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<h2>User Manual</h2>

802.11abgn wireless module

Project Name	802.11abgn wireless module
Customer Part No.	021430401
Approval Sheet Rev.	1.0
Foxconn Part No.	J20H076

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1. Revision History

Date	Document revision	Change History
2013/5/24	1.0	Initial release



2 Product Overview

This documentation outlines the QCA9375 WiFi Module. It is 802.11a/b/g/n compatible, ARIB STD-T66 Compatible; the module Host I/F is USB 2.0.

IEEE 802.11 a/b/g and 802.11n payload data rates for Wireless Local Area Network (WLAN).

1.1 Operating Frequency: 2402~2483.5MHz, 5150MHz~5250MHz, 5250MHz~5350MHz, 5470MHz~5725MHz, 5725MHz~5845MHz

1.2 Modulation: DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM

1.3 Data Rates: 1/2/5.5/11Mbps (11b)
6/9/12/18/24/36/48/54 Mbps (11g)
MCS0~MCS15

1.4 Security: it supports WEP, TKIP, AES, WPA/WPA2 and WAPI

1.5 Full 802.11e QoS support including WMM.

1.6 Support Short Guard interval and Frame aggregation with A-MPDU

The module is designed with a WTB (Wire to Board) connector to connect to host. Dimension is 40.0mm x37.5mm x 5.45mm (typical).

Below figure1 shows functional block diagram of the WLAN module.

3 Signal Description

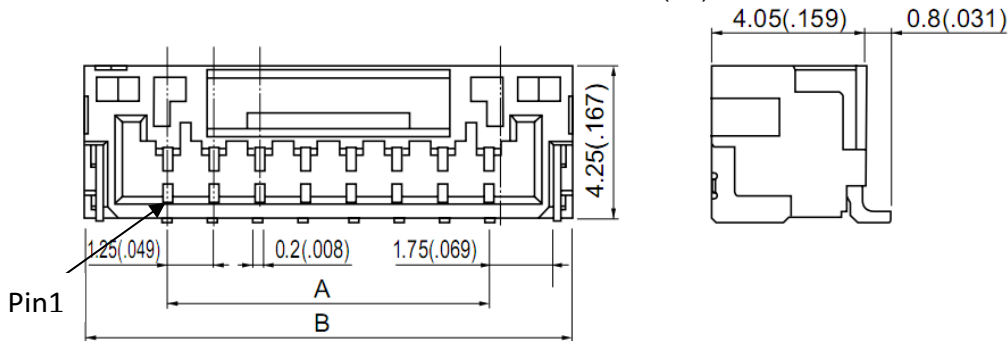
3.1 Signal Diagram

Below figure 2 shows its signal diagram.

3.2 Pinouts

3.2.1 Connector Specification

JST WTB connector, Part Number: SM10B-GHS-TB(LF)



Model No.	Dimensions mm(in.)	
Side entry type	A	B
SM10B-GHS-TB	11.25(.443)	15.75(.620)

3.2.2 Pin definition

Pin#	Pin Name	Pin Type	Description	Remark
1	GND	-	Ground	
2	WoW	O	Wake-up on wireless LAN	Active high
3	CHIP_PWD_L	I	Reset to module	Active low
4	GND	-	Ground	
5	USB_DM	I/O	USB differential signal negative	
6	USB_DP	I/O	USB differential signal positive	
7	VCC_3.3V	Power	3.3V power supply	+/-5%
8	VCC_3.3V	Power	3.3V power supply	+/-5%
9	GND	-	Ground	
10	GND	-	Ground	

4 Electrical Specification

4.1 Absolute Maximum Rating

Symbol	Condition	Min.	Typ.	Max	Unit
VCC_3.3V	Respect to GND	-0.3	3.3	3.6	V
CHIP_PWD_L	Respect to GND	-0.3	3.3	3.6	V
Max Ripple on Supplied Voltage	3.3V			165	mVpp
Operating Temperature	--	-10	25	75	°C
Storage Temperature	--	-40	25	85	°C

4.2 Recommended Operating Condition

Symbol	Condition	Min.	Typ.	Max	Unit
VCC_3.3V	Respect to GND	3.14	3.3	3.46	V
CHIP_PWD_L	Respect to GND	-0.3	3.3	3.46	V

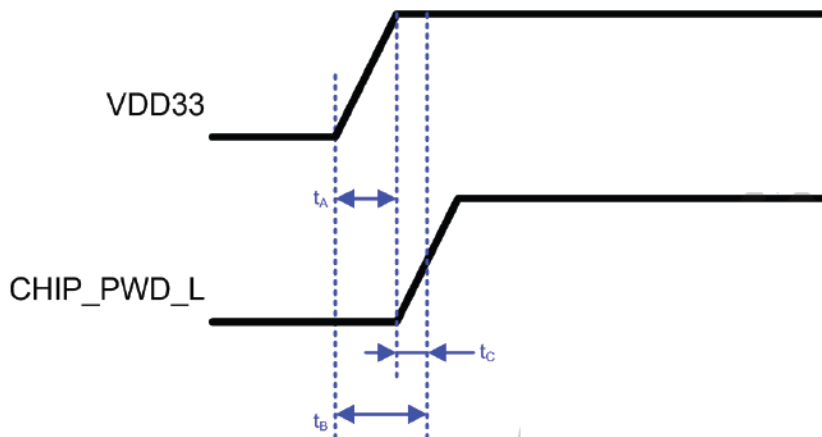
4.3 Power Consumption

Symbol	Condition	Min	Typ.	Max	Unit
3.3V	Supply voltage	3.0	3.3	3.6	V
	Tx Current	--	465	--	mA
	Tx Current	--	400	--	mA
	Tx Current	--	380	--	mA
	Tx Current	--	630	--	mA
	Tx Current	--	490	--	mA
	Tx Current	--	425	--	mA
	Rx Current: 2.4GHz	--	120	--	mA
	Rx Current: 5GHz	--	130	--	mA

4.4 Power Up Sequence

Power up (reset) timing is shown as below:

When host processor controls the CHIP_PWD_L reset pin, then all power supplies should be stable for minimum of 5 μ s before CHIP_PWD_L is de-asserted.





Parameter	Description	Min	Max	Unit
tA	Rise time of VDD3.3V go to 90% of 3.3V	-	25	ms
tC	Time from VDD3.3V reaching 90% of 3.3V to level of CHIP_PWD_L going above 50% of VDD3.3V.	5	-	μs
tB	The value is tA+tC, during this time, the level of CHIP_PWD_L should stay below 50% of VDD3.3V.			

