BCM2070

PRODUCT Brief

BLUETOOTH®2.1 + EDR SINGLE-CHIP HCI SOLUTION

FEATURES

- Processed with 65-nm LP CMOS technology

- Built-in power amplifier to support class 1 transmit output power

- Fully integrated balun and T/R switch eliminate all external RF matching components for class 1, 2, and 3 designs

- Fully supports the Bluetooth 1.1, 1.2, 2.0, and 2.1 standards including 1-, 2-, and 3-Mbps EDR operation

- Lowest current consumption in all modes of operation

- ROM-based solution to eliminate external flash and/or EEPROM memory

- Highest available Bluetooth radio performance of any single-chip solution
  - -90 dBm typical receiver sensitivity
  - Programmable output power up to +12 dBm at 1.8V supply

- Minimized external BOM requirements with less than 10 external passive components

- Flexible set of interfaces that include up to 4 Mbps UART, USB, H4, H5, USB, SDIO, I^{2}C, and serial/parallel flash

- Fractional-N frequency synthesizer supports any crystal or TCXO source from 12 MHz to 40 MHz

- Automatic calibration and frequency detection of crystal frequency

- Supports applications with WLAN and WiMAX coexistence

- Proprietary packet redistribution scheme allowing up to five headsets simultaneous A2DP music streaming

- Supports wideband speech and packet-loss concealment for superior voice quality

SUMMARY OF BENEFITS

- Smallest packages, lowest power consumption, and highest performance Bluetooth® 2.1 + EDR solution

- Maximizes range and simplifies system integration by providing exceptional output power and receiver sensitivity

- Unmatched integration tremendously simplifies board-level design for easy implementation

- Achieves smallest board area requirements with minimum external BOM and smallest package size available today
  - Standard PCB requirement is less than 35 mm^2
  - WLBGA COB solutions are less than 20 mm^2

- ROM-based solution with flexible and much improved code patching to ensure fast and easy integration

- On-chip voltage regulator lowers BOM requirements and provides additional power savings capability

- Minimized power dissipation over other solutions
  - 40% savings in power compared to the previous generation of products in standard telephony headset applications
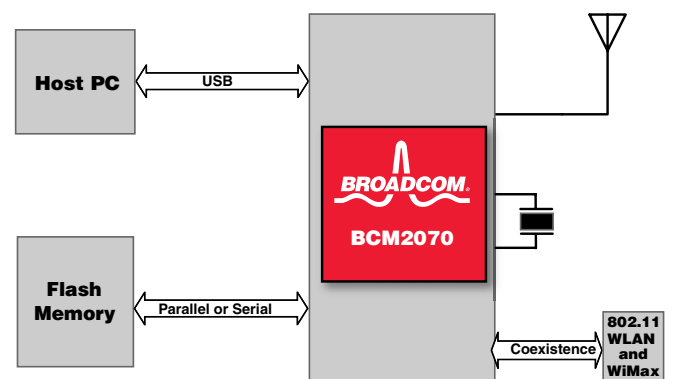
APPLICATIONS

