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

MR LICENSING, LLC,	§	Case No.
Plaintiff,	§	**JURY TRIAL DEMANDED**
v.	§	
TEXAS INSTRUMENTS, INC.,	§	
Defendant.	§	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff MR Licensing LLC ("MRL" or "Plaintiff") files this Complaint against Defendant Texas Instruments, Inc. ("TI" or "Defendant"), for patent infringement under 35 U.S.C. § 271 and alleges as follows:

THE PARTIES

1. Plaintiff MRL is a limited liability company, organized and existing under the laws of the State of Texas, with its principal place of business located at 313 South Washington Avenue, Marshall, Texas 75670. MRL is the owner of all rights, title, and interest in and to U.S. Patent Nos. 6,337,563 (the "'563 Patent"), 6,614,320 (the "'320 Patent"), 9,124,264 (the "'264 Patent), 6,925,554 (the "'554 Patent"), 7,656,127 (the "'127 Patent") , 8,324,873 (the "'873 Patent"), 8,078,887 (the "'887 Patent"), 8,319,482 (the "'482 Patent"), 8,823,344 (the "'344 Patent"), and 7,982,431 (the "'431 Patent") (collectively, the "Asserted Patents").

2. Upon information and belief, TI is a publicly-traded corporation, organized and existing under the laws of the State of Delaware, with its principal place of business located at 12500 TI Boulevard, Dallas, Texas 75243. TI may be served via its register agent, The Corporation

Trust Company, at Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801.

JURISDICTION AND VENUE

3. 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).

4. This Court has personal jurisdiction over the Defendant consistent with the requirements of the Due Process Clause of the United States Constitution and the Texas Long Arm Statute. Defendant TI has its principal place of business in Dallas, Texas, where it employs more than 20,000 employees.

5. This Court has personal jurisdiction over Defendant in this action consistent with the Due Process Clause of the United States Constitution and the Texas Long Arm Statute because Defendant has committed acts within this District giving rise to this action, and has established minimum contacts with this forum, such that the exercise of jurisdiction over Defendant would not offend traditional notions of fair play and substantial justice. Defendant, directly and/or through subsidiaries or intermediaries, has committed and continues to commit acts of infringement in this District by, among other things, importing, offering to sell, and selling products that infringe the Patents-in-Suit, and inducing others to infringe the Patents-in-Suit in this District. Defendant is directly and/or through intermediaries making, using, selling, offering for sale, distributing, advertising, promoting, and otherwise commercializing its infringing products in this District.

6. Venue is proper in this Judicial District pursuant to 28 U.S.C. §§ 1391(b) and 1400(b) because Defendant is subject to personal jurisdiction in this District, has committed acts of patent infringement in this District, and has a regular and established place of business in this District, including at least a commercial manufacturing facility located at 6412 U.S. Highway 75,

Sherman, Texas, 75090. In addition to its existing facilities in this District, TI has, upon information and belief, commenced its construction activities with respect to a new $30 billion chip manufacturing facility also located in this District. Further, upon information and belief, Defendant has previously admitted or not contested proper venue in this District in other patent infringement actions.

PATENTS-IN-SUIT AND FACTUAL BACKGROUND

7. On January 8, 2002, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,337,563 (the "'563 Patent"), entitled "DC-DC Converter and Semiconductor Integrated Circuit Device for DC-DC Converter." A true and correct copy of the '563 Patent is attached as Exhibit A.

8. On September 2, 2003, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,614,320 (the "'320 Patent"), entitled "System and Method of Providing a Programmable Clock Architecture for an Advanced Microcontroller." A true and correct copy of the '320 Patent is attached as Exhibit B.

9. On September 1, 2015, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,124,264 (the "'264 Patent"), entitled "Load Driver." A true and correct copy of the '264 Patent is attached as Exhibit C.

10. On August 2, 2005, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,925,554 (the "'554 Patent"), entitled "Method of Programming USB Microcontrollers." A true and correct copy of the '554 Patent is attached as Exhibit D.

11. On February 2, 2010, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,656,127 (the "'127 Patent"), entitled "Method and Apparatus for Using an External Resistor for Charging Applications." A true and correct copy of the '127 Patent

is attached as Exhibit E.

12. On December 4, 2012, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,324,873 (the "'873 Patent"), entitled "Power Supply Apparatus and Power Supply Method." A true and correct copy of the '873 Patent is attached as Exhibit F.

13. On December 13, 2011, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,078,887 (the "'887 Patent"), entitled "Power Supply Voltage Regulator Circuit and Microcomputer." A true and correct copy of the '887 Patent is attached as Exhibit G.

14. On November 27, 2012, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,319,482 (the "'482 Patent"), entitled "Power Supply and Power Control Device." A true and correct copy of the '482 Patent is attached as Exhibit H.

15. On September 2, 2014, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,823,344 (the "'344 Patent"), entitled "Control Circuit, Electronic Device, and Method for Controlling Power Supply." A true and correct copy of the '344 Patent is attached as Exhibit I.

16. On July 19, 2011, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,982,431 (the "'431 Patent"), entitled "Detection Circuit." A true and correct copy of the '431 Patent is attached as Exhibit J.

17. MRL is the sole and exclusive owner of all right, title, and interest in the '563 Patent, the '320 Patent, the '264 Patent, the'554 Patent, the '127 Patent, the '873 Patent, the '887 Patent, the '482 Patent, the '344 Patent, and the '431 Patent, and holds the exclusive right to take all actions necessary to enforce its rights to the Patents-in-Suit, including the filing of this patent infringement lawsuit. MRL also has the right to recover all damages for past, present, and future

infringement of the Patents-in-Suit and to seek injunctive relief as appropriate under the law.

18. MRL has at all times complied with the marking provision of 35 U.S.C. § 287 with respect to the Patents-in-Suit.

19. Defendant has infringed and continues to infringe one or more of the Patents-in-Suit by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell, and/or import the Accused Products. The Accused Products contain, at the least, (a) TI's battery chargers including, but not limited to, the bq24160, bq24160A, bq24161, bq24161B, bq24163, bq24168, bq24190, bq24192, bq24192I, bq24195, bq24195L, bq24259, bq24260, bq24261, bq24261M, bq24262, bq24266, bq24298, bq24295, bq24296, bq24296M, bq24297, bq24292i, bq25600, bq25600C, bq25600D, bq25601, bq25606, bq25871, bq25703a, bq25708, bq25713, bq24133, bq24610, bq24616, bq24650, bq24725A, bq25890, bq25890H, bq25892, bq25895, bq25895M, bq25896, bq25898, bq25898D, bq25898C, and bq25910; (b) TI's Microcontrollers including, but not limited to, TM4C123GH6ZRB TMS320F2802x, TMS320F2802xx, TMS320F2803x, TMS320F28004x, TMS320F2805x, TMS320F2806x, TMS320F2807x, TI's ARM Cortex-M4 based MCUs, TI's DRA74x and DRA75x family, and TI's C2000 MCUs; (c) TI's USB 3.0 to SATA Bridge products including, but not limited to, the TUSB9261; (d) TI's USB redrivers including, but not limited to the TUSB501-Q1, TUSB542, TUSB564, TUSB1046-DCI, TUSB1002, TUSB1310, TUSB7320, TUSB7340, and SN65LVPE502, Texas Instruments system on chips (SOCs) with support for USB 3.1 or later; (e) all TI AM65x and DRA80xM processors; (f) TI Boost converters including, but not limited to, the TPS61022, TPS61280, TPS61280D, TPS61281, TPS61281D, TPS61282, and TPS61282D; and (g) all TI Synchronous Buck Converters including, but not limited to, the TPSM86837 and TPS548B23. Defendant has received prior notice about the Patents-in-Suit and

its infringement of the Patents-in-Suit, and/or have remained been willfully blind to the Patents-in-Suit.

PRE-SUIT KNOWLEDGE AND WILLFULLNESS

20. Paragraphs 1 through 19 are incorporated by reference as if fully set forth herein.

21. Before filing this action, Defendant was notified about the Asserted Patents and its infringement thereof. The prior assignee of the patents, Monterey Research, LLC ("Monterey"), identified the Asserted Patents to TI in multiple communications from 2018 to 2021. TI was alleged to infringe the Asserted Patents, including identifying exemplary infringing products; Monterey sought to engage TI in discussions regarding its use of Monterey's intellectual property.

22. On September 5, 2018, Monterey sent a letter to TI notifying TI of its infringement of the '563 Patent, the '320 Patent, the '554 Patent, and the '127 Patent. In that letter, Monterey identified many exemplary infringing products, including all TI products with DC-DC converters, such as the bq24160, as infringing the '563 Patent. Monterey further identified many exemplary products, including all TI Piccolo Microcontrollers, such as the TMS320F2803x, as infringing the '320 Patent. Monterey further identified many exemplary products, including all TI products with USB 3.0 to SATA Bridge, such as the TUSB 921, as infringing the '554 Patent. Monterey further identified many exemplary products, including the bq25713 and the bq25871, as infringing the '127 Patent. In this letter, Monterey discussed the possibility of licensing the technology to TI and urged TI to reach out to Monterey's agent, IPValue, to handle the licensing discussion.

23. On December 27, 2018, Monterey sent a follow-up letter to TI regarding its initial September 5, 2018 letter.

24. On September 24, 2021, Monterey sent another letter to TI, both following up on its December 27, 2018 letter and September 5, 2018 letter, and notifying TI of its infringement of

the ’264 Patent, the ’887 Patent, the ’873 Patent, and the ’431 Patent. Monterey identified many exemplary products, including the TUSB501-Q1 and the SN65LVPE502, of infringing the ’264 Patent. Monterey identified many exemplary products, including the AM65x Processor and the DRA80xM Processor of infringing the ’887 Patent. Monterey identified many exemplary products, including all TI power supply products containing an integrated circuit that includes a first switch provided between an inductor and a terminal to which a reference voltage is applied; a second switch provided between the inductor and an output terminal; a first comparator circuit that compares an input voltage with a first comparison voltage; a signal generating circuit that outputs a frequency signal according to an output from the first comparator circuit; and a first control circuit that controls the first and second switches based on an output from the signal generating circuit to control an electrical current flowing into the inductor, such as the TPS61022 8-A Boost converters, of infringing the ’873 Patent. Monterey identified many exemplary products, including the BQ25713 and the BQ25713, of infringing the ’431 Patent. Again, Monterey attempted to engage in licensing discussions about these Asserted Patents with TI.

25. Despite Monterey’s repeated efforts, TI did not engage in meaningful discussions to license the Asserted Patents, and TI has also not taken steps to end its infringement of the Asserted Patents. Instead, TI continues to knowingly, intentionally, and willfully infringe MRL’s patents directly, contributorily, and by inducement, to obtain their significant benefits without a license from MRL.

COUNT I
(Infringement of the ’563 Patent)

26. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

27. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the ’563 Patent.

28. Defendant infringed, contributed to the infringement of, and/or induced infringement of the '563 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the '563 Patent including, but not limited to, at least the Accused Products.

29. Defendant has directly infringed the '563 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 '563 Patent. Upon information and belief, the Accused Products practice the methods and systems covered by the '563 Patent.

30. For example, Defendant directly infringed at least Claim 1 of the '563 Patent by making, using, offering to sell, selling, and/or importing into the United States products that comprise a DC—DC converter for generating a circuit current and charging a battery, comprising: a supply circuit for supplying the circuit current to internal circuits in accordance with an input current supplied from an external DC power supply; a charge circuit for receiving the input current and supplying a charge current to the battery; and a control unit, connected to the charge circuit, for controlling the charge current, the control unit including, a differential charge controller for comparing the input current with a first threshold value and controlling the charge current according to a result of that comparison, a charge current controller for comparing the charge current with a second threshold value and controlling the charge current according to a result of that comparison, a charge voltage controller for comparing a charge voltage of the battery with a third threshold value and controlling the charge current according to a result of that comparison, and a dynamic charge controller for comparing an input voltage from the external DC power supply with a fourth threshold value and controlling the charge current according to a result of that

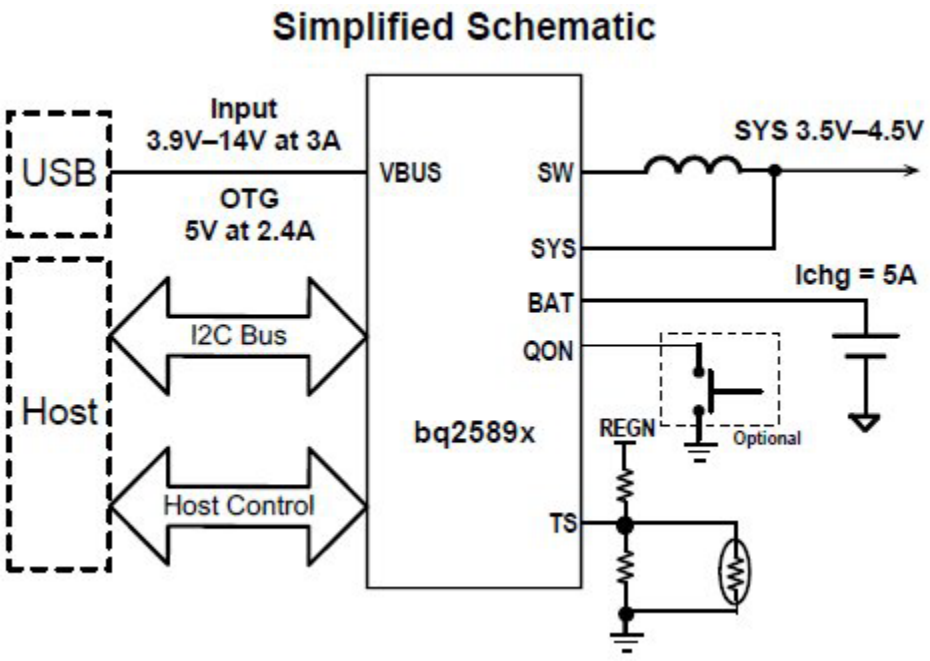
comparison.

31. The Accused Products are DC—DC converters for generating a circuit current and charging a battery. For example, the bq25890 is a battery charger which, on information and belief, converts DC into DC out.

> The bq25890, bq25892 are highly-integrated 5-A switch-mode battery charge management and system power path management device for single cell Li-Ion and Li-polymer battery. The devices support high input voltage fast charging. The low impedance power path optimizes switch-mode operation efficiency, reduces battery charging time and extends battery life during discharging phase.

Source: https://www.ti.com/lit/ds/symlink/bq25890.pdf (Annotated).

32. The Accused Products comprise a supply circuit for supplying the circuit current to internal circuits in accordance with an input current supplied from an external DC power supply. For example, the bq25890 contains VBUS, the input current, which is DC current and supplied by an external source (USB below).

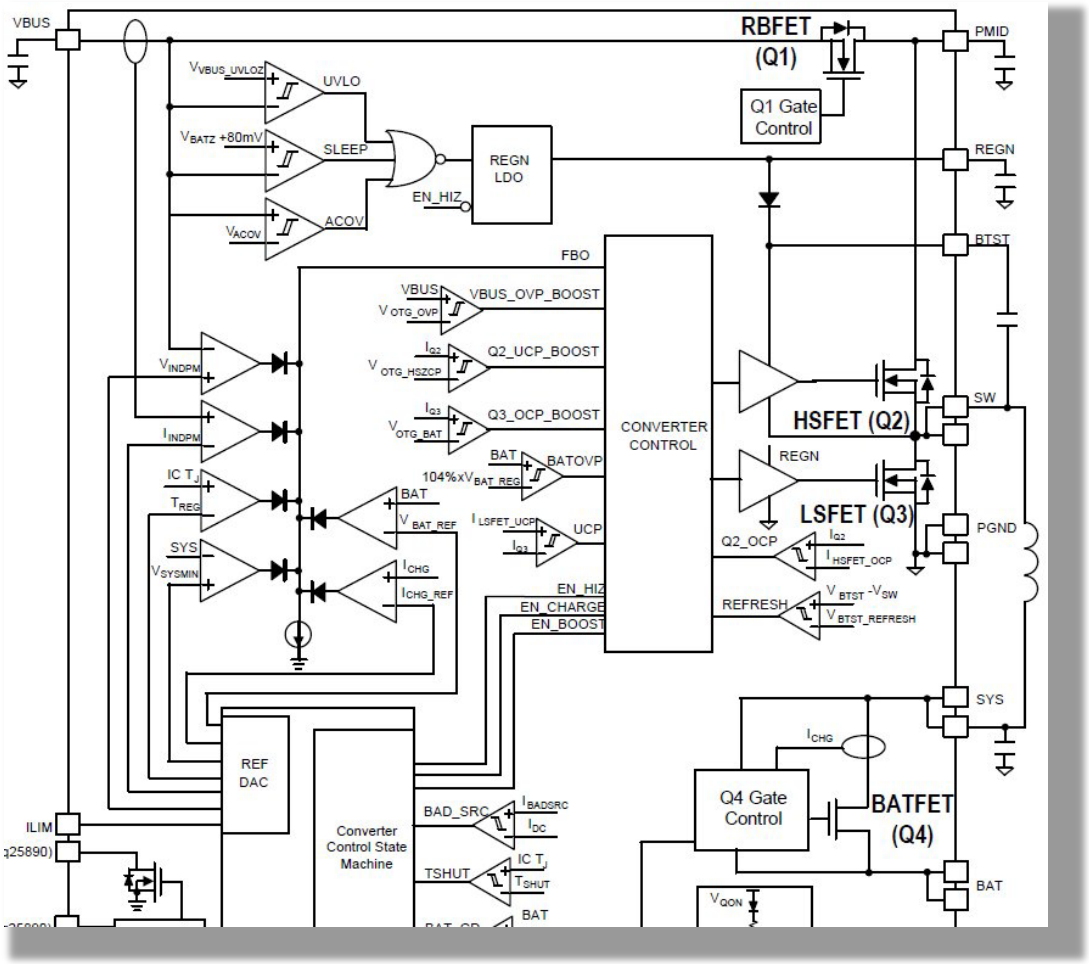


Id.

PIN			TYPE[1]	DESCRIPTION
NAME	bq25890	bq25892		
VBUS	1	1	P	Charger Input Voltage. The internal n-channel reverse block MOSFET (RBFET) is connected between VBUS and PMID with VBUS on source. Place a 1-µF ceramic capacitor from VBUS to PGND and place it as close as possible to IC.
BAT	13,14	13, 14	P	Battery connection point to the positive terminal of the battery pack. The internal BATFET is connected between BAT and SYS. Connect a 10uF closely to the BAT pin.
SYS	15,16	15,16	P	System connection point. The internal BATFET is connected between BAT and SYS. When the battery falls below the minimum system voltage, switch-mode converter keeps SYS above the minimum system voltage. Connect a 20uF closely to the SYS pin.
PGND	17,18	17,18	P	Power ground connection for high-current power converter node. Internally, PGND is connected to the source of the n-channel LSFET. On PCB layout, connect directly to ground connection of input and output capacitors of the charger. A single point connection is recommended between power PGND and the analog GND near the IC PGND pin.
SW	19,20	19,20	P	Switching node connecting to output inductor. Internally SW is connected to the source of the n-channel HSFET and the drain of the n-channel LSFET. Connect the 0.047µF bootstrap capacitor from SW to BTST.