4.5 WLAN RF Specifications

4.5.1 WLAN RF Specification- 802.11b

Items	Contents			
Specification	IEEE 802.11b			
Mode	DSSS / CCK			
Channel	CH1 to CH13			
Data rate	1, 2, 5.5, 11Mbps			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (per chain)				
1) Target Power@1Mbps	14.5	16 ^a	17.5	dBm
2) Target Power@2Mbps	14.5	16 ^a	17.5	dBm
3) Target Power@5.5Mbps	14.5	16 ^a	17.5	dBm
4) Target Power@11Mbps	14.5	16 ^a	17.5	dBm
2. Spectrum Mask @ Target Power				
1) fc-33MHz < f < fc-22MHz	-	-	-50	dBr
2) fc-22MHz < f < fc-11MHz	-	-	-30	dBr
3) fc+11MHz < f < fc+22MHz	-	-	-30	dBr
4) fc+22MHz < f < fc+33MHz	-	-	-50	dBr
3. Frequency Error	-10	-	+10	ppm
4. Modulation Accuracy(EVM)@ Target Power				
1) 1Mbps	-	-	-10	dB
2) 2Mbps	-	-	-10	dB
3) 5.5Mbps	-	-	-10	dB
4) 11Mbps	-	-	-10	dB
5. Tx spurious emission	-	-	-52	dBm
RX Characteristics	Min.	Typ.	Max.	Unit
6. Minimum Input Level Sensitivity				
1) 1Mbps (FER ≤ 8%)	-	-97	-92	dBm
2) 2Mbps (FER ≤ 8%)	-	-94	-89	dBm
3) 5.5Mbps (FER ≤ 8%)	-	-90	-85	dBm
4) 11Mbps (FER ≤ 8%)	-	-87	-82	dBm
7. Maximum Input Level (FER ≤ 8%)	-10	0	-	dBm
8. Rx spurious emission			-65	dBm

a: 2412MHz target power reduced to 15dBm for FCC bandedge limit.



4.5.2 WLAN RF Specification- 802.11g

Items	Contents			
Specification	IEEE 802.11g			
Mode	OFDM			
Channel	CH1 to CH13			
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (per chain)				
1) Target Power@6Mbps	14.5	16 ^b	17.5	dBm
2) Target Power@9Mbps	14.5	16 ^b	17.5	dBm
3) Target Power@12Mbps	14.5	16 ^b	17.5	dBm
4) Target Power@18Mbps	14.5	16 ^b	17.5	dBm
5) Target Power@24Mbps	14.5	16 ^b	17.5	dBm
6) Target Power@36Mbps	13.5	15 ^b	16.5	dBm
7) Target Power@48Mbps	13.5	15 ^b	16.5	dBm
8) Target Power@54Mbps	12.5	14 ^b	15.5	dBm
2. Spectrum Mask @ Target Power				
1) at fc +/- 11MHz	-	-	-20	dBr
2) at fc +/- 20MHz	-	-	-28	dBr
3) at fc > +/-30MHz	-	-	-40	dBr
3. Modulation Accuracy(EVM)@ Target Power				
1) 6Mbps	-	-	-5	dB
2) 9Mbps	-	-	-8	dB
3) 12Mbps	-	-	-10	dB
4) 18Mbps	-	-	-13	dB
5) 24Mbps	-	-	-16	dB
6) 36Mbps	-	-	-19	dB
7) 48Mbps	-	-	-22	dB
8) 54Mbps	-	-	-25	dB
4. Frequency Error	-10	-	+10	ppm
5. Tx spurious emission	-	-	-54	dBm
RX Characteristics	Min.	Typ.	Max.	Unit
6. Minimum Input Level Sensitivity				
1) 6Mbps (PER <10%)	-	-91	-84	dBm
2) 9Mbps (PER < 10%)	-	-89	-83	dBm
3) 12Mbps (PER < 10%)	-	-87	-81	dBm
4) 18Mbps (PER < 10%)	-	-84	-79	dBm
5) 24Mbps (PER < 10%)	-	-82	-76	dBm
6) 36Mbps (PER < 10%)	-	-80	-73	dBm
7) 48Mbps (PER < 10%)	-	-78	-70	dBm
8) 54Mbps (PER < 10%)	-	-76	-69	dBm
7. Maximum Input Level (PER < 10%)	-20	-	-	dBm
8. Rx spurious emission	-	-	-65	dBm

b: 2412MHz target power reduced to 11dBm, 2462MHz target power reduced to 12.5dBm for FCC bandedge limit.



4.5.3 WLAN RF Specification- 802.11n (2.4GHz) HT20

Items	Contents			
Specification	IEEE 802.11n HT20			
Mode	OFDM			
Channel	CH1 to CH13			
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (per chain)				
1) Target Power@MCS0	13.5	15 ^c	16.5	dBm
2) Target Power@ MCS1	13.5	15 ^c	16.5	dBm
3) Target Power@ MCS2	13.5	15 ^c	16.5	dBm
4) Target Power@ MCS3	13.5	15 ^c	16.5	dBm
5) Target Power@ MCS4	13.5	15 ^c	16.5	dBm
6) Target Power@ MCS5	12.5	14 ^c	15.5	dBm
7) Target Power@ MCS6	12.5	14 ^c	15.5	dBm
8) Target Power@ MCS7	11.5	13 ^c	14.5	dBm
2. Spectrum Mask @Target Power				
1) at fc +/- 11MHz	-	-	-20	dBr
2) at fc +/- 20MHz	-	-	-28	dBr
3) at fc > +/-30MHz	-	-	-45	dBr
3. Modulation Accuracy(EVM)@Target Power				
1) MCS0	-	-	-5	dB
2) MCS1	-	-	-10	dB
3) MCS2	-	-	-13	dB
4) MCS3	-	-	-16	dB
5) MCS4	-	-	-19	dB
6) MCS5	-	-	-22	dB
7) MCS6	-	-	-25	dB
8) MCS7	-	-	-27	dB
4. Frequency Error	-10	-	+10	ppm
5. Tx spurious emission	-	-	-54	dBm
RX Characteristics	Min.	Typ.	Max.	Unit
6. Minimum Input Level Sensitivity				
1) MCS0 (PER < 10%)	-	-89	-83	dBm
2) MCS1 (PER < 10%)	-	-87	-81	dBm
3) MCS2 (PER < 10%)	-	-85	-79	dBm
4) MCS3 (PER < 10%)	-	-82	-76	dBm
5) MCS4 (PER < 10%)	-	-79	-73	dBm
6) MCS5 (PER < 10%)	-	-77	-69	dBm
7) MCS6 (PER < 10%)	-	-75	-67	dBm
8) MCS7 (PER < 10%)	-	-73	-66	dBm
7. Maximum Input Level (PER < 10%)	-20	-	-	dBm
8. Rx spurious emission	-	-	-65	dBm

c: 2412MHz target power reduced to 10dBm, 2462MHz target power reduced to 11.5dBm for FCC bandedge limit.



