

BLUETOOTH® 2.1 + EDR SINGLE-CHIP HCI SOLUTION WITH INTEGRATED FM+RDS RADIO RECEIVER

BLUETOOTH FEATURES

- Monolithic single die integration of Bluetooth® and FM Radio
- Bluetooth specification 2.1 + EDR compliant with all data packet types and lengths supported
- Best-in-class Bluetooth radio based on the proven BCM2045 core
- On-chip integrated Class 1 power amplifier (PA) with programmable power control
- Integrated InConcert® 2-wire as well as industry standard 3-wire collaborative coexistence with WLAN systems
- No factory alignment required
- 5.5 Volt preregulator allows direct connect to lithium batteries
- Improved Bluetooth transport with 4-Mbaud UART
- Includes numerous enhancements for lower power dissipation
- ROM-based solution with flexible code patching
- Available in WLBGA 0.4 mm ball pitch and FPGA 0.5 mm ball pitch packages

SUMMARY OF BENEFITS

- On-chip Class 1 PA maintains a robust link over an extended range
- Low external BOM cost and small area with 10 external RLC components. The PCB footprint is < 35 mm² area.
- Operates directly from a lithium battery or from fixed voltages down to 1.65 Volt
- Best-in-class RF performance for longest range and ease of system integration
- Full featured FM system with RDS/RBDS capability
- FM system can operate independently from Bluetooth
- Highly flexible interfaces for control and data/audio routing
- Improved power dissipation for longer battery life

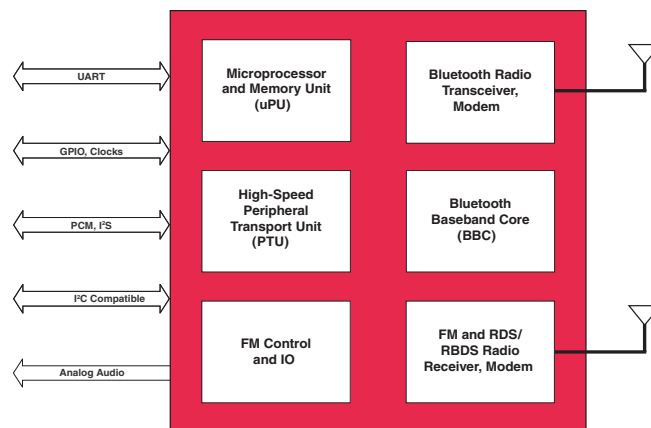
FM+RDS RADIO FEATURES

- 76-MHz to 108-MHz FM bands supported (US, Europe, and Japan)
- Excellent radio performance with 1 μ V sensitivity for 26 dB (S+N)/N
- FM control through either I²C-compatible interface or Bluetooth HCI
- Signal dependant stereo/mono blending
- Signal dependant soft mute
- Auto search and tuning modes
- Audio silence detection
- RSSI, IF frequency, status indicators
- RDS and RBDS demodulator and decoder with filter and buffering functions
- Operates from 32 kHz or reference clock inputs
- Flexible output interfaces including PCM, I²S, and analog stereo DAC and drivers.
- Integrated FM and RDS receiver with only one external cap, one external inductor and optional antenna matching

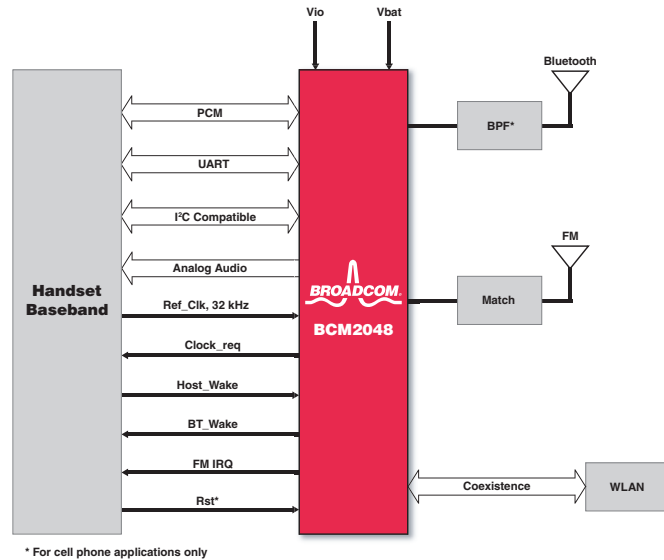
APPLICATIONS

- Mobile handsets and smart phones
- Personal digital assistants
- Mobile MP3 players

BCM2048 Functional Block Diagram



OVERVIEW



BCM2048 Block Diagram

The Broadcom BCM2048 is a monolithic single-chip, Bluetooth[®] 2.1 + EDR-compliant, baseband processor/2.4-GHz transceiver with an integrated FM and RDS/RBDS receiver. It features the highest level of integration and eliminates all critical external components, thus minimizing the footprint and system cost of implementing a Bluetooth and FM solution.

The BCM2048 is the optimal solution for any voice and/or data application that requires the Bluetooth SIG standard Host Controller Interface (HCI) via a high-speed UART and PCM. The BCM2048 incorporates all Bluetooth 2.1 + EDR features including Secure Simple Pairing, Extended Inquiry Response, eSCO, AFH, fast connect, and all EDR packet types and lengths. The BCM2048 also includes InConcert and other industry-standard collaborative coexistence solutions with WLAN systems.

The BCM2048 Bluetooth radio transceiver provides enhanced radio performance to meet the most stringent industrial temperature applications and the tightest integration into mobile handsets and portable devices. It is fully compatible with any of the standard TCXO frequencies and provides full radio compatibility to operate simultaneously with GPS and cellular radios. The BCM2048 also features an on-chip Class 1 power amplifier for higher transmit output power, providing a cost-effective solution for improved communications with other Bluetooth devices such as wireless headsets.

The BCM2048 also integrates a complete FM and RDS/RBDS solution. The integrated solution saves power, external BOM, board space, and maximizes interface flexibility over a separate Bluetooth and FM

solution. The FM subsystem can operate independently of Bluetooth and achieve full performance while Bluetooth is operating. It is designed to cover from 76-MHz up to 108-MHz bands (US, Europe, Japan) and to operate from either the Bluetooth reference clock or a 32-kHz LPO input.

The FM subsystem supports conventional I²C-compatible interfaces and analog outputs for legacy systems, as well as digital interface options, such as I²S and PCM. The I²S and PCM interfaces support 48-kHz operation and can be either master or slave. The analog interface consists of high-quality line-level stereo DACs.

The BCM2048 FM subsystem includes advanced RDS/RBDS capability. The BCM2048 synchronizes, demodulates, and decodes RDS/RBDS signals including CRC processing, post data filter detection, signal quality estimation, and buffering, thus making it easy for an external application to read and process the RDS/RBDS data.

The FM radio reception performance is very high with 1-uV for 26-dB (S+N)/N typical sensitivity and typically 60-dB SNR quality, making it easier on system integration and antenna design. The FM subsystem includes many sought-after features including signal dependant mono/stereo blend, soft mute, and signal bandwidth control. The FM subsystem has digital RSSI signal quality and IF frequency error indicators for system monitoring. Embedded in the FM subsystem are auto search and scan features and large RDS data buffers to simplify interfacing with an external host.

The block diagram above illustrates how the BCM2048 can be used in a cellular application.

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