AMPAK Technology Inc.

正基科技股份有限公司

SPECIFICATION

PRODUCT NAME：AP6275SDPR

REVISION：1.6(WEB)

DATE：May. 20th , 2026

Customer APPROVED	
Company	
Representative Signature	

PREPARED	REVIEW			APPROVED	DCC ISSUE
	PM	QA	ET		

正基科技股份有限公司

AMPAK Technology Inc.

AP6275SDPR

Data Sheet

Address:
8F., No.15-1, Zhonghua Rd., Hukou Township, Hsinchu County, Taiwan, 30352
Website:
http://www.ampak.com.tw

Revision

Revision	Date	Description	Revised By
0.1	2021/09/24	- Preliminary	Ali
0.2	2021/09/29	- Pin definition modified	Ali
0.3	2021/12/08	- Pin definition modified	Ali
0.4	2022/05/10	- Modify Pin Definition - Dimensions	Ali
1.0	2022/08/03	- Modify General Specification - Modify Wi-Fi Specification - Modify Bluetooth Specification	Ali
1.1	2022/10/15	- Modify Pin Definition	Ali
1.2	2022/11/03	- Modify Wi-Fi Specification	Ali
1.3	2023/06/02	- Modify Wi-Fi Specification - Modify Dimensions - Modify Package Information	Ali
1.4	2023/10/26	- Modify Pin Definition	Ali
1.5	2024/05/21	- Modify Dimensions - Modify Wi-Fi Specification	Ali
1.6	2026/05/20	--Delete 802.11a MIMO RX	Sam

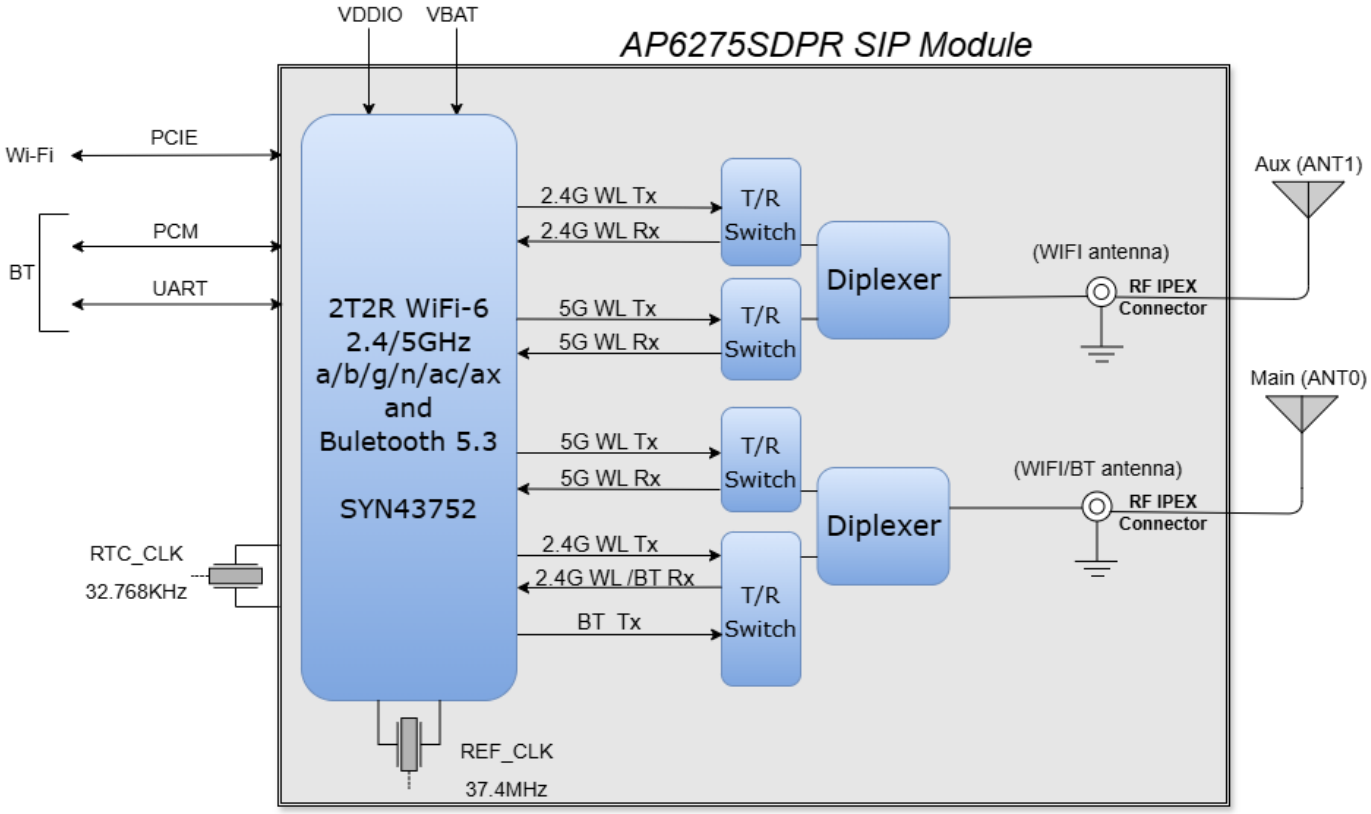
Contents

1. Introduction

1.1 Overview

The AMPAK Technology® AP6275SDPR is a fully Wi-Fi and Bluetooth functionalities module with seamless roaming capabilities and advance security, also it could interact with different vendors' 802.11a/b/g/n/ac/ax 2x2 Access Points with MIMO standard and can accomplish up to speed of 1200Mbps with dual stream in 802.11ax to connect the wireless LAN. Furthermore AP6275SDPR included PCIe interface for Wi-Fi, UART/ PCM interface for Bluetooth.

In addition, this compact module is a total solution for a combination of Wi-Fi + BT technologies. The module is specifically developed for tablet, OTT box and portable devices.



1.2 Product Features

- Lead Free design which is compliant with ROHS requirements.
- TX and RX low-density parity check (LDPC) support for improved range and power efficiency.
- Dual-stream spatial multiplexing up to 1200 Mbps data rate.
- 20, 40, 80 MHz channels with optional SGI. (1024 QAM modulation)
- IEEE 802.11ax beam forming.
- Client MU-MIMO.
- Supports 2 antennas with two for shared BT and WLAN port.
    - Supports PCI express revision 3.0 and power management running at Gen2 speeds.

- BT host digital interface:
    - HCI UART (up to 4 Mbps)
    - PCM for audio data
- Complies with Bluetooth Core Specification Version 5.3 with provisions for supporting future specifications. With Bluetooth Class 1 or Class2 transmitter operation.
- Supports extended synchronous connections (eSCO), for enhanced voice quality by allowing for retransmission of dropped packets.
- Adaptive frequency hopping (AFH) for reducing radio frequency interference.

A simplified block diagram of the module is depicted in the figure above.

2. General Specification

2.1 General Specification

Model Name	AP6275SDPR
Product Description	2T2R 802.11 ax/ac/a/b/g/n Wi-Fi + BT 5.3 Module
Dimension	L x W: 12 x 16(typical) mm H: 1.8(Maximum) mm
WiFi Interface	Support PCIe v3.0 compliant and runs at Gen2 speeds.
BT Interface	UART / PCM
Operating temperature	-40°C to +85°C
Storage temperature	-40°C to 125°C
Humidity	Operating Humidity 10% to 95% Non-Condensing

Note: The optimal RF performance specified in the data sheet, however, is guaranteed only -10 °C to +55 °C and 3.2V < VBAT < 3.6V without derating performance.

2.2 DC Characteristics

2.2.1 Absolute Maximum Ratings

Symbol	Description	Min.	Max.	Unit
VBAT	Input supply Voltage	-0.5	4.5	V
VDDIO	Digital/ Bluetooth/ I/O Voltage	-0.5	2.07	V

2.2.2 Recommended Operating Rating

The module requires two power supplies: VBAT and VDDIO.

Voltage rails	Min.	Typ.	Max.	Unit
VBAT	3.0	3.3	4.8	V
VDDIO	1.68	1.8	1.98	V

VBAT current consumption 1200mA(Peak), when VBAT = 3.3V

The module requires two power supplies: other Digital I/O Pins.

For VDDIO=1.8V	Min.	Max.	Unit
VIH	0.65×VDDIO	N/A	V
VIL	N/A	0.4×VDDIO	V
VOH output@2mA	VDDIO-0.4	N/A	V
VOL output@2mA	N/A	0.4	V

3. Wi-Fi RF Specification

3.1 2.4GHz RF Specification

Conditions : VBAT=3.3V ; VDDIO=1.8V ; Temp:25°C

Feature	Description
WLAN Standard	IEEE 802.11b/g/n/ax & Wi-Fi compliant
Frequency Range	2.400 GHz ~ 2.4835 GHz (2.4GHz ISM Band)
Number of Channels	2.4GHz ： Ch1 ~ Ch13
Modulation	802.11b : DQPSK、DBPSK、CCK 802.11 g/n : OFDM_64-QAM、16-QAM、QPSK、BPSK 802.11ax : OFDM_256-QAM、64-QAM、16-QAM、QPSK、BPSK

Output Power , tolerance ± 1.5 dB

The transmit EVM quality & spectrum mask are compliant with IEEE 802.11 standard

802.11b	**1Mbps**	**2Mbps**	**5.5Mbps**	**11Mbps**	
	19	19	19	19	
802.11g	**6、9Mbps**	**12、18Mbps**	**24Mbps**	**36Mbps**	**48Mbps**
	19	19	18.5	18.5	18
	54Mbps				
	16.5				
802.11n 20MHz	**MCS0~2**	**MCS3**	**MCS4**	**MCS5**	**MCS6**
	19	18.5	18.5	18	16.5
	MCS7				
	16				
802.11ax 20MHz	**HE0~2**	**HE3**	**HE4**	**HE5**	**HE6**
	19	18.5	18.5	18	16.5
	HE7	**HE8**	**HE9**		
	16	16	15		

Note: The specifications of RF output power are subject to change to fulfill the safety regulation and requirements in end-user product.

