1 UNITED STATES PATENT AND TRADEMARK OFFICE

2 _____

BEFORE THE PATENT TRIAL AND APPEAL BOARD

3 _____

4 TEXAS INSTRUMENTS, INC.,
And NXP USA, INC.,

5 Petitioners,

6 V.

7 PARKERVISION, INC.,
Patent Owner,

8

IPR2024-00935

9 IPR2024-00936
Patent 7,865,177 B2

10

11 ----------

12 ORAL AND VIDEOTAPED DEPOSITION OF

13 IAN GALTON, PH.D.

14 JULY 16, 2025

15 TAKEN VIA ZOOM VIDEOCONFERENCE

16 ----------

17

18

19 JOB NO.: 592284

20 PAGES: 1 - 103
REPORTED STENOGRAPHICALLY BY:

21 ANNETTE PELTIER, CSR, CRR

22

1 ORAL AND VIDEOTAPED DEPOSITION OF DR. IAN
2 GALTON, produced as a witness at the instance of
3 the ParkerVision, Inc., and duly sworn, was
4 taken in the above-styled and numbered cause on
5 July 16, 2025, from 10:57 a.m. to 1:17 p.m.
6 Central Standard time, before Annette Peltier,
7 CSR, Texas Certified Realtime Reporter, in and
8 for the State of Texas, reported by machine
9 shorthand pursuant to the PTAB Rules of Civil
10 Procedure and the provisions stated on the
11 record or attached hereto.
12
13
14
15
16
17
18
19
20
21
22


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 A P P E A R A N C E S

2

ON BEHALF OF THE PETITIONERS:

3

ROBERT MAGEE, ESQUIRE
4 Blue Peak Law Group LLP
3790 El Camino Real
5 PMB 846
Palo Alto, CA 94306
6 650.332.1701

7

ON BEHALF OF THE RESPONDENT:

8

JASON CHARKOW, ESQUIRE
9 STEPHANIE MANDIR, ESQUIRE
Daignault Iyer LLP
10 8229 Boone Boulevard
Suite 450
11 Vienna, VA 22182
929.280.1024

12

13 ALSO PRESENT:

14 Lucas Shaker, Videographer

15 Joshua A. Griswold
Rishi Gupta
16 Yao Wang
Celia Lewis
17 Fish & Richardson P.C.

18

19

20

21

22


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 Index

Page

2

Appearances..... 3

3

Examination by Mr. Charkow..... 7

4

Adjournment..... 100

5

Signature Page..... 101

6

Court Reporter's Certificate..... 102

7

Exhibits

8

Number Description Page

9 Exhibit 1 US Patent 7,865,177..... 10

10 Exhibit 2 US Patent 9,188,528..... 13

11 Exhibit 3 Petitioner's Reply to Patent Owner's Response..... 14

12

Exhibit 4 US Patent 6,230,000..... 15

13

Exhibit 5 Fundamentals of Microelectronics

14 Behzad Razavi..... 39

15 Exhibit 6 Petition for Inter Partes Review of United States

16 Patent No. 9,118,528 Pursuant To 35 U.S.C. 311-319, 37

17 C.F.R. 42..... 49

18 Exhibit 7 Article, A 900-MHz CMOS Direct Conversion Receiver.. 62

19

Exhibit 8 Low-Power RF-ICs in Wireless

20 Transceivers..... 65

21 Exhibit 9 Transcript of Ian Galton, Ph.D., February 28, 2025.... 89

22



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

Exhibit 10 US Patent 7,065,327..... 91

* * * * *



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 THE COURT REPORTER: Do you want a 10:57:53
2 copy of today's deposition? 10:57:54
3 MR. MAGEE: Yes, we do. 10:57:56
4 THE COURT REPORTER: Okay. Do you 10:57:58
5 want realtime today? 10:58:06
6 MR. MAGEE: Yeah, that would be 10:58:07
7 great. 10:58:09
8 * * * * * 11:08:02
9 THE VIDEOGRAPHER: Here begins 11:08:02
10 Media Number 1 in the videotaped deposition of 11:08:13
11 Dr. Ian Galton, Ph.D., in the matter of Texas 11:08:17
12 Instruments Incorporated versus ParkerVision, 11:08:22
13 Inc., in the United States Patent and Trademark 11:08:23
14 Office, before the Patent Trial and Appeal Board 11:08:25
15 for IPR Number 2024-00935, and 2024-00936. 11:08:28
16 Today's date is July 16th, 2025, 11:08:37
17 and the time on the video monitor is 11:08 a.m., 11:08:42
18 Central. 11:08:45
19 The remote videographer today is 11:08:45
20 Lucas Shaker, representing Planet Depos. 11:08:48
21 All parties of this video 11:08:50
22 deposition are attending remotely. 11:08:51


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 Would counsel please 11:08:54
2 voice-identify themselves for the record and 11:08:54
3 state whom they represent, starting with the 11:08:54
4 taking attorney. 11:08:58
5 MR. CHARKOW: Jason Charkow, on 11:08:58
6 behalf of the Daignault Iyer firm, on behalf of 11:09:01
7 ParkerVision. 11:09:05
8 MR. MAGEE: Robert Magee of Blue 11:09:06
9 Peak Law Group on behalf of Texas Instruments. 11:09:10
10 Also attending today are Josh Griswold, Rishi 11:09:11
11 Gupta, Yao Wang, and Celia Lewis. 11:09:15
12 THE VIDEOGRAPHER: Thank you, 11:09:18
13 counsel. 11:09:19
14 The court reporter today is 11:09:19
15 Annette Peltier, representing Planet Depos. 11:09:21
16 The witness will now be sworn. 11:09:22
17 IAN GALTON, PH.D., 11:09:25
18 Having been first duly sworn, testified upon his 11:09:25
19 oath as follows: 11:09:26
20 EXAMINATION 11:09:26
21 BY MR. CHARKOW: 11:09:27
22 Q. Can you please state your name for the 11:09:27


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 record? 11:09:41
2 A. Ian Galton. 11:09:41
3 Q. Okay. And is there any reason that you 11:09:44
4 can't give truthful and accurate testimony 11:09:45
5 sitting here today? 11:09:47
6 A. No. 11:09:48
7 Q. Okay. So are you aware that -- strike 11:09:49
8 that. 11:09:54
9 Do you know a Dr. James Dickens? 11:09:54
10 A. No. 11:09:58
11 Q. You never heard of him? 11:09:58
12 A. Not that I recall. 11:10:02
13 Q. All right. Are you aware that Dr. Dickens 11:10:03
14 provided an expert declaration in the 935 IPR? 11:10:06
15 A. The -- 935? No. 11:10:11
16 Q. Are you aware that anybody other than 11:10:16
17 yourself provided a declaration in the 935 IPR? 11:10:19
18 A. I'm sorry, the -- sorry to be confused. 11:10:23
19 What is the 935 IPR? 11:10:30
20 Q. It's the IPR in the '177 patent. 11:10:32
21 A. Oh, oh. Yeah, there was another expert, 11:10:35
22 because I didn't want to sign the protective 11:10:38


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 order. I -- I'm not -- I don't know him and -- 11:10:41
2 and I -- I didn't even know what his name was, 11:10:44
3 or I didn't remember. 11:10:46
4 Q. Okay. So are you aware that another 11:10:47
5 expert provided an expert declaration in the IPR 11:10:52
6 related to the '528 patent? 11:10:54
7 A. I -- I assume he did, but I -- I was not 11:10:58
8 involved in any part of it, so -- so I don't 11:11:01
9 know much about it. 11:11:03
10 Q. Okay. And you didn't list -- strike that. 11:11:04
11 You didn't review Dr. Dickens' 11:11:08
12 declaration, correct? 11:11:11
13 A. No, never seen it. 11:11:12
14 Q. So you have no idea what it says, right? 11:11:13
15 A. That's correct. 11:11:16
16 Q. Okay. Are you aware that ParkerVision had 11:11:16
17 a chip known as "Eddie"? 11:11:19
18 MR. MAGEE: Objection to form. 11:11:22
19 A. No. 11:11:23
20 Q. (BY MR. CHARKOW) Okay. And do you -- did 11:11:23
21 you look at any documents related to 11:11:26
22 ParkerVision's Eddie chip? 11:11:28

1 A. No. 11:11:29
2 Q. Okay. And were you asked to look at 11:11:29
3 documents related to ParkerVision's conception 11:11:33
4 and reduction to practice of the claims of the 11:11:35
5 '177 patent? 11:11:39
6 A. No. 11:11:40
7 Q. Were you asked to look at documents 11:11:40
8 related to ParkerVision's conception and 11:11:43
9 reduction to practice of the claims of the '528 11:11:45
10 patent? 11:11:50
11 A. No. 11:11:50
12 Q. Okay. So if you could open up the '177 11:11:50
13 patent, please. That would have been in the 11:11:57
14 chat. That's going to be Exhibit 1 to your 11:11:59
15 deposition, and is Exhibit 1001 in the IPR. 11:12:01
16 A. It's open. 11:12:06
17 Q. Great. 11:12:06
18 (Whereupon Exhibit Number 1 was 11:12:07
19 marked for identification.) 11:12:09
20 Q. (BY MR. CHARKOW) And if you could turn to 11:12:09
21 figure 83E, which is on PDF Page 118. 11:12:10
22 A. Hold on. 83E, you say? 11:12:16

1 Q. 83E. Correct. 11:12:31
2 A. Okay. 11:12:32
3 Q. On Page 118, PDF. 11:12:32
4 A. I'm there. 11:12:37
5 Q. All right. So 83E, you've seen that 11:12:37
6 diagram before, right? 11:12:42
7 A. Yeah. 11:12:45
8 Q. Okay. And your understanding, that that's 11:12:45
9 showing the charging and discharging of the 11:12:48
10 capacitor in ParkerVision's receiver technology? 11:12:53
11 A. Probably. 11:12:56
12 I mean, I'd have to go back and 11:12:57
13 refresh my memory of -- of what the text that 11:12:59
14 points to it says. I can do that if you want. 11:13:02
15 Q. Yeah. 11:13:04
16 There's a -- I -- fortunately, I made 11:13:04
17 it searchable; so if you put "83E," you may be 11:13:06
18 able to find it pretty quickly. 11:13:10
19 A. Okay. And I'm just wondering, what figure 11:13:42
20 does it refer to? What -- what embodiment, do 11:13:45
21 you know? 11:13:48
22 Q. I -- I don't know. 11:13:48

1 A. Because without that, I'm not going to be 11:13:53
2 able to comment to -- 11:13:55
3 Q. Well, it refers to the -- it's in the 11:14:00
4 energy transfer embodiment section. 11:14:02
5 A. Okay. Yeah. 11:14:07
6 Oh, well, why don't you ask your 11:14:08
7 question; and if I have to figure out what 11:14:10
8 figure it -- it refers to, I'll -- I'll ask for 11:14:12
9 a pause to do that. 11:14:16
10 Q. Well, let me ask you this: 83E shows 11:14:18
11 charging and discharging. 11:14:21
12 Do you see that? 11:14:23
13 A. I do. 11:14:23
14 Q. Right. And charging and dis- -- 11:14:24
15 MR. MAGEE: Object to form. 11:14:26
16 Q. (BY MR. CHARKOW) -- charging -- strike 11:14:27
17 that. 11:14:28
18 Charging and discharging indicates the 11:14:28
19 presence of a load, correct? 11:14:30
20 MR. MAGEE: Objection to form. 11:14:33
21 A. We'd have to look at a particular 11:14:35
22 embodiment, but generally, yes. 11:14:37

1 Q. (BY MR. CHARKOW) Okay. And -- all right. 11:14:39
2 So you could put that -- oh, let's look at the 11:14:44
3 '528 patent. So that would be Exhibit 2 to your 11:14:50
4 deposition. 11:14:52
5 (Whereupon Exhibit Number 2 was 11:14:52
6 marked for identification.) 11:14:53
7 A. Okay. I'm there. 11:14:53
8 Q. (BY MR. CHARKOW) And let's see. So 11:14:53
9 Exhibit 2 to your deposition is the '528 patent, 11:14:59
10 and that's also Exhibit 1001 but for the 936 11:15:02
11 IPR. 11:15:07
12 You have that in front of you? 11:15:07
13 A. I do. 11:15:10
14 Q. Okay. And if you could turn to PDF 11:15:10
15 Page 105, also figure 83E. 11:15:15
16 A. Hold on. Yes, I'm there. 11:15:19
17 Q. Okay. And that's the same 83E that you 11:15:31
18 saw in the '177 patent, correct? 11:15:35
19 A. Yeah. It looks very similar, yes. 11:15:37
20 Q. Okay. All right. You could put those 11:15:39
21 aside. 11:15:44
22 A. Okay. 11:15:46

1 Q. All right. So let me give you another 11:15:46
2 exhibit. 11:15:52
3 (Whereupon Exhibit Number 3 was 11:15:53
4 marked for identification.) 11:15:53
5 Q. (BY MR. CHARKOW) And let me know when you 11:16:08
6 have that open. 11:16:09
7 A. It's downloading, one second. 11:16:10
8 Q. Okay. 11:16:12
9 A. Okay. It's open. 11:16:14
10 Q. Okay. So Exhibit 3 to your deposition is 11:16:14
11 Petitioner's Reply to Patent Owner's Response. 11:16:18
12 Do you see that? 11:16:24
13 A. I do. 11:16:24
14 Q. All right. And if you could go to Page 38 11:16:25
15 of the document -- 38, like, on the bottom of 11:16:27
16 the page of the document. 11:16:29
17 A. Okay, hold on. Okay. 11:16:32
18 Q. And you could see that diagram came from a 11:16:41
19 book. Well, you had it in your declaration, but 11:16:43
20 it -- also from a book called Sedra Smith. 11:16:46
21 You're aware of that, right? 11:16:48
22 A. I am. 11:16:49


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 Q. Okay. And on Page 38 of the -- of 11:16:50
2 Exhibit 3, we see a figure 2.4. 11:16:53
3 Do you see that? 11:16:57
4 A. I do. 11:16:57
5 Q. All right. And that figure 2.4 is from 11:16:58
6 the Sedra Smith textbook, correct? 11:17:00
7 A. Yes. 11:17:04
8 Q. All right. And in figure 2.4 of Sedra, 11:17:04
9 the plus terminal of the Op-amp circuit is 11:17:08
10 connected to ground, correct? 11:17:12
11 A. Yes. 11:17:14
12 Q. Okay. I'm going to give you another 11:17:14
13 exhibit. 11:17:16
14 (Whereupon Exhibit Number 4 was 11:17:17
15 marked for identification.) 11:17:31
16 Q. (BY MR. CHARKOW) You should have another 11:17:31
17 exhibit. Let me know when you have that. 11:17:32
18 A. It's downloading. Okay. I have it. 11:17:33
19 Q. Okay. And so figure 4 is in the IPR as 11:17:39
20 Exhibit 1004. And you've seen this. This is 11:17:45
21 the Tayloe patent, correct? 11:17:47
22 A. Figure 4 -- you're talking about the 11:17:50

1 document? 11:17:52
2 Q. Exhibit -- exhibit -- sorry, strike that. 11:17:52
3 Let me do this again. 11:17:55
4 Exhibit 4 is the Tayloe patent. Do 11:17:56
5 you see that, yes? Okay. 11:18:00
6 MR. CHARKOW: Sorry, the audio 11:18:03
7 didn't come in for that. I don't know if any -- 11:18:04
8 was that just me? He said "yes"? 11:18:05
9 MR. MAGEE: I didn't get it 11:18:08
10 either. 11:18:09
11 A. Yes. 11:18:09
12 Q. (BY MR. CHARKOW) Okay. All right. And 11:18:10
13 Exhibit 4 to your deposition is Exhibit 1004 in 11:18:17
14 the IPR. 11:18:21
15 You've seen Tayloe before, correct? 11:18:26
16 A. Yes. 11:18:28
17 Q. Okay. Can you go to Figure 3, please? 11:18:28
18 A. Yeah. Give me one second to rotate it. 11:18:35
19 Q. Sure. 11:18:37
20 A. Yes, I'm there. 11:18:39
21 Q. Okay. And Figure 3 of Tayloe shows an 11:18:40
22 op-amp circuit's -- well, shows two op-amp 11:18:44

1 circuits, which Tayloe refers to as summing -- 11:18:48
2 amplifiers as 50 and 52, correct? 11:18:51
3 A. Yes. 11:18:53
4 Q. Okay. And neither of those op-amp 11:18:54
5 circuits the -- the positive terminal are 11:18:56
6 connected -- well, strike that. 11:18:58
7 In Figure 3 of Tayloe, the positive 11:18:59
8 terminal of the op-amp circuits are not 11:19:01
9 connected to ground, correct? 11:19:05
10 A. That is correct; but from a analysis point 11:19:06
11 of view, as long as that voltage is held 11:19:09
12 constant, it's equivalent to being connected to 11:19:13
13 ground, as far as the -- the impedence goes and 11:19:16
14 as far as the -- the small signal behavior of 11:19:18
15 the circuit goes. 11:19:25
16 THE COURT REPORTER: I'm sorry, as far 11:19:25
17 as the impedence goes, and as far as what? 11:19:25
18 THE WITNESS: The small signal 11:19:25
19 behavior of the circuit goes. 11:19:25
20 THE COURT REPORTER: Thank you. 11:19:28
21 Q. (BY MR. CHARKOW) Okay. There is a -- 11:19:28
22 there are times where there is a signal that is 11:19:31

1 being received at the positive terminal of the 11:19:34
2 op-amp circuit, correct? 11:19:38
3 MR. MAGEE: Objection, form. 11:19:39
4 A. That is correct. Sorry, that is correct. 11:19:41
5 But at those times, the top inputs to 50 and 52, 11:19:43
6 are held constant. 11:19:48
7 Q. (BY MR. CHARKOW) Okay. 11:19:50
8 A. Actually, could I just amend that? 11:19:58
9 It's not held constant, but -- but 11:20:00
10 it's not connected to the input signal is what I 11:20:02
11 meant to say. 11:20:07
12 Q. All right. You've heard of the term 11:20:08
13 "conventional current," correct? 11:20:13
14 A. Yes. 11:20:14
15 Q. Okay. And conventional current is taught 11:20:15
16 in engineering classes throughout this country 11:20:18
17 and throughout the world, right? 11:20:20
18 A. Yes. 11:20:21
19 Q. Okay. And conventional current is a 11:20:22
20 concept that is discussed in a -- in the 11:20:24
21 electronics industry, correct? 11:20:26
22 A. Yes. 11:20:27


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 Q. And with regards to conventional current, 11:20:28
2 current flows from positive to negative, 11:20:32
3 correct? 11:20:35
4 A. Yes. 11:20:35
5 Q. With regards to conventional current, 11:20:36
6 charge flows from a higher potential to a lower 11:20:38
7 potential, correct? 11:20:40
8 A. No. 11:20:42
9 Q. For a conventional current -- let me ask 11:20:46
10 the question again -- strike that. 11:20:52
11 With regards to conventional current, 11:20:53
12 if we're talking about conventional current, 11:20:55
13 charge flows from a higher potential to a lower 11:20:59
14 potential, correct? 11:21:01
15 A. No. 11:21:02
16 Q. In circuits, "I" -- the letter I, capital 11:21:02
17 I, stands for current, correct? 11:21:10
18 A. Often, yes. 11:21:12
19 Q. Okay. And "I" refers to conventional 11:21:13
20 current, correct? 11:21:17
21 A. It -- it often -- 11:21:19
22 MR. MAGEE: Objection to form. 11:21:20

1 A. Sorry. It often does. 11:21:21
2 Q. (BY MR. CHARKOW) In a circuit diagram, if 11:21:23
3 you see the symbol "I" with an arrow, the arrow 11:21:27
4 is pointing to the direction of conventional 11:21:30
5 current flow, correct? 11:21:33
6 A. No. 11:21:34
7 MR. MAGEE: Objection to form. 11:21:35
8 Q. (BY MR. CHARKOW) If you see an "I" with 11:21:37
9 an arrow, what -- what is it -- what's the arrow 11:21:38
10 pointing to? 11:21:40
11 A. The arrow points in the opposite direction 11:21:41
12 of electron flow when "I" is positive, and it 11:21:45
13 flows in the direction -- it points in the 11:21:49
14 direction of electron flow when "I" is negative. 11:21:51
15 Q. Okay. So does the -- you're talking in 11:21:56
16 the concept of electrons, and I'm not asking 11:22:17
17 about electrons. I'm asking about conventional 11:22:20
18 current -- strike that. 11:22:23
19 In a circuit diagram, if you see the 11:22:24
20 symbol "I" with an arrow, the arrow is pointing 11:22:28
21 to the direction of conventional current flow. 11:22:31
22 Is that a correct or incorrect 11:22:34


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 statement? 11:22:36
2 A. It's incorrect. 11:22:36
3 MR. MAGEE: Objection to form. 11:22:37
4 Q. (BY MR. CHARKOW) It's never -- so the 11:22:38
5 arrow is never pointing in the direction of 11:22:39
6 conventional current flow? 11:22:42
7 A. It depends whether "I" is positive or 11:22:43
8 negative. 11:22:45
9 If it's positive, then conventional 11:22:46
10 current flows in the direction of the arrow. If 11:22:49
11 it's negative, it flows in the other direction. 11:22:53
12 Q. Okay. In a circuit diagram, if you see 11:22:55
13 the symbol "I" with an arrow and -- strike that. 11:23:03
14 Okay. In a circuit diagram, if you 11:23:13
15 see the symbol "I" and it's positive and that 11:23:20
16 "I" has an arrow, the arrow is pointing to the 11:23:22
17 direction of conventional current flow, correct? 11:23:26
18 A. Yes. 11:23:28
19 Q. Okay. You're familiar with Ohm's Law, 11:23:28
20 correct? 11:23:33
21 A. Yes. 11:23:33
22 Q. And Ohm's Law is a fundamental principle 11:23:34


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 of circuit analysis, correct? 11:23:36
2 A. Yes. 11:23:38
3 Q. Okay. Current I through a conductor 11:23:38
4 between two points is -- well, strike that. 11:23:42
5 Ohm's Law states that current I 11:23:45
6 through a conductor between two points is 11:23:47
7 directly proportional to the voltage across the 11:23:49
8 two points, correct? 11:23:52
9 MR. MAGEE: Objection to form. 11:23:55
10 A. Well, define what you mean by a 11:23:56
11 "conductor." 11:23:58
12 Q. (BY MR. CHARKOW) Anything that conducts. 11:23:59
13 A. So if it's a conductance with resistance, 11:24:03
14 then the current flow is proportional to the 11:24:05
15 voltage difference across what you're calling a 11:24:11
16 conductor divided by the resistance. 11:24:13
17 Q. Okay. The formula for Ohm's Law is 11:24:17
18 voltage V equals current I times resistance R, 11:24:20
19 correct? 11:24:24
20 A. Yes. 11:24:24
21 Q. Okay. And the current I through a 11:24:25
22 conductor which has resistance between two 11:24:28


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 points is directly proportional to the voltage 11:24:32
2 across the two points, correct? 11:24:35
3 A. Yes. 11:24:36
4 Q. Okay. You're familiar with also -- strike 11:24:37
5 that. 11:24:40
6 You're also familiar with Kirchoff's 11:24:40
7 Current Law, correct? 11:24:44
8 A. Yes. 11:24:45
9 Q. Okay. And Kirchoff's Current Law states 11:24:45
10 that the sum of currents entering a node equals 11:24:48
11 the sum of currents leaving it, correct? 11:24:53
12 A. Yes. 11:24:55
13 Q. And the formula -- strike that. 11:24:55
14 The formula for power is voltage V 11:24:59
15 times current I, correct? 11:25:03
16 A. So voltage -- we have to put some 11:25:06
17 qualifiers in there. 11:25:10
18 So if you have a component that you're 11:25:10
19 putting current through, then the power 11:25:13
20 dissipated by that -- or -- or sorry, the power 11:25:18
21 going through that component is the voltage 11:25:25
22 across it times the current through it. 11:25:29

1 Q. All right. So -- so power is equal to 11:25:33
2 voltage times current, V times I, correct? 11:25:37
3 A. With the qualifier -- 11:25:39
4 MR. MAGEE: Objection to form. 11:25:41
5 A. -- I said. 11:25:41
6 Q. (BY MR. CHARKOW) Okay. Power is energy 11:25:43
7 per unit time, correct? 11:25:46
8 A. Yes. 11:25:48
9 Q. Okay. And power is the rate of energy 11:25:48
10 transfer, correct? 11:25:51
11 A. Well, not really. I mean, what -- what 11:25:53
12 are you -- you have to define "energy transfer." 11:25:58
13 I mean, that's not a standard term. 11:26:01
14 Q. Well, you have no concept of the word 11:26:02
15 "energy transfer" in your work for decades in 11:26:06
16 the field of electronics? 11:26:08
17 A. I'm just saying, if you -- if you want 11:26:09
18 to -- I mean, you're making a general statement. 11:26:11
19 An energy transfer can mean different things, 11:26:14
20 so -- so ask me a specific question, I'll give 11:26:16
21 you a specific answer. 11:26:19
22 Q. However you understand energy transfer -- 11:26:20