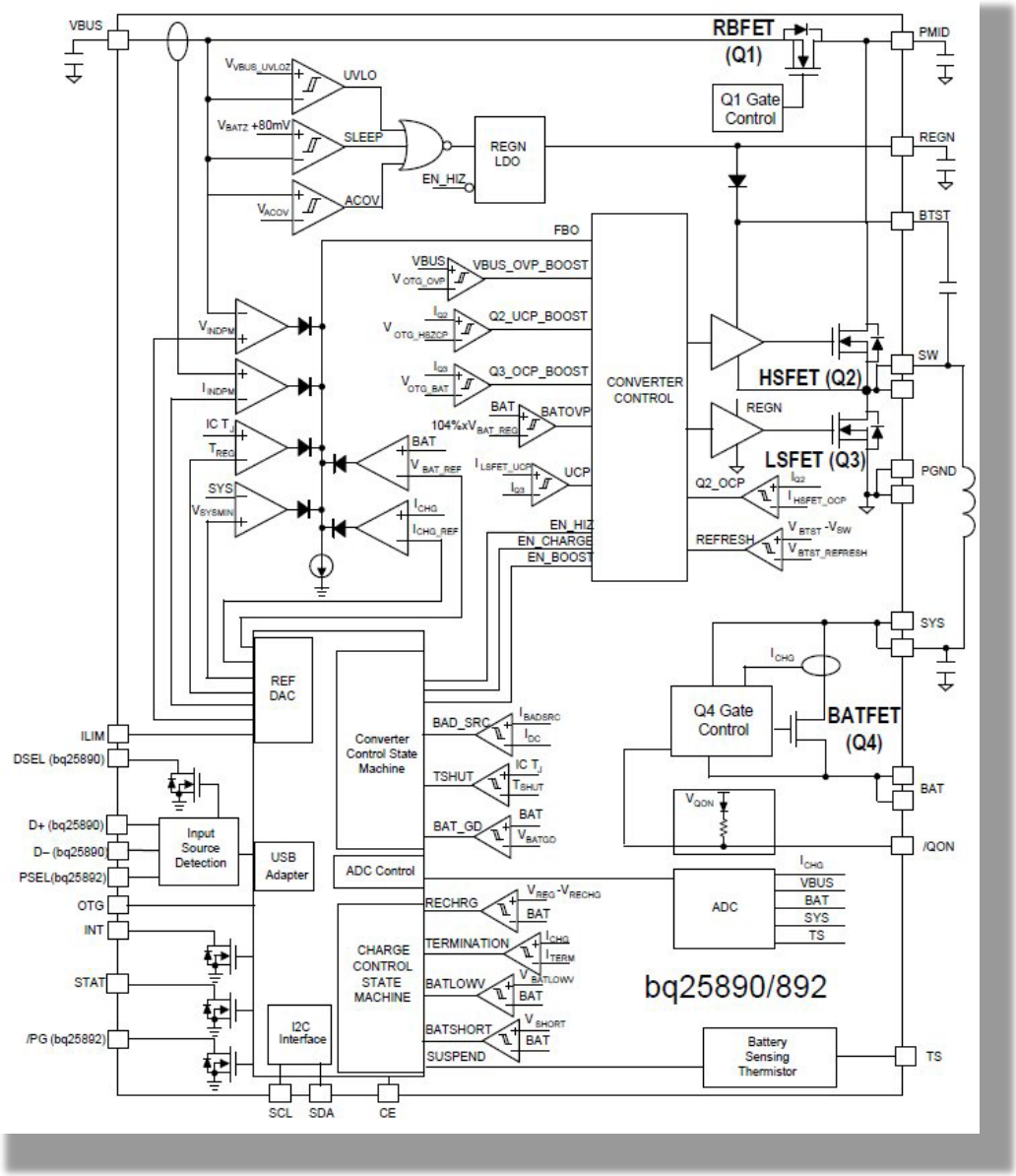
Id.

33. The Accused Products comprise a charge circuit for receiving the input current and supplying a charge current to the battery. For example, the bq25890 has a charge circuit, shown below, which includes RBFET (Q1), HSFET (Q2), and BATFET (Q4). Current flows from VBUS through Q1, Q2, the external inductor and Q4 to the BAT terminal.



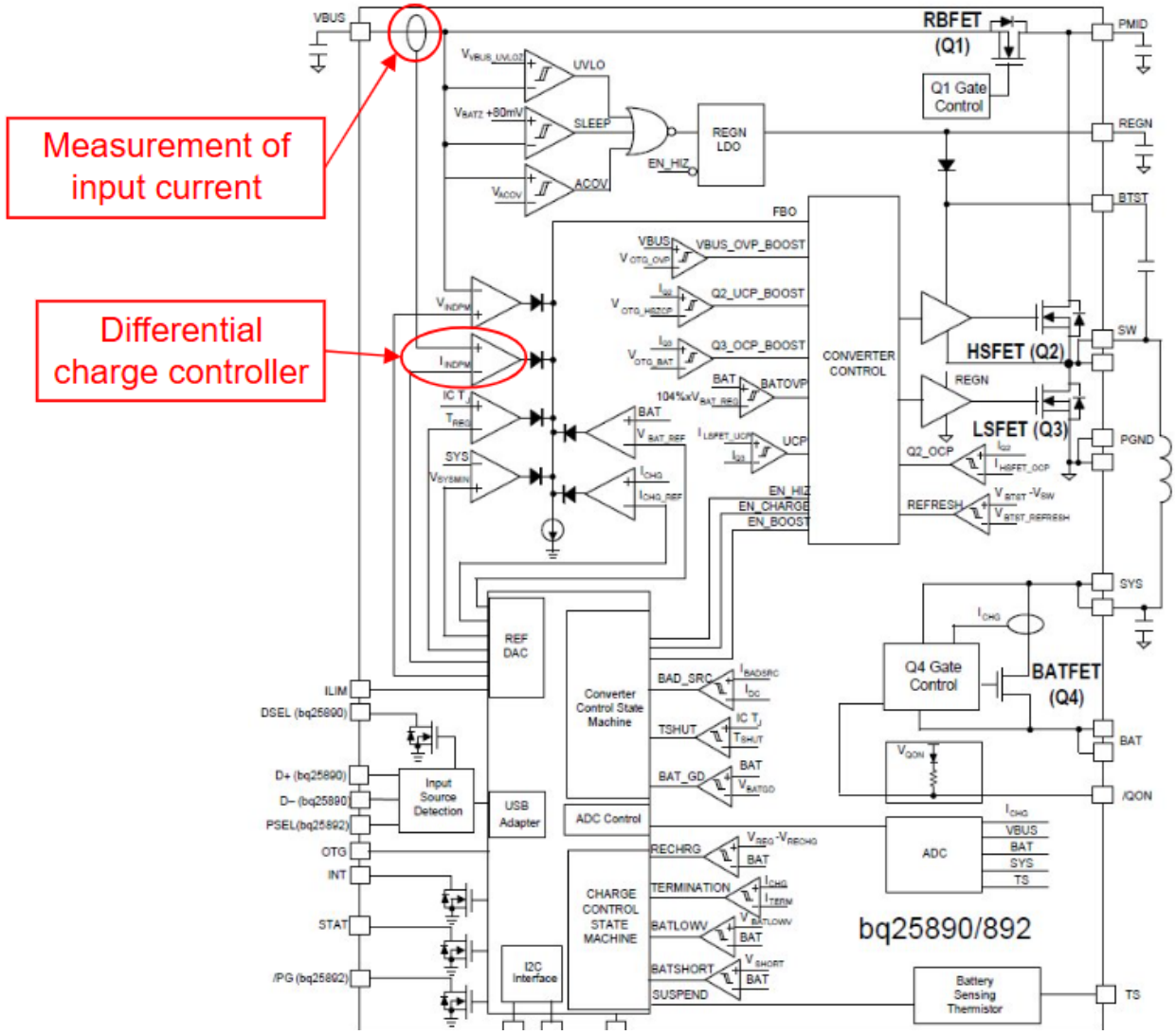
Id.

34. The Accused Products comprise a control unit, connected to the charge circuit, for controlling the charge current. For example, the bq25890 has a supply circuit, the supply circuit includes RBFET (Q1) and HSFET (Q2) which pass current from the VBUS terminal to the SW terminal.



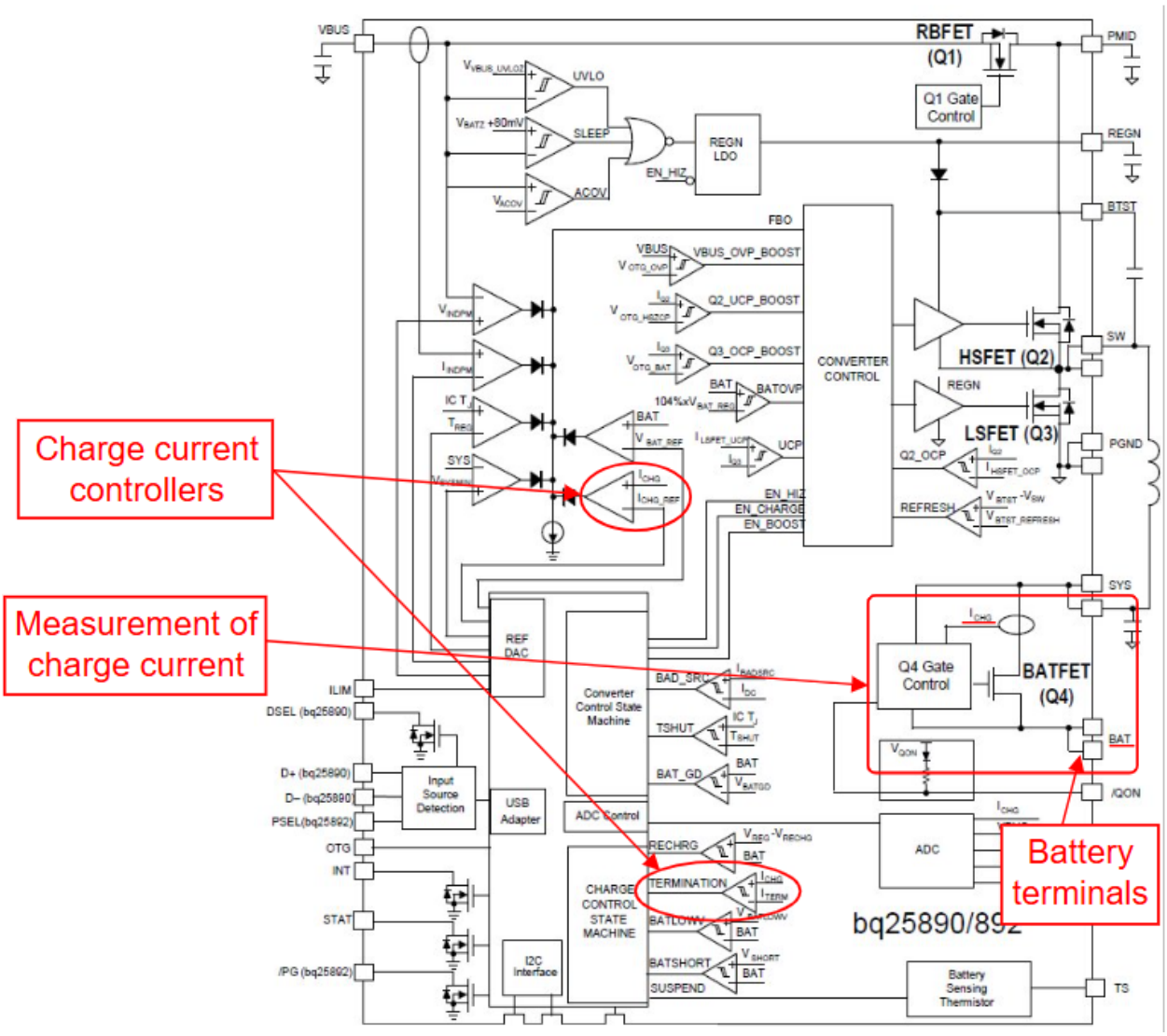
Id.

35. The Accused Products comprise a control unit which includes a differential charge controller for comparing the input current with a first threshold value and controlling the charge current according to a result of that comparison. For example, the bq25890 measures the input current and has a differential charge controller, as shown below. For example. the first threshold value is the input current limit, I_INDPM (Synonymous with I_INLIM).



Id. (Annotated).

36. The Accused Products comprise a control unit which includes a charge current controller for comparing the charge current with a second threshold value and controlling the charge current according to a result of that comparison. For example, the bq25890 contains two charge current controllers. For example, the second threshold value is the termination threshold I_TERM, in the constant voltage phase. For example, during the constant current charging, charge current is regulated at a specified value by comparing the charge current with that threshold value. For example, in the constant current phase, the second threshold is I_CNG_REF.



Id. (Annotated).

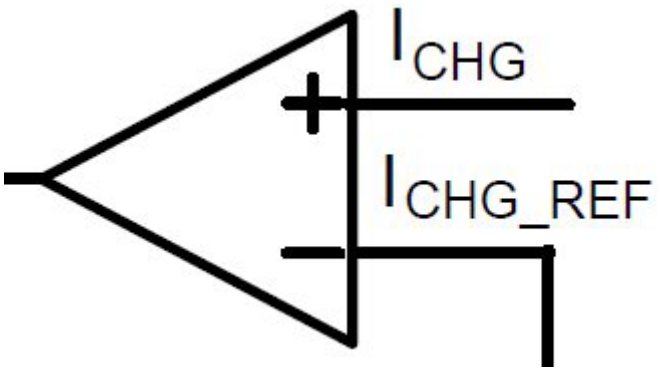
9.2.7.2 *Battery Charging Profile*

The device charges the battery in three phases: preconditioning, constant current and constant voltage. At the beginning of a charging cycle, the device checks the battery voltage and regulates current / voltage.

Table 6. Charging Current Setting

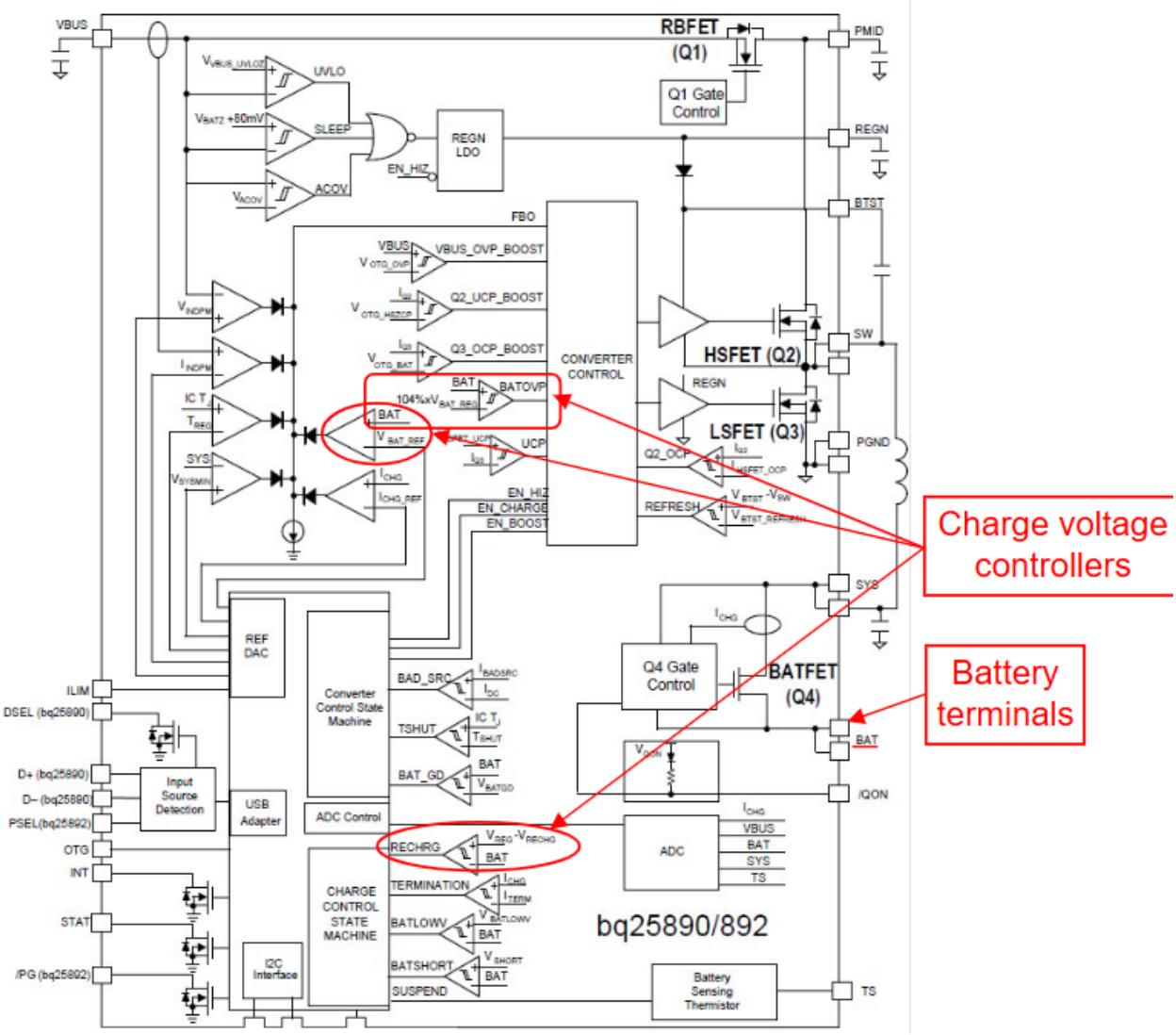
VBAT	CHARGING CURRENT	REG DEFAULT SETTING	CHRG_STAT
< 2 V	$I_{BATSHORT}$	–	01
2 V – 3 V	I_{PRECHG}	128 mA	01
> 3 V	I_{CHG}	2048 mA	10

Id. (Annotated).

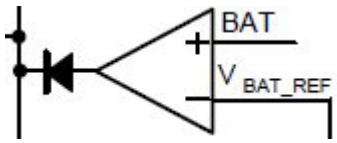


Id.

37. The Accused Products comprise a control unit which includes a charge voltage controller for comparing a charge voltage of the battery with a third threshold value and controlling the charge current according to a result of that comparison. For example, the bq25890 has charge voltage controllers. For example, in the bq25890 charge current is regulated to keep charge voltage constant by comparing the charge voltage with a set threshold voltage, VBAT_REF. For example, in the constant voltage phase, the third threshold is VBAT_REF.



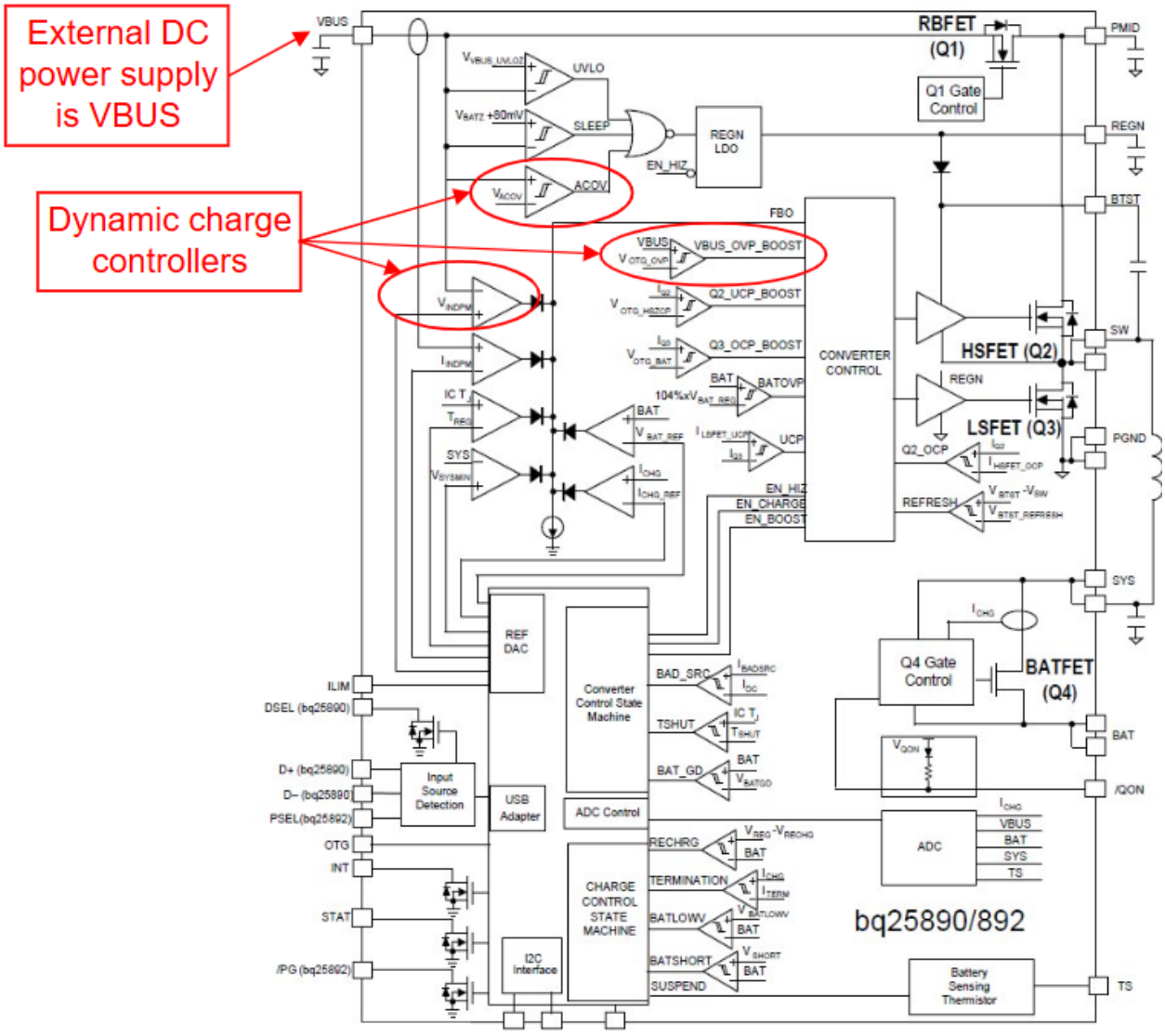
Id. (Annotated).



