

UNITED STATES OF AMERICA
BEFORE FEDERAL TRADE COMMISSION

Public Version

In the Matter of

RAMBUS INCORPORATED,

a corporation.

Docket No. 9302

COMPLAINT COUNSEL'S RESPONSE TO RESPONDENT'S POST-TRIAL BRIEF

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September 29, 2003

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INTRODUCTION

As explained herein, Respondent Rambus Inc.’s Initial Post-Trial Brief (“RB”) does more to prove Complaint Counsel’s case than to disprove it. In 140 pages of argument, Rambus never once denies that it possesses monopoly power in the relevant technology markets defined by Complaint Counsel’s economic expert. Rambus’s arguments focus solely on whether it can be held liable under the antitrust laws for having acquired monopoly power through the challenged conduct. Tellingly, however, in its efforts to defend against liability Rambus is forced to take positions that are plainly contrary to established law or that patently contradict, or simply ignore, the massive weight of accumulated evidence establishing the merits of all three counts of liability outlined by the Commission’s Complaint.

For reasons set forth below, and based on the evidence summarized in Complaint Counsel’s Proposed Findings of Fact (“CCFF”), initial Post-Hearing Brief (“CCB”), and Reply to Respondent’s Proposed Findings of Fact (“CCRF”), we respectfully ask this Court to find liability against Rambus on each of the Commission’s three claims.¹

I. ELEMENTS AND BURDENS OF PROOF

A. Rambus’s Summary of Essential Elements Is Incorrect

Rambus’s brief incorrectly states the essential elements of proof, particularly as relates to Count III—the “unfair methods of competition” claim. Rambus erroneously asserts that “Complaint Counsel must prove all of the elements of a monopolization claim or an attempted monopolization claim,” RB 7-8, thus suggesting that Count III is superfluous. In fact, Rambus’s brief essentially does ignore Count III, but in so doing it commits a serious error.

¹ Through this brief, Complaint Counsel also responds to Rambus’s Proposed Conclusions of Law, which closely track the legal arguments made in its post-hearing brief.

Contrary to Rambus’s claims, Complaint Counsel has never suggested that a finding of liability for “unfair methods of competition” requires a finding of liability for actual or attempted monopolization. Such an approach would thwart the purposes of the FTC Act, which empowers the Commission to punish “activities that violate the spirit” of the Sherman Act, *In re General Motors Corp.*, 103 F.T.C. 641, 701 (1984), even if the conduct may “fall short” of what is required to show Sherman Act offense. *In re Ethyl Corp.*, 101 F.T.C. 425, 597 (1983), *vacated sub nom. E.I. Du Pont de Nemours & Co. v. FTC*, 729 F.2d 128 (2d Cir. 1984). Thus, the “unfair methods of competition” claim warrants Your Honor’s careful attention. *See* CCB 18-19.

B. Rambus Has Offered No Valid Basis to Impose a Heightened Proof Standard

Rambus consumes four pages of its brief discussing cases alleging that the defendant, in the process of procuring a patent, “committed fraud upon the patent office.” RB 12 (emphasis added). These so-called “*Walker Process*” cases are irrelevant for reasons Complaint Counsel has already explained. *See* CCB 26-30. Nonetheless, Rambus contends that “all of the policy considerations” that have caused courts in such cases to apply a clear-and-convincing evidence standard of proof “apply with equal force here.” RB 14. This is far from true. Unlike a *Walker Process* case, this action does not allege fraud;² does not challenge actions before the PTO;³ and

² Rambus acknowledges that courts have insisted upon heightened proof of fraud in *Walker Process* cases because “many, if not most, states require clear and convincing evidence of common law fraud.” RB 11.

³ The heightened burden of proof applied in *Walker Process* cases flows directly from concerns about the “numerous technicalities attending the issuance of a patent” in the patent procurement process. *Walker Process Equip., Inc. v. Food Mach. & Chem. Corp.*, 382 U.S. in 172, 180 (1965) (Harlan, J., concurring). *See also In re VISX, Inc.*, 1999 WL 33577396 (F.T.C.) (expressing concerns about the “complexity of the patent process” and “technical fraud” on the PTO); *Cataphote Corp. v. DeSoto Chem. Coatings, Inc.*, 450 F.2d 769, 772 (9th Cir. 1971) (expressing concerns because “[t]he road to the Patent Office is so tortuous”); CCB 26-27.

does not threaten treble damages or the invalidation of a patent.⁴ Nor does this case threaten in any way to “chill” incentives to apply for patents, which is the core concern underlying the *Walker Process* line of authority. *See* CCB 26-30. The mere fact that this case involves antitrust law and patents clearly is not enough to trigger a heightened burden. *Id.* at 25.

Indeed, cases similar to this one both in terms of the theory of liability and the remedy sought have been resolved without imposition of a heightened burden—one example being equitable estoppel cases, in which misleading conduct by a patentee results in the inability to enforce an undisclosed patent.⁵ The Federal Circuit has expressly adopted the preponderance-of-the-evidence standard for such cases. *See, e.g., Gasser Chair Co. v. Infanti Chair Mfg.*, 60 F.3d 770, 776 (Fed. Cir. 1995) (“Equitable estoppel requires the defendant to prove by a preponderance of the evidence [misleading conduct, reliance, and material prejudice]”) (emphasis added); *accord Ricoh Co. v. Nashua Corp.*, 1999 U.S. APP LEXIS 2672, *9 (Fed. Cir. 1999); *Aukerman Co. v. Chaides Construction Co.*, 960 F.2d 1020 (Fed. Cir. 1992);⁶ *see also*

⁴ *See, e.g., Walker Process*, 382 U.S. at 180 (Harlan, J., concurring) (expressing concern about the chilling effect of “treble-damage suits”); *accord VISX*, 1999 WL 33577396.

⁵ In fact, failure to disclose pertinent patent information in the context of standard-setting has been successfully pursued under this theory. For example, in *Stambler v. Diebold*, 1988 U.S. Dist. LEXIS 10132 (E.D.N.Y. 1988), the plaintiff, who had participated in the relevant standards committee, brought an infringement action years after it learned that a proposed standard related to ATM machines infringed his patent. The court, finding equitable estoppel, stated: “Plaintiff could not remain silent while an entire industry implemented the proposed standard and then when the standards were adopted assert that his patent covered what manufacturers believed to be an open and available standard.” *Id.* at *20. *See also Potter Inst. Co. v. Telex Comp. Prods.*, 1980 U.S. Dist. LEXIS 14348 (E.D. Va. 1980) (plaintiff, who participated in SSO that developed a standard which infringed his patent, was estopped from enforcing patent after failure to disclose patent in violation of SSO’s policy); CX1958 at 2, 12, 15-16 (Patents and Industry Standards: discussing estoppel and antitrust as two theories of non-enforcement of patents as well as *Stambler v. Diebold* and other equitable estoppel cases).

⁶ *Aukerman* identified “special circumstances” that could warrant imposition of a heightened standard, such as “where the danger of deception is present (*e.g.*, establishing the terms of a lost will), where a particular claim is disfavored on policy grounds (*e.g.*, reformation or modification of a written contract), . . . where a particularly important individual interest is at stake such as one’s reputation (*e.g.*,

CCB 27-28. In addition, the proposed remedy here—an order barring Rambus from enforcing certain patents against JEDEC-compliant SDRAM devices—is comparable to the remedy imposed in equitable estoppel cases. Accordingly, Rambus’s argument that the proposed remedy here merits a heightened standard (RB 14) is unavailing.

Although Rambus contends, with no authority, that applying a preponderance standard here would be at odds with “strong public policy considerations” favoring broad “participation in standards-setting” (RB 15), *Allied Tube* suggests the very opposite conclusion. *Indian Head, Inc. v. Allied Tube & Conduit Corp.*, 817 F.2d 938 (2d Cir. 1987), *aff’d*, 486 U.S. 492 (1988). The defendant in *Allied Tube*—which was charged with manipulating a standardization process involving safety standards for electrical conduit—argued on appeal that “the fear of treble damages and judicial second-guessing” could “chill participation” in the standards process. *Id.* at 946. Yet the Second Circuit, though “acute[ly]” aware of the “importance” of the standards, regarded the “potential for abuse” of the standards process for the “purpose of achieving an anticompetitive result” to be an even greater threat. *Id.* at 944, 947. Similarly, the Supreme Court stressed that the “hope of procompetitive benefits . . . depends upon the existence of safeguards sufficient to prevent the standard-setting process from being biased by members with economic interests in restraining competition.” 486 U.S. at 509.

As noted in *Allied Tube*, “chilling” effects are a serious concern here. The predominant concern, however, is that the standard-setting process would be seriously undermined if firms were permitted to exploit their participation for anticompetitive ends. In a brief to the Supreme

fraud or undue influence),” or where a case implicates “the specific statutory provision that a patent is presumed valid.” *Id.* at 1045. This case poses no danger of deception, alleges no claims “disfavored” on policy grounds, implicates no “important individual interests,” and does not seek to invalidate a patent. Thus, there is no basis to depart from the preponderance standard.

Court supporting *certiorari* in *Rambus v. Infineon*, more than a dozen states put it this way:

Competitors will not be willing to participate . . . unless they have a reasonable expectation that the law will protect them from a participant who would take advantage of the process . . . to have the body unknowingly adopt a standard that includes patented technology owned by the participant.

Brief of Virginia., *et al.*, as *Amici Curiae* at 7 (*see* Tab 5 to CCB); *see also* CCB 120-21. These same arguments, and prior precedent, require application of a preponderance standard here.

C. Rambus Ignores Its Burden of Rebutting the Spoliation Inferences

Rambus devotes an entire section of its brief to Complaint Counsel's burden of proof, but utterly disregards that this Court, as a remedy for spoliation, placed the burden upon Rambus to rebut a series of adverse inferences, including (1) that Rambus “knew or should have known . . . that developing JEDEC standards would require the use of patents held or applied for by Rambus”; (2) that it “never disclosed to other JEDEC participants the existence of these patents”; and (3) that it “knew that its failure to disclose the existence of these patents to other JEDEC participants could serve to equitably estop Rambus from enforcing its patents.” Feb. 26, 2003, Order at 9; *see* CCB 30-33. The circumstances of this case warrant a heightened rebuttal standard of proof. *See* Mot. for Add'l Adv. Inf. at 29-31. Regardless of which standard is applied, however, Rambus has failed to rebut these inferences. *See* CCF 422, 821, 849-52, 853 (all CCF cited therein), 858 (all CCF cited therein).

II. RAMBUS FAILED TO MAKE REQUIRED PATENT-RELATED DISCLOSURES

A. Rambus Misconstrues the “Core” Allegation of the Complaint

According to Rambus, the “core allegation” in this case is that it violated a “duty to disclose imposed by JEDEC rules,” thus, absent proof that JEDEC’s disclosure rules were violated, there can be no liability. RB 17 (emphasis added). This Court has already rejected

these arguments. As Your Honor stated in denying Rambus’s motion for summary decision,

Respondent frames the issue to be decided at hearing narrowly: whether Respondent had any duty under JEDEC patent disclosure policies to disclose its patents or patent applications. However, Complaint Counsel’s allegations are far broader than whether Respondent simply had a disclosure obligation under JEDEC patent policies (Order at 12 (emphasis added)).

The key question here, Your Honor has correctly ruled, is whether Rambus “engaged in a pattern of deceptive, exclusionary conduct by subverting an open standards process.” *Id.*

As explained below, Rambus did have a duty to disclose relevant patents and applications, which it violated repeatedly. Even if it could be shown that Rambus complied with JEDEC’s disclosure rules, however, Rambus violated other JEDEC obligations and subverted the fundamental purposes of JEDEC’s open standards process. Such conduct, when it harms competition, is proper grounds for imposing antitrust liability. *Id.*⁷

B. Rambus Misconstrues the Relevant “Intent” Requirement

Rambus contends that “the intent necessary to support either of Complaint Counsel’s claims” is “an intent to gain monopoly through anticompetitive conduct,” *i.e.*, “specific intent.” RB 18 (emphasis added). This contention raises two issues. First of all, Rambus’s use of the word “either” suggests this case involves only two claims. Rambus conveniently ignores the third count alleging “unfair methods of competition,” which does not require proof of “specific intent.” *See* CCB 19, 91. Second, even with reference to Counts I-II, Rambus’s assertion is

⁷ Rambus makes the erroneous claim that Complaint Counsel has conceded that “to prevail, they must prove Rambus violated JEDEC disclosure rules—especially since that is the testimony of their economics expert.” RB 21. Prof. McAfee said nothing of the sort. In the testimony Rambus cites, he merely notes that he assumed Rambus “should have disclosed patents or patent applications with reference to all four of the [relevant] technologies” (Tr. 7546). This assumption remains valid if the Court concludes either that Rambus’s non-disclosures (1) violated JEDEC disclosure rules; (2) violated other JEDEC obligations, such as the duty of good faith; or (3) amounted to conscious subversion of JEDEC’s open standards process. The evidence amply supports all three findings.

incorrect as a matter of law. Only “general intent” is required to prove monopolization, which is defined as “a mere intent to do the act.” *United States v. Aluminum Co. of Am.*, 148 F.2d 416, 431-32 (2d Cir. 1945) (“*Alcoa*”); *Times-Picayune Publ’g Co. v. United States*, 345 U.S. 594, 626 (1953).

Rambus also mischaracterizes what is required to prove specific intent, asserting that “Complaint Counsel must . . . prove that Rambus intended through its actions or omissions to mislead JEDEC by knowingly violating a JEDEC disclosure rule.” RB 20 (emphasis added). Putting aside that Complaint Counsel has proved this much and more, the compound standard articulated by Rambus far exceeds what the law requires. All that need be shown is that Rambus sought “to destroy competition or build monopoly.” *Times-Picayune*, 345 U.S. at 626. If that level of intent is established, as clearly it has been, there is no need to demonstrate that Rambus subjectively intended to “mislead” JEDEC or “knowingly violated” JEDEC’s rules. Furthermore, although not necessary in this case, intent can be inferred from the objective nature of the challenged conduct and its effects. *See, e.g., M&M Med. Supplies & Serv. v. Pleasant Valley Hosp.*, 981 F.2d 160, 166 (4th Cir. 1992) (“Specific intent may be inferred from the defendant’s anticompetitive practices.”); *General Foods Corp.*, 103 F.T.C. 204, 342 (1984) (“ . . . the element of intent inevitably entails the element of conduct.”).

Thus, to prove Counts I (monopolization) and III (unfair methods of competition), Complaint Counsel must show only that Rambus consciously engaged in the challenged conduct—that is, “a mere intent to do the act.” *Alcoa*, 148 F.2d at 432. To prove Count II (attempted monopolization), Complaint Counsel must show that Rambus had a “specific intent to destroy competition or build monopoly,” *Times-Picayune*, 345 U.S. at 626, which may be

inferred from exclusionary conduct.⁸ The evidence more than adequately satisfies these requirements.⁹

C. Rambus Ignores *Allied Tube* and JEDEC's Duty of Good Faith

Rambus asserts “there is virtually no case law elucidating precisely what constitutes anticompetitive conduct” in the standard-setting context and then proceeds to argue by analogy to the *Walker Process* cases. RB 21. As explained above, this case does not involve *Walker Process*-type claims or the policy implications relevant to such claims. On the other hand, Complaint Counsel has drawn attention to a legal precedent that is directly on point—*Indian Head, Inc. v. Allied Tube & Conduit Corp.*, 817 F.2d 938 (2d Cir. 1987), *aff'd*, 486 U.S. 492 (1988). In *Allied Tube*, the defendant was found to have “subverted,” “undermined,” and “violated the integrity” of a standard-setting association’s process, and such conduct was held to violate the antitrust laws notwithstanding the defendant’s “literal compliance with a standard-

⁸ In an article that Rambus itself has relied upon, Boalt Hall law Prof. Mark Lemley describes how “intent to monopolize . . . can be inferred from conduct” in this context. *See* Mark Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 Cal. L. Rev. 1889, 1933-34 (2002) (“This inference might be drawn from facts that suggest knowledge of a misrepresentation regarding IP was likely,” and “where the evidence is indicative of bad faith, courts should be more willing to infer intent.”). Similarly, one of the authorities relied upon by Rambus’s brief suggests that “[i]n many standard-setting cases, such an inference will be easy to draw” and that “[p]roof of the manipulation of the [standard-setting] process towards an anticompetitive end should satisfy the intent prong.” 2 H. HOVENKAMP ET AL., *IP AND ANTITRUST* § 35.5 (2002) (emphasis added).

⁹ Rambus suggests that the Court, in assessing intent, should disregard statements appearing in its own business records, on the theory that they amount only to “colorful . . . hyperbole.” RB 19. Yet even the case that Rambus purports to rely upon for this proposition notes that “[a]ntitrust plaintiffs often establish specific intent with ‘smoking gun’ documents that articulate antitrust scienter in no uncertain terms.” *Advo, Inc. v. Philadelphia Newspapers, Inc.*, 51 F.3d 1191, 1199 (3d Cir. 1995). The problem in *Advo* was that the plaintiff lacked any documents articulating an anticompetitive intent, and instead “attempted to cut and paste unrelated and innocent clauses together to produce guilty declarations.” *Id.* That problem does not exist in this case. Rambus’s business documents spell out in great detail the company’s intent to acquire and exploit monopoly power through the very conduct at issue in this case. *See also, e.g., Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585, 609 (1985) (“Proof of specific intent to engage in predation may be in the form of statements made by the officers or agents of the company.”) (quoting R. BORK, *THE ANTITRUST PARADOX* 157 (1978)).

setting organization’s rules.” *Id.* at 941, 947.¹⁰ In pretrial briefing, Rambus made no attempt to challenge the merits of *Allied Tube* but rather made the baseless contention that, by relying on *Allied Tube*, Complaint Counsel had improperly “changed” the theory of the Complaint. Rambus’s post-trial brief takes a different tack—it ignores *Allied Tube* altogether.¹¹

The *Allied Tube* decision is not all that Rambus ignores. In its brief, Rambus chides Complaint Counsel for its use of “pejorative terms like ‘bad faith’” and suggests that, even if it did in act in bad faith, it cannot be held liable under the antitrust laws unless it violated “the rules and policies of JEDEC.” RB 21-22. Yet Rambus fails to acknowledge that JEDEC’s rules themselves expressly require “good faith.” CCF 310-14. Thus, bad-faith conduct of the sort that has been alleged and proven in this case does violate the “rules and policies of JEDEC.”

The EIA Legal Guides, which governed JEDEC activities throughout the relevant period, establish several “basic rules.” As John Kelly, the EIA/JEDEC general counsel, has testified, these rules are “mandatory,” not optional (Tr. 1840), and the first “basic rule” mandates that all EIA/JEDEC activities be “carried on in good faith.” CX202 at 6. As Kelly explained,

[T]his provision is designed to prevent companies from acting in bad faith in connection with standard-setting activities. . . . [C]ompanies need to participate in the process openly and honestly and fairly and in good faith and not in bad faith, because bad faith undermines the confidence of everyone in the process. It can yield standards that are subject—in which the bad faith affects the outcome of the process, and the standard is not open, and if the standard is not open, then it can—it can impact the entire supply chain and the consumer and the public good. So, I think this is . . . fundamental, and the absence of good faith in the process

¹⁰ The Commission has noted the relevance of *Allied Tube* to Section 5 enforcement actions such as this one. *See In re Dell Computer Corp.*, 121 F.T.C. 616, 626, 1996 FTC LEXIS 291 (citing *Allied Tube* in support of antitrust liability where firm allegedly acquired market power by not disclosing relevant patents to an SSO).

¹¹ It is interesting to note that one of the authorities relied upon in Rambus’s brief describes *Allied Tube* as the “paradigm case” involving “manipulation of the standard-setting process.” 2 H. HOVENKAMP ET AL., IP AND ANTITRUST § 35.5, at 34-35 (emphasis added).

undermines the entire process and the end product of that process. (Tr. 1841-42.)

The duty of good faith established by the Legal Guides is a “rule” that all JEDEC participants are expected to comply with (Kelly, Tr. 1829, 1913) and is specifically intended to capture conduct that is at odds with the organization’s core principles and purposes, even if such conduct is not expressly forbidden by other provisions. Mr. Kelly testified about an instance in which a company with intellectual property (“IP”) relevant to a standard under development retained a consultant to attend meetings on its behalf, but without “disclosing to the consultant the existence of the relevant IP” (Tr. 1847). Consequently, “the consultant never disclosed the IP, the standard was promulgated, and the company claimed that it had patent rights that affected in this case every television set sold in the United States.” *Id.* Kelly acknowledged this might not violate the patent policy but added, “there is . . . no doubt it calls into question the conduct of the company with respect to the good faith obligation here in the Legal Guides” (Tr. 1847-48).¹² Regarding the EIA/JEDEC patent policy¹³ and the duty of good faith, Kelly also testified:¹⁴

¹² See also *id.* at 1848-49 (“[T]he concern in that particular case was that the company that had relevant IP was trying to do an end run around the patent policy through a bad faith activity; that is, retaining a consultant, deliberately leaving that consultant ignorant of their patent portfolio, and then gaining a benefit of information that would ordinarily flow from participation in the committee through the consultant, and then using that information to . . . take advantage of the market power they had by virtue of their patent.”); *id.* at 1983 (describing other conduct that “may not violate the patent policy” but “violates the duty of good faith”); *id.* at 1993 (same); *id.* at 2003 (same).

