:14, 36:4, 37:6, 37:13, 39:18, 40:1, 40:5, 40:6, 40:7, 41:13, 42:1, 50:19 impedances 51:2 impedence 21:12, 26:6, 26:11, 26:19, 26:21, 27:22, 29:4, 33:15, 36:20, 37:13, 37:18, 38:19, 41:10, 41:21, 42:9, 42:11, 49:22 impedences 38:1 implies 11:21 inc 1:5, 1:6, 1:9, 6:5 including 65:17 incomplete 28:2 incorporated 6:5, 75:13 incorrect 28:21, 42:4	indicate 16:8, 17:8, 17:18, 18:6, 40:13, 40:15 indicated 48:7 indicates 15:15, 63:20, 70:10 indication 68:21 individually 9:13 infinite 19:8 information 69:1 inner-modulation 68:22 input 14:6, 17:12, 18:12, 18:21, 22:1, 23:13, 24:4, 24:12, 25:6, 27:19, 27:22, 28:9, 30:14, 30:18, 31:21, 31:22, 32:6, 32:13, 32:20, 32:22, 33:1, 33:9, 33:15, 34:6, 34:20, 34:22, 35:17, 36:4, 36:20, 37:13, 37:17, 38:14, 38:16, 38:18, 40:1, 40:6, 41:10, 41:13, 41:21, 42:9, 42:11, 46:20, 46:22, 47:2, 48:7, 48:9, 48:12, 50:21, 52:7, 52:10, 52:18, 53:16, 54:4, 54:16, 56:7, 58:1,	63:20, 65:4, 67:17, 70:9 inputs 21:18, 23:12, 24:3, 24:19, 48:14, 68:2 inside 18:1 instance 22:6 instead 7:7, 26:22 instrument 18:19 instruments 1:5, 6:4, 6:21, 75:13 interested 13:20, 63:15, 76:1 ip3 68:22 iphone 57:1 ipr 1:12, 5:12, 5:13, 5:16, 5:17, 5:18, 5:19, 6:8, 8:17, 9:3, 9:8, 9:16, 9:20, 11:3, 12:9, 12:13, 20:11, 20:12, 20:15, 43:5, 43:8, 45:5, 45:8, 46:5, 47:16, 54:12, 59:20 iprs 20:21, 43:14, 47:12, 51:13, 52:4 isolation 38:17 it'll 60:14 itself 65:13, 66:2,
--	--	--	--

Transcript of Dr. James Dickens
Conducted on July 18, 2025

85

66:6, 67:21, 68:4 iyer 4:6, 6:18	37:17, 44:12, 50:5, 51:5, 53:20, 58:8, 58:20, 59:15, 61:10, 64:11, 64:16, 67:14, 69:15, 69:22, 70:10, 70:19, 73:20 knowing 38:1 known 25:21	49:13, 52:2, 54:15, 59:19, 61:12, 61:17, 62:9, 70:17 level 13:16, 14:3, 14:12, 58:12, 58:16, 58:21, 59:17, 60:17, 64:2, 65:13, 67:9, 68:9, 69:18, 70:11 lewis 3:12, 7:1 lieu 7:6 limiting 14:5 lines 17:16 list 10:1 little 16:22, 23:21, 33:13, 56:14, 56:17, 60:15, 61:7, 64:11, 71:6 llp 3:5, 4:6 loaded 50:22 long 23:21, 61:16 longer 71:3 look 9:10, 12:7, 12:8, 12:11, 20:18, 22:4, 22:5, 27:5, 32:11, 40:17, 46:14, 47:3, 47:20, 47:22, 50:14, 51:1, 52:12, 54:3, 54:4, 60:14, 62:18, 62:19,	65:10, 68:3, 70:8, 71:16 looked 47:7 looking 12:22, 13:12, 13:15, 34:21, 38:14, 38:17, 50:5, 60:1, 67:22, 68:12, 68:16 looks 19:7, 73:18 lose 44:20 loss 68:10, 70:1 lost 57:19 lot 58:2 low 13:4, 66:3 lower 21:17, 21:20, 35:8, 35:9, 35:12, 35:14
J	L		M
james 1:17, 2:1, 5:3, 6:3, 8:5, 74:7, 74:8, 75:6, 75:16 jason 4:4, 6:17 job 1:22 josh 6:22 joshua 3:10 july 1:19, 6:9, 75:17, 76:5 jump 14:21, 14:22	labeled 22:14, 23:14, 24:5, 24:13, 25:15, 27:7, 31:8, 53:1 large 13:1, 13:2, 13:22, 14:3 larger 34:14 last 39:6 law 3:5, 6:21 lawyers 62:4 least 28:15, 52:18 leave 65:2 leaving 29:3 left 22:15, 22:17, 23:14, 23:15, 24:5, 60:14 left-hand 24:14, 47:17, 62:14 less 38:11, 38:20, 39:18 let's 45:21, 46:3,		made 19:10, 46:21 magee 3:4, 5:5, 6:20, 7:16, 12:3, 13:10, 14:14, 15:18, 17:3, 28:11, 29:1, 30:7, 30:19, 33:6, 33:19, 34:11, 35:5, 36:10, 37:2, 37:20, 39:13, 39:15, 40:11, 41:3, 43:21, 48:18, 48:21, 49:19, 50:11, 51:17, 53:19, 54:9, 55:13,
K			
kadi 1:24, 2:10, 7:3, 75:3 keep 29:5, 33:22 kilohm 36:19, 39:10 kilohms 37:15, 38:11, 38:20 kind 19:10, 60:18, 70:1 know 9:4, 12:20, 13:12, 16:6, 17:22, 18:13, 19:15, 20:5, 20:20, 25:16, 31:9, 34:3, 34:4, 34:19, 35:2, 37:12,			

