nanoNET TRX

High Performance Transceiver for the 2.45 GHz ISM Band

Overview

The nanoNET TRX transceiver is a highly integrated mixed signal chip utilizing the unique wireless communication technology CSS (Chirp Spread Spectrum) developed by Nanotron Technologies. nanoNET TRX allows a high range of up to 900 meters in free space and 60 meters indoors in the 2.45 GHz ISM band (@ 1 Mbps). The system is extremely robust against disturbances such as noise and multipath fading.

Due to its primarily analog signal processing and the robustness of the chirp signal, nanoNET TRX has an extremely low power consumption per successfully transmitted bit. For battery-powered applications requiring a long life and high data rates, this IC offers the ideal solution. The data rate is selectable between 500 kbps, 1 Mbps, and 2 Mbps. Due to the unique chirp pulse, adjustment of the antenna is not critical, which significantly simplifies the installation and maintenance of the system ("pick and place").

The nanoNET TRX transceiver includes a MAC controller with CSMA/CA and TDMA support, as well as Forward Error Correction (FEC), and 128 bit encryption.

Driver software, a Portable Protocol Stack (PPS), an Evaluation Kit, and a Development Kit are also available.

Main Features

- Operating worldwide in the 2.45 GHz ISM band
- Data rates: 2 Mbps and 1 Mbps
- Range: max 900 m free space, 60 m indoors (@ 8 dBm TX power, 1 Mbps)
- CSMA/CA and TDMA Support
- Modulation technique: Chirp Spread Spectrum
- Chirp bandwidth: 64 MHz effective
- Processing gain: 17 dB
- Carrier to Interference ratio: -3 dB to 0 dB (@ BER=10^{-3}, C=-82 dBm, 1Mbps)
- Maximum RF output power: 8 dBm
- TX power adjustment in 19 steps from -27 dBm to 8 dBm
- Receiver sensitivity: -92 dBm (@ BER=10^{-3}, 1Mbps)
- Supply voltage: 2.4 V to 3.6 V
- Current consumption: 35 mA (RX), 78 mA (TX, 8 dBm), 64 m (TX, 0 dBm)
- Standby current with active RTC is 1.5 µA
- Operating temperature range: -40° C to +85° C
- Integrated MAC controller with FEC and CRC
- SPI interface to external µc (up to 16 MHz SPI clock)
- 4 channel digital I/O
- Automatic address matching (48 bit)
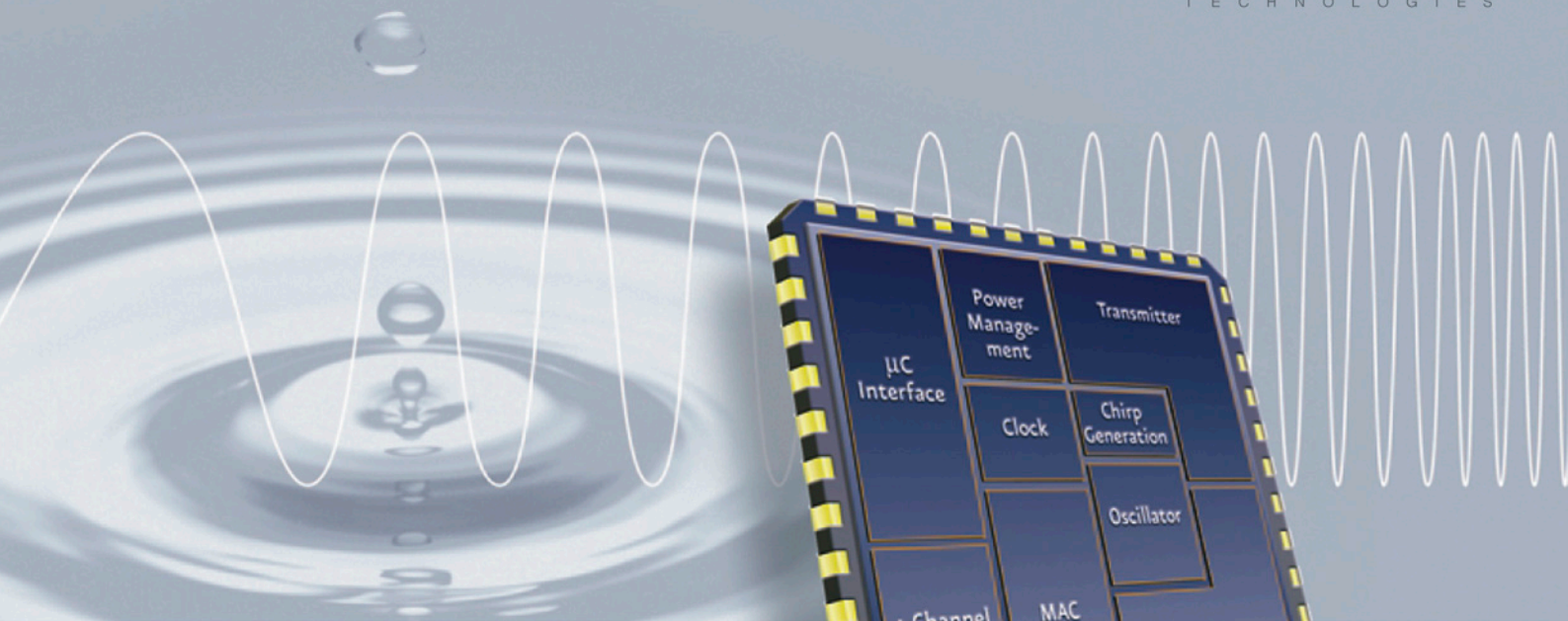
Applications