¹³ As Kelly explained, the EIA and JEDEC patent policies are “one in [sic] the same.” Tr. 1926-27, 1920 (terms “JEDEC patent policy” and “EIA patent policy” were “used interchangeably”). While there are minor differences in the language, Kelly testified that there is no meaningful difference in the substance. Tr. 1977.

¹⁴ It is undisputed that Kelly, who has served as EIA/JEDEC general counsel since 1990, is the person charged with providing authoritative interpretations of all EIA and JEDEC rules. See Kelly, Tr. 1822 (he has “the last word on how the rules of the organization are to be applied”); *id.* at 1915 (same); *id.* at 1939 (his “interpretation controls”); *id.* at 2078 (“If the words require interpretation, that’s my role.”). It is also undisputed that JEDEC participants were informed to direct any questions about EIA/JEDEC rules to Kelly. *Id.* at 1858; see also CX306 at 1 (“Consult the EIA General Counsel about any doubtful question.”); CX449 at 4 (“Questions relating to the JEDEC patent policy should be directed

- that “the fact that all participants are under a duty under the EIA Legal Guides to act in good faith” requires they comply “not just in terms of its written letter but also in terms of the spirit of the patent policy”;
- that “the spirit of the patent policy . . . is to encourage the earliest possible disclosure” of relevant patents and patent applications; and
- that “there are no intended loopholes” (Tr. 2053-55).¹⁵

Accordingly, Rambus’s contention that Complaint Counsel “must prove” that it “violated JEDEC disclosure rules” is without merit. Indeed, there are at least two paths to liability that would not require proving a violation of JEDEC’s disclosure rules. On the solid authority of *Allied Tube*, Your Honor may conclude that Rambus subverted JEDEC’s open standards process through a pattern of misleading conduct, which violated the spirit, if not the letter, of JEDEC’s rules. Your Honor also may conclude that the very same conduct constituted a breach of JEDEC’s duty of good faith—a duty set forth in writing in the EIA Legal Guides.¹⁶

D. The Record Overwhelmingly Supports the Complaint’s Allegations Regarding the Nature and Scope of JEDEC’s Patent Disclosure Rules

Rambus’s brief restates a litany of now-familiar contentions. According to Rambus, JEDEC disclosure policy “encouraged, but did not require” patent-related disclosures; applied only to issued patents, not applications; and even then, only to “essential” patents; but “not until the time of balloting.” RB 23. To be sure, Rambus has dropped some of its earlier contentions, such as its claim that the JEDEC Manual was merely applied to the committee “Chairman” and

to the JEDEC legal department.”).

¹⁵ CX449 at 4 (“The rules are basic. They are grounded in common sense and designed to promote openness, good faith and fair dealing Those who seek to ‘game’ the rules act at their own peril.”).

¹⁶ Rambus concedes that the Legal Guides were “in effect throughout the pertinent time period” and “were required to be followed by JEDEC members.” RB 27 (emphasis added).

was not distributed to rank-and-file members. *See* CCF 418. But as shown below, the arguments Rambus clings to are equally unsound, and are supported, at best, by misleading and incomplete record citations. Indeed, the overwhelming evidence rebuts each of Rambus’s contentions and establishes beyond any doubt that JEDEC’s rules did impose mandatory disclosure obligations, which Rambus repeatedly violated.

1. JEDEC’s Rules Mandated Disclosure of Relevant Patent Information

Voluminous record evidence in the form of both documents and testimony establishes that JEDEC’s rules impose mandatory patent disclosure duties. *See, e.g.*, CX208 at 19 (JEDEC manual: “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); Kelly,¹⁷ Tr. 1777 (“Companies that participate in the process that have relevant IP are required to disclose the IP”); *id.* at 1966 (“[C]ompliance with the policy is mandatory. It’s not optional.”); *id.* at 1979 (“[A]ny time a participant has knowledge of relevant [IP], patent or patent application, that is or may be required to comply with the work underway, then that participant has an absolute duty to disclose it”); Rhoden, Tr. 318-19, 615 (“you are obligated to disclose”); Sussman, Tr. 1346 (disclosure is “required”); Lee, Tr. 6595-96 (“there was a requirement to disclose”); CX2057 at 200 (Meyer, Dep.) (disclosure is an obligation); CCF 323-24.

¹⁷ In light of his position as EIA/JEDEC general counsel, which carried with it ultimate responsibility for interpreting and applying EIA and JEDEC rules, Kelly’s interpretations of JEDEC rules should be given great deference. *See, e.g., Monzillo v. Biller*, 735 F.2d 1456, 1458 (D.C. Cir. 1984) (interpretation of rules by “officials” of organization “entitled to considerable deference” and “should not be overruled” absent bad faith) (emphasis added; citing additional cases). In fact, both the Federal Circuit majority and dissent in the *Infineon* case drew particular attention to Kelly’s testimony. *See Rambus Inc. v. Infineon Techs.*, 318 F.3d 1081, 1097, 1111 (Fed. Cir. 2003) (noting Kelly has “since 1990” been “the person responsible for implementing the EIA/JEDEC patent policy”), *Petition for cert. filed*, 72 U.S.L.W. 3092 (July 3, 2003) (No. 03-37).

Rambus's brief disregards this testimony and that of many other witnesses who confirmed the mandatory nature of JEDEC's disclosure policy. CCFF 323-24. Rambus has failed to demonstrate its contention that "oral testimony in conflict with contemporaneous documentary evidence deserves little weight" (RB 25). Indeed, the documentary evidence Rambus cites is perfectly consistent with the testimony Rambus has chosen to disregard—both establish that JEDEC members were required, not merely encouraged, to disclose relevant patent information.

Rambus draws attention to the EIA Legal Guides, which state that it is a "basic objective" of EIA to "propose or adopt" standards "without regard to whether their proposal or adoption may in any way involve patents." RB 27; CX204 at 4. Rambus implies that such language is inconsistent with a mandatory duty to disclose. Yet John Kelly testified that this language "is in essence a disclaimer saying that EIA does not conduct patent searches, and therefore, can't assume any liability if patents somehow creep into standards unbeknownst to us" (Tr. 1835; *id.* at 1836-37). Kelly further explained that, while EIA makes such disclaimers as a precaution, it also, through the patent policy, "requires . . . early disclosure of . . . patents or patent applications that are or may be related to the work of a standard-setting committee" (Tr. 1838).

Rambus next draws attention to this language from EIA's EP-3 Manual:

No program of standardization shall refer to a product of which there is a known patent unless all the technical information covered by the patent is known to the formulating committee, subcommittee or working group. The Committee Chairman must also have received a written expression from the patent holder that he is willing to license applicants under reasonable terms and conditions that are demonstrably free of any unfair discrimination.

RB 28; CX203A at 11. According to Rambus, this language and similar language from the EP-7 Manual, "can be read to suggest that disclosure of patents is encouraged." RB 29. But Rambus's "reading" of the EIA manuals directly contradicts the reading of John Kelly, who testified:

What it means is that standards activities shall not refer to items on which there is a known patent or patent application unless . . . all relevant technical information relating to the patent is known to the formulating committee. That’s what it says. Now, what that means, if I can just go one step further . . . is that the participants in the process need to . . . be disclosing on an early basis known patents and patent applications that relate to the work of the committee. (Tr. 1870.)¹⁸

Kelly later reiterated that the very same language from the EP-3 and EP-7 manuals that Rambus highlights “set[s] forth an obligation to disclose relevant patents or applications” (Tr. 1905-06).

In further support of its argument, Rambus refers to ANSI—the American National Standards Institute—and to guidelines ANSI published in connection with its own patent policy. *See* RB 29-32.¹⁹ Rambus notes that the ANSI policy seeks to “encourage the early disclosure and identification of patents that may relate to standards under development.” *See* RB 30; Kelly, Tr. 1953; RX1712 at 6 (emphasis added). John Kelly confirmed at trial that the EIA/JEDEC patent policy is “in compliance” with the ANSI patent policy. Tr. 1957. Taking these facts in combination, Rambus seeks to equate the EIA/JEDEC policy with the ANSI policy, suggesting that both merely “encourage” but do not “require” disclosure of relevant patents. RB 31-32.

This argument glosses over the fact that SDOs can “comply” with the ANSI patent policy even if their own patent policies impose more demanding requirements—such as, in the case of EIA/JEDEC, requirements calling for mandatory disclosure of both patents and patent applications. The ANSI patent policy guidelines could not be more explicit in this regard:

By definition, guidelines are suggestions—adherence is not essential for standards

¹⁸ While the EIA manuals make no express reference to patent applications, Kelly testified, “I never heard from anyone inside the EIA organization that ‘patent’ excluded patent applications. It was always my understanding that it included patent applications.” Tr. 1894.

¹⁹ ANSI is not itself a standards development organization (“SDO”); rather, it accredits other SDOs. Kelly, Tr. 1947-48. EIA, for instance, has been accredited by ANSI for many years. *Id.* at 1949. To be accredited by ANSI, SDOs must satisfy various criteria, one of which involves having a patent policy “compatible” with the ANSI policy.

developers to be found in compliance with ANSI’s Patent Policy. Rather, this is an effort to identify possible procedures that a standards developer may wish to adopt, either in whole or in part, for purposes of effectively implementing the Patent Policy. Additional or different steps may also be selected for such purposes (RX1712 at 7 (emphasis added)).

Mr. Kelly, who helped draft the ANSI guidelines (Kelly, Tr. 1950-51), explained the reason for this language:

We were trying . . . to establish some general guidance for the benefit of standards developers that they could either follow or not follow, in whole or in part, and we’re emphasizing here that they had—that the standards developers had the option of adopting additional or different steps from those suggested from the guidelines that might be appropriate in the case of their own standards development activities
(Tr. 1957).²⁰

Consistent with the flexibility that ANSI affords to affiliated SDOs in defining the specific parameters of their own patent policies, EIA and JEDEC have chosen to adopt more demanding patent disclosure rules.²¹ Moreover, while Kelly testified the EIA/JEDEC policy was “in compliance” with the ANSI policy, he also noted that there were “material differences”:

- Q. [I]n your mind as EIA’s general counsel, is the EIA/JEDEC patent policy in compliance with the ANSI patent policy?
- A. Absolutely, yes, sir.
- Q. Is the EIA/JEDEC patent policy identical to the ANSI patent policy in terms of what it requires with respect to patent disclosure or licensing assurances?
- A. No, sir, there is a material difference between the ANSI policy and the EIA/JEDEC policy, and that is that the EIA/JEDEC policy requires the disclosure of patent applications as well as issued patents (Tr. 1957-58).

²⁰ As Kelly pointed out, the ANSI guidelines state that an SDO “may wish to encourage participants to disclose the existence of pending U.S. patent applications relating to a standard under development.” Tr. 1960; RX1712 at 8 (emphasis added).

²¹ Mr. Kelly explained why it makes sense for EIA and JEDEC to have more demanding patent policies by comparison to other ANSI affiliates: “It’s because we’re in a high technology, fast-moving, fast-paced industry in terms of product development and intellectual property, but ANSI deals with a number of different industries.” Tr. 1959; *id.* at 1912 (“in the IT area where we operate, our space, it is critically important to get out information about relevant IP as early in the process as possible, and that means patent applications as well as issued patents”).

It is not surprising, therefore, that in October 2000, when Kelly distributed the ANSI guidelines to leaders of JEDEC's JC-42.3 subcommittee, he pointed out, "while the ANSI and JEDEC patent policies are in most respects the same, there are a few differences." RX1712 at 1. One of the "major" differences, Kelly wrote, was that "the ANSI policy does not apply to pending patent applications, while the JEDEC policy does." *Id.* (emphasis added); *see also* CCFF 435-43, CCRF 141-42. In violation of its own protocols, Rambus ignores this "contemporaneous documentary evidence."

Rambus also makes much of a January 1996 letter sent to the FTC on behalf of EIA and an affiliated trade association, TIA, offering comments on the proposed *Dell* consent order. The letter states that both EIA and TIA "encourage early, voluntary disclosure of patents that relate to the standards in work." RB 30 (Rambus's emphasis). Once again, Rambus seizes upon isolated words and ignores the relevant testimony.

When asked about this same letter at trial, Mr. Kelly, who co-signed the letter, explained what the term "voluntary" meant in this context:

- Q. And the first sentence of that paragraph states, "Both EIA and TIA encourage the early, voluntary disclosure of patents that relate to the standards in work." . . . [C]an you explain what you mean by that language, and in particular, if you could explain how you understand the term "voluntary" as used in that sentence?
- A. Voluntary disclosure, as I think I testified this morning, refers to the disclosure in the context of a process that is from first to last voluntary. It does not mean optional or elective. It means that in the context of a voluntary standard-setting activity, the disclosure is in this context voluntary (Tr. 2016-17).²²

When it comes to the 21-I Manual, Rambus again fails to heed its own advice—to give "much greater weight" to "contemporaneous documentary evidence" (RB 25). Rambus

²² *See also id.* at 1783 (JEDEC's entire process is "voluntary" in that companies choose whether to participate and whether to comply with the standards); *id.* at 1966 (same); *id.* at 2106-07 ("just so the record is clear on that, 'encourage' in this context means we can't impose sanctions, the process is voluntary, therefore we encourage").

acknowledges, as it must, that the 21-I Manual, published in October 1993, appears on its face to impose “an obligation” to disclose relevant “patents, or pending patents” that “might be involved in” JEDEC’s work. *Id.* at 33.²³ Rambus also acknowledges this text is at odds with one of its core contentions—that “the governing manuals” applicable to JEDEC’s work did not require disclosure of relevant IP. *Id.* at 27. In an effort to escape the obvious ramifications of the clear language of the 21-I Manual and the damaging admissions of Mr. Crisp, Rambus asserts that the 21-I Manual, to be effective, needed approval by EIA’s Engineering Department Executive Council (“EDEC”), and no evidence shows it was approved by EDEC; thus, according to Rambus, the 21-I Manual “was, in fact, never in effect.” *Id.* at 33-34.²⁴

This argument borders on meriting no response at all.²⁵ The facts show that the JEDEC

²³ See Crisp, Tr. 2979 (“Q. And when you . . . read [the 21-I Manual], it was clear that the manual required disclosure of both patents and patent applications, wasn’t it? A. Yes, if they related to the work of the committee.”).

²⁴ While the 21-I Manual made more explicit reference to the requirement to disclose not only relevant patents but also patent applications, record evidence demonstrates that this requirement predated the adoption of the 21-I Manual, which merely changed the wording, not the substance, of the policy. See Kelly, Tr. 1925 (21-I Manual “was a restatement of the patent policy, and it in no way varied the policy itself”), 1926-27, 1893-94, 1932 (term “patent” as used in earlier manuals “meant patents and patent applications”); G. Kelley, Tr. 2415-16 (revisions reflected in 21-I Manual did not “change in any way the substance of the JEDEC disclosure policy”). Note also that the JEDEC sign-in sheet “was modified around th[e] same time frame,” making it clear that the patent policy applied to both “patented” and “patentable” items, the latter term referring to “[p]atent applications.” Kelly, Tr. 1934-36; CX306 (emphasis added).

²⁵ The same can be said for many arguments Rambus makes in attempt to deny that JEDEC’s rules required disclosure of relevant patent information. For instance, Rambus calls attention to a document (RX486) that it claims makes it “quite clear . . . that neither EIA nor JEDEC had imposed a mandatory disclosure obligation on its members.” RB 37. This document has nothing to do with patent disclosure rules. As John Kelly testified, the document relates to a proposal that each JEDEC member be asked “to pledge in advance that it will license potentially its entire intellectual property portfolio . . . as a precondition to participating in standards activity”—an idea that Kelly, understandably, did not support. Tr. 2025. Rambus’s brief is filled with other, similarly unpersuasive arguments. Rambus notes, for example, that “on two occasions in 1992 and 1995” it “declined to comment at a JEDEC meeting when asked about its intellectual property” and yet was never told that, by declining comment, it was acting in violation of JEDEC policies. RB 38. Rambus claims that these incidents show that patent disclosure within JEDEC was purely “voluntary.” *Id.* at 39. However, this argument presumes that JEDEC members

Manual 21-I was approved twice by the JEDEC Council—in May and September 1993 (*see* CCF 417 (citing CX54, CX55, G. Kelley, Tr. 2423-28))—and again by EIA general counsel John Kelly. *See* Kelly, Tr. 1924-25. While Rambus seizes on a single statement by Kelly suggesting he “believe[d]” “in 1993” the 21-I Manual would have needed “a final stamp of approval from EDEC,” RB 33, contemporaneous evidence suggests otherwise. The previous iteration of the JEDEC Manual—21-H—which Rambus acknowledges “was in effect,” RB 32 (emphasis added), spells out the procedures to be followed in making revisions:

Proposed revisions to this “JEDEC Manual of Organization and Procedure” shall be submitted to the Council through the Council Secretary who will place them on the Agenda for consideration at regular meetings. Such revisions shall be considered at two regular meetings of the Council with a favorable vote required at both meetings for final approval. If approved by the Council, approval by the EIA Legal Department is also required. The revisions shall then be incorporated into the Manual (CX205 at 15).

As noted above, the record shows that these very procedures were followed when the 21-I Manual was adopted. In addition, voluminous evidence shows that JEDEC participants, including Rambus, understood that 21-I was the “governing” JEDEC Manual. *See, e.g.*, CX2104 (Crisp Micron dep.) at 851-52 (explaining that, when he requested a copy of the manual “that outlined . . . the patent policy,” he was given a copy of the 21-I Manual); Landgraf, Tr. 1700-02 (21-I was the manual that he understood “contained the JEDEC patent policy”); Rhoden, Tr. 313 (21-I was the manual “for all of the participants inside JEDEC to operate and for JEDEC committees to operate under”); G. Kelley, Tr. 2385 (he would “make sure that . . . the meeting was run by JEDEC’s manual of operation and procedures”); Williams, Tr. 790 (21-I “is a manual that guides the policies of JEDEC,” including the patent policy); *see also* CCF 403-04, 820,

knew that Rambus had relevant IP to disclose, but the record does not support such a presumption. At most, there were suspicions Rambus might possess relevant IP, but Rambus’s non-disclosures helped put such suspicions to rest.

845; CCRF 118-21, 163-70.

2. JEDEC's Disclosure Rules Applied Equally to Patent Applications

Rambus's brief acknowledges that the Manual 21-I did impose "an obligation" to disclose both "patents, or pending patents, that might be involved in" JEDEC's standardization efforts. RB 33 (emphasis added). Rambus even concedes that the 21-I Manual constitutes "contemporaneous written evidence that suggests that JEDEC members were required or expected to disclose patent applications to JEDEC." *Id.* at 39-40 (emphasis added). Yet stunningly, Rambus maintains that "it was not obligated to disclose, and that no JEDEC member expected it to disclose," patent applications relating to JEDEC's work. *Id.* at 40. The record does not allow such a conclusion.

Rambus simply ignores contemporaneous JEDEC documents, Rambus documents and the sworn testimony of multiple witnesses (including Rambus witnesses) that confirm that JEDEC's disclosure policy extends to patent applications.²⁶ Instead, Rambus focuses on isolated bits of evidence taken out of context. For instance, Rambus wrongly suggests that a memo sent by JEDEC staff member Ken McGhee in February 2000 (RX1582) implies that disclosing a patent application would be going "one step beyond' the patent policy." RB 37 (emphasis added). The context and other evidence make clear that Mr. McGhee's point was that disclosing a patent application in writing, after a prior oral disclosure relating to the same application, is

²⁶ See CX306 (sign-in sheet: "patentable or patented item"); CX42A at 7 (Townsend memo: "patentable matters;" "the intent of your company to patent or not patent the subject matter"); CX336 (same); CX342 (same); CX347 (same); Crisp, Tr. 2979 (agreeing that when he "read [21-I], it was clear that the manual required disclosure of both patents and patent applications . . . if they related to the work of the committee."), 2980 ("they wanted to know about both patents and patent applications that might relate to the works that were going on within JEDEC"); *id.* at CCF 318-20 (summarizing testimony of Messrs. Kelly, Rhoden, Lee, Sussman, Landgraf, Williams, Brown, Calvin, Kelley, Kellogg and Karp), 357, 366, 370-71, 377-79, 382, 408-18, 818-21, 840-52.

more than JEDEC's rules require. *See* Kelly, Tr. 2004 ("oral explanation to the relevant EIA or JEDEC committee" satisfies JEDEC rules), 2005 (if a company "orally discloses a patent or patent application" a follow-up "letter making disclosures in writing" would "be going beyond" the rules).

Rambus also distorts statements Gordon Kelley of IBM made to JEDEC, claiming that he "informed JEDEC members . . . that IBM would not disclose its intellectual property, and in particular its patent applications, at JEDEC meetings." RB 38. Kelley testified that he merely sought to convey that he "could not guarantee" he would have knowledge of all IBM patent applications that might relate to JEDEC's work "around the world" in IBM's "probably 25 different locations," and that to develop such knowledge he "would have to do a search . . . for all of the patent applications that might apply." G. Kelley, Tr. 2450; *id.* ("I was warning the committee that that [sic] was not something that I could do. It was just not a possible task for me to know what was going on all over the world for the IBM Corporation.").