4.5.4 WLAN RF Specification- 802.11a

Items	Contents			
Specification	IEEE 802.11a			
Mode	OFDM			
Channel	5150MHz~5250MHz, 5250MHz~5350MHz, 5470MHz~5725MHz, 5725MHz~5845MHz			
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (per chain)				
1) Target Power@6Mbps	13	14.5 ^{d,e,f}	16	dBm
2) Target Power@9Mbps	13	14.5 ^{d,e,t}	16	dBm
3) Target Power@12Mbps	13	14.5 ^{d,e,t}	16	dBm
4) Target Power@18Mbps	13	14.5 ^{d,e,t}	16	dBm
5) Target Power@24Mbps	13	14.5 ^{d,e,t}	16	dBm
6) Target Power@36Mbps	12	13.5 ^d	15	dBm
7) Target Power@48Mbps	11	12.5 ^d	14	dBm
8) Target Power@54Mbps	10	11.5	13	dBm
2. Spectrum Mask @ Target Power				
1) at fc +/- 11MHz	-	-	-20	dBr
2) at fc +/- 20MHz	-	-	-28	dBr
3) at fc > +/-30MHz	-	-	-40	dBr
3. Modulation Accuracy(EVM)@ Target Power				
1) 6Mbps	-	-	-5	dB
2) 9Mbps	-	-	-8	dB
3) 12Mbps	-	-	-10	dB
4) 18Mbps	-	-	-13	dB
5) 24Mbps	-	-	-16	dB
6) 36Mbps	-	-	-19	dB
7) 48Mbps	-	-	-22	dB
8) 54Mbps	-	-	-25	dB
4. Frequency Error	-10	-	+10	ppm
5. Tx spurious emission	-	-	-52	dBm
RX Characteristics	Min.	Typ.	Max.	Unit
6. Minimum Input Level Sensitivity				
1) 6Mbps (PER < 10%)	-	-90	-84	dBm
2) 9Mbps (PER < 10%)	-	-89	-83	dBm
3) 12Mbps (PER < 10%)	-	-87	-81	dBm
4) 18Mbps (PER < 10%)	-	-85	-79	dBm
5) 24Mbps (PER < 10%)	-	-82	-76	dBm
6) 36Mbps (PER < 10%)	-	-79	-73	dBm
7) 48Mbps (PER < 10%)	-	-75	-70	dBm
8) 54Mbps (PER < 10%)	-	-74	-69	dBm
7. Maximum Input Level (PER < 10%)	-30	-	-	dBm
8. Rx spurious emission	-	-	-58	dBm

d: 5180MHz~5240MHz, 6Mbps~48Mbps target power reduced to 12dBm for FCC power density limit.

e: 5700MHz, 6Mbps~24Mbps target power reduced to 13.5dBm for FCC bandedge limit.

f: 5180MHz, 6Mbps~24Mbps target power reduced to 12.5dBm for TELEC adjacent channel power limit

5200MHz~5320MHz, 6Mbps~24Mbps target power reduced to 14dBm for TELEC adjacent channel power limit.



4.5.5 WLAN RF Specification- 802.11n (5GHz) HT20

Items	Contents			
Specification	IEEE 802.11a/n HT20			
Mode	OFDM			
Channel	5150MHz~5250MHz, 5250MHz~5350MHz, 5470MHz~5725MHz, 5725MHz~5845MHz			
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (per chain)				
1) Target Power@MCS0	12	13.5 ^{g,h,i}	15	dBm
2) Target Power@ MCS1	12	13.5 ^{g,h,i}	15	dBm
3) Target Power@ MCS2	12	13.5 ^{g,h,i}	15	dBm
4) Target Power@ MCS3	12	13.5 ^{g,h,i}	15	dBm
5) Target Power@ MCS4	12	13.5 ^{g,h,i}	15	dBm
6) Target Power@ MCS5	11	12.5 ^{g,i}	14	dBm
7) Target Power@ MCS6	10	11.5	13	dBm
8) Target Power@ MCS7	9	10.5	12	dBm
2. Spectrum Mask @ Target Power				
1) at fc +/- 11MHz	-	-	-20	dBr
2) at fc +/- 20MHz	-	-	-28	dBr
3) at fc > +/-30MHz	-	-	-45	dBr
3. Modulation Accuracy(EVM)@ Target Power				
1) MCS0	-	-	-5	dB
2) MCS1	-	-	-10	dB
3) MCS2	-	-	-13	dB
4) MCS3	-	-	-16	dB
5) MCS4	-	-	-19	dB
6) MCS5	-	-	-22	dB
7) MCS6	-	-	-25	dB
8) MCS7	-	-	-27	dB
4. Frequency Error	-10	-	+10	ppm
5. Tx spurious emission	-	-	-54	dBm
RX Characteristics	Min.	Typ.	Max.	Unit
6. Minimum Input Level Sensitivity				
1) MCS0 (PER < 10%)	-	-88	-83	dBm
2) MCS1 (PER < 10%)	-	-86	-81	dBm
3) MCS2 (PER < 10%)	-	-84	-79	dBm
4) MCS3 (PER < 10%)	-	-80	-76	dBm
5) MCS4 (PER < 10%)	-	-77	-73	dBm
6) MCS5 (PER < 10%)	-	-74	-69	dBm
7) MCS6 (PER < 10%)	-	-72	-67	dBm
8) MCS7 (PER < 10%)	-	-71	-66	dBm
7. Maximum Input Level (PER < 10%)	-30	-	-	dBm
8. Rx spurious emission	-	-	-58	dBm

g: 5180MHz~5240MHz, MCS0~MCS5 target power reduced to 12dBm for FCC power density limit.

h: 5700MHz, MCS0~MCS4 target power reduced to 12.5dBm for FCC bandedge limit.

i: 5180MHz, MCS0~MCS5 target power reduced to 12.5dBm for TELEC adjacent channel power limit



