

CC&C *Technologies, Inc.*

8F, No. 150, Jian Yi Road, Chung Ho City,
Taipei County, Taiwan 235, R.O.C.
Tel: 886-2-8226-5088 Fax: 886-2-8226-5077
<http://www.ccandc.com.tw>
E-mail: marketing@ccandc.com.tw

Bluetooth Module

BT-0002M-1

User's Guide

Version 1.1

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions:

1) The transmitter module may not be co-located with any other transmitter or antenna. As long as condition above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following: “Contains TX FCC ID: PANBT0002M1”.

Manual Information That Must be Included

The users manual for OEM integrators must include the following information in a prominent location “ **IMPORTANT NOTE:** To comply with FCC RF exposure compliance requirements, the antenna used not be co-located or operating in conjunction with any other antenna or transmitter.

Description

CC&C Technologies, Inc. provides various Bluetooth products. They are suitable for customers to exploit them to implement Bluetooth functionality into various electronic devices. The features of Bluetooth module list as below:

Features

Model Name	BT-0002M-1
Standard	Bluetooth v1.1
Frequency Band	2.4~2.4835GHz unlicensed ISM band
Spread Spectrum	FHSS (Frequency Hopping Spread Spectrum)
RF Output Power	Class 2 (under 4 dBm)
Antenna terminal	50 Ohm
DC power	3.3V
I/O Interface	
USB	Compliant USB V1.1
UART	Baud rate up to 921K
PCM	Yes
PIO	12 PIO
Dimension	15 x 23 mm

Photos



Electrical Characteristics

Absolute Maximum Ratings			
Model Name		BT-0002M-1	Unit
Supply Voltage	Max.	3.5V	V
	Typ.	3.3V	V
	Min	2.8V	V
Storage Temperature	Max.	85	°C
	Min.	-40	°C

Recommend Operation Conditions			
Model Name		BT-0002M-1	Unit
Supply Voltage	Max.	3.5V	V
	Typ.	3.3V	V
	Min	2.8V	V
Operation Temperature	Max.	70	°C
	Min.	0	°C

Input/Output Terminal Characteristics			
Model Name		BT-0002M-1	Unit
Digital (UART, PIO)			
V_{IL} –	Max	+0.8	V
	Min	-0.4	V
V_{IH} –	Max	3.7	V
	Min	2.31	V
USB			
V_{IL} –	Max	0.99	V
	Min	-	V
V_{IH} –	Max	-	V
	Min	2.31	V
V_{OL} –	Max	0.2	V
	Min	0	V
V_{OH} –	Max	3.3	V
	Min	2.8	V

Electrical Characteristics - Continue

Current Consumption		
Model Name	BT-0002M-1	Unit
Mode -Active		
ACL data transfer 115.2 Kbps UART (Master)	30mA	mA
ACL data transfer 720 Kbps USB (Master)	75mA	mA
ACL data transfer 720 Kbps USB (Slave)	75mA	mA
SCO connection HV3 (Master)	TBA	mA
SCO connection HV3 (Slave)	TBA	mA
SCO connection HV1 (Master)	TBA	mA
SCO connection HV1 (Slave)	TBA	mA
Mode -Idle		
UART interface	2mA	mA
USB interface	6mA	mA

