6221A-SRC

Wi-Fi Dual-band 1X1 11ac +Bluetooth 4.2

Combo Module Datasheet

6221A-SRC Module Datasheet

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Customer Approval :

_____ Company

_____ Title

_____ Signature

_____ Date

_____ Fn-Link

Revision History

Version	Date	Revision Content	Draft	Approved
1.0	2018/12/17	New version	Lzm	Lxy
1.1	2018/12/18	Modify the telephone number	Lzm	Lxy
1.2	2018/12/25	Modify the office and TEL	Lzm	Lxy
1.3	2019/07/19	Add TVS solution, higher shielding size	Lxy	Szs
1.4	2020/11/05	Update temperature info.	Lxy	Szs
1.5	2021/07/07	Update BT tx spec.	Lxy	QJP
1.6	2021/08/31	Update package quanlity to 1500	Lxy	QJP
1.7	2021/10/28	Added -0L P/N typle model	LXY	QJP

CONTENTS

1 Overview

1.1 Introduction

Fn-Link Technology would like to announce a low-cost and low-power consumption module which has all of the Wi-Fi functionalities. It is a highly-integrated IEEE 802.11 a/b/g/n/ac MAC/Baseband/RF WLAN single chip. For Wireless LAN(WLAN)operation. The integrated module provides SDIO interface for Wi-Fi . The module provides simple legacy and 20MHz/40MHz/80MHz co-existence mechanisms to ensure backward and network compatibility

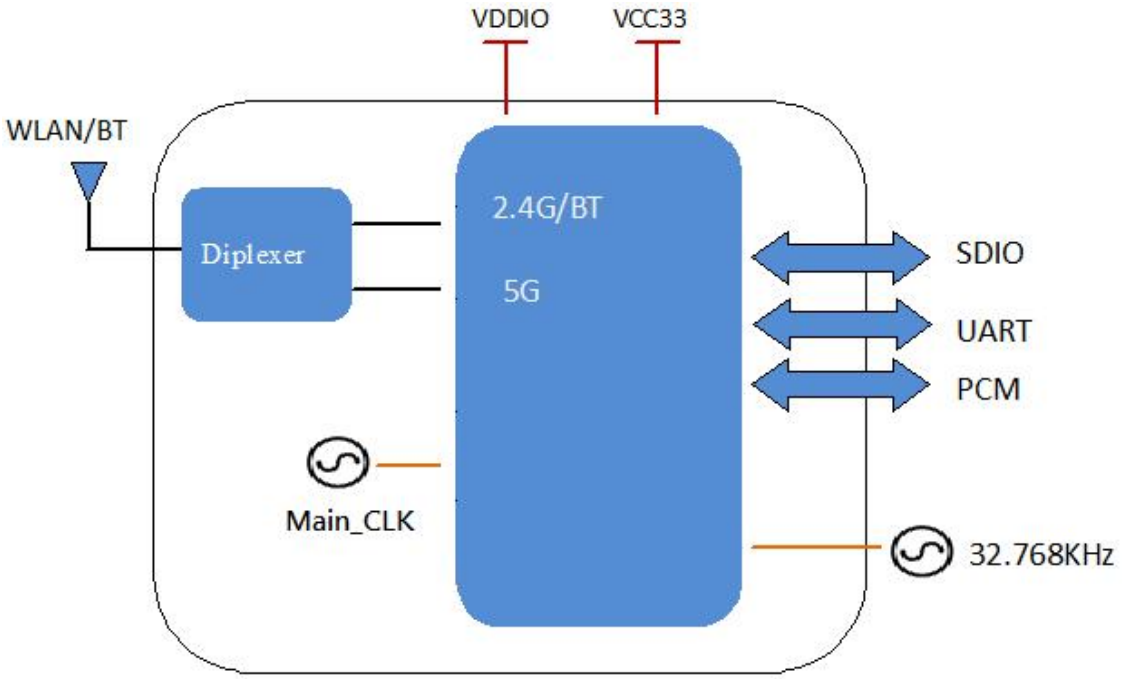
The wireless module complies with IEEE 802.11 a/b/g/n/ac standard and it can achieve up to a speed of 433.3Mbps with single stream in 802.11ac draft to connect to the wireless LAN. The integrated module provides SDIO interface for Wi-Fi, UART / PCM interface for Bluetooth.

This compact module is a total solution for a combination of Wi-Fi + BT technologies. The module is specifically developed for Smart phones and Portable devices.

1.2 Features

- Highly integrated wireless local area network(WLAN) system-on-chip (SOC) for 5 GHZ 802.11ac, or 2.4G/5G 802.11n WLAN applications.
- Supports 20/40MHz at 2.4GHz and supports 20/40/80MHz at 5GHz.
- Supports low power SDIO3.0 interface for WLAN and UART/PCM interface for Bluetooth.
- Supports Bluetooth V4.2+HS, BLE and be backwards compatible with Bluetooth 1.2, 2.X+ enhance data rate.
- Supports WLAN-Bluetooth coexistence.
- Supports Bluetooth for class1 and class2 power level transmissions without requiring an external PA.
- BT host digital interface:
    - HCI UART (up to 4 Mbps)
    - PCM for audio data

Block Diagram:



1.3 General Specification

Model Name	6221A-SRC
Product Description	Support Wi-Fi/Bluetooth functionalities
Dimension	L x W x T: 12 x 12 x 2.0 (typical) mm
Wi-Fi Interface	Support SDIO V3.0/2.0/1.1
BT Interface	UART / PCM
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 85°C
RoHS	All hardware components are fully compliant with EU RoHS directive

1.4 Recommended Operating Rating

		Min.	Typ.	Max.	Unit
Operating Temperature		0	25	70	deg.C
VCC33		3.0	3.3	3.6	V
VDDIO		1.7	1.8 or 3.3	3.6	V
Power Consumption		VCC33 = 3.3V(Unit:mA)			
	Wi-Fi on Mode	68			
	TX (2.4G HT20)	217			
	RX (2.4G HT20)	108			
	TX (5G HT40)	252			
	RX (5G HT40)	115			
	BT on	19			

※1.5 EEPROM Information

WI-FI

Vendor ID	024C
Product ID	C821

2 Wi-Fi RF Specification

2.1 2.4GHz RF Specification

Feature	Description			
WLAN Standard	IEEE 802.11b/g/n, Wi-Fi compliant			
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)			
Number of Channels	2.4GHz：Ch1 ~ Ch14			
Modulation	DBPSK/DQPSK/CCK(DSSS)、BPSK/QPSK/16QAM/64QAM(OFDM)			
Spectrum Mask	Min. b/g/n	Typ. b/g/n	Max. b/g/n	Unit b/g/n
1st side lobes(to fc ± 11MHZ)	-	-41/-32/-42	-	dBr

2st side lobes(to fc ± 22MHZ)	-	-50/-31/-52	-	dBr
Freq. Tolerance	-20/-20/-20	-	20/20/20	ppm
Output Power[2]	802.11b /11Mbps : 16 dBm ± 1.5 dB @ EVM ≤ -9dB			
	802.11g /54Mbps : 15 dBm ± 1.5 dB @ EVM ≤ -25dB			
	802.11n /MCS7(HT 20) : 14 dBm ± 1.5 dB @ EVM ≤ -28dB			
	802.11n /MCS7(HT 40) : 14 dBm ± 1.5 dB @ EVM ≤ -28dB			

Test Items	**Typical Value**	**Standard Value**
Receive Sensitivity (11b) @8% PER	- 1Mbps PER @ -94 dBm	≤-83
	- 2Mbps PER @ -88 dBm	≤-80
	- 5.5Mbps PER @ -86 dBm	≤-79
	- 11Mbps PER @ -85 dBm	≤-76
Receive Sensitivity (11g) @10% PER	- 6Mbps PER @ -88 dBm	≤-85
	- 9Mbps PER @ -86 dBm	≤-84
	- 12Mbps PER @ -85 dBm	≤-82
	- 18Mbps PER @ -83 dBm	≤-80
	- 24Mbps PER @ -81 dBm	≤-77
	- 36Mbps PER @ -78 dBm	≤-73
	- 48Mbps PER @ -74 dBm	≤-69
	- 54Mbps PER @ -72 dBm	≤-68
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -87 dBm	≤-85
	- MCS=1 PER @ -83 dBm	≤-82
	- MCS=2 PER @ -82 dBm	≤-80
	- MCS=3 PER @ -78 dBm	≤-77
	- MCS=4 PER @ -75 dBml	≤-73
	- MCS=5 PER @ -73 dBm	≤-69
	- MCS=6 PER @ -70 dBm	≤-68
	- MCS=7 PER @ -69 dBm	≤-67
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -87 dBm	≤-82
	- MCS=1 PER @ -83 dBm	≤-79
	- MCS=2 PER @ -82 dBm	≤-77
	- MCS=3 PER @ -78 dBm	≤-74
	- MCS=4 PER @ -74 dBm	≤-70
	- MCS=5 PER @ -70 dBm	≤-66
	- MCS=6 PER @ -68 dBm	≤-65
	- MCS=7 PER @ -67 dBm	≤-64

2.2 5GHz RF Specification

Feature	Description	
WLAN Standard	IEEE 802.11a/n/ac, Wi-Fi compliant	
Frequency Range	4.900 GHz ~ 5.845 GHz (5.0 GHz ISM Band)	
Number of Channels	5.0GHz：Please see the table[1]	
Modulation	802.11a/n : 64-QAM,16-QAM, QPSK, BPSK 802.11ac : 256-QAM, 64-QAM,16-QAM, QPSK, BPSK	
Output Power[3]	802.11a /54Mbps : 13 dBm ± 1.5 dB @ EVM ≤ -25dB	
	802.11n /MCS7(HT20) : 12 dBm ± 1.5 dB @ EVM ≤ -28dB	
	802.11n /MCS7(HT40) : 12 dBm ± 1.5 dB @ EVM ≤ -28dB	
	802.11ac/MCS8(VHT20) : 11 dBm ± 1.5 dB @ EVM ≤ -30dB	
	802.11ac/MCS7(VHT40) : 12 dBm ± 1.5 dB @ EVM ≤ -30dB	
	802.11ac/MCS9(VHT40) : 10 dBm ± 1.5 dB @ EVM ≤ -32dB	
	802.11ac/MCS9(VHT80) : 10 dBm ± 1.5 dB @ EVM ≤ -32dB	
Test Items	**Typical Value**	**Standard Value**
Receive Sensitivity (11a, 20MHz) @10% PER	- 6Mbps PER @ -87 dBm	≤-82
	- 9Mbps PER @ -85 dBm	≤-81
	- 12Mbps PER @ -84 dBm	≤-79
	- 18Mbps PER @ -82 dBm	≤-77
	- 24Mbps PER @ -78 dBm	≤-74
	- 36Mbps PER @ -75 dBm	≤-70
	- 48Mbps PER @ -70 dBm	≤-66
	- 54Mbps PER @ -69 dBm	≤-65
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -85 dBm	≤-82
	- MCS=1 PER @ -83 dBm	≤-79
	- MCS=2 PER @ -80 dBm	≤-77
	- MCS=3 PER @ -77 dBm	≤-74
	- MCS=4 PER @ -73 dBm	≤-70
	- MCS=5 PER @ -69 dBm	≤-66
	- MCS=6 PER @ -67 dBm	≤-65
	- MCS=7 PER @ -66 dBm	≤-64
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -82 dBm	≤-81
	- MCS=1 PER @ -79 dBm	≤-78
	- MCS=2 PER @ -78 dBm	≤-76
	- MCS=3 PER @ -73 dBm	≤-72
	- MCS=4 PER @ -70 dBm	≤-69

	- MCS=5	PER @ -65 dBm	≤-64
	- MCS=6	PER @ -64 dBm	≤-63
	- MCS=7	PER @ -62 dBm	≤-61
Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0	PER @ -86 dBm	≤-82
	- MCS=1	PER @ -84 dBm	≤-81
	- MCS=2	PER @ -81 dBm	≤-79
	- MCS=3	PER @ -78 dBm	≤-74
	- MCS=4	PER @ -74 dBm	≤-71
	- MCS=5	PER @ -70 dBm	≤-67
	- MCS=6	PER @ -68 dBm	≤-66
	- MCS=7	PER @ -67 dBm	≤-61
	- MCS=8	PER @ -63 dBm	≤-59
Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0	PER @ -82 dBm	≤-79
	- MCS=1	PER @ -78 dBm	≤-76
	- MCS=2	PER @ -76 dBm	≤-73
	- MCS=3	PER @ -73 dBm	≤-69
	- MCS=4	PER @ -70 dBm	≤-68
	- MCS=5	PER @ -65 dBm	≤-64
	- MCS=6	PER @ -63 dBm	≤-63
	- MCS=7	PER @ -61 dBm	≤-58
	- MCS=8	PER @ -59 dBm	≤-56
	- MCS=9	PER @ -58 dBm	≤-54
Receive Sensitivity (11ac,80MHz) @10% PER	- MCS=0	PER @ -78 dBm	≤-76
	- MCS=1	PER @ -75 dBm	≤-73
	- MCS=2	PER @ -73 dBm	≤-71
	- MCS=3	PER @ -69 dBm	≤-68
	- MCS=4	PER @ -66 dBm	≤-64
	- MCS=5	PER @ -64 dBm	≤-60
	- MCS=6	PER @ -60 dBm	≤-59
	- MCS=7	PER @ -58 dBm	≤-58
	- MCS=8	PER @ -55 dBm	≤-53
	- MCS=9	PER @ -54 dBm	≤-51

NOTES:

3.Module have calibrated MCS7 HT40 rate power,other rates control by driver;

2.Modulehave calibraed MCS7 HT40 /11M rate power, other ratescontrol by driver;

[1]5GHz Channel table

Band (GHz)	Operating Channel Numbers	Channel center frequencies(MHz)
5.15GHz~5.25GHz	36	5180
	40	5200
	44	5220
	48	5240
5.25GHz~5.35GHz	52	5260
	56	5280
	60	5300
	64	5320
5.5GHz~5.7GHz	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620
	128	5640
	132	5660
	136	5680
	140	5700
5.725GHz~5.825GHz	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

3 Bluetooth Specification

3.1 Bluetooth Specification

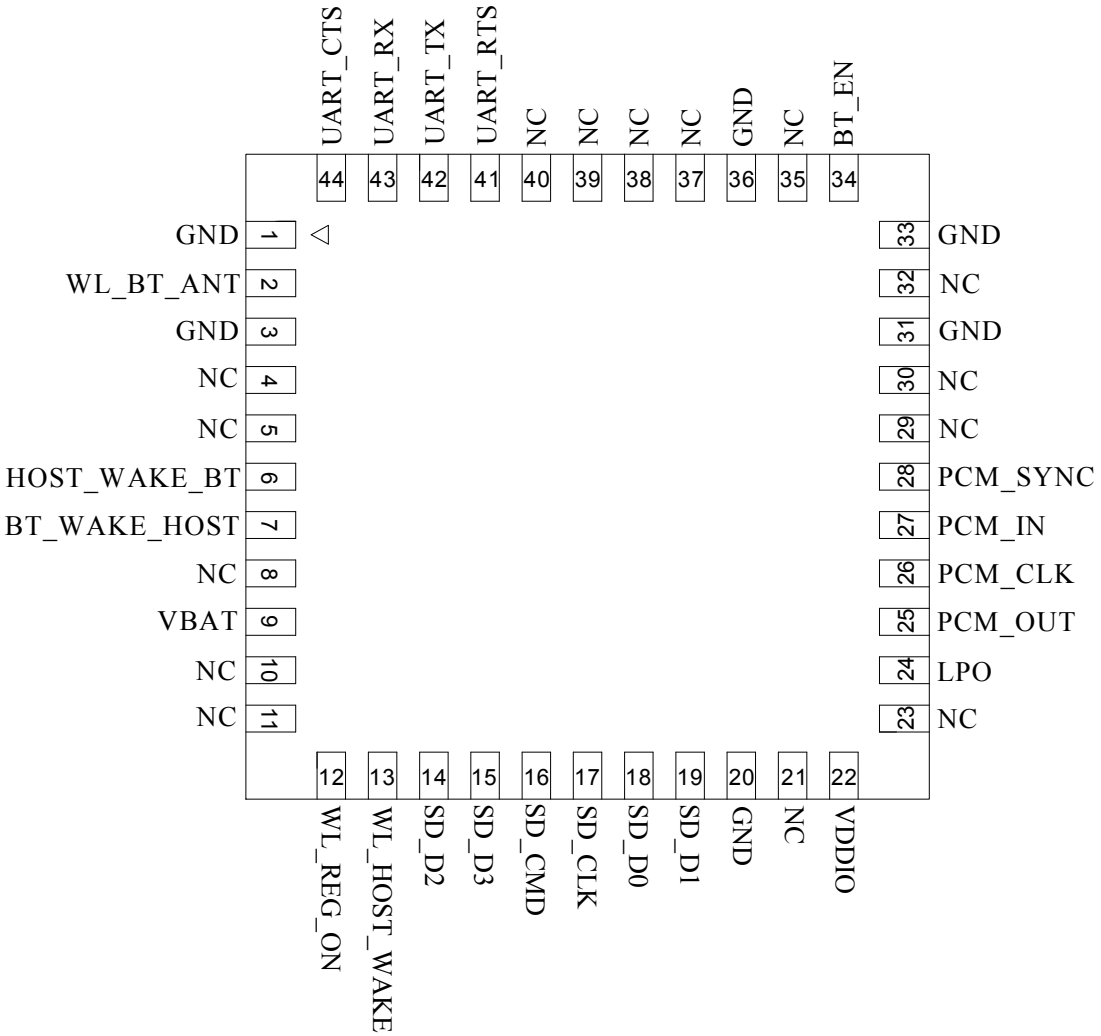
Feature	**Description**
General Specification	
Bluetooth Standard	Bluetooth V4.2 of 1, 2 and 3 Mbps.
Host Interface	UART
Antenna Reference	Small antennas with 0~2 dBi peak gain
Frequency Band	2402 MHz ~ 2480 MHz
Number of Channels	79 channels

Modulation	GFSK, π/4-DQPSK,8DPSK		
RF Specification			
	Min.	**Typical.**	**Max.**
Output Power	2 dBm	5dBm	8 dBm
Sensitivity @ BER=0.1% for GFSK (1Mbps)	-85 dBm		-80 dBm
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)	-85 dBm		-80 dBm
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)	-85 dBm		-80 dBm
Maximum Input Level	GFSK (1Mbps):-20dBm		
	π/4-DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

4 Pin Assignments

4.1 Pin Outline

< TOP VIEW >



4.2 Pin Definition

NO	Name	Type	Description	Voltage
1	GND	—	Ground connections	
2	WL_BT_ANT	I/O	RF I/O port	
3	GND	—	Ground connections	
4	NC	—	Floating (Don't connected to ground)	
5	NC	—	Floating (Don't connected to ground)	
6	HOST_WAKE_BT	I	HOST to wake-up Bluetooth device	VDDIO
7	BT_WAKE_HOST	O	Bluetooth device to wake-up HOST	VDDIO
8	NC	—	Floating (Don't connected to ground)	
9	VBAT	P	Main power voltage source input 3.3V	3.3V
10	NC	—	Floating (Don't connected to ground)	
11	NC	—	Floating (Don't connected to ground)	
12	WL_REG_ON	I	Enable pin for WLAN device	VDDIO

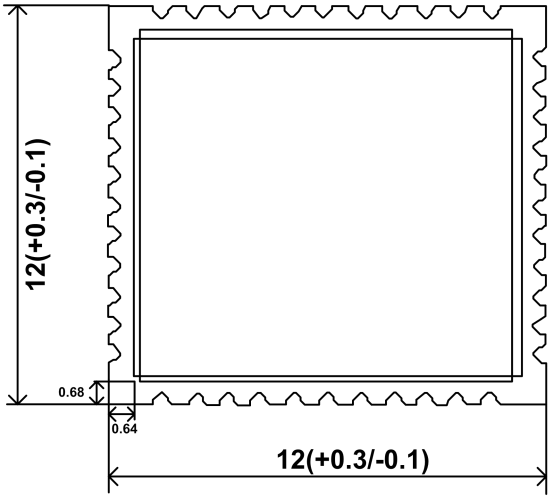
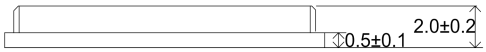
			ON: pull high ; OFF: pull low	
13	WL_HOST_WAKE	O	WLAN to wake-up HOST	VDDIO
14	SD_D2	I/O	SDIO data line 2	1.8V or 3.3V
15	SD_D3	I/O	SDIO data line 3	1.8V or 3.3V
16	SD_CMD	I/O	SDIO command line	1.8V or 3.3V
17	SD_CLK	I/O	SDIO clock line	1.8V or 3.3V
18	SD_D0	I/O	SDIO data line 0	1.8V or 3.3V
19	SD_D1	I/O	SDIO data line 1	1.8V or 3.3V
20	GND	—	Ground connections	
21	NC	—	Floating (Don't connected to ground)	
22	VDDIO	P	I/O Voltage supply input	1.8V or 3.3V
23	NC	—	Floating (Don't connected to ground)	
24	LPO	I	External Low Power Clock input (32.768KHz)	
25	PCM_OUT	O	PCM Data output	VDDIO
26	PCM_CLK	I/O	PCM clock	VDDIO
27	PCM_IN	I	PCM data input	VDDIO
28	PCM_SYNC	I/O	PCM sync signal	VDDIO
29	NC	—	Floating (Don't connected to ground)	
30	NC	—	Floating (Don't connected to ground)	
31	GND	—	Ground connections	
32	NC	—	Floating (Don't connected to ground)	
33	GND	—	Ground connections	
34	BT_EN	I	Enable pin for Bluetooth device ON: pull high ; OFF: pull low	VDDIO
35	NC	—	Floating (Don't connected to ground)	
36	GND	—	Ground connections	
37	NC	—	Floating (Don't connected to ground)	
38	NC	—	Floating (Don't connected to ground)	
39	NC	—	Floating (Don't connected to ground)	
40	NC	—	Floating (Don't connected to ground)	
41	UART_RTS	O	Bluetooth UART interface	1.8V or 3.3V
42	UART_TX	O	Bluetooth UART interface	1.8V or 3.3V
43	UART_RX	I	Bluetooth UART interface	1.8V or 3.3V
44	UART_CTS	I	Bluetooth UART interface	1.8V or 3.3V

P:POWER I:INPUT O:OUTPUT VDDIO:1.8V ~ 3.3V

5 Dimensions

5.1 Module Picture

(Unit: mm)

<table>
<tr><td>L x W : 12 x 12 (+0.3-0.1) mm
 
</td><td> 
</td></tr>
<tr><td>H: 2.0 (±0.2) mm</td><td> 
</td></tr>
<tr><td>Weight</td><td>0.52g</td></tr>
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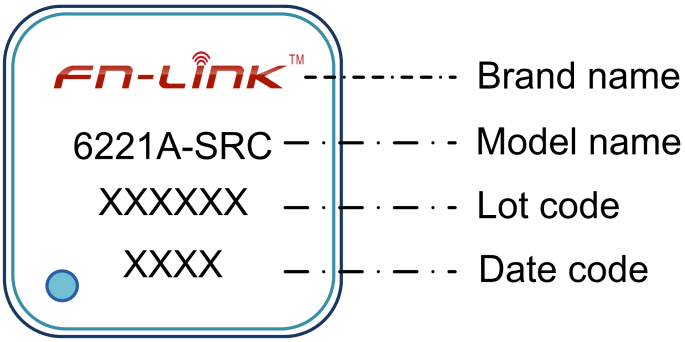
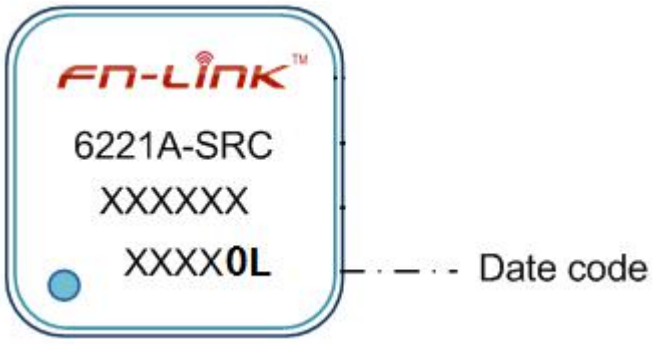
5.2 Marking Description

< TOP VIEW >





NOTE: datacode '0L' is P/N: FG6221ASRC-0L

5.3 Module Physical Dimensions

(Unit: mm)

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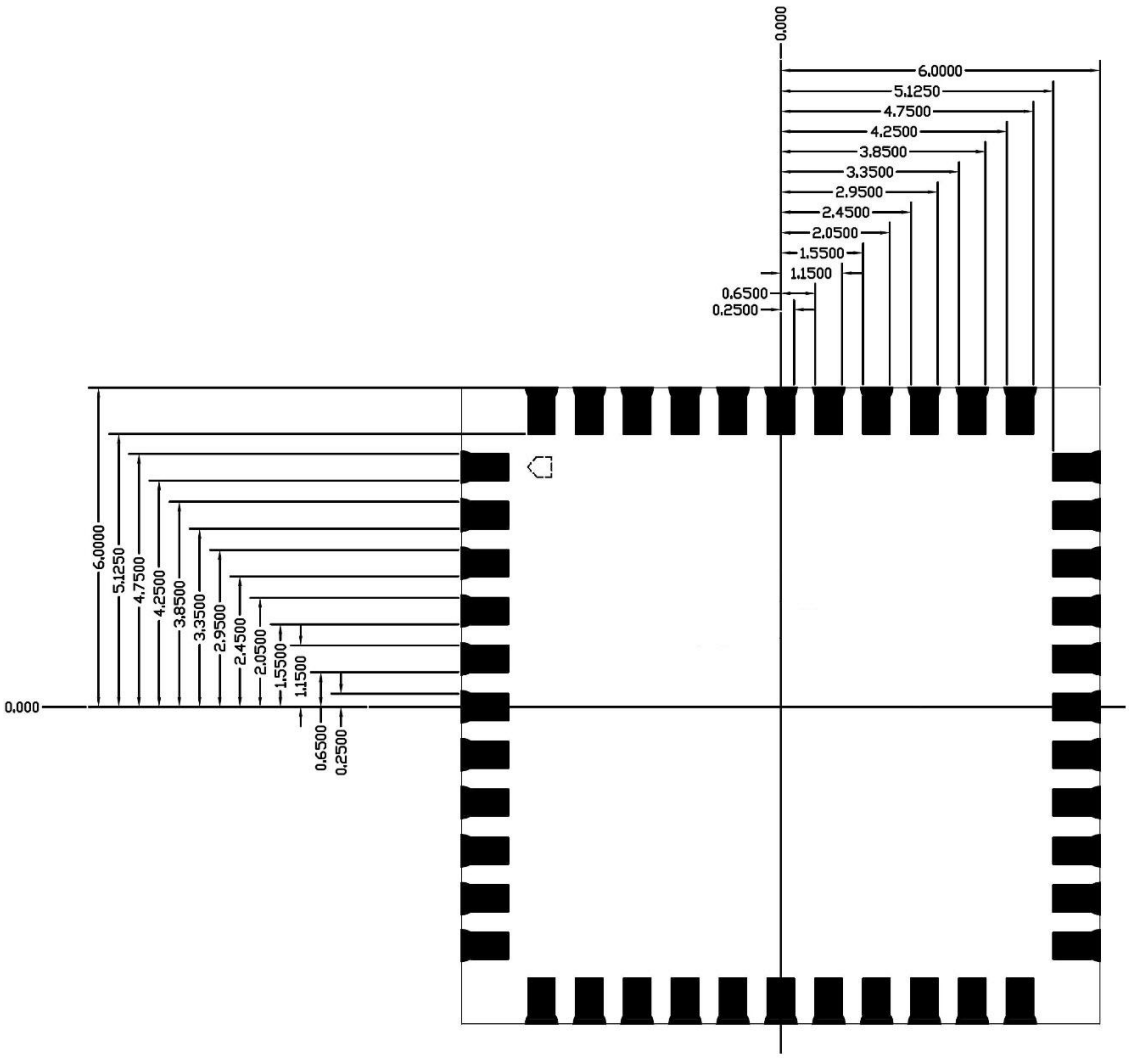
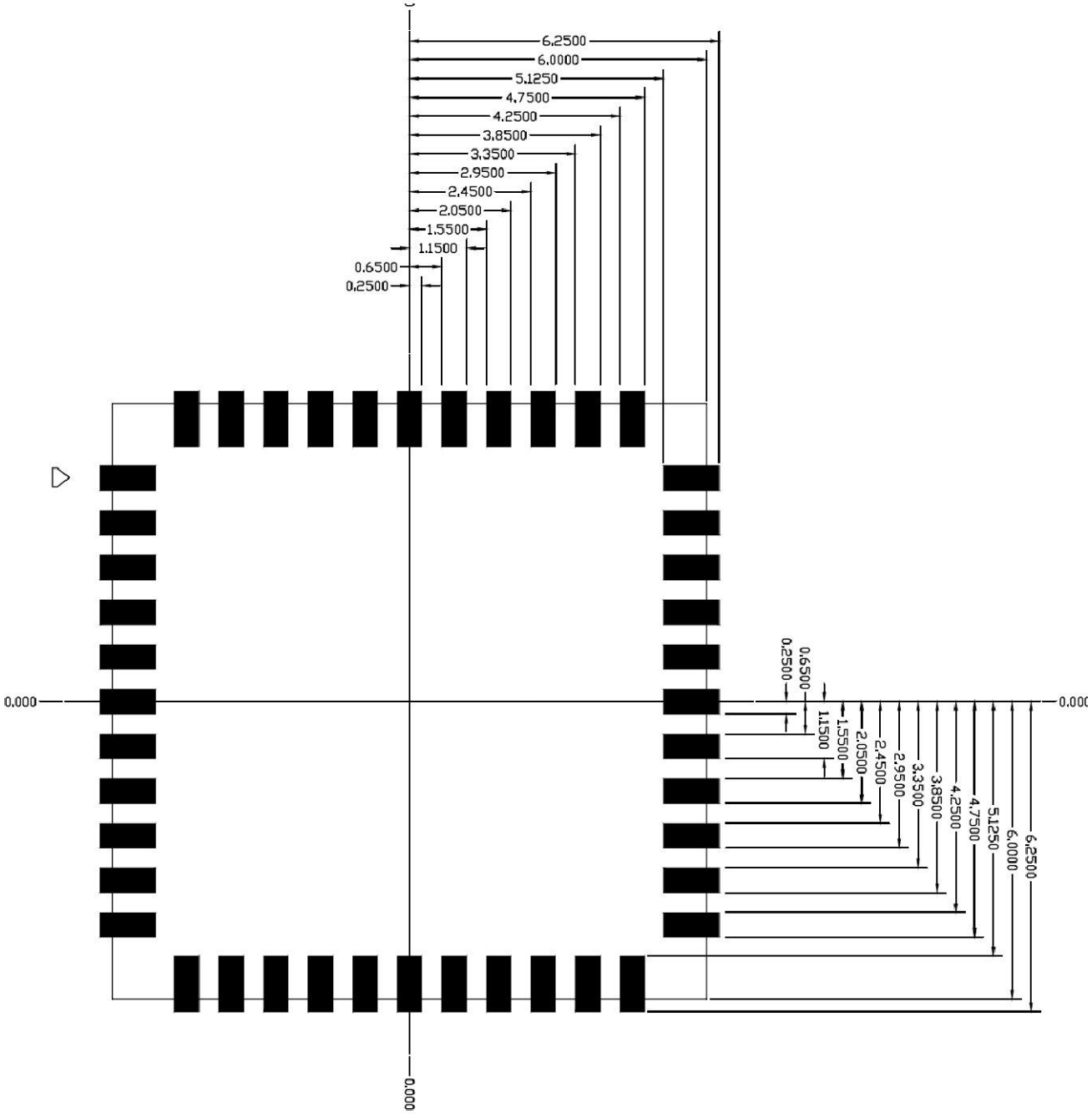


5.4 Layout Recommendation

(Unit: mm)

< TOP VIEW >



6 Host Interface Timing Diagram

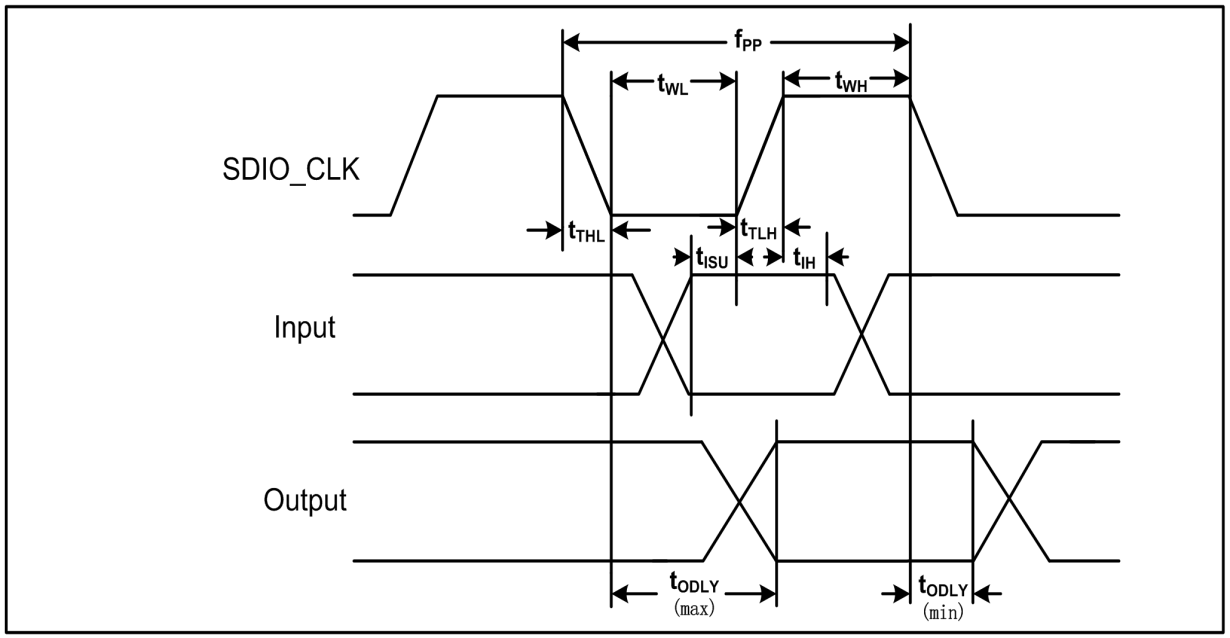
6.1 SDIO Pin Description

The module supports SDIO version 3.0 for all 1.8V 4-bit UHSI speeds: SDR50(100 Mbps), DDR50(50MHz, dual rates) in addition to the 3.3V default speed(25MHz) and high speed (50 MHz). It has the ability to stop the SDIO clock and map the interrupt signal into a GPIO pin. This 'out-of-band' interrupt signal notifies the host when the WLAN device wants to turn on the SDIO interface. The ability to force the control of the gated clocks from within the WLAN chip is also provided.

SDIO Pin Description

SD 4-Bit Mode	
DATA0	Data Line 0
DATA1	Data Line 1 or Interrupt
DATA2	Data Line 2 or Read Wait
DATA3	Data Line 3
CLK	Clock
CMD	Command Line

6.2 SDIO Default Mode Timing Diagram

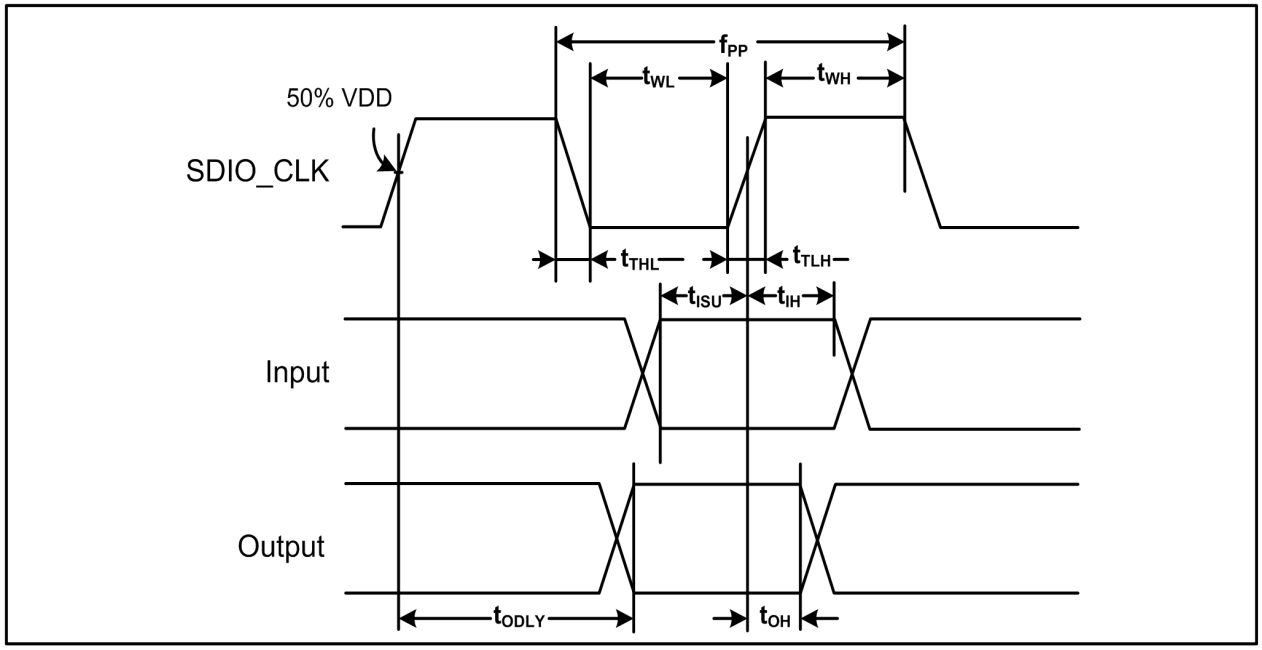


Parameter	*Symbol*	*Minimum*	*Typical*	*Maximum*	*Unit*
SDIO CLK(All values are referred to minimum VIH and maximum VIL[b])					
Frequency - Data Transfer mode	fPP	0	-	25	MHz
Frequency - Identification mode	fOD	0	-	400	kHz
Clock low time	tWL	10	-	-	ns
Clock high time	tWH	10	-	-	ns
Clock rise time	tTLH	-	-	10	ns
Clock low time	tTHL	-	-	10	ns
Inputs:CMD, DAT(referenced to CLK)					
Input setup time	tISU	5	-	-	ns
Input hold time	tIH	5	-	-	ns
Outputs:CMD, DAT(referenced to CLK)					
Output delay time - Data Transfer mode	tODLY	0	-	14	ns
Output delay time - Identification mode	tODLY	0	-	50	ns

a. Timing is based on CL ≤ 40 pF load on CMD and Data.

b. Min(Vih) = 0.7 × VDDIO and max(Vil) = 0.2 × VDDIO.

6.3 SDIO High Speed Mode Timing Diagram



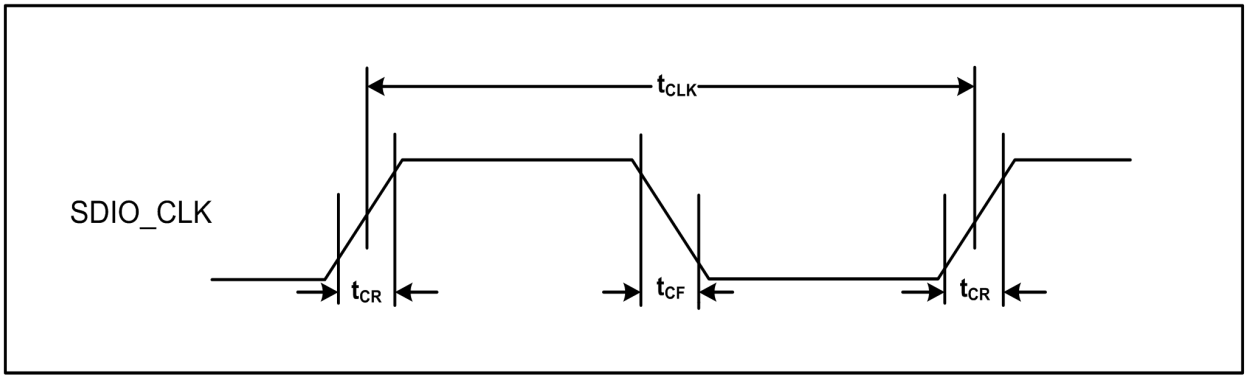
Parameter	*Symbol*	*Minimum*	*Typical*	*Maximum*	*Unit*
SDIO CLK(all values are referred to minimum VIH and maximum VIL[b])					
Frequency - Data Transfer mode	fPP	0	-	50	MHz
Frequency - Identification mode	fOD	0	-	400	kHz
Clock low time	tWL	7	-	-	ns
Clock high time	tWH	7	-	-	ns
Clock rise time	tTLH	-	-	3	ns
Clock low time	tTHL	-	-	3	ns
Inputs:CMD, DAT(referenced to CLK)					
Input setup time	tISU	6	-	-	ns
Input hold time	tIH	2	-	-	ns
Outputs:CMD, DAT(referenced to CLK)					
Output delay time - Data Transfer mode	tODLY	-	-	14	ns
Output delay time - Identification mode	tODLY	2.5	-	-	ns
Total system capacitance(each line)	CL	-	-	40	pF

a. Timing is based on CL ≤ 40 pF load on CMD and Data.

b. Min(Vih) = 0.7 × VDDIO and max(Vil) = 0.2 × VDDIO.

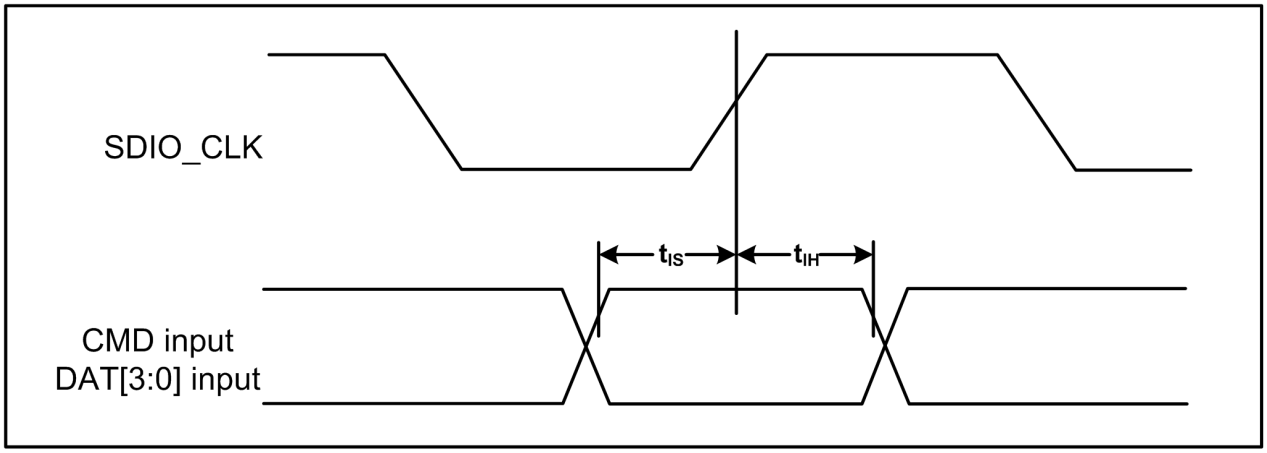
6.4 SDIO Bus Timing Specifications in SDR Modes

Clock timing(SDR Modes)



Parametwer	*Symbol*	*Minimum*	*Maximum*	*Unit*	*Comments*
-	t_{CLK}	40	-	ns	SDR12 mode
		20	-	ns	SDR25 mode
		10	-	ns	SDR50 mode
-	t_{CR}, t_{CF}	-	0.2 × t_{CLK}	ns	t_{CR}, t_{CF} < 2.00 ns (max)@100 MHz, C_{CARD} = 10 pF
Clock duty	-	30	70	%	-

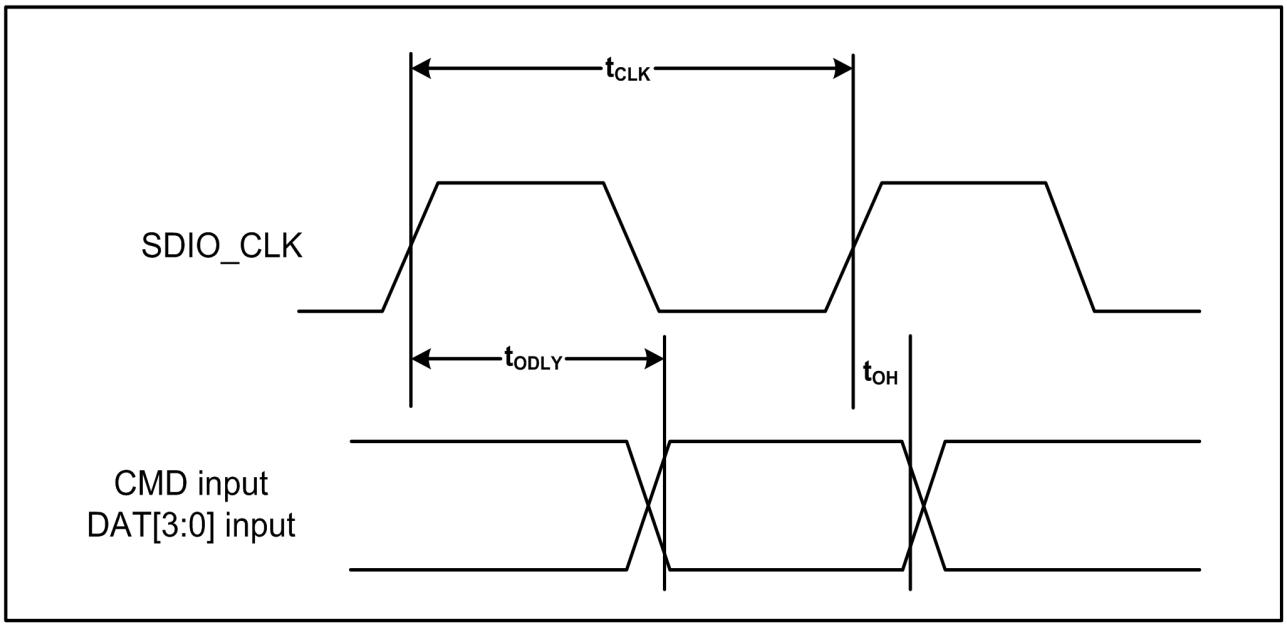
Card Input timing (SDR Modes)



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

a. SDIO 3.0 specification value is 1.40 ns.

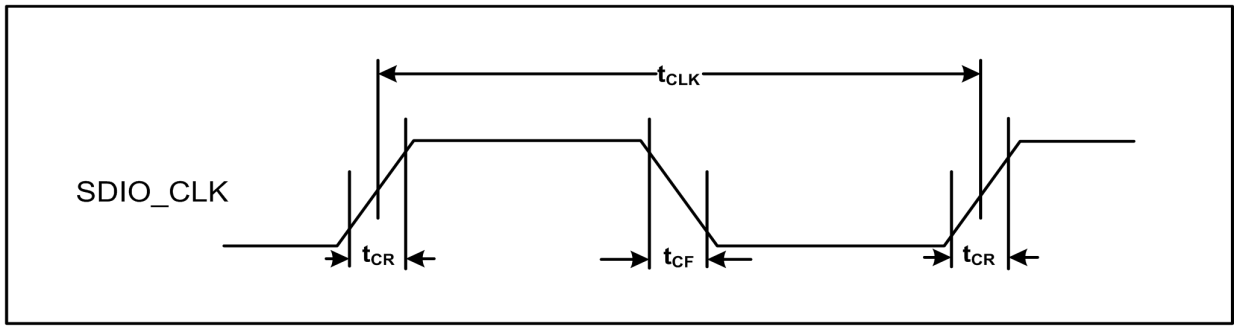
Card output timing (SDR Modes up to 100MHz)



Symbol	Minimum	Maximum	Unit	Comments
t_{ODLY}	-	7.85[a]	ns	t_{CLK}≥10 ns C_L=30 pF using driver type B for SDR50
t_{ODLY}	-	14.0	ns	t_{CLK}≥20 ns C_L=40 pF using for SDR12, SDR25
t_{OH}	1.5	-	ns	Hold time at the t_{ODLY}(min) CL=15 pF

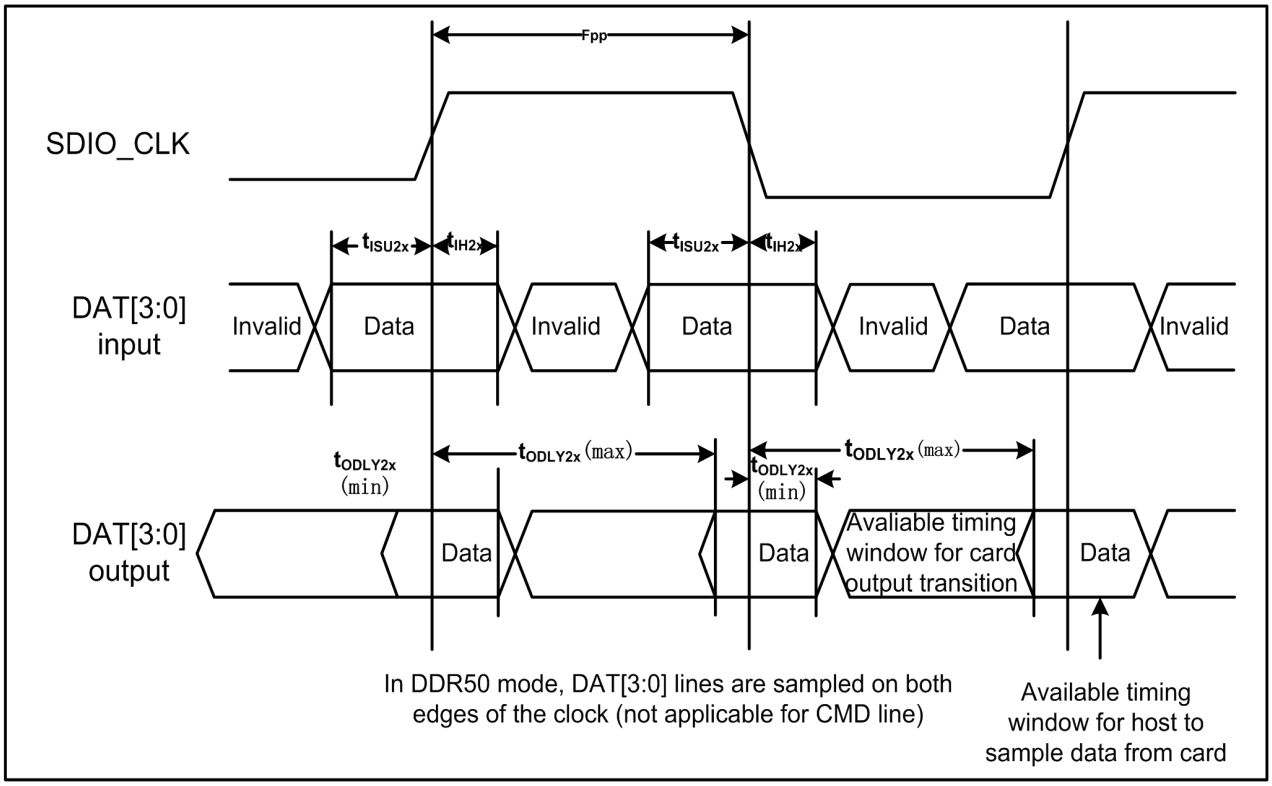
a. SDIO 3.0 specification value is 7.5 ns.

6.5 SDIO Bus Timing Specifications in DDR50 Mode



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

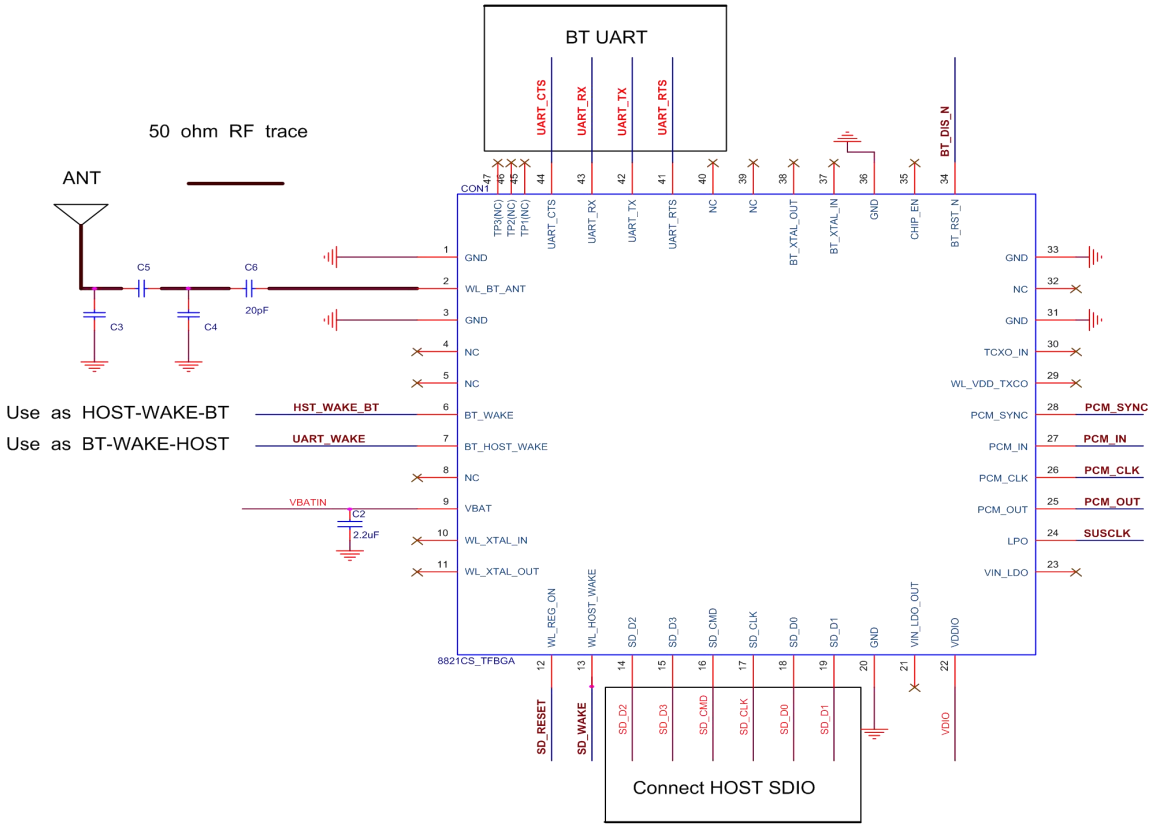
Data Timing



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 CMD					
Output delay time	t_{ODLY2x}	-	7.85[a]	ns	C_{CARD} < 25 pF (1 Card)
Output hold time	t_{ODLY2x}	1.5	-	ns	C_{CARD} < 15 pF (1 Card)

a. SDIO 3.0 specification value is 7.0 ns

7 Reference Design



8 Ordering Information

Part No.	Description
FG6221ASRC-00	RTL8821CS, a/b/g/n/ac, Wi-Fi+BLE4.2, 1T1R, 12X12mm, SDIO +Uart, PCB V1.0
FG6221ASRC-0L	RTL8821CS, a/b/g/n/ac, Wi-Fi+BLE4.2, 1T1R, 12X12mm, SDIO +Uart, PCB V1.0 (无 C33)

9 The Key Material List

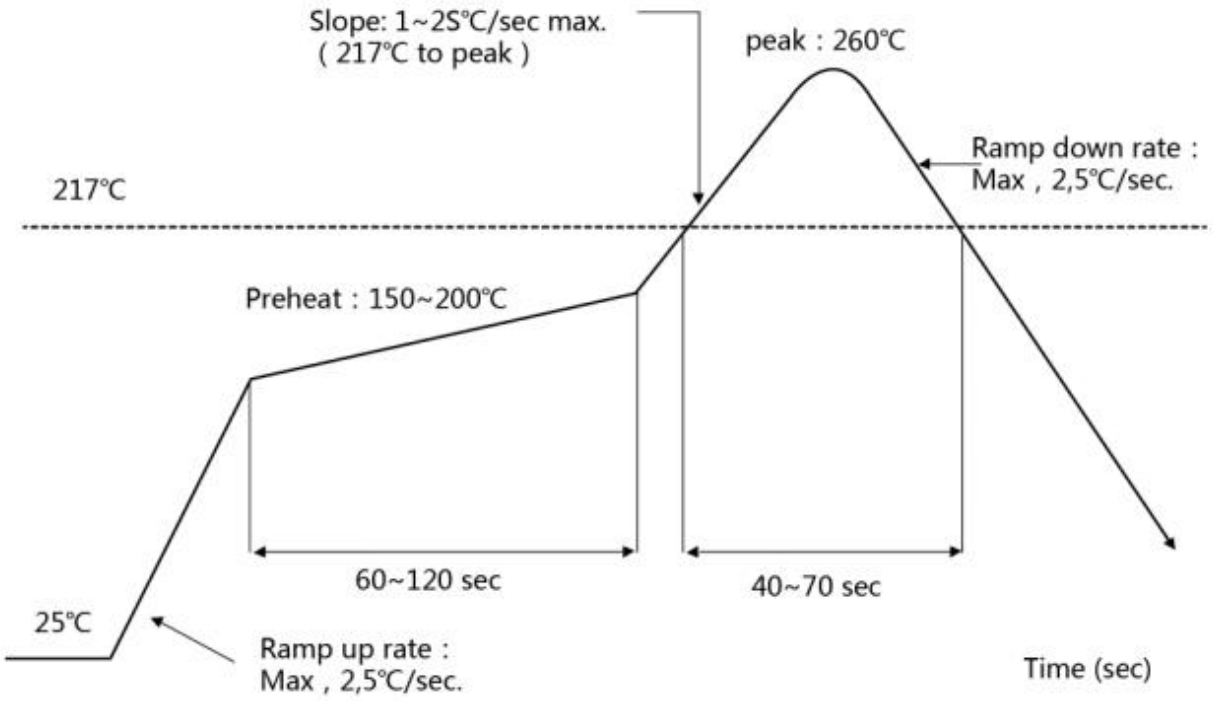
Name	Description	Brand
Inductor	2016,2.2UH,±20%,1200mA	Microgate,cenke,sunlord,ceaiya
Shielding	6221A-SRC V2.0 Shield cover, copper	Suntech,JLitong
diplexer	DP1005,2.4G+5G,diplexer	ACX,Walsin,Murata,Glead,TDK
Crystal	40MHz, 2016, 15pF, 10ppm	Hosonic,ECEC,TKD,JWT
Chipset	RTL8821CS-CG	Realtek
TVS	0201,4V, 0.05pF ESD±15KV/±15KV	muRata,Wayon,sunlord
PCB	6221A-SRC-V1.0,green,4L,12x12x0.5 mm	Sunlord,kx-pcb,brainpower-pcb

10 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : ≤260°C

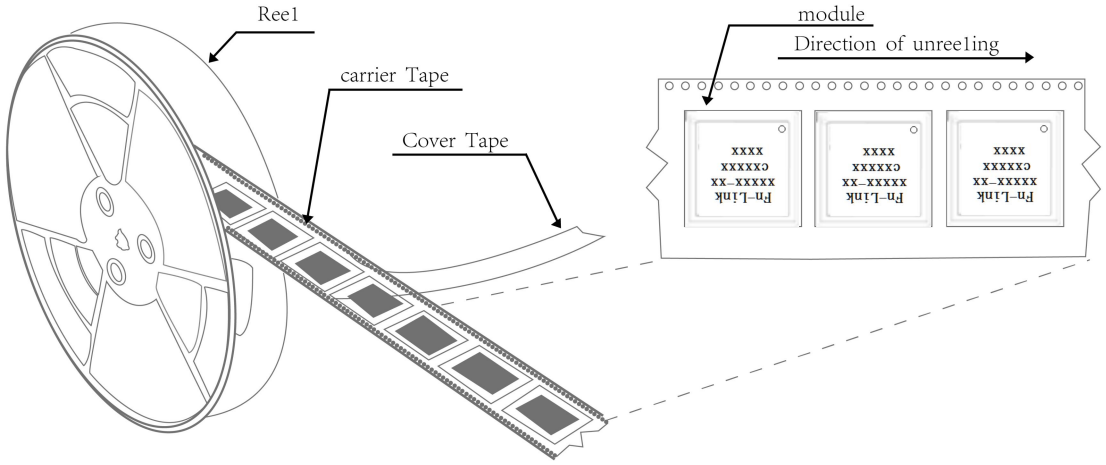
Number of Times : ≤2 times



11 Package Information

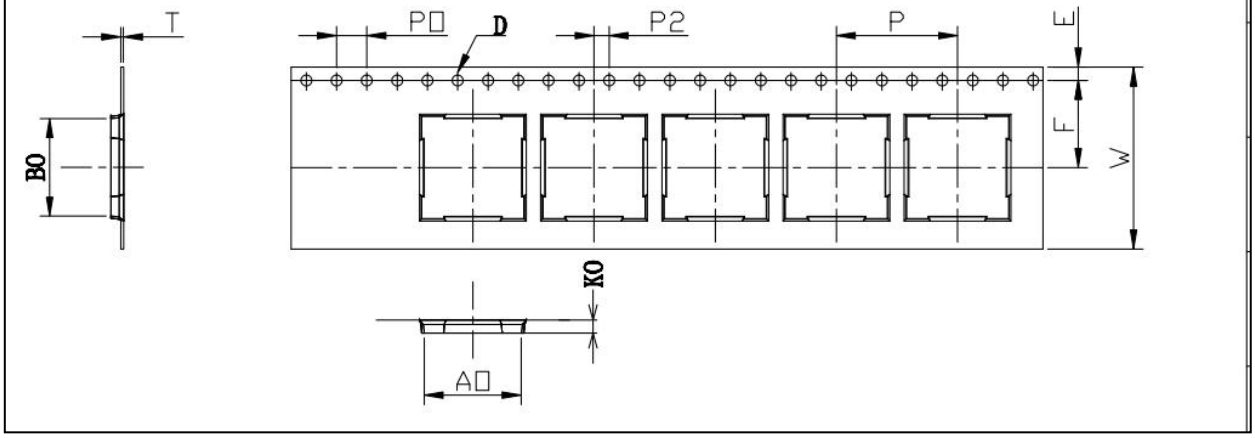
11.1 Reel

A roll of 1500pcs



11.2 Carrier Tape Detail

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	24	12.45	12.45	1.50	11.5	1.75	2.60	4.0	2.0	16.0	0.30
TOLE	+0.3 -0.3	±0.10	±0.10	+0.1 -0.0	+0.1 -0.1	±0.1	±0.10	±0.1	±0.1	±0.1	±0.05



11.3 Packaging Detail

the take-up package

Using self-adhesive tape

Size of black tape:24mm*32.6m the cover tape :21.3mm*32.6m

Color of plastic disc:blue

NY bag size:460mm*385mm

size ： 350*350*35mm

The packing case size:350*210*370mm

11.4 Moisture sensitivity

The Modules is a Moisture Sensitive Device level 3, in according with standard IPC/JEDEC J-STD-020, take care
all the relatives requirements for using this kind of components.
Moreover, the customer has to take care of the following conditions:
a) Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity(RH).
b) Environmental condition during the production: 30°C / 60% RH according to IPC/JEDEC J-STD-033A paragraph 5.
c) The maximum time between the opening of the sealed bag and the reflow process must be 168 hours if condition
b) “IPC/JEDEC J-STD-033A paragraph 5.2” is respected
d) Baking is required if conditions b) or c) are not respected
e) Baking is required if the humidity indicator inside the bag indicates 10% RH or more