GP711

ZigBee Multi-Stack Communications Controller

Product Brief

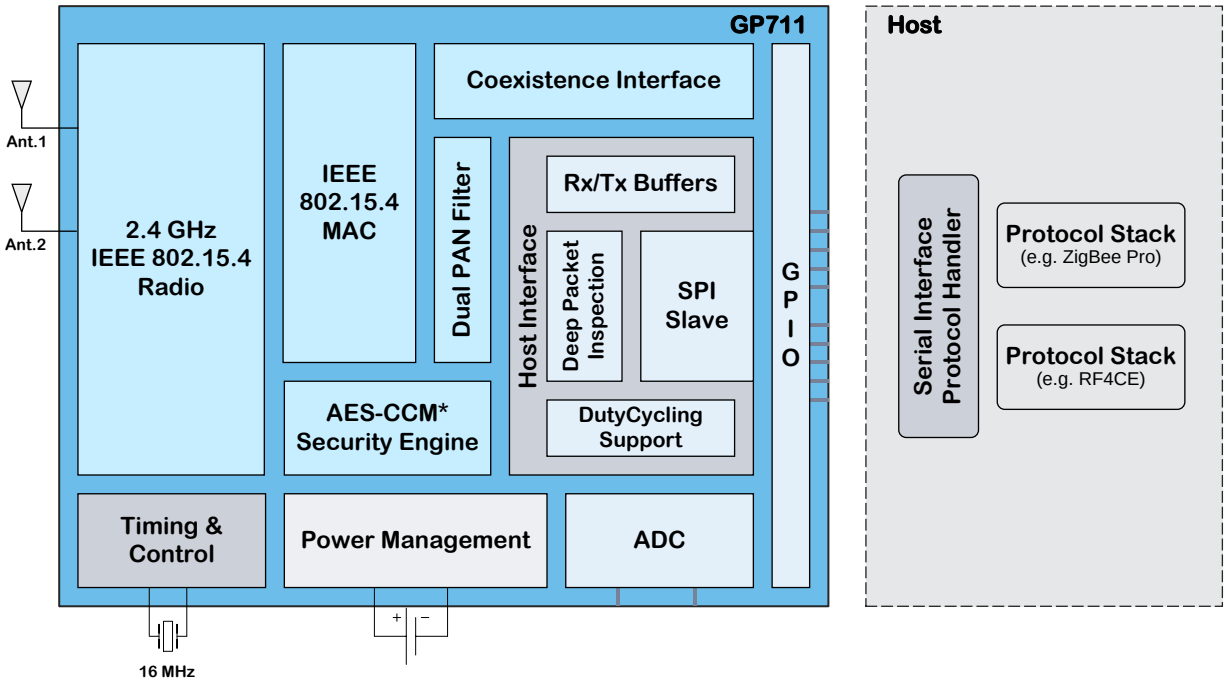
Product Overview

The GP711 System-on-Chip is an IEEE 802.15.4 communications controller for integration into a ZigBee node. It supports dual PAN operation with two (RF4CE, ZigBee Pro or ZigBee IP) protocol stacks in the host processor, and provides a high-speed serial interface (SPI) to the host processor. The GP711 is fully compliant with the IEEE 802.15.4 standard, providing robust spread spectrum data communication with a highly secure encrypted data flow. Its superior Wi-Fi interference rejection capability and antenna diversity offer additional robustness in a crowded wireless 2.4 GHz environment. In addition, the GP711 supports a Coexistence Interface to enable coexistence with other potentially interfering radios (Bluetooth, Wi-Fi) within the same device.

The chip is optimized for low cost while providing superior performance. Its radio characteristics reduce the product's RF design complexity enabling low cost single layer applications using simple PCB antennas requiring no shielding.

The GP711 has an extreme low standby power enabling total system power consumption of less than 1 mW while allowing reception of messages from remote nodes.