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 strike that. 11:26:23
2 Power is the rate of energy transfer. 11:26:24
3 Is that correct or incorrect in any way you 11:26:26
4 understand energy transfer? 11:26:30
5 A. I can't answer -- 11:26:31
6 MR. MAGEE: Objection to form.
7 THE COURT REPORTER: Okay, guys,
8 hold on, hold on.
9 (Reporter clarification about
10 talking over one another.)
11 THE COURT REPORTER: There was an
12 objection to the last question, but I didn't get
13 the objection or the answer.
14 MR. CHARKOW: My apologies. 11:26:47
15 MR. MAGEE: It was just objection 11:26:47
16 to form. 11:26:48
17 THE COURT REPORTER: And, 11:26:48
18 Dr. Galton, if you want to answer that question, 11:26:48
19 I didn't get it. 11:26:53
20 A. Yeah, so "energy transfer" doesn't have a 11:26:53
21 specific meaning in our field. So if you define 11:26:57
22 for me what you mean by "energy transfer," I 11:27:00


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 will -- I will answer "yes" or "no" to your 11:27:03
2 question. 11:27:04
3 Q. (BY MR. CHARKOW) Okay. What is your 11:27:04
4 understanding of the various ways energy 11:27:05
5 transfer is used in your field? 11:27:08
6 A. Well, you can have energy transfer from -- 11:27:10
7 you know, through radiation; you can have energy 11:27:15
8 transfer through electromagnetics; you can have 11:27:19
9 energy transfer through heat, and -- and -- and 11:27:23
10 then as far as the energy that is transferred, 11:27:27
11 some of that energy may be dissipated in the 11:27:31
12 point of origin and some may be received in the 11:27:36
13 point of reception. 11:27:39
14 So it's -- it's just a vague question. 11:27:40
15 I -- I don't have an answer for you. 11:27:41
16 Q. Okay. With regards to electromagnetic 11:27:42
17 signals, power is -- power is the rate of energy 11:27:46
18 transfer, correct? 11:27:48
19 MR. MAGEE: Objection to form. 11:27:49
20 A. No, that's not correct. 11:27:52
21 Q. (BY MR. CHARKOW) Okay. With regards 11:27:53
22 to -- so why is that not correct? 11:27:57


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 A. For the same reason I've -- I've just been 11:27:59
2 saying, I -- I -- even -- you need to define 11:28:01
3 what you mean by "energy transfer." 11:28:03
4 An electromagnetic signal is just -- 11:28:04
5 is -- is just a -- a signal that carries energy 11:28:07
6 with it, but it doesn't necessarily transfer 11:28:16
7 energy from one point to another, so I -- I just 11:28:20
8 don't have an answer for you. 11:28:23
9 Q. Okay. Do you have -- is there any energy 11:28:24
10 transfer that you're aware of where power is -- 11:28:29
11 is the rate of energy transfer? 11:28:34
12 A. Well, it comes down to -- define "energy 11:28:43
13 transfer," and I'll -- I'll give you an answer, 11:28:46
14 but without that, I can't -- I just don't have 11:28:48
15 an answer for you. 11:28:52
16 Q. Sir, I'm asking you to -- any -- anything 11:28:53
17 I could ask in the world about energy transfer, 11:28:55
18 energy -- I'm asking you for energy -- any 11:28:57
19 energy transfer that you could think of, any 11:28:59
20 one. 11:28:59
21 Power is the rate of energy transfer. 11:29:02
22 Can you -- can you identify one case where 11:29:05


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 energy transfer power is the rate of energy 11:29:07
2 transfer? 11:29:09
3 A. Okay. So if we have a -- a battery and we 11:29:10
4 put a -- and we put a resistor across it, then 11:29:14
5 the amount of energy dissipated per unit time by 11:29:21
6 the resistor is power. 11:29:28
7 Q. Okay. And in the context of an RF signal 11:29:47
8 that's coming into a receiver of a wireless 11:29:52
9 chip, power is a rate of energy transferred from 11:30:00
10 that RF signal, correct? 11:30:07
11 A. Transferred -- 11:30:10
12 MR. MAGEE: Objection, form. 11:30:10
13 A. Sorry. I -- 11:30:10
14 THE WITNESS: Annette, I'll do my 11:30:13
15 best to -- to take a breath, sorry. 11:30:14
16 A. Do you want to say it again, Robert? 11:30:18
17 MR. MAGEE: I said "objection, 11:30:20
18 form." She has it. 11:30:22
19 A. Okay. So transferred to what? 11:30:22
20 So, for example, you could have an LNA 11:30:28
21 and then there would be a certain amount of 11:30:34
22 energy transferred to the LNA, but then that LNA 11:30:36


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 would have its own energy that gets transferred 11:30:39
2 somewhere else. 11:30:42
3 So again, you have to define -- you 11:30:42
4 have to define what's doing the -- what's 11:30:44
5 providing the energy and what's receiving the 11:30:46
6 energy for this to be a question that I can 11:30:49
7 answer definitively. 11:30:51
8 Q. (BY MR. CHARKOW) In the context of an RF 11:30:53
9 signal that's coming into a receiver of a 11:30:55
10 wireless chip, in particular an RF signal that's 11:30:57
11 going to a capacitor, power is a rate of energy 11:31:02
12 transferred from the RF signal, correct? 11:31:07
13 MR. MAGEE: Objection to form. 11:31:10
14 A. Okay. So the -- so the -- the RF signal 11:31:12
15 is -- is what you're considering to be the 11:31:20
16 supplier of the energy or -- or power, and the 11:31:21
17 capacitor is what you're considering to be the 11:31:25
18 receiver of the power; is that correct? 11:31:29
19 Q. (BY MR. CHARKOW) Yes. 11:31:31
20 A. And what's in between the RF signal and 11:31:32
21 the capacitor? 11:31:35
22 Q. A switch. 11:31:36

1 A. Okay. Well, that switch will have a 11:31:38
2 certain amount of resistance, so it will 11:31:40
3 dissipate some of the power also. It will -- it 11:31:42
4 will -- so some of the power gets transferred to 11:31:44
5 heating up the switch and some of it goes 11:31:47
6 into -- goes into the capacitor. 11:31:51
7 But most receivers have a low noise 11:31:52
8 amplifier, and so the -- the signal received 11:31:56
9 into the chip actually, you know, will get -- 11:31:59
10 will get transferred to the LNA, and the LNA 11:32:03
11 will transfer its own energy to the capacitor. 11:32:06
12 So again, there's just -- it's -- it's 11:32:08
13 the problem you and I always run into, you're 11:32:10
14 asking me these -- these questions that are -- 11:32:13
15 that are just not completely pinned down, so 11:32:14
16 it's hard to give you a definitive answer. 11:32:17
17 Q. Okay. I just want to understand so I get 11:32:20
18 this clear. 11:32:24
19 You understand in textbooks and -- and 11:32:25
20 pretty standard in the industry, power is -- 11:32:28
21 power is considered the rate at which energy is 11:32:31
22 transferred, period, or converted per unit of 11:32:34

1 time. 11:32:38
2 MR. MAGEE: Objection to form. 11:32:39
3 Q. (BY MR. CHARKOW) You don't teach that in 11:32:40
4 your classes, you haven't seen that in any books 11:32:41
5 that you've ever read in your whole career, 11:32:44
6 you're not aware of that? 11:32:46
7 A. You've asked me this question before, and 11:32:47
8 the problem with it is that energy transfer is 11:32:49
9 ambiguous. 11:32:52
10 So -- so I've given -- you asked me 11:32:53
11 for an example, and I gave you one; and in that 11:32:53
12 case, the answer is yes, but there are other 11:32:57
13 cases where the answer is no. Energy transfer 11:32:59
14 is not a standard term in my field. It can mean 11:33:01
15 a lot of different things. 11:33:04
16 Q. Okay. So if I say power is the rate at 11:33:06
17 which energy is transferred, so I'm not saying 11:33:08
18 energy transfer, I'm saying -- so let me strike 11:33:11
19 that. Let me say it again. 11:33:14
20 Power is the rate at which energy is 11:33:16
21 transferred. Is that a correct statement? 11:33:18
22 A. No, for the same reason. 11:33:20


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 Q. So you're saying, in your field, you've 11:33:24
2 never heard, never read a book, ever in your 11:33:26
3 whole career, in decades you've been in this 11:33:28
4 field, that power is the rate at which energy is 11:33:31
5 transferred? Is that your testimony? 11:33:34
6 A. No, that's not my testimony. 11:33:34
7 MR. MAGEE: Objection to form. 11:33:36
8 Q. (BY MR. CHARKOW) Okay. So then -- then 11:33:37
9 you have -- okay. Strike that. 11:33:38
10 Have you ever read in any textbook 11:33:40
11 anywhere in your whole career that power is the 11:33:42
12 rate at which energy is transferred, yes or no? 11:33:45
13 MR. MAGEE: Objection to form. 11:33:49
14 A. The question is ambiguous, and you have to 11:33:50
15 tell me what's -- what's providing the energy, 11:33:53
16 what's -- what it's being transferred through, 11:33:55
17 and what's receiving the energy. So the answer 11:33:58
18 is, it depends. 11:34:00
19 Q. (BY MR. CHARKOW) Okay. You don't 11:34:01
20 understand that to be a fundamental tenet of, 11:34:03
21 like, electrical engineering, that power is the 11:34:05
22 rate at which energy is transferred? You don't 11:34:07

1 recognize that as a thing, right? 11:34:10
2 A. It depends on the context, so -- so the -- 11:34:13
3 the answer is sometimes the answer is yes, but 11:34:18
4 -- but sometimes the answer is no. You have 11:34:21
5 to -- you know, you have to -- power is -- is 11:34:22
6 delivered to a component; and if you're talking 11:34:29
7 about the transfer of power to that component, 11:34:32
8 then the power dissipated or stored by that 11:34:35
9 component -- component is in the form of energy 11:34:43
10 per unit time; but when you start saying -- 11:34:47
11 well, you know, the way you worded it, it's just 11:34:50
12 ambiguous. 11:34:52
13 Q. Okay. So if the source of the power is an 11:34:52
14 RF signal and the receiver of power is a 11:34:56
15 capacitor and then power -- in a RF receiver 11:35:01
16 chip, power is the rate at which energy is 11:35:05
17 transferred, correct or incorrect? 11:35:08
18 A. Power of what? Because, as I said before, 11:35:11
19 you asked me this question before, and my answer 11:35:14
20 was, in this case, we have to, first of all, 11:35:16
21 assume that the RF signal is connected to the 11:35:19
22 capacitor through a switch. 11:35:24

1 And some of -- some of the power 11:35:26
2 transferred by the RF signal gets dissipated in 11:35:31
3 the switch, and some of it ends up getting 11:35:37
4 stored on the capacitor. 11:35:39
5 Q. Okay. And then if the capacitor is the 11:35:40
6 source of the power and the receiver is a load 11:35:44
7 after a capacitor in an RF chip, power is the 11:35:49
8 rate at which energy is transferred, correct? 11:35:53
9 MR. MAGEE: Objection to form. 11:35:56
10 A. My same answer is, is that it -- it 11:35:57
11 depends on -- on other factors. 11:36:00
12 So, for example, if there's a switch, 11:36:03
13 some of that -- some of that power will get 11:36:05
14 dissipated by the switch and -- but the -- to 11:36:07
15 the extent that no power gets dissipated by the 11:36:10
16 switch, whatever power gets transferred to 11:36:14
17 whatever the load is, then that power is the 11:36:16
18 rate of change of energy. 11:36:22
19 Q. (BY MR. CHARKOW) Right. From the 11:36:25
20 capacitor? 11:36:27
21 A. Under those circumstances, yes. 11:36:28
22 Q. Okay. When calculating power in a 11:36:29

1 circuit, the current used is conventional 11:36:34
2 current, correct, "I"? 11:36:37
3 A. Not necessarily. 11:36:38
4 MR. MAGEE: Objection to form. 11:36:39
5 Q. (BY MR. CHARKOW) Okay. 11:36:41
6 A. I mean, most often that is the case, but 11:36:42
7 it's -- it -- not necessarily. 11:36:45
8 Q. Okay. When one applies Ohm's Law in 11:36:47
9 circuit analysis, the current "I" refers to 11:36:52
10 conventional current, correct? 11:36:54
11 MR. MAGEE: Objection to form. 11:36:55
12 A. You -- I mean, usually that's the case, 11:36:58
13 but it doesn't need to be. 11:37:01
14 Q. (BY MR. CHARKOW) Okay. You would tell 11:37:03
15 your colleagues that? 11:37:05
16 A. Yeah. 11:37:06
17 Q. I -- yeah? Okay. 11:37:06
18 When one applies Kirchhoff's Current 11:37:08
19 Law in circuit analysis, the current is 11:37:12
20 understood to mean conventional current, 11:37:12
21 correct, the "I"? 11:37:15
22 A. Generally, but -- but it doesn't matter. 11:37:18

1 It's just a sign difference. 11:37:20
2 And so in Kirchhoff's Current Law -- 11:37:21
3 Kirchhoff's Current Law, you -- you just have to 11:37:24
4 make sure that whatever current goes in, the 11:37:27
5 same amount of current goes out, and whether 11:37:29
6 it's -- whether you consider the current to be 11:37:31
7 positive or negative, it doesn't matter. 11:37:33
8 Q. Okay. Textbooks in the field talk about 11:37:35
9 conventional current, correct? 11:37:39
10 A. Usually, but -- but with a caveat; and 11:37:41
11 that caveat is what I wrote in my declaration -- 11:37:44
12 namely that conventional current is based on a 11:37:48
13 mistake that Benjamin Franklin made. He guessed 11:37:51
14 the direction of current flow, and he got it 11:37:56
15 wrong. 11:37:58
16 Q. Sure. 11:37:58
17 A. And so historically we used that, but 11:37:58
18 it's -- it's -- it's just a sign difference. 11:38:00
19 MR. CHARKOW: So strike as 11:38:03
20 nonresponsive. 11:38:03
21 Q. (BY MR. CHARKOW) Just please listen to 11:38:04
22 the question and answer the question asked, and 11:38:04

1 stop trying to pepper the record with 11:38:06
2 information that I'm not asking. Okay? Strike 11:38:06
3 that. 11:38:09
4 MR. CHARKOW: Strike -- strike 11:38:11
5 your previous answer as nonresponsive. 11:38:11
6 Q. (BY MR. CHARKOW) I just need a "yes" or 11:38:14
7 "no" question [sic]. It's a very simple 11:38:15
8 question. 11:38:17
9 Textbooks in the field talk about 11:38:17
10 conventional current, yes or no? 11:38:19
11 MR. MAGEE: Objection to form, 11:38:22
12 asked and answered. 11:38:23
13 A. They talk about both conventional current 11:38:24
14 and electron current. 11:38:26
15 Q. (BY MR. CHARKOW) Okay. You know who 11:38:28
16 Dr. Razavi is, correct? 11:38:33
17 A. I do. 11:38:34
18 Q. And Dr. Razavi is the author of a prior 11:38:35
19 art reference that you relied on, correct? 11:38:37
20 A. Yes. 11:38:39
21 Q. Okay. And he's a well-known professor of 11:38:39
22 electrical engineering, correct? 11:38:43


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 A. Yes. 11:38:44
2 Q. And you're aware that Dr. Razavi wrote 11:38:44
3 textbooks that is used to teach electronic -- 11:38:50
4 electrical engineering classes, correct? 11:38:53
5 A. Yes. 11:38:54
6 Q. And have you -- 11:38:54
7 MR. MAGEE: Objection, form. 11:38:56
8 Q. (BY MR. CHARKOW) Have you used any of his 11:38:57
9 books in your teachings? 11:38:58
10 A. Yes. 11:39:01
11 Q. Okay. Which book have you used? 11:39:01
12 A. I don't remember because it -- the last 11:39:05
13 time I used it was probably 20 years ago, but it 11:39:07
14 was -- it was when it -- I don't remember the 11:39:10
15 exact title, but it was his book, one of his 11:39:12
16 books on CMOS, circuit -- integrated circuit 11:39:14
17 design. 11:39:18
18 Q. Okay. Do you remember if it was called 11:39:18
19 the "Fundamentals of Microelectronics"? 11:39:20
20 A. It might have been. I just don't 11:39:24
21 remember. 11:39:24
22 Like I said, it was, like, 20 years 11:39:26

1 ago. 11:39:27
2 These days, in my -- in my courses, I 11:39:27
3 don't -- I don't use textbooks. 11:39:29
4 Q. Okay. I -- I just dropped another exhibit 11:39:30
5 into the chat. 11:39:34
6 (Whereupon Exhibit Number 5 was 11:39:36
7 marked for identification.) 11:39:38
8 Q. (BY MR. CHARKOW) Exhibit 5 to your 11:39:38
9 deposition is an excerpt from the Razavi 11:39:39
10 textbook. 11:39:52
11 A. Okay. Got it. 11:39:52
12 Q. Got that open? All right. 11:39:52
13 If you go down to the PDF Page 3, 11:39:53
14 there's a section called "Large-Signal Model." 11:39:56
15 Do you see that? 11:39:58
16 A. Hold on, just -- structure -- you're -- 11:40:02
17 oh, yeah, I see it. 11:40:05
18 Q. Okay. And you could look through that. 11:40:06
19 And you see Dr. Razavi's discussion of 11:40:08
20 conventional current flows? 11:40:10
21 A. I do. 11:40:12
22 Q. Okay. So you understand that Dr. Razavi 11:40:12

1 teaches conventional current in his textbooks, 11:40:17
2 correct? 11:40:19
3 A. I do. 11:40:19
4 MR. MAGEE: Objection to form. 11:40:20
5 A. Sorry, I do, but notice that he explicitly 11:40:21
6 mentions "conventional" because he's aware -- 11:40:26
7 and as is a POSITA -- that conventional current 11:40:29
8 is the negative of -- of electron current. 11:40:32
9 Q. Okay. And you know what's in Dr. Razavi's 11:40:35
10 head and you know why he wrote what he wrote? I 11:40:38
11 just want to -- I just want to understand. 11:40:41
12 You know why Dr. Razavi did what he 11:40:41
13 did? You talked to him? 11:40:45
14 A. Well, actually, I -- he's a good friend. 11:40:46
15 I know him well, but apart from that -- 11:40:49
16 Q. You talked about this? 11:40:51
17 A. I'm sorry? 11:40:51
18 Q. You talked about this? 11:40:52
19 So you said, Hey, in this section, you 11:40:52
20 talked about conventional current and you put 11:40:55
21 "conventional" in brackets; and the reason why 11:40:57
22 you put parentheses and the reason why you put 11:40:59


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 it there is because of "X." You guys had that 11:41:02
2 discussion? 11:41:05
3 A. If you let me talk, I'll answer the 11:41:05
4 question. 11:41:05
5 No, we did not have that discussion; 11:41:07
6 but there would be no other reason to put 11:41:09
7 "conventional" in parentheses if -- if Behzad 11:41:11
8 Razavi thought that conventional current was the 11:41:16
9 only type of current and that -- and that he'd 11:41:19
10 never heard of electron current, so it just 11:41:21
11 stands to reason. 11:41:23
12 Q. Okay. And how many picofarads are 11:41:24
13 typical -- are typical capacitors in an IC -- 11:41:30
14 strike that. 11:41:30
15 How many picofarads are used for a 11:41:31
16 typical capacitor in an integrated circuit? 11:41:34
17 A. It can range -- it can range from a few 11:41:37
18 femtofarads up to hundreds of picofarads. 11:41:42
19 Q. Okay. A .3 microfarad capacitor is too 11:41:45
20 large for feasible integration into an 11:41:51
21 integrated circuit, correct? 11:41:55
22 A. Yes. 11:41:56

1 MR. MAGEE: Objection, form. 11:41:56
2 Q. (BY MR. CHARKOW) Okay. And one way to 11:41:57
3 reduce capacitor size is to increase the 11:41:58
4 circuit's operating frequency, correct? 11:42:01
5 A. One way to reduce capacitor size is to -- 11:42:06
6 I -- that -- that question -- I mean, we'd have 11:42:10
7 to look at specific circuits. That's not 11:42:15
8 generally necessary -- that's not necessarily 11:42:17
9 true. 11:42:18
10 Q. Well, I'm just saying one way. 11:42:19
11 So if you have a capacitor and an 11:42:22
12 integrated circuit, one way to reduce the 11:42:24
13 capacitor size into -- is to increase the 11:42:26
14 circuit's operating frequency, correct? 11:42:28
15 A. The question just doesn't make sense. 11:42:30
16 I mean, one way to reduce its size -- 11:42:32
17 what does the circuit do, and -- and what -- 11:42:35
18 where is the capacitor being used? I mean, 11:42:39
19 there's just not enough information in that 11:42:41
20 question for me to answer it definitively. 11:42:43
21 Q. Okay. In a filter of a RF chip that has a 11:42:45
22 capacitor, one way to reduce that capacitor size 11:42:49

1 is to increase the circuit's operating 11:42:53
2 frequency, correct? 11:42:55
3 A. Can you define "operating frequency"? I 11:42:58
4 mean, what are -- are we talking about clock 11:43:01
5 rate? Are we talking about bandwidth? Are we 11:43:02
6 talking about the -- the center frequency of the 11:43:06
7 signal? 11:43:09
8 Q. Bandwidth. 11:43:10
9 A. I'm sorry? 11:43:11
10 Q. Bandwidth. 11:43:11
11 A. So if you want to -- okay. So if you're 11:43:13
12 building a low-pass analog filter, then 11:43:19
13 generally you need smaller capacitors if you 11:43:23
14 want to widen the bandwidth. 11:43:26
15 Q. So one way to reduce the capacitor size in 11:43:29
16 the case where a capacitor is used in an RF 11:43:33
17 filter is to increase the circuit's operating 11:43:37
18 frequency, to increase the baseband, correct? 11:43:39
19 A. You're kind of saying it backwards. 11:43:42
20 I mean, in the -- in the sense that 11:43:44
21 usually you have a -- a certain bandwidth of a 11:43:46
22 signal that you're trying to receive in the case 11:43:50

1 of a wireless receiver and -- and depending on 11:43:52
2 the bandwidth that you're trying to create a 11:43:55
3 low-pass -- depending on the bandwidth of the 11:44:01
4 signal, your low-pass filter bandwidth will be 11:44:05
5 larger or smaller; and the larger the bandwidth 11:44:09
6 is, generally the smaller your capacitors can 11:44:11
7 be. 11:44:11
8 But it's not like you choose -- you 11:44:14
9 have -- you're -- it's not like, for instance, 11:44:16
10 you're building a bluetooth receiver and you're 11:44:18
11 like, oh, my capacitors are too big, let me 11:44:21
12 increase the bandwidth of the bluetooth signal; 11:44:25
13 it just doesn't work that way. 11:44:28
14 Q. Okay. If you decrease the -- the baseband 11:44:29
15 signal in an RF chip, you can reduce the 11:44:34
16 capacitor size where that capacitor is used in a 11:44:39
17 filter, correct? 11:44:42
18 A. When you say "reduce the baseband signal," 11:44:43
19 what do you mean by that? Reduce its amplitude, 11:44:47
20 reduce its bandwidth, what? 11:44:50
21 Q. Its bandwidth. 11:44:52
22 A. Okay. So now, can you ask me the question 11:44:53


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

again so that I -- I can hear the whole thing 11:44:56
again? 11:45:00
Q. If you reduce the bandwidth of a baseband 11:45:00
signal in an RF chip, can you reduce the 11:45:05
capacitor size where the capacitor is used in a 11:45:08
filter? 11:45:11
A. So if the -- if the filter you're talking 11:45:11
about is the channel select filter, then the 11:45:14
answer is yes, typically. I mean, it's not 11:45:18
always the case, but usually the answer to -- 11:45:22
would be yes. 11:45:24
Q. If you reduce -- strike that. 11:45:26
All right. Providing capacitors 11:45:38
off-chip rather than on-chip increases 11:45:47
an integrated circuit's -- well, strike that. 11:45:50
Providing capacitors off-chip rather 11:45:51
than on-chip increases a chip size, correct? 11:45:54
A. No. 11:45:56
Q. Okay. 11:45:57
A. It actually decreases the chip size. 11:45:58
Q. Okay. Let me ask it a different way. 11:46:01
Strike that. 11:46:06

