



COMPANY CONFIDENTIAL

FuGui Precision Industrial (Nanning) Co., LTD.
No.51, Tongle Boulevard, Shajing, Jiangnan District, Nanning, P. R. CHINA
Tel: 86-0771-2168888 Ext:30726
FAX: 86-0771-2168888 Ext:64886

J26H005 Delivery Specification

Function	802.11b/g/n/ac 1x1 WLAN + Bluetooth Combo module
Project Name	RTL8821CU 11ac+BT Combo module
Part No.	J26H005
Delivery Specification Rev.	1.0

Prepared by	Reviewed by	Approved by



Content

- 0. REVISION HISTORY** 3
- 1. INTRODUCTION** 4
 - 1.1 SCOPE4
 - 1.2 FUNCTION4
 - 1.3 SPECIFICATION BY MODEL5
 - 1.4 MODULE WEIGHT5
 - 1.5 PRODUCT REGULATORY5
- 2. MECHANICAL SPECIFICATION** 6
 - 2.1 MODULE MECHANICAL DRAWING6
 - 2.2 WTB CONNECTOR7
 - 2.3 RF SWITCH CONNECTOR8
- 3.WTB CONNECTOR PIN-OUT** 8

- 5. ELECTRICAL SPECIFICATION** 9
 - 5.1 RECOMMENDED OPERATING CONDITION9
 - 5.2 RF CHARACTERISTICS9
 - 5.3 CURRENT CONSUMPTION11
 - 5.4 eFUSE CONTENT12
 - 5.5 POWER ON/OFF SEQUENCE14
 - 5.6 FLOATING PIN STATUS16
 - 5.7 ANTENNA SPECIFICATION16
 - 5.8 OPERATING SYSTEM SUPPORT18
- 6. LABEL INFORMATION** 19
 - 6.1 MAC-ID LABEL LASER MARKING19
 - 6.2 REGULATORY LABEL19
 - 6.3 PANEL LABEL20
 - 6.4 CARTON LABEL20
 - 6.5 PALLET LABEL21
- 7. PACKING INFORMATION** 21
 - 7.1 MODULE SCAN GUIDE23
- 8. RELIABILITY** 24
 - 8.1 HARDWARE RELIABILITY TEST24
 - 8.2 PACKAGE RELIABILITY TEST (TBD)25
- 9. QUALITY** 25
 - 9.1 QC FLOW CHART25
 - 9.2 VISUAL INSPECTION STANDARD26
 - 9.3 PVT MFG. TEST PLAN26



0. Revision History

Date	Document revision	Version	Author	Change Description
2017/08/11	1.0	NA	Fly Huang	Initial released

1. Introduction

Project Name: J26H005

This documentation describes the engineering requirements specification of RTL8821CU (WLAN/BT) Combo Module. It is a confidential document of Foxconn.

1.1 Scope

This module design is based on Realtek solution RTL8821CU chipset. The RTL8821CU is a highly-integrated IEEE 802.11a/b/g/n/ac (1T1R) MAC/Baseband/RF WLAN and Bluetooth Baseband/RF single chip. For Wireless LAN (WLAN) operation, it supports 1-stream 802.11ac solution with Multi-user MIMO (Multiple-Input, Multiple-Output) STA mode with USB2.0 network interface controller. For Bluetooth operation, it supports Bluetooth 2.1/4.2 with USB interface controller. This module support antenna diversity for better coverage.

This specification is applied at the product to deliver to Seiko Epson group (including an overseas subsidiary),and EMS, the outsourcer to utilize in the company.

1.2 Function

- USB2.0 interface for WLAN and BT.
- Support dual-band WLAN 20MHz at 2.4GHz and 20/40/80 MHz at 5GHz
- Support BT4.2+HS , BLE and be backwards compatible with BT1.x,2.x+EDR.
- Support BT-WLAN coexistence.
- Support Antenna diversity.
- GP compliance

In accordance with SEIKO EPSON Group's requirements specified by the latest "Green Purchasing Standard for Production Materials", all production materials shall conform to SEIKO Epson's policy about chemical substances already banned or to be eliminated and shall be controlled by "4M Variation Management".

1.3 Specification by Model

EPSON Parts Name	EPSON Parts Code	Foxconn Parts Name	Connector	Regulatory countries	LOT No.				Remark
					U	S	W	I	
J26H005.C01	2187149-00	J26H005.00	WTB (Right Angle)	None	A	0	A	A	PVT

1.4 Module Weight

Model	J26H005
Sample 1	2.7g
Sample 2	2.7g
Sample 3	2.7g

1.5 Product Regulatory

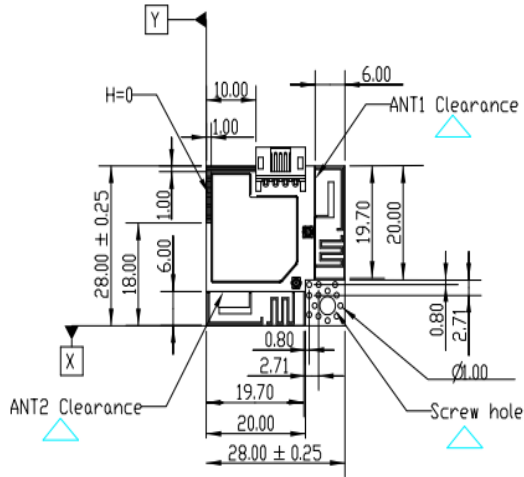
Regulatory countries/IDs

Country	Approval	Certification	Certification No.	Remark
USA		FCC	TBD	
Canada		IC	TBD	
EU		CE	TBD	
Japan		TELEC	TBD	

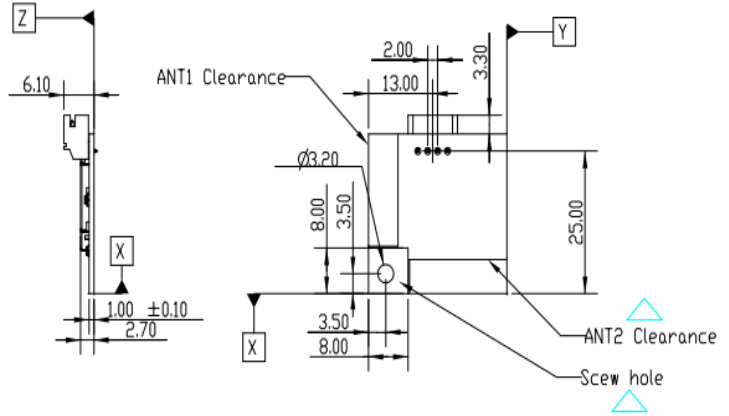
2. Mechanical Specification

2.1 Module Mechanical Drawing

Typical module dimension (W x L): 28mmx28mm.



