

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

REALTEK SEMICONDUCTOR CORP.,
Petitioner,

v.

ATI TECHNOLOGIES ULC
Patent Owner.

Case No. IPR2023-00922
U.S. Patent No. 8,760,454

DECLARATION OF CALVIN WATSON

TABLE OF CONTENTS

	Page
I. BACKGROUND AND INTRODUCTION	1
II. PRIOR DECLARATIONS	3
III. PERFORCE	5
A. Documents Saved in Perforce	6
1. PowerPoint Presentations (Program Reviews)	7
2. Technical Specifications	8
3. Other Documents	9
B. Metadata Saved in Perforce	9
1. Document Logs	10
2. Folder Histories	11
IV. AUTHENTICATION OF EXHIBITS	12
1. Exhibit 2024 (Program Review)	12
2. Exhibit 2025 (Technical Specification)	12
3. Exhibit 2026 (Technical Specification)	13
4. Exhibit 2027 (Technical Specification)	13
5. Exhibit 2028 (Technical Specification)	14
6. Exhibit 2032 (Program Review)	14
7. Exhibit 2033 (Program Review)	14
8. Exhibit 2038 (Technical Specification)	15
9. Exhibit 2040 (Program Review)	15
10. Exhibit 2041 (Program Review)	15
11. Exhibit 2071 (Regression Report)	16
12. Exhibit 2073 (Regression Reports)	16
13. Exhibit 2079 (Technical Specification)	18
14. Exhibit 2088 (Program Review)	19
15. Exhibit 2089 (Program Reviews)	19
16. Exhibit 2090 (Folder History)	26

17.	Exhibit 2091 (Folder History).....	26
18.	Exhibit 2092 (Folder History).....	26
19.	Exhibit 2093 (Folder History).....	27
20.	Exhibit 2094 (Folder History).....	27
21.	Exhibit 2095 (Folder History).....	27
22.	Exhibit 2096 (Folder History).....	27
23.	Exhibit 2097 (Folder History).....	28
24.	Exhibit 2098 (Document Logs)	28
25.	Exhibit 2099 (Netlist Excel Files)	34
26.	Exhibit 2112 (Document Logs and Folder Histories).....	35

I, Calvin Watson, declare as follows:

I. BACKGROUND AND INTRODUCTION

1. I am a technical specialist and patent agent at Advanced Micro Devices, Inc. (“AMD”). My responsibilities include, among other things, supporting the AMD law department on various intellectual property matters.

2. I understand that ATI merged with AMD in 2006. I understand that ATI’s documents are now managed on AMD’s database system, one of which is known as Perforce, which is the same system that ATI used before the merger with AMD. From my responsibilities at AMD, I am familiar with creating, editing, reviewing, maintaining, and retrieving files in Perforce.

3. I understand the above captioned case filed by Petitioner Realtek Semiconductor Corp. involves U.S. Patent Number 8,760,454 (the “’454 patent”). I understand the ’454 patent is currently assigned to ATI Technologies ULC (“ATI”).

4. In this declaration, I provide an overview of Perforce and the types of files that ATI/AMD engineers saved in Perforce. I also intend to authenticate the following Exhibits which were submitted in the ’454 patent IPR. The Exhibits below are true and correct copies of documents, folder histories, document logs, and/or metadata retrieved from AMD’s document databases. Each of these files was kept in the ordinary course of AMD/ATI’s business, and the original

documents, folder histories, document logs, and/or metadata remain in AMD's possession, custody, and control today. I understand these files were produced as exhibits to the instant case with the following exhibit numbers:

Exhibit No.	Reference Name
Ex. 2024	R400 Executive Review (Sept. 16, 2002)
Ex. 2025	GFIXIP 9x SX Micro-Architecture Specification (Version 1.0)
Ex. 2026	WD/IA/VGT Micro-Architecture Specification (Version 1.0)
Ex. 2027	GX9 SPI Specification (Version 1.0)
Ex. 2028	R400 Top Level Specification (Version 0.2)
Ex. 2032	R400 Program Review (Feb. 12, 2003)
Ex. 2033	R400 Program Review (Jan. 15, 2003)
Ex. 2038	R400 Primitive Assembly (Version 0.1)
Ex. 2040	R400 Program Review (Aug. 29, 2002)
Ex. 2041	R400 Program Review
Ex. 2071	Sqsp Regression Report
Ex. 2073	R400 Regression Testing
Ex. 2079	SQ Thread Trace 2.3 User's Guide
Ex. 2088	R400 Executive Review (Sept. 16, 2002)
Ex. 2089	R400 Program Reviews (Various Dates)
Ex. 2090	R400 PA Block Folder History
Ex. 2091	R400 RB Block Folder History
Ex. 2092	R400 SC Block Folder History
Ex. 2093	R400 SPI Block Folder History
Ex. 2094	R400 SP Block Folder History
Ex. 2095	R400 SQ Block Folder History
Ex. 2096	R400 SX Block Folder History
Ex. 2097	R400 VGT Block Folder History
Ex. 2098	R400 Source Code Document Logs 10/1/2002 – 4/17/2003
Ex. 2099	R400 Netlist Area Sheets
Ex. 2112	R400 Source Code Document Logs and Folder Histories

II. PRIOR DECLARATIONS

5. I previously submitted two similar declarations authenticating AMD documents, source code, folder histories, and document logs in two other *inter partes* reviews. The first declaration was submitted in IPR2015-00325, and the second declaration was submitted in IPR2015-00326. I understand those declarations were submitted for the instant case as Exs. 2003 and 2117. Ex. 2003 in the instant case is my declaration from IPR2015-00325, and Ex. 2117 is my declaration from IPR2015-00326.

6. I understand that some of the exhibits I discussed in my authenticating declaration in both IPR2015-00325 and IPR2015-00326 were submitted as exhibits in this case, but were renumbered for this case. In order to address any confusion created by the two sets of exhibit numbers, below I have included a table for these documents with the new exhibit number in the instant case, the old exhibit number from my prior declarations in the prior cases, and a citation to the declaration where I previously explained why they are authentic AMD/ATI documents.

