2.4 GHz Bluetooth™ OneChip™ Audio Solution

Model TR0750

FEATURES

- 2.4 GHz ISM band transceiver with integrated Bluetooth baseband logic
- 2.4 to 3.3 volt operation
- CMOS integrated circuit
- 1 Mbps data rate
- Embedded CODEC
- 10 meters (33 feet) transmission range
- Enhanced 8051 microprocessor
- On-board Flash program memory
- Internal SRAM
- Hold, Sniff, Park, Active, and Standby modes
- JTAG interface standard
- Low power consumption
- Low battery voltage detection
- Sophisticated power management
- Compact packaging

BENEFITS

- Low cost
- Low power
- Small size
- Requires minimal external components

APPLICATIONS

- Cellular phones
- Personal Digital Assistants
- Headsets
- Cordless Phones
- Intercoms
- Baby Monitors

The TR0750 Bluetooth OneChip offers an internal audio CODEC and dual high performance UARTs.

The TR0750 transmits data at up to 1 Mbps on the 2.4GHz ISM band. A complete SoC solution, the TR0750 includes a 2.4 GHz spread spectrum transceiver, a baseband modem, 8051 processor, serial I/O, programmable GPIOs, 64 Kbytes Flash program memory, and 4 Kbytes of SRAM.
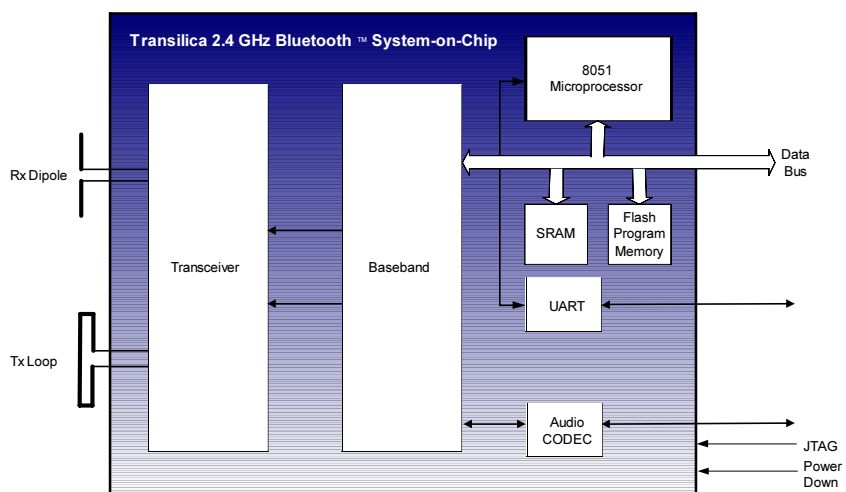
The chip's compact design is packaged for high volume, low cost manufacturing with minimal external components. Low power operation and built-in audio CODEC make the TR0750 ideal for short-range wireless headsets. For long-range applications (such as cordless telephones and intercom systems), the TR0750 allows an external RF booster amplifier to be easily added using its external power controls.

SOFTWARE

Transilica offers embedded software for wireless voice and data applications including Bluetooth 1.1 Certified LC, LM, L2CAP, SDP, and RFCOMM protocol stacks. The TR0750 OneChip can be programmed with the full stack through RFCOMM or the lower stack through HCI. Embedded profiles such as SPP, HSP, DUNP and custom applications are also available. OneChip products come with a limited use (customer-only) license for Transilica software.

EVALUATION KIT

Transilica offers evaluation kits containing hardware, software, and documentation.

Transilica 2.4 GHz Bluetooth ™ System-on-Chip

- Rx Dipole
- Tx Loop
- Transceiver
- Baseband
- 8051 Microprocessor
- Data Bus
- SRAM
- Flash Program Memory
- UART
- Audio CODEC
- JTAG
- Power Down

TD-0750-PB

TR0750 Specifications

Preliminary and Confidential

GENERAL

ABSOLUTE MAXIMUM RATINGS *

Supply voltage	+3.6 VDC
Input RF	-10 dBm
Output RF Load VSWR @2.45 GHz	5:1
Operating ambient temperature	-20 to +85 °C
Storage temperature	-50 to +125 °C

* Exceeding these limits may result in malfunction and/or device damage.

