

United States Court of Appeals for the Federal Circuit

01-1449, -1583, -1604, -1641, 02-1174, -1192

RAMBUS INC.,

Plaintiff-Appellant,

v.

INFINEON TECHNOLOGIES AG,
INFINEON TECHNOLOGIES NORTH AMERICA CORP.,
and INFINEON TECHNOLOGIES HOLDING NORTH AMERICA INC.,

Defendants-Cross Appellants.

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Appealed from: United States District Court for the Eastern District of Virginia

Judge Robert E. Payne

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Defendants-Cross Appellants.

DECIDED: January 29, 2003

Before RADER, BRYSON, and PROST, Circuit Judges.

Opinion for the court filed by Circuit Judge RADER. Dissenting opinion filed by Circuit Judge PROST.

RADER, Circuit Judge.

During trial, the United States District Court for the Eastern District of Virginia granted judgment as a matter of law (JMOL) and held that Infineon Technologies AG, Infineon Technologies North America Corp., and Infineon Technologies Holding North America Inc. (collectively Infineon) did not infringe Rambus Inc.'s patents. The jury later found Rambus liable for fraud associated with standard-setting activities on two computer memory technologies. On post-trial JMOL motions, the district court set aside a verdict of fraud on one of the memory technologies, but permitted the fraud verdict to stand on the other technology. The court then issued an injunction against Rambus and awarded Infineon attorney fees.

Because the district court erred in its claim construction, this court vacates the grant of JMOL of noninfringement and remands for consideration under the revised claim construction. Additionally, because substantial evidence does not support the implicit jury finding that Rambus breached the relevant disclosure duty during its participation in the standards committee, this court reverses the denial of JMOL that let the fraud verdict stand. Based on the record evidence, the district court properly set aside the fraud verdict on the remaining technology. These holdings render the injunction moot and require this court to vacate and remand the attorney fees award for reconsideration in light of this opinion. The record evidence supports the district court's grant of JMOL. Accordingly, this court vacates-in-part, reverses-in-part, affirms-in-part, and remands.

I.

Rambus develops and licenses memory technologies to companies that manufacture semiconductor memory devices. Rambus does not manufacture any memory devices itself, but relies instead on licensing its patent portfolio for revenue. In April 1990, Rambus filed U.S. Patent Application Serial No. 07/510,898 ('898 application) with claims directed to a computer memory technology known as dynamic random access memory (DRAM). The United States Patent and Trademark Office (PTO) determined that the '898 application covered multiple independent inventions. The PTO issued an eleven-way restriction requirement requiring Rambus to elect one invention to pursue in the '898 application. In response, Rambus filed numerous divisional and continuation applications based on the original '898 application -- at least thirty-one of which have issued. Many of these patents claim aspects of a memory technology known as Rambus DRAM (RDRAM). In April 1991, Rambus filed a patent application under the Patent Cooperation Treaty (WIPO application) claiming priority to the '898 application.

In December 1991, Rambus attended a Joint Electron Devices Engineering Council (JEDEC) meeting as a guest. Rambus officially joined JEDEC in February 1992. JEDEC is a standard-setting body associated with the Electronic Industries Association (EIA).¹ JEDEC member companies participate on various committees to develop standards for semiconductor technologies. Committee JC-42.3 drafts standards for random access memory (RAM), a common component in computers, printers, and other electronic devices. JEDEC meetings are open meetings, but nonmembers must receive an invitation to attend. Minutes of the JEDEC meetings and copies of the published JEDEC standards are available to members and nonmembers alike. Both JEDEC and EIA have a written patent policy encouraging the adoption of standards free of patented items or processes. At least by 1993, the EIA/JEDEC patent policy required members to disclose patents and patent applications “related to” the standardization work of the committees.

During Rambus’s membership on committee JC-42.3, JEDEC adopted a standard for synchronous dynamic random access memory (SDRAM). SDRAM increases the speed at which a central processing unit (CPU) can read or write memory by synchronizing itself with the CPU’s clock speed. JEDEC incorporated four technologies into its SDRAM standard that are relevant to this case: programmable CAS latency, programmable burst length, externally supplied reference voltage, and two-bank designs. JEDEC adopted and published its SDRAM standard in early 1993. Since 1993, JEDEC has published several revisions of the standard.

Rambus attended its last JEDEC meeting in December 1995, and officially withdrew from JEDEC in June 1996. In December 1996, JEDEC began work on a standard for double data rate-SDRAM (DDR-SDRAM), the successor to SDRAM. DDR-SDRAM

¹ Since 1991, both JEDEC and EIA have changed their names. JEDEC now is known as the JEDEC Solid State Technology Association. EIA is known as the Electronic Industries Alliance.

doubles the transfer rate between the CPU and memory device by supporting data transfers on both the rising and falling edge of each clock cycle. The JEDEC DDR-SDRAM standard ultimately incorporated four technologies that had been discussed in general before Rambus's withdrawal in 1996. Those technologies include: source-synchronous clocking, low-voltage swing signaling, dual clock edge, and on-chip phase locked loop/delay locked loop (PLL/DLL). JEDEC adopted and published the DDR-SDRAM standard in 2000.

In September 1993, Rambus disclosed its first issued RDRAM patent, U.S. Patent No. 5,243,703 ('703 patent), a divisional of the '898 application, to JEDEC during a committee meeting. As a divisional, the written description of the '703 patent is substantially identical to that of the '898 application. At that same meeting, another JEDEC member also disclosed Rambus's WIPO application to the committee. Rambus did not disclose any patent applications to JEDEC.

After leaving JEDEC Rambus filed more divisional and continuation applications based on the '898 application. Four of the patents that issued from those applications are at issue in the present case, namely U.S. Patent Nos. 5,954,804 ('804 patent), 5,953,263 ('263 patent), 6,034,918 ('918 patent), and 6,032,214 ('214 patent). Rambus filed the applications that ripened into these four patents between February 1997 and February 1999. Again, the written description of each of these patents is substantially identical to that of the '703 patent and the '898 application. The first of these four patents issued in 1999.

In late 2000, Rambus sued Infineon, a manufacturer of semiconductor memory devices (including SDRAM and DDR-SDRAM) and a member of JEDEC, for infringement of the patents-in-suit. Rambus alleged infringement of fifty-seven claims in the four

patents. Infineon counterclaimed for fraud under Virginia state law. Infineon alleged that Rambus committed fraud by not disclosing to JEDEC its patents and patent applications “related to” the SDRAM and DDR-SDRAM standards. After construing the claims, the district court granted JMOL of noninfringement in favor of Infineon under Rule 50(a) of the Federal Rules of Civil Procedure. Fed. R. Civ. P. 50(a); Rambus, Inc. v. Infineon Techs. AG, No. 3:00CV524, slip op. at 1-2 (E.D. Va. May 2, 2001); Rambus, Inc. v. Infineon Techs. AG, No. 3:00cv524, slip op. at 1-2 (E.D. Va. May 30, 2001). Infineon’s fraud counterclaims were tried to a jury. The jury found that Rambus committed fraud during SDRAM and DDR-SDRAM standardization. Rambus moved for JMOL of no fraud on both the SDRAM and DDR-SDRAM verdicts. Alternatively, Rambus requested a new trial. The district court denied JMOL on the SDRAM fraud verdict. The court granted JMOL on the DDR-SDRAM fraud verdict, holding that substantial evidence did not support the jury’s verdict because Rambus left JEDEC before work officially began on the DDR-SDRAM standard. Rambus, Inc. v. Infineon Techs. AG, 164 F. Supp. 2d 743, 767 (E.D. Va. 2001). The district court also denied Rambus’s request for a new trial on the SDRAM verdict, but conditionally granted a new trial on DDR-SDRAM should this court reverse that grant of JMOL. The court issued an injunction against Rambus, Rambus, Inc. v. Infineon Techs. AG, No. 3:00cv524, slip op. at 35 (E.D. Va. Aug. 9, 2001), and awarded Infineon attorney fees, Rambus, Inc. v. Infineon Techs. AG, 155 F. Supp. 2d 668, 691 (E.D. Va. 2001).

Both parties appealed to this court, which has jurisdiction under 28 U.S.C. § 1295(a)(1) (2000). Rambus appeals the denial of JMOL and the denial of a new trial on the SDRAM verdict. Additionally, Rambus appeals the court’s claim construction, the grant of JMOL of noninfringement, the injunction on domestic suits, and the attorney fees award. Infineon cross-appeals the grant of JMOL on the DDR-SDRAM verdict and the court’s refusal to enjoin Rambus’s pending foreign suits against Infineon.

II.

This court reviews a grant or denial of JMOL without deference by reapplying the JMOL standard. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1454, 46 USPQ2d 1169, 1172 (Fed. Cir. 1998) (en banc); Dennis v. Columbia Colleton Med. Ctr., Inc., 290 F.3d 639, 644-45 (4th Cir. 2002); Fed. R. Civ. P. 50(a)(1). For matters submitted to and decided by a jury, this court will affirm a grant or reverse a denial of JMOL only “if the jury’s factual findings are not supported by substantial evidence or if the legal conclusions implied from the jury’s verdict cannot in law be supported by those findings.” Cybor Corp., 138 F.3d at 1454; Havird Oil Co. v. Marathon Oil Co., 149 F.3d 283, 289 (4th Cir. 1998). This court draws all reasonable inferences in favor of the prevailing party without substituting its view of conflicting evidence for that of the jury. SIBIA Neurosciences, Inc. v. Cadus Pharmaceutical Corp., 225 F.3d 1349, 1355, 55 USPQ2d 1927, 1930 (Fed. Cir. 2000); Dennis, 290 F.3d at 645.

Before deciding whether an accused device infringes asserted claims, a court must first construe the claim language to determine the meaning and scope of the claims. Cybor Corp., 138 F.3d at 1454. This court reviews claim construction without deference. Id. at 1456.

This court reviews state law causes of action under the applicable state law for matters not committed to this court’s exclusive jurisdiction. Univ. of W. Va. Bd. of Trustees v. Vanvoorhies, 278 F.3d 1288, 1296, 61 USPQ2d 1449, 1453 (Fed. Cir. 2002); Hunter Douglas, Inc. v. Harmonic Design, Inc., 153 F.3d 1318, 1338, 47 USPQ2d 1769, 1783 (Fed. Cir. 1998). Thus, this court applies Virginia commonwealth law to the fraud actions.

Although Virginia has not stated clearly whether detecting the existence of a duty to disclose is a question of law or fact,² the district court considered the issue a question of fact. As such, the jury had the responsibility to interpret and construe the written EIA/JEDEC patent policy. On appeal, neither party contests the district court's submission of this issue to the jury. Therefore, this court will analyze the existence of a duty to disclose as a question of fact.³

A district court may award a prevailing party attorney fees under 35 U.S.C. § 285 in exceptional cases. This court reviews without deference the district court's application of

² Two cases provide limited insight on this issue. The first -- a Fourth Circuit case reviewing a Virginia fraud action -- states that "[t]he duty to disclose and the reasonableness of reliance" are questions decided by the jury in light of various factors. Bank of Montreal v. Signet Bank, 193 F.3d 818, 834 (4th Cir. 1999). Notably, however, the Fourth Circuit supports its statement with only two case citations -- one to a Fourth Circuit case from South Carolina and one to a Fifth Circuit case -- neither of which say the existence of a duty to disclose is a factual question. In the second case a Virginia court states that whether a duty to speak exists "under the circumstances" is an issue for the fact-finder. Hiatt v. Barcroft Beach, Inc., 22 Va. Cir. 240, 242 (Va. Cir. Ct. 1990). Even so, a jury determination that a duty exists "under the circumstances" does not mean the existence of the duty is a factual question. See, e.g., State Farm Fire & Cas. Co. v. Owen, 729 So.2d 834, 839-40 (Ala. 1998) ("[T]he jury . . . determine[s] only the disputed facts upon which the alleged duty rests, not the existence of the duty itself. . . . If the judge finds that the circumstances as alleged would be enough to create a legal duty, then he should instruct the jury as to what that duty would be if these circumstances did exist. The jury then decides whether those circumstances indeed existed.").

