IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

ACQIS LLC, a Texas limited liability company, Plaintiff, v. PANASONIC HOLDINGS CORPORATION, a Japanese corporation, and PANASONIC CORPORATION OF NORTH AMERICA, a Delaware corporation, Defendants.	Civil Action No. 6:23-cv-00880 JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff ACQIS LLC ("Plaintiff" or "ACQIS"), by its attorneys, hereby alleges patent infringement against Defendants Panasonic Holdings Corporation and Panasonic Corporation of North America (individually "Defendant" and collectively "Defendants" or "Panasonic," unless context indicates otherwise), as follows:

INTRODUCTION

1. This is an action for patent infringement under the United States Patent Laws, 35 U.S.C. § 1 *et seq*. Beginning in the late 1990s, Dr. William Chu founded ACQIS and invented a variety of pioneering computer technologies that employed serial transmission along low voltage differential signal (LVDS) channels to dramatically increase the speed at which data can be transmitted while also reducing power consumption and noise. Dr. Chu's inventions have become

foundational in the computer industry, and are found in a variety of data transmission systems, including PCI Express (PCIe) and/or USB 3.x[1] transactions.

2. Defendants have infringed the following patents owned by ACQIS: U.S. Patent Nos. 9,529,768 ("'768 patent"), 9,703,750 ("'750 patent"), 8,756,359 ("'359 patent"), 8,626,977 ("'977 patent"), RE44,739 ("'739 patent"), 8,977,797 ("'797 patent"), RE45,140 ("'140 patent"), RE44,654 ("'654 patent"), and 8,234,436 ("'436 patent") (collectively, the "ACQIS Patents"). Copies of the ACQIS Patents are attached to this Complaint as Exhibits 1-9.

3. Specifically, Defendants have infringed the ACQIS Patents through: (1) the manufacture, use, offering to sale, and/or sale in the United States, and/or the importation into the United States, of infringing computer products; (2) the practice of claimed methods of the ACQIS Patents by manufacturing, using, and/or testing computer products in the United States; (3) the importation into the United States of computer products made abroad using ACQIS's patented processes; and (4) the inducement of third parties to engage in the activity described above with knowledge of the ACQIS Patents and of the third parties' infringing actions.

4. ACQIS seeks damages and other relief for Defendant's infringement of the ACQIS Patents. ACQIS is entitled to past damages because, without limitation, it has provided actual notice to Defendant and for method claims which do not require marking.

THE PARTIES

5. Plaintiff ACQIS LLC, is a limited liability company organized and existing under the laws of the State of Texas, with offices at 411 Interchange Street, McKinney, Texas 75071. A related entity, ACQIS Technology, Inc., is a corporation organized under the laws of the State of Delaware, having its principal place of business at 1503 Grant Road, Suite 100, Mountain View,

[1] As used herein, "USB 3.x" refers to USB 3.0 and subsequent versions, including USB 3.1, USB 3.2, and any other subsequent versions.

California 94040. ACQIS LLC is operated from California, where its President, Dr. William Chu, resides. Dr. Chu is also the Chief Executive Officer of ACQIS Technology, Inc.

6. Panasonic Holdings Corporation is a Japanese company with its principal place of business at 1006, Kadoma, Kadoma City, Osaka 571-8501, Japan.[2]

7. Panasonic Holdings Corporation is the parent company of a multinational conglomerate that operates under the name "Panasonic" or "Panasonic Group."[3] Panasonic Holdings Corporation was restructured as a holding company in April 2022.[4] Prior to then, Panasonic's predecessor-in-interest, Panasonic Corporation, was corporate parent of the multinational conglomerate that operated under the name "Panasonic" or "Panasonic Group."[5]

8. On information and belief, all actions and liabilities of Panasonic Corporation during the time period relevant to this Complaint are attributable to Panasonic Holdings Corporation. For purposes of this Complaint, "Panasonic HC" refers to Panasonic Corporation (if related to actions before the April 2022 restructuring) and Panasonic Holdings Corporation (if related to actions or liabilities after the April 2022 restructuring).

9. Prior to the April 2022 restructuring, Panasonic HC was an operating company that, in relevant part, designed, manufactured (or had manufactured according to its designs and instructions), and sold products that infringe the ACQIS Patents.

10. Panasonic HC manufactured at least some of these products in its factory in Kobe, Japan.[6]

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[2] https://holdings.panasonic/global/corporate/about/group-companies/phd.html; Panasonic Group Integrated Report 2023, p. 56.
[3] *See, e.g., generally* Panasonic Group Integrated Report 2023.
[4] Press Release, "Panasonic Transitions to a Holding Company System," Nov. 13, 2020.
[5] *See, e.g.,* Panasonic Corporation Annual Report 2019, p. 58.
[6] *See, e.g.*, Todd. R. Weiss, "*Inside Look: How Panasonic Builds Its Toughbook Laptops*," ITProToday.com, Jan 18, 2018 https://www.itprotoday.com/mobile-device-management/inside-look-how-panasonic-builds-its-toughbook-laptops retrieved December 14, 2023; Panasonic

11. On information and belief, Panasonic HC sold products that infringe the ACQIS Patents to at least related entities, such as Panasonic Corporation of North America, Inc. ("Panasonic NA"), for importation and resale in the United States market.

12. On information and belief, Panasonic NA is a wholly owned subsidiary of Panasonic HC.

13. Panasonic NA is a Delaware corporation with its principal place of business at 1043 Raymond Blvd, Newark, NJ 07102.[7] Panasonic NA is registered to do business in the State of Texas and has active offices in numerous towns within the State, including Round Rock and El Paso.

14. Panasonic NA imported, sold, and offered to sell products that infringe the ACQIS Patents.

15. Publicly available import data[8] indicates that Panasonic NA has imported into the United States computer systems.[9] On information and belief, Panasonic NA's imports have included those produced accused of infringement in this Complaint prior to the ACQIS Patents' expiration.

16. Panasonic NA, thorough its division Panasonic System Communications Company of North America ("Panasonic SCNA"), began selling products accused of infringement in this Complaint to the State of Texas in 2017.[10]

Toughbook, "*Inside Look: Panasonic Kobe Factory*," Youtube.com, December 13, 2017 https://www.youtube.com%2Fwatch%3Fv%3DRR8YgcThzYc&usg=AOvVaw1QvP458zxrCP5HL-A3jHQ_&opi=89978449 ("Get an inside look at how products are made and tested at our factory in Kobe, Japan. For more information on Panasonic TOUGHBOOK mobile devices and solutions, please visit http://us.panasonic.com/toughbook.").

[7] https://www.panasonic.com/us/corporate/profile/overview.html.

[8] U.S. Import Records, available from Import Genius.

[9] *See, e.g.*, U.S. Import Bills of Lading Nos. NEDFTPNYWSE85847, NEDFTPCHWSE85399, NEDFTPCHWSE84899, NEDFTPCHWSE84656, NEDFTPCHWSE81506.

[10] *See* https://txdir.widen.net/view/pdf/obtiasys8o/DIR-TSO-4025-

17. Numerous resellers of Panasonic products accused of infringement in this Complaint have sold such products in this District. For example, Ingram Technologies LLC has offered for sale and sold such products since at least 2018.[11] On information and belief, Ingram Technologies LLC and other such resellers of Panasonic products accused of infringement in this Complaint purchased their stock from Panasonic NA and/or Panasonic HC.

18. Panasonic NA has sold and offered for sale products accused of infringement in this Complaint through its website na.panasonic.com. On information and belief, Panasonic NA has sold such products from its website throughout the United States, including to customers in this District.

19. Panasonic HC maintains dominance over, and a close relationship with, its direct and indirect subsidiaries, including Panasonic NA. For example, as described in its 2023 Integrated Report:

a. Panasonic HC holds the Panasonic conglomerate out publicly as a single entity or collective, such as by consistently referring to the conglomerate as "Panasonic" or "the Group."[12]

b. "Group" CFO Mr. Hirokazu Umeda has indicated Panasonic HC maintains direct managerial force on the other Panasonic entities, stating, "On the other hand, in terms of an inward, or unifying force, both Group CEO Kusumi and myself sit on the boards of all the operating companies as outside directors for monitoring from a Group governance perspective in

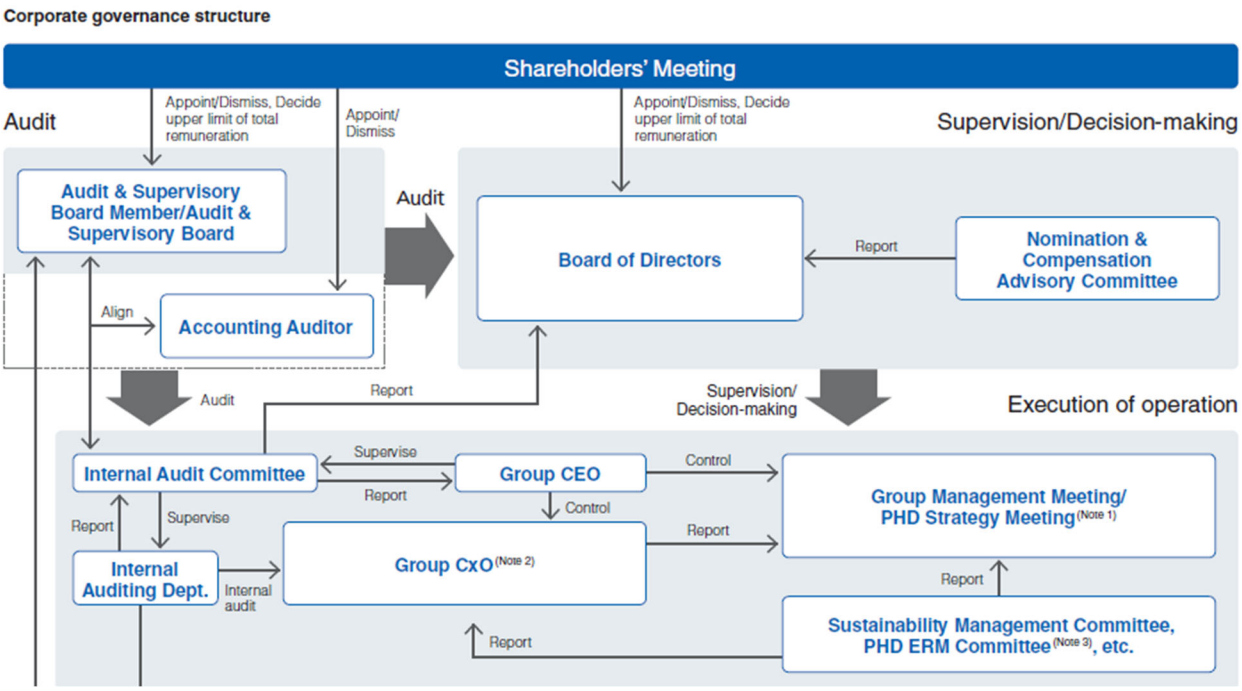
Contract.pdf?t.download=true&u=tmwul0; https://txdir.widen.net/view/pdf/zt8kzjw8wo/DIR-TSO-4025-Appendix-C-Pricing-Index-per-Amendment-2.pdf?t.download=true&u=tmwul0.

[11] *See*, e.g., https://web.archive.org/web/20180817122926/https://www.ingramt.com/product-category/panasonic/ (capture of page showing Panasonic Toughbooks and Toughpads for sale as of August 17, 2018).

[12] *See generally* Panasonic Holdings Corporation 2023 Integrated Report.

the sense that we are making sure everything is optimally aligned within the Group. . . . Panasonic Holdings Corporation (hereinafter referred to as "Panasonic Holdings"), implements financial discipline at each operating company, and if any of them continue to operate businesses with low profitability, the holding company is to intervene."[13]

c. Panasonic HC's Board of Directors exerts managerial force, including supervising and ultimate decision making, on the other Panasonic entities[14]:



d. Panasonic HC's Nomination and Compensation Advisory Committee provides its Board of Directors with information concerning actions to be taking with other Panasonic entities succession plans, such succession plans for the presidents of operating companies.[15]

[13] *Id.* at 18.
[14] *Id.* at 39.
[15] *Id.* at 40.

e. Executives of Panasonic HC concurrently hold positions with direct and/or indirect subsidiaries. For example, in addition to his positions with Panasonic HC, Mr. Umeda is the CEO of Panasonic Holding (Netherlands) B.V., a director and Managing Executive Officer of the Company President of Panasonic Equity Management Japan Co., Ltd.[16]

f. Panasonic HC ensures consolidated, centralized services to the other Panasonic entities. For example, in addition to being an Executive Officer and Director with Panasonic HC, Ms. Ayako Shotoku serves as General Counsel for the entire Group.[17]

20. Such statements indicating Panasonic HC's control over the other Panasonic entities are not unique to its 2023 Integrated Report. For example, the 2019 Annual Report states, "Executive officers will assume responsibility for managing the Panasonic Group, strengthen the strategic functions for Group-wide optimization, including the reform of the Group's portfolio and bold resource shifts, and set the direction of and implement the Group-wide business structural reform toward a new Panasonic. That is, they will be positioned as members of the same team as the CEO."[18]

21. Additionally, Panasonic HC files consolidated financials with its subsidiaries.[19]

22. Panasonic HC's own press related about the April 2022 reorganization indicates that it was effected in order to optimize Panasonic HC's control over the conglomerate: "the Company today resolved to transition to a holding company system in order to further enhance group

[16] *Id.* at 46.
[17] *Id.*
[18] Panasonic Corporation 2019 Annual Report at 40.
[19] *See, e.g.*, *id.* at 49 (10-Year Financial Summary of "Panasonic Corporation and Subsidiaries"); https://holdings.panasonic/global/corporate/investors/pdf/Quarterly_Report_FY2024_2Q.pdf.

management from a medium- to long-term perspective and to ensure growth. . . . As a holding company, Panasonic will continue to support the business growth of each operating company and define growth areas from the perspective of optimizing the group as a whole, thereby striving to enhance the corporate value of the entire group."[20]

23. As a result of Panasonic HC's dominance, the actions of its subsidiaries (including Panasonic NA) are attributable to Panasonic HC, and Panasonic HC's subsidiaries act as its agents.

JURISDICTION AND VENUE

24. This is an action for patent infringement under the United States patent laws, 35 U.S.C. § 101 *et seq*.

25. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

26. This Court has personal jurisdiction over Defendants consistent with the requirements of the Due Process Clause of the United States Constitution and the Texas Long Arm Statute.

27. As alleged above (*see* paragraphs 8-23), Defendants have purposefully manufactured and/or distributed computer products that infringe the ACQIS Patents, or that were made abroad using patented processes claimed in the ACQIS Patents, through established distribution channels with the expectation that those products would be sold in the United States, State of Texas, and in this District.

28. Further, Defendants have (itself and/or through the activities of subsidiaries, affiliates, or intermediaries) committed acts of patent infringement in the United States, State of Texas and this District, including by making, using, offering to sell, and/or selling infringing computer products in the United States, State of Texas and this District; importing infringing computer products and/or computer products made abroad using ACQIS's patented processes into the

[20] Press Release, "Panasonic Transitions to a Holding Company System," Nov. 13, 2020, p. 1.

United States for sale in the State of Texas and this District; and/or inducing others to commit acts of patent infringement in the United States, State of Texas and this District.

29. Accordingly, Defendants have established minimum contacts within Texas and purposefully availed themselves of the benefits of Texas, and the exercise of personal jurisdiction over Defendants would not offend traditional notions of fair play and substantial justice. In addition, this Court has personal jurisdiction over Panasonic HC pursuant to Federal Rule of Civil Procedure 4(k)(2). *See, e.g., ACQIS LLC v. Lenovo Group Ltd. et al.*, 572 F. Supp. 3d 291, 302-307 (W.D. Tex. Nov. 16, 2021) (denying motion to dismiss for lack of personal jurisdiction as to served defendants).

30. Venue is proper in this District pursuant to 28 U.S.C. § 1391(c)(3) because, in addition to the direct and/or indirect infringement caused by Panasonic HC, Panasonic HC does not reside in the United States and thus may be sued in any judicial district in the United States pursuant to 28 U.S.C. § 1391(c)(3).

31. Venue is proper in this District pursuant to 28 U.S.C. § 1400(b) because in addition to the direct and/or indirect infringement caused by Panasonic NA, Panasonic NA has regular and established physical places of business in this District, including at least (1) 495 Round Rock West Dr, Round Rock, Texas, 78681-5012; and (2) 5959 Gateway Blvd W Ste 645, El Paso, Texas, 79925-3390.

