Features:

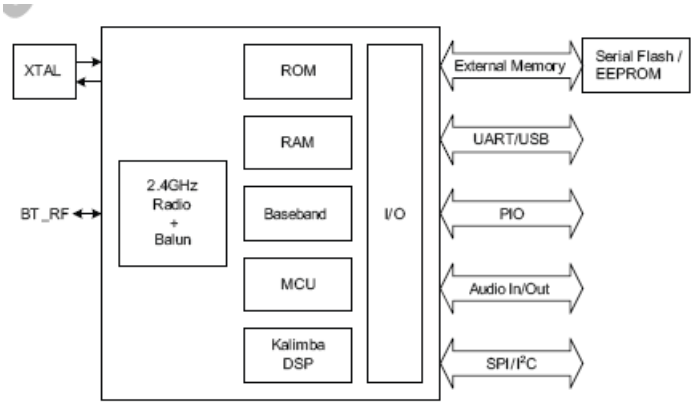
- Bluetooth Spec 4.0 Compliant
- Class 2 type Output Power
- Support A2DP 1.2, HSP 1.2 and HFP 1.6 Profiles
- Secure simple pairing, CSR's proximity pairing and CSR's proximity connection
- HFP v1.6 includes wideband speech and mSBC Codec.
- CSR's latest CVC technology 1-mic hands-free audio enhancement for car-kit and speaker applications
- Multipoint connection to 2 phones for voice and Music
- Support for multi-language programmable audio prompts
- OS battery status monitoring and smart apps
- Voice recognition support for answering a call, enables true hands-free use
- Integrated dual switch-mode regulators, linear regulators and battery charger
- Support for 802.11 Co-existence
- Size: 15mm x 11mm x 2.35mm
- Weight: 0.8g

BM810 Mono Solution Module

Bluetooth Qualified

CSR**8610A04**

May 2012



System Architecture

Product Description:

The BM810 is a Class 2 Bluetooth sub-system using CSR8610 chipset from leading Bluetooth chipset supplier Cambridge Silicon Radio.

It is a single-chip radio and baseband IC for Bluetooth 2.4GHz systems.The integrated peripherals reduce the number of external components required, including no requirement for external codec, battery charger, SMPS, LDOs, balun or external program memory, ensuring minimum production costs.

Applications:

- Hands-free Car Kit
- Headset with NR/AEC
- Wireless Mono speaker

Specifications:

Operating Frequency Band	2.4GHz ~ 2.48GHz unlicensed ISM band
Bluetooth Specification	V4.0
Output Power Class	Class 2
Operating Voltage	3.3V
Host Interface	USB 1.1
Audio Interface	PCM, I2S, Analogue
Dimension	15mm (L) x 11(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	+105°C
Supply Voltage, (V_CHG)	-0.30V	+5.75V

Recommended Operating Conditions	Min	Max
Operating Temperature Range	-40°C	+85°C
Supply Voltage, (V_BAT)	2.5V	4.2V
Supply Voltage, (V_CHG)	4.75V	5.25V

Power Consumption	Units	Average
Slave		
SCO Connection HV3	mA	11.0
SCO Connection EV3	mA	11.8
SCO Connection 2EV3	mA	9.2
Stereo high quality SBC	mA	13.3
Stereo high quality MP3	mA	12.5
Master		
SCO Connection HV3	mA	10.8
SCO Connection EV3	mA	11.2
SCO Connection 2EV3	mA	8.8
Stereo high quality SBC	mA	13.2
Stereo high quality MP3	mA	11.8
SCO Connection HV3	mA	10.8

