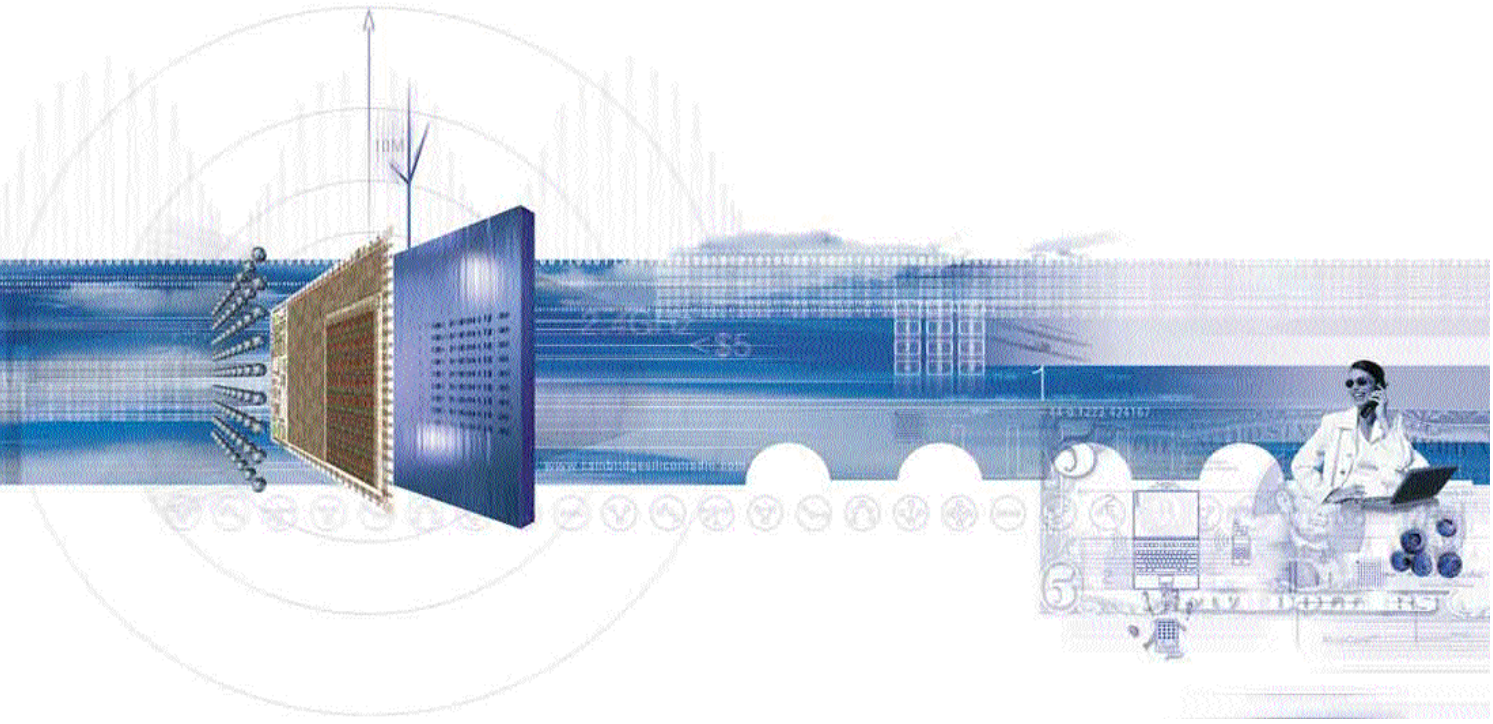
# BC01MOD2ES

Class 2, Single Chip Bluetooth™ Module

**Advance Information for:**

**Class 2 Reference Module**

**May 2001**



**CSR**
Unit 300 Cambridge Science Park
Milton Road
Cambridge
CB4 0XL
United Kingdom

Tel: +44 (0)1223 424167
Fax: +44 (0)1223 424178
www.csr.com

bc01-ds-MOD2ESa

# Product Preview

The **BlueCore™01** Class 2 Reference Module (part number **BC01MOD2ES**) is a small surface mount module that provides a complete 2.4GHz Bluetooth system for data and voice communications.

