

Features:

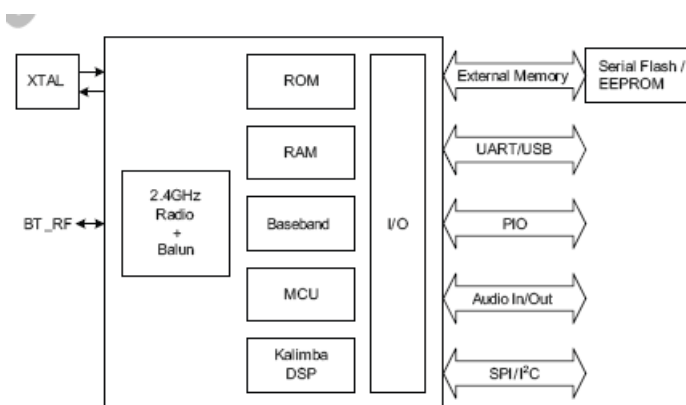
- Bluetooth Spec 4.0 Compliant
- Class 2 type Output Power
- Support A2DP 1.2, AVRCP V1.4 Profiles
- Secure simple pairing, CSR's proximity pairing and CSR's proximity connection
- Support for multi-language programmable audio prompts
- OS battery status monitoring and smart apps
- Wired audio support (USB and analogue)
- SBC, MP3, and AAC decoder support
- 5-band fully configurable EQ
- Integrated dual switch-mode regulators, linear regulators and battery charger
- Size: $21 \pm 0.5\text{mm} \times 13.5 \pm 0.5\text{mm} \times 2.35 \pm 0.5\text{mm}$
- Weight: 0.8g

BM830 Stereo Solution Module

 **Bluetooth** **Qualified**

CSR8630A04

July 2013



System Architecture

Product Description:

The BM830 is a Class 2 Bluetooth sub-system using CSR8630 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:

- Wireless speaker

Specifications:

Operating Frequency Band	2.4GHz ~ 2.48GHz unlicensed ISM band
Bluetooth Specification	V4.0
Output Power Class	Class 2
Max. Output Power	2.5mW
Date Rate	3Mbps
Channel No.	79
Modulation Type	GFSK $\pi/4$ DQPSK 8DPSK
Operating Voltage	3.3V
Host Interface	USB 1.1
Audio Interface	Analogue and USB audio
Dimension	$21 \pm 0.5\text{mm} \times 13.5 \pm 0.5\text{mm} \times 2.35 \pm 0.5\text{mm}$

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

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	-85	≤ -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	4	8	-	-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

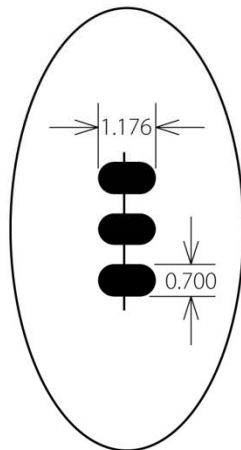
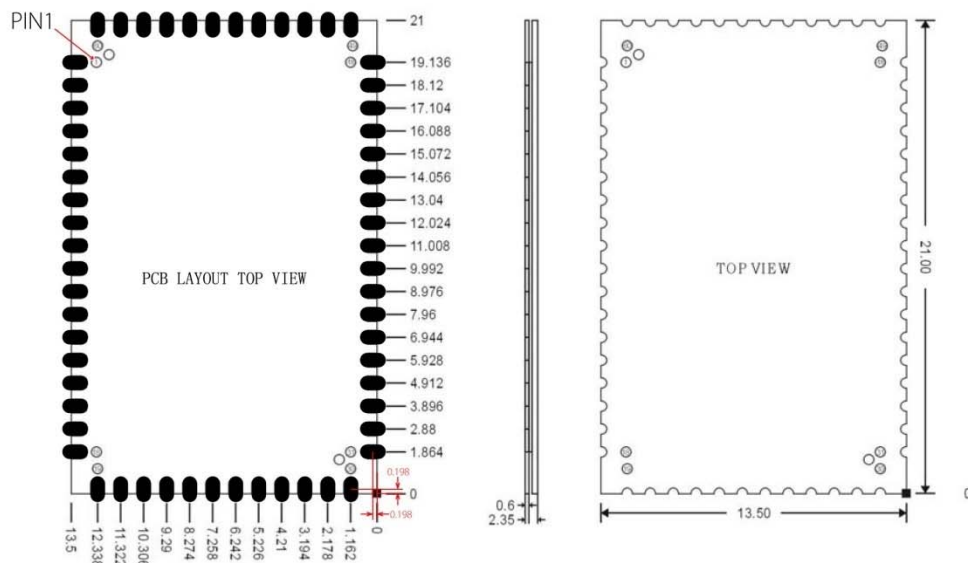
Pin Configurations

