Robust, reliable analog solutions

Sub-GHz Low-Power Multi-Standard Wireless Platform

The NXP® OL2385 radio frequency transceiver with embedded microcontroller is designed for a wide range of industrial and home applications requiring a very high link budget for bi-directional RF communication.

TARGET APPLICATIONS
- Smart grid NAN
- Smart metering
- Building and home automation
- Wireless sensor network
- Machine-to-machine communication
- Low-power wide area networking

OVERVIEW
The embedded microcontroller in the OL2385 multi-standard sub-GHz transceiver enables the implementation of complete subsystem and lower-layer driver functions. As a result, package pre-processing and time-critical ACK responses are simpler than the responses from standard transceiver devices fully controlled by a host MCU.

The device is supplied with standard software stacks such as IEEE802.15.4, W-MBus Data Link Layer and SIGFOX®. These software stacks are preprogrammed in the factory and are controlled by a system host microcontroller via APIs available through either UART or SPI. NXP’s Kinetis® microcontroller is supplied with a driver library and the Kinetis software development kit (SDK).

The transmitter has a high dynamic range of -25 dBm to +14 dBm and efficient power-ramping PA. The excellent phase noise of the transmitter conforms to ETSI, FCC and ARIB standards.

Configured to operate with low active and standby power, the transceiver is ideal for battery-powered applications.
FEATURES AND BENEFITS

Key features

- Single IC for bands (160–960 MHz)
- Ultra-low RX power below 11 mA
- Up to +14 dBm output power at 29 mA
- Sensitivity -128 dBm at 4 kHz
- Excellent phase noise
- Supported software standards:
  - WMBus2013, KNX, 802.15.4, T108, sub-GHz ZigBee®, SigFox
  - 400 kbit/s 4(G)FSK, 200 kbit/s 2(G)FSK, ASK, OOK
  - HVQFN48 package (7 x 7 mm²)
- Operating temperature range: -40 °C to +85 °C

FEATURE HIGHLIGHTS

Image rejection

Minimum image rejection of 50 dB is guaranteed over temperature and supply. Using an NXP-patented onboard generated pilot tone calibration technique in combination with an onboard temperature sensor, calibration values are stored in a look-up table, ensuring optimum settling time.

RF frontend

The use of attenuators makes advanced gain control possible. The gain of the ‘active’ elements within the receive path, e.g., LNA, mixer, etc., remains fixed. Control of the gain is achieved by switching attenuators before and after the LNA. The gain switch is then immediate and predictable, requiring no settling time.

The attenuation factor of these attenuators can be compensated in the digital domain, meaning that gain control can be implemented throughout data reception without the loss of any data bits. This strategy ensures system robustness in the case of multi-path fading or narrowband jammers. Link budget and system robustness are essential parameters for modern automotive RF systems, and the OL2385 transceiver is an industry benchmark in all respects:

- RF front end noise figure: 5 dB
- FSK sensitivity: -128 dBm

- Blocking performance at 1 MHz: 58 dB
- Phase noise at 1 MHz 868 MHz: -127 dBc at 100 kHz 868 MHz: -110 dBc
- Image Rejection: 60 dB

Antenna diversity

Two RF inputs are available for the receiver and allow sequential antenna diversity to be performed, should one antenna show a better performance in a given environment or for a specific radio channel.

OL2385 SIMPLIFIED BLOCK DIAGRAM

A LEADER IN ANALOG SOLUTIONS:

Expanding on more than 30 years of innovation, NXP is a leading provider of high-performance products combining digital, power and standard analog functions. NXP supplies analog and power management ICs that are advancing the automotive, consumer, industrial and networking markets. Analog solutions interface with real-world signals to control and drive for complete embedded systems.