1 Providing capacitors off-chip rather 11:46:07
2 than on-chip increases the size of the -- strike 11:46:10
3 that. 11:46:17
4 Providing capacitors off-chip rather 11:46:17
5 than on-chip increases the size of the -- well, 11:46:29
6 strike that. 11:46:34
7 Okay. A chip design that requires 11:46:43
8 large off-chip capacitors is -- is incompatible 11:46:45
9 with a single-chip IC implementation, correct? 11:46:49
10 MR. MAGEE: Objection to form. 11:46:54
11 A. No, because all -- all chips that we -- 11:46:57
12 and even chips that we would call single chip 11:47:03
13 implementations have off-chip capacitors, at the 11:47:07
14 very least for decoupling the power supplies; 11:47:10
15 and these capacitors are tiny anyway. 11:47:13
16 So even when you call it a single-chip 11:47:16
17 solution, the -- you know, you will have 11:47:18
18 capacitors off-chip, in general. 11:47:21
19 Q. (BY MR. CHARKOW) Okay. A chip design 11:47:22
20 that requires large off-chip capacitors is 11:47:24
21 incompatible with a single-chip IC 11:47:28
22 implementation, correct? 11:47:31


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 MR. MAGEE: Objection, form. 11:47:32
2 A. Not necessarily -- 11:47:32
3 THE WITNESS: I'm sorry, go ahead, 11:47:34
4 Bobby. 11:47:35
5 MR. MAGEE: Objection to form. 11:47:37
6 That's fine. 11:47:38
7 A. So when you're talking about large, I 11:47:39
8 assume you're meaning large value. The physical 11:47:42
9 size of these things are usually pretty small. 11:47:44
10 So -- and -- and decoupling capacitors 11:47:47
11 are generally large-valued, as well. So -- so 11:47:52
12 if you have a -- an off-chip capacitor other 11:47:55
13 than the decoupling capacitors, you know, it -- 11:48:00
14 it -- it's definitely an off-chip component, but 11:48:04
15 it doesn't necessarily have -- have a 11:48:06
16 significant impact on size. 11:48:08
17 For instance, sometimes you put those 11:48:09
18 capacitors and they're absolutely tiny; they're 11:48:11
19 like almost like -- like specks of sand. You 11:48:15
20 can put them on the bottom of the board so it 11:48:17
21 doesn't actually increase the board real estate. 11:48:20
22 So it -- we wouldn't necessarily call a chip 11:48:23

1 a -- we -- let me -- let me back that up. 11:48:27
2 We wouldn't necessarily say a chip is 11:48:30
3 not a single-chip solution just because it has 11:48:34
4 off-chip capacitors because, like I said, they 11:48:39
5 always do. 11:48:41
6 Q. (BY MR. CHARKOW) All right. A chip 11:48:41
7 design that requires large off-chip capacitors 11:48:43
8 that are part of a filter is incompatible with a 11:48:46
9 single-chip IC implementation, correct? 11:48:52
10 A. No. 11:48:54
11 Q. So a single-chip IC, the fact that you 11:48:55
12 have fundamental components that are located 11:48:59
13 off-chip, you still say that's a single-chip IC? 11:49:01
14 That's your position? 11:49:05
15 A. Yeah, because there are always off-chip 11:49:05
16 components. 11:49:08
17 MR. MAGEE: Objection -- hang on, 11:49:08
18 sorry. 11:49:10
19 Objection to form. 11:49:10
20 Go ahead. 11:49:11
21 A. There are always off-chip components. 11:49:12
22 For example, you have a crystal 11:49:14

1 oscillator that's off-chip. You -- you -- and 11:49:16
2 like I said, you have decoupling capacitors that 11:49:20
3 are generally large value. Those are off-chip, 11:49:24
4 too, and -- and so the term "single-chip 11:49:26
5 solution" does not preclude having some 11:49:31
6 supporting passives off-chip. 11:49:34
7 Q. (BY MR. CHARKOW) Okay. Putting in 11:49:38
8 another exhibit. 11:49:55
9 A. I haven't received anything. 11:50:10
10 MR. MAGEE: Nor have I. 11:50:13
11 MR. CHARKOW: Okay. 11:50:15
12 Q. (BY MR. CHARKOW) You should have it now. 11:50:23
13 A. Okay. I've got it. 11:50:25
14 Q. Exhibit 6 to your deposition is the 11:50:26
15 petition for IPR 2024-00936. Let me know when 11:50:29
16 you have that open. 11:50:34
17 A. Got it. 11:50:35
18 (Whereupon Exhibit Number 6 was 11:50:37
19 marked for identification.) 11:50:38
20 Q. (BY MR. CHARKOW) Okay. You've seen this 11:50:38
21 petition before, right? 11:50:42
22 A. Yes. 11:50:45

1 Q. Okay. Can you turn to Page 28 of the 11:50:45
2 petition? So let's see. Yeah, actual -- actual 11:50:49
3 Page 28, meaning 28 on the bottom of the page. 11:50:55
4 A. Okay. Hold on. All right. I'm there. 11:51:02
5 Q. Okay. Do you see the first line? It 11:51:07
6 says, "A POSITA would have been motivated to 11:51:10
7 adapt Tayloe's system as a single-chip (i.e., 11:51:12
8 integrated circuit known as IC.)" 11:51:17
9 You see that? 11:51:19
10 A. Yes. 11:51:19
11 Q. What is meant by "single-chip"? 11:51:20
12 A. Well, okay. So first of all, this isn't 11:51:24
13 my document, but I -- I assume that what it -- 11:51:31
14 what it -- what it means is to put, you know, 11:51:36
15 the essential functionality of Tayloe's system 11:51:39
16 on a single IC. 11:51:43
17 Q. Okay. 11:51:46
18 A. But -- but a person in my field would 11:51:47
19 understand that even though they might say it 11:51:49
20 this way, there are definitely going to be 11:51:52
21 off-chip components. There are going to be -- 11:51:56
22 there's going to be a crystal oscillator, 11:51:57

1 there's going to be decoupling capacitors, and 11:52:00
2 then in the case of Tayloe's system, it's for a 11:52:03
3 ham radio application, And so there's -- there's 11:52:08
4 going to be usually an external amplifier to 11:52:10
5 drive speakers. 11:52:14
6 And so the -- this single-chip is -- 11:52:15
7 is sort of a -- a -- not a precise term, but -- 11:52:18
8 but it's -- it's -- what it's intended to convey 11:52:25
9 is that the -- the functionality of Tayloe's 11:52:29
10 system is primarily implemented on a 11:52:34
11 single-chip. 11:52:37
12 Q. What's the essential functionality that 11:52:37
13 would be implemented on a single-chip in Tayloe? 11:52:39
14 A. Well, the -- the components -- I mean, 11:52:42
15 the -- the commutator -- I mean, the -- you -- 11:52:47
16 what you're probably getting at is is if we 11:52:50
17 implement Tayloe's system exactly, the 11:52:54
18 capacitors will have to be big, large value, 11:52:57
19 not -- not big size, and they'll have to be 11:52:59
20 off-chip. 11:53:02
21 So there's some -- you know, that -- 11:53:03
22 that's a component that would have to be 11:53:05


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 off-chip. 11:53:07
2 But like I said, the crystal 11:53:07
3 oscillator would have to be off-chip, and that 11:53:10
4 -- that's essential, too, in the sense that 11:53:12
5 Tayloe's system won't work without a clock. 11:53:14
6 And then we have to provide clean 11:53:17
7 power supplies to it, so we need off-chip 11:53:19
8 coupling capacitors; and Tayloe's system won't 11:53:22
9 work without those. 11:53:25
10 So -- so the point is that -- that -- 11:53:26
11 this is sort of a sloppy way to -- to say it, 11:53:28
12 but the bottom line is, aside from passives, 11:53:32
13 such as a crystal and such as capacitors, the -- 11:53:36
14 you don't need additional chips to implement, 11:53:41
15 for example, Figure 3 of Tayloe. 11:53:44
16 Q. So you mentioned essential functionality, 11:53:46
17 and I want to understand the components that 11:53:49
18 you -- in Tayloe that you believe are essential 11:53:51
19 functionality. That's your language that you 11:53:53
20 used. 11:53:56
21 A. Yeah. 11:53:56
22 Q. So what's the essential functionality that 11:53:56

1 you stated that would be implemented on a 11:53:59
2 single-chip in Tayloe? 11:54:01
3 A. All transistors required to implement 11:54:02
4 Tayloe's system. 11:54:06
5 Q. That's it? Just transistors? 11:54:07
6 A. And resistors. 11:54:09
7 Q. So just transistors and resistors, that's 11:54:12
8 it? 11:54:15
9 A. Yeah, And any passives that are small 11:54:15
10 enough to fit on the chip, but -- but not 11:54:18
11 necessarily all of them. 11:54:19
12 The -- the -- point is by single-chip, 11:54:20
13 the intent is to mean that you don't need 11:54:22
14 multiple chips to do it. 11:54:25
15 Q. I get it. I'm just trying to understand 11:54:26
16 the -- the -- the limits of what you're saying, 11:54:30
17 so -- strike that. 11:54:31
18 The essential functionality that you 11:54:32
19 state that would be implemented on a single-chip 11:54:37
20 for Tayloe would be transistors, the resistors, 11:54:40
21 and any passives that are small enough to fit on 11:54:45
22 the chip? 11:54:50

1 A. Yes. 11:54:51
2 And to add to that, the -- the -- 11:54:52
3 where the definition in this context of a 11:54:56
4 single-chip would fail is if you needed multiple 11:54:59
5 chips. So the -- so the point is that you're 11:55:03
6 going to build a board that has one chip on it 11:55:05
7 and a bunch of supporting passives. 11:55:08
8 Q. Okay. What -- when you say "passives," 11:55:11
9 what do you mean? 11:55:13
10 A. Things that don't contain transistors. 11:55:14
11 Q. Like what? 11:55:16
12 A. Like capacitors, like a crystal, yeah. 11:55:18
13 Q. Anything else? 11:55:24
14 A. A resistor is a passive. Any -- anything 11:55:25
15 that -- that does not have a power supply or 11:55:28
16 does not -- well, any -- any -- it's -- it's 11:55:31
17 essentially anything that doesn't contain 11:55:34
18 transistors. 11:55:38
19 Q. So anything that's not a trans- -- so 11:55:38
20 basically the only thing that you say is a 11:55:41
21 fundamental essential component that needs to be 11:55:43
22 in a single-chip for Tayloe are transistors 11:55:46

1 because everything else -- you say anything 11:55:48
2 without a transistor can be off the chip. 11:55:50
3 A. It can be, but -- but it would be silly to 11:55:54
4 put things off-chip if -- if you can 11:55:57
5 conveniently put them on-chip. So it just -- 11:56:00
6 Q. Okay. 11:56:00
7 A. -- depends. 11:56:02
8 But the bottom line is, by 11:56:02
9 "single-chip" in this context, it means that 11:56:04
10 when you build the final system on a -- on a 11:56:06
11 circuit board, there's one chip. 11:56:09
12 Q. Okay. 11:56:10
13 A. And there may or may not be other 11:56:11
14 passives, but in general, there will be 11:56:13
15 passives. 11:56:16
16 Q. Okay. So I want you to look at Tayloe on 11:56:17
17 Figure 3 and tell me the components that are 11:56:19
18 shown in Figure 3 that are fundamental, 11:56:21
19 essential components that needs to be on a 11:56:25
20 single-chip for Tayloe. 11:56:27
21 A. Hold on. 11:56:29
22 MR. MAGEE: Objection, form. 11:56:30

1 A. Okay. Figure 3. 11:56:32
2 So if you're going to implement all of 11:56:33
3 Figure 3, the bios network will generally be on 11:56:37
4 the chip, the commutator will be on the chip, 11:56:43
5 the components within the amplifiers 50 and 52 11:56:48
6 will be on-chip, the 90-degrees phase delay may 11:56:55
7 or may not be on a chip. It just depends how 11:56:58
8 that's implemented, and the details aren't 11:57:02
9 presented in Tayloe; and the amplifier 60 would 11:57:04
10 typically be on the chip. 11:57:08
11 Q. (BY MR. CHARKOW) What about the 11:57:11
12 capacitors? 11:57:13
13 A. The capacitors, if -- if they're small 11:57:15
14 enough, would be implemented on-chip. If 11:57:19
15 they're implemented off-chip, what -- what we 11:57:22
16 would often do is implement a portion of those 11:57:25
17 capacitors on-chip and then -- and then have the 11:57:28
18 rest of the capacitance be off-chip and 11:57:32
19 connected in parallel. 11:57:36
20 Q. You're aware that Tayloe's experimental 11:57:36
21 results describe using a 0.3 microfarad 11:57:40
22 capacitor, correct? 11:57:45

1 A. Yes. 11:57:46
2 Q. Okay. And based on Tayloe's disclosure, a 11:57:46
3 0.3 microfarad capacitor would be provided 11:57:50
4 off-chip, correct? 11:57:54
5 A. Most of it would be, yes. 11:57:54
6 Q. Well, do you -- have you cited anything 11:57:56
7 anywhere in any of the documents that you've 11:57:59
8 provided in this case that show that you would 11:58:01
9 split the capacitor between on and off-chip for 11:58:03
10 Tayloe? 11:58:06
11 A. No, because it wasn't -- wasn't relevant, 11:58:07
12 but I'm just telling you that's what I would do. 11:58:10
13 Q. But you have no support, no documentation 11:58:13
14 to show that that would be done or could be 11:58:15
15 done; that's just your unsupported view, right? 11:58:18
16 MR. MAGEE: Objection to form. 11:58:21
17 A. Well, it's my view as a chip designer and 11:58:22
18 it's my view as having -- having done things 11:58:24
19 like that, the -- the problem with -- with going 11:58:27
20 just off to a chip, off to a large capacitor 11:58:30
21 through a bond wire without any kind of 11:58:33
22 capacitance on-chip is you -- you -- you create 11:58:37

1 an opportunity for ringing to occur, so it -- so 11:58:40
2 it would -- wouldn't be a particularly good 11:58:43
3 design practice. 11:58:45
4 So I'm just telling you based on my 11:58:47
5 knowledge of the field; but it wasn't relevant 11:58:48
6 to what I wrote, so I didn't bother to include 11:58:50
7 any references. 11:58:52
8 Q. (BY MR. CHARKOW) Okay. 11:58:53
9 Combining Tayloe with Macnally does 11:58:54
10 not eliminate or reduce Tayloe's capacitor 11:58:59
11 requirements, correct? 11:59:03
12 A. That is correct. 11:59:04
13 Q. So if you combine Tayloe and Macnally, the 11:59:05
14 capacitors still have to be, certainly, 11:59:10
15 off-chip, correct? 11:59:13
16 A. To a large extent, yes. 11:59:15
17 Q. Okay. The '177 patent describes that when 11:59:17
18 a switch is closed, the capacitor after the 11:59:22
19 switch charges and current flows into the 11:59:24
20 capacitor, correct? 11:59:27
21 A. It's a 477-page patent. I mean, in -- in 11:59:30
22 general terms, yes, but it -- but it -- there 11:59:34

1 are probably embodiments for which that isn't 11:59:36
2 quite true. 11:59:39
3 If we -- if you want, we can look at 11:59:40
4 specific embodiments. 11:59:41
5 Q. The '177 patent describes that when a 11:59:42
6 switch is open, the capacitor after the switch 11:59:45
7 discharges and current flows out of the 11:59:47
8 capacitor, correct? 11:59:50
9 MR. MAGEE: Objection to form. 11:59:51
10 A. Not necessarily. 11:59:52
11 Q. (BY MR. CHARKOW) But it does disclose 11:59:54
12 that, right, the '177 patent? 11:59:55
13 A. There -- it disclosed it as an optional 11:59:57
14 feature. It doesn't disclose it as a 12:00:01
15 requirement. 12:00:02
16 Q. Okay. So -- but it does describe it, 12:00:02
17 correct? 12:00:05
18 A. As an optional -- 12:00:05
19 MR. MAGEE: Objection to form. 12:00:07
20 A. It describes it as an option. 12:00:08
21 Q. (BY MR. CHARKOW) Okay. The '528 patent 12:00:10
22 describes that when a switch is closed, the 12:00:12


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 capacitor after the switch charges and current 12:00:15
2 flows into the capacitor, correct? 12:00:17
3 A. It -- it -- yes, I mean, it -- it -- it -- 12:00:21
4 that won't always be the case because -- because 12:00:25
5 sometimes when -- when the -- you know, when the 12:00:31
6 input signal increases, conventional current 12:00:33
7 flows into the capacitor; and when the -- when 12:00:37
8 the RF signal decreases, conventional current 12:00:41
9 flows out. 12:00:43
10 But, in general, there will be roughly 12:00:44
11 50 percent of the time that what you're saying 12:00:47
12 is true. 12:00:49
13 Q. Okay. So the '528 patent -- I'm just 12:00:49
14 asking if it describes -- whether or not it's on 12:00:53
15 an embodiment, I'm just saying it describes; so 12:00:55
16 that's what I'm saying -- strike that. 12:00:58
17 The '528 patent describes that when a 12:00:59
18 switch is open, the capacitor after the switch 12:01:01
19 discharges and current flows out of the 12:01:03
20 capacitor, correct? 12:01:06
21 A. It does mention -- 12:01:06
22 MR. MAGEE: Objection to form. 12:01:07

1 A. Sorry. It does mention that, but for the 12:01:08
2 same reasons I just described, it can flow the 12:01:11
3 other way too, but, yes. 12:01:13
4 Q. (BY MR. CHARKOW) Okay. And -- and you 12:01:14
5 understand that conventional current is the 12:01:18
6 current -- well, strike that. 12:01:20
7 You mentioned conventional current now 12:01:22
8 when you were talking about charging and 12:01:24
9 discharging. 12:01:26
10 Do you recall that? 12:01:27
11 A. Yeah. I did it because you liked that, so 12:01:27
12 I was trying to make you happy. 12:01:29
13 Q. Okay. Great. 12:01:31
14 So with regards to conventional -- 12:01:32
15 well, strike that. 12:01:35
16 So the ParkerVision patents refer to 12:01:36
17 conventional current. You know, when you're 12:01:40
18 talking about charging and discharging, it's 12:01:43
19 talking about conventional current or it's 12:01:45
20 discussing conventional current, correct? 12:01:47
21 A. We'd have to look at -- 12:01:49
22 MR. MAGEE: Objection to form. 12:01:50

1 A. We'd have to look at specific cases, but 12:01:51
2 that's probably true. 12:01:53
3 Q. (BY MR. CHARKOW) Okay. In saturation, an 12:01:55
4 NMOS transistor conducts current from drain to 12:02:02
5 source, correct? 12:02:05
6 A. In -- 12:02:08
7 MR. MAGEE: Objection to form. 12:02:08
8 A. In saturation, a -- an NMOS transistor 12:02:09
9 conducts current -- conventional current from 12:02:15
10 drain to source, yes. 12:02:18
11 Q. (BY MR. CHARKOW) Okay. So let's go to 12:02:19
12 another -- oh, you know what? Let's take a 12:02:21
13 break. It's been an hour. Take a break, quick 12:02:24
14 break. 12:02:27
15 THE VIDEOGRAPHER: Stand by. 12:02:28
16 We're going off the record. The time is 12:02:30
17 12:02 p.m. 12:02:33
18 (Break taken from 12:02 p.m. to 12:02:34
19 12:15 p.m.) 12:15:12
20 (Whereupon Exhibit Number 7 was 12:15:16
21 marked for identification.) 12:15:18
22 THE VIDEOGRAPHER: And we are back 12:15:18

1 on the record. The time is 12:15 p.m. 12:15:25
2 Q. (BY MR. CHARKOW) During the break, did 12:15:27
3 you talk to any attorneys? 12:15:29
4 A. Nope. 12:15:30
5 Q. Okay. So I've just dropped another 12:15:31
6 exhibit into the chat. If you could just take a 12:15:34
7 look at it when you have that -- strike that. 12:15:37
8 You've been provided with Exhibit 7 to 12:15:39
9 your deposition, which is the Razavi reference, 12:15:41
10 which is Exhibit 1017 in the IPRs. 12:15:44
11 A. Hold on. Okay. I got it. 12:15:47
12 Q. All right. And you've seen this reference 12:15:52
13 before, right? 12:15:55
14 A. Yes. 12:15:56
15 Q. Okay. And if you could turn to Figure 2, 12:15:56
16 which has the LNA/mixer implementation. 12:15:59
17 A. Yes, I've got it. 12:16:02
18 Q. Okay. M5 and M6 are NMOS transistors, 12:16:03
19 correct? 12:16:09
20 A. Correct. 12:16:09
21 Q. Okay. And for that matter, in the 12:16:09
22 baseband amplifier circuit, M1 and M2 are also 12:16:15

1 NMOS transistors, correct? Figure 5. 12:16:19
2 A. Yes. 12:16:22
3 Q. And let's just -- let me -- let me just do 12:16:22
4 it all while we're here, sorry. Going back to 12:16:28
5 Figure 2 -- sorry, yeah, so back to Figure 2 12:16:31
6 of -- strike that. 12:16:36
7 Back in figure -- strike that. 12:16:37
8 In Figure 2 of the Razavi reference, 12:16:39
9 all of the transistors, M1, 2, 3, 4, M5, M6, M7, 12:16:46
10 M8, those are all NMOS transistors, correct? 12:16:54
11 A. Yes. 12:16:58
12 Q. And in the Figure 5, the baseband 12:16:59
13 amplifier of Razavi, M1, M2, M3, M4 are all NMOS 12:17:02
14 transistors, correct? 12:17:08
15 A. No. 12:17:08
16 Q. M3 and 4 are not NMOS transistors? 12:17:12
17 A. They are not. 12:17:29
18 Q. What type of transistors are they? 12:17:30
19 A. PMOS. 12:17:33
20 Q. Sorry, CMOS? 12:17:35
21 A. PMOS, P as in Peter. 12:17:37
22 Q. PMOS, okay. Oh, I see. 12:17:39


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 Okay. You can put that aside. 12:17:53
2 I'm providing you with another exhibit 12:17:59
3 to your deposition. 12:18:01
4 (Whereupon Exhibit Number 8 was 12:18:03
5 marked for identification.) 12:18:03
6 Q. (BY MR. CHARKOW) Strike that. 12:18:10
7 You're provided with Exhibit 8 to your 12:18:13
8 deposition. This is a -- a paper by Abidi. 12:18:15
9 Do you have that in front of you? 12:18:20
10 A. I do. 12:18:21
11 Q. All right. And this is Exhibit TI-1059 or 12:18:22
12 Exhibit 1059 to the IPR. 12:18:29
13 You've seen that before, correct? 12:18:31
14 A. Yes. 12:18:33
15 Q. Okay. And you read this whole document 12:18:33
16 before you provided your declaration, correct? 12:18:37
17 A. Yeah, but it was quite a while ago, but 12:18:41
18 yes. 12:18:44
19 Q. Okay. So let's go to Page 1. The first 12:18:44
20 page, which is Page 18 of the -- which is 12:18:49
21 labeled as Page 18 in the left-hand corner, 12:18:52
22 okay? 12:18:55


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

A. Uh-huh. Yes. 12:18:56
Q. All right. So there is a discussion -- 12:18:56
starting on the left-hand side, there's a 12:18:59
section titled "ICs in Broadcast Radio 12:19:02
Receivers." 12:19:07
Do you see that? 12:19:07
A. I do. 12:19:08
Q. Okay. And in there -- in that section, 12:19:09
there is a -- a discussion of on-chip 12:19:12
components. 12:19:15
Do you see that? 12:19:16
So look to the second column on the 12:19:16
first page. You'll see discussions of on-chip 12:19:19
components. You could -- feel free to read that 12:19:23
section if you would like. 12:19:26
A. Hold on. 12:19:30
Which -- the second paragraph, you 12:19:31
said, or the first? 12:19:32
Q. Sorry, it's the -- strike that. 12:19:33
So Exhibit 8, Page 1, on the 12:19:35
right-hand column in the section entitled "ICs 12:19:39
in Broadcast Radio Receivers," there is a 12:19:43

1 discussion of on-chip components. 12:19:46
2 Do you see that? 12:19:48
3 A. Hold on. Yes, I do. 12:19:51
4 Q. Okay. So you see there -- it says, "In 12:19:55
5 designing a low-power, miniature FM receiver," 12:20:01
6 and then there's a person, "Kasperkovitz at 12:20:06
7 Philips realized that there are many advantages 12:20:12
8 in eliminating the RF and IF filters and 12:20:14
9 implementing the required selectivity on-chip." 12:20:17
10 Do you see that? 12:20:21
11 A. I do. 12:20:21
12 Q. Okay. And then the next sentence says, 12:20:21
13 "As it was impossible to integrate the RF 12:20:27
14 filters on-chip with spiral monolithic inductors 12:20:30
15 or to replace the 10.7 megahertz IF crystal 12:20:35
16 filters with active gyrator filters, the key 12:20:41
17 step in solving this problem was to lower the IF 12:20:45
18 from 10.7 megahertz to 70 kilohertz." 12:20:47
19 Do you see that? 12:20:51
20 A. I do. 12:20:51
21 Q. Okay. So this section about ICs and 12:20:52
22 broadcast radio receivers has discussion about 12:20:58

