

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

M-RED INC.,	§	
	§	
Plaintiff,	§	Case No.
	§	
v.	§	JURY TRIAL DEMANDED
	§	
PANASONIC CORPORATION. and	§	
PANASONIC CORPORATION OF	§	
NORTH AMERICA, INC.,	§	
	§	
Defendants.	§	
	§	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff M-Red Inc. (“M-Red” or “Plaintiff”) for its Complaint against Defendants Panasonic Corporation and Panasonic Corporation of North America, Inc. (“Defendants” or “Panasonic”) alleges as follows:

THE PARTIES

1. M-Red is a corporation organized and existing under the laws of the State of Texas, with its principal place of business located at 100 W. Houston Street, Marshall, Texas 75670.

2. Upon information and belief, Defendant Panasonic Corporation is a Japanese corporation with its principal place of business located at 1006 Oaza Kadoma, Kadoma-shi, 571-8501 Japan and may be served pursuant to the provisions of the Hague Convention. Upon information and belief, Panasonic does business in Texas, directly or through intermediaries, and maintains its principal place of business in Japan.

3. Upon information and belief, Defendant Panasonic Corporation of North America, Inc. is a New Jersey corporation with its principal place of business located at Two

Riverfront Plaza, Newark, NJ 07102-5490, United States and may be served with process through its registered agent CT Corporation System at 1999 Bryan Street, Suite 900, Dallas, TX 75201. Upon information and belief, Panasonic Corporation of North America, Inc. is a wholly-owned subsidiary of Panasonic Corporation. On information and belief, Panasonic Corporation of North America, Inc. maintains regular and established places of business within this Judicial District at offices including at least 3461 Plano Parkway, The Colony, TX 75056. Upon information and belief, Defendants employs individuals in this Judicial District involved in the sales and marketing of its products.

JURISDICTION

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

5. This Court has personal jurisdiction over Defendants. Defendants regularly conduct business and have committed acts of patent infringement and/or have induced acts of patent infringement by others in this Judicial District and/or have contributed to patent infringement by others in this Judicial District, the State of Texas, and elsewhere in the United States.

6. Venue is proper in this Judicial District with respect to Panasonic Corporation pursuant to 28 U.S.C. § 1391 because, among other things, Panasonic Corporation does not reside in the United States, and thus may be sued in any Judicial District pursuant to 28 U.S.C. § 1391(c)(3). Venue is further proper in this Judicial District with respect to Panasonic Corporation of North America, Inc. pursuant to 28 U.S.C. §§ 1391 and 1400(b) because, among other things, Panasonic Corporation of North America, Inc. is subject to personal jurisdiction in

this Judicial District, has a regular and established place of business in this Judicial District, has purposely transacted business involving the accused products in this Judicial District, including sales to one or more customers in Texas, and certain of the acts complained of herein, including acts of patent infringement, occurred in this Judicial District.

7. Defendants are subject to this Court's jurisdiction pursuant to due process and/or the Texas Long Arm Statute due at least to their substantial business in this State and Judicial District, including (a) at least part of their past infringing activities, (b) regularly doing or soliciting business in Texas, and/or (c) engaging in persistent conduct and/or deriving substantial revenue from goods and services provided to customers in Texas.

PATENTS-IN-SUIT

8. On February 8, 2005 the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,853,259 (the "'259 Patent") entitled "Ring oscillator dynamic adjustments for auto calibration." A true and correct copy of the '259 Patent is attached hereto as Exhibit A.

9. On June 27, 2006 the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,068,557 (the "'557 Patent") entitled "Ring oscillator dynamic adjustments for auto calibration." A true and correct copy of the '557 Patent is attached hereto as Exhibit B.

10. On April 24, 2007 the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,209,401 (the "'401 Patent") entitled "Ring oscillator dynamic adjustments for auto calibration." A true and correct copy of the '401 Patent is attached hereto as Exhibit C.

11. On April 24, 2001, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,221,682 (the “’682 Patent”) entitled “Method and Apparatus for Evaluating a Known Good Die Using Both Wire Bond and Flip-Chip Interconnects.” A true and correct copy of the ’682 Patent is attached hereto as Exhibit D.

