TinySine

Bluetooth Module Datasheet

Model: TS8675

TinySine Electronics @ 2018

List of Contents

1 Introduction

TINYSINE electronics introduces the pioneer of the Bluetooth 5.0 modules TS-8675 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 CSR8675 BGA chipset which is a single chip radio and baseband IC for Bluetooth 2.4GHz systems,. This module is fully qualified single-chip dual mode Bluetooth@v5.0 system.

2 Key Features

Bluetooth Profiles
- Bluetooth v5.0 specification support
- Qualcomm® Bluetooth® Low Energy secure connection
- A2DP v1.3.1
- AVRCP v1.6
- HFP v1.7
- HSP v1.2
- MAP v1.1
- PBAP v1.1.1
- DID v1.1
- QTIL's proximity pairing and QTIL's proximity connection

Music Enhancements
- aptX, aptX Low Latency, SBC, and AAC audio codecs
- Qualcomm TrueWireless™ Stereo (TWS), which allows two devices to be configured as a stereo pair
- Configurable Signal Detection to trigger events
- 1 bank of up to 10-stage Speaker Parametric EQ
- 6 banks of up to 5-stage User Parametric EQ for music enhancement
- Qualcomm® meloD™ Expansion audio processing: 3D stereo widening
- Compander to compress or expand the dynamic range of the audio
- Post Mastering to improve DAC fidelity
- Dual I²S outputs with crossover

Additional Functionality
- Support for multi-language programmable audio prompts
- Multipoint support for A2DP connection to 2 A2DP sources for music playback
- Talk-time extension, which automatically reduces processor functions to extend use when a low battery condition is detected
- Slim module with 15mm x 22mm x 2.0mm

3 Applications

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

4 Block Diagram
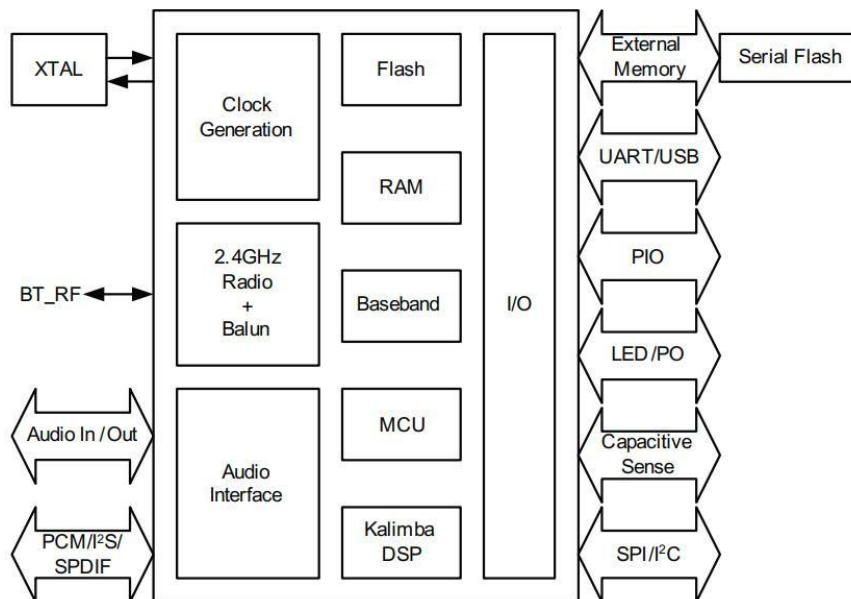
5 General specifications

Model Name	TS-8675
Product Description	**Bluetooth 5.0 Class2 Module**
Bluetooth Standard	Bluetooth 5.0
Chipset	CSR8675 BGA
Dimension	15mm x 22mm x 2.0mm
Operating Conditions	
Voltage	2.8~4.2V
Temperature	-10～+70℃
Storage Temperature	-40～+85℃
Electrical Specifications	
Frequency Range	2402～2480MHz
Maximum RF Transmit Power	9dBm
π/4 DQPSK Receive Sensitivity	-91dBm
8DPSK Receive Sensitivity	-81dBm

