

Class2 BC04-ext Module

BTM-192

Features

- Class2 module with printed pcb antenna
- Bluetooth standard Ver. 2.1 + EDR compliant.
- Low current consumption :
Hold,Sniff,Park,Deep sleep Mode
- 1.8V operation
- Support for up to seven slaves :
SCO links<3>,ACL links,Piconet<7>
- Interface: USB,UART&PCM(for voice CODEC)
- SPP firmware is available
- Support for 802.11 Co-Exsistence
- RoHS compliant
- Small outline. 25.0 x 14.5 x 2.2 mm

Applications

- PDA
- Presenter, Mouse, Keyboard
- Digital camera & printer
- GPS,POS, Barcode Reader
- Data collector
- Domestic and industrial applications

Outline

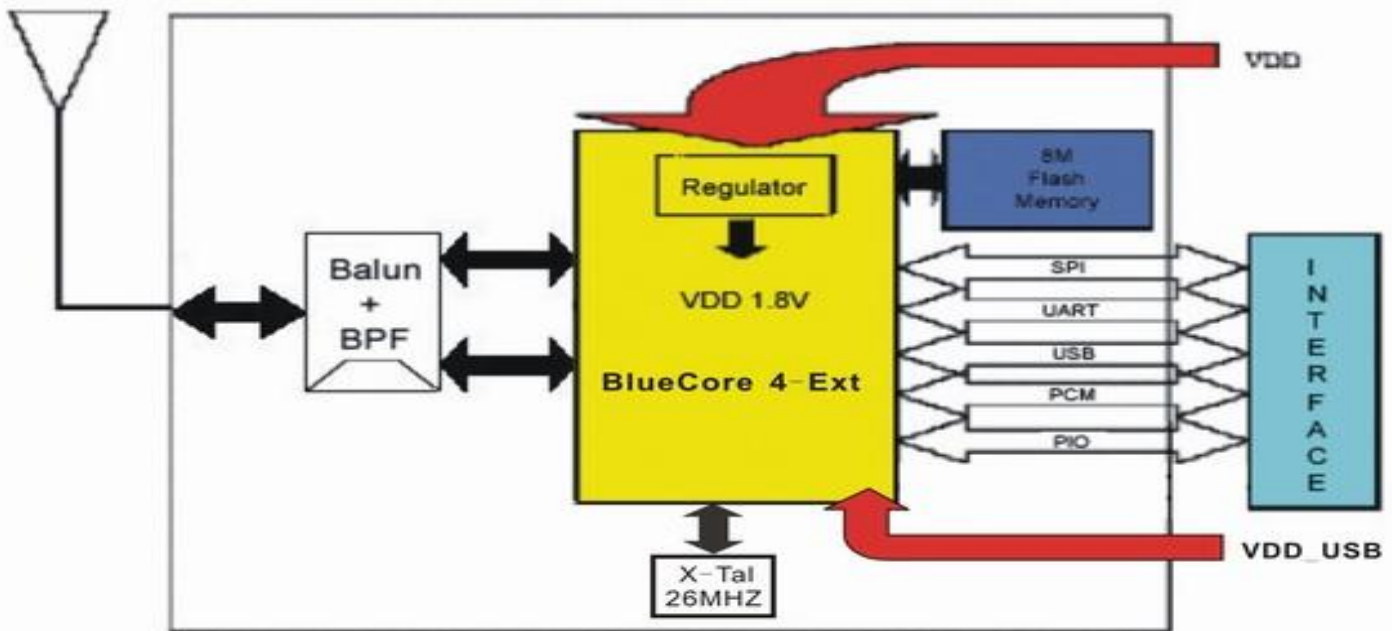


General Electrical Specification

Absolute Maximum Ratings		
Ratings	Min.	Max.
Storage Temperature	-40 °C	+150 °C
Supply Voltage VDD	-0.4 V	2.2 V
Recommended Operating Condition		
Operating Condition	Min.	Max.
Operating Temperature range	-20 °C	+75 °C
Supply Voltage VDD_USB	1.7 V	3.3 V
Supply Voltage VDD	1.7 V	1.9 V