12. The ’259, ’557, and ’401 Patents (The “Norman Patents”) generally describe integrated circuits comprising voltage and temperate sensors which output a voltage and temperate and store the output in memory. The technology was developed by Robert D. Norman and Dominik J. Schmidt. The Norman Patents also describe methods for dynamically adjusting clock frequency based on voltage and temperature values. In some embodiments of the inventions, temperature sensors dynamically monitor environmental parameters and store these parameters on a memory. These temperature monitoring and power saving techniques are incorporated into integrated circuits (“ICs”) and software utilized in Panasonic products. For example, non-party Qualcomm Inc. (“Qualcomm”) sells System-on-a Chips (“SoCs”), including the Snapdragon line of SoCs, and associated software which can perform Dynamic Clock and Voltage Scaling (“DCVS”).¹ According to Qualcomm, DCVS “is a technique used to adjust the frequency and voltage of the power equation to deliver the needed performance at the ideal power level.” Additionally, the “CPU cores of Snapdragon processors lie on separate voltage and frequency planes. This allows each CPU core to hit independent frequencies and voltages, delivering scalable performance and power levels.”² On information and belief, Qualcomm SoCs include a Thermal Engine that works with frequency and voltage scaling to “cap the

¹ DCVS may alternately be referred to as Dynamic Frequency and Voltage Scaling (“DVFS”).

² Power vs. Performance Management of the CPU, Qualcomm, (retrieved April 29, 2019), <https://www.qualcomm.com/news/onq/2013/10/25/power-vs-performance-management-cpu>.

maximum operating frequency of the CPU.”³ Qualcomm SoCs are incorporated into Panasonic products.⁴

13. The ’682 Patent generally describes evaluating semiconductor chips. For example, the ’682 Patent describes utilizing wire bond pads in order to test a semiconductor die. The technology was developed by Steve M. Danziger and Tushar Shah at Lockheed Martin Corporation. Upon information and belief, Panasonic products utilize chips manufactured by the method claimed in the ’682 Patent.

14. Panasonic has infringed and is continuing to infringe the ’259, ’557, ’401, and ’682 Patents (the “Asserted Patents”) by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell and/or importing, products that utilize semiconductors including, but not limited to, semiconductors made by Panasonic and/or third party Qualcomm (the “Accused Products”). On information and belief, the Accused Products infringe the Norman Patents because they utilize on-chip temperature sensors for power management, including Qualcomm SoCs including at least the Snapdragon 602A (APQ8064), 820A (MSM8996), and/or 820 (MSM8996/APQ8096) (the “Exemplary Qualcomm SoCs”). Upon information and belief, Panasonic’s Accused Products include at least the Ford SYNC 3 Infotainment System which includes a Qualcomm SoC. On information and belief, the Accused Products infringe the ’682 Patent because they utilize one or more ICs

³ Qualcomm Snapdragon 410E Processor APQ8016E System Power Overview, Qualcomm (retrieved April 29, 2019), https://developer.qualcomm.com/qfile/35136/lm80-p0436-73_a_qualcomm_snapdragon_410e_processor_apq8016e_system_power_overview.pdf&usg=AOvVaw2fQ9dLyNcd-8h3Rd_-vbbM.

⁴ See Panasonic Automotive and Qualcomm Announce Next Generation In-Vehicle Infotainment Concept System Powered by Android, Qualcomm, (retrieved July 15, 2019), <https://www.qualcomm.com/news/releases/2017/01/04/panasonic-automotive-and-qualcomm-announce-next-generation-vehicle>.

including, but not limited to, the Panasonic MN2WS0270, MN34120, MN34230, MN34440PL, MN34595, MW39781, and MW39783 (the “Exemplary Panasonic SoCs”).

15. M-Red has at all times complied with the marking provisions of 35 U.S.C. § 287 with respect to the patents-in-suit. On information and belief, prior assignees and licensees have also complied with the marking provisions of 35 U.S.C. § 287.

COUNT I
(Infringement of the '259 Patent)

16. Paragraphs 1 through 15 are incorporated by reference as if fully set forth herein.

17. M-Red has not licensed or otherwise authorized Panasonic to make, use, offer for sale, sell, or import any products that embody the inventions of the '259 Patent.