6 Module Package Information

6.1 Pinout Diagram and package dimensions
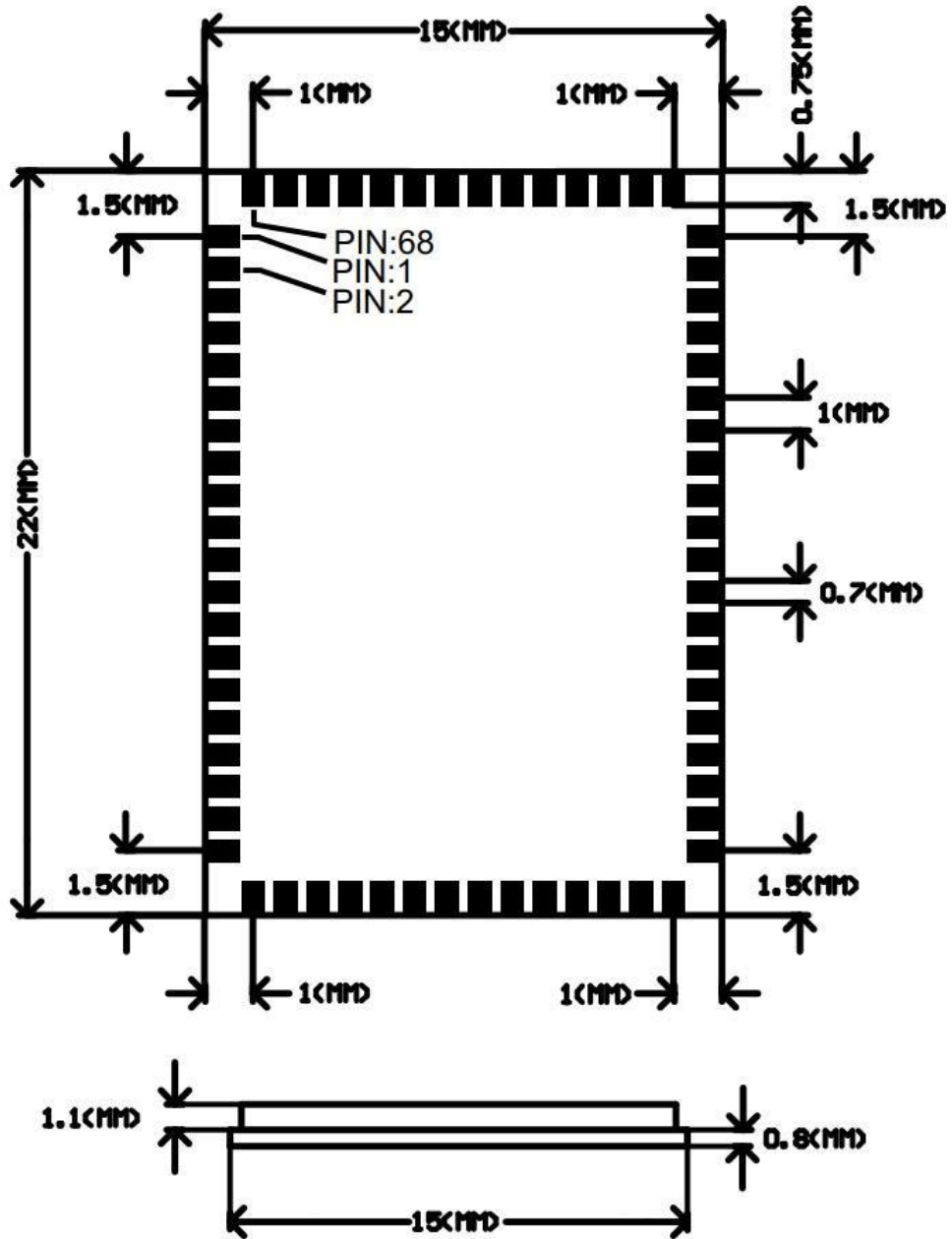
