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## 1 Introduction

**Easy Core Tech.** introduces the pioneer of the Bluetooth 4.2 modules EM6C625B which is a high performance, cost effective, low power and compact solution. The Bluetooth module provides a complete 2.4GHz Bluetooth system based on the BlueCore CSRA64215 chipset which is a single chip radio and baseband IC for Bluetooth 2.4GHz systems,. This module is fully compliant to Bluetooth v4.2 for audio communications.

## 2 Key Features

### Bluetooth Profiles

- Bluetooth v4.2 specification support
- A2DP v1.3
- AVRCP v1.6
- HFP v1.6
- HSP v1.2
- DI v1.3

### Music Enhancements

- aptX, aptX Low Latency, SBC and AAC
- TrueWireless Stereo (TWS)
- Configurable Signal Detection to trigger events
- Up to 10 stages of Speaker Parametric EQ
- Up to 6 banks of 5 stages of User Parametric EQ for music playback (user, rock, pop, classical, jazz, etc)
- MeloD Expansion 3D stereo widening and phase shifting effect
- Volume Control
- Comander to compress or expand the dynamic range of the audio
- Post Mastering to improve DAC fidelity
- Volume Boost

### Additional Functionality

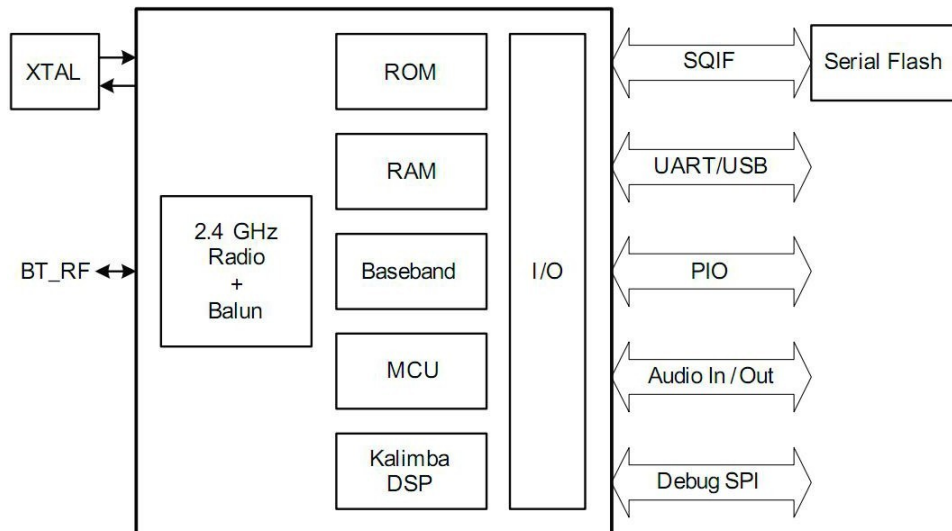
- Support for multi-language programmable audio prompts
- CSR's proximity pairing and CSR's proximity connection
- Multipoint support for A2DP connection to 2 A2DP sources for music playback
- Talk-time extension
- Slim module with 15mm x 18mm x 2.0mm



### 3 Applications

- Stereo Headsets
- Wired Stereo headsets and headphones
- Portable Bluetooth Stereo speakers

