



3. According to SMI's website, SMI "is the global leader in developing NAND flash controllers for SSDs and other solid state storage devices" and is the "world's leading merchant supplier of SSD controllers used in PCs and other client devices, enterprise and data center applications, and embedded eMMC/UFS controllers used in smartphones and IoT devices." <https://www.siliconmotion.com/company/overview>.

4. SMI's website also states that it "was founded in 1995 in San Jose, California and now operate from corporate offices in Hong Kong, Taiwan, and the US." *Id.* (emphasis added); *see also* Silicon Motion's Company Profile at [https://www.siliconmotion.com/download/3k1/a/SMI%20company%20profile\\_202308website.pdf](https://www.siliconmotion.com/download/3k1/a/SMI%20company%20profile_202308website.pdf).

### **JURISDICTION AND VENUE**

5. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq.* This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a) and 1367.

6. This Court has specific and personal jurisdiction over SMI consistent with the requirements of the Due Process Clause of the United States Constitution and the Texas Long Arm Statute (*see* Tex. Civ. Prac. & Rem. Code §§17.041 *et seq.*) because, among other things, (i) SMI has done and continues to do business in Texas, and (ii) SMI has committed and continues to commit, directly or through intermediaries (including subsidiaries, distributors, affiliates, retailers, suppliers, integrators, customers, and others), acts of patent infringement in this State and this District. Such acts of infringement include making, using, offering to sell, and/or selling Accused Products (as more particularly identified and described throughout this Complaint) in this State and this District and/or importing Accused Products into this State and this District and/or inducing

others to commit acts of patent infringement in this State and this District. SMI has purposefully and voluntarily placed, and is continuing to place, one or more Accused Products into the stream of commerce through established distribution channels (including the Internet) with the expectation and intent that such products will be sold to and purchased by consumers in the United States, this State, and this District; and with the knowledge and expectation that such products (whether in standalone form or as integrated in downstream products) will be imported into the United States, this State, and this District.

7. SMI has derived substantial revenue from its infringing acts occurring within this State and this District. It has substantial business in this State and this District, including: (i) at least part of its infringing activities alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent conduct, and/or deriving substantial revenue from infringing goods offered for sale, sold, and imported, and services provided to Texas residents vicariously through and/or in concert with its alter egos, intermediaries, agents, distributors, importers, customers, subsidiaries, and/or consumers.

8. SMI is engaged in making, using, selling, offering for sale, and/or importing products, such as SSD controllers used in PCs and other electronic devices and eMMC/UFS controllers used in smartphones and IoT devices, to and throughout the United States, including this District. SMI also induces its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, and customers in the making, using, selling, offering for sale, and/or importing such products to and throughout the United States, including this District. To this end, SMI and its foreign and U.S.-based subsidiaries—which act together as part of SMI’s global network of sales and manufacturing emissaries—have operated as agents of and for one another and have otherwise acted vicariously for SMI as elements of the same business group and/or enterprise. Indeed, they

work in concert and in orchestrated fashion, subject to agreements that are far nearer than arm's length, in order to implement a distribution channel of infringing products within this District and the United States.

9. SMI maintains a substantial corporate presence in the United States via at least its U.S.-based affiliate and customers. SMI's 2022 Annual Report identifies its parent corporation, Silicon Motion Technology Corporation ("SMTC") and also identifies Silicon Motion, Inc. ("SMI USA"). Silicon Motion 2022 Form 20-F, <https://siliconmotiontechnologycorporation.gcs-web.com/static-files/973eef9c-5b26-431b-ad6c-ae20b311ba42> at 25. SMI acquired SMI USA, a California Corporation, in August 2002. *Id.* SMI's 2022 Annual Report states that "[t]he address of our United States operating subsidiary, Silicon Motion, Inc., is 690 N. McCarthy Blvd. Suite 200, Milpitas, CA 95035." *Id.* SMI USA is a corporation organized under the laws of the State of California and is a wholly-owned subsidiary of SMI. Thus, on information and belief, SMTC and SMI do a significant amount of business in the United States through their affiliates or subsidiaries such as SMI USA.

10. Alone and through at least the activities of its U.S.-based affiliates and subsidiaries (e.g., SMI USA), SMI conducts business in the United States and this District, including importing, distributing, and selling controllers that are incorporated into devices, systems, and processes that infringe the Asserted Patents. *See Trois v. Apple Tree Auction Center, Inc.*, 882 F.3d 485, 490 (5th Cir. 2018) ("A defendant may be subject to personal jurisdiction because of the activities of its agent within the forum state..."); *see also Cephalon, Inc. v. Watson Pharmaceuticals, Inc.*, 629 F. Supp. 2d 338, 348 (D. Del. 2009) ("The agency theory may be applied not only to parents and subsidiaries, but also to companies that are 'two arms of the same business group,' operate in

concert with each other, and enter into agreements with each other that are nearer than arm's length.”).

11. Through importation, offers to sell, sales, distributions, and related agreements to transfer ownership of SMI's products (e.g., controllers) with distributors and customers operating in and maintaining significant business presences in the United States, SMI conducts extensive business in the United States, this State, and this District.

12. This Court has personal jurisdiction over SMI, directly or through intermediaries (e.g., subsidiaries, distributors, affiliates, retailers, suppliers, integrators, customers, and others), including its U.S.-based affiliates and subsidiaries, e.g., SMI USA. Through direction and control of such affiliates and subsidiaries, SMI has committed acts of direct and/or indirect patent infringement within this State and elsewhere within the United States giving rise to this action and/or has established minimum contacts with this forum such that the exercise of personal jurisdiction over SMI would not offend traditional notions of fair play and substantial justice. SMI USA is a wholly-owned subsidiary of SMI. On information and belief, the primary business of SMI USA is the research, development, support, and/or sale of SMI's and SMTC's electronic products in the United States. As such, SMI has a direct financial interest in its U.S.-based subsidiaries and affiliates, and vice versa.

13. On information and belief, SMI controls and otherwise directs and authorizes activities of its U.S.-based subsidiary SMI USA. Such directed and authorized activities include, the U.S.-based subsidiaries using, offering for sale, selling, and/or importing the Accused Products, their components, and/or products containing the same that incorporate and/or perform the fundamental technologies covered by the Asserted Patents. SMI's U.S.-based subsidiary is expressly authorized to import, distribute, offer to sell, and sell the Accused Products on behalf of

SMI. For example, on information and belief, SMI researches, designs, develops, and manufactures controllers, and then directs its U.S.-based subsidiary to import, distribute, offer for sale, and sell the Accused Products in the United States. *See, e.g., United States v. Hui Hsiung*, 778 F.3d 738, 743 (9th Cir. 2015) (finding that the sale of infringing products to third parties rather than for direct import into the U.S. did not “place [defendants’] conduct beyond the reach of United States law [or] escape culpability under the rubric of extraterritoriality”). SMI’s U.S.-based subsidiary also provides, on SMI’s behalf, marketing and technical support services for the Accused Products from their facilities in the United States.

14. According to SMI’s February 2023 Company Profile, SMI’s “Worldwide Top Tier Customers & Market Play” includes dozens of US-based clients that incorporate SMI’s controllers into their products such as Micron, Dell, Western Digital, Microsoft, Tesla, Amazon, HP, Xbox, and Apple. [https://www.siliconmotion.com/download/3k1/a/SMI\\_company\\_profile\\_2021111.pdf](https://www.siliconmotion.com/download/3k1/a/SMI_company_profile_2021111.pdf) at 9 and 13.

15. On information and belief, because SMI’s U.S.-based subsidiary is authorized by SMI to import, distribute, offer to sell, and sell Accused Products and/or to perform the fundamental technologies covered by the Asserted Patents. SMI’s U.S.-based subsidiary’s corporate presence in the United States gives SMI substantially the same business advantages it would enjoy if it conducted its business through its own offices and personnel.

16. In addition, SMI has knowingly induced, and continues to knowingly induce, infringement within this District by advertising, marketing, offering for sale and/or selling Accused Products (such as controllers) that incorporate the fundamental technologies covered by the Asserted Patents. Such advertising, marketing, offering for sale and/or selling of Accused Products is directed to subsidiaries, affiliates, manufacturers, integrators, suppliers, distributors,

resellers, partners, consumers, customers, and/or end users, and this includes providing instructions, user manuals, advertising, and/or marketing materials facilitating, directing and encouraging use, sale, or importation of infringing functionality with SMI's knowledge thereof.