Note: Tolerence without mark default +/-0.05mm
尺寸未标注公差处公差为+/-0.05mm
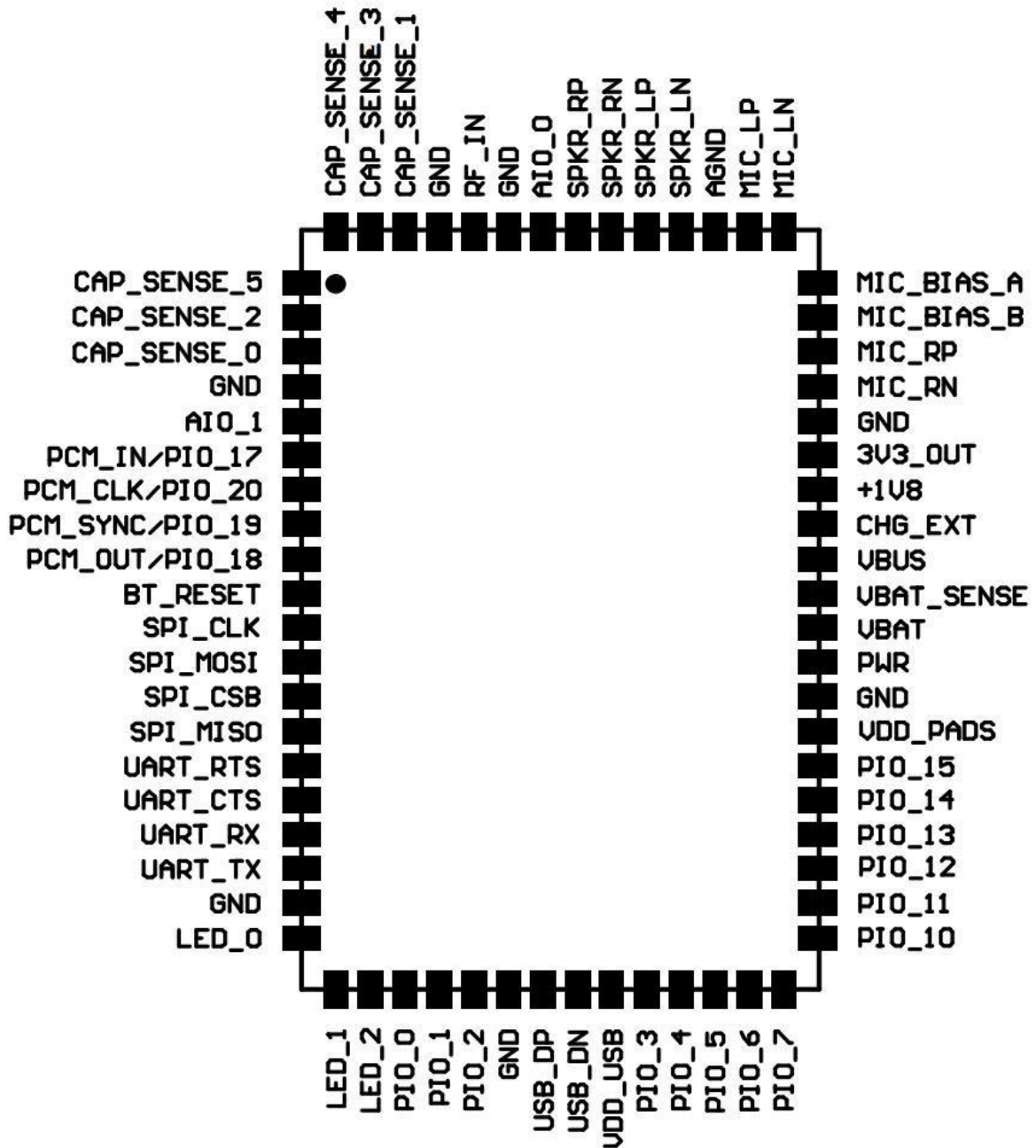
Unit：MM

