Product Bulletin
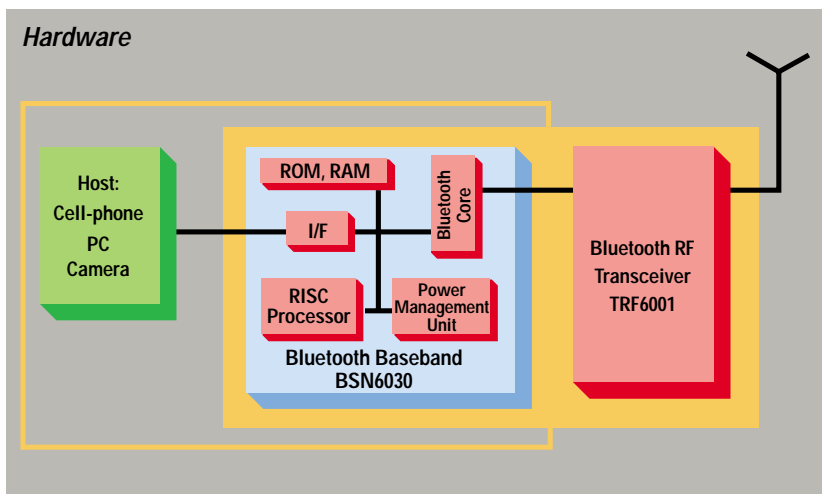
Bluetooth™ Chip Set Solution from Texas Instruments

TI's low-power, affordable Bluetooth Chip Set supports the latest Bluetooth specification with just two devices — an RF transceiver and a digital baseband controller. An all-digital interface between the devices, plus on-chip support for standard communication interfaces and TMS320™ digital signal processors (DSPs), make the chip set easy to implement in Bluetooth applications.
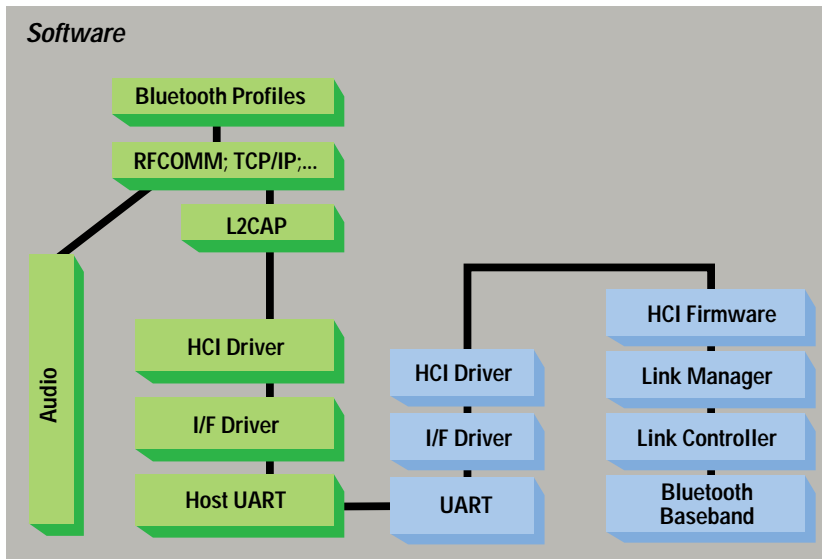
The Bluetooth Chip Set from Texas Instruments provides a two-chip solution that supports the latest Bluetooth specification for short-distance wireless communications. Consisting of the BSN6030 Bluetooth Baseband Controller and the TRF6001 Bluetooth Radio Frequency (RF) Transceiver, the chip set integrates the complete Bluetooth software stack up to the Host Controller Interface (HCI), with no external flash memory required, for a complete Bluetooth system solution.

Operating in the 2.4-GigaHertz (GHz) ISM band worldwide, TI's Bluetooth solution supports simultaneous point-to-point transmission of voice and data, with rates up to 1 Megabit per second (Mbps). The chip set not only saves space and power but also can extend the range of transmission up to five times the distance of a standard implementation of the Bluetooth specification. Among the many types of systems that can take advantage of the TI solution are:

• Digital cellular phones

• Internet appliances

• Cordless phones

• Hands-free phone headsets

• Wireless home networks for PCs, PDAs

• Remote game and video controls

• PC-peripheral communications, including printers, digital cameras, internet audio players

Bluetooth Profiles

RFCOMM; TCP/IP;...