Top view

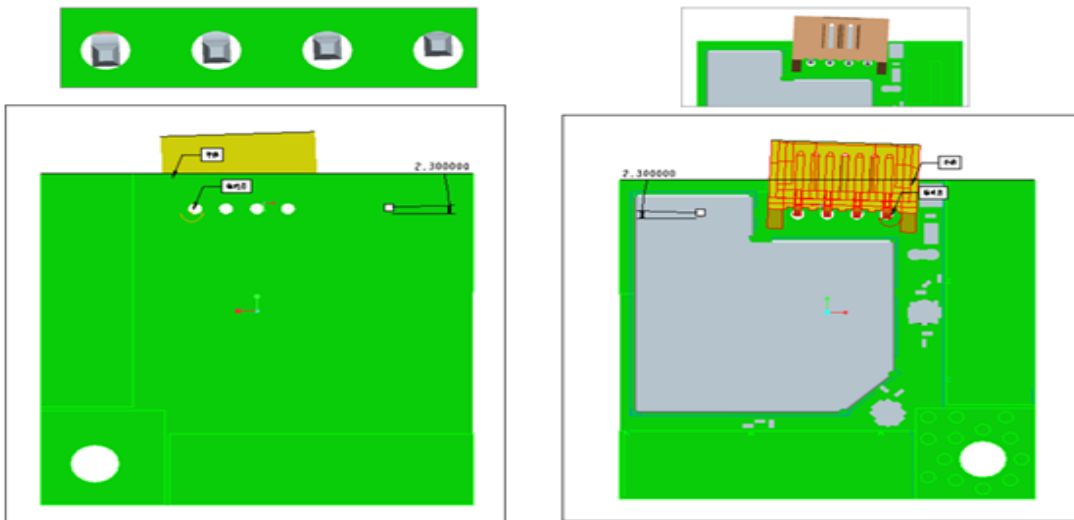


Bottom view

The tolerance for the module mechanical dimension

MATERIAL(SPEC.)										SCALE 1:1
FINISH										SHEET 1 / 1
Select	V									UNIT
Dim.	Tol.	A	B	C	EPS	EPE	BAG	CTN	LABEL	USR
0~6	0.05	0.05	0.10						0.20	0.05
6~30	0.10	0.15	0.20	0.50	0.50	3.00			0.20	0.05
30~120	0.15	0.20	0.30	0.50	0.50	5.00	2.00	0.25	0.25	0.10
120~300	0.20	0.30	0.40	1.00	1.00	10.00	3.00	0.30	0.30	0.15
300~450	0.25	0.40	0.50	2.00	2.00	15.00	5.00	0.50	0.50	0.20
450~600	0.30	0.50	0.60	3.00	3.00	20.00	5.00	0.80	0.80	0.20
DRAFT TOLERANCE		±0.2°		CRITICAL DIM. MARK						※/(P)

Note¹: The max shift degree of WTB connector is 2.3degree.



2.2 WTB Connector

- 4pin, 2.0mm pitch, Right angle type
- Part number: HFK2040-G1C3K-8F
- Vendor: Foxconn FIT
- High temperature plastic PA9T which meet SMT reflow profile(PIP)
- The shifter degree in worst case is 2.3 degree.

POS. NO. N
CAV. NO.

2.00 TYP.

DIM. C
DIM. A
DIM. B

1.70
5.00

POS. NO. 1

DIM. G
0.5
2.00
1.80
DIM. B
DIM. A
HOUANG EXTERNAL FORM
DIM. F=3.40
7.70
6.3
1.70
1.7
DIM. D

RECOMMENDED P.C.B. LAYOUT
Ø0.80±0.10

NOTE:

1. DIMENSIONS SHALL BE INTERPRETED PER ASME Y14.5M-2009.
2. MATERIALS ARE SHOWN ON DRAWING "307-0500-1699".
3. SPECIFICATIONS OF PRODUCT ARE SHOWN ON DRAWING "307-0300-1699".
4. HARMFUL MATERIAL CONTROL PLEASE FOLLOW FOXCONN'S DOC. "EPI12".
5. KINK: FOR 2 POS., THERE ARE NONE KINK.
FOR 3 POS., THE POS. NO. 1 AND 2 ARE KINKED.
FOR 4~15 POS., THE POS. NO. 1, 2, N-1 ARE KINKED.

△ THE RIBS DESCRIPTION:
FOR 2~7 POS., THE RIBS IS SHOWN ON PAGE 2/2;
FOR 8~12 POS., THE RIBS LIE IN POS. NO. 1 AND 2, POS. NO. 3 AND 4,
POS. NO. (N-2) AND (N-3), POS. NO. (N-1) AND N, TOTAL 4 RIBS.
FOR 13~15 POS., THE RIBS LIE IN POS. NO. 1 AND 2, POS. NO. 4 AND 5,
POS. NO. (N-4) AND (N-3), POS. NO. (N-1) AND N, TOTAL 4 RIBS.

△ THE "■" LOGO IS LOCATED APPROX. AS SHOWN.
△ PRODUCT NO. MATRIX: PLEASE SEE DRAWING "307-0500-1699".
ONLY FOR 2 POS., DIM.G=1.10; FOR OTHERS, DIM.G=1.00.

10. PLEASE CONTACT FOXCONN SALES REPRESENTATIVE TO VERIFY PRODUCT DETAILS & AVAILABILITY.
11. THE CONCENTRATIONS OF BR&CL CAN SATISFY THE REQUIREMENTS OF HALOGEN-FREE IN DOCUMENT "EPI12"

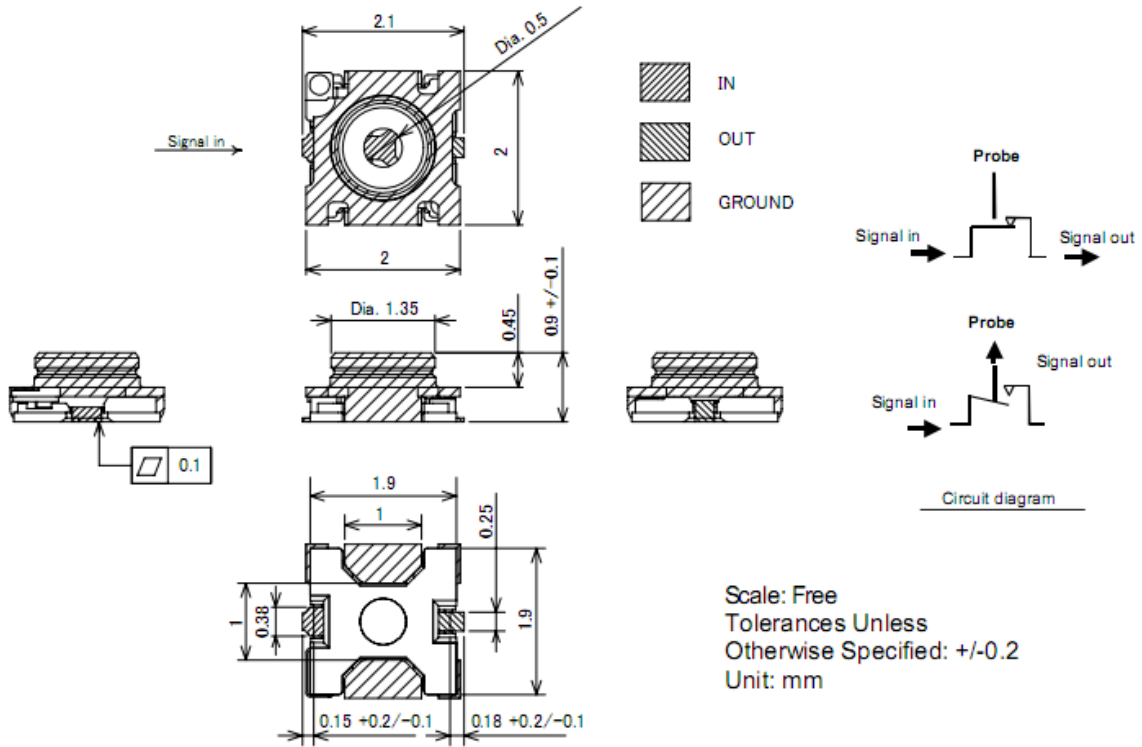
REV.	ECN. NO.	APPD.
X1	BS-15-233609	Yen-chih Chang

PROD. NO.	NO. OF POS.	DIM. A	DIM. B	DIM. C
HFK216A-*****	16	30.00	34.0	28.0
HFK215A-*****	15	28.00	32.0	26.0
HFK214A-*****	14	26.00	30.0	24.0
HFK213A-*****	13	24.00	28.0	22.0
HFK212A-*****	12	22.00	26.0	20.0
HFK211A-*****	11	20.00	24.0	18.0
HFK210A-*****	10	18.00	22.0	16.0
HFK209A-*****	9	16.00	20.0	14.0
HFK208A-*****	8	14.00	18.0	12.0
HFK207A-*****	7	12.00	16.0	10.0
HFK206A-*****	6	10.00	14.0	8.0
HFK205A-*****	5	8.00	12.0	6.0
HFK204A-*****	4	6.00	10.0	4.0
HFK203A-*****	3	4.00	8.0	2.0
HFK202A-*****	2	2.00	6.0	0.8