Id. (Annotated).

38. Accused Products comprise a control unit which includes a dynamic charge controller for comparing an input voltage from the external DC power supply with a fourth threshold value and controlling the charge current according to a result of that comparison. For example, the bq25890 has at least three dynamic charge controllers for comparing input voltage

with fourth threshold value V_INDPM.

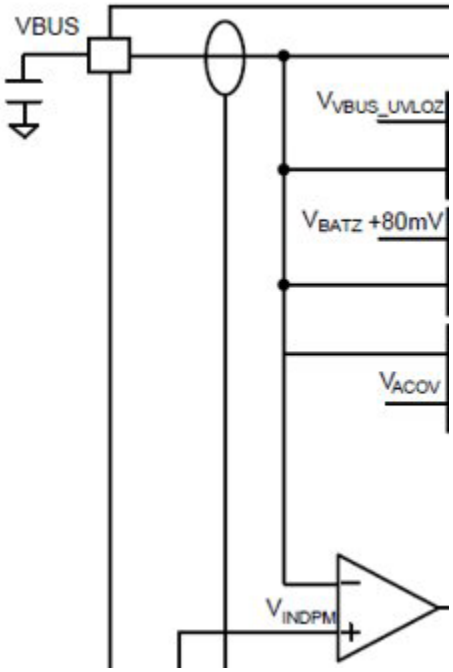


Id. (Annotated).

9.2.6.2 *Dynamic Power Management*

To meet maximum current limit in USB spec and avoid over loading the adapter, the device features Dynamic Power Management (DPM), which continuously monitors the input current and input voltage. When input source is over-loaded, either the current exceeds the input current limit (IINLIM or IDPM_LIM) or the voltage falls below the input voltage limit (VINDPM). The device then reduces the charge current until the input current falls below the input current limit and the input voltage rises above the input voltage limit.

Id. (Annotated).



Id. (Annotated).

39. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringed Claim 1 of the ’563 Patent.

40. Defendant has indirectly infringed one or more claims of the ’563 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement by others, such as Defendant’s customers and end-users, in this District and elsewhere in the United States. For example, Defendant’s customers and end-users 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 Accused Products. Defendant induced this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation. Because of Defendant’s inducement,

Defendant's customers and end-users used the Accused Products in a way Defendant intends and they directly infringed the '563 Patent. Defendant performed these affirmative acts 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 '563 Patent, but while remaining willfully blind to the infringement.

41. Defendant has indirectly infringed one or more claims of the '563 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as customers and end-users, in this District and elsewhere in the United States. Defendant's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others' use and manufacture of the Accused Products, such that the '563 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '563 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the '563 Patent. Defendant performed these affirmative acts with knowledge of the '563 Patent and with intent, or willful blindness, that they cause the direct infringement of the '563 Patent.

42. Defendant had actual notice that it was infringing the '563 Patent as of September 5, 2018.

43. Defendant is, and has been, on actual notice of the '563 Patent and it knowingly, willfully, and deliberately continues to infringe the '563 Patent. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

44. MRL has suffered damages as a result of Defendant's direct and indirect infringement of the '563 Patent in an amount to be proved at trial.

COUNT II
(Infringement of the '320 Patent)

45. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

46. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the '320 Patent.

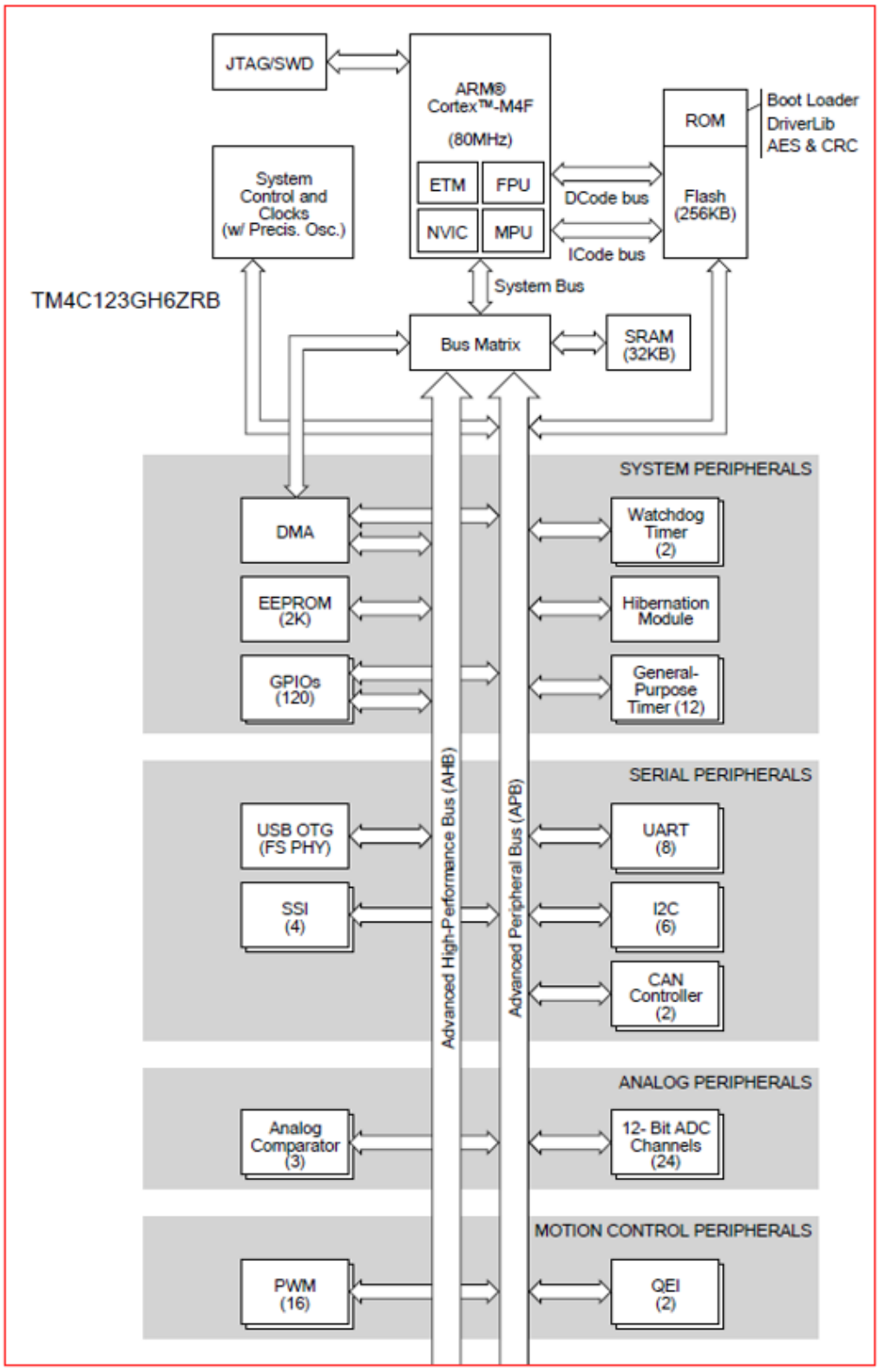
47. Defendant infringed, contributed to the infringement of, and/or induced infringement of the '320 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the '320 Patent including, but not limited to, at least the Accused Products.

48. Defendant has directly infringed the '320 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 '320 Patent. Upon information and belief, the Accused Products practice the methods and systems covered by the '320 Patent.

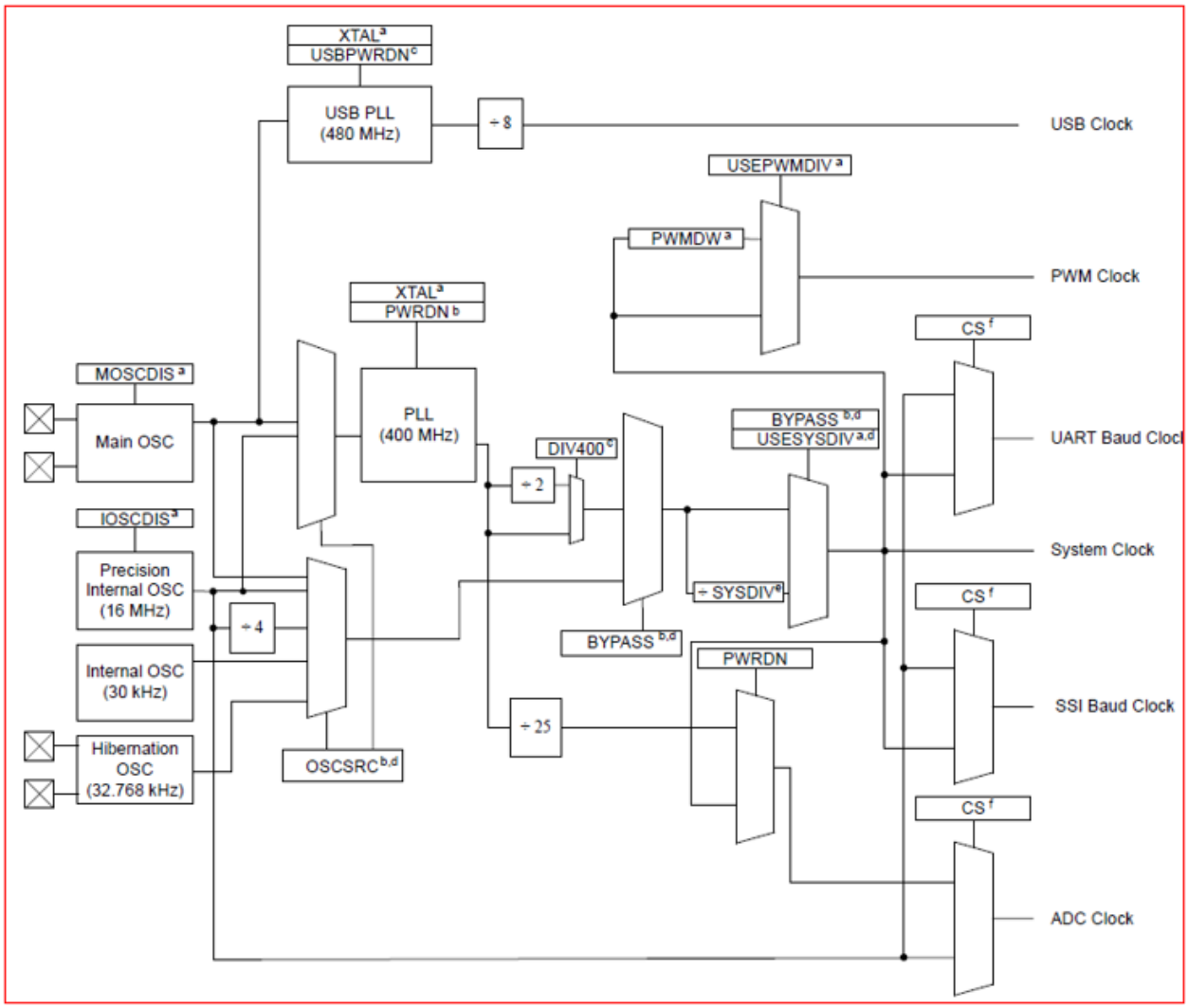
49. For example, Defendant has infringed at least Claim 1 of the '320 Patent by making, using, offering to sell, selling, and/or importing into the United States products that comprise a microcontroller having a microprocessor and programmable logic, a clock architecture comprising: a first internal clock oscillator circuit; an oscillator support circuit that functions as a clock oscillator when a crystal is coupled to said oscillator support circuit; a programmable switch for selectively switching a clock signal line between said first internal clock oscillator circuit and said oscillator support circuit, wherein said clock signal line is coupled to a circuit of said microcontroller; and a second internal clock oscillator circuit for providing a programmable

circuit, wherein said programmable circuit generates a plurality of programmable clock signals, one for said microprocessor.

50. The Accused Products are microcontrollers having a microprocessor and programmable logic, a clock architecture comprising: a first internal clock oscillator circuit. For example, the Tiva TM4C123GH6ZRB is a microcontroller, which contains a microprocessor (ARM CPU), is programmable, and comprises a first clock oscillator circuit (Precision Internal OSC), as shown below.



Source: https://www.ti.com/lit/ds/symlink/tm4c123gh6zrb.pdf (Annotated)



Id. (Annotated).

Precision Internal Oscillator (PIOSC). The precision internal oscillator is an on-chip clock source that is the clock source the microcontroller uses during and following POR. It does not require the use of any external components and provides a 16-MHz clock with ±1% accuracy with calibration and ±3% accuracy across temperature (see "PIOSC Specifications" on page 1436). The PIOSC allows for a reduced system cost in applications that require an accurate clock

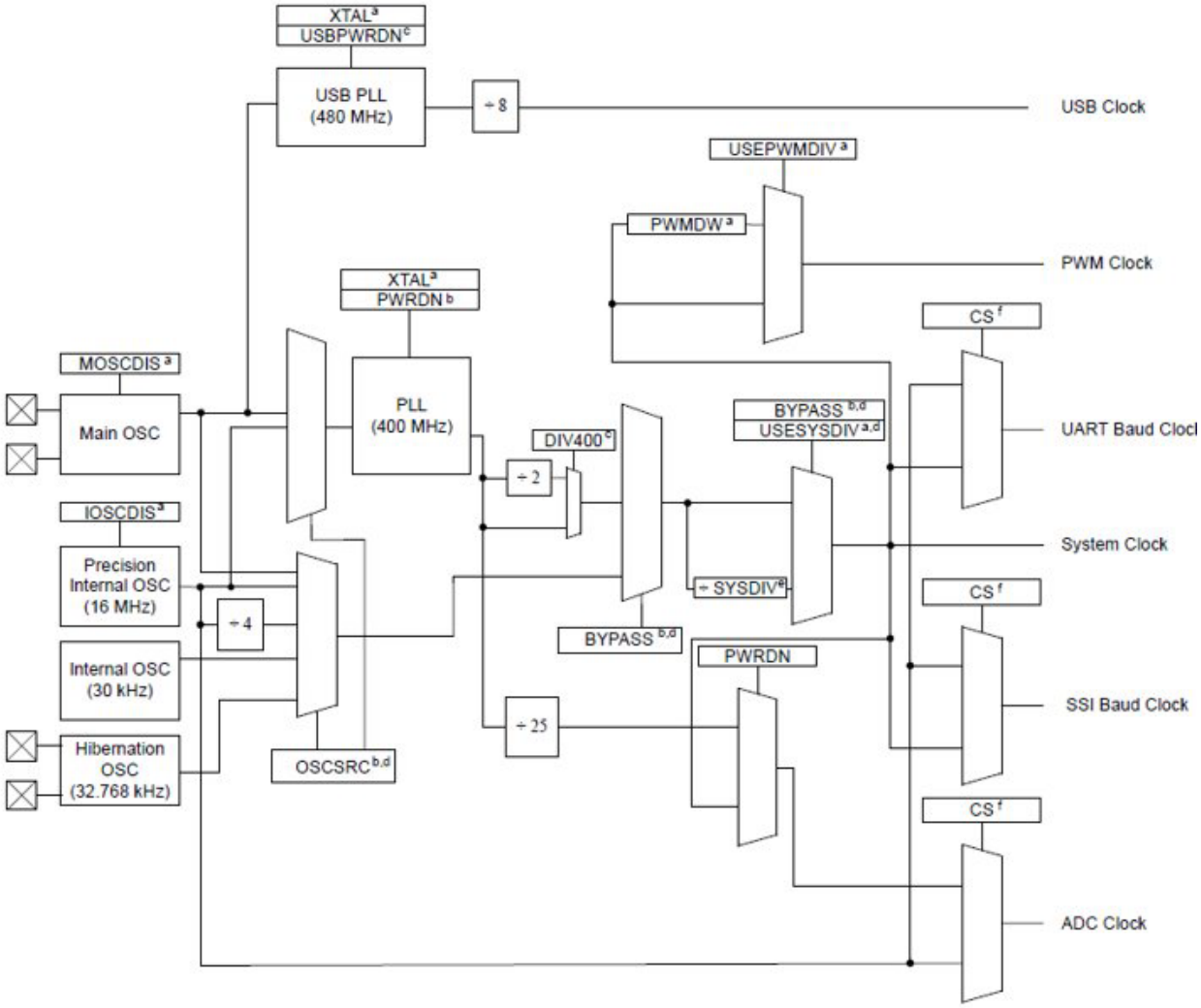
Id. (Annotated).

51. The Accused Products comprise an oscillator support circuit that functions as a clock oscillator when a crystal is coupled to said oscillator support circuit. For example, the Tiva TM4C123GH6ZRB contains a Main OSC which functions as a clock oscillator when a crystal is

coupled to it.

Main Oscillator (MOSC). The main oscillator provides a frequency-accurate clock source by one of two means: an external single-ended clock source is connected to the OSC0 input pin, or an external crystal is connected across the OSC0 input and OSC1 output pins. If the PLL is being

Id. (Annotated).



Id.

52. The Accused Products comprise a programmable switch for selectively switching a clock signal line between said first internal clock oscillator circuit and said oscillator support circuit, wherein said clock signal line is coupled to a circuit of said microcontroller. For example,

the Tiva TM4C123GH6ZRB contains a mux to select either the Main OSC or the Precision Internal OSC. For example, the mux is connected to the microcontroller circuits, as shown below.

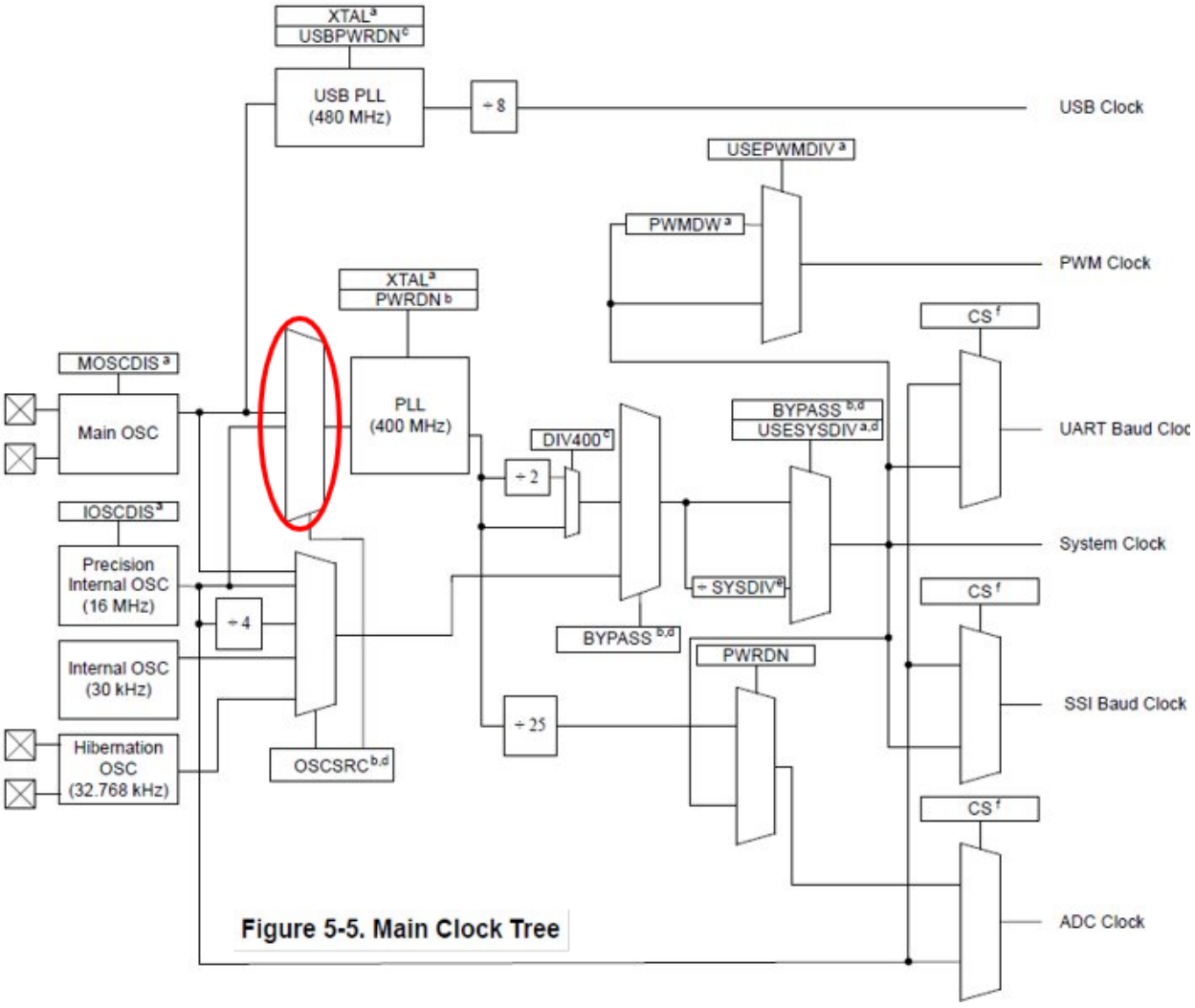


Figure 5-5. Main Clock Tree

Id. (Annotated).