L2CAP

Audio

HCI Driver

I/F Driver

Host UART

HCI Driver

I/F Driver

UART

HCI Firmware

Link Manager

Link Controller

Bluetooth Baseband

TI's Bluetooth *Chip Set includes the complete* Bluetooth *software stack up to the Host Controller Interface (HCI) in on-chip ROM, eliminating the need for external flash memory.*

Extended Range

The TI Bluetooth solution offers an extended sensitivity of -86 decibels with reference to 1 milliWatt (0 dBm) and a bit error rate (BER) of 10^{-3}. This figure represents an increase of 16 dB beyond the sensitivity required by the standard. Under certain conditions, a signal that a basic implementation receives at no greater distance than 10 meters can be received by the TI solution at up to 50 meters. This extra sensitivity allows applications using TI's Bluetooth solution to operate more reliably at longer distances.

Low Power Consumption

Both baseband controller and RF transceiver operate at 3.3 V and employ power-down modes to prolong system operation between battery charges. The BSN6030 controller features an extra-low-power 1.8-V core for additional power savings. The high efficiency of the chip set keeps power consumption to about 10 milliamperes (mA) for a typical Bluetooth voice application.

Worldwide Operation

The TRF6001 transceiver employs frequency-hopping spread spectrum (FHSS) technology for maximum robustness of the radio link. The complete chipset is designed for worldwide regulatory compliance for operation in the 2.4-GHz requency band.
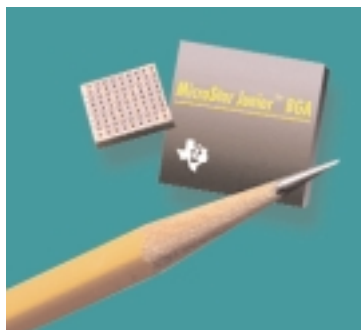
High Performance

The BSN6030 controller achieves high performance with an integrated 32-bit ARM7™ RISC microprocessor, plus 16K words of RAM for data storage and 112K words of programmed ROM.

In addition to running the complete Bluetooth software stack up to the HCI, the device offers processing power for Bluetooth profiles or general application software. To save external components and simplify design, support for A-Law and μ-Law codecs is included on chip, along with a high-speed UART serial interface.

Flexible Clocking

The chip set can operate with flexible clock sources ranging from 10 to 20 MHz in increments of 1 MHz. Since system clock requirements vary, this versatility permits designers to use TI's Bluetooth chip set in a wide v ariety of applications.

MicroStar Junior™ Packaging

TI's advanced MicroStar Junior packaging helps minimize your circuit board's size, weight and cost. These high-performance packages provide excellent heat dissipation and low inductance in a low-profile, chip-scale footprint. MicroStar Junior packages are available with fully or selectively populated ball grids.

Ease of Design

An all-digital interface between the devices, plus several integrated interfaces to standard communications, make it easy to implement TI's Bluetooth solution in a system. The chip set also connects easily to a TMS320 DSP for added value in high-performance real-time applications such as mobile Internet appliances and wireless digital phones with Bluetooth capabilities.

The Bluetooth Chip Set is fully supported by an evaluation module (EVM), documentation and reference design, as well as by TI's extensive network of wireless applications specialists throughout the world.

Space Savings

TI's Bluetooth chip set is designed to save space in mobile applications. No external flash memory is required for program code, saving cost and space, as well as eliminating potential problems with the availability of flash devices.

The BSN6030 controller is available in a range of small-scale MicroStar Junior ball grid arrays (BGA), down to an 80-lead, 6x6 mm package. The TRF6001 transceiver is available in a 56-lead MicroStar Junior BGA that measures just 5x5 mm. Together, the chips require less board area than a single-chip 8x8 mm solution.

TI's Roadmap for Bluetooth

TI is committed to developing a complete family of low-power solutions for Bluetooth application needs. TI's plans for future generations of Bluetooth products include integration of functionality such as low intermediate frequency (IF) filtering, and support for point-to-multipoint operations.

