

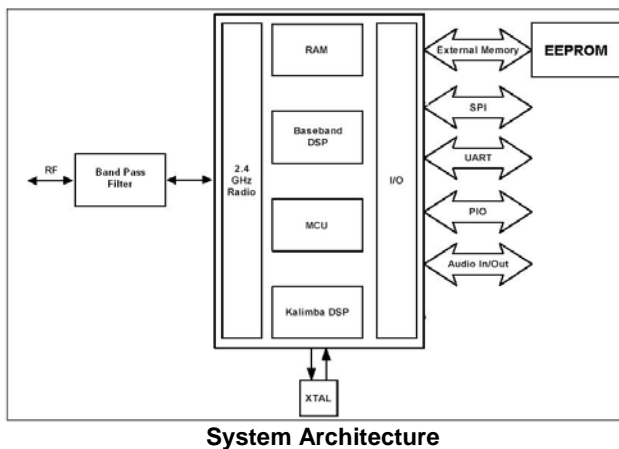
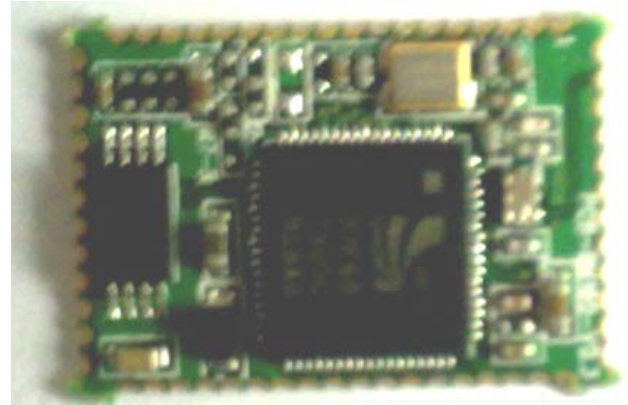
Product Features:

- Bluetooth Spec. V2.1+EDR Compliant
- Class 2 type Output Power
- Support HSP ,HFP, A2DP and AVRCP Profiles
- Integrated Switched-Mode Regulator
- Integrated 150mA Battery Charger
- Integrated Microphone bias
- Integrated LED Driver
- High-quality audio 95dB SNR on DAC playback
- CVC Support for echo and Noise reduction
- Support for 802.11 Co-existence
- Size: 21mm x 13.5 mm x 2.35mm
- Weight: 0.8g

BM160 Class 2 Multimedia Module


CSR, BC57F687A05

Feb. 2012


Product Description:

The BM160 is based on BlueCore5-Multimedia ROM QFN chipset from leading Bluetooth chipset supplier Cambridge Silicon Radio.

BM160 interfaces a Bluetooth radio, baseband, DSP, high-quality audio codec, SMPS, LDOs, a battery charger and external EEPROM memory.

BlueTunes ROM QFN uses advanced DSP features for the latest stereo enhancements and to improve audio quality; including SBC and MP3 decoder, support for FastStream (low battery codec) and 5-band EQ.

The module and device firmware is fully compliant with the Bluetooth specification v2.1+EDR

Applications:

- Hands-free Car Kit
- Stereo Headset
- AV Headphones
- Echo Cancellation
- High Performance Mono Headsets
- Wireless Speakers

Specifications:

Operating Frequency Band	2.4GHz ~ 2.48GHz unlicensed ISM band
Bluetooth Specification	V2.1+EDR
Output Power Class	Class 2
Operating Voltage	1.8V or 3.3V
Audio Interface	Analogue
Dimension	21mm (L) x 13.5 (W) mm x 2.35mm (H)

Specifications are subject to change without prior notice

Electrical Characteristics

Absolute Maximum Rating	Min	Max
Storage Temperature	-40°C	+85°C
Supply Voltage, (V_CHG)	-0.30V	+6.5V

Recommended Operating Conditions	Min	Max
Operating Temperature Range	-20°C	+70°C
Supply Voltage, (V_BAT)	2.7V	4.2V
Supply Voltage, (V_CHG)	4.5V	6.0V

