

PATENT ASSIGNMENT COVER SHEET

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 Stylesheet Version v1.2

EPAS ID: PAT4269162

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	SECURITY INTEREST

CONVEYING PARTY DATA

Name	Execution Date
MICROCHIP TECHNOLOGY INCORPORATED	02/08/2017

RECEIVING PARTY DATA

Name:	JPMORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT
Street Address:	IL1-1145/54/63, P.O. BOX 6026
City:	CHICAGO
State/Country:	ILLINOIS
Postal Code:	60680-6026

PROPERTY NUMBERS Total: 824

Property Type	Number
Patent Number:	5798915
Patent Number:	5835410
Patent Number:	5854564
Patent Number:	5874863
Patent Number:	5899570
Patent Number:	5905880
Patent Number:	5909050
Patent Number:	5912593
Patent Number:	5956589
Patent Number:	5958039
Patent Number:	5987583
Patent Number:	5991196
Patent Number:	5998980
Patent Number:	6002356
Patent Number:	6016019
Patent Number:	6020792
Patent Number:	6020841
Patent Number:	6029241
Patent Number:	6043746
Patent Number:	6052035

PATENT

Property Type	Number
Patent Number:	6052299
Patent Number:	6054823
Patent Number:	6055211
Patent Number:	6057705
Patent Number:	6058294
Patent Number:	6084935
Patent Number:	6087241
Patent Number:	6087863
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Patent Number:	8408723
Patent Number:	8427075
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Patent Number:	8487685
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Patent Number:	8638151
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Property Type	Number
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Patent Number:	8779734
Patent Number:	8780068
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Patent Number:	8922183
Patent Number:	8922362
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Patent Number:	8937565
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Property Type	Number
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Application Number:	13309633
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Property Type	Number
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Property Type	Number
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Application Number:	15216447
Application Number:	15221409
Application Number:	15262923
Application Number:	15263030
Application Number:	15268113

CORRESPONDENCE DATA

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Address Line 2: LATHAM & WATKINS LLP
Address Line 4: CHICAGO, ILLINOIS 60611

ATTORNEY DOCKET NUMBER:	049067-0106
NAME OF SUBMITTER:	ZEYNEP GIESEKE
SIGNATURE:	/zg/
DATE SIGNED:	02/10/2017

Total Attachments: 84

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**CONFIRMATORY GRANT OF SECURITY INTEREST
IN UNITED STATES PATENTS**

THIS CONFIRMATORY GRANT OF SECURITY INTEREST IN UNITED STATES PATENTS (the "Confirmatory Grant") is made effective as of February 8, 2017 by and from Microchip Technology Incorporated, a Delaware corporation (the "Grantor"), to and in favor of JPMORGAN CHASE BANK, N.A., (the "Grantee") for itself and as Administrative Agent for the Secured Parties (as defined in the Credit Agreement referenced below).

WHEREAS, the Grantor, the Lenders and the Grantee have entered into that certain Amended and Restated Credit Agreement dated as of June 27, 2013, as amended and restated as of February 4, 2015 (as may be amended, restated, supplemented or otherwise modified from time to time, the "Credit Agreement").

WHEREAS, certain Subsidiaries of the Grantor have guaranteed the repayment of the Obligations pursuant to a Guaranty dated as of June 27, 2013 (as may be amended, restated, supplemented or otherwise modified from time to time).

WHEREAS, the Grantor and certain Subsidiaries of the Grantor have entered into a Pledge and Security Agreement dated as of the date hereof (as may be amended, restated, supplemented or otherwise modified from time to time, the "Security Agreement").

WHEREAS, the Grantor owns the patents listed on Exhibit A attached hereto (the "Patents"), which Patents are issued or pending with the United States Patent and Trademark Office.

WHEREAS, this Confirmatory Grant has been granted in conjunction with the security interest granted under the Security Agreement to the Grantee for the benefit of the Secured Parties. The rights and remedies of the Grantee with respect to the security interest granted herein are without prejudice to and are in addition to those set forth in the Security Agreement and the other Loan Documents, all terms and provisions of which are incorporated herein by reference. In the event that any provisions of this Confirmatory Grant are deemed to conflict with the Security Agreement, the provisions of the Security Agreement shall govern.

NOW, THEREFORE, in consideration of the mutual covenants and agreements set forth herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, it is hereby agreed that:

1) Definitions. All capitalized terms not defined herein shall have the respective meaning given to them in the Credit Agreement.

2) The Security Interest.

(a) This Confirmatory Grant is made to secure the satisfactory performance and payment of all the Obligations. Upon the payment in full of all Obligations (other than obligations under any Swap Agreement or Banking Services Agreement, in each case not due and payable, and other obligations expressly stated to survive such payment or termination) and expiration or termination of all Letters of Credit (or cash collateralization or other arrangements for such Letters of Credit reasonably satisfactory to the Administrative Agent), the Grantee shall promptly, upon such satisfaction, execute, acknowledge, and deliver to the Grantor all reasonably requested instruments in writing releasing the security interest in the Patents acquired under this Confirmatory Grant.

(b) The Grantor hereby grants to the Grantee a security interest in (1) all of the Grantor's right, title and interest in and to the Patents now owned or from time to time after the date hereof owned or acquired by the Grantor, together with (2) all proceeds and products of the Patents, and (3) all causes of action arising prior to or after the date hereof for infringement of the Patents or unfair competition regarding the same. For the avoidance of doubt, (i) the grant of a security interest herein shall not be deemed to be an assignment of intellectual property rights owned by the Grantor and (ii) the security interest granted under this Confirmatory Grant shall not extend to Excluded Assets and, for the avoidance of doubt, no provision of this Confirmatory Grant shall apply to any such Excluded Assets.

3) Counterparts. This Confirmatory Grant may be executed in any number of counterparts and by different parties in separate counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement. Signature pages may be detached from multiple separate counterparts and attached to a single counterpart.

4) Governing Law. This Confirmatory Grant and the rights and obligations of the parties hereto shall be governed by, and construed and interpreted in accordance with, the law of the State of New York.

[Signature Page Follows]

IN WITNESS WHEREOF, the Grantor has executed this Confirmatory Grant effective as of the date first written above.

MICROCHIP TECHNOLOGY INCORPORATED

By: 
Name: J. Eric Bjornholm
Title: Vice President and Chief Financial Officer

Signature Page to
Confirmatory Grant of Security Interest in United States Patents

PATENT
REEL: 041675 FRAME: 0644

CONFIRMATORY GRANT OF SECURITY INTEREST
IN UNITED STATES PATENTS

Exhibit A - SCHEDULE OF PATENTS

See attached

CONFIRMATORY GRANT OF SECURITY INTEREST
IN UNITED STATES PATENTS

Exhibit A - SCHEDULE OF PATENTS

(i) U.S. registered Patents:

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	5798915	US	8/25/1998	Progressive start-up charge pump and method therefor
Microchip Technology Incorporated	5835410	US	11/10/1998	Self timed precharge sense amplifier for a memory array
Microchip Technology Incorporated	5854564	US	12/29/1998	Direct sensor interface (dsi) module
Microchip Technology Incorporated	5874863	US	2/23/1999	Phase locked loop with fast start-up circuitry
Microchip Technology Incorporated	5899570	US	5/4/1999	Time-based temperature sensor system and method therefor
Microchip Technology Incorporated	5905880	US	5/18/1999	Robust multiple word instruction and method therefor
Microchip Technology Incorporated	5909050	US	6/1/1999	Combination inductive coil and integrated circuit semiconductor chip in a single lead frame package and method therefor
Microchip Technology Incorporated	5912593	US	6/15/1999	Ic (current-capacitor) precision oscillator having frequency and duty cycle controls

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	5956589	US	9/21/1999	Method of forming narrow thermal silicon dioxide side isolation regions in a semiconductor substrate and mos semiconductor devices fabricated by this method
Microchip Technology Incorporated	5958039	US	9/28/1999	Master-slave latches and post increment/decrement operations
Microchip Technology Incorporated	5987583	US	11/16/1999	Processor architecture scheme and instruction set for maximizing available opcodes and address selection modes
Microchip Technology Incorporated	5991196	US	11/23/1999	Reprogrammable memory device with variable page size
Microchip Technology Incorporated	5998980	US	12/7/1999	Highly efficient multi-frequency voltage regulating circuit incorporating a magnetic field power sensor and programmable magnetic field detection
Microchip Technology Incorporated	6002356	US	12/14/1999	Power saving flash a/d converter
Microchip Technology Incorporated	6016019	US	1/18/2000	Capacitor array arrangement for improving capacitor array matching
Microchip Technology Incorporated	6020792	US	2/1/2000	Precision relaxation oscillator integrated circuit with temperature compensation
Microchip Technology Incorporated	6020841	US	2/1/2000	Driver circuit for low voltage operation of a successive approximation register (sar) analog to digital (a/d) converter and method therefor

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6029241	US	2/22/2000	Processor architecture scheme having multiple bank address override sources for supplying address values and method therefor
Microchip Technology Incorporated	6043746	US	3/28/2000	Radio frequency identification (rfid) security tag for merchandise and method therefor
Microchip Technology Incorporated	6052035	US	4/18/2000	Oscillator with clock output inhibition control
Microchip Technology Incorporated	6052299	US	4/18/2000	Robust lc full-wave bridge rectifier input structure
Microchip Technology Incorporated	6054823	US	4/25/2000	Verification of fan operation
Microchip Technology Incorporated	6055211	US	4/25/2000	Force page zero paging scheme for microcontrollers using data random access memory
Microchip Technology Incorporated	6057705	US	5/2/2000	Programmable pin designation for semiconductor devices
Microchip Technology Incorporated	6058294	US	5/2/2000	Adjustable frequency stabilizing internal chip capacitor system
Microchip Technology Incorporated	6084935	US	7/4/2000	Binary counter and method for counting to extend lifetime of storage cells
Microchip Technology Incorporated	6087241	US	7/11/2000	Method of forming side dielectrically isolated semiconductor devices and mos semiconductor devices fabricated by this method

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6087863	US	7/11/2000	Method for improving the efficiency of discharging capacitive loads in h-bridge switching networks
Microchip Technology Incorporated	6091935	US	7/18/2000	Integrated circuit transporter and a method of communication therefor
Microchip Technology Incorporated	6098160	US	8/1/2000	Data pointer for outputting indirect addressing mode addresses within a single cycle and method therefor
Microchip Technology Incorporated	6103576	US	8/15/2000	Dielectric layer of a memory cell having a stacked oxide sidewall and method of fabricating same
Microchip Technology Incorporated	6108326	US	8/22/2000	Microchips and remote control devices comprising same
Microchip Technology Incorporated	6118400	US	9/12/2000	Capacitor array for a successive approximation register (sar) based analog to digital (a/d) converter and method therefor
Microchip Technology Incorporated	6122205	US	9/19/2000	Voltage regulator and boosting circuit for reading a memory cell at low voltage levels
Microchip Technology Incorporated	6139676	US	10/31/2000	Apparatus and method for removing semiconductor chips from a diced semiconductor wafer
Microchip Technology Incorporated	6150864	US	11/21/2000	Time delay circuit which is voltage independent
Microchip Technology Incorporated	6151238	US	11/21/2000	Calibrating functions of an integrated circuit and storing calibration parameters thereof in a programmable fuse array

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6157695	US	12/5/2000	Counter for performing multiple counts and method thereof
Microchip Technology Incorporated	6159765	US	12/12/2000	Integrated circuit package having interchip bonding and method therefor
Microchip Technology Incorporated	6166960	US	12/26/2000	Method, system and apparatus for determining that a programming voltage level is sufficient for reliably programming an eeprom
Microchip Technology Incorporated	6172611	US	1/9/2001	Independent hardware thermal sensing and monitoring
Microchip Technology Incorporated	6180433	US	1/30/2001	Combination inductive coil and integrated circuit semiconductor chip in a single lead frame package and method therefor
Microchip Technology Incorporated	6184659	US	2/6/2001	Microcontroller with integral switch mode power supply controller
Microchip Technology Incorporated	6192463	US	2/20/2001	Processor architecture scheme which uses virtual address registers to implement different addressing modes and method therefor
Microchip Technology Incorporated	6198691	US	3/6/2001	Force page paging scheme for microcontrollers of various sizes using data random access memory
Microchip Technology Incorporated	6201491	US	3/13/2001	Digitally switched potentiometer having improved linearity and settling time