Transcript of Dr. James Dickens
Conducted on July 18, 2025

86

55:18, 56:6, 56:13, 57:13, 57:21, 58:11, 59:4, 59:10, 64:5, 64:15, 65:8, 66:19, 67:7, 67:20, 70:14, 71:15, 71:19, 72:6, 73:21, 74:2 magnitude 21:21, 40:5, 40:8 main 3:15 make 10:14, 10:20, 11:19, 16:15, 20:18, 37:5, 62:17, 64:13 makes 19:12, 22:8 making 19:4, 19:9, 62:18 mandir 4:5, 6:18 many 8:8, 44:19 marked 19:21, 20:1, 25:11, 31:4, 42:16, 42:18, 44:7, 44:9, 72:19 marker 61:1, 61:2, 61:10 marks 74:6 marriage 75:21 match 47:1 matching 33:8, 40:14, 73:4 matter 6:4, 76:2	maybe 11:21, 41:19, 71:16, 73:18 mean 18:9, 29:19, 34:14, 49:21, 50:4, 50:12, 51:18 means 63:14, 64:18, 64:22 measure 13:14, 15:10, 46:20, 64:18 measured 33:10, 35:14, 60:10, 61:4, 63:4 measurement 16:8, 18:19, 53:2, 53:11, 60:9 measurements 19:5, 59:18, 60:2 media 6:2 megahertz 19:15, 27:11, 27:18, 28:8, 28:18, 29:16, 30:4, 30:12, 30:17, 31:21, 32:6, 32:12, 32:19, 37:7, 37:16, 39:9, 40:22, 41:1, 41:7, 41:9, 42:8, 52:14, 52:19, 53:13, 54:3, 55:3, 69:16 mention 16:10 meter 18:20 metrics 15:6, 15:9,	15:11 mhz 27:18 micah 4:12, 6:12 microfarad 22:20, 22:22, 23:2, 37:7, 38:6, 38:12, 38:19, 41:10, 42:10, 48:19 microfarads 21:7, 21:9, 21:11, 21:15, 33:4, 33:18, 34:10, 35:4, 36:8, 37:1, 37:19, 40:10, 41:17, 42:3, 42:5, 49:17 middle 17:1, 52:7, 70:1 might 51:22, 66:21 mill 40:2 milliohm 42:6, 42:7 milliohms 39:18, 40:4, 40:7, 41:9, 41:14, 41:22, 42:8 million 63:15 milliwatts 55:6 mimicking 67:4 mini 19:12 minimal 13:8 minus 28:12, 30:3, 35:15, 57:14, 60:16, 61:11,	69:19, 69:20, 69:21, 69:22 minute 29:18, 71:1 minutes 71:16 missing 11:20 mix 68:10 mixed 53:20 mixer 53:21 mixing 69:17 mkr 60:18 monitor 6:10 more 8:9, 14:6, 33:13, 64:13, 64:22, 66:22, 67:14, 71:2 mountains 58:18 much 21:20, 24:8, 39:19, 64:22, 66:22, 67:8, 67:14, 71:3 must 49:8 N na 46:21, 48:6 name 8:4, 8:20, 9:5, 9:11 narrow 49:21 nearly 22:16 necessarily 18:8, 18:10, 65:9, 65:22
---	---	---	--