Power Consumption	Units	Average
SCO Connection HV3 (30ms interval sniff mode)	mA	TBD
SCO Connection HV1	mA	TBD
ACL Data Transfer 115.2Kbps UART no traffic (Master)	mA	TBD
ACL Data Transfer 115.2Kbps UART no traffic (Slave)	mA	TBD
CODEC		
Microphone inputs and ADC/channel	mA	TBD
DAC and loudspeaker driver, no signal/channel	mA	TBD
Digital audio processing subsystem	mA	TBD

VBAT = 4.2V; f = 2.441GHz; T=20°C

RF Characteristics

Receiver	Units	Min	Typ	Max	Bluetooth Spec
Sensitivity at 0.1% BER	dBm	-	-90	-86	≤ -70
Maximum Receiver Signal	dBm	-20	-10	-	≥ -20
C/I Co-Channel	dB	-	6	11	≤ 11
Adjacent Channel Selectivity C/I -1MHz	dB	-	-6	0	≤ 0
2nd Adjacent Channel Selectivity C/I -2MHz	dB	-	-38	-30	≤ -30
3rd Adjacent Channel Selectivity C/I -3MHz	dB	-	-45	-40	≤ -40
Image Rejection C/I	dB	-	-16	-9	≤ -9

VBAT = 4.2V; f = 2.4441GHz; T=20°C

Transmitter	Units	Min	Typ	Max	Bluetooth Spec
RF Output Power	dBm	0	3	-	-6 to +4
RF Power Control Range	dB	16	24	-	> 16
RF Power Range Control Resolution	dB	-	0.5	-	-
20dB Bandwidth for Modulated Carrier	KHz	-	940	1000	<1000
2nd Adjacent Channel Power (+/- 2MHz)	dBm	-	-36	-20	≤ -20
3rd Adjacent Channel Power (+/- 3MHz)	dBm	-	-45	-40	≤ -40

VBAT = 4.2V; f = 2.4441GHz; T=20°C

All specifications including pinouts and electrical specifications may be changed without prior notice

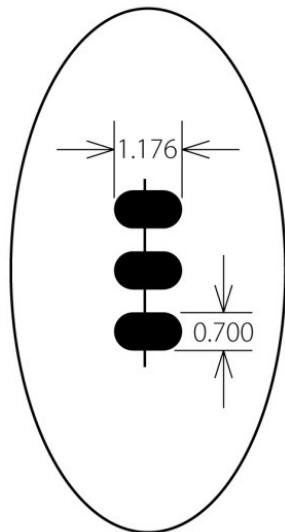
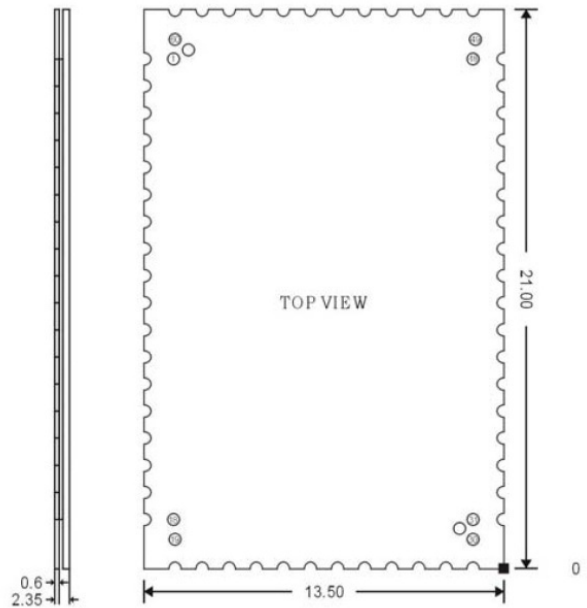
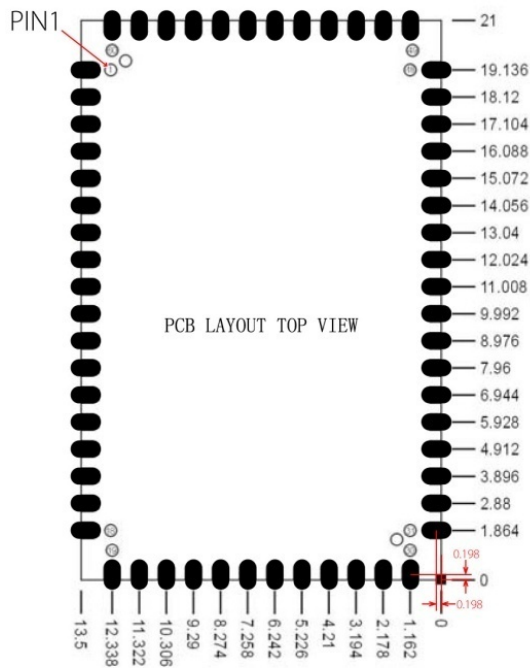