Exhibit Number in Instant Case	Description	Prior IPR and Exhibit Number(s)	Authentication Discussion
Ex. 2009	R400 Testing Folder History	IPR2015-00325, Ex. 2050	Ex. 2003, ¶145
Ex. 2010	R400 Sequencer Specification (Version 0.4)	IPR2015-00325, Ex. 2010	Ex. 2003, ¶¶ 33-35

Exhibit Number in Instant Case	Description	Prior IPR and Exhibit Number(s)	Authentication Discussion
Ex. 2011	R400 Sequencer Specification (Version 2.0)	IPR2015-00325, Ex. 2028	Ex. 2003, ¶¶ 85- 87
Ex. 2012	R400 Shader Processor (Version 0.1)	IPR2015-00325, Ex. 2042	Ex. 2003, ¶¶ 127- 129
Ex. 2013	R400 Top Level Specification (Version 0.2)	IPR2015-00325, Ex. 2041	Ex. 2003, ¶¶ 124- 126
Ex. 2104	R400 Sequencer Specification (Version 0.1)	IPR2015-00325, Ex. 2007	Ex. 2003, ¶¶ 26- 28
Ex. 2105	R400 Sequencer Specification (Version 0.3)	IPR2015-00325, Ex. 2009	Ex. 2003, ¶¶ 30- 32
Ex. 2106	R400 Sequencer Specification (Version 1.2)	IPR2015-00325, Ex. 2018	Ex. 2003, ¶¶ 57- 59
Ex. 2107	R400 Sequencer Specification (Version 1.8)	IPR2015-00325, Ex. 2024	Ex. 2003, ¶¶ 73- 75
Ex. 2108	R400 Sequencer Specification (Version 2.01)	IPR2015-00325, Ex. 2029	Ex. 2003, ¶¶ 88- 90
Ex. 2109	R400 Sequencer Specification (Version 2.07)	IPR2015-00325, Ex. 2035	Ex. 2003, ¶¶ 106- 108

Exhibit Number in Instant Case	Description	Prior IPR and Exhibit Number(s)	Authentication Discussion
Ex. 2110	Document Logs and File Histories	IPR2015-00325, Ex. 2043 - Ex. 2052	Ex. 2003, ¶¶ 136-147
Ex. 2111	PowerPoint Presentations	IPR2015-00325, Ex. 2057 - Ex. 2071	Ex. 2003, ¶¶ 133-135
Ex. 2119	Technical Specifications, Document Logs, and File Histories	IPR2015-00326, Ex. 2007 - Ex. 2072	Ex. 2117, ¶¶ 23-129, 133-148
Ex. 2120	Source Code	IPR2015-00326, Ex. 2073 - Ex. 2118	Ex. 2117, ¶¶ 130-132 (authenticating IPR2015-00326, Exs. 2093-2119)

III. PERFORCE

7. AMD and former ATI engineers used shared-file repositories for documents, source code, and other files. The system that manages the repositories is called Perforce. As part of my responsibilities, I understand how Perforce works and the types of documents that have been saved in Perforce with respect to this case.

8. Perforce allows many users to connect to shared-file repositories. Each shared-file repository is called a depot. Files are organized in a depot using a file tree hierarchy. Any user with a permission to access the files can do so.

9. Perforce maintains time stamped logs, user permissions, and whether files are checked out. This information is stored in a separate database. The information stored in this database is referred to as metadata.

10. Users do not work directly on depot files. When a user checks out files, the files are saved to the user's individual workspace according to the same file hierarchy in the depot. The user works on the files on his or her workspace. When the user is finished editing the files, the user checks in the files. Perforce then accesses the files on the user's workspace and syncs the depot according to the user's changes.

11. Perforce is a revision-control repository. This means that the system saves every revision of every file under Perforce control. When a user uploads an edited file, Perforce saves the file as a new version under the folder tree hierarchy. This type of system is particularly useful during development. For example, a version-control system allows a user to revert to a previous version of code. A user can therefore freely edit code while ensuring that the previous version is maintained.

A. Documents Saved in Perforce

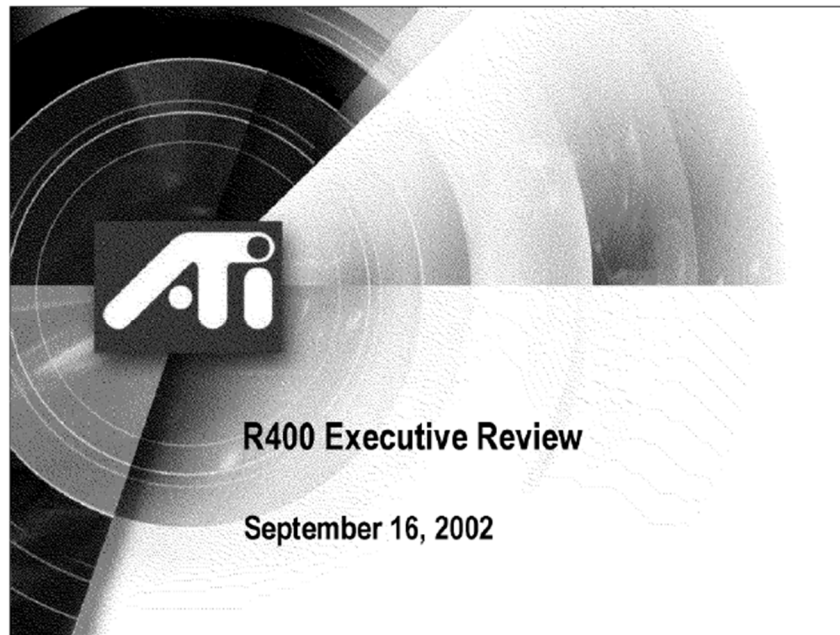
12. Some of the Exhibits, which I am intending to authenticate below, are documents such as PowerPoint presentations, technical specifications, Excel

spreadsheets, and source code. These documents are maintained in Perforce's depot files and are kept in the regular course of business.

1. PowerPoint Presentations (Program Reviews)

13. The program reviews are PowerPoint presentations which are generally stored in Perforce and summarize R400 progress. These documents are kept in the regular course of business.

14. As customary with AMD's regular course of business, the program reviews include a date on the title slide which corresponds to the day the presentation was given.



E.g., Ex. 2024 at p. 1.

2. Technical Specifications

15. The technical specifications are documents stored in Perforce which give a high level overview of the technical details of the R400 project. These documents are kept in the regular course of business.

16. The author of the document manually enters the specification's title, version number, author, and overview. Each field appears on the cover page.

	ORIGINATE DATE 11 March, 2001	EDIT DATE [date \@ "d MMMM, 2000]	DOCUMENT-REV. NUM. GEN-CXXXXX-REVA	PAGE 1 of 34
Author: Steve Morein				
Issue To:		Copy No:		
R400 Top Level Specification ver 0.2				
Overview: This replaces the R400 architecture specification.				
AUTOMATICALLY UPDATED FIELDS: Document Location: Document1 Current Intranet Search Title: R400 Top Level Spec				

E.g., Ex. 2028 at p. 1.

17. The cover page header includes the ORIGINATE DATE and the EDIT DATE. The ORIGINATE DATE is intended to be the date the original document (e.g., the first version within the depot folder) was created. The EDIT DATE is intended to be the date the document was last edited. The EDIT DATE is auto populated using a macro, and this macro cannot be disabled. So, every time

the document is opened, the EDIT DATE changes. This macro is a revision-control feature of Perforce. Further, both the EDIT DATE and the ORIGINATE DATE can be manually changed.