1 on-chip components, right? And you saw that? 12:21:00
2 A. Yes. 12:21:02
3 Q. Okay. And then -- and it's saying that -- 12:21:02
4 well, strike that. 12:21:10
5 And then if you keep reading down, the 12:21:11
6 next sentence says, "Aside from a small off-chip 12:21:16
7 inductor which provides a minimum of RF 12:21:19
8 filtering, the channel bandwidth is mainly 12:21:24
9 defined on-chip by high-order active RC 12:21:27
10 filters." 12:21:31
11 Do you see that? 12:21:31
12 A. I do. 12:21:31
13 Q. Okay. So that's another instance of a 12:21:32
14 discussion on-chip, correct? 12:21:35
15 A. Yes. 12:21:37
16 Q. Okay. Then if you keep reading a few -- 12:21:37
17 several lines down -- so it's maybe like seven, 12:21:43
18 eight lines down. It starts with "This 12:21:48
19 single-chip FM mono receiver." 12:21:50
20 Do you see that? 12:21:52
21 A. Yes. 12:21:53
22 Q. Okay. So Abidi, in Exhibit 8 on Page 1, 12:21:54

1 which is -- on the first page of the document, 12:22:01
2 it says, "This single-chip FM mono receiver 12:22:03
3 requires only 15 small capacitors and 2 12:22:07
4 inductors, making it possible to fit the entire 12:22:12
5 system within a wristwatch." 12:22:15
6 Do you see that? 12:22:17
7 A. I do. 12:22:17
8 Q. Okay. And then the 15 small capacitors 12:22:18
9 and the 2 inductors are referring to on-chip 12:22:21
10 components, correct? 12:22:26
11 A. Hold on a second. 12:22:29
12 Q. Sure. 12:22:30
13 A. Honestly, I'm not sure. I'd have to look 12:22:57
14 at the reference. 12:22:59
15 Q. Okay. So -- so you don't know if the -- 12:23:02
16 it specifically says the only thing that's 12:23:07
17 off-chip is this one inductor, and then it talks 12:23:09
18 about 15 small capacitors and 2 inductors; and 12:23:13
19 you think that could be anything other than 12:23:17
20 on-chip? 12:23:19
21 A. Well, what you're saying is probably true, 12:23:20
22 but -- but the thing is that, like I told you 12:23:23

1 before, there are always other off-chip 12:23:28
2 components, like a crystal and like bypass 12:23:31
3 capacitors; and so it's kind of sloppy wording 12:23:35
4 in the sense that he's -- he's -- he's talking 12:23:37
5 specifically about some components and neither 12:23:43
6 others. 12:23:46
7 So I think you are probably right, but 12:23:46
8 I'm not sure, but -- but as an -- as an 12:23:49
9 additional point, this is an example of what I 12:23:52
10 was saying before; this is what he's calling a 12:23:54
11 single-chip component, and it has at least -- 12:23:57
12 one component is shown here, off-chip, and maybe 12:24:01
13 -- maybe others, as well. I don't know. 12:24:05
14 But -- but for sure it's going to have 12:24:07
15 a crystal off-chip, and it's going to have 12:24:08
16 decoupling capacitors off-chip, so -- so I'm not 12:24:10
17 exactly sure. I'd have to look at the 12:24:14
18 reference. I can do it. I can look it up right 12:24:16
19 now and tell you, if you want. 12:24:18
20 Q. No, thank you. I don't think it's in the 12:24:20
21 record, so we're not going to do that. 12:24:22
22 The section -- so this section on ICs 12:24:24

1 in broadcast radio receivers relates to using 12:24:33
2 on-chip components to make a chip smaller, 12:24:35
3 correct? 12:24:38
4 MR. MAGEE: Objection, form. 12:24:38
5 Q. (BY MR. CHARKOW) Generally? 12:24:39
6 A. No. 12:24:40
7 When you use on-chip components, it 12:24:40
8 usually doesn't make the chip smaller. What it 12:24:43
9 usually does is it allows you to avoid having 12:24:45
10 expensive off-chip components. 12:24:49
11 So, for example, even -- even 12:24:53
12 nowadays, when you buy a cell phone, it's got a 12:24:55
13 bunch of off-chip components but it has way 12:24:57
14 fewer off-chip components than it had in the 12:25:00
15 past because they've managed to replace some of 12:25:03
16 those off-chip components with on-chip 12:25:07
17 components. 12:25:11
18 And -- and the advantage to doing that 12:25:11
19 is often cost because -- because some types 12:25:12
20 of -- of filters, such as SAW filters, are very 12:25:15
21 expensive; and part of it is -- is just bill of 12:25:19
22 materials, so -- but it rarely makes the chips 12:25:22

1 smaller. It usually actually makes them bigger. 12:25:25
2 Q. Okay. Sir, are we reading the same thing? 12:25:27
3 It says, "This single-chip FM mono receiver," 12:25:30
4 that's the one that's described above, "Requires 12:25:33
5 only 15 small capacitors and 2 inductors, making 12:25:36
6 it possible to fit the entire system within a 12:25:39
7 wristwatch," meaning making it smaller. 12:25:40
8 Am I missing -- I mean, that's -- if 12:25:42
9 you don't think that this section talks about 12:25:44
10 using on-chip components to make things smaller, 12:25:46
11 that's fine, you could say that. It -- 12:25:49
12 A. You asked -- you asked me a specific 12:25:53
13 question, and now you want a general answer. 12:25:54
14 The specific question was does -- does moving 12:25:57
15 components on-chip make the chip smaller? And 12:26:03
16 my answer was, generally that's not the case. 12:26:05
17 It can sometimes be the case, but more often 12:26:07
18 than not, it's not -- 12:26:09
19 Q. I said in the context of this section. I 12:26:10
20 didn't say generally. 12:26:13
21 A. Okay. So -- so ask me the question then, 12:26:13
22 again. 12:26:16

1 Q. In the context of the section of Abidi 12:26:16
2 that talks about ICs in broadcast radio 12:26:18
3 receivers, the discussion here is -- talks about 12:26:21
4 using on-chip components to make chips smaller, 12:26:25
5 correct? 12:26:28
6 A. It does. 12:26:31
7 Q. Okay. 12:26:32
8 A. But I mean, it -- it -- it does, but -- I 12:26:35
9 mean, it's a little vague in the sense that we 12:26:41
10 have to compare it to something specifically. 12:26:42
11 So first of all, I -- I don't recall 12:26:44
12 whether those 15 small capacitors and 2 12:26:47
13 inductors are off-chip or on-chip. I -- I -- 12:26:50
14 they may be off-chip, but I'm just not sure. 12:26:53
15 And so I just don't have the 12:26:55
16 information at my fingertips with which to 12:26:57
17 answer your question. 12:27:01
18 Q. I just need to understand. 12:27:01
19 You took -- you took a position -- you 12:27:02
20 took a position in this case, and I just need 12:27:03
21 the board to understand whether your position is 12:27:05
22 either A or B. It's two -- it's -- there's no 12:27:07

1 in between. It's -- it's -- either you have a 12:27:09
2 position A or position B. So let's -- I would 12:27:11
3 like the board to understand that. 12:27:13
4 So here's -- here's the question -- 12:27:14
5 strike that. 12:27:16
6 In section -- there's a section 12:27:16
7 entitled "ICs in Broadcast Radio Receivers," 12:27:21
8 okay? 12:27:24
9 Yes or no: This section that I just 12:27:24
10 mentioned from Abidi relates to using on-chip 12:27:29
11 components to make a chip smaller, yes or no? 12:27:33
12 MR. MAGEE: Objection to form. 12:27:35
13 A. You know, it's been a while since I looked 12:27:37
14 at this reference. I just don't remember. I'm 12:27:39
15 happy to look at it, but I just don't recall the 12:27:42
16 details of this reference. 12:27:45
17 Q. (BY MR. CHARKOW) Go read the whole 12:27:46
18 section, sure. Go read the whole section. 12:27:47
19 A. No. The -- what I'm talking about is the 12:27:49
20 reference to which it refers. 12:27:51
21 Q. Well, I just want to know if that's your 12:27:53
22 position. I just want to know what your 12:27:56


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 position is. 12:27:58
2 A. My position is -- 12:27:58
3 Q. I just want a clear position, yes or no. 12:27:59
4 A. My clear position is -- 12:28:01
5 MR. MAGEE: Object. 12:28:03
6 A. -- I don't know without looking at the 12:28:03
7 reference, the reference to which this -- this 12:28:05
8 paper refers. I'm happy to -- 12:28:06
9 Q. (BY MR. CHARKOW) The reference that's not 12:28:07
10 part of the record that I can't give you? I 12:28:08
11 can't give you it. If it's not in the record, I 12:28:11
12 can't give it to you. 12:28:13
13 A. Well -- 12:28:13
14 MR. MAGEE: Objection, form. Hang 12:28:15
15 on -- 12:28:16
16 (Talking over each other.) 12:28:17
17 MR. MAGEE: Objection to form. Go 12:28:19
18 ahead. 12:28:20
19 A. I -- we can -- I can either look at the 12:28:20
20 reference by -- we can put it in the record and 12:28:23
21 I can look -- look at it quickly. 12:28:25
22 Q. (BY MR. CHARKOW) Can't do it. 12:28:27

1 A. Or I can stick with my answer that is I 12:28:27
2 just don't recall. 12:28:30
3 Q. Okay. So you don't recall one way or 12:28:34
4 another whether the section in Abidi on ICs in 12:28:38
5 broadcast radio receivers, if that relates to 12:28:43
6 using on-chip components to make chips smaller? 12:28:45
7 That's your testimony? 12:28:49
8 A. The objective is to -- is to make the 12:28:49
9 overall system smaller, not necessarily the 12:28:52
10 chips themselves smaller. You -- the idea is, 12:28:54
11 you know, a system is more than just a chip, 12:28:57
12 even if it's a single-chip; and so by putting 12:29:00
13 more of these passive components on-chip, you 12:29:03
14 typically make the overall system smaller and 12:29:08
15 often less expensive but you don't necessarily 12:29:12
16 make the chips smaller. 12:29:15
17 As far as your specific question about 12:29:17
18 this particular circuit, I -- I looked at this 12:29:19
19 reference quite a while ago, and I -- I think, 12:29:23
20 but I'm not 100 percent sure, that those 15 12:29:26
21 small capacitors and 2 inductors are off-chip, 12:29:29
22 but I would have to look at it. I can do it in 12:29:33

1 five -- you know, five minutes, if you want. If 12:29:35
2 you want -- 12:29:36
3 Q. I can't -- I can't -- we're not allowed to 12:29:36
4 do that. I can't -- we can't add anything to 12:29:38
5 the record. It's -- that's -- that's the rules. 12:29:40
6 A. Okay. Then my answer stands. 12:29:41
7 Q. Okay. So you realize you looked at this, 12:29:43
8 like, a few weeks ago, right? Like, this isn't, 12:29:46
9 like, a year ago. 12:29:48
10 MR. MAGEE: Objection, form. 12:29:49
11 Q. (BY MR. CHARKOW) This is a more recent 12:29:50
12 reference. 12:29:52
13 MR. MAGEE: Objection, form. 12:29:52
14 A. So I was on a hiking -- well, anyway, 12:29:53
15 the -- the point is, I wrote 300 pages and -- 12:29:55
16 and I -- I just would have to refresh my memory 12:29:59
17 on this, so -- on that reference, so -- 12:30:02
18 Q. (BY MR. CHARKOW) You wrote 300 pages for 12:30:05
19 what? 12:30:06
20 A. Well, there are -- 12:30:07
21 MR. MAGEE: Objection, form. 12:30:08
22 A. -- there are three declarations I wrote. 12:30:09


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 Each is on the order of 100 pages and -- and -- 12:30:12
2 yeah, so... 12:30:16
3 Q. (BY MR. CHARKOW) I'm just talking about 12:30:17
4 the most recent one. 12:30:18
5 A. I can -- let me tell you what I'm 12:30:20
6 100 percent sure of. What I'm 100 percent sure 12:30:23
7 of is the reference to which this refers, 12:30:26
8 reference 4. I looked at it back then, but I 12:30:29
9 just don't remember. That's all I can tell you. 12:30:32
10 I -- I believe those 15 small capacitors and 2 12:30:35
11 inductors are off-chip, but I'm not 100 percent 12:30:38
12 sure. I don't know how to be any clearer than 12:30:41
13 this. 12:30:45
14 Q. So if you can look at -- let's see. All 12:30:46
15 right. So if we go back to the discussion where 12:30:54
16 it talks about -- it says, "As it was impossible 12:30:57
17 to integrate the RF filters on-chip with spiral 12:31:02
18 monolithic inductors" -- do you recall that? 12:31:06
19 A. Uh-huh. 12:31:09
20 Q. It talks about the way to solve that 12:31:09
21 problem was to lower the IF. 12:31:11
22 Do you see that? 12:31:16

1 A. Yes. 12:31:16
2 Q. Okay. So according to this section of 12:31:17
3 Abidi, by lowering the IF, a single-chip IC is 12:31:20
4 achieved by implementing filters and capacitors 12:31:25
5 on chips, correct? 12:31:27
6 A. That is correct. 12:31:29
7 Q. And the section on -- 12:31:29
8 A. Can I just add -- add something to that? 12:31:33
9 But that's not the only requirement 12:31:36
10 for inductors. 12:31:37
11 So for instance, you would use 12:31:38
12 inductors as the impedence match and those would 12:31:40
13 be off-chip. So -- so I believe that those two 12:31:44
14 inductors and the 15 capacitors, small 12:31:46
15 capacitors, are -- are off-chip; but again, I'd 12:31:49
16 have to -- I'd have to look at the reference to 12:31:51
17 remind myself of that. 12:31:53
18 Q. Okay. But you don't have any recollection 12:31:54
19 specifically, sitting here today, like, you 12:31:57
20 can't say it definitively? 12:31:59
21 A. I cannot because I -- even though you 12:32:00
22 said, well, I worked on this three weeks ago, I 12:32:03

1 actually worked on it a few months ago. I 12:32:05
2 provided all my documentation to Fish & 12:32:07
3 Richardson before I left on a long trip, or I 12:32:10
4 was out of commission. 12:32:14
5 So -- so it's been a while, and my 12:32:14
6 vague recollection is that those components are 12:32:18
7 off-chip, but I -- I just don't remember for 12:32:21
8 sure; and the only way to verify it is to look 12:32:23
9 at reference 4, which I did at the time, but I 12:32:26
10 just don't recall. 12:32:28
11 Q. Okay. The sections on IC in -- strike 12:32:29
12 that. 12:32:35
13 The section that we've been 12:32:35
14 discussing, which is broadcast radio receivers, 12:32:36
15 refers to creating a single-chip IC receiver, 12:32:40
16 correct? 12:32:43
17 A. You mean, in the Abidi paper? 12:32:45
18 Q. Yeah, in that specific section. 12:32:48
19 A. Yes. 12:32:50
20 Q. So if you go to Page 19 -- 12:32:51
21 A. Nine -- wait, wait, are we in the Abidi? 12:33:00
22 Q. Yeah, yeah, Page 19. It's the bottom 12:33:02

1 left, so it's the second page, but Page 19 of 12:33:04
2 the actual document. 12:33:07
3 A. I'm sorry. 12:33:09
4 Q. The bottom right. So when I say, like, 12:33:09
5 18, 19, the documents -- 12:33:13
6 A. Got it. 12:33:14
7 So 19, and where do you want me to 12:33:14
8 look -- 12:33:14
9 Q. All right. So -- strike that. 12:33:15
10 So Page 2 of Exhibit 8, which is -- on 12:33:17
11 Page 2 of Exhibit 8. 12:33:25
12 A. I am -- well, I mean, I'm in -- I'm on 12:33:26
13 Page 2 of Abidi's article. 12:33:31
14 Q. Yeah, that's it. Yes, so -- strike that. 12:33:33
15 Page -- you're on Page 2 of Abidi's 12:33:36
16 article, correct? 12:33:39
17 A. Yes. 12:33:39
18 Q. Okay. And in Abidi, there's a separate 12:33:40
19 section discussing ICs in cellular telephone 12:33:45
20 transceivers. 12:33:48
21 Do you see that? 12:33:50
22 A. I do. 12:33:50

1 Q. Okay. And there's discussion -- so you 12:33:51
2 could read that section. I'm going to ask you 12:33:54
3 some questions if you want to read through that 12:33:56
4 section, but the question that I have is on the 12:33:58
5 left side, third paragraph, the discuss- -- 12:34:01
6 there's a discussion of a Siemens IC? 12:34:03
7 A. I don't see where it says "Siemens." 12:34:14
8 You're talking about the bottom left paragraph 12:34:16
9 on Page 2? 12:34:18
10 Q. Yes. It starts with, "Circuits to 12:34:19
11 implement the complex modulation," and we read a 12:34:22
12 few lines down, it says, "In a 900 megahertz 12:34:25
13 transmitter." 12:34:29
14 A. Yeah, I see it. 12:34:29
15 Q. You see that from Siemens? 12:34:30
16 A. I do. 12:34:32
17 Q. Okay. So in this section of Abidi, which 12:34:32
18 is related to cellular telephone transceivers, 12:34:36
19 there is a discussion of a Siemens product that 12:34:39
20 had a transmitter IC, a separate receiver IC, 12:34:42
21 and a separate IF off-chip baseband SAW filter, 12:34:46
22 correct? 12:34:51

1 A. No, that's not correct. 12:34:51
2 Q. Okay. Let's go through it. 12:34:53
3 So we see, "In a 900 megahertz 12:34:55
4 transmitter silicon bipolar IC from Siemens," we 12:35:01
5 see, "a precision quadrature-upconversion mixer 12:35:05
6 implements the phase-shift keyed modulation 12:35:08
7 specified in the European GSM system to produce 12:35:12
8 a single-sideband, suppressed-carrier output." 12:35:15
9 Do you see that? 12:35:19
10 A. Yes. 12:35:19
11 Q. It says, "The IC, which includes an output 12:35:20
12 stage to drive a separate power amplifier, 12:35:23
13 drains 40" -- I guess, milliamps? 12:35:26
14 A. Yeah. 12:35:29
15 Q. Okay. Then it says, "The companion 12:35:30
16 receiver IC includes a first mixer," right? 12:35:34
17 Which means that the receiver IC is separate 12:35:37
18 from the transmitter IC, right? 12:35:39
19 A. Yes. 12:35:41
20 Q. Okay. So there is a discussion in this 12:35:41
21 section of Abidi that the Siemens product has a 12:35:43
22 transmitter IC and a separate receiver IC, 12:35:47

1 correct? 12:35:51
2 A. Yes. 12:35:51
3 Q. All right. And then we see it says, "The 12:35:51
4 companion receiver IC includes a first mixer 12:35:59
5 with buffers to drive an IF off-chip baseband 12:36:02
6 SAW filter." 12:36:07
7 Do you see that? 12:36:09
8 A. That's not what it says. 12:36:09
9 Q. I'll read it again. 12:36:13
10 "The companion receiver IC includes a 12:36:14
11 first mixer, comma, with buffers to drive an IF 12:36:18
12 off-chip baseband SAW filter." 12:36:23
13 A. Read it more carefully. 12:36:26
14 Q. I literally read the words on the page. 12:36:35
15 You go -- you go read the words. 12:36:37
16 A. What's the word right before "SAW filter"? 12:36:38
17 Q. Base -- oh, "bandpass." 12:36:41
18 The -- strike that. 12:36:43
19 The companion receiver IC include -- 12:36:44
20 strike that. 12:36:48
21 Abidi says, "The companion receiver IC 12:36:48
22 includes a first mixer, with buffers to drive an 12:36:53

1 IF off-chip bandpass SAW filter," correct? 12:36:55
2 A. That's correct. 12:36:59
3 Q. Okay. So there's a discussion in Abidi 12:36:59
4 that the Siemens product has a transmitter IC, 12:37:03
5 and separate from that transmitter IC is an IF 12:37:09
6 off-chip bandpass SAW filter, correct? 12:37:13
7 A. I think you meant "receiver IC," but it 12:37:17
8 says "the companion receiver IC has an off-chip 12:37:22
9 SAW filter." 12:37:25
10 Q. Right. Okay. 12:37:26
11 So there is discussions in Abidi of 12:37:27
12 the Siemens product that has a transmitter IC, a 12:37:30
13 separate receiver IC, and a separate IF off-chip 12:37:34
14 bandpass SAW filter, correct? 12:37:39
15 A. Yes. 12:37:41
16 Q. Okay. Abidi then goes on to describe an 12:37:42
17 Alcatel -- strike that. 12:37:48
18 Abidi then goes on to describe on the 12:37:50
19 right-hand side, the top of the page, an Alcatel 12:37:53
20 product that achieves greater miniaturization 12:37:56
21 than the Siemens product. 12:37:59
22 Do you see that? 12:38:01

1 A. I do. 12:38:01
2 Q. Okay. And the way Alcatel achieved 12:38:01
3 greater miniaturization than the Siemens product 12:38:04
4 was by integrating the transmitter and the 12:38:07
5 receiver sections onto a single bipolar chip, 12:38:11
6 correct? 12:38:14
7 A. Yes. 12:38:14
8 Q. And -- 12:38:15
9 A. Can I add a caveat to that? 12:38:17
10 That didn't make the chip smaller, 12:38:19
11 that made the overall system smaller. 12:38:21
12 Q. Okay. 12:38:24
13 A. The chip actually probably grew, but the 12:38:24
14 overall system, including the board and the 12:38:26
15 passive components around it, that all got 12:38:29
16 smaller. 12:38:33
17 So when he talks about 12:38:33
18 miniaturization, he's talking about the system, 12:38:35
19 not necessarily the chip. This is what I was 12:38:38
20 objecting to in what you said before. 12:38:40
21 Q. Okay. And then it says, "The 12:38:42
22 miniaturization was achieved by using the 12:38:44

1 zero-IF architecture," correct? That makes it 12:38:46
2 possible? 12:38:50
3 A. Yes. 12:38:51
4 Q. Okay. In other words, using zero-IF 12:38:51
5 architecture results in a lower frequency that 12:38:55
6 allows integration of the transmitter and 12:38:58
7 receiver sections, correct? 12:39:01
8 A. No. The -- the -- using -- using a -- a 12:39:04
9 zero-IF architecture allowed them to implement 12:39:11
10 the channel filtering using on-chip components 12:39:16
11 as opposed to a SAW filter. It has nothing to 12:39:21
12 do with -- with the transmitter. 12:39:26
13 Q. Okay. The Alcatel product in Abidi is -- 12:39:29
14 well, strike that. 12:39:34
15 A. And let me mention one other thing, 12:39:41
16 even -- even this particular chip had a large 12:39:43
17 off-chip capacitor -- actually, probably two of 12:39:50
18 them, but certainly one, because it had a -- it 12:39:52
19 had an integrated phased-lock loop. 12:39:55
20 And for that type of system, the 12:39:58
21 bandwidth of that phased-lock loop had to be so 12:39:59
22 low that the capacitors were required to be 12:40:02


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 off-chip, and yet, they still call it a 12:40:05
2 single-chip re- -- transceiver. 12:40:07
3 And also, like I said, there will be a 12:40:11
4 crystal there. There will be -- there will be a 12:40:14
5 matching network which involves inductors, and 12:40:16
6 there will be -- and capacitors, and there will 12:40:20
7 be bypass capacitors. 12:40:22
8 So even though we call it a 12:40:26
9 single-chip colloquially, it doesn't mean that 12:40:28
10 the whole product is a chip. It means that -- 12:40:31
11 it means that -- that most of the functionality 12:40:34
12 is on the chip except for passives. 12:40:35
13 MR. CHARKOW: Okay. Move to 12:40:38
14 strike as nonresponsive. 12:40:38
15 Q. (BY MR. CHARKOW) All right. So let's go 12:40:45
16 to -- do you recall being deposed a bunch of 12:40:48
17 times? Correct? 12:40:54
18 A. I do. 12:40:55
19 Q. Okay. I'm going to -- I'm going to ask 12:40:55
20 you a question. This is just some confirmation 12:41:01
21 that this is correct. 12:41:04
22 All right. So you've been provided 12:41:07

1 with Exhibit 9 to your deposition, which is an 12:41:11
2 excerpt from a deposition. 12:41:14
3 (Whereupon Exhibit Number 9 was 12:41:14
4 marked for identification.) 12:41:15
5 A. Let me -- I'm opening it. One second, 12:41:17
6 I've -- I've got it. 12:41:20
7 Q. (BY MR. CHARKOW) All right. So this was 12:41:21
8 a deposition that was done on February 28th, 12:41:22
9 2025. 12:41:22
10 Do you recall being at that 12:41:27
11 deposition? 12:41:28
12 A. I do. 12:41:28
13 Q. All right. And you gave truthful and 12:41:28
14 accurate testimony at that deposition, correct? 12:41:30
15 A. I did, yes. 12:41:33
16 Q. Okay. So if you could turn to -- on the 12:41:34
17 second page, I just want to ask you a question. 12:41:37
18 A. Okay. 12:41:41
19 Q. On page -- so it's the second page, and 12:41:41
20 then the -- it's in four quadrants, and one of 12:41:44
21 the quadrants is 69 -- 60 -- Page 69. 12:41:47
22 Do you see that? 12:41:55