32. Venue is also appropriate because the patents asserted in this case have been previously asserted in cases before this Court. *See, e.g.*, *ACQIS, LLC v. Quanta Computer, Inc.*, 6:2023-cv-265. Certain of these patents will be the subject of a trial scheduled to be held in this District in March 2024. *ACQIS, LLC v. Asus*, No. 6:2020-cv-966. It would serve the interests of judicial efficiency for this case to be litigated in this District. *See ACQIS LLC v. MiTac Computing Tech.*

Corp., No. W-20-cv-00962-ADA, 2021 U.S. Dist. LEXIS 197938, 2021 WL 4805431 (W.D. Tex., Oct. 14, 2021) (describing four pending cases and denying motion to transfer venue).

FACTUAL BACKGROUND

Dr. Chu and the ACQIS Patents

33. Dr. William Chu has been a prolific innovator in the computing industry since the 1970s.

34. In 1976, Dr. Chu received his Ph.D. in Electrical Engineering from the University of California, Berkeley. Dr. Chu then began working in semiconductor design for American Microsystems, Inc. from 1976 to 1977, and then for Zilog, Inc. from 1977 to 1982.

35. In 1982, Dr. Chu founded Verticom, Inc., which developed innovative technologies relating to video transmission over telephone lines. Verticom also developed graphics products for the PC computer-aided design (CAD) market. Verticom's success resulted in its stock being listed on the NASDAQ exchange in 1987. In 1988, Verticom was acquired by Western Digital Imaging, Inc.

36. Dr. Chu served as Vice President of Engineering for Western Digital from 1988 to 1991, overseeing a development team in the desktop and portable graphics chip division. In the course of his work at Western Digital, Dr. Chu in 1988 started the company's portable graphics chip business, which became #1 in the portable graphics chip market by 1991. Dr. Chu also led Western Digital to achieve the #1 market share in the PC graphics market in 1990.

37. After Western Digital, Dr. Chu worked for Acumos, Inc. from 1991 to 1992 as a Vice President managing engineering for computer graphics chip development. Acumos was acquired by Cirrus Logic, Inc. in 1992.

38. Dr. Chu then worked for Cirrus Logic from 1992 to 1997, first as a General Manager in the Desktop Graphics Division and later as Co-President of the Graphics Chip Business Unit. During Dr. Chu's time at Cirrus Logic, the company achieved #1 market share in the PC graphics chip market.

39. In 1998, Dr. Chu founded ACQIS Technology, Inc. to pursue his vision of developing a small, portable computer module that could be interchangeably connected with a variety of different peripheral consoles. In the course of this development effort, Dr. Chu recognized the need for a better interconnection between the core computing module and a peripheral console. Such interconnections traditionally conveyed peripheral component interconnect (PCI) bus transactions in parallel using a large number of signal channels and connector pins. This made it difficult to employ LVDS channels, which are more "cable friendly," consume less power, and generate less noise. Dr. Chu wanted to develop an interconnection system that was scalable, used connectors with low pin counts, was power-efficient, high performing, and easily extendible for future computing needs and technologies. This development work resulted in a large family of patents now owned by ACQIS, which disclose and claim a variety of pioneering inventions relating to improved, high-performance and low-power consuming interconnection technologies for computer modules.

40. After several decades in the industry, Dr. Chu is now a named inventor of over forty U.S. Patents.

41. Among the patent portfolio covering Dr. Chu's inventions and owned by ACQIS are the ACQIS Patents asserted in this case.

42. The '768 patent, entitled "Computer System Including CPU or Peripheral Bridge Directly Connected to a Low Voltage Differential Signal Channel that Communicates Serial Bits

of a Peripheral Component Interconnect Bus Transaction in Opposite Directions," was duly and legally issued on December 27, 2016, from a patent application filed March 13, 2014, with William W.Y. Chu as the sole named inventor. The '768 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

43. The '750 patent, entitled "Computer System Including CPU or Peripheral Bridge Directly Connected to a Low Voltage Differential Signal Channel that Communicates Serial Bits of a Peripheral Component Interconnect Bus Transaction in Opposite Directions," was duly and legally issued on July 11, 2017, from a patent application filed October 9, 2014, with William W.Y. Chu as the sole named inventor. The '750 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

44. The '359 patent, entitled "Computer System Including CPU or Peripheral Bridge to Communicate Serial Bits of Peripheral Component Interconnect Bus Transaction and Low Voltage Differential Signal Channel to Convey the Serial Bits," was duly and legally issued on June 17, 2014, from a patent application filed January 17, 2013, with William W.Y. Chu as the sole named inventor. The '359 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

45. The '977 patent, entitled "Computer System Including CPU or Peripheral Bridge to Communicate Serial Bits of Peripheral Component Interconnect Bus Transaction and Low Voltage Differential Signal Channel to Convey the Serial Bits," was duly and legally issued on January 7, 2014, from a patent application filed July 27, 2012, with William W.Y. Chu as the sole named inventor. The '977 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

46. The ’739 patent, entitled “Data Security Method and Device for Computer Modules,” was duly and legally issued on January 28, 2014, from a patent application filed May 21, 2013, with William W.Y. Chu as the sole named inventor. The ’739 patent claims priority to U.S. Patent Application No. 11/056,604, filed on February 10, 2005.

47. The ’797 patent, entitled “Method of Improving Peripheral Component Interface Communications Utilizing a Low Voltage Differential Signal Channel,” was duly and legally issued on March 10, 2015, from a patent application filed October 10, 2012, with William W.Y. Chu as the sole named inventor. The ’797 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

48. The ’140 patent, entitled “Data Security Method and Device for Computer Modules,” was duly and legally issued on September 16, 2014, from a reissue application filed December 17, 2013, with William W.Y. Chu as the sole named inventor. The ’140 patent is a reissue of U.S. Patent No. 6,643,777, which issued on November 4, 2003, from a patent application filed May 14, 1999. The ’140 patent claims priority to U.S. Patent Application No. 09/312,199, filed on May 14, 1999.

49. The ’654 patent, entitled “Data Security Method and Device for Computer Modules,” was duly and legally issued on December 17, 2013, from a reissue application filed October 10, 2012, with William W.Y. Chu as the sole named inventor. The ’654 patent is a reissue of U.S. Patent No. 6,643,777, which issued on November 4, 2003, from a patent application filed May 14, 1999. The ’654 patent claims priority to U.S. Patent Application No. 09/312,199, filed on May 14, 1999.

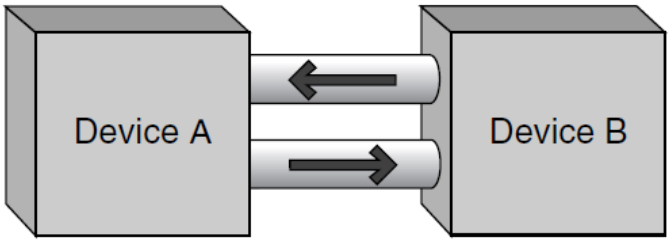
50. The ’436 patent, entitled “Computer System Including Peripheral Bridge to Communicate Serial Bits of Peripheral Component Interconnect Bus Transaction and Low

Voltage Differential Signal Channel to Convey the Serial Bits," was duly and legally issued on July 31, 2012, from a continuation of application No. 12/504,534, filed on Jul. 16, 2009, with William W.Y. Chu as the sole named inventor. The '797 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

51. The inventions claimed in the ACQIS Patents enable computers to operate faster with better efficiency through faster interconnections including between the core computing power modules and any connected consoles.

52. The claims in the ACQIS Patents generally relate to computers and computer systems that employ CPUs coupled to LVDS channels that convey various types of data (*e.g.*, PCI bus transactions, USB 3.x data, and/or digital video data) in a serial bit stream using pairs of unidirectional channels to convey the data in opposite directions.

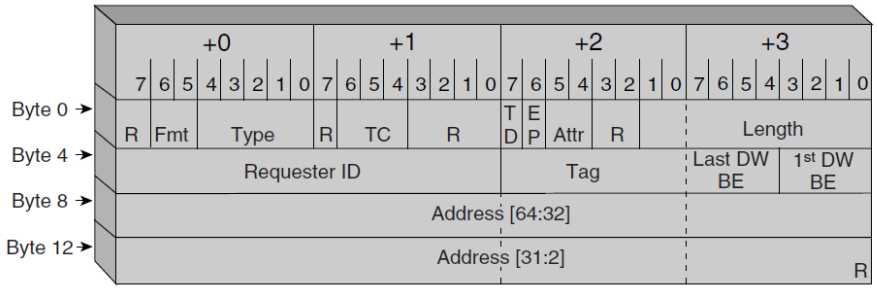
53. Over the years, Dr. Chu's inventive developments have become more and more widely used in computing technologies. One prime example is the computing industry's adoption of PCI Express, which post-dates Dr. Chu's inventions but embodies Dr. Chu's patented interconnection invention by using "high speed, low voltage, differential serial pathway for two devices … to communicate simultaneously by implementing dual unidirectional paths between two devices[.]"



See Introduction to PCI Express – A Hardware and Software Developers Guide, Intel Press (2003), at 1-2 ("There are certain times in the evolution of technology that serve as inflection points that forever change the course of events. For the computing sector and communications, the adoption

of PCI Express, a groundbreaking new general input/output architecture, will serve as one of these inflection points.").

54. PCI Express connections transmit data packets known as transaction layer packets (TLP) that include data bits, address bits, and byte enable (BE) information bits.

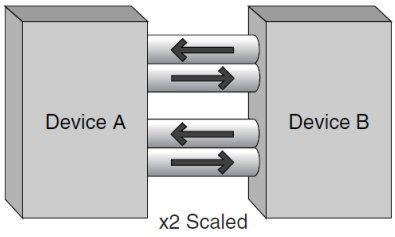


Id. at 93-114.

55. PCI Express "establishes a unique divergence from historical PCI evolutions through a layered architecture improving serviceability and scalability as well as easing software transitions through backward compatibility."[21] The compatibility of PCI Express with PCI can be further explained as follows: "PCI Express employs the same usage model and load-store communication model as PCI and PCI-X. It supports familiar transactions such as memory read/write, IO read/write and configuration read/write transactions. The memory, IO, and configuration address space model is the same as PCI and PCI-X address spaces. By maintaining the address space model, existing OS and driver software will run in a PCI Express system without any modifications. In other words, PCI Express is software backward compatible with PCI and PCI-X systems. In fact a PCI Express system will boot an existing OS with no changes to current drivers and application programs. Even PCI/ACPI power management software will still run."[22]

[21] Adam H. Wilen, Justin P. Schade, Ron Thornburg. INTRODUCTION TO PCI EXPRESS - A HARDWARE AND SOFTWARE DEVELOPER'S GUIDE, Intel Press, 2003, pages 51-52.
[22] Ravi Budruk, et al., PCI EXPRESS SYSTEM ARCHITECTURE, 400, (MindShare Inc., 2004) at 11.

56. In sum, PCI Express connections are LVDS channels that convey data bits, address bits, and byte enable information bits of a PCI bus transaction in a serial bit stream using pairs of unidirectional, differential signal lanes to convey the information in opposite directions allowing the connection to be scalable and dramatically reducing the pin-count required for connectors, as well as other benefits. "Currently PCI Express defines the following configuration of serial links: x1, x2, x4, x8, x12, x16, and x32. … An x2 configuration indicates two serial paths to and from a device[.]"

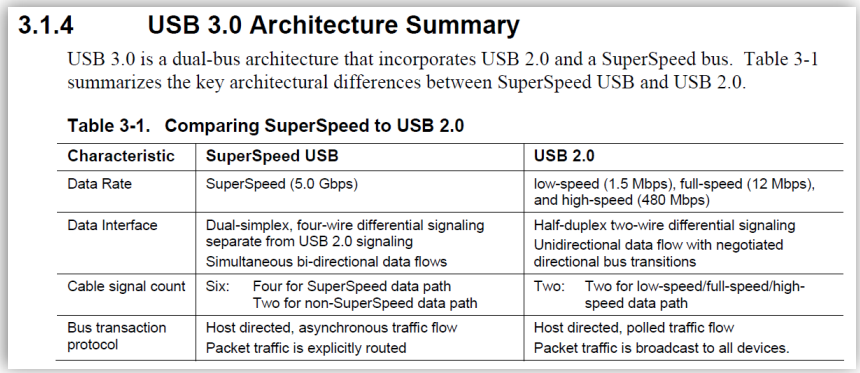


	Value Proposition	Benefits
I/O Simplification	• Scalable width and frequency • Higher bandwidth	• Superior performance • Enable evolving applications
High Performance	• Consolidate system I/O • Unity proliferated segments	• Standard I/O modules • Improve TTM and reduce TCO
Layered Architecture	• Layered Architecture .. Longevity • Reliability, Availability, Serviceability • Advanced Power Management • Works in existing PCI Environment	• Reduced returns • Improved service and support • Smooth software changes
Next Gen Multimedia	• Virtual channels • QoS and Isochrony	• Improved multimedia • "Glitch less" audio and video
Ease of Use	• New Form Factors • Innovative Designs • Hot Plug / Hot Swap	• SImple to Install / upgrade • Increased miniaturization

Figure 4.1 PCI Express Benefits

Id. at 3, 50.

57. Another example of a computer-to-peripheral interconnection that embodies Dr. Chu's patented invention is the USB 3.x connection. The "Super Speed" USB 3.0 architecture uses at least two pairs of unidirectional, point-to-point differential signal paths. Each pair includes a transmit path and a receiving path, thus transmitting the USB data packet information in opposite directions.



3.1.4 USB 3.0 Architecture Summary

USB 3.0 is a dual-bus architecture that incorporates USB 2.0 and a SuperSpeed bus. Table 3-1 summarizes the key architectural differences between SuperSpeed USB and USB 2.0.

Table 3-1. Comparing SuperSpeed to USB 2.0

Characteristic	SuperSpeed USB	USB 2.0
Data Rate	SuperSpeed (5.0 Gbps)	low-speed (1.5 Mbps), full-speed (12 Mbps), and high-speed (480 Mbps)
Data Interface	Dual-simplex, four-wire differential signaling separate from USB 2.0 signaling Simultaneous bi-directional data flows	Half-duplex two-wire differential signaling Unidirectional data flow with negotiated directional bus transitions
Cable signal count	Six: Four for SuperSpeed data path Two for non-SuperSpeed data path	Two: Two for low-speed/full-speed/high-speed data path
Bus transaction protocol	Host directed, asynchronous traffic flow Packet traffic is explicitly routed	Host directed, polled traffic flow Packet traffic is broadcast to all devices.

Universal Serial Bus 3.0 Specification, Rev. 1.0 (Nov. 12, 2008), at 3.1 to 3.5. USB 3.x ports operate in conformance with all USB protocols, including USB 2.0 protocols and USB 3.0 or later protocols, which are backward compatible with the USB 2.0 protocol. In sum, USB 3.x connections are LVDS channels using two unidirectional, differential signal pairs that transmit USB protocol data packets in opposite directions.

58. The Direct Media Interface ("DMI") is similar to PCIe and implements at least four serial lanes that all use differential signaling constituting 2 transmit lanes and 2 receive lanes and, therefore, transmitting data in opposite directions. *See* https://www.intel.com/content/dam/www/public/us/en/documents/white-papers/ia-introduction-basics-paper.pdf; *see also* https://en.wikipedia.org/wiki/Direct_Media_Interface ("DMI shares many characteristics with PCI Express, using multiple lanes and differential signaling to form a point-to-point link.").

59. The On-Package Interface (OPI) is like DMI but is used when a CPU and system controller are integrated into a single system-on-a-chip ("SoC"). *See, e.g.*, https://web.archive.org/web/20170106002415/https://www.anandtech.com/show/10959/intel-launches-7th-generation-kaby-lake-i7-7700k-i5-7600k-i3-7350k/5.

60. Additional interfaces that employ LVDS channels include, but are not limited to, DisplayPort[23], Embedded DisplayPort ("eDP")[24], Serial-Attached SCSI ("SAS")[25], and Serial ATA or Serial AT Attachment ("SATA")[26].