### 4 Block Diagram



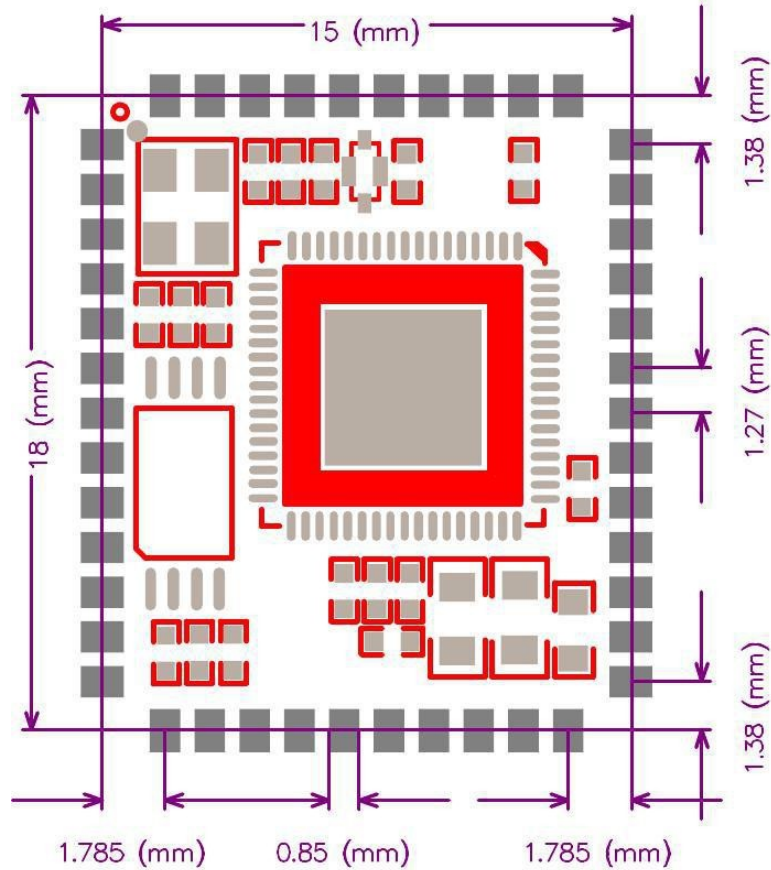
### 5 General specifications

<b>Model Name</b>	<b>EM6C625B</b>
<b>Product Description</b>	<b>Bluetooth 4.2 Class2 Module</b>
Bluetooth Standard	Bluetooth 4.2
Chipset	CSRA64215
Dimension	15mm x 18mm x 2.0mm
<b>Operating Conditions</b>	
Voltage	2.8~4.2V
Temperature	-10~+70 °C
Storage Temperature	-40~+85 °C
<b>Electrical Specifications</b>	
Frequency Range	2402~2480MHz
Maximum RF Transmit Power	4dBm
$\pi/4$ DQPSK Receive Sensitivity	-92dBm
8DPSK Receive Sensitivity	-82dBm