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6205539	US	3/20/2001	Method for manipulating a stack pointer with post increment/decrement operation
Microchip Technology Incorporated	6208191	US	3/27/2001	Positive and negative voltage clamp for a wireless communication input circuit
Microchip Technology Incorporated	6208500	US	3/27/2001	High quality factor capacitor
Microchip Technology Incorporated	6218900	US	4/17/2001	Operational amplifier phase reversal protection
Microchip Technology Incorporated	6222761	US	4/24/2001	Method for minimizing program disturb in a memory cell
Microchip Technology Incorporated	6225678	US	5/1/2001	Layout technique for a matching capacitor array using a continuous top electrode
Microchip Technology Incorporated	6230275	US	5/8/2001	Circuit for powering down unused configuration bits to minimize power consumption
Microchip Technology Incorporated	6236595	US	5/22/2001	Programming method for a memory cell
Microchip Technology Incorporated	6243798	US	6/5/2001	Computer system for allowing a two word jump instruction to be executed in the same number of cycles as a single word jump instruction
Microchip Technology Incorporated	6245597	US	6/12/2001	Method for reducing die cracking in integrated circuits

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6268764	US	7/31/2001	Bandgap voltage comparator used as a low voltage detection circuit
Microchip Technology Incorporated	6300183	US	10/9/2001	Independently programmable memory segments within a pmos electrically erasable programmable read only memory array achieved by n-well separation and method therefor
Microchip Technology Incorporated	6304062	US	10/16/2001	Shunt resistance device for monitoring battery state of charge
Microchip Technology Incorporated	6304461	US	10/16/2001	Dc power converter having bipolar output and bi-directional reactive current transfer
Microchip Technology Incorporated	6304823	US	10/16/2001	Microprocessor power supply system including a programmable power supply and a programmable brownout detector
Microchip Technology Incorporated	6306684	US	10/23/2001	Stress reducing lead-frame for plastic encapsulation
Microchip Technology Incorporated	6321319	US	11/20/2001	Computer system for allowing a two word jump instruction to be executed in the same number of cycles as a single word jump instruction
Microchip Technology Incorporated	6333549	US	12/25/2001	Integrated circuit package having interchip bonding and method therefor
Microchip Technology Incorporated	6342807	US	1/29/2002	Digital trimming of analog components using non-volatile memory

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6349058	US	2/19/2002	Electronic circuit and method for storing configuration and calibration information in a non-volatile memory array
Microchip Technology Incorporated	6356161	US	3/12/2002	Calibration techniques for a precision relaxation oscillator integrated circuit with temperature compensation
Microchip Technology Incorporated	6359475	US	3/19/2002	High-speed, low-power sample and hold circuit
Microchip Technology Incorporated	6384670	US	5/7/2002	Method of using a bandgap voltage comparator in a low voltage detection circuit
Microchip Technology Incorporated	6384762	US	5/7/2002	Digitally switched impedance having improved linearity and settling time
Microchip Technology Incorporated	6393589	US	5/21/2002	Watchdog timer control circuit with permanent and programmable enablement
Microchip Technology Incorporated	6407581	US	6/18/2002	High voltage multipurpose input/output circuit
Microchip Technology Incorporated	6424211	US	7/23/2002	Digital trimming of op amp offset voltage and quiescent current using non-volatile memory
Microchip Technology Incorporated	6424263	US	7/23/2002	Radio frequency identification tag on a single layer substrate
Microchip Technology Incorporated	6427202	US	7/30/2002	Microcontroller with configurable instruction set

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6432761	US	8/13/2002	Apparatus and method for independent threshold voltage control of memory cell and select gate in a split-eprom
Microchip Technology Incorporated	6432773	US	8/13/2002	Memory cell having an ono film with an ono sidewall and method of fabricating same
Microchip Technology Incorporated	6446212	US	9/3/2002	Processor having an extended operating voltage range
Microchip Technology Incorporated	6456044	US	9/24/2002	Microcontroller with integral switch mode power supply controller
Microchip Technology Incorporated	6459616	US	10/1/2002	Split common source on eeprom array
Microchip Technology Incorporated	6459335	US	10/1/2002	Auto-calibration circuit to minimize input offset voltage in an integrated circuit analog input device
Microchip Technology Incorporated	6462621	US	10/8/2002	Operational amplifier that is configurable as a programmable gain amplifier of a general purpose amplifier
Microchip Technology Incorporated	6463544	US	10/8/2002	Method for powering down unused configuration bits to minimize power consumption
Microchip Technology Incorporated	6463798	US	10/15/2002	Tire inflation pressure monitoring and location determining method and apparatus
Microchip Technology Incorporated	6473484	US	10/29/2002	Binary counter and method for counting to extend lifetime of storage cells

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6476648	US	11/5/2002	High-speed, low-power sample and hold circuit
Microchip Technology Incorporated	6480110	US	11/12/2002	Inductively tunable antenna for a radio frequency identification tag
Microchip Technology Incorporated	6496113	US	12/17/2002	Radio frequency identification tag on a single layer substrate
Microchip Technology Incorporated	6504191	US	1/7/2003	Independently programmable memory segments within a pmos electrically erasable programmable read only memory array achieved by n-well separation and method therefor
Microchip Technology Incorporated	6509797	US	1/21/2003	Amplifier phase reversal suppression
Microchip Technology Incorporated	6509825	US	1/21/2003	Integrated circuit device having a self-biased, single pin radio frequency signal input
Microchip Technology Incorporated	6510403	US	1/21/2003	Time constrained sensor data retrieval system and method
Microchip Technology Incorporated	6515464	US	2/4/2003	Input voltage offset calibration of an analog device using a microcontroller
Microchip Technology Incorporated	6522981	US	2/18/2003	Programmable power supply and brownout detector method for a microprocessor power supply
Microchip Technology Incorporated	6535061	US	3/18/2003	Configurable operational amplifier as a microcontroller peripheral

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6542106	US	4/1/2003	Comparator programmable for high-speed or low-power operation
Microchip Technology Incorporated	6552625	US	4/22/2003	Processor with pulse width modulation generator with fault input prioritization
Microchip Technology Incorporated	6555967	US	4/29/2003	Low noise method and apparatus for driving electroluminescent panels
Microchip Technology Incorporated	6559783	US	5/6/2003	Programmable auto-converting analog to digital conversion module
Microchip Technology Incorporated	6563740	US	5/13/2003	Electronic circuit and method for testing and refreshing non-volatile memory
Microchip Technology Incorporated	6571617	US	6/3/2003	Method and apparatus using directional antenna or learning modes for tire inflation pressure monitoring and location determination
Microchip Technology Incorporated	6573723	US	6/3/2003	Current measuring apparatus for battery
Microchip Technology Incorporated	6578139	US	6/10/2003	Processor architecture scheme which uses virtual address registers to implement different addressing modes and method therefor
Microchip Technology Incorporated	6593639	US	7/15/2003	Layout technique for a capacitor array using continuous upper electrodes
Microchip Technology Incorporated	6601160	US	7/29/2003	Dynamically reconfigurable data space

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6604169	US	8/5/2003	Modulo addressing based on absolute offset
Microchip Technology Incorporated	6606670	US	8/12/2003	Circuit serial programming of default configuration
Microchip Technology Incorporated	6628102	US	9/30/2003	Current measuring terminal assembly for a battery
Microchip Technology Incorporated	6653878	US	11/25/2003	Low-power output controlled circuit
Microchip Technology Incorporated	6667583	US	12/23/2003	Method and apparatus for efficiently driving a low-voltage device from a wide-range input supply
Microchip Technology Incorporated	6677759	US	1/13/2004	Method and apparatus for high-voltage battery array monitoring sensors network
Microchip Technology Incorporated	6677860	US	1/13/2004	Method and apparatus for end of discharge indication based on critical energy requirement
Microchip Technology Incorporated	6683587	US	1/27/2004	Switched mode digital logic method, system and apparatus for directly driving lcd glass
Microchip Technology Incorporated	6687293	US	2/3/2004	Method, system and apparatus for calibrating a pulse position modulation (ppm) decoder to a ppm signal
Microchip Technology Incorporated	6697897	US	2/24/2004	Data communication interface between host and slave processors
Microchip Technology	6708268	US	3/16/2004	Microcontroller instruction set

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Incorporated				
Microchip Technology Incorporated	6710773	US	3/23/2004	Inductorless method and apparatus for driving electroluminescent panels
Microchip Technology Incorporated	6720866	US	4/13/2004	Radio frequency identification tag device with sensor input
Microchip Technology Incorporated	6728856	US	4/27/2004	Modified harvard architecture processor having program memory space mapped to data memory space
Microchip Technology Incorporated	6760674	US	7/6/2004	Audio spectrum analyzer implemented with a minimum number of multiply operations
Microchip Technology Incorporated	6771679	US	8/3/2004	Apparatus and method for programmable control of laser diode modulation and operating point
Microchip Technology Incorporated	6772090	US	8/3/2004	Apparatus for secure storage of vehicle odometer values and method therefor
Microchip Technology Incorporated	6775526	US	8/10/2004	Modulated input signal filter
Microchip Technology Incorporated	6781351	US	8/24/2004	Ac/dc cascaded power converters having high dc conversion ratio and improved ac line harmonics
Microchip Technology Incorporated	6788233	US	9/7/2004	Digital decimation filter
Microchip Technology Incorporated	6813529	US	11/2/2004	Method and apparatus for signal frequency decoding without an analog bandpass filter

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6841950	US	1/11/2005	Dimmable electroluminescent lamp drivers and method therefor
Microchip Technology Incorporated	6847808	US	1/25/2005	Ultra-high linearity rf passive mixer
Microchip Technology Incorporated	6847904	US	1/25/2005	Multi-channel programmable gain amplifier controlled with a serial interface
Microchip Technology Incorporated	6909388	US	6/21/2005	Fractal sequencing schemes for offset cancellation in sampled data acquisition systems
Microchip Technology Incorporated	6912594	US	6/28/2005	Serial communication device with multi-mode operation of message receive buffers
Microchip Technology Incorporated	6919759	US	7/19/2005	Digitally controlled tuner circuit
Microchip Technology Incorporated	6922084	US	7/26/2005	Ultra-low power programmable timer and low voltage detection circuits
Microchip Technology Incorporated	6931075	US	8/16/2005	Event detection with a digital processor
Microchip Technology Incorporated	6933199	US	8/23/2005	Method for integrating non-volatile memory with high-voltage and low-voltage logic in a salicide process
Microchip Technology Incorporated	6934728	US	8/23/2005	Euclidean distance instructions
Microchip Technology Incorporated	6937084	US	8/30/2005	Processor with dual-deadtime pulse width modulation generator

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	6944739	US	9/13/2005	Register bank
Microchip Technology Incorporated	6952711	US	10/4/2005	Maximally negative signed fractional number multiplication
Microchip Technology Incorporated	6958920	US	10/25/2005	Switching power converter and method of controlling output voltage thereof using predictive sensing of magnetic flux
Microchip Technology Incorporated	6975679	US	12/13/2005	Configuration fuses for setting pwm options
Microchip Technology Incorporated	6985472	US	1/10/2006	Method of communication using an encoder microchip and a decoder microchip
Microchip Technology Incorporated	6985986	US	1/10/2006	Variable cycle interrupt disabling
Microchip Technology Incorporated	6987300	US	1/17/2006	High voltage esd-protection structure
Microchip Technology Incorporated	6992509	US	1/31/2006	Switched-capacitor sample/hold having reduced amplifier slew-rate and settling time requirements
Microchip Technology Incorporated	7002218	US	2/21/2006	Low capacitance esd-protection structure under a bond pad
Microchip Technology Incorporated	7003543	US	2/21/2006	Sticky z bit

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7007172	US	2/28/2006	Modified harvard architecture processor having data memory space mapped to program memory space with erroneous execution protection
Microchip Technology Incorporated	7012404	US	3/14/2006	Battery cover assembly having integrated battery condition monitoring
Microchip Technology Incorporated	7012472	US	3/14/2006	Digital control loop to improve phase noise performance and rx/tx linearity
Microchip Technology Incorporated	7012484	US	3/14/2006	Filter using multilayer ceramic technology and structure thereof
Microchip Technology Incorporated	7020788	US	3/28/2006	Reduced power option
Microchip Technology Incorporated	7046046	US	5/16/2006	Switched capacitor signal scaling circuit
Microchip Technology Incorporated	7076517	US	7/11/2006	Serial communication device with dynamic filter allocation
Microchip Technology Incorporated	7079009	US	7/18/2006	Anticollision protocol with fast read request and additional schemes for reading multiple transponders in an rfid system
Microchip Technology Incorporated	7091785	US	8/15/2006	Load and line regulation using operational transconductance amplifier and operational amplifier in tandem