Rambus implies that by making such statements, Kelley was openly flouting JEDEC's patent policy. But as Rambus itself emphasizes, JEDEC's policy requires disclosure only if the existence of a relevant patent or application is within the "actual knowledge" of the JEDEC member. RB 41-42, n.15. By the same token, JEDEC's rules do not impose a duty to search for potentially relevant patents or applications. CCFF 325-29. Far from flouting the rules, Gordon Kelley's statements reflect a good-faith effort to comply. Indeed, the contrast between the conduct of IBM and that of Rambus could not be more stark. At the same time that Gordon Kelley cautioned the committee of the possibility that there could be additional IBM patents or applications he did not personally have knowledge of, he reaffirmed IBM's intention to fully comply with its disclosure obligations, and the record confirms that IBM did in fact disclose

patent applications as well as its future intention to file patent applications on certain specific technologies. G. Kelley, Tr. 2451 (“I . . . went on to promise . . . that I would alert the committee to any information that I had that applied to the JEDEC task at hand and if a question came up, I would get them information on any patent that they could describe to me.”); Kellogg, Tr. 5024-26 (“Gordon was indicating that IBM would disclose patent activity that the participating [IBM representatives] were aware of”); RX578 (“I plan to alert the committee when I know of applicable IBM patent(s)”); Kellogg, Tr. 5030-41 (summarizing some of IBM’s disclosures). Rambus, by contrast, implied to the JC-42.3 Committee that it was abiding by the JEDEC disclosure policy at the same time that it was actively concealing its relevant patents and applications. CX711 at 166, 167 (when Rambus’s statement regarding SyncLink generated concern, Crisp reminded the JC-42.3 Committee that Rambus previously had disclosed a patent); CX783 at 2 (Crisp e-mail, 2/26/95: “I certainly do not want to bring this intellectual property issue up without careful consideration. I especially do not want it all over JEDEC . . .”); CX711 at 68, 73 (Crisp e-mail, 5/24/95: “[I]t makes no sense to alert them to a potential [patent] problem they can easily work around.”); CX837 at 2 (Crisp e-mail, 9/23/95: “we should re-evaluate our position relative to what we decide to keep quiet about, and what we say [to JEDEC] we have”); CX1277A at 1, 2 (Presentation, 3/96: “200MHz SDRAM Myth,” “Challenges (do not tell them :-)”); CX919 (Tate e-mail, 2/10/97: “do *NOT* tell customers/partners that we feel DDR may infringe—our leverage is better to wait”); *see also* CCRF 194-95.

Finally, Rambus asserts that “there is evidence that numerous patents and patent applications relating to JEDEC standards were not disclosed to JEDEC.” RB 39. Whether in fact any of the patents or applications alluded to by Rambus were subject to mandatory disclosure is unclear, as in most cases Rambus has failed to provide any analysis of the subject matter of the

patents in question. CCRF 249, 252, 259, 261-62, 265, 267, 270. Indeed, Rambus failed to demonstrate that the patents or applications were not disclosed, let alone any evidence relating to whether the JEDEC members had “actual knowledge” of patents or applications while participating in JEDEC. CCRF 251, 254, 257-58, 264, 269, 272-73. Even if it were true that other companies may have, in some instances, failed to disclose, this does not alter the fact that JEDEC’s rules require such disclosures. Rambus cannot point to one instance in which another company failed to make required disclosures and then successfully enforced the undisclosed patents against JEDEC-standardized products. The only other instances involving something similar—one involving Wang and the other Texas Instruments—resulted in litigation and, in the latter case, revocation of the affected standard. CCF 423-432, 434.

3. JEDEC’s Disclosure Rules Were Not Limited to “Essential” Patents

Rambus also argues that the disclosure obligation extends only to ‘essential’ patents.” RB 40 (emphasis added). Rambus’s claims in this regard find no support in the record.²⁷ The contemporaneous evidence shows that JEDEC itself resolved this issue in a manner squarely at odds with Rambus’s contentions. In March 1994—in connection with JEDEC’s work on “Quad-CAS standards”—Texas Instruments (“TI”) formally proposed that “the JC-42.3 Committee . . . should review and clarify its interpretation of the JEDEC Patent Policy” to make clear that the policy applies only “to patents the use of which is actually required by a JEDEC standard.” CX353 at 2-4 (emphasis added). But TI’s proposal was rejected. In a memorandum distributed to the committee, EIA general counsel John Kelly “disagreed” with this proposed interpretation, Tr. 1943, and reiterated that the policy is invoked whenever “the candidate standard may require

²⁷ Rambus’s theoretical argument has little practical bearing in this case because, as Rambus has clearly stated elsewhere, it believes its patents are essential to the practice of the JEDEC standards. *See* CCF 1950-2032.

the use of a patented invention.” CX353 at 1 (emphasis in original); CX355.²⁸ Consistent with the documentary evidence, Kelly testified, “[A]ny time a participant has knowledge of relevant intellectual property, patent or application, that is or may be required to comply with the work underway, then that participant has an absolute duty to disclose it.” *Id.* at 1979; *see also* Landgraf, Tr. 1693-94 (disclosure of patents or applications “that would potentially be impacting the standard”); G. Kelley, Tr. 2705 (“any claim that might apply to the work of the committee”); Sussman, Tr. 1346 (must disclose where there is a “gray” area); Williams, Tr. 909-11 (must disclose if “there would be a reasonable possibility that the patent was going to be associated with the work of JEDEC”); CCF 335-37.

4. JEDEC’s Rules Require Disclosure as Early in the Process as Possible

Rambus again resorts to policy arguments in an effort to support its contention that patented-related disclosures were not required “until a proposal was balloted for approval.” RB 42. According to Rambus, “the purported purpose of any disclosure of intellectual property—to allow JEDEC to make a conscious decision as to whether to include patented technology in standard—would best be served by disclosure at the time of balloting. Otherwise, there would be many more disclosures than actually required, and JEDEC would spend significant amounts of time considering—or trying to avoid—patents that might not apply to the standard as it is ultimately

²⁸ *See also* Kelly, Tr. 1946 (“TI was taking the position that there had to be an absolute nexus ... between the use of the patent and compliance with the standard, and that’s not the rule”), 1942 (“[M]y response was, no That’s not the rule. ‘May be required’ is the rule.”). Rambus plainly understood that JEDEC’s rules required disclosure of patents and applications that related to or potentially might be required by JEDEC’s standards, or standard-setting work, and was not limited only to patents that were “essential” to use of the standards. For example, Richard Crisp testified that “it was clear that the [21-I] manual required disclosure of both patents and applications . . . if they related to the work of the committee.” Tr. 2979. He also testified, “they wanted to know about both patents and patent applications that might relate to the works that were going on within JEDEC.” Tr. 2980 (emphasis added). Crisp also wrote, in December 1995, “As long as we mention that there are potential patent issues when a showing or a ballot comes to the floor, then we have not engaged in inequitable behavior.” CX711 at 188 (emphasis added).

balloted for approval.” *Id.* at 42-43. These unsupported policy arguments are directly contradicted by the record. *See, e.g.*, the testimony of John Kelly:

- Q. [F]or a duty to disclose to arise, is it necessary that the standardization process has reached the stage of a final ballot?
- A. Absolutely not.
- Q. For a duty to disclose to arise under JEDEC’s or EIA’s rules, is it necessary that any kind of standards-related vote has occurred or has been scheduled to occur?
- A. No, sir. . . .
- Q. [F]or a duty to disclose relevant patents or patent applications to arise, does the standards work have to have reached the stage of a first presentation or showing?
- A. No, sir, it’s a–again, it’s as early as possible. It’s not tied to any procedural formality in the process at all.

Tr. 1984-85; *see also id.* at 1945 (disclosure required “as early as possible in the process”); *id.* at 1956 (same); *id.* at 1972 (same); *id.* at 1981 (same); *id.* at 2065 (“absolutely not the case” that disclosure is only required if “a formal ballot was presented for a vote”); Landgraf, Tr. 1695-96 (you were supposed to disclose “[a]s soon as a member knew”); Calvin, Tr. 1012-13 (obligation to disclose “as you began to realize that the direction the standard was going could be affected by” patents or applications); Rhoden, Tr. 356-57 (disclosure required “as soon as you become aware that a topic is being discussed” for which you have IP); Rhoden, Tr. 488-89 (disclosure duty triggered by “discussion, presentation, ballots, anything that’s taking place inside the committee”); Sussman, Tr. 1343 (disclosure duty triggered by “[b]asically any discussion”); CX208 at 19 (obligation to inform meeting of patents or pending patents that “might be involved in the work they are undertaking.”); CCF 339-44.

E. JEDEC’s Patent Policy Was Clear and Well Understood

The evidence elicited at trial, much of which Rambus ignores, overwhelmingly proves the material allegations of the Commission’s Complaint concerning the nature and scope of JEDEC’s patent disclosure policy. Contrary to Rambus’s various arguments, the EIA/JEDEC

patent policy imposed upon all JEDEC members a mandatory duty to disclose, as early in the process as possible, any patent or application that “may be required” by or “might be involved in” JEDEC’s developing standards. Rambus argues that if JEDEC’s rules did impose mandatory disclosure obligations, the duty to disclose was “too indefinite to be enforced.” RB 43. This contention is belied by the evidence and by Rambus’s own prior admissions.

Before the trial court in *Infineon*, Rambus’s lawyers made the following unambiguous admission: “Rambus acknowledges that it had a duty to disclose . . . all of its actual patents relating to SDRAMs to JEDEC.” Mem. in Supp. of Renewed Mot. for JMOL at 10 (May 31, 2001) (emphasis added) [**Tab 1**].²⁹ The significance of this admission cannot be overstated. This was a clear acknowledgment by Rambus, made closer in time to the actual events in dispute,

- (1) that JEDEC’s rules imposed a mandatory “duty to disclose”;
- (2) that the duty applied to Rambus itself; and
- (3) that it extended to all patents “relating to SDRAMs.”

Id. (emphasis added). While Rambus makes much of statements by the *Infineon* majority suggesting JEDEC’s patent policy is lacking in “defining details” (RB 46; *Rambus*, 318 F.3d at 1102), the same opinion found, by “clear and convincing evidence,” that JEDEC’s rules impose

- “a disclosure duty” (*id.* at 1098);
- applicable to all JEDEC “members” including Rambus (*id.*);
- that “required members to disclose patents and patent applications” (*id.* at 1085);
- provided they “‘related to’ the standardization work of the [relevant

²⁹ See also *Rambus Inc. v. Infineon Techs.*, 164 F. Supp. 2d 743, 751 (E.D. Va. 2001) (“Rambus acknowledges . . . it had a duty to disclose any issued patents while it was a member of JEDEC and participated in JEDEC’s standard-setting process” and only “dispute at trial” was “whether patent applications were required to be disclosed”) (emphasis added).

JEDEC] committees” (*id.*; all emphasis added).

The *Infineon* majority also concluded that JEDEC members, through their actions, “treated” the organization’s rules “as imposing a disclosure duty” of this type. *Id.* at 1111.³⁰

Why did Rambus, in *Infineon*, admit to the mandatory nature of JEDEC’s patent disclosure duty, its broad scope, and its applicability to all members, including Rambus itself? And why did the *Infineon* majority, despite ultimately ruling for Rambus on the fraud issue, reach the very same conclusions, even acknowledging the disclosure duty’s applicability to patent applications as well as patents? The answer to both questions is that any fair reading of the evidence compels such conclusions. As for the *Infineon* majority’s statements about the supposed lack of “defining details” in JEDEC’s policy, the best explanation for this may be the far more limited scope of the record in *Infineon*, which encompassed patent infringement issues and which included only three fact witnesses who were not associated with either Rambus or Infineon (and two of them were by deposition).³¹ Moreover, as noted above (*see* n.16, *supra*), the *Infineon* majority and dissent concurred in the view that the testimony of John Kelly—“EIA’s general counsel since 1990 and the person responsible for implementing the EIA/JEDEC patent policy,” 318 F.3d at 1097—deserved particular attention. Yet in *Infineon*, Mr. Kelly testified only very briefly (he was one of four witnesses in one day). Here, Mr. Kelly testified for the better

³⁰ In discussing the Federal Circuit *Infineon* decision, Rambus asserts that it involved “the very same theory” as this case, “framed in common law terms.” RB 43 (emphasis added). This is incorrect for reasons Complaint Counsel has already explained. *See* CCB 77-83.

³¹ By contrast, the record in this matter reflects testimony of witnesses representing JEDEC and 18 companies, plus other miscellaneous witnesses and expert witnesses. The record in this matter spans 11,407 pages (not including designated deposition testimony), compared with only 3493 pages in the *Infineon* case. Furthermore, many important documents were never introduced into evidence in the *Infineon* case, apparently due in part to Rambus’s failure to produce the documents to Infineon during the course of their litigation.

part of two days, resulting in over 400 pages of transcript. If Your Honor appropriately places considerable weight on Kelly's testimony, it simply is not possible to reach the conclusions that Rambus's brief espouses, including that JEDEC's patent policy was "too indefinite to be enforced." RB 43.³²

One factual episode on which Kelly testified drives this point home. As already noted, in March 1994 TI formally proposed that "the JC-42.3 Committee . . . should review and clarify its interpretation of the JEDEC Patent Policy." CX353 at 2-4 (emphasis added). The minutes from that March 1994 JEDEC meeting record the Committee's contemporaneous reaction to TI's suggestion, using unmistakable language: "The Committee was asked if the patent policy is clear. The Committee felt is was clear." JX19 at 5 (emphasis added). Mark Kellogg of IBM explained:

My recollection is that . . . the discussion had led some to question whether or not there really was any confusion with the patent policy, and it was necessary to determine whether or not there was confusion with the basic patent policy, the need and obligation to disclose patent activity. This vote was taken to see if everyone in the room agreed to the patent policy. My recollection is that this was a unanimous vote. (Tr. 5028.)

³² Rambus also argues—based on statements by the Federal Circuit majority—that the "subjective beliefs" of JEDEC members regarding whether patents or applications may relate to JEDEC's work are "irrelevant" and "cannot" trigger a duty to disclose under JEDEC's rules. RB 47-48. Rather, Rambus claims, a disclosure duty "can only be triggered by the objective fact that a JEDEC member holds patent interests that would cover a technology being standardized." *Id.* at 48 (emphasis added). While Complaint Counsel knows of no evidence in *Infinion* to support this conclusion, such a conclusion cannot possibly be reached based on the record in this case. *See* CCFF 318-24. John Kelly could not have been more vocal in his disagreement with this aspect of the Federal Circuit majority's analysis. He testified, "I'm afraid the majority as a matter of fact got it wrong." Tr. 2063. In his words, the majority's "objective" test "basically requires participants in the process to make an on-the-spot . . . analysis of what the final standard will look like and whether or not the patent," or "patent application" when it "finally issues," will infringe. *Id.* at 2066. He explained that this interpretation of JEDEC's rules creates "an untenable situation" in that "it deters open disclosure rather than encouraging open disclosure" and "basically turns the whole process on its head." *Id.* at 2066-67; *see also* CX3089 (JEDEC amicus brief supporting *en banc* rehearing in *Rambus v. Infinion*). A legal treatise relied upon by Rambus reinforces the views expressed by Mr. Kelly, noting that "[p]atent claim construction is a complex and uncertain legal inquiry, and that courts should be hesitant to impute knowledge of a patent's scope" in place of evidence of what the defendant subjectively "believed" regarding whether "the patent . . . would cover the standard." 2 H. HOVENKAMP ET AL., IP AND ANTITRUST § 35.5, at 35-43 (emphasis added).

Notably, Richard Crisp was in attendance at this meeting on behalf of Rambus. JX19 at 1; CX711 at 15-16. Indeed, Mr. Crisp testified that observing this incident involving Texas Instruments was “one of” the “things” that he “saw in JEDEC meetings” that “helped . . . form [his] belief as to what the policy was.” Tr. 2976. If Crisp himself—contrary to the unanimous vote of his JEDEC colleagues—had been uncertain about the meaning or scope of JEDEC’s disclosure rules, he could have contacted John Kelly for clarification, as JEDEC participants were frequently advised to do (*see* n.13, *supra*), or simply raised his hand at the time of the committee vote. However, he did neither. Kelly, Tr. 2057 (Rambus never asked about JEDEC’s rules); Kellogg, Tr. 5028 (the vote on the policy was unanimous).

Rambus further suggests, citing no evidence, that “any disclosure duty” was limited to “JEDEC members who . . . were presenting their technologies,” as opposed to those “who only passively participated.” RB 48 (emphasis added). It is not surprising that Rambus cites no evidence for this proposition considering that it conflicts with Rambus’s own contemporaneous documents,³³ as well as its prior admissions.³⁴

F. Rambus Had a Duty to Disclose Specific Patent Materials to JEDEC

Rambus’s 14-page argument that it had no duty to disclose any specific patent or application to JEDEC (RB 49-63) is built upon a series of faulty premises. Rambus assumes, without any support, that the requirement under the antitrust laws that it not engage in monopolization translates solely to a duty to abide by JEDEC obligations, which it equates to

³³ CX711 at 188 (“As long as we mention that there are potential patent issues when a showing or ballot comes to [the] floor, then we have not engaged in inequitable behavior.”) (emphasis added).

³⁴ *See* Mem. in Supp. of Renewed Mot. for JMOL at 10 (May 31, 2001) [Tab 1] (“Rambus acknowledges that it had a duty to disclose . . . all of its actual patents relating to SDRAMs to JEDEC.”) (emphasis added).

JEDEC rules, which it further restricts to JEDEC mandatory rules, which it then interprets as narrowly as possible. Rambus asserts, incorrectly, that only “essential” patents that literally “read on,” or “would necessarily have been infringed by,” JEDEC’s standards (or devices complying with such standards) were required to be disclosed (RB 49, 51, 53). Rambus’s series of assumptions, by which it restricts any obligation under the antitrust laws to mere compliance with mandatory JEDEC rules, narrowly interpreted, ignores antitrust precedent, such as *Allied Tube*, as explained in Sections II.A-C above. Furthermore, Rambus’s tortured interpretation of the JEDEC disclosure policy is flatly contradicted by the record evidence. CCF 300-46.

Contrary to Rambus’s claims, determining whether Rambus in fact had a duty to disclose patent-related information to JEDEC does not depend upon a legalistic analysis of which claims in which patents or pending applications literally “read on” features in JEDEC standards or specific standard-setting proposals. Rather, the proper focus of any such analysis should be on three simple, amply supported facts:

- (1) from the beginning of Rambus’s membership in JEDEC at least through mid-1996, Richard Crisp and other Rambus representatives had actual knowledge of the technologies being considered for inclusion in the JEDEC SDRAM and future SDRAM standards;
- (2) Rambus understood that it could amend its pending ‘898 application and various other continuation and divisional applications to add claims specifically covering these technologies; and
- (3) while Rambus was a JEDEC member, Richard Crisp and others at Rambus worked with the company’s lawyers to draft such specific claims and, after they had been filed, to prosecute those filings before the PTO. (CCFF 853-57, 867-1114.)

Even if the Court were to accept Rambus’s most restrictive interpretation of its obligations, however, the record evidence, discussed below, establishes that Rambus did have a duty to disclose various patent applications and at least one issued patent (the ‘327 patent). In

other words, under any reading of JEDEC's rules espoused in this case, the facts show that Rambus violated its duty to disclose relevant patent-related information to JEDEC.

1. Rambus Had a Duty to Disclose the '327 Patent

The record demonstrates that an engineer reasonably would have concluded that claims 1 and 7 of Rambus's '327 patent covered dual-edge clocking presentations made while Rambus was a JEDEC member. CCF 1216-37. Rambus's argument that it had no disclosure duty because the claims of the '327 patent do not "read on" or are not "essential to" the dual-edge clocking technology presented at JEDEC, RB 50-52, is inaccurate and misplaced. In fact, the record reflects that claim 1 of the '327 patent covers the only way to input data on both edges of a clock. CCF 1218-23. While claim 7 of the '327 patent did not cover all possible implementations of dual-edge clocking to output data, Rambus ignores that it covered the most logical and likely implementation of dual-edge clocking to output data. CCF 1229-37. It also ignores the clear language of JEDEC's patent policy, which requires not that a patent or patent application "cover" a proposed technology as that term is specifically construed by patent law, just that it "might be involved in" JEDEC's work. CCF 319, 335-38.³⁵

Rambus's claim that it had no disclosure duty because there was no "triggering event" after the '327 patent issued (RB 50) similarly lacks support. The JEDEC disclosure duty did not turn on any "triggering event," like a ballot proposal. CCF 288-89, 296, 329-31. In any case, there were triggering events. Rambus attended multiple meetings at which dual-edge clocking

³⁵ Rambus also argues that the '327 patent did not relate to the presentations of IBM's toggle mode in December 1991 and April 1992 because toggle mode used the RAS and CAS signals to control memory operation. RB 52-53 n.22. The evidence establishes, however, that the CAS signal in IBM's toggle mode acted as a dual-edge clock signal during its operation. CCF 623, 628-29. Because claims 1 and 7 of the '327 do not specify any particular type of clock signal, the claims would appear to cover IBM's toggle mode. CCF 1218-23, 1229-33.

was discussed. CCF 620-41, 871, 893, 1041-44, 1071-73, 1078-79, 1096-98. After the '327 patent issued, there was a further triggering event: on June 17, 1996, Rambus submitted a letter to JEDEC purporting to list its issued patents. Rambus's omission of the one patent directly relevant to JEDEC work violated Rambus's clear obligation not to affirmatively mislead JEDEC. CCF 1109-14.