17. Using established channels and chains of distribution, SMI provides Accused Products to be used as components in a variety of end-products that are made, used, sold, and imported into the United States and this District. SMI knew or should have known that by purposefully placing the Accused Products into the stream of commerce, those Accused Products would be sold and used in the United States and this District.

18. On information and belief, SMI and/or its agents provide the Accused Products for use in the United States. Silicon Motion's Annual Report acknowledges revenue from the United States and notes that it maintains direct sales personnel in the United States. Silicon Motion 2022 Form 20-F, <https://siliconmotiontechnologycorporation.gcs-web.com/static-files/973eef9c-5b26-431b-ad6c-ae20b311ba42> at 23, 27.

19. Additionally, SMI provides Accused Products to be used as components in many end-products sold, used, and imported into the United States and this District. For example, SMI states in its March 2023 Company Profile that "All NAND Makers adopt SMI SSD controllers for PC OEM SSD" including Kioxia, Micron, Samsung, SK Hynix, Solidigm, and Western Digital which are incorporated in end products from PC OEMs such as HP, Dell, Lenovo, Asus, and Acer. [https://www.siliconmotion.com/download/3k1/a/SMI\\_company\\_profile\\_2021111.pdf](https://www.siliconmotion.com/download/3k1/a/SMI_company_profile_2021111.pdf) at 12. These PC OEMs sell, use, or import various end-products in the United States and this District that use the Accused Products as components.

20. Upon information and belief, several large retailers with locations throughout the United States and in this District, currently sell and have sold the products from the PC OEMs

containing the infringing SSD controllers to customers in the United States and in this District, directly and through retailers such as Best Buy and Walmart.

21. Upon information and belief, SMI encourages and instructs users of SMI's Accused Products in an infringing manner.

22. SMI has, thus, in the multitude of ways described above, availed itself of the benefits and privileges of conducting business in the United States and this District and willingly subjected itself to the exercise of this Court's personal jurisdiction. Indeed, SMI has sufficient minimum contacts with this forum through its transaction of substantial business in this State and this District and its commission of acts of patent infringement as alleged in this Complaint that are purposefully directed towards this State and District.

23. Alternatively, the Court maintains personal jurisdiction over SMI under Federal Rule of Civil Procedure 4(k)(2).

24. Venue is proper in this District pursuant to 28 U.S.C. § 1391 because, among other things, SMI is not a resident of the United States, and thus may be sued in any judicial district, including this one, pursuant to 28 U.S.C. § 1391(c)(3). *See In re HTC Corp.*, 889 F.3d 1349, 1357 (Fed. Cir. 2018) (holding that "[t]he Court's recent decision in *TC Heartland* does not alter" the alien-venue rule.).

### **THE PATENTS-IN-SUIT**

25. K.Mizra is the sole and exclusive owner of all right, title, and interest in the '887 Patent, the '556 Patent, the '608 Patent, the '446 Patent, the '279 Patent, and the '379 Patent, and holds the exclusive right to take all actions necessary to enforce its rights in, and to, the Asserted Patents, including the filing of this patent infringement lawsuit. K.Mizra also has the right to recover all damages for past, present, and future infringements of the Asserted Patents and to seek injunctive relief as appropriate under the law.



26. The '887 Patent is titled, "High speed signaling system with adaptive transmit pre-emphasis." The '887 Patent lawfully issued on May 22, 2012, and stems from U.S. Patent Application No. 12/693,285, which was filed on January 25, 2010.

27. The '556 Patent is titled, "Communication channel calibration for drift conditions." The '556 Patent lawfully issued on April 8, 2014, and stems from U.S. Patent Application No. 13/846,413, which was filed on March 18, 2013.

28. The '608 Patent is titled, "Strobe-offset control circuit." The '608 Patent lawfully issued on August 18, 2015, and stems from U.S. Patent Application No. 14/230,558, which was filed on March 31, 2014.

29. The '466 Patent is titled, "Periodic calibration for communication channels by drift tracking." The '466 Patent lawfully issued on October 13, 2015, and stems from U.S. Patent Application No. 14/535,006, which was filed on November 6, 2014.

30. The '279 Patent is titled, "Memory controller with clock-to-strobe skew compensation." The '279 Patent lawfully issued on September 6, 2016, and stems from U.S. Patent Application No. 14/951,190 which was filed on November 24, 2015.

31. The '379 Patent is titled, "Memory controller for micro-threaded memory operations." The '379 Patent lawfully issued on June 25, 2019, and stems from U.S. Patent Application No. 15/486,068, which was filed on April 12, 2017.

32. K.Mizra has complied with the requirements of 35 U.S.C. § 287, to the extent necessary and/or applicable, and is entitled to collect pre- and post-filing damages for Defendant's infringements of the Asserted Patents.

33. The claims of the Asserted Patents are directed to patent eligible subject matter under 35 U.S.C. § 101. They are not directed to an abstract idea, and the technologies covered by

the claims comprise systems and/or consist of ordered combinations of features and functions that, at the time of invention, were not, alone or in combination, well-understood, routine, or conventional.

**DEFENDANT’S PRE-SUIT KNOWLEDGE OF ITS INFRINGEMENT**

34. K.Mizra’s predecessor-in-interest of the Asserted Patents, Rambus, met with SMI at least around September 13, 2018, and identified at least the ’466 Patent, ’279 Patent, ’887 Patent, and ’556 Patent as being infringed by exemplary SMI products, and further included claim charts demonstrating infringement by SMI. Moreover, on or around January 2023, Rambus further notified SMI of its infringement of the ’466 Patent, ’279 Patent, ’887 Patent, ’556 Patent, ’379 Patent, and ’608 Patent, including identifying exemplary infringing SMI products. In addition, K.Mizra sent SMI a letter around February 15, 2024, identifying SMI’s infringement of the Asserted Patents via exemplary accused product categories.

35. The Accused Products addressed in the Counts below include, but are not limited to, the exemplary products identified in Rambus’s and K.Mizra’s communications with SMI. SMI’s past and continuing sales of the Accused Products (i) willfully infringe the Asserted Patents, and (ii) impermissibly usurp the significant benefits of K.Mizra’s patented technologies without fairly compensating K.Mizra.

**COUNT I**

(INFRINGEMENT OF U.S. PATENT NO. 8,183,887)

36. Plaintiff incorporates the preceding paragraphs herein by reference.

37. This cause of action arises under the patent laws of the United States, and, in particular, 35 U.S.C. §§ 271, *et seq.*

38. K.Mizra is the owner of all substantial rights, title, and interest in and to the '887 Patent including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

39. The '887 Patent is valid, enforceable, and was duly and legally issued by the United States Patent and Trademark Office on May 22, 2012, after full and fair examination.

40. SMI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '887 Patent in this District and elsewhere in Texas and the United States by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell, and/or import, SMI products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '887 Patent, including, but not limited to, the SMI SSD Controllers having a PCIe 3.0 or later Interface, including SMI's Client, Enterprise, and Automotive SSD Controllers, Flash Card Controllers and FerriSSDs, such as for example the SM2262EN / SM2262 Ultra High Speed PCIe Gen3 x 4 NVMe 1.3 SSD Controller (collectively, the "'887 Accused Products").

**Direct Infringement (35 U.S.C. § 271(a))**

41. SMI has directly infringed and continues to directly infringe one or more claims of the '887 Patent in this District and elsewhere in Texas and the United States.