³ While this court reviews this as a factual question, a review of the relevant law of other states and Virginia's law on other tort duties strongly suggests that this issue may well be a legal question with factual underpinnings. For example, according to the Restatement, "whether there is a duty to the other to disclose the fact in question is always a matter for the determination of the court." Restatement (Second) of Torts § 551 cmt. m (1976 Main Vol.). Moreover, Virginia, like most states, considers contract construction a legal question for the court, Craig v. Dye, 526 S.E.2d 9, 11 (Va. 2000), and the asserted duty in this case arises from a written contract. A number of states treat the existence of a disclosure duty as a question of law, and the breach of that duty as a question of fact. See, e.g., Streeks, Inc. v. Diamond Hill Farms, Inc., 605 N.W.2d 110, 121 (Neb. 2000); State Farm Fire, 729 So.2d at 839-40; cf. Bradford v. Vento, 48 S.W.3d 749, 755 (Tex. 2001); Carter Lincoln-Mercury, Inc. v. EMAR Group, Inc., 638 A.2d 1288, 1294 (N.J. 1994). Finally, Virginia treats many tort duties as questions of law. Burns v. Johnson, 458 S.E.2d 448, 451 (Va. 1995) ("The question whether a duty of care exists in a negligence action is a pure question of law."); Acme Markets, Inc. v. Remschel, 24 S.E.2d 430, 434 (Va. 1943).

the proper legal standard under § 285. Brasseler, U.S.A. I, L.P. v. Stryker Sales Corp., 267 F.3d 1370, 1378, 60 USPQ2d 1482, 1487 (Fed. Cir. 2001); cf. Reactive Metals & Alloys Corp. v. ESM, Inc., 769 F.2d 1578, 1582, 226 USPQ 821, 824 (Fed. Cir. 1985). In reviewing a § 285 award, this court reviews underlying factual findings, including whether a case is exceptional, for clear error and underlying legal conclusions without deference. Molins PLC v. Textron, Inc., 48 F.3d 1172, 1186, 33 USPQ2d 1823, 1833 (Fed. Cir. 1995). If the case is found to be exceptional, the district court enjoys broad discretion to make an award, a determination that this court reviews for an abuse of discretion. Brasseler, 267 F.3d at 1379. If the factual or legal underpinnings of the award partially are reversed, this court may vacate the award and remand for further evaluation by the district court. Molins, 48 F.3d at 1186.

III. Claim Construction and Infringement

After construing the asserted claims, the district court granted JMOL in favor of Infineon, holding that Infineon did not infringe the claims as construed. On appeal, Rambus contests the construction of five terms in the four patents-in-suit, namely: “integrated circuit device,” “read request,” “write request,” “transaction request,” and “bus.” The parties agree that, with one exception, the terms have the same meaning in each claim at issue. The only exception is the term “integrated circuit device,” which Infineon argues has a different meaning in the '804 patent because of representations made to the PTO during prosecution of that patent.

Patent claim language defines the scope of the invention. SRI Int'l v. Matsushita Elec. Corp., 775 F.2d 1107, 1121, 227 USPQ 577, 585 (Fed. Cir. 1985) (en banc). As a general rule, claim language carries the meaning of the words in their normal usage in the field of the invention. Toro Co. v. White Consol. Indus., 199 F.3d 1295, 1299, 53 USPQ2d 1065, 1067 (Fed. Cir. 1999). In other words, a claim term means “what one of ordinary

skill in the art at the time of the invention would have understood the term to mean.” Markman v. Westview Instruments, Inc., 52 F.3d 967, 986, 34 USPQ2d 1321, 1335 (Fed. Cir. 1995) (en banc), aff’d 517 U.S. 370 (1996). Nevertheless, inventors may act as their own lexicographers and use the specification to supply implicitly or explicitly new meanings for claim terms. Id. at 980; Bell Atl. Network Servs., Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 1268, 59 USPQ2d 1865, 1870 (Fed. Cir. 2001) (“[A] claim term may be clearly redefined without an explicit statement of redefinition.”); Scimed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1344, 58 USPQ2d 1059, 1065 (Fed. Cir. 2001). Thus, to help determine the proper construction of a patent claim, a construing court consults the written description and the prosecution history. Digital Biometrics, Inc. v. Identix, Inc., 149 F.3d 1335, 1344, 47 USPQ2d 1418, 1424 (Fed. Cir. 1998).

While claims often receive their interpretative context from the specification and the prosecution history, courts may not read limitations into the claims. Comark Communications, Inc. v. Harris Corp., 156 F.3d 1182, 1186, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998). “This court has repeatedly and clearly held that it will not read unstated limitations into claim language.” N. Telecom Ltd. v. Samsung Elecs. Co., 215 F.3d 1281, 1290, 55 USPQ2d 1065, 1072 (Fed. Cir. 2000); see also Renishaw PLC v. Marposs Societa’ per Azioni, 158 F.3d 1243, 1248, 48 USPQ2d 1117, 1120 (Fed. Cir. 1998); Markman, 52 F.3d at 981.

A. Integrated Circuit Device

The district court construed “integrated circuit device” in claim 26 of the ’804 patent to include a device identification register, interface circuitry, and comparison circuitry.

Claim 26 recites:

26. An integrated circuit device having at least one memory section which includes a plurality of memory cells, wherein the integrated circuit device outputs data on an external bus synchronously with respect to first and second external clock signals, the integrated circuit device comprises:

a first internal register to store a value which is representative of a number of clock cycles to transpire before the integrated circuit device responds to a read request;

delay locked loop circuitry to generate an internal clock signal using the first and second external clock signals; and

interface circuitry, coupled to the external bus to receive a read request, the interface circuitry includes a plurality of output drivers, coupled to the external bus, to output data on the external bus in response to the internal clock signal, synchronously with respect to the first and second external clock signals and in accordance with the value stored in the first internal register.

'804 patent, col. 28, ll. 1-21. Nothing in the claim language indicates that “integrated circuit device” necessarily includes a device identification register, interface circuitry, and comparison circuitry. The terms “comparison circuitry” and “device identification register” do not appear anywhere in the text of claim 26.⁴ “Comparison circuitry” is different from the “delay locked loop circuitry” limitation recited in claim 26. Likewise, a “device identification register” is different from the limitation “first internal register to store a value which is representative of a number of clock cycles.” Thus, the claim does not require comparison circuitry or a device identification register. The district court’s construction did not merely clarify or construe the actual words of the claim. Without any claim language addressing comparison circuitry or a device identification register, the court’s construction reads into the claim two new limitations not required by the claim language. See N. Telecom, 215 F.3d at 1290.

The district court erred by placing too much emphasis on a single introductory comment in the prosecution history of the '804 patent. This comment appeared in the

⁴ Claim 26 does recite an “interface circuitry” limitation. While it is proper to construe claim 26 as requiring interface circuitry, it technically is not proper to read the “interface circuitry” limitation into the meaning of the term “integrated circuit device” itself. The generic term “integrated circuit device” has a broad and accepted meaning within the art that does not depend on the limitations of claim 26. Therefore, in construing the meaning of this broad generic term, this court does not include limitations from specific patent claims.

prosecution history after the examiner rejected the pending claims in light of U.S. Patent No. 4,458,357. Responding to the rejection, the patentee submitted twenty-six new claims, four of which were independent claims. In accompanying remarks, the patentee stated:

These newly submitted claims are directed to a memory device (or an integrated circuit having memory) having (1) an internal register for storing an identification value, (2) interface circuitry to receive a request on an external bus, and (3) comparison circuitry to determine whether the identification information in the request corresponds to the identification value in the internal register – wherein when the identification information corresponds to the identification value, the memory device responds to the request.

While the first three independent claims (issued claims 1, 15, and 23) recited, with some modifications, the three limitations listed above, the fourth independent claim (issued claim 26) recited only one of the above listed limitations. Specifically, claim 26, the claim at issue here, includes only the “interface circuitry” limitation. Claim 26, however, contains two other limitations not listed above: an internal register to store a value representative of a number of clock cycles and delay locked loop circuitry.

The prosecution history statement introduces in general terms the new claims. In this sense, the statement properly introduces three features that appear in some of the claims. This general introductory statement, however, is not correct in suggesting that these features appear in each of the new claims. This incorrect statement in the prosecution history does not govern the meaning of the claims. Therefore, consistent with Intervet America, Inc. v. Kee-Vet Laboratories, Inc., 887 F.2d 1050, 12 USPQ2d 1474 (Fed. Cir. 1989), the imprecise statement in the prosecution history does not limit claim 26. The claim language itself controls the bounds of the claim, not a facially inaccurate remark during prosecution.

The patent at issue in Intervet involved a vaccine for a poultry disease. Id. at 1051. In that case the examiner rejected the pending claims because they were not limited to a single vaccination. The examiner said that a single vaccination limitation would distinguish the invention over the prior art. Id. at 1053-54. The prosecuting attorney amended three of the claims to recite “single administration,” but did not so amend the remaining claims. Id. at 1054. In accompanying remarks, the attorney inaccurately described all the claims as “restricted to a single vaccination scheme.” Id. After this erroneous remark, the examiner had two interviews with the attorney and made two examiner’s amendments before allowing the claims. Id. Reviewing this prosecution history, this court in Intervet held that the claims control over a loose remark in the course of prosecution:

When it comes to the question of which should control, an erroneous remark by an attorney in the course of prosecution of an application or the claims of the patent as finally worded and issued by the [PTO] as an official grant, we think the law allows for no choice. The claims themselves control. . . . [I]t is not for the courts to say that they contain limitations which are not in them.

Id. The Intervet court thus did not restrict all of the claims to a single vaccination. Id.; see also Hockerson-Halberstadt v. Avia Group Int’l, 222 F.3d 951, 957, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000).

The present case parallels Intervet. Here, claim 26 does not contain all the limitations found in claims 1, 15, and 23 of the ’804 patent. The prosecuting attorney’s incorrect description of the four new claims does not govern over the language of those claims. Moreover, in this case, the examiner made an examiner’s amendment and amended each of the claims -- including claim 26 -- after this untrue remark by the prosecuting attorney. In this context, a reasonable competitor would not rely on an untrue statement in the prosecution history over the express terms of the claims. In the present case, like Intervet, this court perceives no justification for reading unstated limitations into claim 26.

The term “integrated circuit device,” as used in claim 26, instead receives its ordinary meaning to one of skill in this art as a “circuit constructed on a single monolithic substrate, commonly called a ‘chip.’” See Rambus, Inc. v. Infineon Techs. AG, No. 3:00cv524, slip op. at 70 (E.D. Va. March 15, 2001) (Rambus argues for this construction.); cf. The New IEEE Standard Dictionary of Electrical and Electronic Terms 662 (5th ed. 1993); IBM Dictionary of Computing 347 (10th ed. 1994); see also Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202, 64 USPQ2d 1812, 1818 (Fed. Cir. 2002).

B. Read Request

The district court construed “read request” to mean “a series of bits transmitted over the bus that contain multiplexed address and control information needed to request a read of data from a memory device.” The court similarly construed “write request” and “transaction request” by replacing the language “needed to request a read of data from a memory device” with “needed to request a write of data from a memory device” and “needed to perform a transaction over the bus with a memory device.”

Claim 18 of the '918 patent is representative of the claims reciting a “read request.”

18. A method of operation of a synchronous memory device, wherein the memory device includes a plurality of memory cells, the method of operation of the memory device comprises:

receiving an external clock signal;

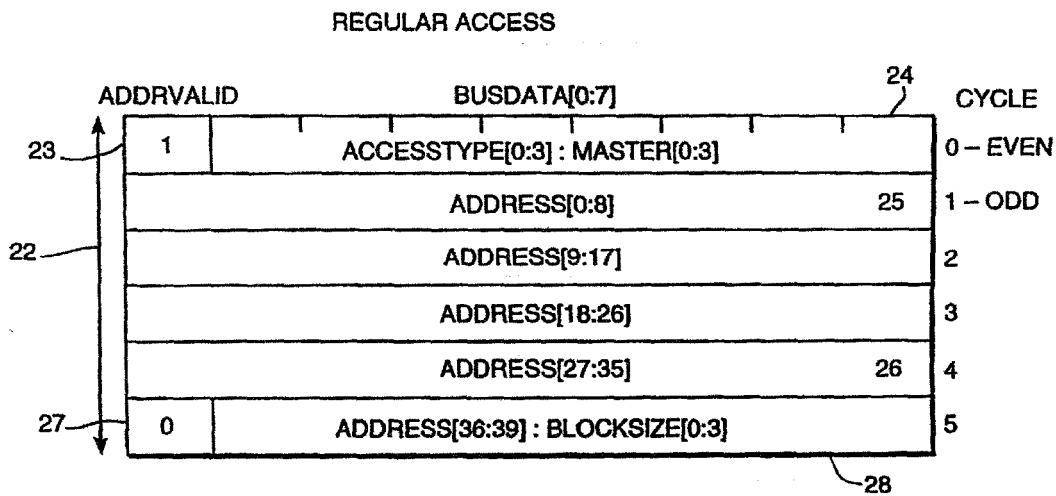
receiving first block size information from a bus controller, wherein the first block size information defines a first amount of data to be output by the memory device onto a bus in response to a read request;

receiving a first request from the bus controller; and

outputting the first amount of data corresponding to the first block size information, in response to the first read request, onto the bus synchronously with respect to the external clock signal.

