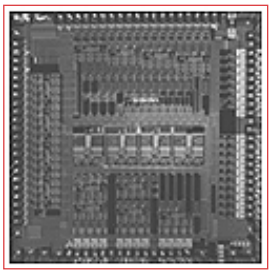
BCM2001

PRODUCT Brief



BCM2001 2.4 GHZ BLUETOOTH™ RADIO

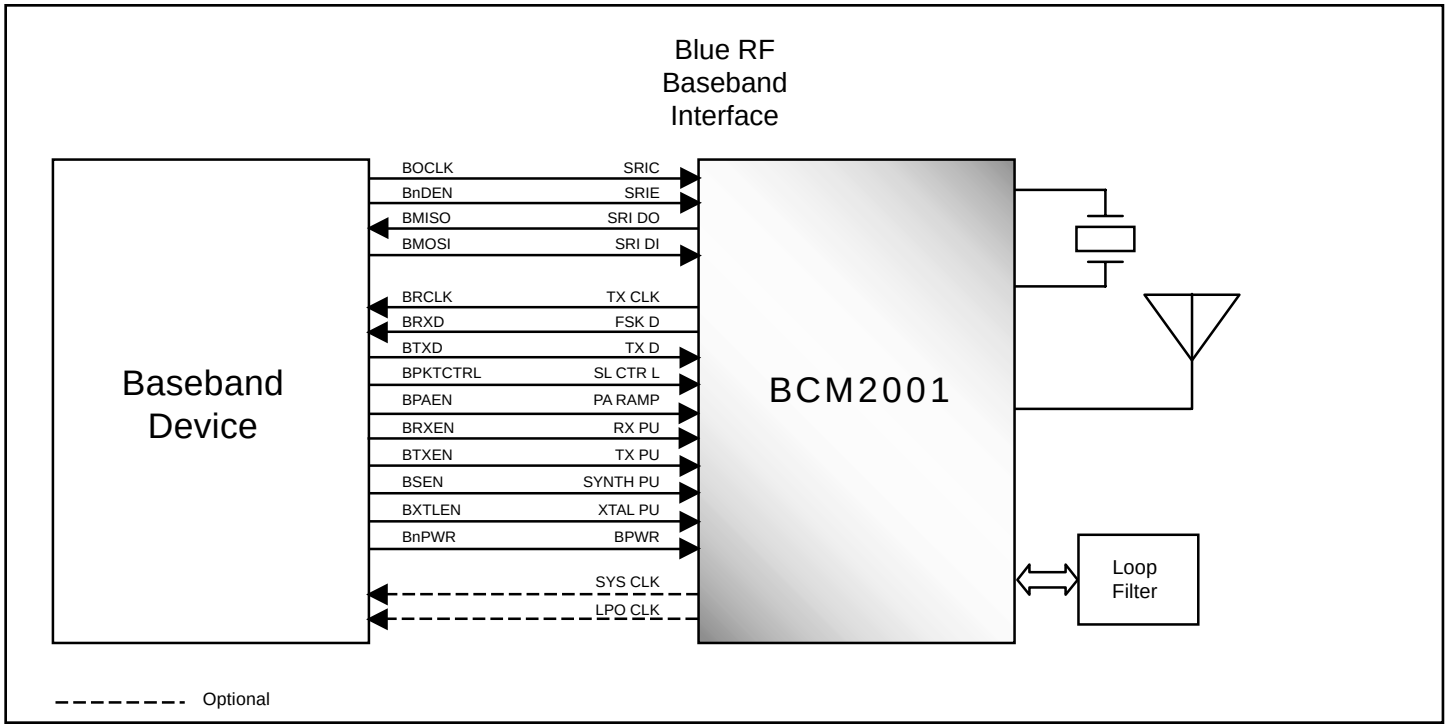
BCM2001 FEATURES

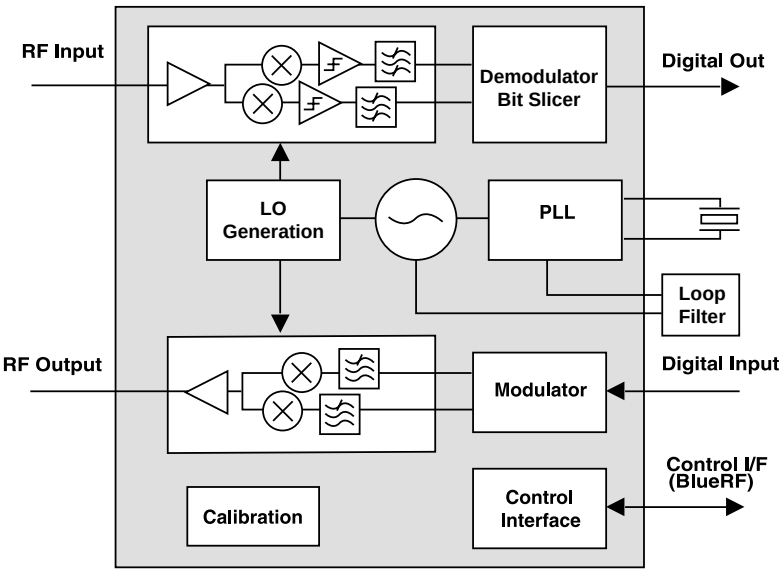
- **Bluetooth 1.1 compliant radio**
- **Differential RF interface**
- **Typical -83 dBm receiver sensitivity across passband under high interference enviroments**
- **Typical +3 dBm RF output power satisfied requirements for Class 2 operation**
- **Excellent blocking performance eliminates the need for external RF filters**
- **Highly linear receiver exceeds Bluetooth specifications**
- **Meets FCC radiated emissions requirements without RF filtering or shielding**
- **Low power consumption**
- **Built-in digital RSSI**
- **Programmable PA gain**
- **8mm x 8mm, 48-pin LPCC standard package**

SUMMARY OF BENEFITS

- **In-band and out-of-band blocking performance significantly exceeds Bluetooth™ requirements, enabling operation in a range of applications including:**
  - PCs
  - Mobile phones
  - PDAs
- **Monolithic implementation in a standard digital CMOS process with minimal external components provides a manufacturable low-cost Bluetooth RF/IF solution.**
- **On-chip auto calibration eliminates process variation across components and mitigates temperature variation, enabling the chips to be used in high-volume applications.**
- **The standard BlueRF RXMODE2 unidirectional baseband interface implemented in the BCM2001 supports connection to a wide variety of current and future baseband devices.**

Bluetooth™ Application