Transcript of Dr. James Dickens
Conducted on July 18, 2025

87

necessary 50:15 need 37:12, 37:16 negative 27:10, 34:7, 35:1, 36:5, 36:19, 37:15, 39:10, 40:21, 52:13, 54:21, 55:2, 55:10, 56:10, 57:8, 60:6, 60:11, 60:20, 62:21, 63:4, 63:19, 65:4, 67:17, 70:9 network 33:8, 40:14, 46:21, 48:6 never 22:8 new 2:12, 75:4, 76:13 next 7:18, 52:22 nine 35:15 noise 12:15, 12:17, 12:18, 12:19, 12:20, 12:22, 13:2, 15:5, 15:14, 15:16, 56:7, 57:22, 60:10, 62:20, 63:2, 63:9, 63:10, 63:14, 63:16, 63:19, 64:2, 64:10, 64:17, 64:19, 64:20, 64:21, 65:3, 66:4, 67:16, 68:15, 68:17, 70:8 normal 13:21	normally 61:3 notary 2:11, 75:1, 75:4, 76:12 note 16:7 notes 43:17, 44:3, 69:5, 69:6, 71:16, 72:18 notice 2:10, 49:3 number 6:3, 19:8, 26:22, 30:1, 34:14, 34:16, 35:10, 35:18, 39:17, 40:19, 41:6, 45:7, 57:12 numbers 6:7, 27:7, 28:13, 32:11, 66:9 nxp 1:6 O object 7:10, 39:15 objection 12:3, 12:4, 13:10, 14:14, 15:18, 17:3, 28:11, 29:1, 30:7, 30:19, 33:6, 33:19, 34:11, 35:5, 36:10, 37:2, 37:20, 39:13, 40:11, 41:3, 43:21, 48:18, 48:21, 49:19, 50:11, 51:17, 53:19, 54:9, 55:13, 55:18, 56:6, 56:13, 57:13, 57:21, 58:11, 59:4, 59:10, 64:5, 64:15, 65:8, 66:19, 67:7, 67:20, 70:14, 72:14, 73:2, 73:14 obstacles 59:1 obviously 12:19, 14:1 occurred 75:16 office 1:1, 6:6 oh 52:9 ohm 28:20, 30:6, 30:14, 30:18, 31:22, 36:4, 36:5, 36:18, 39:9, 51:4 ohms 27:10, 27:11, 27:22, 28:9, 28:12, 29:4, 30:2, 32:3, 32:7, 32:14, 33:2, 33:16, 34:8, 34:22, 35:1, 35:14, 37:14, 40:21, 50:22, 51:3, 51:6 one 13:11, 13:12, 16:15, 16:21, 26:2, 26:11, 31:1, 38:2, 44:20, 48:5, 48:14, 50:12, 51:7, 59:3, 59:5, 63:15, 70:3, 73:16 only 29:8	open 25:16, 25:17, 31:10, 31:11 operates 13:20 opinion 19:17, 21:4, 21:16, 21:22, 73:15 opinions 9:15, 9:19, 10:7, 10:12, 44:1, 45:17, 47:4, 47:22, 48:2, 48:17, 51:8, 51:12 opposed 57:1 organize 71:5 other 11:11, 12:2, 12:5, 16:22, 26:14, 27:3, 42:15, 61:6, 64:7, 65:19, 68:19 others 15:10 otherwise 19:4, 76:1 out 17:17, 34:17, 49:5, 49:6, 51:4, 53:2, 53:11, 60:1, 60:9, 61:9, 64:19, 68:9 outcome 76:2 outer 56:10, 57:8 output 14:6, 16:2, 17:12, 17:13, 18:5, 18:12, 25:7, 38:15, 53:12, 53:18,
---	--	---

Transcript of Dr. James Dickens
Conducted on July 18, 2025

88

53:20, 54:5, 62:19, 63:10, 63:19, 65:3, 65:12, 67:17, 68:1, 70:9 outputs 25:1 outside 18:1, 33:20, 34:12, 35:6, 36:11, 37:3, 37:21, 40:12, 41:4 over 13:21, 38:7, 61:6, 63:15 overall 26:10 owner 1:10, 4:3 P page 5:3, 5:11, 44:2, 45:18, 46:8, 46:11, 47:14, 47:17, 47:19, 48:4, 48:11, 50:6, 52:3, 52:6, 52:22, 54:12, 59:19, 60:8, 62:10, 62:12, 62:15, 62:19, 69:9, 70:17 pages 1:23, 47:15, 47:16 pair 46:6 palo 3:7 parkervision 1:9, 6:5, 6:19 parkervision's 43:18, 45:15, 45:22 part 23:17, 26:14,	29:3, 29:8, 29:19, 29:22, 30:6, 30:18, 30:20, 32:1, 32:2, 32:7, 32:9, 32:14, 32:15, 32:16, 33:21, 33:22, 34:2, 34:3, 34:7, 35:1, 36:6, 36:19, 36:20, 37:15, 38:12, 38:20, 39:9, 39:10, 40:20, 40:22, 47:8, 64:9, 64:10 particular 8:20, 15:13, 28:7, 33:10, 47:8, 50:2 parties 2:2, 6:13, 75:20, 75:22 parts 9:11, 26:9, 29:5, 68:19 party 75:12 passive 68:11 past 22:8 patent 1:1, 1:3, 1:10, 4:3, 6:6, 6:7, 8:18, 9:3, 9:9, 9:16, 9:20, 10:5, 10:7, 10:10, 10:12, 10:16, 10:22, 12:9, 12:13 patents 1:13, 12:1 path 66:12 peak 3:5, 6:20,	60:5, 63:8 penalties 7:9, 7:20 percent 22:6 performance 15:7, 59:17, 63:21, 64:20, 65:14, 65:15, 66:1, 66:7, 66:10, 68:2 performing 55:2 performs 54:6 perjury 7:10, 7:20 petitioners 1:7, 3:3 phase 16:16 phone 57:2 pi 38:5 picture 28:3 place 65:12 planet 6:13, 7:3 play 68:14 please 6:15, 7:6, 8:4, 54:13 plot 5:14, 5:15, 25:16, 25:21, 31:9, 32:21, 47:19, 51:2, 61:5 plots 61:7 plus 65:18 pmb 3:6	point 22:9 pool 14:21 port 48:7 portion 26:19 positions 10:15, 10:16, 10:21, 10:22 possible 58:7 possibly 57:18 potential 59:5 power 13:19, 14:6, 18:19, 22:7, 52:13, 54:17, 54:21, 55:2, 58:12, 58:15, 63:20 practically 58:5 prepared 10:4, 10:9 preparing 51:8, 51:12 present 4:11 preserved 64:3 presumably 66:20 pretty 57:20 previous 32:18, 46:5 previously 46:17, 46:19 prior 12:8, 12:12 probably 8:9, 39:6, 67:12, 67:15 problem 45:2, 65:10,
--	---	---	--

