



Bluetooth Module Datasheet

Model: TS64215

Tinyos Electronics @ 2016
Version 1.2

List of Contents

1 Introduction	3
2 Key Features	3
3 Applications	4
4 Block Diagram	4
5 General specifications	4
6 Module Package Information	5
6.1 Pinout Diagram and package dimensions	5
6.2 Module Pin descriptions	6
7 Electrical Characteristics	8
7.1 Absolute Maximum Ratings	8
7.2 Recommended Operating Conditions	8
8 Recommended reflow temperature profile	9

1 Introduction

Tinysine Electronics introduces the pioneer of the Bluetooth 4.2 modules TS-64215 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

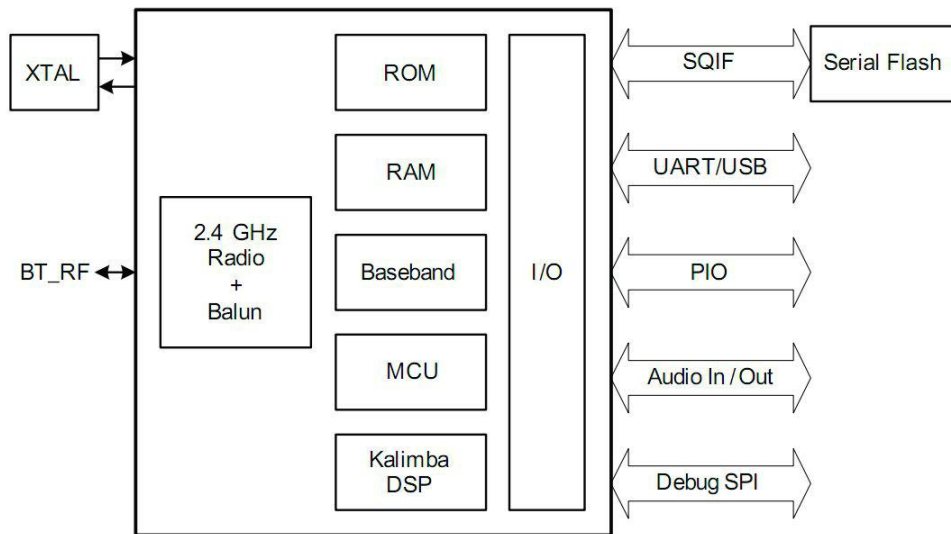