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7091740	US	8/15/2006	Write protection using a two signal control protocol for an integrated circuit device having parameter change capability, chip select and selectable write to non-volatile memory
Microchip Technology Incorporated	7102470	US	9/5/2006	Dual-band bandpass filter with stepped-impedance resonators
Microchip Technology Incorporated	7102558	US	9/5/2006	Five-level feed-back digital-to-analog converter for a switched capacitor sigma-delta analog-to-digital converter
Microchip Technology Incorporated	7113553	US	9/26/2006	Low-complexity joint symbol cck decoder
Microchip Technology Incorporated	7126515	US	10/24/2006	Selectable real time sample triggering for a plurality of inputs of an analog-to-digital converter
Microchip Technology Incorporated	7132893	US	11/7/2006	Selectable gain amplifier
Microchip Technology Incorporated	7155654	US	12/26/2006	Low complexity error concealment for wireless transmission
Microchip Technology Incorporated	7157790	US	1/2/2007	Single die stitch bonding
Microchip Technology Incorporated	7157890	US	1/2/2007	Using pulse width modulation in the control of load sharing between paralleled power supplies
Microchip Technology	7170136	US	1/30/2007	High voltage esd-protection structure

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Incorporated				
Microchip Technology Incorporated	7173401	US	2/6/2007	Differential amplifier and low drop-out regulator with thereof
Microchip Technology Incorporated	7186594	US	3/6/2007	High voltage esd-protection structure
Microchip Technology Incorporated	7193477	US	3/20/2007	Concurrent triple-band gain amplifier for multi-standard coexist communications
Microchip Technology Incorporated	7199603	US	4/3/2007	Increment/decrement, chip select and selectable write to non-volatile memory using a two signal control protocol for an integrated circuit device
Microchip Technology Incorporated	7200164	US	4/3/2007	Packet-based multiplication-free cck demodulator with a fast multipath interference cipher
Microchip Technology Incorporated	7203818	US	4/10/2007	Microcontroller instruction set
Microchip Technology Incorporated	7205746	US	4/17/2007	Battery cover assembly having integrated battery condition monitoring
Microchip Technology Incorporated	7206924	US	4/17/2007	Microcontroller instruction set
Microchip Technology Incorporated	7209030	US	4/24/2007	Noise alarm timer function for three-axis low frequency transponder
Microchip Technology Incorporated	7219246	US	5/15/2007	Digital system having selectable clock speed based upon available supply voltage and pll configuration register settings

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7221763	US	5/22/2007	High throughput aes architecture
Microchip Technology Incorporated	7225088	US	5/29/2007	Programmable power supply and brownout detector for electronic equipment
Microchip Technology Incorporated	7226858	US	6/5/2007	Submicron contact fill using a cvd tin barrier and high temperature pvd aluminum alloy deposition
Microchip Technology Incorporated	7231533	US	6/12/2007	Wake-up reset circuit draws no current when a control signal indicates sleep mode for a digital device
Microchip Technology Incorporated	7243372	US	7/10/2007	Modified harvard architecture processor having data memory space mapped to program memory space with erroneous execution protection
Microchip Technology Incorporated	7245186	US	7/17/2007	Bandpass amplifier
Microchip Technology Incorporated	7248625	US	7/24/2007	Compensation of i-q imbalance in digital transceivers
Microchip Technology Incorporated	7253687	US	8/7/2007	Clamping circuit for operational amplifiers
Microchip Technology Incorporated	7254379	US	8/7/2007	Rf receiver mismatch calibration system and method
Microchip Technology Incorporated	7263138	US	8/28/2007	Q-quenching super-regenerative receiver

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7265708	US	9/4/2007	Analog-to-digital converter with interchangeable resolution and sample and hold amplifier channels
Microchip Technology Incorporated	7272165	US	9/18/2007	Method and system for channel estimation in wlan
Microchip Technology Incorporated	7277682	US	10/2/2007	Rf passive mixer with dc offset tracking and local oscillator dc bias level-shifting network for reducing even-order distortion
Microchip Technology Incorporated	7280805	US	10/9/2007	Lo leakage and sideband image calibration system and method
Microchip Technology Incorporated	7308002	US	12/11/2007	Packet type arbitrator in wlan and corresponding arbitrating method
Microchip Technology Incorporated	7321266	US	1/22/2008	Current-matching variable gain amplifier
Microchip Technology Incorporated	7324615	US	1/29/2008	Time signal receiver and decoder
Microchip Technology Incorporated	7326594	US	2/5/2008	Connecting a plurality of bond pads and/or inner leads with a single bond wire
Microchip Technology Incorporated	7330364	US	2/12/2008	Device for converting high voltage alternating current (ac) to low voltage direct current (dc) and method therefor
Microchip Technology Incorporated	7330522	US	2/12/2008	Complementary code keying (cck) sequentially decoding apparatus and process thereof

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7336122	US	2/26/2008	Low power high side current monitor which operates at high voltages and method therefor
Microchip Technology Incorporated	7336743	US	2/26/2008	Automatic gain control and its controlling method
Microchip Technology Incorporated	7340237	US	3/4/2008	Dual-band active filter
Microchip Technology Incorporated	7356317	US	4/8/2008	Adaptive-biased mixer
Microchip Technology Incorporated	7362253	US	4/22/2008	Introduction to r2rc d/a converter
Microchip Technology Incorporated	7375555	US	5/20/2008	Five volt tolerant integrated circuit signal pad with three volt assist
Microchip Technology Incorporated	7376020	US	5/20/2008	Memory using a single-node data, address and control bus
Microchip Technology Incorporated	7376182	US	5/20/2008	Digital processor with pulse width modulation module having dynamically adjustable phase offset capability, high speed operation and simultaneous update of multiple pulse width modulation duty cycle registers
Microchip Technology Incorporated	7382183	US	6/3/2008	Minimizing switching noise and its effects in auto-zeroed amplifiers
Microchip Technology	7394870	US	7/1/2008	Low complexity synchronization for wireless transmission

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Incorporated				
Microchip Technology Incorporated	7401176	US	7/15/2008	Method and system for fast access to stack memory
Microchip Technology Incorporated	7415369	US	8/19/2008	Calibration of voltage-controlled oscillators
Microchip Technology Incorporated	7417483	US	8/26/2008	Wide-band wide-swing cmos gain enhancement technique and method therefor
Microchip Technology Incorporated	7432773	US	10/7/2008	Method, system and apparatus for reducing oscillator frequency spiking during oscillator frequency adjustment
Microchip Technology Incorporated	7433404	US	10/7/2008	Apparatus for higher resolution pulse width modulation duty cycle
Microchip Technology Incorporated	7436207	US	10/14/2008	Integrated circuit device having at least one of a plurality of bond pads with a selectable plurality of input-output functionalities
Microchip Technology Incorporated	7440753	US	10/21/2008	Communication network switching system and method thereof
Microchip Technology Incorporated	7444167	US	10/28/2008	Dual-band wireless lan rf transceiver
Microchip Technology Incorporated	7453307	US	11/18/2008	Process independent voltage controlled logarithmic attenuator having a low distortion and method therefor
Microchip Technology	7460441	US	12/2/2008	Measuring a long time period

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Incorporated				
Microchip Technology Incorporated	7466591	US	12/16/2008	Method for programming and erasing an array of nmos eeprom cells that minimizes bit disturbances and voltage withstand requirements for the memory array and supporting circuits
Microchip Technology Incorporated	7466753	US	12/16/2008	Microcontroller having a digital to frequency converter and/or a pulse frequency modulator
Microchip Technology Incorporated	7467178	US	12/16/2008	Dual mode arithmetic saturation processing
Microchip Technology Incorporated	7469133	US	12/23/2008	Radio frequency power detector
Microchip Technology Incorporated	7474159	US	1/6/2009	Frequency calibration for frequency synthesizers
Microchip Technology Incorporated	7478191	US	1/13/2009	Method for automatically switching usb peripherals between usb hosts
Microchip Technology Incorporated	7480191	US	1/20/2009	High speed logic level shifter
Microchip Technology Incorporated	7480753	US	1/20/2009	Switching upstream and downstream logic between ports in a universal serial bus hub
Microchip Technology Incorporated	7482888	US	1/27/2009	Fast startup resonant element oscillator
Microchip	7482782	US	1/27/2009	Charge control system using pulse width

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Technology Incorporated				modulation
Microchip Technology Incorporated	7487331	US	2/3/2009	Programming a digital processor with a single connection
Microchip Technology Incorporated	7496341	US	2/24/2009	Device and method for providing dc-offset estimation
Microchip Technology Incorporated	7498754	US	3/3/2009	Architecture for driving multiple loads at constant current
Microchip Technology Incorporated	7498755	US	3/3/2009	Brushed motor control with voltage boost for reverse and braking
Microchip Technology Incorporated	7502436	US	3/10/2009	Apparatus and method for generating push-pull pulse width modulation signals
Microchip Technology Incorporated	7505790	US	3/17/2009	Antenna diversity switch of wireless dual-mode co-existence systems
Microchip Technology Incorporated	7505855	US	3/17/2009	Multi-channel amplifier having programmable operational characteristics controlled with a serial interface
Microchip Technology Incorporated	7508899	US	3/24/2009	Apparatus and method for generating multi-phase pulse width modulation (pwm) and sharing a common (master) duty cycle value among a plurality of pwm generators
Microchip Technology Incorporated	7508900	US	3/24/2009	Apparatus for improved resolution pulse width modulation module duty cycle, dead time and phase

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7508901	US	3/24/2009	Apparatus and method for generating current reset mode pulse width modulation signals
Microchip Technology Incorporated	7513873	US	4/7/2009	Low-noise ultrasound method and beamformer system for doppler processing
Microchip Technology Incorporated	7523243	US	4/21/2009	Multi-host usb device controller
Microchip Technology Incorporated	7529939	US	5/5/2009	Method of and apparatus for transferring data
Microchip Technology Incorporated	7532077	US	5/12/2009	Edge alignment for frequency synthesizers
Microchip Technology Incorporated	7538534	US	5/26/2009	Method and apparatus for controlling output current of a cascaded dc/dc converter
Microchip Technology Incorporated	7538581	US	5/26/2009	Fast ac coupled level translator
Microchip Technology Incorporated	7538705	US	5/26/2009	Offset cancellation and reduced source induced 1/f noise of voltage reference by using bit stream from over-sampling analog-to-digital converter
Microchip Technology Incorporated	7548040	US	6/16/2009	Wireless battery charging of electronic devices such as wireless headsets/headphones
Microchip Technology Incorporated	7554272	US	6/30/2009	Low noise electroluminescent lamp (el) driver and method therefor
Microchip Technology	7554378	US	6/30/2009	Fast dc coupled level translator

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Incorporated				
Microchip Technology Incorporated	7556423	US	7/7/2009	Temperature sensor bow compensation
Microchip Technology Incorporated	7560983	US	7/14/2009	Multiple-path power amplifier
Microchip Technology Incorporated	7561452	US	7/14/2009	Transformer-isolated flyback converters and methods for regulating output current thereof
Microchip Technology Incorporated	7564707	US	7/21/2009	One-time programmable non-volatile memory
Microchip Technology Incorporated	7564263	US	7/21/2009	High-speed logic signal level shifter
Microchip Technology Incorporated	7567611	US	7/28/2009	Compensation of i-q imbalance in digital transceivers
Microchip Technology Incorporated	7570035	US	8/4/2009	Voltage regulator with a hybrid control loop
Microchip Technology Incorporated	7569910	US	8/4/2009	Multiple-transistor structure systems and methods in which portions of a first transistor and a second transistor are formed from the same layer
Microchip Technology Incorporated	7583211	US	9/1/2009	Analog-to-digital conversion circuit
Microchip Technology Incorporated	7583104	US	9/1/2009	Maintaining input and/or output configuration and data state during and when coming out of a low power mode

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7589564	US	9/15/2009	Method of maintaining input and/or output configuration and data states during and when coming out of a low power mode
Microchip Technology Incorporated	7589568	US	9/15/2009	Variable power and response time brown-out-reset circuit
Microchip Technology Incorporated	7589652	US	9/15/2009	Read and write interface communications protocol for digital-to-analog signal converter with non-volatile memory
Microchip Technology Incorporated	7593472	US	9/22/2009	Methods and apparatus for circulation transmissions for ofdm-based mimo systems
Microchip Technology Incorporated	7593500	US	9/22/2009	Apparatus for coordinating triggering of analog-to-digital conversions relative to pulse width modulation cycle timing
Microchip Technology Incorporated	7598809	US	10/6/2009	Rf power amplifier
Microchip Technology Incorporated	7602274	US	10/13/2009	Dynamic configuration of a radio frequency transponder
Microchip Technology Incorporated	7603244	US	10/13/2009	Calibration of voltage controlled oscillators
Microchip Technology Incorporated	7603601	US	10/13/2009	Enabling special modes within a digital device
Microchip Technology Incorporated	7609122	US	10/27/2009	Method and system for calibration of a tank circuit in a phase lock loop