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

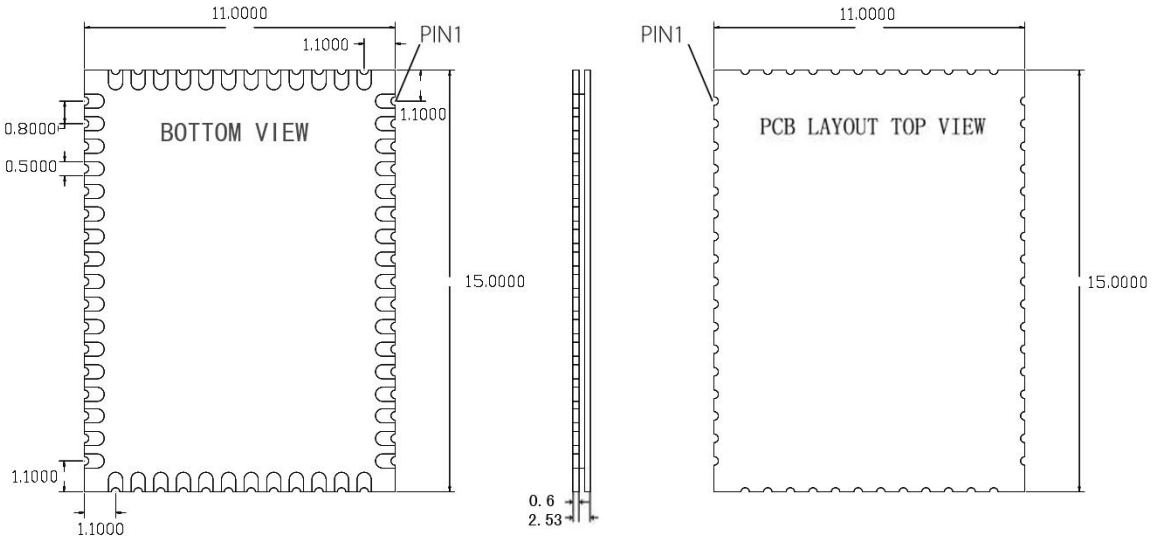
Pin Configurations

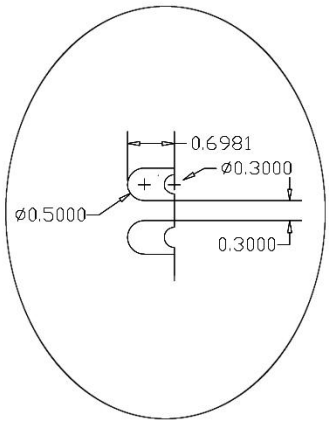
PIN NO.	NAME	TYPE	FUNCTION	RE-MARK
1	GND	GND	Ground	
2	GND	GND	Ground	
3	AIO0	Bi-directional	Analogue programmable input / output line	
4	PIO12	Bi-directional	Programmable Input/Output Line Alternative function: ■ QSPI_FLASH_CS#: serial quad I/O flash chip select ■ I2C_WP: I²C bus memory write protect line	
5	PIO14	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_RX: UART data input	
6	PIO11	Bi-directional	Programmable Input/Output Line Alternative function: ■ QSPI_IO[0]: serial quad I/O flash data bit 0 ■ I2C_SDA: I²C serial data line	
7	PIO17	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_CTS: UART clear to send, active low	
8	PIO10	Bi-directional	Programmable Input/Output Line Alternative function: ■ QSPI_FLASH_CLK: serial quad I/O flash clock ■ I2C_SCL: I²C serial clock line	
9	PIO15	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_TX: UART data output	
10	PIO16	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_RTS: UART request to send, active low	
11	PIO13	Bi-directional	Programmable Input/Output Line Alternative function: ■ QSPI_IO[1]: serial quad I/O flash data bit 1	
12	GND	GND	Ground	
13	PIO2	Bi-directional	Programmable Input/Output Line Alternative functions: ■ SPI_MOSI: SPI data input ■ PCM1_IN: PCM1 synchronous data input	
14	PIO5	Bi-directional	Programmable Input/Output Line Alternative functions: ■ SPI_CLK: SPI clock ■ PCM1_CLK: PCM1 synchronous data clock	
15	PIO4	Bi-directional	Programmable Input/Output Line Alternative functions: ■ SPI_CS#: chip select for SPI, active low ■ PCM1_SYNC: PCM1 synchronous data sync	
16	PIO3	Bi-directional	Programmable Input/Output Line Alternative functions: ■ SPI_MISO: SPI data output ■ PCM1_OUT: PCM1 synchronous data output	
17	GND	GND	Ground	
18	LED1	Bi-directional	LED driver. Alternative function: programmable output PIO[30].	
19	LED0	Bi-directional	LED driver. Alternative function: programmable output PIO[29].	
20	RST#	Input with strong pull-up	Reset if low. Pull low for minimum 5ms to cause a reset.	
21	SPI_PCM#	Bidirectional with weak pull-down	SPI/PCM select input: ■ 0 = PCM/PIO interface ■ 1 = SPI	
22	VREGENABLE	CMOS Input	Regulator enable input Can also be sensed as an input. Regulator enable and multifunction button. A high input (tolerant to VBAT) enables the on-chip regulators, which can then be latched on internally and the button used as a multifunction input	
23	GND	GND	Ground	
24	VBUS	CMOS Input	Charger input.	