Rambus's argument that it did not attend additional meetings when dual-edge clocking was discussed in early 1996 (RB 50 & n.19) is irrelevant. The record shows that during this period multiple Rambus representatives continued to receive and review JEDEC minutes,³⁶ and thus has "actual knowledge" of what was being discussed.³⁷ Similarly, Rambus's assertion that Complaint Counsel failed to show Richard Crisp had knowledge of the '327 patent (RB 50) ignores evidence that Mr. Crisp understood the potential scope and significance of Rambus's patent claims based on, for example, his conversations with Lester Vincent and his work helping

³⁶ See CCF 834, 1057 (Tate e-mail asking staff to send Mr. Diepenbrock "JEDEC meeting reports" to help Rambus efforts "to strengthen our IP position relative to competition"); CCF 1096-98 (Crisp e-mail circulating the minutes from the JEDEC January 1996 meeting); CX868 at 1 (February 1996 Crisp email to Geoffrey Tate and others; reads, in part, "I have put copies of the JC42.3 meeting minutes in each of you mail slots. Notice the Micron presentation especially the part about transmit and receive clocks" (emphasis added)). The record also shows that Mr. Crisp informed others at Rambus that future SDRAMs were likely to incorporate dual-edge clocking. See, e.g., CCF 633-41, 1106-08; see also CCF 1043, 1053.

³⁷ Rambus also suggests, citing no evidence, that there is some "question" whether it had any obligation to disclose "after it stopped attending JEDEC meetings" in December 1995 "but before it finalized its withdrawal" in June 1996, given that it "paid dues only through 1995." *Id.* at 49 n.19. However, uncontroverted testimony establishes that nonpayment of dues would not have relieved Rambus of its duty to disclose. Kelly, Tr. 1808-09 (termination of membership for non-payment of dues only occurs when several "past due notices" have been issued and it is known "to a reasonable degree of certainty" that the member does not "intend to pay their dues;" even then JEDEC members are not dropped "for nonpayment of dues until around September" of the dues year.). Indeed, Rambus routinely paid its dues between February and April of each year while it was a member. CCF 954, 982, 1039.

to draft some of the relevant patent claims.³⁸ CCRF 288.³⁹ Crisp was also specifically aware of Rambus's '327 patent and its assertion that Mosys's use of dual-edge clocking technology infringed that patent. CCFF 1102.

More fundamentally, contrary to Rambus's argument (RB 50), others within Rambus knew that Rambus's patents or applications might be involved in JEDEC work, and they had an obligation to inform Crisp so that he, in turn, could inform JEDEC. CCRF 288. The fact that JEDEC rules did not require representatives to conduct all-out searches for potentially relevant patents (CCFF 325, 333) does not mean that firms can shirk their disclosure duty by shielding their JEDEC representative from key patent information. CCFF 334. Several people at Rambus, including its CEO and Vice President knew about the pending Rambus patent applications and the on-going JEDEC work, CCFF 988-93, 1003-06, 1008, 1043, 1052-53, 1069, 1071-73, 1076-79, 1092-95, 1098, 1100-08, and they could not evade Rambus's duty by shielding Crisp from this information without, at a minimum, violating JEDEC's duty of good faith. CCFF 334.⁴⁰

2. Rambus Had a Duty to Disclose Its Relevant Patent Applications

a. Applications Relating to the SDRAM Standard

The evidence shows that, from May 1992 on, during the entire time that Rambus representatives Richard Crisp, Billy Garrett, and Vice President David Mooring observed JEDEC

³⁸ Crisp also had complete access to Rambus's patent files. CCFF 1050. Complaint Counsel cannot establish whether Crisp received a copy of the '327 patent when it issued, or was otherwise more directly involved in preparing to enforce it against Mosys, in part because, at Rambus's behest, Lester Vincent destroyed portions of his files, including correspondence between Vincent's firm (Blakely, Sokoloff) and Rambus. CCFF 1746-47.

³⁹ Similarly, Rambus's assertion that Complaint Counsel failed to show Richard Crisp had knowledge about the '646 patent, RB 61, ignores the record evidence. CCRF 288.

⁴⁰ Indeed, Rambus CEO Geoff Tate later confirmed he knew that Rambus had concealed the importance of the '327 patent. CX942 at 1 ("we already have the '327 patent but few people are aware of what it means").

work, and ultimately JEDEC ballots, involving a programmable CAS latency and burst length, Rambus representatives (1) believed that Rambus had invented these technologies; (2) understood that Rambus could amend its patent applications (including its '651 and '961 applications) to add claims to cover their use in SDRAM; and (3) were working with Rambus's outside patent lawyer to draft claims—directed at SDRAMs—to be added to Rambus's pending applications to cover use of these technologies. CCF 862-66. Nonetheless, Rambus never made any disclosure to JEDEC that would have alerted its members to such facts.⁴¹

Likewise, Rambus never mentions that, just before JEDEC adopted the SDRAM standard, Rambus failed to disclose an amendment to a patent application it filed with the specific intention of covering the on-going JEDEC work. At the JC-42.3 meeting on May 19-20, 1993, Richard Crisp observed a presentation at which Gordon Kelley of IBM stated that the SDRAM standard was likely to be adopted at the next Council meeting. CCF 959-60. Although Mr. Vincent had recently filed an amendment to Rambus's pending '651 application to add claims that Mr. Crisp and other Rambus representatives believed covered the use of programmable CAS latency in SDRAMs, Mr. Crisp did not disclose any information about the '651 application or any other Rambus patent application at this, the final JC-42.3 Subcommittee meeting before the Council approved the SDRAM standard, or at any other JEDEC meeting. CCF 955, 958-62, 964.⁴²

⁴¹ Indeed, Mr. Mooring attended the July 1992 meeting where JEDEC tallied the SDRAM ballots and did not disclose Rambus's belief, expressed in a document circulated the month prior to the Rambus Board and executives, that "SyncDRAM infringe on some claims in our filed patents." CX543A at 17; *see* CCF 911-927.

⁴² What is relevant here is what Rambus believed and intended at the time. The fact that its lawyers improperly drafted the claims (a mistake that they later corrected) does not absolve Rambus of its disclosure duty. *See* 2 H. HOVENKAMP ET AL., IP AND ANTITRUST § 35.5, at 35-43 (suggesting, in this context, that courts should focus on what the defendant subjectively "believed" regarding whether "the

By the spring of 1994, Allen Roberts and others at Rambus had come to realize that the claims of the '651 application were perhaps not as broad as they had believed. David Mooring suggested that Rambus “kick-off another patenting spree” during this “window of opportunity left while [Rambus] still ha[d] confidential information.” CX726; CCF 987. Shortly thereafter, Mr. Roberts suggested to Lester Vincent enhancements to Rambus’s patent coverage, including the use of registers containing values to control CAS access timing. CX734 at 2; CCF 988-93. In January 1995, Vincent filed an amendment to Rambus’s ‘961 application in which he finally achieved what Rambus had intended from the beginning—new claims covering programmable CAS latency and burst length as used in JEDEC’s SDRAM standard. CCF 1028, 1125-63.

Rambus attempts to dismiss the import of this filing by relying on the PTO’s office action of April 1995 indicating that it would reject these claims as indefinite, even though the application (and the claims) remained pending and although this action had no bearing whatsoever on Rambus’s disclosure duty. *See* RB 55. Indeed, Rambus simply ignores its disclosure obligation between January and April 1995 (during which time Mr. Crisp attended the March 1995 meeting of the JC-42.3 Subcommittee). More importantly, the PTO action had no effect on the claims that Rambus could and did pursue. PTO rejection of claims as indefinite often reflects the PTO’s desire for clarification, and can be overcome with minor, non-substantive changes or no changes at all. CCF 90. Rambus continued to believe it was entitled to such claims, it continued to pursue similar claims in its ‘961 application, and it ultimately succeeded in obtaining similar claims in issued patents. CF 1049, 1649-67.

Rambus’s reliance on the Federal Circuit’s *Infineon* decision, for the proposition that claims in the ‘961 application were limited by a “device identifier feature” (RB 56) is misplaced.

patent . . . would cover the standard”).

Contrary to Rambus’s assertions, the Federal Circuit’s decision is not entitled to *stare decisis* effect in this matter because the FTC is not subject to the jurisdiction of the Federal Circuit. *See* U.S.C. § 1295 (granting the Federal Circuit jurisdiction only over specified matters, not including decisions of the FTC). Nor is the Federal Circuit’s decision, based as it is on the specific and limited record developed during the *Infineon* trial, persuasive here. Unlike Complaint Counsel, Infineon was defending patent infringement allegations and thus had no interest in asserting that Rambus’s prior patent applications covered technologies in Infineon’s products. *See* CCB 79. Rambus likewise sought to avoid any implication that patent applications pending while it was at JEDEC, but not disclosed to JEDEC, covered technologies discussed at JEDEC. As a result, in *Infineon*, the parties offered no testimony as to the scope of coverage of the claims of the ‘961 application, nor did they brief the issue on appeal. Indeed, as the dissent noted, “because neither party appears to have given the jury the necessary evidence to make such an analysis in the first instance,” it was improper for the court to even consider the issue. *Rambus*, 318 F.3d at 1117.

By contrast, there is a reliable record on this issue here. Both Prof. Jacob, an expert on memory architectures and systems, and Mr. Nusbaum, an experienced patent lawyer and examiner, examined the claims of the ‘961 in detail. They explained that, although certain of the claims in the ‘961 application were limited to the “device identifier feature,” the claims Complaint Counsel relied on were not so limited. Jacob, Tr. 5676-80; Nusbaum, Tr. 1561-62.⁴³

In June 1995, Rambus withdrew its ‘961 application and filed a new continuation application, the ‘490 application, also based on the original ‘898 application. The ‘490

⁴³ Rambus did not attempt to defend the Federal Circuit’s statement about the claims of the ‘961. Its patent expert declined to identify language reciting a “device identifier feature.” Fleisler, Tr. 8937, 8941. In contrast, Complaint Counsel’s experts provided detailed explanations regarding the meaning of the ‘961 claims and the lack of any limitation requiring a device identify feature. CCF 1125-63; Jacob, Tr. 5676-80; Nusbaum, Tr. 1561-62.

application contained claims 183-85 covering programmable CAS latency as used in the SDRAM standard. CCF 1164-82. The '490 application was pending before the PTO until February 1996.⁴⁴ During that time, JEDEC considered whether to use programmable or fixed CAS latency in the SDRAM standard as well as whether to carry programmable CAS latency over into the future (DDR) SDRAM standard. CCF 565-67, 570-75, 586-89. Rambus failed to disclose to JEDEC any information about its pending '490 application during this time.

Rambus fails in its attempt to limit retroactively the scope of the '490 application by finding an element in claims 183-85 that does not correspond to JEDEC-compliant SDRAM. Rambus asserts, without support, that the element "specifying the semiconductor device" in claims 183-85 in the '490 application refers to a feature that is not found in SDRAM. RB 58. In fact, the unrefuted testimony of Prof. Jacob and Mr. Nusbaum established that this element corresponds to the chip-select line in the SDRAM architecture.⁴⁵

Rambus also argues that Complaint Counsel failed to establish that Mr. Crisp had knowledge of the specific claims in the '961 and '490 patent applications. RB 57-58. In fact, the

⁴⁴ Rambus asserts that these claims were withdrawn in November 1995. RB at 57. Rambus cites to a "provisional election" made during a telephone conversation by Scot Griffin, an associate working for Lester Vincent, to prosecute claims 176-82 instead of claims 183-85; the PTO action specifically stated that "[a]ffirmation of this election must be made by applicant in responding to this office action." CX1504 at 275. Rambus did not in fact cancel claims 183-85 until February 26, 1996. *Id.* at 279. Even then, cancellation was "without prejudice" to filing the same or similar claims in other continuation or divisional applications. *Id.* In fact, Rambus continued to pursue, and ultimately obtained, claims covering programmable CAS latency as used in SDRAMs. CCF 1650-61.

⁴⁵ Rambus asserts, again without support, that the Federal Circuit's interpretation of language found in certain claims of the '961 application somehow is relevant to the phrase "transaction request specifying the semiconductor device" in claims 183-185 of the '490 application. RB 58. In fact, the claims in question from the '961 application refer to identification information stored in the register, whereas claims 183-85 in the '490 application refer to identification information transmitted across the bus. *See, e.g.*, Jacob, Tr. 5676-80 (the claims of the '961 limited by the device identifier feature include claims 152, 153, and 166); *id.* at 5678 (the limiting language in claim 152 of the '961 application is: "wherein the register is an identification register operative to store an identification number for the semiconductor device").

record shows not only that he was centrally involved in work directed at drafting claims to cover programmable CAS latency, CCF 900-01, 910, 920, 928, 932-33, 948, 955, 958, but also that he was aware that Rambus had pending applications with claims covering programmable CAS latency. *See* CX711 at 68, 73 (5/24/95 Crisp e-mail (When asked about Rambus patents that might read on SyncLink, Mr. Crisp wrote to others within Rambus, “[a]s far as intellectual property issues go here are a few ideas: . . . 4. DRAM with programmable access latency”)). Mr. Crisp also had access to the entire set of Rambus patent files, and reviewed various materials in those files during the summer of 1995.⁴⁶ CX1050. Moreover, Geoff Tate, David Mooring, and Allen Roberts, among others, had been informed of the JEDEC work and were directly involved in efforts to ensure that Rambus’s patent claims would cover programmable CAS latency and burst length as used in the JEDEC standard. CCF 876, 893-95, 900, 905, 908, 921, 926, 930, 938, 940-41, 948, 962-63, 981, 989-93, 1045, 1073.⁴⁷ Accordingly, Rambus has failed to refute the compelling evidence that it violated its duty to disclose to JEDEC the ‘961 and ‘490 patent applications.

b. Applications Relating to the Future SDRAM Standard

Despite its assertions regarding its ‘692 application (RB 58-59), Rambus knew—and

⁴⁶ Complaint Counsel cannot ascertain whether Mr. Vincent sent copies of the ‘961 and ‘490 applications to Mr. Crisp when they were filed in part because Mr. Vincent, at Rambus’s behest, destroyed documents from his patent prosecution files, including correspondence between Blakely, Sokoloff, and Rambus. CCF 1746-47.

⁴⁷ *See also* CX1946 (Roberts conversation with Vincent regarding claims Crisp wanted to add regarding “mode register to control latency” and asking whether the original application covered “blocks”); CX686 (Crisp e-mail copying Roberts regarding planned claims on “DRAM with programmable access latency”); CX1959 (Ware e-mail to Roberts et al: a claim regarding a “writable configuration register permitting programmable CAS latency” that was “directed against SDRAMs” had been filed); CX1970 (meeting among Tate, Roberts, and Vincent; “Enforcement: Sink DRAM . . . config registers”); CX734 (Roberts letter to Vincent re patent enhancements relating to registers to control “CAS access timing”).

should have disclosed to JEDEC—that various claims in that application covered the work it observed at JEDEC involving on-chip PLL/DLL. CCF 1183-98. In September 1994, while Rambus’s ‘692 application was pending, Mr. Crisp observed an NEC presentation incorporating an on-chip PLL. CCF 604-06, 1009-13. Mr. Crisp also observed, or received copies of, JEDEC work involving on-chip PLL/DLL in the latter half of 1995 and early 1996, also while the ‘692 application was pending. CCF 608-16, 1071-73, 1078-82, 1096-99.

Contrary to Rambus’s unsupported statements about Richard Crisp’s lack of knowledge (RB 59), the contemporaneous evidence clearly shows that he knew about the claims in the amended ‘692 application and understood the relationship between those claims and the NEC presentation.⁴⁸ Several times in 1992 and 1993, Mr. Crisp had consulted with Lester Vincent and others at Rambus to add claims covering the use of PLLs and DLLs on DRAMs to pending applications. CCF 932-35, 947-48, 962-64. In June 1993, Mr. Vincent filed an amendment to the pending ‘692 application to add claims covering PLLs/DLLs on DRAMs, including SDRAM. CCF 966. Mr. Vincent sent Mr. Crisp a copy of the amendment to the ‘692 application two days after it was filed. CCF 967. Upon seeing the NEC presentation in 1994, Mr. Crisp e-mailed Rambus management, alerting them to the relationship between the claims and the presentation. CCF 1009-13. Mr. Crisp and Allen Roberts even discussed Rambus potentially having “to fight litigation at some point in the future” and getting NEC to “belly up some dollars.” CCF 1014-15. The next month, Mr. Crisp and Rambus executives again discussed

⁴⁸ Many others at Rambus also knew about both the on-going JEDEC work and the scope of the ‘692 application, including CEO Geoff Tate, VP Allen Roberts, and VP David Mooring. *See* CX711 at 36 (Crisp e-mail about NEC’s presentation sent to entire executive group); CX1961 (forwarding a copy of the amendment to the ‘692 application to Roberts); CX1970 (discussion involving Tate, Roberts, and Vincent on “Enforcement: Sink DRAM . . . PLLs”); CX2056 at 268 (Mooring, Dep.) (“We believed we invented key aspects of several of the things on [the October 1995 survey ballot]”); CCF 962-63, 966-67, 981, 1009-25, 1070-73.

filing suits and collecting royalties for using a PLL on a DRAM. CCF 1018-25. In short, Mr. Crisp had a very clear understanding of the relationship between Rambus's '692 application and JEDEC's on-going SDRAM-related work.⁴⁹ CCF 1017.

During the latter half of 1995 and early 1996, when Rambus representatives observed or otherwise learned of additional JEDEC work involving on-chip PLL/DLLs, Rambus also increased its efforts to ensure that its pending patent claims covered technologies used in SDRAM and "future SDRAM," including on-chip PLL/DLL. *See, e.g.*, CCF 1074-75 (October 1995 amendment to the '692 application).⁵⁰ Again, despite Richard Crisp's advice when he circulated the January 1996 presentation on PLL/DLLs and echo clocks that Rambus "have a long hard look at our IP and if there is a problem, I believe we should tell JEDEC that there is a problem," Rambus never disclosed anything about its pending applications or the related work with its patent lawyer. CX868 at 1; CCF 1098-99.

⁴⁹ Despite Rambus's admonition to focus on "contemporaneous evidence"—what the relevant individuals "said, wrote and did during the time period from early 1992 to mid-1996," RB at 24—Rambus completely disregards the contemporaneous evidence showing that the claims in the amended '692 were intended to cover, did cover, and were understood by Rambus to cover the work observed by Mr. Crisp at JEDEC. Instead, Rambus assumes the narrowest possible interpretation of the disclosure duty, and relies solely on the after-the-fact testimony of a paid expert to try to establish that, despite the contemporaneous understanding of Rambus witnesses, the claims of the '692 technically did not cover the on-going JEDEC work. CCB 59. Even then, Rambus's argument falls short. The third element of claims 151 and 152 of the '692 application, on which Rambus focuses, is satisfied by the generation of a local clock signal for "performing" or "controlling" "memory operations with respect to the memory array." CX1502 at 208, 233-34. By controlling the output buffer, through which the memory array drives data onto the bus, the local clock signal generated by the PLL in NEC's presentation performed and controlled memory operations. Jacob, Tr. 5536-39 ("the figure [in the NEC presentation] shows the local clock signal coupled to the memory array through the output driver that drives data onto the bus, so . . . this . . . performs read operations"); Nusbaum, Tr. 1590-91; CCF 1190. Dr. Fleisler's requirement that the local clock control the memory array directly finds support nowhere in the claims, and, more importantly, is contradicted by the contemporaneous views of Richard Crisp, Allen Roberts, and others.

⁵⁰ *See also* CX3129 at 451-54 (Vincent, Dep.) (meeting between Messrs. Diepenbrock and Vincent regarding DLLs in January 1996); CX3129 at 457-60 (Vincent, Dep.) (meeting between Messrs. Diepenbrock and Vincent regarding DLLs in February 1996).

Additionally, Rambus has failed to refute that it knew—and should have disclosed—that various claims in its ‘646 application likely would have covered JEDEC presentations relating to dual-edge clocking. CCFF 1199-1215. Although Rambus argues that claim 151 should be disregarded because the PTO determined that it was indefinite, RB 60, as noted above, a PTO office action based on indefiniteness had little, if any, effect on Rambus’s ability to pursue the identical or a slightly modified claim.⁵¹ Further, claim 152 of the ‘646 was pending from September 1994 until April 1996, when the ‘327 patent issued. CCFF 1212, 1214. Claim 152 of the ‘646 application issued as claim 1 in the ‘327 patent. CCFF 1214. Thus, for all the reasons that claim 1 of the ‘327 patent would have covered JEDEC work while Rambus was a member, CCFF 1218-32, so too would claim 152 of the ‘646 application have covered that same JEDEC work.