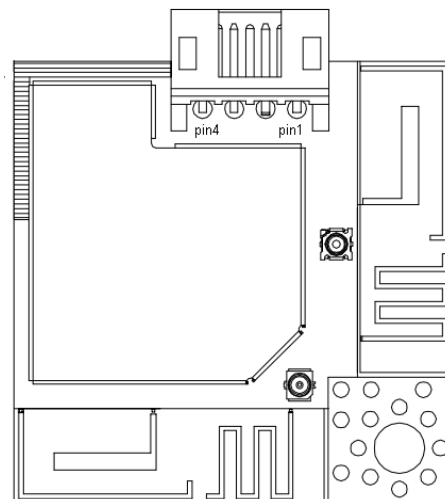
X.±	X'.±	UNITS	mm	NAME(NTENDED USE)	FOXCONN
.X± 0.38	.X'±	MATL		FRICITION HEADER	FOXCONN INTERCONNECT TECHNOLOGY LIMIT
.XX± 0.25	.XX'±			PART NO.(NTENDED USE)	CLASS: CONFIDENTIAL CSECRET GENERAL
.XXX±	.XXX'±	FINISH		HFK2 SERIES	TITLE: CUSTOMER DRAWING
		QTY		APPD: Shih-Wei Hsiao	DWG NO.: 307-0000-1699
				CHKD: Yen-chih Chang	SCALE SHEET REV
				DRAW: Betty xi.Liu	1:1 1/2 X1

2.3 RF Switch Connector

- Part number: MM8030-2610RJ3
- Vendor: Murata



3.WTB Connector Pin-out



Pin Number	Pin Name	I/O	Description	Voltage
1	VDD33	I	3.3V source	3.3V
2	USB_DN	I/O	USB D- Signal	--
3	USB_DP	I/O	USB D+ Signal	--
4	GND	--	Ground	--

5. Electrical Specification

5.1 Recommended Operating Condition

Symbol	Condition	Min.	Typ.	Max	Unit
3.3v(VDD33)	Respect to GND	3.0	3.3	3.6	V
Max Ripple on Supplied Voltage	3.3V @full loading		110	330	mVpp
DC current @3.3V at full loading (WiFi @TX and BT @ TX)	Avg.	-	330	400	mA
USB Suspend current			2.0	10	mA
Operating Temperature		0	+25	+70	°C
Storage Temperature		-25	25	+85	°C
Operating Humidity			30~50%	90%	RH
ESD HBM(contact)	Standard:MIL-STD-883H		+/-1.5		KV
ESD (indirect)	Standard:EN61000-4-2		+/-4		KV

Function operation is not guaranteed outside of this limit, and operation outside of this limit for extended period can adversely affect long-term reliability of the device.

5.2 RF Characteristics

All typical performance specification are measured at RF connector port operating in +25°C@3.3V

Note²: The target power table is just defined for board level.

WiFi	Standard	IEEE802.11a/b/g/n/ac
	Data Rate	802.11b: 11, 5.5, 2, 1 Mbps; 802.11 a/g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: HT20 mode: MCS0~MCS7, up to 72.2Mbps HT40 mode: MCS0~MCS7, up to 150Mbps 802.11ac: VHT20 mode: MCS0~MCS8, up to 86.7Mbps VHT40 mode: MCS0~MCS9, up to 200Mbps VHT80 mode :MCS0~MCS9, up to 433.3Mbps
	Bandwidth	20MHz for 2.4GHz, 20MHz, 40MHz, 80MHz for 5GHz
	Modulation Techniques	802.11b: CCK, DQPSK, DBPSK 802.11a/g: 64QAM, 16QAM, QPSK, BPSK 802.11n: 64QAM, 16QAM, QPSK, BPSK 802.11ac: 256QAM, 64QAM, 16QAM, QPSK, BPSK
	Operating Frequency	2.412GHz~2.462GHz, 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.5~5.70GHz, 5.745 ~ 5.825GHz
	Media Access Control	CSMA/CA with ACK

	Transmit Output Power	2.4GHz: 11b CCK_11Mbps: 21dBm+/-1.5dB 11g 54Mbps: 25 dBm +/-1.5dB 11n HT20_MCS7: 24 dBm +/-1.5dB 5GHz: 11a 54Mbps: 20 dBm +1.5/-2dB 11an HT20_MCS7: 20 dBm +1.5/-2dB HT40_MCS7: 20 dBm +1.5/-2dB 11ac VHT80_MCS7: 20 dBm +1.5/-2dB VHT80_MCS9: 20 dBm +1.5/-2dB
	Frequency error	2.4GHz: +/-10ppm 5GHz: +/-10ppm
	Receiver Sensitivity	2.4GHz: 11b 11Mbps: -83dBm@PER<=8% 11g 54Mbps: -70dBm@PER<=10% 11n HT20 MCS7: -67dBm@PER<=10% 5GHz: 11a 54Mbps: -70dBm@PER<=10% 11n HT20 MCS7: -67dBm@PER<=10% 11n HT40 MCS7: -64dBm@PER<=10% 11ac VHT80 MCS9: -52dBm@PER<=10%
BT	Radio Modulation	FHSS
	Operating Frequency	2.402GHz ~ 2.480GHz
	Channel Numbers	79 channels with 1MHz BW
	BDR Transmitter Output Power	0~+10Bm
	BDR Power Control	2dB≤Power Control Step≤8dB
	BDR Initial Carrier Freq. Tolerance	± 75 kHz
	BDR Carrier Frequency Drift	Drift Rate/50us <±20kHz DH1: +/- 25kHz,DH3: +/- 40kHz,DH5: +/- 40kHz
	BDR Modulation Characteristics	140kHz ≤ Δf1avg ≤175kHz Δf2max ≥115kHz Δf2avg/Δf1avg ≥0.8
	BDR Maximum Receiver Signal	-20dBm@ BER <= 0.1% at 1Mbps
	BDR Sensitivity	-85dBm @BER <= 0.1% at 1Mbps
	EDR Relative Power	P[GFSK]-4dB<P[DPSK]< P[GFSK]+1dB
	EDR Stability and Mod Accuracy	-75 kHz <ωi < 75 kHz -10kHz<ω0 <10kHz RMS DEVM<=0.13 for all 8DPSK @3Mbps Peak DEVM<=0.25 for all 8DPSK @3Mbps 99% DEVM<=0.2 for 99% 8DPSK @3Mbps
	BDR Frequency Range	FL>2.4GHz,FH<2.4835GHz
	EDR Sensitivity	-80dBm@BER <= 0.01% at 2Mbps -80dBm@BER <= 0.01% at 3Mbps
	BDR TX Output Spectrum -20dB Bandwidth	≤1MHz
	LE Output Power	0~+12dBm
	LE Modulation Characteristics	225kHz ≤ Δf1avg ≤275kHz; Δf2max ≥185kHz for at least 99.9% test packets; Δf2avg/Δf1avg ≥0.8
	LE Carrier frequency offset and drift	Carrier frequency offset: ±150kHz Carrier Drift: ≤50kHz Drift rate: ≤20kHz/50us
	LE Receiver Sensitivity	-90dBm@PER <= 30.8%,GFSK,1Mbps

5.3 Current consumption

5.3.1 WiFi current consumption

Band	Mode	LINK RATE	Air Throughput result (Mbps)		RMS Current at 3.3V(mA)		Spec
					avg.	max	
2.4G	11g	54Mbps	TX	29.3	283.7	308.4	<=500mA
			RX	28.3	156	163	<=500mA
	11n_HT20	72Mbps	TX	54.7	306	309.5	<=500mA
			RX	60.5	118.4	129.6	<=500mA
5G	11ac VHT20	86.5Mbps	TX	57.3	322.9	337.7	<=500mA
			RX	63.5	132	141	<=500mA
	11ac VHT40	200Mbps	TX	134	313.1	328.7	<=500mA
			RX	164	131.4	144.5	<=500mA
	11ac VHT80	433.5Mbps	TX	256	307.4	322.5	<=500mA
			RX	262	147.7	155.5	<=500mA
Standby mode			NA	NA	85	104	<=500mA

Remark: Base-on Win7 OS to do WiFi only throughput tests. The standby mode means module connect to AP only, and don't transfer the data.

5.3.2 Bluetooth current consumption

Test Condition	Current at 3.3V			Unit
	Min	Typ.	Max	
Idle mode(power on only)		79		
BT BDR 1DH5 TX@6dBm		149		mA
BT BDR 1DH5 Rx		120		mA
BT EDR 2DH5 TX@6dBm		150		mA
BT EDR 2DH5 Rx		120		mA
BLE TX@6dBm		110		mA
BLE Rx		120		mA
Standby mode		92		mA

Remark: The result is base-on Win7 driver.