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7627708	US	12/1/2009	Multi-host usb device
Microchip Technology Incorporated	7634596	US	12/15/2009	Dynamic peripheral function remapping to external input-output connections of an integrated circuit device
Microchip Technology Incorporated	7642735	US	1/5/2010	Using pulse density modulation for controlling dimmable electronic lighting ballasts
Microchip Technology Incorporated	7644217	US	1/5/2010	Detecting connection to a usb host or hub without using an extra status input
Microchip Technology Incorporated	7646808	US	1/12/2010	Allowing immediate update of pulse width modulation values
Microchip Technology Incorporated	7650440	US	1/19/2010	Peripheral supplied addressing in a simple dma module
Microchip Technology Incorporated	7659756	US	2/9/2010	Mosfet transistor amplifier with controlled output current
Microchip Technology Incorporated	7668895	US	2/23/2010	Galois field computation
Microchip Technology Incorporated	7675134	US	3/9/2010	Temperature compensated work function based voltage reference
Microchip Technology Incorporated	7710303	US	5/4/2010	Analog-to-digital converter offset and gain calibration using internal voltage references

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7714626	US	5/11/2010	System, method and apparatus having improved pulse width modulation frequency resolution
Microchip Technology Incorporated	7721018	US	5/18/2010	Direct memory access controller with flow control
Microchip Technology Incorporated	7723926	US	5/25/2010	Shunting type pwm dimming circuit for individually controlling brightness of series connected leds operated at constant current and method therefor
Microchip Technology Incorporated	7727833	US	6/1/2010	Work function based voltage reference
Microchip Technology Incorporated	7728679	US	6/1/2010	Calibration of voltage controlled oscillators
Microchip Technology Incorporated	7739433	US	6/15/2010	Sharing bandwidth of a single port sram between at least one dma peripheral and a cpu operating with a quadrature clock
Microchip Technology Incorporated	7755527	US	7/13/2010	Read and write interface communications protocol for digital-to-analog signal converter with non-volatile memory
Microchip Technology Incorporated	7756213	US	7/13/2010	Method for enhancing bluetooth transmission speed and robustness of emitting end and receiving end of communication system

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7756222	US	7/13/2010	Adaptive quantization method and apparatus for an ofdm receiver
Microchip Technology Incorporated	7759916	US	7/20/2010	Regulator with device performance dynamic mode selection
Microchip Technology Incorporated	7761689	US	7/20/2010	Programming a digital processor with a single connection
Microchip Technology Incorporated	7764213	US	7/27/2010	Current-time digital-to-analog converter
Microchip Technology Incorporated	7773680	US	8/10/2010	System and method for providing 3-dimensional joint interleaver and circulation transmissions
Microchip Technology Incorporated	7788430	US	8/31/2010	Enhanced single-node protocol for data, address and control operations
Microchip Technology Incorporated	7788434	US	8/31/2010	Interrupt controller handling interrupts with and without coalescing
Microchip Technology Incorporated	7791386	US	9/7/2010	Externally synchronizing multiphase pulse width modulation signals
Microchip Technology Incorporated	7800250	US	9/21/2010	Connection of an internal regulator to an external filter/stabilization capacitor through a selectable external connection and prevention of a current surge therebetween
Microchip Technology Incorporated	7800408	US	9/21/2010	High speed transient active pull-up i2c

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7804379	US	9/28/2010	Pulse width modulation dead time compensation method and apparatus
Microchip Technology Incorporated	7813048	US	10/12/2010	Inductorless electroactive lens driver and system
Microchip Technology Incorporated	7816943	US	10/19/2010	Programmable cycle state machine interface
Microchip Technology Incorporated	7817474	US	10/19/2010	Method for programming and erasing an array of nmos eeprom cells that minimizes bit disturbances and voltage withstand requirements for the memory array and supporting circuits
Microchip Technology Incorporated	7827330	US	11/2/2010	Configuring multi-bit slave addressing on a serial bus using a single external connection
Microchip Technology Incorporated	7852063	US	12/14/2010	Integrated power detector with temperature compensation for fully-closed loop control
Microchip Technology Incorporated	7852118	US	12/14/2010	High speed conditional back bias virtual ground restoration circuit
Microchip Technology Incorporated	7859307	US	12/28/2010	High speed transient active pull-up i2c
Microchip Technology Incorporated	7860470	US	12/28/2010	Cross coupled high frequency buffer
Microchip Technology Incorporated	7861030	US	12/28/2010	Method and apparatus for updating data in rom using a cam

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7863836	US	1/4/2011	Control circuit and method for regulating average inductor current in a switching converter
Microchip Technology Incorporated	7876540	US	1/25/2011	Adaptive electrostatic discharge (esd) protection of device interface for local interconnect network (lin) bus and the like
Microchip Technology Incorporated	7877537	US	1/25/2011	Configurable cache for a microprocessor
Microchip Technology Incorporated	7885047	US	2/8/2011	Adaptive electrostatic discharge (esd) protection of device interface for local interconnect network (lin) bus and the like
Microchip Technology Incorporated	7889787	US	2/15/2011	Ultrasound transmit beamformer integrated circuit and method
Microchip Technology Incorporated	7893684	US	2/22/2011	Integrated power detector with temperature compensation for fully-closed loop control
Microchip Technology Incorporated	7893714	US	2/22/2011	High voltage analog multiplex switch integrated circuit architecture
Microchip Technology Incorporated	7900070	US	3/1/2011	Power saving method of bi-directional communication wireless peripheral device
Microchip Technology Incorporated	7904623	US	3/8/2011	Ethernet controller
Microchip Technology Incorporated	7907021	US	3/15/2011	Two-step vco calibration method
Microchip Technology	7907378	US	3/15/2011	Automatic detection of a cmos device in latch-up and cycling of power thereto

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Incorporated				
Microchip Technology Incorporated	7908455	US	3/15/2011	Low overhead memory management system and method
Microchip Technology Incorporated	7908458	US	3/15/2011	Ethernet controller
Microchip Technology Incorporated	7908516	US	3/15/2011	Low power mode fault recovery method, system and apparatus
Microchip Technology Incorporated	7919973	US	4/5/2011	Method and apparatus for monitoring via's in a semiconductor fab
Microchip Technology Incorporated	7927921	US	4/19/2011	Semiconductor die attachment method using non-conductive screen print and dispense adhesive
Microchip Technology Incorporated	7933361	US	4/26/2011	Hybrid dc-offset reduction method and system for direct conversion receiver
Microchip Technology Incorporated	7948315	US	5/24/2011	Low noise binary-coded gain amplifier and method for time-gain compensation in medical ultrasound imaging
Microchip Technology Incorporated	7949327	US	5/24/2011	Method and apparatus for reception of long range signals in bluetooth
Microchip Technology Incorporated	7956653	US	6/7/2011	Complementary high voltage switched current source integrated circuit

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7961125	US	6/14/2011	Method and apparatus for dithering in multi-bit sigma-delta digital-to-analog converters
Microchip Technology Incorporated	7961126	US	6/14/2011	Method and apparatus for dithering in multi-bit sigma-delta analog-to-digital converters
Microchip Technology Incorporated	7962662	US	6/14/2011	Configuring multi-bit slave addressing on a serial bus using a single external connection
Microchip Technology Incorporated	7965152	US	6/21/2011	Attenuator with a control circuit
Microchip Technology Incorporated	7966457	US	6/21/2011	Configurable cache for a microprocessor
Microchip Technology Incorporated	7966480	US	6/21/2011	Register pointer trap to prevent errors due to an invalid pointer value in a register
Microchip Technology Incorporated	7973569	US	7/5/2011	Offset calibration and precision hysteresis for a rail-rail comparator with large dynamic range
Microchip Technology Incorporated	7973684	US	7/5/2011	Self auto-calibration of analog circuits in a mixed signal integrated circuit device
Microchip Technology Incorporated	7977820	US	7/12/2011	Ultrasound transmit pulse generator
Microchip Technology Incorporated	7978448	US	7/12/2011	Hybrid circuit for circuit protection and switching

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	7979594	US	7/12/2011	Serial communications device with dynamic allocation of acceptance masks using serial implementation
Microchip Technology Incorporated	7986178	US	7/26/2011	Pulse width modulation driver for electroactive lens
Microchip Technology Incorporated	7990773	US	8/2/2011	Sub volt flash memory system
Microchip Technology Incorporated	7994958	US	8/9/2011	Multi-level feed-back digital-to-analog converter using a chopper voltage reference for a switched capacitor sigma-delta analog-to-digital converter
Microchip Technology Incorporated	7996647	US	8/9/2011	Enhanced microprocessor or microcontroller
Microchip Technology Incorporated	7996651	US	8/9/2011	Enhanced microprocessor or microcontroller
Microchip Technology Incorporated	8013640	US	9/6/2011	Programmable ultrasound transmit beamformer integrated circuit and method
Microchip Technology Incorporated	8022714	US	9/20/2011	Capacitance measurement apparatus
Microchip Technology Incorporated	8022751	US	9/20/2011	Systems and methods for trimming bandgap offset with bipolar elements
Microchip Technology Incorporated	8026761	US	9/27/2011	Instrumentation amplifier calibration method, system and apparatus

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8036298	US	10/11/2011	Apparatus and method of error vector measurement for digital and multiple-input multiple output imo communication systems
Microchip Technology Incorporated	8041973	US	10/18/2011	Interrupt/wake-up of an electronic device in a low power sleep mode when detecting a sensor or frequency source activated frequency change
Microchip Technology Incorporated	8065544	US	11/22/2011	Interrupt/wake-up of an electronic device in a low power sleep mode when detecting a sensor or frequency source activated frequency change
Microchip Technology Incorporated	8065545	US	11/22/2011	Interrupt/wake-up of an electronic device in a low power sleep mode when detecting a sensor or frequency source activated frequency change
Microchip Technology Incorporated	8065546	US	11/22/2011	Interrupt/wake-up of an electronic device in a low power sleep mode when detecting a sensor or frequency source activated frequency change
Microchip Technology Incorporated	8072233	US	12/6/2011	Method and apparatus for monitoring via's in a semiconductor fab
Microchip Technology Incorporated	8072959	US	12/6/2011	Generating method for short training field in ieee 802.11n communication systems
Microchip Technology Incorporated	8073092	US	12/6/2011	Automatic synchronization of an internal oscillator to an external frequency reference
Microchip Technology	8080983	US	12/20/2011	Low drop out (ldo) bypass voltage regulator

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Incorporated				
Microchip Technology Incorporated	8085176	US	12/27/2011	Method and apparatus for dithering in multi-bit sigma-delta digital-to-analog converters
Microchip Technology Incorporated	8085805	US	12/27/2011	Adaptive channel selection by wireless nodes for improved operating range
Microchip Technology Incorporated	8094503	US	1/10/2012	Method of programming an array of nmos eeprom cells that minimizes bit disturbances and voltage withstand requirements for the memory array and supporting circuits
Microchip Technology Incorporated	8106597	US	1/31/2012	High efficiency boost led driver with output
Microchip Technology Incorporated	8108708	US	1/31/2012	Power optimization when using external clock sources
Microchip Technology Incorporated	8115552	US	2/14/2012	Amplifier circuit with step gain
Microchip Technology Incorporated	8117378	US	2/14/2012	Preventing unintended permanent write-protection
Microchip Technology Incorporated	8117475	US	2/14/2012	Direct memory access controller
Microchip Technology Incorporated	8130519	US	3/6/2012	Led driver with low harmonic distortion of input ac current and methods of controlling the same

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8138805	US	3/20/2012	Complementary high voltage switched current source integrated circuit
Microchip Technology Incorporated	8140038	US	3/20/2012	Adaptive receivers
Microchip Technology Incorporated	8147409	US	4/3/2012	Method and apparatus for transducer excitation in medical ultrasound imaging
Microchip Technology Incorporated	8154317	US	4/10/2012	Integrated circuit device to support inductive sensing
Microchip Technology Incorporated	8154898	US	4/10/2012	Current driven bipolar high voltage driver for capacitive loads
Microchip Technology Incorporated	8164416	US	4/24/2012	Programmable selective wake-up for radio frequency transponder
Microchip Technology Incorporated	8166213	US	4/24/2012	Controller with indirect accessible memory
Microchip Technology Incorporated	8193839	US	6/5/2012	Multi-level transmitter circuit having substantially constant impedance output
Microchip Technology Incorporated	8193589	US	6/5/2012	Work function based voltage reference
Microchip Technology Incorporated	8193719	US	6/5/2012	Using pulse density modulation for controlling dimmable electronic lighting ballasts