Transcript of Dr. James Dickens
Conducted on July 18, 2025

89

71:4 proceeding 7:12, 11:13 proportional 41:8 protection 14:4 provide 72:15, 73:4 provided 8:17, 9:2, 9:8, 9:15, 9:19, 11:10, 20:9, 20:13, 25:14, 31:7, 34:18, 39:5, 39:6, 42:22, 43:3, 43:6, 49:2, 49:7, 49:11 providing 47:4, 48:1, 48:17 public 2:11, 75:1, 75:4, 76:12 pursuant 2:10 put 14:6, 20:4, 25:10, 31:1, 31:2, 42:14, 44:5, 44:13, 58:17, 66:15, 68:8 putting 67:10 Q question 14:20, 23:16, 23:20, 29:9, 33:12, 33:13, 34:4, 36:2, 36:14, 39:20, 41:18, 57:6, 74:1 questions 20:20, 23:21,	29:11, 29:21, 71:2, 71:13, 73:22 quick 38:21 quickly 38:4 quite 23:17, 28:3, 34:1, 34:5, 64:7, 64:11, 68:4 R ran 56:8 range 13:17, 13:18, 13:21, 14:8, 14:9, 14:10, 15:6, 56:11, 57:9, 57:11, 57:15, 58:15, 64:17, 69:1 ranges 19:14 rather 62:17 ratio 12:15, 12:17, 12:18, 12:19, 13:1, 15:5, 15:14, 63:10, 63:14, 63:19, 64:2, 64:17, 64:21, 65:3, 66:4, 67:16, 68:15, 70:9 ration 58:1 re-ask 29:9, 57:5 reactance 26:19 reactants 26:15, 26:16 read 74:2	reading 9:11 readjust 29:11 ready 8:1, 15:3, 15:4, 46:1 real 3:6, 26:9, 26:22, 29:8, 29:17, 29:19, 29:22, 30:2, 30:6, 30:18, 30:20, 32:1, 32:2, 32:7, 32:9, 32:14, 32:15, 32:16, 33:21, 33:22, 34:2, 34:22, 36:19, 37:13, 39:9 realized 49:8 really 26:18, 33:22, 67:4, 68:4 reason 8:10, 11:15 reasonable 57:11, 59:14, 65:14, 66:7, 66:9 recall 9:10, 9:11, 16:3, 16:11 receive 16:18, 64:19 receiver 13:3, 13:7, 13:9, 15:5, 15:13, 59:18, 63:21, 63:22, 64:3, 65:20, 66:1 receiver-type 59:12 receivers 56:12, 57:10,	64:8 receiving 56:5, 66:1 recess 61:21, 71:10, 72:2 recognize 9:5 reconcile 49:1 record 55:5, 61:17, 61:20, 62:1, 71:8, 71:12, 71:22, 72:4, 74:5, 75:10 redirect 71:17 redo 41:7 refer 47:15 references 12:8, 12:12 referring 17:5, 47:15, 68:7 reflected 22:7 reflection 22:5, 22:12 regardless 37:11 regime 13:21 related 8:17, 9:8, 9:16, 9:20, 10:7, 10:11, 12:9, 12:12, 43:17, 75:19 relative 15:16, 60:16 remember 9:12, 29:20, 50:13 remote 6:12
--	--	---	--