G. Rambus’s Had a Duty to Disclose with Respect to Work on Future SDRAM

Respondent’s argument that JEDEC’s work on the DDR standard began after Rambus withdrew from the organization⁵² (RB 61-63) is contradicted by the weight of the evidence. Trying to deflect attention from the testimony of knowledgeable JEDEC officials, Rambus states that Your Honor should focus on “contemporaneous evidence.” RB at 61. Yet Rambus conveniently ignores the documents from its own files that clearly establish Rambus’s awareness that work on the DDR SDRAM standard had begun long before Rambus left JEDEC.⁵³ The

⁵¹ Additionally, Rambus’s argument that it had no disclosure duty because claim 151 did not “read on” JEDEC presentations, RB 60, is also misplaced. *See supra* pp. 30-31.

⁵² Rambus’s withdrawal from JEDEC did not relieve it of its disclosure obligations. *See* CCFF 344.

⁵³ *See also* CCB at 85-86; CCFF 600-616 (JEDEC work on on-chip PLL/DLL prior to June 17, 1996) and CCFF 623-641 (JEDEC work on dual-edge clocking prior to June 17, 1996). As noted previously, JEDEC consideration of dual-edge clocking occurred prior to adoption of the first generation

evidence, from the 1993-1996 time period, includes the following:

May 1993 email from Richard Crisp noting that JEDEC “is rushing ahead to get a next generation standard” CX700 at 2; CCFF 579.

June 1993 email from Rambus engineer Fred Ware discussing patent claims that could be “directed against future SDRAM.” CX1959 at 1; CCFF 963.

September 1994 email from Mr. Crisp informing Rambus that NEC proposed that JEDEC “put[] a PLL on board their SDRAM” CX711 at 36; CCFF 1013.

September 1994 email exchange between Mr. Crisp and Allan Roberts about Rambus’ IP claims relating to the on-chip PLL technology. *See* CX757 at 1; CCFF 1014 - 1015.

March 1995 email from Mr. Crisp noting contemporaneous statements by JEDEC official Hans Wiggers that “JEDEC has been working for over two years to standardize a high speed interface.” CX711 at 52, 54; CCFF 579.

May 1995 email from Mr. Crisp about IP issues related to SyncLink proposal that included dual-edge clocking. CX711 at 73; *see* CCFF 1043-44, 1046.

September 1995 handwritten note taken by Geoff Tate during a meeting with in-house counsel, stating “SDRAM - now - next.” CX1730 at 1; CCFF 803, 1058.

Fall 1995 JEDEC survey ballot on “future SDRAM,” including dual-edge clocking and on-chip PLL/DLL, circulated at Rambus. CX260 at 3, 9, 12; CCFF 1071-1073.

December 1995 email from Mr. Crisp to others at Rambus, noting “momentum . . . building for getting a new SDRAM standard kicked off.” CX843 at 1; CCFF 1081.

December 1995 JEDEC report from Mr. Crisp about the results of the future SDRAM survey ballot, noting that Mosaid had disclosed “a pending patent application for PLL/DLL on SDRAM.” CX771 at 192; CCFF 1080.

February 1996 email from Mr. Crisp, attaching minutes from a January 1996 JEDEC meeting, alerting Rambus about a Micron presentation entitled “Future SDRAM - clock issues” (JX0029 at 17) that might raise IP issues that Rambus should consider disclosing to JEDEC. CX868 at 1; Crisp, Tr. 3367; CCFF 1098.

See also CCB at 83-87; CCFF 578-658 and 962-1108. Numerous witnesses corroborated this evidence, stating that JEDEC actually began its work on the DDR SDRAM standard in 1993,

SDRAM standard, at some of the very first JEDEC meetings attended by Rambus. *See* CCFF 623-632.

shortly after JEDEC completed work on the first generation SDRAM standard, if not earlier. *See, e.g.*, Rhoden, Tr. 408-09, 460-61, 1200; Williams, Tr. 820; Sussman Tr., 1402, 1429; G. Kelley, Tr. 2566-67, 2582, 2585-86; MacWilliams, Tr. 4815; Lee, Tr. 6636; *see generally* CCF 578-658.

By contrast, Rambus cites to only a handful of ambiguous documents that serve only to substantiate the uncontested fact that the DDR SDRAM standard did not get its name until after Rambus left JEDEC. Indeed, Rambus's "contemporaneous evidence" focuses on one document, created two years after the fact, in which Desi Rhoden regretted that he and his colleagues at JEDEC had not made more progress on the DDR SDRAM standardization effort sooner. RB at 62; CX375. Mr. Rhoden testified that when he used the term "DDR" in that memo, he was referring to "the collection of features" to which the name DDR formally had been appended. *See* Rhoden, Tr. 1200-01. He further explained that "the name DDR was invented and created in December of 1996," Rhoden, Tr. 1200, but the concepts embodied in what became the DDR standard were being discussed for years before December 1996. Rhoden, Tr. 1196; *see also* Rhoden, Tr. 408-09; CCF 580. The other documents Rambus cites suffer from the same semantic issues and Rambus never even sought to explain them at trial. *See* CCF 411-413.

Finally, contrary to Rambus's arguments (RB 63), the *Infineon* decision on this issue should have no persuasive effect here. *See* CCB. First, the court applied a "clear-and-convincing" standard of proof, which is not applicable here. Second, contrary to the record in this case, the court wrongly concluded that JEDEC's disclosure duty turned on when JEDEC assigned an "item number" to a particular presentation by Fujitsu using the term "DDR." *See*

Section II.D., *supra*.⁵⁴ There is no evidence in the record in this matter that would in any way limit the JEDEC disclosure obligation to when JEDEC first applied the term “DDR” to its on-going work on the future SDRAM standard or applied an item number to a particular presentation by Fujitsu. *See* CCB at 40-59; CCFF 316-346, 818-821, 837-848. Finally, the *Infineon* decision rested on the testimony of a single witness, upon whose testimony it found that Infineon had “almost exclusively” relied at trial and in the post-trial briefing on this issue. By contrast, the much more extensive record in this case includes testimony from several witnesses who did not appear in the *Infineon* matter, including Messrs. Rhoden, Williams, Sussman, Gordon Kelley, MacWilliams, and Lee. These witnesses testified that JEDEC’s work on the DDR SDRAM standard predated Rambus’s departure from the organization. Therefore, just as Your Honor rejected Rambus’s argument on this point in ruling on its motion for summary decision, it should be rejected here as well. *See* April 14, 2003, Order Denying Motion for Sum. Dec. at 11-13; *see also* CCB at 77-82.

III. RAMBUS’S VARIOUS “RELIANCE” DEFENSES LACK MERIT

A. Proof That Rambus Conduct Distorted JEDEC’s Process Proves “Reliance”

Complaint Counsel agrees with the fundamental principle that liability in this case requires some showing that the challenged conduct “reasonably appear[s] capable of making a significant contribution to . . . [Rambus’s] monopoly power.” *United States v. Microsoft Corp.*, 253 F.3d 34, 79 (D.C. Cir. 2001).⁵⁵ Rambus distorts the appropriate legal standard, however, by

⁵⁴ In fact, the trial court acknowledged evidence of “several presentations” relating to dual-edge clock and on-board DLL/PLL technologies from 1991 to 1996, while Rambus was a JEDEC member. 164 F. Supp. 2d at 766.

⁵⁵ Note that the conduct in question appears capable of contributing to Rambus’s monopoly power in either of two ways: (1) with knowledge of Rambus’s patents or applications, JEDEC likely would have adopted alternative standards, or (2) individual JEDEC members likely would have obtained

couching it in terminology of fraud and *Walker Process* cases. RB 63-65. While proof of “reasonable reliance” may be essential in those cases, (as Rambus’s own discussion of the elements of Complaint Counsel’s claims makes clear (*see* RB 8-9), “reliance,” as that term is used in the law of fraud, need not be proven in this case.

Rambus quotes selectively from the Hovenkamp treatise—the only authority it cites in this section of its brief that addresses the antitrust claims at issue in this case. RB 64 n.31. Rambus omits from its quotation the standard set forth in that treatise: whether, knowing of the patent, “it is possible that the standard-setting organization would have decided differently.” 2 H.

HOVENKAMP ET AL., IP AND ANTITRUST § 35.5, at 35-40-41 (emphasis added). The treatise also advises that when there is proof “of manipulation of the process towards an anticompetitive end,” this “should incline a court to doubt the technical superiority of the standard ultimately adopted.” *Id.* at 35-36-37 (emphasis added). That is, evidence of anticompetitive manipulation tends to suggest that the outcome of the process was affected.⁵⁶ The record contains more than adequate proof of manipulation of the standard to suggest that the outcome of the JEDEC process was affected. *See generally* CCF 800-1114, 1950-2054.

But even if Complaint Counsel had to show reliance as that concept is used with respect

assurances from Rambus that it would license any relevant patents on terms more favorable than those that Rambus in fact demanded in the aftermath of the DRAM industry’s adoption of the relevant standards. The evidence produced at trial proves impacts of both types. CCF 2100-07, 2415-64.

⁵⁶ Note that in discussing the proof requirements of antitrust claims in this context, the Hovenkamp treatise makes no mention whatsoever of proof of “reliance.” Similarly, in his recent, comprehensive article on IP and standard setting, Prof. Lemley—co-author of the Hovenkamp treatise—provides a detailed discussion of proof of “reliance” in the context of discussing equitable estoppel claims arising out of patent-related misrepresentations or misleading non-disclosures to standard-setting organizations. *See* Mark Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 Cal. L. Rev. 1889, 1918-21 (2002). However, the article’s detailed analysis of the proof requirements of an antitrust claim in this context makes no reference to “reliance.” *See id.* at 1927-35.

to other types of claims, the record evidence would still more than suffice. *See* CCFF 2101. In this regard, Prof. Lemley’s recent article is directly on point. For instance, Lemley states that when dealing with publicly available patents or “published” patent applications, though “[s]ome might argue . . . that SSOs should not be entitled to rely on statements made by the IP owner”—given that it would be theoretically possible to conduct a “search . . . to ensure that no patents cover the proposed standard”—the better view is that “reliance is” appropriate. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 Cal. L. Rev. at 1921 (emphasis added).⁵⁷ Explaining this view, Lemley states,

Such a search is costly and imperfect. Imposing such a requirement on SSOs will therefore not necessarily prevent the patent owner from using a lack of information to her advantage. In either case, therefore, the SSO may lack relevant information if the patent owner fails to disclose the existence of the patent.

Id. Lemley also suggests that “even if an accused infringer is aware of the existence of a patent, it might reasonably rely on the patent owner’s statement as evidence that the patent owner doesn’t consider the patent relevant to the standard.” *Id.*

These points are particularly relevant here. Virtually all of Rambus’s so-called “reliance” arguments are premised on the notion that JEDEC and its member companies were somehow duty-bound to ferret out the truth about Rambus’s patents notwithstanding Rambus’s misleading conduct and bad-faith non-disclosures. But this is not the way JEDEC works. As John Kelly testified, JEDEC is not “in a position to conduct patent searches to determine as a matter of fact whether any patents are involved in the standards work that we perform. We rely on the participants in the process to surface patent issues to our attention.” Tr. 1836-37. In an SSO in

⁵⁷ Lemley makes it clear that the “statements” in this context includes both “affirmatively misleading statements” and “silence in circumstances where there ‘was a clear duty to speak.’” *Id.* at 1918.

which these are the ground rules, it is “reasonable”—as Prof. Lemley notes—for the organization and its members to “rely” upon a given company’s non-disclosures as indicating that the company doesn’t consider any of its known patents or patent applications to be “relevant to the standard.” 90 Cal. L. Rev. at 1921.

B. Rambus Succeeded in Concealing Relevant Patent Information from JEDEC

Contrary to Rambus’s assertions (RB 66-74), the record evidence demonstrates that JEDEC members did not know that Rambus was seeking patent rights over the technologies being considered for incorporation into the JEDEC SDRAM and future SDRAM standards. CCFF 1244-59. JEDEC members were aware that Rambus was pursuing patents over its narrow-bus, multiplexed, packetized RDRAM architecture. CCFF 746-56, 1238-59. Certain individuals were also aware of the claims in Rambus’s ‘898 application relating to its unique loop-back clock and its packaging. *See, e.g.*, Sussman, Tr. 1431 (Rambus presentation of RDRAM showed three key features: a low voltage CMOS driver, a packetized bus, and a “turnaround clock”); Lee, Tr. 6603-04 (describing Rambus “loop back clock”); *id.* at 6610-11. The evidence shows unequivocally, however, that even the individual JEDEC members identified by Rambus, let alone “the entire DRAM and computer industry,” did not know that JEDEC sought to extend its patent rights to cover technologies incorporated in JEDEC standards. CCFF 751-56, 1699. Indeed, Rambus carefully guarded the secret of the scope of its patents. CCFF 813-16, 902-06, 971-76, 1044-46, 1062-67, 1109-14, 1535-37, 1542, 1676-1700.

Rambus makes a failed attempt to show that complying with its disclosure obligation would have “made no difference.” RB 66-74. This argument has three fatal flaws: (1) Rambus wrongly imputes the experience of a few individual members at different times to JEDEC members as a whole throughout the entire relevant time period; (2) Rambus confuses vague

suspicious with actual knowledge based on a reliable disclosure by an informed source; and (3) Rambus ignores the overwhelming evidence showing that JEDEC members were not aware that it might obtain patent claims covering the relevant technologies.

First, JEDEC was a large organization comprised of numerous member companies. As of September 1995, for example, the JC-42.3 Subcommittee had over 60 company members.

JX0027 at 1-3; CX0212. Rambus pointed to no evidence even suggesting that all, or even a substantial number of, JEDEC members understood the scope of Rambus's IP. Rambus focuses mainly on suspicions of just three companies: Siemens, Mitsubishi, and Micron. *See* RB 66-72.

Even if Rambus were correct with respect to these suspicions, knowledge by three companies at different times is fundamentally different from a formal disclosure to all JEDEC members. The evidence shows that concern expressed by even one or a small number of the 60-plus other members of JEDEC could have changed the direction of the standard. CCF 248, 254-55. But these other members did not have the information they needed because Rambus failed to disclose it. Thus, even if three companies had the requisite information, Rambus's failure to disclose to the other, differently situated companies had a significant effect at JEDEC.

Second, Rambus confuses general suspicions held by these companies with a specific, formal disclosure as required by the rules. Unlike a marketplace rumor based on speculation and incomplete data, a formal disclosure by Rambus would have provided reliable and complete information. It would have reflected an understanding of both the patent applications and the JEDEC work at issue. As such, it could have enabled informed decision-making.

Yet Rambus went further than simply failing to make the requisite disclosures, as demonstrated by the events of the May 1992 JC-42.3 meeting Rambus referred to in its brief (RB 66). Siemens had heard rumors that Rambus might have patent claims relating to use of two-

bank designs and raised the issue at the meeting. When Chairman Kelley asked Mr. Crisp if he had any comment, Crisp shook his head “no.” Howard Sussman then stated that he had seen the patent application and believed it did not pose a concern. CCRF 502-03. Crisp did not contradict him. *Id.* This exchange demonstrates a failure by Rambus both to affirmatively identify the potential scope of its patent applications and to disabuse JEDEC members of their misconception that Rambus patents would not apply to the JEDEC standards.⁵⁸ The evidence shows that participants understood from this exchange that Mr. Crisp had no relevant patent information to report, not that he was blatantly violating JEDEC’s rules, as Rambus argues. CCRF 499-500, 904.⁵⁹

Rambus continued to engage in this pattern of affirmative deception. Although Rambus describes its refusal in September 1995 to disclose whether it had patents relating to the RamLink/SyncLink presentation at JEDEC as a “warning” that there should be concern about Rambus intellectual property (RB 70),⁶⁰ Rambus omits two crucial facts. First, Rambus gave no information whatsoever to permit JEDEC members to understand the scope of its potential patent rights. Without such information, JEDEC members understood the warning to relate only to the

⁵⁸ Contrary to Rambus’s assertion (RB 68), post-meeting documents do not indicate that Crisp’s refusal to comment put JEDEC members on notice about Rambus’s patent coverage. CCRF 522-528.

⁵⁹ Likewise, when discussing Willi Meyer’s reaction to discussion of Rambus’s patent at the September 1993 JEDEC meeting, Rambus conveniently overlooks Willi Meyer’s testimony that Rambus’s disclosure of its ‘703 patent led him to conclude that Rambus had no other IP related to JEDEC work to disclose. CCRF 499-500. Thus, in 1993, after adoption of the SDRAM standard, Willi Meyer wrote an internal report to colleagues at Siemens stating that JEDEC had defined a public domain next generation DRAM. CCF 1261. Indeed, Rambus cites to no evidence that anyone understood Rambus’s disclosure of its ‘703 patent to indicate that Rambus might have patent applications relating to JEDEC’s SDRAM work.

⁶⁰ The other “red flags” cited by Rambus are similarly mischaracterized. CCRF 466-595; 655-719.

RamLink/SyncLink architecture, not the SDRAM and future SDRAM standards. CCFF 1068, 1567-72. Tellingly, apart from one pinout, JEDEC never pursued standardization of the SyncLink architecture. CCFF 636; CX711 at 171 (Crisp e-mail, 9/13/95: “Dave Barnum of Augat . . . thinks that the reason there will not be second showings [of the SyncLink architecture at JEDEC] is that we have cast doubt over the patent issue.”).⁶¹ Second, when Rambus’s non-disclosure caused concern at JEDEC, Mr. Crisp “reminded them that we have actually reported a patent to the committee,” CX0711 at 166-67, thus implying that Rambus was abiding by the disclosure policy and would disclose relevant patent information if it had any. In other words, JEDEC responded to the possibility that Rambus had patent rights relating to SyncLink, but Rambus’s statements gave JEDEC no reason to suspect that Rambus was concealing potential patent rights relating to SDRAM and future SDRAM.

Rambus also cites Terry Lee’s (as well as others’) objections to the NEC presentation in March 1997 involving a loop clock. RB 71. Contrary to Rambus’s claim, this incident shows that JEDEC’s “revealed preference” was to avoid Rambus patents. Rambus disclosed its ‘703

⁶¹ Rambus also asserts, without support, that “[c]oncerns over the scope of Rambus’s intellectual property prompted investigations of Rambus’s patents” by Mitsubishi and Micron. RB 70. The Mitsubishi references are not entitled to any weight—Rambus relies solely on Japanese-language documents, as to which there was no testimony, no indication as to who created them, from what information or why, and the translations are suspect. CCRF 556, 671-72, 693-702. The reference to Micron is grossly misleading: Micron investigated Rambus patents in late 1995, not because they had any idea that they might apply to JEDEC work, but because Rambus was proposing to negotiate a license agreement for RDRAM. CCFF 1253. Rambus also quotes a document of Dr. Betty Prince out of context; Dr. Prince was referring to industry understanding of Rambus’s patents as they pertained to the RDRAM architecture, not to SDRAM. Prince, Tr. 3946-47; CX2153 at 1.

The evidence cited by Rambus actually disproves one of Rambus’s central arguments—that, had it disclosed, JEDEC members would have relied on assumptions about prior art to disregard Rambus’s patents. In fact, the Micron and Prince references on which Rambus relies demonstrate the opposite: Some companies believed, in the context of RDRAMs, that prior art might invalidate Rambus’s patents, but they nevertheless signed license agreements with Rambus with respect to RDRAM. CCFF 740, 1607-15. That is, companies were unwilling to rely on assumptions about prior art in deciding whether to agree to license RAMBUS’s technology.

patent, which contained claims covering its loop clock architecture, at the September 1993 JEDEC meeting. CCFF 971-73. Terry Lee and other JEDEC members reviewed and were familiar with the '703 patent. CCFF 1253. In March 1997, when NEC proposed using a return clock similar to the Rambus loop back clock covered by the '703 patent, Terry Lee and others objected immediately. CCFF 2436-40.⁶² This proposal went no further. *Id.* This incident demonstrates that when JEDEC knew about Rambus's patents, it sought to avoid them.⁶³

Finally, the availability of Rambus's PCT application and the later disclosure of its '703 patent in no way support Rambus's argument that engineers at the time should have been able to figure out the scope of Rambus's potential patent rights.⁶⁴ RB 72-74. The PCT application and

⁶² Rambus also cites this as evidence that certain JEDEC members understood that Rambus had patent rights extending beyond its narrow bus, multiplexed, packetized architecture. RB 71. This is true. As explained by Prof. Jacob, Rambus's original patent application had three types of claims: (1) a small number of claims covering the loop clock architecture; (2) a small number of claims covering Rambus's unique packaging, with all pins arranged along one edge of the package; and (3) the remainder, all of which were limited to the narrow, multiplexed, packetized bus architecture. CCFF 1343-50; *see also* Sussman, Tr. 1430-31; Kellogg, Tr. 5053. The events of March 1997, in which JEDEC members reacted to a presentation relating to a loop clock architecture, are fully consistent with this understanding of Rambus's potential patent rights.

