nanoPAN 5360, 5361

High Speed, Low Power RF Modules for the 2.45 GHz ISM Band

Overview

nanoNET is a high-performance and low-power network for the 2.4 GHz ISM band. It is based on Nanotron's patented Chirp Spread Spectrum (CSS) transmission technology and provides a long range of up to 900 meters in free space and typically 60 meters indoors (@ 1 Mbps and 8 dBm output power). The network is extremely robust against disturbances such as noise and mutlipath fading. Due to its primarily analog signal processing and the robustness of the Chirp signal, nanoNET has an extremely low power consumption per successfully transmitted bit.

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 an nanoNET network node and provide an asymmetrical 50 Ω antenna port. The data rate is selectable between 500 kbps, 1 Mbps, and 2 Mbps.

The nanoPAN RF modules are available in two versions. The nanoPAN 5360 contains an additional ISM band pass filter for an even improved robustness. The nanoPAN 5361 does not include the band pass filter, but provides a higher output power and better receiver sensitivity.

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

Main Features

Both Modules

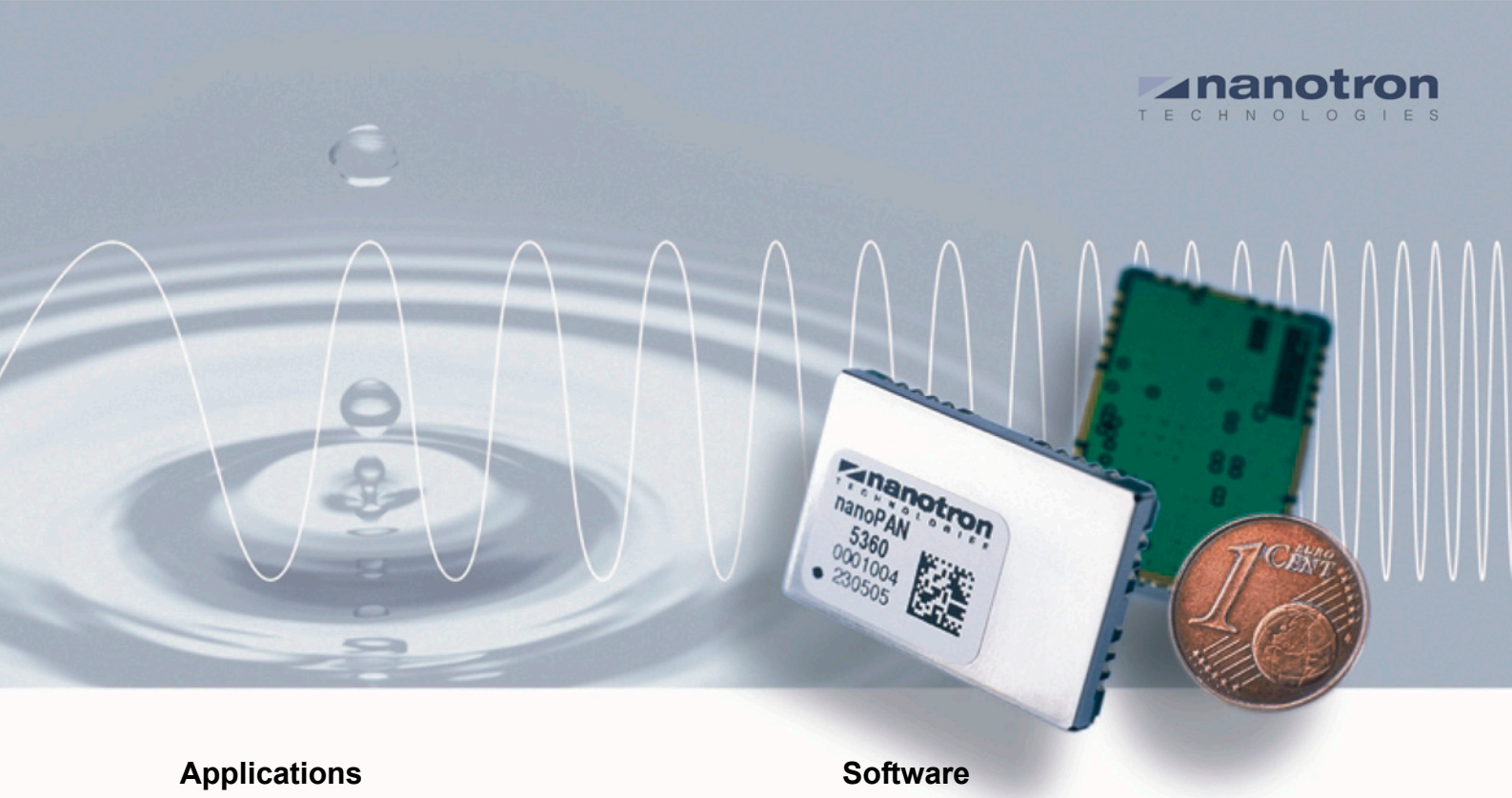
- Operating worldwide in the 2.45 GHz ISM band
- Data rates: 2 Mbps, 1 Mbps, 500 kbps
- Modulation technique: Chirp Spread Spectrum (CSS)
- Chirp bandwidth: 64 MHz effective
- SPI interface to external µc (up to 16 MHz SPI clock)
- Asymmetric 50 Ω antenna port
- Supply voltage: 2.4 V to 3.6 V
- Current consumption: 35 mA (RX),
  78 mA (TX, Maximum output power)
- TX power adjustment in 19 steps
- Operating temperature range: -40° C to +85° C
- 4 channel digital I/O
- Small metal housing (20 X 30 X 3.5 mm)
- Two assembly options: pads for soldering and reflow

