Preliminary AIC8800D80X2PV Low-Energy DualBand 2T2R Wi-Fi6/BTDM5.4 SoC

Data Sheet

Revision: 1.0.0
Jul 2024

The AIC8800D80X2PV provides a highly integrated solution for wireless applications, integrating dual-stream WiFi6 and Bluetooth 5.4.

Features

WiFi Features

- CMOS single-chip fully-integrated RF, Modem and MAC
- Support 2.4GHz/5GHz Wi-Fi6
- Physical data rates up to 1201.0Mbps with 20/40/80MHz bandwidth
- Support 2 spatial stream transmission and high performance reception
- Support 2 Rx maximum rejection combining receiver for all modes
- Support STA, AP, Wi-Fi Direct modes concurrently
- Support STBC
- Support beamforming as beamformee up to 4x2
- Support Wi-Fi6 TWT
- Support Two NAV, Buffer Report, Spatial reuse, Multi-BSSID, intra-PPDU power save
- Support LDPC
- Support downlink MU-MIMO, OFDMA
- Support uplink MU-MIMO, OFDMA
- Support ER, DCM, Mid-amble, UORA
- Support WEP/WPA/WPA2/WPA3-SAE Personal, WAPI

Bluetooth Features

- Complies with Bluetooth Core Specification Version 5.4 with provisions for supporting future specifications.
- Supports all the mandatory and optional features of Bluetooth low energy 5.4.
- Supports advanced master and slave topologies.
- Supports BLE (1/2Mbps/LongRange S2/8).

- Bluetooth Class 1 or Class 2 transmitter operation.
- Supports BLE audio.
- PCM for audio data.
- Adaptive frequency hopping (AFH) for reducing radio frequency interference.

Other Features

- Supports USB2.0/ PCIE2.0/ UART/PCM.
- 6*6*0.75(mm)QFN60

Catalogue

1. AIC8800D80X2PV Overview

1.1. Overview

AIC8800D80X2PV is a 22-nm, highly integrated SoC with 2T2R dual band Wi-Fi6, BTDM 5.4 and high-performance Wlan CPU for wireless application. It provides miniaturized solutions that reduce design costs with minimal material.

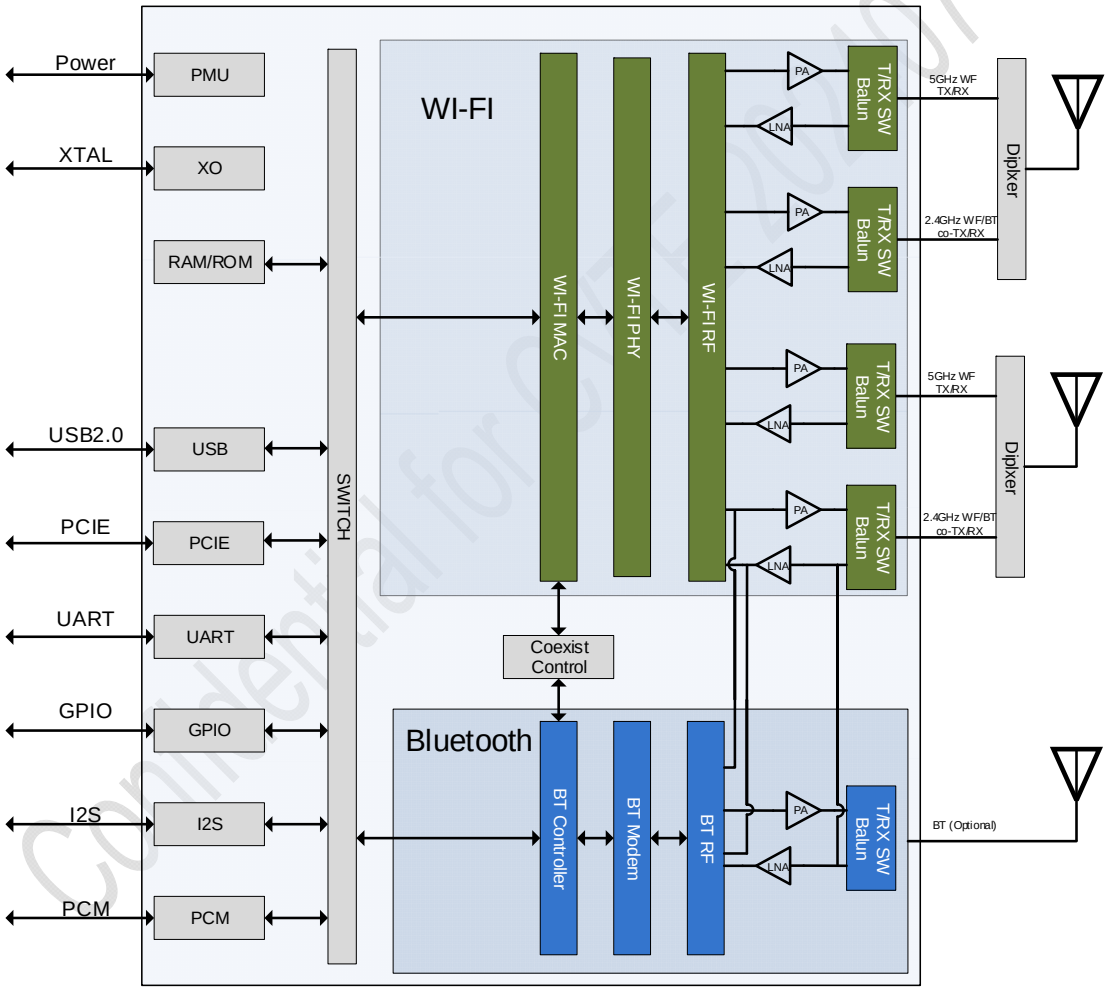


Figure 1-1 System Block Diagram

1.2. Standards Compliance

The AIC8800D80X2PV supports the following standards:

- Bluetooth 2.1+EDR
- Bluetooth3.0
- Bluetooth4.2 (Bluetooth Low Energy)
- Bluetooth5.0/5.1/5.2/5.3/5.4 (BLE Audio)
- 802.11a
- 802.11b
- 802.11g
- 802.11n 20/40MHz channel
- 802.11ac 20/40/80 MHz channel
- 802.11ax 20/40/80 MHz channel
- Security:
  - WEP
  - WPA Personal
  - WPA2 Personal
  - WPA3 SAE Personal