4.5.6 WLAN RF Specification- 802.11n (5GHz) HT40

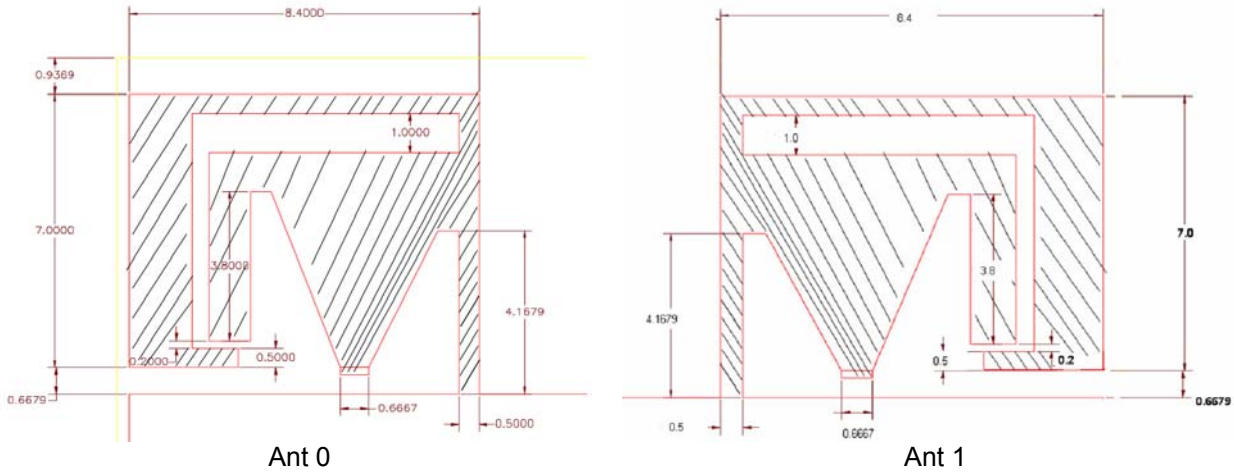
Items	Contents			
Specification	IEEE 802.11a/n HT40			
Mode	OFDM			
Channel	5150MHz~5250MHz, 5250MHz~5350MHz, 5470MHz~5725MHz, 5725MHz~5845MHz			
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (per chain)				
1) Target Power@MCS0	11	12.5 ^{j,k}	14	dBm
2) Target Power@ MCS1	11	12.5 ^{j,k}	14	dBm
3) Target Power@ MCS2	11	12.5 ^{j,k}	14	dBm
4) Target Power@ MCS3	11	12.5 ^{j,k}	14	dBm
5) Target Power@ MCS4	11	12.5 ^{j,k}	14	dBm
6) Target Power@ MCS5	10	11.5 ^{j,k}	13	dBm
7) Target Power@ MCS6	9	10.5 ^j	12	dBm
8) Target Power@ MCS7	8	9.5	11	dBm
2. Spectrum Mask @Target Power				
1) at fc +/- 11MHz	-	-	-20	dBr
2) at fc +/- 20MHz	-	-	-28	dBr
3) at fc > +/-30MHz	-	-	-45	dBr
3. Modulation Accuracy(EVM)@Target Power				
1) MCS0	-	-	-5	dB
2) MCS1	-	-	-10	dB
3) MCS2	-	-	-13	dB
4) MCS3	-	-	-16	dB
5) MCS4	-	-	-19	dB
6) MCS5	-	-	-22	dB
7) MCS6	-	-	-25	dB
8) MCS7	-	-	-28	dB
4. Frequency Error	-10	-	+10	ppm
5. Tx spurious emission	-	-	-52	dBm
RX Characteristics	Min.	Typ.	Max.	Unit
6. Minimum Input Level Sensitivity				
1) MCS0 (PER < 10%)	-	-85	-80	dBm
2) MCS1 (PER < 10%)	-	-82	-78	dBm
3) MCS2 (PER < 10%)	-	-79	-76	dBm
4) MCS3 (PER < 10%)	-	-76	-73	dBm
5) MCS4 (PER < 10%)	-	-73	-70	dBm
6) MCS5 (PER < 10%)	-	-71	-66	dBm
7) MCS6 (PER < 10%)	-	-69	-64	dBm
8) MCS7 (PER < 10%)	-	-68	-63	dBm
7. Maximum Input Level (PER < 10%)	-30	-	-	dBm
8. Rx spurious emission	-	-	-58	dBm

j: 5180MHz, MCS0~MCS6 target power reduced to 10dBm for FCC bandedge limit;
 5320MHz, MCS0~MCS6 target power reduced to 9.5dBm for FCC bandedge limit
 k: 5510MHz, MCS0~MCS5 target power reduced to 10.5dBm for FCC bandedge limit.

6 Antenna Specifications

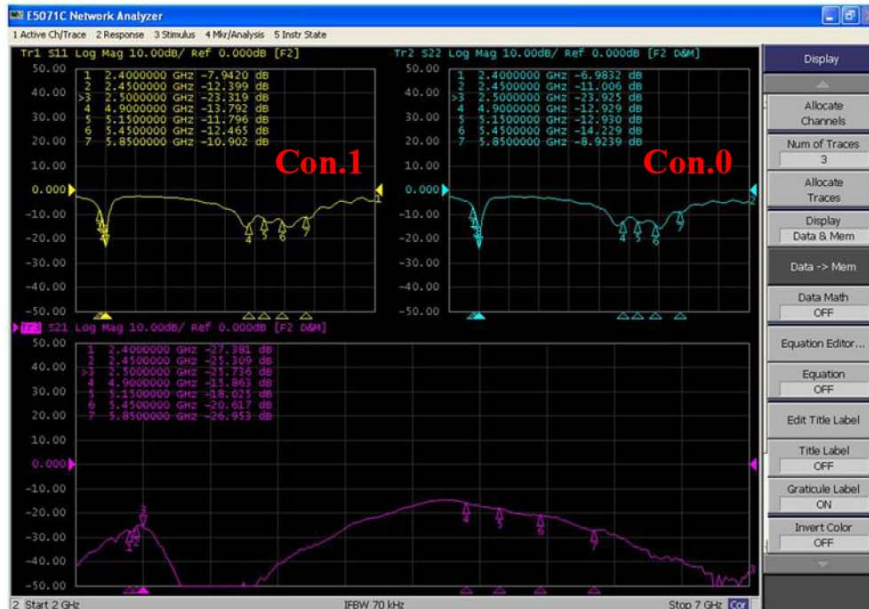
6.1 PCB Printed Antenna Pattern

Ant 0 and Ant 1 pattern are horizontal mirror



6.2 Antenna Radiation Performance

Antenna VSWR and Isolation



S12-isolation	
Con 1 and Con 0 Ant.	-27.38dB@2400MHz
	-25.73dB@2500MHz
	-18.02dB@5150MHz
	-20.61dB@5450MHz
	-26.95dB@5850MHz

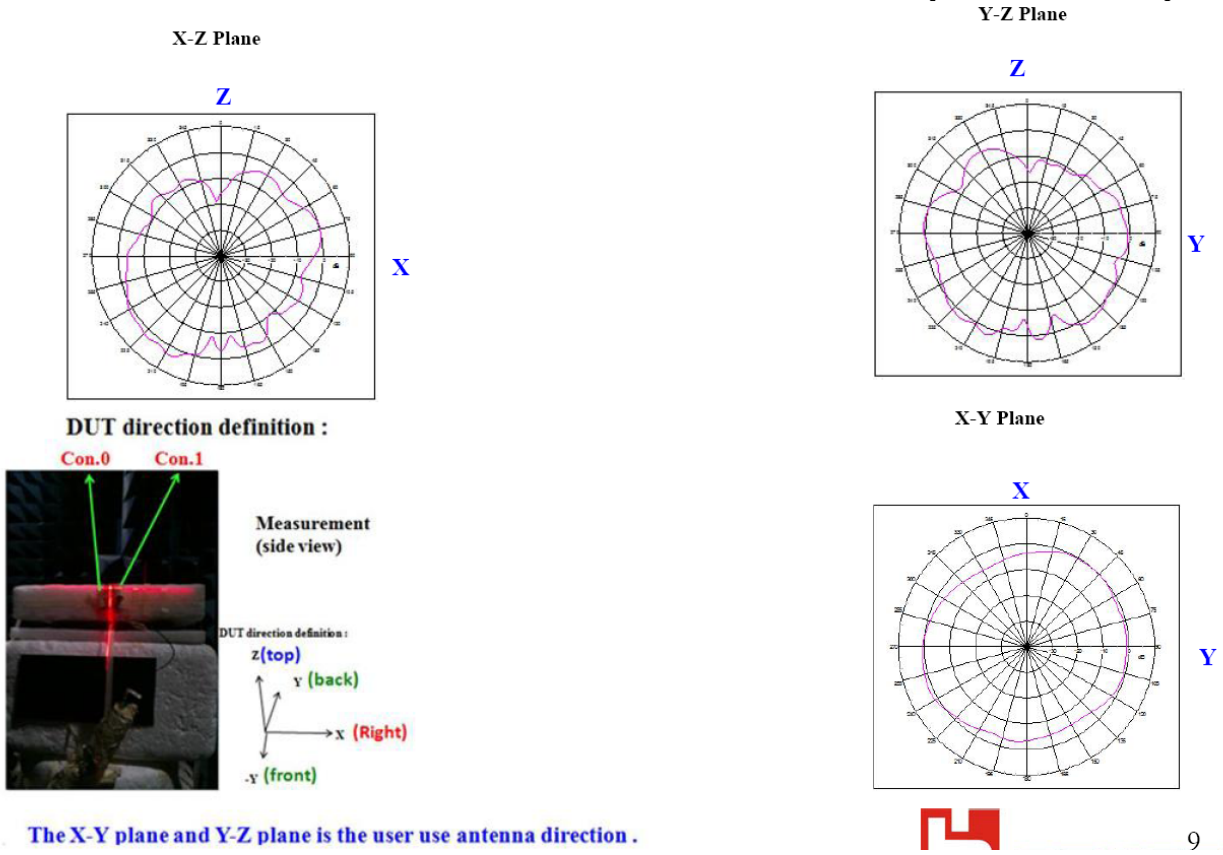
S11	
Con 1 Ant.	-7.942dB@2400MHz
	-23.31dB@2500MHz
	-11.79dB@5150MHz
	-12.46dB@5450MHz
	-10.90dB@5850MHz

