

ZL70550

Ultra-Low-Power Sub-GHz RF Transceiver

Microsemi's ZL70550 RF transceiver is the lowest-power sub-GHz radio for high- or low-duty-cycle, wireless-sensor applications. The device is optimized for very low power consumption in both active and sleep states, making it the leading choice for sensor networks that are powered by a coin-cell battery or an energy harvesting power source.

The ZL70550 device is also highly integrated and requires, in addition to the antenna, only a crystal, two decoupling capacitors, and a resistor. Available as a 2-mm-by-3-mm CSP, the device enables applications with a very small footprint.

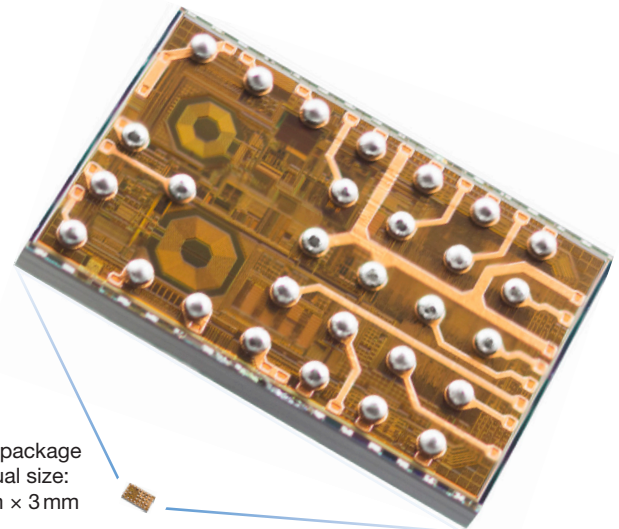
The ZL70550 device operates in unlicensed frequency bands between 779 MHz and 965 MHz and offers a maximum raw data rate of 200 kbit/s at 2.4 mA (typical) with a respectable sensitivity of -95 dBm.

The device includes the Z-Star protocol, which is a powerful and highly optimized MAC that performs complete packet transmissions with acknowledgments and automatic retransmissions on failed receptions. This built-in protocol eliminates the need for processor intervention in packet processing, allowing the processor to go to a power-save state or to perform other critical application processing. Additionally, the MAC supports other user modes of operation with selectable options like CRC, FEC, and auto length.

Applications

The ZL70550 ultra-low-power transceiver is designed for medium- to short-range wireless applications, including:

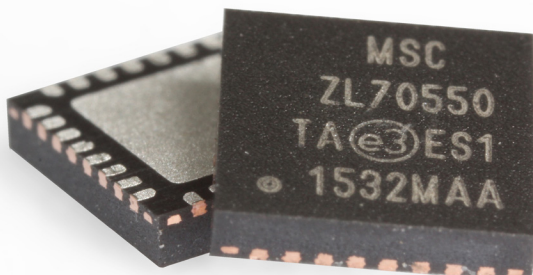
- Medical monitoring
- Industrial/building/home automation
- Security
- Smart cities
- Advanced metering infrastructure
- Asset management
- Energy harvesting
- Voice/compressed-audio communications



CSP package
actual size:
2 mm × 3 mm

Key Features

- Ultralow current of 2.4 mA in receive and 2.75 mA in transmit
- Ultralow sleep current of 10 nA
- Maximum TX output power of 0 dBm
- Maximum RX sensitivity of -106 dBm
- Wide supply range of 1.71 V to 3.6 V
- Operates between 779 MHz and 965 MHz (915-MHz ISM band in North America; 868-MHz SRD band in Europe; 779-MHz to 787-MHz band in China; 916-MHz to 930-MHz and 950-MHz to 956-MHz bands in Japan)
- Supports GFSK modulation
- Raw data rates of 200 kbit/s, 100 kbit/s, or 50 kbit/s
- Very small footprint
 - ♦ Few external components (crystal, resistor, and two decoupling capacitors)
 - ♦ Available in 29-pin CSP package (2 mm by 3 mm) or in 32-pin QFN package (5 mm by 5 mm)
- SPI bus slave for packet data and register access
- Built-in MAC
 - ♦ Support for Microsemi Z-Star or user protocols
 - ♦ Transmit and receive buffer
 - ♦ Optional automatic CSMA packet transfers
 - ♦ Efficient header optimized for small or large payloads
 - ♦ Optional preamble, frame sync, length, FEC, and CRC
- Industrial temperature range (-40°C to 85°C)



QFN package
actual size:
5 mm × 5 mm

ZL70550

Ultra-Low-Power Sub-GHz RF Transceiver

ZL70550 WSN Evaluation Kit with Z-Star Protocol

The ZL70550 Wireless Sensor Network (WSN) Evaluation Kit includes one USB hub and one accelerometer sensor node to demonstrate a high-data-rate, continuous-monitoring application where the node interacts with the hub seamlessly using Microsemi's Z-Star protocol.