# Features

- Small size (14.5mm x 20.85mm)
- Class 2 operation
- Surface mountable
- Single 3.15V power supply
- USB or UART HCI interface

# Module Footprint and Pinout

Figure 1 shows the **BC01MOD2ES** module footprint and Figure 2 shows its pinout.

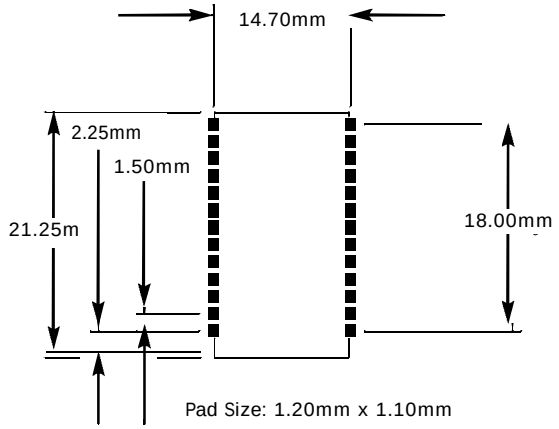



**Figure 1: Class 2 Module PCB Footprint Dimensions**

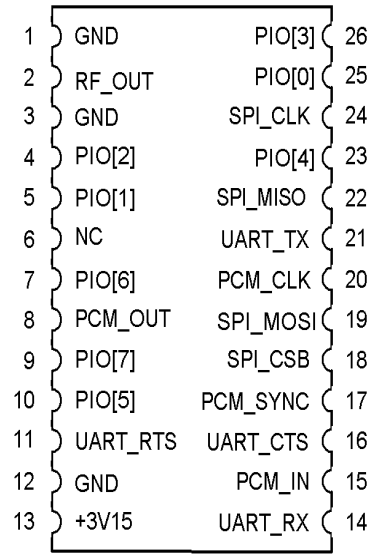



**Figure 2: Pinout (Component Side View)**

# Device Terminal Functions

| Terminal Name | Terminal | Type | Description |
|---|---|---|---|
| **GND** | 1 | 0V | RF Ground |
| **RF_OUT** | 2 | Bi-Dir | Antenna RF port (50Ω) |
| **GND** | 3 | 0V | RF Ground |
| **PIO[2] / USB_PULL_UP** | 4 | Bi-Dir pulled down | I/O port or USB Pull-Up (via external 1K5Ω resistor to D+) |
| **PIO[1]** | 5 | Output | Output active high when data is transmitted over RF link |
| **NC** | 6 | - | No connect |
| **PIO[6]** | 7 | Bi-Dir pulled down | I/O port |
| **PCM_OUT** | 8 | CMOS output | Synchronous $8kss^{-1}$ data output |
| **PIO[7]** | 9 | Bi-Dir pulled down | I/O port |
| **PIO[5] / USB_DETACH** | 10 | Bi-Dir pulled down | Bi-Dir I/O port or USB Detach. Module detaches from USB when this line is high |
| **UART_RTS / USB_D+** | 11 | CMOS output | UART Ready To Send / USB D+ |
| **GND** | 12 | GND | Module supply ground |
| **+3V15** | 13 | VDD | Module supply positive |
| **UART_RX** | 14 | CMOS input 5V tolerant pulled down | UART data input |
| **PCM_IN** | 15 | CMOS input pulled down | Synchronous $8kss^{-1}$ data input |
| **UART_CTS / USB_D-** | 16 | CMOS input | UART Clear To Send / USB D- |
| **PCM_SYNC** | 17 | Bi-Dir pulled down | Synchronous data strobe |
| **SPI_CSB** | 18 | CMOS input 5V tolerant pulled down | Serial Peripheral Interface chip select |
| **SPI_MOSI** | 19 | CMOS input 5V tolerant pulled down | Serial Peripheral Interface data input |
| **PCM_CLK** | 20 | Bi-Dir pulled down | Synchronous data clock |
| **UART_TX** | 21 | CMOS output | UART data output |
| **SPI_MISO** | 22 | CMOS output | Serial Peripheral Interface data output |
| **PIO[4] / USB_ON** | 23 | Bi-Dir pulled down | I/O port or USB on. (USB_ON senses when input is high and wakes **BC01MOD2ES**) |
| **SPI_CLK** | 24 | CMOS input 5V tolerant pulled down | Serial Peripheral Interface clock |
| **PIO[0]** | 25 | CMOS output | Output active high when module receives data over RF link |
| **PIO[3] / USB_WAKE_UP** | 26 | Bi-Dir | I/O port or output goes high to wake up PC pulled down when in USB mode |

