Bluetooth Module Datasheet

CZW-5126-01

Model:CZW-5126-01

Hardware Version：V2.0

Release Date：2019.03.18

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List of Contents

1 summary.....3

2 General specifications.....3

3 Key features.....4

3.1 Audio subsystem.....4

3.2 Application subsystem.....4

3.3 Li-ion battery charger.....4

3.4 Audio engine and digital audio interfaces.....5

3.5 Peripherals and physical interfaces.....5

4 Applications.....5

5 Block diagram..... ...6

6 Module package Information.....7

6.1 Pinout diagram and package dimensions.....7

6.2 Module Pin descriptions.....8

7 Pin function description.....9-10

8 Reference application circuit.....11

9 Characteristics.....12

9.1 Absolute Maximum Ratings.....12

9.2 Recommended Operating Conditions.....12

10 Recommended reflow temperature profile.....12

1 summary

CZW-5126-01 is a Bluetooth module designed by ShenZhen Cheng Zhi Wei Technology Co.,Ltd. using Qualcomm Bluetooth chip qcc5126。

CZW-5126-01 is a Bluetooth, audio and programmable application processor.It includes high-performance, analog, and digital audio codecs, Class-AB and Class-D headphone drivers, advanced power management, Li-ion battery charger, light-emitting diode (LED) drivers, and flexible interfaces including inter┐integrated circuit sound (I²S), universal asynchronous receiver transmitter(UART), and programmable input/output (PIO)。

CZW-5126-01 package is compatible with czw01 series pins, easy replacement and upgrade

2 General specifications

Model Name	CZW-5126-01
Package	40 Pin Module
Dimension	13mm x 28.5mm x 2.4mm
Chipset	QCC5126
Bluetooth Version	Bluetooth 5.1
Power Class	Class2
Transmission Distance	≥10M
Voltage	2.8~4.2V
Temperature	-10～+70℃
Storage Temperature	-40～+85℃
Frequency Range	2402～2480MHz
Maximum RF Transmit Power	9dBm
π/4 DQPSK Receive Sensitivity	-96dBm
8DPSK Receive Sensitivity	-89dBm

3 Key Features

3.1 Audio subsystem

★ Dual 32bit Kalimba audio digital signal processor (DSP) cores with flexible clocking from 2 MHz to 120 MHz to allow optimization and trade-off performance vs. Power consumption
★ DSPs execute code from ROM and from program RAM, original equipment manufacturer (OEM) and third party developed features can run from program RAM
★ 80 KB program RAM
★ 256 KB data RAM
★ 5 Mb ROM
★ 16 Mb Audio buffer RAM

3.2 Application subsystem

★ Dual core application subsystem 32/80 MHz operation
★ 32- bit Firmware Processor:
★ 32- bit Developer Processor:
★ Both cores execute code from external flash memory using QSPI clocked at 32 MHz or 80 MHz
★ On-chip caches per core allow for optimized performance and power consumption Bluetooth subsystem
★ Qualified to Bluetooth v5.0 specification including 2 Mbps Bluetooth low energy (Production parts)
★ Single ended antenna connection with on-chip balun and Tx/Rx switch
★ Bluetooth, Bluetooth low energy, and mixed topologies supported
★ Class 1 support

3.3 Li-ion battery charger

★ Integrated battery charger supporting internal mode (up to 200 mA) and external mode (up to 1.8 A)
★ Variable float (or termination) voltage adjustable in 50 mV steps from 3.65 V to 4.4 V
★ Thermal monitoring and management are implementable in application sftware
★ Pre-charge to fast charge transition configurable at 2.5 V, 2.9 V, 3.0 V, and 3.1 V Power management
★ Integrated power management unit (PMU) to minimize external components
★ Runs directly from a Li-ion, USB, or external supply (2.8 V to 6.5 V)
★ Auto-switching between battery and USB (or other) charging source
★ Power islands employed to optimize power consumption for variety of use-cases
★ Dual switch-mode power supply (SMPS)

3.4 Audio engine and digital audio interfaces

★ 24- bit I²S interface with 1 input and 3 output channels
★ Programmable audio master clock (MCLK)
★ Sony/Philips digital interface (SPDIF): 2, configurable as input or output
★ Stereo analog outputs configurable as differential Class-AB headphone outputs or differential high efficiency Class-D outputs:
★ Dual analog inputs configurable as single ended line inputs or, unbalanced or balanced analog microphone inputs:
★ 1 microphone bias (single bias shared by the two channels):
★ Digital microphone inputs with capability to interface up to 6 digital microphones
★ Both analog-to-digital converter (ADC)s and digital-to-analog converter (DAC)s support sample rates of 8, 16, 32, 44.1, 48, 96 kHz. DACs also support 192 kHz.