Chip Overview



Key Features

- Ultra-low cost PCB design, requiring no shielding, chip antennas or voltage regulators
- IEEE 802.15.4 compliant
- Operates in the worldwide 2.4 GHz ISM-band
- Multi-Stack / Dual-PAN Support with RF4CE Duty Cycling and packet filtering through Deep Packet Inspection
- Excellent range by antenna diversity: 9 dB more reliable link budget compared to single antenna systems
- Additional robustness by packet-in-packet resynchronization
- 30 dB better robustness to Wi-Fi Interference
- External LNA/PA signals for extended range
- Hardware accelerated AES and CCM* encryption with 128, 192 and 256-bit keys
- Suitable for target node
- External Controller SPI Slave interface
- Coexistence Interface with other radios in the device

Excellent Range and Reliability

The GP711 has been optimized for reliable communication in harsh radio environments. The excellent receiver sensitivity allows extended coverage. Built-in antenna diversity with two antennas improves the reliable link budget by 9 dB resulting in approximately twice the reliable range compared to similar systems with only one antenna. In high density networks the packet-in-packet resynchronization further improves the communication reliability. The potential risks of interference by Wi-Fi and/or Bluetooth devices have been reduced by the excellent receiver interference rejection capability.

The Coexistence Interface can be used to enable coexistence of the IEEE 802.15.4 radio of the GP711 with other potentially interfering radios (Wi-Fi, Bluetooth) within the same device.

Ultra-Low Power Consumption

The GP711 is designed for ultra-low power network applications. It supports RF4CE duty cycling and can wake up the host when a specified message has been received, with RF4CE Network layer and Profile layer Deep Packet Inspection, to allow the host to stay asleep as much as possible.

Low Cost

The GP711 is designed to operate on PCB designs using only low cost components and printed circuit antennas. No expensive shielding, chip antennas or voltage regulators are required.

Electrical Characteristics

Standby Mode Currents [1]	
Reset mode	10 nA
Timed, using 16 MHz crystal	800 µA
Operational Currents [1]	
Receive	20 mA
Transmit (at 0 dBm)	21 mA
Supply Voltage	2.1 to 3.6 V
Interfaces	
SPI Slave serial host interface	
Control for external LNA/PA	
Coexistence Interface with other radios	
Crystal Frequency	16.000 MHz (±40 ppm)

Radio Characteristics

Standards compliant	IEEE 802.15.4-2003 IEEE 802.15.4-2006
Radio Regulations compliant	ETSI EN 300 328 FCC CFR-47 Part 15 ARIB STD-T66
Frequency Band	2400 – 2483.5 MHz
Channels	16 (programmable, 5 MHz steps)
Modulation	IEEE 802.15.4
Chip rate	2 Mchip/s
Data Rate	250 kbit/s
Receiver Sensitivity [1]	-93 dBm typical
Antenna diversity gain [2]	9 dB (increases the 'effective' receiver sensitivity to -102 dBm)
Co-channel Rejection	> -2.5 dB
Adjacent Channel Rejection	> 30 dB
Alt. Adjacent Channel Rejection	> 45 dB
Wi-Fi IEEE 802.11g Rejection[3]	> 27 dB
Bluetooth Rejection[4]	> 27 dB
Transmit Power	+3 dBm (adjustable down in 1 dB steps)
Radio Management	Antenna Diversity Digital RSSI Link Quality Indication

General Characteristics

Package	QFN32, 5x5 mm
Operating Temperature	-40 to +85 °C (industrial)
Storage Temperature	-50 to +150 °C
Soldering Temperature	260 °C (10 s max)
Compliance	RoHS

1) Typical, at 3.0 V and 25 °C, unless specified otherwise.
2) For typical indoor usage in an environment with 50 ns delay spread and 2 MHz signal bandwidth using the Rayleigh fading model: antenna diversity with 2 antennas results in a 9 dB improved link budget at a 1% outage probability compared to no antenna diversity. The 9 dB in link budget translates into 70% more range, if using a two slope range model with the breakpoint at 10 m and g1 = 2, g2 = 3.5.
3) At +12 MHz and -13 MHz.
4) At +4 MHz and -4 MHz.

Reference Designs, Tools and SW

Qorvo reference designs, development kits, software libraries and production platforms provide a quick time-to-market solution for sensor and control devices for Smart Home networks and for RF4CE/BLE Remote Control products.

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

Web: www.qorvo.com

Tel: 1-844-890-8163

Email: lpw.support@qorvo.com

Important Notice

The information contained herein is believed to be reliable; however, Qorvo makes no warranties regarding the information contained herein and assumes no responsibility or liability whatsoever for the use of the information contained herein. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for Qorvo products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information. **THIS INFORMATION DOES NOT CONSTITUTE A WARRANTY WITH RESPECT TO THE PRODUCTS DESCRIBED HEREIN, AND QORVO HEREBY DISCLAIMS ANY AND ALL WARRANTIES WITH RESPECT TO SUCH PRODUCTS WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

Without limiting the generality of the foregoing, Qorvo products are not warranted or authorized for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.