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8193845	US	6/5/2012	Binary-weighted delta-sigma fractional-n frequency synthesizer with digital-to-analog differentiators canceling quantization noise
Microchip Technology Incorporated	8198922	US	6/12/2012	Programmable ultrasound transmit beamformer integrated circuit and method
Microchip Technology Incorporated	8208234	US	6/26/2012	Circuit with esd protection for a switching regulator
Microchip Technology Incorporated	8217664	US	7/10/2012	Generating a time delayed event
Microchip Technology Incorporated	8219778	US	7/10/2012	Virtual memory interface
Microchip Technology Incorporated	8222955	US	7/17/2012	Compensated bandgap
Microchip Technology Incorporated	8223053	US	7/17/2012	2-phase gain calibration and scaling scheme for switched capacitor sigma-delta modulator
Microchip Technology Incorporated	8243781	US	8/14/2012	Apparatus and method for signal quality measurement on gfsk signals
Microchip Technology Incorporated	8254073	US	8/28/2012	High voltage transmit/receive switch and method therefor
Microchip Technology Incorporated	8259862	US	9/4/2012	Receivers and symbol decoders thereof

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8264272	US	9/11/2012	Digital control interface in heterogeneous multi-chip module
Microchip Technology Incorporated	8269656	US	9/18/2012	Impedance matched transmission circuit with analog-to-digital converter
Microchip Technology Incorporated	8278860	US	10/2/2012	Variable pulse width modulation for reduced zero-crossing granularity in sensorless brushless direct current motors
Microchip Technology Incorporated	8300736	US	10/30/2012	Method and apparatus for phase reference tracking of digital phase modulated signals in the receiver
Microchip Technology Incorporated	8310381	US	11/13/2012	Capacitive key touch sensing using analog inputs and digital outputs
Microchip Technology Incorporated	8331300	US	12/11/2012	Method for communicating data, a transmitting unit and a computer program product
Microchip Technology Incorporated	8332219	US	12/11/2012	Speech detection method using multiple voice capture devices
Microchip Technology Incorporated	8339058	US	12/25/2012	Three-color rgb led color mixing and control by variable frequency modulation
Microchip Technology Incorporated	8339068	US	12/25/2012	Led brightness control by variable frequency modulation
Microchip Technology Incorporated	8339077	US	12/25/2012	Slow speed operation of brushless direct current motors by gating pulse width modulation drive

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8339113	US	12/25/2012	Buck switch-mode power converter large signal transient response optimizer
Microchip Technology Incorporated	8339299	US	12/25/2012	2-phase gain calibration and scaling scheme for switched capacitor sigma-delta modulator using a chopper voltage reference
Microchip Technology Incorporated	8358090	US	1/22/2013	Dimmer circuit for transformerisolated led driver and method therefor
Microchip Technology Incorporated	8362757	US	1/29/2013	Data retention secondary voltage regulator
Microchip Technology Incorporated	8362819	US	1/29/2013	Synchronizing multi-frequency pulse width modulation generators
Microchip Technology Incorporated	8363435	US	1/29/2013	Digital device with boot strap circuit stimulator
Microchip Technology Incorporated	8368408	US	2/5/2013	Measuring a time period
Microchip Technology Incorporated	8373357	US	2/12/2013	Modulator module in an integrated circuit device
Microchip Technology Incorporated	8378606	US	2/19/2013	Synchronized minimum frequency pulse width modulation drive for sensorless brushless direct current motor
Microchip Technology Incorporated	8378660	US	2/19/2013	Programmable integrated circuit device to support inductive sensing

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8390384	US	3/5/2013	Precision on-board tuning of embedded microcontroller oscillator using charge time measurement unit
Microchip Technology Incorporated	8400741	US	3/19/2013	Programmable echo signal switch with t/r switch for ultrasound beamforming integrated circuit and method
Microchip Technology Incorporated	8408723	US	4/2/2013	Backlighting inductive touch buttons
Microchip Technology Incorporated	8427075	US	4/23/2013	Constant current output sink or source
Microchip Technology Incorporated	8427123	US	4/23/2013	System, method and apparatus to transition between pulse width modulation and pulse-frequency modulation in a switch mode power supply
Microchip Technology Incorporated	8427450	US	4/23/2013	Capacitive touch sensing and light emitting diode drive matrix
Microchip Technology Incorporated	8432140	US	4/30/2013	Dual mode boost regulator
Microchip Technology Incorporated	8432208	US	4/30/2013	Maintaining pulse width modulation data-set coherency
Microchip Technology Incorporated	8437427	US	5/7/2013	Arbitrary frequency shifter in communication systems
Microchip Technology Incorporated	8442453	US	5/14/2013	Radio communication transceiver

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8447046	US	5/21/2013	Circuit with three-stage of power-on sequence used for suppressing the pop noise in audio system
Microchip Technology Incorporated	8447275	US	5/21/2013	Lossless inductor current sensing in a switch-mode power supply
Microchip Technology Incorporated	8451047	US	5/28/2013	Circuit used for indicating process corner and extreme temperature
Microchip Technology Incorporated	8451051	US	5/28/2013	Dual mode sigma delta analog to digital converter and circuit using the same
Microchip Technology Incorporated	8456106	US	6/4/2013	Led driver with extended dimming range and method for achieving the same
Microchip Technology Incorporated	8456147	US	6/4/2013	User-configurable, efficiency-optimizing, calibrated sensorless power/energy conversion switch-mode power supply with a serial communications interface
Microchip Technology Incorporated	8456243	US	6/4/2013	Failsafe oscillator monitor and alarm
Microchip Technology Incorporated	8456342	US	6/4/2013	Switch sequencing for code-range-specific linearity improvement in digital-to-analog converters
Microchip Technology Incorporated	8456478	US	6/4/2013	Microcontroller with integrated graphical processing unit
Microchip Technology Incorporated	8461777	US	6/11/2013	Protection from short cathode condition in led driver and method therefor

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8462473	US	6/11/2013	Adaptive electrostatic discharge (esd) protection circuit
Microchip Technology Incorporated	8472213	US	6/25/2013	Extending pulse width modulation phase offset
Microchip Technology Incorporated	8485724	US	7/16/2013	Thermocouple electromotive force voltage to temperature converter with integrated cold-junction compensation and linearization
Microchip Technology Incorporated	8487685	US	7/16/2013	Enhanced complementary waveform generator
Microchip Technology Incorporated	8489035	US	7/16/2013	Radio communication transceiver
Microchip Technology Incorporated	8495125	US	7/23/2013	Dsp engine with implicit mixed sign operands
Microchip Technology Incorporated	8497690	US	7/30/2013	Automated capacitive touch scan
Microchip Technology Incorporated	8497789	US	7/30/2013	Modified dynamic element matching for reduced latency in a pipeline analog to digital converter
Microchip Technology Incorporated	8509361	US	8/13/2013	Simplified acquisition apparatus and method for a bluetooth receiver
Microchip Technology Incorporated	8524616	US	9/3/2013	Method of nonstoichiometric cvd dielectric film surface passivation for film roughness control

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8531249	US	9/10/2013	Oscillator for generating output signal with adjustable frequency
Microchip Technology Incorporated	8532228	US	9/10/2013	Automatic frequency offset compensation in zero-intermediate frequency receivers using minimum-shift keying (msk) signaling
Microchip Technology Incorporated	8536855	US	9/17/2013	Adjustable shunt regulator circuit without error amplifier
Microchip Technology Incorporated	8534302	US	9/17/2013	Prober cleaning block assembly
Microchip Technology Incorporated	8536853	US	9/17/2013	Data retention secondary voltage regulator
Microchip Technology Incorporated	8536907	US	9/17/2013	Power on reset signal generating apparatus and method
Microchip Technology Incorporated	8539210	US	9/17/2013	Context switching with automatic saving of special function registers memory-mapped to all banks
Microchip Technology Incorporated	8542037	US	9/24/2013	Multi-level high voltage pulser integrated circuit using low voltage mosfets
Microchip Technology Incorporated	8542215	US	9/24/2013	Mutual capacitance measurement in a multi-touch input device
Microchip Technology Incorporated	8542638	US	9/24/2013	System and method for interference identification and frequency allocation
Microchip	8543888	US	9/24/2013	Programmable cyclic redundancy check crc

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Technology Incorporated				unit
Microchip Technology Incorporated	8547122	US	10/1/2013	Temperature measurement of active device under test on strip tester
Microchip Technology Incorporated	8548033	US	10/1/2013	Automatic frequency control under low signal-to-noise conditions
Microchip Technology Incorporated	8558598	US	10/15/2013	Phase shift generating circuit
Microchip Technology Incorporated	8558632	US	10/15/2013	Repetitive single cycle pulse width modulation generation
Microchip Technology Incorporated	8571021	US	10/29/2013	Packet based data transmission with reduced data size
Microchip Technology Incorporated	8577021	US	11/5/2013	5 ringer equivalent number (ren) ringer circuit using a high voltage level translator and a source follower buffer and method therefor
Microchip Technology Incorporated	8582629	US	11/12/2013	Wireless signal transceiving apparatus
Microchip Technology Incorporated	8587278	US	11/19/2013	Led driver with low harmonic distortion of input ac current and methods of controlling the same
Microchip Technology Incorporated	8599053	US	12/3/2013	Switched-capacitance gain amplifier with improved input impedance
Microchip Technology Incorporated	8599155	US	12/3/2013	Touch sense using time domain reflectometry

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8638151	US	1/28/2014	Variable frequency ratiometric multiphase pulse width modulation generation
Microchip Technology Incorporated	8643522	US	2/4/2014	Multichannel analog to digital converter apparatus and method for using
Microchip Technology Incorporated	8645729	US	2/4/2014	External device power control during low power sleep mode without central processing unit intervention
Microchip Technology Incorporated	8648627	US	2/11/2014	Programmable ultrasound transmit beamformer integrated circuit and method
Microchip Technology Incorporated	8650341	US	2/11/2014	Method for can concatenating can data payloads
Microchip Technology Incorporated	8650356	US	2/11/2014	Microcontroller with can module
Microchip Technology Incorporated	8660221	US	2/25/2014	Fast and robust agc apparatus and method using the same
Microchip Technology Incorporated	8664913	US	3/4/2014	Battery powered apparatus with the circuit of integrated power management and charger unit
Microchip Technology Incorporated	8674863	US	3/18/2014	Distributed bootstrap switch
Microchip Technology Incorporated	8688140	US	4/1/2014	Radio frequency tag location system and method
Microchip Technology Incorporated	8688964	US	4/1/2014	Programmable exception processing latency

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8686651	US	4/1/2014	Multiple stage sequential current regulator
Microchip Technology Incorporated	8692530	US	4/8/2014	Efficiency-optimizing, calibrated sensorless power/energy conversion in a switch-mode power supply
Microchip Technology Incorporated	8693595	US	4/8/2014	Adaptive wireless communication receiver
Microchip Technology Incorporated	8698414	US	4/15/2014	High resolution pulse width modulation (pwm) frequency control using a tunable oscillator
Microchip Technology Incorporated	8698556	US	4/15/2014	Low switching error, small capacitors, auto-zero offset buffer amplifier
Microchip Technology Incorporated	8710863	US	4/29/2014	Configurable logic cells
Microchip Technology Incorporated	8718207	US	5/6/2014	Method used for providing an adaptive receiving in wireless communication
Microchip Technology Incorporated	8723595	US	5/13/2014	Voltage generator
Microchip Technology Incorporated	8723672	US	5/13/2014	Automatic audible alarm origination locate
Microchip Technology Incorporated	8723833	US	5/13/2014	Capacitive touch system with noise immunity
Microchip Technology	8729959	US	5/20/2014	Voltage generating apparatus

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Incorporated				
Microchip Technology Incorporated	8735979	US	5/27/2014	Multi-channel homogenous path for enhanced mutual triggering of electrostatic discharge fingers
Microchip Technology Incorporated	8742968	US	6/3/2014	Analog front end device with two-wire interface
Microchip Technology Incorporated	8749294	US	6/10/2014	Low pin count high voltage ultrasound transmitter and method therefor
Microchip Technology Incorporated	8762614	US	6/24/2014	Analog-to-digital converter with early interrupt capability
Microchip Technology Incorporated	8779734	US	7/15/2014	Integrated circuit device with two voltage regulators
Microchip Technology Incorporated	8780068	US	7/15/2014	Capacitive touch sensing and light emitting diode drive matrix
Microchip Technology Incorporated	8786266	US	7/22/2014	Effective current sensing for high voltage switching regulators
Microchip Technology Incorporated	8791844	US	7/29/2014	Modified dynamic element matching for reduced latency in a pipeline analog to digital converter
Microchip Technology Incorporated	8793426	US	7/29/2014	Microcontroller with linear memory access in a banked memory
Microchip Technology Incorporated	8799552	US	8/5/2014	Microcontroller with special banking instructions
Microchip	8803448	US	8/12/2014	Constant current output sink or source