Sensitivity, tolerance ± 2 dB

CCK modulation PER ≦ 8%、OFDM modulation PER ≦ 10%

802.11b	**Data Rate**	**Spec.(dBm)**		
	1Mbps	-97		
	2Mbps	-93		
	5.5Mbps	-91		
	11Mbps	-88		

802.11g SISO	**Data Rate**	**Spec.(dBm)**	**Data Rate**	**Spec.(dBm)**
	6Mbps	-92.5	**24Mbps**	-84.5
	9Mbps	-91.5	**36Mbps**	-81.5
	12Mbps	-90.5	**48Mbps**	-78
	18Mbps	-87.5	**54Mbps**	-75.5
802.11g MIMO	**Data Rate**	**Spec.(dBm)**	**Data Rate**	**Spec.(dBm)**
	6Mbps	-95	**24Mbps**	-87
	9Mbps	-94	**36Mbps**	-84
	12Mbps	-93	**48Mbps**	-81
	18Mbps	-90	**54Mbps**	-78
802.11n_20MHz SISO	**Data Rate**	**Spec.(dBm)**	**Data Rate**	**Spec.(dBm)**
	MCS0	-92	**MCS4**	-81.5
	MCS1	-89	**MCS5**	-78
	MCS2	-87	**MCS6**	-75.5
	MCS3	-84	**MCS7**	-74.5
802.11n_20MHz MIMO	**Data Rate**	**Spec.(dBm)**	**Data Rate**	**Spec.(dBm)**
	MCS0	-93	**MCS5**	-80
	MCS1	-92	**MCS6**	-78
	MCS2	-90	**MCS7**	-76
	MCS3	-87	**MCS8**	-72
	MCS4	-83	**MCS15**	-73
802.11ax_20MHz SISO	**Data Rate**	**Spec.(dBm)**	**Data Rate**	**Spec.(dBm)**
	HE0	-92	**HE6**	-75.5
	HE1	-89	**HE7**	-74.5
	HE2	-87	**HE8**	-72
	HE3	-84	**HE9**	-70
	HE4	-81.5		
	HE5	-78		
Maximum Input Level	802.11b : -10 dBm			
	802.11g/n/ax : -20 dBm			

3.2 5GHz RF Specification

Conditions : VBAT=3.3V ; VDDIO=1.8V ; Temp:25°C

Feature	Description
WLAN Standard	IEEE 802.11a/n/ac/ax & Wi-Fi compliant
Frequency Range	5.15~5.35GHz、5.47~5.725GHz、5.725~5.85GHz (5GHz UNII Band)
Number of Channels	5.15~5.35GHz：Ch36 ~ Ch64 5.47~5.725GHz：Ch100 ~ Ch140 5.725~5.85GHz：Ch149 ~ Ch165
Modulation	802.11a : OFDM_64-QAM、16-QAM、QPSK、BPSK 802.11n : OFDM_64-QAM、16-QAM、QPSK、BPSK 802.11ac : OFDM_256-QAM、OFDM_64-QAM、16-QAM、QPSK、BPSK 802.11ax : OFDM_1024-QAM、 OFDM_256-QAM、OFDM_64-QAM、16-QAM、QPSK、BPSK

Output Power , tolerance ± 2 dB

The transmit EVM quality & spectrum mask are compliant with IEEE 802.11 standard

802.11a	**Frequency (MHz)**	**6~9Mbps**	**12~18Mbps**	**24Mbps**	**36Mbps**
	5150~5350	16	16	15.5	15.5
	5470~5720	16	16	15.5	15.5
	5725~5845	16	16	15.5	15.5
	Frequency (MHz)	**48Mbps**	**54Mbps**		
	5150~5350	15.5	15		
	5470~5720	15.5	15		
	5725~5845	15.5	15		
802.11n 20MHz	**Frequency (MHz)**	**MCS0~2**	**MCS3**	**MCS4**	**MCS5**
	5150~5350	16	16	15.5	15.5
	5470~5720	16	16	15.5	15.5
	5725~5845	16	16	15.5	15.5
	Frequency (MHz)	**MCS6**	**MCS7**		
	5150~5350	15	14		
	5470~5720	15	14		
	5725~5845	15	14		

802.11n 40MHz	Frequency (MHz)	MCS0~2	MCS3	MCS4	MCS5
	5150~5350	15.5	15.5	15	15
	5470~5720	15.5	15.5	15	15
	5725~5845	15.5	15.5	15	15
	Frequency (MHz)	MCS6	MCS7		
	5150~5350	14.5	13.5		
	5470~5720	14.5	13.5		
	5725~5845	14.5	13.5		
802.11ac 20MHz	Frequency (MHz)	MCS0~2	MCS3	MCS4	MCS5
	5150~5350	16	16	15.5	15.5
	5470~5720	16	16	15.5	15.5
	5725~5845	16	16	15.5	15.5
	Frequency (MHz)	MCS6	MCS7	MCS8	
	5150~5350	15	14	11.5	
	5470~5720	15	14	11.5	
	5725~5845	15	14	11.5	
802.11ac 40MHz	Frequency (MHz)	MCS0~2	MCS3	MCS4	MCS5
	5150~5350	15	15	15	15
	5470~5720	15	15	15	15
	5725~5845	15	15	15	15
	Frequency (MHz)	MCS6	MCS7	MCS8	MCS9
	5150~5350	14.5	14	11.5	10
	5470~5720	14.5	14	11.5	10
	5725~5845	14.5	14	11.5	10
802.11ac 80MHz	Frequency (MHz)	MCS0~2	MCS3	MCS4	MCS5
	5150~5350	15.5	15	14.5	14.5
	5470~5720	15.5	15	14.5	14.5
	5725~5845	15.5	15	14.5	14.5
	Frequency (MHz)	MCS6	MCS7	MCS8	MCS9
	5150~5350	14	14	10	10
	5470~5720	14	14	10	10
	5725~5845	14	14	10	10

802.11ax 20MHz	Frequency (MHz)	HE0~2	HE3	HE4	HE5
	5150~5350	16	15.5	15.5	15.5
	5470~5720	16	15.5	15.5	15.5
	5725~5845	16	15.5	15.5	15.5
	Frequency (MHz)	HE6	HE7	HE8	HE9
	5150~5350	14.5	14.5	11.5	11.5
	5470~5720	14.5	14.5	11.5	11.5
	5725~5845	14.5	14.5	11.5	11.5
	Frequency (MHz)	HE10	HE11		
	5150~5350	10	10		
	5470~5720	10	10		
	5725~5845	10	10		
802.11ax 40MHz	Frequency (MHz)	HE0~2	HE3	HE4	HE5
	5150~5350	15	15	15	15
	5470~5720	15	15	15	15
	5725~5845	15	15	15	15
	Frequency (MHz)	HE6	HE7	HE8	HE9
	5150~5350	14.5	14	12	10
	5470~5720	14.5	14	12	10
	5725~5845	14.5	14	12	10
	Frequency (MHz)	HE10	HE11		
	5150~5350	8	8		
	5470~5720	8	8		
	5725~5845	8	8		
802.11ax 80MHz	Frequency (MHz)	HE0~2	HE3	HE4	HE5
	5150~5350	15.5	15	14.5	14.5
	5470~5720	15.5	15	14.5	14.5
	5725~5845	15.5	15	14.5	14.5
	Frequency (MHz)	HE6	HE7	HE8	HE9
	5150~5350	14	14	10	10
	5470~5720	14	14	10	10
	5725~5845	14	14	10	10
	Frequency (MHz)	HE10	HE11		
	5150~5350	8	8		
	5470~5720	8	8		
	5725~5845	8	8		
Note: The specifications of RF output power are subject to change to fulfill the safety regulation and requirements in end-user product.					

Sensitivity, tolerance ± 2 dB OFDM modulation PER ≦ 10%				
802.11a SISO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	6Mbps	-89	24Mbps	-82
	9Mbps	-88	36Mbps	-80
	12Mbps	-87	48Mbps	-75
	18Mbps	-86	54Mbps	-72
802.11n_20MHz SISO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0	-89	MCS4	-78
	MCS1	-87	MCS5	-75
	MCS2	-86	MCS6	-72
	MCS3	-82	MCS7	-70
802.11n_20MHz MIMO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0	-92	MCS5	-78
	MCS1	-90	MCS6	-75
	MCS2	-88	MCS7	-73
	MCS3	-85	MCS8	-88
	MCS4	-81	MCS15	-69
802.11n_40MHz SISO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0	-87	MCS4	-76
	MCS1	-85	MCS5	-71
	MCS2	-82	MCS6	-70
	MCS3	-79	MCS7	-68
802.11n_40MHz MIMO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0	-88	MCS5	-75
	MCS1	-88	MCS6	-73
	MCS2	-86	MCS7	-71
	MCS3	-83	MCS8	-86
	MCS4	-79	MCS15	-67

802.11ac_20MHz SISO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0	-89	MCS5	-74
	MCS1	-87	MCS6	-72
	MCS2	-86	MCS7	-70
	MCS3	-82	MCS8	-67
	MCS4	-78		
802.11ac_20MHz MIMO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0,NSS=1	-92	MCS6,NSS=1	-75
	MCS1,NSS=1	-90	MCS7,NSS=1	-72
	MCS2,NSS=1	-87	MCS8,NSS=1	-70
	MCS3,NSS=1	-84	MCS0,NSS=2	-88
	MCS4,NSS=1	-81	MCS8,NSS=2	-65
	MCS5,NSS=1	-77		
802.11ac_40MHz SISO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0	-87	MCS5	-71
	MCS1	-85	MCS6	-69
	MCS2	-82	MCS7	-68
	MCS3	-79	MCS8	-64
	MCS4	-75	MCS9	-63
802.11ac_40MHz MIMO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0,NSS=1	-89.5	MCS6,NSS=1	-71.5
	MCS1,NSS=1	-87.5	MCS7,NSS=1	-70.5
	MCS2,NSS=1	-84.5	MCS8,NSS=1	-66.5
	MCS3,NSS=1	-81.5	MCS9,NSS=1	-65.5
	MCS4,NSS=1	-77.5	MCS0,NSS=2	-85.5
	MCS5,NSS=1	-73.5	MCS9,NSS=2	-59.5
802.11ac_80MHz SISO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0	-84	MCS5	-67
	MCS1	-81	MCS6	-65
	MCS2	-78	MCS7	-63
	MCS3	-75	MCS8	-62
	MCS4	-72	MCS9	-60

802.11ac_80MHz MIMO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	MCS0,NSS=1	-87	MCS6,NSS=1	-68
	MCS1,NSS=1	-84	MCS7,NSS=1	-66
	MCS2,NSS=1	-81	MCS8,NSS=1	-65
	MCS3,NSS=1	-78	MCS9,NSS=1	-63
	MCS4,NSS=1	-75	MCS0,NSS=2	-83
	MCS5,NSS=1	-70	MCS9,NSS=2	-58
802.11ax_20MHz SISO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	HE0	-89	HE6	-72
	HE1	-87	HE7	-69
	HE2	-86	HE8	-67
	HE3	-82	HE9	-63
	HE4	-78	HE10	-58
	HE5	-74	HE11	-55
802.11ax_40MHz SISO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	HE0	-87	HE6	-69
	HE1	-85	HE7	-68
	HE2	-82	HE8	-64
	HE3	-79	HE9	-63
	HE4	-75	HE10	-59
	HE5	-71	HE11	-54
802.11ax_80MHz SISO	Data Rate	Spec.(dBm)	Data Rate	Spec.(dBm)
	HE0	-84	HE6	-67
	HE1	-81	HE7	-65
	HE2	-78	HE8	-62
	HE3	-75	HE9	-60
	HE4	-72	HE10	-55
	HE5	-67	HE11	-51
Maximum Input Level	802.11a/n/ac/ax : -30 dBm			