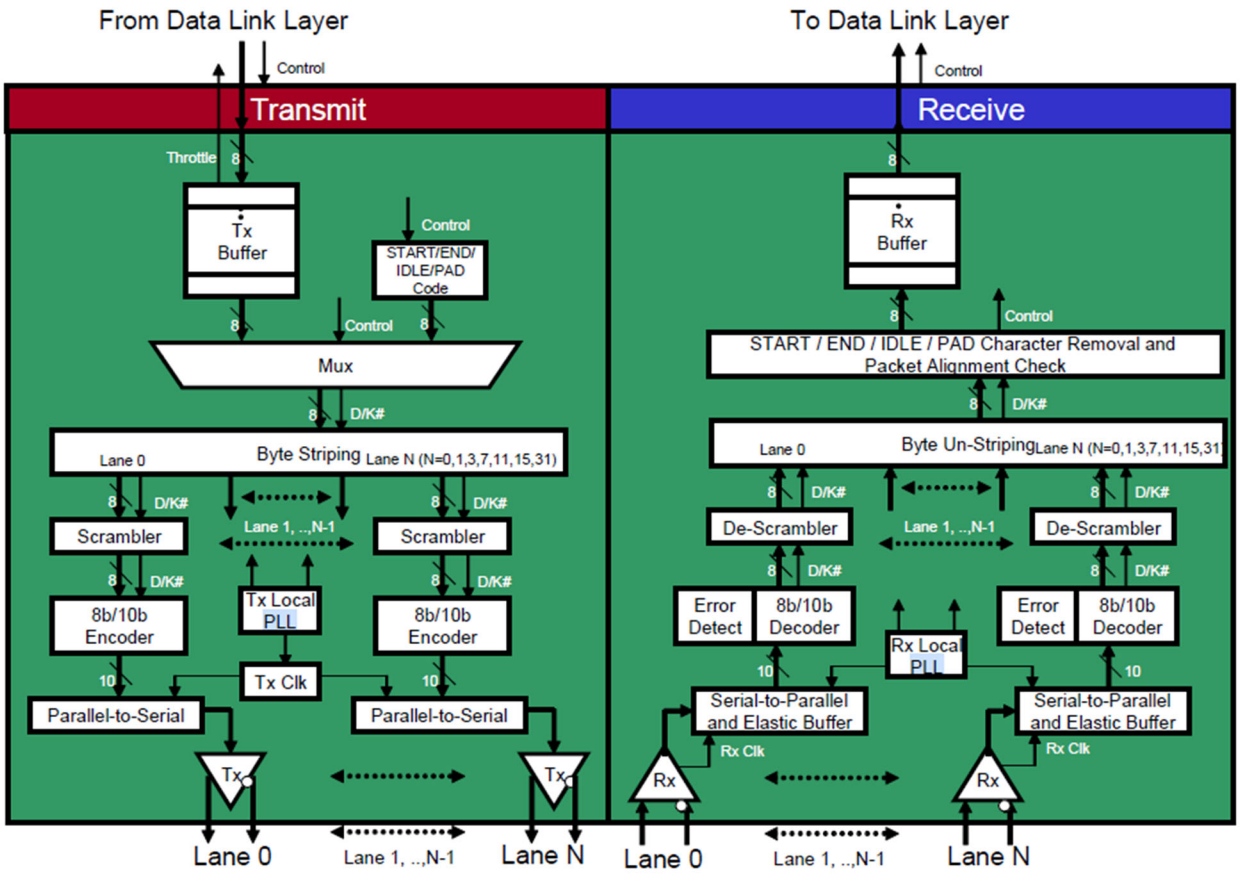
61. The physical layer of PCI Express includes PLL circuitry. *See* PCI Express Base Specification Revision 3.0, Section 1.5.3, page 49 (physical Layer "includes all circuitry for interface operation, including driver and input buffers, parallel-to-serial and serial-to-parallel conversion, PLL(s), impedance matching circuitry" as well as "logical functions related to interface initialization and maintenance"). The figure below also shows the use of PLL circuitry:

[23] Tektonix, THE BASICS OF SERIAL DATA COMPLIANCE AND VALIDATION MEASUREMENTS – PRIMER, page 9.

[24] eDP is a display panel interface standard that defines the signaling interface between CPUs/GPUs and integrated displays. It is based on the existing DisplayPort standard. Essentially, it is an embedded version of the DisplayPort standard oriented toward applications, such as notebooks and All-In-One PCs. Like DisplayPort, it consists of the Main Link, Auxiliary channel, and an optional Hot-Plug Detect signal. *See* https://edc.intel.com/content/www/us/en/design/ipla/software-development-platforms/client/platforms/alder-lake-desktop/12th-generation-intel-core-processors-datasheet-volume-1-of-2/003/embedded-displayport-edp/.

[25] HP. *Serial ATA and Serial Attached SCSI technologies*. TECHNOLOGY BRIEF, 2003, page 5. Available at http://h10032.www1.hp.com/ctg/Manual/c00256909.pdf.

[26] HP. *Serial ATA and Serial Attached SCSI technologies*. TECHNOLOGY BRIEF, 2003, page 5. Available at http://h10032.www1.hp.com/ctg/Manual/c00256909.pdf; Tektonix, THE BASICS OF SERIAL DATA COMPLIANCE AND VALIDATION MEASUREMENTS – PRIMER, page 9.



Ravi Budruk, *et al.*, PCI EXPRESS SYSTEM ARCHITECTURE, 454, (MindShare Inc., 2004), page 401.

62. Each claim of the ACQIS Patents is a patentable, valid and enforceable invention that is novel and non-obvious over the prior art.

63. ACQIS has not authorized or licensed Defendants to practice any of the inventions claimed in the ACQIS Patents.

Defendants' Infringing Products

64. Defendants make and sells a variety of computer products, including laptops and tablets. Defendants import these infringing computer products, as well as computer products made using infringing processes, into the United States and into this judicial District, through established distribution channels with the expectation that those products would be sold in the United States, State of Texas, and this District.

65. Defendants have directly infringed one or more claims of each of the ACQIS Patents under at least 35 U.S.C. §§ 271(a) and (g), by making, using, offering to sell, and/or selling within the United States, and/or importing into the United States, computer products that embody the claimed inventions of Dr. Chu, and/or by importing into, and/or using, offering to sell, and/or selling in, the United States computer products that were made abroad using patented processes claimed in the ACQIS Patents.

66. Furthermore, Defendants have indirectly infringed one or more claims of each of the ACQIS Patents under at least 35 U.S.C. § 271(b), by inducing third parties to make, use, offer to sell, and/or sell within the United Stated, and/or import into the United States computer products that embody the claimed inventions of Dr. Chu, and/or by importing into, and/or using, offering to sell, and/or selling in, the United States computer products that were made abroad using patented processes claimed in the ACQIS Patents, with knowledge of the ACQIS Patents, knowledge that it would induce the direct infringement of others, and specific intent to cause the infringement.

67. Defendants make, use, import, sell, and/or offer to sell a variety of laptop computer products in the United States that infringe one or more of the claims in the ACQIS Patents, and/or import into, and/or use, offer to sell, and/or sell in, the United States laptop computer products that were made abroad using patented processes claimed in the ACQIS Patents including, without limitation, laptop computer products sold under the brand name Toughbook. These products are collectively referred to as the "Accused Laptops."

68. Defendants make, use, import, sell, and/or offer to sell a variety of tablet computer products in the United States that infringe one or more of the claims in the ACQIS Patents, and/or import into, and/or use, offer to sell, and/or sell in, the United States tablet computer

products that were made abroad using patented processes claimed in the ACQIS Patents including, without limitation, tablet computer products sold under the brand name Toughbook. These products are collectively referred to as the "Accused Tablets."

69. The Accused Laptops and Accused Tablets are collectively referred to herein as the "Accused Panasonic Products."

70. On information and belief, Defendants manufacture and tests (or, pursuant to Defendants' designs and instructions, have manufactured and tested) at least certain of the Accused Panasonic Products abroad and use, offer to sell, and/or sell such products in the United States, and/or import such products into the United States.

71. On information and belief, at least certain of the Accused Panasonic Products that Defendants import into the United States are manufactured outside the United States using one or more processes claimed in the ACQIS Patents.

72. The Accused Panasonic Products include products made, used, offered for sale, sold within the United States, and/or imported into the United States, at least since ACQIS provided Defendants actual notice of its infringement on or around May 15, 2018.

73. The Accused Panasonic Products also include products made using the processes claimed in the ACQIS Patents and imported into the United States within the six years preceding the date of this Complaint.

The Accused Laptops

74. On information and belief, all of the Accused Laptops are configured and operate in substantially the same way as explained below using the TOUGHBOOK 31 as an example for illustrative purposes.

75. The TOUGHBOOK 31 is a computer system that runs the Windows 10 operating system.

SOFTWARE

- Windows® 10 Pro 64-bit

https://na.panasonic.com/us/sites/default/files/2018-11/toughbook_31_spec_sheet_0.pdf.

76. The TOUGHBOOK 31 uses an Intel® Core processor, such as 2.6GHz dual-core Intel Core i5 processor by default, which is mounted on a motherboard.

CPU

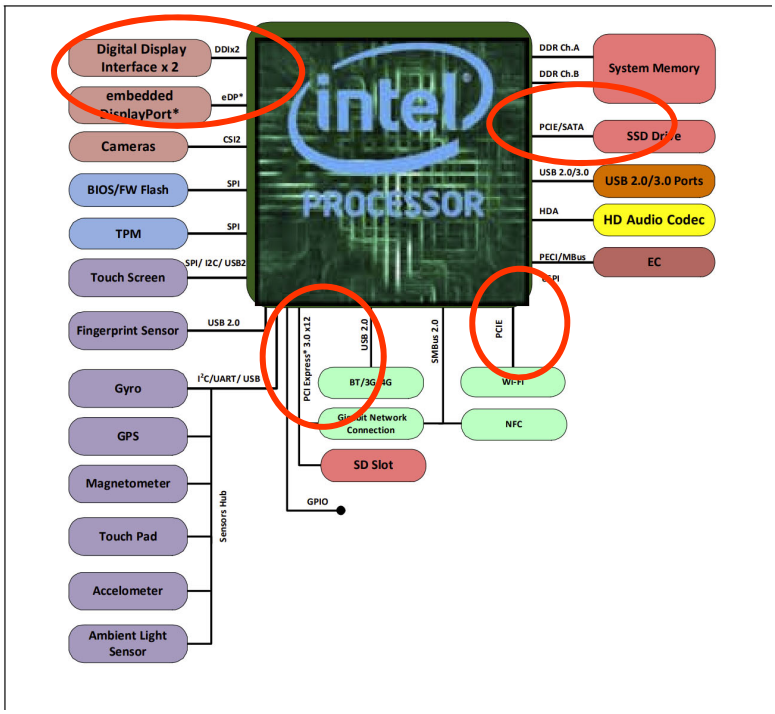
- Intel® Core™ i5-7300U vPro™ Processor
  – 2.6GHz with Turbo Boost up to 3.5GHz, 3MB cache
- Intel® Core™ i7-7600U vPro™ processor[3]
  – 2.8GHz with Turbo Boost up to 3.9GHz, 4MB cache

https://na.panasonic.com/us/sites/default/files/2018-11/toughbook_31_spec_sheet_0.pdf.

77. These processors are also known as the "Kaby Lake" family of processors, Intel's 7th Generation Intel® Core™ i5 Processors. *See, e.g.*, https://www.intel.com/content/www/us/en/products/sku/97472/intel-core-i57300u-processor-3m-cache-up-to-3-50-ghz/specifications.html (specifications for the Intel® Core™ i5-7300U processors, and identifying them as 7th Generation Intel® Core™ i5 Processors, products formerly known as "Kaby Lake").

78. The 7th Generation Intel® Core™ i5-7300U processors integrate the central processing unit (CPU) with a graphics subsystem and an interface controller on a single chip. On information and belief, the Intel Core processors integrate one or more integrated interface controllers, such as to drive the PCIe channels connected to the processor.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12; *see also id.* at 37.

■ Intel® HD Graphics 620

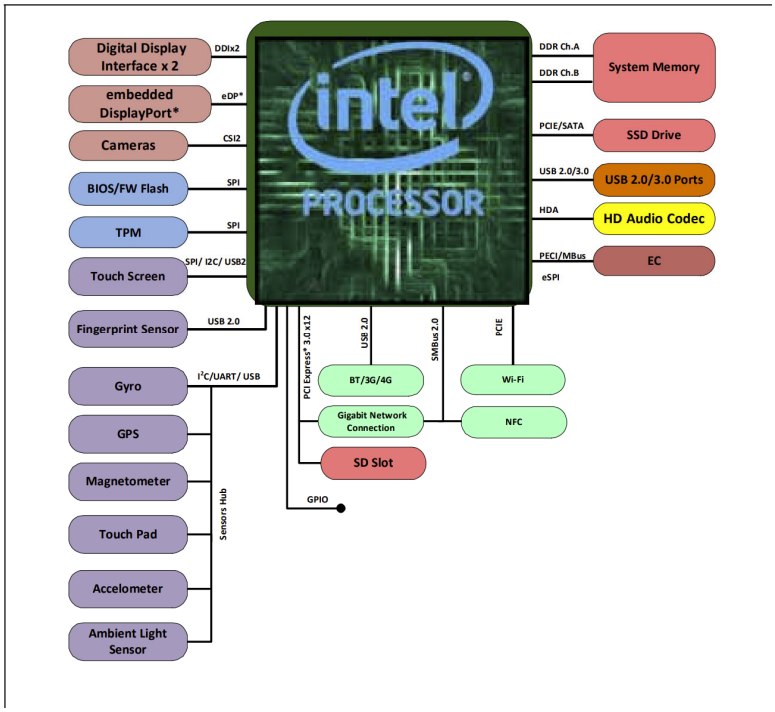
https://na.panasonic.com/us/sites/default/files/2018-11/toughbook_31_spec_sheet_0.pdf.

Expansion Options	
PCI Express Revision ?	3.0
PCI Express Configurations ‡ ?	1x4, 2x2, 1x2+2x1 and 4x1
Max # of PCI Express Lanes ?	12

https://www.intel.com/content/www/us/en/products/sku/97472/intel-core-i57300u-processor-3m-cache-up-to-3-50-ghz/specifications.html.

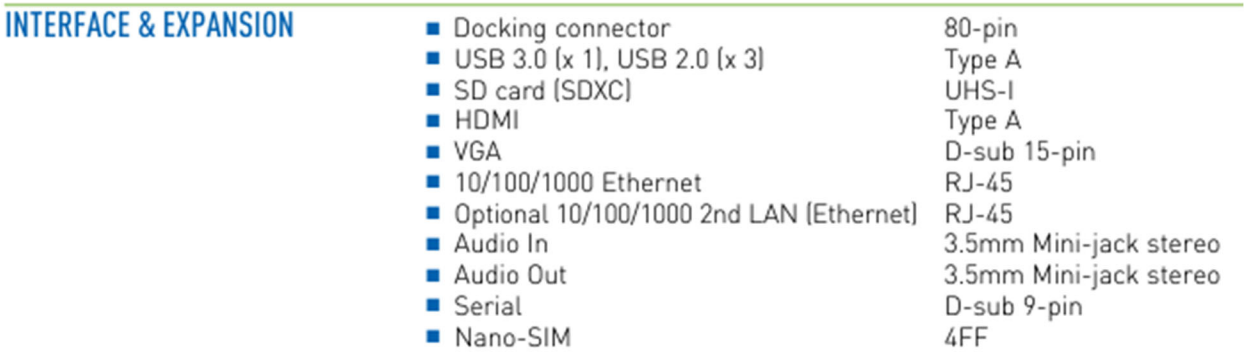
79. The TOUGHBOOK 31 comprises a chassis or enclosure which houses one or more connectors that can couple to components of other computer systems and consoles, including USB3.x ports.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12; (identifying DDI,

USB 3.x, and eDP channels extending from the SoC); *id.* at 34 (explaining that the DDI channels can be configured as HDMI).



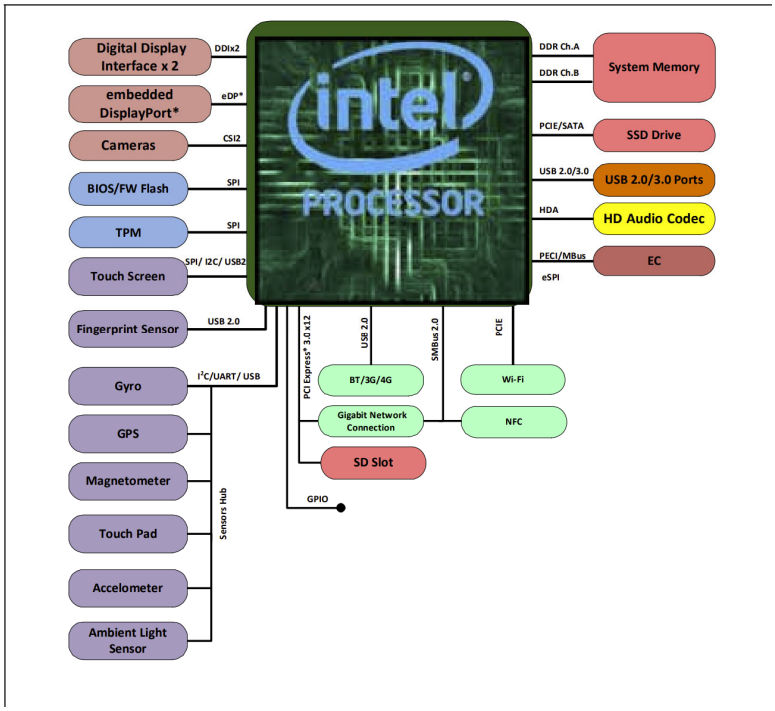
INTERFACE & EXPANSION		
	■ Docking connector	80-pin
	■ USB 3.0 (x 1), USB 2.0 (x 3)	Type A
	■ SD card (SDXC)	UHS-I
	■ HDMI	Type A
	■ VGA	D-sub 15-pin
	■ 10/100/1000 Ethernet	RJ-45
	■ Optional 10/100/1000 2nd LAN (Ethernet)	RJ-45
	■ Audio In	3.5mm Mini-jack stereo
	■ Audio Out	3.5mm Mini-jack stereo
	■ Serial	D-sub 9-pin
	■ Nano-SIM	4FF

https://na.panasonic.com/us/sites/default/files/2018-11/toughbook_31_spec_sheet_0.pdf.