RECOMMENDED OPERATING CONDITIONS

Supply voltage	+2.4 to +3.3 VDC
Operating temperature range	-20 to +85 °C

BASEBAND
PROCESSING CAPABILITIES

Microprocessor	Enhanced 8051 with configurable 8-bit ports
Memory	4 Kbytes SRAM, 64 Kbytes Flash program memory
Power management	Sniff, Park, and Hold power saving modes

BLUETOOTH PACKET PROCESSING

Packets	ID, NULL, POLL, FHS
Asynchronous connection–less link	DM1, DM3, DM5, DH1, DH3, DH5, AUX1
Synchronous connection link	HV1, HV2, HV3, DV
Bit rate	1 Mbps raw, 723 Kbps maximum for single ACL
Security	Encryption and decryption engines
Authentication	Key generators, challenge-response
Scrambler/Descrambler	Bit level
Error Correction	FEC

PORTS

Number of serial ports	2
GPIO	28

TRANSCEIVER

ELECTRICAL
Frequency Synthesizer

VCO frequency range	2400 to 2483.5 MHz
Frequency tolerance	±20 ppM
RF channels	79
Step size	1 MHz
Reference frequency	24 MHz
Frequency lock time	60 μs

Transmitter

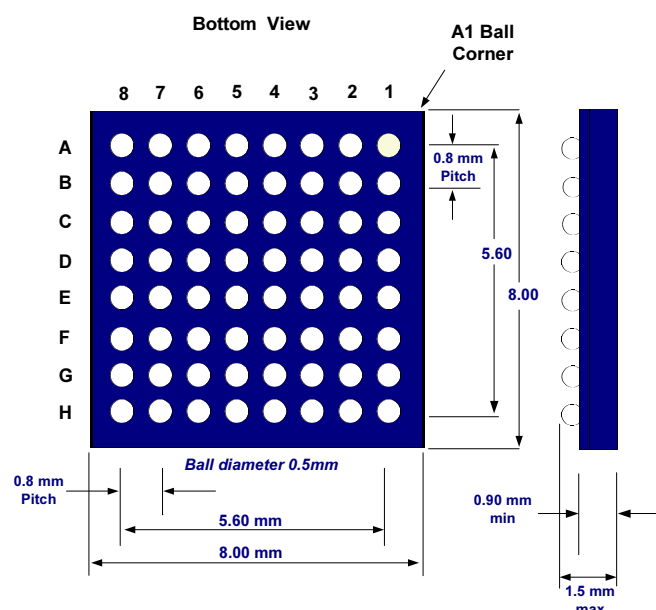|	
Frequency range	2400 to 2483.5 MHz
Output power at antenna input	0 to 3 dBm
Spurious emission	Per FCC Part 15.205
Output impedance	300Ω
Modulation index	0.28 to 0.35
Bit rate	1000 Kbps
BT product	0.5

Receiver

RF frequency range	2400 to 2483.5 MHz
Step size	1 MHz
Input sensitivity	-82 dBm at 0.1% BER
Co-channel interference	11 dB typical
1st adjacent channel interference	0 dB typical
2nd adjacent channel interference	-35 dB typical
3rd adjacent channel interference	-48 dB typical
Image frequency interference	-20 dB typical
Adj. channel to image interference.	-20 dB typical
Image rejection	-40 to -35 dB minimum
Blocking rejection	-10 dBm (30 MHz to 2 GHz)
	-27 dBm (2 to 3 GHz)
	-10 dBm (3 to 12.6 GHz)
Input impedance	73Ω

PHYSICAL CHARACTERISTICS

Dimensions	8x8x1.5 millimeter
Packaging	8x8 64-ball grid array
Terminal positions	Per JESD 95-1, SPP-010

AUDIO CODEC INTERFACE

- PCM A-law
- PCM μ-law
- CVSD

Bottom View — A1 Ball Corner — 0.8 mm Pitch — 5.60 — 8.00 — Ball diameter 0.5mm — 0.8 mm Pitch — 5.60 mm — 8.00 mm — 0.90 mm min — 1.5 mm max

08/01