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 A. I do. 12:41:55
2 Q. All right. And then you were asked a 12:41:55
3 question. The question was: "And how does the 12:41:59
4 mixer generate a 14.3-dB gain?" 12:42:02
5 Do you see that? 12:42:06
6 A. And how does a mixer -- okay, yes. 12:42:08
7 Q. And you could see further up where you 12:42:11
8 were talking about the Macnally reference. 12:42:13
9 Do you see that? 12:42:15
10 A. Further up? 12:42:17
11 Q. Yeah, just to the top of the page of 69. 12:42:18
12 A. Yeah, okay. 12:42:21
13 Q. Okay. So in your answer, you said -- 12:42:22
14 sorry. 12:42:33
15 Sorry, give me a second, I lost it. 12:42:34
16 Okay. So -- strike that. 12:42:42
17 So in your deposition, you testified 12:42:44
18 under oath that "When the RFP increases, the RFP 12:42:47
19 decreases. And so what that means is that in 12:42:52
20 the case more current will flow through the -- 12:42:57
21 you know, from drain to source of M1. And 12:43:00
22 correspondingly less current will flow through 12:43:03

1 M2." 12:43:06
2 Do you see that? 12:43:07
3 A. Yeah. 12:43:07
4 Can we -- I'd like to bring up the 12:43:07
5 Macnally circuit just so I can put it in 12:43:10
6 context. 12:43:12
7 Q. Sure. I'll give it to you, just give me a 12:43:13
8 second. 12:43:16
9 All right. So I'm giving you 12:43:22
10 Exhibit 10 to your deposition, which is the 12:43:25
11 Macnally reference, which is Exhibit 1021 in 12:43:26
12 the -- or TI 1021 in the IPRs. 12:43:29
13 A. I've got it. One second. 12:43:32
14 (Whereupon Exhibit Number 10 was 12:43:34
15 marked for identification.) 12:43:35
16 A. So we're referring to figure -- Figure 3. 12:43:35
17 Let me rotate it. One second. 12:43:40
18 All right. Got it. 12:43:43
19 Q. (BY MR. CHARKOW) All right. So you're in 12:43:45
20 Figure 3 of Macnally, correct? 12:43:46
21 A. I am. 12:43:48
22 Q. All right. So in Figure 3, you see M1? 12:43:52

1 A. I do. 12:43:54
2 Q. And in Macnally, current flows from the 12:43:54
3 drain to the source of M1, correct? 12:44:01
4 A. Conventional current -- 12:44:04
5 MR. MAGEE: Objection to form. 12:44:05
6 A. Sorry. Conventional current flows that 12:44:05
7 way. 12:44:05
8 MR. CHARKOW: Can we take a break? 12:44:09
9 THE WITNESS: Sure. 12:44:13
10 THE VIDEOGRAPHER: Stand by. 12:44:14
11 We are going off the record. The 12:44:15
12 time is 12:44 p.m. 12:44:16
13 (Break taken from 12:44 p.m. to 12:44:19
14 1:05 p.m.) 13:05:53
15 THE VIDEOGRAPHER: We are back on 13:05:58
16 the record. The time is 1:06 p.m. 13:06:02
17 Q. (BY MR. CHARKOW) Circuits that receive 13:06:07
18 higher frequency signals can use smaller 13:06:09
19 capacitors, correct? 13:06:11
20 A. What do you mean by "higher frequency 13:06:14
21 signals"? 13:06:16
22 Q. Higher frequency RF signals. 13:06:17

1 A. It's just an ill-posed question. I mean, 13:06:22
2 circuit -- what does the circuit do? Are we 13:06:25
3 talking about bandwidth? Are we talking about 13:06:27
4 center frequency? You've asked me this 13:06:29
5 question, and I've given you this exact same 13:06:31
6 answer that I just gave you. 13:06:33
7 Q. No, I didn't ask you the same question. I 13:06:35
8 changed the question because you weren't 13:06:37
9 answering it, so I'm trying to -- I'm trying to 13:06:39
10 get a question that will result in an answer, 13:06:40
11 so -- so the RF signal coming -- strike that. 13:06:44
12 With regards to the RF input signal to 13:06:47
13 a -- a receiver of a wireless chip, if -- the 13:06:53
14 higher the frequency of that signal, the smaller 13:07:00
15 capacitors that you can use, correct? 13:07:05
16 MR. MAGEE: Objection to form. 13:07:07
17 A. Used for what? 13:07:08
18 Q. (BY MR. CHARKOW) In a filter. 13:07:09
19 A. No, that's not -- that's not correct, 13:07:14
20 necessarily. 13:07:16
21 Q. Well, what do you mean it's not correct 13:07:18
22 necessarily? When is it correct? 13:07:20

1 MR. MAGEE: Objection to form. 13:07:22
2 A. I mean, it's still a vague question, but 13:07:23
3 I'll give you an example. It's not a definitive 13:07:26
4 example, but it's -- but it's -- it's -- it's 13:07:29
5 rep- -- it's an example. 13:07:31
6 So if we're talking about increasing 13:07:32
7 the frequency -- the center frequency of the RF 13:07:35
8 signal, and -- and the circuit you're talking 13:07:41
9 about performs direct downconversion, then the 13:07:44
10 frequency of the signal has no bearing 13:07:48
11 whatsoever on the capacitors used in the 13:07:50
12 low-pass filter. 13:07:52
13 Q. (BY MR. CHARKOW) Okay. I asked when it 13:07:53
14 does have a bearing, not when it doesn't. 13:07:55
15 A. Well, so when it does -- so there -- if -- 13:07:58
16 I mean, so first, you -- the problem is this is 13:08:10
17 such an ill-posed question. 13:08:12
18 So, first of all, are we talking about 13:08:14
19 the capacitors in a low-pass filter? Are we 13:08:15
20 talking about the capacitors in a bandpass 13:08:17
21 filter? Like, give me more details. Like, I 13:08:20
22 can't -- you're -- you're asking such a vague 13:08:23

1 question. 13:08:24
2 And then you're asking me to -- to, 13:08:25
3 like, tighten up your question for you and then 13:08:29
4 give you an answer; and then when I tried that, 13:08:30
5 you're, like, oh, that's not what I asked. 13:08:33
6 So, you know, give me a precise 13:08:34
7 question, and I'll give you a precise answer. 13:08:36
8 Q. Okay. The -- strike that. 13:08:39
9 A receiver, a wireless receiver 13:08:43
10 receiving a higher frequency signal, can use a 13:08:54
11 smaller capacitor in a bandpass filter, correct? 13:08:59
12 A. Not necessarily. 13:09:06
13 Q. Well, when can it? 13:09:08
14 A. Well, first of all, we don't usually 13:09:12
15 use -- we don't usually implement bandpass 13:09:15
16 filters on-chip in wireless receivers. Those 13:09:17
17 are usually off-chip. 13:09:20
18 And -- and -- and the capacitor size, 13:09:22
19 in that case, would not depend on the RF center 13:09:30
20 frequency. So if you increase the frequency of 13:09:33
21 the RF signal, it would not necessarily have any 13:09:36
22 bearing whatsoever on the capacitor sizes in the 13:09:40

1 filters. 13:09:44
2 Q. Okay. A wireless receiver receiving a 13:09:44
3 high frequency signal can use a smaller 13:09:52
4 capacitor in a low-pass filter, correct? 13:09:57
5 A. It depends what you mean by "higher 13:09:58
6 frequency." If we're talking about the 13:10:01
7 frequency at which the RF signal wiggles, then 13:10:03
8 the answer is no. 13:10:06
9 Q. Okay. Well, is there a case where it 13:10:08
10 would affect the size of the capacitor, where 13:10:11
11 using a higher frequency signal would affect the 13:10:13
12 size of the capacitor? 13:10:16
13 A. It depends on your definition of, quote, 13:10:16
14 higher frequency signal, end quote. 13:10:19
15 So, again, you got to ask me a 13:10:21
16 specific question for me to give you a specific 13:10:23
17 answer. 13:10:25
18 Q. Using a higher -- higher megahertz. I 13:10:25
19 don't know -- so you used higher -- like, 100 13:10:28
20 megahertz higher, or, like, a gigahertz as 13:10:33
21 opposed to megahertz higher. 13:10:36
22 A. Okay. The -- that's what we would call 13:10:37

1 the center frequency of the RF signal, and the 13:10:40
2 center frequency of the RF signal has no bearing 13:10:44
3 whatsoever on the low-pass filters used in a -- 13:10:47
4 in a wireless receiver. 13:10:50
5 Q. Okay. Lower frequent -- strike that. 13:10:51
6 Lower frequencies need larger 13:10:56
7 capacitance to achieve a desired impedence or a 13:10:59
8 time constant compared to higher frequencies 13:11:02
9 which use smaller capacitors to get the same 13:11:05
10 effect, correct? 13:11:07
11 MR. MAGEE: Objection, form. 13:11:07
12 A. Well, wait. 13:11:08
13 Are we talking about the low-pass 13:11:09
14 filter at -- after downconversion, or are we 13:11:13
15 talking about the capacitors that are used in a 13:11:20
16 matching network? 13:11:21
17 I -- the problem is, this is just such 13:11:22
18 a vague question. I don't have a way to answer 13:11:24
19 it. 13:11:26
20 Q. (BY MR. CHARKOW) After downconversion. 13:11:26
21 A. Okay. So after downconversion, the -- the 13:11:28
22 capacitor size is not impacted in any way by the 13:11:31

1 center frequency of the RF signal. I -- I've 13:11:36
2 answered -- I've answered this now a few times, 13:11:40
3 and that -- that's my answer. 13:11:42
4 Q. Sorry, just give me a minute. 13:11:42
5 All right. Is there any relationship 13:12:33
6 between frequencies and the size of the 13:12:40
7 capacitors used in a low-pass filter in a 13:12:42
8 receiver of an RF chip? 13:12:44
9 MR. MAGEE: Objection to form. 13:12:48
10 A. So if we're talking about RF input 13:12:50
11 frequency, no; but if you want to build a 13:12:55
12 low-pass filter with a wider bandwidth, that 13:12:59
13 will usually reduce the size of the -- of the 13:13:04
14 required capacitors, but that has nothing to do 13:13:07
15 with the center frequency of the R -- receive 13:13:10
16 signal. 13:13:14
17 Q. (BY MR. CHARKOW) Is there any 13:13:19
18 relationship between the LL frequency and the 13:13:20
19 size of the capacitors used in a low-pass filter 13:13:23
20 in a receiver of an RF chip? 13:13:26
21 A. If it's a direct conversion receiver, 13:13:28
22 there is not. 13:13:31

1 Q. What happens if it's not a direct 13:13:31
2 conversion receiver? 13:13:33
3 A. Give me an example. 13:13:34
4 Q. A heterodyne receiver. 13:13:36
5 A. Okay. Well, then it -- it does -- it 13:13:39
6 still does not depend on the RF center 13:13:42
7 frequency, but it does -- it -- it -- well, in 13:13:45
8 that case, if it's heterodyne, you -- you -- 13:13:49
9 you're not building a low-pass filter, you're 13:13:52
10 building a bandpass filter, and that's almost 13:13:54
11 always done off-chip. 13:13:54
12 And it's very often done with SAW 13:13:55
13 filters, so -- so it doesn't -- it's not really 13:14:01
14 an issue of capacitance. 13:14:02
15 MR. CHARKOW: Can we just take a 13:14:48
16 break for a minute? Sorry, just nobody go 13:14:49
17 anywhere. I just got to -- I just got to do 13:14:51
18 something, just one minute. I think I'm done. 13:14:53
19 THE VIDEOGRAPHER: Stand by. We 13:14:56
20 are going off the record. The time is 1:14 p.m. 13:14:57
21 (Break taken from 1:15 p.m. to 13:15:00
22 1:16 p.m.) 13:16:43

1 THE VIDEOGRAPHER: We are back on 13:16:43
2 the record. The time is 1:16 p.m. 13:16:48
3 MR. CHARKOW: For the record, 13:16:51
4 Stephanie Mandir, my colleague at Daignault 13:16:54
5 Iyer, joined for the last couple of minutes. 13:16:58
6 And I have no further questions at 13:16:59
7 this time. 13:17:01
8 MR. MAGEE: We have no questions. 13:17:01
9 We'll read and sign. 13:17:03
10 THE VIDEOGRAPHER: All right. 13:17:06
11 I'll close this down. Stand by. 13:17:06
12 This marks the end of the 13:17:07
13 deposition of Dr. Ian Galton, Ph.D, for the 13:17:08
14 matters of IPR2024-00935 and 036. 13:17:13
15 We are going off the record. The 13:17:16
16 time is 1:17 p.m. Central. 13:17:17
17 MR. MAGEE: All right. Thanks 13:17:21
18 everybody. 13:17:23
19 THE COURT REPORTER: Does anybody 13:17:26
20 need a rough? 13:17:27
21 MR. CHARKOW: Yes. 13:17:29
22 (Deposition concluded.)


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 I, IAN GALTON, PH.D., have read the foregoing
deposition and hereby affix my signature that
2 same is true and correct, except as noted above.

3 _____
IAN GALTON, PH.D.
4

5 THE STATE OF _____)

6 COUNTY OF _____)

7 Before me, _____, on

8 this day personally appeared IAN GALTON, PH.D.,

9 known to me (or proved to me under oath or

10 through _____)

11 (description of identity card or other document)

12 to be the person whose name is subscribed to the

13 foregoing instrument and acknowledged to me that

14 they executed the same for the purposes and

15 consideration therein expressed.

16 Given under my hand and seal of office this

17 _____ day of _____,

18 _____.

19

20 _____
NOTARY PUBLIC IN AND FOR
THE STATE OF _____
21 COMMISSION EXPIRES: _____

22


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 UNITED STATES PATENT AND TRADEMARK OFFICE
_____
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD
_____
3
4 TEXAS INSTRUMENTS, INC.,
And NXP USA, INC.,
5 Petitioners,
6 V.
7 PARKERVISION, INC.,
Patent Owner,
8
IPR2024-00935
9 IPR2024-00936
Patent 7,865,177 B2
10
Certificate of Shorthand Reporter
11
12 I, Annette Peltier, CSR, Texas Certified
13 Realtime Reporter in and for the State of Texas
14 do hereby certify:
15 That IAN GALTON, PH.D., the witness whose
16 deposition is herein before set forth, was duly
17 sworn before the commencement of such deposition
18 and that such deposition was taken before me and
19 is a true record of the testimony given by such
20 witness.
21 I further certify that the adverse party,
22 Texas Instruments Inc., and NSP USA, Inc., was


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

1 represented by counsel at the deposition.
2 I further certify that the deposition of IAN
3 GALTON, PH.D., occurred via Zoom videoconference
4 on July 16, 2025, commencing at 10:57 a.m.
5 Central time to 1:17 p.m. Central time.
6 I further certify that I am not related to
7 any of the parties to this action by blood or
8 marriage, I am not employed by or an attorney to
9 any of the parties to this action, and that I am
10 in no way interested, financially or otherwise,
11 in the outcome of this matter.
12 IN WITNESS WHEREOF, I have hereunto set my
13 hand this 18th day of July, 2025.
14
15 _____
Annette Peltier, Texas CSR 3253
16 Expiration Date: 10/31/25
Firm Registration No. 686
17 451 Hungerford Drive
Suite 400
18 Rockville, MD 20850
Phone: 888.433.3767
19 Fax: 888.503.3767
20
21
22


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

A
**abidi**
65:8, 68:22, 73:1, 74:10, 76:4, 79:3, 80:17, 80:21, 81:18, 82:17, 83:21, 84:21, 85:3, 85:11, 85:16, 85:18, 87:13
**abidi's**
81:13, 81:15
**able**
11:18, 12:2
**about**
9:9, 15:22, 19:12, 20:17, 25:9, 27:17, 33:7, 36:8, 37:9, 37:13, 40:16, 40:18, 40:20, 43:4, 43:5, 43:6, 45:8, 47:7, 56:11, 61:8, 61:18, 61:19, 67:21, 67:22, 69:18, 70:5, 72:9, 73:2, 73:3, 74:19, 76:17, 78:3, 78:16, 78:20, 82:8, 86:17, 86:18, 90:8, 93:3, 94:6, 94:9, 94:18, 94:20, 96:6, 97:13, 97:15, 98:10
**above**
72:4, 101:3
**above-styled**
2:4
**absolutely**
47:18
**according**
79:2
**accurate**
8:4, 89:14
**achieve**
97:7
**achieved**
79:4, 86:2, 86:22
**achieves**
85:20
**acknowledged**
101:15
**across**
22:7, 22:15, 23:2, 23:22, 28:4
**action**
103:7, 103:9
**active**
67:16, 68:9
**actual**
50:2, 81:2
**actually**
18:8, 30:9, 40:14, 45:20, 47:21, 72:1, 80:1, 86:13, 87:17
**adapt**
50:7
**add**
54:2, 77:4, 79:8, 86:9
**additional**
52:14, 70:9
**adjournment**
4:8
**advantage**
71:18
**advantages**
67:7
**adverse**
102:28
**affect**
96:10, 96:11
**affix**
101:2
**after**
34:7, 58:18, 59:6, 60:1, 60:18, 97:14, 97:20, 97:21
**again**
16:3, 19:10, 28:16, 29:3, 30:12, 31:19, 45:1, 45:2, 72:22, 79:15, 84:9, 96:15
**ago**
38:13, 39:1, 65:17, 76:19, 77:8, 77:9, 79:22, 80:1
**ahead**
47:3, 48:20, 75:18
**alcatel**
85:17, 85:19, 86:2, 87:13
**all**
6:21, 8:13, 11:5, 13:1, 13:20, 14:1, 14:14, 15:5, 15:8, 16:12, 18:12, 24:1, 33:20, 39:12, 45:13, 46:11, 48:6, 50:4, 50:12, 53:3, 53:11, 56:2, 63:12, 64:4, 64:9, 64:10, 64:13, 65:11, 66:2, 73:11, 78:9, 78:14, 80:2, 81:9, 84:3, 86:15, 88:15, 88:22, 89:7, 89:13, 90:2, 91:9, 91:18, 91:19, 91:22, 94:18, 95:14, 98:5, 100:10, 100:17
**allowed**
77:3, 87:9
**allows**
71:9, 87:6
**almost**
47:19, 99:10
**also**
3:22, 7:10, 13:10, 13:15, 14:20, 23:4, 23:6, 30:3, 63:22, 88:3
**alto**
3:9
**always**
30:13, 45:10, 48:5, 48:15, 48:21, 60:4, 70:1, 99:11
**ambiguous**
31:9, 32:14, 33:12
**amend**
18:8
**amount**
28:5, 28:21, 30:2, 36:5
**amplifier**
30:8, 51:4, 56:9, 63:22, 64:13, 83:12
**amplifiers**
17:2, 56:5
**amplitude**
44:19
**analog**
43:12
**analysis**
17:10, 22:1, 35:9, 35:19
**annette**
1:28, 2:6, 7:15, 28:14, 102:19, 103:16
**another**
8:21, 9:4, 14:1, 15:12, 15:16, 25:10, 27:7, 39:4, 49:8, 62:12,



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

63:5, 65:2, 68:13, 76:4
**answer**
24:21, 25:5, 25:13, 25:18, 26:1, 26:15, 27:8, 27:13, 27:15, 29:7, 30:16, 31:12, 31:13, 32:17, 33:3, 33:4, 33:19, 34:10, 36:22, 37:5, 41:3, 42:20, 45:9, 45:10, 72:13, 72:16, 73:17, 76:1, 77:6, 90:13, 93:6, 93:10, 95:4, 95:7, 96:8, 96:17, 97:18, 98:3
**answered**
37:12, 98:2
**answering**
93:9
**any**
8:3, 9:8, 9:21, 16:7, 25:3, 27:9, 27:16, 27:18, 27:19, 31:4, 32:10, 38:8, 53:9, 53:21, 54:14, 54:16, 57:7, 57:21, 58:7, 63:3, 78:12, 79:18, 95:21, 97:22, 98:5, 98:17, 103:7, 103:9
**anybody**
8:16, 100:19
**anything**
22:12, 27:16, 49:9, 54:13, 54:14, 54:17, 54:19, 55:1, 57:6, 69:19, 77:4
**anyway**
46:15, 77:14
**anywhere**
32:11, 57:7, 99:17
**apart**
40:15
**apologies**
25:14
**appeal**
1:4, 6:14, 102:4
**appearances**
4:4
**appeared**
101:10
**application**
51:3
**applies**
35:8, 35:18
**architecture**
87:1, 87:5, 87:9
**aren't**
56:8
**around**
86:15
**arrow**
20:3, 20:9, 20:11, 20:20, 21:5, 21:10, 21:13, 21:16
**art**
37:19
**article**
4:30, 81:13, 81:16
**aside**
13:21, 52:12, 65:1, 68:6
**asked**
10:2, 10:7, 31:7, 31:10, 33:19, 36:22, 37:12, 72:12, 90:2, 93:4, 94:13, 95:5
**asking**
20:16, 20:17, 27:16, 27:18, 30:14, 37:2, 60:14, 94:22, 95:2
**assume**
9:7, 33:21, 47:8, 50:13
**attached**
2:11
**attending**
6:22, 7:10
**attorney**
7:4, 103:8
**attorneys**
63:3
**audio**
16:6
**author**
37:18
**avoid**
71:9
**aware**
8:7, 8:13, 8:16, 9:4, 9:16, 14:21, 27:10, 31:6, 38:2, 40:6, 56:20

**B**

**b2**
1:15, 102:15
**back**
11:12, 48:1, 62:22, 64:4, 64:5, 64:7, 78:8, 78:15, 92:15, 100:1
**backwards**
43:19
**bandpass**
84:17, 85:1, 85:6, 85:14, 94:20, 95:11, 95:15, 99:10
**bandwidth**
43:5, 43:8, 43:10, 43:14, 43:21, 44:2, 44:3, 44:4, 44:5, 44:12, 44:20, 44:21, 45:3, 68:8, 87:21, 93:3, 98:12
**base**
84:17
**baseband**
43:18, 44:14, 44:18, 45:3, 63:22, 64:12, 82:21, 84:5, 84:12
**based**
36:12, 57:2, 58:4
**basically**
54:20
**battery**
28:3
**bearing**
94:10, 94:14, 95:22, 97:2
**because**
8:22, 12:1, 33:18, 38:12, 40:6, 41:1, 46:11, 48:3, 48:4, 48:15, 55:1, 57:11, 60:4, 61:11, 71:15, 71:19, 79:21, 87:18, 93:8
**been**
7:18, 10:13, 27:1, 32:3, 38:20, 50:6, 62:13, 63:8, 74:13, 80:5, 80:13, 88:22
**before**
1:4, 2:6, 6:14, 11:6, 16:15, 31:7, 33:18,

33:19, 49:21, 63:13, 65:13, 65:16, 70:1, 70:10, 80:3, 84:16, 86:20, 101:9, 102:4, 102:23, 102:24, 102:25
**begins** 6:9
**behalf** 3:3, 3:12, 7:6, 7:9
**behavior** 17:14, 17:19
**behzad** 4:24, 41:7
**being** 17:12, 18:1, 32:16, 42:18, 88:16, 89:10
**believe** 52:18, 78:10, 79:13
**benjamin** 36:13
**best** 28:15
**between** 22:4, 22:6, 22:22, 29:20, 57:9, 74:1, 98:6, 98:18
**big** 44:11, 51:18, 51:19
**bigger** 72:1
**bill** 71:21
**bios** 56:3
**bipolar** 83:4, 86:5
**blood** 103:7
**blue** 3:6, 7:8
**bluetooth** 44:10, 44:12
**board** 1:4, 6:14, 47:20, 47:21, 54:6, 55:11, 73:21, 74:3, 86:14, 102:4
**bobby** 47:4
**bond** 57:21
**book** 14:19, 14:20, 32:2, 38:11, 38:15
**books** 31:4, 38:9, 38:16
**boone** 3:17
**both** 37:13
**bother** 58:6
**bottom** 14:15, 47:20, 50:3, 52:12, 55:8, 80:22, 81:4, 82:8
**boulevard** 3:17
**brackets** 40:21
**break** 62:13, 62:14, 62:18, 63:2, 92:8, 92:13, 99:16, 99:21
**breath** 28:15
**bring** 91:4
**broadcast** 66:4, 66:22, 67:22, 71:1, 73:2, 74:7, 76:5, 80:14
**buffers** 84:5, 84:11, 84:22
**build** 54:6, 55:10, 98:11
**building** 43:12, 44:10, 99:9, 99:10
**bunch** 54:7, 71:13, 88:16
**buy** 71:12
**bypass** 70:2, 88:7

