BROADCOM®

Connecting **everything**®

BCM2004
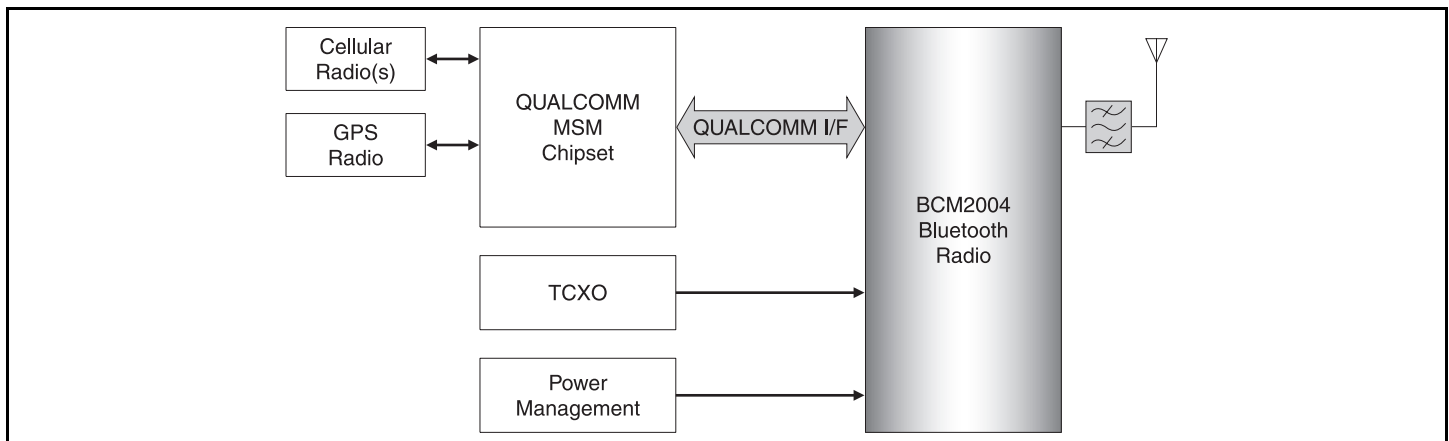### PRODUCT Brief

BLUETOOTH® RADIO FOR QUALCOMM®-BASED HANDSETS

FEATURES

- **BQB qualified as Bluetooth® version 1.1 and 1.2**
- **BQB qualified module solutions available today**
- **Achieves -88 dBm receiver sensitivity under high interference environments**
- **Programmable PA provides up to +4 dBm output power, satisfying requirements for Class 2 or 3 operation**
- **Spurious and blocking performance supports simultaneous operation with GPS, CDMA, WCDMA, and GSM/GPRS worldwide radio frequency plans**
- **Fully integrated RF front-end matching circuits eliminates external baluns and T/R switch**
- **All critical external passive components have been integrated**
- **Fully integrated voltage regulator supports operation from 1.8V to 4.6V operation**
- **Advanced packaging to support PCB or module-based solutions**
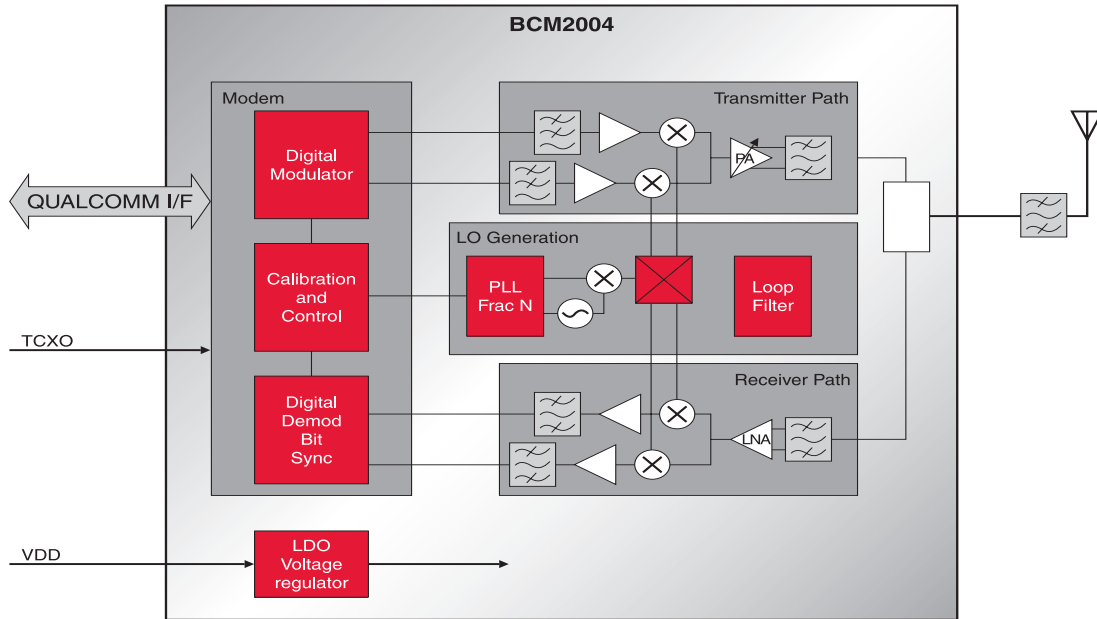 - Wafer scale chip size package
  - Fine pitch ball grid array