Parameter	Description	Min.	Typ.	Max.	Units
RF Output Power	Measured in 50 ohm	0	2	4	dBm
RX Sensitivity			-83	-80	dBm
Input Low Voltage	RESET,UART,GPIO,PCM	-0.30	-	0.80	V
Input High Voltage	RESET,UART,GPIO,PCM	0.70VDD	-	VDD+0.30	V
Output Low Voltage	UART,GPIO,PCM	-	-	0.40	V
Output High Voltage	UART,GPIO,PCM	VDD-0.40	-	-	V
Average Current Consumption	Deep sleep		40		uA
	ACL 40ms sniff		2.4		mA
	SCO connection HV1		39	-	mA
Peak Current	Tx burst +4dBm		-	58	mA

Block Diagram



Radio Characteristics – Basic Data Rate

Radio Characteristics, VDD = 3.3V Temperature = +20°C

	Frequency (GHz)	Min	Typ	Max	Bluetooth Specification	Unit
Sensitivity at 0.1% BER	2.402	-	-83	-82	≤ -70	dBm
	2.441	-	-83	-82		dBm
	2.480	-	-83	-82		dBm
Maximum received signal at 0.1% BER	2.402	-	-6	0	≥ -20	dBm
	2.441	-	-6	0		dBm
	2.480	-	-6	0		dBm
RF transmit power ⁽¹⁾	2.402	-	+2	-	-6 to +4 ⁽²⁾	dBm
	2.441	-	+2	-		dBm
	2.480	-	+2	-		dBm
Initial carrier frequency tolerance	2.402	-	12	20	± 75	kHz
	2.441	-	10	20		kHz
	2.480	-	9	20		kHz
20dBm bandwidth for modulated carrier	2.402	-	879	1000	≤ 1000	kHz
	2.441	-	816	1000		kHz
	2.480	-	819	1000		kHz
Drift (single slot packet)	2.402	-	-	20	≤ 25	kHz
	2.441	-	-	20		kHz
	2.480	-	-	20		kHz
Drift (five slot packet)	2.402	-	-	20	≤ 40	kHz
	2.441	-	-	20		kHz
	2.480	-	-	20		kHz
Drift Rate	2.402	-	-	15	20	kHz/50 μ s
	2.441	-	-	15		kHz/50 μ s
	2.480	-	-	15		kHz/50 μ s
RF power control range		16	35	-	≥ 16	dB
RF power range control resolution		-	1.8	-	-	dB
$\Delta f1^{avg}$ "Maximum Modulation"	2.402	145	165	175	$140 < \Delta f1^{avg} < 175$	kHz
	2.441	145	165	175		kHz
	2.480	145	165	175		kHz
	2.402	115	150	-		kHz

Δf_2^{maz} "Minimum Modulation"	2.441	115	150	-	115	kHz
	2.480	115	150	-		kHz
C/I co-channel		-	10	11	≤ 11	dB
Adjacent channel selectivity C/I $F=F_0+1$ MHz ⁽³⁾⁽⁵⁾		-	-4	0	≤ 0	dB
Adjacent channel selectivity C/I $F=F_0-1$ MHz ⁽³⁾⁽⁵⁾		-	-4	0	≤ 0	dB
Adjacent channel selectivity C/I $F=F_0+2$ MHz ⁽³⁾⁽⁵⁾		-	-35	-30	≤ -30	dB
Adjacent channel selectivity C/I $F=F_0-2$ MHz ⁽³⁾⁽⁵⁾		-	-21	-20	≤ -20	dB
Adjacent channel selectivity C/I $F \geq F_0+3$ MHz ⁽³⁾⁽⁵⁾		-	-45	-	≤ -40	dB
Adjacent channel selectivity C/I $F \leq F_0-5$ MHz ⁽³⁾⁽⁵⁾		-	-45	-	≤ -40	dB
Adjacent channel selectivity C/I $F=F_{\text{image}}$ ⁽³⁾⁽⁵⁾		-	-18	-9	≤ -9	dB
Adjacent channel transmit power $F=F_0 \pm 2$ MHz ⁽⁴⁾⁽⁵⁾		-	-35	-20	≤ -20	dBc
Adjacent channel transmit power $F=F_0 \pm 3$ MHz ⁽⁴⁾⁽⁵⁾		-	-55	-40	≤ -40	dBc

Notes:

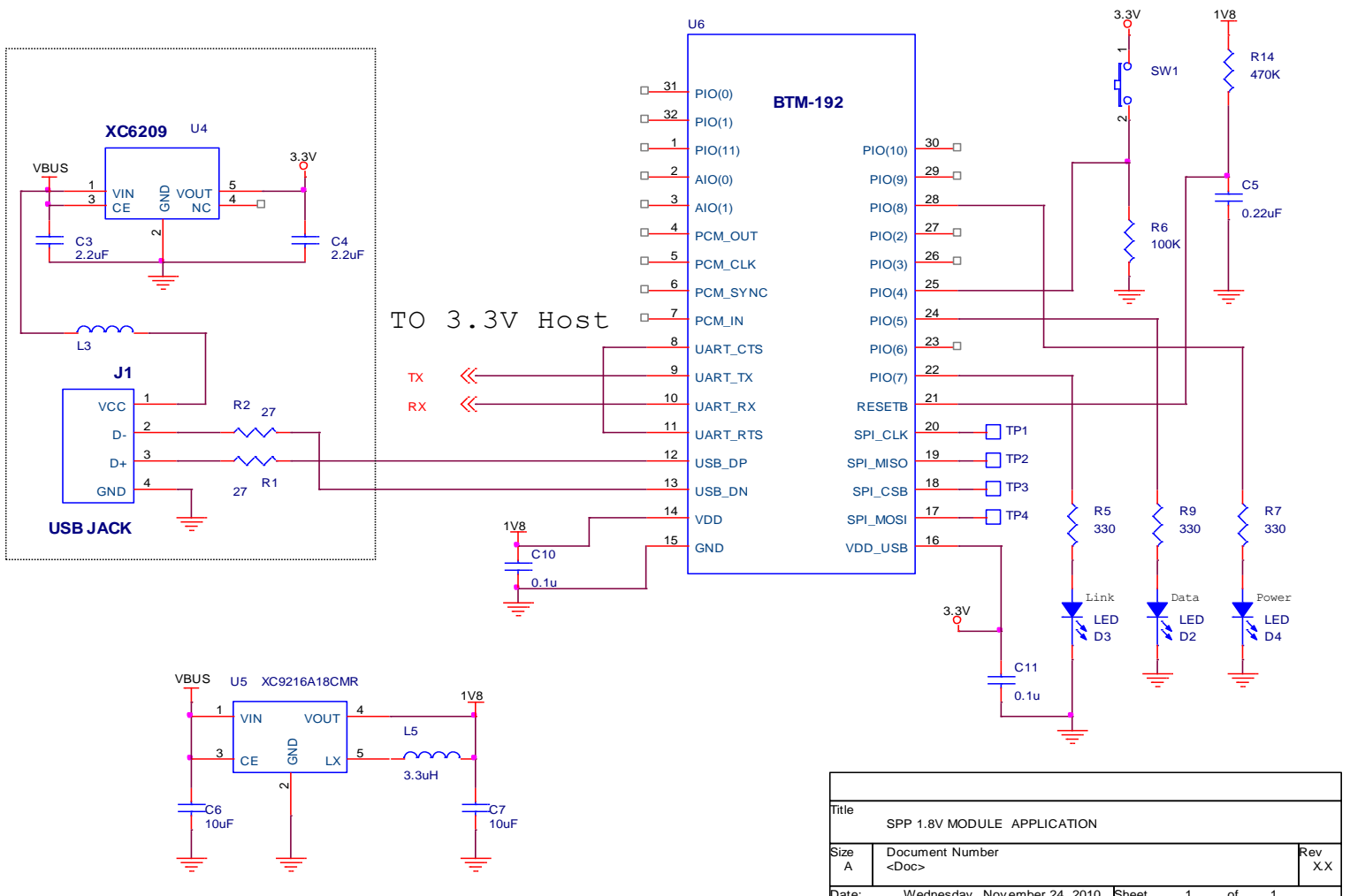
- (1) BlueCore-External firmware maintains the transmit power to be within the Bluetooth specification v2.0 limits.
- (2) Class 2 RF transmit power range, Bluetooth specification v2.0
- (3) Up to five exceptions are allowed in v2.0 of the Bluetooth specification
- (4) Up to three exceptions are allowed in v2.0 of the Bluetooth specification
- (5) Measured at $F_0 = 2441$ MHz