PIN NO.	NAME	TYPE	FUNCTION	RE-MARK
1	GND	GND	Ground	
2	AIO0	Bi-directional	Analogue programmable input / output line	
3	PIO14	Bi-directional	Programmable input / output line 14. Alternative function: ■ UART_RX: UART data input	
4	PIO15	Bi-directional	Programmable input / output line 15. Alternative function: ■ UART_TX: UART data output	
5	PIO16	Bi-directional	Programmable input / output line 16. Alternative function: ■ UART_RTS: UART request to send, active low	
6	PIO17	Bi-directional	Programmable input / output line 17. Alternative function: ■ UART_CTS: UART clear to send, active low	
7	PIO10	Bi-directional	Programmable input / output line 10. Alternative function: ■ QSPI_FLASH_CLK: SPI flash clock ■ I2C_SCL: I ² C serial clock line	
8	SCL	Bi-directional	Internal EEPROM SCL	
9	PIO11	Bi-directional	Programmable input / output line 11. Alternative function: ■ QSPI_IO[0]: SPI flash data bit 0 ■ I2C_SDA: I ² C serial data line	
10	PIO12	Bi-directional	Programmable input / output line 12. Alternative function: ■ QSPI_FLASH_CS#: SPI flash chip select ■ I2C_WP: I ² C bus memory write protect line	
11	PIO13	Bi-directional	Programmable input / output line 13. Alternative function: ■ QSPI_IO[1]: SPI flash data bit 1	
12	SPI_PCM#	Bidirectional with weak pull-down	SPI/PCM select input: ■ 0 = PCM/PIO interface ■ 1 = SPI	
13	GND	GND	Ground	
14	PIO3	Bi-directional	Programmable input / output line 3. Alternative function: ■ SPI_MISO: SPI data output ■ PCM1_OUT: PCM1 synchronous data output	
15	PIO2	Bi-directional	Programmable input / output line 2. Alternative function: ■ SPI_MOSI: SPI data input ■ PCM1_IN: PCM1 synchronous data input	
16	PIO5	Bi-directional	Programmable input / output line 5. Alternative function: ■ SPI_CLK: SPI clock ■ PCM1_CLK: PCM1 synchronous data clock	
17	PIO4	Bi-directional	Programmable input / output line 4. Alternative function: ■ SPI_CS#: chip select for SPI, active low ■ PCM1_SYNC: PCM1 synchronous data sync	
18	GND	GND	Ground	
19	GND	GND	Ground	
20	RST#	Input with strong pull-up	Reset if low. Pull low for minimum 5ms to cause a reset.	
21	GND	GND	Ground	
22	LED1	Bi-directional	LED driver. Alternative function: programmable output PIO[30].	
23	LED0	Bi-directional	LED driver. Alternative function: programmable output PIO[29].	
24	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	
25	GND	GND	Ground	
26	VBUS	Power Input	Charger input. Typically connected to VBUS (USB supply) as Section 12 shows.	
27	CHG_EXT		External battery charger control. External battery charger transistor base control when using external charger boost. Otherwise leave unconnected.	
28	VBAT_SENSE		Battery charger sense input. Connect directly to the battery positive pin.	
29	VBAT	Power IN	Battery positive terminal.	
30	GND	GND	Ground	
31	1V8_OUT	Power out	Serial Peripheral Interface Clock	
32	VDD_PADS	Power IN	Positive supply input for input/output ports	
33	3V3_OUT	Power out	3.3V bypass linear regulator output.	
34	GND	GND	Ground	
35	USB_N	Bi-directional	USB data minus	
36	USB_P	Bi-directional	USB data plus with selectable internal 1.5kΩ pull-up resistor	
37	GND	GND	Ground	
38	PIO9	Bi-directional	Programmable input / output line 9. Alternative function: ■ UART_CTS: UART clear to send, active low	
39	PIO0	Bi-directional	Programmable input / output line 0. Alternative function: ■ UART_RX: UART data input	
40	PIO1	Bi-directional	Programmable input / output line 1. Alternative function: ■ UART_TX: UART data output	
41	PIO8	Bi-directional	Programmable input / output line 8. Alternative function: ■ UART_RTS: UART request to send, active low	
42	PIO7	Bi-directional	Programmable Input/Output Line	
43	PIO6	Bi-directional	Programmable Input/Output Line	
44	PIO21	Bi-directional	Programmable Input/Output Line	
45	PIO18	Bi-directional	Programmable Input/Output Line	
46	LED2	Bi-directional	LED driver. Alternative function: programmable output PIO[31]	
47	GND	GND	Ground	
48	MIC_BIAS	Analogue out	Microphone bias	
49	LINE_AN	Analogue in	Line input negative, channel A	
50	LINE_AP	Analogue in	Line input positive, channel A	
51	LINE_BN	Analogue in	Line input negative, channel B	
52	LINE_BP	Analogue in	Line input positive, channel B	
53	AGND	Analogue	Ground connection for audio and audio driver.	
54	SPK_RN	Analogue out	Speaker output negative, right	
55	SPK_RP	Analogue out	Speaker output positive, right	
56	SPK_LN	Analogue out	Speaker output negative, left	
57	SPK_LP	Analogue out	Speaker output positive, left	
58	GND	GND	Ground	
59	RF_IN	GND	Bluetooth 50Ω transmitter output /receiver input	
60	GND	GND	Ground	