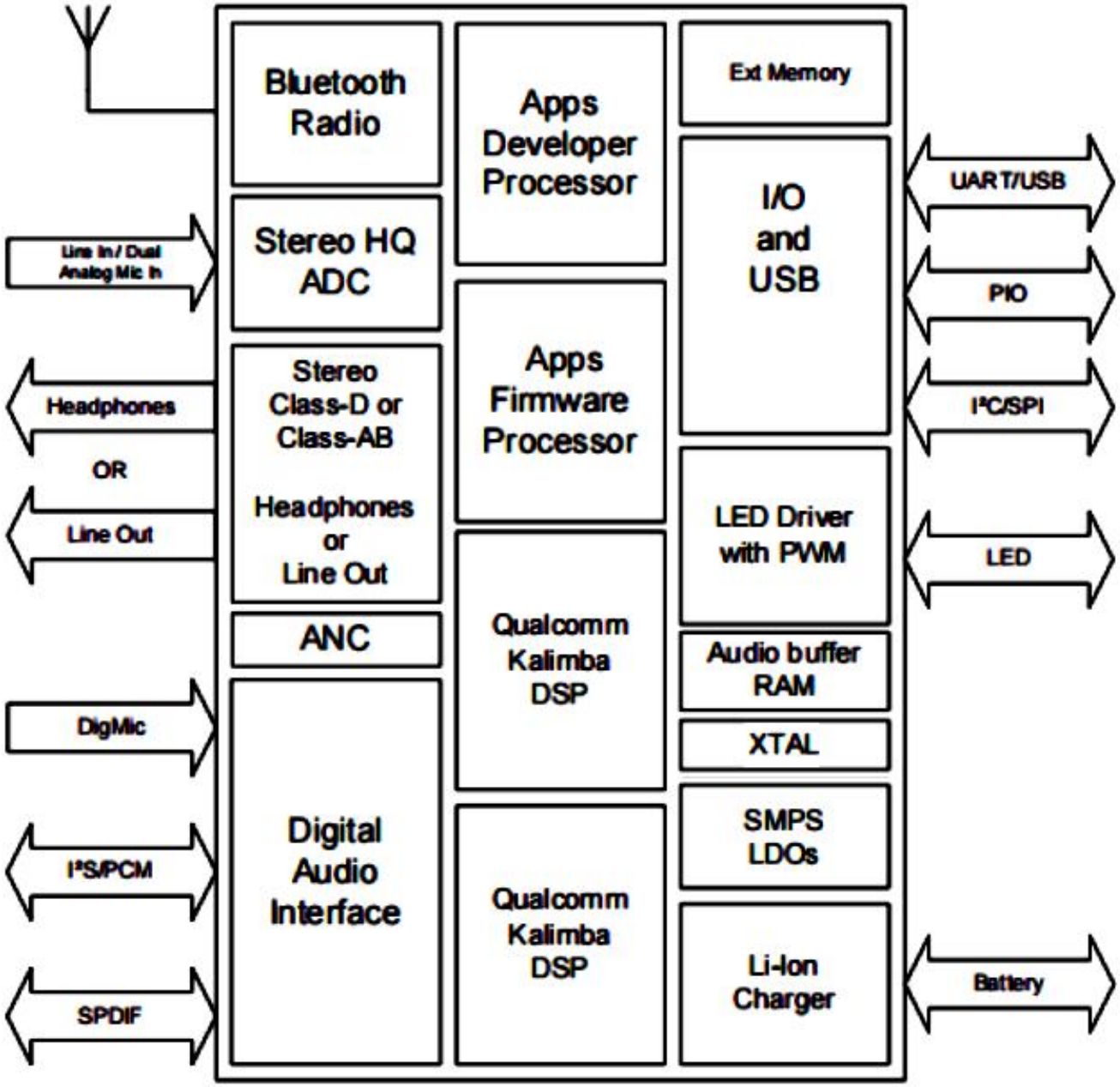
3.5 Peripherals and physical interfaces

★ A UART interface
★ 2 x Bit Serializers (programmable serial peripheral interface (SPI) and I²C hardware accelerator)
★ 1 x USB interface:
★ A secure digital input/output (SDIO) v2.0 compliant Host with 1 port, capable of interfacing to storage device (SD), or multimedia card (MMC) cards