18. Defendants have and continue to directly infringe the '259 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '259 Patent. Upon information and belief, these products include Panasonic SoCs and products that incorporate Panasonic SoCs, including at least the Exemplary Panasonic SoCs, which are sold in the United States and incorporated by others into products sold in the United States. Upon information and belief, these products further include Qualcomm SoCs, such as the Panasonic Ford SYNC 3 Infotainment System incorporating a Qualcomm SoC such as the Exemplary Qualcomm SoCs.

19. For example, Defendants have and continue to directly infringe at least claim 1 of the '259 Patent by making, using, offering to sell, selling, and/or importing into the United States products that include an apparatus to compensate for voltage and temperature variations on an integrated circuit, such as, for example, the thermal controller components and associated software utilized with the Accused Products such as the Exemplary Panasonic SoCs, products

that incorporate the Exemplary Panasonic SoCs, and Panasonic products that incorporate Exemplary Qualcomm SoCs. The Exemplary Qualcomm SoCs, such as the SoCs utilized in the Panasonic Ford SYNC 3 Infotainment System includes a voltage sensor. The Exemplary Qualcomm SoCs each operate at different voltages and frequencies and dynamically adjust these voltages and frequencies based on outputs from sensors.

20. Defendants have and continue to directly infringe at least claim 1 of the '259 Patent by making, using, offering to sell, selling, and/or importing into the United States products that include an apparatus to compensate for voltage and temperature variations on an integrated circuit, comprising: a voltage sensor having a digital voltage output; a temperature sensor having a digital temperature output; a register coupled to the voltage sensor and the temperature sensor, the register adapted to concatenate the digital voltage output and the temperature output into an address output; and a memory device having an address input coupled to the address output of the register, the memory device being adapted to store one or more corrective vectors.

21. On information and belief, the Accused Products include SoCs that include a voltage sensor having a voltage output, and a temperature sensor having a temperature output. For example, on information and belief, the Qualcomm SoC used in the Panasonic Ford SYNC 3 Infotainment System includes a voltage sensor. For example the Exemplary Qualcomm SoCs, each include one or more temperature and voltage sensors that provide outputs stored in one or more registers.

22. On information and belief, the Qualcomm SoCs used in the Panasonic Ford SYNC 3 Infotainment System include a register coupled to the voltage sensor and the temperature sensor, the register adapted to concatenate the voltage output and the temperature

output into an address output. On information and belief, the Qualcomm SoC used in the Panasonic Ford SYNC 3 Infotainment System includes one or more registers including registers that store voltage and temperature information related to the performance of the temperature sensors, the thermal controller, and the voltage states of the SoC and its cores. For example, upon information and belief, the one or more registers of the Exemplary Qualcomm SoCs are adapted to combine the digital voltage and temperature in order to determine whether to alter the performance of the processor.

23. On information and belief, the Qualcomm SoCs used in the Panasonic Ford SYNC 3 Infotainment System include a memory device having an address input coupled to the address output of the register, the memory device being adapted to store one or more corrective vectors. On information and belief, the Qualcomm SoC used in the Panasonic Ford SYNC 3 Infotainment System include RAM, cache memory, and buffer memory to store corrective vectors, such as commands to increase or decrease the frequency and/or voltage of the SoC via, for example, dynamic voltage and frequency scaling (DVFS). For example, the Exemplary Qualcomm SoCs each include “Thermal Engine” functionality that works with frequency and voltage scaling to “cap the maximum operating frequency of the CPU.”⁵

24. Defendants have and continue to indirectly infringe one or more claims of the ’259 Patent by knowingly and intentionally inducing others, including Panasonic customers and end-users of the Accused Products and products that include the Accused Products, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States products that include infringing technology, such

⁵ Qualcomm Snapdragon 410E Processor APQ8016E System Power Overview, Qualcomm (retrieved April 29, 2019), https://developer.qualcomm.com/qfile/35136/lm80-p0436-73_a_qualcomm_snapdragon_410e_processor_apq8016e_system_power_overview.pdf&usg=AOvVaw2fQ9dLyNcd-8h3Rd_-vbbM.

as the Panasonic Ford SYNC 3 Infotainment System incorporating a Qualcomm SoC such as the Exemplary Qualcomm SoCs.