Transcript of Dr. James Dickens
Conducted on July 18, 2025

90

remotely 2:3, 6:14, 75:16 removed 50:15, 50:16 report 16:10, 17:16, 18:4, 18:14, 23:8, 45:14, 45:19, 47:7, 49:3, 49:4, 49:10, 52:3, 53:9, 54:2, 54:13, 62:10, 63:9, 66:12, 67:22, 68:20, 69:5, 70:5, 70:8, 72:17 reported 1:24 reporter 2:11, 7:2, 7:5, 7:7, 7:17, 7:22, 14:17, 30:11, 41:2, 41:20, 60:12, 75:1, 75:3 reports 47:11 represent 6:16, 34:17, 65:20 represented 73:17, 75:13 representing 6:13, 7:3, 38:13 represents 30:1, 63:7 require 19:2 resistance 26:7, 26:12, 26:18 resisters 50:21 resolve 13:5, 14:2	rest 67:22 restate 23:20, 23:22, 24:1 review 8:20, 10:6, 10:11, 38:16, 44:2, 45:18, 73:10 reviewed 72:18 reviewing 72:11, 72:21 rf 15:13, 48:7 richardson 3:14, 7:1 right 9:1, 9:2, 10:2, 14:19, 18:3, 20:7, 22:19, 23:4, 25:10, 27:1, 28:6, 31:1, 31:15, 33:12, 34:5, 35:4, 35:20, 42:13, 44:5, 44:6, 46:1, 46:17, 46:18, 47:10, 47:14, 48:15, 50:5, 50:12, 52:12, 54:11, 54:20, 54:21, 55:16, 57:3, 58:4, 58:9, 58:17, 60:22, 64:7, 66:8, 66:14, 67:2, 69:7, 69:9, 70:7, 74:2 right-hand 27:6, 31:17 rishi 3:11, 6:22 robert 3:4, 6:20 running 63:3	S said 15:11, 17:10, 28:14, 29:7, 34:4, 53:22, 54:1, 62:13, 66:5 same 20:19, 40:18, 45:7, 54:13 save 44:20 saved 44:21 saving 20:6 saw 17:19, 36:7, 36:22 say 17:20, 18:9, 23:22, 29:19, 40:2, 48:6, 49:13, 51:7, 57:14, 64:6, 68:6, 69:11, 69:12 saying 17:15, 18:3, 35:15, 46:19, 58:14, 58:15 says 11:4, 12:18, 40:21, 50:22, 51:4, 52:7, 52:13, 54:16, 60:9, 60:18, 60:20, 62:20 scale 60:13 scenario 59:5 schematic 22:18, 24:18, 24:22, 33:5, 34:10, 36:22, 50:20, 51:5,	51:16, 51:19, 72:12, 72:15, 72:22, 73:11 schematics 18:15, 36:7, 40:10, 49:2 scope 33:20, 34:12, 35:6, 36:11, 37:3, 37:21, 39:16, 40:12, 41:4 score 13:2 scroll 52:21 second 32:4, 36:14, 40:17, 40:20, 45:2, 70:3, 70:18 see 20:22, 24:19, 25:1, 27:7, 27:8, 27:10, 27:11, 27:12, 30:2, 30:9, 31:15, 31:17, 31:19, 35:18, 38:3, 52:2, 52:8, 52:9, 52:10, 52:15, 53:1, 53:3, 53:4, 53:14, 53:15, 54:20, 59:22, 61:1, 61:2, 61:4, 61:8, 62:22, 63:1, 63:2, 63:12, 68:18, 69:13, 69:19, 71:17 seeing 49:14 seem 49:10, 56:22 seems 56:19
--	---	---	--

Transcript of Dr. James Dickens
Conducted on July 18, 2025

91

seen 18:16, 25:18, 43:11, 45:11, 53:5, 53:7 sense 13:11 sensitive 65:6 sensitively 14:2 sensitivity 13:3, 13:7, 15:6, 67:19, 68:14, 68:17, 69:2 set 31:20, 32:5, 32:11, 40:17, 75:7, 76:4 sets 31:16 seven 62:13, 62:14 shift 16:16 short 22:5 shorthand 75:1 shouldn't 17:20 show 34:1, 50:20 showed 17:16, 18:4, 36:3, 36:16, 36:18, 68:1 showing 48:9, 48:12 shown 21:6, 22:17, 23:3, 26:3, 27:15, 33:4, 34:10, 40:10, 48:1, 49:15, 51:11, 51:15, 60:6, 60:7 shows 27:14, 28:7,	28:18, 29:15, 30:5, 30:13, 30:16, 31:20, 32:5, 32:12, 34:2, 49:18, 53:9, 53:12, 54:2, 54:5 shunting 22:11 side 16:21, 16:22, 24:14, 27:6, 31:15, 31:18 sign 74:3 signal 12:15, 12:18, 12:19, 13:1, 13:5, 13:8, 13:22, 14:9, 14:11, 15:5, 15:14, 15:15, 16:2, 16:9, 16:15, 16:18, 17:8, 17:11, 17:18, 18:1, 18:7, 23:13, 24:4, 24:10, 24:12, 24:16, 27:19, 28:8, 28:19, 29:16, 30:4, 30:12, 30:17, 31:21, 32:6, 32:13, 32:19, 32:20, 32:22, 35:22, 39:9, 40:22, 49:5, 49:6, 52:13, 52:18, 54:4, 54:5, 54:16, 54:21, 55:2, 55:10, 55:15, 55:16, 55:22, 56:1, 56:3, 56:5, 56:7, 56:8, 57:17, 57:22, 58:1, 59:2,	59:7, 60:5, 63:8, 63:10, 63:13, 63:14, 63:19, 63:20, 64:2, 64:3, 64:17, 64:21, 65:3, 65:4, 66:1, 66:4, 66:12, 67:16, 67:17, 68:9, 68:14, 68:17, 69:14, 69:17, 70:8, 70:9 signals 16:14, 16:15, 22:1, 56:11, 57:9, 64:19, 65:7 signature-plkal 76:10 signed 12:6 similar 66:16 simple 63:22 simply 13:1 single 18:18, 18:20, 22:18 single-ended 17:11, 17:12, 17:20, 17:22, 18:2, 18:21 singled-ended 19:5 sitting 8:11, 9:1 small 13:4, 13:22, 14:1, 58:1, 64:19 smaller 24:8, 34:15, 35:18, 39:19, 39:21, 39:22, 50:19	smith 25:20, 25:22, 26:2, 27:2, 27:5, 27:14, 28:7, 28:18, 29:4, 31:12, 34:21, 36:3, 36:16, 36:18, 38:12, 38:13, 46:11, 46:16, 47:3, 47:8, 47:18, 48:3, 48:11, 49:14, 49:18, 50:5, 61:6 snr 12:16, 52:7, 52:10, 53:1, 53:11, 54:16, 60:1, 60:9, 62:19, 63:13 some 9:5, 11:11, 19:11, 23:20, 38:15, 42:15, 43:17, 59:1, 67:5, 73:4 someone 9:5 something 10:1, 17:6, 57:2, 58:13, 70:10, 73:19 somewhere 39:2, 61:3 sorry 11:16, 27:15, 29:18, 35:11, 35:13, 36:13, 37:9, 37:11, 40:3, 43:22, 46:2, 47:7, 55:14, 55:18, 60:18, 64:18, 70:3, 70:18 sort 59:11, 67:4, 67:5
--	---	--	---