18. It is the regular and customary practice of AMD (and predecessor ATI) to record the date that a technical specification or testing record was edited. The record is kept on the document itself, as shown in a sample below.

	ORIGINATE DATE 11 March, 2001	EDIT DATE {date \@ "d MMMM, YYYY"} 11 March, 2001	DOCUMENT-REV. NUM. GEN-CXXXXX-REVA	PAGE 5 of 34
<u>Revision Changes:</u>				
Rev 0.0 (Steve Morein) Date: March 11, 2001 Initial revision.		Document recreated from earlier documents		
Date March 14, 2001 April 21, 2001		Finally got back to editing it. Upated texture path, hopefully this one works.		

E.g., Ex. 2028 at p. 5.

3. Other Documents

19. Other documents stored in Perforce include Excel spreadsheets and Regression reports. As explained in further detail below, Perforce also includes data regarding revision history of the documents. Where any documents, such as some Excel spreadsheets, do not have a date visible on the face of the document, I have included the last edit date from the metadata in Perforce.

B. Metadata Saved in Perforce

20. Some of the Exhibits, which I authenticate below, are document logs and folder histories. Document logs and folder histories are metadata files. These

metadata files contain information relating to revision history of the depot files (e.g., technical specifications) maintained in Perforce. Through document logs and folder histories, Perforce allows administrators to track edits, track who made the edits, and track when the edits were made. Metadata files are kept in the regular course of business.

21. In Perforce, there are two types of metadata files: (1) document logs; and (2) folder histories.

1. Document Logs

22. Document logs track each revision to the depot files in Perforce. Each depot file has a corresponding document log. So, each document log tells the revision history of its corresponding file.

23. Perforce maintains certain information in document logs. For example, Perforce automatically saves the date a document was changed and the workspace that made the change. Further, for any edited file a user uploads to the system, the user is prompted to enter a description of the file or a brief description of the changes made to the file.

24. An excerpt of sample document log is shown below for the source code file pa.v. In this excerpt, four revisions were uploaded. Various users uploaded the revisions on various dates.

```
//depot/r400/devel/parts_lib/src/gfx/pa/pa.v
... #148 change 91060 edit on 2003/03/19 by dclifton@dclifton_r400 (ktext)

Reverted width of IO_PA_scan and PA_IO_scan back to 15 bits.

... #147 change 91033 edit on 2003/03/19 by dclifton@dclifton_r400 (ktext)

Changed number of IO_PA_scan and PA_IO_scan pins to 14 each.

... #146 change 90895 edit on 2003/03/19 by bhankins@fl_bhankins_r400_win (ktext)

add test signals

... #145 change 90862 edit on 2003/03/19 by bhankins@fl_bhankins_r400_win (ktext)

add common_dft test ports
```

E.g., Ex. 2098 at p. 1.

2. Folder Histories

25. Folder histories list the same information as the document logs. The difference is that a folder history compiles all the document log files saved within the folder and its subfolders. The information in the folder history file is organized by date. An excerpt of a sample folder history file is shown below.

```
Change 91529 on 2003/03/21 by dclifton@dclifton_r400

Generated with version 1.6 of genperfcode--syntax issues possibly causing unknowns in
gate sims are fixed

Change 91513 on 2003/03/21 by rramsey@rramsey_crayola_linux_orl

connect sc_rtr up to signal from SC when not running pa_block_sim

Change 91060 on 2003/03/19 by dclifton@dclifton_r400

Reverted width of IO_PA_scan and PA_IO_scan back to 15 bits.
```

E.g., Ex. 2090 at p. 1.

IV. AUTHENTICATION OF EXHIBITS

26. As part of my responsibilities, I verified the Exhibits listed in Section IV of this Declaration with documents and metadata stored in Perforce and on internal AMD databases. My responsibilities include, among other things, supporting the AMD law department on various intellectual property matters. I am authenticating these Exhibits. The Exhibits include: (1) technical specifications; (2) PowerPoint presentations such as program reviews; (3) Excel spreadsheets; (4) regression testing; and (5) metadata, which include file histories and document logs.

1. Exhibit 2024 (Program Review)

27. Exhibit 2024 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated September 16, 2002. Ex. 2024 at p. 1. The file name is Review020916.ppt.

28. Exhibit 2024 is stored in Perforce at
//depot/r400/web/project/Program Reviews/Executive
Reviews/Review020916.ppt#1.

2. Exhibit 2025 (Technical Specification)

29. Exhibit 2025 is a true and accurate copy of a technical specification. The file name is GFXIP_9x_SX_MAS.docx. It was last edited by Dong Yiao on February 12, 2014. See Ex. 2025 at p. 2.

30. Exhibit 2025 is stored in Perforce at
//depot/macosx/extras/docs/HW_Docs/GFX9/Block
Specs/sx/GFXIP_9x_SX_MAS.docx#1.

3. Exhibit 2026 (Technical Specification)

31. Exhibit 2026 is a true and accurate copy of a technical specification. The file name is IA_VGT_Spec.docx. As provided by Perforce, the last change made to this file was on August 12, 2015, by Glenn Ortner. Glenn Ortner is a Fellow Software Development Engineer at AMD and is currently still employed at AMD.

32. Exhibit 2026 is stored in Perforce at
//depot/macosx/extras/docs/HW_Docs/GFX9/Block
Specs/vgt/IA_VGT_Spec.docx#1.

4. Exhibit 2027 (Technical Specification)

33. Exhibit 2027 is a true and accurate copy of a technical specification. The file name is gfx9_SPI_Specification#1.docx. It was last edited November 3, 2016. *See* Ex. 2027 at p. 1.

34. Exhibit 2027 is stored in Perforce at
//depot/macosx/extras/docs/HW_Docs/GFX9/Block
Specs/spi/gfx9_SPI_Specification.docx#1.

5. Exhibit 2028 (Technical Specification)

35. Exhibit 2028 is a true and accurate copy of a technical specification describing the development of the R400. The file name is R400 Top Level Spec.DOC. Steve Morein created this document on March 11, 2001. *See* Ex. 2028 at p. 1, 5. Steven Morein also revised the document on March 14, 2001, and April 21, 2001. *See id.* at p. 5.

36. Exhibit 2028 is stored in Perforce at //depot/r400/arch/doc/chip/R400 Top Level Spec.DOC#7.

6. Exhibit 2032 (Program Review)

37. Exhibit 2032 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated February 12, 2003. Ex. 2032 at p. 1. The file name is Lili S. - R400 reviewfeb03.ppt.