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Technology Incorporated				
Microchip Technology Incorporated	8825912	US	9/2/2014	Dynamic state configuration restore
Microchip Technology Incorporated	8825926	US	9/2/2014	Processor with assignable general purpose register set
Microchip Technology Incorporated	8836128	US	9/16/2014	Forming fence conductors in an integrated circuit
Microchip Technology Incorporated	8836302	US	9/16/2014	Low dropout voltage regulator and electronic device thereof
Microchip Technology Incorporated	8836350	US	9/16/2014	Capacitive touch sensing using an internal capacitor of an analog-to-digital converter (adc) and a voltage reference
Microchip Technology Incorporated	8841897	US	9/23/2014	Voltage regulator having current and voltage foldback based upon load impedance
Microchip Technology Incorporated	8842829	US	9/23/2014	Code hopping encryption technique for barrier operator systems
Microchip Technology Incorporated	8847802	US	9/30/2014	Microcontroller adc with a variable sample and hold capacitor
Microchip Technology Incorporated	8855249	US	10/7/2014	Preamble detection at low signal-to-noise levels
Microchip Technology Incorporated	8853091	US	10/7/2014	Method for manufacturing a semiconductor die with multiple depth shallow trench isolation

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8855244	US	10/7/2014	Digitally demodulating a minimum-shift keying (msk) signal
Microchip Technology Incorporated	8856406	US	10/7/2014	Peripheral trigger generator
Microchip Technology Incorporated	8858003	US	10/14/2014	Physical force capacitive touch sensors having conductive plane and backlighting
Microchip Technology Incorporated	8866525	US	10/21/2014	Configurable time delays for equalizing pulse width modulation timing
Microchip Technology Incorporated	8873616	US	10/28/2014	High resolution pulse width modulator
Microchip Technology Incorporated	8878183	US	11/4/2014	Method and apparatus for monitoring semiconductor fabrication
Microchip Technology Incorporated	8878581	US	11/4/2014	Variable frequency ratiometric multiphase pulse width modulation generation
Microchip Technology Incorporated	8884372	US	11/11/2014	Analog signal compatible cmos switch as an integrated peripheral to a standard microcontroller
Microchip Technology Incorporated	8884771	US	11/11/2014	Smoke detection using change in permittivity of capacitor air dielectric
Microchip Technology Incorporated	8896219	US	11/25/2014	Dimming circuit and method
Microchip Technology Incorporated	8896473	US	11/25/2014	Digital-to-analog-converter with resistor ladder

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8896975	US	11/25/2014	Voltage regulator over-voltage detection system, method and apparatus
Microchip Technology Incorporated	8897324	US	11/25/2014	Timebase peripheral
Microchip Technology Incorporated	8898356	US	11/25/2014	Combined power and input/output line
Microchip Technology Incorporated	8907580	US	12/9/2014	Circuit and method for flicker suppression in light emitting diodes (leds)
Microchip Technology Incorporated	8908823	US	12/9/2014	Digital period divider
Microchip Technology Incorporated	8909169	US	12/9/2014	Optimizing isolation and insertion loss of a radio frequency single pole-double-throw switch
Microchip Technology Incorporated	8921986	US	12/30/2014	Insulated bump bonding
Microchip Technology Incorporated	8922183	US	12/30/2014	Adaptive integrated analog control system compensation
Microchip Technology Incorporated	8922362	US	12/30/2014	Temporal horn pattern synchronization
Microchip Technology Incorporated	8933907	US	1/13/2015	Capacitive touch system using both self and mutual capacitance
Microchip Technology Incorporated	8937565	US	1/20/2015	Impedance matched transmission circuit with analog-to-digital converter

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8937351	US	1/20/2015	Power mos transistor with improved metal contact
Microchip Technology Incorporated	8957651	US	2/17/2015	User-configurable, efficiency-optimizing, power/energy conversion switch-mode power supply with a serial communications interface
Microchip Technology Incorporated	8963430	US	2/24/2015	Circuit for detection and control of led string operation
Microchip Technology Incorporated	8962397	US	2/24/2015	Multiple well drain engineering for hv mos devices
Microchip Technology Incorporated	8963622	US	2/24/2015	Method and apparatus for generating regulated isolation supply voltage
Microchip Technology Incorporated	8970187	US	3/3/2015	Voltage generator
Microchip Technology Incorporated	8970190	US	3/3/2015	Using low voltage regulator to supply power to a source-biased power domain
Microchip Technology Incorporated	8970415	US	3/3/2015	Multi-level capacitive dac
Microchip Technology Incorporated	8970416	US	3/3/2015	4n+1 level capacitive dac using n capacitors
Microchip Technology Incorporated	8972214	US	3/3/2015	Touch sense determined by characterizing impedance changes in a transmission line

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	8981973	US	3/17/2015	Successive-approximation-register (sar) analog-to-digital converter (adc) attenuation capacitor calibration method and apparatus
Microchip Technology Incorporated	8984198	US	3/17/2015	Data space arbiter
Microchip Technology Incorporated	8984323	US	3/17/2015	Scheduling events in a microprocessor using a plurality of delta time registers arranged as a sequence buffer and indicating a sequence position of the sequence buffer to process an event
Microchip Technology Incorporated	8985849	US	3/24/2015	High resolution temperature measurement
Microchip Technology Incorporated	8988134	US	3/24/2015	System and method for operating low power circuits at high temperatures
Microchip Technology Incorporated	8988142	US	3/24/2015	Integrated high voltage isolation using low value capacitors
Microchip Technology Incorporated	8988156	US	3/24/2015	Low emi wide frequency range oscillator with automatic digital amplitude control
Microchip Technology Incorporated	9000674	US	4/7/2015	Multiple stage sequential current regulator
Microchip Technology Incorporated	9018928	US	4/28/2015	Relative efficiency measurement in a pulse width modulation system

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9026071	US	5/5/2015	Multi-systems integrated modulation module and communication device
Microchip Technology Incorporated	9028661	US	5/12/2015	Glucose measurement using a current source
Microchip Technology Incorporated	9034758	US	5/19/2015	Forming fence conductors using spacer etched trenches
Microchip Technology Incorporated	9035635	US	5/19/2015	Using synchronous converter in asynchronous mode to prevent current reversal during battery charging
Microchip Technology Incorporated	9035685	US	5/19/2015	System, method and apparatus having improved pulse width modulation frequency resolution
Microchip Technology Incorporated	9035919	US	5/19/2015	Electrostatics stylus
Microchip Technology Incorporated	9037096	US	5/19/2015	Reducing insertion loss in Ina bypass mode by using a single-pole-triple-throw switch in a rf front end module
Microchip Technology Incorporated	9041313	US	5/26/2015	Low dropout light emitting diode (led) ballast circuit and method therefor
Microchip Technology Incorporated	9048104	US	6/2/2015	Multi-chip package module and a doped polysilicon trench for isolation and connection
Microchip Technology Incorporated	9048863	US	6/2/2015	Pulse density digital-to-analog converter with slope compensation function

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9054733	US	6/9/2015	Quantization noise coupling delta sigma adc with a delay in the main dac feedback
Microchip Technology Incorporated	9054851	US	6/9/2015	Dithering circuit for serial data transmission
Microchip Technology Incorporated	9071172	US	6/30/2015	Sine modified trapezoidal drive for brushless dc motors
Microchip Technology Incorporated	9071181	US	6/30/2015	Three phase brushless dc motor sensor-less control using sinusoidal drive method and apparatus
Microchip Technology Incorporated	9071264	US	6/30/2015	Microcontroller with sequencer driven analog-to-digital converter
Microchip Technology Incorporated	9093433	US	7/28/2015	Using bump bonding to distribute current flow on a semiconductor power device
Microchip Technology Incorporated	9094751	US	7/28/2015	Headphone apparatus and audio driving apparatus thereof
Microchip Technology Incorporated	9100008	US	8/4/2015	Bootstrapped switch with a highly linearized resistance
Microchip Technology Incorporated	9106136	US	8/11/2015	Pulse width modulation load share bus
Microchip Technology Incorporated	9116229	US	8/25/2015	Ultrasound transmit beamformer integrated circuit and method
Microchip Technology Incorporated	9129680	US	9/8/2015	Self-biasing multi-reference

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9129695	US	9/8/2015	Self-biasing current reference
Microchip Technology Incorporated	9131448	US	9/8/2015	Standalone radio frequency wireless device having data acquisition capabilities
Microchip Technology Incorporated	9141572	US	9/22/2015	Direct memory access controller
Microchip Technology Incorporated	9144041	US	9/22/2015	Capacitive/inductive proximity detection for wi-fi protection
Microchip Technology Incorporated	9144051	US	9/22/2015	Proximity detection using an antenna and directional coupler switch
Microchip Technology Incorporated	9154091	US	10/6/2015	Op-amp sharing technique to remove memory effect in pipelined circuit
Microchip Technology Incorporated	9153568	US	10/6/2015	Chip, electrostatic discharge protection device and fabrication thereof
Microchip Technology Incorporated	9154155	US	10/6/2015	2-phase switched capacitor flash adc
Microchip Technology Incorporated	9159218	US	10/13/2015	Initiation of carbon monoxide and/or smoke detector alarm test using image recognition and/or facial gesturing
Microchip Technology Incorporated	9159442	US	10/13/2015	Serial memory with fast read with look-ahead
Microchip Technology Incorporated	9172387	US	10/27/2015	Sampling input stage with multiple channels

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9176011	US	11/3/2015	Single wire analog output sensor architecture
Microchip Technology Incorporated	9176088	US	11/3/2015	Method and apparatus for detecting smoke in an ion chamber
Microchip Technology Incorporated	9189940	US	11/17/2015	Method and apparatus for detecting smoke in an ion chamber
Microchip Technology Incorporated	9195497	US	11/24/2015	Microcontroller with context switch
Microchip Technology Incorporated	9197271	US	11/24/2015	Proximity detection using an antenna and directional coupler switch
Microchip Technology Incorporated	9201446	US	12/1/2015	Timebase peripheral
Microchip Technology Incorporated	9207209	US	12/8/2015	Method and apparatus for detecting smoke in an ion chamber
Microchip Technology Incorporated	9208095	US	12/8/2015	Configurable cache for a microprocessor
Microchip Technology Incorporated	9210769	US	12/8/2015	Constant brightness led drive communications port
Microchip Technology Incorporated	9224659	US	12/29/2015	Method and apparatus for semiconductor testing at low temperature
Microchip Technology Incorporated	9225253	US	12/29/2015	High voltage switching linear amplifier and method therefor

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9233300	US	1/12/2016	System to deliver prioritized game audio wirelessly with a minimal latency
Microchip Technology Incorporated	9236852	US	1/12/2016	Input capture peripheral with gating logic
Microchip Technology Incorporated	9240785	US	1/19/2016	Analog signal compatible cmos switch as an integrated peripheral to a standard microcontroller
Microchip Technology Incorporated	9245988	US	1/26/2016	Electrostatic discharge protection device and electronic apparatus thereof
Microchip Technology Incorporated	9246667	US	1/26/2016	Method and apparatus for clock recovery
Microchip Technology Incorporated	9246378	US	1/26/2016	Method and apparatus for extending the power output range of a power converter used for a lighting system
Microchip Technology Incorporated	9252769	US	2/2/2016	Microcontroller with optimized adc controller
Microchip Technology Incorporated	9257517	US	2/9/2016	Vertical dmos-field effect transistor
Microchip Technology Incorporated	9257899	US	2/9/2016	Charge pump circuit and phase lock loop circuit having the same
Microchip Technology Incorporated	9257942	US	2/9/2016	Audio amplifier apparatus

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9257980	US	2/9/2016	Measuring capacitance of a capacitive sensor with a microcontroller having digital outputs for driving a guard ring
Microchip Technology Incorporated	9258027	US	2/9/2016	Proximity detection using an antenna and directional coupler switch
Microchip Technology Incorporated	9265103	US	2/16/2016	Multiple stage sequential current regulator
Microchip Technology Incorporated	9261931	US	2/16/2016	Peripheral special function register with soft-reset disable
Microchip Technology Incorporated	9261932	US	2/16/2016	Minimizing switchover time in a hot swappable program memory
Microchip Technology Incorporated	9263397	US	2/16/2016	Wafer mapping process control with indicator line
Microchip Technology Incorporated	9269597	US	2/23/2016	Open cavity plastic package
Microchip Technology Incorporated	9269606	US	2/23/2016	Spacer enabled active isolation for an integrated circuit device
Microchip Technology Incorporated	9281808	US	3/8/2016	Variable voltage level translator
Microchip Technology Incorporated	9286241	US	3/15/2016	Cryptographic transmission system
Microchip Technology Incorporated	9287884	US	3/15/2016	Enhanced numerical controlled oscillator