Transcript of Dr. James Dickens
Conducted on July 18, 2025

92

sounds 61:14 source 22:7 sp1 21:18, 23:12, 24:3, 24:10 sp2 21:18, 23:13, 24:4, 24:10 special 19:10 specific 56:20 spectrum 18:20, 18:22, 19:4, 53:7, 65:17, 69:14 speculating 51:7, 73:19 speculation 50:4 splitter 17:5 spot 60:22 stand 71:7, 71:21, 74:4 standard 6:11, 59:11, 59:18 standpoint 64:21 start 14:3, 14:4 state 2:12, 6:16, 8:4, 16:5, 16:7, 50:12, 64:12, 75:4, 76:13 statement 10:19, 11:2, 13:15, 28:5, 30:8, 36:12, 49:20, 55:8, 57:4, 59:13, 59:15, 65:16,	70:16 states 1:1, 6:6 station 57:18, 58:7, 58:9 stephanie 4:5, 6:18 still 51:1 stipulate 7:6 street 3:15 strength 13:8 strengths 14:9, 14:11 strike 15:20, 16:6, 19:16, 19:19, 21:3, 23:1, 23:9, 27:16, 27:17, 28:16, 29:14, 29:17, 30:10, 30:14, 30:15, 33:14, 36:2, 36:15, 36:16, 42:12, 42:21, 43:2, 45:3, 47:20, 48:10, 51:11, 52:11, 53:10, 55:9, 56:2, 57:7 strong 63:20 stronger 15:15, 63:16 stuff 64:9, 67:11 submitted 10:5, 10:9 successfully 13:5 suggests 64:3 suite 3:15, 4:7	supplemental 11:4, 11:7, 11:9, 11:12, 11:21 sure 10:14, 10:20, 11:19, 20:19, 23:17, 37:5 swearing 7:7 sworn 7:4, 75:8 system 12:21 systems 13:13 T table 68:1 tail 67:12 take 14:19, 14:21, 17:10, 17:12, 61:12, 70:19, 70:22, 71:15 taken 68:15, 75:9 takes 16:14, 17:10 talk 61:18 talked 9:14, 9:18, 29:20, 32:18 talking 56:15, 58:21 tell 28:3, 33:3, 33:9, 33:16, 34:8, 35:21, 40:8, 40:18, 41:15, 42:1, 42:5, 50:1, 50:18, 65:22, 66:3, 66:9, 67:21, 68:4	telling 35:21 tells 49:21, 66:4 terms 34:5, 65:22, 67:13 test 23:7, 28:19, 29:16, 30:5, 30:13, 30:17, 32:7, 32:20, 35:16, 45:14, 52:19, 53:16, 55:2, 56:3, 56:7, 58:10, 59:12, 63:3, 67:3, 68:20, 68:21, 69:12, 72:16 tested 16:1, 17:17, 27:20, 28:1, 28:8, 33:2, 36:5, 36:21, 50:8, 51:10, 51:14, 53:12, 54:6, 65:6, 66:17, 72:13, 73:1, 73:12, 73:16 testimony 7:9, 7:19, 8:11, 75:10 testing 25:4, 31:22, 43:18, 45:21, 52:18, 53:17, 56:2, 57:16, 57:22, 59:6, 59:7, 67:8, 69:12, 72:9 tests 59:11, 59:16 texas 1:5, 3:16, 6:4, 6:21, 75:13 th 6:9, 75:17,
---	--	--	---