'918 patent, col. 26, ll. 13-27 (emphases added). The relevant claim language thus recites only that data is output onto a bus in response to a “read request.”

Both parties agree that the term “read request” has no unambiguous ordinary meaning to one of skill in the art. Infineon argues that because the claims contemplate a response to a “read request,” the “read request” must contain all information necessary to perform the requested read. Thus, Infineon argues that the “read request” must include both address and control information. Rambus agrees that in order to actually perform a read the device must be given address and control information. Rambus asserts, however, that such address and control information is part of the “request packet,” not the “read request.” Rambus argues that “read request” refers only to an instruction to the memory device to perform a read action. According to Rambus, the “read request” is one component of the “request packet” -- comprising the first four bits of the packet. Figure 4 of the '918 patent illustrates a “request packet:”



As shown above, the “request packet” has multiple fields, including an AccessType field, Address fields, and a BlockSize field. Rambus contends that the four-bit AccessType field contains the “read request.” The first bit instructs the memory device to perform a read; the next three bits tell the device what type of read to perform (e.g., page read, normal access read, etc.).

The district court interpreted the claim language requiring a response to a “read request” to mean that the “read request” must include address and control information. To the contrary, the claim language itself shows the fallacy of holding that outputting data in response to a “read request” necessarily implies that the read request must contain all information necessary for a memory device to respond. Claim 18 recites receiving a “block size” that defines an amount of data to be output onto a bus in response to a read request. By specifying the “block size” as separate from the “read request,” claim 18 indicates that the block size is not part of the read request. Nevertheless, block size, which tells the device how much data to read, is necessary to permit the device to respond to a read request.⁵ Thus, even though the device needs a block size to respond, such block size is not part of the read request. See ’918 patent, col. 24, l. 58–col. 25, l. 3 (Claim 1 recites providing a “block size” to the memory device in one limitation and issuing a “read request” to the memory device in another limitation.).

In addition, the district court’s interpretation of “read request” conflicts with other passages of the specification. While the memory device must respond to a read request, the specification indicates that the address and control information is part of the request packet -- not the read request. In other words, the specification does not use read request and request packet interchangeably. Rather, it shows a difference between a read request and a request packet. Each reference to address and control information consistently indicates that such information is a part of the request packet, which the specification defines as “a contiguous series of bytes containing address and control information.” ’918 patent, col. 8, l. 59–col. 9, l. 4; see also col. 9, ll. 24–43; col. 6, ll. 61–62 (defining request packet as “a sequence of bytes comprising address and control information”); col. 9, ll. 11–

⁵ To tell the memory device what data to read, the controlling device (e.g., the CPU) may provide a start and stop point for the data location, or provide a start point and a value for how much data to read (i.e., block size). The claimed invention uses the “block size” method.

13 (request packet has control information). Other than in the abstract and the claims, the term “read request” appears only twice in the specification. See id., col. 9, l. 2 & col. 12, ll. 33-35. Neither reference to “read request” suggests the presence of address and control information. The specification merely indicates that the “read request” requests data from a memory device and specifies what type of read (e.g., page mode, normal mode, etc.) to perform. See id., col. 9, l. 39-col. 10, l. 39; col. 8, l. 66-col. 9, l.3 & Figure 4.

Moreover, the dependent claims demonstrate that a read request is distinct from a request packet. Dependent claims 27 and 28, which depend from claim 18, recite:

27. The method of claim 18 wherein the first block size information and the first read request are included in a request packet.

28. The method of claim 27 wherein the first block size information and the first read request are included in the same request packet.

id., col. 27, ll. 6-11. Although one of ordinary skill would know that a memory device needs a block size and address and control information to respond, the claims do not state that such information forms a part of the read request. In fact, the claims do not even require that such information be part of the same request packet. Even though the memory device needs this information, the claims need not recite every component necessary to enable operation of a working device. Rodime PLC v. Seagate Tech., Inc., 174 F.3d 1294, 1303, 50 USPQ2d 1429, 1435 (Fed. Cir. 1999) (applicant need not claim every feature of a working device). The district court’s construction would render claim language in dependent claims 27 and 28 meaningless. This court disfavors such a construction. Comark Communications, 156 F.3d at 1187; Wright Med. Tech., Inc. v. Osteonics Corp., 122 F.3d 1440, 1445, 43 USPQ2d 1837, 1841 (Fed. Cir. 1997).

The district court also relied on a statement made during prosecution as an admission by Rambus that a “transaction request” includes “identification information.” At

the time of this statement, however, pending claim 186 (issued claim 1 of the '918 patent) referred to “a transaction request including identification information.” The examiner amended the claim by inserting the word “packet” after each occurrence of “request” in pending claim 186, which in fact clarifies that identification information is part of a request packet, not a “transaction request.” Notably, the examiner did not make such amendments to pending claims 200 and 208, which recited “identification information and a read request.” See also '804 patent, col. 26, ll. 4-5.

Finally, this court perceives no justification for including multiplexing as a part of the meaning of “read request.” Multiplexing, if necessitated by the claims, is applicable to the construction of the term “bus,” not “read request.” The claims do not support reading multiplexing into “read request.”

From the correct perspective of one of skill in the art at the time of invention, the term “read request” means a series of bits used to request a read of data from a memory device where the request identifies what type of read to perform. The terms “write request” and “transaction request” mean, respectively, a series of bits used to request a write of data to a memory device and a series of bits used to request performance of a transaction with a memory device.

C. Bus

The district court construed “bus” to mean “a multiplexed set of signal lines used to transmit address, data and control information.” In its Markman opinion, the district court noted Rambus’s proposed ordinary meaning of “bus,” but held that the patentees acted as their own lexicographer by redefining “bus” to be a multiplexed bus. Multiplexing refers to the sharing of a single set of lines to send multiple types of information. Under the district court’s construction, the “bus” carries three types of information: address, data, and control information.

The term “bus” is very common in the electrical arts and has a well-recognized meaning in such arts, namely, a set of signal lines (e.g., copper traces on a circuit board) to which a number of devices are connected, and over which information is transferred between devices. The New IEEE Standard Dictionary of Electrical and Electronic Terms 141 (5th ed. 1993). The claims generally recite outputting data over a “bus.” The claims do not specify that the bus multiplexes address, data, and control information. See ’918 patent, col. 26, ll. 19-27. Nothing in the claims compels a definition different from the ordinary meaning of “bus.” Before according “bus” this meaning, however, this court must consider the usage and meaning of the term as used in the relevant context of the specification.

In general, most references to “bus” in the specification do not limit the ordinary meaning of this term. Only two references potentially limit the meaning of “bus” in the context of the specification. In the Summary of the Invention, the patentee stated that the “present invention” includes a bus for carrying substantially all address, data, and control information. ’918 patent, col. 3, ll. 50-60. The patentee further stated that “the bus carries device-select information without the need for separate device-select lines connected directly to individual devices.”⁶ Id. In the Detailed Description, the patentee stated:

The present invention is designed to provide a high speed, multiplexed bus for communication between processing devices and memory devices The bus carries substantially all address, data and control information needed by devices for communication with other devices on the bus. In many systems using the present invention, the bus carries almost every signal between every device in the entire system. There is no need for separate device-select lines since device-select information for each device on the bus is carried over the bus. There is no need for separate address

⁶ The multiplexed bus eliminates device-select (point-to-point) connections by multiplexing control information with address and data information. This elimination of point-to-point connections is one focus of the multiplexed bus. See ’918 patent, col. 2, ll. 12-15 (While some prior art buses multiplexed address and data information, they retained point-to-point connections for control information.); col. 2, ll. 16-19, 26-34, 36-42, and 44-49.

and data lines because address and data information can be sent over the same lines.

'918 patent, col. 5, ll. 36-46. See also '918 patent, col. 5, ll. 52-53. While clear language characterizing “the present invention” may limit the ordinary meaning of claim terms, see Scimed, 242 F.3d at 1343; Bell Atlantic, 262 F.3d at 1268, such language must be read in context of the entire specification and the prosecution history. Although the above references, taken alone, may suggest some limitation of “bus” to a multiplexing bus, the remainder of the specification and prosecution history shows that Rambus did not clearly disclaim or disavow such claim scope in this case. See Inverness Med. Switz. Gmbh v. Princeton Biomeditech Corp., 309 F.3d 1365, 1372, 64 USPQ2d 1926, 1932 (Fed. Cir. 2002) (statements made during prosecution were not a clear and unambiguous disclaimer of a claim scope). Thus, Rambus did not limit the ordinary meaning of “bus” in the patents-in-suit.

In this case, the prosecution history shows that a multiplexing bus is only one of many inventions disclosed in the '898 application. Although some of Rambus's claimed inventions require a multiplexing bus, multiplexing is not a requirement in all of Rambus's claims. A careful review of the prosecution histories of the patents-in-suit shows that Rambus expressly recited multiplexing in the claim language for claims limiting the bus to the inventive multiplexing bus. For example, original claim 1 of the '898 application recites a “bus including a plurality of bus lines for carrying substantially all address, data and control information needed by said memory device.” Other original claims further require that the “bus carry[] device-select information without the need for separate device-select lines connected directly to individual semiconductor devices.” This claim language indicates that Rambus did not redefine “bus” in the specification to be a multiplexing bus. Indeed, it is because Rambus viewed “bus” under its ordinary meaning that Rambus specified -- in the claim language -- that the inventive multiplexing bus carries substantially

all address, data, and control information and that the bus operates without the need for device-select lines.

Several restriction requirements issued by the PTO also clarify that some of the inventions described in the '898 application did not require the multiplexing bus. The PTO issued an eleven-way restriction requirement during prosecution of the '898 application. Later, during prosecution of U.S. Patent No. 5,841,580 (the grandparent of the '918 patent and the parent of the '263 patent), the PTO issued a two-way restriction, dividing the claims into two distinct groups: a multiplexing bus group (Group I) and a latency invention group (Group II). That two-way restriction stated:

[T]he memory device in Group I does not require the access-time register of Group II, and the semiconductor device in Group II does not require the plurality of conductor [sic] being multiplexed to receive an address as claimed in Group I.

Rambus elected to prosecute the latency claims from Group II in the '580 patent. Therefore, the claims of the '580 patent do not require a multiplexing bus. The claims of the '580 patent, however, do recite a "bus." See '580 patent, col. 24., l. 46. By stating that the latency claims, which recited a "bus," do not require multiplexing, the PTO demonstrated an understanding of "bus" that is not limited to a multiplexing bus.

The specification and prosecution histories, taken in their entirety, convince this court that Rambus did not redefine "bus" to be a multiplexing bus in the patents-in-suit. None of Rambus's statements constitute a clear disclaimer or disavowal of claim scope. In these patents, the term "bus" carries its ordinary meaning as a set of signal lines to which a number of devices are connected, and over which information is transferred between devices.

In sum, the district court erred in its construction of each of the disputed terms. In light of the revised claim construction, this court vacates the grant of JMOL of noninfringement and remands for the district court to reconsider infringement.

IV. Fraud

The jury found that Rambus committed actual fraud by not disclosing to JEDEC patents and patent applications related to the SDRAM and DDR-SDRAM standards. The district court denied JMOL on the SDRAM fraud verdict, but granted JMOL of no fraud on the DDR-SDRAM fraud verdict. Rambus appeals the denial of JMOL on the SDRAM verdict, arguing it did not have patents or applications related to the SDRAM standard while at JEDEC. Infineon cross-appeals the grant of JMOL on the DDR-SDRAM verdict, arguing that the court did not give proper deference to the jury verdict.