Recommended PCB layout footprint

6.2 Module Pin descriptions

Pin#	Pin Name	Pin Type	Description
1	CAP_SENSE_5	Analogue input	Capacitive touch sensor input
2	CAP_SENSE_2	Analogue input	Capacitive touch sensor input
3	CAP_SENSE_0	Analogue input	Capacitive touch sensor input
4	GND	Ground	Digital Ground
5	AIO_1	Bi-directional	Analogue programmable input / output line
6	PCM_IN/PIO_17	Bi-directional with weak pull_down	Synchronous data input.Alternative function PIO[17]
7	PCM_CLK/PIO_20	Bi-directional with weak pull_down	Synchronous data clock.Alternative function PIO[20]
8	PCM_SYNC/PIO_19	Bi-directional with weak pull_down	Synchronous data sync.Alternative function PIO[19]

9	PCM_OUT/PIO_18	Bi-directional with weak pull_down	Synchronous data output.Alternative function PIO[18]
10	BT_RESET	Input with strong pull-up	Reset if low.Input debouced so must be low for >5ms to cause a reset
11	SPI_CLK	Input with weak pull-down	SPI Clock
12	SPI_MOSI	Input with weak pull-down	SPI data input
13	SPI_CSB	Input with strong pull-up	Chip select for SPI,active low
14	SPI_MISO	Output with weak pull-down	SPI data output
15	UART_RTS	Bi-directional with weak pull_up	UART request to send,active low.Alternative function PIO[16]
16	UART_CTS	Bi-directional with weak pull_down	UART clear to send,active low
17	UART_RX	Bi-directional with strong pull_up	UART data input
18	UART_TX	Bi-directional with weak pull_up	UART data output
19	GND	Ground	Digital Ground
20	LED_0	Open drain	LED driver Alternative function PIO[29]
21	LED_1	Open drain	LED driver Alternative function PIO[30]
22	LED_2	Open drain	LED driver Alternative function PIO[31]
23	PIO_0	Bi-directional with weak pull_down	Programmable input/output line
24	PIO_1	Bi-directional with weak pull_down	Programmable input/output line
25	PIO_2	Bi-directional with weak pull_down	Programmable input/output line
26	GND	Ground	Digital Ground
27	USB_DP	Bi-directional	USB data plus with selectable internal 1.5kohm pull-up resistor
28	USB_DN	Bi-directional	USB data minus
29	VDD_USB	NC	Positive supply for USB ports
30	PIO_3	Bi-directional with weak pull_down	Programmable input/output line
31	PIO_4	Bi-directional with weak pull_down	Programmable input/output line
32	PIO_5	Bi-directional with weak pull_down	Programmable input/output line
33	PIO_6	Bi-directional with weak pull_down	Programmable input/output line
34	PIO_7	Bi-directional with weak pull_down	Programmable input/output line
35	PIO_10	Bi-directional with weak pull_down	Programmable input/output line
36	PIO_11	Bi-directional with weak pull_down	Programmable input/output line
37	PIO_12	Bi-directional with weak pull_down	Programmable input/output line
38	PIO_13	Bi-directional with weak pull_down	Programmable input/output line
39	PIO_14	Bi-directional with weak pull_down	Programmable input/output line
40	PIO_15	Bi-directional with weak pull_down	Programmable input/output line
41	VDD_PADS	Analogue in	positive supply input for digital input/output ports PIOx
42	GND	Ground	Digital Ground
43	PWR	Input enable	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.
44	VBAT	Power supply	Battery positive terminal
45	VBAT_SENSE	NC	Battery charger sense input
46	VBUS	Power supply	Alternative supply via bypass regulator for 1.8V and 1.35V switchmode power supply regulator inputs. Must