## 6 Module Package Information

### 6.1 Pinout Diagram and package dimensions

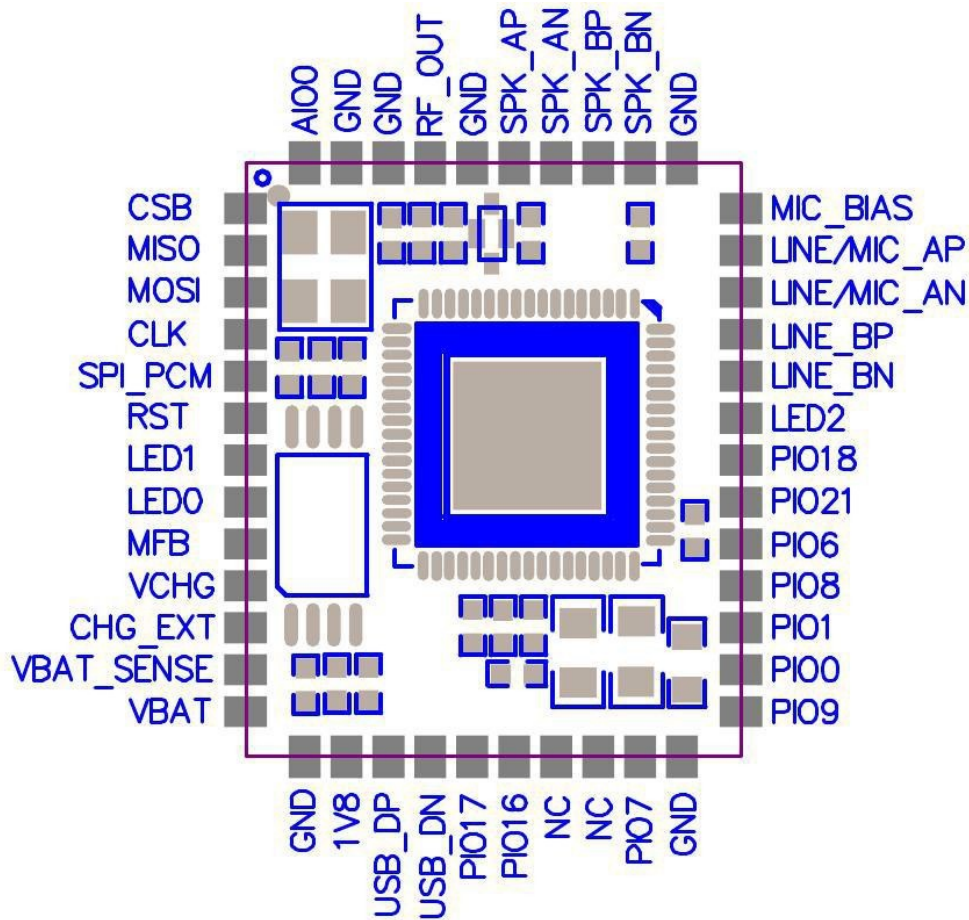


Unit: MM

**Recommended PCB layout footprint**



## 6.2 Module Pin descriptions



Pin No.	Pin Name	Pin Type	Description
1	SPI_CSB	Bidirectional with weak pull-down	Programmable input / output line 4 Alternative function: SPI_CS#: chip select for Debug SPI, active low PCM1_SYNC: PCM1 synchronous data sync I2S1_WS: I <sup>2</sup> S1 word select
2	SPI_MISO	Bidirectional with weak pull-down	Programmable input / output line 3 Alternative function: SPI_MISO: Debug SPI data output PCM1_OUT: PCM1 synchronous data output I2S1_SD_OUT: I <sup>2</sup> S1 synchronous data output
3	SPI_MOSI	Bidirectional with weak pull-down	Programmable input / output line 2 Alternative function: SPI_MOSI: Debug SPI data input PCM1_IN: PCM1 synchronous data input I2S1_SD_IN: I <sup>2</sup> S1 synchronous data input SPDIF_IN: SPDIF input



4	SPI_CLK	Bidirectional with weak pull-down	Programmable input / output line 5 Alternative function: SPI_CLK: Debug SPI clock PCM1_CLK: PCM1 synchronous data clock I2S1_SCK: I2S1 synchronous data clock
5	SPI_PCM#	Input with weak pull-down	SPI/PCM select input: 0 = PCM/PIO interface 1 = SPI
6	RSTn	Input with strong pull-up	Reset if low. Pull low for minimum 5ms to cause a reset.
7	LED1	Bidirectional	LED driver
8	LED0	Bidirectional	LED driver
9	VREG_EN	Power on/off key input	Power on/off input key indication
10	VCHG	Charger voltage input	Internal charger input for charging
11	CHG_EXT	Charger external pin	External battery charger control. External battery charger transistor base control when using external charger boost. Otherwise leave unconnected.
12	VBAT_SENSE	Battery Sense	Battery charger sense input
13	VBAT	Battery positive terminal	Power supply input for 2.7~4.2V
14	GND	VSS	Ground
15	1V8	1.8V output	1.8V output for keys
16	USB_P	Bidirectional	USB data plus
17	USB_N	Bidirectional	USB data minus
18	PIO17	Bidirectional with strong pull-down	Programmable input/output line 17
19	PIO16	Bidirectional with strong pull-up	Programmable input/output line 16
20	NC	NC	NC
21	NC	NC	NC
22	PIO7	Bidirectional with strong pull-down	Programmable input/output line 7
23	GND	VSS	Ground
24	PIO9	Bidirectional with strong pull-down	Programmable input/output line 9
25	PIO0	Bidirectional with strong pull-up	Programmable input/output line 0
26	PIO1	Bidirectional with strong pull-up	Programmable input/output line 1
27	PIO8	Bidirectional with strong pull-up	Programmable input/output line 8
28	PIO6	Bidirectional with strong pull-down	Programmable input/output line 6
29	PIO21	Bidirectional with weak pull-down	Programmable input/output line 21
30	PIO18	Bidirectional with weak pull-down	Programmable input/output line 18
31	LED2	Bidirectional	LED driver
32	LINE_BN	Analog input	Line input negative, channel B
33	LINE_BP	Analog input	Line input positive, channel B
34	LINE/MIC_AN	Analog input	Line or microphone input positive, channel
35	LINE/MIC_AP	Analog input	Line or microphone input negative, channel