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9288697	US	3/15/2016	Wireless communication circuit with a wideband received signal strength indicator
Microchip Technology Incorporated	9298570	US	3/29/2016	Processor device with reset condition trace capabilities
Microchip Technology Incorporated	9300319	US	3/29/2016	2-phase switched capacitor flash adc
Microchip Technology Incorporated	9301086	US	3/29/2016	Data transmission system and method for bluetooth interface
Microchip Technology Incorporated	9306055	US	4/5/2016	High voltage double-diffused mos (dmos) device and method of manufacture
Microchip Technology Incorporated	9306746	US	4/5/2016	Randomizing current injection circuit to obscure gate noise for added security
Microchip Technology Incorporated	9310828	US	4/12/2016	Complementary output generator module
Microchip Technology Incorporated	9310952	US	4/12/2016	Capacitive touch system using both self and mutual capacitance
Microchip Technology Incorporated	9312844	US	4/12/2016	Slope compensation module
Microchip Technology Incorporated	9312852	US	4/12/2016	Inductive load driver slew rate controller
Microchip Technology Incorporated	9318702	US	4/19/2016	Resistive memory cell having a reduced conductive path area

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9323985	US	4/26/2016	Automatic gesture recognition for a sensor system
Microchip Technology Incorporated	9336122	US	5/10/2016	Device having configurable breakpoint based on interrupt status
Microchip Technology Incorporated	9337253	US	5/10/2016	Method and apparatus for constructing an isolation capacitor in an integrated circuit
Microchip Technology Incorporated	9337725	US	5/10/2016	Output current control in a boundary conduction mode buck converter
Microchip Technology Incorporated	9337811	US	5/10/2016	Asymmetric hysteretic controllers
Microchip Technology Incorporated	9338035	US	5/10/2016	Microcontroller with can bus module and auto speed detect
Microchip Technology Incorporated	9342195	US	5/17/2016	System and method to share electrodes between capacitive touch controller and gesture detection device
Microchip Technology Incorporated	9343147	US	5/17/2016	Resistive random access memory (reram) and conductive bridging random access memory (cbram) cross coupled fuse and read method and system
Microchip Technology Incorporated	9349950	US	5/24/2016	Resistive memory cell with trench-shaped bottom electrode
Microchip Technology Incorporated	9351158	US	5/24/2016	Method for wireless easy connect

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9354743	US	5/31/2016	Apparatus for improving signal-to-noise performance of projected capacitance touch screens and panels
Microchip Technology Incorporated	9356613	US	5/31/2016	Pulse density modulation digital-to-analog converter with triangle wave generation
Microchip Technology Incorporated	9362496	US	6/7/2016	Resistive memory cell with trench-shaped bottom electrode
Microchip Technology Incorporated	9367179	US	6/14/2016	Capacitive voltage divider touch sensor
Microchip Technology Incorporated	9377507	US	6/28/2016	Processor device with instruction trace capabilities
Microchip Technology Incorporated	9379621	US	6/28/2016	Digital slope compensation for peak current controlled converters
Microchip Technology Incorporated	9385043	US	7/5/2016	Spacer enabled poly gate
Microchip Technology Incorporated	9385053	US	7/5/2016	Method and apparatus for semiconductor testing at low temperature
Microchip Technology Incorporated	9385313	US	7/5/2016	Resistive memory cell having a reduced conductive path area
Microchip Technology Incorporated	9388621	US	7/12/2016	Decryption of access codes of diverse protocols in barrier operator systems
Microchip Technology Incorporated	9404948	US	8/2/2016	Mains voltage zero-crossing detector

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9412942	US	8/9/2016	Resistive memory cell with bottom electrode having a sloped side wall
Microchip Technology Incorporated	9425186	US	8/23/2016	Electrostatic discharge protection circuit
Microchip Technology Incorporated	9429980	US	8/30/2016	Flexible clocking for audio sample rate converter in a usb system
Microchip Technology Incorporated	9430107	US	8/30/2016	Determining touch locations and forces thereto on a touch and force sensing surface
Microchip Technology Incorporated	9431390	US	8/30/2016	Compact electrostatic discharge (esd) protection structure
Microchip Technology Incorporated	9437093	US	9/6/2016	Differential current measurements to determine ion current in the presence of leakage current
Microchip Technology Incorporated	9444040	US	9/13/2016	Sidewall type memory cell
Microchip Technology Incorporated	9448575	US	9/20/2016	Bipolar transistor adjustable shunt regulator circuit
Microchip Technology Incorporated	9450419	US	9/20/2016	Combined power supply and input/output system with boost capability
Microchip Technology Incorporated	9450585	US	9/20/2016	Selecting four signals from sixteen inputs
Microchip Technology Incorporated	9455037	US	9/27/2016	Eeprom memory cell with low voltage read path and high voltage erase/write path

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9467141	US	10/11/2016	Measuring capacitance of a capacitive sensor with a microcontroller having an analog output for driving a guard ring
Microchip Technology Incorporated	9467154	US	10/11/2016	Low power and integrable on-chip architecture for low frequency pll
Microchip Technology Incorporated	9474118	US	10/18/2016	Cascode-type dimming switch using a bipolar junction transistor for driving a string of light emitting diodes
Microchip Technology Incorporated	9471074	US	10/18/2016	Usb regulator with current buffer to reduce compensation capacitor size and provide for wide range of esr values of external capacitor
Microchip Technology Incorporated	9473161	US	10/18/2016	Mixed signal automatic gain control for increased resolution
Microchip Technology Incorporated	9473205	US	10/18/2016	Coaxial data communication with reduced emi
Microchip Technology Incorporated	9496887	US	11/15/2016	Analog to digital converter with internal timer
Microchip Technology Incorporated	9504122	US	11/22/2016	Fluorescent replacement led lamps
Microchip Technology Incorporated	9506813	US	11/29/2016	Digital temperature sensor with integrated digital temperature filter
Microchip Technology Incorporated	9509321	US	11/29/2016	Main clock high precision oscillator

<u>Grantor</u>	<u>Patent Number</u>	<u>Country of Registration</u>	<u>Issue Date</u>	<u>Brief Description of Patent Subject Matter</u>
Microchip Technology Incorporated	9512659	US	12/6/2016	Code hopping based system with increased security
Microchip Technology Incorporated	9515549	US	12/6/2016	Capless voltage regulator using clock-frequency feed forward control
Microchip Technology Incorporated	9520042	US	12/13/2016	Smoke detector with enhanced audio and communications capabilities
Microchip Technology Incorporated	9521503	US	12/13/2016	Audio player with bluetooth function and audio playing method thereof
Microchip Technology Incorporated	9525372	US	12/20/2016	Method and system for determining the position of a synchronous motor's rotor
Microchip Technology Incorporated	9542009	US	1/10/2017	Knob based gesture system
Microchip Technology Incorporated	9542051	US	1/10/2017	Analog elimination of ungrounded conductive objects in capacitive sensing
Microchip Technology Incorporated	9543899	US	1/10/2017	Class d power driver peripheral
Microchip Technology Incorporated	9543948	US	1/10/2017	Physical force capacitive touch sensors

(ii) U.S. Patent applications:

<u>Grantor</u>	<u>Application Serial Number</u>	<u>Country of Application</u>	<u>Filing Date</u>	<u>Brief Description of Patent Subject Matter</u>
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Microchip Technology Incorporated	13/309633	US	12/2/2011	Integrated circuit device with integrated voltage controller
Microchip Technology Incorporated	13/330968	US	12/20/2011	Preamble design and processing method for on-the-fly, frame-by-frame air data rate detection in wireless receivers
Microchip Technology Incorporated	13/355206	US	1/20/2012	Inductive touch sensor using a flexible coil
Microchip Technology Incorporated	13/449850	US	4/18/2012	Configurable logic cells
Microchip Technology Incorporated	13/450079	US	4/18/2012	Logic device for combining various interrupt sources into a single interrupt source and various signal sources to control drive strength
Microchip Technology Incorporated	13/627378	US	9/26/2012	Virtual general purpose input/output for a microcontroller
Microchip Technology Incorporated	13/671953	US	11/8/2012	Method and system to dynamically position a switch mode power supply output voltage
Microchip Technology Incorporated	13/709399	US	12/10/2012	Current sensing with internal adc capacitor
Microchip Technology Incorporated	13/778301	US	2/27/2013	Power field effect transistor
Microchip Technology Incorporated	13/831373	US	3/14/2013	Capacitive sensor electrode
Microchip Technology Incorporated	13/831517	US	3/14/2013	Capacitive based gesture input system
Microchip Technology	13/831596	US	3/15/2013	System and method for locating wireless nodes

Incorporated				
Microchip Technology Incorporated	13/842386	US	3/15/2013	Multi-current harmonized paths for low power local interconnect network (lin) receiver
Microchip Technology Incorporated	13/843530	US	3/15/2013	Enhancing security of sensor data for a system via an embedded controller
Microchip Technology Incorporated	13/924302	US	6/21/2013	Auxiliary power supplies
Microchip Technology Incorporated	13/938229	US	7/10/2013	Line current reference generator
Microchip Technology Incorporated	13/946952	US	7/19/2013	Power converter with inductance invariance
Microchip Technology Incorporated	13/965490	US	8/13/2013	Ultrasound capacitive t/r switch device, circuit
Microchip Technology Incorporated	14/010516	US	8/26/2013	Blue-tooth communication system and broadcasting method thereof
Microchip Technology Incorporated	14/021910	US	9/9/2013	Capacitive parametric zero crossing detector device, circuit and method
Microchip Technology Incorporated	14/025143	US	9/12/2013	Noise detection and correction routines
Microchip Technology Incorporated	14/028458	US	9/16/2013	Enhanced microprocessor or microcontroller
Microchip Technology Incorporated	14/038199	US	9/26/2013	Soft switching synchronous quasi resonant converter
Microchip Technology	14/045689	US	10/3/2013	Pulse amplitude controlled current source for ultrasound transmit

Incorporated				beamformer and method thereof
Microchip Technology Incorporated	14/087844	US	11/22/2013	Microcontroller with digital clock source
Microchip Technology Incorporated	14/097370	US	12/5/2013	Force sensing x-y touch sensor
Microchip Technology Incorporated	14/097405	US	12/5/2013	Temperature sensor peripheral having independent temperature coefficient and offset adjustment programmability
Microchip Technology Incorporated	14/167331	US	1/29/2014	Esd-protection circuit for integrated circuit device
Microchip Technology Incorporated	14/181971	US	2/17/2014	Programmable device personalization
Microchip Technology Incorporated	14/182024	US	2/17/2014	Using capacitive proximity detection with resistive touch screens for wake-up
Microchip Technology Incorporated	14/184034	US	2/19/2014	Resistive memory cell with sloped bottom electrode
Microchip Technology Incorporated	14/186609	US	2/21/2014	Phase lock loop lock indicator
Microchip Technology Incorporated	14/197330	US	3/5/2014	Two-wire serial interface and protocol
Microchip Technology Incorporated	14/197507	US	3/5/2014	Matrix electrode design for three-dimensional e-field sensor
Microchip Technology Incorporated	14/197721	US	3/5/2014	Single wire programming and debugging interface

Microchip Technology Incorporated	14/199785	US	3/6/2014	Dynamic pause period calculation for serial data transmission
Microchip Technology Incorporated	14/200417	US	3/7/2014	Programmable cpu register hardware context swap mechanism
Microchip Technology Incorporated	14/204208	US	3/11/2014	Dual boot panel swap mechanism
Microchip Technology Incorporated	14/209068	US	3/13/2014	Boot sequencing for multi boot devices
Microchip Technology Incorporated	14/244746	US	4/3/2014	Current control circuit for linear led driver
Microchip Technology Incorporated	14/254127	US	4/16/2014	Lcd controller with capacitive touch interface
Microchip Technology Incorporated	14/254407	US	4/16/2014	Projected capacitive touch with force detection
Microchip Technology Incorporated	14/258992	US	4/22/2014	Sampling negative coil current in a switching power converter and method thereof
Microchip Technology Incorporated	14/278420	US	5/15/2014	Wireless door lock power transfer system having communications capabilities
Microchip Technology Incorporated	14/289603	US	5/28/2014	Speaker apparatus and speaker system
Microchip Technology Incorporated	14/301462	US	6/11/2014	Capacitive proximity detection using delta-sigma conversion
Microchip Technology Incorporated	14/315889	US	6/26/2014	Method and apparatus of non-linear compensation of power monitoring for power supply units

