ZL70250

Product Preview

Ultra-Low-Power Sub-GHz RF Transceiver

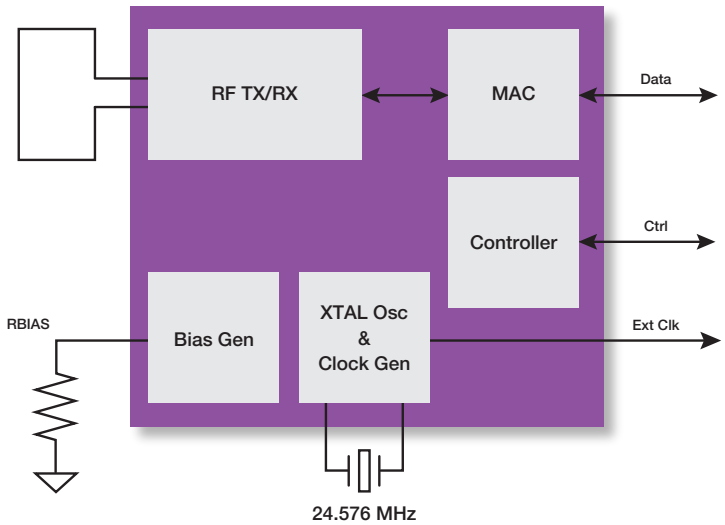
The ZL70250 ultra-low-power radio frequency (RF) transceiver provides a wireless link in applications where power consumption is of primary importance. The transceiver's ultralow power requirements allow battery miniaturization or the use of energy-harvesting methods, enabling devices with an extremely small form factor.

The availability of the transceiver in a CSP form factor combined with the extremely low number of external components also contributes in minimizing the application footprint.

The ultra-low-power device operates in unlicensed frequency bands between 795 and 965 MHz and offers a data rate of 186 kbit/s to support voice communication. For data communication, the ZL70250 supports extremely low power consumption in packet-based networks (see the Product Brief for the ZL70250 WSN Evaluation Platform with Z-Star Protocol).

The device includes the RF transceiver as well as a Media Access Controller (MAC) that performs most link support functions including Received Signal Strength Indication (RSSI), Clear Channel Assessment (CCA), sniff, preamble and sync, packetization, and whitening. The device uses standard interfaces, enabling easy integration with a standard microcontroller or Digital Signal Processor (DSP).

ZL70250 Simplified Diagram



Ultra-Low-Power Transceiver for Short-Range Wireless Applications

- Ultralow transmit and receive current of less than 2 mA enables extremely long battery life, very small battery size, or energy harvesting
- Low supply voltage of 1.2 V to 1.8 V further reduces power consumption
- Operates between 795 and 965 MHz (915-MHz ISM band in North America; 868-MHz SRD band in Europe)
- High data rate (186 kbit/s raw) allows short data bursts and supports bidirectional voice communication
- Very few external components (only crystal and bias resistor required) and a CSP package enable end-devices with very small footprint
- Standard interfaces: SPIbus master for packet data and two-wire for status and control
- Integrated MAC performs all link layer basic functions, enabling simple and low-power controller functions

Applications

- Battery-powered wireless sensor network
- Applications relying on energy harvesting
- Wireless communication with very long battery life
- Voice communication
- Remote control

Availability and Support

The ZL70250 ultra-low-power RF transceiver is available for qualified customers. Contact Medical sales (http://www.microsemi.com/cmpg/hs/sales_medicalproducts.htm) for ordering information. For more information on Microsemi's ISM-band radio transceiver technology, please refer to our website (http://www.microsemi.com/cmpg/hs/82_ZL70250.htm).

Microsemi

ZL70250

Short-Range, Battery-Powered Communications

The ultra-low-power ZL70250 RF transceiver enables wireless telemetry in applications powered by coin-cell batteries or energy harvesters, where wireless telemetry was previously unfeasible. As illustrated below, end-applications may include wireless sensor networks (including on-body sensors) or voice communication.

With a typical current consumption below 2 mA in both transmit (–13 dBm) and receive, and a data rate of 186 kbit/s, the ZL70250 enables bidirectional RF links with an impressive efficiency of 13 nJ/bit over a range of up to 100 meters.