**C**

**ca** 3:9
**calculating** 34:22
**call** 46:12, 46:16, 47:22, 88:1, 88:8, 96:22
**called** 14:20, 38:18, 39:14
**calling** 22:15, 70:10
**came** 14:18
**camino** 3:7
**can't** 8:4, 25:5, 27:14, 75:10, 75:11, 75:12, 75:22, 77:3, 77:4, 79:20, 94:22
**cannot** 79:21
**capacitance** 56:18, 57:22, 97:7, 99:14
**capacitor** 11:10, 29:11, 29:17, 29:21, 30:6, 30:11, 33:15, 33:22, 34:4, 34:5, 34:7, 34:20, 41:16, 41:19, 42:3, 42:5, 42:11, 42:13, 42:18, 42:22, 43:15, 43:16, 44:16, 45:5, 47:12, 56:22, 57:3, 57:9, 57:20, 58:10, 58:18, 58:20, 59:6, 59:8, 60:1, 60:2, 60:7, 60:18, 60:20, 87:17, 95:11, 95:18, 95:22, 96:4, 96:10, 96:12, 97:22
**capacitors** 41:13, 43:13, 44:6, 44:11, 45:13, 45:16, 46:1, 46:4, 46:8, 46:13, 46:15, 46:18, 46:20, 47:10, 47:13, 47:18, 48:4, 48:7, 49:2, 51:1, 51:18, 52:8, 52:13, 54:12, 56:12, 56:13, 56:17, 58:14, 69:3, 69:8, 69:18, 70:3, 70:16, 72:5, 73:12, 76:21, 78:10, 79:4, 79:14, 79:15, 87:22, 88:6, 88:7, 92:19, 93:15, 94:11, 94:19, 94:20,



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

97:9, 97:15, 98:7, 98:14, 98:19
**capital** 19:16
**card** 101:13
**career** 31:5, 32:3, 32:11
**carefully** 84:13
**carries** 27:5
**case** 27:22, 31:12, 33:20, 35:6, 35:12, 43:16, 43:22, 45:10, 51:2, 57:8, 60:4, 72:16, 72:17, 73:20, 90:20, 95:19, 96:9, 99:8
**cases** 31:13, 62:1
**cause** 2:4
**caveat** 36:10, 36:11, 86:9
**celia** 3:27, 7:11
**cell** 71:12
**cellular** 81:19, 82:18
**center** 43:6, 93:4, 94:7, 95:19, 97:1, 97:2, 98:1, 98:15, 99:6
**central** 2:6, 6:18, 100:16, 103:5
**certain** 28:21, 30:2, 43:21
**certainly** 58:14, 87:18
**certificate** 4:12, 102:17
**certified** 2:7, 102:19
**certify** 102:21, 102:28, 103:2, 103:6
**change** 34:18
**changed** 93:8
**channel** 45:8, 68:8, 87:10
**charge** 19:6, 19:13
**charges** 58:19, 60:1
**charging** 11:9, 12:11, 12:14, 12:16, 12:18, 61:8, 61:18
**charkow** 3:14, 4:6, 7:5, 7:21, 9:20, 10:20, 12:16, 13:1, 13:8, 14:5, 15:16, 16:6, 16:12, 17:21, 18:7, 20:2, 20:8, 21:4, 22:12, 24:6, 25:14, 26:3, 26:21, 29:8, 29:19, 31:3, 32:8, 32:19, 34:19, 35:5, 35:14, 36:19, 36:21, 37:4, 37:6, 37:15, 38:8, 39:8, 42:2, 46:19, 48:6, 49:7, 49:11, 49:12, 49:20, 56:11, 58:8, 59:11, 59:21, 61:4, 62:3, 62:11, 63:2, 65:6, 71:5, 74:17, 75:9, 75:22, 77:11, 77:18, 78:3, 88:13, 88:15, 89:7, 91:19, 92:8, 92:17, 93:18, 94:13, 97:20, 98:17, 99:15, 100:3, 100:21
**chat** 10:14, 39:5, 63:6
**chip** 9:17, 9:22, 28:9, 29:10, 30:9, 33:16, 34:7, 42:21, 44:15, 45:4, 45:17, 45:20, 46:7, 46:12, 46:19, 47:22, 48:2, 48:6, 53:10, 53:22, 54:6, 55:2, 55:11, 56:4, 56:7, 56:10, 57:17, 57:20, 71:2, 71:8, 72:15, 74:11, 76:11, 86:5, 86:10, 86:13, 86:19, 87:16, 88:10, 88:12, 93:13, 98:8, 98:20
**chips** 46:11, 46:12, 52:14, 53:14, 54:5, 71:22, 73:4, 76:6, 76:10, 76:16, 79:5
**choose** 44:8
**circuit** 15:9, 17:15, 17:19, 18:2, 20:2, 20:19, 21:12, 21:14, 22:1, 35:1, 35:9, 35:19, 38:16, 41:16, 41:21, 42:12, 42:17, 50:8, 55:11, 63:22, 76:18, 91:5, 93:2, 94:8
**circuit's** 16:22, 42:4, 42:14, 43:1, 43:17, 45:15
**circuits** 17:1, 17:5, 17:8, 19:16, 42:7, 82:10, 92:17
**circumstances** 34:21
**cited** 57:6
**civil** 2:9
**claims** 10:4, 10:9
**clarification** 25:9
**classes** 18:16, 31:4, 38:4
**clean** 52:6
**clear** 30:18, 75:3, 75:4
**clearer** 78:12
**clock** 43:4, 52:5
**close** 100:11

**closed**
58:18, 59:22
**cmos**
4:30, 38:16, 64:20
**colleague**
100:4
**colleagues**
35:15
**colloquially**
88:9
**column**
66:12, 66:21
**combine**
58:13
**combining**
58:9
**come**
16:7
**comes**
27:12
**coming**
28:8, 29:9, 93:11
**comma**
84:11
**commencement**
102:24
**commencing**
103:4
**comment**
12:2
**commission**
80:4, 101:25
**commutator**
51:15, 56:4
**companion**
83:15, 84:4, 84:10, 84:19, 84:21, 85:8
**compare**
73:10
**compared**
97:8
**completely**
30:15
**complex**
82:11
**component**
23:18, 23:21, 33:6, 33:7, 33:9, 47:14, 51:22, 54:21, 70:11, 70:12
**components**
48:12, 48:16, 48:21, 50:21, 51:14, 52:17, 55:17, 55:19, 56:5, 66:10, 66:14, 67:1, 68:1, 69:10, 70:2, 70:5, 71:2, 71:7, 71:10, 71:13, 71:14, 71:16, 71:17, 72:10, 72:15, 73:4, 74:11, 76:6, 76:13, 80:6, 86:15, 87:10
**concept**
18:20, 20:16, 24:14
**conception**
10:3, 10:8
**concluded**
100:22
**conductance**
22:13
**conductor**
22:3, 22:6, 22:11, 22:16, 22:22
**conducts**
22:12, 62:4, 62:9
**confirmation**
88:20
**confused**
8:18
**connected**
15:10, 17:6, 17:9, 17:12, 18:10, 33:21, 56:19
**consider**
36:6
**consideration**
101:17
**considered**
30:21
**considering**
29:15, 29:17
**constant**
17:12, 18:6, 18:9, 97:8
**contain**
54:10, 54:17
**context**
28:7, 29:8, 33:2, 54:3, 55:9, 72:19, 73:1, 91:6
**conveniently**
55:5
**conventional**
18:13, 18:15, 18:19, 19:1, 19:5, 19:9, 19:11, 19:12, 19:19, 20:4, 20:17, 20:21, 21:6, 21:9, 21:17, 35:1, 35:10, 35:20, 36:9, 36:12, 37:10, 37:13, 39:20, 40:1, 40:6, 40:7, 40:20, 40:21, 41:7, 41:8, 60:6, 60:8, 61:5, 61:7, 61:14, 61:17, 61:19, 61:20, 62:9, 92:4, 92:6
**conversion**
4:31, 98:21, 99:2
**converted**
30:22
**convey**
51:8
**copy**
6:2
**corner**
65:21
**correspondingly**
90:22
**cost**
71:19
**could**
10:12, 10:20, 13:2, 13:14, 13:20, 14:14, 14:18, 18:8, 27:17, 27:19, 28:20, 39:18, 57:14, 63:6, 63:15, 66:14, 69:19, 72:11, 82:2, 89:16, 90:7
**counsel**
7:1, 7:13, 103:1
**country**
18:16
**county**
101:8
**couple**
100:5
**coupling**
52:8
**courses**
39:2
**court**
4:12, 6:1, 6:4, 7:14, 17:16, 17:20, 25:7, 25:11, 25:17, 100:19
**create**
44:2, 57:22
**creating**
80:15
**crr**
1:28
**crystal**
48:22, 50:22, 52:2, 52:13,

54:12, 67:15, 70:2, 70:15, 88:4
**csr**
1:28, 2:7, 102:19, 103:16
**current**
18:13, 18:15, 18:19, 19:1, 19:2, 19:5, 19:9, 19:11, 19:12, 19:17, 19:20, 20:5, 20:18, 20:21, 21:6, 21:10, 21:17, 22:3, 22:5, 22:14, 22:18, 22:21, 23:7, 23:9, 23:15, 23:19, 23:22, 24:2, 35:1, 35:2, 35:9, 35:10, 35:18, 35:19, 35:20, 36:2, 36:3, 36:4, 36:5, 36:6, 36:9, 36:12, 36:14, 37:10, 37:13, 37:14, 39:20, 40:1, 40:7, 40:8, 40:20, 41:8, 41:9, 41:10, 58:19, 59:7, 60:1, 60:6, 60:8, 60:19, 61:5, 61:6, 61:7, 61:17, 61:19, 61:20, 62:4, 62:9, 90:20, 90:22, 92:2, 92:4, 92:6
**currents**
23:10, 23:11

**D**

**daignault**
3:16, 7:6, 100:4
**date**
6:16, 103:17
**day**
101:10, 101:19, 103:13
**days**
39:2
**db**
90:4
**decades**
24:15, 32:3
**declaration**
8:14, 8:17, 9:5, 9:12, 14:19, 36:11, 65:16
**declarations**
77:22
**decoupling**
46:14, 47:10, 47:13, 49:2, 51:1, 70:16
**decrease**
44:14
**decreases**
45:20, 60:8, 90:19
**define**
22:10, 24:12, 25:21, 27:2, 27:12, 29:3, 29:4, 43:3
**defined**
68:9
**definitely**
47:14, 50:20
**definition**
54:3, 96:13
**definitive**
30:16, 94:3
**definitively**
29:7, 42:20, 79:20
**degrees**
56:6
**delay**
56:6
**delivered**
33:6
**depend**
95:19, 99:6
**depending**
44:1, 44:3
**depends**
21:7, 32:18, 33:2, 34:11, 55:7, 56:7, 96:5, 96:13
**depos**
6:20, 7:15
**deposed**
88:16
**deposition**
1:18, 2:1, 6:2, 6:10, 6:22, 10:15, 13:4, 13:9, 14:10, 16:13, 39:9, 49:14, 63:9, 65:3, 65:8, 89:1, 89:2, 89:8, 89:11, 89:14, 90:17, 91:10, 100:13, 100:22, 101:2, 102:23, 102:24, 102:25, 103:1, 103:2
**describe**
56:21, 59:16, 85:16, 85:18
**described**
61:2, 72:4
**describes**
58:17, 59:5, 59:20, 59:22, 60:14, 60:15, 60:17
**description**
4:15, 101:13
**design**
38:17, 46:7, 46:19, 48:7, 58:3
**designer**
57:17
**designing**
67:5
**desired**
97:7
**details**
56:8, 74:16, 94:21
**diagram**
11:6, 14:18, 20:2, 20:19, 21:12, 21:14
**dickens**
8:9, 8:13, 9:11
**difference**
22:15, 36:1, 36:18
**different**
24:19, 31:15, 45:21
**direct**
4:31, 94:9, 98:21, 99:1
**direction**
20:4, 20:11, 20:13, 20:14, 20:21, 21:5, 21:10, 21:11, 21:17, 36:14
**directly**
22:7, 23:1
**dis**
12:14
**discharges**
59:7, 60:19
**discharging**
11:9, 12:11, 12:18, 61:9, 61:18
**disclose**
59:11, 59:14
**disclosed**
59:13
**disclosure**
57:2
**discuss**
82:5
**discussed**
18:20



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

**discussing**
61:20, 80:14, 81:19
**discussion**
39:19, 41:2, 41:5, 66:2, 66:9, 67:1, 67:22, 68:14, 73:3, 78:15, 82:1, 82:6, 82:19, 83:20, 85:3
**discussions**
66:13, 85:11
**dissipate**
30:3
**dissipated**
23:20, 26:11, 28:5, 33:8, 34:2, 34:14, 34:15
**divided**
22:16
**document**
14:15, 14:16, 16:1, 50:13, 65:15, 69:1, 81:2, 101:13
**documentation**
57:13, 80:2
**documents**
9:21, 10:3, 10:7, 57:7, 81:5
**doing**
29:4, 71:18
**done**
57:14, 57:15, 57:18, 89:8, 99:11, 99:12, 99:18
**down**
27:12, 30:15, 39:13, 68:5, 68:17, 68:18, 82:12, 100:11
**downconversion**
94:9, 97:14, 97:20, 97:21
**downloading**
14:7, 15:18
**dr**
2:1, 6:11, 8:9, 8:13, 9:11, 25:18, 37:16, 37:18, 38:2, 39:19, 39:22, 40:9, 40:12, 100:13
**drain**
62:4, 62:10, 90:21, 92:3
**drains**
83:13
**drive**
51:5, 83:12, 84:5, 84:11, 84:22, 103:19
**dropped**
39:4, 63:5
**duly**
2:3, 7:18, 102:23
**during**
63:2

**E**

**e**
11:17
**each**
75:16, 78:1
**eddie**
9:17, 9:22
**effect**
97:10
**eight**
68:18
**either**
16:10, 73:22, 74:1, 75:19
**el**
3:7
**electrical**
32:21, 37:22, 38:4
**electromagnetic**
26:16, 27:4
**electromagnetics**
26:8
**electron**
20:12, 20:14, 37:14, 40:8, 41:10
**electronic**
38:3
**electronics**
18:21, 24:16
**electrons**
20:16, 20:17
**eliminate**
58:10
**eliminating**
67:8
**else**
29:2, 54:13, 55:1
**embodiment**
11:20, 12:4, 12:22, 60:15
**embodiments**
59:1, 59:4
**employed**
103:8
**end**
96:14, 100:12
**ends**
34:3
**energy**
12:4, 24:6, 24:9, 24:12, 24:15, 24:19, 24:22, 25:2, 25:4, 25:20, 25:22, 26:4, 26:6, 26:7, 26:9, 26:10, 26:11, 26:17, 27:3, 27:5, 27:7, 27:9, 27:11, 27:12, 27:17, 27:18, 27:19, 27:21, 28:1, 28:5, 28:9, 28:22, 29:1, 29:5, 29:6, 29:11, 29:16, 30:11, 30:21, 31:8, 31:13, 31:17, 31:18, 31:20, 32:4, 32:12, 32:15, 32:17, 32:22, 33:9, 33:16, 34:8, 34:18
**engineering**
18:16, 32:21, 37:22, 38:4
**enough**
42:19, 53:10, 53:21, 56:14
**entering**
23:10
**entire**
69:4, 72:6
**entitled**
66:21, 74:7
**equal**
24:1
**equals**
22:18, 23:10
**equivalent**
17:12
**esquire**
3:5, 3:14, 3:15
**essential**
50:15, 51:12, 52:4, 52:16, 52:18, 52:22, 53:18, 54:21, 55:19
**essentially**
54:17
**estate**
47:21
**european**
83:7
**even**
9:2, 27:2, 46:12, 46:16, 50:19, 71:11, 76:12, 79:21, 87:16, 88:8



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

**ever**
31:5, 32:2, 32:10
**everybody**
100:18
**everything**
55:1
**exact**
38:15, 93:5
**exactly**
51:17, 70:17
**examination**
4:6, 7:20
**example**
28:20, 31:11, 34:12, 48:22, 52:15, 70:9, 71:11, 94:3, 94:4, 94:5, 99:3
**except**
88:12, 101:3
**excerpt**
39:9, 89:2
**executed**
101:16
**exhibit**
4:16, 4:17, 4:18, 4:21, 4:23, 4:25, 4:30, 4:33, 4:35, 5:1, 10:14, 10:15, 10:18, 13:3, 13:5, 13:9, 13:10, 14:2, 14:3, 14:10, 15:2, 15:13, 15:14, 15:17, 15:20, 16:2, 16:4, 16:13, 39:4, 39:6, 39:8, 49:8, 49:14, 49:18, 62:20, 63:6, 63:8, 63:10, 65:2, 65:4, 65:7, 65:11, 65:12, 66:20, 68:22, 81:10, 81:11, 89:1, 89:3, 91:10, 91:11, 91:14
**exhibits**
4:14
**expensive**
71:10, 71:21, 76:15
**experimental**
56:20
**expert**
8:14, 8:21, 9:5
**expiration**
103:17
**expires**
101:25
**explicitly**
40:5
**expressed**
101:17
**extent**
34:15, 58:16
**external**
51:4

**F**

**fact**
48:11
**factors**
34:11
**fail**
54:4
**familiar**
21:19, 23:4, 23:6
**far**
17:13, 17:14, 17:16, 17:17, 26:10, 76:17
**fax**
103:23
**feasible**
41:20
**feature**
59:14
**february**
4:36, 89:8
**feel**
66:14
**femtofarads**
41:18
**few**
41:17, 68:16, 77:8, 80:1, 82:12, 98:2
**fewer**
71:14
**field**
24:16, 25:21, 26:5, 31:14, 32:1, 32:4, 36:8, 37:9, 50:18, 58:5
**figure**
10:21, 11:19, 12:7, 12:8, 13:15, 15:2, 15:5, 15:8, 15:19, 15:22, 16:17, 16:21, 17:7, 52:15, 55:17, 55:18, 56:1, 56:3, 63:15, 64:1, 64:5, 64:7, 64:8, 64:12, 91:16, 91:20, 91:22
**filter**
42:21, 43:12, 43:17, 44:4, 44:17, 45:6, 45:7, 45:8, 48:8, 82:21, 84:6, 84:12, 84:16, 85:1, 85:6, 85:9, 85:14, 87:11, 93:18, 94:12, 94:19, 94:21, 95:11, 96:4, 97:14, 98:7, 98:12, 98:19, 99:9, 99:10
**filtering**
68:8, 87:10
**filters**
67:8, 67:14, 67:16, 68:10, 71:20, 78:17, 79:4, 95:16, 96:1, 97:3, 99:13
**final**
55:10
**financially**
103:10
**find**
11:18
**fine**
47:6, 72:11
**fingertips**
73:16
**firm**
7:6, 103:18
**first**
7:18, 33:20, 50:5, 50:12, 65:19, 66:13, 66:18, 69:1, 73:11, 83:16, 84:4, 84:11, 84:22, 94:16, 94:18, 95:14
**fish**
3:28, 80:2
**fit**
53:10, 53:21, 69:4, 72:6
**five**
77:1
**flow**
20:5, 20:12, 20:14, 20:21, 21:6, 21:17, 22:14, 36:14, 61:2, 90:20, 90:22
**flows**
19:2, 19:6, 19:13, 20:13, 21:10, 21:11, 39:20, 58:19, 59:7, 60:2,



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

60:7, 60:9, 60:19, 92:2, 92:6
**fm** 67:5, 68:19, 69:2, 72:3
**follows** 7:19
**foregoing** 101:1, 101:15
**form** 9:18, 12:15, 12:20, 18:3, 19:22, 20:7, 21:3, 22:9, 24:4, 25:6, 25:16, 26:19, 28:12, 28:18, 29:13, 31:2, 32:7, 32:13, 33:9, 34:9, 35:4, 35:11, 37:11, 38:7, 40:4, 42:1, 46:10, 47:1, 47:5, 48:19, 55:22, 57:16, 59:9, 59:19, 60:22, 61:22, 62:7, 71:4, 74:12, 75:14, 75:17, 77:10, 77:13, 77:21, 92:5, 93:16, 94:1, 97:11, 98:9
**formula** 22:17, 23:13, 23:14
**forth** 102:23
**fortunately** 11:16
**four** 89:20
**franklin** 36:13
**free** 66:14
**frequencies** 97:6, 97:8, 98:6
**frequency** 42:4, 42:14, 43:2, 43:3, 43:6, 43:18, 87:5, 92:18, 92:20, 92:22, 93:4, 93:14, 94:7, 94:10, 95:10, 95:20, 96:3, 96:6, 96:7, 96:11, 96:14, 97:1, 97:2, 98:1, 98:11, 98:15, 98:18, 99:7
**frequent** 97:5
**friend** 40:14
**front** 13:12, 65:9
**functionality** 50:15, 51:9, 51:12, 52:16, 52:19, 52:22, 53:18, 88:11
**fundamental** 21:22, 32:20, 48:12, 54:21, 55:18
**fundamentals** 4:23, 38:19
**further** 90:7, 90:10, 100:6, 102:28, 103:2, 103:6

**G**

**gain** 90:4
**galton** 1:19, 2:2, 4:35, 6:11, 7:17, 8:2, 25:18, 100:13, 101:1, 101:5, 101:10, 102:22, 103:3
**gave** 31:11, 89:13, 93:6
**general** 24:18, 46:18, 55:14, 58:22, 60:10, 72:13
**generally** 12:22, 35:22, 42:8, 43:13, 44:6, 47:11, 49:3, 56:3, 71:5, 72:16, 72:20
**generate** 90:4
**getting** 34:3, 51:16
**gigahertz** 96:20
**give** 8:4, 14:1, 15:12, 16:18, 24:20, 27:13, 30:16, 75:10, 75:11, 75:12, 90:15, 91:7, 94:3, 94:21, 95:4, 95:6, 95:7, 96:16, 98:4, 99:3
**given** 31:10, 93:5, 101:18, 102:26
**giving** 91:9
**go** 11:12, 14:14, 16:17, 39:13, 47:3, 48:20, 62:11, 65:19, 74:17, 74:18, 75:17, 78:15, 80:20, 83:2, 84:15, 88:15, 99:16
**goes** 17:13, 17:15, 17:17, 17:19, 30:5, 30:6, 36:4, 36:5, 85:16, 85:18
**going** 10:14, 12:1, 15:12, 23:21, 29:11, 50:20, 50:21, 50:22, 51:1, 51:4, 54:6, 56:2, 57:19, 62:16, 64:4, 70:14, 70:15, 70:21, 82:2, 88:19, 92:11, 99:20, 100:15
**good** 40:14, 58:2
**great** 6:7, 10:17, 61:13
**greater** 85:20, 86:3
**grew** 86:13
**griswold** 3:24, 7:10
**ground** 15:10, 17:9, 17:13
**group** 3:6, 7:9
**gsm** 83:7
**guess** 83:13
**guessed** 36:13
**gupta** 3:25, 7:11
**guys** 25:7, 41:1
**gyrator** 67:16

H
**ham** 51:3
**hand** 101:18, 103:13
**hang** 48:17, 75:14
**happens** 99:1
**happy** 61:12, 74:15, 75:8
**hard** 30:16
**head** 40:10
**hear** 45:1
**heard** 8:11, 18:12, 32:2, 41:10
**heat** 26:9
**heating** 30:5
**held** 17:11, 18:6, 18:9
**here** 6:9, 8:5, 64:4, 70:12, 73:3, 79:19
**here's** 74:4
**hereby** 101:2, 102:21
**herein** 102:23
**hereto** 2:11
**hereunto** 103:12
**heterodyne** 99:4, 99:8
**hey** 40:19
**high** 96:3
**high-order** 68:9
**higher** 19:6, 19:13, 92:18, 92:20, 92:22, 93:14, 95:10, 96:5, 96:11, 96:14, 96:18, 96:19, 96:20, 96:21, 97:8
**hiking** 77:14
**historically** 36:17
**hold** 10:22, 13:16, 14:17, 25:8, 39:16, 50:4, 55:21, 63:11, 66:16, 67:3, 69:11
**honestly** 69:13
**hour** 62:13
**however** 24:22
**hundreds** 41:18
**hungerford** 103:19