25. Defendants, with knowledge that these products, or the use thereof, infringe the '259 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continue to knowingly and intentionally induce, direct infringement of the '259 Patent by providing these products to customers and ultimately to end users for use in an infringing manner in the United States including, but not limited to, end users of products that incorporate Accused Products.

26. Defendants induced infringement by others, including end users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end users, infringe the '259 Patent, but while remaining willfully blind to the infringement.

27. M-Red has suffered damages as a result of Defendants' direct and indirect infringement of the '259 Patent in an amount to be proved at trial.

28. M-Red has suffered, and will continue to suffer, irreparable harm as a result of Defendants' infringement of the '259 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

COUNT II
(Infringement of the '557 Patent)

29. Paragraphs 1 through 15 are incorporated by reference as if fully set forth herein.

30. M-Red has not licensed or otherwise authorized Panasonic to make, use, offer for sale, sell, or import any products that embody the inventions of the '557 Patent.

31. Defendants have and continue to directly infringe the '557 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by

making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '557 Patent. Upon information and belief, these products include Panasonic SoCs and products that incorporate Panasonic SoCs, including at least the Exemplary Panasonic SoCs, which are sold in the United States and incorporated by others into products sold in the United States. Upon information and belief, these products further include Panasonic products incorporating Qualcomm SoCs, including at least the at least the Panasonic Ford SYNC 3 Infotainment System incorporating a Qualcomm SoC such as the Exemplary Qualcomm SoCs.

32. For example, Defendants have and continue to directly infringe at least claim 1 of the '557 Patent by making, using, offering to sell, selling, and/or importing into the United States products that include an integrated circuit comprising a voltage sensor having a voltage input; a temperature sensor having a temperature input; and a memory capable of receiving an input address based upon the voltage output and the temperature output, the memory configured to store compensation data. On information and belief, such integrated circuits include, by way of example, the Accused Products that include thermal controller components and associated software such as the Exemplary Panasonic SoCs, products that incorporate the Exemplary Panasonic SoCs, and Panasonic products that incorporate Exemplary Qualcomm SoCs. For example, the Accused Products operate at different voltages and frequencies and dynamically adjust these voltages and frequencies based on outputs from sensors. On information and belief, such integrated circuits include, by way of example, Qualcomm SoCs included in Panasonic infotainment systems such as the Panasonic Ford SYNC 3 Infotainment System that include thermal controller components and associated software, such as the Exemplary Qualcomm SoCs.

For example, Qualcomm SoCs operate at different voltages and frequencies and dynamically adjust these voltages and frequencies based on outputs from sensors.

33. On information and belief, the Accused Products include a voltage sensor having a voltage output, and a temperature sensor having a temperature output. For example, on information and belief, the Qualcomm SoCs used in Panasonic Infotainment Systems, such as the Exemplary Qualcomm SoCs utilized in the Panasonic Ford SYNC 3 Infotainment System, include one or more temperature and voltage sensors that provide outputs.

34. On information and belief, the Accused Products further include storage capable of receiving an input address based upon the voltage output and the temperature output, the memory configured to store compensation data. For example, on information and belief, the Qualcomm SoCs used in Panasonic Infotainment Systems, such as the Exemplary Qualcomm SoCs utilized in the Panasonic Ford SYNC 3 Infotainment System, include RAM, cache memory, and buffer memory capable of receiving an input address based upon the voltage output and temperature output, and are configured to store compensation data, such as commands to increase or decrease the frequency and/or voltage of the SoCs. For example, the Qualcomm SoCs incorporated in the Accused Products each include “Thermal Engine” functionality that works with frequency and voltage scaling to “cap the maximum operating frequency of the CPU.”⁶

35. Defendants have and continue to indirectly infringe one or more claims of the ’557 Patent by knowingly and intentionally inducing others, including Panasonic customers and end-users of the Accused Products and products that include the Accused Products, to directly

⁶ Qualcomm Snapdragon 410E Processor APQ8016E System Power Overview, Qualcomm (retrieved April 29, 2019), https://developer.qualcomm.com/qfile/35136/lm80-p0436-73_a_qualcomm_snapdragon_410e_processor_apq8016e_system_power_overview.pdf&usg=AOvVaw2fQ9dLyNcd-8h3Rd_-vbbM.

infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States products that include infringing technology, such as the Panasonic Ford SYNC 3 Infotainment System incorporating a Qualcomm SoC such as the Exemplary Qualcomm SoCs.