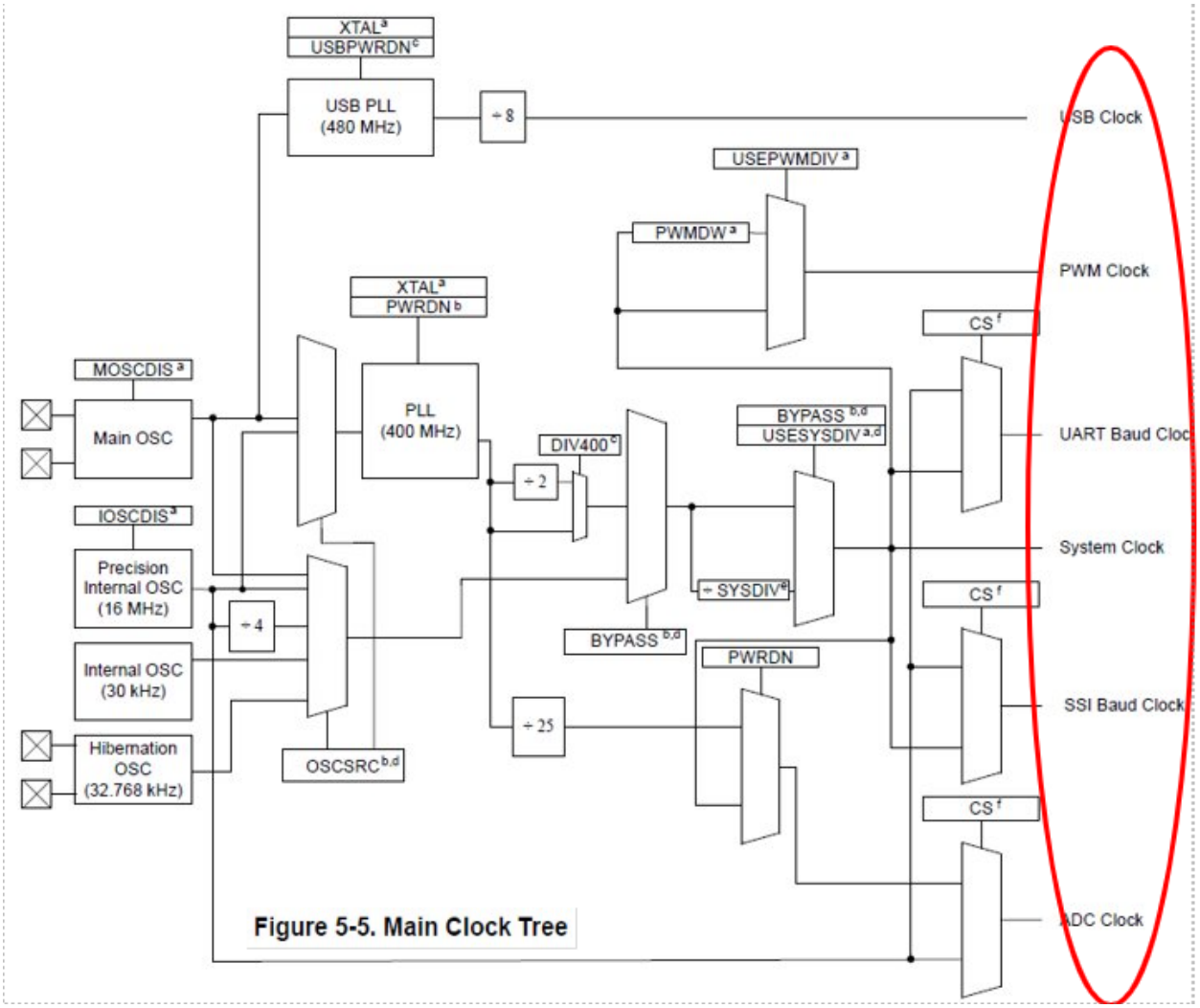


Figure 5-5. Main Clock Tree

Id. (Annotated).

53. The Accused Products comprise a second internal clock oscillator circuit for providing a programmable circuit, wherein said programmable circuit generates a plurality of programmable clock signals, one for said microprocessor. For example, the Tiva TM4C123GH6ZRB has a second internal clock oscillator circuit (the Internal OSC which is a Low-Fruquency Internal Oscillator). For example, the Tiva TM4C123GH6ZRB has a programmable circuit capable of generating a plurality of programmable clock signal, as the Tiva TM4C123GH6ZRB has "[m]ultiple clock sources for the microcontroller system clock."

Low-Frequency Internal Oscillator (LFIOSC). The low-frequency internal oscillator is intended for use during Deep-Sleep power-saving modes. The frequency can have wide variations; refer to "Low-Frequency Internal Oscillator (LFIOSC) Specifications" on page 1436 for more details. This

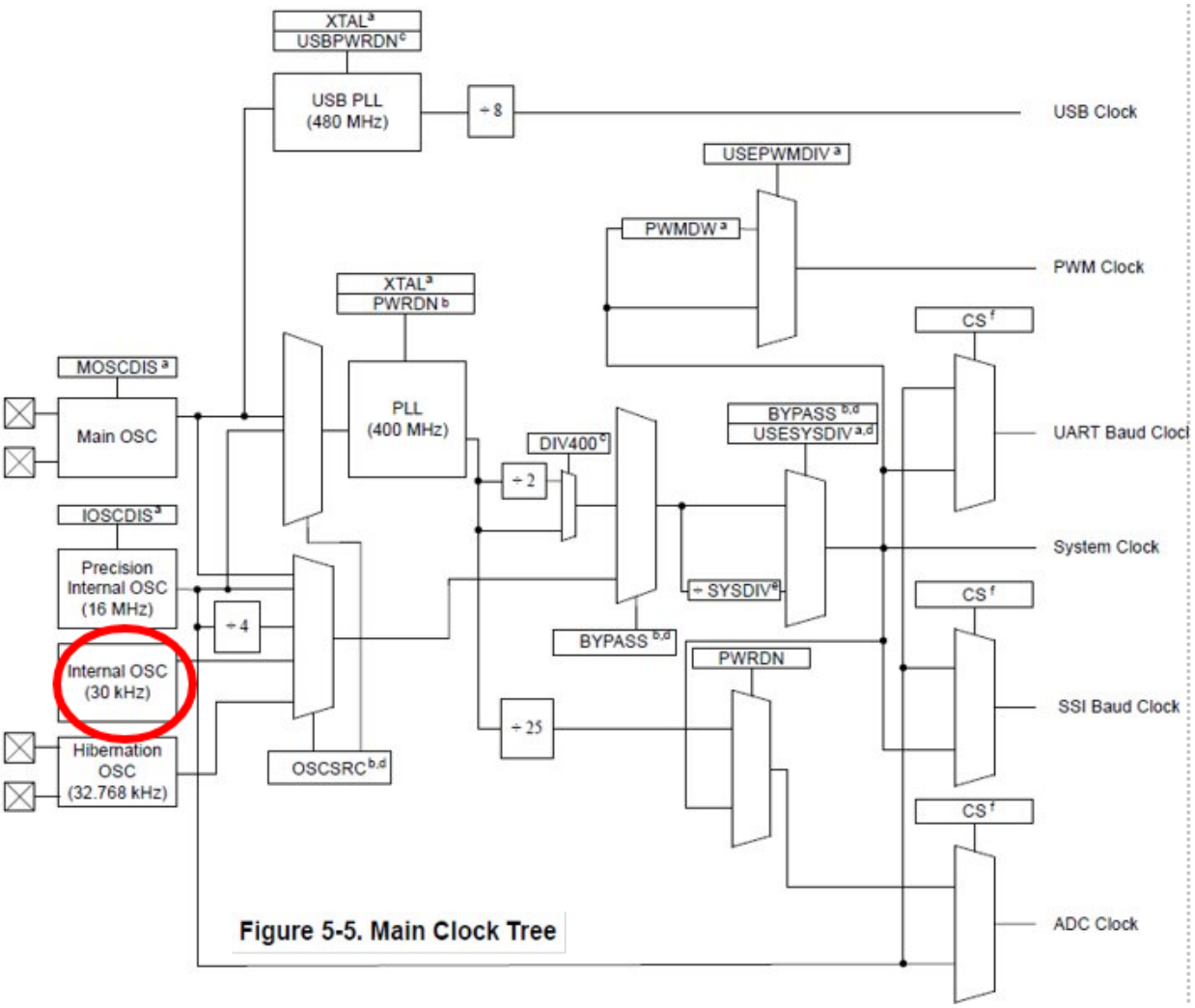


Figure 5-5. Main Clock Tree

Id. (Annotated).

- Multiple clock sources for microcontroller system clock. The following clock sources are provided to the TM4C1230C3PM microcontroller:
  - Precision Internal Oscillator (PIOSC) providing a 16-MHz frequency
    - 16 MHz ±3% across temperature and voltage
    - Can be recalibrated with 7-bit trim resolution to achieve better accuracy (16 MHz ±1%)
    - Software power down control for low power modes
  - Main Oscillator (MOSC): A frequency-accurate clock source by one of two means: an external single-ended clock source is connected to the `OSC0` input pin, or an external crystal is connected across the `OSC0` input and `OSC1` output pins.
  - Low Frequency Internal Oscillator (LFIOSC): On-chip resource used during power-saving modes

Id. (Annotated).

54. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringed Claim 1 of the '320 Patent.

55. Defendant has indirectly infringed one or more claims of the '320 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement by others, such as Defendant's customers and end-users, in this District and elsewhere in the United States. For example, Defendant's customers and end-users 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 Accused Products. Defendant induced this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation. Because of Defendant's inducement, Defendant's customers and end-users used the Accused Products in a way Defendant intends and they directly infringed the '320 Patent. Defendant performed these affirmative acts 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 '320 Patent, but while remaining willfully blind to the infringement.

56. Defendant has indirectly infringed one or more claims of the '320 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as customers and end-users, in this District and elsewhere in the United States. Defendant's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others' use and manufacture of the Accused Products, such that the '320 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '320 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the '320 Patent. Defendant performed these affirmative acts with knowledge of the '320 Patent and with intent, or willful blindness, that it causes the direct infringement of the '320 Patent.

57. Defendant had actual notice that it was infringing the '320 Patent as of September 5, 2018.

58. Defendant is, and has been, on actual notice of the '320 Patent and it knowingly, willfully, and deliberately continues to infringe the '320 Patent. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

59. MRL has suffered damages as a result of Defendant's direct and indirect infringement of the '320 Patent in an amount to be proved at trial.

COUNT III
(Infringement of the '264 Patent)

60. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

61. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the ’264 Patent.

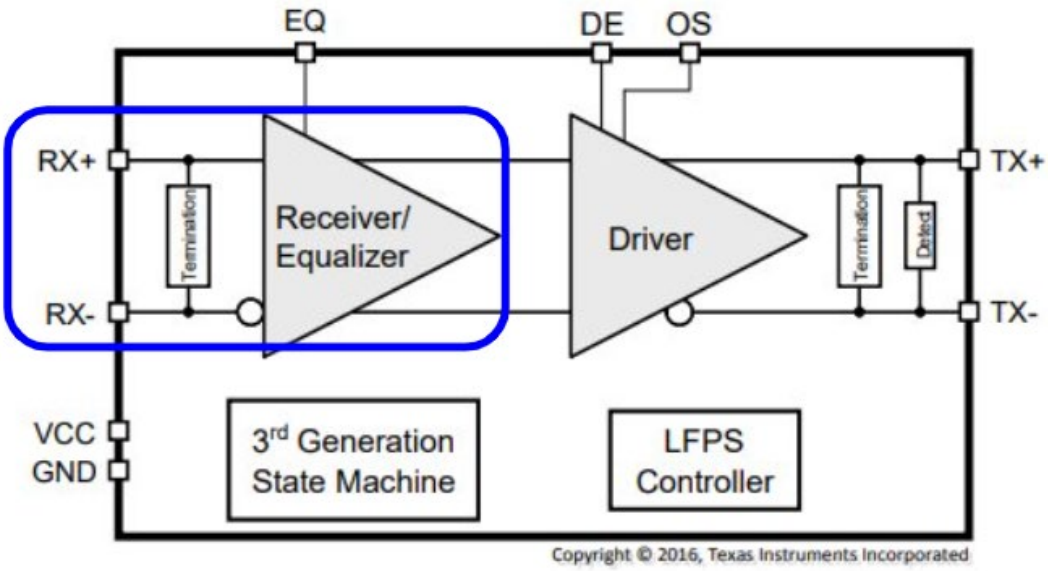
62. Defendant infringes, contributes to the infringement of, and/or induces infringement of the ’264 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the ’264 Patent including, but not limited to, at least the Accused Products.

63. Defendant has and continues to directly infringe the ’264 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 ’264 Patent. Upon information and belief, these products include the Accused Products that practice the methods and systems covered by the ’264 Patent.

64. For example, Defendant directly infringes at least Claim 1 of the ’264 Patent by making, using, offering to sell, selling, and/or importing into the United States products that practice a method comprising: receiving an input signal; determining an appropriate output voltage based on the input signal; determining a desired output voltage range based on the input signal; configuring an output driver to a first mode of operation to drive an output terminal to a first voltage within the desired output voltage range; and configuring the output driver to a second mode of operation to take place in response to the output terminal voltage reaching the first voltage within the desired output voltage range, wherein the output driver to drive the output terminal to a second voltage approximately equal to the appropriate output voltage.

65. The Accused Products practice a method comprising receiving an input signal. For example, the TUSB501-Q1 recieves an input signal, as evidenced by the reciever pictured below.

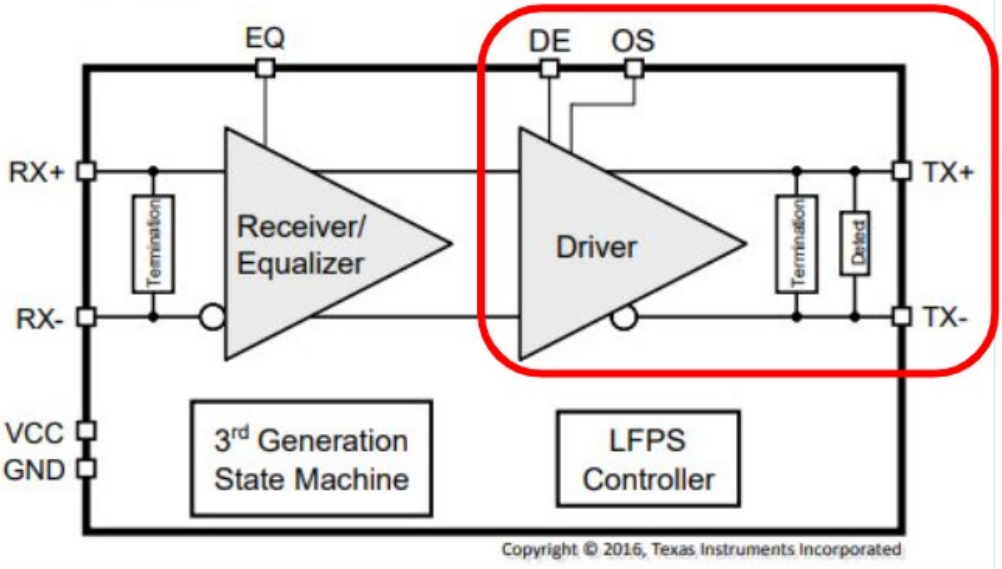
9.2 Functional Block Diagram



Source: https://www.ti.com/lit/ds/symlink/tusb501-q1.pdf (Annotated).

66. The Accused Products practice a method comprising determining an appropriate output voltage based on the input signal. For example, the TUSB501-Q1 has a differential drive with "output swing control."

9.2 Functional Block Diagram



Id. (Annotated)

9.3.2 De-Emphasis Control and Output Swing

The differential driver output provides selectable de-emphasis and output swing control in order to achieve USB3.0 compliance. The TUSB501-Q1 offers a unique way to adjust output de-emphasis and transmitter swing based on the OS and DE terminals. The level of de-emphasis required in the system depends on the channel length after the output of the re-driver.

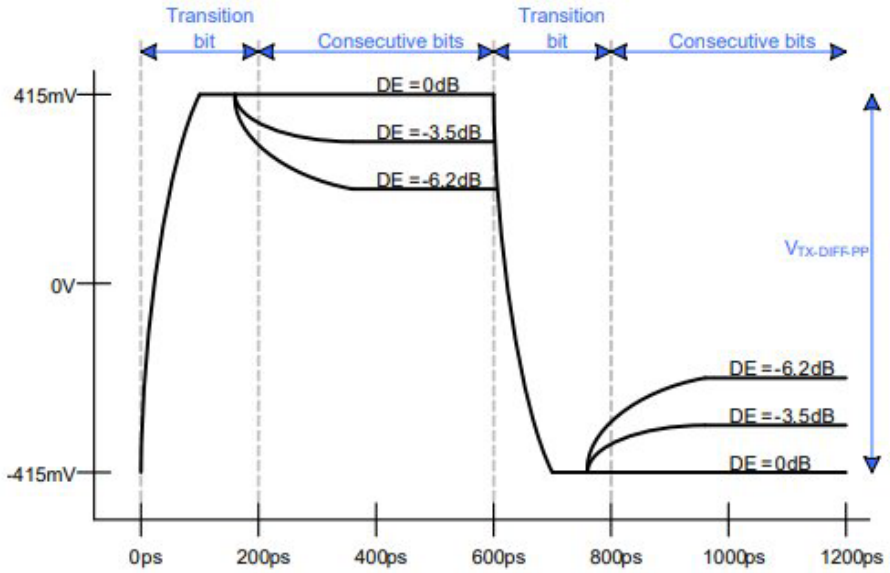


Figure 7. Transmitter Differential Voltage, OS = L

Id.

67. The Accused Products practice a method comprising determining a desired output voltage range based on the input signal. For example, the TUSB501-Q1 has a differential driver which takes input voltage and has an output swing which adjusts output voltage to "achieve USB3.0 compliance."

9.3.2 De-Emphasis Control and Output Swing

The differential driver output provides selectable de-emphasis and output swing control in order to achieve USB3.0 compliance. The TUSB501-Q1 offers a unique way to adjust output de-emphasis and transmitter swing based on the OS and DE terminals. The level of de-emphasis required in the system depends on the channel length after the output of the re-driver.

