PRODUCT SUMMARY

SKY66430-11: LTE for IoT System-in-Package

Applications

- Wearables
- Personal trackers
- Asset trackers
- Alarm systems
- Security cameras
- Industrial monitoring devices
- Low-power IoT devices

Features

- Complete BB to RF solution in a single package:
  - Integrated baseband, transceiver, RF front end, RAM memory, and power management
  - 8.8 mm x 10.8 mm x 0.95mm BGA package, 0.5mm pitch
  - Device weight: 229 mg
- Compliant to 3GPP Rel-13 LTE Advanced Pro specifications, including VoLTE support
- Upgradable to 3GPP Rel-14
- Optimized for LTE half-duplex operation (HD-FDD) for
- LTE-M/NB-IoT
- Global frequency band support:
  - Low-band: B5/B8/B12/B13/B14/B17/B18/B19/B20/B26/B28
  - Mid-band: B1/B2/B3/B4/B25/B66
- Two AUX ports to support additional bands
- Extended DRX and PSM features for long sleep duration cases
- Extremely low leakage internal PMU that enables operability for 10 years
- Smart PA biasing scheme to maximize efficiencies during low-output power operation
- Throughput:
  - LTE-M (1.4 MHz bandwidth) up to 300 kbps DL, 375 kbps UL
  - NB-IoT (200 kHz bandwidth):
    - NB1: 27.2 kbps DL, 62.5 kbps UL
    - NB2: 120 kbps DL, 170 kbps UL
- Single 3.1 V to 4.5 V supply operation
- Operating temperature range: -40 °C to +85 °C
- Skyworks conformal shielding
- Lead (Pb)-free and RoHS-compliant
- MSL3 @ 260 °C per JEDEC J-STD-020

Description

The SKY66430-11 is a multi-band multi-chip System-in-Package (SiP) supporting cellular LTE-M/NB-IoT (half-duplex FDD) platforms. The SiP integrates the entire RF front end, transceiver, power management, memory, and baseband modem for an LTE multi-band radio operating in the 700 to 2200 MHz frequency range. NOR flash, crystals, and a few passives external to the package complete the SiP implementation.

Front-End Section

The front-end section includes Rx low-pass filters, broadband PA with bias controller, Tx low-pass harmonic filter, and antenna switch.

Rx Section

Receive low-pass filters are integrated into the SIP along with the necessary matching to yield a 50 Ω single-ended impedance for the antenna. The filters provide a high level of rejection to out-of-band interferers, protecting the transceiver from high blocking signal levels and guaranteeing 3GPP LTE blocking test conformance. The Rx low-pass filters are cascaded with the low throw count switch to establish a lower insertion loss and noise figure than conventional LTE receivers.

Tx Section

The PA load-line is optimized for high efficiency while simultaneously meeting 3GPP ACLR and emissions mask specifications with LTE up to 6 RB. An integrated LPF is implemented to reject the PA and transceiver harmonics while at the same time minimizing any post PA loss for an optimized transmit current consumption. Out-of-band emissions performance is emphasized by the design to be 3GPP-compliant for low-band B5/B8/B12/B13/B14/B17/B18/B19/B20/B26/B28 and mid-band B1/B2/B3/B4/B25/B66.

This SiP includes the Sequans Monarch 3330 chipset

SEQUANS MONARCH INSIDE

Transceiver Section

A direct-conversion RF solution using low power technology has the following functional characteristics:

- Direct conversion in the Tx and Rx paths
- On-chip Fractional-N frequency synthesizers
- On-chip anti-alias filters
- On-chip AGC circuit
- On-chip reconstruction filters
- On-chip calibration including VCO and DC offset correction in the Rx paths
- Rx and Tx gain and phase correction loops between the RF and baseband
- Software control for synthesizer, Tx/Rx, adjustment, and gain control
- External clock reference of 38.4 MHz

Skyworks Green™ products are compliant with all applicable legislation and are halogen-free. For additional information, refer to *Skyworks Definition of Green™*, document number SQ04-0074.