36. Defendants, with knowledge that these products, or the use thereof, infringe the '557 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continue to knowingly and intentionally induce, direct infringement of the '557 Patent by providing these products to customers and ultimately to end users for use in an infringing manner in the United States including, but not limited to, end users of products that incorporate Accused Products,

37. Defendants induced infringement by others, including end users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end users, infringe the '557 Patent, but while remaining willfully blind to the infringement.

38. M-Red has suffered damages as a result of Defendants' direct and indirect infringement of the '557 Patent in an amount to be proved at trial.

39. M-Red has suffered, and will continue to suffer, irreparable harm as a result of Defendants' infringement of the '557 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

COUNT III
(Infringement of the '401 Patent)

40. Paragraphs 1 through 15 are incorporated by reference as if fully set forth herein.

41. M-Red has not licensed or otherwise authorized Panasonic to make, use, offer for sale, sell, or import any products that embody the inventions of the '401 Patent.

42. Defendants have and continue to directly infringe the '401 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '401 Patent. Upon information and belief, these products include Panasonic SoCs and products that incorporate Panasonic SoCs, including at least the Exemplary Panasonic SoCs, which are sold in the United States and incorporated by others into products sold in the United States. Upon information and belief, these products further include Panasonic products incorporating Qualcomm SoCs, including at least the at least the Panasonic Ford SYNC 3 Infotainment System incorporating a Qualcomm SoC such as the Exemplary Qualcomm SoCs.

43. For example, Defendants have and continue to directly infringe at least claim 1 of the '401 Patent by making, using, offering to sell, selling, and/or importing into the United States products that include an integrated circuit comprising: a voltage sensor having a voltage output; a temperature sensor having a temperature output; an analog-to-digital converter ("ADC") coupled to the voltage sensor and the temperature sensor, the ADC to convert the voltage output and the temperature output to digital values; and a storage coupled to receive an input address based upon at least one of the voltage output and temperature output, the storage configured to store compensation data, for example, the thermal controller components and associated software utilized with the Accused Products, such as the Exemplary Panasonic SoCs, products that incorporate the Exemplary Panasonic SoCs, and Panasonic products that incorporate Exemplary Qualcomm SoCs. For example, on information and belief, the Exemplary Qualcomm SoCs each include a voltage sensor having a digital voltage output. For example, the Exemplary Qualcomm

SoCs incorporated in Panasonic products operate at different voltages and frequencies and dynamically adjust these voltages and frequencies based on outputs from sensors.

44. On information and belief, the Qualcomm SoCs used in the Panasonic Ford SYNC 3 Infotainment System include a voltage sensor having a voltage output, and a temperature sensor having a temperature output. For example, on information and belief, Qualcomm SoCs such as the Exemplary Qualcomm SoCs, incorporated in the Panasonic Ford SYNC 3 Infotainment System, include one or more temperature and voltage sensors that provide outputs.

45. On information and belief, the Qualcomm SoCs used in the Panasonic Ford SYNC 3 Infotainment System include an analog-to-digital converter coupled to the voltage sensor and the temperature sensor, the ADC to convert the voltage output and the temperature output to digital values. For example, on information and belief, Qualcomm SoCs such as the Exemplary Qualcomm SoCs, incorporated in the Panasonic Ford SYNC 3 Infotainment System, include sensors which output analog signals which are converted to digital signals prior to storage.