★ QSPI NOR flash interface
★ Up to 19 PIO and 5 open drain/digital input LED pads with pulse width modulation (PWM)

4 Applications

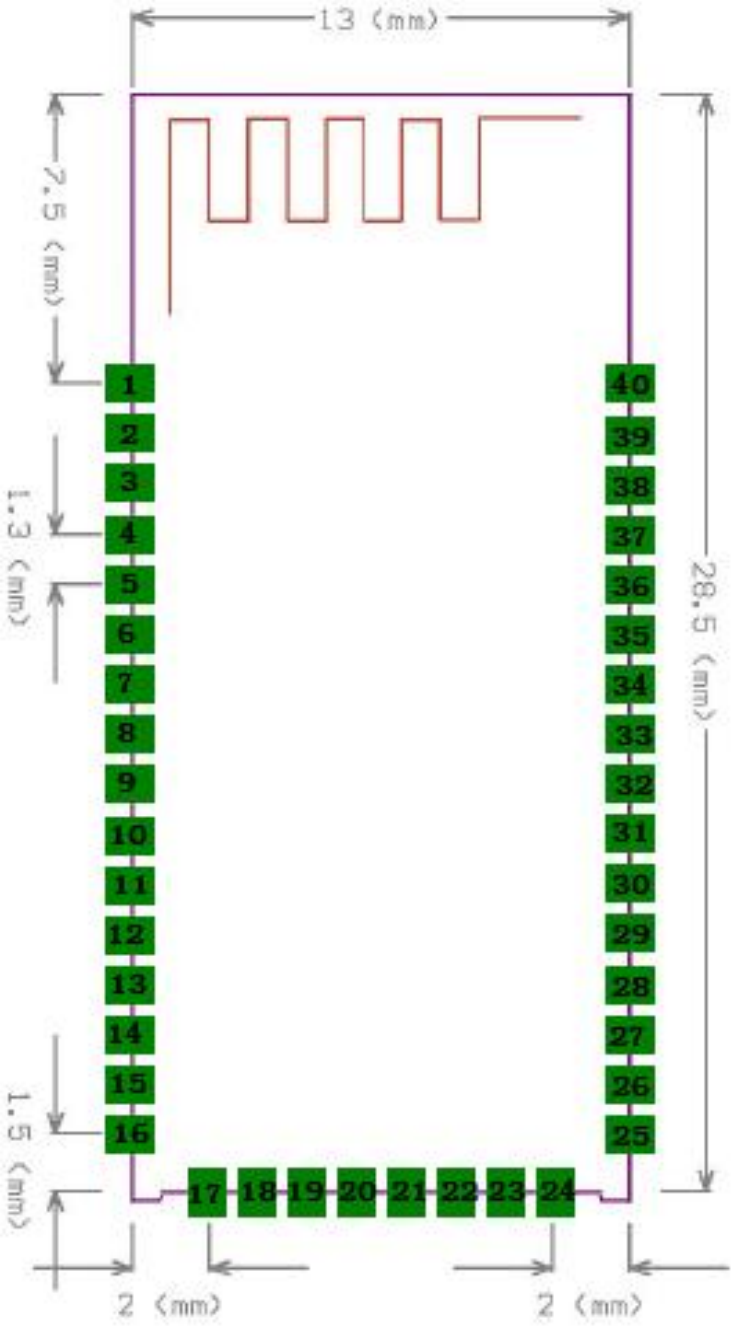
★ Wireless speakers
★ Wired/wireless stereo headsets/headphones
★ Qualcomm True Wireless™ stereo earbuds/speakers