80. The Intel processors employed in the TOUGHBOOK 31 connect directly to a variety of LVDS channels that convey data bits in a serial stream using unidirectional pairs of lanes transmitting data in opposite directions, including Intel's OPI[27] and PCIe channels, and the directly-connected PCIe channels connect the CPU to a mass storage device.

[27] When Intel connects the processor to a chipset on the same platform as a SoC, it connects these components via OPI interface. *See* https://en.wikichip.org/wiki/intel/microarchitectures/kaby_lake#Sockets.2FPlatform (disclosing OPI connection between dies on SoC of the Kaby Lake U series processors).

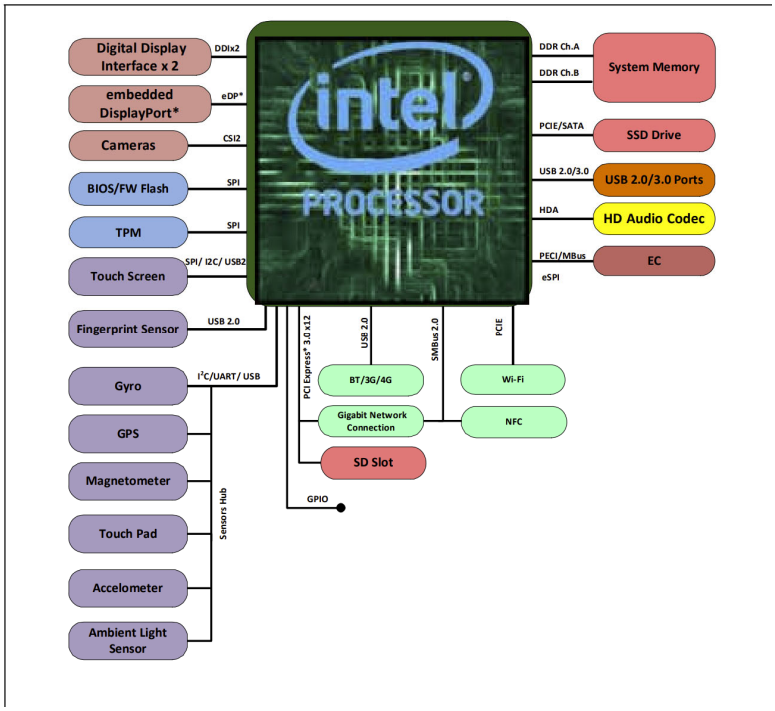
Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12.

81. The Intel processors employed in the TOUGHBOOK 31 also connect directly to a variety of differential signal channels that output digital video signals through a connector, including HDMI.

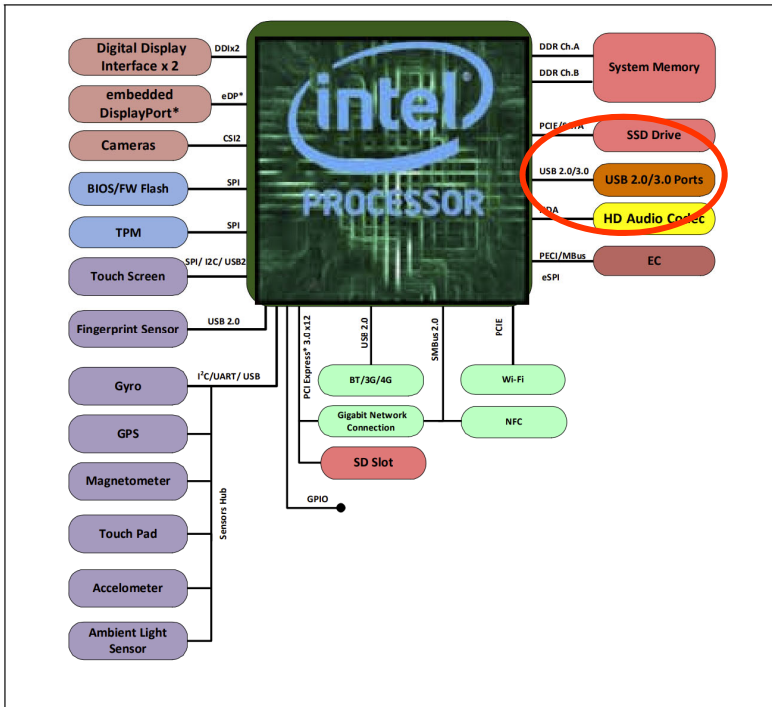
Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12; *id.* at 34 (explaining that the DDI channels can be configured as HDMI); *see also* https://na.panasonic.com/us/sites/default/files/2018-11/toughbook_31_spec_sheet_0.pdf (disclosing HDMI and other ports on the product).

82. The Intel processors employed in the TOUGHBOOK 31 also connect to LVDS channels that convey USB data packets through pairs of unidirectional differential signal paths in opposite directions—USB 3.x ports.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



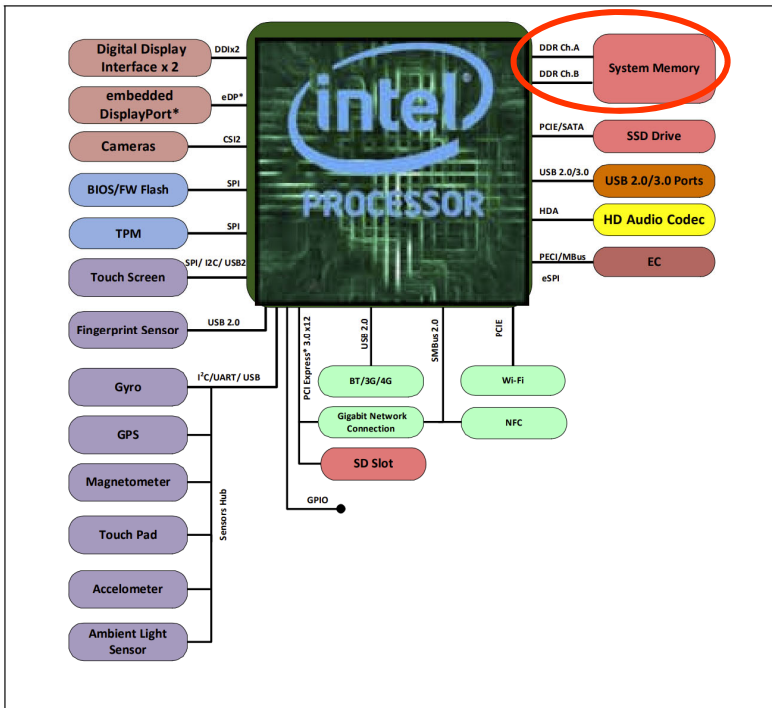
https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12.

83. The TOUGHBOOK 31 has DDR4 system memory connected directly to the CPU.

- Factory Installed Memory (RAM) - 16GB or 32GB DDR4-2133MT/s[4]

https://na.panasonic.com/us/sites/default/files/2018-11/toughbook_31_spec_sheet_0.pdf.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



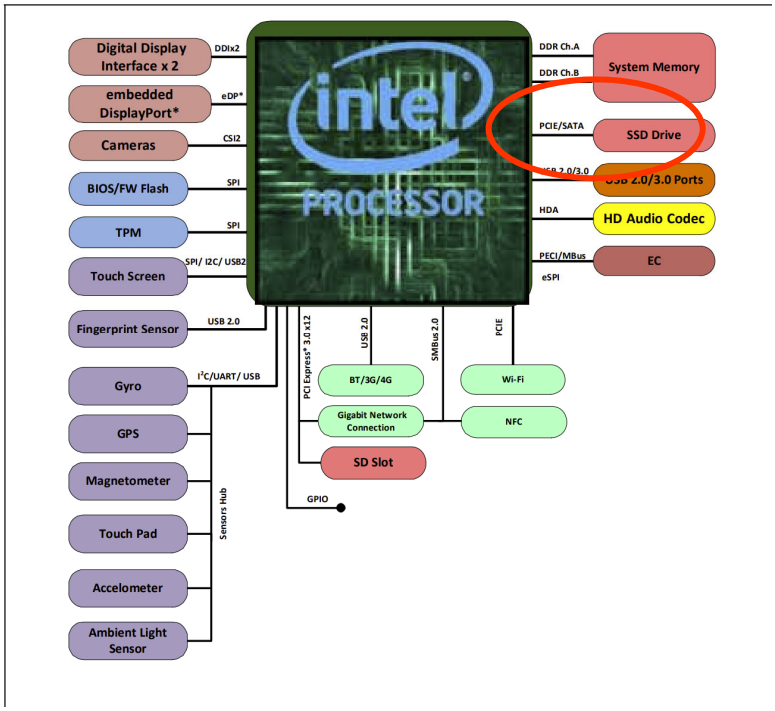
https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12.

84. The TOUGHBOOK 31 has a mass storage SSD coupled to the CPU using PCIe.

- Shock-mounted storage drive with quick-release
  - 256GB or 512GB SSD with heater[4]
  - Optional OPAL encrypted SSD with heater

https://na.panasonic.com/us/sites/default/files/2018-11/toughbook_31_spec_sheet_0.pdf.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12.

85. The Intel processors used in the TOUGHBOOK 31 have a peripheral bridge called the Platform Controller Hub (PCH) connected to the CPU module using OPI.[28] Because the PCH is coupled to PCIe, USB 3.x, and other interface connections, they necessarily have integrated interface controllers to control data transmission through those interfaces. *See* https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 37 (depicting connection between CPU and PCH). The U-Processor Line and Y-Processor Line are offered in a 1-Chip Platform that includes the 7th Generation Intel processor families I/O Platform Controller Hub

[28] When Intel connects the processor to a chipset on the same platform as a SoC, it connects these components via OPI interface. *See* https://en.wikichip.org/wiki/intel/microarchitectures/kaby_lake#Sockets.2FPlatform (disclosing OPI connection between dies on SoC of the Kaby Lake U series processors).

(PCH) die on the same package as the processor die.[29] PCH is the "chipset with centralized platform capabilities including the main I/O interfaces along with display connectivity, audio features, power management, manageability, security, and storage features."[30]

86. The Intel PCH used in the TOUGHBOOK 31 has an Integrated Clock Controller (ICC) that includes PLL circuitry, which generates different clock frequencies to convey the PCI bus transactions and USB transactions through the PCIe and USB channels based on the different clock frequencies. Because the Intel processors used in the TOUGHBOOK 31 have memory, OPI, display, and/or PCIe connections, and can send and receive data on those connections, they necessarily have integrated interface controllers to control data transmission through those interfaces.

24.2 PCH ICC Clocking Profiles

The PCH ICC hardware includes the following clocking profiles:

- "Standard" Profile (See Figure 24-1)
  - BCLK PLL = Disabled
  - USBPCIE PLL = Enabled with Down Spread Spectrum Clocking (SSC) Capability
- "Adaptive" Profile (See Figure 24-2)
  - BCLK PLL = Enabled with Down Spread Spectrum Clocking (SSC) and Under Clocking Capability
  - USBPCIE PLL = Enabled with Down Spread Spectrum Clocking (SSC) Capability
- "Over Clocking" Profile
  - BCLK PLL = Enabled with Down Spread Spectrum Clocking (SSC) and Over Clocking Capability
  - USBPCIE PLL = Enabled with Down Spread Spectrum Clocking (SSC) Capability

These PCH ICC Clocking Profiles can be enabled through the Intel® Flash Image Tool. Refer details in the Intel® ME User's Guide within the Intel® ME FW Kit for steps on using the Intel® Flash Image Tool (FIT) tool. Table 24-1 documents the supported ICC Clocking Profiles per PCH SKU.

The Standard ICC Profile is set by default and is the recommended ICC Clocking Profile.

https://www.intel.com/content/www/us/en/content-details/334658/7th-generation-intel-

[29] https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 11.
[30] *Id.* at 18.

processor-families-i-o-for-u-y-platforms-datasheet-volume-1-of-2.html, at 164; *see also id.* at 54-55, 165, 167,183; Ravi Budruk, et al., PCI EXPRESS SYSTEM ARCHITECTURE, 454, (MindShare Inc., 2004), page 401.

87. In view of the foregoing facts concerning the technical features and functionalities of the Accused Laptops (*see* paragraphs 74-86), when Defendants or another party abroad manufacture the Accused Laptops, it improves the speed and performance of the peripheral data communication in its computer products by using a method of manufacturing that includes the following steps: (a) obtaining a CPU with a graphics controller in a single chip; (b) connecting one or more unidirectional differential signal channels to the CPU to output digital video data; (c) providing a connector with an LVDS channel to facilitate data communication with external peripherals; (d) providing multiple LVDS channels, connecting them to the CPU, which use one or more pairs of unidirectional lanes that convey USB protocol data and/or address, data, and/or byte enable bits of PCIe bus transaction data in serial bit streams in opposite directions; (e) connecting the CPU directly to a peripheral bridge on a circuit board; and (f) directly connecting to the peripheral bridge one or more LVDS channels with pairs of unidirectional lanes that convey data in serial bit streams in opposite directions.

88. On information and belief, Defendants or another party perform the foregoing manufacturing steps outside the United States to make at least certain of the Accused Laptops, and Defendants then import those Accused Laptops into the United States to be marketed and sold.

The Accused Tablets

89. On information and belief, all of the Accused Tablets are configured and operate in substantially the same way as explained below using the TOUGHPAD FZ-G1 as an example for illustrative purposes.

90. The TOUGHPAD FZ-G1 is a computer system that runs the Windows 7 or 10 operating system.

SOFTWARE

- Windows 10 Pro 64 bit

https://na.panasonic.com/ns/256628_Toughbook_G1_spec_sheet_FNL_100918_HR.PDF.

91. The TOUGHPAD FZ-G1 uses an Intel® Core processor, such as 2.6GHz dual-core Intel Core i5 processor by default, which is mounted on a motherboard.

CPU

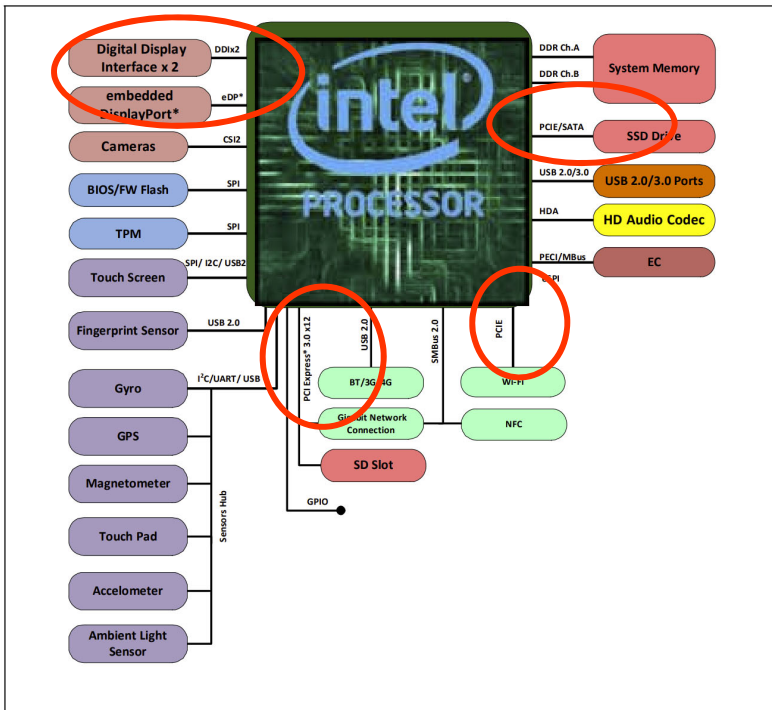
- Intel® Core™ i5-7300U vPro™ Processor
  - 2.6 GHz up to 3.5 GHz with Intel® Turbo Boost Technology
  - Intel Smart Cache 3MB
- Intel® Core™ i7-7600U vPro™ processor (Optional)
  - 2.8GHz up to 3.9GHz with Intel® Turbo Boost Technology
  - Intel Smart Cache 4MB

https://na.panasonic.com/ns/256628_Toughbook_G1_spec_sheet_FNL_100918_HR.PDF.