Baseband Modem Section

- DL processing block, handling LTE downlink physical layer (Rx)
- UL processing block, handling LTE uplink physical layer (Tx)
- Synchronization processing block, handling frequency search and synchronization to LTE network
- Optimized for new Cat-M1 channels and operation of 3GPP Release 13
- Three high-speed UARTs with hardware flow control
- One I^2C master up to 3.4 Mbps
- One SPI master and slave up to 13 MHz
- Muxed GPIOs interruptible, with support of pulse counter and PWM functionality
- Two UICC interfaces compliant with ETSI TS 102 221 specification, including SIM card removal detection and support for 1.8 V and 3 V voltage levels
- Secured JTAG, with possibility of enabling or disabling the interface by hardware or secured software

NOTE: *This SiP includes the Sequans Monarch 3330 chipset. For more specific information related to that chip set, which is not included in this data sheet, refer to the data sheet for that product.*

A functional block diagram is shown in Figure 1. A typical application block diagram is shown in Figure 2.

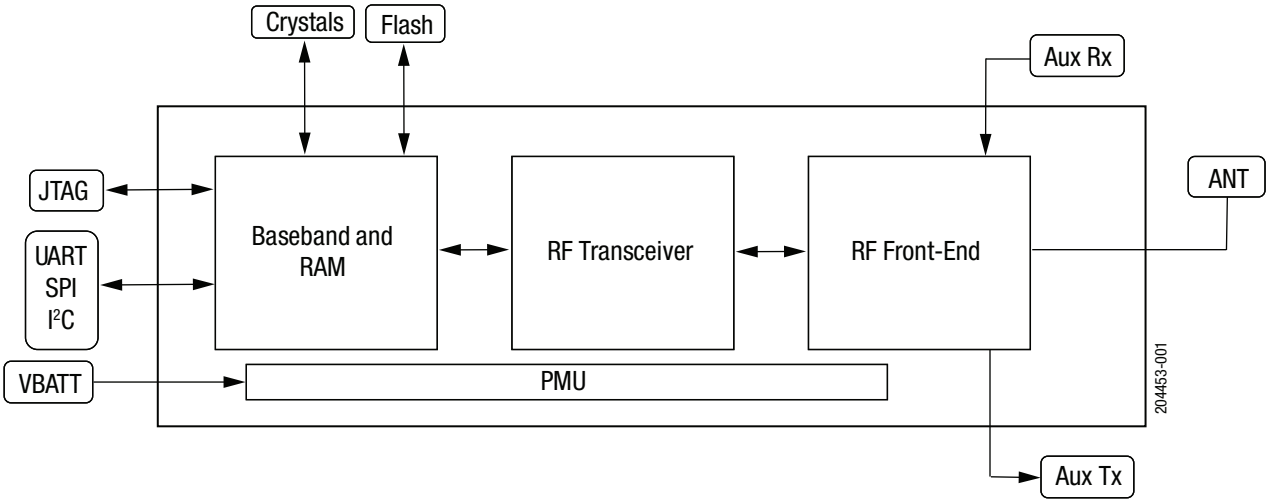

Figure 1. SKY66430-11 Functional Block Diagram

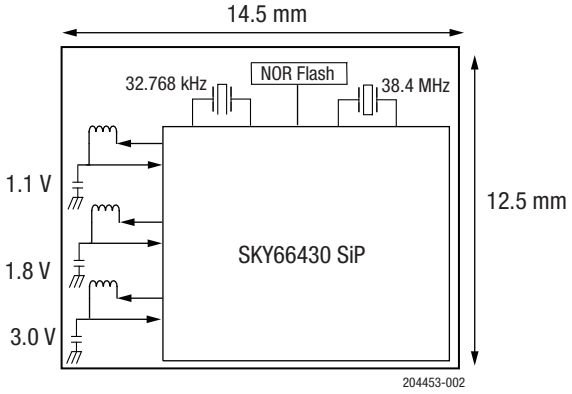

Figure 2. SKY66430-11 Typical Application Block Diagram

Ordering Information

Part Number	Product Description	Evaluation Board Part Number
SKY66430-11 / SQN66430-11	LTE for IoT System-in-Package	SKY66430-11EK1