NXP LoPSTer (PQJ7981) ISM/SRD band transceiver

Peace of mind with a two-way car key

NXP's two-way solutions drive the next level of car-access applications, adding user feedback and enhanced security capability to the convenience of remote keyless entry.

Features

▸ Advanced security using challenge response or mutual authentication protocols via the bidirectional communication link

▸ Highly integrated solution for the 315 / 434 / 868 / 915 MHz bands, requiring very few external components

▸ On-chip channel filtering with automatic calibration supported to provide stable cut-off frequencies and filter roll-off

▸ Best-in-class link budget achieved with benchmark receiver sensitivity

▸ Onboard signal-signature recognition unit with preamble pattern recognition

▸ Configurable Rx polling timer with 2% absolute accuracy

▸ 32-pin HVQFN Pb-free package

Benefits

▸ Innovative applications
  - Locking status, occupant detection, and 'headlights on' warning can all be transferred to the key and observed by the user
  - Users can be notified on their key if their car alarm is triggered
  - Wireless diagnostics at dealership service center
  - Check battery charging status in e-vehicles

Applications

▸ Keyless entry
▸ Tire Pressure Monitoring System (TPMS)

The NXP LoPSTer, a highly integrated, single-chip transceiver solution, is ideally suited to keyless entry and similar telemetry applications operating in the ISM/SRD bands. The small form factor, low power consumption and wide supply voltage range make this device suitable for use in battery-powered handheld devices and their counterparts.

The device uses a fully integrated, programmable fractional-N PLL (including loop filter) to control the local oscillator, thus supporting multi-channel operation and frequency-hopping schemes. This feature also allows programmable frequency steps for XTAL drift compensation. The device can employ ASK/OOK, FSK, or GFSK-like modulations for relaxed narrowband applications.

The device is based on a low-IF, direct-conversion receiver architecture, with on-chip IF filtering and programmable channel bandwidth. The device settings can be modified 'on-the-fly' to achieve the best possible system performance. For example, long-range narrowband applications (RKE) can be realized and, with a change in channel filter settings, wideband signals (PKE or TPMS) can be received.
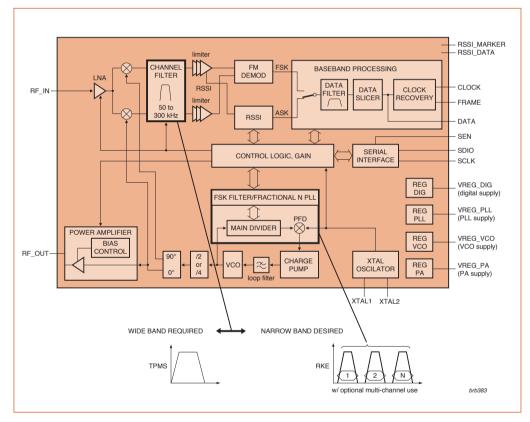
LoPSTer supports keyless entry and Tire Pressure Monitoring Systems (TPMS) in the global automotive market. Automotive qualification enables keyless entry with a bidirectional RF link to the car, and, since they allow reception of keyless entry and TPMS data with the same receiver, they simplify the design of TPMS applications. The small HVQFN footprint and full ISM band overage make it ideal for placement in keys, where board space is very limited.

One-way remote and passive keyless entry and TPMS

NXP also offers solutions for one-way RF applications. The FraNTIC (PCF7900) is a highly power-efficient transmitter that uses a fractional-N PLL for multi-channel operation that enables a robust jamming application for car access.

The VIPER (PQJ7911) is ideally suited to car access and TPMS applications. By providing a highly programmable state machine and incorporating a polling timer, VIPER can operate autonomously, waiting to receive signals from car keys or TPMS transmitters. The programmable channel filter facilitates the optimum performance for all possible protocols and applications.

LoPSTer block diagram with variable bandwidth channel filter