- Cellular and mobile communication devices

- PDA and low-power embedded communication devices

- PC and integration on PC motherboard applications

- Package types available
  - 50-pin fpBGA package (4.5 mm x 4 mm)
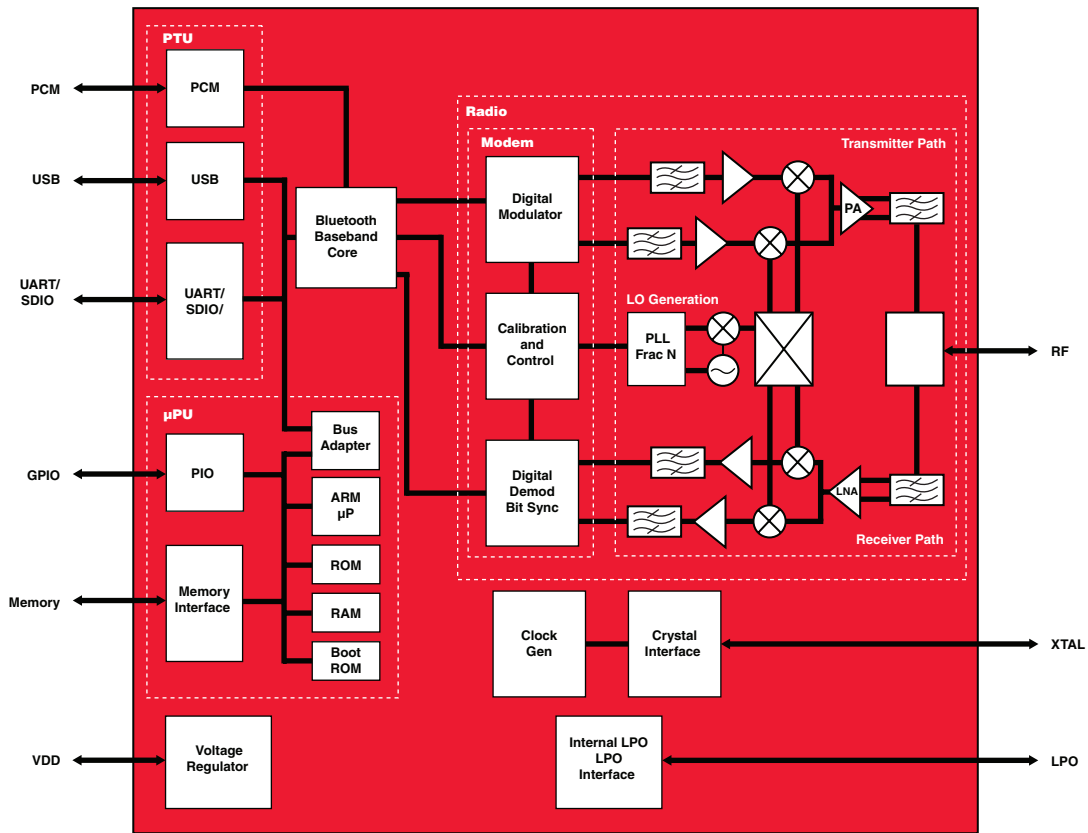 - 42-bump wafer-level BGA (WLBGA) package

Typical Cell Phone Application
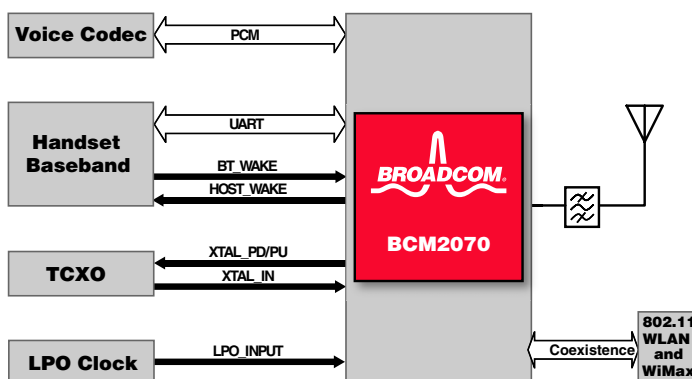
Typical PC Application

BCM2070 Block Diagram

The Broadcom BCM2070 is a monolithic, single-chip, stand-alone baseband processor with a high performance integrated 2.4-GHz transceiver for Bluetooth + EDR applications. It is fully compliant with Bluetooth 2.1 and all prior standard features. Processed using advanced 65-nm LP CMOS technology, the BCM2070 offers unmatched integrated solution with the smallest footprint and lowest cost of implementing a Bluetooth system.

The use of the advanced 65-nm process enables the BCM2070 to achieve the lowest possible current consumption in all modes of operation.

The BCM2070 has an architecture that has been designed to take advantage of the EDR standard. Its superior integrated RF design enables much higher output power and lower input sensitivity, which makes the BCM2070 the ideal solution to support Bluetooth EDR. The built-in Class 1 PA, which is capable of transmitting 10 dBm output power, can be enabled with 1.8V power supply. Together with Broadcom's leading Packet Loss Concealment (PLC) technology, which effectively reduces packet loss and bit error rates, the BCM2070 can effectively combat interference and reduce dropped connections that result from distance and physical obstructions. These translate directly into higher and more reliable throughput and greater link-range performance. The BCM2070 also includes industry collaborative coexistence solutions with WLAN and WiMAX systems. By using Broadcom's proprietary packet redistribution scheme, the BCM2070 is the industry's first Bluetooth product that is capable of supporting up to five simultaneous A2DP applications.

Ultra low-cost solutions can be achieved with the BCM2070 by using standard chip-on-board assembly techniques using the WLBGA package. Low-risk applications are enabled through the extensive integration of external passive and active components. All sensitive RF and analog portions of the Bluetooth radio and baseband have been integrated into the device, including the most sensitive high-frequency matching components. This eliminates the possibility of board-level interference and degradation in performance due to the environment and board-level designs. The built-in programmable voltage regulation (1.8V to 3.6V) was added to eliminate the need for an external voltage regulator, which further reduces the overall BOM cost. The device is capable of operation using a noisy digital 1.8 to 3.6V power supply.

Connecting
everything®

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