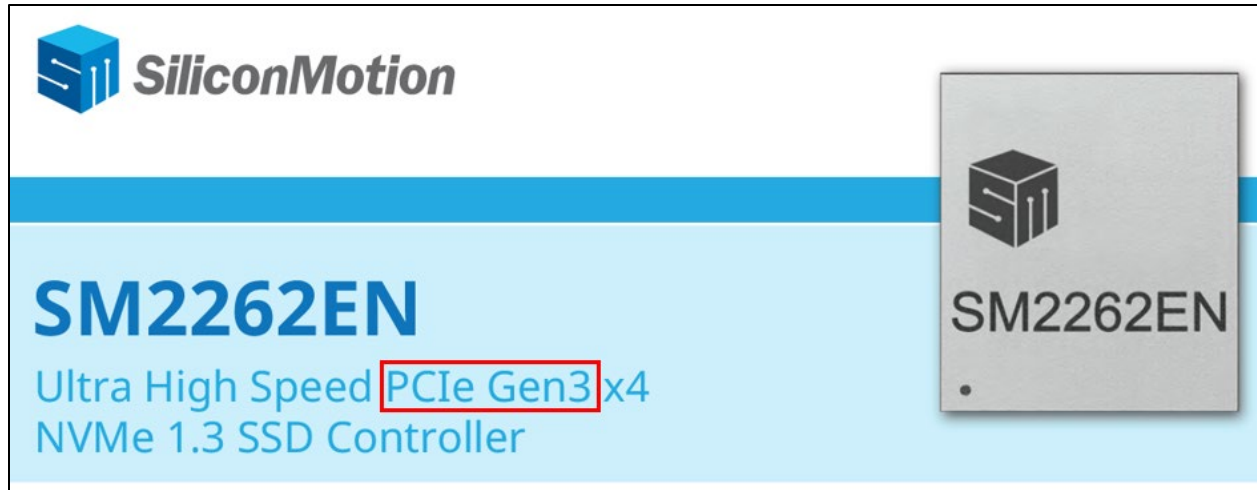
42. SMI has directly infringed and continues to directly infringe, either by itself or via its agent(s), at least claim 19 of the '887 Patent<sup>1</sup> as set forth under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the '887 Accused Products. Furthermore, SMI

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<sup>1</sup> Throughout this Complaint, wherever K.Mizra identifies specific claims of the Asserted Patents infringed by SMI, K.Mizra expressly reserves the right to identify additional claims and products in its infringement contentions in accordance with applicable local rules and the Court's case management order. Specifically identified claims throughout this Complaint are provided for notice pleading only.

makes and sells the '887 Accused Products outside of the United States and either delivers those products to its customers, distributors, and/or subsidiaries in the United States, or, in the case that it delivers the '887 Accused Products outside of the United States, it does so intending and/or knowing that those products are destined for the United States and/or designed and designated for sale or use in the United States, thereby directly infringing the '887 Patent. *See, e.g., Lake Cherokee Hard Drive Techs., L.L.C. v. Marvell Semiconductor, Inc.*, 964 F. Supp. 2d 653, 658 (E.D. Tex. 2013). Furthermore, SMI directly infringes the '887 Patent through its direct involvement in, and control of, the activities of its subsidiaries and/or affiliates, including SMI USA. Subject to SMI's direction and control, such subsidiaries and affiliates conduct activities that constitute direct infringement of the '887 Patent under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing '887 Accused Products. SMI receives direct financial benefit from such infringements of its U.S.-based subsidiaries and/or affiliates, including SMI USA as demonstrated, for example, in the consolidated balance sheets in SMTC's Form 20-F. <https://siliconmotiontechnologycorporation.gcs-web.com/static-files/973eef9c-5b26-431b-ad6c-ae20b311ba42> at F-4 and F-9.

43. By way of illustration only, the '887 Accused Products meet each and every element of claim 19 of the '887 Patent. The '887 Accused Products comprise an apparatus that is an SSD Controller with a PCIe interface. For example, the SM2262EN includes a PCIe interface as shown below.



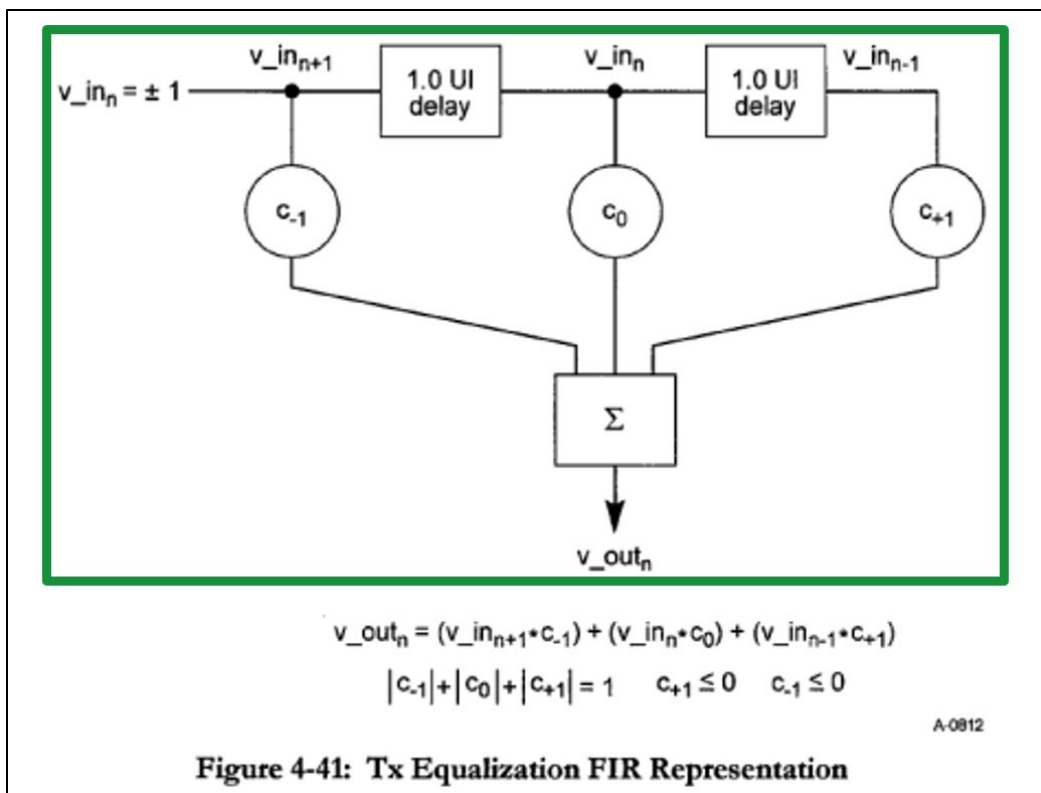
SM2262EN Ultra High Speed PCIe Gen3 x4 NVMe 1.3 SSD Controller (“Product Brief”) (available at: <https://www.siliconmotion.com/products/client/detail>)

44. The ’887 Accused Products comprise a set of drivers to transmit a digital sequence to a receiver, each driver controlled in association with one of a plurality of taps. For example, the ’887 Accused Products, including for example the SM2262EN, support PCIe 3.0. The PCIe3.0 specification indicates that an “8.0 GT/s transmitter shall implement a coefficient-based equalization mode.” PCI Express Base Specification Revision 3.0 (Nov. 10, 2010) at 334. PCIe 3.0 further provides that the transmitter “equalization coefficients are based on the following FIR filter relationship as shown in Figure 4-41.” *Id.* The coefficient-based equalization mode includes transmitting a digital sequence and further indicates that each driver is controlled in association with one of a plurality of taps.

#### **4.3.3.5.1. 8.0 GT/s Transmitter Equalization**

An 8.0 GT/s transmitter shall implement a coefficient-based equalization mode in order to support fine grained control over Tx equalization resolution. Additionally, a transmitter shall support a specified number of presets that give a coarser control over Tx equalization resolution. Both coefficient space and preset space are controllable via messaging from the receiver via an equalization procedure. The equalization procedure operates on the same physical path as normal signaling and is implemented via extensions to the existing protocol link layer.

*Id.* at 334.



*Id.* at 335.

45. The '887 Accused Products comprise an update circuit to update a tap weight associated with at least one of the plurality of taps responsive to feedback from the receiver. For example, the PCIe3.0 specification indicates this limitation by describing this functionality: “[b]oth coefficient space and preset space are controllable via messaging from the receiver via an equalization procedure.” *Id.* at 334.

46. The '887 Accused Products further meet the following limitation: “the feedback representing a setting for the at least one of the plurality of taps,” as indicated by “Bit 6:3 – Transmitted Preset”. *Id.* at 229. Furthermore, the '887 Accused Products further meet the following limitation: “the feedback adjusted to compensate for a target signal level,” as indicated by the formula shown below:

$$v\_out_n = (v\_in_{n+1} \cdot c_{-1}) + (v\_in_n \cdot c_0) + (v\_in_{n-1} \cdot c_{+1})$$

$$|c_{-1}| + |c_0| + |c_{+1}| = 1 \quad c_{+1} \leq 0 \quad c_{-1} \leq 0$$

**Figure 4-41: Tx Equalization FIR Representation**

*Id.* at 335.

