



## 2.4 GHz Bluetooth™ OneChip™ Serial Port Solution

Model TR0740

The TR0740 Bluetooth OneChip offers dual high performance UARTs and 32 programmable GPIOs. The high GPIO count makes it ideal for I/O-intensive applications like wireless keyboards or game controllers.

### 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
- GPIO interface
- 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

- Keyboards
- Desktop and Notebook computers
- Personal Digital Assistants
- Modems
- Joysticks
- Remote Controls

The TR0740 transmits data at up to 1 Mbps on the 2.4 GHz ISM band. A complete SoC solution, the TR0740 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.

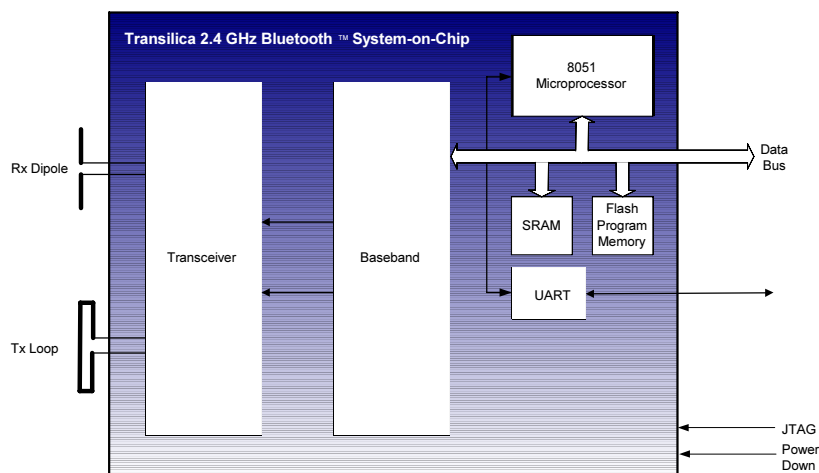
The chip is packaged for high volume manufacturing. Low power operation and minimal external component requirements make the TR0740 ideal for low cost portable devices.

### 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 TR0740 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.



# TR0740 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 four 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                   | 32 |

## 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

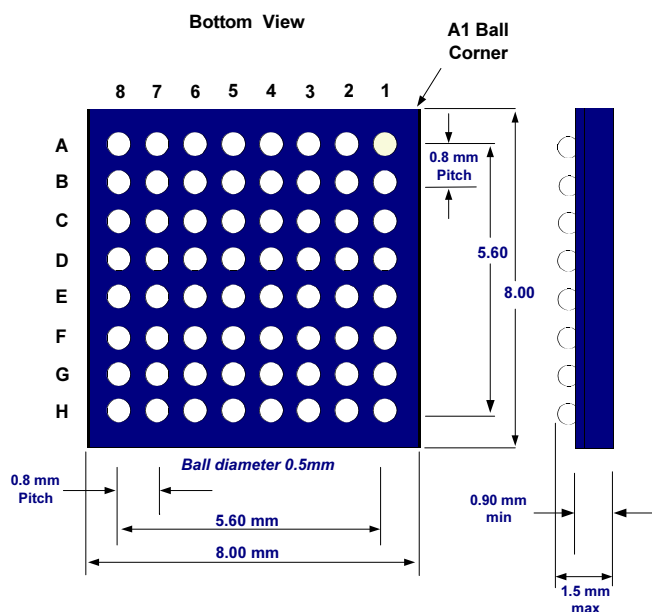
|                               |                     |
|-------------------------------|---------------------|
| Frequency range               | 2400 to 2483.5 MHz  |
| Output power at antenna input | 0 to 3 dBm          |
| Spurious emission             | Per FCC Part 15.205 |
| Output impedance              | 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   | 1 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)<br>-27 dBm (2 to 3 GHz)<br>-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 |



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