To prove fraud in Virginia, a party must show by clear and convincing evidence: 1) a false representation (or omission in the face of a duty to disclose), 2) of a material fact, 3) made intentionally and knowingly, 4) with the intent to mislead, 5) with reasonable reliance by the misled party, and 6) resulting in damages to the misled party. ITT Hartford Group, Inc. v. Va. Fin. Assocs., Inc., 520 S.E.2d 355, 361 (Va. 1999); Bank of Montreal v. Signet Bank, 193 F.3d 818, 826 (4th Cir. 1999). A party's silence or withholding of information does not constitute fraud in the absence of a duty to disclose that information.⁷ Bank of Montreal, 193 F.3d at 827. Generally, "fraud must relate to a present or a pre-existing fact, and cannot ordinarily be predicated on unfulfilled promises or statements as to future

⁷ The dissent suggests that Rambus is liable for fraud on the basis that it had relevant superior knowledge and a duty to disclose that knowledge because of a special relationship with other JEDEC members. Virginia courts have recognized that the duty to disclose may arise from a contractual or fiduciary relationship. Cohen v. Mastie, 31 Va. Cir. 96, 99 (1993); see also Devansky v. Dryvit Sys., Inc., 52 Va. Cir. 359, 361 (2000); Allen Realty Corp. v. Holbert, 227 Va. 441 (1984) (plaintiff's accountant failed to disclose offers for the purchase of plaintiff's assets). In the present appeal, the parties do not argue that Rambus's duty was based on a fiduciary or confidential relationship with Infineon. Even absent waiver of such an argument, a disclosure duty based on a fiduciary relationship seems unlikely. Rambus and Infineon are competitors. There is no basis for finding that Rambus and Infineon shared a fiduciary relationship solely by virtue of their JEDEC membership. Indeed, the implications of holding that mere membership forms a fiduciary duty among all JEDEC members could be substantial and raise serious antitrust concerns. Here, the parties argued the existence of a duty based on only Rambus's act of joining JEDEC with awareness of the EIA/JEDEC policy. There is no other proper basis for finding the existence of a disclosure duty.

events.” Patrick v. Summers, 369 S.E.2d 162, 164 (Va. 1988) (quoting Soble v. Herman, 9 S.E.2d 459, 464 (Va. 1940)); see also ITT Hartford Group, 520 S.E.2d at 361. In some cases, however, misrepresentations about a party’s present intentions also may give rise to fraud. Elliott v. Shore Stop, Inc., 384 S.E.2d 752, 756 (Va. 1989). Failure to prove even one of the elements of fraud -- such as existence of a duty to disclose -- defeats a fraud claim. Bank of Montreal, 193 F.3d at 826.

A. Duty to Disclose

Before determining whether Rambus withheld information about patents or applications in the face of a duty to disclose, this court first must ascertain what duty Rambus owed JEDEC. Mr. John Kelly, EIA’s general counsel since 1990 and the person responsible for implementing the EIA/JEDEC patent policy, testified that three manuals, namely, EP-3-F, EP-7-A, and JEP 21-I, contain the patent disclosure policy. Before 1993, JEDEC’s policy discouraged the adoption of standards that “call for the exclusive use of a patented item or process.” The policy also discouraged standards referring to a “patented item or process” unless the committee knew “the technical information covered by the patent” and the patentee agreed to license the patent under reasonable terms.

JEP 21-I, published in October 1993, stated:

EIA and JEDEC standards . . . that require the use of patented items should be considered with great care. . . . [C]ommittees should ensure that no program of standardization shall refer to a product on which there is a known patent unless all the relevant technical information covered by the patent is known

The manual also included a policy revision expressly adding “pending patent[s]” to the policy language. The manual further stated:

The Chairperson . . . must . . . call attention to the obligation of all participants to inform the meeting of any knowledge they may have of any patents, or pending patents, that might be involved in the work they are undertaking. Appendix E (Legal Guidelines Summary) provides copies of viewgraphs that should be used at the beginning of the meeting to satisfy this requirement.

Appendix E read, in relevant part, as follows :

EIA/JEDEC PATENT POLICY SUMMARY

Standards that call for the use of a patented item or process may not be considered by a JEDEC committee unless all of the relevant technical information covered by the patent or pending patent is known to the committee, subcommittee, or working group.

Appendix E also provided that patentees or applicants must agree to license others to use the patent “for the purpose of implementing the standard(s).” Thus, Appendix E prohibited standards that “call for use of a patented item or process” unless all information “covered by the patent or pending patent” was known and a “license . . . for the purpose of implementing the standard(s)” was available under reasonable terms. Mr. Willibald Meyer, Infineon’s JEDEC representative, explained how members learned of the EIA/JEDEC patent policy. He testified:

Q. In your experience in the years you have attended JEDEC, Mr. Meyer, how is it that members learn what the patent policy is? Is it from reading manuals?

A. Very unlikely.

Q. How is it that members of JEDEC learn of the patent policy?

A. Well, you go to the meetings, you attend [sic] a couple of times, and you learn from how the meeting works and how things are dealt with.

Mr. Meyer further testified that the “patent policy” was discussed orally at each JC-42.3 meeting. Mr. Reese Brown, a JEDEC consultant who edited the standards and maintained the activity log for committee JC-42, also testified that he learned of the patent policy from the Appendix E viewgraphs shown at the meetings. He testified:

Q. When you went to the JC-42.3 meetings, did you look up on the wall when they put the patent policy on the wall?

A. Yes, I read it on the screen.

Q. And that’s what you understood the patent policy to be?

A. Yes.

Q. And when you look at the minutes, they would have a copy of that patent policy attached to the minutes so in case you were dozing or doodling or typing on your computer, you could read the patent policy if you wanted?

A. One could if they wanted to.

Q. So in any event, that's where you got your understanding of the patent policy?

A. Yes.

According to the written minutes of committee JC-42.3, JEDEC members were shown the "patent policy" as essentially recorded in Appendix E at each of the committee meetings. For example, the minutes of a July 21, 1992 meeting in Denver, Colorado, entitled "EIA/JEDEC Minutes of Meeting No. 63," indicate that members were shown the patent policy as contained in Attachment A to the minutes. Attachment A reads:

EIA Policy

3.4 Patented Items or Processes

Avoid requirements in the EIA Standards that call for use of a patented item or process. No program standard shall refer to a patented item or process unless all of the technical information covered by the patent is known to the formulating committee or working group

Other committee minutes indicate that this same language was displayed at meetings held in December 1993, in San Diego, California, and again in December 1995, in Dallas, Texas. The record does not indicate that the directive to the chairman was shown to JEDEC members. Instead, the record indicates that the only "patent policy" ever shown members was the policy as recorded in Appendix E.

The language of these policy statements actually does not impose any direct duty on members. While the policy language advises JEDEC as a whole to avoid standards "calling for the use of" a patent and the manual obligates the chairperson to remind members to inform the meeting of any patents or applications relevant to the work of the committee, this court finds no language -- in the membership application or manual excerpts -- expressly requiring members to disclose information. There is no indication that members ever legally agreed to disclose information.

Nevertheless, because JEDEC members treated the language of Appendix E as imposing a disclosure duty, this court likewise treats this language as imposing a

disclosure duty. Assuming such a duty, however, the directive to the chairperson was not intended as a statement of the duty, but as a requirement on the chairperson to point members to the duty in Appendix E. Nothing in this record suggests that the directive to the chairperson is broader than the policy shown to members by the viewgraphs of Appendix E. Only the language of Appendix E was shown to members. Appendix E prohibited standards that “call for use of a patented item or process” and encouraged disclosure of information “covered by the patent or pending patent.” It was that language that the chairperson was instructed to show members to inform them of their duty. That language links the disclosure duty to patents or applications whose claims cover the proposed JEDEC standard. Further, the JEDEC policy permitted adoption of a standard covered by a patent if the claimed technology was available under reasonable license terms. Thus, JEDEC’s policy identifies the duty to disclose based on the scope of claimed inventions that would cover any standard and cause those who use the standard to infringe.

Although the JEDEC policy does not use the language “related to,” the parties consistently agree that the JEDEC policy language requires disclosure of patents “related to” the standardization work of the committee. Infineon, however, argues this language also requires disclosure of patent applications “related to” the committee’s work. While both parties repeatedly treat the “related to” language as coextensive with the policy language, the parties differ in their interpretation of “related to.” Rambus argues that “related to” means patents that read on or cover the standard. Although advocating a “more is better” interpretation, the necessary implication of Infineon’s arguments also is that whether a patent or application is “related to” the standard depends on the claims of the patent or application.

Rambus disclosed the '703 patent in September 1993. JEDEC also learned of Rambus's WIPO application at the same meeting. Infineon argues that the '703 patent disclosed to JEDEC did not "relate to" the SDRAM standard, but that other undisclosed applications did "relate to" the SDRAM standard. Additionally, Mr. Meyer, Infineon's JEDEC representative, testified that he read the '703 patent and the WIPO application and concluded that they did not "relate to" the SDRAM standard. This conclusion is telling because the written description and drawings of the undisclosed patents and applications are identical to the disclosed '703 patent. The only material difference between the disclosed '703 patent and the undisclosed patents and applications appears in the claims. Accepting, as the jury also must have, Infineon's argument that the '703 patent is unrelated to the JEDEC standard but that undisclosed patents and applications (with the same written description and drawings) are related to the standard, whether a patent or application is "related to" the standard necessarily must depend on the claims of the patent or application.

Indeed, other Infineon arguments evince that this interpretation of "related to" is correct. For example, Infineon states that the '703 patent "contained claims relating only to . . . RDRAM" and did not indicate that Rambus might file "applications based on the same specification, but with SDRAM-related claims." Accepting Infineon's arguments, again as the jury must have, the necessary implication of those arguments is that "related to" -- and thus the disclosure duty -- focuses on the claims.

Infineon's witnesses also imparted this meaning to the disclosure duty. Mr. Gordon Kelley, committee chairman for JC-42.3 and IBM's JEDEC representative, testified:

Q. Under what circumstances would a patent need to be disclosed to JEDEC?

A. If a member representing a company . . . is aware of a patent that their company holds that reads to or applies to a patent or patent claims or a [sic] application of patent or patent claims, then it is the obligation of that member to bring that information to the committee.

Q. And what do you mean by reads to or applies to?

A. That the patent – that if you exercised the design or production of the component that was being standardized would require the use of that patent.

In later testimony Mr. Kelley reemphasized the role of the claims in the disclosure duty, stating:

It violates the JEDEC policy . . . of notifying the committee when there are patents issued that have – that read on or apply directly to the activities of a standards process without notifying the committee.

When asked what information should be disclosed to satisfy the disclosure requirement, Mr. Kelley responded:

In my case and I think in most cases I would paraphrase what I understood the claims of the patent or patent application to be. I never actually brought patents and distributed them. . . . I always felt it was the responsibility of the companies if I identified a patent for them to get the information. But I would paraphrase the claims as I understood them and why or how they applied to the proposal subject.

Moreover, Mr. Meyer, Infineon’s JEDEC representative, testified similarly:

Q. What was your understanding of the relationship that a patent had to have in order to be disclosed under JEDEC’s patent policy?

A. Well, it had to be related to the work at JEDEC in the sense that it described features that were necessary to meet the standard.

Q. In other words, in order to practice a standard, it would be necessary to use the feature that was patented, right?

A. Yes.

Q. So if the patent would not be required to be used in order to practice the standard, it didn’t have to be disclosed, right?

A. If it was – as I said, if it was a circuit, which could be done differently, then no.

Infineon’s arguments and Infineon’s witnesses provide evidence of the members’ understanding of the JEDEC policy. Both indicate that the relevant disclosure duty hinges on whether the issued or pending claims are needed to practice the standard.⁸ This construction accords with the primary JEDEC goal of adopting open standards that can be

⁸ The dissent quotes testimony where Mr. Kelley stated that JEDEC members should disclose patents “that applied to a proposed standard.” As noted above, however, Mr. Kelley later testified that when he said “reads to or applies to” he meant that “the design or production of the component that was being standardized would require the use of that patent.”

practiced without unreasonable license fees or terms. Infineon provides no evidence that the policy required (or that JEDEC members understood the policy to require) disclosure of patents and applications not necessary to practice the standard. On this record, a reasonable jury could find only that the duty to disclose a patent or application arises when a license under its claims reasonably might be required to practice the standard.

To the extent Infineon may argue that the duty to disclose also encompasses situations where an application describes (but does not claim) technologies under discussion at JEDEC, this court notes that Rambus disclosed the '703 patent and thus satisfied such a construction of the duty. With disclosure of the '703 patent, JEDEC had the written description for all the undisclosed patents and applications. Indeed, all JEDEC members had notice of the written description of all of Rambus's patents before adopting its SDRAM standard. The only thing Rambus did not disclose to JEDEC -- and thus the necessary focus of the fraud inquiry -- was the claims in those patents and applications. The inquiry, therefore, is claim-specific and standard-specific.

Thus, Rambus's duty to disclose extended only to claims in patents or applications that reasonably might be necessary to practice the standard. In other words, this duty encompassed any patent or application with claims that a competitor or other JEDEC member reasonably would construe to cover the standardized technology. This does not require a formal infringement analysis. Members are not required to perform a limitation-by-limitation comparison or conduct an equivalents analysis. Rather, the disclosure duty operates when a reasonable competitor would not expect to practice the standard without a license under the undisclosed claims. Stated another way, there must be some reasonable expectation that a license is needed to implement the standard. By the same token, the disclosure duty does not arise for a claim that recites individual limitations directed to a feature of the JEDEC standard as long as that claim also includes limitations

not needed to practice the standard. This is so because the claim could not reasonably be read to cover the standard or require a license to practice the standard.