I
**ian** 1:19, 2:1, 4:35, 6:11, 7:17, 8:2, 100:13, 101:1, 101:5, 101:10, 102:22, 103:2
**ic** 41:13, 46:9, 46:21, 48:9, 48:11, 48:13, 50:8, 50:16, 79:3, 80:11, 80:15, 82:6, 82:20, 83:4, 83:11, 83:16, 83:17, 83:18, 83:22, 84:4, 84:10, 84:19, 84:21, 85:4, 85:5, 85:7, 85:8, 85:12, 85:13
**ics** 66:4, 66:21, 67:21, 70:22, 73:2, 74:7, 76:4, 81:19
**idea** 9:14, 76:10
**identification** 10:19, 13:6, 14:4, 15:15, 39:7, 49:19, 62:21, 65:5, 89:4, 91:15
**identify** 27:22
**identity** 101:13
**ill-posed** 93:1, 94:17
**impact** 47:16
**impacted** 97:22
**impedence** 17:13, 17:17, 79:12, 97:7
**implement** 51:17, 52:14, 53:3, 56:2, 56:16, 82:11, 87:9, 95:15
**implementation** 46:9, 46:22, 48:9, 63:16
**implementations** 46:13
**implemented** 51:10, 51:13, 53:1, 53:19, 56:8, 56:14, 56:15
**implementing** 67:9, 79:4
**implements** 83:6
**impossible** 67:13, 78:16
**inc** 1:6, 1:7, 1:10, 2:3, 6:13, 102:6, 102:7, 102:10, 102:29
**include** 58:6, 84:19
**includes** 83:11, 83:16, 84:4, 84:10, 84:22
**including** 86:14
**incompatible** 46:8, 46:21, 48:8
**incorporated** 6:12
**incorrect** 20:22, 21:2, 25:3, 33:17
**increase** 42:3, 42:13, 43:1, 43:17, 43:18, 44:12, 47:21, 95:20
**increases** 45:14, 45:17, 46:2, 46:5, 60:6, 90:18
**increasing** 94:6
**index** 4:1
**indicates** 12:18
**inductor** 68:7, 69:17
**inductors** 67:14, 69:4,


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

69:9, 69:18, 72:5, 73:13, 76:21, 78:11, 78:18, 79:10, 79:12, 79:14, 88:5
**industry** 18:21, 30:20
**information** 37:2, 42:19, 73:16
**input** 18:10, 60:6, 93:12, 98:10
**inputs** 18:5
**instance** 2:2, 44:9, 47:17, 68:13, 79:11
**instrument** 101:15
**instruments** 1:6, 6:12, 7:9, 102:6, 102:29
**integrate** 67:13, 78:17
**integrated** 38:16, 41:16, 41:21, 42:12, 45:15, 50:8, 87:19
**integrating** 86:4
**integration** 41:20, 87:6
**intended** 51:8
**intent** 53:13
**inter** 4:25
**interested** 103:10
**involved** 9:8
**involves** 88:5
**ipr** 1:13, 1:14, 6:15, 8:14, 8:17, 8:19, 8:20, 9:5, 10:15, 13:11, 15:19, 16:14, 49:15, 65:12, 100:14, 102:13, 102:14
**iprs** 63:10, 91:12
**issue** 99:14
**iyer** 3:16, 7:6, 100:5

**J**

**james** 8:9
**jason** 3:14, 7:5
**job** 1:25
**joined** 100:5
**josh** 7:10
**joshua** 3:24
**july** 1:20, 2:5, 6:16, 103:4, 103:13

**K**

**kasperkovitz** 67:6
**keep** 68:5, 68:16
**key** 67:16
**keyed** 83:6
**kilohertz** 67:18
**kind** 43:19, 57:21, 70:3
**kirchhoff's** 35:18, 36:2, 36:3
**kirchoff's** 23:6, 23:9
**know** 8:9, 9:1, 9:2, 9:9, 11:21, 11:22, 14:5, 15:17, 16:7, 26:7, 30:9, 33:5, 33:11, 37:15, 40:9, 40:10, 40:12, 40:15, 46:17, 47:13, 49:15, 50:14, 51:21, 60:5, 61:17, 62:12, 69:15, 70:13, 74:13, 74:21, 74:22, 75:6, 76:11, 77:1, 78:12, 90:21, 95:6, 96:19
**knowledge** 58:5
**known** 9:17, 50:8, 101:11

**L**

**labeled** 65:21
**language** 52:19
**large** 41:20, 46:8, 46:20, 47:7, 47:8, 48:7, 49:3, 51:18, 57:20, 58:16, 87:16
**large-signal** 39:14
**large-valued** 47:11
**larger** 44:5, 97:6
**last** 25:12, 38:12, 100:5
**law** 3:6, 7:9, 21:19, 21:22, 22:5, 22:17, 23:7, 23:9, 35:8, 35:19, 36:2, 36:3
**least** 46:14, 70:11
**leaving** 23:11
**left** 80:3, 81:1, 82:5, 82:8
**left-hand** 65:21, 66:3
**less** 76:15, 90:22
**let's** 13:2, 13:8, 50:2, 62:11, 62:12, 64:3, 65:19, 74:2, 78:14, 83:2, 88:15
**letter** 19:16
**lewis** 3:27, 7:11
**liked** 61:11
**limits** 53:16
**line** 50:5, 52:12, 55:8
**lines** 68:17, 68:18, 82:12
**list** 9:10
**listen** 36:21

**literally**
84:14
**little**
73:9
**llp**
3:6, 3:16
**lna**
28:20, 28:22, 30:10, 63:16
**load**
12:19, 34:6, 34:17
**located**
48:12
**long**
17:11, 80:3
**look**
9:21, 10:2, 10:7, 12:21, 13:2, 39:18, 42:7, 55:16, 59:3, 61:21, 62:1, 63:7, 66:12, 69:13, 70:17, 70:18, 74:15, 75:19, 75:21, 76:22, 78:14, 79:16, 80:8, 81:8
**looked**
74:13, 76:18, 77:7, 78:8
**looking**
75:6
**looks**
13:19
**loop**
87:19, 87:21
**lost**
90:15
**lot**
31:15
**low**
30:7, 87:22
**low-pass**
43:12, 44:3, 44:4, 94:12, 94:19, 96:4, 97:3, 97:13, 98:7, 98:12, 98:19, 99:9
**low-power**
4:33, 67:5
**lower**
19:6, 19:13, 67:17, 78:21, 87:5, 97:5, 97:6
**lowering**
79:3
**lucas**
3:23, 6:20

**M**

**m1**
63:22, 64:9, 64:13, 90:21, 91:22, 92:3
**m2**
63:22, 64:13, 91:1
**m3**
64:13, 64:16
**m4**
64:13
**m5**
63:18, 64:9
**m6**
63:18, 64:9
**m7**
64:9
**m8**
64:10
**machine**
2:8
**macnally**
58:9, 58:13, 90:8, 91:5, 91:11, 91:20, 92:2
**made**
11:16, 36:13, 86:11
**magee**
3:5, 6:3, 6:6, 7:8, 9:18, 12:15, 12:20, 16:9, 18:3, 19:22, 20:7, 21:3, 22:9, 24:4, 25:6, 25:15, 26:19, 28:12, 28:17, 29:13, 31:2, 32:7, 32:13, 34:9, 35:4, 35:11, 37:11, 38:7, 40:4, 42:1, 46:10, 47:1, 47:5, 48:17, 49:10, 55:22, 57:16, 59:9, 59:19, 60:22, 61:22, 62:7, 71:4, 74:12, 75:5, 75:14, 75:17, 77:10, 77:13, 77:21, 92:5, 93:16, 94:1, 97:11, 98:9, 100:8, 100:17
**mainly**
68:8
**make**
36:4, 42:15, 61:12, 71:2, 71:8, 72:10, 72:15, 73:4, 74:11, 76:6, 76:8, 76:14, 76:16, 86:10
**makes**
71:22, 72:1, 87:1
**making**
24:18, 69:4, 72:5, 72:7
**managed**
71:15
**mandir**
3:15, 100:4
**many**
41:12, 41:15, 67:7
**marked**
10:19, 13:6, 14:4, 15:15, 39:7, 49:19, 62:21, 65:5, 89:4, 91:15
**marks**
100:12
**marriage**
103:8
**match**
79:12
**matching**
88:5, 97:16
**materials**
71:22
**matter**
6:11, 35:22, 36:7, 63:21, 103:11
**matters**
100:14
**maybe**
68:17, 70:12, 70:13
**md**
103:21
**mean**
11:12, 22:10, 24:11, 24:13, 24:18, 24:19, 25:22, 27:3, 31:14, 35:6, 35:12, 35:20, 42:6, 42:16, 42:18, 43:4, 43:20, 44:19, 45:9, 51:14, 51:15, 53:13, 54:9, 58:21, 60:3, 72:8, 73:8, 73:9, 80:17, 81:12, 88:9, 92:20, 93:1, 93:21, 94:2, 94:16, 96:5
**meaning**
25:21, 47:8,



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

50:3, 72:7
**means**
50:14, 55:9, 83:17, 88:10, 88:11, 90:19
**meant**
18:11, 50:11, 85:7
**media**
6:10
**megahertz**
67:15, 67:18, 82:12, 83:3, 96:18, 96:20, 96:21
**memory**
11:13, 77:16
**mention**
60:21, 61:1, 87:15
**mentioned**
52:16, 61:7, 74:10
**mentions**
40:6
**mhz**
4:30
**microelectronics**
4:23, 38:19
**microfarad**
41:19, 56:21, 57:3
**might**
38:20, 50:19
**milliamps**
83:13
**miniature**
67:5
**miniaturization**
85:20, 86:3, 86:18, 86:22
**minimum**
68:7
**minute**
98:4, 99:16, 99:18
**minutes**
77:1, 100:5
**missing**
72:8
**mistake**
36:13
**mixer**
63:16, 83:5, 83:16, 84:4, 84:11, 84:22, 90:4, 90:6
**model**
39:14
**modulation**
82:11, 83:6
**monitor**
6:17
**mono**
68:19, 69:2, 72:3
**monolithic**
67:14, 78:18
**months**
80:1
**more**
72:17, 76:11, 76:13, 77:11, 84:13, 90:20, 94:21
**most**
30:7, 35:6, 57:5, 78:4, 88:11
**motivated**
50:6
**move**
88:13
**moving**
72:14
**much**
9:9
**multiple**
53:14, 54:4
**myself**
79:17

**N**

**name**
7:22, 9:2, 101:14
**namely**
36:12
**necessarily**
27:6, 35:3, 35:7, 42:8, 47:2, 47:15, 47:22, 48:2, 53:11, 59:10, 76:9, 76:15, 86:19, 93:20, 93:22, 95:12, 95:21
**necessary**
42:8
**need**
27:2, 35:13, 37:6, 43:13, 52:7, 52:14, 53:13, 73:18, 73:20, 97:6, 100:20
**needed**
54:4
**needs**
54:21, 55:19
**negative**
19:2, 20:14, 21:8, 21:11, 36:7, 40:8
**neither**
17:4, 70:5
**network**
56:3, 88:5, 97:16
**never**
8:11, 9:13, 21:4, 21:5, 32:2, 41:10
**next**
67:12, 68:6
**nine**
80:21
**nmos**
62:4, 62:8, 63:18, 64:1, 64:10, 64:13, 64:16
**nobody**
99:16
**node**
23:10
**noise**
30:7
**nonresponsive**
36:20, 37:5, 88:14
**nope**
63:4
**notary**
101:23
**noted**
101:3
**nothing**
87:11, 98:14
**notice**
40:5
**nowadays**
71:12
**nsp**
102:29
**number**
4:15, 6:10, 6:15, 10:18, 13:5, 14:3, 15:14, 39:6, 49:18, 62:20, 65:4, 89:3, 91:14
**numbered**
2:4
**nxp**
1:7, 102:7

**O**

**oath**
7:19, 90:18, 101:11
**object**
12:15, 75:5
**objecting**
86:20
**objection**
9:18, 12:20, 18:3, 19:22, 20:7, 21:3, 22:9, 24:4, 25:6, 25:12,



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

25:13, 25:15, 26:19, 28:12, 28:17, 29:13, 31:2, 32:7, 32:13, 34:9, 35:4, 35:11, 37:11, 38:7, 40:4, 42:1, 46:10, 47:1, 47:5, 48:17, 48:19, 55:22, 57:16, 59:9, 59:19, 60:22, 61:22, 62:7, 71:4, 74:12, 75:14, 75:17, 77:10, 77:13, 77:21, 92:5, 93:16, 94:1, 97:11, 98:9
**objective**
76:8
**occur**
58:1
**occurred**
103:3
**off-chip**
45:14, 45:16, 46:1, 46:4, 46:8, 46:13, 46:18, 46:20, 47:12, 47:14, 48:4, 48:7, 48:13, 48:15, 48:21, 49:1, 49:3, 49:6, 50:21, 51:20, 52:1, 52:3, 52:7, 55:4, 56:15, 56:18, 57:4, 57:9, 58:15, 68:6, 69:17, 70:1, 70:12, 70:15, 70:16, 71:10, 71:13, 71:14, 71:16, 73:13, 73:14, 76:21, 78:11, 79:13, 79:15, 80:7, 82:21, 84:5, 84:12, 85:1, 85:6, 85:8, 85:13, 87:17, 88:1, 95:17, 99:11
**office**
1:1, 6:14, 101:18, 102:1
**often**
19:18, 19:21, 20:1, 35:6, 56:16, 71:19, 72:17, 76:15, 99:12
**oh**
8:21, 12:6, 13:2, 39:17, 44:11, 62:12, 64:22, 84:17, 95:5
**ohm's**
21:19, 21:22, 22:5, 22:17, 35:8
**on-chip**
45:14, 45:17, 46:2, 46:5, 55:5, 56:6, 56:14, 56:17, 57:22, 66:9, 66:13, 67:1, 67:9, 67:14, 68:1, 68:9, 68:14, 69:9, 69:20, 71:2, 71:7, 71:16, 72:10, 72:15, 73:4, 73:13, 74:10, 76:6, 76:13, 78:17, 87:10, 95:16
**one**
14:7, 16:18, 25:10, 27:7, 27:20, 27:22, 31:11, 35:8, 35:18, 38:15, 42:2, 42:5, 42:10, 42:12, 42:16, 42:22, 43:15, 54:6, 55:11, 69:17, 70:12, 72:4, 76:3, 78:4, 87:15, 87:18, 89:5, 89:20, 91:13, 91:17, 99:18
**only**
41:9, 54:20, 69:3, 69:16, 72:5, 79:9, 80:8
**op-amp**
15:9, 16:22, 17:4, 17:8, 18:2
**open**
10:12, 10:16, 14:6, 14:9, 39:12, 49:16, 59:6, 60:18
**opening**
89:5
**operating**
42:4, 42:14, 43:1, 43:3, 43:17
**opportunity**
58:1
**opposed**
87:11, 96:21
**opposite**
20:11
**option**
59:20
**optional**
59:13, 59:18
**oral**
1:18, 2:1
**order**
9:1, 78:1
**origin**
26:12
**oscillator**
49:1, 50:22, 52:3
**other**
8:16, 21:11, 31:12, 34:11, 41:6, 47:12, 55:13, 61:3, 69:19, 70:1, 75:16, 87:4, 87:15, 101:13
**others**
70:6, 70:13
**otherwise**
103:10
**out**
12:7, 36:5, 59:7, 60:9, 60:19, 80:4
**outcome**
103:11
**output**
83:8, 83:11
**over**
25:10, 75:16
**overall**
76:9, 76:14, 86:11, 86:14
**own**
29:1, 30:11
**owner**
1:11, 102:11
**owner's**
4:19, 14:11

**P**

**page**
4:2, 4:10, 4:15, 10:21, 11:3, 13:15, 14:14, 14:16, 15:1, 39:13, 50:1, 50:3, 58:21, 65:19, 65:20, 65:21, 66:13, 66:20, 68:22, 69:1, 80:20, 80:22, 81:1, 81:10, 81:11, 81:13,

81:15, 82:9, 84:14, 85:19, 89:17, 89:19, 89:21, 90:11
**pages** 1:26, 77:15, 77:18, 78:1
**palo** 3:9
**paper** 65:8, 75:8, 80:17
**paragraph** 66:17, 82:5, 82:8
**parallel** 56:19
**parentheses** 40:22, 41:7
**parkervision** 1:10, 2:3, 6:12, 7:7, 9:16, 61:16, 102:10
**parkervision's** 9:22, 10:3, 10:8, 11:10
**part** 9:8, 48:8, 71:21, 75:10
**partes** 4:25
**particular** 12:21, 29:10, 76:18, 87:16
**particularly** 58:2
**parties** 6:21, 103:7, 103:9
**party** 102:28
**passive** 54:14, 76:13, 86:15
**passives** 49:6, 52:12, 53:9, 53:21, 54:7, 54:8, 55:14, 55:15, 88:12
**past** 71:15
**patent** 1:1, 1:4, 1:11, 1:15, 4:16, 4:17, 4:18, 4:21, 4:27, 5:1, 6:13, 6:14, 8:20, 9:6, 10:5, 10:10, 10:13, 13:3, 13:9, 13:18, 14:11, 15:21, 16:4, 58:17, 58:21, 59:5, 59:12, 59:21, 60:13, 60:17, 102:1, 102:4, 102:11, 102:15
**patents** 61:16
**pause** 12:9
**pdf** 10:21, 11:3, 13:14, 39:13
**peak** 3:6, 7:9
**peltier** 1:28, 2:6, 7:15, 102:19, 103:16
**pepper** 37:1
**percent** 60:11, 76:20, 78:6, 78:11
**performs** 94:9
**period** 30:22
**person** 50:18, 67:6, 101:14
**personally** 101:10
**peter** 64:21
**petition** 4:25, 49:15, 49:21, 50:2
**petitioner's** 4:18, 14:11
**petitioners** 1:8, 3:3, 102:8
**ph** 1:19, 4:36, 6:11, 7:17, 100:13, 101:1, 101:5, 101:10, 102:22, 103:3
**phase** 56:6
**phase-shift** 83:6
**phased-lock** 87:19, 87:21
**philips** 67:7
**phone** 71:12, 103:22
**physical** 47:8
**picofarads** 41:12, 41:15, 41:18
**pinned** 30:15
**planet** 6:20, 7:15
**please** 7:1, 7:22, 10:13, 16:17, 36:21
**plus** 15:9
**pmb** 3:8
**pmos** 64:19, 64:21, 64:22
**point** 17:10, 26:12, 26:13, 27:7, 52:10, 53:12, 54:5, 70:9, 77:15
**pointing** 20:4, 20:10, 20:20, 21:5, 21:16
**points** 11:14, 20:11, 20:13, 22:4, 22:6, 22:8, 23:1, 23:2
**portion** 56:16
**posita** 40:7, 50:6
**position** 48:14, 73:19, 73:20, 73:21, 74:2, 74:22, 75:1, 75:2, 75:3, 75:4
**positive** 17:5, 17:7, 18:1, 19:2, 20:12, 21:7, 21:9, 21:15, 36:7
**possible** 69:4, 72:6, 87:2
**potential** 19:6, 19:7, 19:13, 19:14
**power** 23:14, 23:19, 23:20, 24:1, 24:6, 24:9, 25:2, 26:17, 27:10, 27:21, 28:1, 28:6, 28:9, 29:11, 29:16, 29:18, 30:3, 30:4, 30:20, 30:21, 31:16, 31:20, 32:4, 32:11, 32:21, 33:5,


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

33:7, 33:8, 33:13, 33:14, 33:15, 33:16, 33:18, 34:1, 34:6, 34:7, 34:13, 34:15, 34:16, 34:17, 34:22, 46:14, 52:7, 54:15, 83:12
**practice** 10:4, 10:9, 58:3
**precise** 51:7, 95:6, 95:7
**precision** 83:5
**preclude** 49:5
**presence** 12:19
**present** 3:22
**presented** 56:9
**pretty** 11:18, 30:20, 47:9
**previous** 37:5
**primarily** 51:10
**principle** 21:22
**prior** 37:18
**probably** 11:11, 38:13, 51:16, 59:1, 62:2, 69:21, 70:7, 86:13, 87:17
**problem** 30:13, 31:8, 57:19, 67:17, 78:21, 94:16, 97:17
**procedure** 2:10
**produce** 83:7
**produced** 2:2
**product** 82:19, 83:21, 85:4, 85:12, 85:20, 85:21, 86:3, 87:13, 88:10
**professor** 37:21
**proportional** 22:7, 22:14, 23:1
**protective** 8:22
**proved** 101:11
**provide** 52:6
**provided** 8:14, 8:17, 9:5, 57:3, 57:8, 63:8, 65:7, 65:16, 80:2, 88:22
**provides** 68:7
**providing** 29:5, 32:15, 45:13, 45:16, 46:1, 46:4, 65:2
**provisions** 2:10
**ptab** 2:9
**public** 101:23
**purposes** 101:16
**pursuant** 2:9, 4:27
**put** 11:17, 13:2, 13:20, 23:16, 28:4, 40:20, 40:22, 41:6, 47:17, 47:20, 50:14, 55:4, 55:5, 65:1, 75:20, 91:5
**putting** 23:19, 49:7, 76:12

**Q**

**quadrants** 89:20, 89:21
**quadrature-upconversion** 83:5
**qualifier** 24:3
**qualifiers** 23:17
**question** 12:7, 19:10, 24:20, 25:12, 25:18, 26:2, 26:14, 29:6, 31:7, 32:14, 33:19, 36:22, 37:7, 37:8, 41:4, 42:6, 42:15, 42:20, 44:22, 72:13, 72:14, 72:21, 73:17, 74:4, 76:17, 82:4, 88:20, 89:17, 90:3, 93:1, 93:5, 93:7, 93:8, 93:10, 94:2, 94:17, 95:1, 95:3, 95:7, 96:16, 97:18
**questions** 30:14, 82:3, 100:6, 100:8
**quick** 62:13
**quickly** 11:18, 75:21
**quite** 59:2, 65:17, 76:19
**quote** 96:13, 96:14

**R**

**radiation** 26:7
**radio** 51:3, 66:4, 66:22, 67:22, 71:1, 73:2, 74:7, 76:5, 80:14
**range** 41:17
**rarely** 71:22
**rate** 24:9, 25:2, 26:17, 27:11, 27:21, 28:1, 28:9, 29:11, 30:21, 31:16, 31:20, 32:4, 32:12, 32:22, 33:16, 34:8, 34:18, 43:5
**rather** 45:14, 45:16, 46:1, 46:4
**razavi** 4:24, 37:16, 37:18, 38:2, 39:9, 39:22, 40:12, 41:8, 63:9, 64:8, 64:13
**razavi's** 39:19, 40:9
**rc** 68:9
**read** 31:5, 32:2, 32:10, 65:15, 66:14, 74:17, 74:18, 82:2,


ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

82:3, 82:11, 84:9, 84:13, 84:14, 84:15, 100:9, 101:1
**reading** 68:5, 68:16, 72:2
**real** 3:7, 47:21
**realize** 77:7
**realized** 67:7
**really** 24:11, 99:13
**realtime** 2:7, 6:5, 102:20
**reason** 8:3, 27:1, 31:22, 40:21, 40:22, 41:6, 41:11
**reasons** 61:2
**recall** 8:12, 61:10, 73:11, 74:15, 76:2, 76:3, 78:18, 80:10, 88:16, 89:10
**receive** 43:22, 92:17, 98:15
**received** 18:1, 26:12, 30:8, 49:9
**receiver** 4:31, 11:10, 28:8, 29:9, 29:18, 33:14, 33:15, 34:6, 44:1, 44:10, 67:5, 68:19, 69:2, 72:3, 80:15, 82:20, 83:16, 83:17, 83:22, 84:4, 84:10, 84:19, 84:21, 85:7, 85:8, 85:13, 86:5, 87:7, 93:13, 95:9, 96:2, 97:4, 98:8, 98:20, 98:21, 99:2, 99:4
**receivers** 30:7, 66:5, 66:22, 67:22, 71:1, 73:3, 74:7, 76:5, 80:14, 95:16
**receiving** 29:5, 32:17, 95:10, 96:2
**recent** 77:11, 78:4
**reception** 26:13
**recognize** 33:1
**recollection** 79:18, 80:6
**record** 2:11, 7:2, 8:1, 37:1, 62:16, 63:1, 70:21, 75:10, 75:11, 75:20, 77:5, 92:11, 92:16, 99:20, 100:2, 100:3, 100:15, 102:26
**reduce** 42:3, 42:5, 42:12, 42:16, 42:22, 43:15, 44:15, 44:18, 44:19, 44:20, 45:3, 45:4, 45:12, 58:10, 98:13
**reduction** 10:4, 10:9
**refer** 11:20, 61:16
**reference** 37:19, 63:9, 63:12, 64:8, 69:14, 70:18, 74:14, 74:16, 74:20, 75:7, 75:9, 75:20, 76:19, 77:12, 77:17, 78:7, 78:8, 79:16, 80:9, 90:8, 91:11
**references** 58:7
**referring** 69:9, 91:16
**refers** 12:3, 12:8, 17:1, 19:19, 35:9, 74:20, 75:8, 78:7, 80:15
**refresh** 11:13, 77:16
**regards** 19:1, 19:5, 19:11, 26:16, 26:21, 61:14, 93:12
**registration** 103:18
**related** 9:6, 9:21, 10:3, 10:8, 82:18, 103:6
**relates** 71:1, 74:10, 76:5
**relationship** 98:5, 98:18
**relevant** 57:11, 58:5
**relied** 37:19
**remember** 9:3, 38:12, 38:14, 38:18, 38:21, 74:14, 78:9, 80:7
**remind** 79:17
**remote** 6:19
**remotely** 6:22
**rep** 94:5
**replace** 67:15, 71:15
**reply** 4:18, 14:11
**reported** 1:27, 2:8
**reporter** 2:7, 6:1, 6:4, 7:14, 17:16, 17:20, 25:7, 25:9, 25:11, 25:17, 100:19, 102:17, 102:20
**reporter's** 4:12
**represent** 7:3
**represented** 103:1
**representing** 6:20, 7:15
**required** 53:3, 67:9, 87:22, 98:14
**requirement** 59:15, 79:9
**requirements** 58:11
**requires** 46:7, 46:20, 48:7, 69:3, 72:4
**resistance** 22:13, 22:16, 22:18, 22:22, 30:2
**resistor** 28:4, 28:6, 54:14
**resistors** 53:6, 53:7,



