User Manual

AP6275SDSR

IEEE 802.11ax/ac/a/b/g/n 2x2

WiFi with Bluetooth5.2 M.2 LGA Type 1216 Module

1. Introduction

1.1 Product Overview

AP6275SDSR is an 802.11ax (WiFi 6) SiP Module, 802.11ax allow Increased capacity, faster speed, better coverage connections, improve the battery life of IoT sensors, and extend the range of Wi-Fi signals. By implementing the new 802.11ax standard with its unique features such as OFDMA, 1024QAM, Target Wake Time (TWT), and spatial reuse, the AP6275SDSR module enables smooth streaming of high-resolution videos, fewer dropped connections and faster connections farther away from the router and in dense environments.

The Wi-Fi and Bluetooth 5.2 functionalities module with seamless roaming capabilities and advanced security. The 802.11 ax sip module can support Multi-User MIMO (MU-MIMO) technology to increase channel capacity when simultaneously servicing multiple devices using the same frequency chunks. Furthermore the included SDIO interface for Wi-Fi, UART/ PCM interface for Bluetooth.

1.2 Product Features

1.2.1 WLAN

- Dual-stream spatial multiplexing up to 1200 Mbps data rate
- 20, 40, 80 MHz channels with optional SGI (1024 QAM modulation)
- TX and RX low-density parity check (LDPC) support for improved range and power efficiency
- Supports 2 antennas with two for shared BT and WLAN port
  - Supports standard SDIO v3.0, compatible with SDIO v2.0 HOST interfaces
- Client MU-MIMO

1.2.2 Bluetooth

- BT host digital interface:
  - HCI UART (up to 4 Mbps)
  - PCM for audio data
- Complies with Bluetooth Core Specification Version 5.2 with provisions for supporting future specifications. With Bluetooth Class 1 or Class 2 transmitter operation
- Supports extended synchronous connections (eSCO), for enhanced voice quality by allowing for retransmission of dropped packets

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2. Specification

2.1 General Specification

Standards	IEEE 802.11 ax/ac/a/b/g/n Wi-Fi + BT 5.2 Module(2T2R) Bluetooth : V5.2, V5.0, V4.2, V4.1, V4.0 LE, V3.0+HS, V2.1+EDR
Chipset	Broadcom
Operating Frequency	2.400 GHz ~ 2.4835 GHz (2.4GHz ISM Band) 5.150 GHz ~5.850GHz (5GHz UNII Band) Bluetooth: 2.402 GHz ~ 2.480 GHz
Modulation	WiFi: 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11gn: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11an: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) 802.11ax: OFDMA (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM) BT: Header: GFSK Payload 2M: π/4-DQPSK Payload 3M: 8-DPSK
WiFi Interface	Support SDIO 3.0 / 2.0.
BT Interface	UART / PCM
Form Factor	M.2 1216 Module
Antenna	2 x MHF4 connector
Dimension	L x W x H: 12mm(± 0.1mm) x 16mm(± 0.1mm) x 1.65mm(Max.)
Operating temperature	-40°C to 85°C
Storage temperature	-40°C to 125°C
Humidity(Non-Condensing)	10%~ 95% (Operating)
Weight	0.56g
Driver Support	Linux, Android

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.

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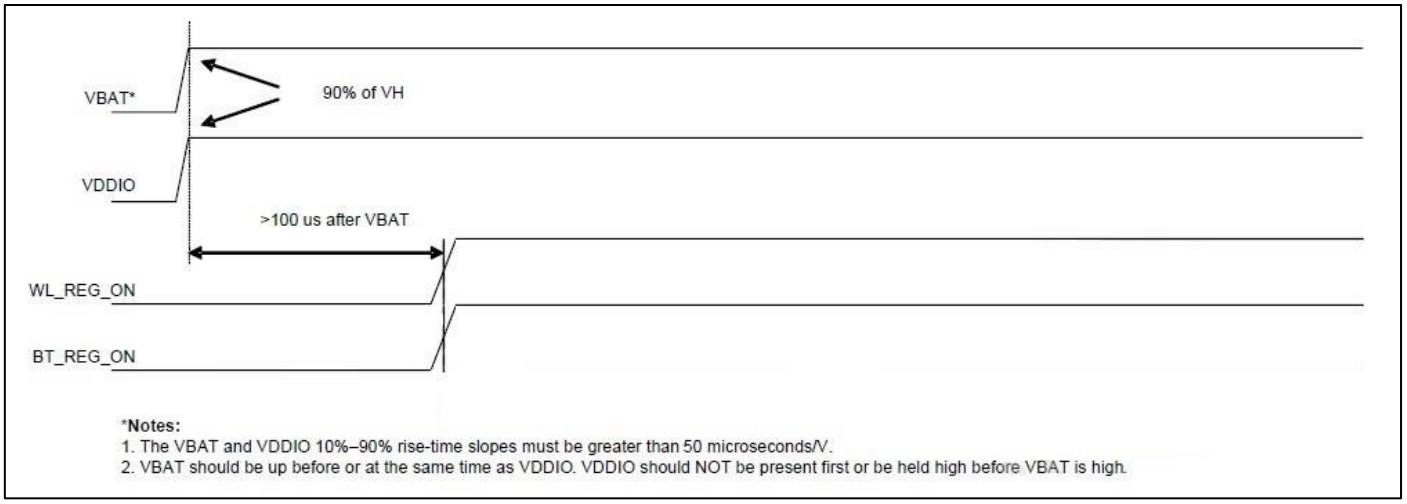
4. Host Interface Timing Diagram

4.1 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.



WLAN=ON, Bluetooth=ON

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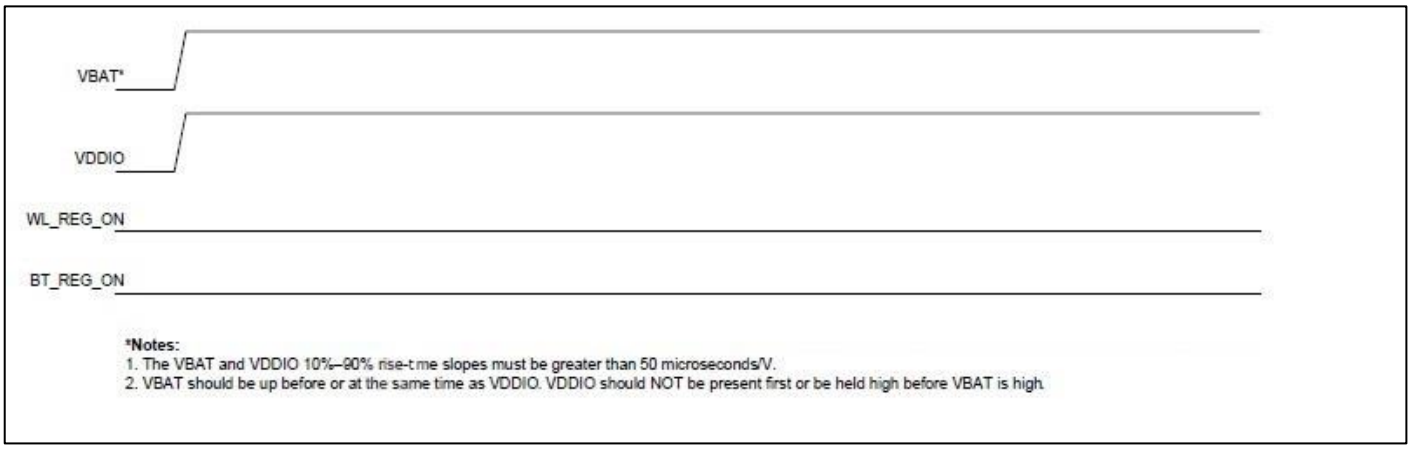
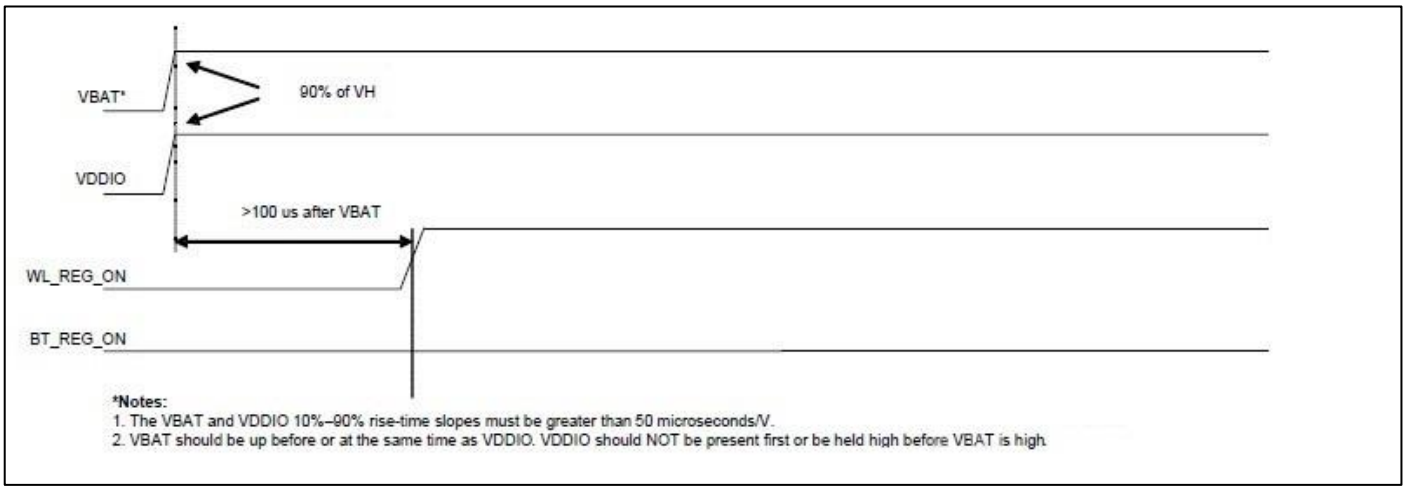
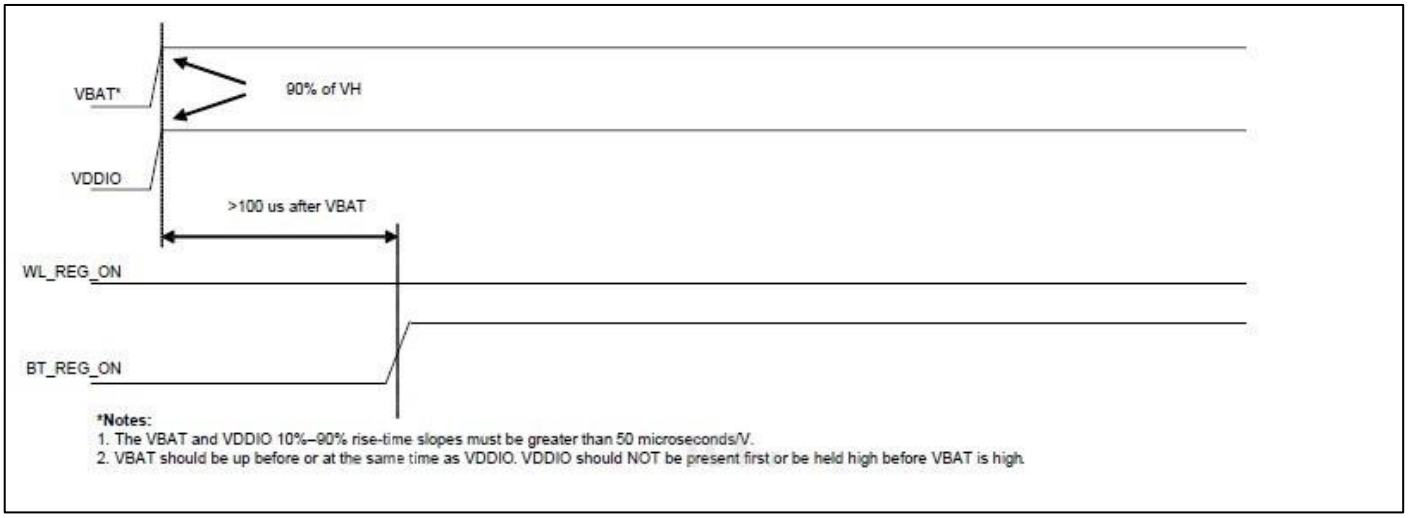


WLAN=OFF, Bluetooth=OFF



WLAN=ON, Bluetooth=OFF



WLAN=OFF, Bluetooth=ON

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4.2 SDIO Interface Description

The module WLAN section provides support for SDIO version 3.0 at 1.8V signaling, including the new UHS-1 mode:

DS : Default speed (DS) up to 25MHz, including 1- and 4-bit modes.

- SDR12 : SDR up to 25 MHz
- SDR25 : SDR up to 50MHz
- SDR50 : SDR up to 100MHz
- SDR104 : SDR up to 208MHz
- DDR50 : DDR up to 50MHz

Noted : The AP6275SDSR is backward compatible with SDIO V2.0 host interfaces.

SDIO Pin Description

SD 4-Bit Mode		**SD 1-Bit Mode**	
DATA0	Data Line 0	DATA	Data line
DATA1	Data Line 1 or Interrupt	IRQ	Interrupt
DATA2	Data Line 2 or Read Wait	RW	Read Wait
DATA3	Data Line 3	N/C	Not used
CLK	Clock	CLK	Clock
CMD	Command Line	CMD	Command Line

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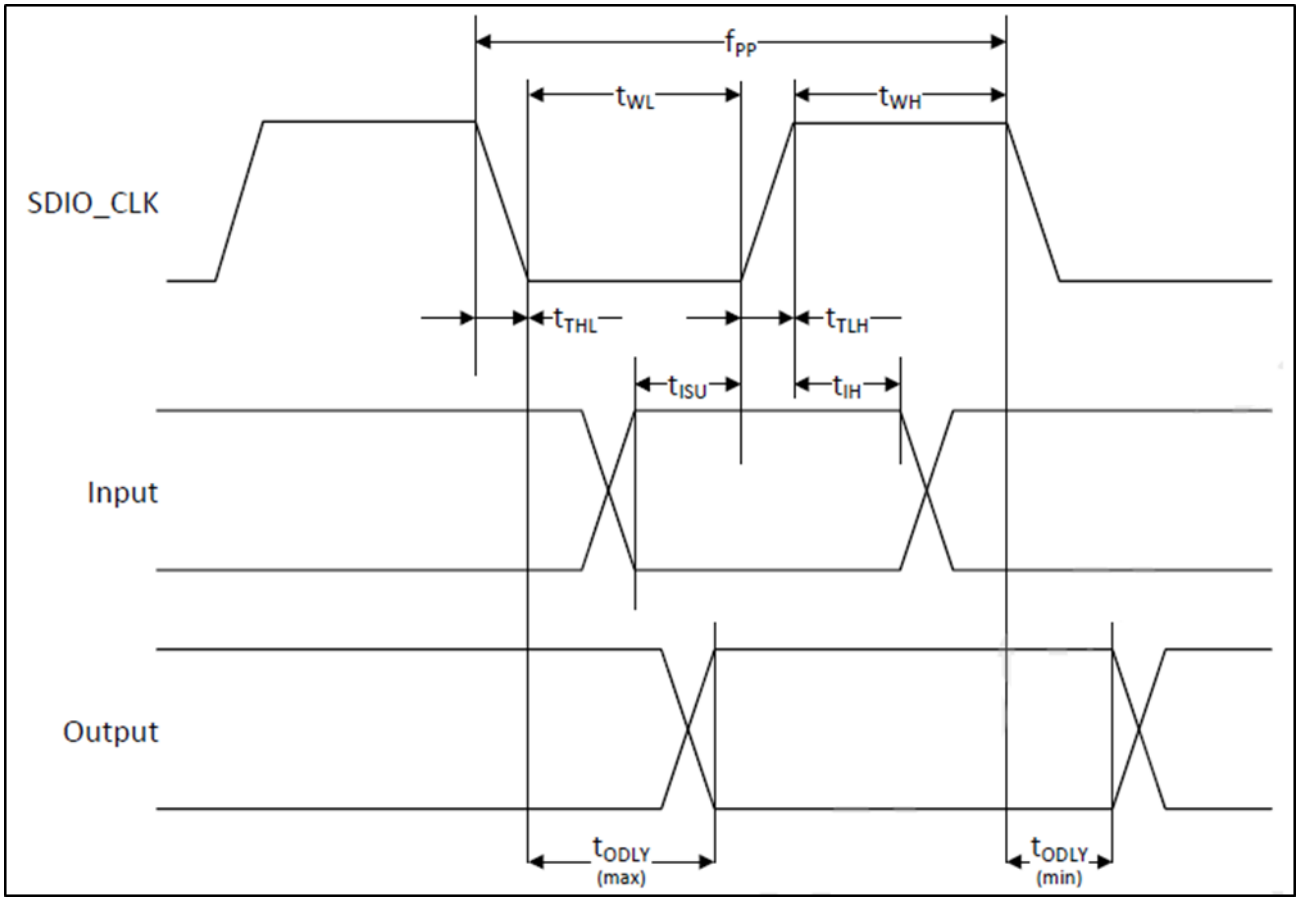

Parameter	Symbol	Minimum	Typical	Maximum	Unit
SDIO CLK (ALL values are referred to minimum VIH and maximum VIL b)					
Frequency – Data Transfer mode	f_{PP}	0	-	25	MHz
Frequency – Identification mode	f_{OD}	0	-	400	kHz
Clock low time	t_{WL}	10	-	-	ns
Clock high time	t_{WH}	10	-	-	ns
Clock rise time	t_{TLH}	-	-	10	ns
Clock low time	t_{THL}	-	-	10	ns
Inputs：CMD, DAT(referenced to CLK)					
Input setup time	t_{ISU}	5	-	-	ns
Input hold time	t_{IH}	5	-	-	ns
Outputs：CMD, DAT(referenced to CLK)					
Output delay time, - Data Transfer mode	t_{ODLY}	0	-	14	ns
Output delay time, - Identification mode	t_{ODLY}	0	-	50	ns

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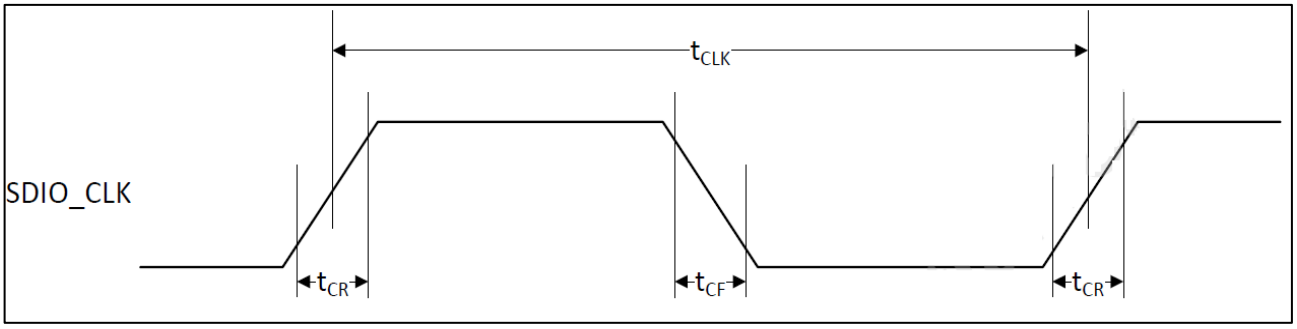
4.3 SDIO Bus Timing Specifications in SDR Modes

Clock timing (SDR Modes)



Parameter	Symbol	Minimum	Maximum	Unit	Comments
-	t_{CLK}	40	-	ns	SDR12 mode
		20	-	ns	SDR25mode
		10	-	ns	SDR50 mode
		4.8	-	ns	SDR104 mode
-	t_{CR},t_{CF}	-	0.2 x t_{CLK}	ns	t_{CR},t_{CF} < 2.00 ns (max) @100MHz, C_{CARD} = 10 pF t_{CR},t_{CF} < 0.96 ns (max) @208MHz, C_{CARD} = 10 pF
Clock duty	-	30	70	%	-

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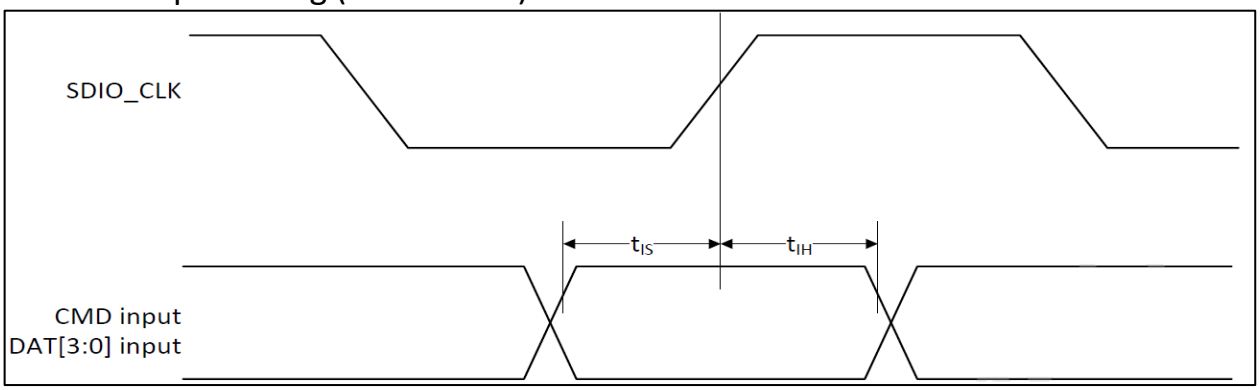
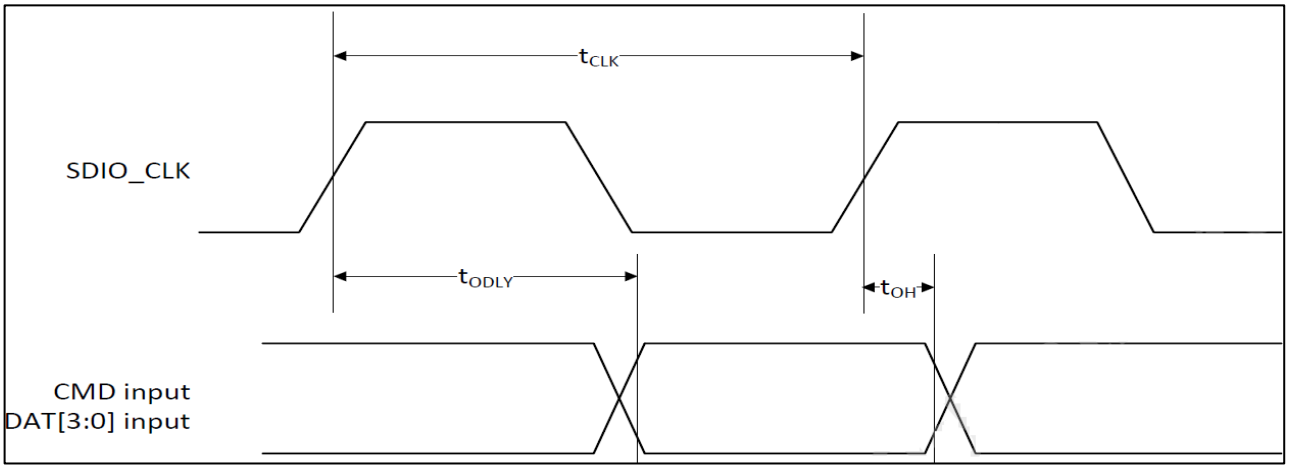
SDIO Bus Input timing (SDR Modes)



Symbol	Minimum	Maximum	Unit	Comments
SDR104 Mode				
t_{IS}	1.4	-	ns	C_{CARD} = 10 pF, VCT= 0.975V
t_{IH}	0.80	-	ns	C_{CARD} = 5 pF, VCT= 0.975V
SDR50 Mode				
t_{IS}	3.00	-	ns	C_{CARD} = 10 pF, VCT= 0.975V
t_{IH}	0.80	-	ns	C_{CARD} = 5 pF, VCT= 0.975V

SDIO Bus output timing (SDR Modes up to 100MHz)



Symbol	Minimum	Maximum	Unit	Comments
t_{ODLY}	-	7.5	ns	$t_{CLK} \geq$ 10 ns C_L = 30 pF using driver type B for SDR50
t_{ODLY}	-	14.0	ns	$t_{CLK} \geq$ 20 ns C_L = 40 pF using for SR12, SDR25
t_{OH}	1.5	-	ns	Hold time at the t_{ODLY} (min) C_L = 15 pF

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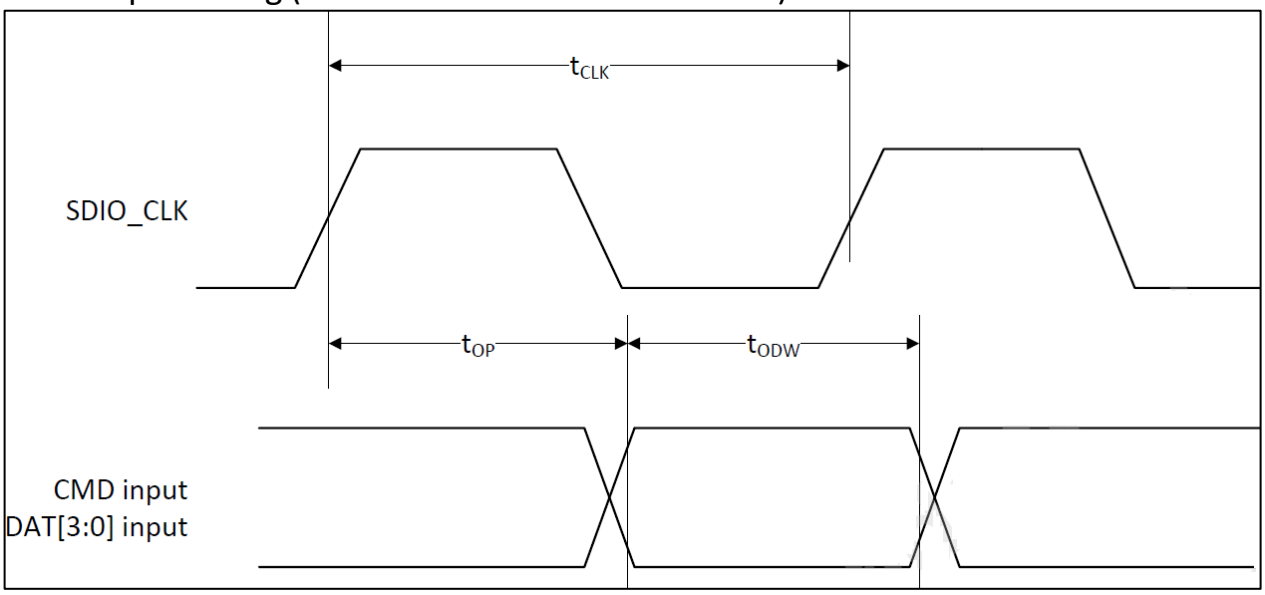
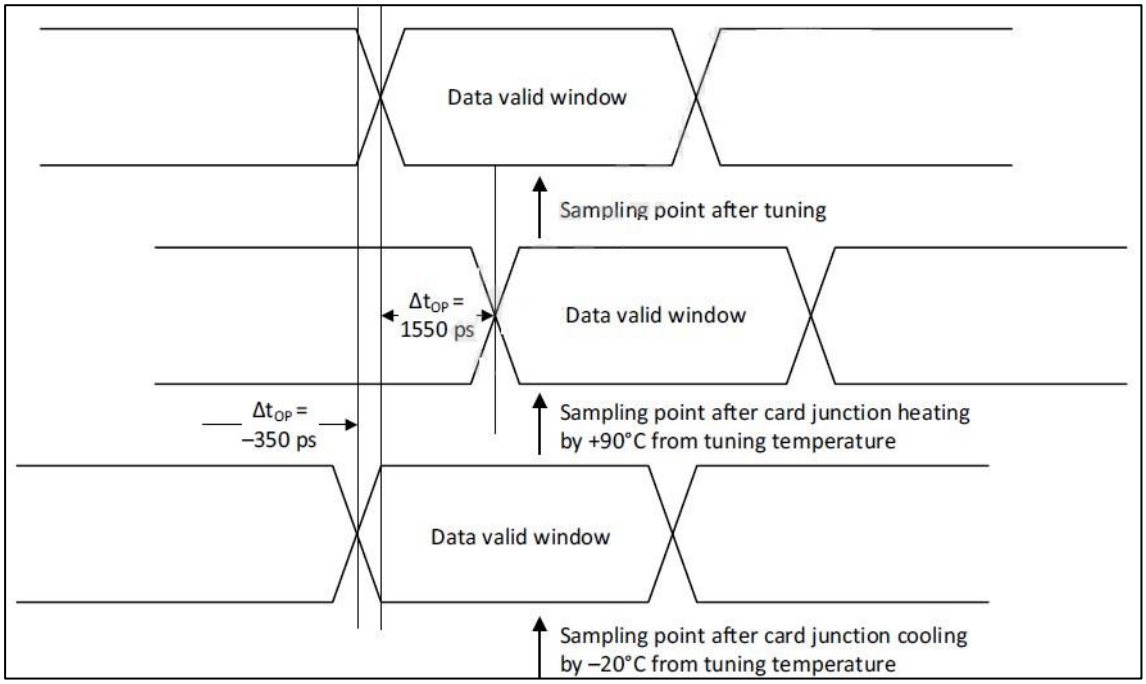
Card output timing (SDR Modes 100MHz to 208MHz)



Symbol	Minimum	Maximum	Unit	Comments
t_{OP}	0	2	UI	Card output phase
△t_{OP}	-350	+1550	ps	Delay variation due to temp. change after tuning
△t_{ODW}	0.60	-	UI	t_{ODW} = 2.88 ns @ 208MHz

- △t_{OP} = +1550 ps for junction temperature of △t_{OP} = 90 degrees during operation
- △t_{OP} = -350 ps for junction temperature of △t_{OP} = -20 degrees during operation
- △t_{OP} = +2600 ps for junction temperature of △t_{OP} = -20 to +125 degrees during operation

Δt_{OP} Consideration for Variable Data Window (SDR 104 Mode)



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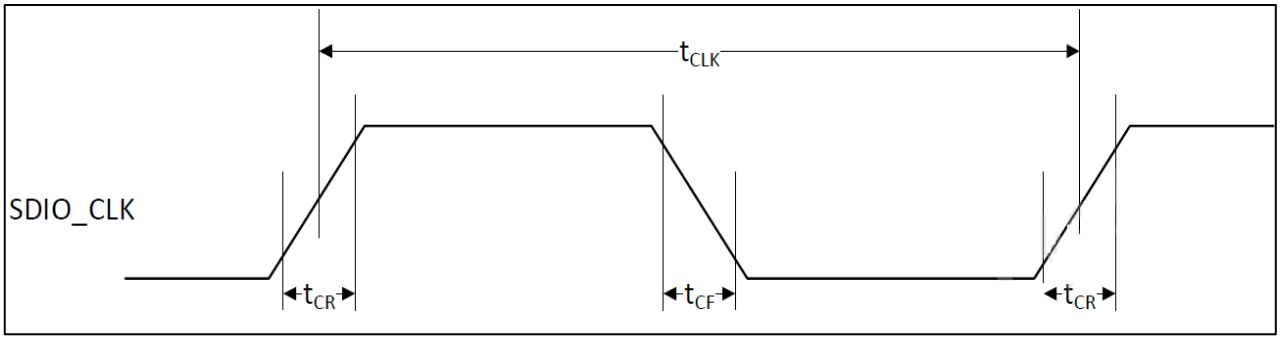
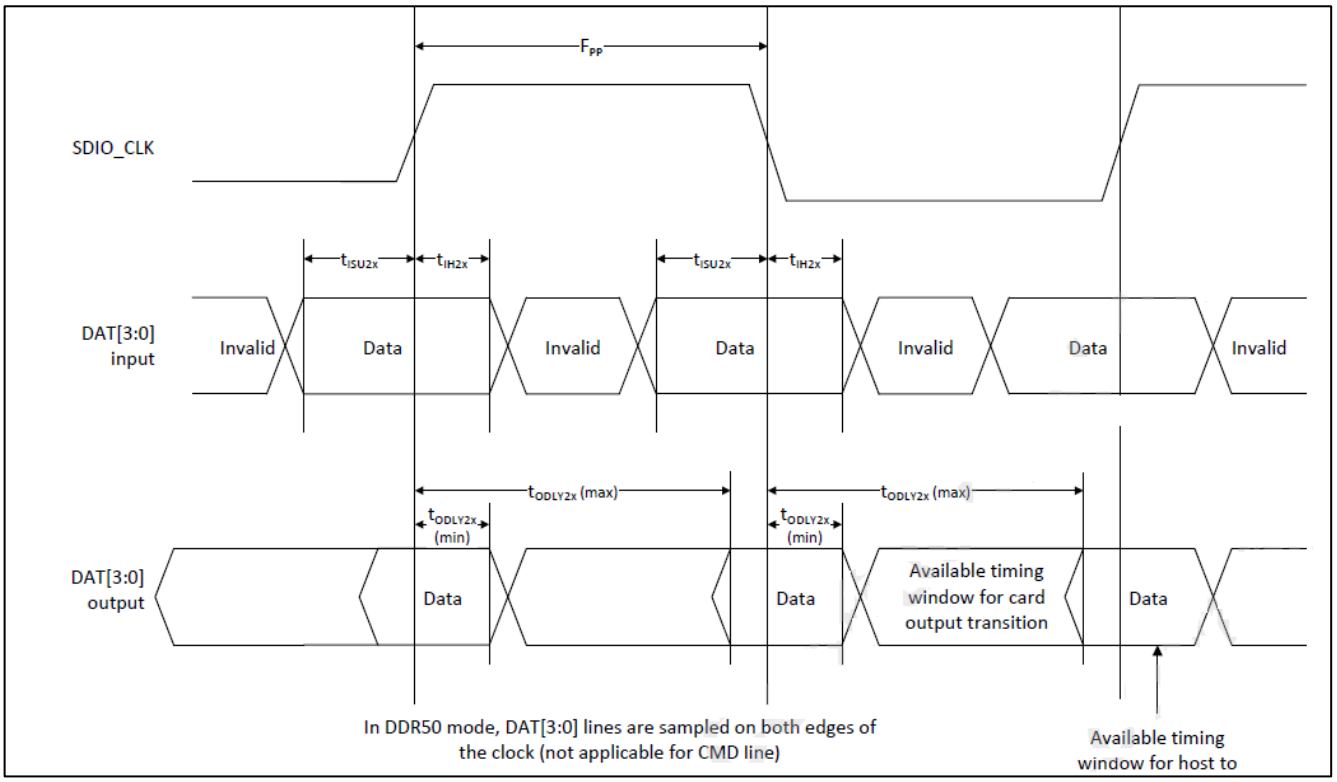
4.4 SDIO Bus Timing Specifications in DDR50 Mode



Parameter	Symbol	Minimum	Maximum	Unit	Comments
-	t_{CLK}	20	-	ns	DDR50 mode
-	t_{CR},t_{CF}	-	0.2 x t_{CLK}	ns	t_{CR},t_{CF} <4.00 ns(max) @ 50MHz C_{CARD}= 10 pF
Clock duty	-	45	55	%	-

Data Timing



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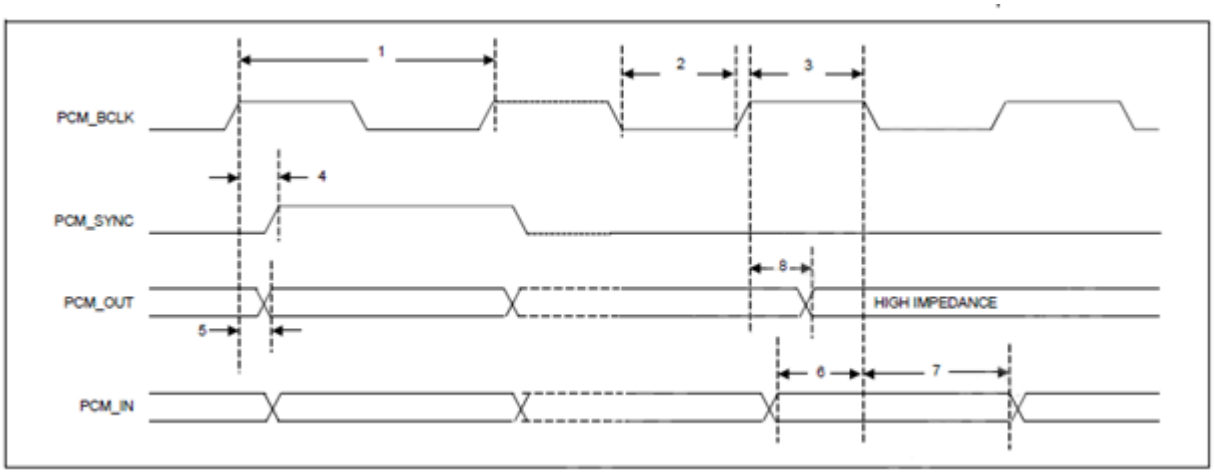
Parameter	Symbol	Minimum	Maximum	Unit	Comments
Input CMD					
Input setup time	t_{ISU}	6	-	ns	C_{CARD} < 10 pF (1 Card)
Input hold time	t_{IH}	0.8	-	ns	C_{CARD} < 10 pF (1 Card)
Output CMD					
Output delay time	t_{ODLY}	-	13.7	ns	C_{CARD} < 30 pF (1 Card)
Output hold time	t_{OH}	1.5	-	ns	C_{CARD} < 15 pF (1 Card)
Input DAT					
Input setup time	t_{ISU2x}	3	-	ns	C_{CARD} < 10 pF (1 Card)
Input hold time	t_{IH2x}	0.8	-	ns	C_{CARD} < 10 pF (1 Card)
Output DAT					
Output delay time	t_{ODLY2x}	-	7.5	ns	C_{CARD} < 25 pF (1 Card)
Output hold time	t_{ODLY2x}	1.5	-	ns	C_{CARD} < 15 pF (1 Card)

4.5 PCM Interface Description

AP6275SDSR supports two independent PCM interfaces that share the pins with the I2S 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 AP6275SDSR..

Short Frame Sync, Master Modem

PCM Timing Diagram (Short Frame Sync, Master Mode)



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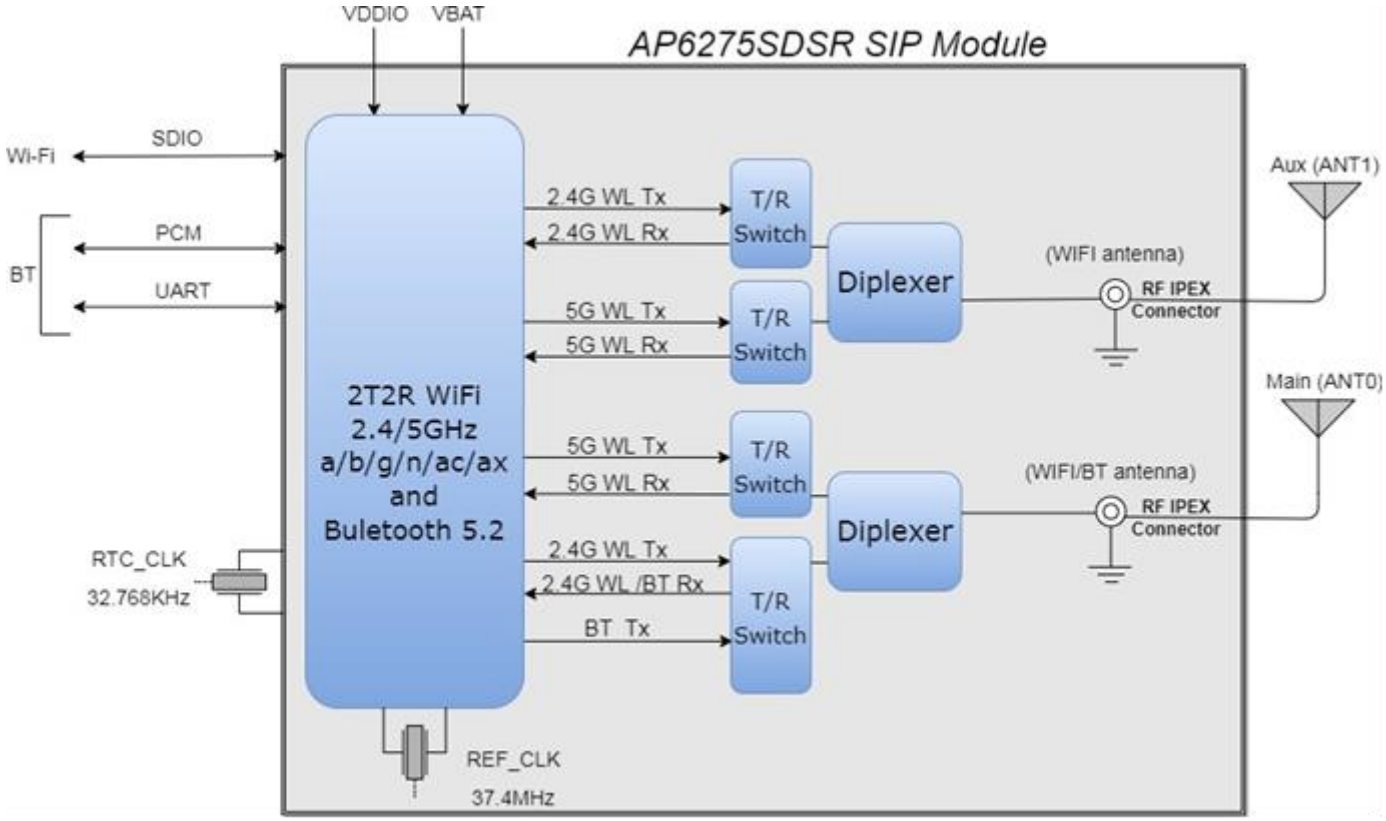
5. Block Diagram



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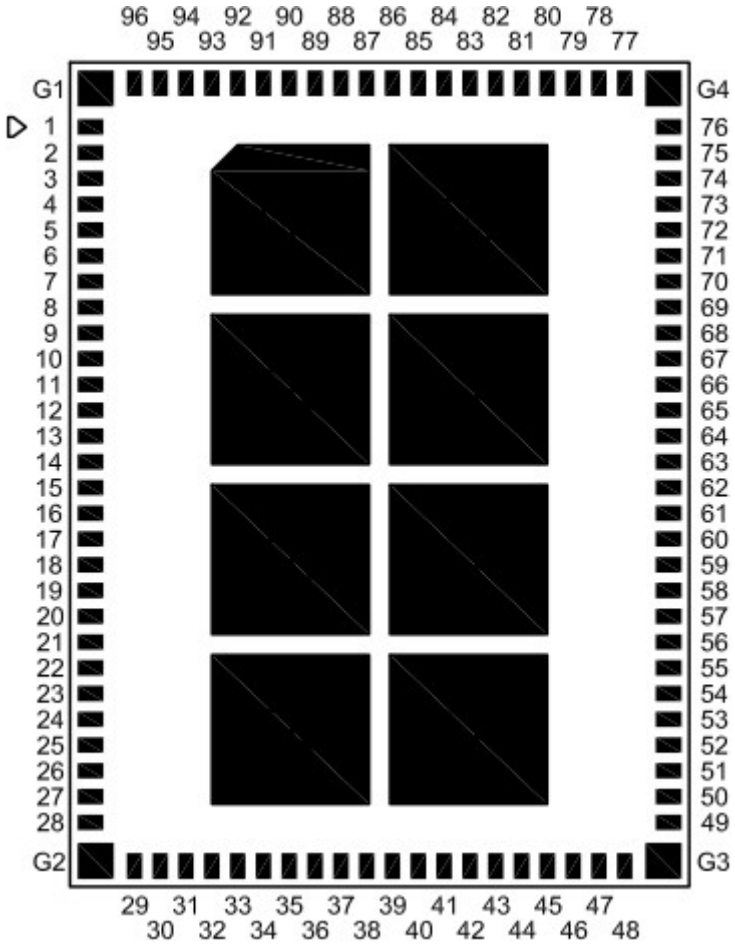
6. Pin Definition

6.1 Pin Outline



6.2 Pin Table

NO	Name	Type	Description
1	NC	—	Floating (Don't connected to ground)
2	NC	—	Floating (Don't connected to ground)
3	NC	—	Floating (Don't connected to ground)
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)

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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	NC	—	Floating (Don't connected to ground)
30	NC	—	Floating (Don't connected to ground)
31	NC	—	Floating (Don't connected to ground)
32	GND	—	Ground connections
33	NC	—	Floating (Don't connected to ground)
34	NC	—	Floating (Don't connected to ground)
35	GND	—	Ground connections
36	NC	—	Floating (Don't connected to ground)
37	NC	—	Floating (Don't connected to ground)
38	GND	—	Ground connections
39	NC	—	Floating (Don't connected to ground)
40	NC	—	Floating (Don't connected to ground)
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

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46	WL_HOST_WAKE	O	WLAN to wake-up HOST
47	SDIO_DATA_3	I/O	SDIO data line 3
48	SDIO_DATA_2	I/O	SDIO data line 2
49	SDIO_DATA_1	I/O	SDIO data line 1
50	SDIO_DATA_0	I/O	SDIO data line 0
51	SDIO_DATA_CMD	I/O	SDIO command line
52	SDIO_DATA_CLK	I/O	SDIO clock line
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_GPIO1	I/O	WLAN GPIO 1
65	WL_GPIO2	I/O	WLAN GPIO 2
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

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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

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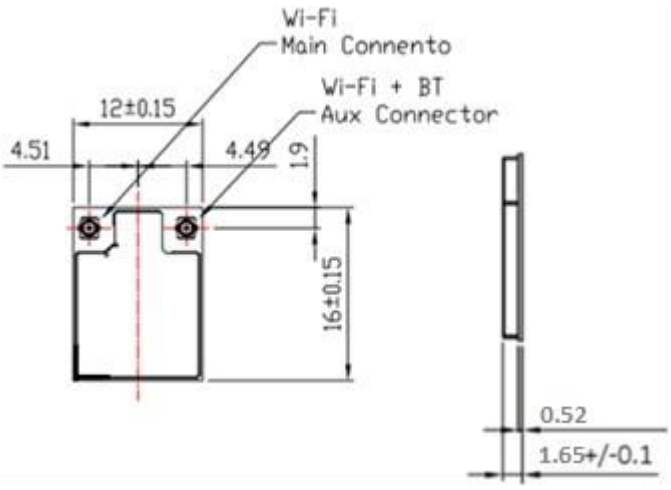
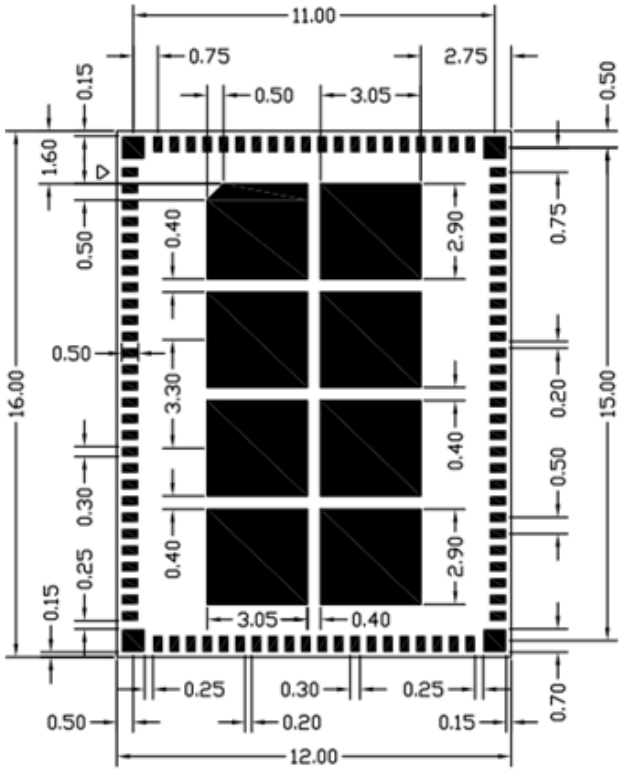
7. Mechanical Specifications

7.1 Module Dimensions

< TOP VIEW >



< Bottom VIEW >



unit: mm
GENERAL TOLERANCE IS ±0.10mm
UNLESS OTHERWISE SPECIFIED

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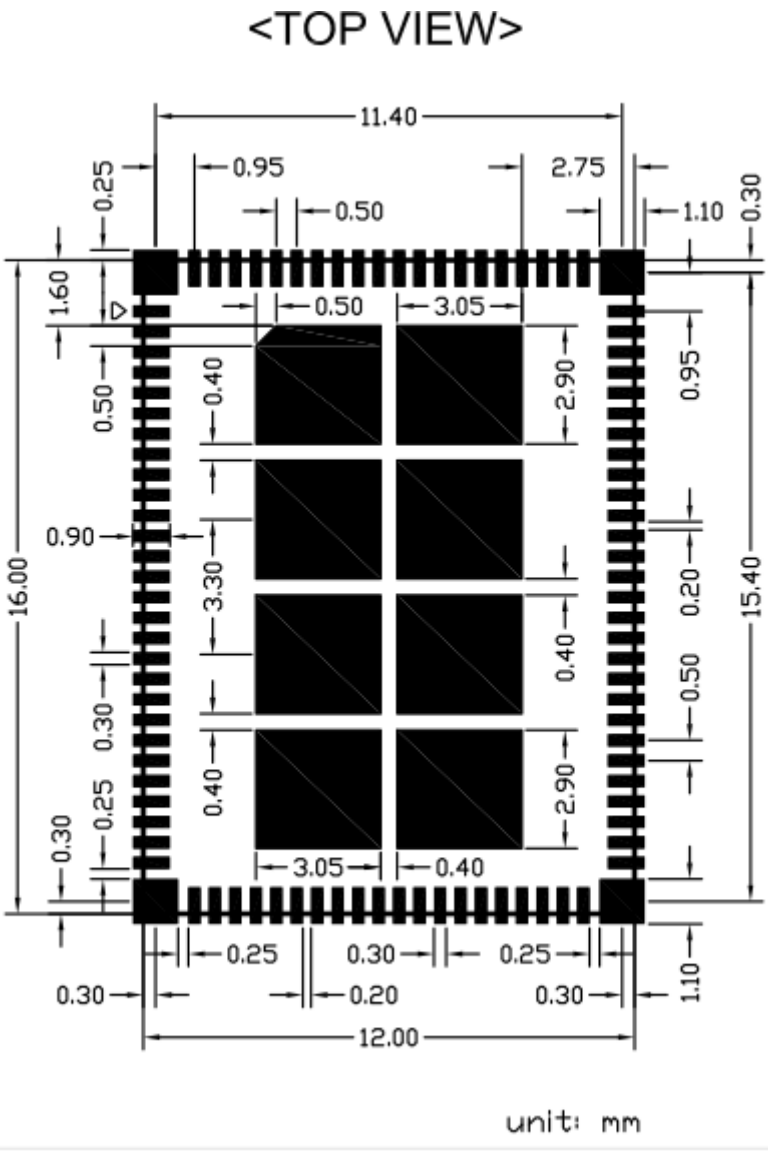
7.2 PCB Footprint



- 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 SparkLAN 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,或是聯絡速連通訊技術支持團隊).

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8. 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 or sine-wave	-
Input impedance	>100k <5	Ω pF
Clock jitter (integrated over 300Hz – 15KHz)	<1	Hz
Output high voltage	0.7Vio - Vio	V

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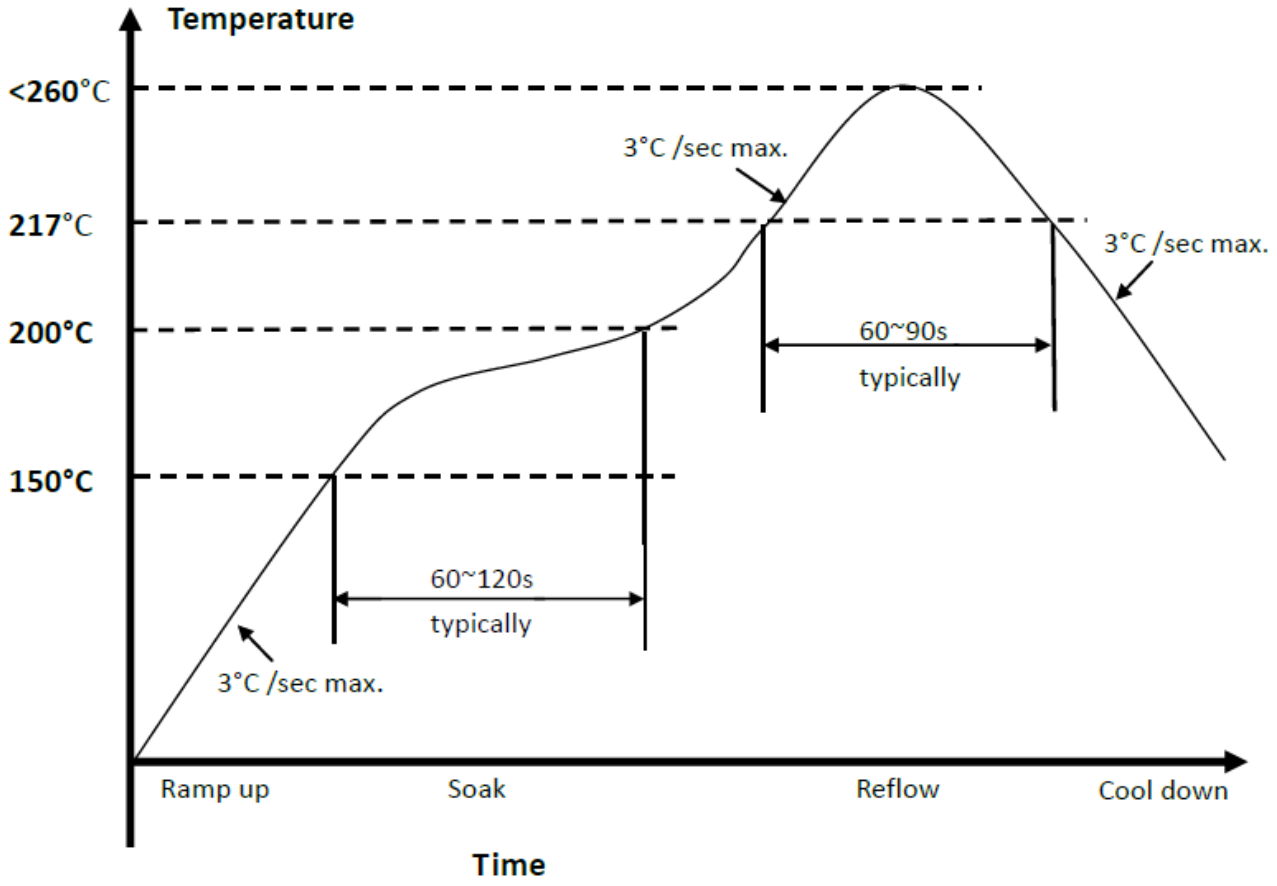
9. Recommended Reflow Profile



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

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9.1 Caution for SMT Preparation

Moisture Sensitivity Level: 4

1. Calculated shelf life in sealed bag: 12 months at <40℃ and <90% relative humidity (RH).
2. Peak package body temperature: 250℃.
3. After bag was opened, devices that will be subjected to reflow solder or other high temperature process must be
    a) Mounted within: 72 hours of factory conditions ≤30℃/60%RH or
    b) Stored per J-STD-033
4. Devices require bake before mounting, if:
    a) Humidity Indicator Card reads> 10% for level 2a-5a devices or >60% for level 2 devices when read at 23±5℃
    b) 3a or 3b are not met.
5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure.

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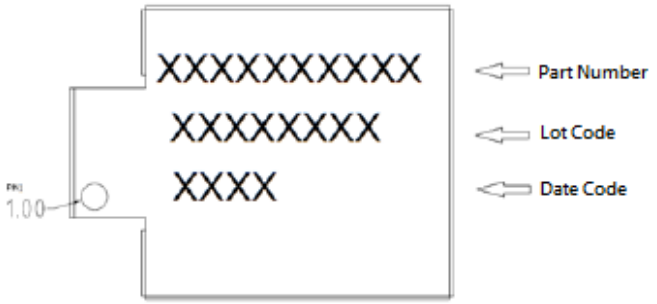
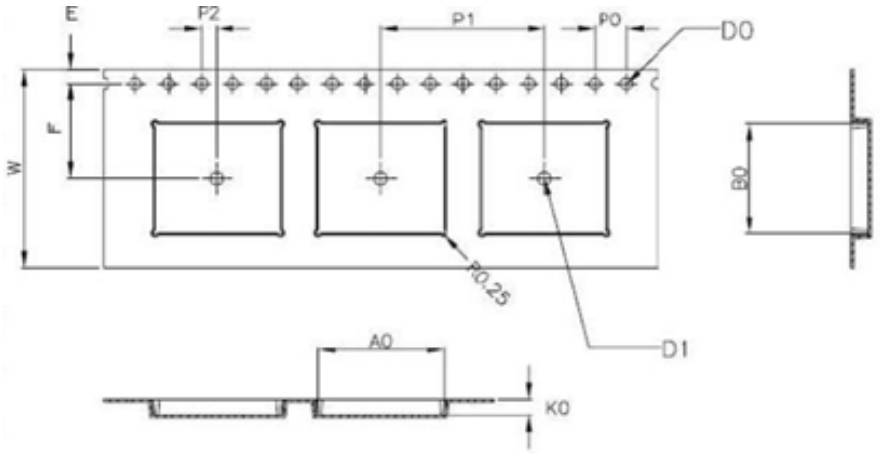
10. Package Information





W	24.00±0.30
A0	15.30±0.10
B0	13.30±0.10
K0	2.00±0.10
E	1.75±0.10
F	11.50±0.10
P0	4.00±0.10
P1	20.00±0.10
P2	2.00±0.10
D0	1.50 +0.10 -0.00
D1	ϕ 1.50MIN

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

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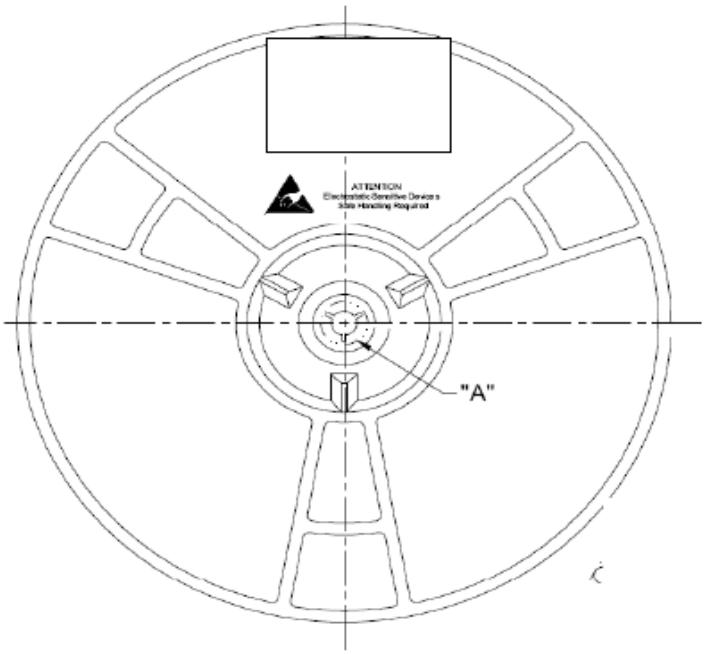

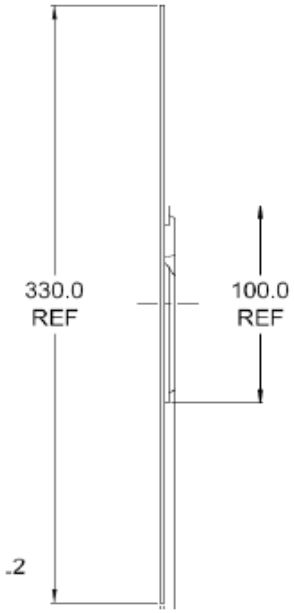

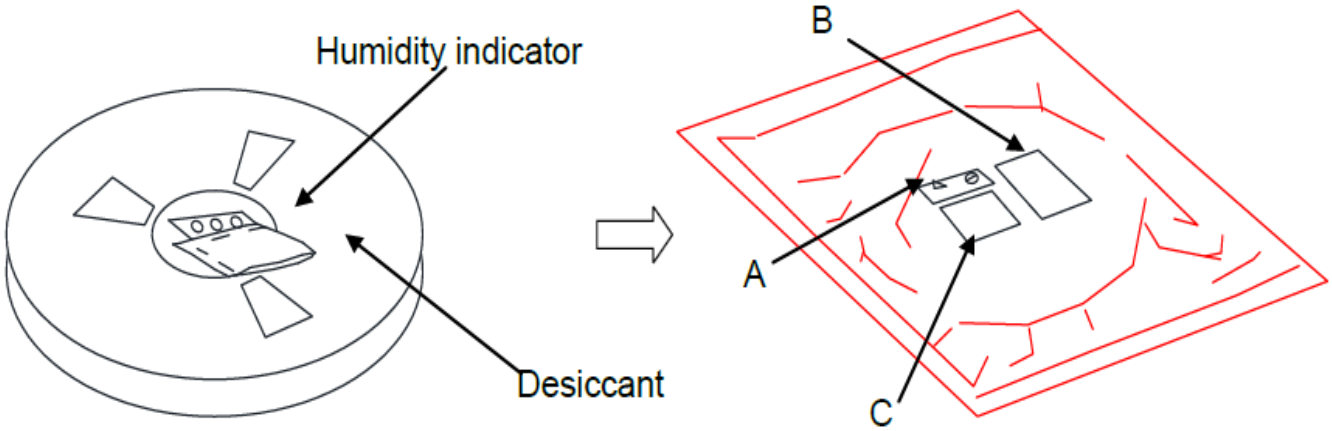

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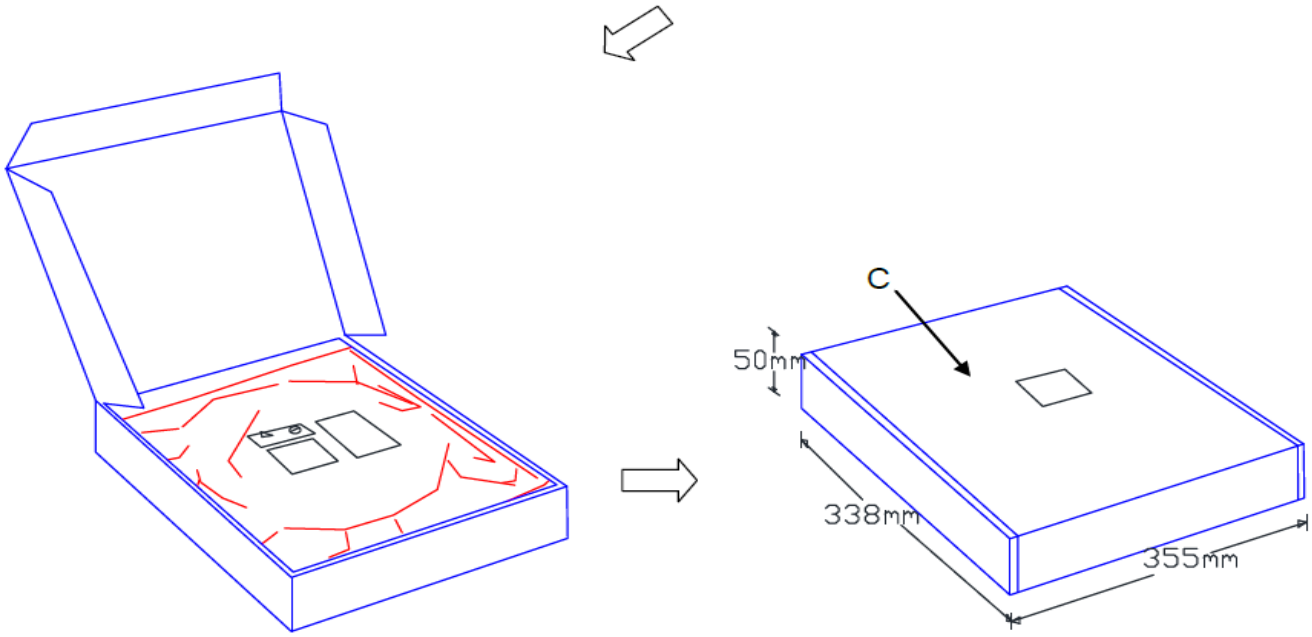