			Typically connected to VBUS (USB supply) as Section 12 shows.	
25	CHG_EXT		External battery charger control. External battery charger transistor base control when using external charger boost. Otherwise leave unconnected.	
26	VBAT_SENSE	CMOS input	Battery charger sense input. Connect directly to the battery positive pin.	
27	VBAT	CMOS Input	Battery positive terminal.	
28	GND	GND	Ground	
29	1V8_SMPS	CMOS Input	Serial Peripheral Interface Clock	
30	VDD_PADS	Power IN	Positive supply input for input/output ports	
31	PIO9	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_CTS: UART clear to send, active low	
32	PIO0	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_RX: UART data input	
33	PIO6	Bi-directional	Programmable Input/Output Line	
34	PIO18	Bi-directional	Programmable Input/Output Line	
35	PIO19	Bi-directional	Programmable Input/Output Line	
36	GND	GND	Ground	
37	USB_N	Bi-directional	USB data minus	
38	USB_P	Bi-directional	USB data plus with selectable internal 1.5kΩ pull-up resistor	
39	PIO7	Bi-directional	Programmable Input/Output Line	
40	PIO1	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_TX: UART data output	
41	PIO8	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_RTS: UART request to send, active low	
42	PIO21	Bi-directional	Programmable Input/Output Line	
43	PIO20	Bi-directional	Programmable Input/Output Line	
44	LED2	Bi-directional	LED driver. Alternative function: programmable output PIO[31]	
45	GND	GND	Ground	
46	MIC_BIAS	Analogue out	Microphone bias	
47	MIC_RN	Analogue in	Microphone input negative, channel A	
48	MIC_RP	Analogue in	Microphone input positive, channel A	
49	N.C			
50	N.C			
51	AGND	Analogue	Ground connection for audio and audio driver.	
52	N.C			
53	N.C			
54	SPK_LN	Analogue out	Speaker A output negative, left	
55	SPK_LP	Analogue out	Speaker A output positive, left	
56	GND	GND	Ground	
57	RF_IN	GND	Bluetooth 50Ω transmitter output /receiver input	
58	GND	GND	Ground	

Recommended Layout patterns:

Physical Dimension Unit in mm

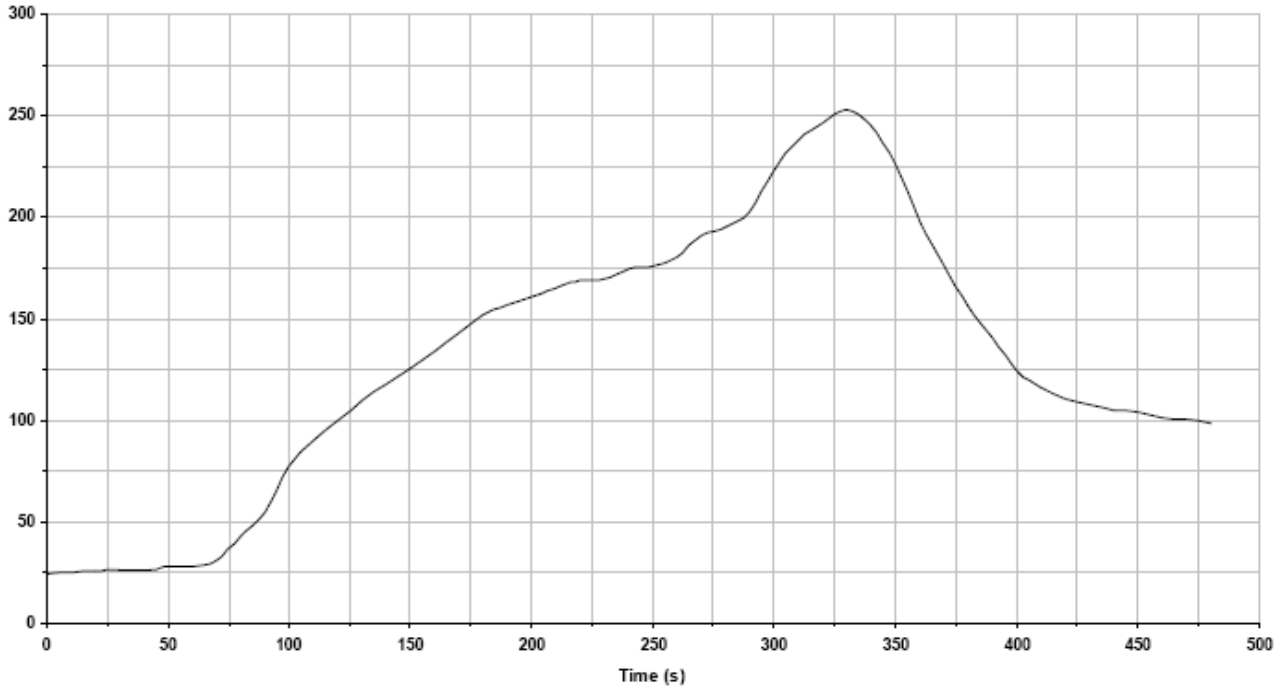




NO	PINNAME	NO	PINNAME
1	GND	31	PIO[9]
2	GND	32	PIO[0]
3	AIO[0]	33	PIO[6]
4	PIO[12]	34	PIO[18]
5	PIO[14]	35	PIO[19]
6	PIO[11]	36	GND
7	PIO[17]	37	USB_N
8	PIO[10]	38	USB_P
9	PIO[15]	39	PIO[7]
10	PIO[16]	40	PIO[1]
11	PIO[13	41	PIO[8]
12	GND	42	PIO[21]
13	PIO[2]	43	PIO[20]
14	PIO[5]	44	LED[2]
15	PIO[4]	45	GND
16	PIO[3]	46	MIC_BIAS
17	GND	47	MIC_RN
18	LED[1]	48	MIC_RP
19	LED[0]	49	MIC_LN
20	RST#	50	MIC_LP
21	SPI_PCM#	51	AGND
22	VREGENABLE	52	SPKR_RN
23	GND	53	SPKR_RP
24	VBUS	54	SPKR_LN
25	CHG_EXT	55	SPKR_LP
26	VBAT_SENSE	56	GND
27	VBAT	57	RF
28	GND	58	GND
29	1V8_SMPS		
30	VDD_PADS		

Configuration

Recommended Reflow Temperature Profile:



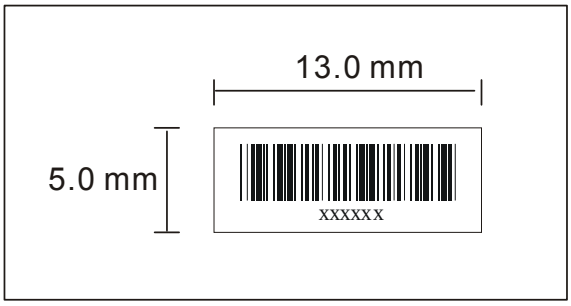
Key features of the profile:

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

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

Document References

References	Version
Specifications of the Bluetooth System	V4.0, 17 Dec. 2009
BlueCore-CSR8610 Product Data Sheet	CS-208517-DS-2 07 FEB 2012

Document History

Revision	Date	History
V1.0	2012-01-31	First release
V1.1	2012-04-03	1.Changed to CSR8610A04 version 2.Changed PIN30 to VDD_PADS
V2.0	2012-05-31	Add BQB information

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