4. Bluetooth Specification

4.1 Bluetooth Specification

Conditions : VBAT=3.3V ; VDDIO=1.8V ; Temp:25°C

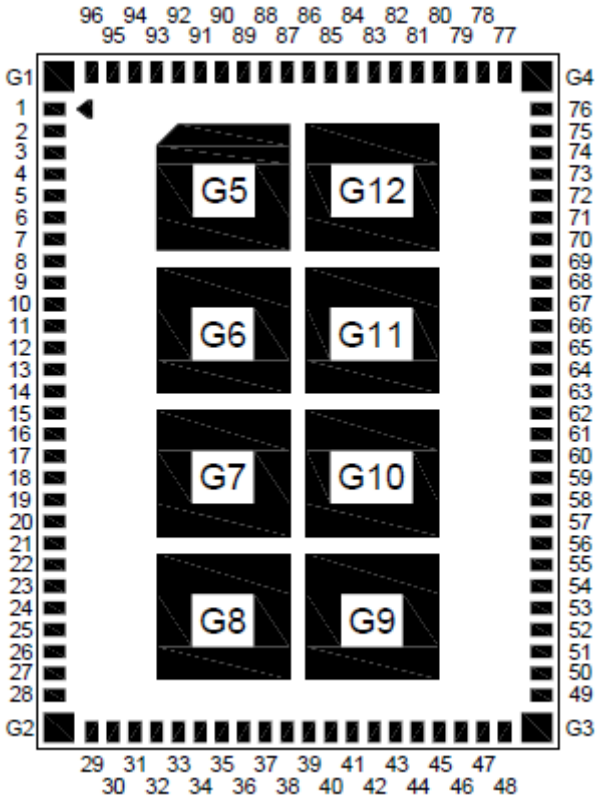
Feature	**Description**
General Specification	
Bluetooth Standard	BDR、EDR(2、3Mbps)、LE(1Mbps)、LE2(2Mbps)、LELR
Host Interface	UART
Frequency Band	2402 MHz ~ 2480 MHz
Number of Channels	79 channels for classic、40 channels for BLE
Modulation	GFSK, π/4-DQPSK, 8DPSK
RF Specification	
Output Power , tolerance ± 2 dB	
	CL1 (dBm)
BDR Output Power	7
EDR Output Power	5
BLE Output Power	7
Sensitivity, tolerance ± 2 dB	
Sensitivity @ BER=0.1% for GFSK (1Mbps)	-89 dBm
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)	-92 dBm
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)	-84 dBm
Sensitivity @ PER=30.8% for LE (1Mbps)	-92 dBm
Sensitivity @ PER=30.8% for 2LE (2Mbps)	-91 dBm
Maximum Input Level	GFSK (1Mbps):-20dBm
	π/4-DQPSK (2Mbps) :-20dBm
	8DPSK (3Mbps) :-20dBm

Note*：The Bluetooth BDR output power is able to be configured by firmware (hcd file).

5. Pin Definition

5.1 Pin Outline

< TOP VIEW >



5.2 Pin Assignment

NO	Name	Type	Description
1	NC	—	Floating (Don't connected to ground)
2	NC	—	Floating (Don't connected to ground)
3	WL_GPIO4	I/O	WLAN GPIO 4
4	VBAT	I	VBAT system power supply input
5	VBAT	I	VBAT system power supply input
6	GND	—	Ground connections
7	WL_GPIO5	I/O	WLAN GPIO 5
8	WL_GPIO8	I/O	WLAN GPIO 8
9	WL_GPIO9	I/O	WLAN GPIO 9
10	NC	—	Floating (Don't connected to ground)
11	NC	—	Floating (Don't connected to ground)
12	ABUCK_1P12	I	Internal Buck voltage generation pin
13	ABUCK_1P12	I	Internal Buck voltage generation pin

14	GND	—	Ground connections
15	ASR_VLX	O	Internal Analog Buck voltage generation pin
16	ASR_VLX	O	Internal Analog Buck voltage generation pin
17	GND	—	Ground connections
18	CSR_VLX	O	Internal Analog Buck voltage generation pin
19	CSR_VLX	O	Internal Analog Buck voltage generation pin
20	GND	—	Ground connections
21	CBUCK_0P9	I	Internal Buck voltage generation pin
22	CBUCK_0P9	I	Internal Buck voltage generation pin
23	GND	—	Ground connections
24	BT_WAKE	I	HOST wake-up Bluetooth device
25	NC	—	Floating (Don't connected to ground)
26	GND	—	Ground connections
27	LPO_IN	I	External Low Power Clock input (32.768KHz)
28	WL_GPIO1	I/O	WLAN GPIO 1/WL_DEV_WAKE
29	PCIE_PME_L	OD	PCI power management event output
30	PCIE_CLKREQ_L	OD	PCIe clock request
31	PCIE_PERST_L	I	PCIe host indication to reset the device
32	GND	—	Ground connections
33	PCIE_RCLK_N	I	PCI Express differential clock input-Negative
34	PCIE_RCLK_P	I	PCI Express differential clock input-Positive
35	GND	—	Ground connections
36	PCIE_TX_N	O	PCI Express transmit data-Negative
37	PCIE_TX_P	O	PCI Express transmit data-Positive
38	GND	—	Ground connections
39	PCIE_RX_N	I	PCI Express receive data- Negative
40	PCIE_RX_P	I	PCI Express receive data-Positive
41	GND	—	Ground connections
42	NC	—	Floating (Don't connected to ground)
43	NC	—	Floating (Don't connected to ground)
44	NC	—	Floating (Don't connected to ground)
45	WL_REG_ON	I	Low asserting reset for WiFi core
46	WL_HOST_WAKE	O	WLAN to wake-up HOST
47	NC	—	Floating (Don't connected to ground)
48	NC	—	Floating (Don't connected to ground)
49	NC	—	Floating (Don't connected to ground)
50	NC	—	Floating (Don't connected to ground)
51	NC	—	Floating (Don't connected to ground)
52	NC	—	Floating (Don't connected to ground)

53	BT_HOST_WAKE	O	Bluetooth device to wake-up HOST
54	BT_UART_CTS	I	Bluetooth UART clear to send
55	BT_UART_TX	O	Bluetooth UART serial data output
56	BT_UART_RX	I	Bluetooth UART serial data input
57	BT_UART_RTS	O	Bluetooth UART request to send
58	PCM_SYNC	I/O	PCM Sync; can be master (output) or slave (input)
59	PCM_IN	I	PCM data input
60	PCM_OUT	O	PCM Data output
61	PCM_CLK	I/O	PCM clock; can be master (output) or slave (input)
62	GND	—	Ground connections
63	BT_REG_ON	I	Low asserting reset for Bluetooth core
64	WL_GPIO2	I/O	WLAN GPIO 2
65	WL_GPIO3	I/O	WLAN GPIO 3
66	DBG_UART_RX/WL_GPIO10	I/O	DBG UART Tx , WLAN GPIO 10
67	DBG_UART_TX/WL_GPIO11	I/O	DBG UART Rx , WLAN GPIO 11
68	GND	—	Ground connections
69	NC	—	Floating (Don’t connected to ground)
70	NC	—	Floating (Don’t connected to ground)
71	GND	—	Ground connections
72	VIO	P	I/O 1.8 Voltage supply input
73	VIO	P	I/O 1.8 Voltage supply input
74	GND	—	Ground connections
75	GND	—	Ground connections
76	GND	—	Ground connections
77	GND	—	Ground connections
78	GND	—	Ground connections
79	GND	—	Ground connections
80	GND	—	Ground connections
81	GND	—	Ground connections
82	GND	—	Ground connections
83	GND	—	Ground connections
84	GND	—	Ground connections
85	GND	—	Ground connections
86	GND	—	Ground connections
87	GND	—	Ground connections
88	GND	—	Ground connections
89	GND	—	Ground connections
90	GND	—	Ground connections
91	GND	—	Ground connections

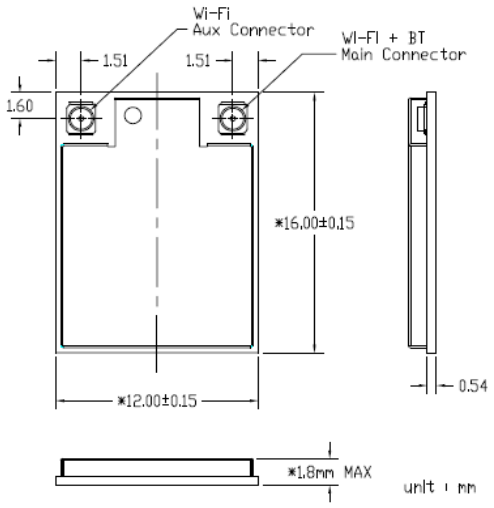
92	GND	—	Ground connections
93	GND	—	Ground connections
94	GND	—	Ground connections
95	GND	—	Ground connections
96	GND	—	Ground connections
G1	GND	—	Ground connections
G2	GND	—	Ground connections
G3	GND	—	Ground connections
G4	GND	—	Ground connections
G5	GND	—	Ground connections
G6	GND	—	Ground connections
G7	GND	—	Ground connections
G8	GND	—	Ground connections
G10	GND	—	Ground connections
G11	GND	—	Ground connections
G12	GND	—	Ground connections

6. Dimensions

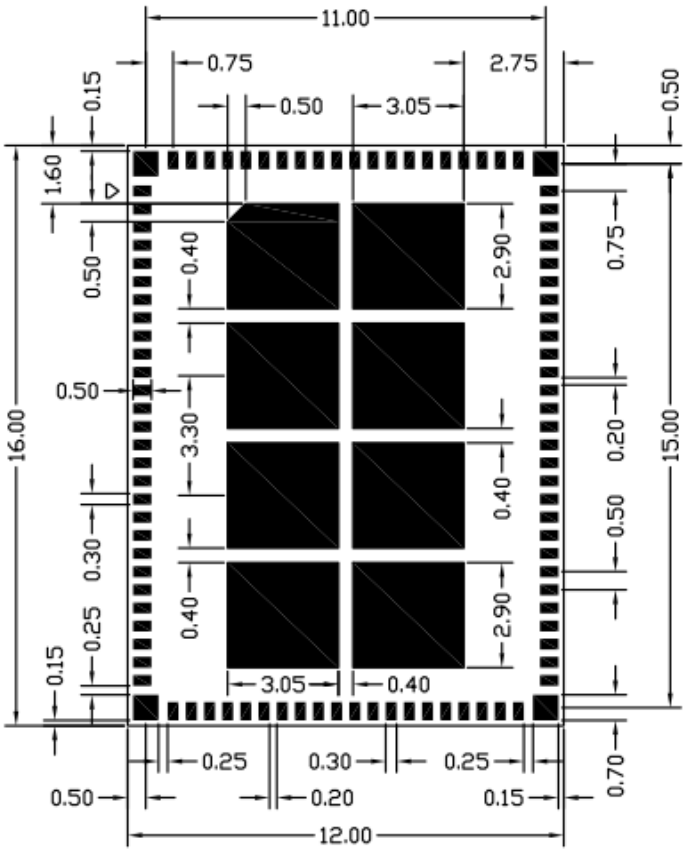
6.1 Module Dimensions

(Unit: mm)

< TOP VIEW >



< TOP VIEW >

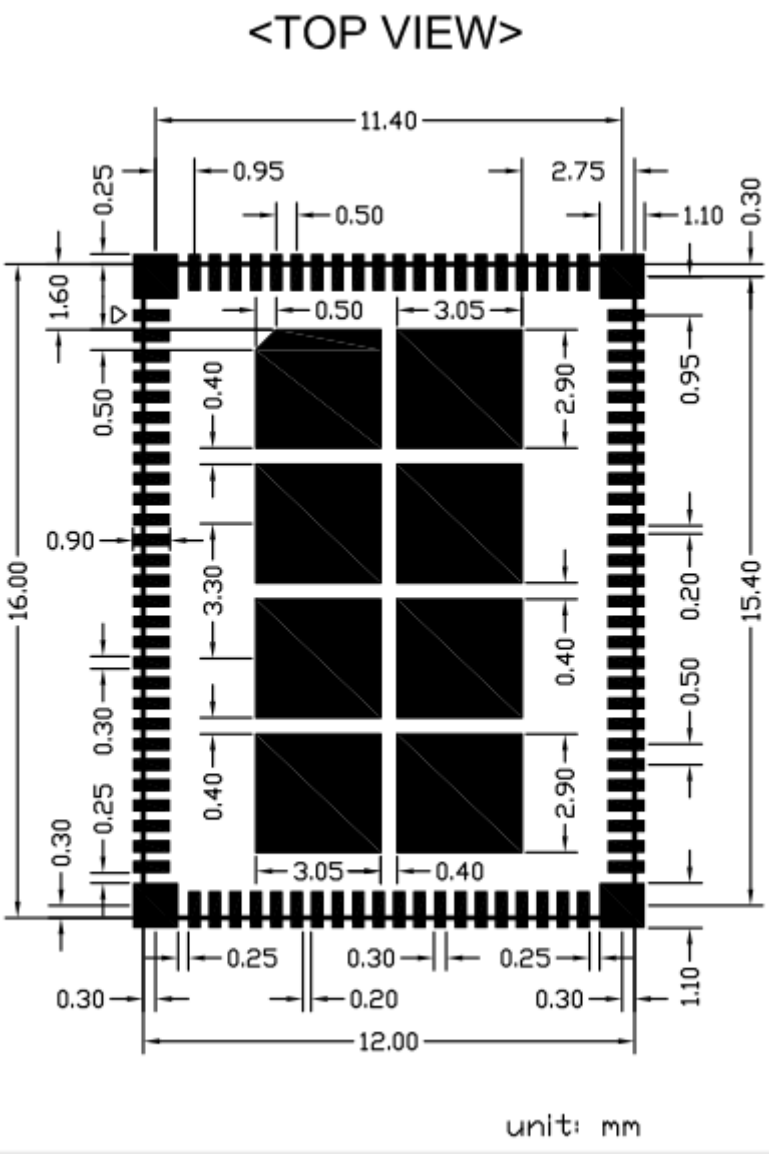


GENERAL TOLERANCE IS ±0.10mm
UNLESS OTHERWISE SPECIFIED

unit: mm

6.2 Recommended footprint

(Unit: mm)



- Solder paste layer design is generally the same as recommended footprint.
  (錫膏層設計通常建議和焊墊尺寸相同)
- If soldering quality with good wetting on upright side is essential for PQC, how to optimize the aperture design in the stencil to adjust the amount of solder paste would be crucial.
  In addition, a kind of stencil design with stepped thickness in partial area would be considered if the thickness of stencil is about 0.1mm or thinner. Please optimize the stencil design by manufacture engineer or contact AMPAK FAE for assistance.
  (如果模組吃錫品質考量側面爬錫，如何優化鋼網開孔設計以調整適當的錫膏量是非常重要的。尤其鋼網的厚度大約是 0.1mm 或更薄時，可考慮局部加厚鋼網的設計。請諮詢製程工程師以優化鋼網的設計,或是聯絡正基科技技術支持團隊).

External clock reference

External LPO signal characteristics

Parameter	Specification	Units
Nominal input frequency	32.768	kHz
Frequency accuracy	+/-25	ppm
Duty cycle	30 - 70	%
Input signal amplitude	1.8±0.09	V
Signal type	Square-wave	-
Input impedance	>100k <5	Ω pF
Clock jitter (integrated over 300Hz – 15KHz)	<1	Hz
Output high voltage	0.7Vio - Vio	V

7. Host Interface Timing Diagram

7.1 Power-up Sequence Timing Diagram

The module has signals that allow the host to control power consumption by enabling or disabling the Bluetooth, WLAN and internal regulator blocks. These signals are described below.
Additionally, diagrams are provided to indicate proper sequencing of the signals for carious operating states. The timing value indicated are minimum required values: longer delays are also acceptable.

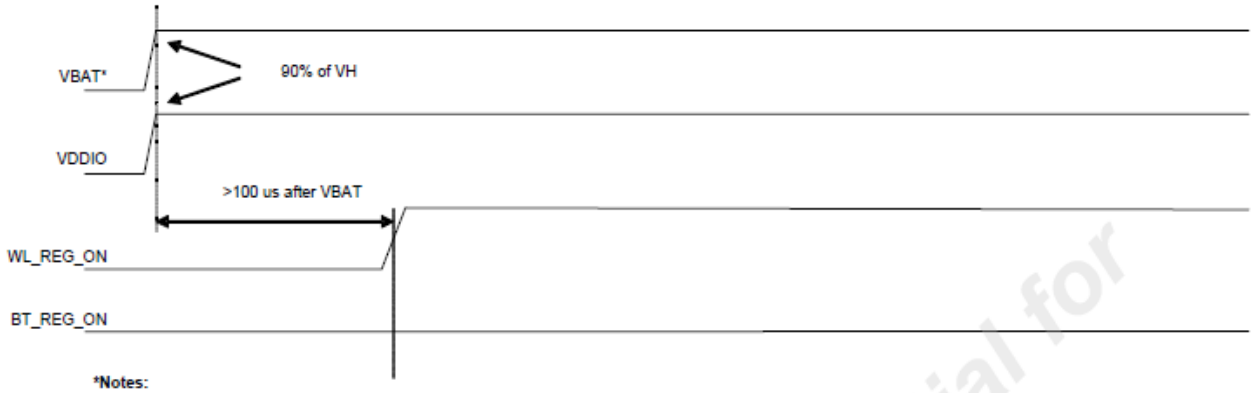
- WL_REG_ON: This signal is used by the PMU to power up the WLAN section. It is also OR-gated with the BT_REG_ON input to control the internal regulators. When this pin is high, the regulators are enabled and the WLAN section is out of reset. When this pin is low, the WLAN section is in reset. If BT_REG_ON and WL_REG_ON are both low, the regulators are disabled.
- BT_REG_ON: This signal is used by the PMU to decide whether or not to power down the internal regulators. If BT_REG_ON and WL_REG_ON are low, the regulators will be disabled.
- It suggests customers connect WL_REG_ON and BT_REG_ON to GPIOs for control, otherwise unexpected errors may occur when boot-up the device.
- In the figure, The VDDIO power supply has been included in the module. When VBAT is power-up, VDDIO will rise to high level after 15 ms.
- The module main chip has an internal power-on reset (POR) circuit. The device will be held in reset for a maximum of 110 ms after VDDC and VDDIO have both passed the POR threshold. Wait at least 150 ms after VDDC and VDDIO are available before initiating PCIe accesses.

*Notes:
1. The VBAT and VDDIO 10%–90% rise-time slopes must be greater than 50 microseconds/V.
2. VBAT should be up before or at the same time as VDDIO. VDDIO should NOT be present first or be held high before VBAT is high.

WLAN=ON, Bluetooth=ON

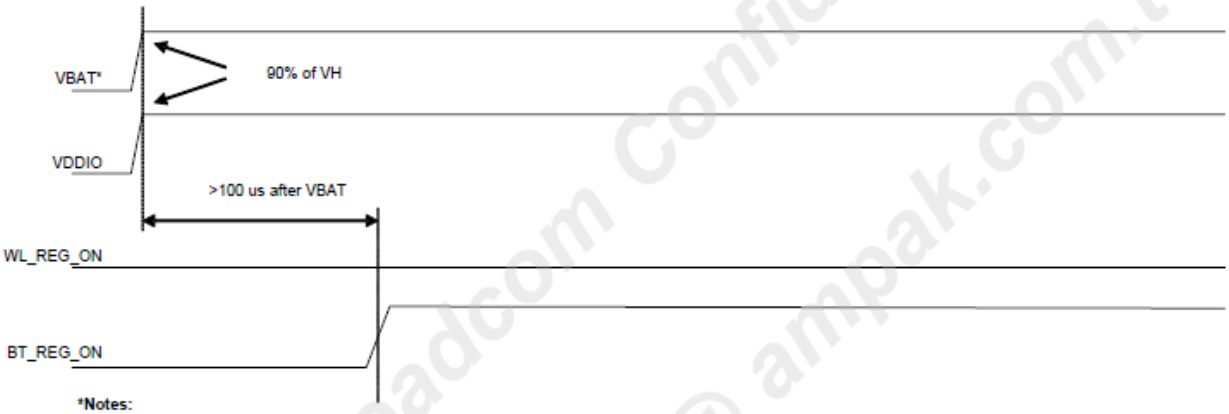
*Notes:
1. The VBAT and VDDIO 10%–90% rise-time slopes must be greater than 50 microseconds/V.
2. VBAT should be up before or at the same time as VDDIO. VDDIO should NOT be present first or be held high before VBAT is high.

WLAN=OFF, Bluetooth=OFF



*Notes:
1. The VBAT and VDDIO 10%–90% rise-time slopes must be greater than 50 microseconds/V.
2. VBAT should be up before or at the same time as VDDIO. VDDIO should NOT be present first or be held high before VBAT is high.

WLAN=ON, Bluetooth=OFF



*Notes:
1. The VBAT and VDDIO 10%–90% rise-time slopes must be greater than 50 microseconds/V.
2. VBAT should be up before or at the same time as VDDIO. VDDIO should NOT be present first or be held high before VBAT is high.

WLAN=OFF, Bluetooth=ON

7.2 PCIe Interface Description

The PCI Express(PCIe) core on the AP6275SDPR is a high-performance serial I/O interconnect that is protocol compliant and electrically compatible with the PCI Express Base Specification v3.0 running at Gen2 speeds.

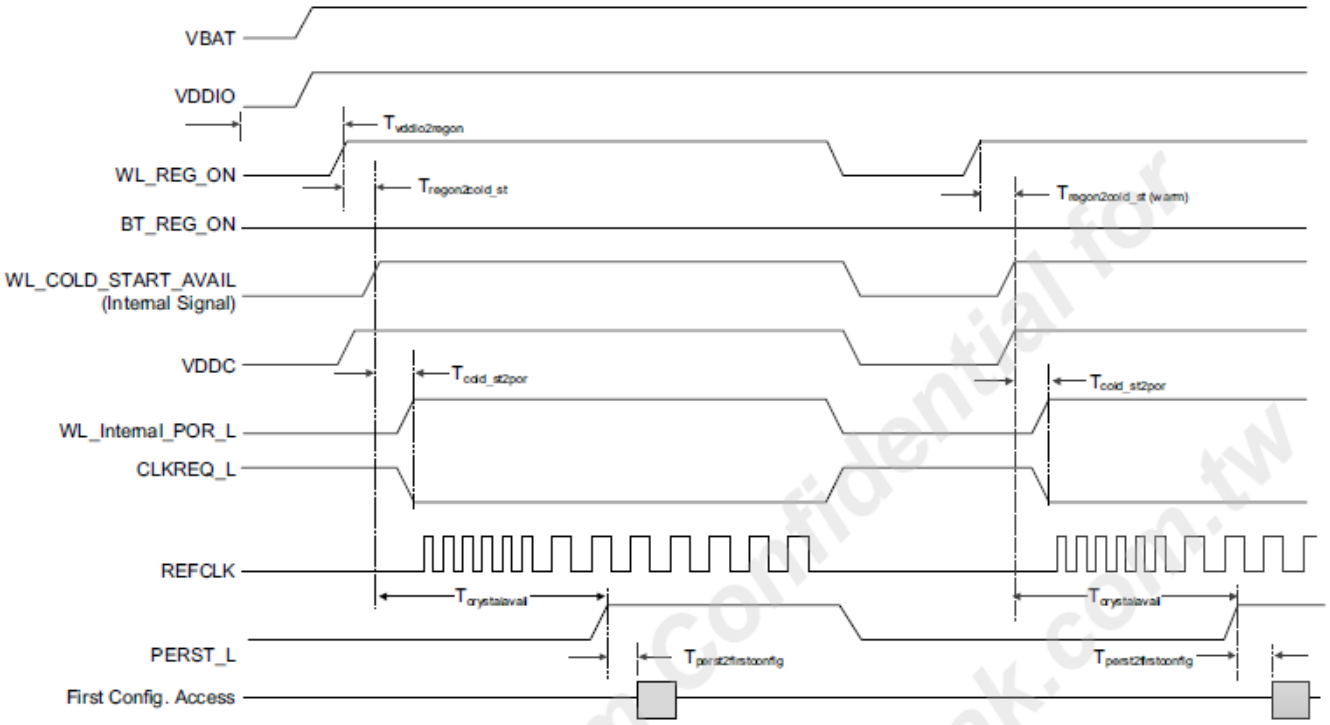
PCI Express Interface Parameters

Parameter	Symbol	Comments	Min.	Typ.	Max.	Unit
General[a]						
Baud rate	BPS	—	—	5	—	Gbaud
Reference clock peak-to-peak differential[b]	Vref	LVPECL, AC coupled	0.95	—	—	V
Receiver						
Differential termination	ZRX-DIFF-DC	Differential termination	80	100	120	Ω
DC impedance	ZRX-DC	DC common-mode impedance	40	50	60	Ω
Powered down termination (POS)	ZRX-HIGH-IMP-DC-POS	Power-down or RESET high impedance	100k	—	—	Ω
Powered down termination (NEG)	ZRX-HIGH-IMP-DC-NEG	Power-down or RESET high impedance	1k	—	—	Ω
Input voltage	VRX-DIFFp-p	AC coupled, differential p-p	175	—	—	mV
Jitter tolerance	TRX-EYE	Minimum receiver eye width	0.4	—	—	UI
Differential return loss	RLRX-DIFF	Differential return loss	10	—	—	dB
Common-mode return loss	RLRX-CM	Common-mode return loss	6	—	—	dB
Unexpected electrical idle enter detect threshold integration time	TRX-IDEL-DET-DIFF-ENTERTIME	An unexpected electrical idle must be recognized no longer than this time to signal an unexpected idle condition.	—	—	10	ms
Signal detect threshold	VRX-IDLE-DET-DIFFp-p	Electrical idle detect threshold	65	—	175	mV
Transmitter						
Output voltage	VTX-DIFFp-p	Differential p-p, programmable in 16 steps	0.8	—	1200	mV
Output voltage rise time	VTX-RISE	20% to 80%	0.125 (2.5 GT/s) 0.15 (5 GT/s)	—	—	UI
Output voltage fall time	VTX-FALL	80% to 20%	0.125 (2.5 GT/s) 0.15 (5 GT/s)	—	—	UI
RX detection voltage swing	VTX-RCV-DETECT	The amount of voltage change allowed during receiver detection.	—	—	600	mV

PCI Express Interface Parameters (Continued)

Parameter	Symbol	Comments	Min.	Typ.	Max.	Unit
TX AC peak common-mode voltage (5 GT/s)	VTX-CM-AC-PP	TX AC common mode voltage (5 GT/s)	—	—	100	mV
TX AC peak common-mode voltage (2.5 GT/s)	VTX-CM-AC-P	TX AC common mode voltage (2.5 GT/s)	—	—	20	mV
Absolute delta of DC common-mode voltage during L0 and electrical idle	VTX-CM-DC-ACTIVE-IDLE-DELTA	Absolute delta of DC common-mode voltage during L0 and electrical idle.	0	—	100	mV
Absolute delta of DC common-mode voltage between D+ and D-	VTX-CM-DC-LINE-DELTA	DC offset between D+ and D-	0	—	25	mV
Electrical idle differential peak output voltage	VTX-IDLE-DIFF-AC-p	Peak-to-peak voltage	0	—	20	mV
TX short circuit current	ITX-SHORT	Current limit when TX output is shorted to ground.	—	—	90	mA
DC differential TX termination	ZTX-DIFF-DC	Low impedance defined during signaling (parameter is captured for 5.0 GHz by RLTX-DIFF)	80	—	120	Ω
Differential return loss	RLTX-DIFF	Differential return loss	10 (min) for 0.05: 1.25 GHz	—	—	dB
Common-mode return loss	RLTX-CM	Common-mode return loss	6	—	—	dB
TX eye width	TTX-EYE	Minimum TX eye width	0.75	—	—	UI

PCIe Power-On Timing



Timing Parameter	Notes	Value[a]	Unit
$T_{vddio2regon}$	–	0.1	ms
$T_{regon2cold\_st}$	3.4 ms + 162 instruction-level parallelism (ILP) cycles	10.13	ms
T_{cold_st2por}	54 ILP cycles	2.24	ms
$T_{crystalavail}$	509 ILP cycles	21.17	ms
$T_{perst2firstconfig}$	–	6.0	ms
$T_{vddioon2firstconfig}$	$T_{vddio2regon} + T_{regon2cold\_st} + T_{crystalavail} + T_{perst2firstconfig}$	37.4[b]	ms
$T_{regon2cold\_st\ (warm)}$	162 ILP cycles	6.73	ms

a. The time values assume an ILP tolerance of ±30%.

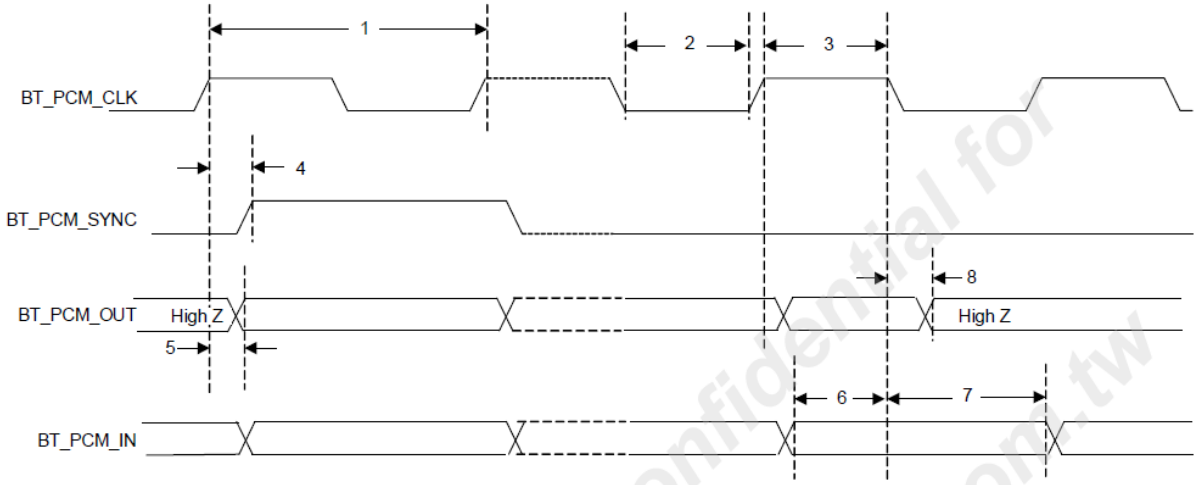
b. With VDDIO as a reference, 37.4 ms is the minimum system wait time before issuing the first configuration access.

7.3 PCM Interface Description

AP6275SDPR supports two independent PCM interfaces that share the pins with the I^2S interfaces. The PCM interface can connect to linear PCM codec devices in master or slave mode. In master mode, generates the BT_PCM_CLK and BT_PCI_SYNC signals, and in slave mode, these signals are provided by another master on the PCM interface and are inputs to the AP6275SDPR.

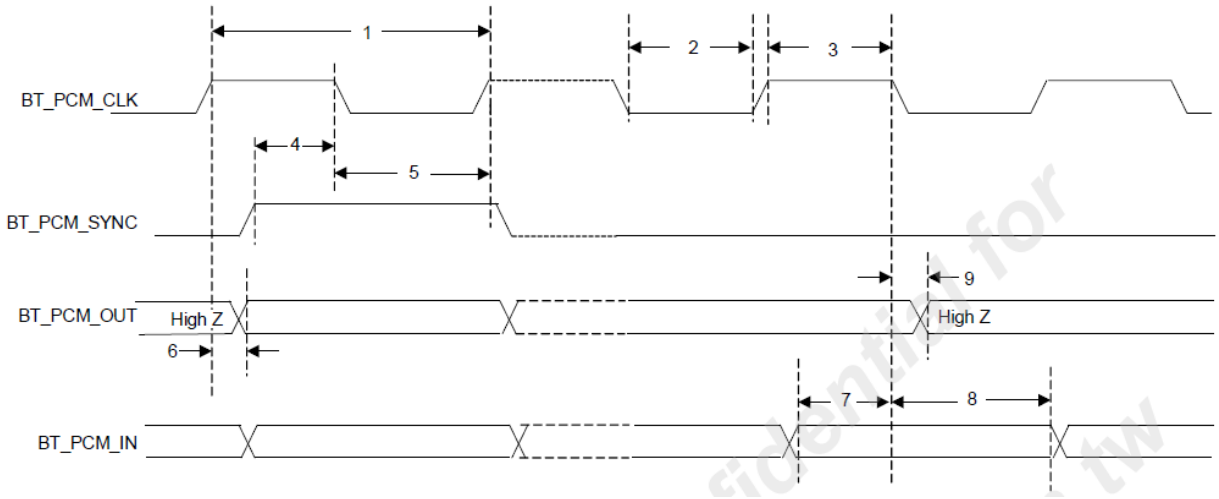
PCM Timing

Short Frame Sync, Master Mode



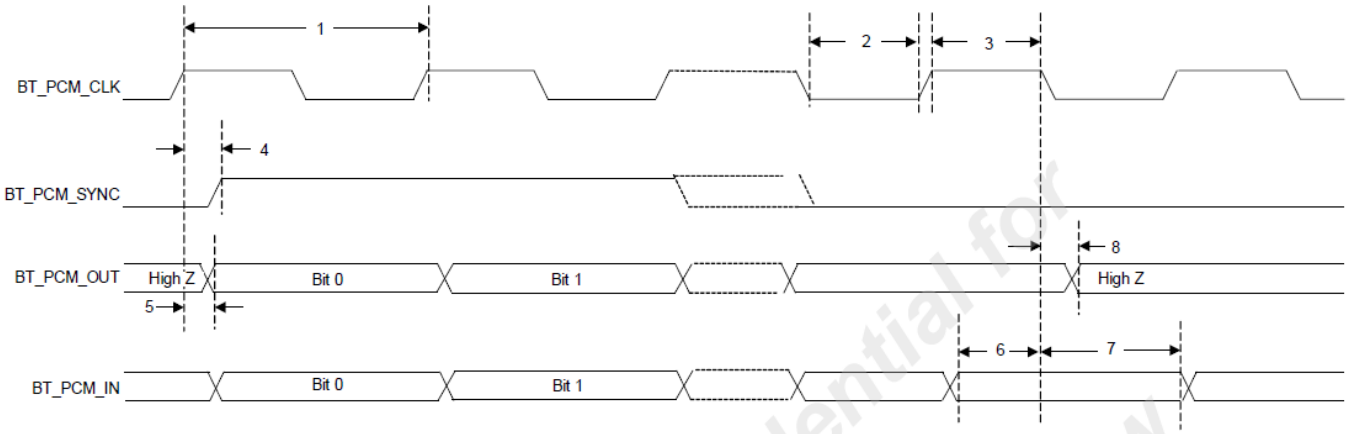
Reference	Characteristics	Minimum	Typical	Maximum	Unit
1	PCM bit clock frequency	—	—	12	MHz
2	PCM bit clock low	41	—	—	ns
3	PCM bit clock high	41	—	—	ns
4	BT_PCM_SYNC delay	0	—	25	ns
5	BT_PCM_OUT delay	0	—	25	ns
6	BT_PCM_IN setup	8	—	—	ns
7	BT_PCM_IN hold	8	—	—	ns
8	Delay from falling edge of BT_PCM_CLK during the last bit period to BT_PCM_OUT becoming high impedance.	0	—	25	ns

Short Frame Sync, Slave Mode



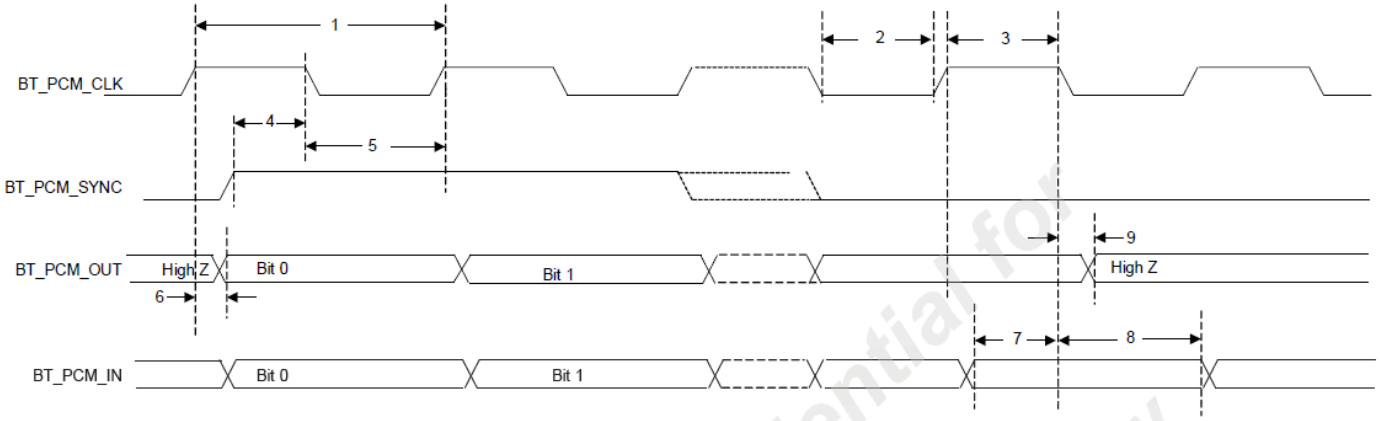
Reference	Characteristics	Minimum	Typical	Maximum	Unit
1	PCM bit clock frequency	—	—	12	MHz
2	PCM bit clock low	41	—	—	ns
3	PCM bit clock high	41	—	—	ns
4	BT_PCM_SYNC setup	8	—	—	ns
5	BT_PCM_SYNC hold	8	—	—	ns
6	BT_PCM_OUT delay	0	—	25	ns
7	BT_PCM_IN setup	8	—	—	ns
8	BT_PCM_IN hold	8	—	—	ns
9	Delay from falling edge of BT_PCM_CLK during the last bit period to BT_PCM_OUT becoming high impedance.	0	—	25	ns

Long Frame Sync, Master Mode



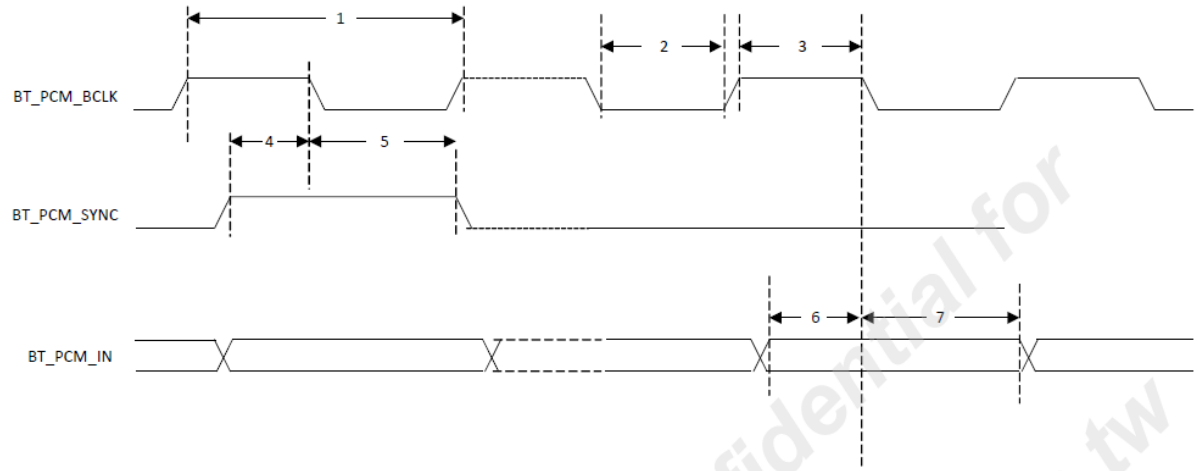
Reference	Characteristics	Minimum	Typical	Maximum	Unit
1	PCM bit clock frequency	—	—	12	MHz
2	PCM bit clock low	41	—	—	ns
3	PCM bit clock high	41	—	—	ns
4	BT_PCM_SYNC delay	0	—	25	ns
5	BT_PCM_OUT delay	0	—	25	ns
6	BT_PCM_IN setup	8	—	—	ns
7	BT_PCM_IN hold	8	—	—	ns
8	Delay from falling edge of BT_PCM_CLK during the last bit period to BT_PCM_OUT becoming high impedance.	0	—	25	ns

Long Frame Sync, Slave Mode



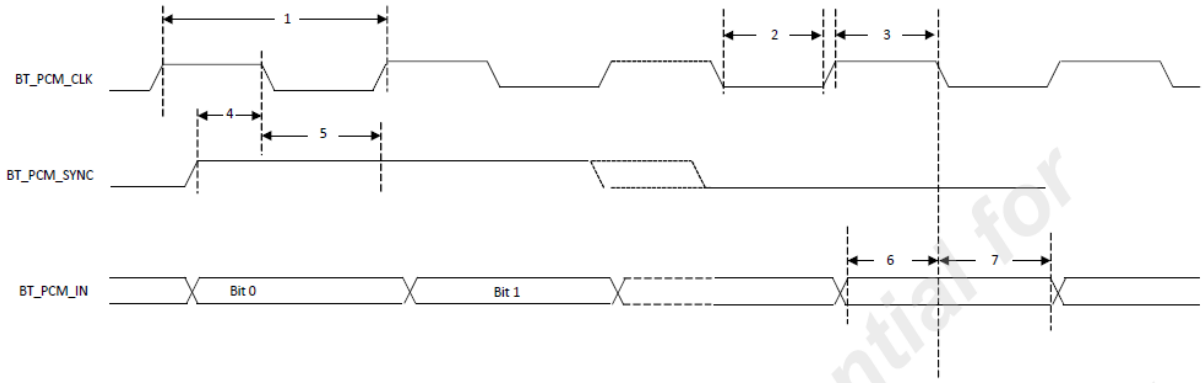
Reference	Characteristics	Minimum	Typical	Maximum	Unit
1	PCM bit clock frequency	—	—	12	MHz
2	PCM bit clock low	41	—	—	ns
3	PCM bit clock high	41	—	—	ns
4	BT_PCM_SYNC setup	8	—	—	ns
5	BT_PCM_SYNC hold	8	—	—	ns
6	BT_PCM_OUT delay	0	—	25	ns
7	BT_PCM_IN setup	8	—	—	ns
8	BT_PCM_IN hold	8	—	—	ns
9	Delay from falling edge of BT_PCM_CLK during the last bit period to BT_PCM_OUT becoming high impedance.	0	—	25	ns

Short Frame Sync, Burst Mod



Reference	Characteristics	Minimum	Typical	Maximum	Unit
1	PCM bit clock frequency	—	—	24	MHz
2	PCM bit clock low	20.8	—	—	ns
3	PCM bit clock high	20.8	—	—	ns
4	BT_PCM_SYNC setup	8	—	—	ns
5	BT_PCM_SYNC hold	8	—	—	ns
6	BT_PCM_IN setup	8	—	—	ns
7	BT_PCM_IN hold	8	—	—	ns

Long Frame Sync, Burst Mode

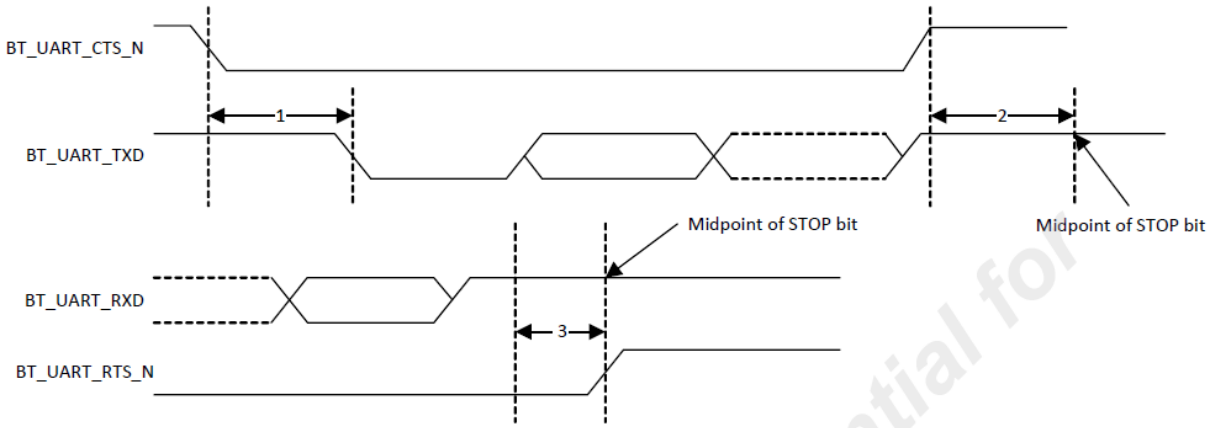


Reference	Characteristics	Minimum	Typical	Maximum	Unit
1	PCM bit clock frequency	—	—	24	MHz
2	PCM bit clock low	20.8	—	—	ns
3	PCM bit clock high	20.8	—	—	ns
4	BT_PCM_SYNC setup	8	—	—	ns
5	BT_PCM_SYNC hold	8	—	—	ns
6	BT_PCM_IN setup	8	—	—	ns
7	BT_PCM_IN hold	8	—	—	ns

7.4 UART Interface Description

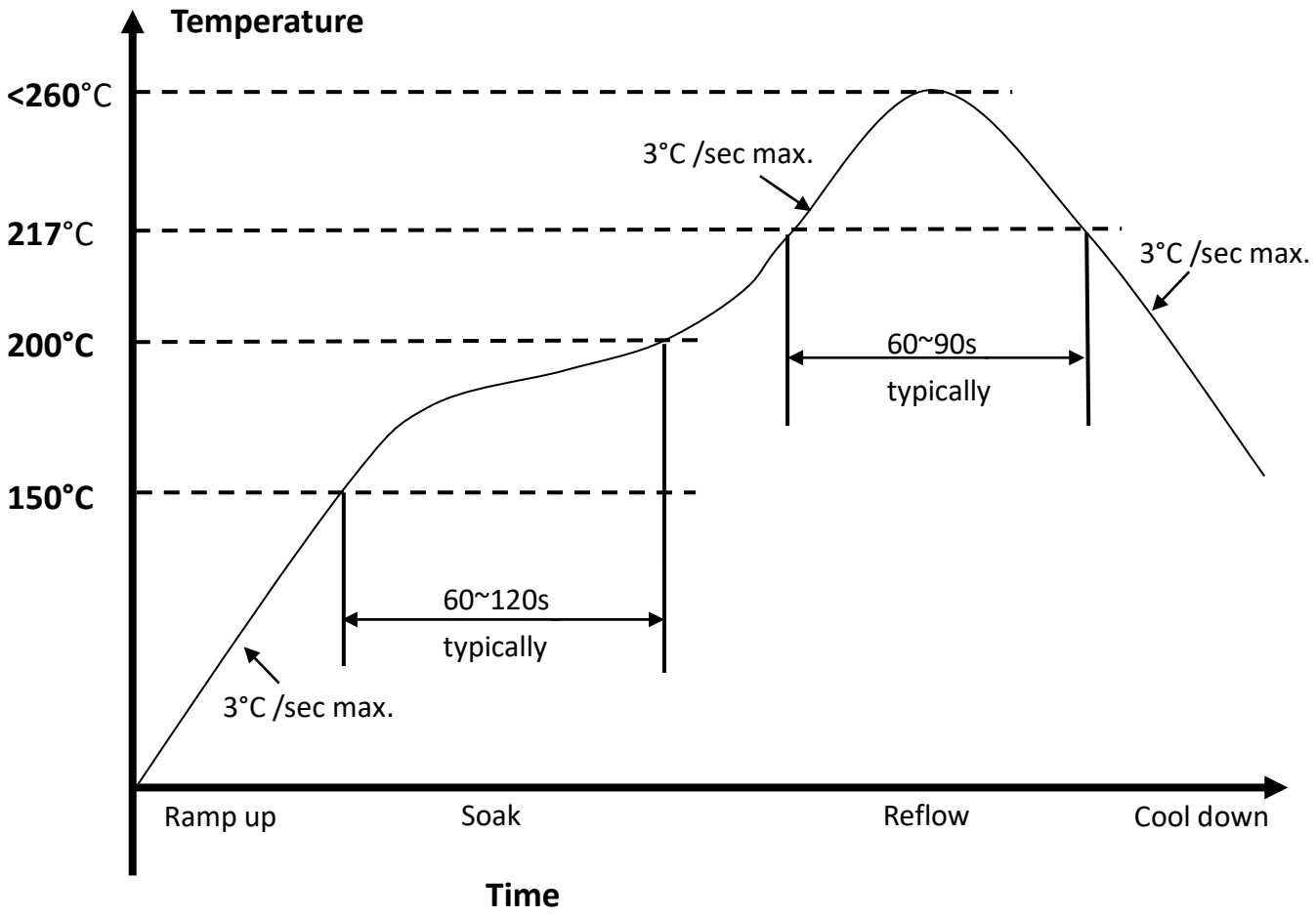
The AP6275SDPR UART is a standard 4-wire interface with adjustable baud rates from 9600 bps to 4.0 Mbps. The interface features an automatic baud rate detection capability that returns a baud rate selection. Alternatively, the baud rate may be selected through a vendor-specific UART HCI command.

UART Timing



Reference	Characteristics	Minimum	Typical	Maximum	Unit
1	Delay time, BT_UART_CTS_N low to BT_UART_TXD valid	—	—	1.5	Bit periods
2	Setup time, BT_UART_CTS_N high before midpoint of stop bit	—	—	0.5	Bit periods
3	Delay time, midpoint of stop bit to BT_UART_RTS_N high	—	—	0.5	Bit periods

8. Recommended Reflow Profile



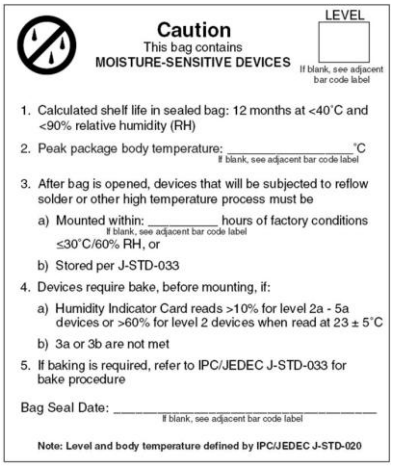
1. Referred to IPC/JEDEC standard
2. Peak Temperature : <260°C (Time within 5°C of actual Peak Temperature 20-40 seconds)
3. Cycle of Reflow : 2 times max.
4. Adding Nitrogen (N2) to implement 2000ppm or less of oxygen concentration during reflow process is recommended.
5. If the shelf time is exceeded, be sure baking step to remove the moisture from the component

9. Package Information

9.1 Label

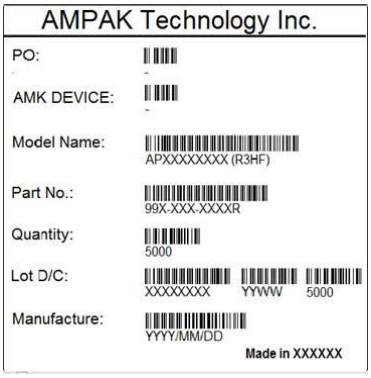
Picture A→ Anti-static and humidity notice

