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Transcript of William Mangione-Smith, Ph.D.

Date: May 10, 2024

Case: Realtek Semiconductor Corp. -v- ATI Technologies ULC (PTAB)

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Conducted on May 10, 2024

<p>1 UNITED STATES PATENT AND TRADEMARK OFFICE 2 BEFORE THE PATENT TRIAL AND APPEAL BOARD 3 4 REALTEK SEMICONDUCTOR CORP.,) 5) 6 Petitioner,) 7) 8 vs.) Case No. IPR2023-00922 9) 10 ATI TECHNOLOGIES ULC,) 11) U.S. Patent No. 12 Patent Owner.) 8,760,454 13) 14) 15 16 DEPOSITION OF WILLIAM MANGIONE-SMITH, PH.D. 17 May 10, 2024 18 Seattle, Washington 19 9:09 a.m. 20 21 22 Reporter: Teri Simons, CCR, RMR, CRR</p>	<p>1 EXAMINATION INDEX 2 EXAMINATION BY: PAGE NO. 3 MR. JOHNSON 4 4 5 EXHIBIT INDEX 6 EXHIBIT NO. DESCRIPTION PAGE NO. 7 (No exhibits marked for identification.) 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22</p>
<p>1 APPEARANCES 2 3 4 For the Petitioner: 5 6 Jeffrey L. Johnson 7 Baker Botts LLP 8 910 Louisiana Street 9 Houston, TX 77002-4995 10 713.229.1222 11 Jeffrey.johnson@bakerbotts.com 12 13 For the Patent Owner: 14 15 Reza Dokhanchy 16 Mintz Levin Cohn Ferris Glovsky & 17 Popeo 18 3580 Carmel Mountain Road 19 Suite 300 20 San Diego, CA 92130 21 858.314.1596 22 Rdokhanchy@mintz.com</p>	<p>1 BE IT REMEMBERED that on Friday, 2 May 10, 2024, at 9:09 a.m., before Terilyn Simons, 3 Certified Court Reporter, CCR, RMR, CRR, CLR, appeared 4 WILLIAM MANGIONE-SMITH, PH.D., the witness herein; 5 WHEREUPON, the following proceedings 6 were had, to wit: 7 <<<<<<>>>>>>>> 8 WILLIAM MANGIONE-SMITH, PH.D., having been first duly 9 sworn by the Certified Court 10 Reporter, testified as follows: 11 EXAMINATION 12 BY MR. JOHNSON: 13 Q Good morning, Dr. Smith, Dr. Mangione-Smith-- 14 A "Mangione-Smith," please. 15 Q "Mangione-Smith," okay, I'll do my best. 16 A Thank you. 17 Q I don't think I have ever deposed you before, so it's 18 nice to meet you. 19 Are you ready to begin today? 20 A I am. 21 Nice to meet you as well, and I don't recall being 22 deposed by you as well.</p>