5 Block Diagram

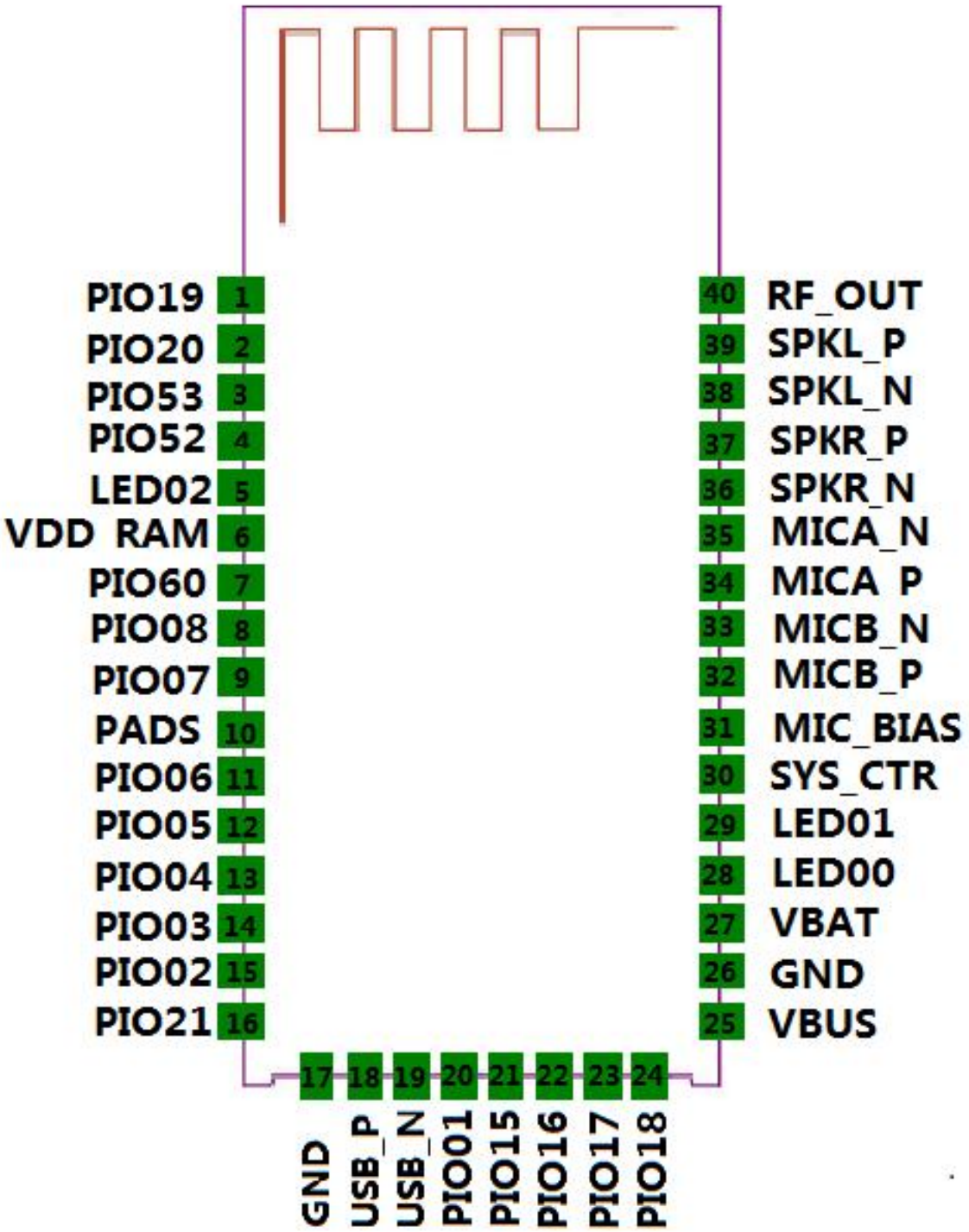


6 Module Package Information

6.1 Pinout Diagram and package dimensions



6.2 Module Pin descriptions

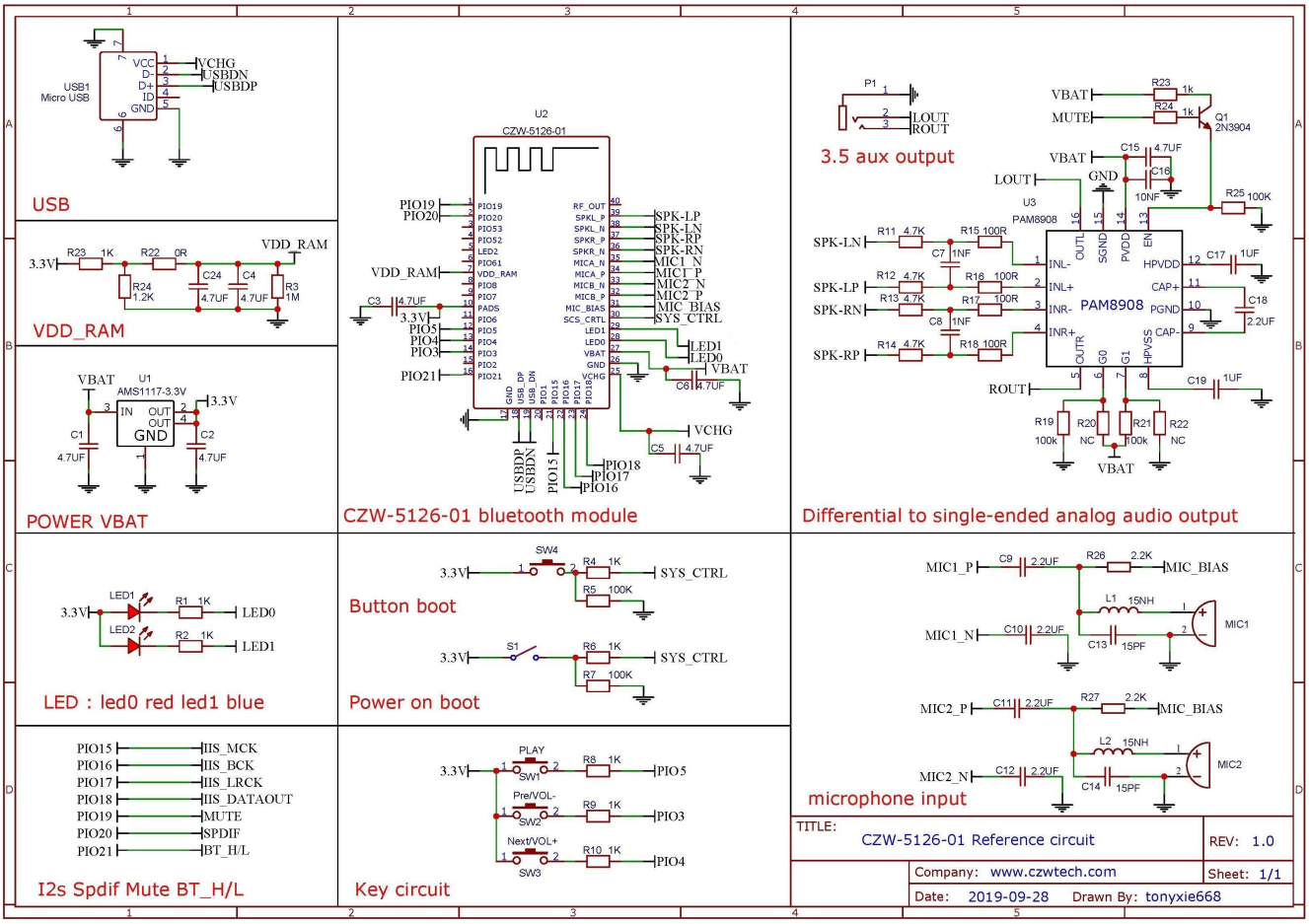


7 Pin Function Description

Pin#	Pin Name	Pin type	Description
1	PIO[19]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 19. Alternative function: PCM_DIN[0]
2	PIO[20]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 20. Alternative function: PCM_DOUT[1]
3	PIO[53]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 53. Alternative function: SDIO_CMD
4	PIO[52]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 52. Alternative function: SDIO_CLK
5	LED[2]	Analog or digital input/ open drain output.	General-purpose analog/digital input or open drain LED output.
6	PIO[61]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 61.
7	VDD_RAM	Supply	1.8 V PIO supply for Audio buffer RAM.
8	PIO[8]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 8. Alternative function: TBR_CLK
9	PIO[7]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 7. Alternative function: TBR_MISO[0]
10	PADS	Supply	1.8 V/3.3 V PIO supply.
11	PIO[6]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 6. Alternative function: TBR_MOSI[0]
12	PIO[5]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 5. Alternative function: TBR_MISO[1]
13	PIO[4]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 4. Alternative function: TBR_MOSI[1]
14	PIO[3]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 3. Alternative function: TBR_MISO[2]