S22	
Con 0 Ant.	-6.983dB@2400MHz
	-23.92dB@2500MHz
	-12.93dB@5150MHz
	-14.22dB@5450MHz
	-8.923dB@5850MHz

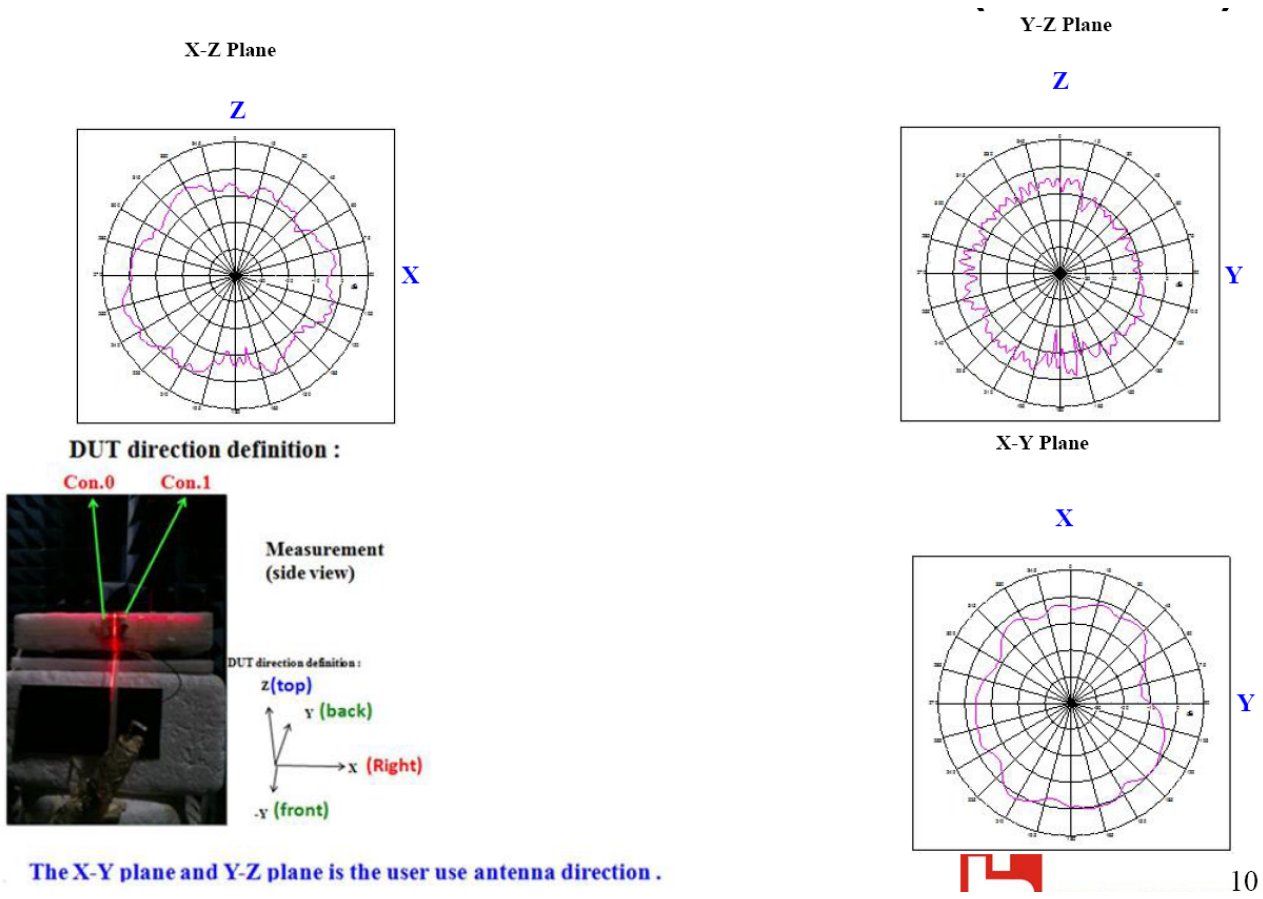
Antenna Peak gain and Efficiency

Ant. Without panel	Frequency	Con 1 and Con 0 Ant S12 isolation	Con 0 Ant. Efficiency (%) Peak Gain(dBi)	Con 1 Ant. Efficiency (%) Peak Gain(dBi)
ES3.0 calibration murata cable loss	2.40GHz	-27.38dB	Eff.: 66% , 3.04dBi	Eff.: 68% , 3.06dBi
	2.50GHz	-25.73dB	Eff.: 69% , 3.10dBi	Eff.: 73% , 3.18dBi
	5.15GHz	-18.02dB	Eff.: 75% , 4.51dBi	Eff.: 73% , 4.54dBi
	5.45GHz	-20.61dB	Eff.: 72% , 4.75dBi	Eff.: 76% , 4.78dBi
	5.85GHz	-26.95dB	Eff.: 71% , 4.80dBi	Eff.: 73% , 4.98dBi

