



US2400 Low Power 2.4GHz Transceiver

The US2400 integrates a 2.4 GHz RF transceiver with an **IEEE 802.15.4-2006** compliant Baseband/MAC block within a single chip.

The US2400 can be controlled by a microprocessor for low-data-rate applications such as home-, industrial-automation, consumer electronics, PC peripheral ...etc. For medium-data-rate applications like wireless voice and image transmission, the **US2400 provides 1M/2M bps turbo mode**.

The RF block of the US2400 integrates receiver, transmitter, VCO and PLL. The Baseband/MAC block provides the hardware architecture for both **IEEE 802.15.4 compliant MAC and PHY layers**. It mainly consists of TX/RX control, CSMA-CA controller, 'Superframe' constructor, security engine and digital signal processing module.

It uses advanced architecture to minimize the external component count and the power consumption.

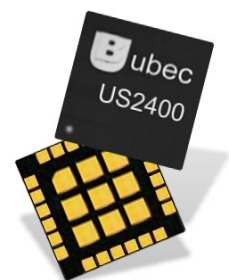
General Features

RF/Analog

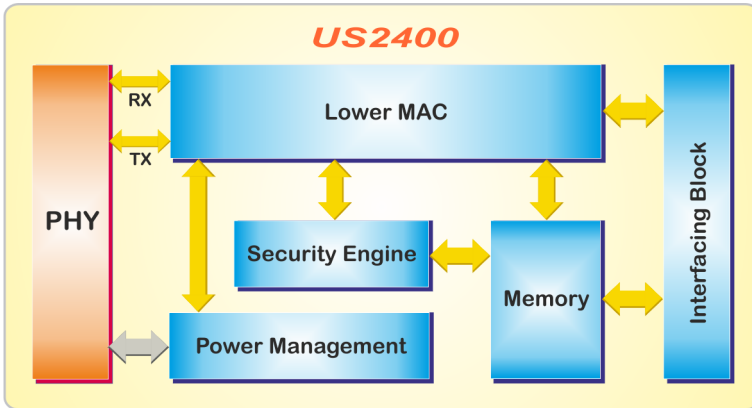
- ISM band 2.405 ~ 2.480 GHz operation
- IEEE 802.15.4-2006 specification compliant
- Single End RF input/output
- RF sensitivity: -94 dBm @ 250kbps
- Maximum RF input level: 3dBm
- High receiver and RSSI dynamic range
- RSSI range: 44dB @ 250kbps
- RF output power: 1 dBm typical
- RF output power control range: 40dB
- 1M/2M bps turbo mode supported
- Supply voltage: 2.4 to 3.6V
- Current consumption in RX Mode: 20.4mA
- Current consumption in TX Mode: 25.5mA
- Idle Mode: 6mA/Halt mode: 1.8mA
- Standby mode: 5.1µA/Deep sleep mode: 4µA
- Power down mode: 0.1µA
- 32 MHz reference clock output
- Digital VCO and filter calibration
- Integrated RSSI ADC and I/Q DACs
- Few external component count
- Small 24-pin leadless LGA 6x6 mm² package

MAC/Baseband

- IEEE 802.15.4-2006 specification compliant
- Hardware CSMA-CA mechanism, automatic ACK response and FCS check
- Programmable "Superframe" construction
- Functionally independent TX FIFOs, including beacon FIFO, transmit FIFO and GTS FIFOs
- Dual RX FIFOs
- Hardware security engine (AES-128)
- Various power saving modes
- Support all CCA modes and RSSI/LQI
- Simple 4-wire SPI interface



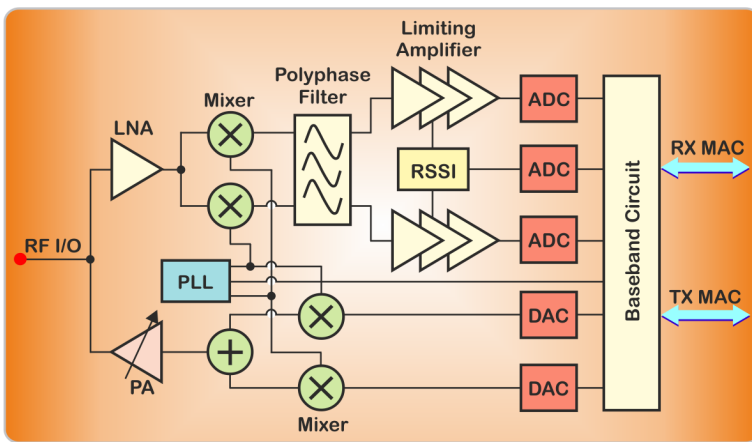
US2400 Chip Block Diagram



Applications

- Home/Building/Factory Automation
- Wireless Sensor Network
- ZigBee Systems
- 6LoWPAN Routing Protocols
- Wireless HART Communication
- RF Remote Controller
- Consumer Electronics
- Low Power Wireless Communication
- Advanced Meter Infrastructure (AMI)

PHY Block Architecture



Evaluation Board US2400-CS

US2400 Application Circuit

