



## NXP UHF to 900-MHz transceiver SA58646

# Single-chip analog transceiver for UHF to 900 MHz

Housed in a small LQFP package (10 x 10 mm), this highly integrated BiCMOS transceiver provides complete Rx/Tx functionality in basestations and handsets. It is ideally suited for use in full-duplex radios, push-to-talk walkie-talkies, data transceivers, and full-duplex cordless phones.

### Key features

- ▶ Complete RF Rx functionality (single-frequency conversion RF receiver)
- ▶ Complete RF Tx functionality
- ▶ Integrated synthesizer
- ▶ Baseband Rx section with volume control
- ▶ Baseband Tx section
- ▶ 3-wire microcontroller interface
- ▶ Voltage regulator to supply internal PLLs
- ▶ Selectable voltage doubler
- ▶ Programmable timer for low-battery detection multiplexed with RSSI carrier detect
- ▶ LQFP64 package (10 x 10 x 1.4 mm)

### Applications

- ▶ Full-duplex radios (902 to 928 MHz)
- ▶ Data transceivers (UHF to 900 MHz)
- ▶ Push-to-talk walkie-talkies (FRS UHF)
- ▶ eMetering
- ▶ Handheld medical monitoring devices

The NXP UHF 900-MHz transceiver SA58646 performs all the reception (Rx) and transmission (Tx) functions for a basestation or handset, from the antenna to the microcontroller interface. Programmable features reduce the number of external components, so the design uses less space and there are fewer external adjustments.

Applications for the SA58646 include Family Radio Services (FRS) UHF push-to-talk walkie-talkies, full-duplex cordless phones in the 902-to-928-MHz range, and data transceivers in the UHF-to-900-MHz or 433-MHz ranges.

To save space in portable applications, the device is housed in a plastic low-profile quad flat package (LQFP) with 64 leads that measures only 10 x 10 x 1.4 mm. The minimum supply voltage is a VCC of 2.9 V, which limits the voltage swing on both charge pumps to approximately 2.3 V.

Three operating modes reduce current consumption in handset applications. In Active (talk) mode, all blocks are powered. In Rx mode, all circuitry in the RF receiver section

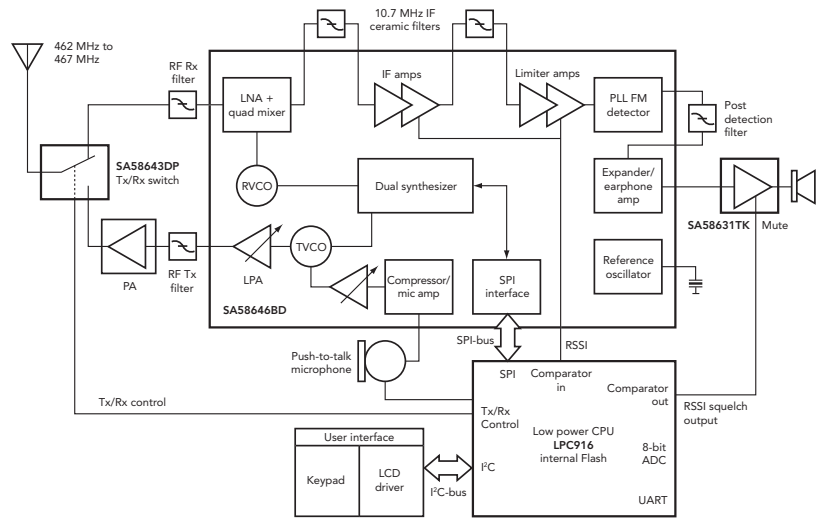
are active. In inactive mode, all circuitry except the serial interface is powered down.

The FM receiver section has an integrated LNA and an image reject mixer, so there's no need for an external RF preselector filter. The transmit VCO is frequency modulated by speech or data.

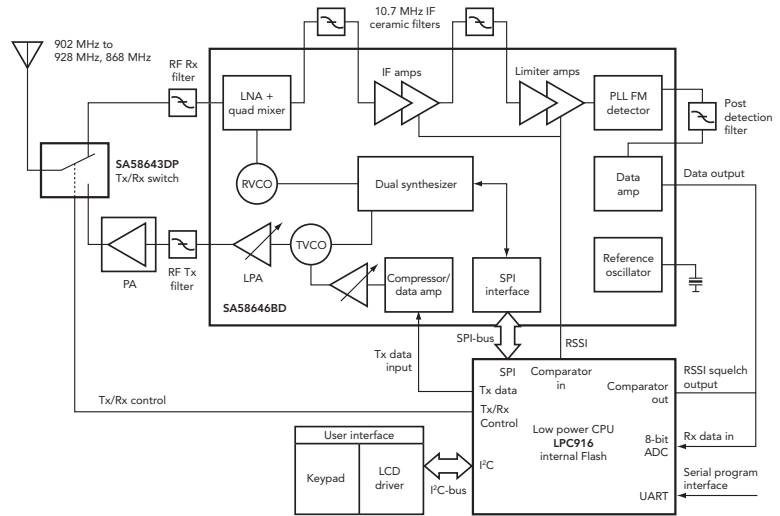
Volume in the earpiece amplifier is controlled via software or hardware in the baseband Rx section, which has a mute function and an expander. The baseband Rx section also has a microphone amplifier, a compressor with automatic level control and a hard limiter, as well as a Tx gain. Each Tx and Rx audio-signal path has a programmable gain block.

For communication with a microcontroller, there is 3-wire serial interface. The interface sets the value of the Rx gain with 32 linear steps of 0.5 dB each. The interface is also used to program the thresholds of two detect functions, low-battery detect, which monitors battery status, and carrier detect, which indicates whether a carrier is present on a given channel. The two detect functions can be time-multiplexed.

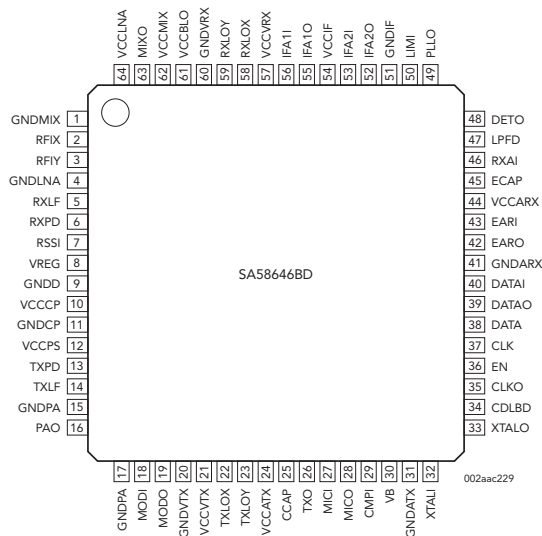
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Family radio services UHF walkie-talkie application block diagram



902-928 MHz / 868 MHz data transceiver application block diagram



SA58646 pin configuration

### Ordering information

Type number	Temp range	Package	Dimensions	Version
SA58646BD	-20 to +80 °C	64-pin LQFP	10 x 10 x 1.4 mm	SOT314-2

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