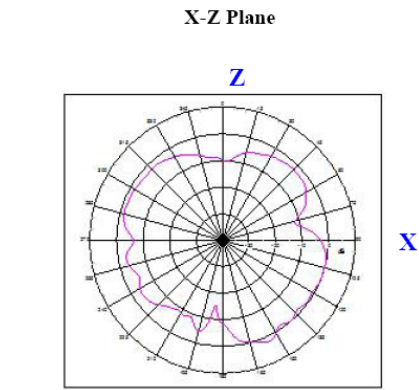
Antenna 0 2.4GHz radiation pattern



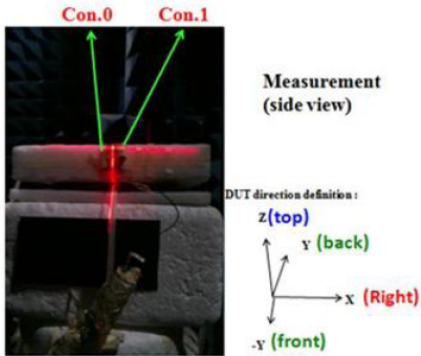
Antenna 0 5GHz radiation pattern



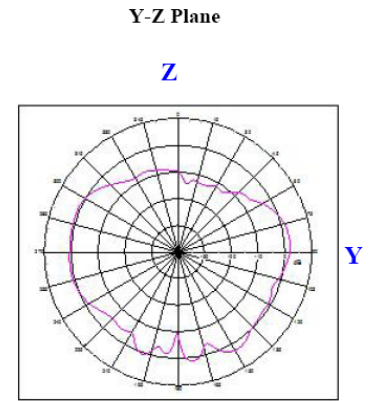
Antenna 1 2.4GHz radiation pattern



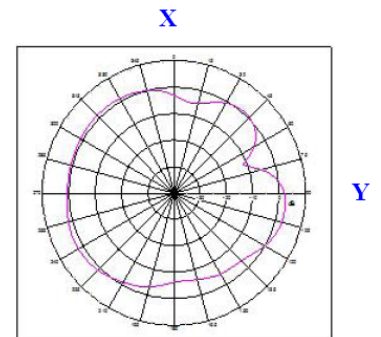
DUT direction definition :



The X-Y plane and Y-Z plane is the user use antenna direction .

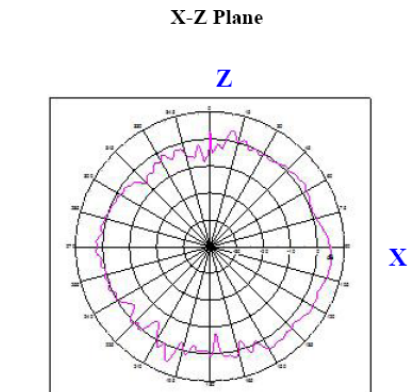


X-Y Plane

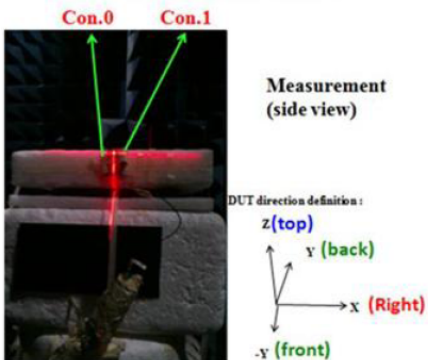


11

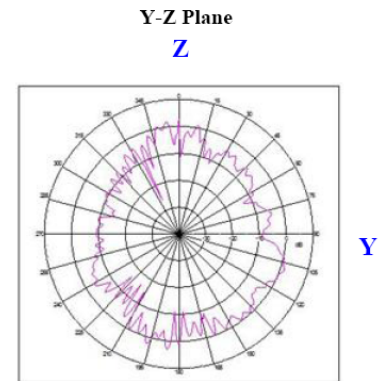
Antenna 1 5GHz radiation pattern



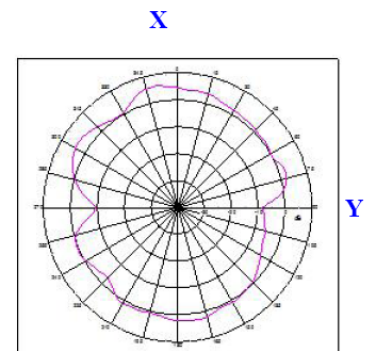
DUT direction definition :



The X-Y plane and Y-Z plane is the user use antenna direction .



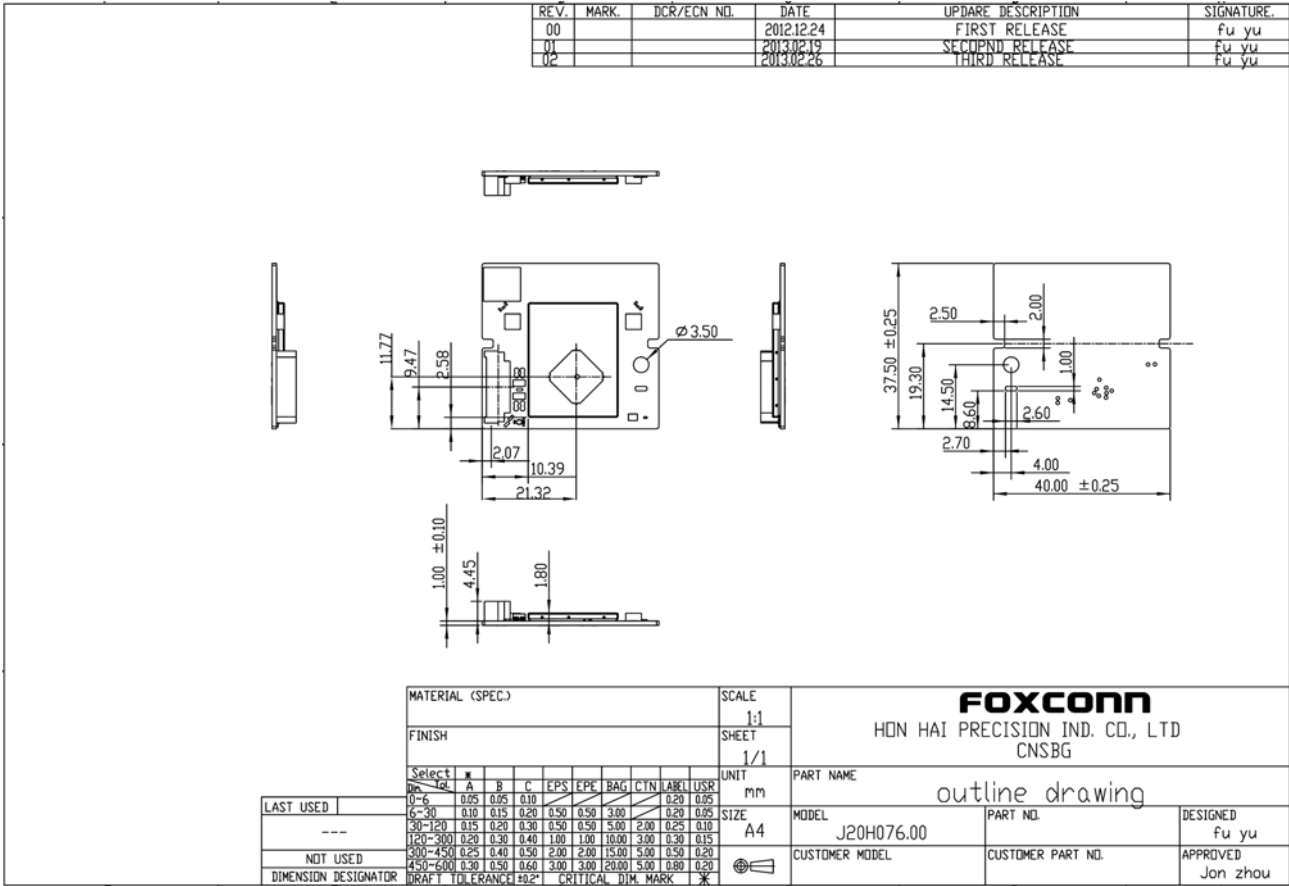
X-Y Plane



12

7 Module Mechanical Specifications

Dimension (W x L x H):
40.0mmx37.5mmx5.45mm





8 Handling Notice

ESD

There are semiconductors on the module, please handle the module under ESD protected and well-controlled environment (<100V).