Label B→ MSL caution / Storage Condition

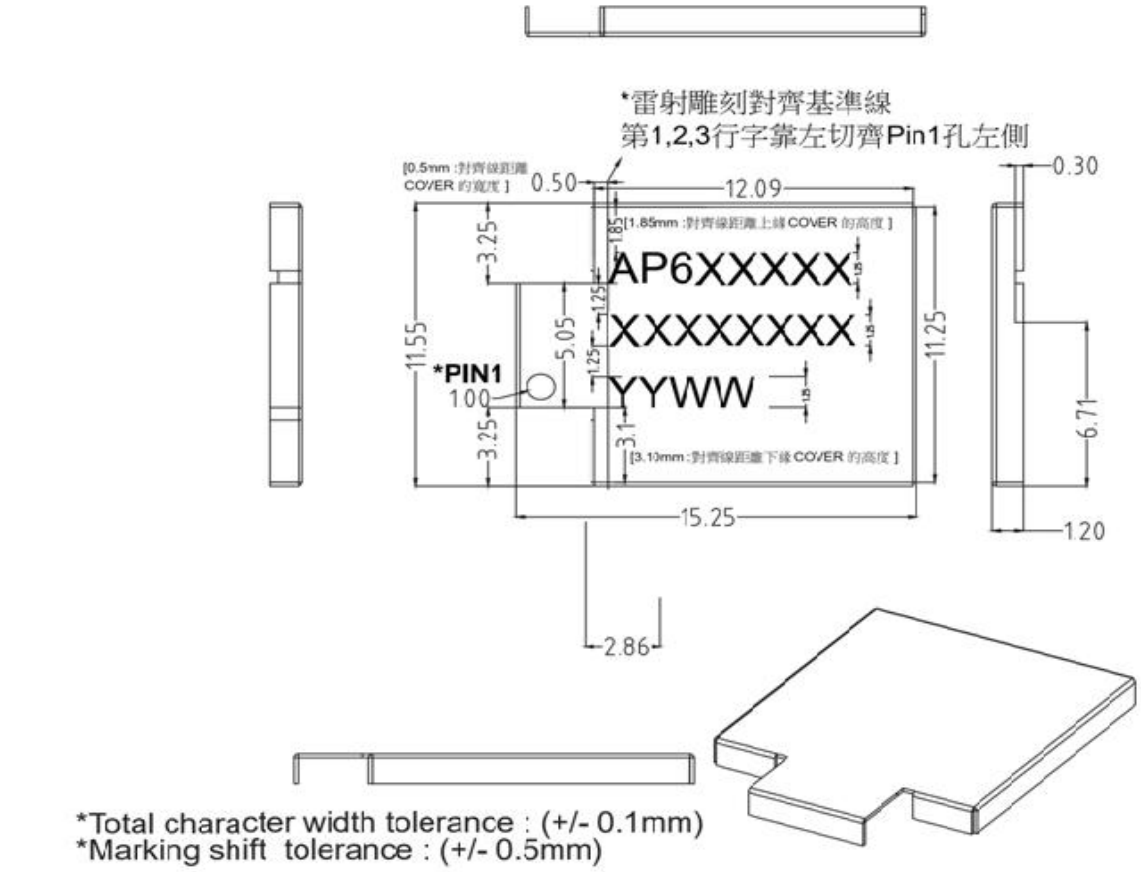


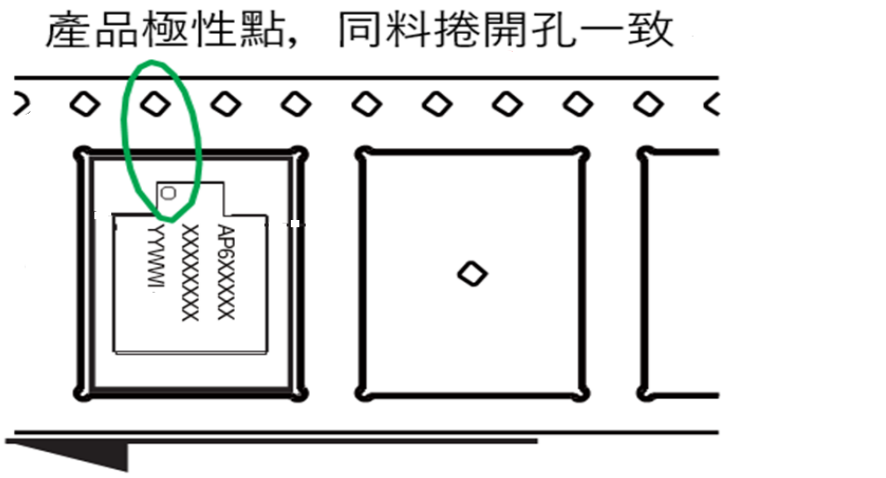
Label C→ Inner box label .

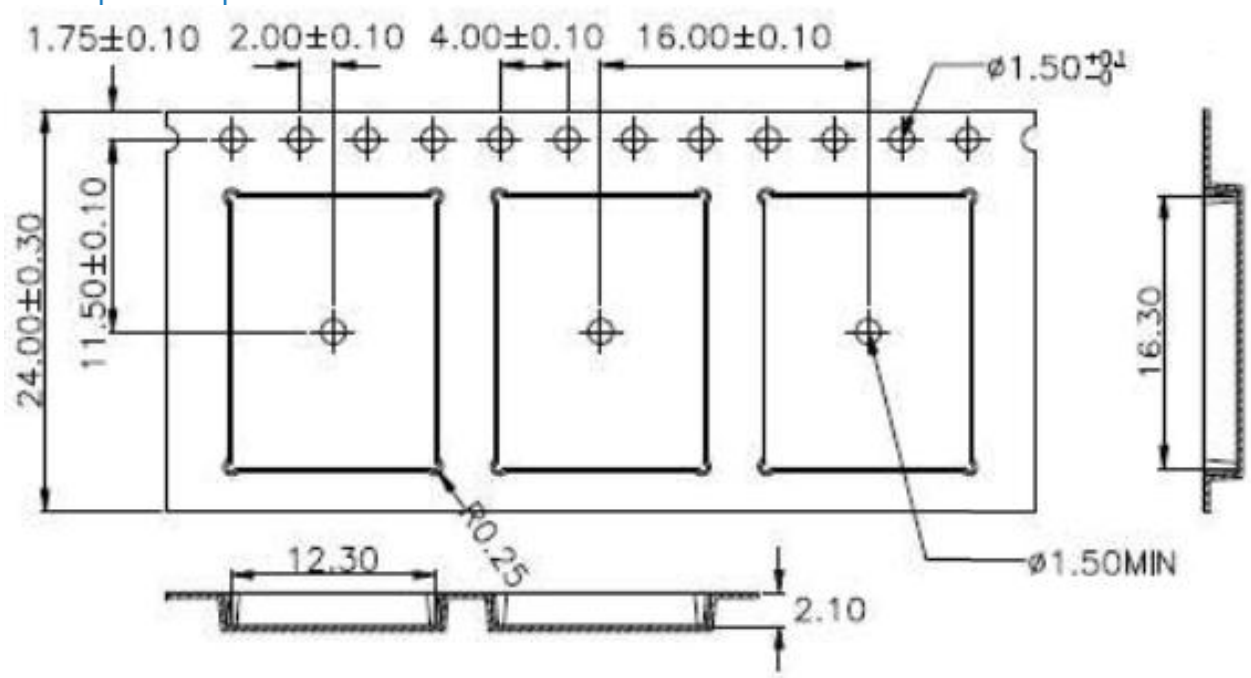
Label D→ Carton box label .



9.2 Dimension

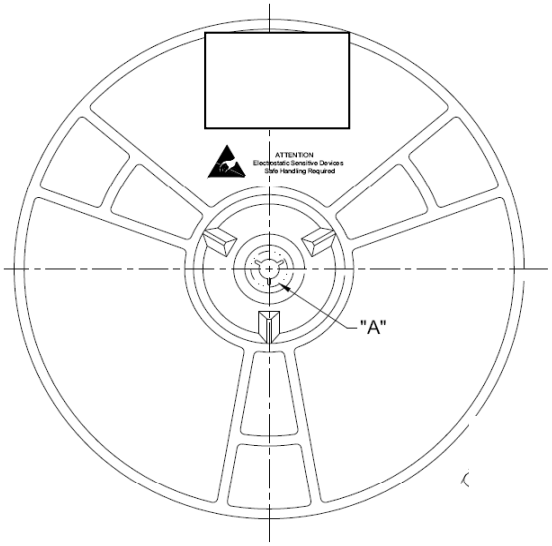


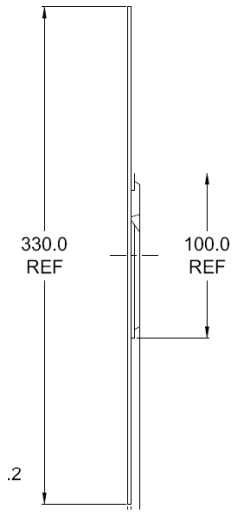




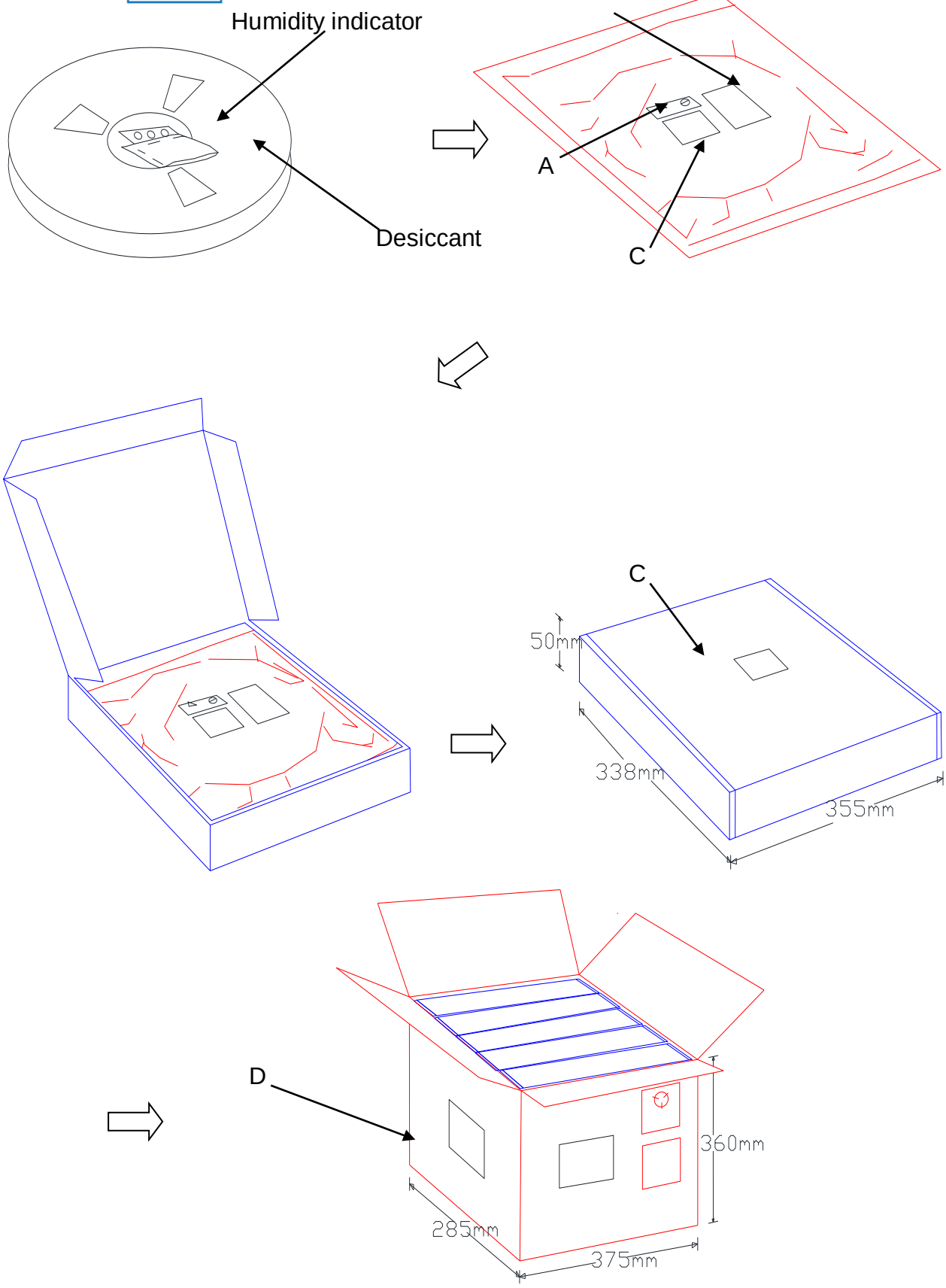
Package	Quantity	Note
Reel/Bag/Box	1000pcs	
Carton	5000pcs	5Box

1. 10 sprocket hole pitch cumulative tolerance ±0.20.
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness: 0.30±0.05mm.
6. Component load per 13”reel : 1000 pcs





B


Humidity indicator
Desiccant
A
C
C
50mm
338mm
355mm
D
360mm
285mm
375mm

9.3 MSL Level / Storage Condition