# BlueLink™ 6.0 single-chip Bluetooth® and FM solution

**BlueLink™ 6.0
Bluetooth® Technology**

**BRF6350**

**Key benefits:**

- Industry's best-performing *Bluetooth* specification 2.1 + EDR and highest fidelity FM stereo and mono performance on a single chip
- Integration of *Bluetooth* and FM in the same silicon provides solution size savings compared to discrete solution
- Proven *Bluetooth*-FM RF co-existence
- Complete host software stack support for *Bluetooth* and FM, enabling ease of design and quick time-to-market

- On-chip power management adapted to cellular applications
- Incorporates TI's *Bluetooth* and WLAN co-existence hardware and software solution, providing a collaborative interface with TI's mobile WLAN chipsets
- Uses TI's DRP™ technology and is manufactured using 90-nm CMOS to deliver smallest and lowest cost *Bluetooth* and FM single-chip solution
- *Bluetooth* class 1 support: 10 dBm *Bluetooth* transmit output power with no external power amplifier

## PRODUCT BULLETIN

## Overview

Optimized for mobile terminals, the BRF6350 is the newest addition to Texas Instruments (TI's) BlueLink™ 6.0 family of products for *Bluetooth*® wireless networking. As TI's fourth generation *Bluetooth* single-chip, the BRF6350 is a digital CMOS solution that integrates a complete *Bluetooth* Specification v2.1+EDR system with an FM radio receiver on a single piece of silicon.



BRF6350 BlueLink™ 6.0 Functional Block Diagram
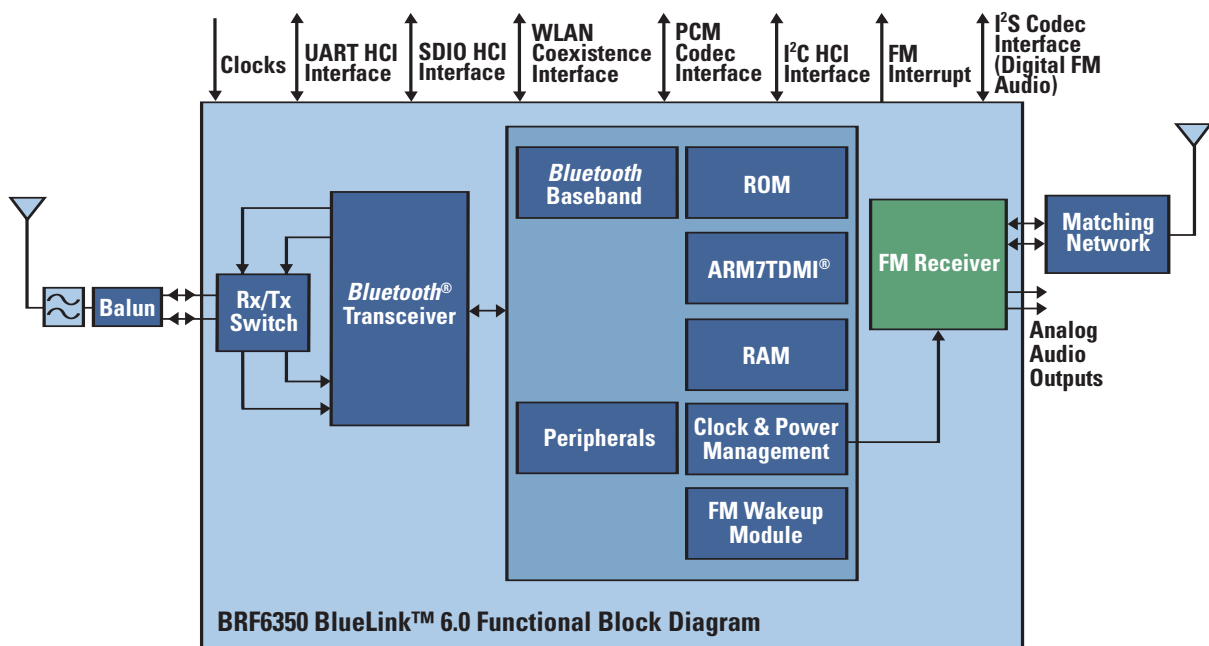
TI's BRF6350 is a highly integrated device, including *Bluetooth* baseband, RF transceiver, ARM7TDMI®, memory (ROM and RAM), power management and an FM receiver. The BRF6350 utilizes TI's 90 nm manufacturing capabilities and DRP™ technology, a revolution in RF technology offering major advantages over the existing solutions based on analog RF to reduce size, power and cost of wireless semiconductors.