38. Exhibit 2032 is stored in Perforce at //depot/r400/web/project/Program Reviews/Feb2003_Review/Lili S. - R400 reviewfeb03.ppt#1.

7. Exhibit 2033 (Program Review)

39. Exhibit 2033 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated January 15, 2003. Ex. 2033 at p. 1. The file name is Lili S. - R400 reviewjan03.ppt.

40. Exhibit 2033 is stored in Perforce at
//depot/r400/web/project/Program Reviews/Jan2003_Review/Lili S. - R400
reviewjan03.ppt#1.

8. Exhibit 2038 (Technical Specification)

41. Exhibit 2038 is a true and accurate copy of a technical specification describing the development of the R400. The file name is R400_CP_PA_Top.doc. Clay Taylor created this document on October 29, 2001. *See* Ex. 2028 at pp. 1, 3.

42. Exhibit 2038 is stored in Perforce at
//depot/r400/doc_lib/design/blocks/pa/R400_CP_PA_Top.doc#1.

9. Exhibit 2040 (Program Review)

43. Exhibit 2040 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated August 29, 2002. Ex. 2040 at p. 1. The file name is Bob P. - R400_PD.ppt.

44. Exhibit 2040 is stored in Perforce at
//depot/r400/web/project/Program Reviews/AugustReview/Bob P. -
R400_PD.ppt#1.

10. Exhibit 2041 (Program Review)

45. Exhibit 2041 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The file name is Frank H. -R400 -

Program Review - August 2002.ppt. As provided by Perforce, the last change made to this file was on September 11, 2002 by Joseph Cox. Joseph Cox was the CVP of Silicon Design Engineering at AMD, and he left AMD on December 31, 2020.

46. Exhibit 2041 is stored in Perforce at

//depot/r400/web/project/Program Reviews/AugustReview/Frank H. -R400 -
Program Review - August 2002.ppt#1.

11. Exhibit 2071 (Regression Report)

47. Exhibit 2071 is a true and accurate copy of a regression report of the SQ block of the R400 dated January 22, 2004. The file name is

sqsp_regress_report012204.txt.

48. Exhibit 2071 is stored in Perforce at

//depot/r400/web/project/Validation/Reports/regress/tb_sqsp/sqsp_regress_report0
12204.txt.

12. Exhibit 2073 (Regression Reports)

49. Exhibit 2073 is a compilation of several different documents.

50. Page 1 to 135 is a true and accurate copy of an emulation regression test history of the R400 dated April 16, 2003. The file name is

r400_emu_test_regress_history_041603.txt. The file is stored in Perforce at

//depot/r400/web/project/Validation/Reports/Emulation/r400_emu_test_regress_hi
story_041603.txt.

51. Pages 136 to 160 is a true and accurate copy of an emulation regression test history of the R400 dated August 5, 2002. The file name is r400_emu_test_regress_history_080502.txt. The file is stored in Perforce at //depot/r400/web/project/Validation/Reports/Emulation/r400_emu_test_regress_history_080502.txt.

52. Pages 161 to 185 is a true and accurate copy of an emulation regression test history of the R400 dated August 6, 2002. The file name is r400_emu_test_regress_history_080602.txt. The file is stored in Perforce at //depot/r400/web/project/Validation/Reports/Emulation/r400_emu_test_regress_history_080602.txt.

53. Pages 186 to 273 is a true and accurate copy of an emulation regression test history of the R400 dated December 3, 2002. The file name is r400_emu_test_regress_history_120302.txt. The file is stored in Perforce at //depot/r400/web/project/Validation/Reports/Emulation/r400_emu_test_regress_history_120302.txt.

54. Pages 274 to 367 is a true and accurate copy of an emulation regression test summary of the R400 dated December 31, 2002. The file name is r400_emu_test_regress_history_123102.txt. The file is stored in Perforce at //depot/r400/web/project/Validation/Reports/Emulation/r400_emu_test_regress_history_123102.txt.

55. Page 368 is a true and accurate copy of an emulation regression test summary of the R400 dated April 16, 2003. The file name is r400_emu_test_regress_statistics_041603.log. The file is stored in Perforce at `./depot/r400/web/project/Validation/Reports/Emulation/r400_emu_test_regress_statistics_041603.log`.

56. Page 369 is a true and accurate copy of an emulation regression test summary of the R400 dated December 3, 2002. The file name is r400_emu_test_regress_statistics_120302.log. The file is stored in Perforce at `./depot/r400/web/project/Validation/Reports/Emulation/r400_emu_test_regress_statistics_120302.log`.

57. Page 370 is a true and accurate copy of an emulation regression test summary of the R400 dated December 31, 2002. The file name is r400_emu_test_regress_statistics_123102.log. The file is stored in Perforce at `./depot/r400/web/project/Validation/Reports/Emulation/r400_emu_test_regress_statistics_123102.log`.

13. Exhibit 2079 (Technical Specification)

58. Exhibit 2079 is a true and accurate copy of a technical specification. The file name is GFX9_sq_thread_trace_users_guide.docx. It was authored by Brian Emberling, Jeremy Furtek, Andrew Pomianowski, Guennadi Riguer, and Andrew Brown. *See* Ex. 2079, at p. 1. As provided by Perforce, the last change

made to this file was on March 11, 2016 by Edward Mandac. Edward Mandac is a Sr. Manager in Software Development at AMD and is currently still employed at AMD.

59. Exhibit 2079 is stored in Perforce at
//depot/macosx/extras/docs/HW_Docs/GFX9/Block
Specs/sq/GFX9_sq_thread_trace_users_guide.docx#1.

14. Exhibit 2088 (Program Review)

60. Exhibit 2088 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated September 16, 2002. Ex. 2008 at p. 1. The file name is R400_September16.ppt.

61. Exhibit 2088 is a duplicate copy of a file stored in Perforce under a different file name at //depot/r400/web/project/Program Reviews/Executive Reviews/Review020916.ppt#1.

15. Exhibit 2089 (Program Reviews)

62. Exhibit 2089 is a compilation of several different documents.

63. Page 1 is a true and accurate copy of the original Excel Spreadsheet incorporated into another exhibit, Exhibit 2088, at page 9.

64. Page 2 is a true and accurate copy of the original Excel Spreadsheet incorporated into another exhibit, Exhibit 2088, at page 2.

65. Pages 3 through 14 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated September 30, 2002. Ex. 2089 at p. 3. The file name is R400_September30.ppt. This file is a duplicate copy of a file stored in Perforce under a different file name at //depot/r400/web/project/Program Reviews/Executive Reviews/Review020930-BW.ppt#1.

66. Pages 15 through 28 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated October 28, 2002. Ex. 2089 at p. 15. The file name is R400_October28.ppt. This file is a duplicate copy of a file stored in Perforce under a different file name at //depot/r400/web/project/Program Reviews/Executive Reviews/Review021028-BW.ppt#1.