92. These processors are also known as the "Kaby Lake" family of processors, Intel's 7th Generation Intel® Core™ i5 Processors. *See, e.g.*, https://www.intel.com/content/www/us/en/products/sku/97472/intel-core-i57300u-processor-3m-cache-up-to-3-50-ghz/specifications.html (specifications for the Intel® Core™ i5-7300U processors, and identifying them as 7th Generation Intel® Core™ i5 Processors, products formerly known as "Kaby Lake").

93. The 7th Generation Intel® Core™ i5-7300U processors integrate the central processing unit (CPU) with a graphics subsystem and an interface controller on a single chip. On information and belief, the Intel Core processors integrate one or more integrated interface controllers, such as to drive the PCIe channels connected to the processor.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12; *see also id.* at 37.

– Intel® HD Graphics 620 (Built-in CPU) video controller

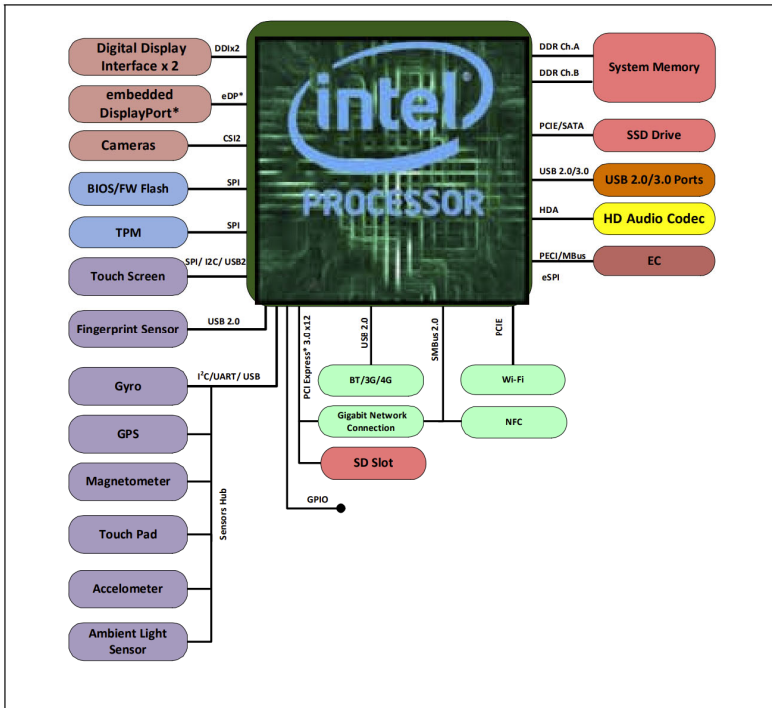
https://na.panasonic.com/ns/256628_Toughbook_G1_spec_sheet_FNL_100918_HR.PDF.

Expansion Options	
PCI Express Revision ?	3.0
PCI Express Configurations ‡ ?	1x4, 2x2, 1x2+2x1 and 4x1
Max # of PCI Express Lanes ?	12

https://www.intel.com/content/www/us/en/products/sku/97472/intel-core-i57300u-processor-3m-cache-up-to-3-50-ghz/specifications.html.

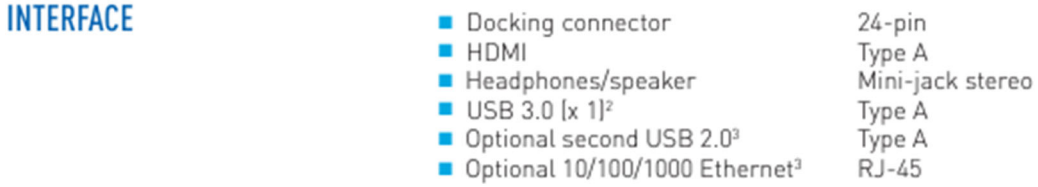
94. The TOUGHPAD FZ-G1 comprises a chassis or enclosure which houses one or more connectors that can couple to components of other computer systems and consoles, including USB3.x ports.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12; (identifying DDI,

USB 3.x, and eDP channels extending from the SoC); *id.* at 34 (explaining that the DDI channels can be configured as HDMI).



INTERFACE

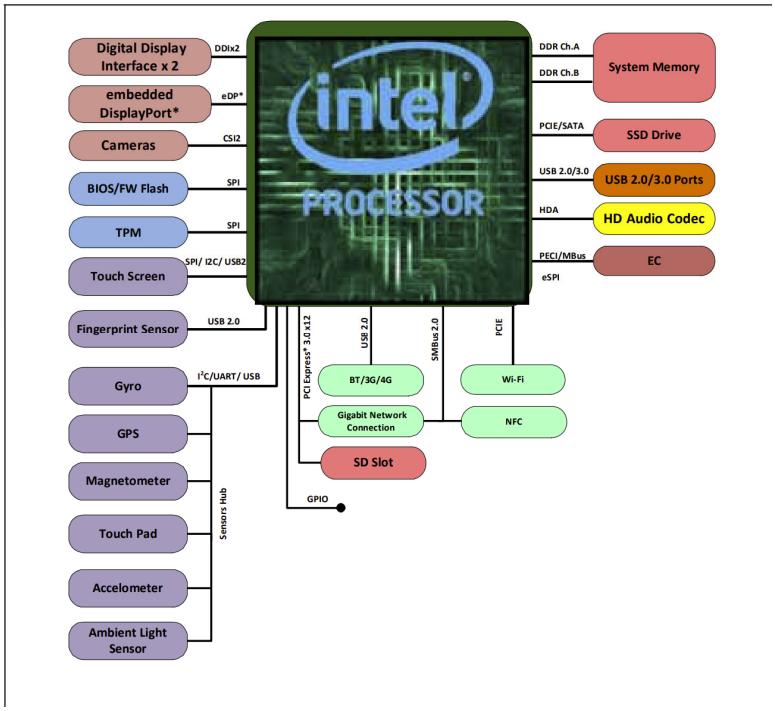
Docking connector	24-pin
HDMI	Type A
Headphones/speaker	Mini-jack stereo
USB 3.0 (x 1)[2]	Type A
Optional second USB 2.0[3]	Type A
Optional 10/100/1000 Ethernet[3]	RJ-45

https://na.panasonic.com/ns/256628_Toughbook_G1_spec_sheet_FNL_100918_HR.PDF.

95. The Intel processors employed in the TOUGHPAD FZ-G1 connect directly to a variety of LVDS channels that convey data bits in a serial stream using unidirectional pairs of lanes transmitting data in opposite directions, including Intel's OPI[31] and PCIe channels, and the directly-connected PCIe channels connect the CPU to a mass storage device.

[31] When Intel connects the processor to a chipset on the same platform as a SoC, it connects these components via OPI interface. *See* https://en.wikichip.org/wiki/intel/microarchitectures/kaby_lake#Sockets.2FPlatform (disclosing OPI connection between dies on SoC of the Kaby Lake U series processors).

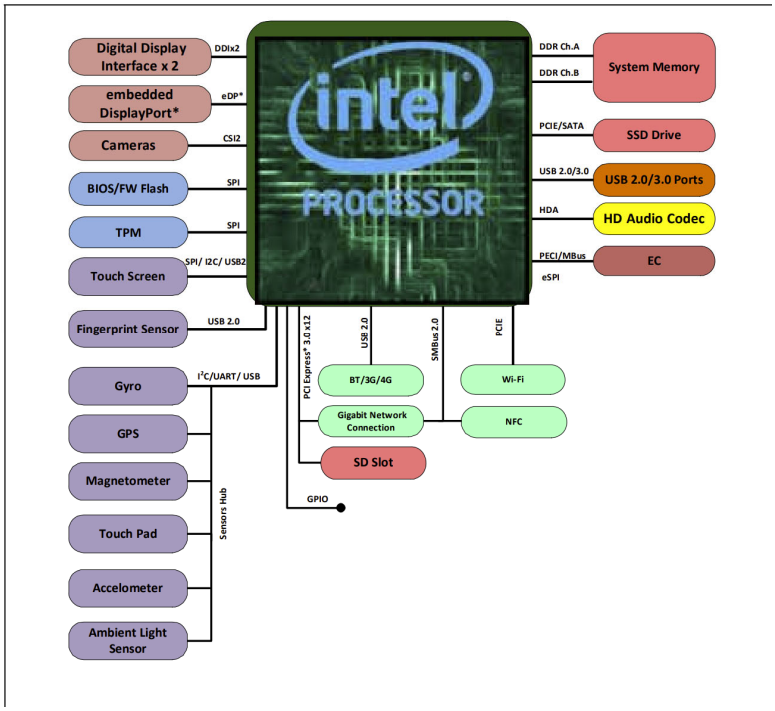
Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12.

96. The Intel processors employed in the TOUGHPAD FZ-G1 also connect directly to a variety of differential signal channels that output digital video signals through a connector, including HDMI.

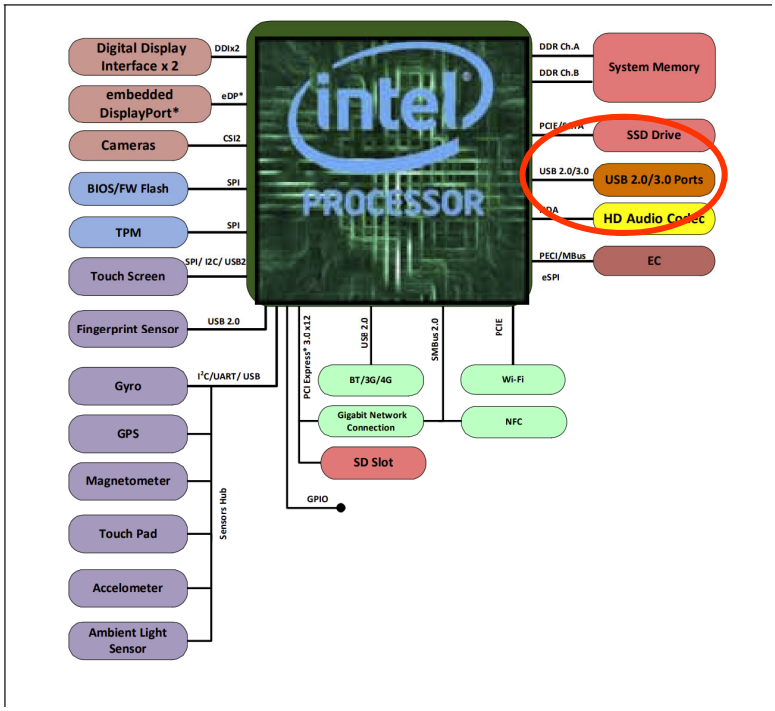
Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12; *id.* at 34 (explaining that the DDI channels can be configured as HDMI); *see also* https://na.panasonic.com/ns/256628_Toughbook_G1_spec_sheet_FNL_100918_HR.PDF (disclosing HDMI and other ports on the product).

97. The Intel processors employed in the TOUGHPAD FZ-G1 also connect to LVDS channels that convey USB data packets through pairs of unidirectional differential signal paths in opposite directions—USB 3.x ports.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



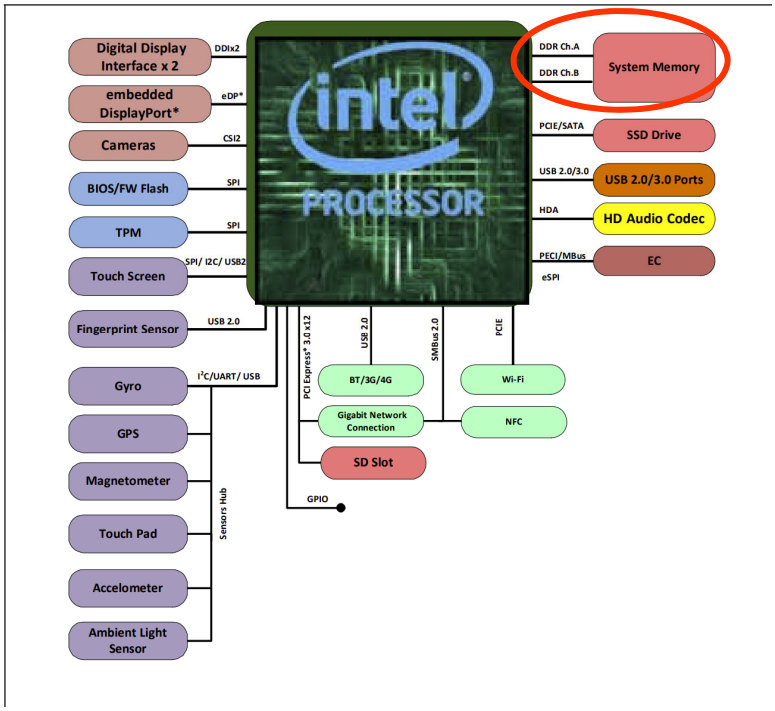
https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12.

98. The TOUGHPAD FZ-G1 has DDR3 system memory connected directly to the CPU.

- 8GB DDR3L SDRAM[4,5]

https://na.panasonic.com/ns/256628_Toughbook_G1_spec_sheet_FNL_100918_HR.PDF.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



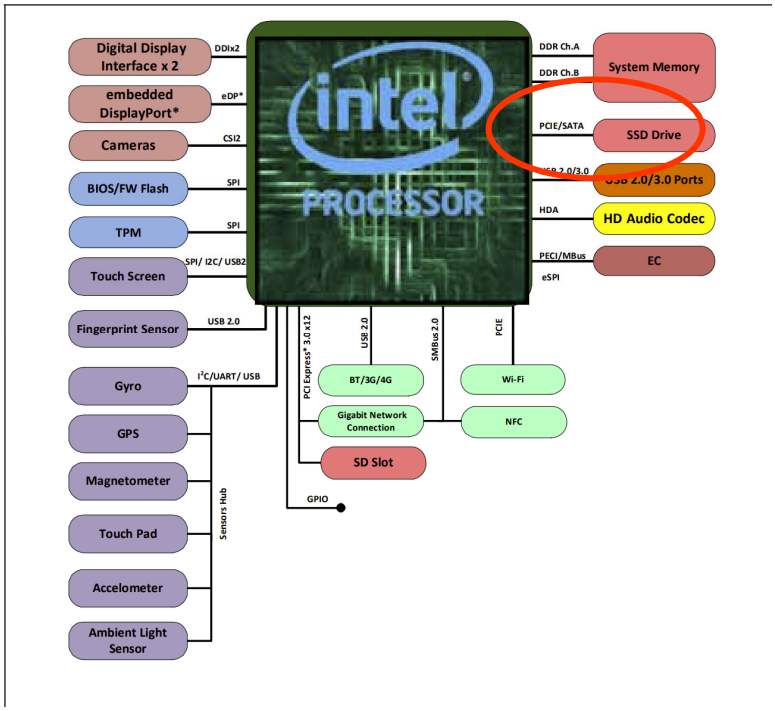
https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12.

99. The TOUGHPAD FZ-G1 has a mass storage SSD coupled to the CPU using PCIe.

- 256GB solid state drive (SSD) with heater[4,5]
- Optional 512GB and 1TB Option

https://na.panasonic.com/ns/256628_Toughbook_G1_spec_sheet_FNL_100918_HR.PDF.

Figure 1-1. KBL Y/U/U 4-Core and AML-Y22 Processor Line Platforms



https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 12.

100. The Intel processors used in the TOUGHPAD FZ-G1 have a peripheral bridge called the Platform Controller Hub (PCH) connected to the CPU module using OPI.[32] Because the PCH is coupled to PCIe, USB 3.x, and other interface connections, they necessarily have integrated interface controllers to control data transmission through those interfaces. *See* https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 37 (depicting connection between CPU and PCH). The U-Processor Line and Y-Processor Line are offered in a 1-Chip Platform that includes the 7th Generation Intel processor families I/O Platform Controller Hub

[32] When Intel connects the processor to a chipset on the same platform as a SoC, it connects these components via OPI interface. *See* https://en.wikichip.org/wiki/intel/microarchitectures/kaby_lake#Sockets.2FPlatform (disclosing OPI connection between dies on SoC of the Kaby Lake U series processors).

(PCH) die on the same package as the processor die.[33] PCH is the "chipset with centralized platform capabilities including the main I/O interfaces along with display connectivity, audio features, power management, manageability, security, and storage features."[34]

101. The Intel PCH used in the TOUGHPAD FZ-G1 has an Integrated Clock Controller (ICC) that includes PLL circuitry, which generates different clock frequencies to convey the PCI bus transactions and USB transactions through the PCIe and USB channels based on the different clock frequencies. Because the Intel processors used in the TOUGHPAD FZ-G1 have memory, OPI, display, and/or PCIe connections, and can send and receive data on those connections, they necessarily have integrated interface controllers to control data transmission through those interfaces.