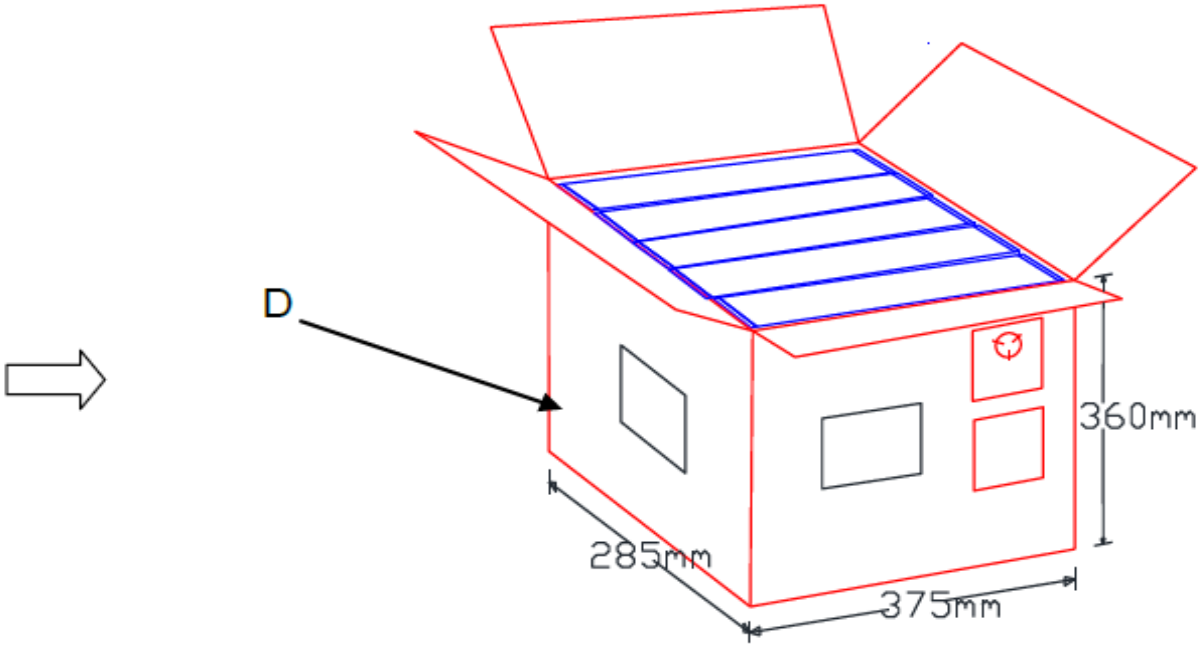

Note: 1 tape reel = 1 box = 1,000pcs
1 Carton = 5 box = 5,000pcs

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11. Ordering Information

Product Name	Part Number	Description
AP6275SDSR	TBD	11ax/ac/a/b/g/n 2T2R WiFi + BT5.2 M.2 LGA Type 1216 Module

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Installation

- Connect the Module to the PCIe slot of the computer.
- Install Wi-Fi driver.
- After the Wi-Fi Driver is installed , click the Network icon on the Windows, then search the network , and connect the Wireless Network you want.

Federal Communication Commission Interference Statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

RF exposure statements

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body or nearby persons.

CFR 47 FCC PART 15 SUBPART C (15.247) and SUBPART E (15.407) has been investigated. It is applicable to the modular transmitter.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

This radio transmitter RYK-AP6275SDSR has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Unique antenna connector must be used on the Part 15 authorized transmitters used in the host product.

Antenna Type	Brand	Antenna Model	Maximum Gain (dBi)		Remark
			2.4 GHz	5GHz	
Dipole	SparkLAN	AD-103AG	2.02 dBi	2.03 dBi	Length of Antenna cable:150mmConnector type of Antenna cable: I-PEX/MHF4 to RP-SMA(F)
Dipole	SparkLAN	AD-301N	4.4 dBi	5.8 dBi	
Dipole	SparkLAN	AD-302N	3.14 dBi	2.87 dBi	
Dipole	SparkLAN	AD-303N	3.14 dBi	3.45 dBi	
Dipole	SparkLAN	AD-305N	5 dBi	5.53 dBi	
Dipole	SparkLAN	AD-308N	3 dBi	5 dBi	
Dipole	SparkLAN	AD-309N	1.68 dBi	4.72 dBi	
Dipole	SparkLAN	AD-310N	2.65 dBi	4.86 dBi	
Dipole	SparkLAN	AD-311N	2.67 dBi	4.91 dBi	
Dipole	GRAND-TEK Technology	103DG00000140	4.8 dBi	5 dBi	
Dipole	GRAND-TEK Technology	103DG00000150	2.5 dBi	5.3 dBi	

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID:RYK-AP6275SDSR” Or “Contains FCC ID:RYK-AP6275SDSR”

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and the host product manufacturer is

responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Industry Canada statement:
This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:
1) This device may not cause interference, and
2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
1) l'appareil ne doit pas produire de brouillage;
2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

Caution:
1) The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

2) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

3) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and

Avertissement:
1) Le dispositif fonctionnant dans la bande 5150-5250 MHz est réservé uniquement

pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

2) Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la imitation P.I.R.E.;

3) Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant la bande 5725-5850 MHz doit se conformer à la limitation P.I.R.E spécifiée pour l'exploitation point à point et non point à point, selon le cas.

Radiation Exposure Statement:
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This radio transmitter (IC: 6158A-AP6275SDSR has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.
Le présent émetteur radio (IC: 6158A-AP6275SDSR a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés cidessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Antenna Type	Brand	Antenna Model	Maximum Gain (dBi)		Remark
			2.4 GHz	5GHz	
Dipole	SparkLAN	AD-103AG	2.02 dBi	2.03 dBi	Length of Antenna cable:150mmConnector type of Antenna cable: I-
Dipole	SparkLAN	AD-301N	4.4 dBi	5.8 dBi	
Dipole	SparkLAN	AD-302N	3.14 dBi	2.87 dBi	

Dipole	SparkLAN	AD-303N	3.14 dBi	3.45 dBi	PEX/MHF4 to RP-SMA(F)
Dipole	SparkLAN	AD-305N	5 dBi	5.53 dBi	
Dipole	SparkLAN	AD-308N	3 dBi	5 dBi	
Dipole	SparkLAN	AD-309N	1.68 dBi	4.72 dBi	
Dipole	SparkLAN	AD-310N	2.65 dBi	4.86 dBi	
Dipole	SparkLAN	AD-311N	2.67 dBi	4.91 dBi	
Dipole	GRAND-TEK Technology	103DG00000140	4.8 dBi	5 dBi	
Dipole	GRAND-TEK Technology	103DG00000150	2.5 dBi	5.3 dBi	

If the ISED certification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains IC: 6158A-AP6275SDSR”.

Si le numéro de certification ISDE n'est pas visible lorsque le module est installé à l'intérieur d'un autre appareil, alors l'extérieur de l'appareil dans lequel le module est installé doit également afficher une étiquette faisant référence au module inclus. Cette étiquette extérieure peut utiliser un libellé comme celui-ci: “ Contient IC: 6158A-AP6275SDSR“.

Plaque signalétique du produit final:
Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 6158A-AP6275SDSR ".

Manual Information To the End User:
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final
L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le

manuel de l'utilisateur du produit final qui intègre ce module. Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manue

Must use the device only in host devices that meet the FCC/ISED RF exposure category of mobile, which means the device is installed and used at distances of at least 20cm from persons.
The end user manual shall include FCC Part 15 /ISED RSS GEN compliance statements related to the transmitter as show in this manual.
Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B, ICES 003.
Host manufacturer is strongly recommended to confirm compliance with FCC/ISED requirements for the transmitter when the module is installed in the host.
Must have on the host device a label showing Contains FCC ID: RYK-AP6275SDSR, Contains IC:6158A-AP6275SDSR
The use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer’s instruction manual.

If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

l'hôte doit utiliser l'instrument uniquement dans des dispositifs qui répondent à la fcc / (catégorie d'exposition rf mobile, ce qui signifie le dispositif est installé et utilisé à une distance d'au moins 20 cm de personnes.
le manuel de l'utilisateur final doit inclure la partie 15 / (fac rss gen déclarations de conformité relatives à l'émetteur que de montrer dans ce manuel.
le fabricant est responsable de la conformité de l'hôte, le système d'accueil avec le module installé avec toutes les autres exigences applicables du système comme la partie 15 b, ices - 003. accueillir le fabricant est fortement recommandé de confirmer la conformité avec les exigences de la fcc / (émetteur lorsque le module est installé dans l'hôte.
le dispositif d'accueil doivent avoir une étiquette indiquant contient FCC ID:RYK-AP6275SDSR, contient IC : 6158A-AP6275SDSR

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

應避免影響附近雷達系統之操作。
高增益指向性天線只得應用於固定式點對點系統。

此模組若安裝於其他平台時，該平台標籤需標明：

此平台內建無線模組