To hold otherwise would contradict the record evidence and render the JEDEC disclosure duty unbounded. Under such an amorphous duty, any patent or application having a vague relationship to the standard would have to be disclosed. JEDEC members would be required to disclose improvement patents, implementation patents, and patents directed to the testing of standard-compliant devices -- even though the standard itself could be practiced without licenses under such patents. The record contains further evidence suggesting that the JEDEC members did not perceive the disclosure duty to include obligations of that breadth. For example, the record contains a tracking list showing only five disclosed applications and sixty disclosed patents from a committee membership of over fifty companies. Those companies include many leading manufacturers heavily involved in memory technology, such as IBM, Toshiba, Intel, AMD, Samsung, Siemens, Hyundai, Micron, Sun Microsystems, Hewlett-Packard, Hitachi, Motorola, LG Semicon, and Fujitsu. If these members perceived the duty to encompass any patent or application with a vague relationship to the JEDEC standard, the record would likely contain a substantially greater number of disclosed patents and applications. Even Infineon's own actions demonstrate that the disclosure duty was not so broad because Infineon itself did not disclose to JEDEC an application on testing SDRAM. Presumably, it did not disclose that application because it was not necessary to practice the SDRAM standard.

To weigh the legal sufficiency of the jury verdict, this court also must consider when the duty to disclose arises. This inquiry will show whether Rambus participated in JEDEC proceedings at a time when it had a duty to disclose. The JEDEC policy itself does not state when a committee member's duty arises. Infineon argues that discussions before

formal consideration of a standard trigger the disclosure duty. To the contrary, Mr. Gordon Kelley, the committee chairman and IBM's JEDEC representative, testified that the disclosure duty arose at formal balloting of a proposed standard. Formal ballots include a check box next to a statement certifying that the voter is not aware of any patents involved in the ballot. Mr. Kelley did not testify that the EIA/JEDEC policy required or that members understood the policy to require disclosures before formal balloting. Mr. Kelley's testimony does not support Infineon's position that the disclosure duty arises before formal consideration of a standard.

The other witness Infineon relies on for the position that JEDEC imposes the duty before formal votes is Mr. Reese Brown. Mr. Brown, a JEDEC consultant who edits the standards and maintains the activity log for committee JC-42, testified that the disclosure duty arises only if the "material [being discussed] is described as part of a legitimate proposal that's aimed at a standard." Giving Infineon the benefit of all reasonable inferences, Mr. Brown's testimony at most indicates that the disclosure duty arises when proposals are aimed at a particular standard. Infineon proffers no substantial evidence that the disclosure duty applicable to one standard is triggered by discussion of proposals aimed at a different standard. As discussed above, the disclosure inquiry here is claim-specific and standard-specific. Substantial evidence does not support Infineon's position that the duty arises before legitimate proposals are aimed at the standard (i.e., before work formally begins on the standard). The most a reasonable jury could conclude is that the disclosure duty is triggered when work formally begins on a proposed standard.

The record does not show that JEDEC applied the disclosure duty to a member's plans or intentions. The patent policy requires disclosure of certain "patents or pending patents" -- not disclosure of a member's intentions to file or amend patent applications. Indeed, Mr. Kenneth McGhee, secretary of committee JC-42, Mr. John Kelly, and Mr.

Meyer all testified that the policy did not address a member's intentions to file future patent applications. Mr. Kelly further testified that because antitrust laws discourage direct competitors from discussing market-driving innovations, members "were not supposed to reveal their future plans." Further, Mr. Meyer testified that the disclosure duty did not require members to disclose plans to modify applications. Thus, the record supports only the conclusion that a member's intentions to file or amend applications do not fall within the scope of JEDEC's disclosure duty.⁹

In this case there is a staggering lack of defining details in the EIA/JEDEC patent policy. When direct competitors participate in an open standards committee, their work necessitates a written patent policy with clear guidance on the committee's intellectual property position. A policy that does not define clearly what, when, how, and to whom the members must disclose does not provide a firm basis for the disclosure duty necessary for a fraud verdict. Without a clear policy, members form vaguely defined expectations as to what they believe the policy requires -- whether the policy in fact so requires or not.¹⁰ JEDEC could have drafted a patent policy with a broader disclosure duty. It could have drafted a policy broad enough to capture a member's failed attempts to mine a disclosed specification for broader undisclosed claims. It could have. It simply did not.

B. Breach of Duty to Disclose

This court next reviews the record for substantial evidence to support the jury's verdict that Rambus breached the JEDEC duty during both SDRAM and DDR-SDRAM standardization. Because the patents-in-suit were filed after Rambus left JEDEC in 1996,

⁹ Because JEDEC's minutes are available to non-members and because there are no confidentiality agreements between individual members, a member's revelations of future intentions to file an application likely would jeopardize some foreign patent rights.

¹⁰ Just as lack of compliance with a well-defined patent policy would chill participation in open standard-setting bodies, after-the-fact morphing of a vague, loosely defined policy to

Infineon relies on other applications Rambus had pending before its 1996 withdrawal from JEDEC. The only thing not disclosed to JEDEC was the claims in these applications. As discussed above, Infineon had to show by clear and convincing evidence that these undisclosed claims reasonably read on or cover the particular standard under consideration by JEDEC. In other words, Infineon had to present clear and convincing evidence that there is a reasonable expectation that the standard cannot be practiced without a license under the undisclosed claims.

1. SDRAM Standard

In its opinion denying JMOL, the district court identified several patents and applications that it said had claims directed to the SDRAM standard. Specifically, the district court stated that Rambus had pending claims “related to” five technologies: two-bank designs, externally supplied reference voltage, PLLs, programmable CAS latency, and programmable burst length.

The trial court stated that the '898 application contained claims related to two-bank design and burst length technology. Further, the trial court identified patent application number 07/954,945 ('945 application), filed in September 1992, as having claims directed toward programmable burst length. This application issued in June 1994 as U.S. Patent No. 5,319,755 ('755 patent). The court also identified application numbers 07/847,651 ('651 application), filed in March 1992, and 07/847,961 ('961 application), filed in March 1992 but later abandoned, as having claims directed toward CAS latency. The '651 application issued in February 1997 as U.S. Patent No. 5,606,717. The court held that patent application 07/847,692 ('692 application), filed in March 1992 but later abandoned, had PLL claims. Finally, the court stated that application number 07/847,532 ('532 application), filed in March 1992, contained claims directed to an externally supplied

capture actions not within the actual scope of that policy likewise would chill participation in open

reference voltage. This application issued as U.S. Patent No. 5,473,575 ('575 patent) in December 1995.

This court has examined the claims of the cited applications as well as the relevant portions of the SDRAM standard. Based on this review, this court has determined that substantial evidence does not support the finding that these applications had claims that read on the SDRAM standard. The claims in the '945 application, which issued as the '755 patent, recited a multiplexed bus and a device identifier feature, neither of which are present in the SDRAM standard. For example, original claim 151 of the '945 application (issued claim 1) recited a bus "for carrying control information, addresses, and the data." Original claim 151 further stated that the control information provided for memory selection "without using any separate memory select line." Therefore, a manufacturer may practice the SDRAM standard without a license under the claims of the '755 patent. Similarly, claims in the '961 application were limited to the device identifier feature and claims in the '651 application required the multiplexed bus. Thus, licenses under the claims of these applications or the '717 patent would not be necessary to practice the SDRAM standard.

To continue with this inquiry, the SDRAM standard does not use PLL technology, making the '692 application irrelevant. The claims of the '532 application, which the court identified as directed to an externally supplied reference voltage, recited voltage swings of less than one volt and did not read on the 3.3 volt voltage swing specified by the SDRAM standard. Therefore, a manufacturer could practice the SDRAM standard without a license under any claims of the '532 application. Substantial evidence does not support a finding that any of these patents or applications therefore fell within Rambus's disclosure duty. Finally, the district court stated that the '898 application had claims related to two-bank design and burst length. This court has reviewed all 209 claims in the '898 application.

There is no substantial evidence to support a holding that the '898 application had claims that reasonably would be needed to practice the SDRAM standard. To the extent that the district court said there was evidence showing that Rambus had claims "relating to [two-bank and burst length technology]," this statement is true only if "related to" is construed more broadly than the duty as determined by this court.

Moreover, specific to this record, Rambus alleges that Infineon admitted at trial that the '755 and '575 patents were not related to the SDRAM standard. If Rambus is correct, this assertion further shows that no SDRAM manufacturer following the JEDEC standard would need a license under any of Rambus's undisclosed patents or applications.

Rambus asserts in its opening brief to this court that "no builder of an SDRAM under the JEDEC standard would need a license under any of the patents and applications relied on by the [trial] court." Rambus made this same argument in its renewed JMOL motion, stating that it did not have "a single undisclosed patent claim, issued or pending, that any JEDEC member would have been required to license (even arguably) to practice the JEDEC standards at issue." Despite Rambus's repeated assertions (e.g., in its renewed JMOL motion, its opening brief to this court, and at panel hearing before this court) that these claims were not necessary to practice the SDRAM standard, Infineon does not directly address Rambus's arguments. Rather than deny Rambus's assertions, Infineon states only that "Rambus' argument is, at best, disingenuous, since . . . documents amply demonstrate that Rambus believed its pending patents covered the SDRAM standard." In effect, Infineon argues that Rambus's mistaken belief that its claims read on the SDRAM standard made its actions fraudulent. In other words, Infineon would expand the EIA/JEDEC patent policy to add a subjective belief component to the disclosure duty.

The JEDEC policy, though vague, does not create a duty premised on subjective beliefs. JEDEC's disclosure duty erects an objective standard. It does not depend on a member's subjective belief that its patents do or do not read on the proposed standard. Otherwise the standard would exempt a member from disclosure, if it truly, but unreasonably, believes its claims do not cover the standard. As discussed above, the JEDEC test in fact depends on whether claims reasonably might read on the standard. A member's subjective beliefs, hopes, and desires are irrelevant. Hence, Rambus's mistaken belief that it had pending claims covering the standard does not substitute for the proof required by the objective patent policy.

The record shows that Rambus's claimed technology did not fall within the JEDEC disclosure duty. The record shows at most that Rambus wanted to obtain claims covering the SDRAM standard. Some of that evidence does not put Rambus in the best light. Rambus thought it could cover the SDRAM standard and tried to do so while a member of an open standards-setting committee. While such actions impeach Rambus's business ethics, the record does not contain substantial evidence that Rambus breached its duty under the EIA/JEDEC policy.

If evidence of Rambus violating its duty to disclose exists, Infineon did not place it in the record or provide it to this court. Infineon bore the burden of proving the existence of a disclosure duty and a breach of that duty by clear and convincing evidence. Infineon did not meet that burden. Infineon did not show any expectation that the patents and applications identified by the district court covered the SDRAM standard.¹¹ Instead, the record shows that, despite Rambus's best efforts, Rambus did not obtain SDRAM claims.

¹¹ The dissent argues that Rambus bore the burden of showing that it "did not actually have any pending claims that read on the standard" as a defense to rebut Infineon's fraud case. Whether Rambus had claims that reasonably might read on the standard, however, goes to the question of whether Rambus breached its disclosure duty. It is not a defense for Rambus to prove, but an element of Infineon's fraud case.

Because there is no expectation that the undisclosed claims are necessary to implement the standard, these claims did not trigger Rambus's disclosure duty. Rambus's actions might constitute fraud under a different patent policy; however, they do not constitute fraud under this policy.

In sum, substantial evidence does not support the jury's verdict that Rambus breached its duties under the EIA/JEDEC policy. Infineon did not show the first element of a Virginia fraud action and therefore did not prove fraud associated with the SDRAM standard. No reasonable jury could find otherwise. The district court erred in denying JMOL of no fraud on the SDRAM verdict. Because of these holdings, the new trial and injunction issues are moot.

2. DDR-SDRAM Standard

In granting JMOL of no fraud on the DDR-SDRAM verdict, the district court held that substantial evidence did not support the jury's verdict because Rambus withdrew from JEDEC before formal consideration of the DDR-SDRAM standard.

Rambus attended its last JEDEC meeting on December 6, 1995, and formally withdrew from JEDEC by a letter dated June 17, 1996. JEDEC did not begin formal work on the DDR-SDRAM standard until December 1996. JEDEC adopted and published the DDR-SDRAM standard in 2000.