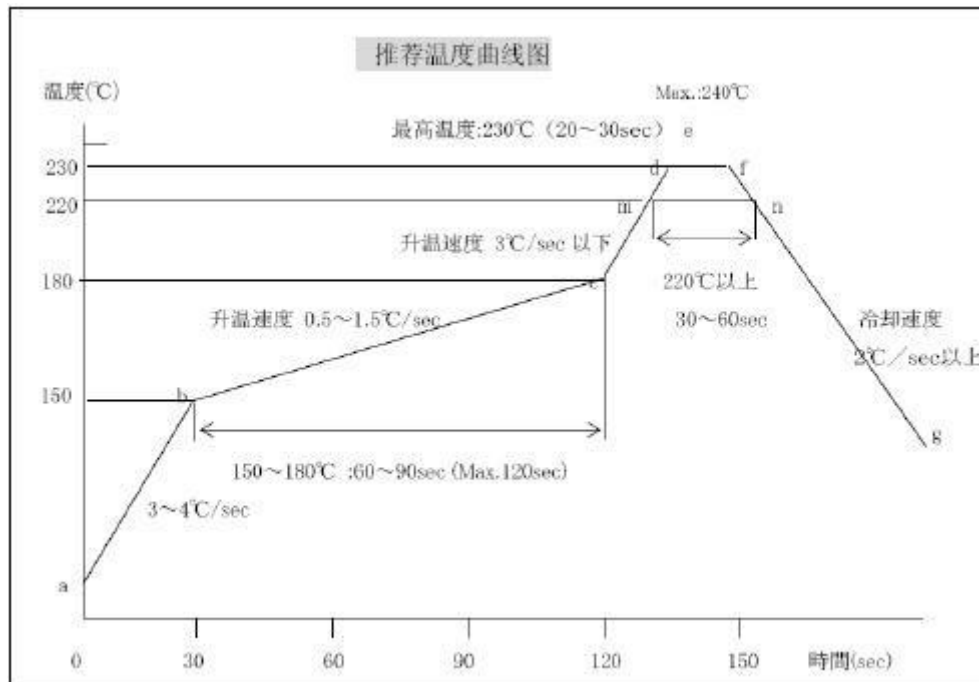|			be connected to the same potential as VOUT_3V3.
47	CHG_EXT	NC	External battery charger control
48	+1V8	Open drain output	LED driver
49	3V3_OUT	Analogue out	3.3V bypass linear regulator output
50	GND	Ground	Digital Ground
51	MIC_RN	Analogue in	Microphone input negative,right
52	MIC_RP	Analogue in	Microphone input positive,right
53	MIC_BIAS_B	Analogue out	Microphone bias B
54	MIC_BIAS_A	Analogue out	Microphone bias A
55	MIC_LN	Analogue in	Microphone input negative,left
56	MIC_LP	Analogue in	Microphone input positive,left
57	AGND	Ground	Analogue Ground
58	SPKR_LN	Analogue out	Speaker output negative,left
59	SPKR_LP	Analogue out	Speaker output positive,left
60	SPKR_RN	Analogue out	Speaker output negative,right
61	SPKR_RP	Analogue out	Speaker output positive,right
62	AIO_0	Bi-directional	Analogue programmable input / output line
63	GND	Ground	Analogue Ground
64	RF_IN	RF	Bluetooth 50ohm transmitter output/receiver input
65	GND	Ground	Analogue Ground
66	CAP_SENSE_1	Analogue input	Capacitive touch sensor input
67	CAP_SENSE_3	Analogue input	Capacitive touch sensor input
68	CAP_SENSE_4	Analogue input	Capacitive touch sensor input

7 Electrical Characteristics

7.1 Absolute Maximum Ratings

Rating	Minimum	Maximum
Storage temperature	-40℃	+85℃

7.2 Recommended Operating Conditions

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

8 Recommended reflow temperature profile

推荐温度曲线图

温度(℃)

Max.:240℃

最高温度:230℃（20～30sec）e

升温速度 3℃/sec 以下

升温速度 0.5～1.5℃/sec

220℃以上
30～60sec

冷却速度
3℃/sec以上

150～180℃ :60～90sec (Max.120sec)

3～4℃/sec

時間(sec)

LEVEL
3

CAUTION
This bag contains
MOISTURE-SENSITIVE DEVICES

If Blank,see adjacent
bar code label

1. Calculated shelf life in sealed bag:12 months at < 40 ℃ and < 90%
   relative humidity (RH)
2. Peak package body temperature: _____260_____ ℃
   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 ℃ / 60 %
   b) stored at < 10%RH
4. Devices require bake, before mounting, if :
   a) Humidity Indicator Card is > 10 %when read at 23 ± 5 ℃
   b) 3a or 3b not met.
5. If baking is required, devices may be baked for 48 hours at 125 ± 5 ℃
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℃ baking for at least 9 hours before SMT AND IR reflow process!

Record of Changes

Data	Revision	Description
2013-01-30	V1.0	Original publication of this document.
2018-07-05	V1.1	Update Bluetooth version.

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