15	PIO[2]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 2. Alternative function: TBR_MISO[3]
16	PIO[21]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 21. Alternative function: PCM_DOUT[2]
17	GND	Ground	Ground
18	USB_DP	Digital	USB Full Speed device D+ I/O. IEC-61000-4-2 (device level) ESD Protection
19	USB_DN	Digital	USB Full Speed device D- I/O. IEC-61000-4-2 (device level) ESD Protection
20	PIO[1]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Automatically defaults to RESET# mode when the device is unpowered, or in off modes. Reconfigurable as a PIO after boot. Alternative function: Programmable I/O line 1
21	PIO[15]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 15. Alternative function: MCLK_OUT
22	PIO[16]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 16. Alternative function: PCM_CLK

Pin#	Pin Name	Pin type	Description
23	PIO[17]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 17. Alternative function: PCM_SYNC
24	PIO[18]	Digital: Bidirectional with programmable strength internal pull- up/pull-down	Programmable I/O line 18. Alternative function: PCM_DOUT[0]
25	VBUS	Supply	Charger input to Bypass regulator.
26	GND	Ground	Ground
27	VBAT	Supply	Battery voltage input.
28	LED[0]	Analog or digital input/ open drain output.	General-purpose analog/digital input or open drain LED output.
29	LED[1]	Analog or digital input/ open drain output.	General-purpose analog/digital input or open drain LED output.