⁶³ Rambus also relies on e-mails exchanged within Micron in April 1997 showing that Micron heard from an engineer at Intel that Rambus might believe it could obtain patent claims covering dual edge clocking. RB 71-72. There is no evidence, however, that Micron regarded this as anything other than a rumor passed from a low-level engineer in the graphics group at Intel to a low-level sales representative at Micron. Lee, Tr. 6701, 6704. With 20-20 hindsight, it is indeed unfortunate that Micron did not take this rumor more seriously. This is hardly evidence, however, of how Micron would have reacted had Rambus properly disclosed within JEDEC, let alone evidence as to how the other 60+ JEDEC members would have reacted.

⁶⁴ Contrary to Rambus's arguments, Rambus's disclosures to DRAM manufacturers and others did not provide notice that Rambus would pursue, and might obtain, patent claims covering the four technologies at issue when used in SDRAMs or DDR SDRAMs. In those disclosures, Rambus did not explain the scope of its potential patent rights, or even what it invented. CCFF 749, 1240-52. Rambus made every effort to distinguish its architecture from a traditional wide bus, non-packetized architecture. CCFF 746, 749-50; *see also* CX1309 at 28; CX1320; CX1382 at 17. To the extent that Rambus explained that it used features such as programmable block size or circuitry to average an early and a late clock signal in its RDRAM architecture, there was no indication that Rambus would seek to claim patent rights over use of programmable burst length or on-chip DLL when used in a traditional, wide bus

the '703 patent did not put JEDEC members on notice of what Rambus was secretly adding its pending applications.⁶⁵ CCF 1277- 1355.

Rambus's argument that the scope of its patents was readily discernible (RB 72-74) is inconsistent with its other arguments and with the record evidence. What is the basis for Rambus's argument that it had a legitimate business justification for concealing patent applications, RPF 94-98, if JEDEC members could have figured out the subject matter of its claims from the PCT application?⁶⁶ Moreover, regardless of whether JEDEC members hypothetically could have ascertained information Rambus should have disclosed, the fact of the matter is that they did not. Overwhelming evidence confirms that JEDEC members did not understand that Rambus could claim patent rights to the technologies at issue as used in the JEDEC standards.⁶⁷ CCF 1244-59.

Finally, Rambus's argument is inconsistent with its own contemporaneous documents confirming that it knew DRAM makers did not understand the scope of its potential patent

architecture. CCF 1240-53.

⁶⁵ Rambus also implies that, because the PTO has issued patents containing claims covering the four technologies at issue, that proves that an engineer reading the specification at the time should have recognized that Rambus was in possession of those inventions. RB 73-74. This argument is backwards—Rambus's own patent expert testified that patent law's written description requirement does not require that a person of ordinary skill in the art would be able to predict the claims that could potentially come out of a patent specification. Fliesler, Tr. 8903.

⁶⁶ Rambus's argument about having a legitimate business reason to violate JEDEC's rules is flawed for other reasons. CCF 1435-37, 1441, 1446.

⁶⁷ Indeed, Rambus's argument turns the JEDEC disclosure policy on its head. The purpose of the disclosure policy was to prevent JEDEC members from having to pore over any available public information and guess what other members might be able to claim. The disclosure policy put the onus on the party with the best information—the patent holder—to inform others of what it could claim. After intentionally having concealed the scope of its patent applications, Rambus now seeks to shift responsibility to JEDEC members for not having figured out for themselves the potential scope of Rambus's patent rights. Rambus attempts to defend its conduct by saying, in effect, "JEDEC members had some hints and clues available to them: they should have caught us."

claims, and sought to ensure that they did not discover this information:

CX770 (Harmon e-mail, 10/11/94: “[L]et’s not rock the boat” by telling Samsung we have patent applications relating to on-chip PLL).

CX783 at 2 (Crisp e-mail, 2/26/95: “I certainly do not want to bring this intellectual property issue up without careful consideration. I especially do not want it all over JEDEC.”).

CX711 at 68, 73 (Crisp e-mail, 5/24/95: “[I]t makes no sense to alert them to a potential [patent] problem they can easily work around.”).

CX1727A at 2 (Tate notes, 6/8/95 (quoting Horowitz regarding disclosing Rambus IP relating to SyncLink: “Stirring pot now makes us look like bad guys”).

CX837 at 2 (Crisp e-mail, 9/23/95: “we should re-evaluate our position relative to what we decide to keep quiet about, and what we say we have”).

CX1277A at 1, 2 (Presentation, 3/96: “200Mhz SDRAM Myth:” “Challenges (do not tell them :-)”).

CX919 (Tate e-mail, 2/10/97: “do *NOT* tell customers/partners that we feel DDR may infringe—our leverage is better to wait”).

CX938 (Davidow e-mail, 7/11/97: “One of the things we have avoided discussing with our partners is intellectual property problem. . . . We have not yet told Siemens that we think SLDRAM and SDRAM-DDR infringe our patents.”).

CX942 (Tate e-mail, 8/4/97: “our policy so far has been NOT to publicize our patents and i think we should continue with this”).

CX947 at 1 (Clarke e-mail, 8/15/97: “Q. Do Double Data Rate (DDR) SDRAM use this patent? A. We don’t know yet.”).

CX960 (Tate e-mail, 10/1/97: “when joel [karp] starts we need to have our spin control ready for partners/etc as to why we are hiring him and what he will be doing.”).

CX987 at 4 (Tate e-mail, 1/19/98: “ddr infringes our patents (question: when do we start saying this publicly?)”).

CX1069 (Karp e-mail, 5/1/99: “They probably think they avoid our IP if they don’t [use a narrow, packet-based bus]”).

CX1089 (Tate e-mail, 12/9/99: “it’s important NOT to indicate/hint/wink/etc what we expect the results of our infringement analysis to be!!!”).

In sum, the record is clear that JEDEC members did not understand that Rambus might be able to obtain patent claims covering technologies used in the JEDEC standards, that Rambus knew this at the time, and that Rambus exploited JEDEC's lack of understanding by continuing to keep JEDEC members in the dark. Although Rambus alleges that a handful of companies, at various times, may have had some degree of suspicion about the potential scope of Rambus patents, Rambus failed to identify even one company with solid information from a reliable source, and JEDEC members' contemporaneous documents confirm that they believed the JEDEC standards to be free of patents. CCF 1255-58. More fundamentally, Rambus completely ignores the other 60-plus members of the JC-42.3 Subcommittee. The unrefuted evidence shows that representatives of numerous companies, including NEC, Sanyo, VLSI, Sun, AMD, and Hyundai, had no clue that Rambus's potential patent rights might extend to JEDEC-compliant SDRAM. CCF 1244-45, 1249-51, 1254, 1257. Indeed, the one instance in which JEDEC members recognized that a proposal might infringe Rambus patents, they emphatically rejected the proposal on the spot. CCF 2436-40. Having intentionally failed to fulfill its disclosure obligation to JEDEC, Rambus cannot now defend itself by arguing that other JEDEC members are themselves to blame for having failed to divine the potential scope of Rambus's patent claims.

IV. HAD RAMBUS MADE GOOD-FAITH PATENT DISCLOSURES, JEDEC LIKELY WOULD HAVE ADOPTED ALTERNATIVE TECHNOLOGIES

A. Patent Disclosures By Rambus Would Have Made a Difference

Disregarding the record evidence, Rambus argues that, even if Rambus had fully complied with its JEDEC disclosure obligations, "it would have made no difference": JEDEC members nevertheless would have adopted the same technologies without insisting on a RAND

letter or otherwise negotiating license terms in advance. *See* RB 75-76. Rambus supports this argument with incomplete testimony from only two witnesses, Tom Landgraf and Gordon Kelley. *Id.* Moreover, Rambus conveniently omits key elements of their testimony. Mr. Landgraf testified that he would have required Rambus to agree to RAND terms. CCFF 2415. Mr. Kelley testified that he first would have sought to avoid the Rambus technology, and next would have considered the terms of any RAND statement, with the ideal terms being “free.” Kelley, Tr. 2565-66; CCFF 2417, 2434. A review of the universe of testimony on this point establishes one thing very clearly: had Rambus honored its disclosure obligations, it most definitely would have made a difference. The testimony of the witnesses on this point reflects real-world differences that rings true. This testimony is fully consistent with the real world of JEDEC, in which representatives seek to avoid standardizing patented technology, espouse differing viewpoints, and arrive at solutions through negotiation.

For example, Howard Sussman—the individual who first proposed using programmable CAS latency and burst length in the SDRAM standard, CCFF 513, 516, 527—was clear: had Rambus disclosed, he would have supported fixed CAS latency and burst length. CCFF 2101. His certainty is not surprising in light of the amount of effort he spent arguing to get programmable CAS latency and burst length rather than one of the alternatives into the standard. CCFF 2107. Similarly, Andreas Bechtolsheim testified that Sun would have “strongly opposed the use of royalty-bearing elements” in a memory standard, as it was “always preferable to choose a specification that would not be encumbered by proprietary rights.” Tr. 5814-15. He would have preferred use of pins to set CAS latency and burst length. *Id.* at 5808-11.

Others, such as Terry Lee and Willi Meyer, testified that they would have supported using alternative technologies, although not having gone through the analysis at the time, they did not

settle on a particular alternative to each of the technologies in question. CCFF 2101. Mr. Lee identified a number of viable alternative technologies. CCFF 2107, 2139, 2144, 2235, 2334, 2394. Dr. Oh also made clear that Hyundai would not have supported DDR SDRAM if it had known there were royalties associated with any of the technologies in the standard. CCFF 2101. Mark Kellogg and Dr. Betty Prince testified that, had Rambus disclosed, they would have considered alternative technologies more carefully, although not having conducted an analysis at the time, could not say for certain what the outcome would have been. CCFF 2101.⁶⁸ As noted above, Mr. Kelley would have considered alternatives as well as what licensing terms Rambus would have offered. CCFF 2101. Only Mr. Landgraf testified that he would have supported the same technologies, provided Rambus agreed to RAND licensing terms. In short, not one witness testified that a disclosure by Rambus would have made no difference.

B. JEDEC's Choice of "Rambus Technology" in a World Distorted by Misleading Conduct Says Nothing About the But-For World

Rambus argues that because JEDEC chose the four relevant technologies over the alternatives for the SDRAM and DDR standards, JEDEC would have used these same technologies even had Rambus made a proper disclosure. *See* RB 77-79. What Rambus fails to acknowledge is that JEDEC chose the four technologies with the belief that they could be used for free. Rambus did not—because it cannot—show that JEDEC members would have made this choice knowing that Rambus would seek to collect in excess of _____ from DRAM manufacturers and others for use of those technologies. CCFF 2041, 2043 (*in camera*). The fact that a technology is chosen for use at one price (free) says nothing about whether it

⁶⁸ Again, Mr. Kellogg identified a number of technologies that he considered to be viable alternatives to the four technologies at issue. CCFF 2101, 2107, 2145, 2159, 2188, 2235-36, 2246, 2275, 2367, 2397, 2411.

would be chosen at a far higher price (over *in camera*)).

The fact is that JEDEC selected the four technologies as part of a complex process, and for a number of different reasons. CCF 239-55, 505-44, 565-644, 2650. There was no such thing as a “best” technology; different members had different preferences. CCF 248, 2650; CCF 727. Often little factors made a big difference. CCF 248. Programmable CAS latency and burst length garnered support in part because JEDEC members understood the use of the WCBR cycle to program the mode register as an evolutionary step from asynchronous DRAMs. CCF 532-34.⁶⁹ They adopted on-chip DLL although it was not needed for most applications, simply to reach a compromise with graphics cards manufacturers. CCF 2379.

Rambus argues that JEDEC’s consideration, and rejection, of alternative technologies in 2000 in connection with the DDR-2 SDRAM standard shows that JEDEC would have considered the four technologies at issue to be superior to the alternatives in the 1992-95 time period. *See* RB 79-83. On the contrary, as discussed below, JEDEC’s DDR-2 SDRAM experience actually demonstrates how powerful the lock-in phenomenon is in this industry.

In an effort to evade the implications of the alternative technologies described by numerous witnesses, Rambus contends that Complaint Counsel must also show that these alternatives were “noninfringing.” RB 85-86. Complaint Counsel bears no such burden.

⁶⁹ Rambus’s technical experts’ ignorance about the WCBR cycle generally, let alone its significance in the decision to adopt programmable CAS latency and burst length, demonstrates how far removed Rambus’s post-hoc arguments are from the factual record. *See* Soderman, Tr. 9467-69 (“Q: Dr. Soderman are you familiar with a concept known as WCBR? A: Could you describe the acronym right now so it would refresh everyone’s memory? Q: Let me break it down. Have you heard of the “acronym CBR?” A: It’s not a common term. . . . Q: Could you please explain how WCBR is used in connection with the programmable mode register? [Objection omitted.] THE WITNESS: I’m not familiar with exactly what the WCBR acronym was supposed to convey. . . . Q: I wonder if you could explain how that sequence of signals is used in connection with the programmable mode register? A: I would have to go back and look at my notes. It is a very subtle sequence. I would have to study that. I was not asked to do that, that specific sequence of events.”).

Rambus relies on a doctrine of patent law providing that the amount of damages owed in case of infringement may be reduced if a defendant can show it could have used a non-infringing alternative. *See Grain Processing Corp. v. American Maize-Products Co.*, 185 F.3d 1341, 1353-54 (Fed. Cir. 1999). Contrary to Rambus’s argument, in such cases the initial burden is on the patent holder to show the absence of non-infringing alternatives. *Panduit Corp. v. Stahlin Brothers Fibre Works, Inc.*, 575 F.2d 1152, 1156 (6th Cir. 1978); *see, e.g., Tate Access Floors, Inc. v. Maxcess Technologies, Inc.*, 222 F.3d 958, 971 (Fed. Cir. 2000) (citing *Panduit*). This is in accord with the general rule that “the patentee bears the burden of proving infringement.” *Ultra-Tex Surfaces, Inc. v. Hill Brothers Chemical Co.*, 204 F.3d 1360, 1364 (Fed. Cir. 2000); *accord Nutrinova Nutrition Specialties and Food Ingredients GMBH v. International Trade Comm’n*, 224 F.3d 1356, 1359 (Fed. Cir. 2000) (“As a general proposition, the law places the burden of proving infringement on the patentee who alleges it.”).

Furthermore, the record demonstrates that Rambus again has raised a theoretical issue with little support in the facts of the case. Rambus has identified two patents—its ‘263 patent and its ‘120 patent—that it asserts might be infringed by two of the six CAS latency alternatives and two of the six burst length alternatives respectively. RPF 964-65.⁷⁰ Rambus offered no expert testimony whatsoever regarding its ‘263 patent, however; instead, it expects Your Honor to perform an independent infringement analysis. RPF 863-64; CCRF 858, 886. Rambus’s reliance

⁷⁰ Rambus also asserts that one alternative might be covered by a Samsung patent, its ‘956 patent. There is no record evidence regarding the appropriate interpretation of the claims or scope of coverage of the ‘956 patent. CCRF 964. In any event, even if Rambus were correct and this one alternative were subject to a Samsung patent, that would not exclude it as a potential alternative. Potential coverage by a Samsung patent is fundamentally different from coverage by a Rambus patent. Samsung might have agreed not to assert the patent, or it might have been willing to license it at a zero royalty or a very low royalty. Many JEDEC members have cross-licenses with Samsung and thus would not have paid a royalty for use of this patent in any event. Thus, had JEDEC chosen to identify CAS latency in the read command, JEDEC members likely would have paid no royalty for use of this technology.

on Dr. Soderman's testimony regarding the '120 patent is fundamentally misplaced, as he failed to conduct a proper claims analysis and himself admitted that other individuals, including patent attorneys, could better answer than he whether the claims would be infringed by a particular alternative. CCF 2125-29, 2292-94, 2300-02; CCRF 938, 946. Dr. Soderman also admitted that he had interpreted the term "operation code" in claim 1 of the '120 patent as referring to part of a request packet, which would exclude all JEDEC-compliant SDRAMs (including any SDRAMs using the alternative technologies in question) from the scope of coverage of the '120 patent. CCF 2128, 2295, 2303. Furthermore, to arrive at its desired conclusion, Rambus makes assumptions about certain technical aspects of the alternatives that are not supported by the evidence. See CCRF 862-63, 886-90, 938, 946. In other words, the record evidence indicates that these four alternatives (out of 25 total alternatives) do not infringe the patents identified by Rambus, and the '120 patent does not apply to SDRAMs at all.

V. THE DRAM INDUSTRY IS "LOCKED IN" TO JEDEC'S SDRAM STANDARDS

A. Dr. Rapp's Flawed "Switching Cost" Analysis Does Not Disprove Lock-In

In discussing the lock-in issue, Rambus suggests that its economic expert's "calculations show that switching costs are modest compared to the costs of production or the costs of Rambus's royalties," and thus if "there were acceptable alternatives" to Rambus's technologies, "switching costs would not be a barrier to adopting those alternatives." RB 95. Rambus also suggests that, while there may be "coordination issues" associated with an industry-wide effort to revise JEDEC's standards to work around Rambus's technologies, similar "[c]oordination issues are handled routinely and do not create lock-in." *Id.* These arguments, which closely track Rambus's unrealistic approach to the lock-in issue at trial, are fundamentally flawed, both as pertains to the evidence and to economic theory.

To start with, Dr. Rapp's own testimony makes clear that his "switching cost" calculations substantially understate the relevant costs. Dr. Rapp acknowledged, among other things,

- that his calculations related to costs borne by a "single manufacturer" of DRAMs and that, to appropriately assess lock-in, it would be important to "multiply" the costs to account for multiple manufacturers (Tr. 10124, 10146);
- that he did not consider "the specific type of change that would have to be made to go to any given alternative" to Rambus's technologies, but assumed "general . . . circuitry design changes," and that the costs and complication of switching could vary "depending upon the alternatives" that might be selected (Tr. 10140-42); and
- that, because any attempt to work around Rambus's technologies would require "changes in other products besides DRAMs," such as microprocessors, chipsets, and motherboards, "it's appropriate to consider such costs"—which he did not do—and that such costs could "actually exceed the costs that would be borne by DRAM manufacturers" (Tr. 10124-31, 10136).⁷¹

Complaint Counsel's economic expert—Prof. McAfee—drew attention to these and other omissions and errors in Dr. Rapp's analysis, concluding that "by omitting costs" Dr. Rapp's analysis was biased and understated the magnitude of the costs. Tr. 11283, 11285; *see* Tr. 11282-96.⁷² But as Prof. McAfee explained, an even more serious flaw in Dr. Rapp's analysis is his complete disregard of the "coordination" problems that render it economically impracticable for the industry to work around of Rambus's technologies, as incorporated in the SDRAM standards. *See* McAfee, Tr. 11296 ("Rapp's analysis . . . failed to account for coordination costs, which I

⁷¹ Dr. Rapp not only conceded the existence of these and other flaws in his "switching cost" analysis, but also admitted that, with respect to the SDRAM standard (as opposed to the DDR SDRAM standard), the DRAM industry actually "is . . . locked into" the current standards, considering that SDRAM is "at the end of its life cycle." Tr. 10161.

⁷² For instance, Prof. McAfee noted that Dr. Rapp's analysis "left out" the "entire category of . . . switching costs" representing the "costs incurred by the producers of complementary products and the users of DRAM." Tr. 11283. "All of those costs are going to be relevant to the question of lock-in," Prof. McAfee explained, "because you can't get sellers to switch if you can't get the buyers to switch. As a result, it's the total market switching costs, not just the DRAM makers' switching costs, that are relevant." *Id.*

consider to be large. . . . [I]n this case it's critical to consider coordination costs.”); *see also* CCF 2576-2584 (reaching consensus within JEDEC as to how to change the standards would be extremely difficult).

It is not only Prof. McAfee who finds “coordination” issues to be important in assessing lock-in. Rambus’s other economic expert, Prof. David Teece, recently published an article concerning “Standard Setting and Antitrust” in which he explains:

[T]here is often a significant coordination problem in getting all interested parties to switch to an alternative. For example, computer manufacturers may already have designed their motherboards and computers to work with existing standardized chips, and switching to a different chip design would require changes, not only to the chips themselves, but also to the motherboards and computers. The difficulties associated with coordinating the necessary changes may make it impracticable to switch away from the patented standard.

David J. Teece and Edward F. Sherry, *Standard Setting and Antitrust*, 87 Minn. L. Rev. 1913, 1937 (2003) (emphasis added). *See also* Teece, Tr. 10494 (agreeing that, “in addition to potential switching costs, . . . there are other factors that could lead to coordination problems in getting all interested parties . . . to switch to an alternative”).⁷³ The record shows that the very sort of “coordination problems” that Prof. Teece has described, both in his academic writings and his testimony at trial, do exist in this case and have worked to seriously impede industry efforts to “switch away” from SDRAM standards that incorporated Rambus’s patented technology.⁷⁴

⁷³ It is interesting to note that, while Dr. Rapp’s “lock-in” analysis ignores such coordination problems, before the Commission issued its Complaint in this matter, Dr. Rapp authored a “white paper” to the Commission on behalf of Rambus in which he expressly stated that, in addition to “switching costs,” “coordination difficulties” were also a “relevant consideration.” Tr. 10134-35.