- Active RFID
- Industrial Monitoring and Control
- Medical Applications
- Building Safety
- Meter and Sensor Reading
- Multimedia

Sample Application

The nanoNET TRX transceiver can work with almost every microcontroller and is designed in such a way that only a minimal number of external components are required to build a fully operational bi-directional wireless communication node, which reduces the BOM to a minimum.
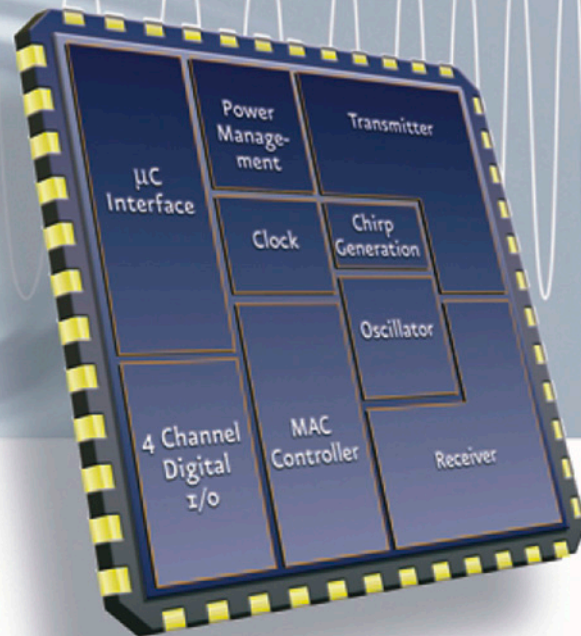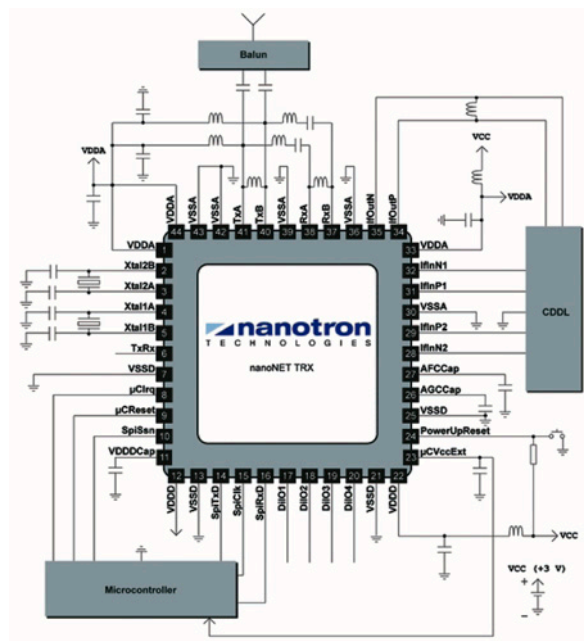
RF Modules nanoPAN 5360, 5361

For easy product development and fast market entry, Nanotron Technologies provides the RF modules nanoPAN 5360 and nanoPAN 5361. They contain the complete RF part of a nanoNET node and provide asymmetrical 50 Ω antenna port. The nanoPAN 5360 contains an additional ISM band pass filter for an even improved robustness.
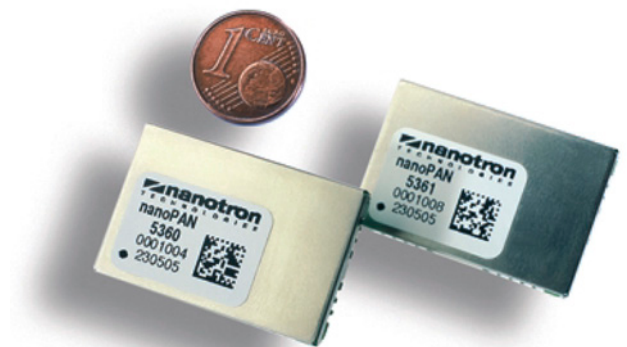
Ordering Information

Number	Description
NA0108B	nanoNET TRX Transceiver Chip (RoHS compliance certificate available)

Further Information:
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Chirp it.