24.2 PCH ICC Clocking Profiles

The PCH ICC hardware includes the following clocking profiles:

- "Standard" Profile (See Figure 24-1)
  - BCLK PLL = Disabled
  - USBPCIE PLL = Enabled with Down Spread Spectrum Clocking (SSC) Capability
- "Adaptive" Profile (See Figure 24-2)
  - BCLK PLL = Enabled with Down Spread Spectrum Clocking (SSC) and Under Clocking Capability
  - USBPCIE PLL = Enabled with Down Spread Spectrum Clocking (SSC) Capability
- "Over Clocking" Profile
  - BCLK PLL = Enabled with Down Spread Spectrum Clocking (SSC) and Over Clocking Capability
  - USBPCIE PLL = Enabled with Down Spread Spectrum Clocking (SSC) Capability

These PCH ICC Clocking Profiles can be enabled through the Intel® Flash Image Tool. Refer details in the Intel® ME User's Guide within the Intel® ME FW Kit for steps on using the Intel® Flash Image Tool (FIT) tool. Table 24-1 documents the supported ICC Clocking Profiles per PCH SKU.

The Standard ICC Profile is set by default and is the recommended ICC Clocking Profile.

https://www.intel.com/content/www/us/en/content-details/334658/7th-generation-intel-

[33] https://www.intel.com/content/www/us/en/content-details/334661/7th-generation-intel-processor-families-for-u-y-platforms-datasheet-volume-1-of-2.html, at 11.
[34] *Id.* at 18.

processor-families-i-o-for-u-y-platforms-datasheet-volume-1-of-2.html, at 164; *see also id.* at 54-55, 165, 167,183; Ravi Budruk, et al., PCI EXPRESS SYSTEM ARCHITECTURE, 454, (MindShare Inc., 2004), page 401.

102. In view of the foregoing facts concerning the technical features and functionalities of the Accused Tablets (*see* paragraphs 89-101), when Defendants or another party abroad manufacture the Accused Laptops, it improves the speed and performance of the peripheral data communication in its computer products by using a method of manufacturing that includes the following steps: (a) obtaining a CPU with a graphics controller in a single chip; (b) connecting one or more unidirectional differential signal channels to the CPU to output digital video data; (c) providing a connector with an LVDS channel to facilitate data communication with external peripherals; (d) providing multiple LVDS channels, connecting them to the CPU, which use one or more pairs of unidirectional lanes that convey USB protocol data and/or address, data, and/or byte enable bits of PCIe bus transaction data in serial bit streams in opposite directions; (e) connecting the CPU directly to a peripheral bridge on a circuit board; and (f) directly connecting to the peripheral bridge one or more LVDS channels with pairs of unidirectional lanes that convey data in serial bit streams in opposite directions.

103. On information and belief, Defendants or another party perform the foregoing manufacturing steps outside the United States to make at least certain of the Accused Laptops, and Defendants then import those Accused Laptops into the United States to be marketed and sold.

ACQIS Provided Panasonic Actual Notice of Infringement

104. On or around May 15, 2018, ACQIS notified Defendants, pursuant to 35 U.S.C. § 287(a), of all of the ACQIS Patents and Defendants' infringement thereof based on the Accused Panasonic Products by way of a letter to Panasonic Canada, Inc., and Panasonic SCNA (a division

of Panasonic NA). Panasonic Canada, Inc. and Panasonic NA operate as Panasonic HC's agent for service of notification of infringement of U.S. patents, and/or act in Panasonic HC's stead in the U.S. and as Panasonic HC's alter ego such that notification of infringement to Panasonic Canada, Inc., or Panasonic NA constitutes notification to Panasonic HC. Furthermore, on information and belief, Panasonic Canada, Inc., and Panasonic NA notified Panasonic HC of ACQIS's letter and/or provided ACQIS's letter to Panasonic HC.

105. ACQIS's letter described the enforcement history of ACQIS's patent portfolio, noting its prior lawsuit enforcing ACQIS Patents directed to blade server products and which are related to the presently-asserted ACQIS Patents. ACQIS identified that this prior lawsuit resulted in a significant jury verdict against IBM. ACQIS' letter identified all of the ACQIS Patents asserted herein and described the applicability of the ACQIS Patents to Defendants' computer products, including Toughbook and Toughpad.

106. ACQIS invited Defendants to discuss potential licensing arrangements to allow Defendants to continue to utilize the patented technologies in the ACQIS patent portfolio.

107. ACQIS received no response to its May 15, 2018 letter, and Defendants continued to make, import, and/or sell, and/or induce others to do the same, the Accused Panasonic Products identified in ACQIS's letter in willful violation of ACQIS' patent rights, or at the very least in reckless disregard of ACQIS' patent rights.

108. Upon receiving actual notice of the ACQIS Patents and how they apply to Defendants' computer products, Defendants at the very least ignored the notice and chose to remain willfully blind to its own infringement.

109. Defendants' choice to ignore ACQIS, the ACQIS Patents, and ACQIS' offer to engage in a licensing arrangement for non-blade server computer products, and instead to continue making and selling the infringing Accused Panasonic Products, is egregious and exceptional.

110. Defendants' conduct constitutes willful infringement of the ACQIS Patents, beginning at least as early as May 15, 2018.

Defendants' Indirect Infringement

111. Defendants indirectly infringe the ACQIS Patents under 35 U.S.C. §§ 271(b) and (c) by inducing third parties, such as importers, resellers, customers, and end users, to directly infringe the ACQIS Patents by using, offering for sale, selling and/or importing the Accused Panasonic Products in this District and elsewhere in the United States and by importing into the United States and selling the Accused Panasonic Products despite knowledge that those products are material parts of a computer system, and are not staple articles of commerce with substantial non-infringing uses. For example, Accused Panasonic Products are offered for sale and sold in this District and elsewhere in the United States through retailers and other sellers.

112. Defendants took affirmative acts to induce third parties to commit those direct infringing acts. Defendants did so by, at least, actively promoting the Accused Panasonic Products for the U.S. market. For example, on information and belief, for every one of the Accused Panasonic Products sold in the United States, Defendants pursue and obtain approval from U.S. and state regulatory agencies to allow sales of such Accused Panasonic Products in the United States. Defendants compete for business in the United States (including by advertising). Further, Panasonic NA's website offers support for U.S. consumers of the Accused Products.

113. Defendants have taken these acts despite knowledge of the ACQIS Patents and the infringement by the Accused Panasonic Products, Defendants know and specifically intend that

their customers will sell the infringing Accused Panasonic Products in the United States or cause the Accused Panasonic Products to be sold in the United States.

114. Defendants' customers directly infringe the ACQIS Patents by importing the Accused Panasonic Products into the United States, offering to sell and selling the Accused Panasonic Products in the United States, and using the Accused Panasonic Products in the United States.

115. Defendants further induce direct infringement of the ACQIS Patents by providing instruction and direction to end users of the Accused Panasonic Products about how to use the Accused Panasonic Products in a manner that infringes one or more claims of the ACQIS Patents. Defendants know and specifically intend that end users will use the Accused Panasonic Products in an infringing manner as directed by Defendants. On information and belief, Defendants have configured the Accused Panasonic Products in such a manner that direct infringing use necessarily occurs upon operation of the Accused Panasonic Products in their normal, intended manner without any specific action of the end user other than turning on the product.

116. Defendants have induced others' direct infringement as stated above despite actual notice that the Accused Panasonic Products infringe the ACQIS Patents, as set forth herein. Defendants therefore have caused others, including their purchasers and end users, to directly infringe the ACQIS Patents with knowledge of the ACQIS Patents and with the specific intent, or at the very least willful blindness, that others, including the purchasers and end users, will directly infringe. Defendants knew the acts they induced (such as importation, retail sales in the United States, and use by consumers in the United States) constituted infringement.

COUNT I
INFRINGEMENT OF U.S. PATENT NO. 9,529,768

117. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-116 of this Complaint in support of its first cause of action as though fully set forth herein.

118. Pursuant to 35 U.S.C. § 282, the claims of the ’768 patent are presumed valid.

119. In view of the foregoing facts and allegations, including paragraphs 74-103 above, Panasonic has directly infringed one or more claims of the ’768 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, offering to sell, and/or importing the Accused Panasonic Products; has induced its customers or end-users to infringe one or more claims of the ’768 patent in violation of 35 U.S.C. § 271(b); and/or has contributed to the infringement of one or more claims of the ’768 patent in violation of 35 U.S.C. § 271(c).

120. Panasonic’s infringement of the ’768 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic’s inducement and/or contributory infringement in connection with, the Accused Laptops is shown by way of the exemplary TOUGHBOOK 31 laptop as set forth in paragraphs 74-88 above, which demonstrates infringement of at least claim 13 of the ’768 patent by showing:

(a) the TOUGHBOOK 31 is a computer;

(b) the TOUGHBOOK 31 has an integrated central processing unit (CPU) and interface controller in a single chip, because the TOUGHBOOK 31 uses a 7th Generation Intel® Core™ i5 (“Kaby Lake”) Processor, which includes interface controllers (*e.g.*, to drive PCIe channels) and the CPU integrated as a single chip;

(c) the TOUGHBOOK 31 has a first LVDS channel directly extending from the interface controller to convey address and data bits of a PCI bus transaction in a serial bit stream, wherein the first LVDS channel comprises first unidirectional, multiple, differential

signal pairs to convey data in a first direction and second unidirectional, multiple, differential signal pairs to convey data in a second, opposite direction opposite directions through different numbers of differential signal pairs, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 include PCIe channels directly extending from the interface controller;

(d) the TOUGHBOOK 31 has system memory directly coupled to the integrated CPU and interface controller, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 are directly coupled to DDR4 system memory.

121. On information and belief, the Accused Laptops are in relevant part substantially similar to the exemplary TOUGHBOOK 31, in particular with regard to the manner in which the Accused Laptops include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '768 patent as to each of the Accused Laptops.

122. ACQIS' infringement allegations against the Accused Laptops are not limited to claim 13 of the '768 patent, and additional infringed claims will be identified through infringement contentions and discovery.

123. Panasonic's infringement of the '768 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic's inducement and/or contributory infringement in connection with, the Accused Tablets is shown by way of the exemplary TOUGHPAD FZ-G1 tablet as set forth in paragraphs 89-103 above, which demonstrates infringement of at least claim 13 of the '768 patent by showing:

(a) the TOUGHPAD FZ-G1 is a computer;

(b) the TOUGHPAD FZ-G1 has an integrated central processing unit (CPU) and interface controller in a single chip, because the TOUGHPAD FZ-G1 uses a 7th Generation Intel® Core™ i5 ("Kaby Lake") Processor, which includes interface controllers (*e.g.*, to drive PCIe channels) and the CPU integrated as a single chip;

(c) the TOUGHPAD FZ-G1 has a first LVDS channel directly extending from the interface controller to convey address and data bits of a PCI bus transaction in a serial bit stream, wherein the first LVDS channel comprises first unidirectional, multiple, differential signal pairs to convey data in a first direction and second unidirectional, multiple, differential signal pairs to convey data in a second, opposite direction opposite directions through different numbers of differential signal pairs, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 include PCIe channels directly extending from the interface controller;

(d) the TOUGHPAD FZ-G1 has system memory directly coupled to the integrated CPU and interface controller, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 are directly coupled to DDR3 system memory.

124. On information and belief, the Accused Tablets are in relevant part substantially similar to the exemplary TOUGHPAD FZ-G1, in particular with regard to the manner in which the Accused Tablets include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '768 patent as to each of the Accused Tablets.

125. ACQIS' infringement allegations against the Accused Tablets are not limited to claim 13 of the '768 patent, and additional infringed claims will be identified through infringement contentions and discovery.

126. As early as around May 15, 2018, Panasonic had actual notice of the '768 patent and the infringement alleged herein.

127. The above-described acts of infringement committed by Panasonic have caused injury and damage to ACQIS and ACQIS' licensees.

128. ACQIS is entitled to recover all damages sustained as a result of Panasonic's wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

129. Panasonic's infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT II
INFRINGEMENT OF U.S. PATENT NO. 9,703,750

130. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-116 of this Complaint in support of its second cause of action as though fully set forth herein.

131. Pursuant to 35 U.S.C. § 282, the claims of the '750 patent are presumed valid.

132. In view of the foregoing facts and allegations, including paragraphs 74-103 above, Panasonic has directly infringed one or more claims of the '750 patent in violation of 35 U.S.C. § 271(g) by importing into, or selling, offering to sell, or using in, the United States the Accused Panasonic Products that were manufactured by one or more of the methods claimed in the '750

patent, and/or has induced its customers or end-users to infringe one or more claims of the ’750 patent in violation of 35 U.S.C. § 271(b).

133. The Accused Panasonic Products are not trivial or nonessential components of other products and are not materially changed by subsequent processes.

134. Panasonic’s infringement of the ’750 patent through its importation into, and/or use, offers to sell, or sales in, the United States of, and/or Panasonic’s inducement in connection with, the Accused Laptops is shown by way of the exemplary TOUGHBOOK 31 laptop as set forth in paragraphs 74-88 above., These paragraphs demonstrate that the TOUGHBOOK 31 was necessarily manufactured according to at least claim 50 of the ’750 patent g:

(a) Panasonic or another party performs a method of improving external peripheral data communication of a computer when manufacturing the TOUGHBOOK 31;

(b) when manufacturing the TOUGHBOOK 31, Panasonic or another party obtains an integrated CPU and graphics controller as a single chip, because the TOUGHBOOK 31 uses a 7th Generation Intel® Core™ i5 (“Kaby Lake”) Processor;

(c) when manufacturing the TOUGHBOOK 31, Panasonic or another party connects a first unidirectional, differential signal pair channel directly to the integrated CPU and graphics controller, because the 7th Generation Intel® Core™ i5 (“Kaby Lake”) Processor employed in the TOUGHBOOK 31 includes numerous PCIe channels directly extending from the interface controller;

(d) when manufacturing the TOUGHBOOK 31, Panasonic or another party provides a connector for external peripheral data communication, because the TOUGHBOOK 31 has a connector for external peripherals, such as a USB 3.x port; and

(e) when manufacturing the TOUGHBOOK 31, Panasonic or another party provides an

LVDS channel to convey USB protocol data through a connector that uses two unidirectional, serial bit channels that transmit data in opposite directions, because the TOUGHBOOK 31 has a USB 3.x port that conveys USB 3.x data.

135. On information and belief, the Accused Laptops are in relevant part substantially similar to the exemplary TOUGHBOOK 31, in particular with regard to the manner in which the Accused Laptops include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '750 patent as to each of the Accused Laptops.

136. ACQIS' infringement allegations against the Accused Laptops are not limited to claim 50 of the '750 patent, and additional infringed claims will be identified through infringement contentions and discovery.

137. Panasonic's infringement of the '750 patent through its importation into, and/or use, offers to sell, or sales in, the United States of, and/or Panasonic's inducement in connection with, the Accused Tablets is shown by way of the exemplary TOUGHPAD FZ-G1 tablet as set forth in paragraphs 89-103 above., These paragraphs demonstrate that the TOUGHPAD FZ-G1 was necessarily manufactured according to at least claim 50 of the '750 patent g:

(f) Panasonic or another party performs a method of improving external peripheral data communication of a computer when manufacturing the TOUGHPAD FZ-G1;

(g) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party obtains an integrated CPU and graphics controller as a single chip, because the TOUGHBOOK 31 uses a 7th Generation Intel® Core™ i5 ("Kaby Lake") Processor;

(h) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party connects

a first unidirectional, differential signal pair channel directly to the integrated CPU and graphics controller, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processor employed in the TOUGHPAD FZ-G1 includes numerous PCIe channels directly extending from the interface controller;

(i) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party provides a connector for external peripheral data communication, because the TOUGHBOOK 31 has a connector for external peripherals, such as a USB 3.x port; and

(j) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party provides an LVDS channel to convey USB protocol data through a connector that uses two unidirectional, serial bit channels that transmit data in opposite directions, because the TOUGHPAD FZ-G1 has a USB 3.x port that conveys USB 3.x data.

138. On information and belief, the Accused Tablets are in relevant part substantially similar to the exemplary TOUGHPAD FZ-G1, in particular with regard to the manner in which the Accused Tablets include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '750 patent as to each of the Accused Tablets.

139. ACQIS' infringement allegations against the Accused Tablets are not limited to claim 1 of the '750 patent, and additional infringed claims will be identified through infringement contentions and discovery.

140. As early as around May 15, 2018, Panasonic had actual notice of the '750 patent and the infringement alleged herein.

141. The above-described acts of infringement committed by Panasonic have caused injury and damage to ACQIS and ACQIS' licensees.

142. ACQIS is entitled to recover all damages sustained as a result of Panasonic's wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

143. Panasonic's infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT III
INFRINGEMENT OF U.S. PATENT NO. 8,756,359

144. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-116 of this Complaint in support of its third cause of action as though fully set forth herein.