2. Power Supplies and Power Management

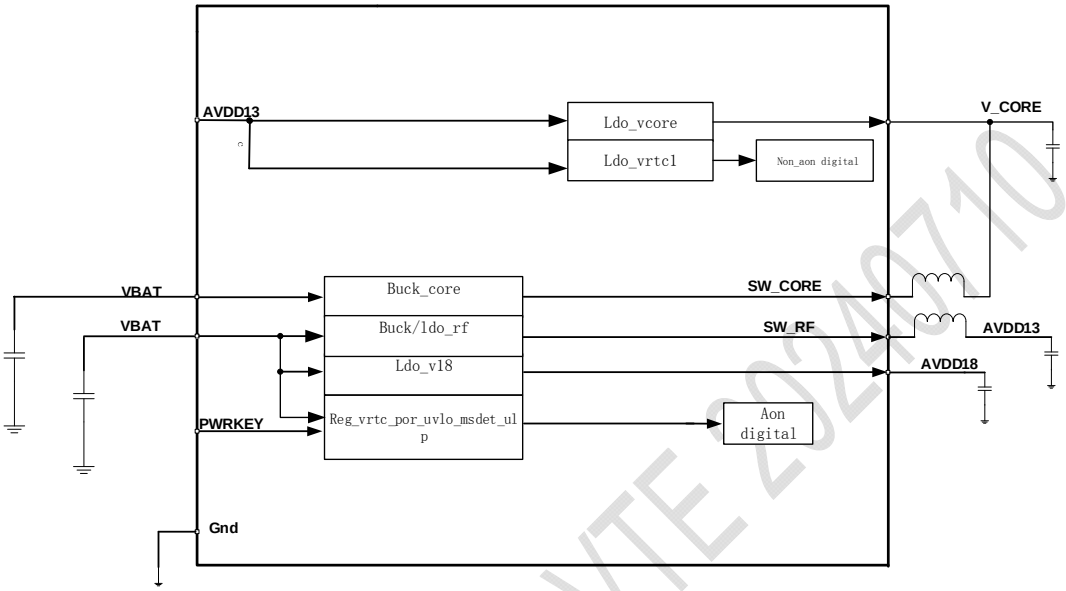


Figure 2-1 AIC8800D80X2PV PMU Topology

3. External Frequency Reference

An external crystal is used for generating all radio frequencies and normal operation clocking, the frequency is 40MHz. AIC8800D80X2PV adopts colpitts mode.

In colpitts mode, XTAL1 is input, XTAL2 need to connect to the ground, load capacitor cannot be add to the XTAL pin.

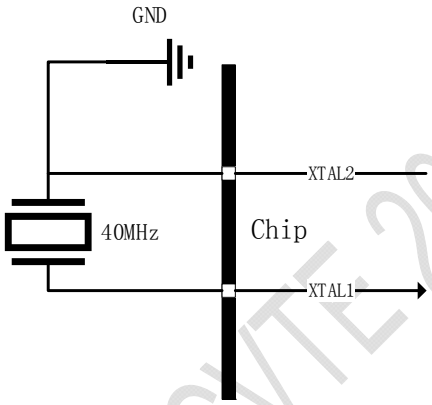


Figure 3-1 Colpitts Mode

The table 3-1 lists the requirement for the crystal

Table 3-1 copitts mode crystal requirement

Symbol	Parameter	Value	Note
FL	Nominal Frequency	40MHz	
-	Frequency Tolerance	±10ppm	@25℃±3℃
	Frequency Stability	±10ppm	Over Operating Temp. Range (Reference 25℃)
ESR	Equivalent Series Resistance	＜40ohm	
CL	Load Capacitance	10pF	
TS	Trim Sensitivity	≥10ppm/pF	
DL	Drive Level	＞100uW	

4. QFN Map and Pin Descriptions

4.1. QFN Map

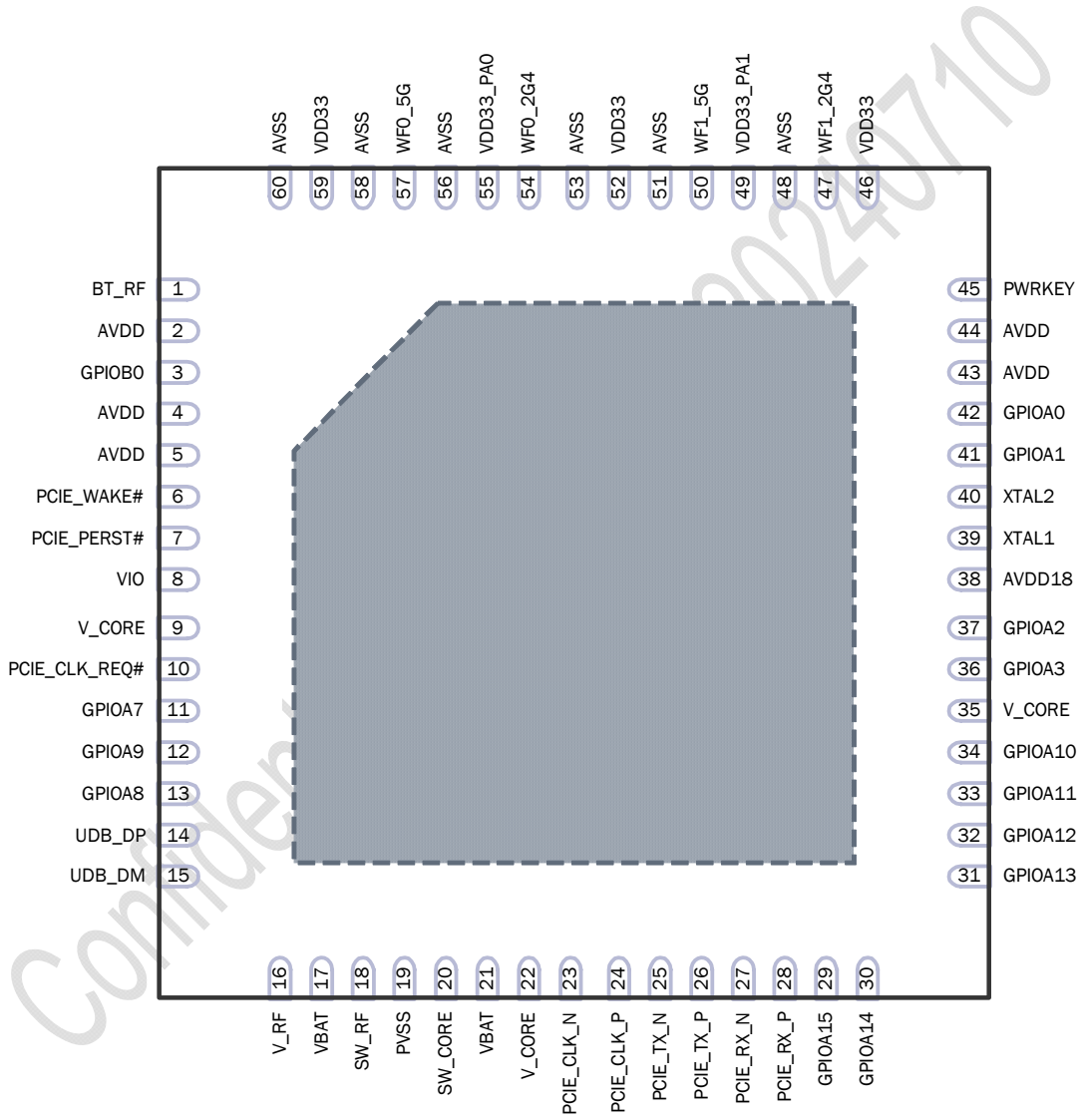


Figure 4-1 AIC8800D80X2PV QFN Map

4.2. Pin List and Descriptions

Table 4-1 AIC8800D80X2PV QFN60 Pins Description

Pin NO.	Name	Description
1	BT_RF	BT RF IO
2	AVDD	BT power supply, connect the inductor which connect pin18 and a capacitor, please connect the net of the capacitor
3	GPIOB0	GPIOB0
4	AVDD	WF0 power supply, connect the inductor which connect pin18, please connect the net of the capacitor and a capacitor
5	AVDD	WF ABB power supply, connect the inductor which connect pin18, please connect the net of the capacitor and a capacitor
6	PCIE_WAKE#	PCIE WAKE# Open Drain with pull up on platform, active low
7	PCIE_PERST#	PCIE Reset, active low
8	VIO	VIO power supply, support 1.8/3.3v, connect a 1uF capacitor closely
9	V_CORE	Connect the inductor which connect pin20 and a capacitor, please connect the net of the capacitor and a capacitor
10	PCIE_CLK_REQ#	Reference clock request signal, active low
11	GPIOA7	GPIOA7
12	GPIOA9	GPIOA9
13	GPIOA8	GPIOA8
14	USB_DP	USB data positive
15	USB_DM	USB data minus
16	V_RF	Connect the inductor which connect pin18 and a capacitor
17	VBAT	Connect a 4.7uF decoupling capacitor closely and 3.3V power supply
18	SW_RF	Connect a 2.2uH inductor closely, and a 10uF capacitor connect the other side of the inductor
19	PVSS	Connect to the ground
20	SW_CORE	Connect a 2.2uH inductor closely, and a 10uF capacitor connect the other side of the inductor
21	VBAT	Connect a 4.7uF decoupling capacitor closely and 3.3V power supply
22	V_CORE	Connect the inductor which connect pin20 and a capacitor
23	PCIE_CLK_N	PCIE reference clock signals (100MHz)
24	PCIE_CLK_P	PCIE reference clock signals (100MHz)
25	PCIE_TX_N	PCIE TX differential signals
26	PCIE_TX_P	PCIE TX differential signals
27	PCIE_RX_N	PCIE RX differential signals
28	PCIE_RX_P	PCIE RX differential signals

Pin NO.	Name	Description
29	GPIOA15	GPIOA15
30	GPIOA14	GPIOA14
31	GPIOA13	GPIOA13
32	GPIOA12	GPIOA12
33	GPIOA11	GPIOA11
34	GPIOA10	GPIOA10
35	V_CORE	Connect the inductor which connect pin20 and a capacitor, please connect the net of the capacitor and a capacitor
36	GPIOA3	GPIOA3
37	GPIOA2	GPIOA2
38	AVDD18	1.8v power supply for XTAL and EFUSE
39	XTAL1	XTAL_IN
40	XTAL2	Connect to the ground
41	GPIOA1	GPIOA1
42	GPIOA0	GPIOA0
43	AVDD	Power supply for RF clock and LO, connect the inductor which connect pin18, please connect the net of the capacitor and a capacitor
44	AVDD	WF1 power supply, connect the inductor which connect pin18, please connect the net of the capacitor and a capacitor
45	PWRKEY	Chip enable, active high
46	VDD33	WF1 2.4G TX 3.3v power supply
47	WF1_2G4	WF1 2.4G RF IO
48	AVSS	Connect to the ground
49	VDD33 _PA1	WF1 2.4/5G PA 3.3v power supply
50	WF1_5G	WF1 5G RF IO
51	AVSS	Connect to the ground
52	VDD33	WF0 2.4G and WF1 5G TX 3.3v power supply
53	AVSS	Connect to the ground
54	WF0_2G4	WF0 2.4G RF IO, shared with BT in co-antenna mode
55	VDD33_PA0	WF0 2.4/5G PA 3.3v power supply
56	AVSS	Connect to the ground
57	WF0_5G	WF0 5G RF IO
58	AVSS	Connect to the ground
59	VDD33	BT and WF0 5G TX 3.3v power supply
60	AVSS	Connect to the ground
61	EPAD	EPAD, connect to the ground via multiple holes, ensure the chip to work properly and heat dissipation

4.3. IO Assignment

Table 4-2 AIC8800D80X2PV IO Assignment

		AIC8800D80X2PV
GPIOA	GPIOA0	PCM_FSYNC
	GPIOA1	PCM_CLK
	GPIOA2	PCM_DIN
	GPIOA3	PCM_DOUT
	GPIOA4	PCIE_WAKE#
	GPIOA5	PCIE_PERST#
	GPIOA6	PCIE_CLK_REQ#
	GPIOA7	
	GPIOA8	UART0_RX
	GPIOA9	UART0_TX
	GPIOA10	
	GPIOA11	
	GPIOA12	
	GPIOA13	
	GPIOA14	
	GPIOA15	
GPIOB	GPIOB0	
USB2.0	USB_DP	USB_DP
	USB_DM	USB_DM
PCIE	TX_P	PCIE_TX_P
	TX_N	PCIE_TX_N
	RX_P	PCIE_RX_P
	RX_N	PCIE_RX_N
	CLK_P	PCIE_CLK_P
	CLK_N	PCIE_CLK_N

IO Status

- I: Input signal
- O: Output signal
- I/O: Input/Output signal
- UP : Pulled up (of 50K)
- DN: Pulled down (of 50K)
- OFF: Neither pulled up nor pulled down

Table 4-3 Default state of AIC8800D80X2PV IO power-on

GPIO	Function	I/O	PULL
GPIOA0	swclk	I	UP
GPIOA1	swd	I/O	UP
GPIOA2	gpioa_2	I/O	DN
GPIOA3	gpioa_3	I/O	DN
GPIOA4	pcie_wake_n	I/O	OFF
GPIOA5	pcie_perst_n	I	DN
GPIOA6	pcie_clkreq_n	I/O	OFF
GPIOA7	gpioa_7	I/O	DN
GPIOA8	uart0_rx	I	UP
GPIOA9	uart0_tx	O	OFF
GPIOA10	gpioa_10	I/O	DN
GPIOA11	gpioa_11	I/O	DN
GPIOA12	gpioa_12	I/O	DN
GPIOA13	gpioa_13	I/O	DN
GPIOA14	gpioa_14	I/O	DN
GPIOA15	gpioa_15	I/O	DN
GPIOB0	gpiob_0	I/O	UP
USB_DP	usb_dp		
USB_DM	usb_dm		

5. Electrical Characteristics

5.1. Nominal Range

Table 5-1 DC Electrical Specification (Recommended Operation Conditions)

Symbol	Description	Min.	Typ.	Max.	Unit.
VBAT	Supply Voltage for System	3.0	3.3	3.6	V
V_RF	Power supply for RF	1.26	1.4	1.54	V
AVDD	Power Supply for BT/WF0/WF1/WF ABB/RF clock/LO	1.26	1.4	1.54	V
V_CORE	Supply Voltage for Digital	0.756	0.84	0.924	V
AVDD18	1.8V Power Supply for XTAL and EFUSE	1.8	2	2.2	V
VDD33	3.3V Power Supply for WF0 2.4/5G WF1 2.4/5G and BT TX	3.0	3.3	3.6	V
VDD33 _PA0	3.3V Power Supply for WF0 2.4/5G PA	3.0	3.3	3.6	V
VDD33 _PA1	3.3V Power Supply for WF1 2.4/5G TX	3.0	3.3	3.6	V
VIO	Supply Voltage for VIO,VIO=1.8V	1.71	1.8	1.89	V
	Supply Voltage for VIO,VIO=3.3V	3.135	3.3	3.465	V
V_{IL}(VIO=1.8V)	CMOS Low Level Input Voltage		0.6		V
V_{IH}(VIO=1.8V)	CMOS High Level Input Voltage		1.2		V
V_{IL}(VIO=3.3V)	CMOS Low Level Input Voltage		0.44		V
V_{IH}(VIO=3.3V)	CMOS High Level Input Voltage		2.62		V

5.2. Environmental ratings

The environmental ratings are shown in Table 5-2

Table 5-2 Environmental Rating

Symbol	Description	Min.	Typ.	Max.	Unit.
T_{amb}	Ambient Temperature	-40	27	+85	℃
T_{store}	Store Temperature	-55		+125	℃

5.3. Reliability characteristics

Table 5-3 Reliability test report

Test Items	Test Condition	Test Criteria
HTOL	TBD	JESD22-A108F
ESD	TBD	JS-001-2023
	TBD	JS-002-2022
Latch up	TBD	JESD78
Solder ability	TBD	J-STD-002D-2013
High Temperature Storage	TBD	JESD22-A103
TCT	TBD	JESD22-A104E-2014
uHAST	TBD	JESD22-A118
PCT	TBD	JESD22-A102E-2015
Moisture sensitivity level	TBD	J-STD-020D

6. Bluetooth RF Specifications

6.1. Transmit Characteristics

Table 6-1 2.4 GHz BT low energy 1m Transmiter Specifications

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Description		Min	Typ	Max	Spec	Unit
Maximum RF transmit Power						dBm
Peak power – Average power					≤3	dB
In-band emissions	≥+3MHz				≤-30	dBm
	+2MHz				≤-20	dBm
	-2MHz				≤-20	dBm
	≤-3MHz				≤-30	dBm
Modulation characteristics	Δf1avg				225~275	kHz
	99.9% Δf2max				≥185	kHz
	Δf2avg/Δf1avg				≥0.8	
Center freq. deviation, F_n(n=0,1,2,...,k)					±150	kHz
Freq. drift, $\|F_0 - F_n\|$(n=2,3,4,...,k)					±50	kHz
Initial freq. drift, $\|F_1 - F_0\|$					±20	kHz
Max. Freq. drift rate, $\|F_n - F_{n-5}\|$(n=6,7,8,...,k)					±20	kHz/50us
Harmonics						dBm

Table 6-2 2.4 GHz BT low energy 2m Transmiter Specifications

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Description		Min	Typ	Max	Spec	Unit
Maximum RF transmit Power						dBm
Peak power – Average power					≤3	dB
In-band emissions	$f_{\_TX}$±4MHz				≤-20	dBm
	$f_{\_TX}$±5MHz				≤-20	dBm
	$f_{\_TX}$±[6+n]MHz, n=0,1,2...				≤-30	dBm
Modulation characteristics	Δf1avg				250~550	kHz
	99.9% Δf2max				≥370	kHz
	Δf2avg/Δf1avg				≥0.8	
Center freq. deviatino, F_n(n=0,1,2,...,k)					±150	±150
Freq. drift, $\|F_0 - F_n\|$(n=2,3,4,...,k)					±50	±50

Description	Min	Typ	Max	Spec	Unit
Initial freq. drift, $\|F_1 - F_0\|$				±20	±20
Max. Freq. drift rate, $\|F_n - F_{n-5}\|$(n=6,7,8,…,k)				±20	±20

6.2. Receive Characteristics

Table 6-3 2.4 GHz BT Receive low energy 1Mbps

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Description		Min	Typ	Max	Spec	Unit
Receiver sensitivity					≤-70	dBm
Maximum input level					≥-10	dBm
Co-Channel interference, C/I					≤21	dB
C/I	$F=F_0$+1MHz				≤15	dB
	$F=F_0$-1MHz				≤15	dB
	$F=F_0$+2MHz				≤-17	dB
	$F=F_0$+3MHz				≤-27	dB
	$F=F_0$-3MHz				≤-27	dB
	$F=F_{image}$				≤-15	dB
Inter-modulation					≥-50	dBm
Blocking	30MHz to 2000MHz				≥-30	dBm
	2003MHz to 2399MHz				≥-35	dBm
	2484MHz to 2997MHz				≥-35	dBm
	3000MHz to 12.75GHz				≥-30	dBm

Table 6-4 2.4 GHz BT Receive low energy 2Mbps

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Description		Min	Typ	Max	Spec	Unit
Receiver sensitivity					≤-70	dBm
Maximum input level					≥-10	dBm
Co-Channel interference, C/I					≤21	dB
C/I	$F=F_0$+2MHz				≤15	dB
	$F=F_0$-2MHz				≤15	dB
	$F=F_0$+4MHz				≤-17	dB
	$F=F_0$+6MHz				≤-27	dB
	$F=F_0$-6MHz				≤-27	dB
	$F=F_{image}$				≤-15	dB
Inter-modulation					≥-50	dBm

Description		Min	Typ	Max	Spec	Unit
Blocking	30MHz to 2000MHz				≥-30	dBm
	2003MHz to 2399MHz				≥-35	dBm
	2484MHz to 2997MHz				≥-35	dBm
	3000MHz to 12.75GHz				≥-30	dBm

Table 6-5 2.4 GHz BT Receive low energy long range 500kbps

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Description		Min	Typ	Max	Spec	Unit
Receiver sensitivity					≤-75	dBm
Maximum input level					≥-10	dBm
Co-Channel interference, C/I					≤17	dB
C/I	$F=F_0+1MHz$				≤11	dB
	$F=F_0-1MHz$				≤11	dB
	$F=F_0+2MHz$				≤-21	dB
	$F=F_0+3MHz$				≤-31	dB
	$F=F_0-3MHz$				≤-31	dB
	$F=F_{image}$				≤-19	dB

Table 6-6 2.4 GHz BT Receive low energy long range 125kbps

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Description		Min	Typ	Max	Spec	Unit
Receiver sensitivity					≤-82	dBm
Maximum input level					≥-10	dBm
Co-Channel interference, C/I					≤12	dB
C/I	$F=F_0+1MHz$				≤6	dB
	$F=F_0-1MHz$				≤6	dB
	$F=F_0+2MHz$				≤-26	dB
	$F=F_0+3MHz$				≤-36	dB
	$F=F_0-3MHz$				≤-36	dB
	$F=F_{image}$				≤-24	dB

7. WLAN RF Specifications

7.1. Transmit Characteristics

Table 7-1 2.4 GHz Wi-Fi Transmit Performance Specifications

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Transmit mode	Test Condition	WF0_2G4			WF1_2G4			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
11b 1M	EVM≤35%							dBm
11b 11M	EVM≤35%							dBm
11g 6M	EVM≤-5dB							dBm
11g 54M	EVM≤-25dB							dBm
HT20 MCS0	EVM≤-5dB							dBm
HT20 MCS7	EVM≤-27dB							dBm
HT40 MCS0	EVM≤-5dB							dBm
HT40 MCS7	EVM≤-27dB							dBm
HE20 MCS0	EVM≤-5dB							dBm
HE20 MCS11	EVM≤-35dB							dBm
HE40 MCS0	EVM≤-5dB							dBm
HE40 MCS11	EVM≤-35dB							dBm

Table 7-2 5 GHz Wi-Fi Transmit Performance Specifications

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Transmit mode	Test Condition	WF0_5G			WF1_5G			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
11g 6M	EVM≤-5dB							dBm
11g 54M	EVM≤-25dB							dBm
HT20 MCS0	EVM≤-5dB							dBm
HT20 MCS7	EVM≤-27dB							dBm
HT40 MCS0	EVM≤-5dB							dBm
HT40 MCS7	EVM≤-27dB							dBm
VHT20 MCS0	EVM≤-5dB							dBm
VHT20 MCS8	EVM≤-30dB							dBm
VHT40 MCS0	EVM≤-5dB							dBm
VHT40 MCS9	EVM≤-32dB							dBm
VHT80 MCS0	EVM≤-5dB							dBm
VHT80 MCS9	EVM≤-32dB							dBm
HE20 MCS0	EVM≤-5dB							dBm
HE20 MCS11	EVM≤-35dB							dBm
HE40 MCS0	EVM≤-5dB							dBm
HE40 MCS11	EVM≤-35dB							dBm
HE80 MCS0	EVM≤-5dB							dBm
HE80 MCS11	EVM≤-35dB							dBm

7.2. Receive Characteristics

Table 7-3 2.4 GHz Wi-Fi Receive Performance Specifications

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

SYMBOL	Test Condition	WF0_2G4			WF1_2G4			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
Rx Sensitivity	1 Mbps DSSS							dBm
	11 Mbps DSSS							dBm
	6 Mbps OFDM							dBm
	54 Mbps OFDM							dBm
	HT/VHT20 MCS0							dBm
	HT/VHT20 MCS7							dBm
	HT/VHT 40 MCS0							dBm
	HT/VHT 40 MCS7							dBm
	VHT 40 MCS9							dBm
	HE20 MCS0							dBm
	HE20 MCS7							dBm
	HE20 MCS9							dBm
	HE20 MCS11							dBm
	HE40 MCS0							dBm
	HE40 MCS7							dBm
	HE40 MCS9							dBm
	HE40 MCS11							dBm
Adjacent channel rejection	2Mbps DSSS							dB
	11Mbps DSSS							dB
	6 Mbps OFDM							dB
	54 Mbps OFDM							dB
	HT20 MCS0							dB
	HT20 MCS7							dB
	HT40 MCS0							dB
	HT40 MCS7							dB
	HE20 MCS0							dB
	HE 20 MCS11							dB
	HE 40 MCS0							dB
	HE 40 MCS11							dB

Max input level	11b							dBm
	MCS0							dBm
	MCS3							dBm
	MCS5							dBm
	MCS7							dBm

Table 7-4 5 GHz Wi-Fi Receive Performance Specifications

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

SYMBOL	Test Condition	WF0_5G			WF1_5G			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
Rx Sensitivity	6 Mbps OFDM							dBm
	54 Mbps OFDM							dBm
	HT/VHT20 MCS0							dBm
	HT/VHT20 MCS7							dBm
	HT/VHT 40 MCS0							dBm
	HT/VHT 40 MCS7							dBm
	VHT40 MCS9							dBm
	VHT80 MCS9							dBm
	HE20 MCS0							dBm
	HE20 MCS7							dBm
	HE20 MCS9							dBm
	HE20 MCS11							dBm
	HE40 MCS0							dBm
	HE40 MCS7							dBm
	HE40 MCS9							dBm
	HE40 MCS11							dBm
	HE80 MCS0							dBm
	HE80 MCS7							dBm
	HE80 MCS9							dBm
	HE80 MCS11							dBm
Adjacent channel rejection	6 Mbps OFDM							dB
	54 Mbps OFDM							dB
	HT20 MCS0							dB
	HT20 MCS7							dB
	HT40 MCS0							dB
	HT40 MCS7							dB

	VHT20 MCS0							dB
	VHT20 MCS8							dB
	VHT40 MCS0							dB
	VHT40 MCS9							dB
	VHT80 MCS0							dB
	VHT80 MCS9							dB
	HE20 MCS0							dB
	HE20 MCS11							dB
	HE40 MCS0							dB
	HE40 MCS11							dB
	HE80 MCS0							dB
	HE80 MCS11							dB
Max input level	MCS0							dBm
	MCS3							dBm
	MCS5							dBm
	MCS7							dBm

8. System Power Consumption

Table 8-1 AIC8800D80X2PV WLAN 2.4G RF TX Power Consumption

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Test Packet Type	Power[dbm]	DC[mA]
Transmit@HE40,11ax,1024QAM		TBD
Transmit@HE20,11ax,1024QAM		TBD
Transmit@VHT40,11ac,256QAM		TBD
Transmit@VHT20,11ac,256QAM		TBD
Transmit@HT40,11n,64QAM		TBD
Transmit@HT20,11n,64QAM		TBD
Transmit@ 11g, 54M,64QAM		TBD

Table 8-2 AIC8800D80X2PV WLAN 2.4G RF RX Power Consumption

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Test Packet Type	Power[dbm]	DC[mA]
Receive@HE40,11ax,1024QAM	-40	TBD
Receive@HE20,11ax,1024QAM	-40	TBD
Receive@VHT40,11ac,256QAM	-40	TBD
Receive@VHT20,11ac,256QAM	-40	TBD
Receive@HT40,11n,64QAM	-40	TBD
Receive@HT20,11n,64QAM	-40	TBD
Receivet@ 11g, 54M,64QAM	-40	TBD
Receive@11b,11M,DSSS	-40	TBD

Table 8-3 AIC8800D80X2PV WLAN 5G RF TX Power Consumption

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Test Packet Type	Power[dbm]	DC[mA]
Transmit@HE40,11ax,1024QAM		TBD
Transmit@HE20,11ax,1024QAM		TBD
Transmit@VHT40,11ac,256QAM		TBD
Transmit@VHT20,11ac,256QAM		TBD
Transmit@HT40,11n,64QAM		TBD
Transmit@HT20,11n,64QAM		TBD
Transmit@ 11a, 54M,64QAM		TBD

Table 8-4 AIC8800D80X2PV WLAN 5G RF RX Power Consumption

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Test Packet Type	Power[dbm]	DC[mA]
Receive@HE80,11ax,1024QAM	-40	TBD
Receive@HE40,11ax,1024QAM	-40	TBD
Receive@HE20,11ax,1024QAM	-40	TBD
Receive@VHT80,11ac,256QAM	-40	TBD
Receive@VHT40,11ac,256QAM	-40	TBD
Receive@VHT20,11ac,256QAM	-40	TBD
Receive@HT40,11n,64QAM	-40	TBD
Receive@HT20,11n,64QAM	-40	TBD

Table 8-5 AIC8800D80X2PV Bluetooth RF TX Power Consumption

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Test Packet Type	Power[dbm]	DC[mA]	Power[dbm]	DC[mA]
Transmit@ BR DH5 PRBS9				TBD
Transmit@ EDR 2DH5 PRBS9				TBD
Transmit@ EDR 3DH5 PRBS9				TBD
Transmit@ LE 1M PRBS9				TBD
Transmit@LE 2M PRBS9				TBD
Transmit@LE LongRange(S8) 125K PRBS9				TBD
Transmit@LE LongRange(S2) 500K PRBS9				TBD

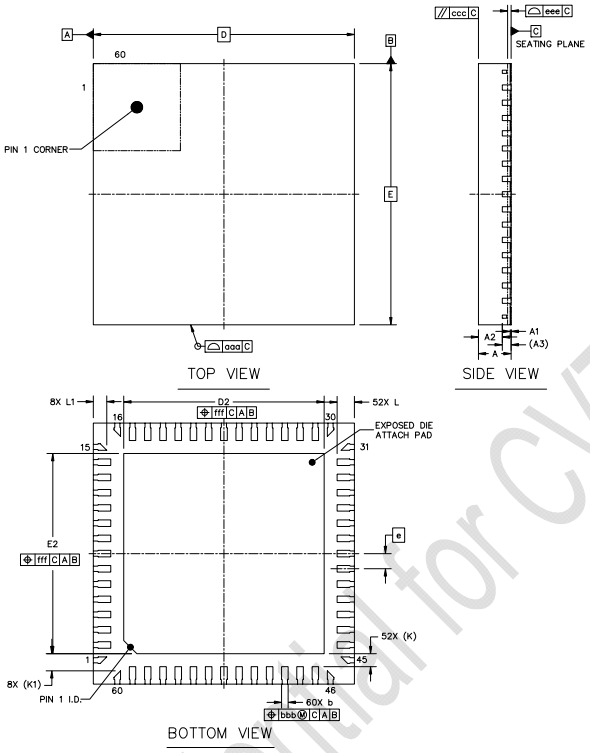
Table 8-6 AIC8800D80X2PV Bluetooth RF RX Power Consumption

(VBAT = 3.3V, TA = 27°C, unless otherwise specified)

Test Packet Type	Power[dbm]	DC[mA]
Receive @ BR DH5 PRBS9	-40	TBD
Receive @ EDR 2DH5 PRBS9	-40	TBD
Receive @ EDR 3DH5 PRBS9	-40	TBD
Receive@LE 1M PRBS9	-40	TBD
Receive@LE 2M PRBS9	-40	TBD
Receive@LE LongRange(S8) 125K PRBS9	-40	TBD
Receive@LE LongRange(S2) 500K PRBS9	-40	TBD

9. Package Physical Dimension

9.1. Package Dimensions



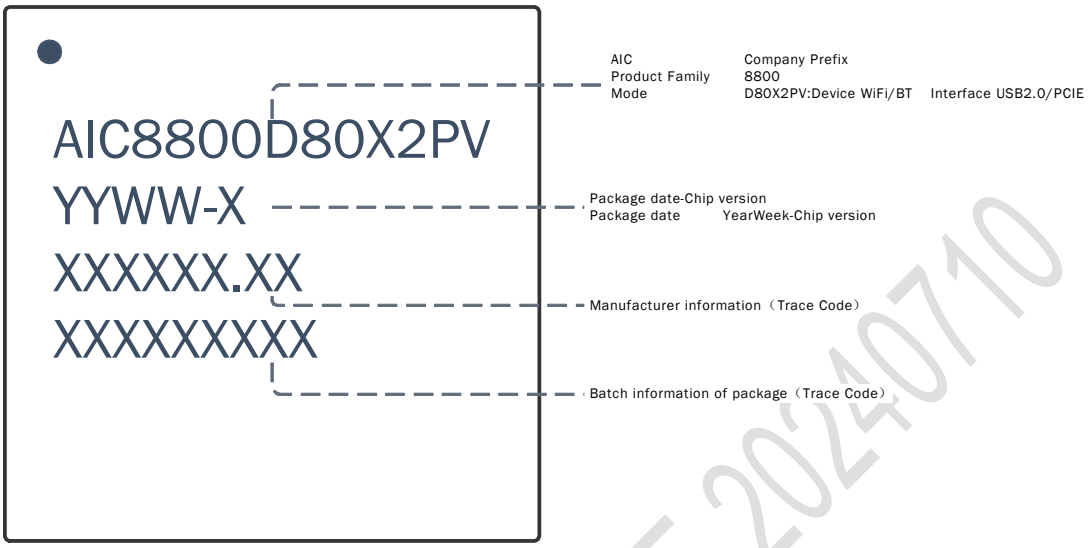
		SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS		A	0.7	0.75	0.8
STAND OFF		A1	0	0.02	0.05
MOLD THICKNESS		A2	---	0.55	---
L/F THICKNESS		A3		0.203 REF	
LEAD WIDTH		b	0.1	0.15	0.2
BODY SIZE	X	D		6 BSC	
	Y	E		6 BSC	
LEAD PITCH		e		0.35 BSC	
EP SIZE	X	D2	4.5	4.6	4.7
	Y	E2	4.5	4.6	4.7
LEAD LENGTH		L	0.3	0.4	0.5
		L1	0.207	0.307	0.407
LEAD TIP TO EXPOSED PAD EDGE		K		0.3 REF	
		K1		0.393 REF	
PACKAGE EDGE TOLERANCE		aaa		0.1	
MOLD FLATNESS		ccc		0.1	
COPLANARITY		eee		0.08	
LEAD OFFSET		bbb		0.07	
EXPOSED PAD OFFSET		fff		0.1	

Figure 9-1 Package Dimensions

9.2. Reel Information

TBD

9.3. Product Identification



9.4. Package Thermal Characteristics

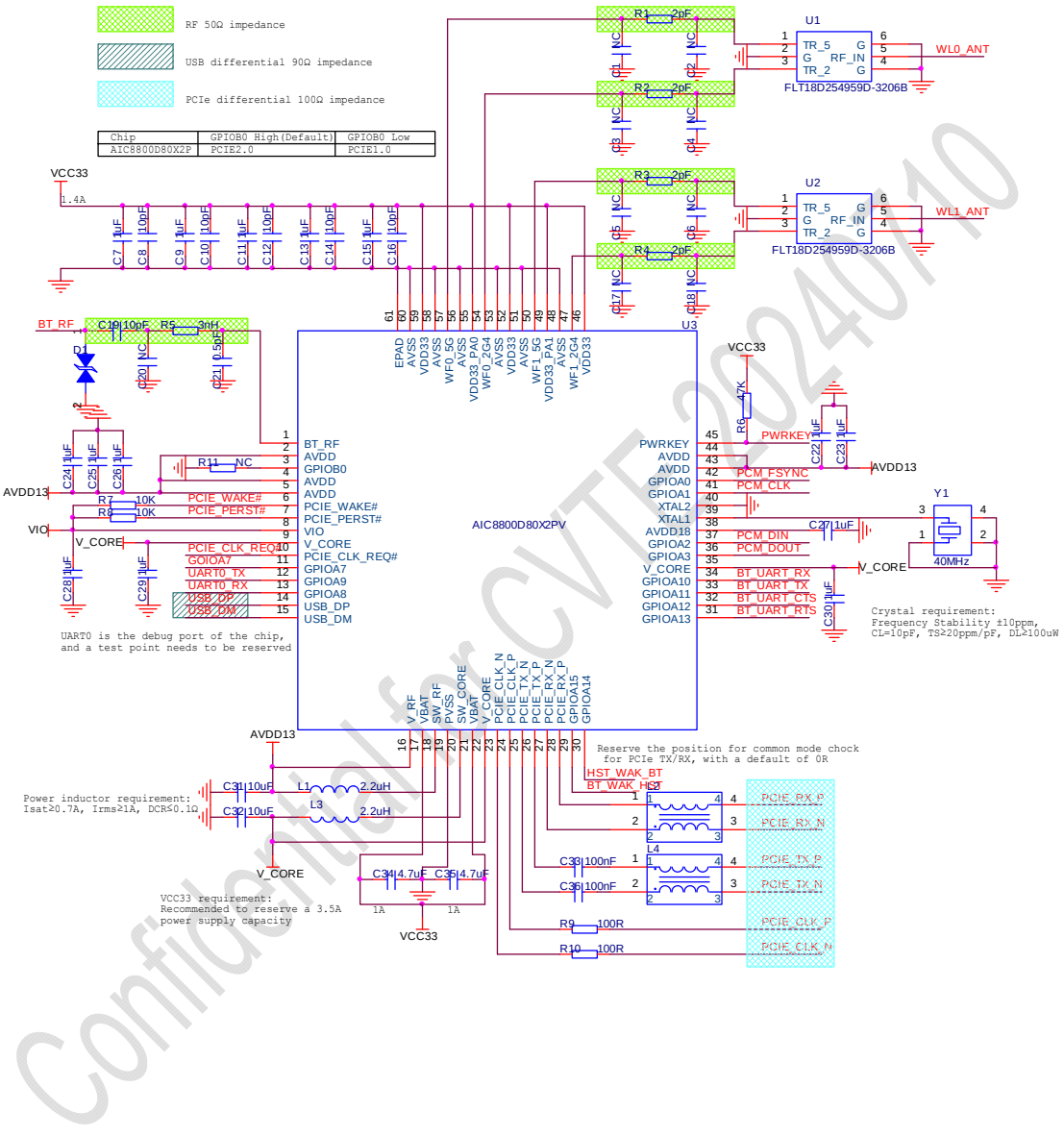
Table 19-1 Package Thermal Characteristics

Characteristic	Value
θ_{JA} in still air (°C/W)	TBD
θ_{JB} (°C/W)	TBD
θ_{JC} (°C/W)	TBD
ψ_{JT} (°C/W)	TBD
ψ_{JB} (°C/W)	TBD
Maximum junction temperature Tj (°C)	TBD
Maximum power dissipation (W)	TBD

10. Ordering Information

Part Number	Package	Description	Operating Ambient Temperature
AIC8800D80X2PV	60 pin QFN package(6mm*6mm，0.35mm pitch)	2T2R Dual-band 2.4 GHz and 5 GHz WiFi6+ Bluetooth 5.4	－20°C to +80°C

11. Application Schematic Diagram



12. Solder Reflow Profile

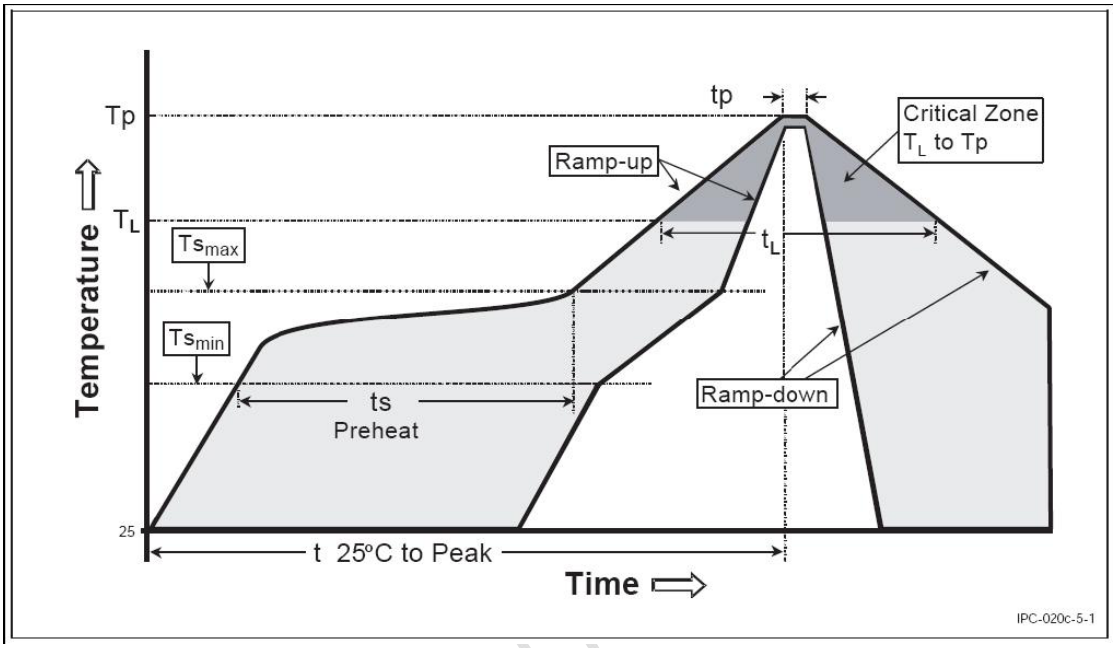


Figure12-1 Classification Reflow Profile

Table 12-1 Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-Up Rate (TSmax to Tp)	3 ℃/second max.	3 ℃/second max.
Preheat -Temperature Min (Tsmin) -Temperature Max (Tsmax) -Time (tsmin to tsmax)	 100 ℃ 100 ℃ 60-120 seconds	 150 ℃ 200 ℃ 60-180 seconds
Time maintained above: -Temperature (TL) -Time (tL)	 183 ℃ 60-150seconds	 217℃ 60-150 seconds
Peak /Classification Temperature(Tp)	See Table 12-2	See Table 12-3
Time within 5 oC of actual Peak Temperature (tp)	10-30 seconds	20-40 seconds
Ramp-Down Rate	6 ℃/second max.	6 ℃/seconds max.
Time 25 oC to Peak Temperature	6 minutes max.	8 minutes max.

Table 12-2 Sn-Pb Eutectic Process – Package Peak Reflow Temperatures

Package Thickness	Volume mm3 <350	Volume mm3 ≥350
＜2.5mm	240 + 0/-5 ℃	225 + 0/-5 ℃
≥2.5mm	225 + 0/-5 ℃	225 + 0/-5 ℃

Table 12-3 Pb-free Process – Package Classification Reflow Temperatures

Package Thickness	Volume mm3 ＜350	Volume mm3 350-2000	Volume mm3 ＞2000
＜1.6mm	260 + 0 ℃ *	260 + 0 ℃ *	260 + 0 ℃ *
1.6mm – 2.5mm	260 + 0 ℃ *	250 + 0 ℃ *	245 + 0 ℃ *
≥2.5mm	250 + 0 ℃ *	245 + 0 ℃ *	245 + 0 ℃ *
*Tolerance : The device manufacturer/supplier shall assure process compatibility up to and including the stated classification temperature(this mean Peak reflow temperature + 0 ℃. For example 260+ 0 ℃) at the rated MSL Level.			

Note 1: All temperature refers topside of the package. Measured on the package body surface.

Note 2: The profiling tolerance is + 0 ℃, - X ℃ (based on machine variation capability)whatever is required to control the profile process but at no time will it exceed – 5 ℃. The producer assures process compatibility at the peak reflow profile temperatures defined in Table 12-3.

Note 3: Package volume excludes external terminals (balls, bumps, lands, leads) and/or non integral heat sinks.

Note 4: The maximum component temperature reached during reflow depends on package the thickness and volume. The use of convection reflow processes reduces the thermal gradients between packages. However, thermal gradients due to differences in thermal mass of SMD package may sill exist.

Note 5: Components intended for use in a “lead-free” assembly process shall be evaluated using the “lead free” classification temperatures and profiles defined in Table12-1, 12-2, 12-3 whether or not lead free.

13. Change List

The following table summarizes revisions to this document.

REV	DATE	AUTHER	CHANGE DESCRIPTION
v1.0.0	20240710	AICSEMI	Release version

14. RoHS Compliant

The products meet the requirements of Directive 2011/65/EU of Europe Parliament and of the Council on the Restriction of Hazardous Substance (RoHS). The products are free from halogenated or antimony trioxide-based flame retardants and other hazardous chemicals.

15. ESD Sensitivity

Electrostatic discharge (ESD) occurs naturally in laboratory and factory environments. An established high-voltage potential is always at risk of discharging to a lower potential. If this discharge path is through a semiconductor device, destructive damage may result. ESD countermeasures and handling methods must be developed and used to control the factory environment at each manufacturing site. AIC products must be handled according to the ESD Association standard: ANSI/ESD S20.20-1999, Protection of Electrical and Electronic Parts, Assemblies, and Equipment.

16. Disclaimer

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