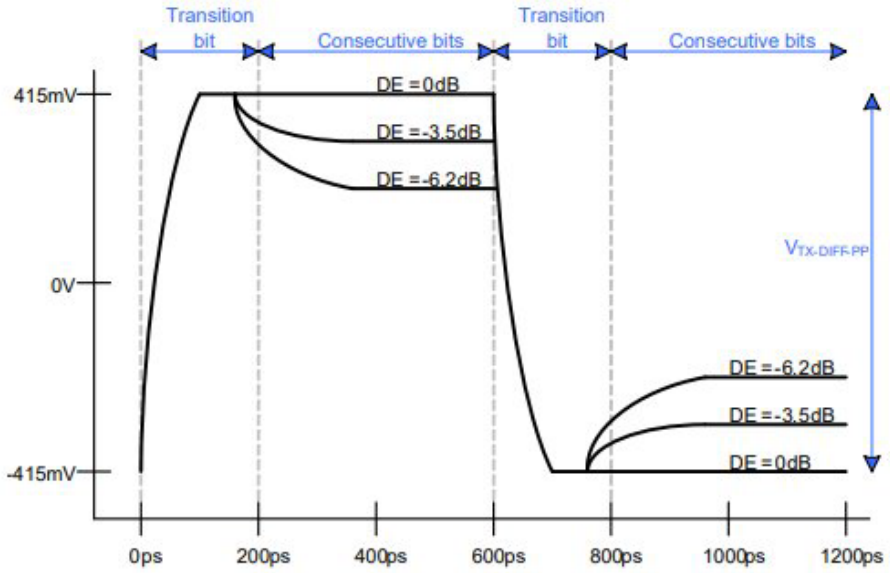


Figure 7. Transmitter Differential Voltage, OS = L

Id.

68. The Accused Products practice a method comprising configuring an output driver to a first mode of operation to drive an output terminal to a first voltage within the desired output voltage range. For example, the TUSB501-Q1 "supports configuration of . . . Output Swing," as shown below.

The device aggressive Low-Power Architecture operates at a 3.3-V power supply and achieves enhanced performance, as lower as 3 mW with no connection and 126 mW in active state. The receiver equalizer has three gain settings that are controlled by terminal EQ: 3 dB, 6 dB, and 9 dB. The equalization should be set based on amount of insertion loss in the channel before the TUSB501-Q1. Likewise, the output driver supports configuration of De-Emphasis and Output Swing (terminals DE and OS). The automatic LFPS De-Emphasis control further enables the system to be USB3.0 compliant. The TUSB501-Q1 operates over the industrial temperature range of -40°C to 85°C in a small 2 x 2 mm WSON package.

Table 1. Control Pin Effects (Typical Values)

PIN	DESCRIPTION	LOGIC STATE	GAIN
EQ	Equalization Amount	Low	3 dB
		Floating	6 dB
		High	9 dB

PIN	DESCRIPTION	LOGIC STATE	OUTPUT DIFFERENTIAL VOLTAGE FOR THE TRANSITION BIT
OS	Output Swing Amplitude	Low	930 mV_{pp}
		High	1300 mV_{pp}

PIN	DESCRIPTION	LOGIC STATE	DE-EMPHASIS RATIO	
			FOR OS = LOW	FOR OS = HIGH
DE	De-Emphasis Amount	Low	0 dB	–2.6 dB
		Floating	–3.5 dB	–5.9 dB
		High	–6.2 dB	–8.3 dB

Id. (Annotated)

69. The Accused Products practice a method comprising configuring the output driver to a second mode of operation to take place in response to the output terminal voltage reaching the first voltage within the desired output voltage range, wherein the output driver to drive the output terminal to a second voltage approximately equal to the appropriate output voltage. For example, the TUSB501-Q1 "supports configuration of De-Empasis," as shown below.

The device aggressive Low-Power Architecture operates at a 3.3-V power supply and achieves enhanced performance, as lower as 3 mW with no connection and 126 mW in active state. The receiver equalizer has three gain settings that are controlled by terminal EQ: 3 dB, 6 dB, and 9 dB. The equalization should be set based on amount of insertion loss in the channel before the TUSB501-Q1. Likewise, the output driver supports configuration of De-Emphasis and Output Swing (terminals DE and OS). The automatic LFPS De-Emphasis control further enables the system to be USB3.0 compliant. The TUSB501-Q1 operates over the industrial temperature range of -40°C to 85°C in a small 2 x 2 mm WSON package.

Table 1. Control Pin Effects (Typical Values)

PIN	DESCRIPTION	LOGIC STATE	GAIN
EQ	Equalization Amount	Low	3 dB
		Floating	6 dB
		High	9 dB

PIN	DESCRIPTION	LOGIC STATE	OUTPUT DIFFERENTIAL VOLTAGE FOR THE TRANSITION BIT
OS	Output Swing Amplitude	Low	930 mV_{pp}
		High	1300 mV_{pp}

PIN	DESCRIPTION	LOGIC STATE	DE-EMPHASIS RATIO (1)	
			FOR OS = LOW	FOR OS = HIGH
DE	De-Emphasis Amount	Low	0 dB	–2.6 dB
		Floating	–3.5 dB	–5.9 dB
		High	–6.2 dB	–8.3 dB

Id. (Annotated)

70. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringed Claim 1 of the ’264 Patent.

71. Defendant indirectly infringes one or more claims of the ’264 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement by others, such as Defendant’s customers and end-users, in this District and elsewhere in the United States. For example, Defendant’s customers and end-users 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 Accused Products. Defendant induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product

manuals, advertisements, and online documentation. Because of Defendant's inducement, Defendant's customers and end-users used the Accused Products in a way Defendant intends and they directly infringe the '264 Patent. Defendant performs these affirmative acts 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 '264 Patent, but while remaining willfully blind to the infringement.

72. Defendant indirectly infringes one or more claims of the '264 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as customers and end-users, in this District and elsewhere in the United States. Defendant's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others' use and manufacture of the Accused Products, such that the '264 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '264 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the '264 Patent. Defendant performs these affirmative acts with knowledge of the '264 Patent and with intent, or willful blindness, that they cause the direct infringement of the '264 Patent.

73. Defendant had actual notice that it was infringing the '264 Patent as of September 24, 2021.

74. Defendant is, and has been, on actual notice of the '264 Patent and it knowingly, willfully, and deliberately continues to infringe the '264 Patent. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

75. MRL has suffered damages as a result of Defendant's direct and indirect infringement of the '264 Patent in an amount to be proved at trial.

COUNT IV
(Infringement of the '554 Patent)

76. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

77. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the '554 Patent.

78. Defendant infringed, contributed to the infringement of, and/or induced infringement of the '554 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the '554 Patent including, but not limited to, at least the Accused Products.

79. Defendant has directly infringed the '554 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 '554 Patent. Upon information and belief, the Accused Products practice the methods and systems covered by the '554 Patent.

80. For example, Defendant directly infringe at least Claim 1 of the '554 Patent by making, using, offering to sell, selling, and/or importing into the United States products comprising: a communication engine configured to (i) transfer normal data over one or more data lines when in a first mode and (ii) receive programming data over said data lines when in a second mode; and a programming circuit configured to (i) receive said program data from said communication engine and (ii) write said program data to a memory.

81. The Accused Products comprise a communication engine configured to (i) transfer normal data over one or more data lines when in a first mode and (ii) receive programming data over said data lines when in a second mode. For example, the TUSB9261 has a communication engine ("USB 3.0 SuperSpeed" and "USB 2.0 High-Speed"), may transfer via the "USB Attached SCSI Protocol," and can also receive program data, as it supports "[f]irmware [u]pdate [v]ia USB."

8.1 Application Information

The device serves as a bridge between a downstream USB 3.0 host port and a SATA device such as a hard disk drive. A crystal or oscillator supplies the required clock source. A SPI flash device contains the firmware that is loaded into the TUSB9261 after the deassertion of RESET. Push buttons or any other desired logic can be connected to the TUSB9261 GPIO pins. The TUSB9261 can also output a pulse-width modulated signal that can be used to drive an activity LED.

8.2 Typical Application

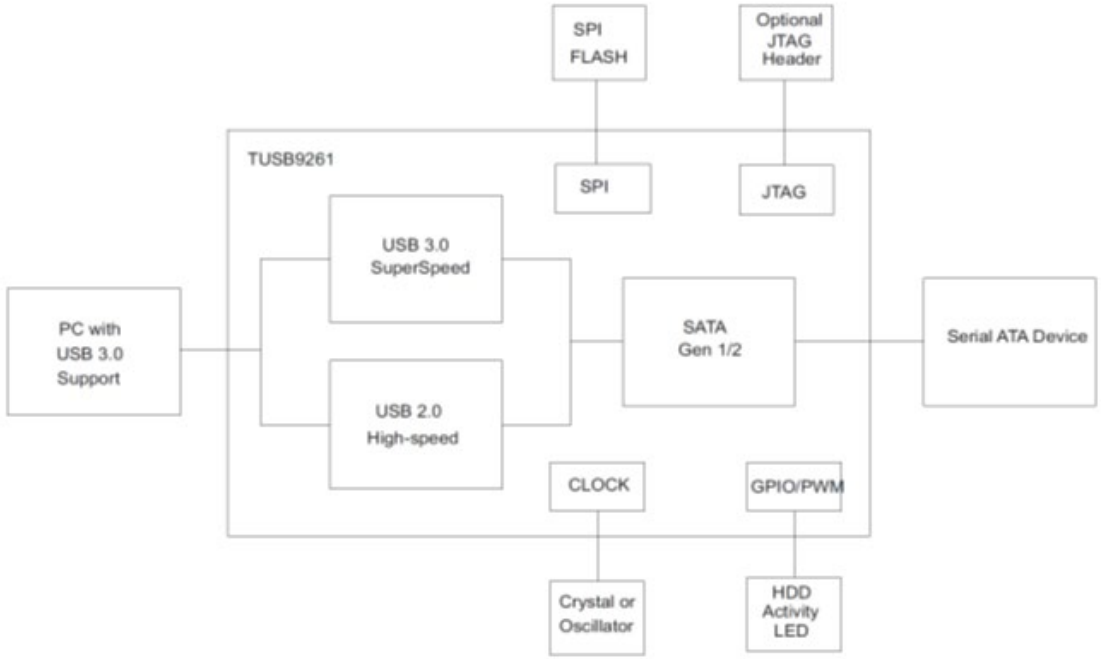
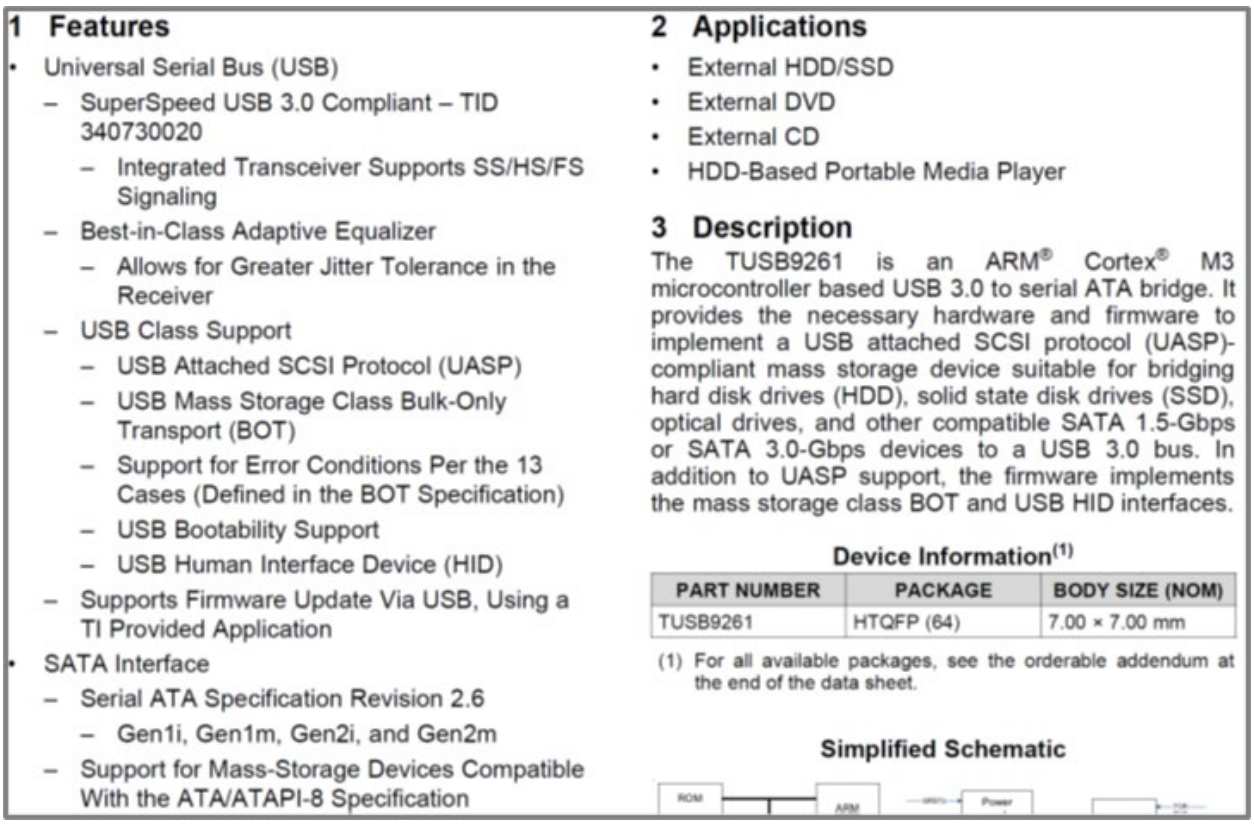


Figure 2. Typical Application Schematic

Source: https://www.ti.com/lit/ds/symlink/tusb9261.pdf



1 Features

- Universal Serial Bus (USB)
  - SuperSpeed USB 3.0 Compliant – TID 340730020
    - Integrated Transceiver Supports SS/HS/FS Signaling
  - Best-in-Class Adaptive Equalizer
    - Allows for Greater Jitter Tolerance in the Receiver
  - USB Class Support
    - USB Attached SCSI Protocol (UASP)
    - USB Mass Storage Class Bulk-Only Transport (BOT)
    - Support for Error Conditions Per the 13 Cases (Defined in the BOT Specification)
    - USB Bootability Support
    - USB Human Interface Device (HID)
  - Supports Firmware Update Via USB, Using a TI Provided Application
- SATA Interface
  - Serial ATA Specification Revision 2.6
    - Gen1i, Gen1m, Gen2i, and Gen2m
  - Support for Mass-Storage Devices Compatible With the ATA/ATAPI-8 Specification

2 Applications

- External HDD/SSD
- External DVD
- External CD
- HDD-Based Portable Media Player

3 Description

The TUSB9261 is an ARM® Cortex® M3 microcontroller based USB 3.0 to serial ATA bridge. It provides the necessary hardware and firmware to implement a USB attached SCSI protocol (UASP)-compliant mass storage device suitable for bridging hard disk drives (HDD), solid state disk drives (SSD), optical drives, and other compatible SATA 1.5-Gbps or SATA 3.0-Gbps devices to a USB 3.0 bus. In addition to UASP support, the firmware implements the mass storage class BOT and USB HID interfaces.

Device Information(1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TUSB9261	HTQFP (64)	7.00 × 7.00 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.

Simplified Schematic

Id.

82. The Accused Products comprise a programming circuit configured to (i) receive said program data from said communication engine and (ii) write said program data to a memory. For example, the TUSB9261 is capable of "in-circuit programming of the SPI Flash."

This document provides details on using the Flash Burner software with TUSB926x based devices. The software is a Windows-based tool allowing in-circuit programming of the SPI Flash via the universal serial bus (USB). A valid firmware file is necessary to properly use the TUSB926x device as a USB 3.0 to SATA bridge.

The term Flash Burner is equivalent to TUSB926x Flash Burner or Re-Programmer.

Source: https://e2e.ti.com/cfs-file/__key/communityserver-discussions-components-files/138/sllu125d.pdf

83. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringed Claim 1 of the '554 Patent.

84. Defendant has indirectly infringed one or more claims of the ’554 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement by others, such as Defendant’s customers and end-users, in this District and elsewhere in the United States. For example, Defendant’s customers and end-users 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 Accused Products. Defendant induced this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation. Because of Defendant’s inducement, Defendant’s customers and end-users used the Accused Products in a way Defendant intends and they directly infringed the ’554 Patent. Defendant performed these affirmative acts 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 ’554 Patent, but while remaining willfully blind to the infringement.

85. Defendant has indirectly infringed one or more claims of the ’554 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as customers and end-users, in this District and elsewhere in the United States. Defendant’s affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others’ use and manufacture of the Accused Products, such that the ’554 Patent is directly infringed by others. The accused components within the Accused Products are material to the

invention of the ’554 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the ’554 Patent. Defendant performed these affirmative acts with knowledge of the ’554 Patent and with intent, or willful blindness, that it causes the direct infringement of the ’554 Patent.

86. Defendant had actual notice that it was infringing the ’554 Patent as of September 5, 2018.

87. Defendant is, and has been, on actual notice of the ’554 Patent and it knowingly, willfully, and deliberately continues to infringe the ’554 Patent. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

88. MRL has suffered damages as a result of Defendant’s direct and indirect infringement of the ’554 Patent in an amount to be proved at trial.

COUNT V
(Infringement of the ’127 Patent)

89. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

90. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the ’127 Patent.

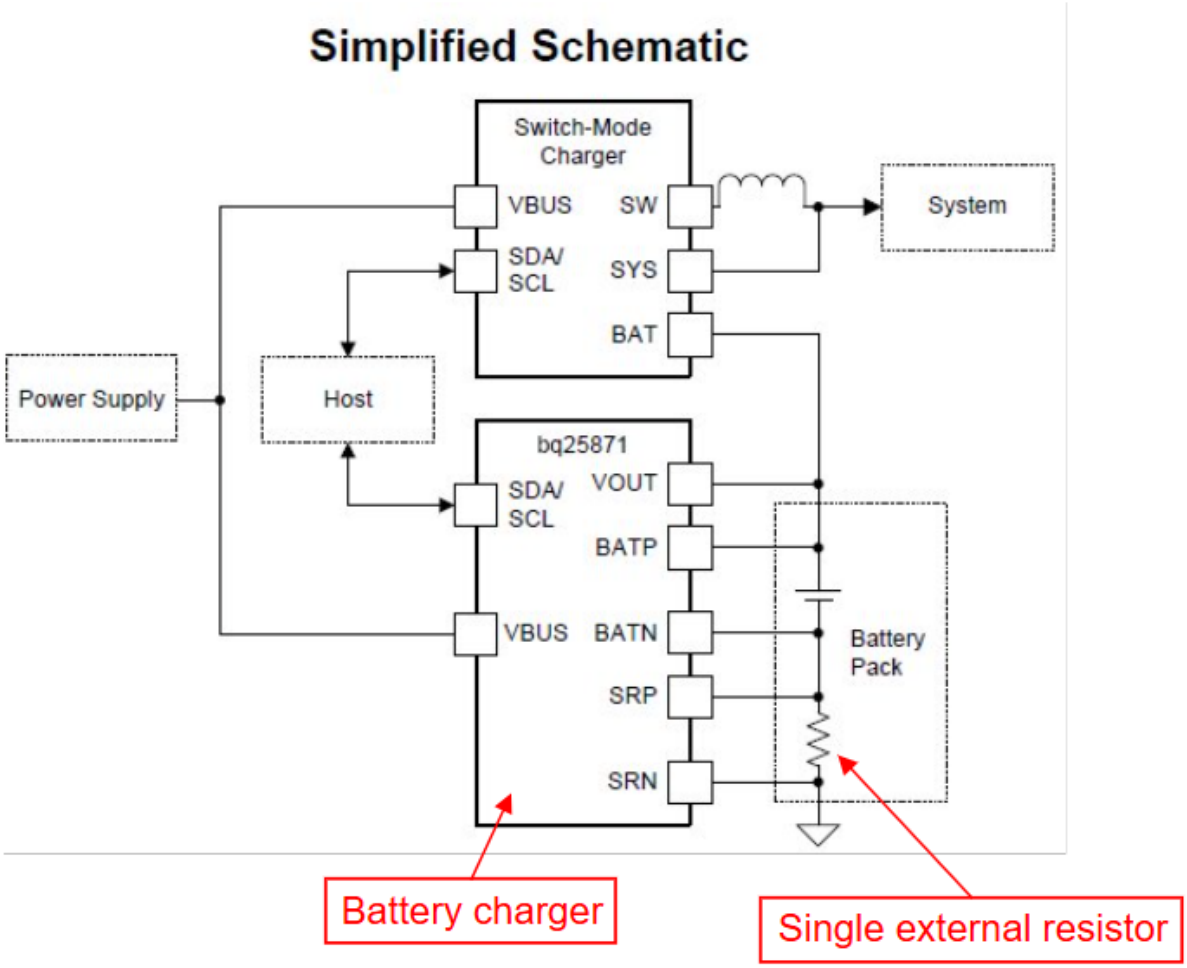
91. Defendant infringes, contributes to the infringement of, and/or induces infringement of the ’127 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the ’127 Patent including, but not limited to, at least the Accused Products.