## *General features*

- Highly optimized for mobile terminals
  - Supports major cellular reference frequencies
  - Small solution size: 36.3 mm$^2$
  - McBSP compatible I/F
  - Low power consumption
- Flexibility to be easily integrated into various host system topologies:
  - The *Bluetooth* and FM interfaces could be separated from each other (e.g. separate host interface, separate digital audio)
  - The *Bluetooth* and FM interfaces could be shared (e.g. same host interface, same digital audio)
- The two functions can work simultaneously
  - FM receives/scans/sends RDS information to host, while *Bluetooth* can be in any operational mode
- Supports both BGA and WSP packages
- On-chip power management adapted to cellular applications
  - LDO support range: 1.7 V to 1.9 V
  - Direct connection to battery: 2.2 V to 5.4 V
  - Feeding from DC2DC
  - Power saving modes to minimize power consumption when *Bluetooth* and FM functions are not in use
- Temperature detection and compensation mechanism ensures minimal variation in the RF performance over the whole temperature range
- Complete reference designs with TI's TCS cellular chipsets and OMAP™ applications processors for fast time-to-market
- Fully embedded FM receiver (including synthesizer and VOC tank)
- 3 V I/O support

**FM features**

- Supports US/Europe and Japanese FM bands
- Fully embedded RDS/RBDS demodulation
- Reliable stereo indication
- Digital receiver architecture (selectivity, image rejection, demodulation) ensuring performance robustness in extreme conditions
- Very low sensitivity level and superior interference rejection
- Frequency
  - Range: 76-108 MHz
  - Channel resolution: 50 KHz
- Supports mono/stereo modes
- Supports standard FM radio functionality
  - Autonomous scan functionality (station seek) including soft mute
  - Set frequency
  - Increase/decrease frequency by one step
  - Forward RDS data to the host
  - Receive either mono or stereo
  - Support mono/stereo blend
  - Support mute
- Supports FM standalone operation
- FM interfaces
  - Analog left/right audio outputs
  - Serial left/right digital stereo audio on $I^2S$
  - RF_IN – Differential input to low-noise amplifier
  - $I^2C$ control bus
  - Asynchronous interrupt to the host
  - Supports FM functionality with system slow clock

**Bluetooth features**

- Enhanced data rate: 2 Mbps and 3 Mbps
- Full *Bluetooth* Specification v2.1+EDR
- Support of SDIO 1 bit, byte basis mode
- Improved RF performance
  - Sensitivity: -85 dBm
  - TX Power: 10 dBm (Class 1 typical)
- Fast UART, up to 4 Mbps for full EDR support
  - High rate H4 UART HCI
  - High rate HCI three wire UART transport layer (H5)
- Superior coexistence mechanisms
  - Collaborative interface with TI's WLAN chipsets to enable VoIPoWLAN and *Bluetooth* voice (bandwidth sharing, antenna sharing)
  - *Bluetooth* Specification v2.1 AFH

**Bluetooth features (continued)**

- Enhanced Codec (PCM) I/F capabilities
- TI's DRP technology provides the following benefits:
  - Support for EDR *Bluetooth* technology (DQPSK & 8PSK)
  - Integrated 2.4 GHz RF transceiver
  - All digital PLL transmitter with digitally controlled oscillator
  - Near zero IF architecture
  - TX/RX switch
  - Support for Class 1 applications
  - RF built-in-self-test (BIST)
- Automatic clock detection mechanism
- Patch trap mechanism that enables feature changes in ROM (ROM updates, improvements)

**For more information** www.ti.com/bluelink_6

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