47. Thus, at least for the above reasons, the '887 Accused Products meet all of the limitations of claim 19.

**Indirect Infringement (Inducement – 35 U.S.C. § 271(b))**

48. In addition and/or in the alternative to its direct infringements, SMI has indirectly infringed and continues to indirectly infringe one or more claims of the '887 Patent by knowingly and intentionally inducing others, including its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers, to directly infringe by making, using, offering to sell, selling and/or importing into the United States the '887 Accused Products.

49. At a minimum, SMI has knowledge of the '887 Patent since at least September 2018, when it met with Rambus and received claim charts demonstrating infringement by SMI as discussed in the pre-suit notice section above as well as before the filing of this complaint via the correspondence from K.Mizra as also noted in the pre-suit notice section above. Since receiving notice of its infringements, SMI has actively induced the direct infringements of its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers as set forth under U.S.C. § 271(b). Such inducements have been committed with the knowledge, or with willful blindness to the fact, that the acts induced constitute infringement of the '887 Patent. Indeed, SMI has intended to cause, continues to intend to cause, and has taken, and continues to take affirmative steps to induce infringement by, among other things, creating and disseminating advertisements and instructive materials that promote the infringing use of the '887 Accused

Products; creating and/or maintaining established distribution channels for the '887 Accused Products into and within the United States; manufacturing the '887 Accused Products in conformity with U.S. laws and regulations; providing technical documentation for the '887 Accused Products, including white papers, product briefs, and descriptions of the features and technologies;<sup>2</sup> promoting the incorporation of the '887 Accused Products into end-user products.

### **Damages**

50. On information and belief, despite having knowledge of the '887 Patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '887 Patent, SMI has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. SMI's infringing activities relative to the '887 Patent, e.g., its decision to continue infringing the '887 Patent, have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that K.Mizra is entitled to enhanced damages under 35 U.S.C. § 284 up to three times the amount found or assessed.

51. K.Mizra has been damaged as a result of SMI's infringing conduct described in this Count. SMI is, thus, liable to K.Mizra in an amount that adequately compensates K.Mizra for SMI's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

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<sup>2</sup> See, e.g., <https://www.siliconmotion.com/products/client/detail>; <https://www.siliconmotion.com/products/enterprise/detail>; <https://www.siliconmotion.com/products/Portable/detail>; <https://www.siliconmotion.com/products/automotive/detail>; <https://www.siliconmotion.com/products/Flash-Card/detail>; <https://www.siliconmotion.com/product/Ferri-Embedded-Storage.html>; and the product briefs and white papers linked therefrom



**COUNT II**

(INFRINGEMENT OF U.S. PATENT NO. 8,693,556)

52. Plaintiff incorporates the preceding paragraphs herein by reference.

53. This cause of action arises under the patent laws of the United States, and, in particular, 35 U.S.C. §§ 271, *et seq.*

54. K.Mizra is the owner of all substantial rights, title, and interest in and to the '556 Patent including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

55. The '556 Patent is valid, enforceable, and was duly and legally issued by the United States Patent and Trademark Office on April 8, 2014, after full and fair examination.

56. SMI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '556 Patent in this District and elsewhere in Texas and the United States by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell, and/or import, SMI products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '556 Patent, including, but not limited to, the SMI Controllers having an LPDDR3 and/or LPDDR4 controller functionality, including SMI's Client and Enterprise SSD Controllers, such as the SM2270 (collectively, the "'556 Accused Products").

**Direct Infringement (35 U.S.C. § 271(a))**

57. SMI has directly infringed and continues to directly infringe one or more claims of the '556 Patent in this District and elsewhere in Texas and the United States.

58. SMI has directly infringed and continues to directly infringe, either by itself or via its agent(s), at least claim 10 of the '556 Patent as set forth under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the '556 Accused Products. Furthermore, SMI

makes and sells the '556 Accused Products outside of the United States and either delivers those products to its customers, distributors, and/or subsidiaries in the United States, or, in the case that it delivers the '556 Accused Products outside of the United States, it does so intending and/or knowing that those products are destined for the United States and/or designed and designated for sale or use in the United States, thereby directly infringing the '556 Patent. *See, e.g., Lake Cherokee Hard Drive Techs., L.L.C. v. Marvell Semiconductor, Inc.*, 964 F. Supp. 2d 653, 658 (E.D. Tex. 2013). Furthermore, SMI directly infringes the '556 Patent through its direct involvement in, and control of, the activities of its subsidiaries and/or affiliates, including SMI USA. Subject to SMI's direction and control, such subsidiaries and affiliates conduct activities that constitute direct infringement of the '556 Patent under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing '556 Accused Products. SMI receives direct financial benefit from such infringements of its U.S.-based subsidiaries and/or affiliates, including SMI USA as demonstrated, for example, in the consolidated balance sheets in SMTC's Form 20-F. <https://siliconmotiontechnologycorporation.gcs-web.com/static-files/973eef9c-5b26-431b-ad6c-ae20b311ba42> at F-4 and F-9.

59. By way of illustration only, the '556 Accused Products meet each and every element of claim 10 of the '556 Patent. The '556 Accused Products comprise an integrated circuit. For example, the SM2270 comprises an integrated circuit.

60. The '556 Accused Products comprise an interface for a communication channel. The DRAM controller(s) in, for example, the SM2270, include an interface for a communication channel between the controller and the DRAM so that, e.g., signals can be sent from the controller to the DRAM and received by the controller from the DRAM.

61. The '556 Accused Products comprise logic to apply a parameter associated with transmission of data on the communication channel. For example, the '556 Accused Products, including for example the SM2270, support LPDDR3. The LPDDR3 specification indicates that it supports write leveling. *See* JESD No. 209-3C at 68. Through the application of the write leveling procedure, the controller adjusts the clock to data strobe signal timing relationship. This timing relationship is a parameter associated with the transmission of write data on the DQ bus which is part of the communication channel. The memory controller in the integrated circuit includes logic to apply the clock to strobe offset parameter to the data strobe signal and the transmitted write data.

62. The '556 Accused Products comprise logic to process a calibration sequence to establish an operation value that represents the parameter, and to transmit or receive data in accordance with the operation value. For example, the memory controller includes logic to process the calibration sequence to establish the operation value of the clock to data strobe offset parameter discussed in the preceding paragraph. *Id.* This includes logic to process the calibration sequence that includes, e.g., the controller sampling the feedback information sent by the DRAM relating to its sampling of the clock input with the rising edge of DQS and then either incrementing or decrementing the DQS\_t and/or DQS\_c delay settings, launching the next DQS/DQS# pulse, and eventually locking the strobe delaying settings to achieve write leveling. *Id.*

63. The '556 Accused Products comprise logic to determine adjustment information for the parameter, interspersed with said transmission or reception of data on the communication channel. Upon information and belief, write leveling is performed from time to time, interspersed with data transmission on the LPDDR3 channel, to account for temperature and voltage drift. LPDDR3 devices are subject to temperature drift rate (Tdriftrate) and voltage

drift rate (Vdriftrate) in various applications. Upon information and belief, the memory controller in the integrated circuit includes logic to determine whether an adjustment of the operational value is necessary and to determine the amount of adjustment needed.

64. The '556 Accused Products comprise logic to adjust the operation value for the parameter using said adjustment information. Upon information and belief, the memory controller in the integrated circuit includes logic to adjust the operation value according to the adjustment information.

65. SMI Controllers with LPDDR4 controller functionality infringe in a similar way as discussed in the preceding paragraphs via their implementation of write leveling. *See, e.g.*, JEDEC Standard No. 209-4B at 186-187.

66. Thus, at least for the above reasons, the '556 Accused Products meet all of the limitations of claim 10.

**Indirect Infringement (Inducement – 35 U.S.C. § 271(b))**

67. In addition and/or in the alternative to its direct infringements, SMI has indirectly infringed and continues to indirectly infringe one or more claims of the '556 Patent by knowingly and intentionally inducing others, including its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers, to directly infringe by making, using, offering to sell, selling and/or importing into the United States the '556 Accused Products.