The on-chip Z-Star protocol supports Carrier Sense Multiple Access (CSMA) packet transactions in a star network configuration. This robust, proprietary protocol is optimized for ultra-low-power wireless sensor networks and minimizes both packet size and transaction time while offloading the application processor. The protocol may be further optimized for specific customer applications (for example, by varying packet length, data rate, and frequency of transmission). Additionally, customers can develop their own hardware and software for their unique sensor application.



Main control GUI

Independent data displays for each sensor

ZL70550 WSN Evaluation Kit Contents

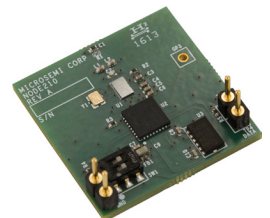
Each kit contains:

- One USB hub (HUB200), including:
 - ◆ ZL70550 transceiver with 50-Ω matching network and dual-band antenna
 - ◆ USB interface to monitor and control the Z-Star network from a PC
 - ◆ Microcontroller running the Z-Star protocol stack while supporting the USB interface
 - ◆ Extender board for customer software development
- One sensor node (NODE200), including:
 - ◆ ZL70550 transceiver with 50-Ω matching network and dual-band antenna
 - ◆ Microcontroller running the Z-Star protocol and accelerometer application
 - ◆ CR1632 coin-cell battery
 - ◆ Extender board for customer software development
- Software
 - ◆ Two types of GUI displays (see figure, bottom left):
 - Main display, allowing configuration and control of sensor network
 - Real-time graphs of data for up to three sensors
 - ◆ C-based API that runs on a PC supporting all commands to the USB hub
 - ◆ Firmware for both USB hub and sensor node
 - ◆ Source code is available with software license agreement
- Full documentation
 - ◆ Software download includes User's Guide, Source Code Overview, and hardware documentation (board schematics, layout, Gerber files, and Bill of Material (BOM)) for all included boards

Optional Sensor Boards

Optional sensor boards can be ordered to use with the ZL70550 WSN Evaluation Kit:

- NODE210, an accelerometer node with a built-in loop antenna



ZL70550

Ultra-Low-Power Sub-GHz RF Transceiver

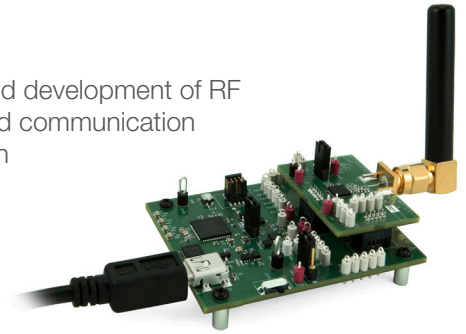
ZL70550 Application Development Kit

The ZL70550 Application Development Kit (ADK) enables rapid evaluation, prototyping, and development of RF communication systems. The kit combines hardware and software to create an end-to-end communication system that demonstrates the ZL70550 RF transceiver's exceptional energy efficiency, high integration, and high data rate.

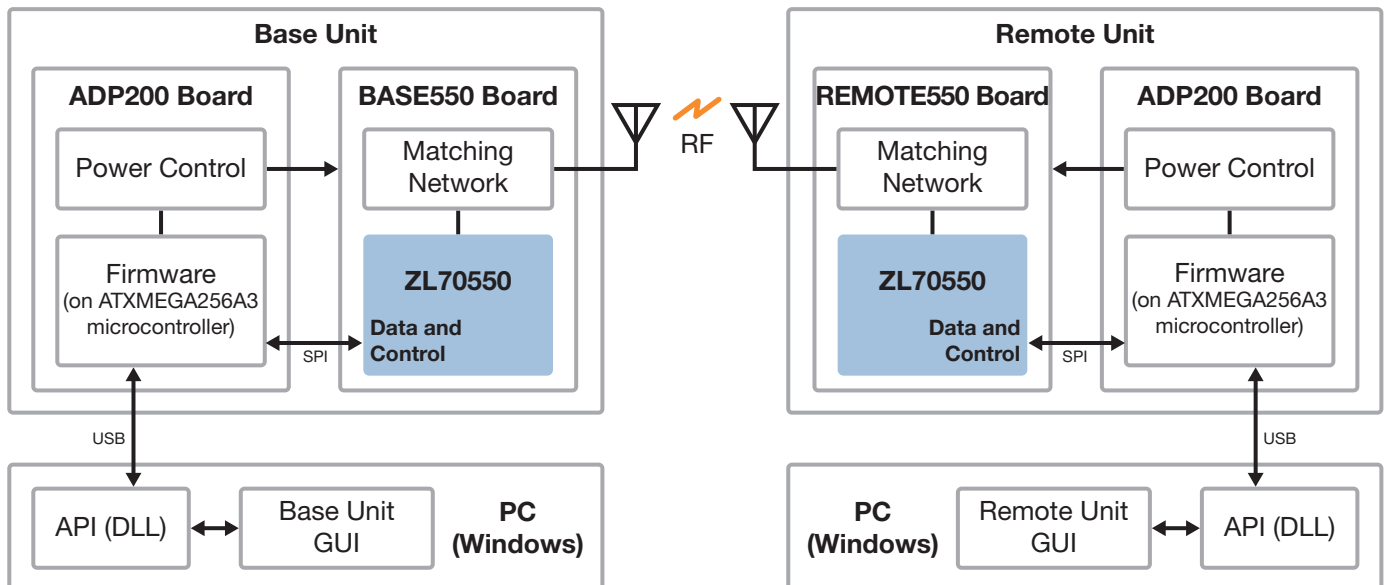
The ZL70550 ADK is an out-of-the-box solution that includes all hardware and software required to quickly and easily design RF communication systems. The kit includes:

- Application Development Platform (ADP200) board
 - ◆ Bridge board to allow for USB2.0 interface between a PC running the ADK software and the application processor on the ADP200 board
 - ◆ One programmable power supply with measurement capability
- ZL70550 evaluation boards (BASE550 and REMOTE550)
 - ◆ Each board is paired with an ADP200 board, resulting in a complete RF test and evaluation platform for a base station and remote device application
 - ◆ RF section includes the ZL70550 transceiver, probe points of key digital and analog signals, a matching network for 779-MHz to 928-MHz operation (BASE550 includes selectable SAW filters for the European SRD band and the North American ISM band), and a 50-Ω SMA connector
 - ◆ Microcontroller with JTAG debug interface controlling the ZL70550 device
 - ◆ Dual-band antennas

- Software
 - ◆ Windows GUI application that provides a user-friendly visual interface for controlling and demonstrating the capabilities of a ZL70550-enabled RF system including trim and tune, Packet Error Rate (PER) while demonstrating all packet modes and options, as well as accessing ZL70550-specific registers
 - ◆ Well-defined application programming interface (API) realized through a Windows DLL
- Embedded firmware
 - ◆ Supports all radio functions for a base station and remote device application
 - ◆ Supports RF evaluation by providing test modes and ZL70550 register access
- Full documentation
 - ◆ Software download includes ADK User's Guide, Source Code Overview, and extensive hardware documentation (board schematics, layout, Gerber files, and Bill of Material (BOM)) for all included boards



Using the ZL70550 ADK, customers can quickly create their own custom board designs and use Microsemi software as a starting point for software development for specific ZL70550-enabled systems. Microsemi also offers the Z-Star protocol stack, which supports wireless sensor networks.



ZL70550

Ultra-Low-Power Sub-GHz RF Transceiver

Short-Range, Battery-Powered Communications

The ultra-low-power ZL70550 RF transceiver enables wireless communication in applications powered by coin-cell batteries or energy harvesters, where wireless communication 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 2.75 mA in transmit (-10 dBm) and below 2.4 mA in receive (-95 dBm sensitivity), and a data rate of 200 kbit/s, the ZL70550 device enables bidirectional RF links over a distance of more than 100 meters (based on antenna gain and operating environment). A sensitivity of -106 dBm can be achieved by optionally increasing the receiver current consumption (to approximately 3.2 mA), enabling FEC, and using the lowest data rate.

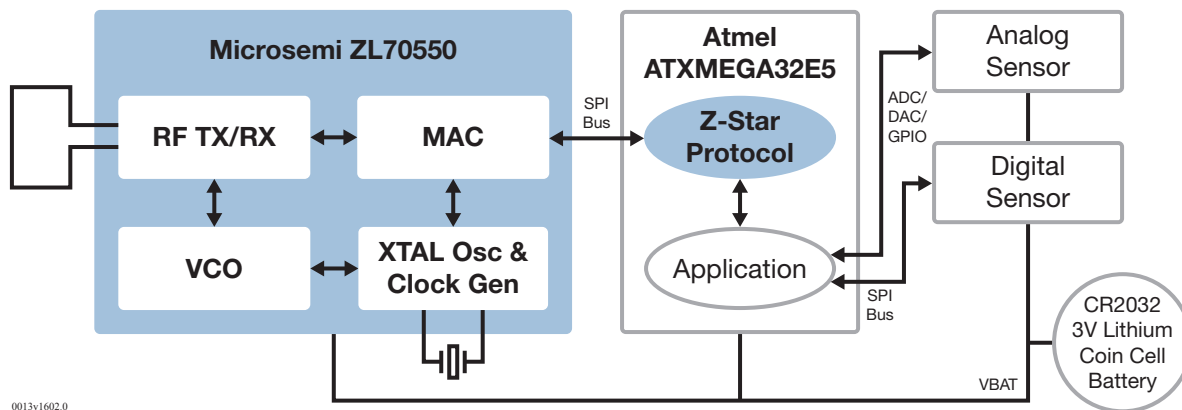
The output power is programmable and can be reduced to -25 dBm to save power in cases where the link budget allows. Output power can also be increased up to 0 dBm for more range