Recommended Layout patterns:

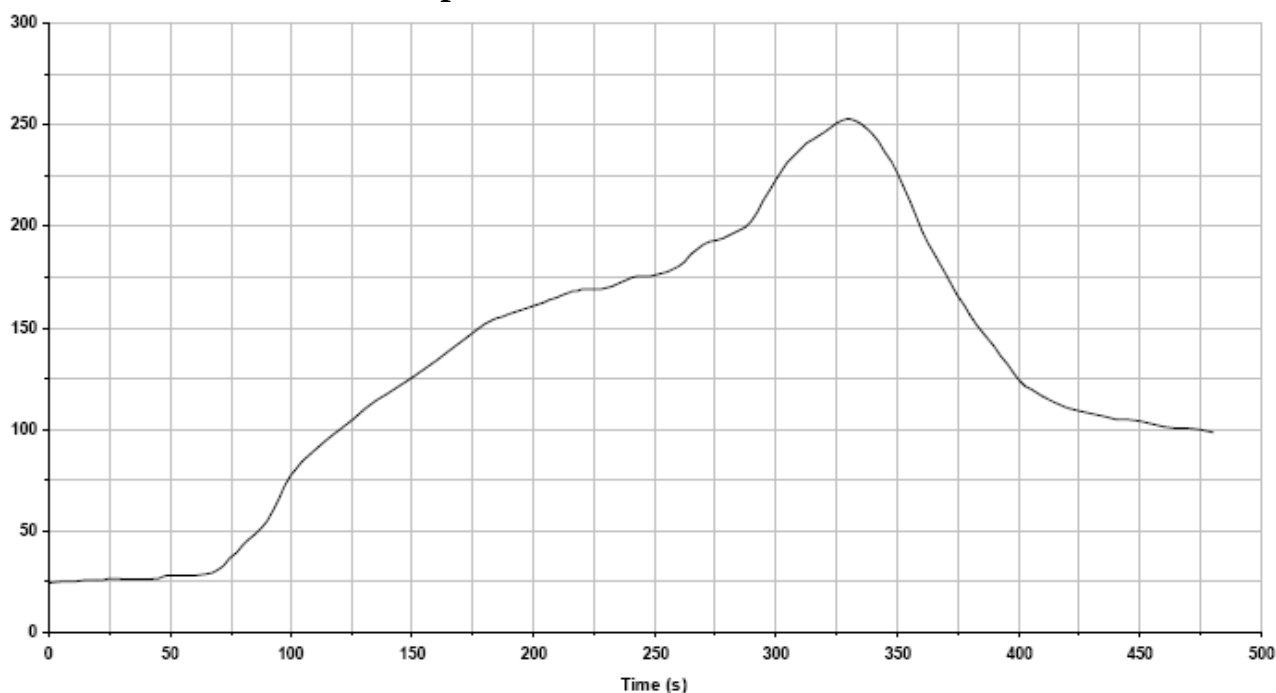
Physical Dimension Unit in mm



NO	PINNAME	NO	PINNAME
1	GND	31	1V8_OUT
2	AIO0	32	VDD
3	PIO14	33	3V3_OUT
4	PIO15	34	GND
5	PIO16	35	USB_DN
6	PIO17	36	USB_DP
7	PIO10	37	GND
8	SCL	38	PIO9
9	PIO11	39	PIO0
10	PIO12	40	PIO1
11	PIO13	41	PIO8
12	SPI/PCM	42	PIO7
13	GND	43	PIO6
14	PIO3	44	PIO21
15	PIO2	45	PIO18
16	PIO5	46	LED2
17	PIO4	47	GND
18	GND	48	MIC_BIAS
19	GND	49	LINE_AN
20	RESET	50	LINE_AP
21	GND	51	LINE_BN
22	LED1	52	LINE_BP
23	LED0	53	GND
24	VREGENABLE	54	SPK_RN
25	GND	55	SPK_RP
26	VBUS	56	SPK_LN
27	CHG_EXT	57	SPK_NP
28	VBAT_SENSE	58	GND
29	VBAT	59	RF
30	GND	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

00A6 94 XXXXXX

Concerning the dimension and printing content of the tab, :

1 line the last six letters of the LAP on the module

2 line the software version

3 line the customer material part number

Qr code area, with 12 letters (MAC Address)



(This Photos are for reference only)

The tab code pastes style:



(This Photos are for reference only)

Moisture Sensitive Level

The MSL Rating of BM830 Module is 3.

TABLE 1. MOISTURE SENSITIVITY LEVELS

LEVEL	FLOOR LIFE	
	CONDITIONS	TIME (NOTE 1)
1	$\leq 30^{\circ}\text{C} / 85\% \text{ RH}$	Unlimited (Note 2)
2	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	1 Year
2A	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	4 Weeks
3	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	168 Hours
4	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	72 Hours
5	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	48 Hours
5A	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	24 Hours