Infineon argues that because some technologies that ultimately made their way into the DDR-SDRAM standard were discussed before Rambus's withdrawal, Rambus had a duty to disclose patents and applications "related to" the DDR-SDRAM standard. This court appreciates the building-block nature of such standard-setting activities. As indicated above, however, the disclosure duty, as defined by the EIA/JEDEC policy, did not arise before legitimate proposals were directed to and formal consideration began on the DDR-SDRAM standard. None of the evidence relied on by Infineon (e.g., survey ballot,

technology proposals on the SDRAM standard) provides substantial evidence for the implicit jury finding that Rambus had patents or applications “related to” the DDR-SDRAM standard that should have been disclosed before the standard came under formal consideration.

Because Infineon did not show that Rambus had a duty to disclose before the DDR-SDRAM standard-setting process formally began, the district court properly granted JMOL of no fraud in Rambus’s favor on the DDR-SDRAM verdict.

V. Attorney Fees

The district court held that Infineon was entitled to \$7,123,989.52 in attorney fees and expenses under 35 U.S.C. § 285 as a prevailing party in the patent infringement suit and \$2,382,782.87 in attorney fees for prevailing on its fraud counterclaim. Because the attorney fees under § 285 and Virginia law were duplicative, the court awarded a total amount of \$7,123,989.52 to Infineon.

The trial court based its finding of exceptionality on: Rambus’s claim construction and infringement positions, the asserted fraud as inequitable conduct, and litigation misconduct. The court expressly found that each of these grounds individually supported finding this case exceptional. Because the award was not based solely on litigation misconduct, the court held that it was not necessary for Infineon to show a relationship between the requested fees and the litigation misconduct.

Given this court’s modifications to the appealed claim construction and reversal of the SDRAM fraud verdict, neither the claim construction nor the fraud provides a basis for the § 285 award. The sole remaining ground for awarding fees under § 285 is the alleged litigation misconduct. The district court found that Rambus’s misconduct included: failure to list documents on its privilege log, false and misleading testimony by Rambus executives, obfuscatory discovery responses, refusing to admit facts not genuinely at issue

(e.g., date of Rambus's JEDEC membership), and destroying documents before suit but after sending cease and desist letters to Infineon. Although arguing that the award of fees was improper under § 285, Rambus addresses only the claim construction and the fraud grounds. In sum, Rambus does not contest the district court's holding of litigation misconduct.

Litigation misconduct and unprofessional behavior may suffice, by themselves, to make a case exceptional under § 285, Epcon Gas Sys., Inc. v. Bauer Compressors, Inc., 279 F.3d 1022, 1034, 61 USPQ2d 1470, 1479 (Fed. Cir. 2002). Indeed, the district court found that Rambus's misconduct alone supported the determination that this case was exceptional. Rambus has not shown that this holding is clearly erroneous. In cases deemed exceptional only on the basis of litigation misconduct, however, the amount of the award must bear some relation to the extent of the misconduct. Read Corp. v. Portec, Inc., 970 F.2d 816, 831, 23 USPQ2d 1426, 1438 (Fed. Cir. 1992), abrogated in part on other grounds by Markman, 52 F.3d 967; see also Beckman Instruments, Inc. v. LKB Produkter AB, 892 F.2d 1547, 1553-54, 13 USPQ2d 1301, 1306-07 (Fed. Cir. 1989).

In sum, given this court's holdings on claim construction and fraud and the lack of apportionment between the award and the misconduct, this court vacates the attorney fees award and remands to the district court. On remand, the district court may consider whether Infineon remains a prevailing party, and if so, whether an award is warranted. If the court determines that an award is warranted, it will have the opportunity to set the amount of the award to redress the litigation misconduct.

Finally, because this court has reversed the SDRAM fraud verdict, Virginia common law no longer forms a basis for the award of fees. Thus, this court's reversal of the SDRAM fraud verdict compels a reversal of the \$2,382,782.87 awarded to Infineon on its fraud counterclaim.

CONCLUSION

Because the district court erred in its claim construction, this court vacates the grant of JMOL of noninfringement and remands for consideration under the revised claim construction. Because substantial evidence does not support the jury's verdict that Rambus committed fraud associated with the SDRAM standard, this court reverses the denial of JMOL on the SDRAM fraud verdict. This court affirms the grant of JMOL on the DDR-SDRAM fraud verdict because the district court properly determined that substantial evidence did not support the implicit jury finding that Rambus had a duty to disclose patents and applications before formal consideration of a standard. Finally, this court vacates and remands the attorney fees award under § 285 and reverses the fee award under Virginia common law. These holdings render the injunction and the new trial issues moot. Accordingly, this court vacates-in-part, reverses-in-part, affirms-in-part, and remands to the district court.

COSTS

Each party shall bear its own costs.

AFFIRMED-IN-PART, REVERSED-IN-PART, VACATED-IN-PART, and REMANDED

United States Court of Appeals for the Federal Circuit

01-1449, -1583, -1604, -1641, 02-1174, -1192

RAMBUS INC.,

Plaintiff-Appellant,

v.

INFINEON TECHNOLOGIES AG,
INFINEON TECHNOLOGIES NORTH AMERICA CORP.,
and INFINEON TECHNOLOGIES HOLDING NORTH AMERICA INC.,

Defendants-Cross Appellants.

PROST, Circuit Judge, dissenting-in-part.

I respectfully dissent from section IV of the majority's opinion reversing the district court's denial of Rambus's motion for judgment as a matter of law on the issue of fraud. In my opinion, substantial evidence supports the jury's verdict that Rambus committed actual fraud under Virginia state law.

"The species of fraud are numberless, and like a chameleon, fraud is always colored by the context from which it arises. For that reason, it is usually for the jury to determine from the facts of a specific case, whether a fraud was committed." Hirschberg v. G.W. Motors, Inc., 34 Va. Cir. 55, 60 (1994).

Fraud is seldom, if ever, provable by direct testimony, but usually must be shown by circumstances which are sufficient to convince fair-minded men that they would not have occurred without the existence of a fraudulent purpose and design. Fraud is a mixed question of law and fact but, in most cases, is a jury question.

French v. Beville, 62 S.E.2d 883, 889 (Va. 1951); Hirschberg, 34 Va. Cir. at 60. In this case, the jury heard direct and circumstantial evidence supporting the conclusion that Rambus committed fraud in the context of its membership in the JEDEC standard setting organization.

Rambus attended its first JEDEC meeting in December 1991 and became a member in February 1992. At the time Rambus joined JEDEC, it had several pending patent applications derived from the '898 patent application, which has spawned more than a thousand claims in dozens of continuation and divisional applications. Rambus also had a specific plan for using its pending patent applications against anyone using the SDRAM standard. According to Rambus's June 18, 1992, business plan:

[W]e believe that Sync DRAMs infringe on some claims in our filed patents; and that there are additional claims we can file for our patents that cover features of Sync DRAMs. Then we will be in position to request patent licensing (fees and royalties) from any manufacturer of Sync DRAMs. Our action plan is to determine the exact claims and file the additional claims by the end of Q3/92. Then to advise Sync DRAM manufacturers in Q4/92.

Rambus did not, in fact, inform anyone at JEDEC about its pending patent applications by the end of 1992. Instead, Rambus continued to attend JEDEC meetings for three more years, watching the SDRAM standard evolve and then amending its patent applications to try to cover features of the standard. Richard Crisp, Rambus's JEDEC representative, testified at trial about how "Rambus was intentionally drafting claims to intentionally cover the JEDEC SDRAMs":

[Y]ou'll agree as an initial matter, right, that over the years '92, '93, '94 and '95 while you were attending meetings, JEDEC meetings for Rambus, at least during a portion of that time you were also working with the Rambus patent lawyers to change the claims in these applications? Right?

A. Yes.

Q. And you'll agree, won't you, sir, that at least on some occasions you went to a JEDEC meeting and then met with the Rambus patent lawyer? Right?

A. Yes. That's right.

Q. And you'll agree, won't you, that in the meetings you had with Rambus patent lawyers after a JEDEC meeting, that one source of the information for changing the Rambus patent claims was what you had seen at JEDEC with respect to the SDRAM standardization? Right?

A. Yes. That's right.

* * *

Q. And what you did in those meetings was work on new claims for the Rambus pending patent applications, and your intent was to make them broad enough that they would cover an SDRAM using the features that you had seen at the prior meetings. Isn't that a fact?

A. In some cases that was true.

The record is replete with additional and specific instances of Rambus employees attending JEDEC meetings, taking notes of what was discussed, identifying instances where Rambus already had claims covering what was discussed, and then seeking claims to cover what they learned at the JEDEC meetings. Yet Rambus "did not tell the people at JEDEC that what they were proposing for standardization infringed [its] patents." Instead, after considering whether to "walk into the next JEDEC meeting and simply provide a list of patent numbers which have issued," Rambus concluded that it was better to remain silent because "we may not want to make it easy for all to figure out what we have, especially if nothing looks really strong." Rambus was even advised by its patent attorneys "to stop attending JEDEC" and that "if you go to the JEDEC meetings and stay silent and don't do anything else, you still have a risk that your patents will be unenforceable if you let the standard go forward and you don't tell them you have patents." Rambus was explicitly warned in 1992 that "you cannot mislead JEDEC into thinking that Rambus will not enforce its patent."

In 1995, members of JEDEC suspected that Rambus may have intellectual property rights related to the SDRAM standard. Richard Crisp "was asked [at a JEDEC meeting] to make a comment about the Rambus intellectual property position as it may relate to [a particular] proposal." Rambus responded in writing on September 11, 1995, that "[a]t this time, Rambus elects to not make a specific comment on our intellectual property position." Rambus attended its last JEDEC meeting in December 1995, and on June 17, 1996, Rambus formally withdrew from JEDEC. In its farewell letter to JEDEC, Mr. Crisp stated: "Recently at JEDEC meetings the subject of Rambus patents has been raised. Rambus

plans to continue to license its proprietary technology on terms that are consistent with the business plan of Rambus, and those terms may not be consistent with the terms set by standards bodies, including JEDEC.” Even after withdrawing from JEDEC, Rambus continued to furtively pursue its scheme to patent the evolving SDRAM standard by receiving reports from undisclosed attendees at JEDEC meetings named “Deep Throat” and “Secret Squirrel.”

Rambus also tried to destroy the evidence of its plan to draft patent claims to cover the SDRAM standard. Rambus implemented a “document retention policy” in 1998 in part “for the purpose of getting rid of documents that might be harmful in litigation.” It also attempted to prevent discovery of relevant documents by failing to list them on its privilege log in this case. Having believed that they had destroyed or disguised the documents evidencing their plan to patent the SDRAM standard, Rambus’s witnesses initially provided “false or misleading testimony.” Rambus, Inc. v. Infineon Techs. AG, 155 F. Supp. 2d 668, 681 (E.D. Va. 2001). The false testimony was exposed after the court pierced the attorney-client privilege, compelling Rambus to produce previously concealed documents. Id. Once the Rambus witnesses were “confronted with documents obtained after the piercing of the attorney-client privilege” and “prodded by reference to the belatedly obtained documents,” they were compelled to admit that they had in fact participated in the prosecution of Rambus’s patent applications based on information learned at JEDEC meetings. Id.

The jury found that Rambus’s thus exposed scheme amounted to fraud under Virginia state law. In Virginia, “[t]he elements of actual fraud are: (1) a false representation, (2) of a material fact, (3) made intentionally and knowingly, (4) with intent to mislead, (5) reliance by the party misled, and (6) resulting damage to the party misled.” Spence v. Griffin, 372 S.E.2d 595, 598 (Va. 1988). Fraud may arise from “deliberate

concealment or a relationship, contractual or otherwise, that would give rise to a duty to disclose.” Devansky v. Dryvit Sys., Inc., 52 Va. Cir. 359, 361 (2000). “For purposes of an action for fraud, concealment, whether accomplished by word or conduct, may be the equivalent of a false representation, because concealment always involves deliberate nondisclosure designed to prevent another from learning the truth.” Spence, 372 S.E.2d at 599; see also Norris v. Mitchell, 495 S.E.2d 809, 812 (Va. 1998). When fraud is based on a violation of a duty to disclose, the scope of that duty “depends upon the circumstances of each case and the relationship between the parties.” Hirschberg, 34 Va. Cir. at 57. The duty can arise in many ways:

The principle is basic in the law of fraud, as it relates to nondisclosure, that a charge of fraud is maintainable where a party who knows material facts is under a duty, under the circumstances, to speak and disclose his information, but remains silent. Situations evoking the duty of disclosure may arise in various ways in different cases. Generally speaking, however, in the conduct of various transactions between persons involving business dealings, commercial negotiations, or other relationships relating to property, contracts, and miscellaneous rights, there are times and occasions when the law imposes upon a party a duty to speak rather than remain silent in respect of certain facts within his knowledge, and thus to disclose information, in order that the party with whom he is dealing may be placed on an equal footing with him. In such a case a failure to speak amounts to a suppression of a fact which should have been disclosed, and is a fraud. In such circumstances, a failure to state a fact is actually equivalent to fraudulent concealment and amounts to fraud just as much as an affirmative falsehood.