The Idle mode means “ module power on only, don't open any testing tool”

The standby mode means “module connect to BT device only, and don't transfer the data”



5.4 eFuse Content

5.4.1 WiFi eFuse

Revision Note

EEPROM address	Version Value	Chang Lists	Owner	Date	Remark
0xC4	0x01	for WiFi Efuse address 0xC4, change value from 0x00 to 0x01	Fly. Huang	2017/08/11	PVT

efuse for WiFi																Efuse address	Description	Remark	
address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F			
0	29	81	00	BC	09	00	21	00	6E	04	A4	34	10	00	30	0B	0x00-0F		fixed value
1	26	26	26	27	29	29	28	29	2A	2B	2C	02	FF	FF	FF	FF	0x10h~15h	Path A 2.4G cck TX calibration power index	
2	FF	FF	28	27	27	27	24	24	24	25	25	26	26	26	26	26	0x16h~1Ah	Path A 2.4G 2.4G 11n HT40 MCS7 TX calibration power index	
3	02	FF	FF	FF	FF	FF	1C	FF	FF	FF	FF	28	28	28	28	28	0x1Bh	path A 2.4G power diff index. Bit[0:3]: the power index difference between OFDM and HT40 Bit[4:7]: the power index difference between HT20 and HT40	fixed value(0x02)
4	28	28	28	28	28	02	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0x22h~2Fh	Path A 5G 11n HT40 mcs7 TX calibration power index	
5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0x30h	path A 5G power diff index. Bit[0:3]: the power index difference between OFDM and HT40 Bit[4:7]: the power index difference between HT20 and HT40	fixed value(0x02)
6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0x36h	path A 5G power index difference between 11ac and HT40 Bit[0:3]: the power index difference between VHT160 and HT40 Bit[4:7]: the power index difference between HT20 and HT40	fixed value(0x1C)
7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0x3Ah~3Fh	Path B cck TX power calibration index	
8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0x40h~44h	Path B 11n HT40 mcs7 TX calibration power index	
9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0x45h	path A 5G power diff index	fixed value(0x02)
A	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0xB8h	channel plan:0x7F	fixed value(0x7F)
B	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0xB9h	Crystal calibration data	
C	FF	29	00	C0	01	00	00	00	00	FF	20	FF	FF	FF	FF	FF	0xBAh	Thermal meter	
D	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0xC3h	Antenna setting	fixed value
E	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0xC4h	EEPROM version: 0x01	fixed value
F	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0xCAh	RFE Type	fixed value
10	DA	0B	20	C8	E3	46	02	A8	6B	AD	71	90	81	09	03	52	0x100~101h	VID:0x0BDA	fixed value
11	65	61	6C	74	65	6B	0E	3	38	30	32	2E	31	31	61	63	0x102~103h	PID:0xC820	fixed value
12	20	4E	49	43	08	03	31	32	33	34	35	36	FF	FF	FF	FF	0x104	for USB eye diagram optima	fixed value
13	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0x107~10Ch	WiFi MAC: A86BAD719081	confirm consistency with label
14	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0xC1~0xC2	other config	fixed value
15	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0xC4~0xC8		
16	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0x105~0x106		
17	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	0x10D~0x12B		



COMPANY CONFIDENTIAL

Note:

USB Vendor ID (VID): 0x0BDA

USB Product ID (PID): 0xC820

5.4.2 BT eFuse

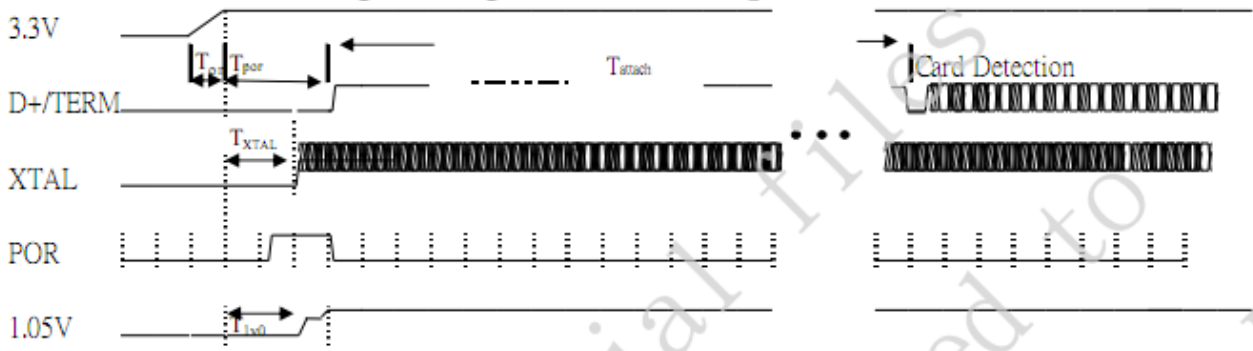


efuse for BT																						
address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F						
0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
4	FF	FF	FF	FF	82 90	71 AD	6B A8	FF	FF	FF	FF	FF	FF	FF	FF	FF						
5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
A	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
B	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
C	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
D	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	10 D8	FF	FF	FF	FF	FF						
E	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
F	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
10	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
11	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
12	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
13	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
14	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
15	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	26 1A	1B 1B	1A 01									
16	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
17	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
18	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	00 1D	FF	FF	FF	FF	FF						
19	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
1A	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
1B	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
1C	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	29 C0	FF						
1D	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
1E	FF	FF	FF	FF	10 32	20	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
1F	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
20	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
21	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
22	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
23	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
24	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
25	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
26	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
27	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
28	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
29	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
2A	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
2B	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
2C	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
2D	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
2E	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
2F	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
30	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
31	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
32	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
33	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
34	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
35	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
36	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
37	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
38	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
39	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
3A	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
3B	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
3C	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
3D	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
3E	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						
3F	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF						

5.5 Power On/Off Sequence

5.5.1 Power On Sequence

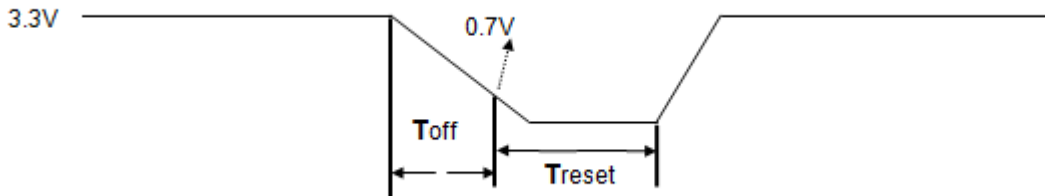
USB Bus Timing during Power On Sequence



Ton: The main power ramp up duration
 Tpor: The power on reset releases and power management unit executes power on tasks
 Tattach: USB attach state

Item	Min.	Typ.	Max	Unit
Ton	--	1.5	5	ms
Tpor	--	2	20	ms
Txtal	--	1.5	8	ms
Tattach	100	250	--	ms
T1v05	0	0	5	ms

5.5.2 Power Off Sequence



Toff: The main power ramp down duration(from 3.3V fall to 0.7V)
 VDD33(3.3V) is coming from system, different DC power supply's load cap value may cause the different discharge time.

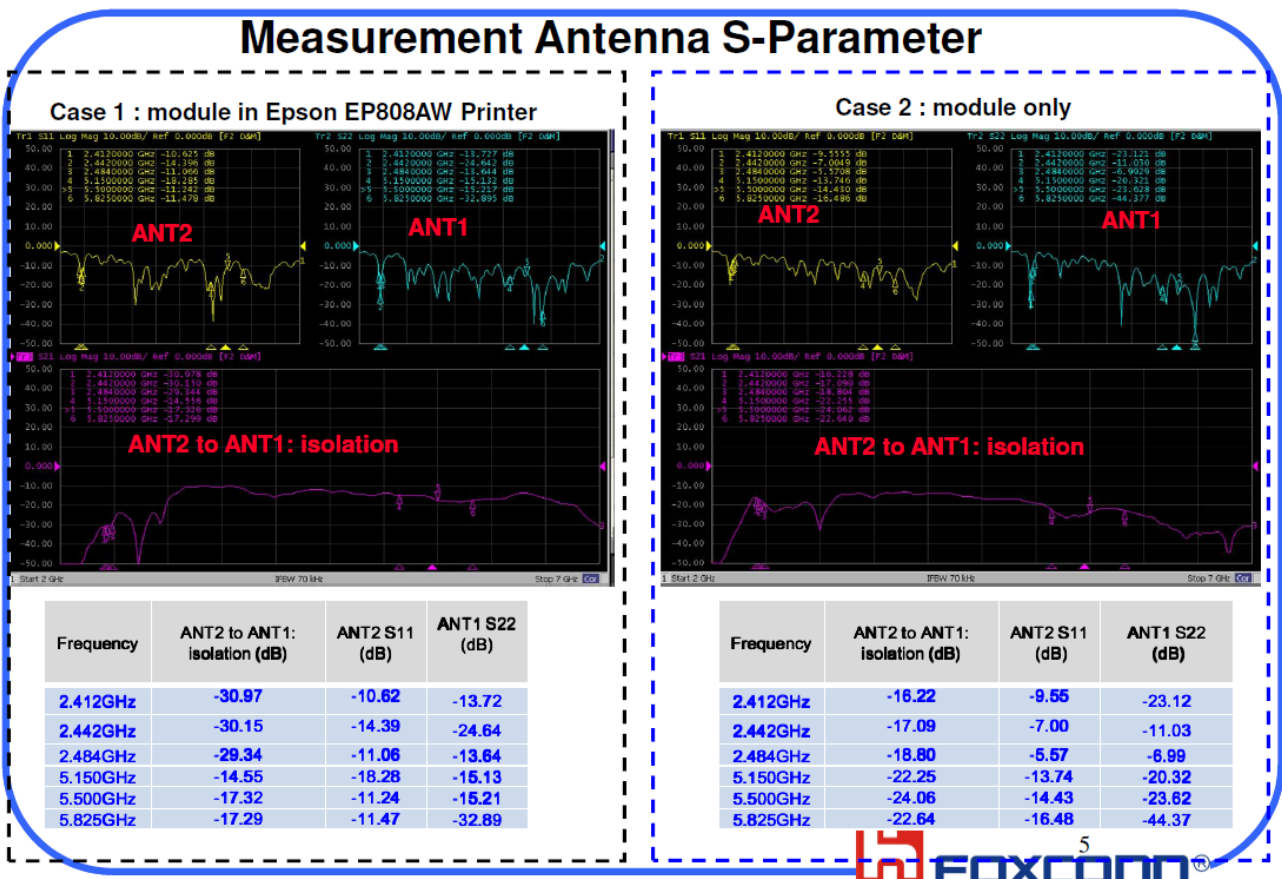
Treset: To assert Chip reset, keep the VDD33 under 0.7V for 100ms

Item	Min.	Typ.	Max	Unit
Toff	--	430	1000	ms
Treset	100	--	--	ms

5.6 Floating pin status

Chip	Pin No.	Name	Type	status (High impedance or internal pull low or internal pull high?)	current leakage when floating? (Y/N)
8821CU	pin1	PCM_IN/GPIO0	I	Internal pull low	N
	pin2	PCM_OUT/GPIO1	O	Internal pull low	N
	pin3	PCM_SYNC/GPIO2	O	Internal pull low	N
	pin4	PCM_CLK/GPIO3	IO	Internal pull low	N
	pin7	BT_LOG/LED[1]	O	high impedance	N
	pin8	BT_LED[1]	O	high impedance	N
	pin9	WL_LED/GPIO8	O	high impedance	N
	pin10	SUS_CLK/EECS	I	high impedance	N
	pin19	PAPE_5G	O	/	N
	pin20	LNAON_5G	O	/	N
	pin26	NC	/	/	N
	pin35	GPIO[6]	IO	high impedance	N
	pin36	GPIO[7]	I	high impedance	N
	pin37	GPIO9/WL_DIS#	I	internal pull up	N
	pin39	GPIO[13]/BT_WAKE	IO	high impedance	N
pin40	GPIO[14]/USB_WAKE	IO	high impedance	N	
pin56	GPIO[11]/BT_DIS_N	I	internal pull up	N	

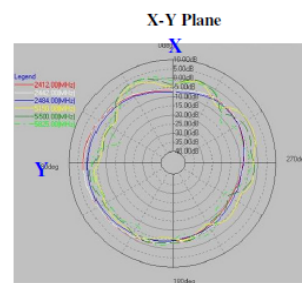
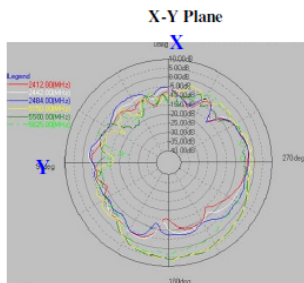
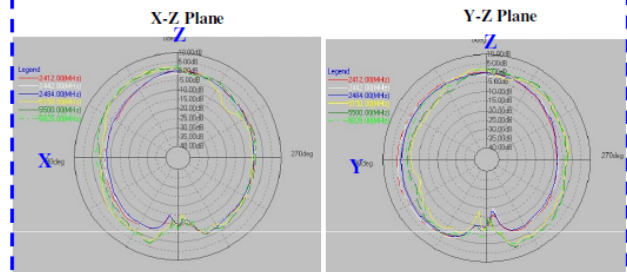
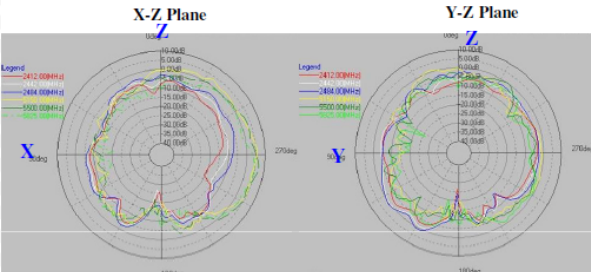
5.7 Antenna Specification



3. Measurement Ant. Radiation Patterns (ANT2)

Case 1 : module in Epson EP808AW Printer

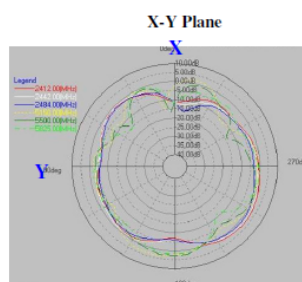
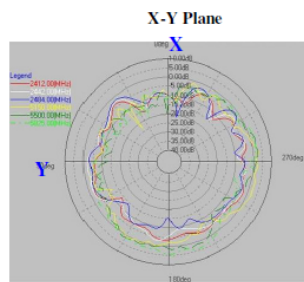
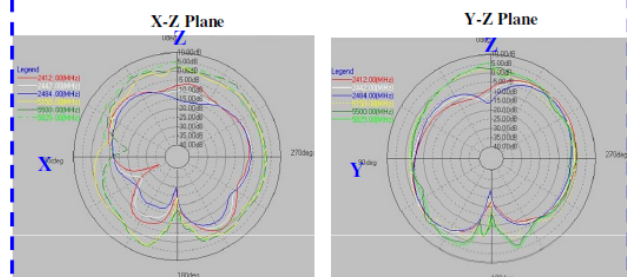
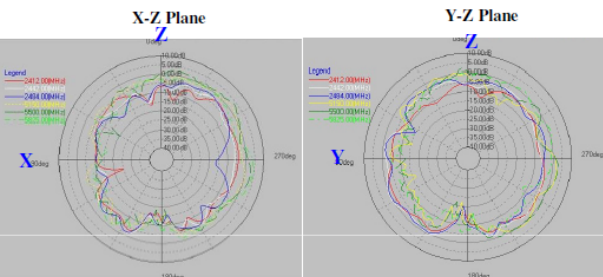
Case 2 : module only



3. Measurement Ant. Radiation Patterns (ANT1)

Case 1 : module in Epson EP808AW Printer

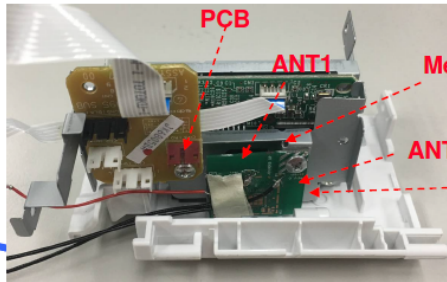
Case 2 : module only



Antenna performance table

Frequency	module in Epson EP808AW Printer			module only		
	ANT2 to ANT1: isolation (dB)	ANT2 S11 (dB)	ANT1 S22 (dB)	ANT2 to ANT1: isolation (dB)	ANT2 S11 (dB)	ANT1 S22 (dB)
2.412GHz	-30.97	-10.62	-13.72	-16.22	-9.55	-23.12
2.442GHz	-30.15	-14.39	-24.64	-17.09	-7.00	-11.03
2.484GHz	-29.34	-11.06	-13.64	-18.80	-5.57	-6.99
5.150GHz	-14.55	-18.28	-15.13	-22.25	-13.74	-20.32
5.500GHz	-17.32	-11.24	-15.21	-24.06	-14.43	-23.62
5.825GHz	-17.29	-11.47	-32.89	-22.64	-16.48	-44.37

Frequency	module in Epson EP808AW Printer		module only	
	ANT2 Efficiency (%), Peak Gain (dBi)	ANT1 Efficiency (%), Peak Gain (dBi)	ANT2 Efficiency (%), Peak Gain (dBi)	ANT1 Efficiency (%), Peak Gain (dBi)
2.412GHz	Eff.: 25% , 0.56dBi	Eff.: 30% , 1.10dBi	Eff.: 56% , 2.53dBi	Eff.: 59% , 3.09dBi
2.442GHz	Eff.: 31% , 0.77dBi	Eff.: 33% , 1.45dBi	Eff.: 51% , 2.32dBi	Eff.: 57% , 2.23dBi
2.484GHz	Eff.: 30% , 1.40dBi	Eff.: 31% , 1.15dBi	Eff.: 48% , 0.70dBi	Eff.: 50% , 1.01dBi
5.150GHz	Eff.: 59% , 6.32dBi	Eff.: 59% , 3.86dBi	Eff.: 63% , 3.94dBi	Eff.: 72% , 5.94dBi
5.500GHz	Eff.: 56% , 7.18dBi	Eff.: 58% , 5.35dBi	Eff.: 71% , 5.10dBi	Eff.: 78% , 6.29dBi
5.825GHz	Eff.: 58% , 6.67dBi	Eff.: 65% , 5.44dBi	Eff.: 72% , 5.23dBi	Eff.: 81% , 7.12dBi



Module in Epson EP808AW Printer antenna efficiency degrade because the Metal bracket and the another PCB as left figure show



5.8 Operating System Support

Support the Win7, Win8.1, Win10, Linux operating system on normal driver

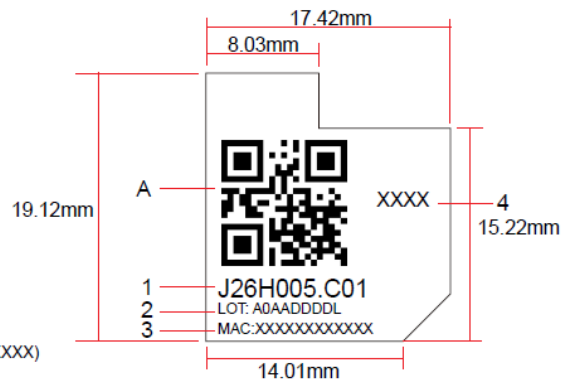
6. Label Information

6.1 MAC-ID Label Laser Marking

All content is engraved by laser into shielding cover.

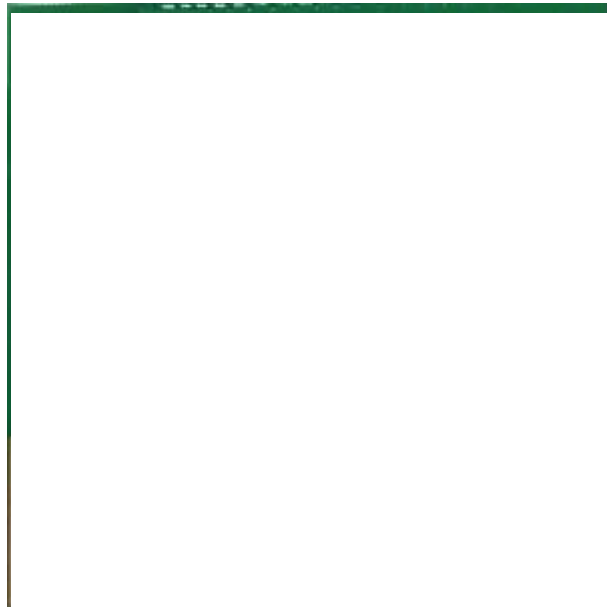
Notes

1. J26H005.C01
Customer Part number
2. LOT number: A0AADDL
A: Wifi identification number (is fixed)
0: Safety identification number(is fixed)
A: Foxconn 4M version(is fixed)
A: IC 4M version(is fixed)
D:SMT year (last digit of year, like 2017 is "7")
DD:SMT week code
D:SMT date (like Mondy"1",Tuesday"2",Wednesday"3"....Sundy"7")
L:SMT production line
3. MAC : XXXXXXXXXXXX
MAC ID address
2 MAC/Product,MAC ID signature print
Odd number for Wifi MAC
Even number for BT MAC (Namely wifi MAC +1=BT MAC).
4. XXXX
XXXX:The last four digit of MO-VVSS
VV:the engineering version
(refer to Foxconn label Rev column in the cover of the MFG document)
SS: the version of A300 /A400 product
(refer to Doc Rev.in the cover of MFG document)
- A. Barcode: QR code, Size: 8.12x8.12 mm
QR code scan content: A0AADDLXXXXXXXXX(LOT:A0AADDL MAC:XXXXXXXXXX)



6.2 Regulatory Label

Regulatory label was printed on PCB Bottom side for PVT, it will be updated after get the official regulatory ID

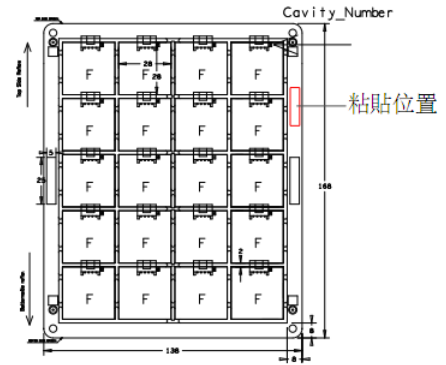


6.3 Panel Label

P:PCB label
 F:Foxconn location
 YMD:Year,month,day
 SSSS:Serial number (00000-zzzzz)
 Barcode:128 code, 2.54mm height
 Font:Verdana,Bold,4pt



scale 3:1



Date code define

1st Character Year Codes

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Code	6	7	8	9	0	1	2	3	4	5	6	So on

2nd Character Month codes

Month	January	February	March	April	May	June	July	August	September	October	November	December
Code	1	2	3	4	5	6	7	8	9	A	B	C

3rd Character Day Codes

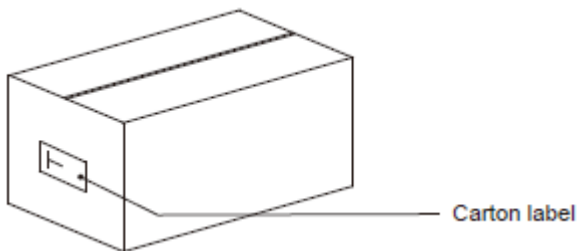
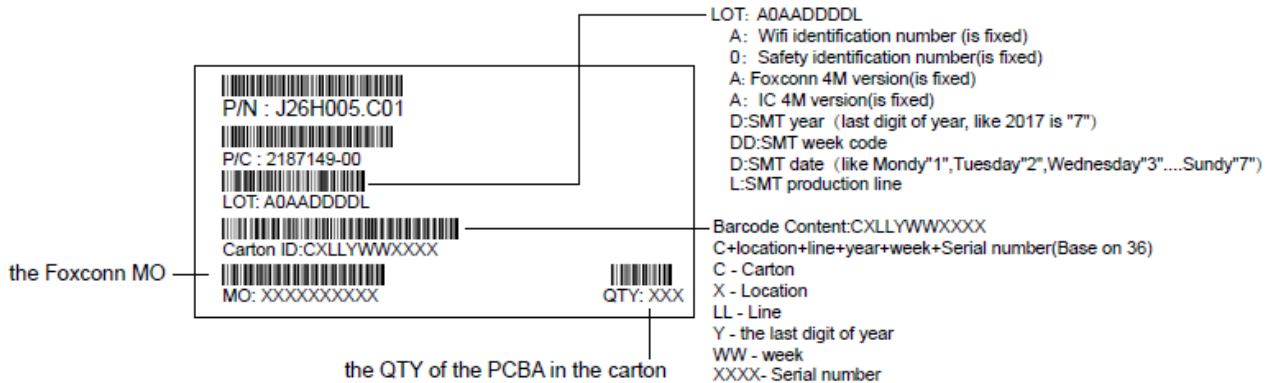
Day	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th	13 th	14 th	15 th	16 th	17 th	18 th	19 th
Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J