92. Defendant has and continues to directly infringe the ’127 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

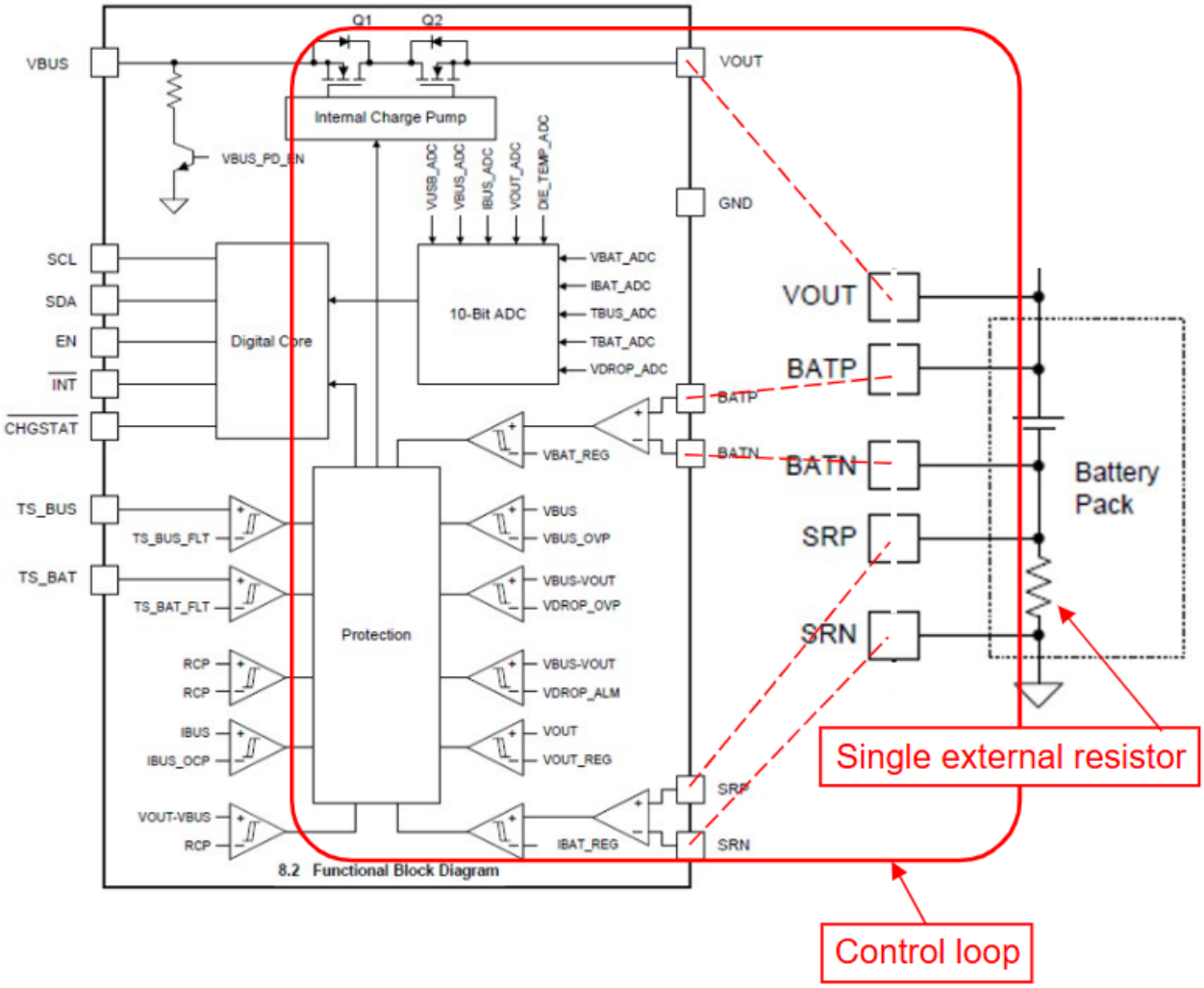
and every limitation of one or more claims of the ’127 Patent. Upon information and belief, these products include the Accused Products that practice the methods and systems covered by the ’127 Patent.

93. For example, Defendant has and continues to directly infringe at least Claim 1 of the ’127 Patent by making, using, offering to sell, selling, and/or importing into the United States products comprising: a battery charger control loop comprising a single external resistor, the loop is configured to set a battery charge current of a battery and monitor an over-current condition of the battery.

94. The Accused Products comprise a battery charger control loop comprising a single external resistor, the loop is configured to set a battery charge current of a battery and monitor an over-current condition of the battery, as shown below. For example, the bq25871 comprises a battery charger control loop comprising a single external resistor, the loop is configured to set a battery charge current of a battery and monitor an over-current condition of the battery, as shown below.



Source: https://www.ti.com/lit/ds/symlink/bq25871.pdf (Annotated).



8.2 Functional Block Diagram

Id. (Annotated)

8.3.5.4 IBAT and VBAT Protection

The device monitors current through the battery by monitoring the voltage across the external, series battery sense resistor. The differential voltage of this sense resistor is measured on SRP and SRN. A 10-mΩ series resistor is recommended for battery current monitoring. A lower resistor value can be used, but it will result in lower measurement accuracy. A higher resistor value can be used, but it will result in decreased charging efficiency.

When the IBAT_REG threshold is reached, the device will go into LDO mode to regulate the battery current at the IBAT_REG threshold. See LDO mode section for more details about the device operation during LDO mode. If the IBAT_OCP threshold is reached and IBAT_OCP protection has been enabled, the battery switch will be disabled within t_{OFF_FET} after a deglitch time of t_{IBAT_OCP} and CHG_EN is set to '0'. Host intervention is required to set CHG_EN to '1' to enable the battery switch again.

Id. (Annotated)

> The integrated 10-bit ADC can measure input voltage and current, battery voltage and current, as well as battery temperature and input connector temperature. This allows the user application to continuously monitor the power input and battery charging parameters to ensure the safety of the battery charging. The flexible OVP and OCP thresholds for VBUS, VOUT, and battery can be modified via I^2C registers as the battery goes through constant current (CC) and constant voltage (CV) mode.

Id. (Annotated)

95. Defendant has and continues to indirectly infringe one or more claims of the '127 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement by others, such as Defendant's customers and end-users, in this District and elsewhere in the United States. For example, Defendant's customers and end-users 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 Accused Products. Defendant induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation. Because of Defendant's inducement, Defendant's customers and end-users use the Accused Products in a way Defendant intends and they directly infringe the '127 Patent. Defendant performs these affirmative acts 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 '127 Patent, but while remaining willfully blind to the infringement. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringes Claim 1 of the '127 Patent.

96. Defendant has and continues to indirectly infringe one or more claims of the '127 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as customers and end-users, in this District and elsewhere in the United States. Defendant's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others' use and manufacture of the Accused Products, such that the '127 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '127 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the '127 Patent. Defendant performs these affirmative acts with knowledge of the '127 Patent and with intent, or willful blindness, that they cause the direct infringement of the '127 Patent.

97. Defendant had actual notice that it was infringing the '127 Patent as of September 5, 2018.

98. Defendant is, and seen, on actual notice of the '127 Patent and it knowingly, willfully, and deliberately continues to infringe the '127 Patent. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

99. MRL has suffered damages as a result of Defendant's direct and indirect infringement of the '127 Patent in an amount to be proved at trial.

100. MRL has suffered, and will continue to suffer, irreparable harm as a result of Defendant's infringement of the '127 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

COUNT VI
(Infringement of the '873 Patent)

101. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

102. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the '873 Patent.

103. Defendant infringes, contributes to the infringement of, and/or induces infringement of the '873 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the '873 Patent including, but not limited to, at least the Accused Products.

104. Defendant has and continues to directly infringe the '873 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 '873 Patent. Upon information and belief, these products include the Accused Products that practice the methods and systems covered by the '873 Patent.

105. For example, Defendant has and continues to directly infringe at least Claim 1 of the '873 Patent by making, using, offering to sell, selling, and/or importing into the United States products comprising a power supply apparatus comprising: a first switch provided between an inductor and a terminal to which a reference voltage is applied; a second switch provided between the inductor and an output terminal; a first comparator circuit that compares an input voltage with a first comparison voltage; a signal generating circuit that outputs a frequency signal according to an output from the first comparator circuit; and a first control circuit that controls the first and second switches based on an output from the signal generating circuit to control an electrical current flowing into the inductor.

106. The Accused Products are power sources. For example, the TPS61022 8-A Boost converter (the "TPS61022") is "a power supply solution."

3 Description

The TPS61022 provides a power supply solution for portable equipment and IoT devices powered by various batteries and super capacitors. The TPS61022 has minimum 6.5-A valley switch current limit over full temperature range. With a wide input voltage range of 0.5 V to 5.5 V, the TPS61022 supports supercapacitor backup power applications, which may deeply discharge the supercapacitor.

Source: https://biakom.com/pdf/tps61022.pdf

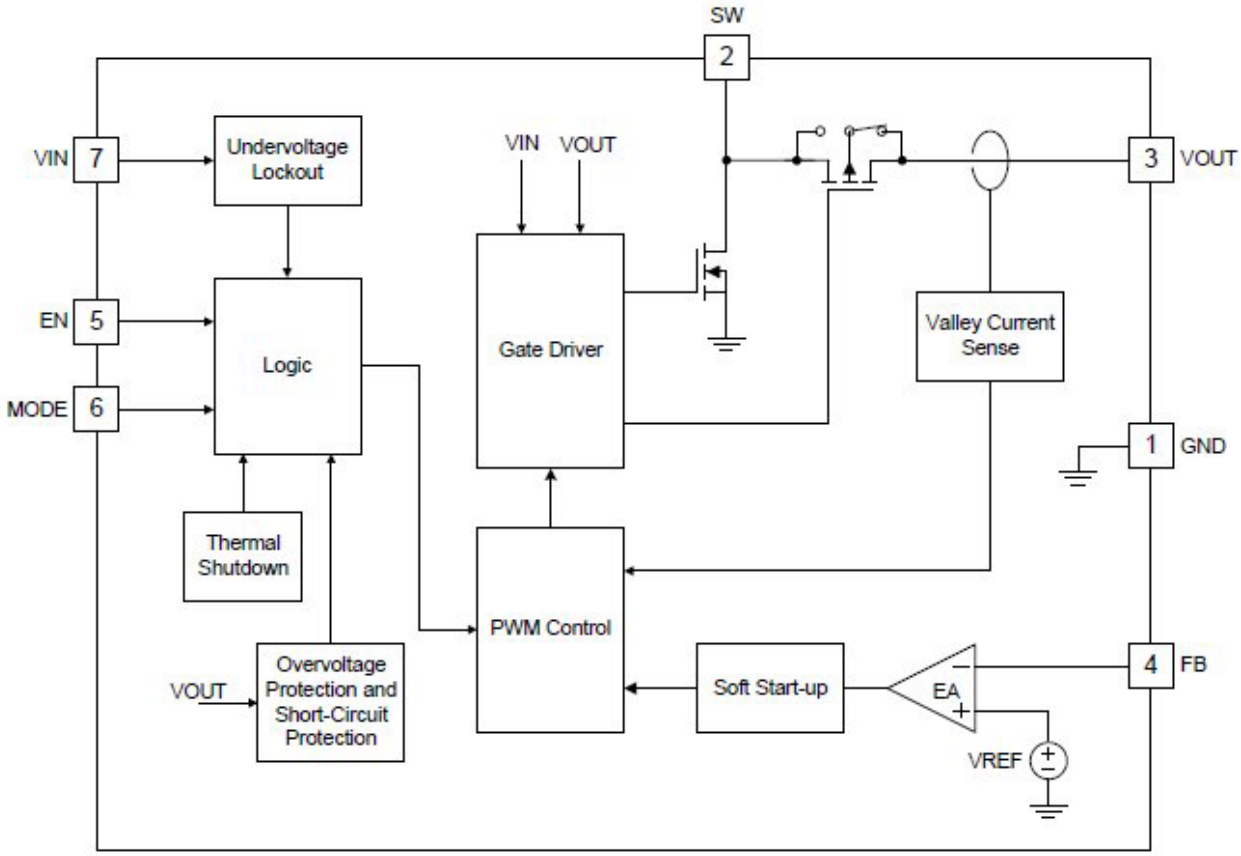
107. The Accused Products comprise a first switch provided between an inductor and a terminal to which a reference voltage is applied. For example, the TPS61022 has a switch pin "SW" which connects to an inductor, and a ground pin "GND" which connects it to reference voltage. For example, the TPS61022 has a switch between GND and SW.

Pin Functions

PIN		I/O	DESCRIPTION
NO.	NAME		
1	GND	PWR	Ground pin of the IC
2	SW	PWR	The switch pin of the converter. It is connected to the drain of the internal low-side power MOSFET and the source of the internal high-side power MOSFET.
3	VOUT	PWR	Boost converter output
4	FB	I	Voltage feedback of adjustable output voltage.
5	EN	I	Enable logic input. Logic high voltage enables the device. Logic low voltage disables the device and turns it into shutdown mode.
6	MODE	I	Operation mode selection in the light load condition. When it is connected to logic high voltage, the device works in forced PWM mode. When it is connected to logic low voltage, the device works in auto PFM mode.
7	VIN	I	IC power supply input

Id.

7.2 Functional Block Diagram



Id.

108. The Accused Products comprise a second switch provided between the inductor and an output terminal. For example, the TPS61022 has an output terminal, "VOUT," and a switch between SW and VOUT, as shown above.

109. The Accused Products comprise a first comparator circuit that compares an input voltage with a first comparison voltage. For example, the TPS61022 compares input voltage with a comparison voltage, as the TPS61022 "operates at 1-MHz switching frequency when the input voltage is above 1.5V the switch frequency decreases gradually to 0.6 MHz when the input voltage is below 1.5V."

> The TPS61022 operates at 1-MHz switching frequency when the input voltage is above 1.5 V. the switching frequency decreases gradually to 0.6 MHz when the input voltage is below 1.5 V down to 1 V. A MODE pin sets the TPS61022 operating either in power-save mode or forced PWM mode in light load condition. The TPS61022 only consumes a 26-µA quiescent current from V_{OUT} in light load condition. During shutdown, the load is completely disconnected from the input power. The TPS61022 has 5.7-V output overvoltage protection, output short-circuit protection, and thermal shutdown protection.

Id.

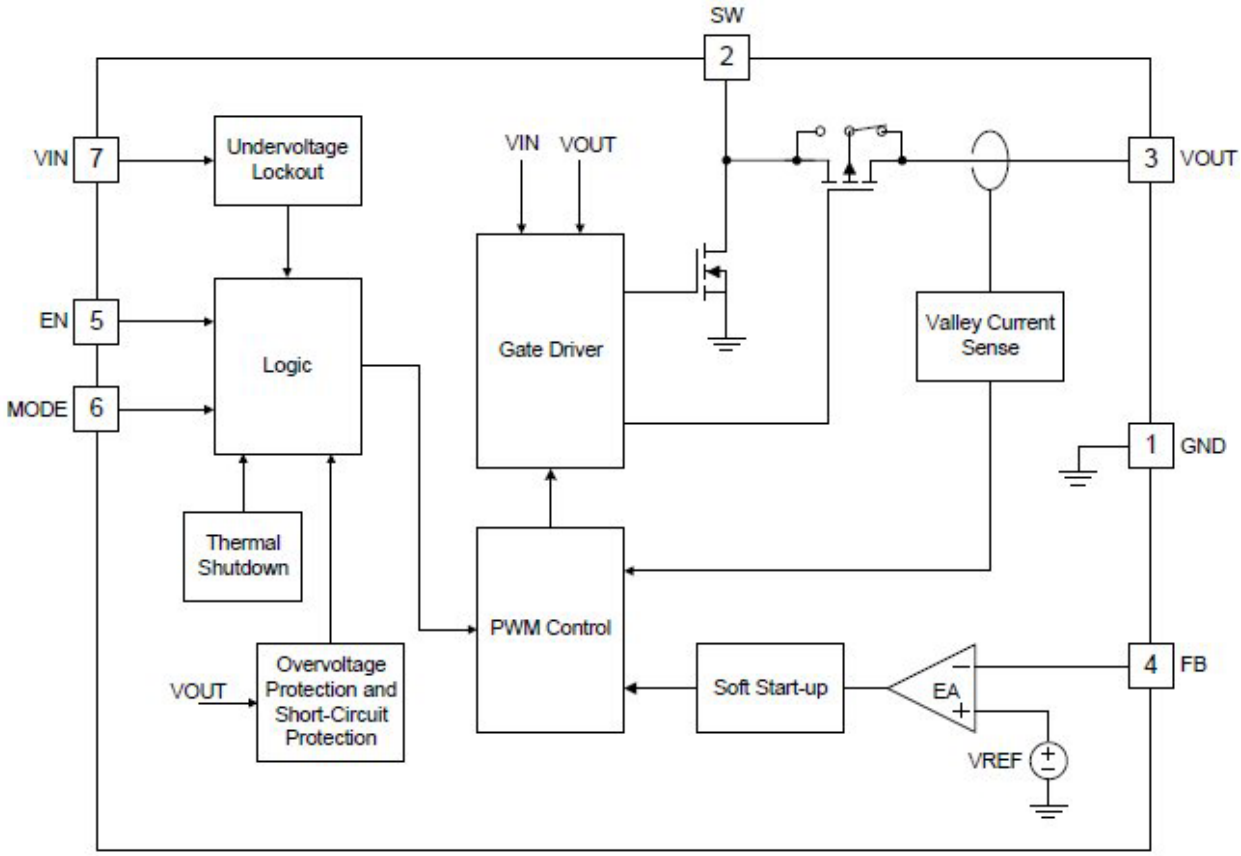
110. The Accused Products comprise a signal generating circuit that outputs a frequency signal according to an output from the first comparator circuit. For example, the TPS61022 "operates at 1-MHz switching frequency when the input voltage is above 1.5V the switch frequency decreases gradually to 0.6 MHz when the input voltage is below 1.5V."

> The TPS61022 operates at 1-MHz switching frequency when the input voltage is above 1.5 V. the switching frequency decreases gradually to 0.6 MHz when the input voltage is below 1.5 V down to 1 V. A MODE pin sets the TPS61022 operating either in power-save mode or forced PWM mode in light load condition. The TPS61022 only consumes a 26-µA quiescent current from V_{OUT} in light load condition. During shutdown, the load is completely disconnected from the input power. The TPS61022 has 5.7-V output overvoltage protection, output short-circuit protection, and thermal shutdown protection.

Id.

111. The Accused Products comprise a first control circuit that controls the first and second switches based on an output from the signal generating circuit to control an electrical current flowing into the inductor. For example, the TPS61022's first and second switches are controlled by the PWM Controller using the Gate Driver to drive the switches and with the Logic, Soft Start-up and Valley Current Sense functions as inputs to the PWM Controller.

7.2 Functional Block Diagram



Id.

112. Defendant has and continues to indirectly infringe one or more claims of the '873 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement by others, such as Defendant's customers and end-users, in this District and elsewhere in the United States. For example, Defendant's customers and end-users 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 Accused Products. Defendant induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the

Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation. Because of Defendant's inducement, Defendant's customers and end-users use the Accused Products in a way Defendant intends and they directly infringe the '873 Patent. Defendant performs these affirmative acts 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 '873 Patent, but while remaining willfully blind to the infringement. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringes Claim 1 of the '873 Patent.

113. Defendant has and continues to indirectly infringe one or more claims of the '873 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as customers and end-users, in this District and elsewhere in the United States. Defendant's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others' use and manufacture of the Accused Products, such that the '873 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '873 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the '873 Patent. Defendant performs these affirmative acts with knowledge of the '873 Patent and with intent, or willful blindness, that it causes the direct infringement of the '873 Patent.