68. At a minimum, SMI has knowledge of the '556 Patent since at least September 2018, when it met with Rambus and received claim charts demonstrating infringement by SMI as discussed in the pre-suit notice section above as well as before the filing of this complaint via the correspondence from K.Mizra as also noted in the pre-suit notice section above. Since receiving notice of its infringements, SMI has actively induced the direct infringements of its subsidiaries,

distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers as set forth under U.S.C. § 271(b). Such inducements have been committed with the knowledge, or with willful blindness to the fact, that the acts induced constitute infringement of the '556 Patent. Indeed, SMI has intended to cause, continues to intend to cause, and has taken, and continues to take affirmative steps to induce infringement by, among other things, creating and disseminating advertisements and instructive materials that promote the infringing use of the '556 Accused Products; creating and/or maintaining established distribution channels for the '556 Accused Products into and within the United States; manufacturing the '556 Accused Products in conformity with U.S. laws and regulations; providing technical documentation for the '556 Accused Products, including white papers, product briefs, and descriptions of the features and technologies;<sup>3</sup> promoting the incorporation of the '556 Accused Products into end-user products.

### **Damages**

69. On information and belief, despite having knowledge of the '556 Patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '556 Patent, SMI has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. SMI's infringing activities relative to the '556 Patent, e.g., its decision to continue infringing the '556 Patent, have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that K.Mizra is entitled to enhanced damages under 35 U.S.C. § 284 up to three times the amount found or assessed.

70. K.Mizra has been damaged as a result of SMI's infringing conduct described in this Count. SMI is, thus, liable to K.Mizra in an amount that adequately compensates K.Mizra for

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<sup>3</sup> See, e.g., <https://www.siliconmotion.com/products/client/detail>; <https://www.siliconmotion.com/products/enterprise/detail>; and the product briefs and white papers linked therefrom

SMI's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

**COUNT III**

(INFRINGEMENT OF U.S. PATENT NO. 9,111,608)

71. Plaintiff incorporates the preceding paragraphs herein by reference.

72. This cause of action arises under the patent laws of the United States, and, in particular, 35 U.S.C. §§ 271, *et seq.*

73. K.Mizra is the owner of all substantial rights, title, and interest in and to the '608 Patent including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

74. The '608 Patent is valid, enforceable, and was duly and legally issued by the United States Patent and Trademark Office on August 18, 2015, after full and fair examination.

75. SMI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '608 Patent in this District and elsewhere in Texas and the United States by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell, and/or import, SMI products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '608 Patent, including, but not limited to, the SMI Controllers having LPDDR4 controller functionality, including SMI's Client SSD Controllers, such as for example the SM2264 (collectively, the "'608 Accused Products").

**Direct Infringement (35 U.S.C. § 271(a))**

76. SMI has directly infringed and continues to directly infringe one or more claims of the '608 Patent in this District and elsewhere in Texas and the United States.

77. SMI has directly infringed and continues to directly infringe, either by itself or via its agent(s), at least claim 1 of the '608 Patent as set forth under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the '608 Accused Products. Furthermore, SMI makes and sells the '608 Accused Products outside of the United States and either delivers those products to its customers, distributors, and/or subsidiaries in the United States, or, in the case that it delivers the '608 Accused Products outside of the United States, it does so intending and/or knowing that those products are destined for the United States and/or designed and designated for sale or use in the United States, thereby directly infringing the '608 Patent. *See, e.g., Lake Cherokee Hard Drive Techs., L.L.C. v. Marvell Semiconductor, Inc.*, 964 F. Supp. 2d 653, 658 (E.D. Tex. 2013). Furthermore, SMI directly infringes the '608 Patent through its direct involvement in, and control of, the activities of its subsidiaries and/or affiliates, including SMI USA. Subject to SMI's direction and control, such subsidiaries and affiliates conduct activities that constitute direct infringement of the '608 Patent under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the '608 Accused Products. SMI receives direct financial benefit from such infringements of its U.S.-based subsidiaries and/or affiliates, including SMI USA as demonstrated, for example, in the consolidated balance sheets in SMTC's Form 20-F. <https://siliconmotiontechnologycorporation.gcs-web.com/static-files/973eef9c-5b26-431b-ad6c-ae20b311ba42> at F-4 and F-9.

78. By way of illustration only, the '608 Accused Products meet each and every element of claim 1 of the '608 Patent. The '608 Accused Products comprise an integrated circuit (IC) memory controller. For example, the SM2264 comprises an integrated circuit (IC) memory controller.

79. The '608 Accused Products comprise a first pin to receive a first data signal. The DRAM controller in, for example, the SM2264, include a first pin to receive a first data signal at, e.g., one of the DQ pins.

80. The '608 Accused Products comprise a first adjustable delay element to delay the received first data signal and generate a first delayed data signal. For example, the '608 Accused Products, including for example the SM2264, support LPDDR4. The LPDDR4 specification indicates that it supports DQS-DQ Training, which is implemented because of the unmatched DQS-DQ paths. *See* JEDEC Standard No. 209-4 at 116. The un-matched DQS-DQ paths indicate that not only to the write data paths are trained to ensure proper data communication between the memory controller and the memory, but additionally the read data paths area similarly trained. *Id.* at 116, 125. Read DQS-DQ training uses a first adjustable delay element to variably delay the first data signal to align it for capture according to DQS.

81. The '608 Accused Products comprise a second pin to receive a second data signal at, e.g., another one of the DQ pins.

82. The '608 Accused Products comprise a second adjustable delay element to delay the received second data signal and generate a second delayed data signal according to the DQS-DQ training discussed above. Because the DQS and DQ paths are unmatched, the delay on the individual DQ signals are individually trained. *See* JEDEC Standard No. 209-4 at 183 (Figs. 112-113). Thus, the '608 Accused Products comprise a second adjustable delay element that correlates to the second data signal received by the second pin.

83. The '608 Accused Products comprise a pin to receive a strobe signal, e.g., the DQS\_t and/or DQS\_c pins.



84. The '608 Accused Products comprise a first sampling circuit to sample the first delayed data signal based on the strobe signal. The DQS\_t/DQS\_c strobe signal is used by a first sampling circuit to sample the read DQ data on the first DQ pin in the memory controller after it has been appropriately delayed to account for the DQ/DQS mismatch for that DQ pin.

85. The '608 Accused Products comprise a second sampling circuit to sample the second delayed data signal based on the received strobe signal. The DQS\_t/DQS\_c strobe signal is used by a second sampling circuit to sample the read DQ data on the second DQ pin in the memory controller after it has been appropriately delayed to account for the DQ/DQS mismatch for that DQ pin.

86. Thus, at least for the above reasons, the '608 Accused Products meet all of the limitations of claim 1.

**Indirect Infringement (Inducement – 35 U.S.C. § 271(b))**

87. In addition and/or in the alternative to its direct infringements, SMI has indirectly infringed and continues to indirectly infringe one or more claims of the '608 Patent by knowingly and intentionally inducing others, including its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers, to directly infringe by making, using, offering to sell, selling and/or importing into the United States the '608 Accused Products.

88. At a minimum, SMI has knowledge of the '608 Patent since at least January 2023, when it received correspondence from Rambus as discussed in the pre-suit notice section above as well as before the filing of this complaint via the correspondence from K.Mizra as also noted in the pre-suit notice section above. Since receiving notice of its infringements, SMI has actively induced the direct infringements of its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers as set forth under U.S.C. § 271(b). Such

inducements have been committed with the knowledge, or with willful blindness to the fact, that the acts induced constitute infringement of the '608 Patent. Indeed, SMI has intended to cause, continues to intend to cause, and has taken, and continues to take affirmative steps to induce infringement by, among other things, creating and disseminating advertisements and instructive materials that promote the infringing use of the '608 Accused Products; creating and/or maintaining established distribution channels for the '608 Accused Products into and within the United States; manufacturing the '608 Accused Products in conformity with U.S. laws and regulations; providing technical documentation for the '608 Accused Products, including white papers, product briefs, and descriptions of the features and technologies;<sup>4</sup> promoting the incorporation of the '608 Accused Products into end-user products.

### **Damages**

89. On information and belief, despite having knowledge of the '608 Patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '608 Patent, SMI has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. SMI's infringing activities relative to the '608 Patent, e.g., its decision to continue infringing the '608 Patent, have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that K.Mizra is entitled to enhanced damages under 35 U.S.C. § 284 up to three times the amount found or assessed.