Pin Configurations

PIN NO.	NAME	TYPE	FUNCTION	RE-MARK
1	AIO1	Bi-directional	Programmable input/output line	
2	AIO0	Bi-directional	Programmable input/output line	
3	RESET	CMOS input with weak internal pull-up	Reset if low. Input debounced so must be low for >5ms to cause a reset	
4	GND	GND	Ground	
5	PIO9	Bi-directional	Programmable Input/Output Line	
6	N/A			
7	PIO11	Bi-directional	Programmable Input/Output Line	
8	PIO12	Bi-directional	Programmable Input/Output Line	
9	PIO13	Bi-directional	Programmable Input/Output Line	
10	PIO14	Bi-directional	Programmable Input/Output Line	
11	N/A			
12	GND	GND	Ground	
13	VDD	Power	3.3V Supply	For 3.3V Version
	VDD	Power	Connect to 1V8	For 1.8V Version
14	VDD_USB	Power	Positive Supply For UART/USB Port Connect to VDD	
15	+1V8	Power	+1.8V Supply	
16	GND	GND	Ground	
17	N/A			
18	N/A			
19	UART_RTS	CMOS Output	UART Request To Send (Active Low)	
20	UART_CTS	CMOS Input	UART Clear To Send (Active Low)	
21	UART_RX	CMOS Input	UART Data Input (Active High)	
22	UART_TX	CMOS Output	UART Data Output (Active High)	
23	N/A			
24	N/A			
25	TEST_EN		For test purposes only, Leave unconnected	
26	N/A			
27	SPI_CSB	CMOS Input	Chip Select For Synchronous Serial Interface (Active Low)	
28	SPI_MISO	CMOS Output	Serial Peripheral Interface Data Output	
29	SPI_CLK	CMOS Input	Serial Peripheral Interface Data Clock	
30	SPI_MOSI	CMOS Output	Serial Peripheral Interface Data Input	
31	VRE_IN	Analogue	Take high to enable switch-mode regulator	
32	VDD_BAT	Battery terminal +ve	Lithium ion/polymer battery positive terminal. Battery charger output and input to switch-mode regulator	
33	GND	GND	Ground	
34	VDD_CHG	Charger input	Lithium ion/polymer battery charger input	
35	LED1	Open drain output	LED Driver	
36	LED0	Open drain output	LED Driver	
37	GND	GND	Ground	
38	SPK_L_N	Analogue	Speaker output negative, left	
39	SPK_L_P	Analogue	Speaker output positive, left	
40	SPK_R_N	Analogue	Speaker output negative, right	
41	SPK_R_P	Analogue	Speaker output positive, right	
42	GND_S	Analogue GND	Analogue Ground	
43	MIC_BIAS	Analogue	Microphone bias	
44	MIC_B_P	Analogue	Microphone input positive, right	
45	MIC_B_N	Analogue	Microphone input negative, right	
46	MIC_A_P	Analogue	Microphone input positive, left	
47	MIC_A_N	Analogue	Microphone input negative, left	
48	GND	GND	Ground	
49	PIO0	Bi-directional	Programmable Input/Output Line	
50	PIO1	Bi-directional	Programmable Input/Output Line	
51	PIO2	Bi-directional	Programmable Input/Output Line	
52	PIO3	Bi-directional	Programmable Input/Output Line	
53	PIO4	Bi-directional	Programmable Input/Output Line	
54	PIO5	Bi-directional	Programmable Input/Output Line	
55	PIO6	Bi-directional	Programmable Input/Output Line	
56	PIO7	Bi-directional	Programmable Input/Output Line	
57	PIO8	Bi-directional	Programmable Input/Output Line	
58	GND	GND	Ground	
59	RF-IN	RF	RF Interface	
60	GND	GND	Ground	