Radio Characteristics – Enhanced Data Rate

Transmitter , VDD = 3.3V Temperature = +20°C						
	Frequency (GHz)	Min.	Typ.	Max.	Bluetooth Specification	Unit
Maximum RF transmit power	2.402	-6	0	+2	-6 to +20	dBm
	2.441	-6	0	+2		dBm
	2.480	-6	0	+2		dBm
Relative transmit power		-	-1.5	-	-4 to +1	dB
$\pi/4$ DQPSK Maximum carrier frequency stability w_0		-	2	-	$\leq \pm 10$ for all blocks	kHz
$\pi/4$ DQPSK Maximum carrier frequency stability w_i		-	6	-	$\leq \pm 75$ for all packets	kHz
$\pi/4$ DQPSK Maximum carrier frequency stability $ w_0 + w_i $		-	8	-	$\leq \pm 75$ for all blocks	kHz
8 DPSK Maximum carrier frequency stability w_0		-	2	-	$\leq \pm 10$ for all blocks	kHz
8 DPSK Maximum carrier frequency stability w_i		-	6	-	$\leq \pm 75$ for all packets	kHz
8 DPSK Maximum carrier frequency stability $ w_0 + w_i $		-	8	-	$\leq \pm 75$ for all blocks	kHz
$\pi/4$ DQPSK Modulation Accuracy	RMS DVEM	-	7	-	≤ 20	%
	99% DEVM	-	13	-	≤ 30	%
	Peak DEVM	-	19	-	≤ 35	%
8 DPSK Modulation Accuracy	RMS DVEM	-	7	-	≤ 13	%
	99% DEVM	-	13	-	≤ 20	%
	Peak DEVM	-	17	-	≤ 25	%
In-band spurious emissions	$F > F_0 + 3$ MHz	-	<-50	-	≤ -40	dBm
	$F < F_0 - 3$ MHz	-	<-50	-	≤ -40	dBm
	$F = F_0 - 3$ MHz	-	-46	-	≤ -40	dBm
	$F = F_0 - 2$ MHz	-	-34	-	≤ -20	dBm
	$F = F_0 - 1$ MHz	-	-35	-	≤ -26	dBm
	$F = F_0 + 1$ MHz	-	-35	-	≤ -26	dBm
	$F = F_0 + 2$ MHz	-	-31	-	≤ -20	dBm

	$F=F_0+3\text{ MHz}$	-	-33	-	≤ -40	dBm
EDR Differential Phase Encoding			No Errors		≥ 99	%
Receiver , VDD = 3.3V Temperature =+20°C						
	Modulation	Min.	Typ.	Max.	Bluetooth Specification	Unit
Sensitivity at 0.1% BER	$\pi/4$ DQPSK	-	-82	-	≤ -70	dBm
	8 DPSK	-	-76	-	≤ -70	dBm
Maximum received signal level at 0.1% BER	$\pi/4$ DQPSK	-	-8	-	≥ -20	dBm
	8 DPSK	-	-10	-	≥ -20	dBm
C/I co-channel at 0.1% BER	$\pi/4$ DQPSK	-	10	-	$\leq +13$	dB
	8 DPSK	-	19	-	$\leq +21$	dB
Adjacent channel selectivity C/I $F=F_0+1\text{ MHz}$	$\pi/4$ DQPSK	-	-10	-	≤ 0	dB
	8 DPSK	-	-5	-	$\leq +5$	dB
Adjacent channel selectivity C/I $F=F_0-1\text{ MHz}$	$\pi/4$ DQPSK	-	-11	-	≤ 0	dB
	8 DPSK	-	-5	-	$\leq +5$	dB
Adjacent channel selectivity C/I $F=F_0+2\text{ MHz}$	$\pi/4$ DQPSK	-	-40	-	≤ -30	dB
	8 DPSK	-	-40	-	≤ -25	dB
Adjacent channel selectivity C/I $F=F_0-2\text{ MHz}$	$\pi/4$ DQPSK	-	-23	-	≤ -20	dB
	8 DPSK	-	-20	-	≤ -13	dB
Adjacent channel selectivity C/I $F=F_0+3\text{ MHz}$	$\pi/4$ DQPSK	-	-45	-	≤ -40	dB
	8 DPSK	-	-45	-	≤ -33	dB
Adjacent channel selectivity C/I $F=F_0-5\text{ MHz}$	$\pi/4$ DQPSK	-	-45	-	≤ -40	dB
	8 DPSK	-	-45	-	≤ -33	dB
$F_0 = 2405, 2441, 2477\text{ MHz}$						
Adjacent channel selectivity C/I $F=F_{\text{image}}$	$\pi/4$ DQPSK		-20		≤ -7	dB
	8 DPSK		-15		≤ 0	dB