⁷⁴ The record shows that changing the DRAM standards to avoid the Rambus patents would lead to DRAM chips that are not compatible with existing DRAM or other components that interoperate with DRAM. CCF 2541-2546. As a result, not only DRAM chips, but other components that work with DRAM chips would have to be changed. CCF 2550-2562. Also, because DRAM customers require multiple sources, all DRAM manufacturers must change. CCF 2547-2549. The coordination problem stems from the fact that all of these firms have to ensure that their products work with all of the other products. Not surprisingly, this has sometimes been referred to in the industry as a “chicken and egg” problem. (CX2315 at 1 (“It is a chicken and an egg problem. . . . The vendors won’t line up to produce

Prof. McAfee explained, for instance, that any revision in JEDEC's standards to work around Rambus's technologies would require a consensus—concerning precisely what changes to the standards would be made—not only among DRAM manufacturers, but also among DRAM users, as well as the producers of complementary products:

[T]he DRAM manufacturers won't switch without the . . . buyers, willing to purchase, and the buyers won't be willing to purchase unless the complementary components suppliers are also providing the components, and so you need a consensus . . . that is, you need coordination (Tr. 11301; *see also* CCF 2550 - 2562).

As Prof. McAfee testified, however, there are significant practical and economic impediments to obtaining such a consensus. For instance, even if DRAM makers could agree on a common solution for working around Rambus's patents, it would be difficult to get DRAM users to "go along with the new standard" considering that they already "have an existing product" that meets their performance needs, and switching to an alternative product that provides "similar performance" would not generate additional "profits" for such companies. Tr. 11303-04 ("if I want these companies to go along with the new standard, they're going to expect to make some profits, and it's the inducements beyond just the actual costs that are going to be relevant in getting them to switch"); *see also* CCF 2554 - 2555. As Prof. McAfee explained, complementary suppliers confront the same issue, and hence, as with "DRAM customers," they are "less motivated to change." Tr. 11303; *see also* CCF 2558-2562.

But the difficulty in reaching consensus to change JEDEC's existing standards extends to DRAM manufacturers as well, in part because various DRAM makers "have different positions with respect to the existing standard." McAfee, Tr. 7448. As Prof. McAfee explained,

the device unless there are users... but the users won't consider the part unless the suppliers/infrastructure is in place.); Polzin, Tr. 4012; Macri, Tr. 4619-4620).

[A]t the moment, . . . approximately half of the market has licenses to produce the standard from Rambus and the other half does not. Now, the half that has licenses is going to feel quite differently about the costs of changing the standard than the half that doesn't, and in fact the half that has licenses might benefit from the lack of licenses of the other half. . . . This creates differing incentives. Having a license or not creates differing incentives *ex post* (*id.* at 7448-49).

At present, Prof. McAfee explained, “some of the producers, because they are licensed under Rambus, have an incentive . . . not to get a new standard issued . . . in the hope that the other producers are going to be shut down.” *Id.* at 7450.⁷⁵ Such “differing incentives,” Prof. McAfee testified, serve as “an impediment to the ease of reaching agreement,” thereby exacerbating lock-in problems.⁷⁶ Prof. Teece corroborated this point, acknowledging that “from the standpoint of economic theory” one would expect “the individual decisions of individual JEDEC members [to] be based on their own self-interests.” Tr. 10497. Prof. Teece also has written that “[f]irms may have a preference for adopting a standard” that allows them to capitalize on “a comparative advantage” they may have “relative to other firms” in terms of “the technological approach reflected in” a given “patented technology.” Teece and Sherry, 87 Minn. L. Rev. at 1936.

As Prof. McAfee explained, understanding the significance of these coordination problems is key to understanding why the DRAM industry is locked in to JEDEC's standards. Indeed, in this case, Prof. McAfee explained, the economic impact of these coordination issues

⁷⁵ Prof. McAfee contrasted this “*ex post*” situation with the situation that existed “prior to the development of the standard,” explaining that in the *ex ante* period “these companies . . . had fairly closely aligned interests in terms of producing” the “best cost-benefit standard that they could produce.” Tr. 7449-50.

⁷⁶ Prof. McAfee also testified that certain DRAM users have incorporated “specific features” in the existing SDRAM standards into their own products in ways that create “distinct incentives” among DRAM users what they might accept in the form of “alternative standards.” Tr. 7450-51. As an example, Prof. McAfee referred to AMD's use of “a burst length of 8” compared to Intel's use of “a burst length of 4.” Tr. 7451; *see also* CCF 2580-2581. These choices were facilitated by the use of programmable burst in the SDRAM standards, but having now made these choices, these two highly important DRAM users now have “a disparity in incentives” that could seriously impede efforts to move away from programmable burst feature. *Id.*

substantially exceeds the impact of the sorts of monetary switching costs that Dr. Rapp, albeit incorrectly and incompletely, sought to quantify, which explains why Dr. Rapp's analysis leads to "the wrong answer." Tr. 11301. In Prof. McAfee's words, "[R]egardless of the switching costs, the financial switching costs, the coordination costs" described above "still completely block the switching to a new standard." Tr. 11300.⁷⁷ Thus, Prof. McAfee has concluded, "[T]here is in fact substantial lock-in in this industry and as a result there is a potential for the creation of monopoly power by incorporating the technologies in the standard." Tr. 11304.

B. The Use of Rambus Technology in DDR-2 Shows (Not Disproves) Lock-In

Rambus also implies that the mere consideration of alternative technologies in connection with the DDR-2 SDRAM standard demonstrates that JEDEC was not locked in to use of the Rambus technologies. *See* RB 82. However, while such consideration may be convincing evidence that JEDEC members understood that there were alternatives to each of the technologies claimed by Rambus, the fact that JEDEC considered alternatives is not evidence that the industry was free of lock-in effects. Instead, JEDEC's consideration of, and in particular

⁷⁷ Rambus criticizes Complaint Counsel for "not produc[ing] any evidence quantifying switching costs." RB 95. In fact, however, several witnesses did testify about the substantial costs that their companies would have to undertake in order to switch to alternative DRAM standards that worked around Rambus's technologies. *See, e.g.*, Bechtolsheim, Tr. 5882 ("to redesign and requalify these boards with a new type of memory technology, the cost to the company could approach or exceed \$1 billion"); Heye, Tr. 3743 (just validating a revised infrastructure would cost "out to the millions"); Appleton, Tr. 6401 ("a change in [memory] technology" would cost "hundreds of millions of dollars"); *see also* CCRF 1342, *in camera* (based on lost inventory and the replacement of masks alone, the switching cost for Micron is in the range of _____ and _____ as of the fourth quarter of 2002, over 100 times more than Dr. Rapp's estimates). While Prof. McAfee did not endeavor to produce a monetary estimate of switching costs, he also testified that "even if the switching costs, the actual direct financial costs" were "very, very low" (which he explained was not true, because of the coordination issues discussed above), it would still be "difficult or impossible to switch" to alternative standards. Tr. 11300. As for quantifying "coordination costs," Prof. McAfee testified that this would be "a massive challenge" and in fact there is no "practical way" to do so, but that this does not diminish "the significance from the standpoint of economics." Tr. 11296-97.

the reasons for JEDEC's decision not to adopt, alternatives for the DDR-2 SDRAM standard demonstrate that the industry is, in fact, locked in to the current standards.

JEDEC, through the "Future DRAM Task Group" began deliberations on what was to become the DDR-2 SDRAM standard in the spring of 1998. CCF 3230. The first order of business for the Future DRAM Task Group was to decide which existing DRAM standard should serve as the "baseline" for the new standard. CCF 3236. The baseline for the new standard was intended to be the starting point from which the new standard was to develop. Rhoden, Tr. 409-410. By the Summer of 1998, the Task Group had settled on DDR SDRAM as the baseline for the new standard, thus assuring, at that point, that many of the Rambus technologies would be incorporated into the new standard. CCF 3237. By choosing DDR SDRAM as the baseline for the new standard, the Task Group ensured that it would be possible for the industry to develop backwards compatible products that would speed the adoption of the new standard. CCF 3244-50. The major functions of the new standard were described by March/April of 1999. CX397 at 6. At the same time that the Task Group was developing the new standard, a number of firms were already designing products based on the emerging DDR-2 SDRAM standard, so that today a number of firms sell DDR-2 SDRAM related products. CCF 3239-42.

The record demonstrates that the Task Group did consider alternatives to the technologies claimed by Rambus. CCF 3251-53. The record also demonstrates, however, that by the time Rambus began asserting its patents against DRAM manufacturers in late 1999 and early 2000, it was clear to the Task Group that adopting alternatives would both delay the standard and disrupt the adoption of the standard. First, by that time, a number of firms were already preparing to introduce products that would use the new standard, and removing the technologies claimed by Rambus would have required those firms to redesign their products. CCF 3255 (on-chip DLL);

CCFF 3258 (dual-edged clocking). Second, it was clear to the Task Group that changing the DDR-2 SDRAM standard that late would lead to an unacceptable delay in the introduction of the standard itself. Kellogg, Tr. 5204-05 (“[O]ur belief was that the introduction of a total new clock structure . . . would slow down DDR-II indefinitely.”). Finally, it was clear to the Task Group that adopting alternatives would eliminate the benefits of using DDR SDRAM as the baseline for DDR-2 SDRAM because it would mean that firms could not design backwards compatible components. CCFF 3254 (on-chip DLL); CCFF 3260 (dual-edged clocking).

In other words, the fact that the Future DRAM Task Group considered, but did not adopt, alternatives proves two things: (1) there were potentially acceptable alternatives, and (2) by the year 2000, it was too late for the industry to adopt them.⁷⁸

VI. RAMBUS’S CHALLENGED CONDUCT IS “EXCLUSIONARY”

A. Rambus Misstates the Legal Definition of “Exclusionary” Conduct

Recognizing the diverse ways in which firms can illegitimately undermine the competitive process and thereby accumulate undeserved market power, neither the courts nor the Commission have been wedded to any single definition of what constitutes “exclusionary” conduct. Conduct fitting a variety of definitions has been deemed exclusionary. CCB 88-90. Yet Rambus asserts that there is only one definition of exclusionary: conduct must “consist of short-run actions that do not make sense except in terms of their adverse impact on competition.”

⁷⁸ Rambus also argues that “the economic evidence shows that neither switching costs and coordination issues would not prevent the DRAM industry from going to alternatives, if they existed.” However, while the facts do not demonstrate that the industry was prevented from changing the standards in response to the Rambus lawsuits, that is not an issue in this case. Instead, the facts establish what is an issue in this case: that Rambus has the ability to increase prices for its technologies because other firms in the industry would find it less costly to pay Rambus’s prices rather than to switch. In other words, these facts show that Rambus’s conduct, which led to the use of the technologies by JEDEC in the first place, also led to its monopoly power.

RB 97-98. While the test Rambus alludes to is indeed used by courts in assessing exclusionary conduct, it is by no means the only test that can be applied, or the appropriate test in this case.

Rambus relies upon a joint FTC/Department of Justice *amicus* brief filed in support of a petition for *certiorari* in *Verizon Communications., Inc. v. Law Offices of Curtis V. Trinko*. Yet Rambus entirely ignores the agencies' subsequent *amicus* brief addressing the merits of the *Trinko* case, in which the agencies argue, "In the context of an alleged refusal to assist a rival, conduct is exclusionary only if it would not make business or economic sense apart from its tendency to reduce or eliminate competition." Brief for the United States and FTC as *Amici Curiae* at 7, *Trinko* (U.S., No. 02-862) (emphasis added) [Tab 2]. This and other statements in the agencies' *Trinko* briefs make clear that the position articulated by the agencies was intended to be limited to this context, and this context alone. Indeed, the agencies were exceedingly careful to distinguish other contexts in which different tests for exclusionary conduct are appropriate. *Id.* at 12 n.3 ("In other contexts not implicated here, courts have sometimes found that the violation of other extrinsic duties such as prohibitions against fraud and deception – may be a significant factor when ascertaining whether the conduct is exclusionary for antitrust purposes.").⁷⁹ In fact, the agencies specifically draw attention to "the private standard-setting process" as a different context that "may afford opportunities for opportunistic behavior that may harm competition" but in which different tests for exclusionary conduct may apply. *Id.* at 14 n.4. Notably, in referring to exclusionary conduct in the "private standard-setting" context, the agencies cite to only one authority, *Allied Tube & Conduit Corp. v. Indian Head, Inc.*, 486 U.S.

⁷⁹ The agencies cite for this proposition the same authority—ABA SECTION OF ANTITRUST LAW, ANTITRUST LAW DEVELOPMENTS 249 (5th ed. 2002)—that Complaint Counsel cites when discussing the proper definition of exclusionary conduct in its post-hearing brief. *See* CCB 88-89.

492 (1988). In the context presented here, it is appropriate for this Court to conclude that Rambus's conduct was exclusionary because it amounted to "deception" or violated "extrinsic duties," such as the duty of good faith and duty to disclose relevant patent information established by JEDEC's rules. *See Allied Tube*, 817 F.2d 938; *Dell Computer Corp.*, 121 F.T.C. 616.⁸⁰

Misleading a standard-setting organization fits well within the definition of "exclusionary," as the Supreme Court and other courts have defined that term. Exclusionary conduct is that which "not only (1) tends to impair the opportunities of rivals, but also (2) either does not further competition on the merits or does so in an unnecessarily restrictive way." *Aspen Skiing*, 472 U.S. at 605 n.32. Accordingly, deceptive and misleading conduct that deprives consumers of information is exclusionary. For example, Microsoft's misleading statements regarding the capabilities of its Java development application, which allowed it to harm competing operating systems, was held to be exclusionary. *See United States v. Microsoft, Inc.*, 253 F.3d 34, 76-77 (D.C. Cir.), *cert. denied*, 534 U.S. 952 (2001). Similarly, conduct that suppresses information to consumers is recognized as anticompetitive.⁸¹ *See Conwood Co. v.*

⁸⁰ The Hovenkamp treatise—on which Rambus relies—notes that in this context "[m]isrepresentations" and "manipulation" may be exclusionary. *See* 2 H. HOVENKAMP ET AL., IP AND ANTITRUST § 35.5, at 35-40. Consistent with this agency's recent Supreme Court filing in *Trinko*, the treatise also refers to *Allied Tube* as the "paradigm" case involving such conduct. *Id.* at 35-34.

⁸¹ It is well recognized that depriving markets and consumers of relevant information can cause harm to consumers. *See 44 Liquormart, Inc. v. Rhode Island*, 517 U.S. 484, 503 (1996) (bans on commercial speech "hinder consumer choice"); *see also id.* at 503 n.13 (explaining that ban on price advertising designed to increase price of alcohol deprived consumers of relevant information). Indeed, Prof. McAfee testified extensively that providing false and misleading information deprives consumers of relevant information. CCF 2991. The effect of such misinformation is to cause consumers to make incorrectly informed choices. CCF 2990. Causing such ill-informed choices thus can have an exclusionary effect on competing products. CCF 2991.

United States Tobacco Co., 290 F.3d 768 (6th Cir. 2002), *cert. denied*, 123 S. Ct. 876 (2003).⁸²

Rambus's conduct was exclusionary under this proper reading of the relevant antitrust authority.

B. There Is No Legitimate Business Justification for Rambus's Conduct

Rambus argues that its conduct cannot be deemed exclusionary because there are "legitimate business justifications for keeping . . . patent applications confidential." RB 101. This argument suffers from a multitude of defects, both factual and legal. Simply articulating a theoretical business justification is not enough. It is the defendant's burden to demonstrate that the justification is supported by facts. *See Microsoft*, 253 F.3d at 59; *see also id.* at 66 (Microsoft's failure to offer procompetitive justification for certain conduct lead to conclusion it was exclusionary). This Rambus has failed to do.

Rambus's proffered "justifications" amount to generic propositions regarding the interests of "patent applicants" in keeping their applications confidential. RB 102. While as a generic proposition it may be true that patent applicants would rather maintain the confidentiality of their applications, this hardly excuses Rambus's conduct in this case, given that it voluntarily joined JEDEC and thereby assumed responsibility to comply with JEDEC's rules, including rules requiring disclosure of the existence of relevant patent applications. *See* CCB 38-39 & n.20. If, as Rambus appears to be claiming, generalized interests in keeping patent applications confidential were a license to violate the disclosure rules of a standard-setting organization, it would be impossible for SSOs to operate any effective disclosure policy. As a group of SSOs recently stated in an *amicus* filing urging Supreme Court review of the Federal Circuit's *Infineon*

⁸² *See also Du Pont*, 729 F.2d at 137 ("collusive, predatory, restrictive [and] deceitful conduct that substantially lessens competition" violates Section 5 of FTC Act); *National Ass'n of Pharm. Mfrs. v. Ayerst Labs.*, 850 F.2d 904, 916 (2d Cir. 1988) (deceptive advertising used to perpetuate patent monopoly potentially violated Sherman Act); *Caribbean Broadcasting Sys. v. Cable & Wireless PLC*, 148 F.3d 1080, 1087 (D.C. Cir. 1998) (misrepresentations sufficient to state claim under Section 2).

decision, “Absent a fundamental trust by each standard setting participant that no other participant can manipulate the process to its own advantage, many vendors and others will decide not to participate in standard setting at all.” Brief of *Amici Curiae*, Consumer Electronics Association *et al.*, at 5 (“CEA *Amicus Br.*”) (attached as Tab 4 to CCB).

The most glaring omission from Rambus’s “justification” story is contemporaneous evidence linking these justifications to the actual events at issue in this case. Rambus’s attempts to provide such a linkage do not withstand careful scrutiny.⁸³ First, as Rambus has repeatedly pointed out (*see, e.g.*, RB 73), its PCT application made public the written description and original 150 claims of its ‘898 application in 1991. Accordingly, at that point there was no confidentiality or business justification for failing to call that application to JEDEC’s attention. *See* CCRF 92, 98, 100. Second, Rambus’s putative concerns about interference proceedings are completely unsupported. *See* CCRF 96. Rambus has adduced no factual evidence that, even now, any other person has requested that the PTO commence an interference proceeding. Moreover, concerns about avoiding an interference proceeding, otherwise properly declared by the PTO (not a private party) to determine the true inventor, are not a legitimate business justification any more than asserting an invalid patent is legitimate. *See* 37 C.F.R. § 1.607 (2003); CCRF 96-97; *see also Walker Process, supra* (asserting fraudulently obtained patents can constitute antitrust violation). Third, Rambus argues that disclosure of information about pending applications could jeopardize its foreign patent rights (RB 104). Such concerns

⁸³ Rambus’s economic expert—Dr. Rapp—while testifying that Rambus purportedly had legitimate business justifications for its conduct for reasons outlined in Rambus’s brief, was quick to concede that he could not “link” these justifications “to any specific evidence or testimony.” Tr. 10169-70; *id.* at 10172 (noting he had not “seen anything in the record” to suggest that such issues were “in fact . . . a concern that influenced Rambus’s decisions regarding disclosure of patent-related information to JEDEC”).

misconstrue the applicable law. Rambus's foreign patent applications receive the benefit of the '898 application's United States filing date—April 18, 1990—through treaties to which the United States is a party. *See* Fliesler, Tr. 8839-40, 8883-86, 8888. Rambus has offered no credible explanation of how any disclosure after that date could have adversely affected its foreign patent rights. CCRF 98-100.

The only evidence affirmatively advanced by Rambus to support its business justification argument—Richard Crisp's testimony suggesting that he was following counsel's advice "not to disclose Rambus's patent applications" (RB 105)—is woefully insufficient to establish a factual basis for Rambus's proffered justifications. The argument presumes that JEDEC's rules called for disclosure of the confidential contents of relevant patent applications, but that is plainly incorrect. It is clear that, under JEDEC's rules, member companies were never required to disclose the actual patent application or the precise wording of the claims. Rather, they were expected merely to "identify the nature of technology involved in the application" and an explanation of "how that technology relates to the work of the committee." Kelly, Tr. 1972. The evidence shows that Richard Crisp understood this. In December 1995, he wrote, "As long as we mention that there are potential patent issues when a showing or a ballot comes to the floor, then we have not engaged in inequitable behavior." CX711 at 188. Thus, even if Mr. Crisp had been told by the company's lawyers not to reveal the confidential contents of Rambus patent applications, this would not provide a justification for Rambus to violate JEDEC's disclosure policy by withholding all information about its applications.⁸⁴

⁸⁴ Exclusionary conduct, even if it arguably has a legitimate business purpose, is unlawful if it is done in an "unnecessarily restrictive way." *Aspen Skiing*, 472 U.S. at 605 n.32; *see also Microsoft*, 253 F.3d at 59 (if anticompetitive harm of conduct outweighs its procompetitive benefit, then exclusionary conduct is established). Even assuming Rambus had a legitimate interest in not disclosing any information about its pending patent applications, there were steps it could have taken that would have been far less "restrictive" of competition.

For the reasons explained above—and in light of the substantial volume of evidence revealing the illegitimate motives for Rambus’s challenged conduct—Rambus’s legitimate business justification arguments at best constitute the sort of unsupported, after-the-fact contrivances that courts have routinely rejected as pretextual.⁸⁵ *See Image Tech. Servs.*, 125 F.3d at 1219 (“Neither the aims of intellectual property law, nor the antitrust laws justify allowing a monopolist to rely upon a pretextual business justification to mask anticompetitive conduct.”).

C. Rambus’s Conduct Was Exclusionary

The record establishes that Rambus’s conduct, including repeated failures to make good-faith patent-related disclosures to JEDEC, led JEDEC to choose among alternative technologies while lacking material information namely, knowledge that features proposed for inclusion in the SDRAM and DDR SDRAM standards could infringe upon Rambus patents. Stated differently, Rambus’s technologies were chosen and others were rejected due to distortions in the process brought about by Rambus’s misleading conduct. McAfee, Tr. 7172-73. Conduct of this sort is exclusionary because, as the Supreme Court has said, “it tends to impair the opportunity of rivals.” *Aspen Skiing*, 472 U.S. at 605 n.32. Placing the same concept in economic terms, Prof. McAfee testified that such conduct is exclusionary because it has the potential to exclude “equal or superior” alternatives from the marketplace. McAfee, Tr. 7168.

Complaint Counsel demonstrated at trial that this is precisely the effect that Rambus’s conduct has had in the relevant antitrust markets that Prof. McAfee defined. As a result of Rambus’s conduct, the influence it had on JEDEC’s standardization process, and the fact that the

⁸⁵ Rambus’s attempts to support its legitimate business justifications by suggesting that Complaint Counsel’s expert “conceded” certain points are spurious. RB 108-09. Prof. McAfee testified that he did “consider other purposes that might lead” Rambus to engage in such conduct, but “didn’t find” any evidence to support an alternative explanation. McAfee, Tr. 7539.

industry has become “locked-in” to standards embodying Rambus’s technologies, alternative technologies that in the past were viable substitutes for Rambus’s technologies have been rendered non-viable and excluded from the market altogether. CCF 2500-84.

Rambus’s attack on this proof in part comes down to a game of semantics. Rambus argues that proof showing the exclusion of “commercially viable substitutes” does not equate with proof of exclusion of “equal or superior” alternatives, and therefore does not satisfy Prof. McAfee’s own economic test. RB 116. However, Prof. McAfee made it clear through his testimony that exclusion of commercially viable alternatives, through the type of misleading conduct at issue here, does properly meet the economist’s definition of “exclusionary.” Tr. 7167 (“I find that Rambus’s alleged conduct is in fact exclusionary.”).

In reaching his conclusions in this regard, Prof. McAfee first defined relevant markets, using well-accepted economic methodologies. *See* Tr. 7312 (explaining that market definition is the first step in determining whether “alternatives have been excluded or not”); CCF 2757-2904. As Prof. McAfee concluded, and Rambus’s own expert conceded, the alternatives tendered by Complaint Counsel were substitutes that exerted a price-constraining influence on Rambus’s technologies in the relevant markets he defined. Rapp, Tr. 9861-62. Rambus attempts to argue, however, that even the exclusion of commercially viable, price-constraining alternatives does not amount to exclusionary conduct. Rather, Rambus argues that the only proof that would suffice in this regard would be objective proof showing that, by virtue of its challenged conduct, Rambus’s technologies displaced technologies that were better in “cost-performance” terms. Rambus’s arguments fly in the face of well-established legal principles. Prof. McAfee’s methodology tracks the approach commonly followed in defining markets and assessing harm to competition in antitrust cases. Products are in the same market if they have “reasonable

interchangeability for the purposes for which they are produced price, use and qualities considered.” *Palladin Assocs., Inc. v. Montana Power Co.*, 328 F.3d 1145, 1163 (9th Cir. 2003). Accordingly, “[p]roducts will be considered to be reasonably interchangeable if consumers treat them as ‘acceptable substitutes.’” *Pepsico, Inc. v. Coca-Cola Co.*, 315 F.3d 101, 105 (2d Cir. 2002).⁸⁶ Prof. McAfee’s approach to defining markets followed this same approach. He studied what consumers of DRAM technology specifically, JEDEC members considered to be reasonable substitutes for Rambus’s technologies, when price, quality, and use were considered. *See* CCB 94-98. Indeed, Rambus’s experts during trial expressed no material disagreement with Prof. McAfee’s market definitions. *See* Rapp, Tr. 10031 (noting that he did not disagree with “the ultimate definitions”).

While Rambus criticizes Prof. McAfee’s approach to evaluating alternatives as being “subjective,” it is perfectly appropriate and consistent with the case law for an economist to take significant account of the views and real-world behavior of relevant consumers. *See* Teece, Tr. 10372 (noting appropriateness of basing economic conclusions on observations about “JEDEC’s behavior”). On the other hand, Rambus’s so-called “objective” approach to evaluating alternatives suffers from serious defects. Rambus attempted to show that the manufacturing costs of SDRAM and DDR SDRAM using the various alternative technologies would exceed the cost of using Rambus’s technology and paying the demanded royalties. Putting aside the fact that such a calculus ignores both JEDEC’s policies that are designed to ensure that JEDEC’s

⁸⁶ It is well established that products need not be identical in price to be reasonably interchangeable substitutes for the defendant’s product. *See, e.g., Nifty Foods Corp. v. Great Atlantic & Pacific Tea Co.*, 614 F.2d 832, 840 (2d Cir. 1980) (private-label versus brand-name frozen foods); *AD/SAT v. Associated Press*, 181 F.3d 216, 228 (2d Cir. 1999) (delivery methods for advertisements), or type, *see, e.g., Cable Holdings, Inc. v. Home Video Inc.*, 825 F.2d 1559, 1563 (11th Cir. 1987) (video entertainment through cable, satellite, or video cassette); *America Online, Inc. v. GreatDeals.Net*, 107 F. Supp. 2d 1192, 1200 (N.D. Cal. 2000) (forms of advertising).

members get to make this assessment before selecting the standard and JEDEC's actual methods of selecting technologies for a standard, the evidence does not support Rambus's proposed conclusions. As set out in Complaint Counsel's reply findings, Rambus's cost calculations are doubly flawed. First, as a general matter, the calculations rest upon the flawed assumption that these costs would be the same for each manufacturer. *See* CCRF 969, 1125. Moreover, the cost estimates greatly overstate what the evidence demonstrates these alternatives would have cost to use from a manufacturing standpoint. *See* CCRF 973-76 (cost of alternatives to programmable CAS latency); *id.* 979-82 (cost of alternatives to programmable burst length); *id.* 1130-31 (cost of alternatives to dual-edge clocking); *id.* 1135-36 (cost of alternatives to on-chip PLL). Indeed, in several instances the alternatives were cheaper than Rambus's technology, even before adding on the royalty costs associated with the use of Rambus's technology. Furthermore, Rambus offered no competent evidence that any of the alternatives presented by Complaint Counsel were technically inferior. *See* CCRF 977, 983, 1132, 1134. In short, Complaint Counsel's proposed alternatives were technically viable and no more expensive than Rambus's technologies before Rambus's royalties are taken into account. Exclusion of such alternative technologies through misleading, bad-faith conduct for which no valid, legitimate business justification has been shown, plainly does amount to exclusionary conduct and properly should be condemned under the antitrust laws.

D. The "Efficiency" of JEDEC's Rules Is Not in Issue Here

The efficiency of JEDEC's rules is specifically not at issue in this case, as Your Honor ruled before the trial began. *See* Order on Motions in Limine 11 ("The issue here is not whether JEDEC's standards are anticompetitive. Rather, the issue is whether Respondent used its participation in JEDEC to benefit itself economically by creating or attempting to create a

monopoly in one or more DRAM markets.”) (Apr. 21, 2003). Nevertheless, in a further attempt to cloud the issue of exclusionary conduct, Rambus argues, essentially, that JEDEC’s disclosure rules are inefficient because they do not necessarily achieve their goal of disclosure of relevant information and potentially interfere with intellectual property rights. RB 112-14. As Your Honor’s prior ruling recognized, the argument is meritless. Although the pro-competitive benefits of standard-setting organizations were not on trial, if they were, the evidence elicited would be more than sufficient to establish the substantial consumer benefits that derive from SSOs and from rules—including patent disclosure rules—that permit such organizations to operate efficiently. *See generally* CCF 112-21, 300-04, 316-17. Indeed, Prof. McAfee, who in light of the pre-trial ruling did not offer a cost-benefit analysis of the disclosure rules, *see* RB 112-13 (citing McAfee, Tr. 7728), did explain several of the procompetitive benefits of such disclosure rules, *see* McAfee, Tr. 7276-78. Others have similarly recognized the procompetitive benefits of and standard-setting generally, as well as rules requiring good-faith disclosure of patent information by the members of such organizations. *See, e.g.,* CEA *Amicus* Br. at 15-17 (discussing why intellectual property policies “are necessary for the success of voluntary standard setting”). In the context of private standard-setting activities, nothing could be more destructive of competition than allowing the willful violation of such rules for individual gain. *See* CCB 120-21.

VII. RAMBUS’S CONDUCT HAS RESULTED IN ANTICOMPETITIVE EFFECTS

The record evidence demonstrates that, through the exclusionary conduct at issue in this case, Rambus has obtained monopoly power in the relevant technology markets and has caused both actual and potential future anticompetitive effects. *See* CCB 116-19; CCF 1995-2054, 3012-60. Notably, Rambus does not deny that it in fact possesses monopoly power in such

markets, nor does it appear to deny the existence of the various market conditions that Complaint Counsel has pointed to as evidence of anticompetitive effects. Rather, Rambus's response amounts to the contention that the world would be no different today if it had never engaged in the challenged conduct, because—it maintains—(a) its technologies were “superior” to alternatives and would have been selected by JEDEC even if the organization's members had known of Rambus's issued and pending patents, and (b) at most Rambus, in a but-for world, would have been required to charge “reasonable and non-discriminatory” royalties for its technologies, which, Rambus claims, it has done in any event. Neither of these contentions can be reconciled with the record evidence in this case.⁸⁷

A. The Record Shows That JEDEC Members Likely Would Have Chosen Alternative Technologies Had They Been Informed of Rambus Patents

In this section of its brief, Rambus again asserts that its technologies were “superior” to alternatives and would have been chosen through JEDEC's process even if—contrary to the real world—Rambus had provided proper patent-related disclosures. As discussed above, however, this contention simply cannot be squared with the facts. The record demonstrates that alternatives existed that cost the same or less than the Rambus technologies. *See* Section VI. Rambus has failed to produce persuasive evidence that JEDEC would have made the same

⁸⁷ Rambus also suggests that, as a matter of economic theory, standard-setting activities in the DRAM marketplace are simply not capable of creating or enhancing market power, given that for this to occur the market in issue must be one in which there are “high compatibility requirements.” RB 131. This argument does not warrant serious attention. To begin with, Rambus itself does not deny that there are “high compatibility requirements” here. It only contends that “the DRAM industry does not have exceedingly high compatibility requirements.” *Id.* (emphasis added). Moreover, Dr. Rapp, on whose testimony Rambus relies, has previously testified that the DRAM industry is one in which high compatibility requirements exist and hence “standards may be important” from the standpoint of creating or enhancing market power. Rapp, Tr. 10089-90. The evidence in this case also clearly demonstrates that compatibility requirements are extremely important in the DRAM industry (CCFF 112-21; CCRF 1511), and that standardization does add substantially to market power and accordingly, the value of patents. Indeed, Rambus's own documents demonstrate that this is true. *See* CX903 at 2 (“The most valuable patents are ones that must be used in order to be in compliance with a standard.”).

choices had it known the true price of the Rambus technologies, *see* Section IV.B; rather, the overwhelming weight of the evidence indicates that JEDEC members would have selected alternative technologies. Section IV.A; CCF 2101.

As noted above, Rambus's own authorities suggests that where, as here, there is proof "of manipulation of the process towards an anticompetitive end," this "should incline a court to doubt the technical superiority of the standard ultimately adopted." 2 H. HOVENKAMP ET AL., IP AND ANTITRUST § 35.5, at 36-37 (emphasis added). In other words, given the ample evidence demonstrating that Rambus did indeed seek to subvert and manipulate JEDEC's process by concealing the existence of relevant patent materials, this court should "doubt" Rambus's contention that the standards that were ultimately adopted, which embody the company's patented technology, are "technically superior" and would have been adopted even absent Rambus's challenged conduct.

B. Rambus Has No Basis to Contend That "JEDEC Members Would Pay the Same Royalties in the But-For World"

As discussed above, the evidence elicited at trial shows that, had Rambus complied in good faith with its obligations to disclose relevant patent information to JEDEC, the most likely outcome is that JEDEC would have worked around the Rambus technologies, opting in favor of commercially viable alternatives that were in existence at that time. But in discussing the "but-for" world, Rambus posits two alternative scenarios, in which—contrary to the weight of the evidence—JEDEC would have proceeded to adopt standards incorporating Rambus's technology even knowing of Rambus's patents, or pending patents.

The first hypothetical scenario Rambus envisions is one in which "JEDEC had proceeded without asking for a RAND letter." RB 135. According to Rambus, if this had occurred,

“nothing would be different.” *Id.* The problem with this scenario is that the hypothesis of JEDEC knowingly adopting patented or patent-pending technologies in its standards without first asking the IP owner for a RAND letter is completely at odds with the process that JEDEC has followed throughout the relevant period. CCFF 347-56, 2417, 3023. In an attempt to construct this implausible, counter-factual scenario, Rambus argues, “JEDEC might have believed that Rambus’s patent applications would not result in issued patents or, if they did, that the patents would not be valid because of prior art.” RB 88. Yet there is no evidence in the record that such considerations have ever caused JEDEC to depart from the firm rule that “the organization may not incorporate a known patented technology in circumstances in which” it has not received advance, written assurances of “reasonable and non-discriminatory” licensing from the owner of the relevant IP. Kelly, Tr. 1874; *id.* at 1884-85 (describing this as an “absolute requirement” within both EIA and JEDEC); CX203A at 11.

Rambus claims that this scenario is not “mere speculation” in light of events that occurred within another EIA-affiliated organization—the Consumer Electronics Association (“CEA”)—involving a company named Echelon. Yet the two scenarios are fundamentally different. As John Kelly testified, Echelon presented CEA with “roughly a six-inch stack of documents” that it claimed “may relate to the work” of CEA. Tr. 2135. But Mr. Kelly explained, “There was no proffer of relevance” and “no indication that the patent was or might be required for anything.” *Id.* Moreover, Mr. Kelly explained that it was clear from a variety of facts and circumstances that “Echelon was deliberately trying to impede” and “stall” the standardization process “for its own purposes, in violation of the duty of good faith.” *Id.*; *id.* at 2136 (it was “an abuse of process”); *id.* at 2155-71. In these circumstances, Mr. Kelly explained, after consulting with lawyers and evaluating the issue over a period of months, CEA declined to

give in to Echelon's demand that it be asked for a RAND letter, fully believing that if it were it to do so Echelon would use this as an opportunity to manipulate the process. *See also* CCRF 1166.

Rambus obviously is far off base in citing to these events as an example of what might have transpired in a but-for world in which Rambus complied in good faith with JEDEC's policies. As John Kelly's testimony shows, Echelon's conduct reflected anything but good faith. Prof. Teece agreed that, as he understood the facts, Echelon was seeking to "derail" the standardization process, and that this was not "similar" to Rambus's assumed conduct in the but-for world. Tr. 10671. Prof. Teece further agreed that, from a methodological standpoint, when one formulates a but-for world the proper approach is to assume that "the defendant . . . conforms its conduct . . . with what it is challenged for not having done in the real world." *Id.* at 10676-77. Hence, in this case, the proper assumption is that Rambus, in the but-for world, "did not engage in any conduct that was . . . at odds with the requirements of the rules or the process of JEDEC." *Id.* at 10677. Because that is what must be assumed to occur in the but-for world, it is of no relevance to consider what might have occurred in an irrelevant scenario in which a firm, like Echelon, patently violated JEDEC's rules in ways that exuded bad faith.

The other "but-for" world scenario that Rambus considers is one in which it was asked for, and agreed to provide, a RAND letter to JEDEC. To start with, this scenario also conflicts with the facts. The evidence elicited at trial demonstrated that Rambus was strongly opposed to any limitation or restriction on its freedom to license whomever it wished on whatever terms it deemed appropriate. For this reason, when Rambus was asked to provide RAND assurances to IEEE, it refused to do so. CCF 1091, 1535-39. The weight of the evidence suggests that Rambus would have taken the same approach in a but-for world in which JEDEC had been advised of Rambus's patents and followed its customary procedures in asking for a RAND letter.

McAfee, Tr. 11311 (opining that “based on their business strategy,” it is “more likely than not” that Rambus would “refuse to issue a RAND letter”); CCFF 3024-25; CX873 (draft withdrawal letter: “Rambus Inc cannot agree to the terms of the JEDEC patent [licensing] policy as it limits our ability to solely control the dissemination and use of our intellectual property.”); CX874 (draft withdrawal letter: “In particular the patent [licensing] policy of JEDEC does not comport with our business model.”).

Even if one were to assume that Rambus did, in the but-for world, agree to RAND terms, it does not follow—as Rambus claims—that “the situation in the but-for world would be identical” to the situation today. RB 135. It is far from clear that JEDEC would have adopted Rambus’s technologies even if it had agreed to sign a RAND letter, given the many alternatives to Rambus’s patented technologies to which JEDEC could have turned. CCFF 2433-40, 3029-33. Prof. McAfee testified that he “would put no probability/weight on adopting the existing standards . . . because of the existence of commercially viable alternatives.” Tr. 11314-15.

Furthermore, if one assumes both that Rambus would sign a RAND letter in the but-for world and that JEDEC, having received such a letter, would have proceeded to use Rambus’s technologies in its standards, this still does not result in the situation posited by Rambus in which nothing would have been different. To start with, there is good reason to believe that individual JEDEC members, in this scenario, would have conditioned their individual support for use of Rambus’s technologies on receipt of Rambus’s agreement to licensing terms more attractive than those that Rambus has demanded in the aftermath of industry lock-in. *See, e.g.*, McAfee, Tr. 11313-14 (opining that *ex ante* negotiations were “a distinct possibility” and that the most likely outcome of such negotiations would be “lower royalties than those that prevail today.”); CCFF 2441-64, 3034-36.

What cannot be defended, however, is Rambus's claim that the license terms it has extracted from licensees in the real world are both reasonable and non-discriminatory and, hence, perfectly consistent with the type of RAND commitments that JEDEC requires. Rambus's efforts at trial to defend its real-world license terms on such grounds plainly were unsuccessful. The sole witness upon which Rambus relied in defending this proposition at trial was Prof. Teece. Using the easel, Rambus's counsel created a demonstrative exhibit—DX-353—tracking the various data points that Prof. Teece used as a basis for his testimony about the “reasonableness” of Rambus's royalty rates. On cross-examination, however, Prof. Teece was forced to admit, among other things:

- that here may have been some “zero royalty rates” that were part of the universe of his sample but that he “didn't really pay much attention to them” (Tr. 10467);
- that he was not sure if the rates he quoted for licenses issued by Texas Instruments to Hyundai and Samsung were actually the “effective” rates, which could be “higher” or “lower” (Tr. 10619);
- that he did know anything about the nature of the Kentron technology included in his sample (Tr. 10623); did not know if it was ever adopted by JEDEC (Tr. 10625-26); did not know if it has been widely adopted or used (Tr. 10634); and indeed did not know if it had ever been licensed at any rate (Tr. 10635);
- that he was not sure whether the Digital Equipment Corporation rate he used even related to a DRAM technology, whether it was ever adopted by JEDEC, or whether Digital had ever collected royalties at that rate (Tr. 10637); and
- that, despite relying on IBM rates as part of his sample, he also was not sure if any specific IBM technology was ever adopted by JEDEC (Tr. 10639); was not aware of any specific royalty rate being paid to IBM in the range he quoted (Tr. 10639); and that he could not give an example of any relevant DRAM-related technology covered by IBM patents (*id.*).

In its brief, although Rambus avoids citing to the testimony of Prof. Teece, it relies on the very same royalty information that Prof. Teece's testimony demonstrates to be unreliable. *See* RB 136-37. In light of Prof. Teece's testimony, this evidence should be given no weight. Nor

should Rambus's contention that it has not charged "discriminatory" license rates (RB 137-38) be given any weight, given the absence of factual support for Rambus's theoretical assertions in this regard.

By contrast to Rambus's unreliable reliance on royalty rates with no established applicability to the markets in issue here, the overwhelming weight of the evidence suggests that the rates that Rambus has demanded under licenses to its SDRAM and DDR-SDRAM-related patents are demonstrably unreasonable and far in excess of the rates (if any) it might have been able to charge in a "but-for" world. CCF 1999-2011, 2033-37, 2041-43, 2441-64.

CONCLUSION

For these and the additional reasons set forth in Complaint Counsel’s Post-Hearing Brief, in its Proposed Findings of Fact, and Reply Findings of Fact, Complaint Counsel urges this Court to find liability against Rambus on each count of the three counts outlined by the Commission’s Complaint. As the evidence developed through the administrative hearing in this case firmly established, imposition of liability and an appropriate remedy are necessary in order to restore market conditions as closely as possible to those that would have prevailed absent Rambus’s conduct, to prevent future harm to the markets at issue and related markets, and to prevent harm to the standard-setting process.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Brian Beall, hereby certify that on October 1, 2003, I caused a copy of the following materials:

1. Public Version Complaint Counsel's Response To Respondent's Post-Trial Brief

to be served upon the following persons:

by hand delivery to:

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