36	MIC BIAS	Analog	Microphone bias output
37	GND	VSS	Ground
38	SPK_BN	Analog output	Speaker output negative right
39	SPK_BP	Analog output	Speaker output positive right
40	SPK_AN	Analog output	Speaker output negative left
41	SPK_AP	Analog output	Speaker output positive left
42	GND	VSS	Ground
40	RF_PORT	Analog	Bluetooth signal input/output port
44	GND	VSS	Ground
45	GND	VSS	Ground
46	AIO0	Bidirectional	Analogue programmable input/output line

## 7 Electrical Characteristics

### 7.1 Absolute Maximum Ratings

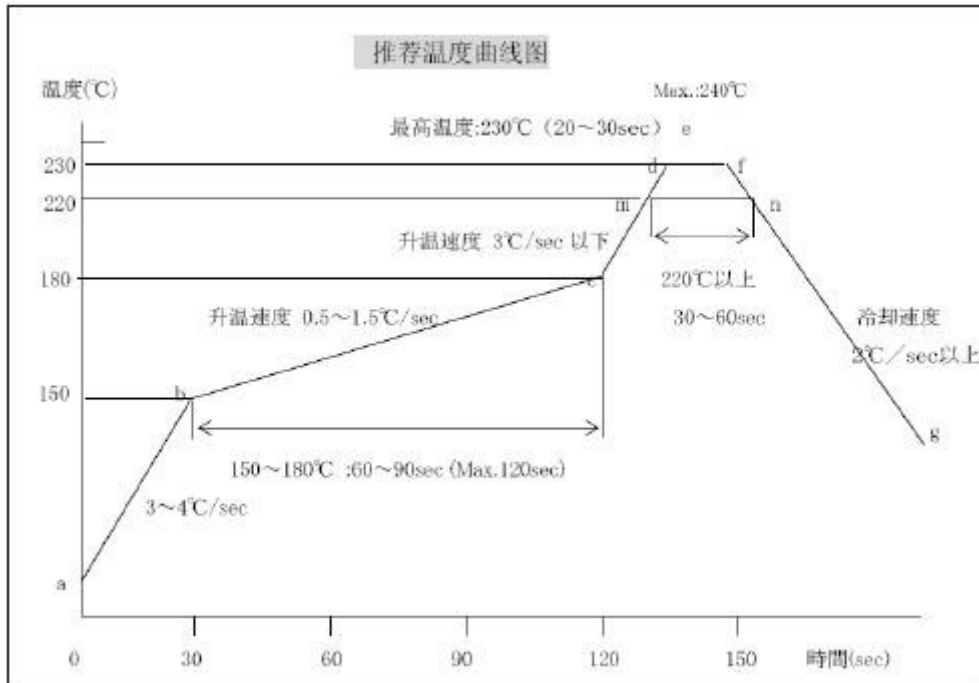
Rating	Minimum	Maximum
Storage temperature	-40°C	+85°C


### 7.2 Recommended Operating Conditions

Operating Condition	Minimum	Maximum
Operating temperature range	-10°C	+70°C
Supply voltage: VBAT	+2.8V	+4.2V



## 8 Recommended reflow temperature profile





**CAUTION**  
This bag contains  
MOISTURE-SENSITIVE DEVICES

LEVEL

3

If Blank, see adjacent  
bar code label

1. Calculated shelf life in sealed bag:12 months at < 40 °C and < 90% relative humidity (RH)
2. Peak package body temperature: 260 °C  
If Blank, see adjacent bar code label
3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must
  - a) Mounted within: 168 hours of factory  
If Blank, see adjacent bar code label
 conditions ≤ 30 °C / 60 %  
 b) stored at < 10%RH
4. Devices require bake, before mounting, if :
  - a) Humidity Indicator Card is > 10 %when read at 23 ± 5 °C
  - b) 3a or 3b not met.
5. If baking is required, devices may be baked for 48 hours at 125 ± 5 °C  
Note: If device containers cannot be subjected to high temperature or shorter bake times are desired,  
reference IPC /JEDEC J-STQ-033 for bake procedure

Bag Seal Date: \_\_\_\_\_  
If Blank, see adjacent bar code label

Note: Level and body temperature defined by IPC /JEDEC J-STQ-020

**The module Must go through 125°C baking for at least 9 hours before SMT AND IR reflow process!**





## Record of Changes

Data	Revision	Description
2016-01-30	V1.0	Original publication of this document.
2016-07-25	V1.1	Fix the error description.

## IMPORTANT NOTICE

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