145. Pursuant to 35 U.S.C. § 282, the claims of the '359 patent are presumed valid.

146. In view of the foregoing facts and allegations, including paragraphs 74-103 above, Panasonic has directly infringed one or more claims of the '359 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, offering to sell, and/or importing the Accused Panasonic Products; has induced its customers or end-users to infringe one or more claims of the '359 patent in violation of 35 U.S.C. § 271(b); and/or has contributed to the infringement of one or more claims of the '359 patent in violation of 35 U.S.C. § 271(c).

147. Panasonic's infringement of the '359 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic's inducement and/or contributory infringement in connection with, the Accused Laptops is shown by way of the exemplary TOUGHBOOK 31 laptop as set forth in paragraphs 74-88 above, which demonstrates infringement of at least claim 6 of the '359 patent by showing:

(a) the TOUGHBOOK 31 is a computer;

(b) the TOUGHBOOK 31 has a variety of connectors configured to couple to a console, including a USB 3.x port;

(c) the TOUGHBOOK 31 has a central processing unit (CPU), because the TOUGHBOOK 31 uses a 7th Generation Intel® Core™ i5 ("Kaby Lake") Processor;

(d) the TOUGHBOOK 31 has a first LVDS channel directly extending from the CPU, comprising a first unidirectional, differential signal line pair to convey data in a first direction and a second unidirectional, differential signal line pair to convey data in a second, opposite direction, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 include, for example, PCIe and USB 3.x channels directly extending from them; and

(e) the TOUGHBOOK 31 has a second LVDS channel that can couple to a console through a USB 3.x port, which use two sets of unidirectional, differential signal pairs to convey USB protocol data packets in opposite directions.

148. On information and belief, the Accused Laptops are in relevant part substantially similar to the exemplary TOUGHBOOK 31, in particular with regard to the manner in which the Accused Laptops include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '359 patent as to each of the Accused Laptops.

149. ACQIS' infringement allegations against the Accused Laptops are not limited to claim 6 of the '359 patent, and additional infringed claims will be identified through infringement contentions and discovery.

150. Panasonic's infringement of the '359 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic's inducement and/or contributory infringement in connection with, the Accused Tablets is shown by way of the exemplary TOUGHPAD FZ-G1 tablet as set forth in paragraphs 89-103 above, which demonstrates infringement of at least claim 6 of the '359 patent by showing:

(a) the TOUGHPAD FZ-G1 is a computer;

(b) the TOUGHPAD FZ-G1 has a variety of connectors configured to couple to a console, including a USB 3.x port;

(c) the TOUGHPAD FZ-G1 has a central processing unit (CPU), because the TOUGHPAD FZ-G1 uses a 7th Generation Intel® Core™ i5 ("Kaby Lake") Processor;

(d) the TOUGHPAD FZ-G1 has a first LVDS channel directly extending from the CPU, comprising a first unidirectional, differential signal line pair to convey data in a first direction and a second unidirectional, differential signal line pair to convey data in a second, opposite direction, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 include, for example, PCIe and USB 3.x channels directly extending from them; and

(e) the TOUGHPAD FZ-G1 has a second LVDS channel that can couple to a console through a USB 3.x port, which use two sets of unidirectional, differential signal pairs to convey USB protocol data packets in opposite directions.

151. On information and belief, the Accused Tablets are in relevant part substantially similar to the exemplary TOUGHPAD FZ-G1, in particular with regard to the manner in which the Accused Tablets include and utilize PCIe and/or USB 3.x functionality. This Section is thus

illustrative of the manner in which Panasonic infringes the claims of the ’359 patent as to each of the Accused Tablets.

152. ACQIS’ infringement allegations against the Accused Tablets are not limited to claim 6 of the ’359 patent, and additional infringed claims will be identified through infringement contentions and discovery.

153. As early as around May 15, 2018, Panasonic had actual notice of the ’359 patent and the infringement alleged herein.

154. The above-described acts of infringement committed by Panasonic have caused injury and damage to ACQIS and ACQIS’ licensees.

155. ACQIS is entitled to recover all damages sustained as a result of Panasonic’s wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

156. Panasonic’s infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys’ fees pursuant to 35 U.S.C. § 285.

COUNT IV
INFRINGEMENT OF U.S. PATENT NO. 8,626,977

157. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-116 of this Complaint in support of its third cause of action as though fully set forth herein.

158. Pursuant to 35 U.S.C. § 282, the claims of the ’977 patent are presumed valid.

159. In view of the foregoing facts and allegations, including paragraphs 74-103 above, Panasonic has directly infringed one or more claims of the ’977 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, offering to sell, and/or importing the Panasonic Accused Laptops

and Accused Desktops; has induced its customers or end-users to infringe one or more claims of the ’977 patent in violation of 35 U.S.C. § 271(b); and/or has contributed to the infringement of one or more claims of the ’977 patent in violation of 35 U.S.C. § 271(c).

160. Panasonic’s infringement of the ’977 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic’s inducement and/or contributory infringement in connection with, the Accused Laptops is shown by way of the exemplary TOUGHBOOK 31 laptop as set forth in paragraphs 74-88 above, which demonstrates infringement of at least claim 1 of the ’977 patent by showing:

(a) the TOUGHBOOK 31 is a computer;

(b) the TOUGHBOOK 31 has a variety of connectors configured to couple to a console, including USB 3.x ports;

(c) the TOUGHBOOK 31 has an integrated central processing unit (CPU) and graphics subsystem in a single chip, because the TOUGHBOOK 31 uses a 7th Generation Intel® Core™ i5 (“Kaby Lake”) Processor, which includes a graphics subsystem and the CPU integrated as a single chip;

(d) the TOUGHBOOK 31 has an LVDS channel directly extending from the CPU using two sets of unidirectional, differential signal line pairs to transmit encoded address and data bits of a PCI bus transaction in a serial bit stream in opposite directions, because the 7th Generation Intel® Core™ i5 (“Kaby Lake”) Processors employed in the TOUGHBOOK 31 include, for example, PCIe channels directly extending from the CPU.

(e) the TOUGHBOOK 31 has serial bit channels coupled to the USB-3.x that are adapted to convey USB protocol data packets in opposite directions; and

(f) the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 output digital video display signals through DDI and/or eDP channels.

161. On information and belief, the Accused Laptops are in relevant part substantially similar to the exemplary TOUGHBOOK 31, in particular with regard to the manner in which the Accused Laptops include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '977 patent as to each of the Accused Laptops.

162. ACQIS' infringement allegations against the Accused Laptops are not limited to claim 1 of the '977 patent, and additional infringed claims will be identified through infringement contentions and discovery.

163. Panasonic's infringement of the '977 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic's inducement and/or contributory infringement in connection with, the Accused Tablets is shown by way of the exemplary TOUGHPAD FZ-G1 tablet as set forth in paragraphs 89-103 above, which demonstrates infringement of at least claim 1 of the '977 patent by showing:

(a) the TOUGHPAD FZ-G1 is a computer;

(b) the TOUGHPAD FZ-G1 has a variety of connectors configured to couple to a console, including USB 3.x ports;

(c) the TOUGHPAD FZ-G1 has an integrated central processing unit (CPU) and graphics subsystem in a single chip, because the TOUGHPAD FZ-G1 uses a 7th Generation Intel® Core™ i5 ("Kaby Lake") Processor, which includes a graphics subsystem and the CPU integrated as a single chip;

(d) the TOUGHPAD FZ-G1 has an LVDS channel directly extending from the CPU using two sets of unidirectional, differential signal line pairs to transmit encoded address and data bits of a PCI bus transaction in a serial bit stream in opposite directions, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 include, for example, PCIe channels directly extending from the CPU.

(e) the TOUGHPAD FZ-G1 has serial bit channels coupled to the USB3.x that are adapted to convey USB protocol data packets in opposite directions; and

(f) the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 output digital video display signals through DDI and/or eDP channels.

164. On information and belief, the Accused Tablets are in relevant part substantially similar to the exemplary TOUGHPAD FZ-G1, in particular with regard to the manner in which the Accused Tablets include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '977 patent as to each of the Accused Tablets.

165. ACQIS' infringement allegations against the Accused Tablets are not limited to claim 1 of the '977 patent, and additional infringed claims will be identified through infringement contentions and discovery.

166. As early as around May 15, 2018, Panasonic had actual notice of the '977 patent and the infringement alleged herein.

167. The above-described acts of infringement committed by Panasonic have caused injury and damage to ACQIS and ACQIS' licensees.

168. ACQIS is entitled to recover all damages sustained as a result of Panasonic's wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

169. Panasonic's infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT V
INFRINGEMENT OF U.S. PATENT NO. RE44,739

170. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-116 of this Complaint in support of its third cause of action as though fully set forth herein.

171. Pursuant to 35 U.S.C. § 282, the claims of the '739 patent are presumed valid.

172. In view of the foregoing facts and allegations, including paragraphs 74-103 above, Panasonic has directly infringed infringe one or more claims of the '739 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, offering to sell, and/or importing the Panasonic Accused Laptops and Accused Desktops; has induced its customers or end-users to infringe one or more claims of the '739 patent in violation of 35 U.S.C. § 271(b); and/or has contributed to the infringement of one or more claims of the '739 patent in violation of 35 U.S.C. § 271(c).

173. Panasonic's infringement of the '739 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic's inducement and/or contributory infringement in connection with, the Accused Laptops is shown by way of the exemplary TOUGHBOOK 31 laptop as set forth in paragraphs 74-88 above, which demonstrates infringement of at least claim 18 of the '739 patent by showing:

(a) the TOUGHBOOK 31 is a computer;

(b) the TOUGHBOOK 31 has an integrated central processing unit (CPU) and graphics controller in a single chip directly coupled to a first differential signal channel to convey digital video display information, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 is directly coupled to one or more differential signal channels to convey digital signals, including eDP and/or DDI channels;

(c) the TOUGHBOOK 31 has a second LVDS channel with at least two pairs of unidirectional, differential signal lanes to transmit data in opposite directions, including USB 3.x channels;

(d) the TOUGHBOOK 31 has a variety of connectors configured to couple to a console, including USB 3.x ports; and

(e) upon coupling to a console, the second LVDS channel in the TOUGHBOOK 31 transmits USB protocol data through the USB 3.x ports.

174. On information and belief, the Accused Laptops are in relevant part substantially similar to the exemplary TOUGHBOOK 31, in particular with regard to the manner in which the Accused Laptops include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '739 patent as to each of the Accused Laptops.

175. ACQIS' infringement allegations against the Accused Laptops are not limited to claim 18 of the '739 patent, and additional infringed claims will be identified through infringement contentions and discovery.

176. Panasonic's infringement of the '739 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic's inducement

and/or contributory infringement in connection with, the Accused Tablets is shown by way of the exemplary TOUGHPAD FZ-G1 tablet as set forth in paragraphs 89-103 above, which demonstrates infringement of at least claim 18 of the '739 patent by showing:

(a) the TOUGHPAD FZ-G1 is a computer;

(b) the TOUGHPAD FZ-G1 has an integrated central processing unit (CPU) and graphics controller in a single chip directly coupled to a first differential signal channel to convey digital video display information, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 is directly coupled to one or more differential signal channels to convey digital signals, including eDP and/or DDI channels;

(c) the TOUGHPAD FZ-G1 has a second LVDS channel with at least two pairs of unidirectional, differential signal lanes to transmit data in opposite directions, including USB 3.x channels;

(d) the TOUGHPAD FZ-G1 has a variety of connectors configured to couple to a console, including USB 3.x ports; and

(e) upon coupling to a console, the second LVDS channel in the TOUGHPAD FZ-G1 transmits USB protocol data through the USB 3.x ports.

177. On information and belief, the Accused Tablets are in relevant part substantially similar to the exemplary TOUGHPAD FZ-G1, in particular with regard to the manner in which the Accused Tablets include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '739 patent as to each of the Accused Tablets.

178. ACQIS' infringement allegations against the Accused Tablets are not limited to claim 18 of the '739 patent, and additional infringed claims will be identified through infringement contentions and discovery.

179. As early as around May 15, 2018, Panasonic had actual notice of the '739 patent and the infringement alleged herein.

180. The above-described acts of infringement committed by Panasonic have caused injury and damage to ACQIS and ACQIS' licensees.

181. ACQIS is entitled to recover all damages sustained as a result of Panasonic's wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

182. Panasonic's infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT VI
INFRINGEMENT OF U.S. PATENT NO. 8,977,797

183. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-116 of this Complaint in support of its third cause of action as though fully set forth herein.

184. Pursuant to 35 U.S.C. § 282, the claims of the '797 patent are presumed valid.

185. In view of the foregoing facts and allegations, including paragraphs 74-103 above, Panasonic has directly infringed one or more claims of the '797 patent in violation of 35 U.S.C. § 271(g) by importing into, or selling, offering to sell, or using in, the United States the Accused Panasonic Products that were manufactured by one or more of the methods claimed in the '797

patent, and/or has induced its customers or end-users to infringe one or more claims of the '797 patent in violation of 35 U.S.C. § 271(b).

186. The Accused Panasonic Products are not trivial or nonessential components of other products and are not materially changed by subsequent processes.

187. Panasonic's infringement of the '797 patent through its importation into, and/or use, offers to sell, or sales in, the United States of, and/or Panasonic's inducement in connection with, the Accused Laptops is shown by way of the exemplary TOUGHBOOK 31 laptop as set forth in paragraphs 74-88 above. These paragraphs demonstrate that the TOUGHBOOK 31 laptop was necessarily manufactured according to at least claim 36 of the '797 patent:

(a) Panasonic or another party performs a method of improving data throughput on a motherboard when manufacturing the TOUGHBOOK 31, which contains a motherboard;

(b) when manufacturing the TOUGHBOOK 31, Panasonic or another party mounts an integrated CPU and interface controller as a single chip on the motherboard, because the Intel processor employed in the TOUGHBOOK 31 includes interface controllers (*e.g.*, to drive/control PCIe channels) and the CPU integrated as a single chip;

(c) when manufacturing the TOUGHBOOK 31, Panasonic or another party connects an LVDS channel directly to an interface controller integrated with the CPU, which LVDS channel uses two unidirectional, serial channels to transmit data in opposite directions because the TOUGHBOOK 31 has PCIe channels and an OPI interface directly connected to the interface controller;

(d) when manufacturing the TOUGHBOOK 31, Panasonic or another party increases data throughput in the serial channels by providing each channel with multiple

differential signal line pairs, because the PCIe and OPI channels have multiple pairs of differential signal lanes;

(e) when manufacturing the TOUGHBOOK 31, Panasonic or another party configures the interface controller to adapt to different numbers of differential signal line pairs to convey encoded address and data bits of a PCI bus transaction in serial form, because the interface controller integrated with the CPU are configured to convey PCIe data signals through PCIe channels having differential signal line pairs; and

(f) when manufacturing the TOUGHBOOK 31, Panasonic or another party couples the integrated CPU and interface device to a peripheral device such as a mass storage device, which is attached to the motherboard through a PCIe channel.

188. On information and belief, the Accused Laptops are in relevant part substantially similar to the exemplary TOUGHBOOK 31, in particular with regard to the manner in which the Accused Laptops include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the ’797 patent as to each of the Accused Laptops.

189. ACQIS’ infringement allegations against the Accused Laptops are not limited to claim 36 of the ’797 patent, and additional infringed claims will be identified through infringement contentions and discovery.

190. Panasonic’s infringement of the ’797 patent through its importation into, and/or use, offers to sell, or sales in, the United States of, and/or Panasonic’s inducement in connection with, the Accused Tablets is shown by way of the exemplary TOUGHPAD FZ-G1 tablet as set forth in paragraphs 89-103 above. These paragraphs demonstrate that the TOUGHPAD FZ-G1 tablet was necessarily manufactured according to at least claim 36 of the ’797 patent:

(a) Panasonic or another party performs a method of improving data throughput on a motherboard when manufacturing the TOUGHPAD FZ-G1, which contains a motherboard;

(b) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party mounts an integrated CPU and interface controller as a single chip on the motherboard, because the Intel processor employed in the TOUGHPAD FZ-G1 includes interface controllers (*e.g.*, to drive/control PCIe channels) and the CPU integrated as a single chip;

(c) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party connects an LVDS channel directly to an interface controller integrated with the CPU, which LVDS channel uses two unidirectional, serial channels to transmit data in opposite directions because the TOUGHPAD FZ-G1 has PCIe channels and an OPI interface directly connected to the interface controller;

(d) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party increases data throughput in the serial channels by providing each channel with multiple differential signal line pairs, because the PCIe and OPI channels have multiple pairs of differential signal lanes;

(e) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party configures the interface controller to adapt to different numbers of differential signal line pairs to convey encoded address and data bits of a PCI bus transaction in serial form, because the interface controller integrated with the CPU are configured to convey PCIe data signals through PCIe channels having differential signal line pairs; and

(f) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party couples

the integrated CPU and interface device to a peripheral device such as a mass storage device, which is attached to the motherboard through a PCIe channel.