nanoPAN 5360

- Maximum output power: 6 dBm
- Receiver sensitivity: -90 dBm (@ BER=10^{-3} and 1 Mbps)
- ISM band pass filter for maximum robustness

nanoPAN 5361

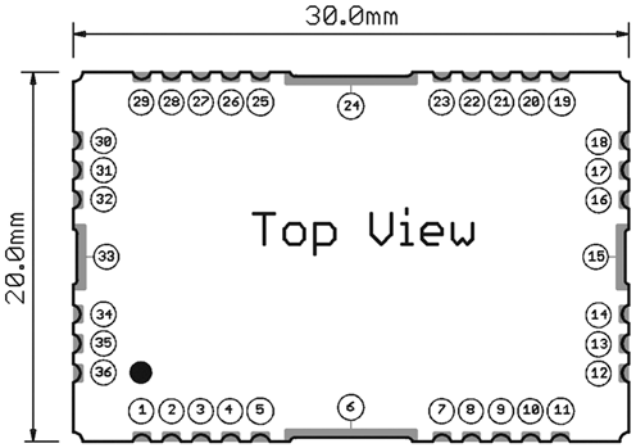
- Maximum output power: 8 dBm
- Receiver sensitivity: -92 dBm (@ BER=10^{-3} and 1 Mbps)
- High range: maximum 900 meters in free space, typically 60 m indoors



Applications

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

Pin Assignment



Pin no.	Pin name	Pin no.	Pin name
1,3,4,6,15-22 24-26,28,30-33	GND	12	DIIO2
		13	DIIO1
2	VCC	14	PWRUPRESET
5	SPICLK	23	VCC_OUT
7	UCVCC	27	ANT
8	SPITXD	29	TX_RX
9	SPIRXD	34	UCIRQ
10	DIIO4	35	UCRESET
11	DIIO3	36	SPISSN

Software

Nanotron Technologies provides two software products to speed up your product development: a transceiver driver and a Portable Protocol Stack (PPS). The driver provides all functionality required to access the nanoNET TRX transceiver, such as initializing the chip and sending and receiving of data. For larger networks, our PPS is the ideal solution – it provides advanced services such as broadcasting, frame forwarding, fragmentation, and software acknowledgements between end stations. Both software products can run even on 8 bit microcontrollers.

Evaluation and Development Kits

For an easy start into the world of Chirp transmission technology, Nanotron provides an Evaluation Kit. Just connect the RF Test Modules to the microcontroller boards, connect the boards via RS 232 to your PC or laptop, and start the software. The GUI allows you to conveniently set the RF parameters, and it demonstrates the performance of the air link in real time on your computer screen. The nanoNET Development Kit is the ideal tool to develop your own applications based on Nanotron's nanoNET TRX Transceiver.

Ordering Information

Number	Description
MP5360M	nanoPAN 5360 RF Module
MP5361M	nanoPAN 5361 RF Module

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