

## High Performance Digital FM Transceiver for Portable Devices

### General Description

The QN8006 is a high performance, low power, full-featured single-chip stereo FM transceiver designed for cell phones, GPS personal navigation devices, portable audio/video players, and automotive accessories. The QN8006 covers frequencies from 76 MHz to 108 MHz in 50/100/200 kHz step sizes for worldwide FM band support. The QN8006 also supports RDS/RBDS data transmit and receive.

The QN8006 integrates both FM receiving and transmitting functions, including RF front-end circuits (PA, LNA, and channel selective filter), full digital FM modulator/demodulator, MPX codec, pre-emphasis/de-emphasis and feature-rich audio processing (audio AGC, soft clipping, SM, HCC, and SNC). Auto Seek and clear channel scan functions enable automatic channel selection for best sound quality. Integrated antenna tuning eases antenna matching in real applications. The QN8006 provides both digital and analog audio interfaces. 2-wire and 3-wire digital control interfaces provide simple access to programmable functions.

Advanced digital architecture enables superior receiver sensitivity, crystal clear audio, unsurpassed spectral purity, ultra-low harmonic and spurious levels, and high immunity to TDMA burst noise. The QN8006 is ideal for cellular handsets and GPS personal navigation applications.

The QN8006's small footprint, high integration with minimum external component count, and support for multiple clock frequencies make it easy to integrate into a variety of small form-factor low-power portable applications. Integrated low-phase noise digital synthesizers and extensive on-chip auto calibration ensures robust consistent performance over temperature and process variations. An integrated voltage regulator enables direct connection to a battery and provides high PSRR for superior noise suppression. A low-power idle mode extends battery life.

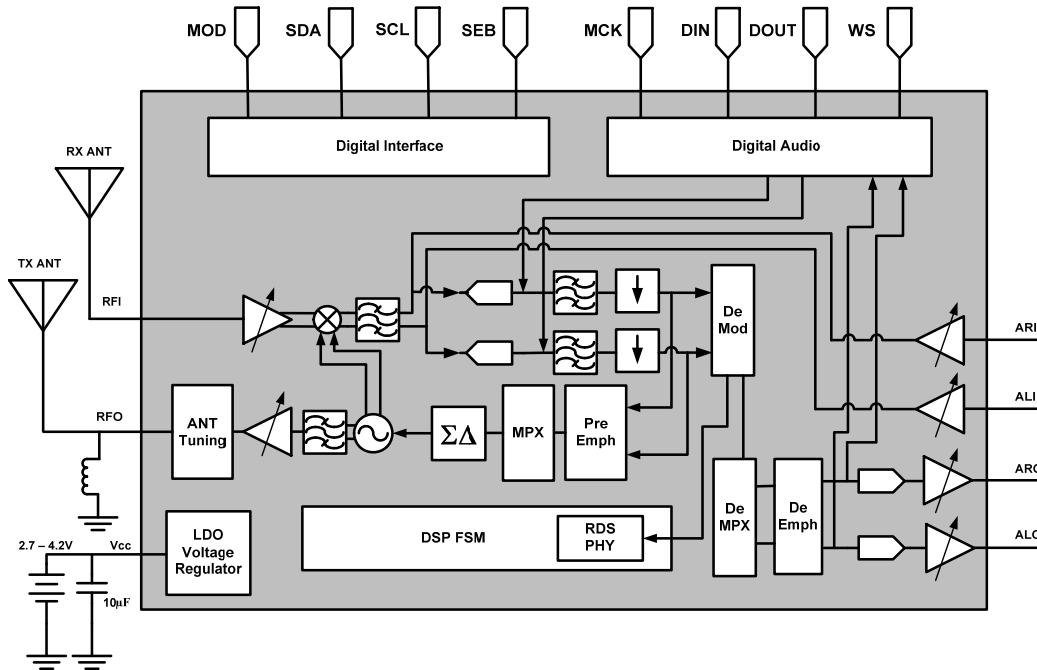
ESD protection is on all pins. The QN8006 is fabricated in highly reliable CMOS technology.

### Key Features

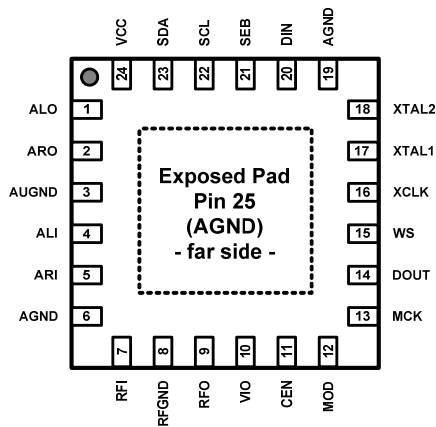
- **Worldwide FM Band Receive and Transmit**
  - 76 MHz to 108 MHz full band tuning in 50/100/200 kHz step sizes
  - 50/75  $\mu$ s pre-emphasis and de-emphasis
- **Ease of Integration**
  - Small footprint, 4 x 4 x 0.85mm QFN24
  - Only 2 external passive components required
  - Adaptive antenna tuning
  - Low cellular and GPS band spurs
  - High Immunity to TDMA (GSM/GPRS) burst noise
  - Multiple crystal frequencies supported
  - 2- and 3-wire control interfaces
- **Very Low Power Consumption**
  - 11.5mA (Transmit Mode), 18.8mA (Receive Mode)
  - Integrated voltage regulator, direct connect to battery
  - Power saving idle and standby modes
  - Low shutdown leakage current
- **High Performance FM Receiver (FMR)**
  - Superior sensitivity 1.4  $\mu$ V<sub>EMF</sub>
  - 66dB Stereo SNR, 0.03% THD
  - High interference rejection
  - Integrated audio processing (SNC, HCC, SM)
  - Auto Seek
- **High Performance FM Transmitter (FMT)**
  - 66dB Stereo SNR, 0.03% THD
  - Maximum 124dBuV RF output level with 42dB adjustable range
  - Integrated Clear Channel Scan
- **RDS/RBDS Transmit & Receive**
  - Supports US and European data service, including TMC (Traffic Messaging Channel) (not available in QN8006L)
- **Flexible Audio Interfaces**
  - Digital audio interface supports I<sup>2</sup>S and a variety of PCM data formats with 4 different data rates
  - Programmable analog audio input/output
  - Integrated audio AGC and soft clipping
- **Robust Operation**
  - -25<sup>o</sup>C to +85<sup>o</sup>C operation
  - ESD protection on all input and output pads

### Typical Applications

- Cell Phones / PDAs / Smart Phones
- Portable Audio & Media Players
- GPS Personal Navigation Devices
- Automotive and Accessories



QN8006 Block Diagram



QN8006 Pinout

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