46. On information and belief, the Qualcomm SoCs incorporated in the Panasonic Ford SYNC 3 Infotainment System further include a storage capable of receiving an input address based upon the voltage output and the temperature output, the memory configured to store compensation data. For example, on information and belief, Qualcomm SoCs such as the Exemplary Qualcomm SoCs, incorporated in the Panasonic Ford SYNC 3 Infotainment System, include ram, cache memory, and buffer memory capable of receiving an input address based upon the voltage output and temperature output, and are configured to store compensation data, such as commands to increase or decrease the frequency and/or voltage of the SoC. For example,

the Qualcomm SoCs incorporated in Panasonic products each include “Thermal Engine” functionality that works with frequency and voltage scaling to “cap the maximum operating frequency of the CPU.”⁷

47. Defendants have and continue to indirectly infringe one or more claims of the ’401 Patent by knowingly and intentionally inducing others, including Panasonic customers and end-users of the Accused Products and products that include the Accused Products, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States products that include infringing technology, such as the Panasonic Ford SYNC 3 Infotainment System incorporating a Qualcomm SoC such as the Exemplary Qualcomm SoCs.

48. Defendants, with knowledge that these products, or the use thereof, infringe the ’401 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the ’401 Patent by providing these products to customers and ultimately to end users for use in an infringing manner in the United States including, but not limited to, end users of products that incorporate Accused Products,

49. Defendants induced infringement by others, including end users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end users, infringe the ’401 Patent, but while remaining willfully blind to the infringement.

⁷ Qualcomm Snapdragon 410E Processor APQ8016E System Power Overview, Qualcomm (retrieved April 29, 2019), https://developer.qualcomm.com/qfile/35136/lm80-p0436-73_a_qualcomm_snapdragon_410e_processor_apq8016e_system_power_overview.pdf&usg=AOvVaw2fQ9dLyNcd-8h3Rd_-vbbM.

50. M-Red has suffered damages as a result of Defendants' direct and indirect infringement of the '401 Patent in an amount to be proved at trial.

51. M-Red has suffered, and will continue to suffer, irreparable harm as a result of Defendants' infringement of the '401 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

COUNT IV
(Infringement of the '682 Patent)

52. Paragraphs 1 through 15 are incorporated by reference as if fully set forth herein.

53. M-Red has not licensed or otherwise authorized Panasonic to make, use, offer for sale, sell, or import any products that embody the inventions of the '682 Patent.

54. Defendants have directly infringed the '682 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '682 Patent. Upon information and belief, these products include ICs manufactured by third parties and imported by Panasonic as well as Panasonic ICs included in Panasonic products imported by Panasonic. On information and belief, these products have been imported and sold in the United States and incorporated by others into products imported and sold in the United States.

55. For example, Defendants have directly infringed at least claim 1 of the '682 Patent by making, using, offering to sell, selling, and/or importing into the United States integrated circuits and/or products that include an integrated circuit made by a method of making a known good integrated circuit device for solder ball array connection to an end use device. For example, on information and belief, one or more Panasonic products, such as Panasonic

televisions, include the Panasonic MN2WS0270 integrated circuit device for solder ball array connection to an end use device:

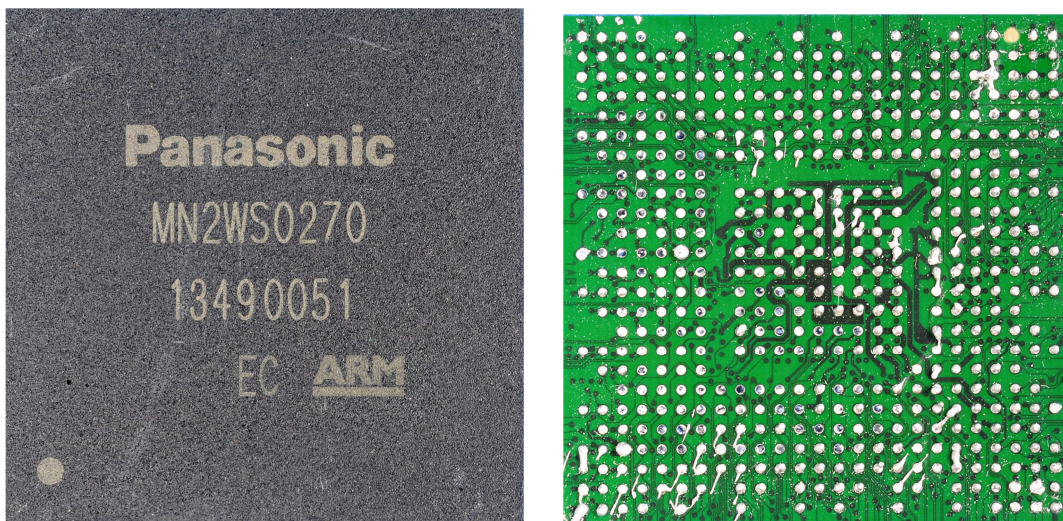


Figure 1: Panasonic MN2WS0270 IC Top (L) and Bottom (R)