90. K.Mizra has been damaged as a result of SMI's infringing conduct described in this Count. SMI is, thus, liable to K.Mizra in an amount that adequately compensates K.Mizra for

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<sup>4</sup> See, e.g., <https://www.siliconmotion.com/products/client/detail> and the product briefs and white papers linked therefrom

SMI's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

**COUNT IV**

(INFRINGEMENT OF U.S. PATENT NO. 9,160,466)

91. Plaintiff incorporates the preceding paragraphs herein by reference.

92. This cause of action arises under the patent laws of the United States, and, in particular, 35 U.S.C. §§ 271, *et seq.*

93. K.Mizra is the owner of all substantial rights, title, and interest in and to the '466 Patent including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

94. The '466 Patent is valid, enforceable, and was duly and legally issued by the United States Patent and Trademark Office on October 13, 2015, after full and fair examination.

95. SMI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '466 Patent in this District and elsewhere in Texas and the United States by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell, and/or import, SMI products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '466 Patent, including, but not limited to, the SMI Controllers that have flash memory controller functionality, such as for the SM2262EN, and SMI Controllers that have DDR3, DDR4, DDR5, and/or LPDDR3 controller functionality, such as the SM2270. (collectively, the "'466 Accused Products").

**Direct Infringement (35 U.S.C. § 271(a))**

96. SMI has directly infringed and continues to directly infringe one or more claims of the '466 Patent in this District and elsewhere in Texas and the United States.

97. SMI has directly infringed and continues to directly infringe, either by itself or via its agent(s), at least claim 1 of the '466 Patent as set forth under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the '466 Accused Products. Furthermore, SMI makes and sells the '466 Accused Products outside of the United States and either delivers those products to its customers, distributors, and/or subsidiaries in the United States, or, in the case that it delivers the '466 Accused Products outside of the United States, it does so intending and/or knowing that those products are destined for the United States and/or designed and designated for sale or use in the United States, thereby directly infringing the '466 Patent. *See, e.g., Lake Cherokee Hard Drive Techs., L.L.C. v. Marvell Semiconductor, Inc.*, 964 F. Supp. 2d 653, 658 (E.D. Tex. 2013). Furthermore, SMI directly infringes the '466 Patent through its direct involvement in, and control of, the activities of its subsidiaries and/or affiliates, including SMI USA. Subject to SMI's direction and control, such subsidiaries and affiliates conduct activities that constitute direct infringement of the '466 Patent under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing '466 Accused Products. SMI receives direct financial benefit from such infringements of its U.S.-based subsidiaries and/or affiliates, including SMI USA as demonstrated, for example, in the consolidated balance sheets in SMTC's Form 20-F. <https://siliconmotiontechnologycorporation.gcs-web.com/static-files/973eef9c-5b26-431b-ad6c-ae20b311ba42> at F-4 and F-9.

98. By way of illustration only, the '466 Accused Products perform a method of operation in a system that includes a receive component having circuitry to receive a digital signal in accordance with the requirements of claim 1 of the '466 Patent. The '466 Accused Products comprise a flash controller or a DRAM controller that performs that method. For example, the

SM2262EN performs a method of operation, whereby it includes a receive component that receives digital signals from the flash memory.

99. The '466 Accused Products perform the step of subjecting the receive component to a first calibration during initialization to identify an initial value for a parameter affecting proper reception by the circuitry of the receive component of data communicated across a channel as part of the digital signal. For example, the '466 Accused Products, including for example the SM2264EN, operate to control flash memory. The Flash memory specification indicates that it supports ZQCL or ZQ Calibration Long, which performs this step. *See* Open NAND Flash Interface Specification at 239. The ZQ Calibration Long command is used to perform the initial calibration during a power-up initialization or reset sequence. *Id.* This performs the step of subjecting the receive component (e.g., the controller) to a first calibration during initialization (e.g., ZQ Calibration Long) to identify an initial value for a parameter affecting proper reception by the circuitry of the receive component (e.g., the calibrated values) of data communicated across a channel as part of the digital signal (e.g., the data communicated from the flash to the controller).

100. The '466 Accused Products perform the step of periodically subjecting the receive component to a second calibration to update an existing value of the parameter for drift attributable to change in at least one of operating voltage or temperature. The Flash memory specification indicates that it supports ZQCS or ZQ Calibration Short, which performs this step. *See* Open NAND Flash Interface Specification at 240. The ZQ Calibration Short command is used to perform periodic calibrations to account for small voltage and temperature variations. *Id.*

101. The '466 Accused Products meet the limitation of wherein the existing value is dependent on the initial value and wherein the second calibration is constrained to occur during a time period that is shorter than a time period of the first calibration. In ZQ Calibration Short, a

shorter timing window is provided to perform the reduced calibration and transfer of values. *See* Open NAND Flash Interface Specification at 240. The Flash memory specification further indicates that a longer time is required to calibrate the output driver and on-die termination circuits at initialization (which correlates to ZQCL) and relatively smaller time to perform periodic calibrations (which correlates to ZQCS). *Id.* at 88.

102. SMI Controllers that have DDR3, DDR4, DDR5, and/or LPDDR3 controller functionality, such as for example SM2270, infringe in a similar way as discussed in the preceding paragraphs via their implementation of ZQCL and ZQCS. *See, e.g.*, JEDEC Standard No. 79-3F at 107 (Section 5.5.1).

103. Thus, at least for the above reasons, the '466 Accused Products meet all of the limitations of claim 1.

**Indirect Infringement (Inducement – 35 U.S.C. § 271(b))**

104. In addition and/or in the alternative to its direct infringements, SMI has indirectly infringed and continues to indirectly infringe one or more claims of the '466 Patent by knowingly and intentionally inducing others, including its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers, to directly infringe by making, using, offering to sell, selling and/or importing into the United States the '466 Accused Products.

105. At a minimum, SMI has knowledge of the '466 Patent since at least September 2018, when it met with Rambus and received claim charts demonstrating infringement by SMI as discussed in the pre-suit notice section above as well as before the filing of this complaint via the correspondence from K.Mizra as also noted in the pre-suit notice section above. Since receiving notice of its infringements, SMI has actively induced the direct infringements of its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers as

set forth under U.S.C. § 271(b). Such inducements have been committed with the knowledge, or with willful blindness to the fact, that the acts induced constitute infringement of the '466 Patent. Indeed, SMI has intended to cause, continues to intend to cause, and has taken, and continues to take affirmative steps to induce infringement by, among other things, creating and disseminating advertisements and instructive materials that promote the infringing use of the '466 Accused Products; creating and/or maintaining established distribution channels for the '466 Accused Products into and within the United States; manufacturing the '466 Accused Products in conformity with U.S. laws and regulations; providing technical documentation for the '466 Accused Products, including white papers, product briefs, and descriptions of the features and technologies;<sup>5</sup> promoting the incorporation of the '466 Accused Products into end-user products.

### **Damages**

106. On information and belief, despite having knowledge of the '466 Patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '466 Patent, SMI has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. SMI's infringing activities relative to the '466 Patent, e.g., its decision to continue infringing the '466 Patent, have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that K.Mizra is entitled to enhanced damages under 35 U.S.C. § 284 up to three times the amount found or assessed.

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<sup>5</sup> See, e.g., <https://www.siliconmotion.com/products/client/detail>; <https://www.siliconmotion.com/products/enterprise/detail>; <https://www.siliconmotion.com/products/Portable/detail>; <https://www.siliconmotion.com/products/automotive/detail>; <https://www.siliconmotion.com/products/UFS/detail>; <https://www.siliconmotion.com/products/eMMC/detail>; <https://www.siliconmotion.com/products/Flash-Card/detail>; <https://www.siliconmotion.com/products/USB-Flash-Drive/detail>; and the product briefs and white papers linked therefrom

107. K.Mizra has been damaged as a result of SMI's infringing conduct described in this Count. SMI is, thus, liable to K.Mizra in an amount that adequately compensates K.Mizra for SMI's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

**COUNT V**

(INFRINGEMENT OF U.S. PATENT NO. 9,437,279)

108. Plaintiff incorporates the preceding paragraphs herein by reference.

109. This cause of action arises under the patent laws of the United States, and, in particular, 35 U.S.C. §§ 271, *et seq.*

110. K.Mizra is the owner of all substantial rights, title, and interest in and to the '279 Patent including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

111. The '279 Patent is valid, enforceable, and was duly and legally issued by the United States Patent and Trademark Office on September 6, 2016, after full and fair examination.

112. SMI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '279 Patent in this District and elsewhere in Texas and the United States by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell, and/or import, SMI products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '279 Patent, including, but not limited to, the SMI Controllers having DDR3, DDR4, DDR5, and/or LPDDR3 controller functionality, including SMI's Client, Enterprise, and Automotive SSD Controllers, such as for example the SM2258 (collectively, the "'279 Accused Products").



**Direct Infringement (35 U.S.C. § 271(a))**

113. SMI has directly infringed and continues to directly infringe one or more claims of the '279 Patent in this District and elsewhere in Texas and the United States.

114. SMI has directly infringed and continues to directly infringe, either by itself or via its agent(s), at least claim 11 of the '279 Patent as set forth under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the '279 Accused Products. Furthermore, SMI makes and sells the '279 Accused Products outside of the United States and either delivers those products to its customers, distributors, and/or subsidiaries in the United States, or, in the case that it delivers the '279 Accused Products outside of the United States, it does so intending and/or knowing that those products are destined for the United States and/or designed and designated for sale or use in the United States, thereby directly infringing the '279 Patent. *See, e.g., Lake Cherokee Hard Drive Techs., L.L.C. v. Marvell Semiconductor, Inc.*, 964 F. Supp. 2d 653, 658 (E.D. Tex. 2013). Furthermore, SMI directly infringes the '279 Patent through its direct involvement in, and control of, the activities of its subsidiaries and/or affiliates, including SMI USA. Subject to SMI's direction and control, such subsidiaries and affiliates conduct activities that constitute direct infringement of the '279 Patent under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing '279 Accused Products. SMI receives direct financial benefit from such infringements of its U.S.-based subsidiaries and/or affiliates, including SMI USA as demonstrated, for example, in the consolidated balance sheets in SMTC's Form 20-F. <https://siliconmotiontechnologycorporation.gcs-web.com/static-files/973eef9c-5b26-431b-ad6c-ae20b311ba42> at F-4 and F-9.

115. By way of illustration only, the '279 Accused Products meet each and every element of claim 11 of the '279 Patent. The '279 Accused Products comprise a memory controller

integrated circuit (IC). For example, the SM2258 comprises a memory controller integrated circuit (IC).

116. The '279 Accused Products comprise first timing circuitry to outputting a first timing signal to a memory IC via a first timing signal line. For example, the '279 Accused Products, including for example the SM2258, support DDR3. The DDR3 specification indicates a source clock signal that requires first timing circuitry to output a first timing signal to a memory IC via a first timing signal line. *See* JESD79-3F at 42-45.

117. The '279 Accused Products comprise calibration circuitry to perform a timing calibration operation, including circuitry to: output a sequence of differently delayed calibration data timing signals to the memory IC via a second timing signal line. For example, the DDR3 specification indicates that the '279 Accused Products support write leveling. During write leveling, the controller repeatedly delays the data strobe signals (DQS – DQS#), which are sent over second timing signal line(s) via the DQS pins. *See* JESD79-3F at 13, 42.

118. The '279 Accused Products includes circuitry to identify one of the calibration data timing signals that compensates for a difference in signal propagation times over the first and second timing signal lines. For example, The DDR3 specification indicates that, in the write leveling process, the memory controller involved in the leveling must have adjustable delay setting on DQS – DQS# to align the rising edge of DQS – DQS# with that of the clock at the DRAM pin. *Id.* at 42. The DRAM asynchronously feeds back CK – CK#, sampled with the rising edge of DQS-DQS#, through the DQ bus. *Id.* The controller samples the incoming DQ and decides to increment or decrement DQS – DQS# delay setting and launches the next DQS/DQS# pulse after some time, which is controller dependent. *Id.* at 43. Once a 0 to 1 transition is detected, the controller locks DQS – DQS# delay setting and write leveling is achieved for the device. *Id.* Thus, the '279

Accused Products also include circuitry to select, as a write timing delay, a delay value applied to generate the identified one of the calibration data timing signals. This is demonstrated by the locked DQS-DQS# delay setting.

119. The '279 Accused Products comprise write circuitry to perform a write operation, including circuitry to: output address/control signals to be sampled by the memory IC at a time or times corresponding to one or more transitions of the first timing signal. For example, The DDR3 specification indicates that the '279 Accused Products output command and address signals in conjunction with a write operation. *Id.* at 71. Those signals are to be sampled by the memory IC at a time or times corresponding to the transitions of the clock signal. *Id.* The '279 Accused Products also include circuitry to output first write data to the memory IC in association with the address/control signals. This data is output on the DQ line(s). *Id.* The '279 Accused Products also include circuitry to output a write data timing signal, delayed according to the write timing delay, to the memory IC via the second timing signal line to time reception of the write data therein. This write data timing signal is output as DQS signals on the DQS line(s). *Id.*

120. SMI Controllers that have DDR4, DDR5, LPDDR3, and/or LPDDR4 controller functionality infringe in a similar way as discussed in the preceding paragraphs via their implementation of write leveling. *See, e.g.*, JESD79-4D (DDR4) at 36-38; JESD79-5 (DDR5) at 191-192; JESD209-3C (LPDDR3) at 68; JESD209-4C (LPDDR4) at 213-216.

121. Thus, at least for the above reasons, the '279 Accused Products meet all of the limitations of claim 11.

**Indirect Infringement (Inducement – 35 U.S.C. § 271(b))**

122. In addition and/or in the alternative to its direct infringements, SMI has indirectly infringed and continues to indirectly infringe one or more claims of the '279 Patent by knowingly

and intentionally inducing others, including its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers, to directly infringe by making, using, offering to sell, selling and/or importing into the United States the '279 Accused Products.

123. At a minimum, SMI has knowledge of the '279 Patent since at least September 2018, when it met with Rambus and received claim charts demonstrating infringement by SMI as discussed in the pre-suit notice section above as well as before the filing of this complaint via the correspondence from K.Mizra as also noted in the pre-suit notice section above. Since receiving notice of its infringements, SMI has actively induced the direct infringements of its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers as set forth under U.S.C. § 271(b). Such inducements have been committed with the knowledge, or with willful blindness to the fact, that the acts induced constitute infringement of the '279 Patent. Indeed, SMI has intended to cause, continues to intend to cause, and has taken, and continues to take affirmative steps to induce infringement by, among other things, creating and disseminating advertisements and instructive materials that promote the infringing use of the '279 Accused Products; creating and/or maintaining established distribution channels for the '279 Accused Products into and within the United States; manufacturing the '279 Accused Products in conformity with U.S. laws and regulations; providing technical documentation for the '279 Accused Products, including white papers, product briefs, and descriptions of the features and technologies;<sup>6</sup> promoting the incorporation of the '279 Accused Products into end-user products.

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<sup>6</sup> See, e.g., <https://www.siliconmotion.com/products/client/detail>; <https://www.siliconmotion.com/products/enterprise/detail>; <https://www.siliconmotion.com/products/automotive/detail>; and the product briefs and white papers linked therefrom

**Damages**

124. On information and belief, despite having knowledge of the '279 Patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '279 Patent, SMI has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. SMI's infringing activities relative to the '279 Patent, e.g., its decision to continue infringing the '279 Patent, have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that K.Mizra is entitled to enhanced damages under 35 U.S.C. § 284 up to three times the amount found or assessed.

125. K.Mizra has been damaged as a result of SMI's infringing conduct described in this Count. SMI is, thus, liable to K.Mizra in an amount that adequately compensates K.Mizra for SMI's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

**COUNT VI**

(INFRINGEMENT OF U.S. PATENT NO. 10,331,379)

126. Plaintiff incorporates the preceding paragraphs herein by reference.

127. This cause of action arises under the patent laws of the United States, and, in particular, 35 U.S.C. §§ 271, *et seq.*

128. K.Mizra is the owner of all substantial rights, title, and interest in and to the '379 Patent including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

129. The '379 Patent is valid, enforceable, and was duly and legally issued by the United States Patent and Trademark Office on June 25, 2019, after full and fair examination.

130. SMI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '379 Patent in this District and elsewhere in Texas and the United States by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell, and/or import, SMI products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '379 Patent, including, but not limited to, the SMI Controllers having DDR4 functionality, including SMI's Client and Enterprise SSD Controllers, such as for example the SM2270 (collectively, the "'379 Accused Products").

**Direct Infringement (35 U.S.C. § 271(a))**

131. SMI has directly infringed and continues to directly infringe one or more claims of the '379 Patent in this District and elsewhere in Texas and the United States.