The **BCM2001** Bluetooth™ transceiver is an integrated radio transceiver device, optimized for use in 2.4-GHz Bluetooth wireless systems. It is designed to provide low-power, low-cost, and robust communication for applications operating in the globally available 2.4-GHz unlicensed ISM band. It is fully compliant with the Bluetooth Specification and meets or exceeds the requirements, where appropriate, to provide the highest communication link quality of service.

The **BCM2001** features a simple, innovative shared LO architecture that enables a high-performance radio implementation in a single CMOS chip. A proprietary PLL design generates quadrature LO signals in the 2.4-GHz band for both the transmitter and receiver. The PLL is locked to a 12-MHz, free-running crystal oscillator. The frequency agile LO covers the 79 Bluetooth frequency-hopping channels. 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, which perform well without a costly RF band pass filter. 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. The signal is then boosted to the class 2 Bluetooth output power level by a power amplifier. Four output power levels are digitally programmable from full power to low power in 8-dB steps.

The **BCM2001** is controlled via a BlueRF unidirectional interface. BlueRF is a Bluetooth industry standard specification that provides compatibility between Bluetooth RF and baseband chips. 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.

For more information please contact us at:
Phone: 949-450-8700, FAX: 949-450-8710
Email: info@broadcom.com

BROADCOM®

Visit our web site at: www.broadcom.com

2001-PB02-R.4.20.01

BROADCOM CORPORATION
16215 Alton Parkway, P.O. Box 57013
Irvine, California 92619-7013