Recommended Layout patterns:

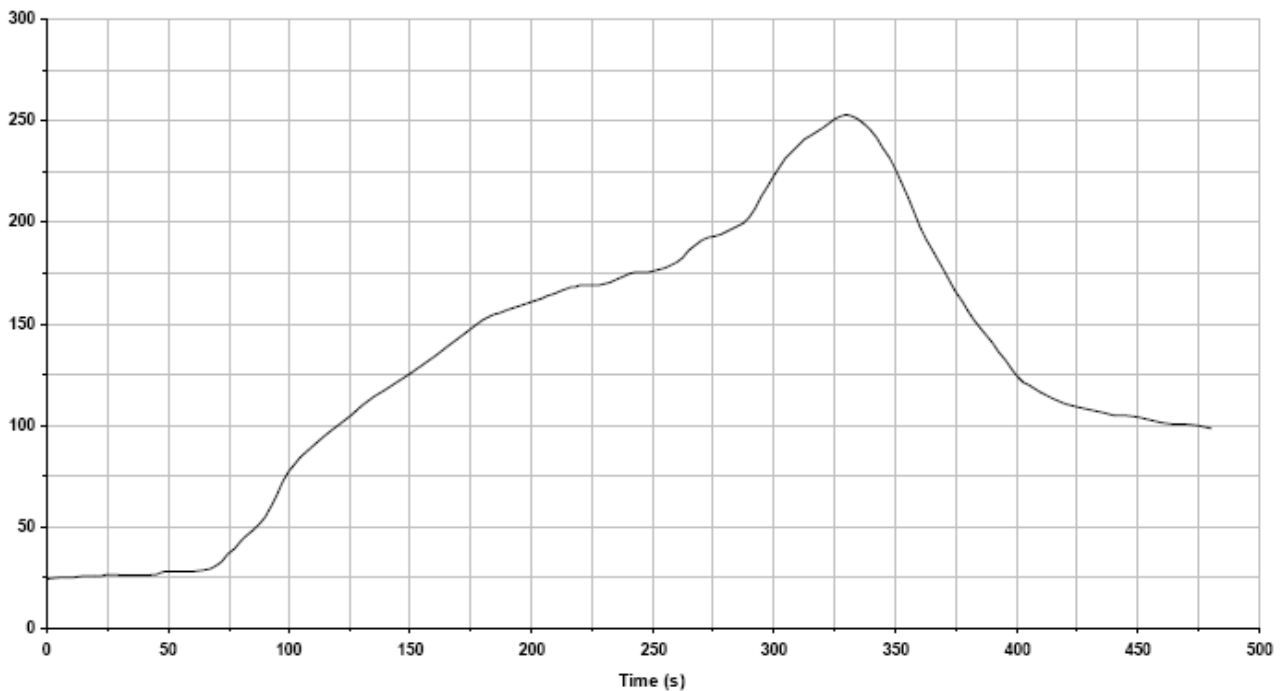
Physical Dimension Unit in mm



NO PINNAME	NO PINNAME
1. AI01	31. VRE_IN
2. AI00	32. VDD_BAT
3. RESET	33. GND
4. GND	34. VDD_CHG
5. PI09	35. LED1
6. N/A	36. LED0
7. PI011	37. GND
8. PI012	38. SPK_L_N
9. PI013	39. SPK_L_P
10. PI014	40. SPK_R_N
11. N/A	41. SPK_R_P
12. GND	42. GND_S
13. VDD	43. MIC_BIAS
14. VDD_USB	44. MIC_B_P
15. +1V8	45. MIC_B_N
16. GND	46. MIC_A_P
17. N/A	47. MIC_A_N
18. N/A	48. GND
19. UART_RTS	49. PI00
20. UART_CTS	50. PI01
21. UART_RX	51. PI02
22. UART_TX	52. PI03
23. N/A	53. PI04
24. N/A	54. PI05
25. TEST_EN	55. PI06
26. N/A	56. PI07
27. SPI_CSB	57. PI08
28. SPI_MISO	58. GND
29. SPI_CLK	59. RF
30. SPI_MOSI	60. GND

Configuration

Recommended Reflow Temperature Profile:



Key features of the profile:

- Initial Ramp=1-2.5°C/sec to 175°C equilibrium
- Equilibrium time=60 to 80 seconds
- Ramp to Maximum temperature (250°C)=3°C/sec Max
- Time above liquidus temperature(217°C): 45 - 90 seconds
- Device absolute maximum reflow temperature: 250°C

MAC Address:

Each Module has his MAC Address
001d df XXXXXX

Concerning the dimension of the tab, only printing the last six letters of the LAP on the module.