SUMMARY OF BENEFITS

- **Bluetooth radio designed in cooperation with QUALCOMM, specifically for use in QUALCOMM®-based handsets**
- **Only Bluetooth device available which is fully compliant with QUALCOMM's most advanced CDMA coexistence tests**
- **Optimized for integration and simultaneous operation in small form factor handsets**
  - Enhanced spurious emissions and cellular blocking performance
  - Advanced packaging options simplify integration
  - Low active power consumption and single digit standby current
- **Highest level of system integration eliminates all external active and critical components providing the lowest total BOM cost**
- **Fabricated in standard bulk CMOS**
- **Built-in self calibration and temperature compensation eliminates effects of process and temperature variation**
- **Smallest total footprint minimizes board area and height requirements**

BCM2004 CDMA Handset Application

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BCM2004

The **BCM2004** Bluetooth transceiver is an integrated radio transceiver that is optimized for use in QUALCOMM MSM-based wireless systems. The transceiver is Bluetooth 1.1 and 1.2 compliant and is designed to enable simultaneous operation with any of the radios options, including GPS, WCDMA, CDMA, and GSM/GPRS.

The **BCM2004** is a high-performance radio implemented in digital CMOS. It incorporates fractional-N frequency generation technology to synthesize all industry standard reference frequencies for mobile phone applications. A proprietary self-calibrating VCO structure allows for both excellent phase noise and fast frequency hopping covering the entire band.

The receiver front-end consists of a low-noise amplifier and an image reject mixer. Balanced mixer structures fed by accurate quadrature LO signals allow an excellent noise figure and strong image rejection.

A low IF frequency allows for high performance amplifier and filter designs in CMOS. The bandpass filter structure features self-calibration circuitry that automatically adjusts circuit elements to compensate for any process variation. This eliminates tuning and ensures that process and temperature variation are uniform across the devices. The IF amplifiers provide a limiting function so that the following stages always get a constant signal level regardless of the RF input level. An RSSI signal is also generated in these amplifiers for the system to determine signal strength. The signal is then filtered further, demodulated, and finally sent to a bit slicer to generate logic level data output.

The GFSK transmit signal is first generated at baseband in a proprietary modulator. It is then filtered and upconverted to RF using the quadrature LO signals. Four output power levels are digitally programmable from full power to low power in 4-dB steps.

The **BCM2004** has a fully integrated T/R switch and associated matching circuits. This eliminates the need for any external inductors or active components.

The **BCM2004** is controlled via a QUALCOMM proprietary baseband interface. This interface provides control for the various sections of the chip, defines data transfers, and allows access to the various internal registers of the device.

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