Application Circuit



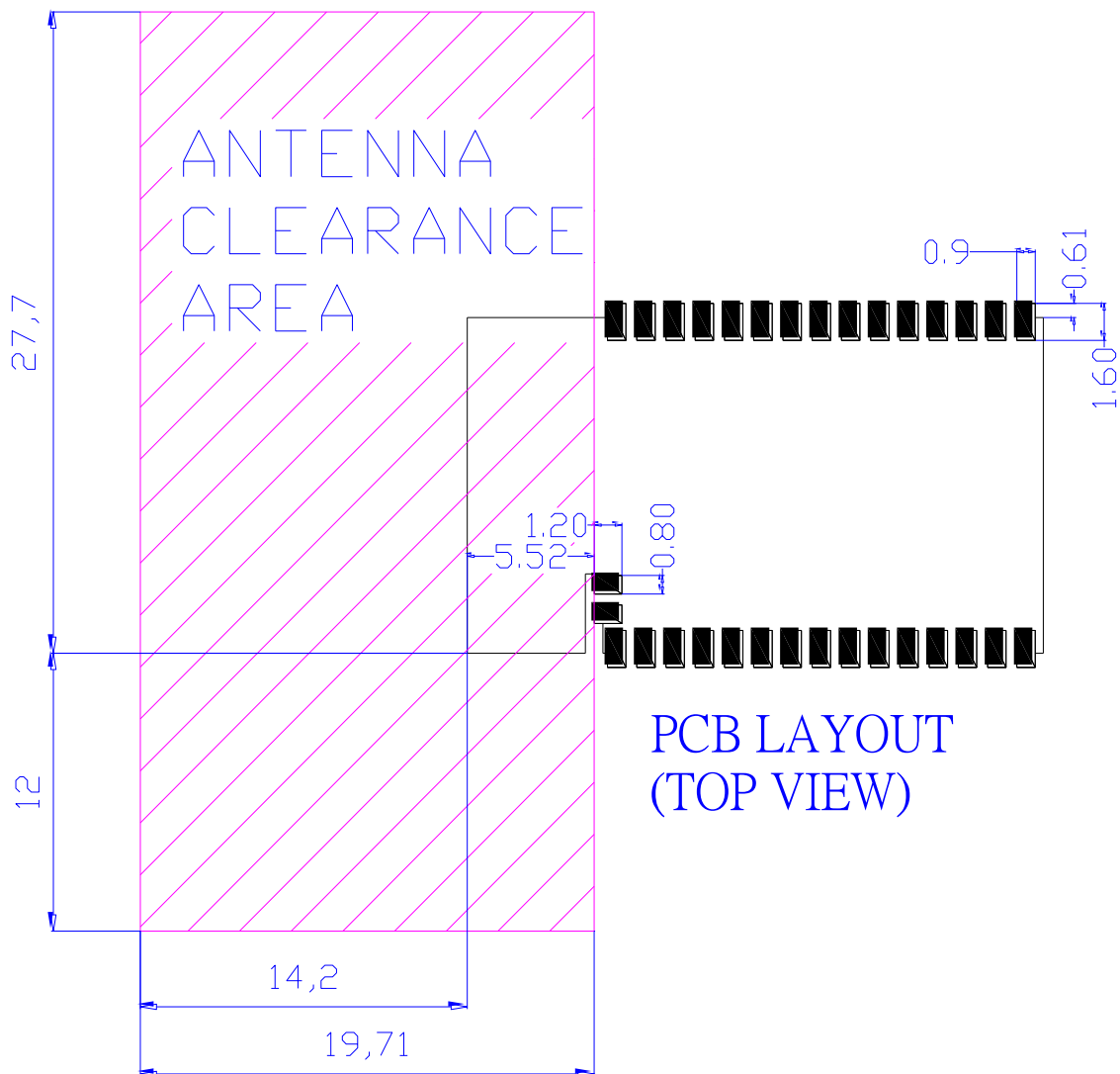
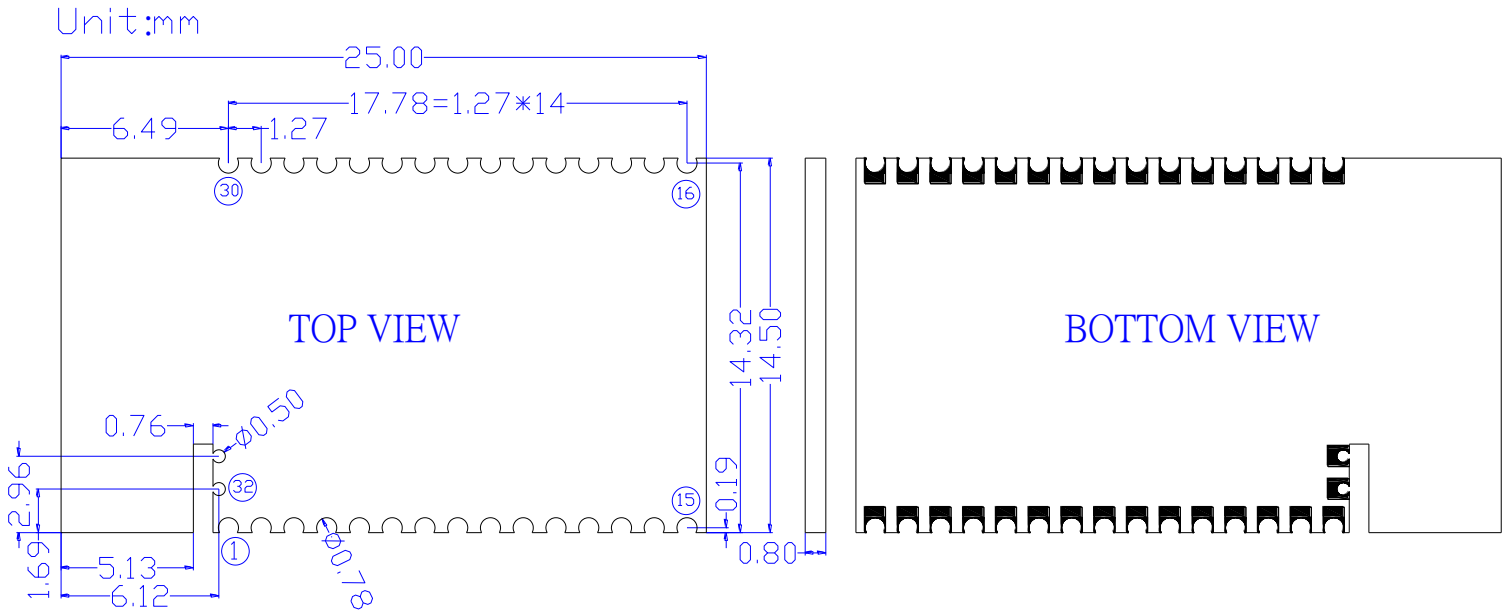
BTM-192 Pins out Information