132. SMI has directly infringed and continues to directly infringe, either by itself or via its agent(s), at least claim 1 of the '379 Patent as set forth under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the '379 Accused Products. Furthermore, SMI makes and sells the '379 Accused Products outside of the United States and either delivers those products to its customers, distributors, and/or subsidiaries in the United States, or, in the case that it delivers the '379 Accused Products outside of the United States, it does so intending and/or knowing that those products are destined for the United States and/or designed and designated for sale or use in the United States, thereby directly infringing the '379 Patent. *See, e.g., Lake Cherokee Hard Drive Techs., L.L.C. v. Marvell Semiconductor, Inc.*, 964 F. Supp. 2d 653, 658 (E.D. Tex. 2013). Furthermore, SMI directly infringes the '379 Patent through its direct involvement in, and control of, the activities of its subsidiaries and/or affiliates, including SMI USA. Subject to SMI's direction and control, such subsidiaries and affiliates conduct activities

that constitute direct infringement of the '379 Patent under 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing '379 Accused Products. SMI receives direct financial benefit from such infringements of its U.S.-based subsidiaries and/or affiliates, including SMI USA as demonstrated, for example, in the consolidated balance sheets in SMTC's Form 20-F. <https://siliconmotiontechnologycorporation.gcs-web.com/static-files/973eef9c-5b26-431b-ad6c-ae20b311ba42> at F-4 and F-9.

133. By way of illustration only, the '379 Accused Products meet each and every element of claim 1 of the '379 Patent. The '379 Accused Products comprise a memory controller to control a memory device, the memory device having a plurality of bank groups. For example, the SM2270 comprises a memory to control DDR4 memory, which includes a plurality of bank groups. *See, e.g.*, JESD79-4D at 5, 11 (discussing four bank groups and Bank Group Inputs).

134. The '379 Accused Products comprise circuitry to provide a clock signal to the memory device, the clock signal having clock transitions. For example, the '379 Accused Products, including for example the SM2270, support DDR4. The DDR4 specification indicates that the controller comprises circuitry to provide a clock signal to the memory device, the clock signal having clock transitions, e.g., CK, CK\_t, and/or CK\_c. *See id.* at 5, 190.

135. The '379 Accused Products comprise a command interface to transmit, to the memory device, row activation commands to instruct row activations and column access commands to instruct column accesses. The DDR4 specification indicates that the controller comprises a command interface to transmit, to the memory device, row activation commands to instruct row activations and column access commands to instruct column accesses, e.g., via RAS and CAS signals. *See id.* at 5, 190.

136. The '379 Accused Products comprise circuitry to schedule issuance of the row activation commands and the column access commands from the command interface. For the '379 Accused Products to properly operate, the row activation commands and column access commands must be separated by minimum time intervals. The '379 Accused Products have circuitry to issue commands such that these minimum separations occur. Commands to the DDR4 memory are scheduled such that these minimum separations are satisfied. *See* JESD79-4D at Figs. 69, 71 (showing tCCD and tRRD timing, which are delays between row and column commands); *see also* Table 147.

137. The '379 Accused Products meet the limitation reciting a first interval, defined by a first number of clock transitions to transpire between back-to-back row activations to banks within a common bank group, is longer than a second interval, defined by a second number of clock transitions to transpire between back-to-back row activations to banks within different bank groups. The DDR4 specification indicates a tRRD\_S interval that applies to consecutive activate commands to different bank groups. *Id.* at 88. The DDR4 specification indicates a tRRD\_L interval that applies to consecutive activate commands to the different banks of the same bank group. *Id.* at 88. tRRD\_S is short, whereas tRRD\_L is long. *Id.*; *see also id.* at 238, Table 172.

138. The '379 Accused Products meet the limitation reciting a third interval, defined by a third number of clock transitions to transpire between back-to-back column accesses to banks within a common bank group, is longer than a fourth interval, defined by a fourth number of clock transitions to transpire between back-to-back column accesses to banks within different bank groups. The DDR4 specification indicates a tCCD\_S interval that applies to consecutive CAS commands (or column commands) to different bank groups. *Id.* at 88. The DDR4 specification



indicates a tCCD\_L interval that applies to consecutive CAS commands to the same bank group. *Id.* at 88. tCCD\_S is short, whereas tCCD\_L is long. *Id.*; *see also id.* at 214, Table 154.

139. Thus, at least for the above reasons, the '379 Accused Products meet all of the limitations of claim 1.

**Indirect Infringement (Inducement – 35 U.S.C. § 271(b))**

140. In addition and/or in the alternative to its direct infringements, SMI has indirectly infringed and continues to indirectly infringe one or more claims of the '379 Patent by knowingly and intentionally inducing others, including its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers, to directly infringe by making, using, offering to sell, selling and/or importing into the United States the '379 Accused Products.

141. At a minimum, SMI has knowledge of the '379 Patent since at least January 2023, when it received correspondence from Rambus as discussed in the pre-suit notice section above as well as before the filing of this complaint via the correspondence from K.Mizra as also noted in the pre-suit notice section above. Since receiving notice of its infringements, SMI has actively induced the direct infringements of its subsidiaries, distributors, affiliates, retailers, suppliers, integrators, importers, customers, and/or consumers as set forth under U.S.C. § 271(b). Such inducements have been committed with the knowledge, or with willful blindness to the fact, that the acts induced constitute infringement of the '379 Patent. Indeed, SMI has intended to cause, continues to intend to cause, and has taken, and continues to take affirmative steps to induce infringement by, among other things, creating and disseminating advertisements and instructive materials that promote the infringing use of the '379 Accused Products; creating and/or maintaining established distribution channels for the '379 Accused Products into and within the United States; manufacturing the '379 Accused Products in conformity with U.S. laws and

regulations; providing technical documentation for the '379 Accused Products, including white papers, product briefs, and descriptions of the features and technologies;<sup>7</sup> promoting the incorporation of the '379 Accused Products into end-user products.

### **Damages**

142. On information and belief, despite having knowledge of the '379 Patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '379 Patent, SMI has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. SMI's infringing activities relative to the '379 Patent, e.g., its decision to continue infringing the '379 Patent, have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that K.Mizra is entitled to enhanced damages under 35 U.S.C. § 284 up to three times the amount found or assessed.

143. K.Mizra has been damaged as a result of SMI's infringing conduct described in this Count. SMI is, thus, liable to K.Mizra in an amount that adequately compensates K.Mizra for SMI's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

### **CONCLUSION**

144. K.Mizra is entitled to recover from SMI the damages sustained by K.Mizra as a result of SMI's wrongful acts, and willful infringements, in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court.

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<sup>7</sup> See, e.g., <https://www.siliconmotion.com/products/client/detail>; <https://www.siliconmotion.com/products/enterprise/detail>; and the product briefs and white papers linked therefrom

145. K.Mizra has incurred and will incur attorneys' fees, costs, and expenses in the prosecution of this action. The circumstances of this dispute may give rise to an exceptional case within the meaning of 35 U.S.C. § 285, and K.Mizra is entitled to recover its reasonable and necessary attorneys' fees, costs, and expenses.

**JURY DEMAND**

146. K.Mizra hereby requests a trial by jury pursuant to Rule 38 of the Federal Rules of Civil Procedure.

**PRAYER FOR RELIEF**

147. K.Mizra respectfully requests that the Court find in its favor and against SMI, and that the Court grant K.Mizra the following relief:

- (i) A judgment that one or more claims of the Asserted Patents have been infringed, either literally and/or under the doctrine of equivalents, by SMI;
- (ii) A judgment that one or more claims of the Asserted Patents have been willfully infringed, either literally and/or under the doctrine of equivalents, by SMI;
- (iii) A judgment that SMI account for and pay to K.Mizra all damages and costs incurred by Plaintiff because of SMI's infringing activities and other conduct complained of herein, including an accounting for any sales or damages not presented at trial;
- (iv) A judgment that SMI account for and pay to K.Mizra a reasonable, ongoing, post judgment royalty because of SMI's infringing activities, including continuing infringing activities, and other conduct complained of herein;
- (v) A judgment that K.Mizra be granted pre-judgment and post judgment interest on the damages caused by SMI's infringing activities and other conduct complained of herein;
- (vi) A judgment that this case is exceptional under the provisions of 35 U.S.C. § 285 and award enhanced damages; and
- (vii) Such other and further relief as the Court deems just and equitable.

Dated: February 15, 2024

Respectfully submitted,

/s/ Patrick J. Conroy

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