30	SYS_CTRL	Digital input	Typically connected to an ON/OFF push button. Boots device in response to a button press when power is still present from battery and/or charger but software has placed the device in the OFF or DORMANT state. Additionally useable as a digital input in normal operation. No pull. Additional function: PIO[0] input only
31	MIC_BIAS	VDD_AUDIO_1V8	Mic bias output.
32	MIC2_P	VDD_AUDIO_1V8	Microphone differential 2 input, positive. Alternative function: Differential audio line input right, positive
33	MIC2_N	VDD_AUDIO_1V8	Microphone differential 2 input, negative. Alternative function: Differential audio line input right, negative
34	MIC1_P	VDD_AUDIO_1V8	Microphone differential 1 input, positive. Alternative function: Differential audio line input left, positive
35	MIC1_N	VDD_AUDIO_1V8	Microphone differential 1 input, positive. Alternative function: Differential audio line input left, positive
36	SPKR_N	VDD_AUDIO_HP_ SPKR	Headphone/speaker differential right output, negative. Alternative function: Differential right line output, negative
37	SPKR_P	VDD_AUDIO_HP_ SPKR	Headphone/speaker differential right output, positive. Alternative function: Differential right line output, positive
38	SPKL_N	VDD_AUDIO_HP_ SPKL	Headphone/speaker differential left output, negative. Alternative function: Differential left line output, negative
39	SPKL_P	VDD_AUDIO_HP_ SPKL	Headphone/speaker differential left output, positive. Alternative function: Differential left line output, positive
40	RF_OUT	VDD_BT_RADIO	Bluetooth transmit/receive.

8 Reference application circuit



Notice: for reference only, please design the circuit according to the actual application