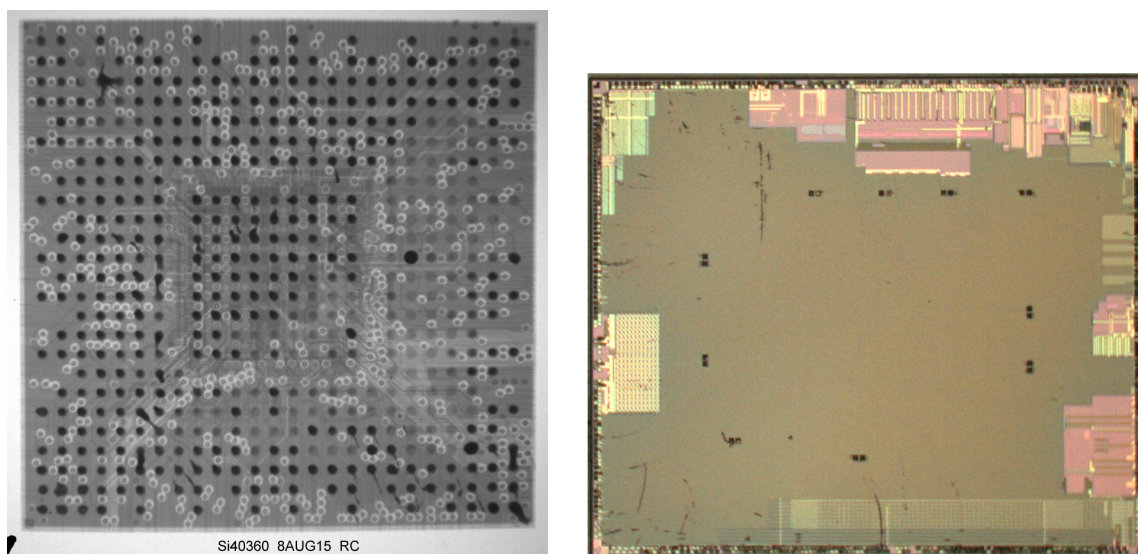


Figure 2: Panasonic MN2WS0270 IC Package X-Ray (L) and Die Image (R)

56. On information and belief, the Panasonic MN2WS0270 was made by constructing the integrated circuit device having wire bond pads, and a solder ball array (*see, e.g.*, Figure 1(R)), wherein the solder ball array is connected to the wire bond pads by discrete connections on the integrated circuit (*see, e.g.*, Figure 2(L) and 2(R)). On information and belief, after

constructing the integrated circuit device of the Panasonic MN2WS0270, the integrated circuit device was further made by connecting it to a test device with the wire bond pads and the integrated circuit device was tested.

57. M-Red has suffered damages as a result of Defendants' direct infringement of the '682 Patent in an amount to be proved at trial.

DEMAND FOR JURY TRIAL

Plaintiff hereby demands a jury for all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, M-Red prays for relief against Defendants as follows:

- a. Entry of judgment declaring that Defendants have directly infringed one or more claims of each of the patents-in-suit;
- b. An order awarding damages sufficient to compensate M-Red for Defendants' infringement of the patents-in-suit, but in no event less than a reasonable royalty, together with interest and costs;
- c. Entry of judgment declaring that this case is exceptional and awarding M-Red its costs and reasonable attorney fees under 35 U.S.C. § 285; and
- d. Such other and further relief as the Court deems just and proper.

Dated: July 16, 2019

Respectfully submitted,

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**ATTORNEYS FOR PLAINTIFF
M-RED INC.**