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5	<p>1 Q So since we haven't met before, I'll just go over a few</p> <p>2 basic things that I'm sure you're very well aware of</p> <p>3 because I know you've been deposed many times.</p> <p>4 Is there any reason you can't give me truthful</p> <p>5 answers today?</p> <p>6 A Not that I'm aware of.</p> <p>7 Q Are you on any kind of medication that will impair your</p> <p>8 ability to understand my questions or give answers today?</p> <p>9 A No.</p> <p>10 Q Okay. I see that you've brought some papers with you</p> <p>11 today.</p> <p>12 Can you tell me what those are?</p> <p>13 A Sure.</p> <p>14 Printouts of my report and some of the materials</p> <p>15 that are cited.</p> <p>16 Q Can you just go through them and identify each one for</p> <p>17 me?</p> <p>18 A Sure.</p> <p>19 The first one is ATI Exhibit No. 2071, and I know</p> <p>20 there is an issue with some of them having two exhibit</p> <p>21 numbers, so I'm going to do my best to get the right</p> <p>22 exhibit number.</p>	7	<p>1 were made to various circuitry. In this case I believe</p> <p>2 it's all focused on the SQ circuitry.</p> <p>3 Next is ATI Exhibit No. 2099. This is a document</p> <p>4 that has estimates for the area required for different</p> <p>5 circuit blocks in the R400.</p> <p>6 Next is ATI Exhibit 2111. It's titled, "ATI</p> <p>7 Technologies Incorporated R400 program."</p> <p>8 Then I have Realtek Exhibit 1001. This is the '454</p> <p>9 patent.</p> <p>10 Then Realtek Exhibit 1009. This is a reprint of</p> <p>11 the— this is what I have referred to as the Selzer</p> <p>12 reference, S-E-L-Z-E-R, titled, "Dynamic load balancing</p> <p>13 within a high performance graphics system."</p> <p>14 Next is Realtek 1008. It's a magazine article</p> <p>15 titled, "Introducing the Intel I860 64-bit</p> <p>16 microprocessor."</p> <p>17 Next is Realtek Exhibit 1007. This is a reprint of</p> <p>18 the article, "A simple flexible parallel graphics</p> <p>19 architecture," where the lead author is John Amanatides,</p> <p>20 A-M-A-T-I-D-E-S.</p> <p>21 Next is Realtek Exhibit No. 1010 titled, "Thread</p> <p>22 prioritization, a thread scheduling mechanism for</p>
6	<p>1 Do you want me to characterize it as well?</p> <p>2 Q Can you just tell me briefly what it is?</p> <p>3 A Sure.</p> <p>4 This is what's called a regression log of testing</p> <p>5 various circuits, and it looks like it's got a date of</p> <p>6 being run on January of 2004.</p> <p>7 Q And do you know what it was testing?</p> <p>8 A In my notes I probably do.</p> <p>9 There is a comment at the top that it's— oh, it's a</p> <p>10 regression report for the SQ on the R400 project.</p> <p>11 Q Okay. All right. And the next one?</p> <p>12 A The next one is titled, "R400 Top Level specification,</p> <p>13 Version 0.2," and it's got an exhibit number of ATI</p> <p>14 Exhibit 2013.</p> <p>15 Q Okay.</p> <p>16 A The next one is titled, "Shader processor, Version 0.1,"</p> <p>17 and the exhibit number is ATI Exhibit 2012.</p> <p>18 The next is "R400 sequencer specification," and then</p> <p>19 below that it says, "SEQ, Version 0.4," Exhibit ATI 2010.</p> <p>20 Q Okay.</p> <p>21 A Then there is ATI Exhibit 2095, which is what is often</p> <p>22 referred to as a change log. It's a log of changes that</p>	8	<p>1 multi-context parallel processors," and this is typically</p> <p>2 referred to by me as the "Fiske reference," F-I-S-K-E.</p> <p>3 Then I have a printout of my declaration, which is</p> <p>4 ATI Exhibit 2121.</p> <p>5 Q Thank you.</p> <p>6 Are those clean copies or do you have any notes or</p> <p>7 marks in them?</p> <p>8 A I have not made any notes or marks on any of these.</p> <p>9 I didn't print them out, so I couldn't swear that</p> <p>10 they were clean, but I know of no markings in them.</p> <p>11 Q So somebody else gave them to you?</p> <p>12 A Yes.</p> <p>13 Q I assume that was Counsel?</p> <p>14 A Yes.</p> <p>15 Q Okay. So did you ask for printouts of those or they</p> <p>16 provided those at their own discretion?</p> <p>17 A They were provided to me yesterday while we were doing</p> <p>18 preparation for the deposition today.</p> <p>19 Q Okay. And did you make that selection or did Counsel</p> <p>20 make it, in terms of which documents to print?</p> <p>21 A Well, I think— it's hard to say.</p> <p>22 Which ones to print, I certainly didn't direct any</p>

9

1 printing.

2 Counsel came with a large box. He may have printed

3 everything that was an exhibit. I just don't know.