PIN	NAME	TYPE	FUNCTION
1	PIO(11)	Bi-directional	Programmable Input/Output line
2	AIO(0)	Bi-directional	Programmable Input/Output Line or or Analogue input
3	AIO(1)	Bi-directional	Programmable Input/Output Line or Analogue input
4	PCM_OUT	CMOS Output	Synchronous Data Output
5	PCM_CLK	Bi-directional	Synchronous Data Clock
6	PCM_SYNC	Bi-directional	Synchronous Data Sync
7	PCM_IN	CMOS Input	Synchronous Data Input
8	UART_CTS	CMOS Input	UART Clear To Send (Active Low)
9	UART_TX	CMOS Output	UART Data Output
10	UART_RX	CMOS Input	UART Data Input
11	UART_RTS	CMOS Output	UART Request To Send (Active Low)
12	USB_DP	Bi-directional	USB Data Plus
13	USB_DN	Bi-directional	USB Data Minus
14	VDD	Power	1.8V Power Supply Input, Positive supply for internal Core and RF
15	GND	GND	Ground
16	VDD_USB	Power	3.3V Power Supply Input for USB/UART/SPI/PCM ports and all PIOs.
17	SPI_MOSI	CMOS Input	Serial Peripheral Interface Data Input
18	SPI_CSB	CMOS Input	Chip Select For Synchronous Serial Interface active low
19	SPI_MISO	CMOS Output	Serial Peripheral Interface Data Output
20	SPI_CLK	CMOS Input	Serial Peripheral Interface Clock
21	RESETB	CMOS input	Reset if low. Input debounced so must be low for >5ms to cause a reset
22	PIO(7)	Bi-directional	Programmable Input/Output line (Drive Link status led, active high, it will flash 3 times when it reboot.)
23	PIO(6)	Bi-directional	Programmable Input/Output line
24	PIO(5)	Bi-directional	Programmable Input/Output line (Drive Data status led, active high, it will flash 3 times when it reboot)
25	PIO(4)	Bi-directional	Programmable Input/Output line (Accept a Button Input, active high)
26	PIO(3)	Bi-directional	Programmable Input/Output Line
27	PIO(2)	Bi-directional	Programmable Input/Output line
28	PIO(8)	Bi-directional	Programmable Input/Output line (Drive Power status led, active high, it will flash 3 times when it reboot.)
29	PIO(9)	Bi-directional	Programmable Input/Output line
30	PIO(10)	Bi-directional	Programmable Input/Output line
31	PIO(0)	Bi-directional	Programmable Input / Output Line
32	PIO(1)	Bi-directional	Programmable Input/Output Line