67. Page 29 is intentionally omitted.

68. Pages 30 through 45 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated October 15, 2002. Ex. 2089 at p. 30. The file name is R400_October15.ppt. This file is a duplicate copy of a file stored in Perforce under a different file name

at //depot/r400/web/project/Program Reviews/Executive Reviews/Review021015-BW.ppt#1.

69. Page 46 is intentionally omitted.

70. Pages 47 through 57 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated November 11, 2002. Ex. 2089 at p. 47. The file name is R400_November11.ppt. This file is stored in an internal AMD database at \\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\11 November02\R400_November11.ppt.

71. Pages 58 through 68 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated November 25, 2002. Ex. 2089 at p. 58. The file name is R400_November25.ppt. This file is stored in an internal AMD database at \\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\11 November02\R400_November25.ppt.

72. Pages 69 through 79 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is

dated December 9, 2002. Ex. 2089 at p. 69. The file name is R400_December09.ppt. This file is stored in an internal AMD database at \\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\12 December02\R400_December09.ppt.

73. Pages 80 through 90 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated December 16, 2002. Ex. 2089 at p. 80. The file name is R400_December16.ppt. This file is stored in an internal AMD database at \\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\12 December02\R400_December16.ppt.

74. Pages 91 through 99 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated December 23, 2002. Ex. 2089 at p. 91. The file name is R400_December23.ppt. This file is stored in an internal AMD database at \\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\12 December02\R400_December23.ppt.

75. Pages 100 through 109 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the

document to have occurred during development of the R400. The title page is dated January 6, 2003. Ex. 2089 at p. 100. The file name is R400_Jan6.ppt. This file is stored in an internal AMD database at

\\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\January\R400_Jan6.ppt.

76. Pages 110 through 118 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated January 13, 2003. Ex. 2089 at p. 110. The file name is R400_Jan13.ppt. This file is stored in an internal AMD database at

\\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\January\R400_Jan13.ppt.

77. Pages 119 through 134 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated January 20, 2003. Ex. 2089 at p. 119. The file name is R400_Jan20.ppt. This file is stored in an internal AMD database at

\\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\January\R400_Jan20.ppt.

78. Pages 135 through 149 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated January 27, 2003. Ex. 2089 at p. 135. The file name is R400_Jan27.ppt. This file is stored in an internal AMD database at \\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\January\R400_Jan27.ppt.

79. Pages 150 through 162 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated February 10, 2003. Ex. 2089 at p. 150. The file name is R400_Feb10.ppt. This file is stored in an internal AMD database at \\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\February\R400_Feb10.ppt.

80. Pages 163 through 172 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated February 24, 2003. Ex. 2089 at p. 163. The file name is R400_Feb24.ppt. This file is stored in an internal AMD database at

\\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\February\R400_Feb24.ppt.

81. Pages 173 through 180 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated March 10, 2003. Ex. 2089 at p. 173. The file name is R400_Mar10.ppt. This file is stored in an internal AMD database at

\\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\March\R400_Mar10.ppt.

82. Pages 181 through 190 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated March 24, 2003. Ex. 2089 at p. 181. The file name is R400_Mar24.ppt. This file is stored in an internal AMD database at

\\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\March\R400_Mar10.ppt.

83. Pages 191 through 202 is a true and accurate copy of a PowerPoint presentation from a program review meeting that is indicated on the face of the document to have occurred during development of the R400. The title page is dated April 7, 2003. Ex. 2089 at p. 191. The file name is R400_Apr7.ppt. This file

is stored in an internal AMD database at

\\cviis01\wwwroot\ProgramManagement\Documents\Exec_Reviews\April\R400_
Apr7.ppt.

16. Exhibit 2090 (Folder History)

84. Exhibit 2090 is a true and accurate copy of folder history of the PA block of the R400 between October 1, 2002 and March 21, 2003. The file name is PA_check-in_history.txt. This exhibit lists the changes tracked in Perforce that were made to files of the PA block stored in Perforce at
//depot/r400/devel/parts_lib/src/gfx/.

17. Exhibit 2091 (Folder History)

85. Exhibit 2091 is a true and accurate copy of folder history of the RB block of the R400 between October 1, 2002 and April 17, 2003. The file name is RB_check-in_history.txt. This exhibit lists the changes tracked in Perforce that were made to files of the RB block stored in Perforce at
//depot/r400/devel/parts_lib/src/gfx/.

18. Exhibit 2092 (Folder History)

86. Exhibit 2092 is a true and accurate copy of folder history of the SC block of the R400 between October 1, 2002 and April 11, 2003. The file name is SC_check-in_history.txt. This exhibit lists the changes tracked in Perforce that were made to files of the SC block stored in Perforce at
//depot/r400/devel/parts_lib/src/gfx/.

19. Exhibit 2093 (Folder History)

87. Exhibit 2093 is a true and accurate copy of folder history of the SPI block of the R400 between April 1, 2003 and April 10, 2003. The file name is SPI_check-in_history.txt. This exhibit lists the changes tracked in Perforce that were made to files of the SPI block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

20. Exhibit 2094 (Folder History)

88. Exhibit 2094 is a true and accurate copy of folder history of the SP block of the R400 between October 1, 2002 and April 10, 2003. The file name is SP_check-in_history.txt. This exhibit lists the changes tracked in Perforce that were made to files of the SP block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

21. Exhibit 2095 (Folder History)

89. Exhibit 2095 is a true and accurate copy of folder history of the SQ block of the R400 between October 1, 2002 and April 17, 2003. The file name is SQ_check-in_history.txt. This exhibit lists the changes tracked in Perforce that were made to files of the SQ block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

22. Exhibit 2096 (Folder History)

90. Exhibit 2096 is a true and accurate copy of folder history of the SX block of the R400 between October 1, 2002 and April 17, 2003. The file name is

SX_check-in_history.txt. This exhibit lists the changes tracked in Perforce that were made to files of the SX block stored in Perforce at
`//depot/r400/devel/parts_lib/src/gfx/`.

23. Exhibit 2097 (Folder History)

91. Exhibit 2097 is a true and accurate copy of folder history of the VGT block of the R400 between October 2, 2002 and February 20, 2003. The file name is VGT_check-in_history.txt. This exhibit lists the changes tracked in Perforce that were made to files of the VGT block stored in Perforce at
`//depot/r400/devel/parts_lib/src/gfx/`.

24. Exhibit 2098 (Document Logs)

92. Exhibit 2098 is a compilation of several different documents.

93. Pages 1 through 7 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at
`//depot/r400/devel/parts_lib/src/gfx/pa/pa.v` between October 1, 2002 and April 17, 2003. The file name is pa.v.log.