4 Q Okay. And so you met with Counsel yesterday to prepare

5 for your deposition?

6 A Yes.

7 Q And did you do anything else to prepare for your

8 deposition, other than meet with Counsel yesterday?

9 A Certainly. I did some reviewing this morning and over

10 the last couple of weeks.

11 Q Okay. Did you have any other meetings with any other

12 individuals?

13 A No.

14 Q Any phone calls, conversations with any other individuals

15 to prepare for your deposition?

16 A Not that I can recall, not specifically to prepare for my

17 deposition.

18 Q And Counsel was Reza or were there other attorneys

19 present?

20 A No, it was just he.

21 Q Okay. So I was going to mark the patent and your

22 declaration, but I'm not going to do that.

10

1 You already have a copy.

2 (Discussion off the record.)

3 Q (By Mr. Johnson) With respect to your declaration, which

4 is Exhibit No. 2121, did you prepare that declaration on

5 your own?

6 A It contains-- the opinions expressed in there are my

7 opinions.

8 I certainly had assistance in discussion with other

9 individuals along the process of me developing the

10 declaration.

11 Q That was a bad question.

12 Did you write the initial draft of the declaration?

13 A Even that's a little hard to answer because some of it,

14 for example, is my background and an explanation of my

15 understanding of the law, I believe. That's typically in

16 there.

17 Those sections have been developed over many years

18 with many different clients.

19 Furthermore, there have been two declarations in

20 this matter, and I looked at the technology over the

21 years, working previously in the context of an ITC

22 matter, so, sure, it's possible that different people

11

1 had, you know, typed up different sections and said, you

2 know, "What do you think of this," or I said, "We need to

3 argue X, Y, and Z," and somebody said, "Well, then I'll

4 take a crack at that," and then I reviewed it.

5 Q Okay. So maybe, as we go through today, you can identify

6 portions where you think you might have made the initial

7 draft and others where they were provided to you, if

8 possible.

9 Would that be okay?

10 A Sure.

11 Q Okay. Once the declaration was finalized but before you

12 signed it, did you review it?

13 A Yes.

14 Q And after you signed it and submitted it in this case,

15 have you reviewed it again?

16 A Yes.

17 Q Have you found it to contain any errors or mistakes,

18 anything you want to correct on the record before we get

19 started?

20 A Nothing that occurs to me as I sit here today.

21 Q I'm sure there's typos in any document. I am not talking

22 about those, just any other kind of mistakes that you

12

1 might have noticed.

2 A Nothing that occurs to me.

3 Q Okay. Thank you.

4 In your declaration you refer to the transcripts of

5 some other individuals, like Mr. Gruber and others,

6 Dr. Watson-- I mean, Mr. Watson.

7 Did you have any conversations with those

8 individuals, where you cite to their transcripts, in

9 preparing for your declaration?

10 A I don't believe so, not that I recall.

11 Q So to the extent that you cite to them or rely on them in

12 your declaration, you are basing that solely on the

13 documents that you reviewed, correct?

14 A That's my recollection.

15 It's my practice, if I'm relying on a personal

16 discussion, I will cite it that way, but I don't recall

17 any such conversations.

18 Q And you can feel free to look at any of the documents

19 that you brought with you today as you need them. It

20 doesn't bother me at all, okay?

21 If you need a break or anything, just let me know.

22 I am very flexible.

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13	<p>1 I try to take breaks as quickly as I can when you</p> <p>2 ask for them. If I'm asking a question, and I want to</p> <p>3 finish one or two things, I will try to do that quickly,</p> <p>4 but feel free to ask, okay?</p> <p>5 A That sounds good.</p> <p>6 I prefer to take a break, a brief one, every hour,</p> <p>7 just to stretch my legs.</p> <p>8 Q I will do my best.</p> <p>9 I am sure your counsel will remind me often.</p> <p>10 Do you recall that there's a term in the '454 patent</p> <p>11 claims that says, "Vertex manipulation operation"?</p> <p>12 Have you heard of that term before?</p> <p>13 A It seems familiar.</p> <p>14 Can you point me to the section where that appears?</p> <p>15 Q Sure.</p> <p>16 You can just look at Claim 1 in Exhibit No. 1001.</p> <p>17 Claim 1 appears in Column 6.</p> <p>18 A Yes, I see that.</p> <p>19 Q Is "vertex manipulation operation" a term of art?</p> <p>20 A I don't recall hearing exactly that sequence of words</p> <p>21 previously, but certainly the-- I think that there's a</p> <p>22 clear understanding to a person of ordinary skill in the</p>	15	<p>1 A So outside of the context of the '454, a vertex operation</p> <p>2 would be an operation that works on vertex data.</p> <p>3 Q Okay. And then a little later in Claim 1 it refers to</p> <p>4 "vertex calculation operation."</p> <p>5 Do you see that?</p> <p>6 A I don't doubt it's in there. I'm just not seeing it.</p> <p>7 Q Sorry, I think I said "Vertex."</p> <p>8 I meant "pixel," "pixel calculation operation."</p> <p>9 Do you see that?</p> <p>10 A I see "pixel calculation" but not "pixel operation</p> <p>11 calculation."</p> <p>12 Q Let me restart. Sorry.</p> <p>13 In the continuing clause of Claim 1, there's a</p> <p>14 reference to "pixel calculation operations."</p> <p>15 Do you see that?</p> <p>16 A Yes.</p> <p>17 Q Was that a term of art that you were aware of before</p> <p>18 encountering the '454 patent?</p> <p>19 A I would say the concept is.</p> <p>20 I don't recall with great confidence seeing exactly</p> <p>21 that sequence of words.</p> <p>22 Q Is there a difference between a vertex manipulation</p>
14	<p>1 art.</p> <p>2 Q So we'll get to that.</p> <p>3 I just want to know, in your experience as a person</p> <p>4 of ordinary skill in the art and an expert in the field,</p> <p>5 whether or not you had heard the term "vertex</p> <p>6 manipulation operation" before.</p> <p>7 A It's possible.</p> <p>8 The concept I certainly had heard of, but I don't</p> <p>9 recall exactly hearing that sequence of words previously.</p> <p>10 Q Is-- and then a little later in Claim 1 it refers to a</p> <p>11 "vertex operation."</p> <p>12 Is that a term of art?</p> <p>13 A I think that's a little bit closer to a term of art, so I</p> <p>14 would say yes.</p> <p>15 Q Okay. And so you have encountered that term in your past</p> <p>16 experiences prior to the '454 patent?</p> <p>17 A I believe so, but I am not suggesting that I have a</p> <p>18 reference to point to.</p> <p>19 Q That's fine. I just want to know what your general</p> <p>20 understanding was outside of the context of the '454</p> <p>21 patent as to what a vertex operation would have been.</p> <p>22 Can you give me that understanding?</p>	16	<p>1 operation, a vertex operation, and a vertex calculation</p> <p>2 operation?</p> <p>3 A Sure.</p> <p>4 Q Okay. Can you explain to me the difference between those</p> <p>5 three terms?</p> <p>6 A Well, there are a number of different types of</p> <p>7 operations.</p> <p>8 I think "operation" was in all three of those terms.</p> <p>9 "Vertex manipulation operation" would be an</p> <p>10 operation that manipulates, I would say, the vertices,</p> <p>11 and the third one was a vertex, I think, calculation--</p> <p>12 just "vertex operations"--</p> <p>13 Q Yes.</p> <p>14 A No--</p> <p>15 Q Okay. Let me ask the question just to make sure you're</p> <p>16 not floundering around.</p> <p>17 So you've already identified what you believe is a</p> <p>18 vertex manipulation operation. I appreciate that.</p> <p>19 What I would like to know is, how is that different</p> <p>20 from just a general vertex operation?</p> <p>21 Let's start there.</p> <p>22 A It is an instance of a vertex operation.</p>

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