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 ZL70550 device offers a large number of optimization parameters, all available to the user via the SPI bus 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 ZL70550 device also includes a powerful MAC that offers a highly flexible and robust set of protocol features for implementing a communications link. Some of the capabilities include:

- Support for Microsemi Z-Star or user protocols
- Transmit and receive buffer
- Optional automatic CSMA packet transfers
- Efficient header optimized for small or large payloads
- Optional preamble, frame sync, length, FEC, and CRC



Microsemi Headquarters

One Enterprise, Aliso Viejo, CA 92656 USA
 Within the USA: +1 (800) 713-4113
 Outside the USA: +1 (949) 380-6100
 Sales: +1 (949) 380-6136
 Fax: +1 (949) 215-4996
 email: sales.support@microsemi.com
 www.microsemi.com

Microsemi, a wholly owned subsidiary of Microchip Technology Inc. (Nasdaq: MCHP), offers a comprehensive portfolio of semiconductor and system solutions for aerospace & defense, communications, data center and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; enterprise storage and communication solutions, security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Learn more at www.microsemi.com.

Microsemi makes no warranty, representation, or guarantee regarding the information contained herein or the suitability of its products and services for any particular purpose, nor does Microsemi assume any liability whatsoever arising out of the application or use of any product or circuit. The products sold hereunder and any other products sold by Microsemi have been subject to limited testing and should not be used in conjunction with mission-critical equipment or applications. Any performance specifications are believed to be reliable but are not verified, and Buyer must conduct and complete all performance and other testing of the products, alone and together with, or installed in, any end-products. Buyer shall not rely on any data and performance specifications or parameters provided by Microsemi. It is the Buyer's responsibility to independently determine suitability of any products and to test and verify the same. The information provided by Microsemi hereunder is provided "as is, where is" and with all faults, and the entire risk associated with such information is entirely with the Buyer. Microsemi does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other IP rights, whether with regard to such information itself or anything described by such information. Information provided in this document is proprietary to Microsemi, and Microsemi reserves the right to make any changes to the information in this document or to any products and services at any time without notice.

©2018 Microsemi, a wholly owned subsidiary of Microchip Technology Inc. All rights reserved. Microsemi and the Microsemi logo are registered trademarks of Microsemi Corporation. All other trademarks and service marks are the property of their respective owners.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Sub-GHz Development Tools](#) category:

Click to view products by [Microsemi](#) manufacturer:

Other Similar products are found below :

[EVAL-ADF7021DBJZ](#) [EVAL-ADF7021-NDBZ2](#) [MICRF219A-433 EV](#) [MICRF220-433 EV](#) [AD6679-500EBZ](#) [130436-HMC1010LP4E](#)
[EVAL-ADF7901EBZ](#) [EVAL-ADF790XEBZ](#) [110976-HMC453QS16G](#) [STEVAL-IKR002V7D](#) [STEVAL-IKR002V3D](#) [SKY66188-11-EK1](#)
[SKY66013-11-EVB](#) [DRF1200/CLASS-E](#) [1096](#) [1098](#) [MDEV-900-PRO](#) [DVK-SFUS-1-GEVK](#) [DVK-SFUS-API-1-GEVK](#) [US-SIGFOX-](#)
[GEVB](#) [STEVAL-IKR002V2D](#) [107755-HMC454ST89](#) [DM182017-2](#) [110961-HMC453ST89](#) [SX1272MB2DAS](#) [3179](#) [DC689A](#) [DC1513B-](#)
[AB](#) [3229](#) [3230](#) [3231](#) [3232](#) [DC963B](#) [DC1250A-AA](#) [DC1513B-AC](#) [DC1513B-AD](#) [DC1513B-AA](#) [TEL0075](#) [131903-HMC921LP4E](#) [EU-](#)
[SIGFOX-GEVB](#) [856512-EVB](#) [856512-EVB-1](#) [856704-EVB](#) [856882-EVB](#) [856908-EVB](#) [3071](#) [3073](#) [4072](#) [4073](#) [4074](#)