For More Information

To learn more about TI's Bluetooth Chip Set, or other TI short-distance wireless products, call your regional TI sales office or visit

www.ti.com/sc/bluetooth
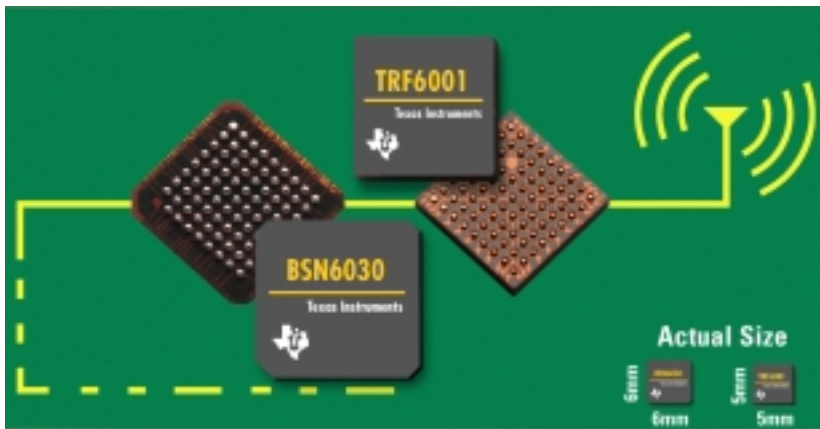
BSN6030 Bluetooth Baseband Controller

- Embedded ARM7 RISC microprocessor
- 16K word RAM, 112K word fully programmed ROM with Bluetooth software stack up to HCI including UART transport layer
- 3.3-V single supply with power-down modes
- Ultra-low-power 1.8-V core
- On-chip PLL for variable clock source from 10 to 20 MHz
- Integrated UART interface
- Glueless connection to external Codecs
- Space-saving MicroStar Junior BGA package options down to a 6x6 mm footprint

TRF6001 Bluetooth RF Transceiver

- 2.4-GHz frequency-hopping spread spectrum (FHSS) radio
- 3.3-V single supply with power-down mode
- -86 dB sensitivity at BER = 10^{-3}
- Single-conversion receiver
- Low-noise amplifier with gain control
- On-chip PLL for variable clock source from 10 to 20 MHz
- Space-saving 5x5 mm, 56-lead MicroStar Junior BGA package

TI Worldwide Technical Support

Internet

TI Semiconductor Home Page
www.ti.com/sc

TI Distributors
www.ti.com/sc/docs/general/distrib.htm

Product Information Centers

Americas

Phone	+1(972) 644-5580
Fax	+1(214) 480-7800
Internet	www.ti.com/sc/ampic

Europe, Middle East, and Africa

Phone

Belgium (English)	+32 (0) 27 45 55 32
France	+33 (0) 1 30 70 11 64
Germany	+49 (0) 8161 80 33 11
Israel (English)	1800 949 0107
Italy	800 79 11 37
Netherlands (English)	+31 (0) 546 87 95 45
Spain	+34 902 35 40 28
Sweden (English)	+46 (0) 8587 555 22
United Kingdom	+44 (0) 1604 66 33 99
Fax	+44 (0) 1604 66 33 34
Email	epic@ti.com
Internet	www.ti.com/sc/epic

Japan

Phone

International	+81-3-3344-5311
Domestic	0120-81-0026

Fax

International	+81-3-3344-5317
Domestic	0120-81-0036

Internet

International	www.ti.com/sc/jpic
Domestic	www.tij.co.jp/pic

Asia

Phone

	Local Access Code	TI Number
International	+886-2-23786800	
Domestic	Local Access Code	TI Number
Australia	1-800-881-011	-800-800-1450
China	00-800-8800-6800	-
Hong Kong	800-96-1111	-800-800-1450
India	000-117	-800-800-1450
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New Zealand	000-911	-800-800-1450
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Singapore	800-0111-111	-800-800-1450
Taiwan	080-006800	-
Thailand	0019-991-1111	-800-800-1450
Fax	886-2-2378-6808	
Email	tiasia@ti.com	
Internet	www.ti.com/sc/apic	

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