The tab code pastes style:

QDL Certificate



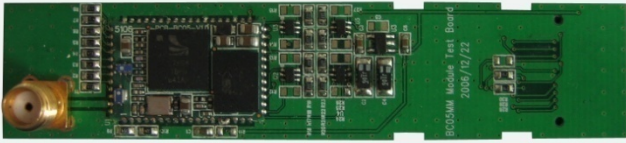

QUALIFIED DESIGN: Bluetooth Class 2 module (BM160)**BLUETOOTH QUALIFIED DESIGN LISTING:** B019094**CORE SPECIFICATION:** 2.1+EDR**ASSESSMENT DATE:** 20 February 2012**BQE CERTIFIED:** Totti Huang**DECLARED BLUETOOTH SPECIFICATIONS PART:**Product Type,
Radio,
Summary ICS

This certificate acknowledges the *Bluetooth*® Specifications declared by the member were achieved in accordance with the *Bluetooth* Qualification Process as specified within the *Bluetooth* Specifications and as required within PRD 2.0.

The *Bluetooth* word mark and logos are owned by the Bluetooth SIG, Inc.

Ordering Information

No	Items	Ordering Code (Class 2)	Description
2	BlueTunes Module	BM160	
3	BlueTunes Module Test Kit	BM160 TK	Test kit to fit CSR Casira Kit
4	Titanis Antenna	2010B4844-01	GigaAnt 2.4GHz Swivel SMA Antenna

	
BM160S Test Kit	Titanis Antenna

Document References

References	Version
Specifications of the Bluetooth System	V2.1+EDR, 26 July 2007
BlueTunes ROM QFN Data Sheet	CS-122312-DSP1 23 Oct 2008

Document History

Revision	Date	History
Draft V0.1	2009-10-22	
V1.0	2009-11-30	Official release
V1.1	2009-12-01	
V1.2	2009-12-02	Swap LED0 and LED1
V1.3	2012-02-20	Add BQB Certificate

Contact Information

Sunitec Enterprise Co., Ltd.

Head Office:

3F.,No.98-1,Mincyuan Rd Sindian City, Taipei
 County 231,Taiwan
 Tel: 886-2-82191696
 Fax: 886-2-82191676

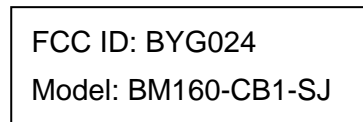
China Factory:

No.2,Qilin Road 2,Run Tang Ind., Dan-Keng Village Fu
 Ming Community, Guan-lan Town, BaoAn District,
 Shenzhen Guangdong China
 Tel: 86-755-29802983
 Fax: 86-755-29802984
 E-mail:sales@sunitec-cn.com & project@sunitec-cn.com
<http://www.sunitec-cn.com>

Notice: The user should not modify or change this equipment without written approval from SANGEAN ELECTRONICS INC. Modification could void authority to use this equipment.

Label for end product must include “Contains FCC ID: BYG024” or “A RF transmitter inside, FCC ID: BYG024”.

FCC ID Label Graph:



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.

Note:

If the product is too small to make so many text labels, only need to indicate the FCC ID number on the label, but the above text will be printed in the manual or packaging box.

IMPORTANT NOTE: To comply with the FCC RF exposure compliance requirements, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. No change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user’s authority to operate the device.

The module has been regulatory approved for integrations which meet the following conditions:

1. The radio integration is embedded
2. The antenna must be installed such that 20 cm is maintained between the antenna and users
3. The ‘Type’ and ‘Gain’ of the antenna selected for the integration of the external antenna must meet the requirements as detailed in section.

Used outside of these conditions will trigger re-approval.