Among other ways, the obligation to communicate facts may arise from the fact that one of the parties has superior knowledge or means of knowledge; from the fact that confidential relations exist between them; from the fact that a party does something or says something which, for want of the disclosure, is false and deceptive; from the fact that he is placed or places himself in a position where his silence will convey a false impression; or from the fact that a statement or representation has been made in the bona fide belief that it is true, and before it is acted on, the party who has made it discovers that it is untrue.

Id. at 57-58 (quoting 37 Am. Jur. 2d, Fraud and Deceit, § 146).

Applying this Virginia state law, we must determine whether Rambus has shown on appeal that it is entitled to judgment as a matter of law that it did not commit actual fraud as found by the jury. Judgment as a matter of law is appropriate when “a party has been

fully heard on an issue and there is no legally sufficient evidentiary basis for a reasonable jury to find for that party on that issue.” Fed. R. Civ. P. 50(a)(1). As the appellant, Rambus “must show that the jury’s findings, presumed or express, are not supported by substantial evidence or, if they were, that the legal conclusion(s) implied from the jury’s verdict cannot in law be supported by those findings.” Perkin-Elmer Corp. v. Computervision Corp., 732 F.2d 888, 893, 221 USPQ 669, 673 (Fed. Cir. 1984). Because the jury returned a general verdict on the ultimate legal question of whether Rambus committed fraud, “the law presumes the existence of findings necessary to support the verdict the jury reached.” Id. at 893, 221 USPQ at 673. There are two issues underlying whether Rambus is entitled to judgment as a matter of law: the scope of Rambus’s duty to disclose and whether Rambus violated this duty.

I

According to the majority, “a reasonable jury could only find that the duty to disclose a patent or application arises when a license under its claims reasonably might be required to practice the standard.” The majority then proceeds to apply this standard by determining de novo whether Rambus had any pending or issued claims while it was a member of JEDEC that read on the final JEDEC standard.

I believe that the evidence in this case supports a broader duty than the one applied by the majority. According to the October 1993 JEDEC Manual of Organization and Procedure, section 9.3.1. titled “Committee Responsibility Concerning Intellectual Property”:

The Chairperson of any JEDEC committee, subcommittee, or working group must call to the attention of all those present the requirements contained in the EIA Legal Guides, and call attention to the obligation of all participants to inform the meeting of any knowledge they may have of any patents, or

pending patents, that might be involved in the work they are undertaking (emphasis added).¹²

In my opinion, this portion of the manual clearly states the duty of disclosure required by all members of JEDEC, which is different from the duty applied by the majority in at least two respects. First, the statement “might be involved in” the standard is much broader than requiring disclosure of only claims reading on the standard. Second, the majority applies the duty to the final standard adopted by JEDEC, whereas the manual requires disclosure based on the “work they are undertaking,” which is much more expansive than the final, completed standard resulting from the work undertaken. The majority’s comparison of pending claims to the final standard does not take into account the possibility that, during the course of its work, the committee considers, debates, rejects and amends various proposals as the standard evolves.

Documents and witness testimony show that the members of JEDEC understood the JEDEC policy to require that its members disclose patents and pending patent applications that might be involved in the standard setting process. For example, during the development of the SDRAM standard, the committee discussed and then voted on many different features. The ballots for these votes stated that “[i]f anyone receiving this ballot is aware of patents involving this ballot, please alert the Committee accordingly during your voting response” (emphasis added). One witness interpreted the language on the voting ballot as requiring disclosure of “intellectual property that is related to that ballot or to the content of that ballot” (emphasis added). Similarly, the committee’s stated “patent tracking” procedure included “review[ing] items identified as of potential patent interest at each meeting” (emphasis added). In addition, the minutes from the December 6, 1995,

¹² At trial, the parties disputed whether the duty to disclose pending applications existed prior to October 1993, when JEDEC revised its manual to explicitly require disclosure of both patents and pending applications. Witnesses testified at trial that the duty required disclosure of patent applications prior to October 1993. I therefore focus on the issue of whether the duty to disclose was limited to claims reading on the standard, as discussed by the majority opinion, or to patents and applications that might be involved in the work on a standard.

committee meeting state that “MOSAID noted that they had a pending patent on DLL and noted that it was a particular implementation and may not be required to use the standard.” Gordon Kelley, the committee chairman and IBM’s JEDEC representative, testified about Rambus’s particular kind of conduct and whether it violated JEDEC’s policies:

Q. As the chairman at least during some period of time of some of the relevant JEDEC committees that we’ve talked about here today, did you think it was – or did you have any understanding as to whether it was acceptable practice for a JEDEC member to attend JEDEC meetings and then write claims to cover proposals in the JEDEC standards without disclosing those – those patent applications or patents that contain those claims?

[objection]

A. So, for the part of your question with regard to write claims, are you suggesting that someone attended the JEDEC meetings and then subsequent to the JEDEC meeting went and wrote claims that he or she learned at the JEDEC meeting? Is that what you mean?

Q. Exactly, or modified existing patents to cover what was proposed at the JEDEC meetings?

[objection]

Q. And my question is did you have – did you have any understanding at the time as a JEDEC participant and also as the chairman whether that was acceptable behavior or not?

[objection]

A. This letter in January of 1994 to Buf Slay I think documents my position on that, that that cannot be allowed. It’s in complete violation of JEDEC requirements of openness and fairness with regard to notification of patents and pending patents.

In addition, John Kelly, EIA’s general counsel and the person responsible for implementing the EIA/JEDEC patent policy, testified that the JEDEC patent policy “required the early disclosure of patents and patent applications that are or may be required to comply with the standard” (emphasis added). Willibald Meyer, Infineon’s JEDEC representative, likewise testified to a disclosure duty that was not limited to claims that read on the standard:

The question is, sir, what was your understanding of the JEDEC patent policy in July, June and July 1992?

THE WITNESS: The understanding was that the holders of a patent or an application should make the committee aware in the case that they were aware of that, the application of the patent which they held or had filed was in relationship to the work in JEDEC that we were doing (emphasis added).

Evidence also shows that even Rambus understood that it was required to disclose something more than only those claims reading on the SDRAM standard. Rambus timely disclosed only one of its patents to JEDEC: the '703 patent. However, Rambus admitted that the '703 patent "did not relate to JEDEC's SDRAM work but [was] directed to the implementation of Rambus'[s] RDRAM products." Rambus's compulsion to disclose this one patent is evidence that it broadly interpreted its duty of disclosure (although at the time, Rambus allegedly thought its duty was limited to issued patents, not pending applications).¹³

Certainly the majority opinion has identified testimony that can be interpreted to support its framing of the duty to disclose. However, the majority has applied the duty as being limited to the issue of whether claims read on the final standard, which is not consistent with the broader duty stated in the JEDEC manual or the other evidence identified above. Having identified substantial evidence supporting a sufficiently broad duty of disclosure to support the jury's verdict, our job is done. The applicable standard of review does not permit us to go further, reweighing the evidence and determining de novo that the duty should be defined or applied in a different manner. See Comark Communications, Inc. v. Harris Corp., 156 F.3d 1182, 1192-93, 48 USPQ2d 1001, 1010 (Fed. Cir. 1998); Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1375, 231

¹³ The majority opinion states that to the extent the duty to disclose may encompass situations where an application describes but does not claim technologies under discussion at JEDEC, Rambus satisfied that duty by disclosing the '703 patent. I do not necessarily agree. Rambus's disclosure of a patent with clearly irrelevant claims does not absolve it of disclosing other applications with the same disclosure that might have relevant claims. I also note that there is evidence that Rambus's disclosure of the '703 patent was deceptive because JEDEC members were led to believe that Rambus had nothing else of relevance to disclose.

USPQ 81, 87 (Fed. Cir. 1986). I respectfully submit that the evidence described above compels us to conclude that there was sufficient evidence for the jury to find that Rambus had a duty to disclose pending and issued patents that might be involved in the development of the SDRAM standard, as stated in section 9.3.1 of the JEDEC manual.

The majority rejects the plain meaning of this section of the JEDEC manual for two reasons. First, the majority interprets Appendix E, not section 9.3.1, as giving rise to the duty to disclose. Second, according to the majority, a plain reading of section 9.3.1 of the manual would “render the JEDEC disclosure duty unbounded. Under such an amorphous duty, any patent or application having a vague relationship to the standard would have to be disclosed.” I disagree with each of these reasons for not following the duty of disclosure stated in section 9.3.1 of the JEDEC manual.

With respect to the majority’s first reason for rejecting the plain language of the manual, the majority relies on various testimony about the JEDEC “patent policy” to arrive at the conclusion that the members of JEDEC “treated the language of Appendix E as imposing a disclosure duty.” This conclusion is contrary to testimony at trial showing that members of JEDEC understood Appendix E to describe the procedures to be applied once JEDEC has learned of a relevant patent, which is different from the requirement for disclosing relevant patents and patent applications. For example, Reese Brown testified that the “patent policy” has two distinct components:

Q. Can you tell me what the patent policy is?

A. Well, there are two parts. One that says that whenever material comes up in the committee for discussion and for voting, any members who are aware of any patent position or potential patent positions on the material should and are obligated to reveal that to the committee at that time. . . . The other portion of the policy has to do with if a specific patent material has been – or patent positions have been identified in connection with a proposal that is in the process of being approved for a ballot of standardization

John Kelly's testimony likewise distinguished between the disclosure requirement and the requirement for obtaining "assurances" from a patentee once JEDEC has learned of a relevant patent. Gordon Kelley had a similar view:

Q. Between 1991 and 1996 what do you believe that patent policy in JEDEC to be?

A. The stated policy was that, first of all, all member companies would notify the committee of patents that they were aware of that applied to a proposed standard. And another requirement was that they would agree that their licensing practice to all other member companies of JEDEC would be all companies would be licensed, excepting none, and that the license would be either free or offered at reasonable rates, without exception.

Later in his testimony, Mr. Kelley outright rejected the theory that the disclosure duty comes from the language describing what is to happen when JEDEC learns of a relevant patent:

Q. About one line down at the end of the sentence it starts with the word if, if the committee determines that the standard requires the use of patented items, then the committee chairperson must receive a written assurance, and it continues.

A. Yes.

Q. Sir, does that language accurately reflect your understanding of when a patent needed to be disclosed?

A. No. The language that I'm seeing here refers to a patent issue that has been raised in the committee. . . .

Thus, according to the understanding of these witnesses, the language of Appendix E is only one part of the "patent policy" – the part that describes the appropriate procedures that the committee must apply once a disclosure has been made. Appendix E does not describe the second part of the patent policy: the obligation to disclose relevant patents and patent applications, as stated in section 9.3.1 of the JEDEC manual. Moreover, the testimony quoted above from Reese Brown specifically refers to the duty to disclose when voting. The voting ballot parrots the language of section 9.3.1, requiring members to disclose patents and applications "involving th[e] ballot." The ballot therefore confirms the separate duty of disclosure as stated in section 9.3.1, not Appendix E.

The majority also implies that the members of JEDEC do not use their own manual to learn about the rules they must follow, including the duty of disclosure. This conclusion, too, is not supported by the testimony at trial. Rambus's Mr. Crisp described the manual as what "was used to tell people what the rules were." In addition, both Mr. Kelly and Mr. Brown testified that they learned about the rules of membership from the JEDEC manual. Mr. Kelly testified as follows:

Q. So in the time period of 1991 through September of 1993, if we wanted to know the rules in JEDEC, we would look to [manual] JEP-21-H; is that right?

A. Yes, sir. . . . The manual contains – without reference to this text, I can tell you that the manual contains a reference to our patent policy EIA JEDEC patent policy, which required the early disclosure of patents and patent applications that are or may be required to comply with the standard.

* * *

Q. In that manual, under 9.3.1, Committee Responsibility Concerning Intellectual Property, were the members of JEDEC told that the chairperson of any JEDEC committee, subcommittee or working group must call attention to the obligations of all participants to inform the meeting of any knowledge they may have of any patents or pending patents that might be involved in the work they are undertaking?