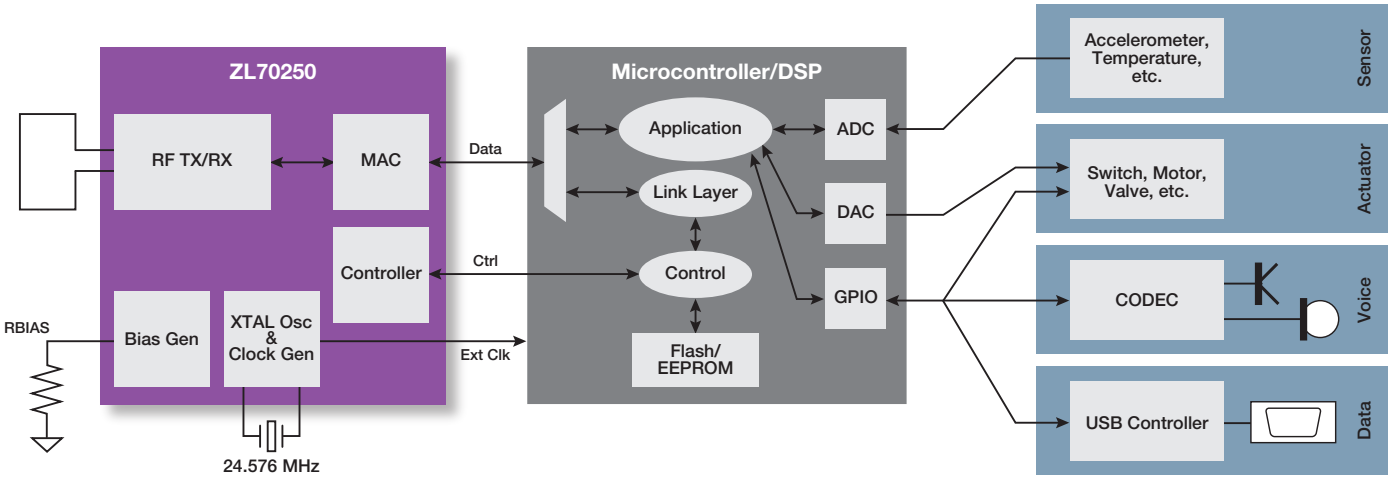
The output power is programmable and can be reduced to –25 dBm to save power in cases where the link budget allows. Output power can also be increased up to 0 dBm for more range or to allow for system losses, such as a very small antenna or body tissue absorption.

In order to achieve the minimum possible power consumption, the ZL70250 offers a large number of optimization parameters, all available to the user via the control interface. To streamline the setup and optimization process, most parameters have an on-chip automatic trim capability. The frequency tuning is also highly automated.

While consuming very little power, the ZL70250 also includes a highly flexible MAC that offers all the basic functions needed to implement a link layer with the minimum amount of data transfer between the ZL70250 and its controller. Some of the capabilities include:

- Digital RSSI indicator
- Clear channel assessment
- Transmit with automatic clear-to-send
- Sniff with automatic receive or sleep
- Programmable receiver gain
- Preamble and sync
- Whitening
- Packetization with programmable size for both transmit and receive
- Automatic sleep after receive
- Automatic turnaround for bidirectional data transfer

The ZL70250 is also highly integrated. Besides the antenna and in some cases its matching network, only a crystal and a reference resistor are required. Available as a 2-mm-by-3-mm CSP, the device enables applications with a very small footprint.



Microsemi Corporate Headquarters
One Enterprise, Aliso Viejo CA 92656 USA
Within the USA: +1 (949) 380-6100
Sales: +1 (949) 380-6136
Fax: +1 (949) 215-4996

Microsemi Corporation (NASDAQ: MSCC) offers a comprehensive portfolio of semiconductor solutions for: aerospace, defense and security; enterprise and communications; and industrial and alternative energy markets. Products include high-performance, high-reliability analog and RF devices, mixed signal and RF integrated circuits, customizable SoCs, FPGAs, and complete subsystems. Microsemi is headquartered in Aliso Viejo, Calif. Learn more at www.microsemi.com.

Publication Number: 8ZS002 ZL70250-PP/144614-1/8.12