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

53:20
**respondent**
3:12
**response**
4:19, 14:11
**rest**
56:18
**result**
93:10
**results**
56:21, 87:5
**review**
4:26, 9:11
**rf**
28:7, 28:10, 29:8, 29:10, 29:12, 29:14, 29:20, 33:14, 33:15, 33:21, 34:2, 34:7, 42:21, 43:16, 44:15, 45:4, 60:8, 67:8, 67:13, 68:7, 78:17, 92:22, 93:11, 93:12, 94:7, 95:19, 95:21, 96:7, 97:1, 97:2, 98:1, 98:8, 98:10, 98:20, 99:6
**rf-ics**
4:33
**rfp**
90:18
**richardson**
3:28, 80:3
**right**
8:13, 9:14, 11:5, 11:6, 12:14, 13:1, 13:20, 14:1, 14:14, 14:21, 15:5, 15:8, 16:12, 18:12, 18:17, 24:1, 33:1, 34:19, 39:12, 45:13, 48:6, 49:21, 50:4, 57:15, 59:12, 63:12, 63:13, 65:11, 66:2, 68:1, 70:7, 70:18, 77:8, 78:15, 81:4, 81:9, 83:16, 83:18, 84:3, 84:16, 85:10, 88:15, 88:22, 89:7, 89:13, 90:2, 91:9, 91:18, 91:19, 91:22, 98:5, 100:10, 100:17
**right-hand**
66:21, 85:19
**ringing**
58:1
**rishi**
3:25, 7:10
**robert**
3:5, 7:8, 28:16
**rockville**
103:21
**rotate**
16:18, 91:17
**rough**
100:20
**roughly**
60:10
**rules**
2:9, 77:5
**run**
30:13

**S**

**said**
16:8, 24:5, 28:17, 33:18, 38:22, 40:19, 48:4, 49:2, 52:2, 66:18, 72:19, 79:22, 86:20, 88:3, 90:13
**same**
13:17, 27:1, 31:22, 34:10, 36:5, 61:2, 72:2, 93:5, 93:7, 97:9, 101:3, 101:16
**sand**
47:19
**saturation**
62:3, 62:8
**saw**
13:18, 68:1, 71:20, 82:21, 84:6, 84:12, 84:16, 85:1, 85:6, 85:9, 85:14, 87:11, 99:12
**say**
10:22, 18:11, 28:16, 31:16, 31:19, 44:18, 48:2, 48:13, 50:19, 52:11, 54:8, 54:20, 55:1, 72:11, 72:20, 79:20, 81:4
**saying**
24:17, 27:2, 31:17, 31:18, 32:1, 33:10, 42:10, 43:19, 53:16, 60:11, 60:15, 60:16, 68:3, 69:21, 70:10
**says**
9:14, 11:14, 50:6, 67:4, 67:12, 68:6, 69:2, 69:16, 72:3, 78:16, 82:7, 82:12, 83:11, 83:15, 84:3, 84:8, 84:21, 85:8, 86:21
**seal**
101:18
**searchable**
11:17
**second**
14:7, 16:18, 66:12, 66:17, 69:11, 81:1, 89:5, 89:17, 89:19, 90:15, 91:8, 91:13, 91:17
**section**
12:4, 39:14, 40:19, 66:4, 66:8, 66:15, 66:21, 67:21, 70:22, 72:9, 72:19, 73:1, 74:6, 74:9, 74:18, 76:4, 79:2, 79:7, 80:13, 80:18, 81:19, 82:2, 82:4, 82:17, 83:21
**sections**
80:11, 86:5, 87:7
**sedra**
14:20, 15:6, 15:8
**see**
12:12, 13:8, 14:12, 14:18, 15:2, 15:3, 16:5, 20:3, 20:8, 20:19, 21:12, 21:15, 39:15, 39:17, 39:19, 50:2, 50:5, 50:9, 64:22, 66:6, 66:11, 66:13, 67:2, 67:4, 67:10, 67:19,

68:11, 68:20, 69:6, 78:14, 78:22, 81:21, 82:7, 82:14, 82:15, 83:3, 83:5, 83:9, 84:3, 84:7, 85:22, 89:22, 90:5, 90:7, 90:9, 91:2, 91:22
**seen**
9:13, 11:5, 15:20, 16:15, 31:4, 49:20, 63:12, 65:13
**select**
45:8
**selectivity**
67:9
**sense**
42:15, 43:20, 52:4, 70:4, 73:9
**sentence**
67:12, 68:6
**separate**
81:18, 82:20, 82:21, 83:12, 83:17, 83:22, 85:5, 85:13
**set**
102:23, 103:12
**seven**
68:17
**several**
68:17
**shaker**
3:23, 6:20
**shorthand**
2:9, 102:17
**should**
15:16, 49:12
**show**
57:8, 57:14
**showing**
11:9
**shown**
55:18, 70:12
**shows**
12:10, 16:21, 16:22
**sic**
37:7
**side**
66:3, 82:5, 85:19
**siemens**
82:6, 82:7, 82:15, 82:19, 83:4, 83:21, 85:4, 85:12, 85:21, 86:3
**sign**
8:22, 36:1, 36:18, 100:9
**signal**
17:14, 17:18, 17:22, 18:10, 27:4, 27:5, 28:7, 28:10, 29:9, 29:10, 29:12, 29:14, 29:20, 30:8, 33:14, 33:21, 34:2, 43:7, 43:22, 44:4, 44:12, 44:15, 44:18, 45:4, 60:6, 60:8, 93:11, 93:12, 93:14, 94:8, 94:10, 95:10, 95:21, 96:3, 96:7, 96:11, 96:14, 97:1, 97:2, 98:1, 98:16
**signals**
26:17, 92:18, 92:21, 92:22
**signature**
4:10, 101:2
**signature-p1kal**
103:14
**significant**
47:16
**silicon**
83:4
**silly**
55:3
**similar**
13:19
**simple**
37:7
**since**
74:13
**single**
46:12, 50:16, 86:5
**single-chip**
46:9, 46:16, 46:21, 48:3, 48:9, 48:11, 48:13, 49:4, 50:7, 50:11, 51:6, 51:11, 51:13, 53:2, 53:12, 53:19, 54:4, 54:22, 55:9, 55:20, 68:19, 69:2, 70:11, 72:3, 76:12, 79:3, 80:15, 88:2, 88:9
**single-sideband**
83:8
**sir**
27:16, 72:2
**sitting**
8:5, 79:19
**size**
42:3, 42:5, 42:13, 42:16, 42:22, 43:15, 44:16, 45:5, 45:17, 45:20, 46:2, 46:5, 47:9, 47:16, 51:19, 95:18, 96:10, 96:12, 97:22, 98:6, 98:13, 98:19
**sizes**
95:22
**sloppy**
52:11, 70:3
**small**
17:14, 17:18, 47:9, 53:9, 53:21, 56:13, 68:6, 69:3, 69:8, 69:18, 72:5, 73:12, 76:21, 78:10, 79:14
**smaller**
43:13, 44:5, 44:6, 71:2, 71:8, 72:1, 72:7, 72:10, 72:15, 73:4, 74:11, 76:6, 76:9, 76:10, 76:14, 76:16, 86:10, 86:11, 86:16, 92:18, 93:14, 95:11, 96:3, 97:9
**smith**
14:20, 15:6
**solution**
46:17, 48:3, 49:5
**solve**
78:20
**solving**
67:17
**some**
23:16, 26:11, 26:12, 30:3, 30:4, 30:5, 34:1, 34:3, 34:13, 49:5, 51:21, 70:5, 71:15, 71:19, 82:3, 88:20
**something**
73:10, 79:8, 99:18
**sometimes**
33:3, 33:4, 47:17, 60:5,

72:17
**somewhere**
29:2
**sorry**
8:18, 16:2, 16:6, 17:16, 18:4, 20:1, 23:20, 28:13, 28:15, 40:5, 40:17, 43:9, 47:3, 48:18, 61:1, 64:4, 64:5, 64:20, 66:19, 81:3, 90:14, 90:15, 92:6, 98:4, 99:16
**sort**
51:7, 52:11
**source**
33:13, 34:6, 62:5, 62:10, 90:21, 92:3
**speakers**
51:5
**specific**
24:20, 24:21, 25:21, 42:7, 59:4, 62:1, 72:12, 72:14, 76:17, 80:18, 96:16
**specifically**
69:16, 70:5, 73:10, 79:19
**specified**
83:7
**specks**
47:19
**spiral**
67:14, 78:17
**split**
57:9
**stage**
83:12
**stand**
62:15, 92:10, 99:19, 100:11
**standard**
2:6, 24:13, 30:20, 31:14
**stands**
19:17, 41:11, 77:6
**start**
33:10
**starting**
7:3, 66:3
**starts**
68:18, 82:10
**state**
2:8, 7:3, 7:22, 53:19, 101:7, 101:24, 102:20
**stated**
2:10, 53:1
**statement**
21:1, 24:18, 31:21
**states**
1:1, 4:26, 6:13, 22:5, 23:9, 102:1
**stenographically**
1:27
**step**
67:17
**stephanie**
3:15, 100:4
**stick**
76:1
**still**
48:13, 58:14, 88:1, 94:2, 99:6
**stop**
37:1
**stored**
33:8, 34:4
**strike**
8:7, 9:10, 12:16, 16:2, 17:6, 19:10, 20:18, 21:13, 22:4, 23:4, 23:13, 25:1, 31:18, 32:9, 36:19, 37:2, 37:4, 41:14, 45:12, 45:15, 45:22, 46:2, 46:6, 53:17, 60:16, 61:6, 61:15, 63:7, 64:6, 64:7, 65:6, 66:19, 68:4, 74:5, 80:11, 81:9, 81:14, 84:18, 84:20, 85:17, 87:14, 88:14, 90:16, 93:11, 95:8, 97:5
**structure**
39:16
**subscribed**
101:14
**suite**
3:18, 103:20
**sum**
23:10, 23:11
**summing**
17:1
**supplier**
29:16
**supplies**
46:14, 52:7
**supply**
54:15
**support**
57:13
**supporting**
49:6, 54:7
**suppressed-carrier**
83:8
**sure**
16:19, 36:4, 36:16, 69:12, 69:13, 70:8, 70:14, 70:17, 73:14, 74:18, 76:20, 78:6, 78:12, 80:8, 91:7, 92:9
**switch**
29:22, 30:1, 30:5, 33:22, 34:3, 34:12, 34:14, 34:16, 58:18, 58:19, 59:6, 59:22, 60:1, 60:18
**sworn**
2:3, 7:16, 7:18, 102:24
**symbol**
20:3, 20:20, 21:13, 21:15
**system**
50:7, 50:15, 51:2, 51:10, 51:17, 52:5, 52:8, 53:4, 55:10, 69:5, 72:6, 76:9, 76:11, 76:14, 83:7, 86:11, 86:14, 86:18, 87:20

**T**

**take**
28:15, 62:12, 62:13, 63:6, 92:8, 99:15
**taken**
1:21, 2:4, 62:18, 92:13, 99:21, 102:25
**taking**
7:4
**talk**
36:8, 37:9, 37:13, 41:3, 63:3
**talked**
40:13, 40:16, 40:18, 40:20
**talking**
15:22, 19:12, 20:15, 25:10, 33:6, 43:4,

43:5, 43:6, 45:7, 47:7, 61:8, 61:18, 61:19, 70:4, 74:19, 75:16, 78:3, 82:8, 86:18, 90:8, 93:3, 94:6, 94:8, 94:18, 94:20, 96:6, 97:13, 97:15, 98:10
**talks**
69:17, 72:9, 73:2, 73:3, 78:16, 78:20, 86:17
**taught**
18:15
**tayloe**
15:21, 16:4, 16:15, 16:21, 17:1, 17:7, 51:13, 52:15, 52:18, 53:2, 53:20, 54:22, 55:16, 55:20, 56:9, 57:10, 58:9, 58:13
**tayloe's**
50:7, 50:15, 51:2, 51:9, 51:17, 52:5, 52:8, 53:4, 56:20, 57:2, 58:10
**teach**
31:3, 38:3
**teaches**
40:1
**teachings**
38:9
**technology**
11:10
**telephone**
81:19, 82:18
**tell**
32:15, 35:14, 55:17, 70:19, 78:5, 78:9
**telling**
57:12, 58:4
**tenet**
32:20
**term**
18:12, 24:13, 31:14, 49:4, 51:7
**terminal**
15:9, 17:5, 17:8, 18:1
**terms**
58:22
**testified**
7:18, 90:17
**testimony**
8:4, 32:5, 32:6, 76:7, 89:14, 102:26
**texas**
1:6, 2:7, 2:8, 6:11, 7:9, 102:6, 102:19, 102:20, 102:29, 103:16
**text**
11:13
**textbook**
15:6, 32:10, 39:10
**textbooks**
30:19, 36:8, 37:9, 38:3, 39:3, 40:1
**th**
6:16, 89:8, 103:13
**thank**
7:12, 17:20, 70:20
**thanks**
100:17
**themselves**
7:2, 76:10
**therein**
101:17
**thing**
33:1, 45:1, 54:20, 69:16, 69:22, 72:2, 87:15
**things**
24:19, 31:15, 47:9, 54:10, 55:4, 57:18, 72:10
**think**
27:19, 69:19, 70:7, 70:20, 72:9, 76:19, 85:7, 99:18
**third**
82:5
**thought**
41:8
**three**
77:22, 79:22
**through**
22:3, 22:6, 22:21, 23:19, 23:21, 23:22, 26:7, 26:8, 26:9, 32:16, 33:22, 39:18, 57:21, 82:3, 83:2, 90:20, 90:22, 101:12
**throughout**
18:16, 18:17
**ti**
65:11, 91:12
**tighten**
95:3
**time**
2:6, 6:17, 24:7, 28:5, 31:1, 33:10, 38:13, 60:11, 62:16, 63:1, 80:9, 92:12, 92:16, 97:8, 99:20, 100:2, 100:7, 100:16, 103:5
**times**
17:22, 18:5, 22:18, 23:15, 23:22, 24:2, 88:17, 98:2
**tiny**
46:15, 47:18
**title**
38:15
**titled**
66:4
**today**
6:5, 6:19, 7:10, 7:14, 8:5, 79:19
**today's**
6:2, 6:16
**told**
69:22
**took**
73:19, 73:20
**top**
18:5, 85:19, 90:11
**trademark**
1:1, 6:13, 102:1
**trans**
54:19
**transceiver**
88:2
**transceivers**
4:34, 81:20, 82:18
**transcript**
4:35
**transfer**
12:4, 24:10, 24:12, 24:15, 24:19, 24:22, 25:2, 25:4, 25:20, 25:22, 26:5, 26:6, 26:8, 26:9, 26:18, 27:3, 27:6, 27:10, 27:11, 27:13, 27:17, 27:19,

27:21, 28:1, 28:2, 30:11, 31:8, 31:13, 31:18, 33:7
**transferred** 26:10, 28:9, 28:11, 28:19, 28:22, 29:1, 29:12, 30:4, 30:10, 30:22, 31:17, 31:21, 32:5, 32:12, 32:16, 32:22, 33:17, 34:2, 34:8, 34:16
**transistor** 55:2, 62:4, 62:8
**transistors** 53:3, 53:5, 53:7, 53:20, 54:10, 54:18, 54:22, 63:18, 64:1, 64:9, 64:10, 64:14, 64:16, 64:18
**transmitter** 82:13, 82:20, 83:4, 83:18, 83:22, 85:4, 85:5, 85:12, 86:4, 87:6, 87:12
**trial** 1:4, 6:14, 102:4
**tried** 95:4
**trip** 80:3
**true** 42:9, 59:2, 60:12, 62:2, 69:21, 101:3, 102:26
**truthful** 8:4, 89:13
**trying** 37:1, 43:22, 44:2, 53:15, 61:12, 93:9
**turn** 10:20, 13:14, 50:1, 63:15, 89:16
**two** 16:22, 22:4, 22:6, 22:8, 22:22, 23:2, 73:22, 79:13, 87:17
**type** 41:9, 64:18, 87:20
**types** 71:19
**typical** 41:13, 41:16
**typically** 45:9, 56:10, 76:14

**U**

**uh-huh** 66:1, 78:19
**under** 34:21, 90:18, 101:11, 101:18
**understand** 24:22, 25:4, 30:17, 30:19, 32:20, 39:22, 40:11, 50:19, 52:17, 53:15, 61:5, 73:18, 73:21, 74:3
**understanding** 11:8, 26:4
**understood** 35:20
**unit** 24:7, 28:5, 30:22, 33:10
**united** 1:1, 4:26, 6:13, 102:1
**unsupported** 57:15
**usa** 1:7, 102:7, 102:29
**use** 39:3, 71:7, 79:11, 92:18, 93:15, 95:10, 95:15, 96:3, 97:9
**using** 56:21, 71:1, 72:10, 73:4, 74:10, 76:6, 86:22, 87:4, 87:8, 87:10, 96:11, 96:18
**usually** 35:12, 36:10, 43:21, 45:10, 47:9, 51:4, 71:8, 71:9, 72:1, 95:14, 95:15, 95:17, 98:13

**V**

**va** 3:19
**vague** 26:14, 73:9, 80:6, 94:2, 94:22, 97:18
**value** 47:8, 49:3, 51:18
**various** 26:4
**verify** 80:8
**versus** 6:12
**via** 1:21, 103:3
**video** 6:17, 6:21
**videoconference** 1:21, 103:3
**videographer** 3:23, 6:9, 6:19, 7:12, 62:15, 62:22, 92:10, 92:15, 99:19, 100:1, 100:10
**videotaped** 1:18, 2:1, 6:10
**vienna** 3:19
**view** 17:11, 57:15, 57:17, 57:18
**voice-identify** 7:2
**voltage** 17:11, 22:7, 22:15, 22:18, 23:1, 23:14, 23:16, 23:21, 24:2

**W**

**wait** 80:21, 97:12
**wang** 3:26, 7:11
**want** 6:1, 6:5, 8:22, 11:14, 24:17, 25:18, 28:16, 30:17, 40:11, 43:11, 43:14, 52:17, 55:16, 59:3, 70:19, 72:13, 74:21, 74:22, 75:3, 77:1, 77:2, 81:7, 82:3, 89:17, 98:11
**way** 25:3, 33:11, 42:2, 42:5, 42:10, 42:12, 42:16, 42:22, 43:15, 44:13, 45:21, 50:20, 52:11, 61:3, 71:13, 76:3,



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

78:20, 80:8, 86:2, 92:7, 97:18, 97:22, 103:10
**ways** 26:4
**we'll** 100:9
**we're** 19:12, 62:16, 64:4, 70:21, 77:3, 91:16, 94:6, 96:6, 98:10
**we've** 80:13
**weeks** 77:8, 79:22
**well-known** 37:21
**weren't** 93:8
**whatever** 34:16, 34:17, 36:4
**whatsoever** 94:11, 95:22, 97:3
**whereof** 103:12
**whereupon** 10:18, 13:5, 14:3, 15:14, 39:6, 49:18, 62:20, 65:4, 89:3, 91:14
**whether** 21:7, 36:5, 36:6, 60:14, 73:12, 73:21, 76:4
**whole** 31:5, 32:3, 32:11, 45:1, 65:15, 74:17, 74:18, 88:10
**widen** 43:14
**wider** 98:12
**wiggles** 96:7
**wire** 57:21
**wireless** 4:33, 28:8, 29:10, 44:1, 93:13, 95:9, 95:16, 96:2, 97:4
**within** 56:5, 69:5, 72:6
**without** 12:1, 27:14, 52:5, 52:9, 55:2, 57:21, 75:6
**witness** 2:2, 7:16, 17:18, 28:14, 47:3, 92:9, 102:22, 102:27, 103:12
**wondering** 11:19
**word** 24:14, 84:16
**worded** 33:11
**wording** 70:3
**words** 84:14, 84:15, 87:4
**work** 24:15, 44:13, 52:5, 52:9
**worked** 79:22, 80:1
**world** 18:17, 27:17
**wouldn't** 47:22, 48:2, 58:2
**wristwatch** 69:5, 72:7
**wrong** 36:15
**wrote** 36:11, 38:2, 40:10, 58:6, 77:15, 77:18, 77:22

X

**x** 41:1

Y

**yao** 3:26, 7:11
**yeah** 6:6, 8:21, 11:7, 11:15, 12:5, 13:19, 16:18, 25:20, 35:16, 35:17, 39:17, 48:15, 50:2, 52:21, 53:9, 54:12, 61:11, 64:5, 65:17, 78:2, 80:18, 80:22, 81:14, 82:14, 83:14, 90:11, 90:12, 91:3
**year** 77:9
**years** 38:13, 38:22
**yourself** 8:17

Z

**zero-if** 87:1, 87:4, 87:9
**zoom** 1:21, 103:3

.

**.1024** 3:20
**.1701** 3:10
**.3** 41:19
**.3767** 103:22, 103:23

0

**0.3** 56:21, 57:3
**00935** 1:13, 6:15, 100:14, 102:13
**00936** 1:14, 6:15, 49:15, 102:14
**02** 62:17, 62:18
**036** 100:14
**05** 92:14
**06** 92:16
**08** 6:17

1

**1** 2:5, 92:14, 92:16, 99:20, 99:21, 99:22, 100:2, 100:16, 103:5
**10** 2:5, 4:16, 5:1, 91:10, 91:14, 103:4, 103:17
**10.7** 67:15, 67:18
**100** 4:8, 76:20, 78:1, 78:6, 78:11, 96:19
**1001** 10:15, 13:10
**1004** 15:20, 16:13
**101** 4:10



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936

**1017**
63:10
**102**
4:12
**1021**
91:11, 91:12
**103**
1:26
**105**
13:15
**1059**
65:11, 65:12
**11**
6:17
**118**
10:21, 11:3
**12**
62:17, 62:18, 62:19, 63:1, 92:12, 92:13
**13**
4:17
**14**
4:19, 99:20
**14.3**
90:4
**15**
4:21, 62:19, 63:1, 69:3, 69:8, 69:18, 72:5, 73:12, 76:20, 78:10, 79:14, 99:21
**16**
1:20, 2:5, 6:16, 99:22, 100:2, 103:4
**17**
2:5, 100:16, 103:5
**177**
8:20, 10:5, 10:12, 13:18, 58:17, 59:5, 59:12
**18**
65:20, 65:21, 81:5, 103:13
**19**
80:20, 80:22, 81:1, 81:5, 81:7

**2**

**2.4**
15:2, 15:5, 15:8
**20**
38:13, 38:22
**2024**
1:13, 1:14, 6:15, 49:15, 100:14, 102:13, 102:14
**2025**
1:20, 2:5, 4:36, 6:16, 89:9, 103:4, 103:13
**20850**
103:21
**22182**
3:19
**25**
103:17
**28**
4:36, 50:1, 50:3, 89:8

**3**

**300**
77:15, 77:18
**31**
103:17
**311**
4:28
**319**
4:28
**3253**
103:16
**35**
4:28
**37**
4:28
**3790**
3:7
**38**
14:14, 14:15, 15:1
**39**
4:24

**4**

**40**
83:13
**400**
103:20
**42**
4:29
**44**
92:12, 92:13
**450**
3:18
**451**
103:19
**477**
58:21
**49**
4:29

**5**

**50**
17:2, 18:5, 56:5, 60:11
**52**
17:2, 18:5, 56:5
**528**
9:6, 10:9, 13:3, 13:9, 59:21, 60:13, 60:17
**57**
2:5, 103:4
**592284**
1:25

**6**

**6,230,000**
4:21
**60**
56:9, 89:21
**62**
4:31
**65**
4:34
**650.332**
3:10
**686**
103:18
**69**
89:21, 90:11

**7**

**7,065,327**
5:1
**7,865,177**
1:15, 4:16, 102:15
**70**
67:18

**8**

**8229**
3:17
**83**
10:21, 10:22, 11:1, 11:5, 11:17, 12:10, 13:15, 13:17
**846**
3:8
**888.433**
103:22
**888.503**
103:23
**89**
4:36

**9**

**9,118,528**
4:27
**9,188,528**
4:17
**90**
56:6
**900**
4:30, 82:12, 83:3
**91**
5:1
**929.280**
3:20
**935**
8:14, 8:15,



ParkerVision Exhibit 2042
TI and NXP v. ParkerVision - IPR2024-00936