Transcript of Dr. James Dickens
Conducted on July 18, 2025

93

76:5 thank 7:17, 7:22 thanks 15:2, 41:5 themselves 6:16 theres 61:7 they'd 21:20 things 27:1, 27:3 think 39:5, 40:14, 41:18, 45:1, 56:21, 56:22, 60:14, 64:6, 70:20, 73:17 thinking 38:10 third 32:11 thought 46:19 three 15:10, 31:16, 65:11, 71:16 through 29:10, 69:16, 70:20 throughout 66:12, 69:3 time 6:9, 6:11, 10:4, 10:9, 61:20, 62:1, 70:13, 71:8, 71:12, 71:14, 71:20, 71:22, 72:4, 74:7 times 8:8, 38:5, 38:6, 38:7, 63:16 titled 11:18 today 6:12, 6:22,	7:3, 7:19, 8:12 today's 6:9 together 65:19, 68:15 told 30:9, 51:19 took 10:17, 11:1, 58:6 top 52:6, 53:1, 60:1, 60:14, 69:21 total 50:3 towers 57:2 tp 22:2, 23:13, 24:4, 24:12, 24:13, 24:19, 35:18 tp1 25:1 tp2 25:1 track 44:20 trademark 1:1, 6:6 transcript 5:9, 7:11, 19:22, 20:2, 25:12, 31:5, 42:17, 42:19, 44:8, 44:10 transformers 19:12, 19:13 transmitter 58:20 transmitting 59:2 trial 1:3, 6:7 true 7:9, 7:19, 75:10	truthful 8:11 try 51:20 trying 36:13, 38:4, 49:1, 58:4, 61:9, 67:4, 69:4 turn 14:4, 46:8, 47:14, 52:2, 54:11, 59:19 two 8:9, 12:6, 16:14, 16:15, 16:21, 17:16, 18:3, 18:4, 19:5, 19:20, 20:4, 24:19, 25:1, 25:6, 25:7, 28:12, 38:2, 44:16, 44:18, 50:21, 65:18, 71:16 two-tone 68:20, 68:21 type 19:10, 19:12, 25:18, 25:21, 58:16, 66:21 types 19:13 U under 7:9, 7:20, 27:7, 28:19, 29:16, 30:5, 30:13, 30:17, 31:22, 32:4, 32:7, 32:20, 53:17, 62:20, 72:16 underneath 52:12 understand 47:18, 52:17, 52:20, 53:21,	58:14 understanding 11:9, 11:17, 32:21, 43:22 understood 15:1, 32:19 united 1:1, 6:5 until 61:21, 71:10, 72:2 upper 27:6, 31:17 usa 1:6 use 16:10, 17:7, 17:8, 19:11, 56:20, 59:8, 66:21 useless 22:18 using 21:11, 21:15, 49:4, 51:22, 55:2, 56:3, 63:8 usually 14:4 V value 23:1, 23:3, 32:14, 35:12, 37:13 values 23:5, 26:3, 31:16, 31:20, 32:5, 40:18, 51:10, 51:15, 63:9 various 8:19, 19:9 verified 7:13 verizon 57:2 version 73:18
---	---	--	---

Transcript of Dr. James Dickens
Conducted on July 18, 2025

94

versus 68:2 via 75:16 video 6:10, 6:14, 61:19, 61:22, 71:11, 72:3, 74:5, 74:6 videoconference 2:2 videographer 4:12, 6:2, 6:12, 7:2, 61:19, 61:22, 71:7, 71:11, 71:21, 72:3, 74:4 videotaped 1:16, 6:3, 74:8 vienna 4:8 view 23:1, 23:3 viewing 12:21 virginia 4:8 virtually 1:18, 2:2 visualize 26:3, 27:2 voice-identify 6:15 W wags 67:13 wait 45:1 wang 3:13, 6:22 want 11:19, 12:19, 70:20, 71:5, 71:19 wanted 68:3	waste 71:19 way 7:12, 11:18, 13:12, 19:14, 22:20, 25:8, 25:9, 50:12, 50:14, 51:7, 56:21, 58:17, 59:14, 64:12, 65:17, 76:1 ways 12:21, 13:14, 19:9 we'll 61:18, 74:2 we're 52:22, 58:21, 71:8 we've 61:13 weak 55:10, 55:14, 55:16, 55:21, 56:5, 56:8, 59:6, 66:1 weakest 57:16, 65:7 went 58:6 weren't 24:12, 24:15 whatever 13:19, 49:4 whenever 8:1 whereas 16:9 whereof 76:4 whether 9:7 whole 47:7 wi-fi 56:12, 57:10, 58:6, 58:7, 58:9, 58:19	wireless 15:7, 59:9, 70:12 within 12:20, 75:4 without 33:8, 35:2, 51:1, 51:6 witness 7:4, 7:7, 7:8, 7:18, 7:21, 37:4, 41:6, 61:14, 61:16, 71:4, 75:6, 75:11, 76:4 witness's 7:12 word 64:7 work 23:4, 23:6, 25:18 works 19:18, 21:5 wouldn't 38:19, 50:9, 51:2, 67:11, 67:12 wrong 41:19 X x's 61:7 Y yao 3:13, 6:22 yeah 10:18, 15:9, 25:20, 26:21, 37:22, 39:7, 41:3, 44:19, 62:16 york 2:12, 75:4, 76:13 Z zoom 20:22, 75:16	. .1 21:7, 21:9, 21:11, 21:15, 22:20, 22:22, 23:2, 34:15, 35:16, 37:1, 37:7, 38:6, 38:12, 38:19, 40:15, 41:10, 42:5, 42:9 0 0.1 33:4, 33:18, 34:9, 35:4, 36:8, 37:19, 40:9, 41:16, 42:2, 48:19, 49:17 00935 1:12, 5:12, 5:16, 5:19, 6:8, 43:5 00936 1:12, 5:13, 5:17, 5:18, 6:8 03 1:20, 6:10, 75:18 08 61:20, 61:21 1 1 1:20, 6:10, 75:18 1.042 37:15 1.4 38:20 1.4026 36:19, 39:10 10 38:6, 69:9, 71:1 100 32:5, 37:7,
---	--	--	--