9 Electrical Characteristics

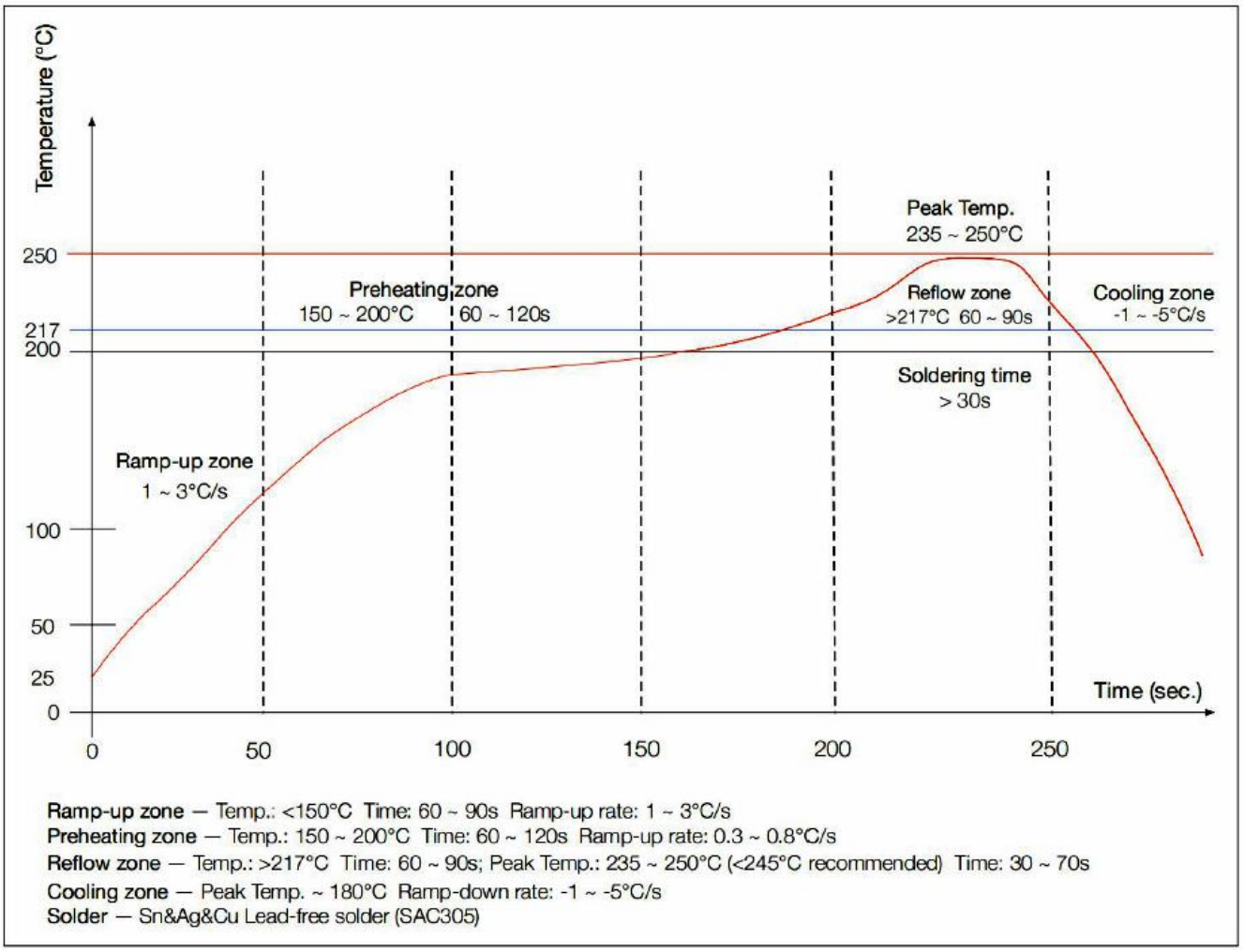
9.1 Absolute Maximum Ratings

Rating	Minimum	Maximum
Storage temperature	-40℃	+85℃

9.2 Recommended Operating Conditions

Operating Condition	Minimum	Maximum
Operating temperature range	-40℃	+85℃
Supply voltage: VBAT	+2.8V	+4.3V

10 Recommended reflow temperature profile



Ramp-up zone — Temp.: <150°C Time: 60 ~ 90s Ramp-up rate: 1 ~ 3°C/s
Preheating zone — Temp.: 150 ~ 200°C Time: 60 ~ 120s Ramp-up rate: 0.3 ~ 0.8°C/s
Reflow zone — Temp.: >217°C Time: 60 ~ 90s; Peak Temp.: 235 ~ 250°C (<245°C recommended) Time: 30 ~ 70s
Cooling zone — Peak Temp. ~ 180°C Ramp-down rate: -1 ~ -5°C/s
Solder — Sn&Ag&Cu Lead-free solder (SAC305)

The module Must go through 100℃ baking for at least 12 hours before SMT AND IR reflow process!

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