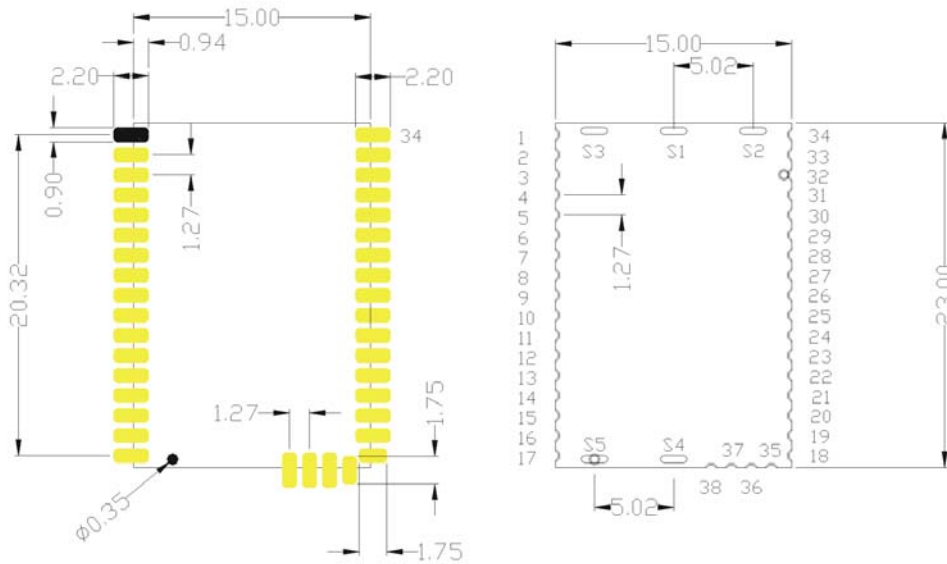
Radio Characteristics -Transmission

Transmission					
Item		Measure	Bluetooth Spec.	Note	
Output Power		3dBm			
Transmit Output Spectrum	Frequency Range	2400.94	>2400MHz	Measuring the -30dBm point when use channel 0 and 79	
		2481.06	<2483.5MHz		
	20 dB Bandwidth	2402 MHz	800k	<1MHz	
		2441 MHz	800k	<1MHz	
		2480 MHz	800k	<1MHz	
Adjacent Channel Power	M-N =2	-25dBm	≤ -20dBm		
	M-N ≥3	-45dBm	≤ -40dBm		
Modulation Test	Modulation Characteristics				
	00001111 payload	$\Delta F1_{max}$			
		$\Delta F1_{avg}$	167k	$140 \leq \Delta F1_{avg} \leq 175KHz$	
	01010101 payload	$\Delta F2_{max}$	195k	$\geq 115KHz$ at least 99.9%	
		$\Delta F2_{avg}$			
		$\Delta F2_{avg} / \Delta F1_{avg}$	1.04	≥ 0.8	
	Initial Carrier Frequency Tolerance	2402 MHz	6.24k	$\pm 75KHz$	
		2441 MHz	6.4k	$\pm 75KHz$	
		2480 MHz	2.66k	$\pm 75KHz$	
	Carrier Frequency Drift	1 slot	-17K	$\pm 25KHz$	
		3 slot	-13K	$\pm 40KHz$	
		5 slot	-15K	$\pm 40KHz$	
	Frequency Drift Rate	1 slot	-0.2K	KHz /us	
		3 slot	-0.2K	KHz /us	
		5 slot	-0.3K	KHz /us	

Radio Characteristics -Receiver

Receiver				
Item	Measure	Bluetooth Specification	Note	
Bit Error Rate ≤ 0.1%	Sensitivity - Single slot packets (DH1)	-83 dBm	≤ -70dBm	
	Sensitivity - Multi-slot packets (DH3)	-83 dBm	≤ -70dBm	
	Sensitivity - Multi-slot packets (DH5)	-83 dBm	≤ -70dBm	
	C/I performance			
	Co channel interference, $C/I_{\text{co-channel}}$	TBA	11dB	
	Adjacent 1MHz interference, $C/I_{1\text{MHz}}$	TBA	0dB	
	Adjacent 2MHz interference, $C/I_{2\text{MHz}}$	TBA	-30dB	
	Adjacent ≥3MHz interference, $C/I_{\geq 3\text{MHz}}$	TBA	-40dB	
	Image frequency Interference, C/I_{Image}	TBA	-9dB	
	Adjacent 1MHz interference to in-band mirror frequency, $C/I_{\text{Image} \pm 1\text{MHz}}$	TBA	-20dB	
	Blocking performance			
	30MHz – 2000MHz	TBA	-10dBm	Interfering signal power level
	2000 – 2400MHz	TBA	-27dBm	Interfering signal power level
	2500 – 3000MHz	TBA	-27dBm	Interfering signal power level
	3000MHz – 12.75GHz	TBA	-10dBm	Interfering signal power level
	Intermodulation Performance			
Maximum Input Level	PASS	≥ -20dBm		

Pin Assignment and Mechanical Drawing



Recommended Pad Dimension

CLASS II MODULE

1	GND	18	PCM_OUT	35	PIO8
2	NC	19	PCM_SYNC	36	PIO9
3	GND	20	PCM_IN	37	PIO10
4	TEST_A	21	PCM_CLK	38	PIO11
5	TEST_B	22	USB+	S1	GND(SOLDING SHIELDING)
6	RESET	23	USB-	S2	GND(SOLDING SHIELDING)
7	SPI_MISO	24	PIO7	S3	GND(SOLDING SHIELDING)
8	SPI_CSB	25	PIO6	S4	GND(SOLDING SHIELDING)
9	SPI_CLK	26	PIO5	S5	GND(SOLDING SHIELDING)
10	SPI_MOSI	27	PIO4	S1~S5 FOR INTERNAL USE	
11	UART_CTS	28	PIO3		
12	UART_TX	29	PIO2		
13	UART_RTS	30	PIO1		
14	UART_RX	31	PIO0		
15	VCC_1.8V(0)	32	Analog Ground		
16	VCC_3.3V(I)	33	RF_OUT(CLASS II)		
17	GND	34	Analog Ground		

CC&C Technologies, Inc. reserves the right to make technical changes to its product as part of its development.

While every care has been take to ensure the accuracy of the contents of this document, CC&C can no accept responsibility for any errors. All data and specifications are subject to change without notice.

All the trademarks of products and companies mentioned in this data sheet belong to their respective.

Life Support Policy and Use in safety-Critical Application.

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury.