

AC7911D Datasheet

Zhuhai Jieli Technology Co.,LTD

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AC7911D Features

High performance 32-bit RISC CPU

- Double core RISC 32-bit CPU(Support FPU)
- 24KB D-Cache 6 way, 32KB I-Cache 8way
- DC-320MHz operation
- 128 Vectored interrupts
- Four Levels interrupt priority

Flexible I/O

- 32 GPIO pins
- All GPIO pins can be programmable as input or output individually
- All GPIO pins are internal pull-up/pull-down selectable individually
- CMOS/TTL level Schmitt triggered input
- External wake up/interrupt on all GPIOs

Peripheral Feature

- FUSB 1.1 OTG controller
- Audio interface supports IIS, left adjusted, right adjusted and DSP mode
- Multi-function 32-bit timers, support capture and PWM mode
- 16-bit PWM generator for motor driving
- 8-bit active parallel port
- Three full-duplex advanced UART
- Two SPI interface supports host and device mode
- One SD Card Host controller
- One IIC interface supports host and device mode
- One SPDIF receiving interface without analog amplify
- Quadrate decoder
- Watchdog
- Two Crystal Oscillator
- Eight channels 10-bit ADC
- Power-on reset
- Embedded PMU support low power mode

Bluetooth Feature

- CMOS single-chip fully-integrated radio and baseband
- Compliant with Bluetooth V2.1(BR+EDR)+ BLE V5.3 specification
- Bluetooth Piconet and Scatternet support
- Meet class2 and class3 transmitting power requirement
- Support GFSK and $\pi/4$ DQPSK all packet types
- Provides +15dbm transmitting power
- Receiver with -93dBm sensitivity
- Support a2dp\avctp\avdtp\avrcp\hfp\spp\smf\att\gap\gatt\rfcomm\sdp\l2cap profile


WIFI Feature

- Support all mandatory IEEE 802.11b data rates of 1, 2, 5.5 and 11 Mbps, all 802.11g payload data rates of 6, 9, 12, 18, 24, 36, 48 and 54 Mbps, as well as 802.11n MCS0~MCS7, MCS32, 20MHz/40MHz BW, 800ns and 400ns guard interval.
- Support advanced 1x1 802.11n features: Full / Half Guard Interval
Frame Aggregation
Reduced Inter-frame Space (RIFS)
Space Time Block Coding (STBC)
Greenfield mode
- Support WEP/WPA-PSK(TKIP/CCMP) /WPA2-PSCK/AES256/AES128/SHA256 /SHA128
- Support apply to AP/STA
- Transmitter power:



DSSS 1M/S	17	dBm
MCS0	16	dBm
MCS7	13	dBm
- Receiver sensitivity:

DSSS 1M/S	-95	dBm
MCS0	-92	dBm
MCS7	-74	dBm

Packages

-  QFN48(6mm*6mm)

Temperature

-  Operating temperature: -40°C to +85°C
-  Storage temperature: -65°C to +150°C



1. Pin Definition

1.1 Pin Assignment

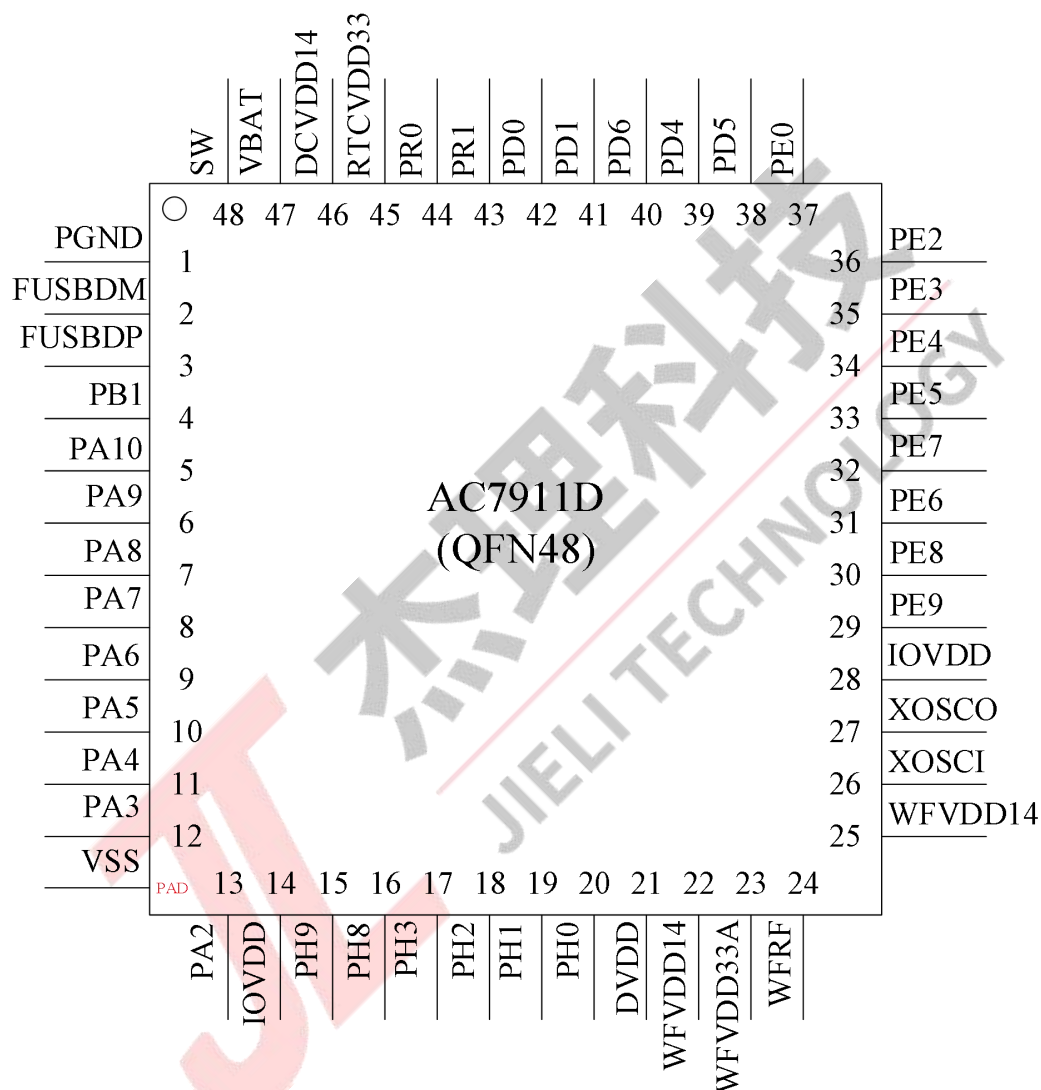


Figure 1-1 AC7911D_QFN48 Package Diagram

1.2 Pin Description

Table 1-1 AC7911D_QFN48 Pin Description

PIN NO.	Name	I/O Type	Drive (mA)	Function	Other Function
1	PGND	P	/	PMU Ground	-
2	FUSBDM	I/O	10	USB Negative Data (pull down)	UART1_RXD: Uart1 Data In(D) ISP_DI_A SPI2_DOB: SPI2 Data Out(B) IIC_SDA_A: IIC SDA(A) ADC12: ADC Channel 12 SDTAP_DATB
3	FUSBDP	I/O	10	USB Positive Data (pull down)	UART1_TXD: Uart1 Data Out(D) ISP_CLK_A SPI2_CLKB: SPI2 Clock(B) IIC_SCL_A: IIC SCL(A) ADC13: ADC Channel 13 SDTAP_CLKB
4	PB1	I/O	24/16/8/2.4	GPIO (pull up)	ISP_DO UART0_TXB: Uart0 Data Out(B) ADC3: ADC Channel 3 Long Press reset TMR1: Timer1 Clock In Wakeup8: Port Wakeup 8
5	PA10	I/O	24/16/8/2.4	GPIO	SD0_DAT1B: SD0 Data1(B) ALNK0_DAT3B1: Audio Link0 Data3(B1) ALNK1_DAT3B1: Audio Link1 Data3(B1) ADC2: ADC Channel 2 TMR7CK(MCPWM)
6	PA9	I/O	24/16/8/2.4	GPIO	SD0_DAT0B: SD0 Data0(B) ALNK0_DAT2B1: Audio Link0 Data2(B1) ALNK1_DAT2B1: Audio Link1 Data2(B1) TMR6CK(MCPWM)
7	PA8	I/O	24/16/8/2.4	GPIO	IIC_SDA_B: IIC SDA(B) SD0_CLKB: SD0 Clock(B) ALNK0_DAT1B1: Audio Link0 Data1(B1) ALNK1_DAT1B1: Audio Link1 Data1(B1) SPDIF_D ADC1: ADC Channel 1 PWMCH1L(MCPWM) Wakeup4: Port Wakeup 4 SDTAP_DATD

PIN NO.	Name	I/O Type	Drive (mA)	Function	Other Function
8	PA7	I/O	24/16/8/2.4	GPIO	IIC_SCL_B: IIC SCL(B) SD0_CMDB: SD0 CMD(B) ALNK0_DAT0B1: Audio Link0 Data0(B1) ALNK1_DAT0B1: Audio Link1 Data0(B1) SPDIF_C ADC0: ADC Channel 0 PWMCH1H(MCPWM) TMR0: Timer0 Clock In Wakeup3: Port Wakeup 3 SDTAP_CLKD
9	PA6	I/O	24/16/8/2.4	GPIO	UART0_RXA: Uart0 Data In(A) SD0_DAT3B: SD0 Data3(B) ALNK0_LRCKB1: Audio Link0 Word Select (B1) ALNK1_LRCKB1: Audio Link1 Word Select(B1) FPIN0(MCPWM)
10	PA5	I/O	24/16/8/2.4	GPIO	UART0_TXA: Uart0 Data Out(A) SD0_DAT2B: SD0 Data2(B) ALNK0_SCLKB1: Audio Link0 Serial Clock(B1) ALNK1_SCLKB1: Audio Link1 Serial Clock(B1) CAP3: Timer3 Capture
11	PA4	I/O	24/16/8/2.4	GPIO	CLKOUT1: Clock Out1 SPI2_DOC: SPI2 Data Out(C) ALNK0_MCKB1: Audio Link0 Master Clock(B1) ALNK1_MCKB1: Audio Link1 Master Clock(B1) UART0_RXC: Uart0 Data In(C) PWMCH0L(MCPWM)
12	PA3	I/O	24/16/8/2.4	GPIO	SPI2_CLKC: SPI2 Clock(C) UART0_TXC: Uart0 Data Out(C) PWMCH0H(MCPWM)
13	PA2	I/O	24/16/8/2.4	GPIO	SPI2_DIC: SPI2 Data In(C) TMR0CK(MCPWM)
14	IOVDD	P	/	IO Power 3.3V	-
15	PH9	I/O	24/16/8/2.4	GPIO	
16	PH8	I/O	24/16/8/2.4	GPIO	

PIN NO.	Name	I/O Type	Drive (mA)	Function	Other Function
17	PH3	I/O	24/16/8/2.4	GPIO	SD0_DAT1C: SD0 Data1(C) UART2_RXA: Uart2 Data In(A) ADC11: ADC Channel 11 PWMCH5H(MCPWM) TOUCH14: Touch Input Channel 14
18	PH2	I/O	24/16/8/2.4	GPIO	SD0_CLKC: SD0 Clock(C) SPI2_DIA: SPI2 Data In(A) UART2_TXA: Uart2 Data Out(A) TOUCH13: Touch Input Channel 13
19	PH1	I/O	24/16/8/2.4	GPIO	IIC_SDA_D: IIC SDA(D) SD0_CMDC: SD0 CMD(C) SPI2_DOA: SPI2 Data Out(A) UART0_RXD: Uart0 Data In(D) PWMCH3L(MCPWM) TOUCH12: Touch Input Channel 12
20	PH0	I/O	24/16/8/2.4	GPIO	IIC_SCL_D: IIC SCL(D) SD0_DAT0C: SD0 Data0(C) SPI2_CLKA: SPI2 Clock(A) UART0_TXD: Uart0 Data Out(D) ADC10: ADC Channel 10 PWMCH3H(MCPWM) Wakeup12: Port Wakeup 12 TOUCH11: Touch Input Channel 11
21	DVDD	P	/	Core Power 1.2V	-
22	WVDD14	P	/	RF Power 1.4V	-
23	WVDD33A	P	/	RF Power 3.3V	-
24	WFRF	-	/	RF Antenna	-
25	WVDD14	P	/	RF Power 1.4V	-
26	XOSCI	I	/	RF OSCI	-
27	XOSCO	O	/	RF OSCO	-
28	IOVDD	P	/	IO Power 3.3V	-
29	PE9	I/O	24/16/8/2.4	GPIO	PAP_D15_B: PAP Data15(B)
30	PE8	I/O	24/16/8/2.4	GPIO	PAP_D14_B: PAP Data14(B)
31	PE6	I/O	24/16/8/2.4	GPIO	PAP_D12_B: PAP Data12(B)
32	PE7	I/O	24/16/8/2.4	GPIO	PAP_D13_B: PAP Data13(B)
33	PE5	I/O	24/16/8/2.4	GPIO	PAP_D11_B: PAP Data11(B)
34	PE4	I/O	24/16/8/2.4	GPIO	PAP_D10_B: PAP Data10(B)
35	PE3	I/O	24/16/8/2.4	GPIO	PAP_D9_B: PAP Data9(B)
36	PE2	I/O	24/16/8/2.4	GPIO	PAP_D8_B: PAP Data8(B)
37	PE0	I/O	24/16/8/2.4	GPIO	PAP_WR_B: PAP Write(B) UART2_TXD: Uart2 Data Out(D)

PIN NO.	Name	I/O Type	Drive (mA)	Function	Other Function
38	PD5	I/O	24/16/8/2.4	GPIO	SPI0_DOA(0): SPI0 Data Out(A) SFC_DOA(0): SFC Data Out(A)
39	PD4	I/O	24/16/8/2.4	GPIO	SPI0_CLKA: SPI0 Clock(A) SFC_CLKA: SFC Clock(A)
40	PD6	I/O	24/16/8/2.4	GPIO	SFGAT: Flash Power Gate
41	PD1	I/O	24/16/8/2.4	GPIO	SPI0_DIA(1): SPI0 Data In(A) SFC_DIA(1): SFC Data In(A)
42	PD0	I/O	24/16/8/2.4	GPIO (pull up)	SPI0_CSA: SPI0 Chip Select(A) SFC_CSA: SFC Chip Select(A)
43	PR1	I/O	16/2.4	GPIO	OSC32KO
44	PR0	I/O	16/2.4	GPIO	OSC32KI
45	RTCVDD33	P	/	RTC Power 3.3V	-
46	DCVDD14	P	/	Core Power 1.4V	-
47	VBAT	P	/	LDO Power	-
48	SW	P	/	DC-DC Switch Pin	-
PAD		P	/	VSS	-

2. Electrical Characteristics

2.1 Absolute Maximum Ratings

Table 2-1

Symbol	Parameter	Min	Max	Unit
Tamb	Ambient Temperature	-40	+85	°C
Tstg	Storage temperature	-65	+150	°C
VBAT	Supply Voltage	-0.3	5.5	V
RTCVDD33	RTC Power Voltage	-0.3	3.5	V
WVDD33A	RF Power 3.3V Voltage	-0.3	3.5	V
WVDD14	RF Power 1.4V Voltage	-0.3	1.55	V
V _{3.3IO}	3.3V IO Input Voltage	-0.3	IOVDD+0.3	V

2.2 PMU Characteristics

Table 2-2

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
VBAT	Voltage Input	2.2	3.7	5.5	V	—
IOVDD	Voltage output	2.1	3.3	3.5	V	LDO5V = 5V, 200mA loading
DCVDD14	Voltage output	1.2	1.4	1.55	V	LDO mode: 70mA loading DC-DC mode: 120mA loading
RTCVDD33	Voltage input	2.2	3.0	3.5	V	—
DVDD	Voltage output	0.87	1.2	1.32	V	LDO5V=5V, 100mA loading
WVDD33A	Voltage Input	2.1	3.3	3.5	V	—
WVDD14	Voltage Input	1.2	1.4	1.55	V	—

2.3 IO Input/Output Electrical Logical Characteristics

Table 2-3

IO input characteristics						
Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V_{IL}	Low-Level Input Voltage	-0.3	—	$0.3 \cdot IOVDD$	V	$IOVDD = 3.3V$
V_{IH}	High-Level Input Voltage	$0.7 \cdot IOVDD$	—	$IOVDD + 0.3$	V	$IOVDD = 3.3V$
IO output characteristics						
V_{OL}	Low-Level Output Voltage	—	—	0.33	V	$IOVDD = 3.3V$
V_{OH}	High-Level Output Voltage	2.7	—	—	V	$IOVDD = 3.3V$

2.4 Internal Resistor Characteristics

Table 2-4

Port	General Output	High Drive	Internal Pull-Up Resistor	Internal Pull-Down Resistor	Comment
PA,PD, PE,PH, PB1	8mA	24mA	10K	10K	1.PB1&PD0 default pull up 2.FUSBDM & FUSBDP default pull down 3. Internal pull-up/pull-down resistance accuracy $\pm 20\%$
PR0,PR1	2.4mA	16mA	10K	10K	
FUSBDP FUSBDM	10mA	—	1.5K	15K	

2.5 ESD Protection

Table 2-5

Parameter	Typ.	Test pin	Reference standard
Human Body Mode	$\pm 4KV$	All pins(except WFRF)	JEDEC EIA/JESD22-A114
Machine Mode	$\pm 200V$	All pins	JEDEC EIA/JESD22-A115
Charge Device Model	$\pm 1KV$	All pins	JEDEC EIA/JESD22-C101F
Latch up	$\pm 200mA$	All GPIO pins	JEDEC STANDARD NO.78E
	$1.5 \times V_{opmax}$	All power pins	

Note : $1.5 \times V_{opmax}$ = 1.5 times maximum operating voltage.

3. Package Information

3.1 QFN48(6mm*6mm)

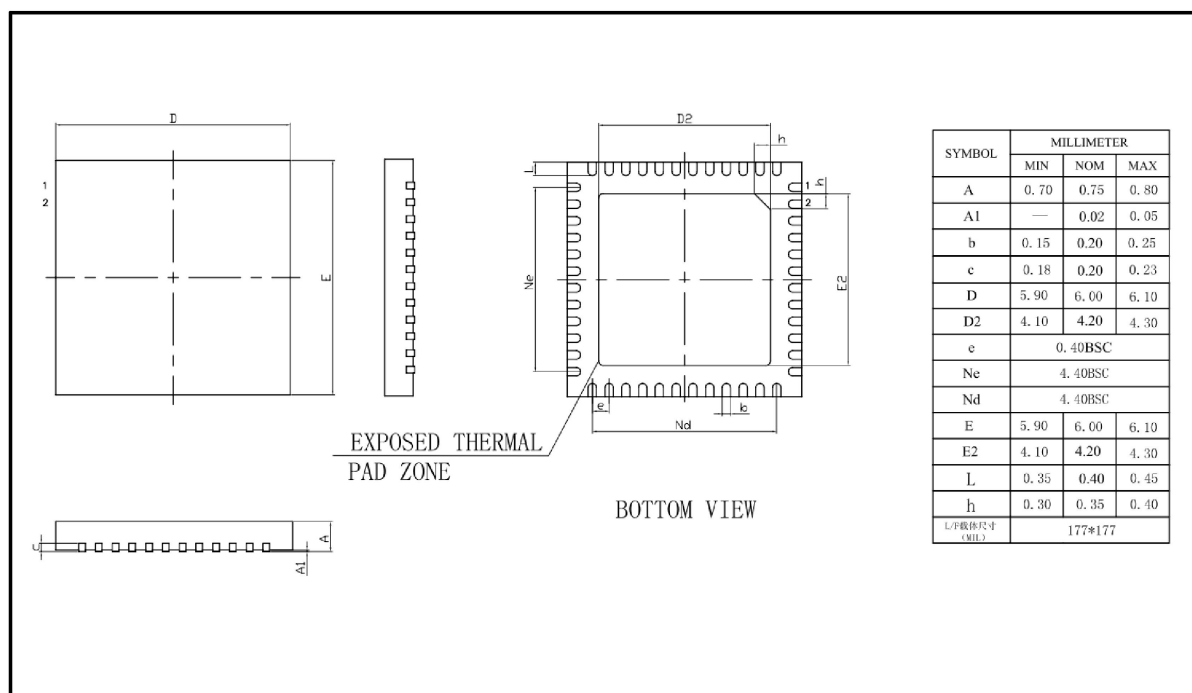
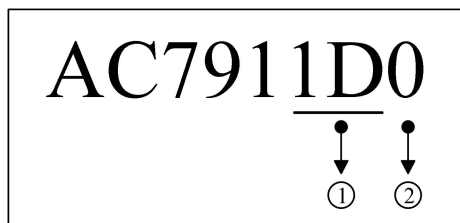


Figure 3-1 AC7911D_QFN48 Package

4. Package Type Specification



①Represents different chips (different packages or bindings)

②Represents different memory sizes

0: No memory

2: 2Mbit Flash

4: 4Mbit Flash

8: 8Mbit Flash

6: 16Mbit Flash

3: 32Mbit Flash

5: 64Mbit Flash

7: 128Mbit Flash

A: 1Mx16 SDRAM

B: 4Mx16 SDRAM

C: 16M bit PSRAM

D: 64M bit PSRAM

5. Solder-Reflow Condition

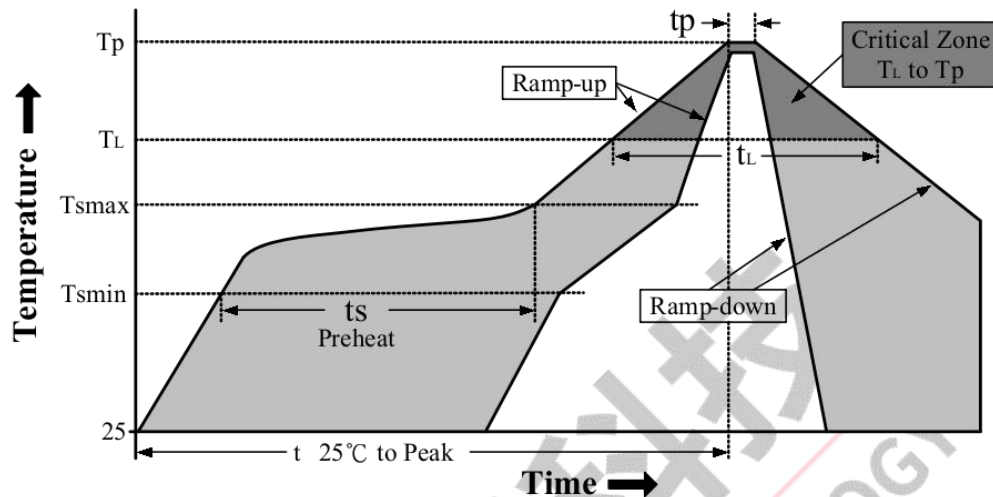


Figure 5-1 Classification Reflow Profile

Classification Profiles

Table 5-1

Profile Feature		Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat/Soak	Temperature Min (T_{smin})	100°C	150°C
	Temperature Max (T_{smax})	150°C	200°C
	Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds	60-180 seconds
Average ramp-up rate (T_{smax} to T_p)		3°C/second max	3°C/second max
Liquidous temperature (T_L)		183°C	217°C
Time (t_L) maintained above T_L		60-150 seconds	60-150 seconds
Peak package body temperature (T_p)		See Table 6-2	See Table 6-3
Time within 5°C of actual Peak Temperature (t_p) ²		10-30 seconds	20-40 seconds
Ramp-down rate (T_p to T_L)		6°C/second max	6°C/second max
Time 25°C to peak temperature		6 minutes max	8 minutes max

Note 1: All temperatures refer to topside of the package, measured on the package body surface.

Note 2: Time within 5°C of actual peak temperature (t_p) specified for the reflow profiles is a “supplier” minimum and “user” maximum.

SnPb - Classification Temperature

Table 5-2

Package Thickness	Volume mm ³ < 350	Volume mm ³ ≥ 350
<2.5 mm	240 +0/-5°C	225 +0/-5°C
≥2.5 mm	225 +0/-5°C	225 +0/-5°C

Pb-free - Classification Temperature **Table 5-3**

Package Thickness	Volume mm ³ < 350	Volume mm ³ 350 - 2000	Volume mm ³ > 2000
< 1.6mm	260℃	260℃	260℃
1.6 mm - 2.5mm	260℃	250℃	245℃
> 2.5mm	250℃	245℃	245℃

6. Revision History

Date	Revision	Description
2021.09.22	V1.0	Initial Release
2022.07.20	V1.1	Updated parameter