Additional Functionality

- 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 28.5mm x 13mm x 2.0mm

3 Applications

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

4 Block Diagram

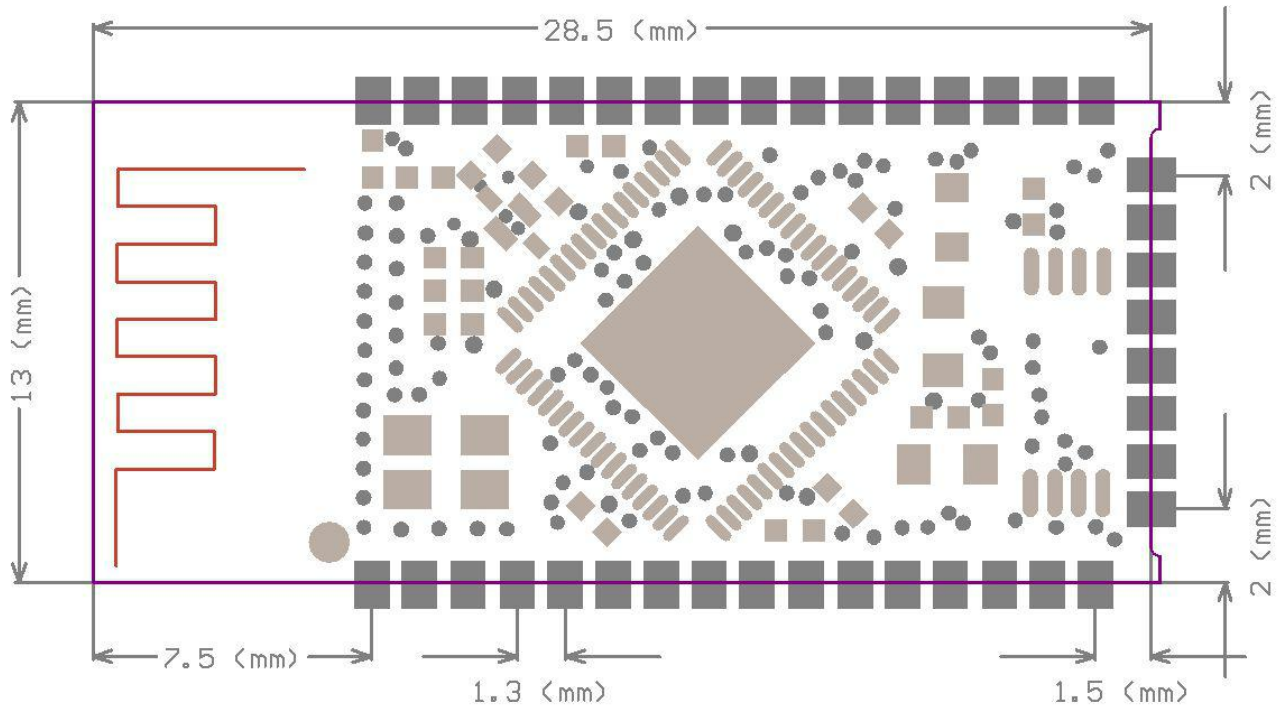


5 General specifications

Model Name	TS-64215
Product Description	Bluetooth 4.2 Class2 Module
Bluetooth Standard	Bluetooth 4.2
Chipset	CSRA64215
Dimension	28.5mm x 13mm x 2.0mm
Operating Conditions	
Voltage	2.8~4.2V
Temperature	-10~+70°C
Storage Temperature	-40~+85°C
Electrical Specifications	
Frequency Range	2402~2480MHz
Maximum RF Transmit Power	4dBm
$\pi/4$ DQPSK Receive Sensitivity	-92dBm
8DPSK Receive Sensitivity	-82dBm

6 Module Package Information

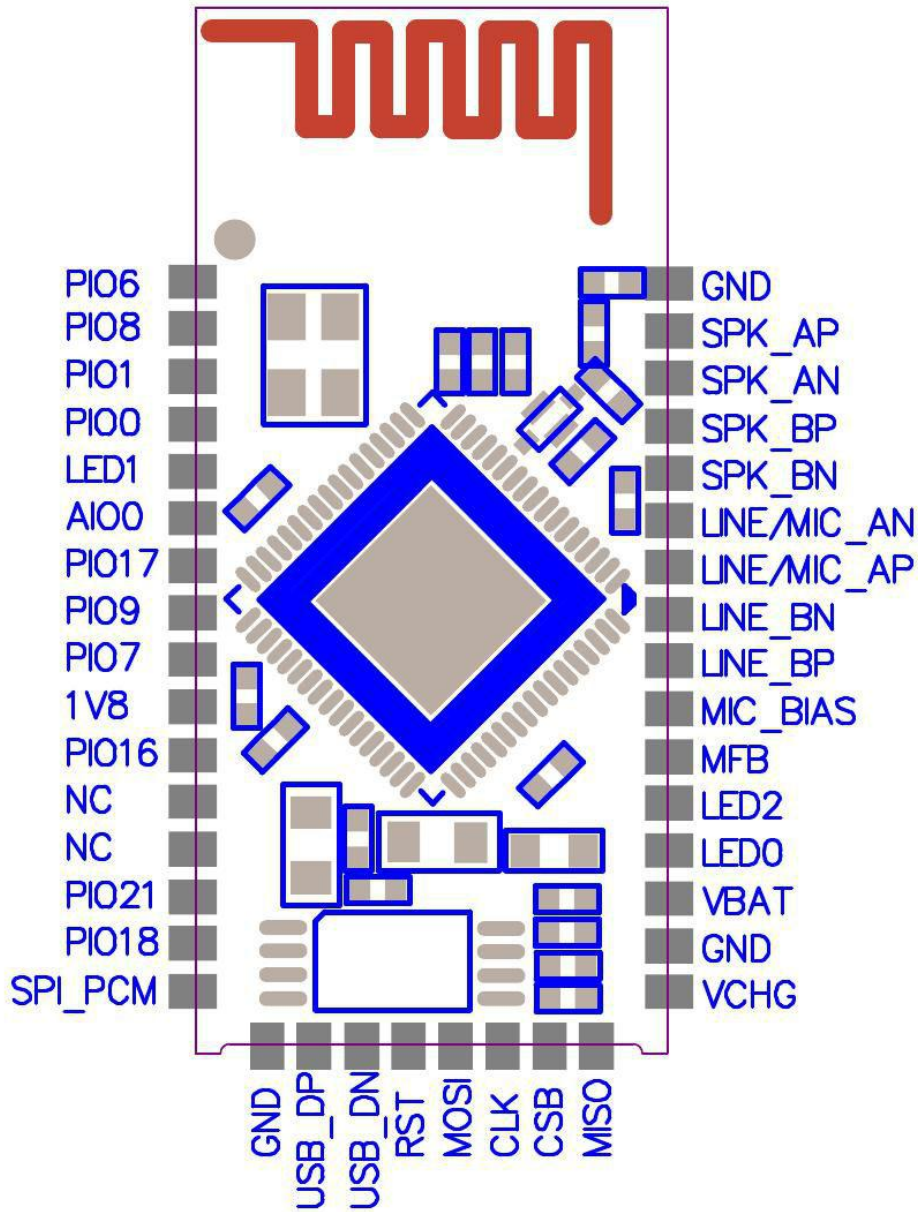
6.1 Pinout Diagram and package dimensions



Unit: MM

Recommended PCB layout footprint

6.2 Module Pin descriptions



Pin No.	Pin Name	Pin Type	Description
1	PIO6	Bidirectional with strong pull-down	Programmable input/output line 6
2	PIO8	Bidirectional with strong pull-up	Programmable input/output line 8
3	PIO1	Bidirectional with strong pull-up	Programmable input/output line 1
4	PIO0	Bidirectional with strong pull-up	Programmable input/output line 0
5	LED1	Bidirectional	LED driver
6	AIO0	Bidirectional	Analogue programmable input/output line
7	PIO17	Bidirectional with strong pull-down	Programmable input/output line 17
8	PIO9	Bidirectional with strong pull-down	Programmable input/output line 9

9	PIO7	Bidirectional with strong pull-down	Programmable input/output line 7
10	1V8	1.8V output	1.8V output for keys
11	PIO16	Bidirectional with strong pull-up	Programmable input/output line 16
12	NC	NC	NC
13	NC	NC	NC
14	PIO21	Bidirectional with weak pull-down	Programmable input/output line 21
15	PIO18	Bidirectional with weak pull-down	Programmable input/output line 18
16	SPI_PCM#	Input with weak pull-down	SPI/PCM select input: 0 = PCM/PIO interface 1 = SPI
17	GND	VSS	Ground
18	USB_P	Bidirectional	USB data plus
19	USB_N	Bidirectional	USB data minus
20	RSTn	Input with strong pull-up	Reset if low. Pull low for minimum 5ms to cause a reset.
21	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 ² S1 synchronous data input SPDIF_IN: SPDIF input
22	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: I ² S1 synchronous data clock
23	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 ² S1 word select
24	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 ² S1 synchronous data output
25	VCHG	Charger voltage input	Internal charger input for charging
26	GND	VSS	Ground
27	VBAT	Battery positive terminal	Power supply input for 2.7~4.2V
28	LED0	Bidirectional	LED driver
29	LED2	Bidirectional	LED driver
30	VREG_EN	Power on/off key input	Power on/off input key indication

31	MIC_BIAS	Analog	Microphone bias output
32	LINE_BP	Analog input	Line input positive, channel B
33	LINE_BN	Analog input	Line input negative, channel B
34	LINE/MIC_AP	Analog input	Line or microphone input positive, channel
35	LINE/MIC_AN	Analog input	Line or microphone input negative, channe
36	SPK_BN	Analog output	Speaker output negative right
37	SPK_BP	Analog output	Speaker output positive right
38	SPK_AN	Analog output	Speaker output negative left
39	SPK_AP	Analog output	Speaker output positive left
40	GND	VSS	Ground

7 Electrical Characteristics

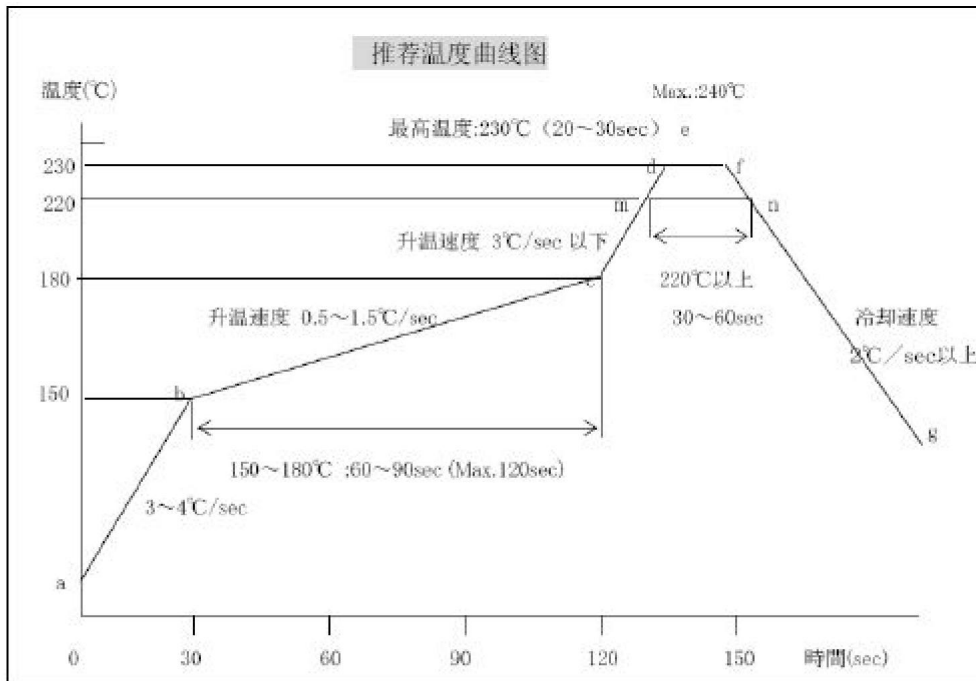
7.1 Absolute Maximum Ratings


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!

若拆封后未立即上线，建议让模块下次上线前务必以 125°C烘烤 9 小时以上！

Record of Changes

Data	Revision	Description
2015-11-26	V1.0	Original publication of this document.
2016-01-29	V1.2	

IMPORTANT NOTICE

Tinysine Technologies Co.,Ltd reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current. All products are sold subject to the Tinysine terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

Tinysine warrants performance of its products to specifications applicable at the time of sale in accordance with Tinysine's standard warranty. Testing and other quality control techniques are utilized to the extent Tinysine deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

In order to minimize risks associated with customer applications, adequate design and operating safeguards must be used by the customer to minimize inherent or procedural hazards. Tinysine products are not authorized for use as critical components in life support devices or systems without the express written approval of an officer of the company. Life support devices or systems are devices or systems that are intended for surgical implant into the body, or support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided, can be reasonably expected to result in a significant injury to the user. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Tinysine assumes no liability for applications assistance or customer product design.

Tinysine does not warrant or represent that any license, either express or implied, is granted under any patent right, mask work right, or other intellectual property right of Tinysine covering or relating or any combination, machine, or process in which such products or services might be or are used.