191. On information and belief, the Accused Tablets are in relevant part substantially similar to the exemplary TOUGHPAD FZ-G1, in particular with regard to the manner in which the Accused Tablets include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '797 patent as to each of the Accused Tablets.

192. ACQIS' infringement allegations against the Accused Tablets are not limited to claim 36 of the '797 patent, and additional infringed claims will be identified through infringement contentions and discovery.

193. As early as around May 15, 2018, Panasonic had actual notice of the '797 patent and the infringement alleged herein.

194. The above-described acts of infringement committed by Panasonic have caused injury and damage to ACQIS and ACQIS' licensees.

195. ACQIS is entitled to recover all damages sustained as a result of Panasonic's wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

196. Panasonic's infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT VII
INFRINGEMENT OF U.S. PATENT NO. RE45,140

197. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-116 of this Complaint in support of its third cause of action as though fully set forth herein.

198. Pursuant to 35 U.S.C. § 282, the claims of the ’140 patent are presumed valid.

199. In view of the foregoing facts and allegations, including paragraphs 74-103 above, Panasonic has directly infringed one or more claims of the ’140 patent in violation of 35 U.S.C. § 271(g) by importing into, or selling, offering to sell, or using in, the United States the Accused Panasonic Products that were manufactured by one or more of the methods claimed in the ’140 patent, and/or has induced its customers or end-users to infringe one or more claims of the ’140 patent in violation of 35 U.S.C. § 271(b).

200. The Accused Panasonic Products are not trivial or nonessential components of other products and are not materially changed by subsequent processes.

201. Panasonic’s infringement of the ’140 patent through its importation into, and/or use, offers to sell, or sales in, the United States of, and/or Panasonic’s inducement in connection with, the Accused Laptops is shown by way of the exemplary TOUGHBOOK 31 laptop as set forth in paragraphs 74-88 above. These paragraphs demonstrate that the TOUGHBOOK 31 laptop was necessarily manufactured according to at least claim 35 of the ’140 patent:

(a) Panasonic or another party performs a method of improving performance of a computer when manufacturing the TOUGHBOOK 31;

(b) when manufacturing the TOUGHBOOK 31, Panasonic or another party obtains an integrated CPU and graphics controller as a single chip, because the TOUGHBOOK 31 uses a 7th Generation Intel® Core™ i5 (“Kaby Lake”) Processor;

(c) when manufacturing the TOUGHBOOK 31, Panasonic or another party connects an

LVDS channel directly to the integrated CPU and graphics controller that uses two unidirectional, serial bit channels to transmit data in opposite directions, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 directly connect to PCIe and OPI channels;

(d) when manufacturing the TOUGHBOOK 31, Panasonic or another party connects a differential signal channel directly to the integrated CPU and graphics controller to output digital video data, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 connect to DDI and/or eDP channels;

(e) when manufacturing the TOUGHBOOK 31, Panasonic or another party provides a connector for external peripheral data communication, because the TOUGHBOOK 31 has a variety of connectors for external peripherals, including a USB3.x port; and

(f) when manufacturing the TOUGHBOOK 31, Panasonic or another party provides a second LVDS channel using two unidirectional, serial bit channels to transmit data in opposite directions through the connector, because the TOUGHBOOK 31 has a USB3.x connector capable of supporting USB3.x.

202. On information and belief, the Accused Laptops are in relevant part substantially similar to the exemplary TOUGHBOOK 31, in particular with regard to the manner in which the Accused Laptops include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '140 patent as to each of the Accused Laptops.

203. ACQIS' infringement allegations against the Accused Laptops are not limited to claim 35 of the '140 patent, and additional infringed claims will be identified through infringement contentions and discovery.

204. Panasonic's infringement of the '140 patent through its importation into, and/or use, offers to sell, or sales in, the United States of, and/or Panasonic's inducement in connection with, the Accused Tablets is shown by way of the exemplary TOUGHPAD FZ-G1 tablet as set forth in paragraphs 89-103 above. These paragraphs demonstrate that the TOUGHPAD FZ-G1 tablet was necessarily manufactured according to at least claim 35 of the '140 patent:

(a) Panasonic or another party performs a method of improving performance of a computer when manufacturing the TOUGHPAD FZ-G1;

(b) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party obtains an integrated CPU and graphics controller as a single chip, because the TOUGHPAD FZ-G1 uses a 7th Generation Intel® Core™ i5 ("Kaby Lake") Processor;

(c) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party connects an LVDS channel directly to the integrated CPU and graphics controller that uses two unidirectional, serial bit channels to transmit data in opposite directions, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 directly connect to PCIe and OPI channels;

(d) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party connects a differential signal channel directly to the integrated CPU and graphics controller to output digital video data, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 connect to DDI and/or eDP channels;

(e) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party provides a connector for external peripheral data communication, because the TOUGHPAD FZ-G1 has a variety of connectors for external peripherals, including a USB3.x port; and

(f) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party provides a second LVDS channel using two unidirectional, serial bit channels to transmit data in opposite directions through the connector, because the TOUGHPAD FZ-G1 has a USB3.x connector capable of supporting USB3.x.

205. On information and belief, the Accused Tablets are in relevant part substantially similar to the exemplary TOUGHPAD FZ-G1, in particular with regard to the manner in which the Accused Tablets include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '140 patent as to each of the Accused Tablets.

206. ACQIS' infringement allegations against the Accused Tablets are not limited to claim 35 of the '140 patent, and additional infringed claims will be identified through infringement contentions and discovery.

207. As early as around May 15, 2018, Panasonic had actual notice of the '140 patent and the infringement alleged herein.

208. The above-described acts of infringement committed by Panasonic have caused injury and damage to ACQIS and ACQIS' licensees.

209. ACQIS is entitled to recover all damages sustained as a result of Panasonic's wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

210. Panasonic's infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT VIII
INFRINGEMENT OF U.S. PATENT NO. RE44,654

211. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-116 of this Complaint in support of its third cause of action as though fully set forth herein.

212. Pursuant to 35 U.S.C. § 282, the claims of the '654 patent are presumed valid.

213. In view of the foregoing facts and allegations, including paragraphs 74-103 above, Panasonic has directly infringed one or more claims of the '654 patent in violation of 35 U.S.C. § 271(g) by using one or more of the methods claimed in the '654 patent to manufacture the Accused Panasonic Products and then importing, selling, offering to sell and/or using the Accused Panasonic Products, and/or has induced its customers or end-users to infringe one or more claims of the '654 patent in violation of 35 U.S.C. § 271(b).

214. The Accused Panasonic Products made using the methods claimed in the '654 patent are not trivial or nonessential components of other products and are not materially changed by subsequent processes.

215. Panasonic's infringement of the '654 patent through its importation into, and/or use, offers to sell, or sales in, the United States of, and/or Panasonic's inducement in connection with, the Accused Laptops is shown by way of the exemplary TOUGHBOOK 31 laptop as set forth in paragraphs 74-88 above. These paragraphs demonstrate that the TOUGHBOOK 31 laptop was necessarily manufactured according to at least claim 23 of the '654 patent:

(a) Panasonic or another party performs a method of increasing data communication speed of a computer when manufacturing the TOUGHBOOK 31;

(b) when manufacturing the TOUGHBOOK 31, Panasonic or another party connects a CPU directly to a peripheral bridge on a printed circuit board, because the TOUGHBOOK 31 uses an Intel core CPU directly connected to the Intel PCH via an OPI connection;

(c) when manufacturing the TOUGHBOOK 31, Panasonic or another party connects an LVDS channel directly to the peripheral bridge (PCH), which uses two unidirectional, serial channels to transmit data in opposite directions, because the TOUGHBOOK 31 has PCIe channels and OPI channels directly connected to the Intel PCH;

(d) when manufacturing the TOUGHBOOK 31, Panasonic or another party provides a connector to connect the computer to a console, because the TOUGHBOOK 31 has a variety of connector ports such as USB3.x;

(e) when manufacturing the TOUGHBOOK 31, Panasonic or another party provides a second LVDS channel using two unidirectional, serial channels to transmit data in opposite directions through the connector to the console, because the TOUGHBOOK 31 has a USB3.x; and

(f) when manufacturing the TOUGHBOOK 31, Panasonic or another party enables the transmission of USB protocol data through the second LVDS channel via a USB 3.x channel and port.

216. On information and belief, the Accused Laptops are in relevant part substantially similar to the exemplary TOUGHBOOK 31, in particular with regard to the manner in which the Accused Laptops include and utilize PCIe and/or USB 3.x functionality. This Section is thus

illustrative of the manner in which Panasonic infringes the claims of the ’654 patent as to each of the Accused Laptops.

217. ACQIS’ infringement allegations against the Accused Laptops are not limited to claim 23 of the ’654 patent, and additional infringed claims will be identified through infringement contentions and discovery.

218. Panasonic’s infringement of the ’654 patent through its importation into, and/or use, offers to sell, or sales in, the United States of, and/or Panasonic’s inducement in connection with, the Accused Tablets is shown by way of the exemplary TOUGHPAD FZ-G1 tablet as set forth in paragraphs 89-103 above. These paragraphs demonstrate that the TOUGHPAD FZ-G1 tablet was necessarily manufactured according to at least claim 23 of the ’654 patent:

(a) Panasonic or another party performs a method of increasing data communication speed of a computer when manufacturing the TOUGHPAD FZ-G1;

(b) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party connects a CPU directly to a peripheral bridge on a printed circuit board, because the TOUGHPAD FZ-G1 uses an Intel core CPU directly connected to the Intel PCH via an OPI connection;

(c) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party connects an LVDS channel directly to the peripheral bridge (PCH), which uses two unidirectional, serial channels to transmit data in opposite directions, because the TOUGHPAD FZ-G1 has PCIe channels and OPI channels directly connected to the Intel PCH;

(d) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party provides a connector to connect the computer to a console, because the TOUGHPAD FZ-G1

has a variety of connector ports such as USB3.x;

(e) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party provides a second LVDS channel using two unidirectional, serial channels to transmit data in opposite directions through the connector to the console, because the TOUGHPAD FZ-G1 has a USB3.x; and

(f) when manufacturing the TOUGHPAD FZ-G1, Panasonic or another party enables the transmission of USB protocol data through the second LVDS channel via a USB 3.x channel and port.

219. On information and belief, the Accused Tablets are in relevant part substantially similar to the exemplary TOUGHPAD FZ-G1, in particular with regard to the manner in which the Accused Tablets include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '654 patent as to each of the Accused Tablets.

220. ACQIS' infringement allegations against the Accused Tablets are not limited to claim 23 of the '654 patent, and additional infringed claims will be identified through infringement contentions and discovery.

221. As early as around May 1, 2018, Panasonic had actual notice of the '654 patent and the infringement alleged herein.

222. The above-described acts of infringement committed by Panasonic have caused injury and damage to ACQIS and ACQIS' licensees.

223. ACQIS is entitled to recover all damages sustained as a result of Panasonic's wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

224. Panasonic's infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT IX
INFRINGEMENT OF U.S. PATENT NO. 8,234,436

225. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-116 of this Complaint in support of its first cause of action as though fully set forth herein.

226. Pursuant to 35 U.S.C. § 282, the claims of the '436 patent are presumed valid.

227. In view of the foregoing facts and allegations, including paragraphs 74-103 above, Panasonic has directly infringed one or more claims of the '436 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, offering to sell, and/or importing the Accused Panasonic Products; has induced its customers or end-users to infringe one or more claims of the '436 patent in violation of 35 U.S.C. § 271(b); and/or has contributed to the infringement of one or more claims of the '436 patent in violation of 35 U.S.C. § 271(c).

228. Panasonic's infringement of the '436 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic's inducement and/or contributory infringement in connection with, the Accused Laptops is shown by way of the exemplary TOUGHBOOK 31 laptop as set forth in paragraphs 74-88 above, which demonstrates infringement of at least claim 13 of the '436 patent by showing:

(a) the TOUGHBOOK 31 is a computer;

(b) the TOUGHBOOK 31 has a first LVDS channel comprising at least two sets of unidirectional, multiple serial bit channels to convey data in opposite directions, including but not limited to its PCIe and OPI channels;

(c) the TOUGHBOOK 31 has an integrated central processing unit (CPU) with a peripheral controller in a single chip directly coupled to one or more LVDS channels which can communicate encoded address and data bits of Peripheral Component Interconnect (PCI) bus transaction in serial form, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 are directly coupled to at least PCIe and OPI channels;

(d) the TOUGHBOOK 31 has system memory directly coupled to the integrated CPU and interface controller, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 are directly coupled to DDR4 memory;

(e) the TOUGHBOOK 31 has a mass storage device coupled to the CPU, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 are coupled to the SSD; and

(f) the TOUGHBOOK 31 has a second LVDS channel which conveys digital video data that are directly coupled to the integrated CPU with graphics controller, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHBOOK 31 are directly coupled to eDP and/or DDI channels.

229. On information and belief, the Accused Laptops are in relevant part substantially similar to the exemplary TOUGHBOOK 31, in particular with regard to the manner in which the Accused Laptops include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '436 patent as to each of the Accused Laptops.

230. ACQIS' infringement allegations against the Accused Laptops are not limited to claim 13 of the '436 patent, and additional infringed claims will be identified through infringement contentions and discovery.

231. Panasonic's infringement of the '436 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of, and/or Panasonic's inducement and/or contributory infringement in connection with, the Accused Tablets is shown by way of the exemplary TOUGHPAD FZ-G1 tablet as set forth in paragraphs 89-103 above, which demonstrates infringement of at least claim 13 of the '436 patent by showing:

(a) the TOUGHPAD FZ-G1 is a computer;

(b) the TOUGHPAD FZ-G1 has a first LVDS channel comprising at least two sets of unidirectional, multiple serial bit channels to convey data in opposite directions, including but not limited to its PCIe and OPI channels;

(c) the TOUGHPAD FZ-G1 has an integrated central processing unit (CPU) with a peripheral controller in a single chip directly coupled to one or more LVDS channels which can communicate encoded address and data bits of Peripheral Component Interconnect (PCI) bus transaction in serial form, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 are directly coupled to at least PCIe and OPI channels;

(d) the TOUGHPAD FZ-G1 has system memory directly coupled to the integrated CPU and interface controller, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 are directly coupled to DDR3 memory;

(e) the TOUGHPAD FZ-G1 has a mass storage device coupled to the CPU, because

the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 are coupled to the SSD; and

(f) the TOUGHPAD FZ-G1 has a second LVDS channel which conveys digital video data that are directly coupled to the integrated CPU with graphics controller, because the 7th Generation Intel® Core™ i5 ("Kaby Lake") Processors employed in the TOUGHPAD FZ-G1 are directly coupled to eDP and/or DDI channels.

232. On information and belief, the Accused Tablets are in relevant part substantially similar to the exemplary TOUGHPAD FZ-G1, in particular with regard to the manner in which the Accused Tablets include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which Panasonic infringes the claims of the '436 patent as to each of the Accused Tablets.

233. ACQIS' infringement allegations against the Accused Tablets are not limited to claim 13 of the '436 patent, and additional infringed claims will be identified through infringement contentions and discovery.

234. As early as around May 15, 2018, Panasonic had actual notice of the '436 patent and the infringement alleged herein.

235. The above-described acts of infringement committed by Panasonic have caused injury and damage to ACQIS and ACQIS' licensees.

236. ACQIS is entitled to recover all damages sustained as a result of Panasonic's wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

237. Panasonic's infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found

or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

JURY TRIAL DEMANDED

ACQIS LLC hereby demands a trial by jury on all claims and issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff ACQIS LLC respectfully requests that this Court grant the following relief to ACQIS LLC:

A. enter judgment that Panasonic has infringed one or more claims of each of the ACQIS Patents through: (1) the manufacture, use, offering to sell, and/or sale in the United States, and/or the importation into the United States, of infringing Panasonic computer products; (2) the practice of claimed methods of the ACQIS Patents by manufacturing, using, and/or testing Panasonic computer products in the United States; (3) the importation into the United States of Panasonic computer products made abroad using patented processes claimed in the ACQIS Patents; (4) inducing third parties to directly infringe; and/or (5) contributory infringement.

B. enter judgement that such infringement is willful;

C. enter judgment awarding ACQIS monetary relief pursuant to 35 U.S.C. § 284 in an amount adequate to compensate for Panasonic's infringement of the ACQIS Patents to be determined at trial, but not less than a reasonable royalty, awarding ACQIS all pre- and post-judgment interest and costs, and awarding ACQIS enhanced damages for Panasonic's willful infringement of the ACQIS Patents;

D. enter an order, pursuant to 35 U.S.C. § 285, declaring this an exceptional case and awarding to ACQIS its reasonable attorneys' fees; and

E. enter an order awarding to ACQIS such other and further relief, whether at law or in equity, that this Court seems just, equitable, and proper.

Dated: December 22, 2023. Respectfully submitted,

By: */s/ Paige Arnette Amstutz*

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