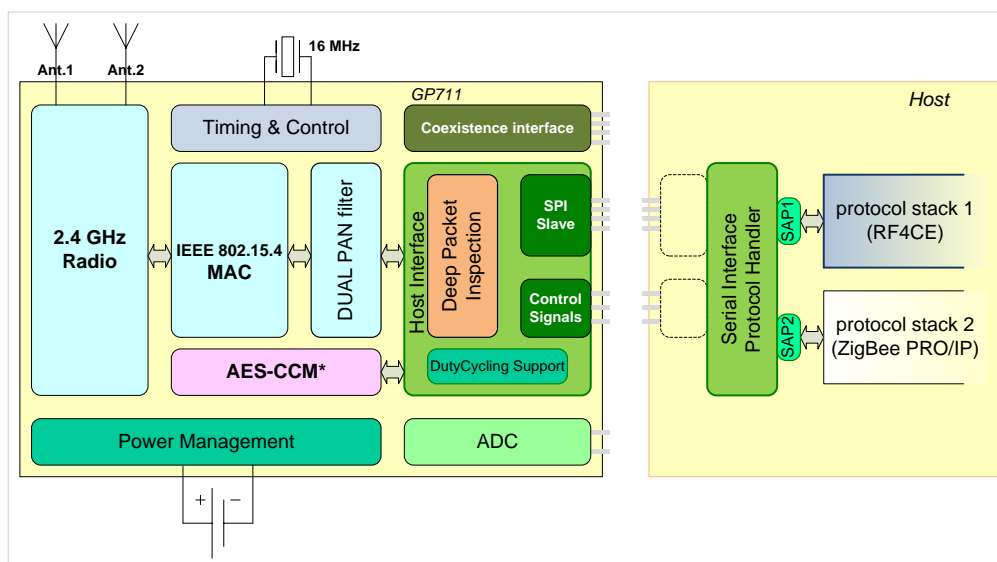


The GreenPeak Technologies GP711 System-on-Chip is an IEEE 802.15.4 communications controller for integration into a ZigBee RF4CE^[1], ZigBee PRO^[2] or ZigBee IP^[3] node. It supports dual PAN operation with two (RF4CE, ZigBee PRO or ZigBee IP) protocol stacks in the host processor, and provides a high-speed 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
- Multi Stack / Dual PAN Support with RF4CE Duty Cycling and packet filtering through Deep Packet Inspection
- Operates in the worldwide 2.4 GHz ISM-band
- Excellent range by antenna diversity: 9 dB more reliable link budget compared to single antenna systems
- 30 dB better robustness to Wi-Fi interference
- External LNA/PA signals for extended range
- Hardware accelerated AES-128 CCM* security mode with automatic encryption, decryption and authentication
- Suitable for target node
- SPI serial host interface
- Coexistence Interface with other radios in the device

- [1] For a high-level overview of RF4CE please refer to the "Understanding RF4CE" white paper on the ZigBee website: <http://www.zigbee.org/LearnMore/WhitePapers.aspx>.
- [2] For a description of the ZigBee PRO Feature Set please refer to the "ZigBee Specification Overview" on the ZigBee website: <http://www.zigbee.org/Specifications/ZigBee/Overview.aspx>.
- [3] For a description of ZigBee IP please refer to the "ZigBee IP Specification Overview" on the ZigBee website: <http://www.zigbee.org/Specifications/ZigBeeIP/Overview.aspx>.

GreenPeak Technologies is a fabless semiconductor company offering innovative ultra low power wireless and battery-free data communication technologies for consumer electronics and sense and control applications.

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 combination of excellent receiver dynamic range and an auto tuned band-pass filter. 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.

Low Cost

The GP711 RF4CE communication controller is designed to operate on very low cost, single layer, paper phenol like PCB material using only low cost components and printed circuit antennas. No expensive shielding, chip antennas or voltage regulators are required.

Reference Designs and Tools

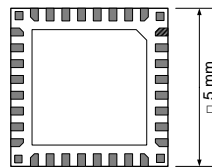
GreenPeak Technologies reference designs and development and production platforms provide a quick time-to-market solution for Set Top Boxes or Routers requiring ZigBee PRO stack support as well as RF4CE, for Remote Controls, Sensors and other Home Automation Network products.

Electrical Characteristics

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

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



Radio Characteristics

Standards compliant	IEEE802.15.4-2003 IEEE802.15.4-2006 IEEE802.15.4-2011
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 step size)
Modulation	IEEE802.15.4
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

1) At 3.0V 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 80% more range, if using a two slope range model with the breakpoint at 10m and $g_1 = 2$, $g_2 = 3.5$.

3) At +12 MHz and -13 MHz.

4) At +4 MHz and -4 MHz.