# Power Consumption

VDD = 3.15V Temperature =20°C f = 2.45GHz

| Mode | Avg | Peak | Unit |
|---|---|---|---|
| SCO connection HV3 (1s interval sniff mode) | 51 | - | mA |
| SCO connection HV1 (1s interval sniff mode) | 87 | - | mA |
| ACL data transfer 115.2kbps UART | 37 | - | mA |
| ACL data transfer 720kbps USB | 95 | - | mA |
| Peak current during RF burst | - | 135 | mA |
| Leakage current (all off) supply connected | 200 | - | µA |

**Note:** Power consumption is for the entire **BC01MOD2ES** module including the **BC01b**, Flash and LNA. The module is in Master mode.

# Radio Characteristics for 20°C (5)

VDD = 3.15V f = 2.45GHz

| Receiver | Min | Typ | Max | Bluetooth Specification | Unit |
|---|---|---|---|---|---|
| Sensitivity at 0.1% BER (1) | - | -89 | | -70 | dBm |
| Maximum received signal (1) | - | -20 | - | -20 | dBm |
| C/I Co-channel (1) | - | 9 | - | 11 | dB |
| Adjacent channel selectivity C/I 1MHz (1) | - | -2 | - | 0 | dB |
| 2nd adjacent channel selectivity C/I 2MHz (1) | - | -34 | - | -30 | dB |
| 3rd adjacent channel selectivity C/I >3MHz (1) (2) | - | -45 | - | -40 | dB |
| Image rejection C/I (1) (3) | - | -14 | - | -9 | dB |
| **Transmitter** | **Min** | **Typ** | **Max** | **Bluetooth Specification** | **Unit** |
| RF transmit power (1) | - | 0 | - | -6 to +4 | dBm |
| RF power control range (1) | - | 40 | - | 16 | dB |
| RF power range control resolution | | 2 | - | - | dB |
| 20dB bandwidth for modulated carrier | - | 885 | - | 1000 | kHz |
| 2nd adjacent channel transmit power (1) (±2MHz) | - | -30 | - | -20 (5) | dBc |
| 3rd adjacent channel transmit power (1) (±3MHz) | - | -40 | - | -40 (5) | dBc |

**Notes:**

(1) Measured according to the Bluetooth specification

(2) Up to five spurious responses within Bluetooth limits are allowed

(3) At carrier -3MHz

(4) Measured at $f_1 - f_2 = 5MHz$

(5) Measured using CSR firmware build Beta10.3 or later

# Status of Information Provided

**Advance Information**

Information for designers on the target specification for a CSR product now in development.

All detailed specifications including pinouts and electrical specifications can be changed by CSR without notice.

**Pre-Production**

Final pinout and mechanical dimensions. All electrical specifications can be changed by CSR without notice.

Pre-Production product is designated as 'Engineering Samples' and is marked 'ES' on the package.

**Production**

Final datasheet including the guaranteed minimum and maximum limits for the electrical specifications.

Production datasheets supersede all previous versions.

This is the Advance Information version of the **BC01MOD2ES** datasheet.

## Life Support Policy and Use in Safety-critical Applications

CSR's products are not authorised for use in life-support or safety-critical applications.

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For further information, refer to the following documents:

| Document | Reference |
|---|---|
| Specification of the Bluetooth System, v1.1 | Version 1.1 Dated 22 FEB 01 |
| Universal Serial Bus Specification Revision 1.1 | Dated 23 SEP 1998 |

# Record of Changes

| Date: | Revision: | Reason for Change: |
|---|---|---|
| 17 MAY 01 | a | Original publication of this document<br>(CSR reference bc01-ds-MOD2ESa) |

# Advance Information for Class 2 Reference Module

## bc01-ds-MOD2ES

## May 2001