6	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	6 Hours

NOTES:

1. Time after removing from dry pack in a $\leq 30^{\circ}\text{C} / 60\% \text{ RH}$ ambient.
2. Dry pack not required. Maximum conditions $30^{\circ}\text{C} / 85\% \text{ RH}$.

Un-opened reels Shelf life:

BM830 has 12 months maximum from bag seal date when stored at $< 40^{\circ}\text{C} / 90\% \text{ RH}$.

Standard Packing Information

Module packing Box (Max 3000pcs module per box)

60pcs per tray, 10trays per ESD bag, sealed in ESD PE bag.

Maximum modules per ESD bag is 600pcs

Module packing bag dimension: 350.0mm x 195.0mm

Delivering carton box

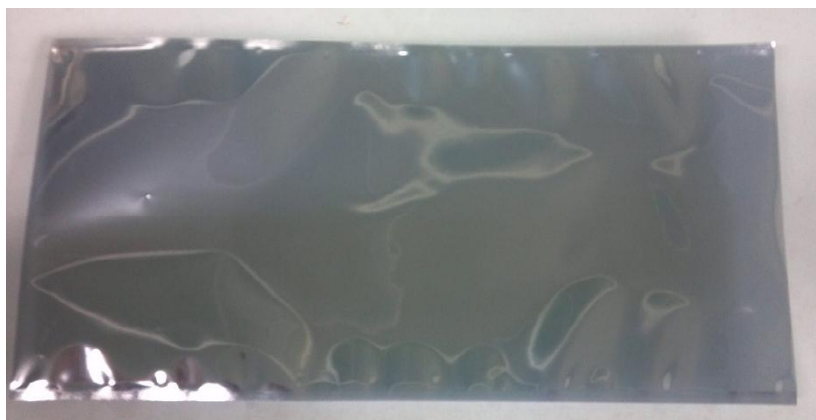
To hold two units of module carton boxes for shipment (Max 3000pcs modules per box)

Delivery Carton Box dimension: 320.0mm x 210.0mm x 170.0mm (W x D x H)

ESD tray dimension: 290.00mm x 145.00mm x 10mm(W x D x H)



ESD tray (to be packed in ESD PE bag).



ESD PE bag size: 350.0mm x 195mm

QDL Certificate

Document References

References	Version
Specifications of the Bluetooth System	V4.0, 17 Dec. 2009
BlueCore-CSR8630 Product Data Sheet	CS-303724-DSP1



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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

The module must be installed in HOME THEATER AUDIO SYSTEM

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 FCC ID: ACI-SC-HTB8.”

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

Document History

Revision	Date	History
V0.1	2013-08-02	First release
V0.2	2013-12-2	Add the packing information
Contact Information		

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