Transcript of Dr. James Dickens
Conducted on July 18, 2025

95

40:22, 41:1, 41:6, 42:8, 52:13, 54:21, 55:3, 55:10, 56:10, 57:8, 57:14, 63:19, 65:4, 67:17, 70:9 115.8 62:21 115.9 60:11, 60:20, 63:4 15 69:19 150 32:12, 37:7 151 61:11 16 41:9, 41:14, 41:22, 42:6, 42:7, 42:8, 47:14, 47:17, 48:11, 50:6 17 47:17 1717 3:15 177 8:18, 9:3, 9:16, 10:5, 10:7, 10:15, 11:22, 12:9 18 1:19, 6:9, 60:8, 75:17, 76:8 180 16:16 19 5:12 1915.940 27:11 1998 70:13 2 2 61:20, 61:21,	62:1, 71:9, 71:10, 71:12, 72:1, 72:2, 72:4, 74:7, 74:9, 75:18 2-2 52:10 2-3 53:1, 53:11, 54:4, 60:1, 60:8, 60:9 20 5:13, 61:21, 62:1, 76:5 2000 70:13 2010 5:18, 5:19, 44:14, 44:15, 44:16, 45:5, 45:7, 45:14, 47:11, 48:12, 50:6, 52:3, 52:22, 54:12, 59:20, 62:11, 62:12, 72:8 2011 5:12, 5:13, 20:11, 20:15, 20:20, 21:6, 22:15, 23:4, 24:6, 24:14, 24:19, 25:1, 51:15, 73:7 202 4:9 2022 5:16, 5:17, 43:5, 43:8, 43:14, 46:5, 46:9, 69:10, 72:19, 72:21 2024 1:12, 5:12, 5:13, 5:16, 5:17, 5:18, 5:19, 6:8, 43:5 2025 1:19, 6:9,	75:17, 76:5 2026 76:8 214 3:17 22182 4:8 230 33:2, 33:16, 37:14 230.94 31:22, 36:18, 39:9 231 32:3, 37:14 25 5:14, 76:5 270 4:9 281 3:8 29.3 69:22 3 30 69:21, 69:22 30.46 32:16 30.469 32:13 3036 3:8 31 5:15 32 39:18, 40:2, 40:4, 40:7, 71:9, 71:10 3790 3:6 39 69:9 4 4.94 53:13, 54:5 40 69:21	4026 37:15 42 5:16, 5:17 43 71:10, 71:12, 72:1, 72:2 44 5:18, 5:19 450 4:7 47 72:2 48 30:14, 34:22, 36:4, 51:3, 51:5, 72:4 48.2 30:2 48.242 27:10, 28:9, 28:19, 30:6, 30:18, 30:21 49 50:22 5 50 31:21, 37:6, 37:15, 38:5, 39:8, 51:3, 60:16, 74:7, 74:9, 75:18 500 41:9 5000 3:15 5070 3:17 528 9:9, 9:20, 10:10, 10:12, 10:21, 11:3, 11:22, 12:13 55.1 60:6 5666 4:9
--	--	---	--

Transcript of Dr. James Dickens
Conducted on July 18, 2025

96

592285 1:22 6 60 64:16 60.7 63:10, 63:13, 63:18, 65:3, 67:16, 70:8 63 22:14, 23:14, 24:5, 24:13 64 50:21 65 32:10, 50:21 65.156 32:7, 40:21 66 22:2, 23:13, 24:4, 24:12, 24:19, 35:18 67 21:5, 21:10, 21:12, 21:17, 22:2, 22:4, 22:17, 23:11, 23:13, 24:2, 24:4, 24:11, 24:13, 24:19, 33:17, 35:3, 35:11, 36:8, 37:1, 49:15, 50:7, 69:16 68 21:6, 21:9, 21:13, 21:17, 22:4, 22:17, 23:12, 24:2, 24:11, 33:17, 35:3, 35:12, 36:8, 37:1, 49:15, 50:7 7 7,865,177 1:13	7-3 48:1, 48:16 719.91 40:21 72 5:5 747 3:17 75201 3:16 76 1:23 8 8229 4:7 846 3:6 9 9,118,528 1:13 9.4 28:12, 30:3, 30:22, 35:1, 36:5 9.4004 27:11, 34:8 914.95 52:14 915 52:19, 54:3, 55:3 915.94 32:18 915.940 28:7, 28:18, 29:15, 30:4, 30:12, 30:16 935 20:11, 20:12, 45:8 936 20:15, 43:8, 45:5 94306 3:7 972 3:8	99.999 22:6	
---	--	-----------------------	--