A. Yes, sir, it was.

Mr. Brown confirmed that the JEDEC manual is the appropriate place to look for the JEDEC patent policy. Shortly before the testimony quoted by the majority, Mr. Brown testified as follows:

Q. Okay. Now, is a patent policy in writing so other people can know what it is?

A. I believe that it is in writing.

Q. Where would we find it?

A. Probably in a document called "JEDEC" – something – "21" followed by a letter, which is a council-created documents which is a set of rules.¹⁴

In spite of this testimony, the majority concludes that members of JEDEC only learned about the disclosure duty from the viewgraphs displayed during meetings, and that there

was no evidence that anything other than Appendix E was displayed at those meetings.

Richard Crisp testified to the contrary:

Q. You're aware, aren't you, sir, that as of October 1993, JEDEC published a new manual for the memory committee, right?

A. Yes, I know that now.

Q. And you know that in the manual, it specifically states that patent applications have to be disclosed as part of the JEDEC application, don't you?

A. Yes, I do know that.

Q. And during the time that you were going to these meetings, including in 1992 and in 1993, that new language was put up on the overhead projector at the meetings and discussed by Jim Townsend, wasn't it?

A. I think it was.

* * *

Q. You were aware that the chairman of the committee put up on the overhead projector at the meetings the new language of the policy which specifically required the disclosure of patent applications, right?

[objection]

A. Yes.

Based on my reading of the record, I therefore believe that there was more than substantial evidence for the jury to have concluded that the disclosure duty is stated in section 9.3.1. of the JEDEC manual, not Appendix E, and that the members of JEDEC knew about this duty from the manual, voting ballots, and meetings.

The majority also rejects the language of section 9.3.1 as being overly broad and ambiguous. However, JEDEC was free to formulate whatever duty it desired and it is not this court's job to rewrite or reinterpret the duty on the basis that it is unbounded (which I do not think it is). JEDEC clearly knows how to draft rules and procedures with specificity when it so chooses. This point is amply demonstrated by the language of Appendix E and other sections of the manual describing in detail the rules that must be followed once JEDEC learns of a relevant patent or patent application. The fact that JEDEC chose not to

¹⁴ The particular JEDEC manual referred to herein is manual JEP-21-I, "JEDEC

use the same kind of language when stating the duty of disclosure indicates that it did not desire to have a bright line rule, such as the one the majority has now imposed upon it. Instead of creating a duty that it believes JEDEC should have adopted, the court need only determine that there was sufficient evidence of what the duty is such that a jury could apply the duty to the conduct at issue and determine whether the duty was violated. In my opinion, there was sufficient evidence for the jury to have concluded that the duty to disclose was stated by the plain text of section 9.3.1 of the JEDEC manual, requiring the disclosure of patents and pending applications that might be involved in the work of the committee.

II

Given the duty to disclose as stated in section 9.3.1 of the JEDEC manual, the next issue is whether substantial evidence supports a finding that Rambus failed to disclose pending and issued patents that might be involved in the development of the SDRAM standard. In my opinion, there is an abundance of such evidence.

The jury heard repeated admissions from Rambus that it had pending claims that not only related to the developing SDRAM standard, but even covered particular features of the standard.¹⁵ For example, Rambus's business plan stated that "Sync DRAMs infringe claims in Rambus'[s] filed patents and other claims that Rambus will file in updates later in 1992." In a March 14, 1995, email, Richard Crisp wrote from a JEDEC meeting that "[t]aken along with the fact that they rely on an externally bussed reference, this should be anticipated by some of our claims. I would say that the proposal may well infringe our work." Mr. Crisp wrote many emails during JEDEC meetings noting instances where he believed Rambus had pending claims that covered features of the evolving standard. In one such email, he wrote: "Note that many of the SDRAMs use an externally

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supplied reference voltage in the input buffers. I believe we have a claim we added to cover this configuration.” Later in that same email, he said:

Suggested that one NC be used for a Vref for a high performance interface. (again we need to check claims about “DRAM with input receivers using an externally supplied reference voltage”). We may be able to slow down or stop (or at least collect from) all of the CTT, GTL, and HSTL devices if this claim is allowed (Allen, I believe this is one of the claims you, Lester, Tracy and I wrote up in late '91, right?)

A 1993 document reporting on the status of drafting new claims derived from the '898 application stated: “(1) Writable configuration register permitting programmable CAS latency[.] This claim has been written up and filed. This is directed against SDRAMs. . . . (4) DRAM with multiple open rows This is directed against SDRAMs.” At trial, Richard Crisp testified at length about a particular instance of a claim drafted to read on a low voltage swing feature of the SDRAM standard proposed at one of the JEDEC meetings:

Q. So when we look at this here, we see Texas Instruments made a presentation for a synchronous DRAM 16 megabit, right?

A. Yes.

Q. If you look at one of [the] features they had on their 16 megabit presentation, it talks about they wanted a low voltage swing. Do you see that?

A. Yes.

* * *

Q. And then a few days later, Jim Gasbarro [a Rambus engineer] is meeting with the Rambus patent lawyer talking about low swing signals on a DRAM. Do you see that?

A. Yes.

* * *

Q. Then in February of 1992, the lawyer sends you the draft amendment to the claims, correct? If you want to refresh your recollection, you can look at Defendants' Trial Exhibit 1531. You'll see it's a February 19th, 1992, letter. . . . And he refers to the enclosed revised draft preliminary amendment. Do you see that?

A. Yes, I do.

¹⁵ Thus, even under the duty to disclose as defined and applied by the majority, I believe that substantial evidence shows that Rambus violated that duty.

* * *

Q. So if you look at the preliminary amendment [at Plaintiff's Trial Exhibit 26], this is the final version that was filed on March 5th, 1992. Do you see that?

A. . . . Yes.

Q. And if you look at the claims that were being added on March 5th, 1992, particularly claim 151, and if you look at the B element, it talks about low voltage swing signals, right?

A. Yes, it does.

Crisp also testified that in May of 1992, he met with Rambus's patent attorney to "add claims to our patent application broad enough to cover the SDRAM if the SDRAM uses mode register and programmable CAS latency." In perhaps the clearest admission of the case, Crisp testified that the features of double edge transfer, mode register, programmable CAS latency, programmable burst length and PLL, DLL "were discussed there [at the JEDEC committee meetings] in some form or another, and we certainly had patent applications that covered aspects of those, of those technologies."

In my opinion, this evidence, which is just a portion of what Infineon presented at trial, is more than sufficient to support the finding that Rambus did in fact have pending patent claims related to, and even reading on, aspects of the SDRAM standard.¹⁶ The majority, however, requires a different kind of proof than the clear admissions Rambus made through witness testimony and internal documents. By limiting the application of the duty to disclose to the issue of whether pending claims read on the final standard, the majority requires an element-by-element comparison of the limitations of a pending claim

¹⁶ The majority discounts Infineon's evidence that Rambus believed it had pending claims covering the standard. According to the majority, the JEDEC standard does not have a subjective belief component and a "member's subjective beliefs, hopes, and desires are irrelevant." I respectfully disagree. Rambus's statements that it believed it had pending claims covering the SDRAM standard is evidence that Rambus did in fact have claims covering the SDRAM standard. Moreover, Rambus's belief is a critical component of the overall fraud action, which includes the component of an intent to mislead. Rambus's beliefs about the scope of its duty are also relevant to what that duty actually is, just as the testimony cited in this dissent and in the majority opinion – where witnesses explain what they believe the duty to mean – is evidence of what the duty actually is.

to the text of the SDRAM standard.¹⁷ Infineon did not call an expert witness at trial to make such a comparison; nor does it appear that Rambus presented a witness to prove the negative – that none of its pending claims ever read on any feature of the SDRAM standard discussed at the JEDEC meetings.

The district court, however, did identify six instances where Rambus had pending claims related to the SDRAM standard. See Rambus, Inc. v. Infineon Techs. AG, 164 F. Supp. 2d 743, 752-53 (E.D. Va. 2001). Rambus argues on appeal, and the majority accepts the argument, that none of these pending claims actually reads on the SDRAM standard. The majority has gone so far as to make a de novo comparison of the pending claims to the JEDEC standard in order to conclude that no claims could possibly read on the standard. I do not believe that we, as an appellate court of review, are in a position to make this finding because neither party appears to have given the jury the necessary evidence to make such an analysis in the first instance. See Fromson v. W. Litho Plate & Supply Co., 853 F.2d 1568, 1570, 7 USPQ2d 1606, 1608 (Fed. Cir. 1988) (“Obviously, a finding not made cannot be reviewed[.]”). Rambus points to no trial testimony supporting the argument it now makes on appeal. See Shell Petroleum, Inc. v. United States, 182 F.3d 212, 218 n.13 (3d Cir. 1999) (“The appellant is required to provide a record to support the claims it makes on appeal.”). Certainly it was Infineon’s burden to prove up fraud by clear and convincing evidence, and I believe Infineon did so based in part on Rambus’s admissions; I do not believe Infineon was limited to proving its case by a limitation-by-

¹⁷ The majority states that its disclosure duty does not “require a formal infringement analysis,” even though the majority then proceeds to determine whether the pending claims read on the standard. While determining whether there is a “reasonable expectation that a license is needed to implement the standard” allows some degree of latitude beyond a rote comparison of pending claims to the relevant standard, the majority’s application of its standard is narrower than the duty it has defined. Its application of the duty is confined to consideration of whether or not pending claims read on the final standard.

In my opinion, the evidence I have identified in this opinion is sufficient to show that a competitor might reasonably expect that it should obtain a license from Rambus, regardless of whether or not any claim reads on the standard. For example, a reasonable competitor could conclude that Rambus could obtain claims reading on the standard or that Rambus had a plausible claim construction or doctrine of equivalents theory that is not readily apparent from a simple reading of the claims.

limitation claim analysis. To the extent Rambus wanted to rebut Infineon's fraud case on the theory that Rambus did not actually have any pending claims that read on the standard, then it was incumbent on Rambus to prove this point at trial. It does not appear from the record before us that Rambus did so.

In addition, Rambus's briefing on appeal only addresses five of the six instances of relevant pending claims identified by the district court. Rambus makes no challenge to the district court's conclusion that "the evidence shows that, when JEDEC discussed adding a 2-bank design and burst-length technology to the SDRAM standard, Rambus had pending claims relating to those technologies pending in its first patent application, the '898 application." Rambus, 164 F. Supp. 2d at 752. Absent any argument to the contrary from Rambus, I presume that the district court is correct, notwithstanding the majority's independent conclusion based on its review of the pending claims, which in my opinion is beyond the scope of our review. See Fromson, 853 F.2d at 1570, 7 USPQ2d at 1608 ("This is the eighty-fourth case in which the court has been forced, ad nauseum, to remind counsel that it is a court of review, i.e., that it will not find the facts de novo, that it is not a place for counsel to retry their cases, [and] that its judges do not participate as advocates to fill gaps left by counsel at trial"); Atl. Thermoplastics Co. v. Faytex Corp., 5 F.3d 1477, 1479, 28 USPQ2d 1343, 1345 (Fed. Cir. 1993) ("Fact-finding by the appellate court is simply not permitted."). Moreover, the majority concedes that the '898 application has claims relating to two-bank and burst length technology so long as "related to" is "construed more broadly than the duty" as defined by the majority.

Thus, in my opinion, substantial evidence supports a finding that Rambus failed to disclose pending patent applications that might be involved in the SDRAM standard. Rambus made numerous, unambiguous admissions to that effect and failed to prove anything to the contrary at trial.

CONCLUSION

This case is not an easy one, and I appreciate the majority's efforts to find a bright line rule for what constitutes fraud in the context of standard setting organizations. But the majority's application of its rule, that only claims reading on the standard need be disclosed, is not the JEDEC standard. JEDEC's disclosure policy required its members to disclose patents and pending applications that "might be involved in the work they are undertaking." While the majority rejected this standard as unbounded, nothing required JEDEC to formulate its policy with precision and clarity. And, while the majority may believe that JEDEC's "might be involved" standard is impossibly amorphous, the majority's restatement of the JEDEC policy might prove impossibly complex. The majority's application of its rule arguably requires a Markman claim construction, application of the doctrine of equivalents, a Festo analysis, and perhaps even a Johnson & Johnston analysis before anyone can say for sure whether a claim reads on a standard. As a result, an action for fraud will become more a federal patent case than a case arising under state law.

In any event, as I read the record, there is more than sufficient evidence upon which the jury could have concluded that Rambus had a duty to disclose pending and issued patents that might be involved in JEDEC's development of the SDRAM standard and that Rambus violated that duty. I respectfully submit that the jury's verdict should stand and I would therefore affirm the district court's denial of Rambus's motion for judgment as a matter of law.