Notes:

- PIO pins can be customized function.
- VDD supply for internal Core and RF
- VDD_USB supply for [USB/UART/SPI/PCM](#) ports and all PIOs

BTM-192 Dimension



Note :

Metal objects should be kept at least 15.25mm away from the Meander Line types of antennas in the Bluetooth frequency band in order for the antenna to work efficiently.

Qualified Design Listing Details



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[>> DISPLAY PICS DETAILS >>](#)

Qualified Design ID (QD ID) B016983 | [Export PICS](#)
PRD 1.0 ID (QP ID)
Design Name Bluetooth BC4 Module
Wi-Fi® Certification ID
Subsetting Designs

Date Created	Type	PICS
Jul 25, 2010	Main	PICS

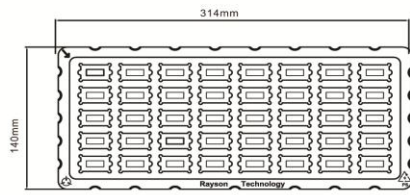
Member Company Rayson Technology Co., Ltd.
Specification Name 2.1+EDR
Core Spec Addenda CSA1-Controller, CSA1-Host
Design Model Number BTM-182,BTM-192
Hardware Version Number Rev. A0
Software Version Number V4.37
Qualification Assessment Date July/28/2010
Listing Date July/28/2010
Design Description The dongle embedded BT module designed for data application
Product Type End Product
[Technical Data Sheet \(RIN\)](#) (not available)
Listed By [LIAO CHE LU](#)
BQE [Arvin Ho](#)

Profile / Protocol	Role / Version (If Any)
Baseband	
Radio	
Service Discovery Protocol	
Logical Link Control and Adaptation Protocol	
Generic Access Profile	
Link Manager	
RFCOMM with TS 07.10	
Serial Port Profile	
Audio/Video Control Transport Protocol	AVCTP 1.0 Controller Target
Audio/Video Distribution Transport Protocol	Acceptor AVDTP 1.0 Initiator Sink Source
Interoperability Test Specification	

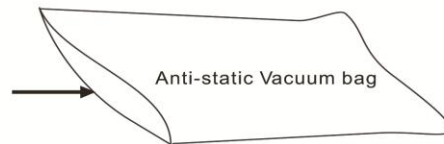
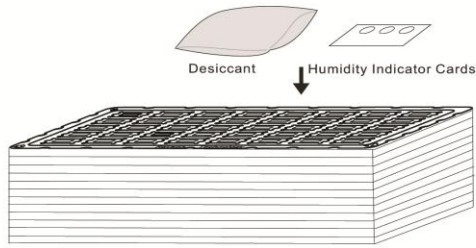
https://www.bluetooth.org/tpg/QLI_viewQDL.cfm?qid=16983

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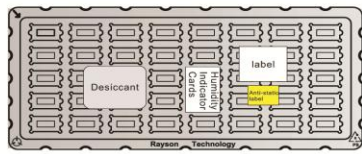
BTM-192 Packing drafting



BTM-192 tray · for the 40 pcs/tray
(the tray size : 314*140*7.5mm)



BTM-192 have has twelve tier · The top and bottom layer is empty
(40*10=400PCS)



Anti-static Vacuum bag glues label and Anti-static label