94. Pages 8 through 9 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at
`//depot/r400/devel/parts_lib/src/gfx/tp/tp.tree` between October 1, 2002 and April 17, 2003. The file name is tp.tree.log.

95. Pages 10 through 11 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/pa/pa_ag.v` between October 1, 2002 and April 17, 2003. The file name is `pa_ag.v.log`.

96. Pages 12 through 14 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/pa/pa_ccg_sxifsm.v` between October 1, 2002 and April 17, 2003. The file name is `pa_ccg_sxifsm.v.log`.

97. Pages 15 through 17 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/pa/pa_sxifccg.v` between October 1, 2002 and April 17, 2003. The file name is `pa_sxifccg.v.log`.

98. Pages 18 through 26 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sc/sc.v` between October 1, 2002 and April 17, 2003. The file name is `sc.v.log`.

99. Pages 27 through 28 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/tis/sq_tex_instr_queue.v` between October 1, 2002 and April 17, 2003. The file name is `sq_tex_instr_queue.v.log`.

100. Pages 29 through 31 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sp/sp.v` between October 1, 2002 and April 17, 2003. The file name is `sp.v.log`.

101. Page 32 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/tis/sq_tex_instr_seq.v` between October 1, 2002 and April 17, 2003. The file name is `sq_tex_instr_seq.v.log`.

102. Pages 33 through 37 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/pa/sp_macc.v` between October 1, 2002 and April 17, 2003. The file name is `sp_macc.v.log`.

103. Pages 38 through 44 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_macc32.mc` between October 1, 2002 and April 17, 2003. The file name is `sp_macc32.mc.log`.

104. Page 45 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ca/sq_thread_arb.v` between October 1, 2002 and April 17, 2003. The file name is `sq_thread_arb.v.log`.

105. Pages 46 through 48 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_macc_gpr.v` between October 1, 2002 and April 17, 2003. The file name is `sp_macc_gpr.v.log`.

106. Pages 49 through 54 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_vector.v` between October 1, 2002 and April 17, 2003. The file name is `sp_vector.v.log`.

107. Pages 55 through 67 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/sq.v` between October 1, 2002 and April 17, 2003. The file name is `sq.v.log`.

108. Pages 68 through 69 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx_parameter_caches.v` between October 1, 2002 and April 17, 2003. The file name is `sx_parameter_caches.v.log`.

109. Pages 70 through 75 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ais/sq_ais_output.v` between October 1, 2002 and April 17, 2003. The file name is `sq_ais_output.v.log`.

110. Pages 76 through 79 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ais/sq_alu_instr_queue.v` between October 1, 2002 and April 17, 2003. The file name is `sq_alu_instr_queue.v.log`.

111. Pages 80 through 81 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx_export_buffers.v` between October 1, 2002 and April 17, 2003. The file name is `sx_export_buffers.v.log`.

112. Pages 82 through 86 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ais/sq_alu_instr_seq.v` between October 1, 2002 and April 17, 2003. The file name is `sq_alu_instr_seq.v.log`.

113. Pages 87 through 93 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/cfs/sq_ctl_flow_seq.v` between October 1, 2002 and April 17, 2003. The file name is `sq_ctl_flow_seq.v.log`.

114. Pages 94 through 97 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx_export_control.v` between October 1, 2002 and April 17, 2003. The file name is `sx_export_control.v.log`.

115. Pages 98 through 99 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/pa/sq_defs.v` between October 1, 2002 and April 17, 2003. The file name is `sq_defs.v.log`.

116. Pages 100 through 101 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/misc/sq_export_alloc.v` between October 1, 2002 and April 17, 2003. The file name is `sq_export_alloc.v.log`.

117. Page 102 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx_param_cache_ctl.v` between October 1, 2002 and April 17, 2003. The file name is `sx_param_cache_ctl.v.log`.

118. Page 103 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ia/sq_input_arb.v` between October 1, 2002 and April 17, 2003. The file name is `sq_input_arb.v.log`.

119. Pages 104 through 105 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/is/sq_instruction_store.v` between October 1, 2002 and April 17, 2003. The file name is `sq_instruction_store.v.log`.

120. Pages 106 through 110 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ss/sq_pix_thread_buff.v` between October 1, 2002 and April 17, 2003. The file name is `sq_pix_thread_buff.v.log`.

121. Pages 111 through 113 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/tis/sq_target_instr_fetch.v` between October 1, 2002 and April 17, 2003. The file name is `sq_target_instr_fetch.v.log`.

122. Pages 114 through 118 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ss/sq_vtx_thread_buff.v` between October 1, 2002 and April 17, 2003. The file name is `sq_vtx_thread_buff.v.log`.

123. Pages 119 through 122 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx.v` between October 1, 2002 and April 17, 2003. The file name is `sx.v.log`.

25. Exhibit 2099 (Netlist Excel Files)

124. Exhibit 2099 is a compilation of several different documents.

125. Page 1 is a true and accurate copy of an Excel spreadsheet related to the development of the R400. The file name is `Netlist_2-0_Area.xls`. This file is

stored in Perforce at //depot/r400/web/project/Hardware/Netlist_2-0_Area.xls#1. According to Perforce, the last change made to this file was on May 22, 2003 by Peter Pellerite. Peter Pellerite was a Program Manager-Silicon Engineering at AMD and his last day was October 7, 2015.

126. Page 2 is a true and accurate copy of an Excel spreadsheet related to the development of the R400. The file name is Netlist_3-0_Area.xls. According to Perforce, the last change made to this file was on May 22, 2003 by Peter Pellerite.

127. Page 3 is a true and accurate copy of an Excel spreadsheet related to the development of the R400. The file name is Netlist_4-0-1_Area.xls. According to Perforce, the last change made to this file was on May 22, 2003 by Peter Pellerite.

26. Exhibit 2112 (Document Logs and Folder Histories)

128. Exhibit 2112 is a compilation of several different documents.

129. Page 1 is an exhibit previously submitted in IPR2015-00325, where it was numbered Ex. 2107. It was previously authenticated by me through a declaration I submitted in IPR2015-00325. That same declaration was resubmitted in the instant case as Ex. 2003. Ex. 2003, ¶148 (discussing Ex. 2017 as named in IPR2015-00325). As stated in Ex. 2003, this exhibit is the folder history for the files stored under the folder //depot/r400/devel/parts_lib/src/sp/. *Id.* This folder history is a complete and accurate revision history of the files within this folder. *Id.*

130. Pages 2 through 7 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ais/sq_alu_instr_seq.v` between April 18, 2003 and November 20, 2003. The file name is `sq_alu_instr_seq.v.log`.

131. Pages 8 through 24 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/sq.v` between April 18, 2003 and November 20, 2003. The file name is `sq.v.log`.

132. Pages 25 through 28 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ais/sq_alu_instr_queue.v` between April 18, 2003 and November 20, 2003. The file name is `sq_alu_instr_queue.v.log`.

133. Pages 29 through 32 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/tis/sq_tex_instr_seq.v` between April 18, 2003 and November 20, 2003. The file name is `sq_tex_instr_seq.v.log`.

134. Pages 33 through 40 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ss/sq_vtx_thread_buff.v` between April 18, 2003 and November 20, 2003. The file name is `sq_vtx_thread_buff.v.log`.

135. Pages 41 through 42 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/tp/tp.tree` between April 18, 2003 and November 20, 2003. The file name is `tp.tree.log`.

136. Pages 43 through 48 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/cfs/sq_ctl_flow_seq.v` between April 18, 2003 and November 20, 2003. The file name is `sq_ctl_flow_seq.v.log`.

137. Page 49 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ia/sq_input_arb.v` between April 18, 2003 and November 20, 2003. The file name is `sq_input_arb.v.log`.

138. Page 50 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx_export_buffers.v` between April 18, 2003 and November 20, 2003. The file name is `sx_export_buffers.v.log`.

139. Pages 51 through 53 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/tis/sq_tex_instr_queue.v` between April 18, 2003 and November 20, 2003. The file name is `sq_tex_instr_queue.v.log`.

140. Pages 54 through 56 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/misc/sq_defs.v` between April 18, 2003 and November 20, 2003. The file name is `sq_defs.v.log`.

141. Pages 57 through 59 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/is/sq_instruction_store.v` between April 18, 2003 and November 20, 2003. The file name is `sq_instruction_store.v.log`.

142. Pages 60 through 63 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sp/sp.v` between April 18, 2003 and November 20, 2003. The file name is `sp.v.log`.

143. Pages 64 through 66 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/tis/sq_target_instr_fetch.v` between April 18, 2003 and November 20, 2003. The file name is `sq_target_instr_fetch.v.log`.

144. Pages 67 through 68 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_macc32.mc` between April 18, 2003 and November 20, 2003. The file name is `sp_macc32.mc.log`.

145. Pages 69 through 70 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_macc_gpr.v` between April 18, 2003 and November 20, 2003. The file name is `sp_macc_gpr.v.log`.

146. Page 71 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/pa/pa_ccg_sxifsm.v` between April 18, 2003 and November 20, 2003. The file name is `pa_ccg_sxifsm.v.log`.

147. Pages 72 through 76 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx.v` between April 18, 2003 and November 20, 2003. The file name is `sx.v.log`.

148. Pages 77 through 79 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_macc.v` between April 18, 2003 and November 20, 2003. The file name is `sp_macc.v.log`.

149. Pages 80 through 82 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sc/sc.v` between April 18, 2003 and November 20, 2003. The file name is `sc.v.log`.

150. Pages 83 through 89 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ais/sq_ais_output.v` between April 18, 2003 and November 20, 2003. The file name is `sq_ais_output.v.log`.

151. Pages 90 through 92 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ca/sq_thread_arb.v` between April 18, 2003 and November 20, 2003. The file name is `sq_thread_arb.v.log`.

152. Pages 93 through 95 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_vector.v` between April 18, 2003 and November 20, 2003. The file name is `sp_vector.v.log`.

153. Pages 96 through 103 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/ss/sq_pix_thread_buff.v` between April 18, 2003 and November 20, 2003. The file name is `sq_pix_thread_buff.v.log`.

154. Pages 104 through 105 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx_parameter_caches.v` between April 18, 2003 and November 20, 2003. The file name is `sx_parameter_caches.v.log`.

155. Page 106 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx_export_control.v` between April 18, 2003 and November 20, 2003. The file name is `sx_export_control.v.log`.

156. Pages 107 through 111 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sq/misc/sq_export_alloc.v` between April 18, 2003 and November 20, 2003. The file name is `sq_export_alloc.v.log`.

157. Page 112 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/sx/sx_param_cache_ctl.v` between April 18, 2003 and November 20, 2003. The file name is `sx_param_cache_ctl.v.log`.

158. Pages 113 through 115 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/pa/pa.v` between April 18, 2003 and November 20, 2003. The file name is `pa.v.log`.

159. Page 116 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/pa/pa_ag.v` between April 18, 2003 and November 20, 2003. The file name is `pa_ag.v.log`.

160. Page 117 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/pa/pa_sxifccg.v` between April 18, 2003 and November 20, 2003. The file name is `pa_sxifccg.v.log`.

161. Pages 118 through 151 is a true and accurate copy of folder history of the RB block of the R400 between April 18, 2003 and November 20, 2003. The file name is `RB_check-in_history.txt`. These pages list the changes tracked in Perforce that were made to files of the RB block stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/`.

162. Pages 152 through 157 is a true and accurate copy of folder history of the SPI block of the R400 between April 18, 2003 and November 20, 2003. The file name is `SPI_check-in_history.txt`. These pages list the changes tracked in Perforce that were made to files of the SPI block stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/`.

163. Pages 158 through 176 is a true and accurate copy of folder history of the SX block of the R400 between April 18, 2003 and November 20, 2003. The file name is `SX_check-in_history.txt`. These pages list the changes tracked in Perforce that were made to files of the SX block stored in Perforce at `//depot/r400/devel/parts_lib/src/gfx/`.

164. Pages 177 through 195 is a true and accurate copy of folder history of the SP block of the R400 between April 18, 2003 and November 20, 2003. The file name is SP_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the SP block stored in Perforce at
`//depot/r400/devel/parts_lib/src/gfx/`.

165. Pages 196 through 248 is a true and accurate copy of folder history of the SQ block of the R400 between April 18, 2003 and November 20, 2003. The file name is SQ_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the SQ block stored in Perforce at
`//depot/r400/devel/parts_lib/src/gfx/`.

166. Pages 249 through 259 is a true and accurate copy of folder history of the SC block of the R400 between April 18, 2003 and November 20, 2003. The file name is SC_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the SC block stored in Perforce at
`//depot/r400/devel/parts_lib/src/gfx/`.

167. Pages 260 through 264 is a true and accurate copy of folder history of the VGT block of the R400 between April 18, 2003 and November 20, 2003. The file name is VGT_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the VGT block stored in Perforce at
`//depot/r400/devel/parts_lib/src/gfx/`.

168. Pages 265 through 271 is a true and accurate copy of folder history of the PA block of the R400 between April 18, 2003 and November 20, 2003. The file name is PA_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the PA block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

169. Pages 272 through 318 is a true and accurate copy of folder history of the VC block of the R400 between April 18, 2003 and November 20, 2003. The file name is VC_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the VC block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

170. Pages 319 through 320 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/ais/sq_alu_instr_seq.v between August 24, 2001 and September 30, 2002. The file name is sq_alu_instr_seq.v.log.

171. Pages 321 through 331 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/sq.v between August 24, 2001 and September 30, 2002. The file name is sq.v.log.

172. Pages 332 through 333 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at

//depot/r400/devel/parts_lib/src/gfx/sq/ais/sq_alu_instr_queue.v between August 24, 2001 and September 30, 2002. The file name is sq_alu_instr_queue.v.log.

173. Pages 334 through 335 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/tis/sq_tex_instr_seq.v between August 24, 2001 and September 30, 2002. The file name is sq_tex_instr_seq.v.log.

174. Page 336 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/ss/sq_vtx_thread_buff.v between August 24, 2001 and September 30, 2002. The file name is sq_vtx_thread_buff.v.log.

175. Pages 337 through 340 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/tp/tp.tree between August 24, 2001 and September 30, 2002. The file name is tp.tree.log.

176. Pages 341 through 345 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/cfs/sq_ctl_flow_seq.v between August 24, 2001 and September 30, 2002. The file name is sq_ctl_flow_seq.v.log.

177. Pages 346 through 347 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at

//depot/r400/devel/parts_lib/src/gfx/tp/tp.v between August 24, 2001 and September 30, 2002. The file name is tp.v.log.

178. Page 348 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/ia/sq_input_arb.v between August 24, 2001 and September 30, 2002. The file name is sq_input_arb.v.log.

179. Page 349 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sx/sx_export_buffers.v between August 24, 2001 and September 30, 2002. The file name is sx_export_buffers.v.log.

180. Page 350 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/tis/sq_tex_instr_queue.v between August 24, 2001 and September 30, 2002. The file name is sq_tex_instr_queue.v.log.

181. Pages 351 through 352 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/misc/sq_defs.v between August 24, 2001 and September 30, 2002. The file name is sq_defs.v.log.

182. Pages 353 through 354 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at

//depot/r400/devel/parts_lib/src/gfx/sq/is/sq_instruction_store.v between August 24, 2001 and September 30, 2002. The file name is sq_instruction_store.v.log.

183. Pages 355 through 359 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sp/sp.v between August 24, 2001 and September 30, 2002. The file name is sp.v.log.

184. Pages 360 through 361 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/tis/sq_target_instr_fetch.v between August 24, 2001 and September 30, 2002. The file name is sq_target_instr_fetch.v.log.

185. Pages 362 through 363 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_macc32.mc between August 24, 2001 and September 30, 2002. The file name is sp_macc32.mc.log.

186. Pages 364 through 367 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_macc_gpr.v between August 24, 2001 and September 30, 2002. The file name is sp_macc_gpr.v.log.

187. Pages 368 through 369 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at

//depot/r400/devel/parts_lib/src/gfx/pa/pa_ccg_sxifsm.v between August 24, 2001 and September 30, 2002. The file name is pa_ccg_sxifsm.v.log.

188. Pages 370 through 374 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sx/sx.v between August 24, 2001 and September 30, 2002. The file name is sx.v.log.

189. Pages 375 through 378 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_macc.v between August 24, 2001 and September 30, 2002. The file name is sp_macc.v.log.

190. Pages 379 through 387 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sc/sc.v between August 24, 2001 and September 30, 2002. The file name is sc.v.log.

191. Pages 388 through 390 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/ais/sq_ais_output.v between August 24, 2001 and September 30, 2002. The file name is sq_ais_output.v.log.

192. Pages 391 through 393 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at

//depot/r400/devel/parts_lib/src/gfx/sq/ca/sq_thread_arb.v between August 24, 2001 and September 30, 2002. The file name is sq_thread_arb.v.log.

193. Pages 394 through 399 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sp/vector/sp_vector.v between August 24, 2001 and September 30, 2002. The file name is sp_vector.v.log.

194. Page 400 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sq/ss/sq_pix_thread_buff.v between August 24, 2001 and September 30, 2002. The file name is sq_pix_thread_buff.v.log.

195. Page 401 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sx/sx_parameter_caches.v between August 24, 2001 and September 30, 2002. The file name is sx_parameter_caches.v.log.

196. Page 402 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sx/sx_export_control.v between August 24, 2001 and September 30, 2002. The file name is sx_export_control.v.log.

197. Pages 403 through 404 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at

//depot/r400/devel/parts_lib/src/gfx/sq/misc/sq_export_alloc.v between August 24, 2001 and September 30, 2002. The file name is sq_export_alloc.v.log.

198. Page 405 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/sx/sx_param_cache_ctl.v between August 24, 2001 and September 30, 2002. The file name is sx_param_cache_ctl.v.log.

199. Pages 406 through 413 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/pa/pa.v between August 24, 2001 and September 30, 2002. The file name is pa.v.log.

200. Pages 414 through 416 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/pa/pa_ag.v between August 24, 2001 and September 30, 2002. The file name is pa_ag.v.log.

201. Pages 417 through 418 is a document log for RTL source code of the R400. It is a complete and accurate revision history of the file stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/pa/pa_sxifccg.v between August 24, 2001 and September 30, 2002. The file name is pa_sxifccg.v.log.

202. Pages 419 through 466 is a true and accurate copy of folder history of the RB block of the R400 between August 24, 2001 and September 30, 2002. The

file name is RB_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the RB block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

203. Pages 467 through 476 is a true and accurate copy of folder history of the SX block of the R400 between August 24, 2001 and September 30, 2002. The file name is SX_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the SX block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

204. Pages 477 through 491 is a true and accurate copy of folder history of the SP block of the R400 between August 24, 2001 and September 30, 2002. The file name is SP_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the SP block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

205. Pages 492 through 517 is a true and accurate copy of folder history of the SQ block of the R400 between August 24, 2001 and September 30, 2002. The file name is SQ_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the SQ block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

206. Pages 518 through 563 is a true and accurate copy of folder history of the SC block of the R400 between August 24, 2001 and September 30, 2002. The

file name is SC_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the SC block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

207. Pages 564 through 589 is a true and accurate copy of folder history of the VGT block of the R400 between August 24, 2001 and September 30, 2002. The file name is VGT_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the VGT block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

208. Pages 590 through 638 is a true and accurate copy of folder history of the PA block of the R400 between August 24, 2001 and September 30, 2002. The file name is PA_check-in_history.txt. These pages list the changes tracked in Perforce that were made to files of the PA block stored in Perforce at //depot/r400/devel/parts_lib/src/gfx/.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true. The statements in this declaration were made with the knowledge that willful false statements and the like are made punishable by fine or imprisonment under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the '454 patent.

Executed this 16 day of February in 2024 at Austin, Texas.

Respectfully Submitted,



Calvin Watson