Storage and Usage Condition

1. Moisture barrier bag must be stored under 40 °C, humidity under 90% RH, when the moisture barrier bag is sealed by Foxconn.
2. The calculated shelf life for the dry packed product shall be a 12 months from the bag seal date.
3. If Moisture barrier bag is open, the component must be stored in an environment of $25 \pm 5^{\circ}\text{C}$ /10%RH
4. Please keep the module at 30°C/70% RH.

9 Reliability Test Plan

The Summary of Reliability Items						
No.	Item	Test Condition	Unit	Test Period	Specification	Test Result
1	High Temperature Load Test	1. Power on, operation 2. Temperature :70°C Duration: 24hrs After test, leave samples in standard temperature for 2hrs.	2 units	1 day	1. Visual Inspection – Match with IPC-A-610C. 2. Function test Pass	
2	Low Temperature Load Test	1. Power on, operation 2. Temperature: -10°C Duration: 24hrs After test, leave samples in standard temperature for 2hrs.	2 units	1 day	1. Visual Inspection – Match with IPC-A-610C. 2. Function test Pass	
3	Low Temperature Storage Test	1. Power off, Storage 2. Temperature: -25°C 3. Duration: 1000hrs After test, leave samples in standard temperature for 2hrs.	2 units	42 days	1. Visual Inspection – Match with IPC-A-610C. 2. Function test Pass	
4	High Temperature and Humidity Storage Test	1. Power off, Storage 2. Temperature: 85°C and Humidity: 85%R.H 3. Duration: 1000Hrs After test, leave samples in standard temperature for 2 hrs.	2 units	42 days	1. Visual Inspection – Match with IPC-A-610C. 2. Function test Pass	
5	High Temperature and Humidity Cycle Test	Power off, Storage 25°C->65°C, 60%~96% R.H 2.5hrs, 65°C, 60%~96% RH 3hrs, 65°C->25°C, 80%~93% R.H 2.5hrs, 25°C~65°C, 90%~93% R.H 2.5hrs, 65°C, 90%~93% R.H 3hrs, 65°C->25°C, 80%~96% R.H 2.5hrs, 25°C, 90%~96% R.H 2hrs, -10°C, 3hs, 25°C, 3hrs After test, leave samples in standard temperature for 24 hrs.	4 units	6 days	1. Visual Inspection – Match with IPC-A-610C 2. Function test Pass	
6	High Temperature and Operation Test	1. Power on, Operation 2. Temperature: 70°C 3. Duration: 1000 hrs After test, leave samples in standard temperature for 1 hr.	2 units	42 days	1. Visual Inspection – Match with IPC-A-610C 2. Function test Pass	
7	High Temperature and Humidity Operation Test	1. Power on, Operation 2. Temperature: 65°C and Humidity: 90%R.H 3. Duration: 1000 hrs After test, leave samples in standard temperature for 2 hrs.	2 units	42 days	1. Visual Inspection – Match with IPC-A-610C 2. Function test Pass	
8	Thermal Shock Test & Cross section	1. Power off, Storage 2. 125 °C/30mins 3. -40°C/30mins	5 units	24 days	1. Visual Inspection – Match with IPC-A-610C. 2. Function test Pass.	

	inspection	4. 5 mins transfer time 5. Total 550 Cycles 6. Cross section			3. Cross section inspection reference Sony standard.	
9	Vibration Test	1. 5-50HZ 1.56G 2. 9Hz/min 3. 30min/axis X,Y,Z axis. 4. Cross section	2 units	1 day	1. Visual Inspection – Match with IPC-A-610C. 2. Function test Pass. 3. Cross section inspection reference Sony standard.	
10	Impact Test	1. Sine wave and a half wave 2. Acceleration: 80G 3. Pulse action time: 11ms 3times/axis X, Y, Z axis 4. Cross section	2 units	1 day	1. Visual Inspection – Match with IPC-A-610C. 2. Function test Pass. 3. Cross section inspection reference Sony standard.	
11	Label Heat Humidity Test	Temp. 80°C and RH 50%, Duration: 8hours	5 units	1 day	1. The label has not floats, peels off, torn 2. It is possible to read normally	
12	Label Temperature Cycle Test	Temperature cycle test: 25°C -65°C,90%~96% 2.5hours, 65°C, 90%~96% 3hours, 65°C ->25°C,80%~90% 2.5hours, 25°C ~65°C,90%~96% 2.5hours, 65°C, 90%~99% 3hours, 65°C -25°C,80%~90% 2.5hours, 25°C, 90%~96% 2hours, -10°C, 90%~96%,3hours, 25°C, 90%~96%, 3hours. Repeat 5 cycles.	2 units	5 day	1. The label has not floats, peels off, torn 2. It is possible to read normally	
13	Label Low Temperature Test	Power off, and store at -40°C. Duration: 12 hrs	5 units	1 day	1. The label has not floats, peels off, torn 2. It is possible to read normally	
14	Compression Test (with package)	$P=[Wt \times (S - 1) \times F]$ Wt = Total weight of package S = Number of packages in stack F = Safety factor = 5 Compression rate = 0.21mm/s Time = 1hr	1 carton	3days	1. Visual Inspection – Match with ISTA_2A. 2. Package no damage 3. Function pass 4. Mechanical and Keys parts no loose.	
15	Random Vibration Test (with package)	Bottom:30min, Top:10min, Left:10min, Front:10min. 1.15Grms Frequency PSD Level,g2/Hz 1.0 0.0001 4.0 0.01 100.0 0.01 200.0 0.001	1 carton	3days	1. Visual Inspection – Match with ISTA_2A. 2. Package no damage 3. Function pass 4. Mechanical and Keys parts no loose.	
16	Drop Test (with package)	1.Drop height: as the figure 2.Drop sequence: one corner, three edges, six faces	1 carton	1 day	1. Visual Inspection – Match with ISTA_2A. 2. Package no damage 3. Function pass 4. Mechanical and Keys parts no loose.	
17	Sinus Vibration Test (with package)	Displacement:25mm Duration:14200times	1 carton	1 day	1. Visual Inspection – Match with ISTA_2A. 2. Package no damage 3. Function pass 4. Mechanical and Keys parts no loose.	



10 Marking Information

Please refer to below for the laser marking details.

1: 2D barcode, content is total 37 digits, include MAC ID, Customer data, and SONY Part Number

Barcode content:

XXXXXXXXXXXX/ZZZZYYMMDDLNNHHC/021430401

12 digits MAC Serial Number Sony P/N

MAC: "XXXXXXXXXXXX" follow foxconn rule.

VV : the engineering version (refer to Foxconn label Rev in the cover of the MFG document)

SS: the version of A300/A400 product (refer to Doc Rev.in the cover of MFG document)

"ZZZZYYMMDDLNNHHC" see below table.

Location	Description	Remarks
ZZZZ	Serial Number	range: 0001~FFFF It will be incremented by one.
YY	Year	eg:0C=2012,0D=2013,...hexadeciamal
MM	Month	range : 01-0C, eg:05=May,06=June,...
DD	Date	range : 01-1F,hexadeciamal
LL	Line Number	range : 01-FF,hexadeciamal
N	Module name	Print "0"
HH	Hardware Version	range:00~FF; 00=ES1; 01=ES2; 02=ES2.5B; 03=ES2.5; 04=ES3; 05=MP,
C	Region code	Print "0"

eg: ES1 2012/5/17 Line8 first product should read:00010C0511080000

- 2: MAC address
- 3: Foxconn model name – Label version
- 4: Foxconn manufacture order
- 5: SONY Part Number
- 6: Serial number + Customer data

11 Packing Information

VER.	MARK	ECR/ECN NO.	DATE	UPDATE DESCRIPTION	SIGNATURE
00			2013.04.18	First Release	Taim

1. Qty : 45pcs/Layer, 17 layers/carton.
 2. The top layer used as shield cover, without products.
 3. The two neighboring layers always laid reversely.

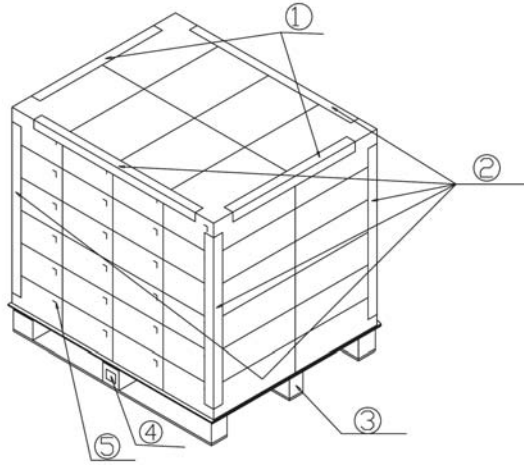
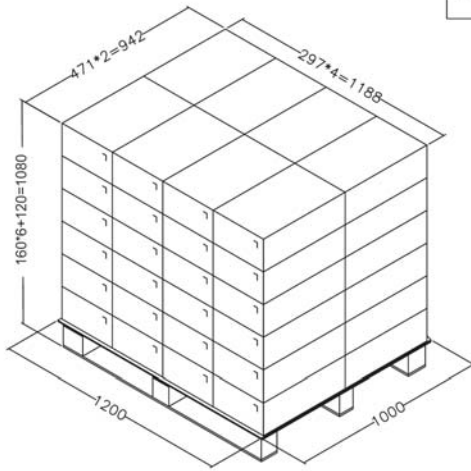
Carton outor size:460*285*145mm
 Carton=17aryers=16*45=720 Pcs

1	Tray	513.00360.005	17/720
2	Carton	520.00309.005	1/720
3	Carton label	503.00098.005	1/720
4	Paper board	522.00043.005	1/720
5	Drier	528.00011.005	2/720
6	Tray label	503.00090.005	16/720
7	PE Bag	510.00404.015	1/720

組立圖及包裝出貨方式/J27H076.01/00/1 OF 3

MATERIAL (SPEC.)		SCALE	FOXCONN		
FINISH		SHEET	HON HAI PRECISION IND. CO., LTD.		
Select		UNIT	PART NAME		
Dim. Tol.	A B C EPS EPE BAG CTN Label USR	mm	Carton packing drawing		
0~6	0.05 0.05 0.10	SIZE	MODEL	PART NO.	DESIGNED
6~30	0.10 0.15 0.20 0.50 0.50 3.00		A4	J27H076.00	
30~120	0.15 0.20 0.30 0.50 0.50 5.00 2.00 0.25		CUSTOMER MODEL	CUSTOMER PART NO.	APPROVED
120~300	0.20 0.30 0.40 1.00 1.00 10.00 3.00 0.30				Sunny wu
300~450	0.25 0.40 0.50 2.00 2.00 15.00 5.00 0.50				
450~600	0.30 0.50 0.60 3.00 3.00 20.00 5.00 0.80				
DRAFT TOLERANCE	± 0.2*				

REV.	MARK	ECR/ECN NO.	DATE	UPDATE DESCRIPTION	SIGNATURE
00	N/A	N/A	2013.04.18	First Release	Taim



1 pallet=6 layers =6*8 cartons=48*720pcs=34560 pcs
 Rate of pallet area used= (942*1188)/1190*990=95%
 Each Carton Barcode should be faced out

組立圖及包裝出貨方式/J27H076.01/00/2 OF 3

5	Carton label	503.00098.005	1/720
4	Pallet label	503.00089.005	2/34560
3	Pallet	527.00019.005	1/34560
2	Paper board bezel	522.00023.005	6/34560
1	Paper board bezel	522.00215.005	2/34560
Item	Description	P/N	QTY

MATERIAL (SPEC.)										SCALE	FOXCONN		
FINISH										1:1	HON HAI PRECISION IND. CO., LTD.		
Select										SHEET	CNSBG		
										1/1	PART NAME Pallet ASM		
SIZE	A	B	C	EPS	EPE	BAG	CTN	Label	USR	UNIT	MODEL	PART NO.	DESIGNED
0-6	0.05	0.05	0.10							MM	J27H076.00		Taim
6-30	0.10	0.15	0.20	0.50	0.50	3.00				A4			
30-120	0.15	0.20	0.30	0.50	0.50	15.00	12.00	0.25					
120-300	0.20	0.30	0.40	1.00	1.00	30.00	3.00	0.30					
300-450	0.25	0.40	0.50	2.00	2.00	15.00	5.00	0.50					
450-600	0.30	0.50	0.60	3.00	3.00	10.00	5.00	0.80					
BRAFT TOLERANCE ±0.27 CRITICAL DIM. MARK *											CUSTOMER MODEL	CUSTOMER PART NO.	APPROVED
													Sunny Wu

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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 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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

Radiation Exposure Statement:

This equipment complies with FCC 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.

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: MCLJ20H076". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

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.

Industry Canada statement:

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

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 device is intended only for OEM integrators under the following conditions: (For module device use)

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes:

(Pour utilisation de dispositif module)

- 1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et
- 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 2878D-J20H076".

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 2878D-J20H076".

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 manuel.

Caution :

(i) 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;

(ii) the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall comply with the e.i.r.p. limit; and

(iii) the maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

(iv) Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

(i) les dispositifs fonctionnant dans la bande 5 150-5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

(ii) le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5 250-5 350 MHz et 5 470-5 725 MHz doit se conformer à la limite de p.i.r.e.;

(iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5 725-5 825 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

(iv) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance

sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250-5 350 MHz et 5 650-5 850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

For Taiwan:低功率電波輻射性電機管理辦法


第十二條 經型式認證合格之低功率射頻電機，非經許可，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。

第十四條 低功率射頻電機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。

前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機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。

在 5.25-5.35 赫赫頻帶內操作之無線資訊傳輸設備，限於室內使用。

1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤。
2. 系統廠商應於平台上標示「本產品內含射頻模組：XXXyyyLPDzzzz-x」字樣。