114. Defendant had actual notice that it was infringing the '873 Patent as of September 24, 2021.

115. Defendant is, and has been, on actual notice of the ’873 Patent and it knowingly, willfully, and deliberately continues to infringe the ’873 Patent. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

116. MRL has suffered damages as a result of Defendant’s direct and indirect infringement of the ’873 Patent in an amount to be proved at trial.

117. MRL has suffered, and will continue to suffer, irreparable harm as a result of Defendant’s infringement of the ’873 Patent, for which there is no adequate remedy at law, unless Defendant’s infringement is enjoined by this Court.

COUNT VII
(Infringement of the ’887 Patent)

118. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

119. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the ’887 Patent.

120. Defendant infringes, contributes to the infringement of, and/or induces infringement of the ’887 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the ’887 Patent including, but not limited to, at least the Accused Products.

121. Defendant has and continues to directly infringe the ’887 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 ’887 Patent. Upon information and belief, these products include the Accused Products that practice the methods and systems covered by the ’887 Patent.

122. For example, Defendant has and continues to directly infringe at least Claim 6 of the ’887 Patent by making, using, offering to sell, selling, and/or importing into the United States products that comprise a microcomputer comprising: a normal circuit, the normal circuit including a CPU; a backup system circuit having a separate power supply from the normal circuit; and a power supply circuit for switching to a first, a second, a third, and a fourth state, and the switching is based on a combination of logic for a normal circuit power control signal for controlling power supplied to the normal circuit and a backup circuit power control signal for controlling power supplied to the backup system circuit, wherein in the first state when the normal circuit power control signal and the backup circuit power control signal are inactive, voltage is supplied to neither the normal circuit nor the backup system circuit, wherein in the second state when the normal circuit power control signal is active and the backup circuit power control signal is inactive, the primary power supply voltage is supplied to the normal circuit and the secondary power supply voltage is supplied to the backup system circuit, wherein in the third state when the normal circuit power control signal is inactive and the backup circuit power control signal is active, voltage is not supplied to the normal circuit and the secondary power supply voltage is supplied to the backup system circuit, and wherein in the fourth state when the normal circuit power control signal and the backup circuit power control signal are active, the primary power supply voltage is supplied to both the normal circuit and the backup system circuit.

123. The Accused Products comprise a microcomputer comprising: a normal circuit, the normal circuit including a CPU. For example, the AM65x series is a system on chip (SoC) containing an ARM processor.

Device Overview

The AM65x and DRA80xM SoCs are part of the K3 Multicore SoC architecture platform. The AM65x SoC is targeted for broad market, and industrial control, while the DRA80xM is targeted for automotive applications. These SoCs aim to meet the complex processing needs of modern embedded products. They are designed as a low power, high performance and highly integrated device architecture, adding significant enhancement on processing power, graphics capability, video and imaging processing, virtualization and coherent memory support. In addition, these SoCs support state of art security and functional safety features.

Source: https://www.ti.com/lit/ug/spruid7e/spruid7e.pdf

1.3.1 ARM Cortex-A53 Subsystem

The integrated 64-bit Arm Cortex-A53 subsystem (CC_ARMSS) supports the following main features:

- Two instances of dual-core Cortex-A53 MPCore processors (CC_ARMSS0 and CC_ARMSS1), each with L1 memory system and a single shared L2 cache
- Full Arm®v8-A architecture compliancy
- Advanced Single Instruction Multiple Data (SIMD) and floating point extension (Arm® Neon™)
- Floating-Point Unit (FPU) VFPv4
- Armv8 Cryptography Extensions
- Arm General Interrupt Controller (GICv3) architecture
- In-order pipeline with symmetric dual-issue of most instructions
- 32KB program and 32KB data Level 1 (L1) Cache
- 512KB shared Level 2 (L2) Cache
- Support for up to four timers within each Cortex-A53 core
- Arm® CoreSight™ Debug and Trace Architecture
- ECC protection for L1 data cache and L2 Cache
- Parity protection for L1 Instruction Cache
- 256-bit wide, synchronous or asynchronous VBUSM.C master interface
- Dedicated RTI windowed watchdog timer per core
- Support for Big-Endian (BE) and Little-Endian (LE) at core level
- Interface with Arm GIC-500 Interrupt Controller (SoC level, not part of CC_ARMSS)
- Advanced power management for low power optimization

The CC_ARMSS is also referred to as Arm CorePac and A53SS.

Id.

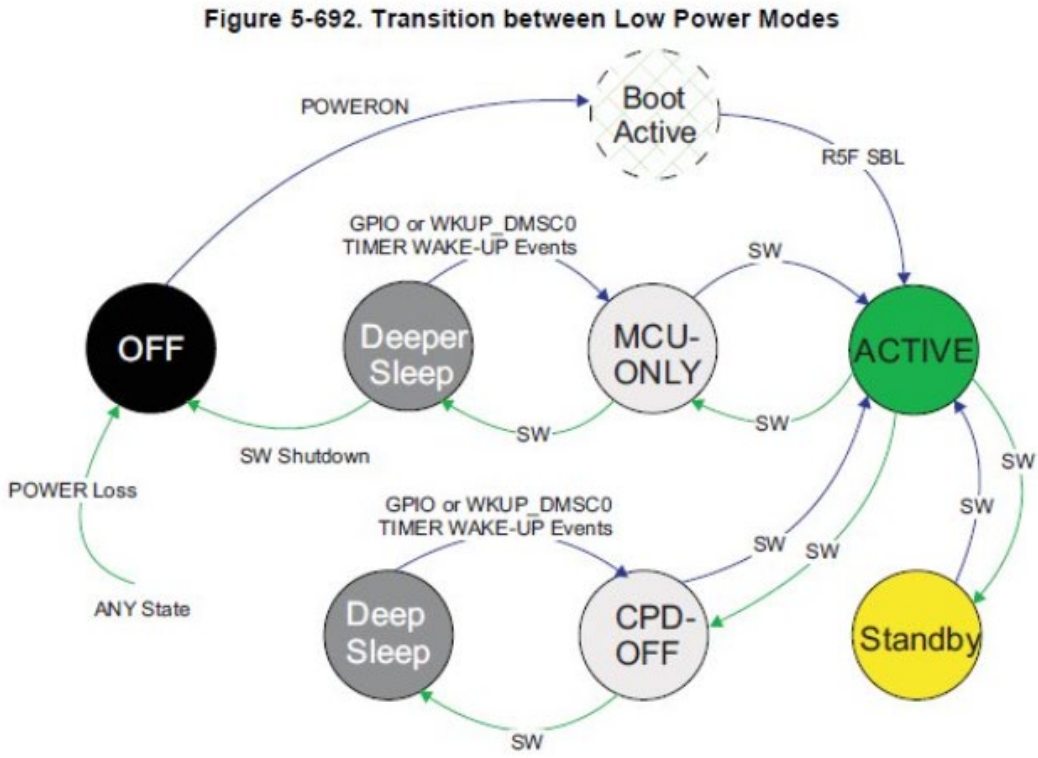
124. The Accused Products comprise a backup system circuit having a separate power supply from the normal circuit. For example, the AM65x series comprises "[i]independently controlled power supply per module."

The device also integrates:

- Power distribution, reset controls and clock management components
- Power-management techniques for device power consumption minimization:
  - Gated clocks
  - Multiple voltage domains
  - Independently controlled power supply per module
  - Voltage and Temperature Management (VTM) module
  - Power-on Reset Generator (PRG)
  - On-die low-dropout (LDO) regulators
  - Power Sleep Controllers (PSC)

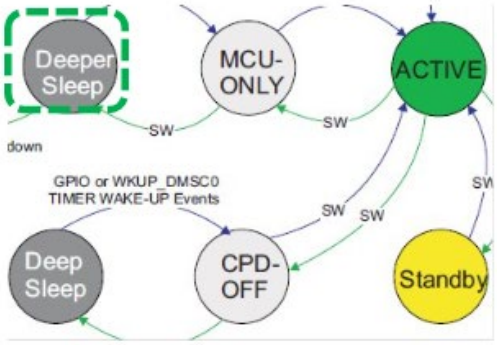
Id. (Annotated)

125. The Accused Products comprise a power supply circuit for switching to a first, a second, a third, and a fourth state, and the switching is based on a combination of logic for a normal circuit power control signal for controlling power supplied to the normal circuit and a backup circuit power control signal for controlling power supplied to the backup system circuit. For example, the AM65x series is capable of switching between at least four power supply current states, as shown below. For example, on information and belief, the switching is based on combination of logic for a normal circuit power control signal for controlling power supplied to the normal circuit and a backup circuit power control signal for controlling power supplied to the backup system circuit.



Id.

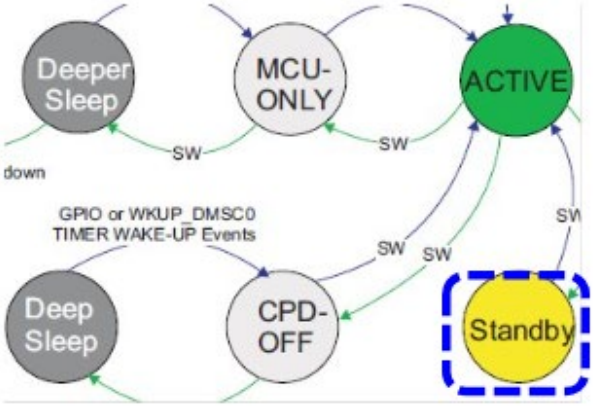
126. The Accused Products comprise a power supply circuit for switching wherein in the first state when the normal circuit power control signal and the backup circuit power control signal are inactive, voltage is supplied to neither the normal circuit nor the backup system circuit. For example, the AM65x series, when in "DeeperSleep" mode, "all power rails are off except WKUPSS, and Full SoC 1.8 V IO rails," as shown below.



- DeeperSleep: all power rails are OFF except WKUPSS, and Full SoC 1.8 V IO rails. External DDR memory may be optionally in self-refresh.

Id. (Annotated)

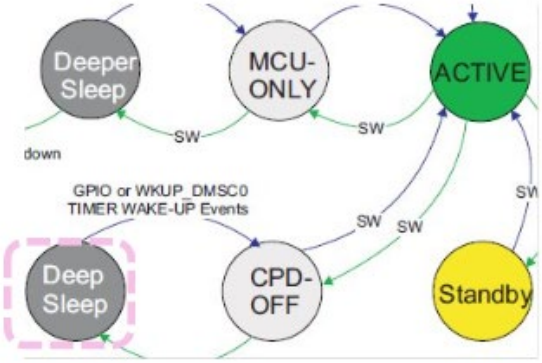
127. The Accused Products comprise a power supply circuit for switching wherein in the second state when the normal circuit power control signal is active and the backup circuit power control signal is inactive, the primary power supply voltage is supplied to the normal circuit and the secondary power supply voltage is supplied to the backup system circuit. For example, the AM65x series, when in "Standby" mode, "ARM cores *MPU/MCUs) in WFI" are "system active," as shown below.



- Standby: Arm cores (MPU/MCUs) in WFI, system active.

Id. (Annotated)

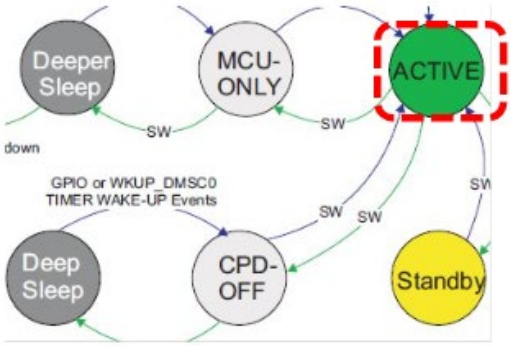
128. The Accused Products comprise a power supply circuit for switching wherein in the third state when the normal circuit power control signal is inactive and the backup circuit power control signal is active, voltage is not supplied to the normal circuit and the secondary power supply voltage is supplied to the backup system circuit. For example, the AM65x series, when in "DeepSleep" mode, "all processor core domains are OFF" and "voltage domain ON," as shown below.



- DeepSleep: all processor core power domains are OFF (voltage domain ON). Only WKUP power domains are ON. Some top-level modules that does not have power domains, will be ON. This power state may be used as an alternative to the DeeperSleep, in case where system needs to tie WKUP, MCU, and Main_SoC rails together.

Id. (Annotated)

129. The Accused Products comprise a power supply circuit for switching wherein in the fourth state when the normal circuit power control signal and the backup. For example, the AM65x series, when in "Active" mode, "main status and control registers are ON," and "processors and subsystems are ON," as shown below.



- Active: main status and control registers are ON, processors and subsystems are ON, based on use cases.

Id. (Annotated)

130. Defendant has and continues to indirectly infringe one or more claims of the '887 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement by others, such as Defendant's customers and end-users, in this District and elsewhere in the United States. For example, Defendant's customers and end-users 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 Accused Products. Defendant induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation. Because of Defendant's inducement, Defendant's customers and end-users use the Accused Products in a way Defendant intends and they directly infringe the '887 Patent. Defendant performs these affirmative acts 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 ’887 Patent, but while remaining willfully blind to the infringement. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringes Claim 6 of the ’887 Patent.

131. Defendant has and continues to indirectly infringe one or more claims of the ’887 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as customers and end-users, in this District and elsewhere in the United States. Defendant’s affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others’ use and manufacture of the Accused Products, such that the ’887 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the ’887 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the ’887 Patent. Defendant performs these affirmative acts with knowledge of the ’887 Patent and with intent, or willful blindness, that it causes the direct infringement of the ’887 Patent.

132. Defendant had actual notice that it was infringing the ’887 Patent as of September 24, 2021.

133. Defendant is, and has been, on actual notice of the ’887 Patent and it knowingly, willfully, and deliberately continues to infringe the ’887 Patent. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

134. MRL has suffered damages as a result of Defendant’s direct and indirect infringement of the ’887 Patent in an amount to be proved at trial.

135. MRL has suffered, and will continue to suffer, irreparable harm as a result of Defendant's infringement of the '887 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

COUNT VIII
(Infringement of the '482 Patent)

136. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

137. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the '482 Patent.

138. Defendant infringes, contributes to the infringement of, and/or induces infringement of the '482 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the '482 Patent including, but not limited to, at least the Accused Products.

139. Defendant has and continues to directly infringe the '482 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 '482 Patent. Upon information and belief, these products include the Accused Products that practice the methods and systems covered by the '482 Patent.

140. For example, Defendant has and continues to directly infringe at least Claim 1 of the '482 Patent by making, using, offering to sell, selling, and/or importing into the United States products that comprise a power supply comprising: a first switch and a second switch coupled in series between an input voltage terminal to which an input voltage is applied and a reference voltage terminal to which a reference voltage lower than the input voltage is applied, the first switch provided on a side of the input voltage terminal and the second switch provided on a side

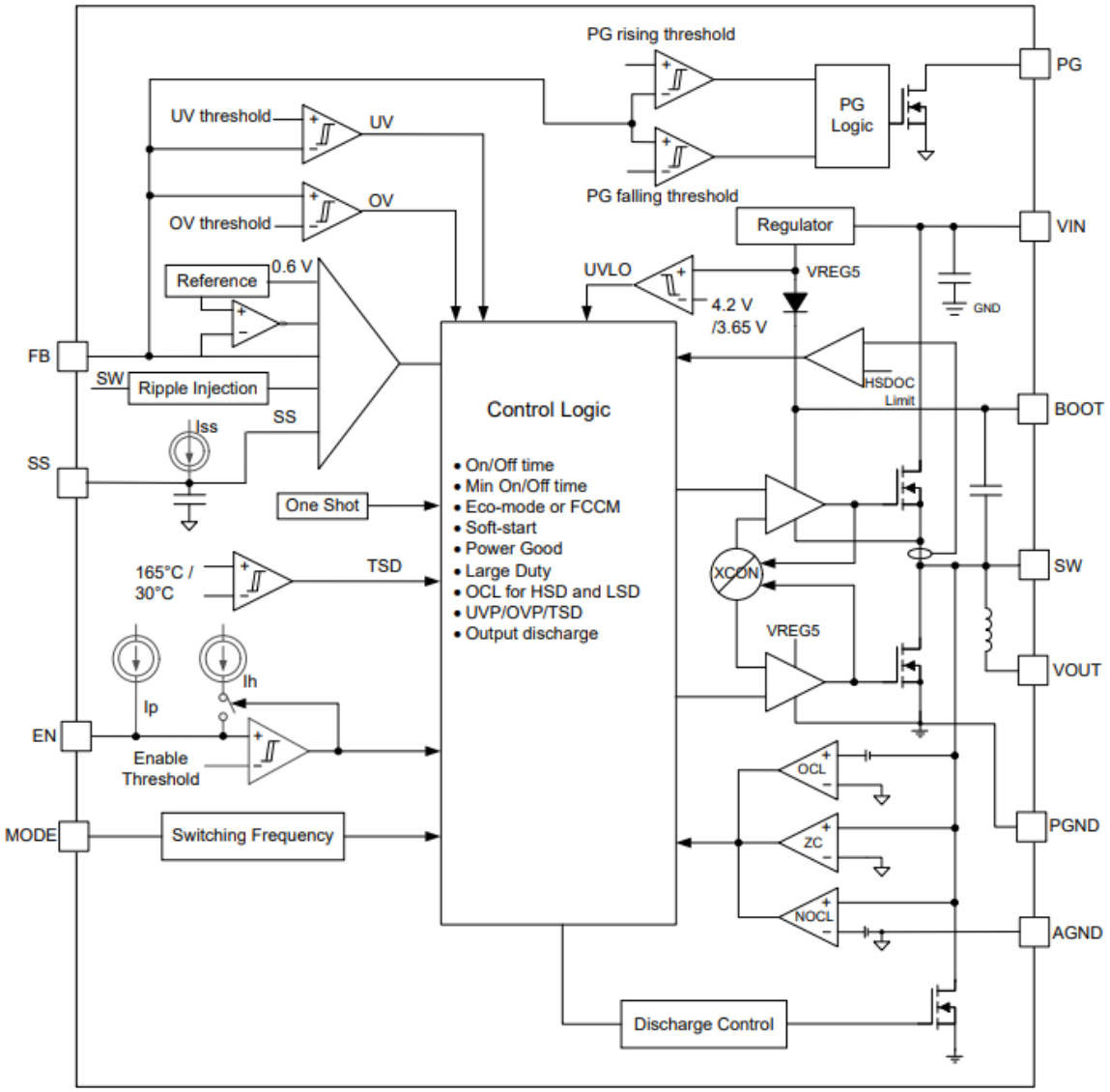
of the reference voltage terminal; an inductor disposed between a junction coupling the first and second switches and an output terminal from which an output voltage is output; and a controller controlling the first and second switches to be alternately switched at a given switching cycle depending on an error of the output voltage with respect to a target voltage, wherein the controller changes the switching cycle of the first switch turning-on from a first cycle to a second cycle longer than the first cycle when a voltage at the junction when the second switch is in a turned-on state indicates a light load state.

141. The Accused Products comprise a power supply comprising: a first switch and a second switch coupled in series between an input voltage terminal to which an input voltage is applied and a reference voltage terminal to which a reference voltage lower than the input voltage is applied, the first switch provided on a side of the input voltage terminal and the second switch provided on a side of the reference voltage terminal. For example, on information and belief, the TPSM86837 is a power supply comprising a first switch and a second switch coupled in series between an input voltage terminal to which an input voltage is applied and a reference voltage terminal to which a reference voltage lower than the input voltage is applied, the first switch provided on a side of the input voltage terminal and the second switch provided on a side of the reference voltage terminal contains an input voltage and a reference voltage, as evidenced by the below.

- 4.5V to 28V input voltage range
- 0.6V to 5.5V output voltage range
- 8A continuous output current capability
- Integrated MOSFETs, inductor, and basic passives
- 0.6V ±1% reference voltage at 25°C

Source: https://www.ti.com/lit/ds/symlink/tpsm86837.pdf

6.2 Functional Block Diagram



Id.

142. The Accused Products comprise an inductor disposed between a junction coupling the first and second switches and an output terminal from which an output voltage is output. For example, on information and belief, the TPSM86837 comprises an inductor disposed between a junction coupling the first and second switches and an output terminal from which an output voltage is output.