Microchip Technology Incorporated	14/328265	US	7/10/2014	Human interface device and method
Microchip Technology Incorporated	14/340580	US	7/25/2014	Blue-tooth communication system and broadcasting method thereof
Microchip Technology Incorporated	14/447321	US	7/30/2014	Gain control method, module, and wireless signal receiver using the same
Microchip Technology Incorporated	14/462242	US	8/18/2014	Touch screen stylus with force and/or angle sensing functionality
Microchip Technology Incorporated	14/464012	US	8/20/2014	Touch screen stylus with communication interface
Microchip Technology Incorporated	14/503702	US	10/1/2014	Multiple channel capacitive voltage divider scanning method and apparatus
Microchip Technology Incorporated	14/503883	US	10/1/2014	Continuous circle gesture detection for a sensor system
Microchip Technology Incorporated	14/506071	US	10/3/2014	Integrated device with auto configuration
Microchip Technology Incorporated	14/517943	US	10/20/2014	Electronic apparatus and electronic fuse thereof
Microchip Technology Incorporated	14/525543	US	10/28/2014	Method for photolithography-free self-aligned reverse active etch
Microchip Technology Incorporated	14/532489	US	11/4/2014	Capacitor-less low drop-out (ldo) regulator
Microchip Technology Incorporated	14/538133	US	11/11/2014	Multi-channel i2s transmit control system and method

Microchip Technology Incorporated	14/538253	US	11/11/2014	Integrated circuit device with tamper detection input and having real time clock calendar logging thereof
Microchip Technology Incorporated	14/554383	US	11/26/2014	Memory cell retention enhancement through erase state modification
Microchip Technology Incorporated	14/560342	US	12/4/2014	Digital temperature sensor with integrated timer and burst mode
Microchip Technology Incorporated	14/564089	US	12/9/2014	Bluetooth low energy beacon device and advertising method
Microchip Technology Incorporated	14/565919	US	12/10/2014	Automatic load share architecture for usb port power
Microchip Technology Incorporated	14/592379	US	1/8/2015	Determining rate of change in temperature measurements
Microchip Technology Incorporated	14/594388	US	1/12/2015	Efficient dithering technique for sigma-delta analog-to-digital converters
Microchip Technology Incorporated	14/596120	US	1/13/2015	System and method for gesture control
Microchip Technology Incorporated	14/599086	US	1/16/2015	Touch detection in a capacitive sensor system
Microchip Technology Incorporated	14/608753	US	1/29/2015	Digital period divider
Microchip Technology Incorporated	14/616076	US	2/6/2015	Gesture based access control method and system
Microchip Technology Incorporated	14/669232	US	3/26/2015	System and method for ripple-free ac power determination

Microchip Technology Incorporated	14/669321	US	3/26/2015	Ramp generation module
Microchip Technology Incorporated	14/669460	US	3/26/2015	Wireless quiet enrolment
Microchip Technology Incorporated	14/673347	US	3/30/2015	Bumps bonds formed as metal line interconnects in a semiconductor device
Microchip Technology Incorporated	14/698428	US	4/28/2015	Universal serial bus smart hub
Microchip Technology Incorporated	14/698526	US	4/28/2015	Flexconnect disconnect detection
Microchip Technology Incorporated	14/699700	US	4/29/2015	Port disconnect charging function for usb hub
Microchip Technology Incorporated	14/701854	US	5/1/2015	Usb power port control
Microchip Technology Incorporated	14/701924	US	5/1/2015	Switchless usb c-connector hub
Microchip Technology Incorporated	14/709739	US	5/12/2015	Unifying class device interface with one host interface by using embedded controller
Microchip Technology Incorporated	14/709881	US	5/12/2015	Circuit for measuring power violations using high side current sensing
Microchip Technology Incorporated	14/714315	US	5/17/2015	System, method and apparatus having improved pulse width modulation frequency resolution
Microchip Technology Incorporated	14/714427	US	5/18/2015	Method and system for improving led lifetime and color quality in dimming apparatus

Microchip Technology Incorporated	14/714475	US	5/18/2015	Forming fence conductors using spacer etched trenches
Microchip Technology Incorporated	14/727768	US	6/1/2015	Multi-chip package module and a doped polysilicon trench for isolation and connection
Microchip Technology Incorporated	14/729402	US	6/3/2015	Device and method to assign device pin functionality for multi-processor core devices
Microchip Technology Incorporated	14/729879	US	6/3/2015	Device and method to assign device pin ownership for multi-processor core devices
Microchip Technology Incorporated	14/735359	US	6/10/2015	Method of forming shallow trench isolation (sti) structures
Microchip Technology Incorporated	14/735425	US	6/10/2015	Air-gap assisted etch self-aligned dual damascene
Microchip Technology Incorporated	14/742571	US	6/17/2015	Circuit and method for active crosstalk reduction in multiple-channel power supply controllers
Microchip Technology Incorporated	14/743945	US	6/18/2015	Circuit and method for detecting short circuit failure of a switching transistor
Microchip Technology Incorporated	14/748118	US	6/23/2015	Sequential linear led driver utilizing headroom control
Microchip Technology Incorporated	14/750181	US	6/25/2015	Compensation of a target object coupling to feeding lines in capacitive sensing system
Microchip Technology Incorporated	14/817107	US	8/3/2015	Bootstrapped switch with a highly linearized resistance
Microchip Technology Incorporated	14/826980	US	8/14/2015	Low power connection detect method and system for usb charging

Microchip Technology Incorporated	14/828864	US	8/18/2015	Method and system for ground plane isolation
Microchip Technology Incorporated	14/837470	US	8/27/2015	Apparatus and method for led running light control and status
Microchip Technology Incorporated	14/860398	US	9/21/2015	Direct memory access controller
Microchip Technology Incorporated	14/863779	US	9/24/2015	Selectable programmable gain or operational amplifier
Microchip Technology Incorporated	14/872878	US	10/1/2015	Communication method and apparatus using modulation of post-conduction oscillation frequency in switching converters
Microchip Technology Incorporated	14/880699	US	10/12/2015	Side channel access through usb streams
Microchip Technology Incorporated	14/883381	US	10/14/2015	Measuring output current in a buck smps
Microchip Technology Incorporated	14/883842	US	10/15/2015	Analog-to-digital conversion with micro-coded sequencer
Microchip Technology Incorporated	14/919000	US	10/21/2015	Analog switch for transmitting high voltage signals without utilizing high voltage power supplies
Microchip Technology Incorporated	14/945679	US	11/19/2015	Flat no-leads package with improved contact pins
Microchip Technology Incorporated	14/945729	US	11/19/2015	Start-up controller for a power converter
Microchip Technology	14/946024	US	11/19/2015	Qfn package with improved contact pins

Incorporated				
Microchip Technology Incorporated	14/952559	US	11/25/2015	Resistive memory cell having a spacer region for reduced conductive path area / enhanced electric field
Microchip Technology Incorporated	14/964017	US	12/9/2015	High voltage double-diffused mos (dmos) device and method of manufacture
Microchip Technology Incorporated	14/964548	US	12/9/2015	High voltage double-diffused mos (dmos) device and method of manufacture
Microchip Technology Incorporated	14/967930	US	12/14/2015	Differential current measurements to determine ion current in the presence of leakage current
Microchip Technology Incorporated	14/984676	US	12/30/2015	Auxiliary power supplies
Microchip Technology Incorporated	14/994928	US	1/13/2016	Switchable filtering circuit and the operation method using the same
Microchip Technology Incorporated	15/002123	US	1/20/2016	Battery with communication interface
Microchip Technology Incorporated	15/012287	US	2/1/2016	System and method for generating cross-core breakpoints in a multi-core microcontroller
Microchip Technology Incorporated	15/050438	US	2/22/2016	Open cavity plastic package
Microchip Technology Incorporated	15/051335	US	2/23/2016	Constant-current controller with square-wave input current shaping
Microchip Technology Incorporated	15/053504	US	2/25/2016	Watchdog timer
Microchip Technology	15/053972	US	2/25/2016	Blde adaptive zero crossing detection

Incorporated				
Microchip Technology Incorporated	15/060539	US	3/3/2016	Three input comparator
Microchip Technology Incorporated	15/060553	US	3/3/2016	Microcontroller or microprocessor with dual mode interrupt
Microchip Technology Incorporated	15/064843	US	3/9/2016	Combinatorial/sequential pulse width modulation
Microchip Technology Incorporated	15/064964	US	3/9/2016	Low-pin microcontroller device with multiple independent microcontrollers
Microchip Technology Incorporated	15/065027	US	3/9/2016	Low-pin microcontroller device with multiple independent microcontrollers
Microchip Technology Incorporated	15/065193	US	3/9/2016	Resistive memory cell with sloped bottom electrode
Microchip Technology Incorporated	15/065354	US	3/9/2016	Resistive memory cell having a reduced conductive path area
Microchip Technology Incorporated	15/066879	US	3/10/2016	Using pmos power switch in a combination switching and linear regulator
Microchip Technology Incorporated	15/072759	US	3/17/2016	One time programmable memory
Microchip Technology Incorporated	15/073238	US	3/17/2016	Compression method and system for user friendly address in mesh networking
Microchip Technology Incorporated	15/088789	US	4/1/2016	Zero-voltage switching buck converter and control circuit therefor
Microchip Technology	15/089352	US	4/1/2016	Run time ecc error injection scheme for hardware validation

Incorporated				
Microchip Technology Incorporated	15/095896	US	4/11/2016	Inductive load driver slew rate controller
Microchip Technology Incorporated	15/134749	US	4/21/2016	Capacitive sensor system with multiple transmit electrodes
Microchip Technology Incorporated	15/135347	US	4/21/2016	Sensor device for a display
Microchip Technology Incorporated	15/141817	US	4/28/2016	Central processing unit with dsp engine and enhanced context switch capabilities
Microchip Technology Incorporated	15/141823	US	4/29/2016	Central processing unit with enhanced instruction set
Microchip Technology Incorporated	15/157879	US	5/18/2016	Microcontroller with average current measurement circuit using voltage-to-current converters
Microchip Technology Incorporated	15/168319	US	5/31/2016	Apparatus for improving signal-to-noise performance of projected capacitance touch screens and panels
Microchip Technology Incorporated	15/168390	US	5/31/2016	Reducing power in a power converter when in a standby mode
Microchip Technology Incorporated	15/168569	US	5/31/2016	Primary-side start-up method and circuit arrangement for a series-parallel resonant power converter
Microchip Technology Incorporated	15/169352	US	5/31/2016	Method and apparatus for split burst bandwidth arbitration
Microchip Technology Incorporated	15/169456	US	5/31/2016	Integrated circuit with sensor printed in situ
Microchip Technology	15/182340	US	6/14/2016	Sensor design for enhanced touch and gesture decoding

Incorporated				
Microchip Technology Incorporated	15/184683	US	6/16/2016	Ultra-low power crystal oscillator with adaptive self-start
Microchip Technology Incorporated	15/184748	US	6/16/2016	Damascene thin-film resistor with an added mask layer
Microchip Technology Incorporated	15/184789	US	6/16/2016	Configurable mailbox data buffer apparatus
Microchip Technology Incorporated	15/185257	US	6/17/2016	Uart with automated protocols
Microchip Technology Incorporated	15/186034	US	6/17/2016	Periodic kick-starter for a crystal oscillator
Microchip Technology Incorporated	15/188263	US	6/21/2016	Independent uart brk detection
Microchip Technology Incorporated	15/188464	US	6/21/2016	Uart with line activity detector
Microchip Technology Incorporated	15/200255	US	7/1/2016	Spacer enabled poly gate
Microchip Technology Incorporated	15/200322	US	7/1/2016	Resistive memory cell having a reduced conductive path area
Microchip Technology Incorporated	15/209467	US	7/13/2016	Spi interface with less-than-8-bit bytes and variable packet size
Microchip Technology Incorporated	15/209543	US	7/13/2016	Method for enlarging data memory in an existing microprocessor architecture with limited memory addressing
Microchip Technology	15/215743	US	7/21/2016	Backside stacked die in an integrated circuit (ic) package

Incorporated				
Microchip Technology Incorporated	15/215791	US	7/21/2016	Smart wireless asset tracking
Microchip Technology Incorporated	15/216447	US	7/21/2016	Method and system for usb 2.0 bandwidth reservation
Microchip Technology Incorporated	15/221409	US	7/27/2016	Zero overhead code coverage analysis
Microchip Technology Incorporated	15/262923	US	9/12/2016	Sidewall-type memory cell
Microchip Technology Incorporated	15/263030	US	9/12/2016	Flat no-leads package with improved contact pins
Microchip Technology Incorporated	15/268113	US	9/16/2016	Combined power supply and input/output system with boost capability