143. The Accused Products comprise a controller controlling the first and second switches to be alternately switched at a given switching cycle depending on an error of the output voltage with respect to a target voltage. For example, on information and belief, the TPSM86837 comprises a controller controlling the first and second switches to be alternately switched at a given switching cycle depending on an error of the output voltage with respect to a target voltage.

144. The Accused Products comprise a controller, wherein the controller changes the switching cycle of the first switch turning-on from a first cycle to a second cycle longer than the first cycle when a voltage at the junction when the second switch is in a turned-on state indicates a light load state. For example, on information and belief, the TPSM86837 comprises a controller wherein the controller changes the switching cycle of the first switch turning on from a first cycle to a second cycle longer than the first cycle when a voltage at the junction when the second switch is in a turned-on state indicates a light load state.

145. Defendant has and continues to indirectly infringe one or more claims of the ’482 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement by others, such as Defendant’s customers and end-users, in this District and elsewhere in the United States. For example, Defendant’s customers and end-users 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 Accused Products. Defendant induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation. Because of Defendant’s inducement,

Defendant's customers and end-users use the Accused Products in a way Defendant intends and they directly infringe the '482 Patent. Defendant performs these affirmative acts 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 '482 Patent, but while remaining willfully blind to the infringement. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringes Claim 1 of the '482 Patent.

146. Defendant has and continues to indirectly infringe one or more claims of the '482 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as customers and end-users, in this District and elsewhere in the United States. Defendant's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others' use and manufacture of the Accused Products, such that the '482 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '482 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the '482 Patent. Defendant performs these affirmative acts with knowledge of the '482 Patent and with intent, or willful blindness, that it causes the direct infringement of the '482 Patent.

147. Defendants have willfully infringed, and continue to willfully infringe, the '482 Patent by intentionally and deliberately carrying out acts of direct and indirect infringement, while knowing or taking deliberate steps to avoid learning, that those acts infringe. For example, Defendants been aware of MRL's patent portfolio, as evidenced by MRL and TI's correspondence. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

148. MRL has suffered damages as a result of Defendant's direct and indirect infringement of the '482 Patent in an amount to be proved at trial.

149. MRL has suffered, and will continue to suffer, irreparable harm as a result of Defendant's infringement of the '482 Patent, for which there is no adequate remedy at law, unless Defendant' infringement is enjoined by this Court.

COUNT IX
(Infringement of the '344 Patent)

150. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

151. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the '344 Patent.

152. Defendant infringes, contributes to the infringement of, and/or induces infringement of the '344 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the '344 Patent including, but not limited to, at least the Accused Products.

153. Defendant has and continues to directly infringe the '344 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 '344 Patent. Upon information and belief, these products include the Accused Products that practice the methods and systems covered by the '344 Patent.

154. For example, Defendant has and continues to directly infringe at least Claim 1 of the '344 Patent by making, using, offering to sell, selling, and/or importing into the United States products that comprise a control circuit comprising: a first control circuit coupled to a first switch and a second switch of a power supply, wherein the first control circuit is configured to switch the

first switch and a second switch in a complementary manner in accordance with a comparison result of a first reference voltage and a voltage value of a feedback voltage corresponding to an output voltage of the power supply; a first comparison circuit configured to compare one of a voltage value of the output voltage and the voltage value of the feedback voltage with a second reference value; and a second comparison circuit configured to compare a current value of a coupling point current flowing through a point between the first switch and the second switch with a third reference value; and a second control circuit configured to disable complementary switching of the first switch and the second switch and configured to inactivate the second switch in accordance with an output signal from the first comparison circuit, wherein the second control circuit enables the disabled complementary switching in accordance with an output signal of the second comparison circuit.

155. The Accused Products comprise a control circuit comprising: a first control circuit coupled to a first switch and a second switch of a power supply, wherein the first control circuit is configured to switch the first switch and a second switch in a complementary manner in accordance with a comparison result of a first reference voltage and a voltage value of a feedback voltage corresponding to an output voltage of the power supply. For example, on information and belief the TPS548B23 comprises a control circuit comprising: a first control circuit coupled to a first switch and a second switch of a power supply, wherein the first control circuit is configured to switch the first switch and a second switch in a complementary manner in accordance with a comparison result of a first reference voltage and a voltage value of a feedback voltage corresponding to an output voltage of the power supply, as evidenced by the below.

> The TPS548B23 device has differential remote sense, high-performance integrated MOSFETs, and an accurate ±1.0% internal reference. The device features accurate load and line regulation and Eco-mode or Forced Continous Conduction Mode (FCCM) operation. Pinstrap options allow for configuration of the overcurrent limit, fault response, internal or external feedback , output voltage selection, switching frequency, and soft-start time..

Source: https://www.ti.com/lit/ds/symlink/tps548b23.pdf

156. The Accused Products comprise a first comparison circuit configured to compare one of a voltage value of the output voltage and the voltage value of the feedback voltage with a second reference value. For example, on information and belief, the TPS548B23 comprises a first comparison circuit configured to compare one of a voltage value of the output voltage and the voltage value of the feedback voltage with a second reference value.

157. The Accused Products comprise a second comparison circuit configured to compare a current value of a coupling point current flowing through a point between the first switch and the second switch with a third reference value. For example, on information and belief, the TPS548B23 comprises a second comparison circuit configured to compare a current value of a coupling point current flowing through a point between the first switch and the second switch with a third reference value.

158. The Accused Products comprise a second control circuit configured to disable complementary switching of the first switch and the second switch and configured to inactivate the second switch in accordance with an output signal from the first comparison circuit, wherein the second control circuit enables the disabled complementary switching in accordance with an output signal of the second comparison circuit. For example, on information and belief, the TPS548B23 comprises a second control circuit configured to disable complementary switching of

the first switch and the second switch and configured to inactivate the second switch in accordance with an output signal from the first comparison circuit, wherein the second control circuit enables the disabled complementary switching in accordance with an output signal of the second comparison circuit.

159. Defendant has and continues to indirectly infringe one or more claims of the '344 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement by others, such as Defendant's customers and end-users, in this District and elsewhere in the United States. For example, Defendant's customers and end-users 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 Accused Products. Defendant induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation. Because of Defendant's inducement, Defendant's customers and end-users use the Accused Products in a way Defendant intends and they directly infringe the '344 Patent. Defendant performs these affirmative acts 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 '344 Patent, but while remaining willfully blind to the infringement. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringes Claim 1 of the '344 Patent.

160. Defendant has and continues to indirectly infringe one or more claims of the '344 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such

as customers and end-users, in this District and elsewhere in the United States. Defendant's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others' use and manufacture of the Accused Products, such that the '344 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '344 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the '344 Patent. Defendant performs these affirmative acts with knowledge of the '344 Patent and with intent, or willful blindness, that it causes the direct infringement of the '344 Patent.

161. Defendant have willfully infringed, and continue to willfully infringe, the '344 Patent by intentionally and deliberately carrying out acts of direct and indirect infringement, while knowing or taking deliberate steps to avoid learning, that those acts infringe. For example, Defendants been aware of MRL's patent portfolio, as evidenced by MRL and TI's correspondence. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

162. MRL has suffered damages as a result of Defendant's direct and indirect infringement of the '344 Patent in an amount to be proved at trial.

163. MRL has suffered, and will continue to suffer, irreparable harm as a result of Defendant's infringement of the '344 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

COUNT X
(Infringement of the '431 Patent)

164. Paragraphs 1 through 25 are incorporated by reference as if fully set forth herein.

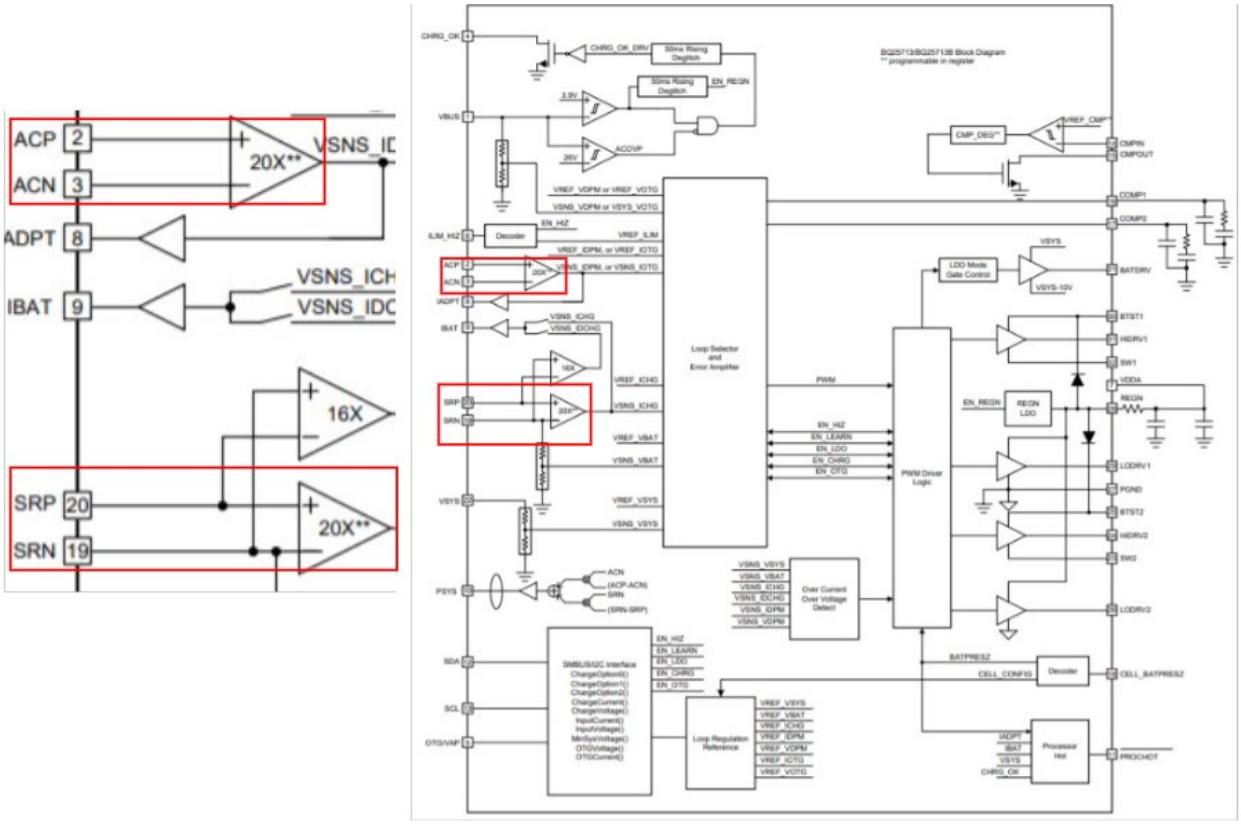
165. MRL has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the ’431 Patent.

166. Defendant infringes, contributes to the infringement of, and/or induces infringement of the ’431 Patent by making, using, selling, offering for sale, distributing, exporting from, and/or importing into the United States products and/or methods covered by one or more claims of the ’431 Patent including, but not limited to, at least the Accused Products.

167. Defendant has and continues to directly infringe the ’431 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 ’431 Patent. Upon information and belief, these products include the Accused Products that practice the methods and systems covered by the ’431 Patent.

168. For example, Defendant has and continues to directly infringe at least Claim 1 of the ’431 Patent by making, using, offering to sell, selling, and/or importing into the United States products that comprise a detection circuit for detecting current flowing to a plurality of resistors, the detection circuit comprising: a plurality of current amplifiers, respectively coupled to the plurality of resistors, which generate a plurality of detection signals, wherein each of the plurality of current amplifiers generates a corresponding one of the plurality of detection signals in accordance with the current flowing to a corresponding one of the plurality of resistors; and an error amplifier, coupled to the plurality of current amplifiers, which compares the plurality of detection signals with a plurality of reference signals, each associated with the corresponding one of the plurality of detection signals, and generates an error signal according to the current flowing to the plurality of resistors based on the comparison.

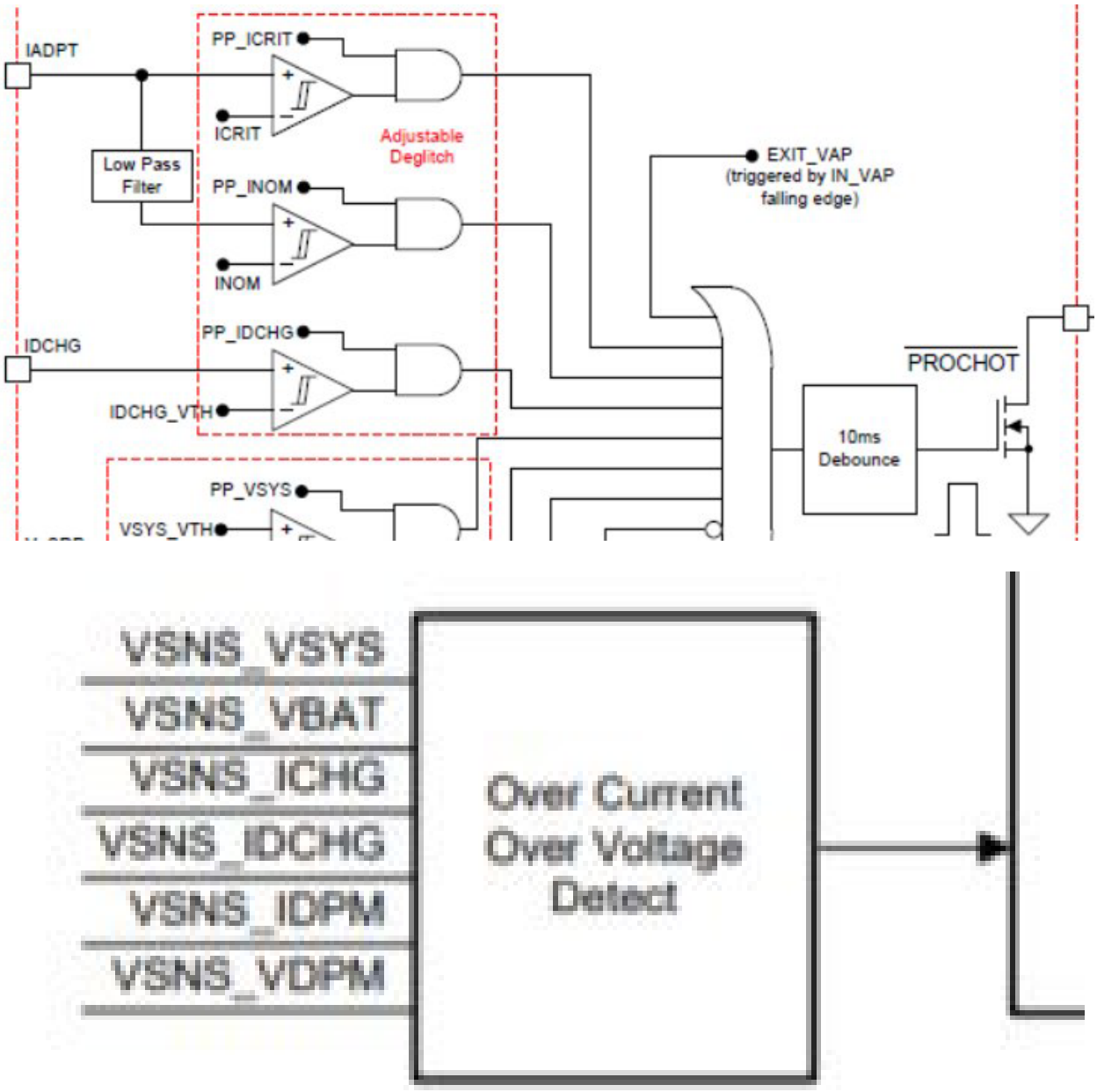
169. The Accused Products comprise a detection circuit for detecting current flowing to a plurality of resistors, the detection circuit comprising: a plurality of current amplifiers, respectively coupled to the plurality of resistors, which generate a plurality of detection signals, wherein each of the plurality of current amplifiers generates a corresponding one of the plurality of detection signals in accordance with the current flowing to a corresponding one of the plurality of resistors. For example, the BQ25713 contains at least two current amplifiers, as shown below. For example, on information and belief, each amplifier generates a corresponding detection signal in accordance with current flow to a corresponding resistor.



Source: https://www.ti.com/lit/ds/symlink/bq25713b.pdf (Annotated)

170. The Accused Products comprise an error amplifier, coupled to the plurality of current amplifiers, which compares the plurality of detection signals with a plurality of reference signals, each associated with the corresponding one of the plurality of detection signals, and

generates an error signal according to the current flowing to the plurality of resistors based on the comparison. For example, on information and belief, the BQ25713 amplifies at least two error signals "PROCHOT" and "Over Current Over Voltage Detect," as shown below.



Id. (Annotated)

171. Defendant has and continues to indirectly infringe one or more claims of the '431 Patent, as provided by 35 U.S.C. § 271(b), by knowingly and intentionally inducing infringement

by others, such as Defendant's customers and end-users, in this District and elsewhere in the United States. For example, Defendant's customers and end-users 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 Accused Products. Defendant induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation. Because of Defendant's inducement, Defendant's customers and end-users use the Accused Products in a way Defendant intends and they directly infringe the '431 Patent. Defendant performs these affirmative acts 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 '431 Patent, but while remaining willfully blind to the infringement. Through demonstrations, testing, repairs, and instructional guidance, Defendant uses the Accused Products in a manner that directly infringes Claim 1 of the '431 Patent.

172. Defendant has and continues to indirectly infringe one or more claims of the '431 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as customers and end-users, in this District and elsewhere in the United States. Defendant's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contributes to others' use and manufacture of the Accused Products, such that the '431 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '431 Patent, are not staple articles or commodities of commerce,

have no substantial non-infringing uses, and are known by Defendant to be especially made or adapted for use in the infringement of the '431 Patent. Defendant performs these affirmative acts with knowledge of the '431 Patent and with intent, or willful blindness, that they cause the direct infringement of the '431 Patent.

173. Defendant had actual notice that it was infringing the '431 Patent as of September 24, 2021.

174. Defendant is, and has been, on actual notice of the '431 Patent and it knowingly, willfully, and deliberately continues to infringe the '431 Patent. As such, MRL is entitled to enhanced damages pursuant to 35 U.S.C. § 284.

175. MRL has suffered damages as a result of Defendant's direct and indirect infringement of the '431 Patent in an amount to be proved at trial.

176. MRL has suffered, and will continue to suffer, irreparable harm as a result of Defendant's infringement of the '431 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

DEMAND FOR JURY TRIAL

Plaintiff hereby demands a jury for all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, MRL prays for relief against Defendant as follows:

a. Entry of judgment declaring that Defendant directly and/or indirectly infringe(d) one or more claims of each of the Patents-in-Suit;

b. Entry of judgment declaring that Defendant's infringement of the Patents-in-Suit is willful;

c. An order awarding damages sufficient to compensate Plaintiff for Defendant's infringement of the Patents-in-Suit, but in no event less than a reasonable royalty, including supplemental damages post-verdict, together with pre-judgment and post-judgment interest and costs;

d. Enhanced damages pursuant to 35 U.S.C. § 284;

e. Entry of judgment declaring that this case is exceptional and awarding Plaintiff its costs and reasonable attorney fees pursuant to 35 U.S.C. § 285;

f. An accounting for acts of infringement;

g. Such other equitable relief which may be requested and to which the Plaintiff is entitled; and

h. Such other and further relief as the Court deems just and proper.

Dated: August 27, 2025

Respectfully submitted,

/s/ *Alfred R. Fabricant*

Alfred R. Fabricant
NY Bar No. 2219392
Email: ffabricant@fabricantllp.com
Joseph M. Mercadante
NY Bar No. 4784930
Email: jmercadante@fabricantllp.com
Enrique W. Iturralde
NY Bar No. 5526280
Email: eiturralde@fabricantllp.com
FABRICANT LLP
411 Theodore Fremd Avenue
Suite 206 South
Rye, New York 10580
Telephone: (212) 257-5797
Facsimile: (212) 257-5796

Rudolph "Rudy" Fink IV
Texas Bar No. 24082997
rfink@davisfirm.com
THE DAVIS FIRM, PC

213 N. Fredonia Street, Suite 230
Longview, Texas 75601
Telephone: (903) 230-9090
Facsimile: (903) 230-9661

ATTORNEYS FOR PLAINTIFF
MR LICENSING, LLC