Day	20 th	21 st	22 nd	23 rd	24 th	25 th	26 th	27 th	28 th	29 th	30 th	31 st
Code	K	L	M	N	O	P	Q	R	S	T	U	V

6.4 Carton Label

Label size:100*50mm (503.00098.005)

All Barcode:128code,height:4mm,Type:CODE B
 All font are Arial, 10 pt ,except 'P/N:J26H005.C01' is Arial,11 pt.



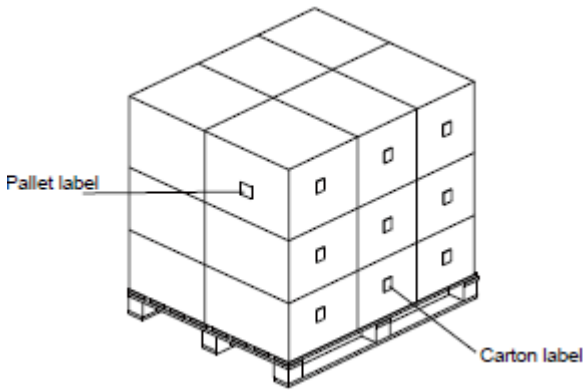
6.5 Pallet Label

Label size: 110*36mm

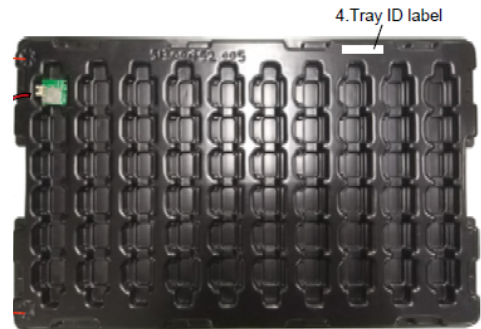
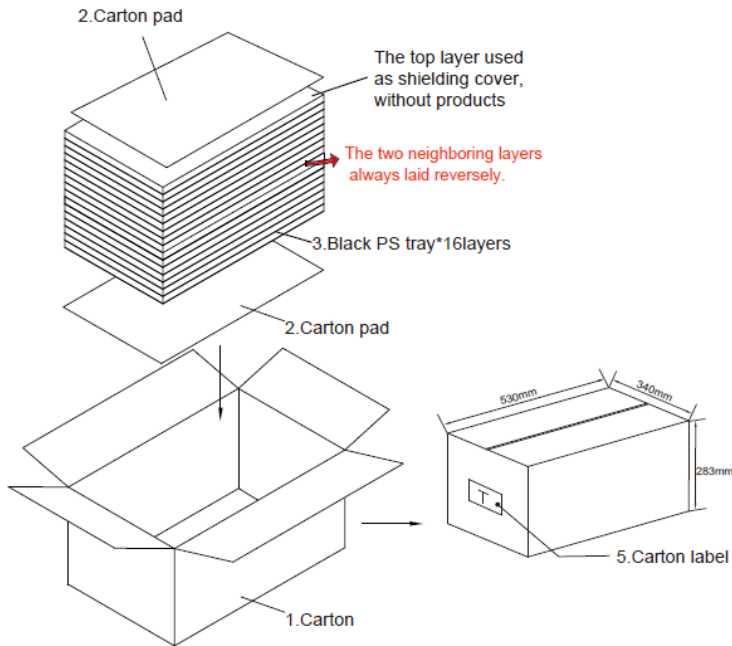
Barcode: 128code,height:10mm,Type:CODE B
 All text: Arial Bold , 18pt



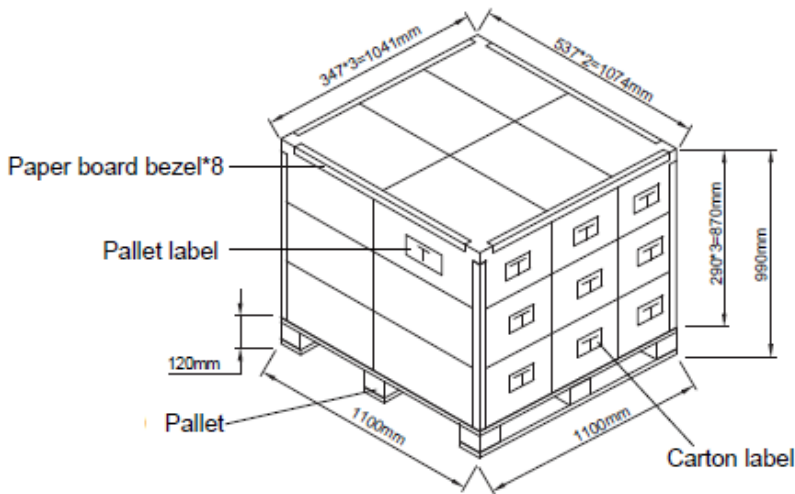
Barcode content :PIPPYWWSSSS
 P+product line+package line+year+week+Serial number
 P: Pallet
 I: Product line
 PP: Package line
 Y: the last digit of year
 WW : Week
 SSSS: Serial number,every two week reset to 0001



7. Packing Information



- Notes:
- 1 carton=1layer tray+15layer tray=15*60pcs=900pcs
 - 1 carton=2Carton Pad
 - The top layer used as shielding cover,without products.
 - The two neighboring layers always laid reversely.
 - Carton size:530*340*283mm, Carton pad size:520*330mm
 Tray size:520*330*23.5mm
 - The connector side is facing the tray's marking side.



Notes:

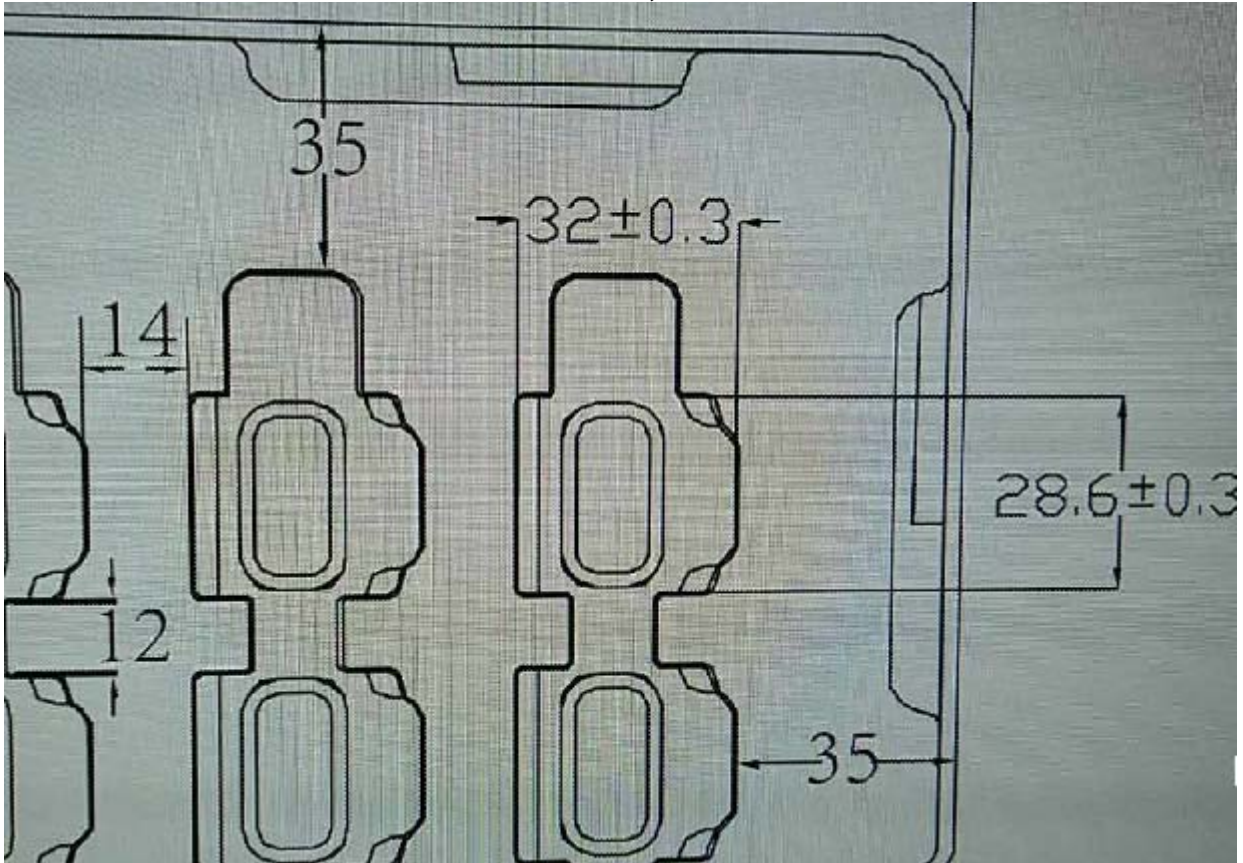
- 1. Carton outside: 537*347*290
Pallet Size: 1100*1100*120mm
- 2.1 Pallet=(2*3*3) cartons x 900pcs=16200pcs
- 3. Each carton label should be face out

Item	Description	P/N	QTY
8	Paper board bezel	522.00216.005	8/16200
7	Pallet label	503.00089.005	1/16200
6	Pallet	527.00007.005	1/16200

The detailed dimension of the tray

The hollow length and side value/

The distance between module and module, and between module and outline of tray



7.1 Module Scan Guide

1. Taking the module in declining way about 45° to prevent the shielding reflecting the lightness;



2. Taking the scanner and turning left in 45° angle;
Note: The distance between scanner and module is about 5-8cm



8. Reliability

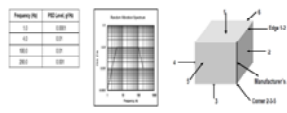
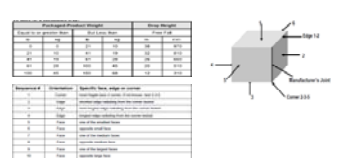
8.1 Hardware Reliability test

No.	Item	Test Condition	Unit	Test Period	Test Criteria	Test result
1	High temperature operation test	1. Power on, operation 2. Temperature: 70°C 3. Duration: 96hrs	ZDT:2pcs VGT:2pcs	10 Days	1. Visual Inspection – Match with IPC-A-610E. 2. Function test pass	Pass
2	Low temperature operation test	1. Power on, operation 2. Temperature: 0°C 3. Duration: 96hrs	ZDT:2pcs VGT:2pcs	10 Days	1. Visual Inspection – Match with IPC-A-610E. 2. Function test pass	Pass
3	High temperature storage test	1. Power off, storage 2. Temperature: 70°C 3. Duration: 96hrs	ZDT:2pcs VGT:2pcs	5 Days	1. Visual Inspection – Match with IPC-A-610E. 2. Function test pass	Pass
4	Low temperature storage test	1. Power off, storage 2. Temperature: -25°C 3. Duration: 96hrs	ZDT:2pcs VGT:2pcs	5 Days	1. Visual Inspection – Match with IPC-A-610E. 2. Function test pass	Pass
5	Hot start test	1. Power off 2. Temperature: 70°C 3. Duration: 72hrs 4. After 72hrs, power on/off 3times and activate in full function.	ZDT:2pcs VGT:2pcs	4 Days	1. Visual Inspection – Match with IPC-A-610E. 2. Function test pass	Pass
6	Cold start test	1. Power off 2. Temperature: 0°C 3. Duration: 72hrs 4. After 72hrs, power on/off 3times and activate in full function.	ZDT:2pcs VGT:2pcs	4 Days	1. Visual Inspection – Match with IPC-A-610E. 2. Function test pass	Pass
7	Temperature & humidity cycle test	1. Power on, operation 2. Temperature: 25°C, humidity: 50%R.H. for 2hrs. 3. Temperature: 70°C, humidity: 90%R.H. for 10hrs. 4. Temperature: 25°C, humidity: 50%R.H. for 2hrs. 5. Temperature: 0°C, for 10hrs 6. Repeat step2~5 for total 3cycles	ZDT:2pcs VGT:2pcs	8 Days	1. Visual Inspection – Match with IPC-A-610E. 2. Function test pass	Pass
8	Thermal Shock test	1. Power off, storage 2. -25°C/30mins 3. 70°C/30mins 4. Transfer time:5mins 5. Total 100cycles 6. Cross section location:U1/Y1	ZDT:5pcs VGT:5pcs	5 Days	1. Visual Inspection – Match with IPC-A-610E. 2. Function test pass 3. Cross section -No separation - Allowable Crack Length: Max. 25% of pad diameter	Pass
9	Againg test	70C, 90%R.H,1000h, check function@100H,300H,500h,800H,1000H.Apply voltage only. Cross-section location:U1/Y1	ZDT:5pcs VGT:5pcs	42 Days	1. Visual Inspection – Match with IPC-A-610E. 2. Function test pass 3. Cross section -No separation - Allowable Crack Length: Max. 25% of pad diameter	Pass

10	Thermal profile test	1. Power on, operation 6hrs at 70°C then record thermal data	ZDT:1pcs VGT:1pcs	3 Days	1. Visual Inspection – Match with IPC-A-610E. 2.Function test pass	Pass
11	Sine Vibration operational test	1. Power on, operation 2. Frequency: 5-500-5Hz 3. Acceleration: 2G 4. Velocity: 0.443oct/min 5. Test : x, y, z axis. 6. 30mins/axis.	ZDT:2pcs VGT:2pcs	4 Days	1. Visual Inspection – Match with IPC-A-610E. 2.Function test pass	Pass
12	Shock test (Non-operation)	1.1/2sine wave ,230G , 3msec 2. Test : +/- x, y, z axis 3. 3times/axis	ZDT:2pcs VGT:2pcs	4 Days	1. Visual Inspection – Match with IPC-A-610E. 2.Function test pass	Pass

8.2 Package Reliability Test (TBD)

The product shall pass below package reliability test plan.

No	Test Items	Description	Test Criteria	Reference	Qty'	Result
1	Atmospheric Conditioning	Test Temperature: 38°C Test humidity: 85%R.H. Dwell time: 72hours	No obvious visible damage on boxes after temperature and humidity test.	ISTA-2A	1carton	TBD
2	Static Compression Test	Units are packaged Compression load=Wt x (S - 1) x F Wt:Total weight of the packaged-product S:Total number of packaged-products in a stack 1:Represents the bottom container in a Stack Compression Test duration:1hour	No obvious visible damage on boxes after static compression test.	ISTA-2A	1carton	TBD
3	Random Vibration Test	The following breakpoints shall be programmed into the vibration controller to produce the acceleration versus frequency profile (spectrum) below with an overall Grm s level of 1.15. Face 3: 30mins, Face1: 10mins, Face 2 or 4: 10mins, Face 5 or 6: 10mins 	No obvious visible damage on boxes after random vibration test.	ISTA-2A	1carton	TBD
4	Package drop test	The test drop height varies with the weight of the packaged-product. Find the weight of the packaged-product in the following chart to determine a drop height or an equivalent impact velocity to be used for a substituted drop: 	No obvious visible damage on boxes after packaged drop test.	ISTA-2A	1carton	TBD
5	Fix displacement Test	Displacement:25mm Duration:14200times	No obvious visible damage on boxes after fixed displacement test.	ISTA-2A	1carton	TBD

9. Quality

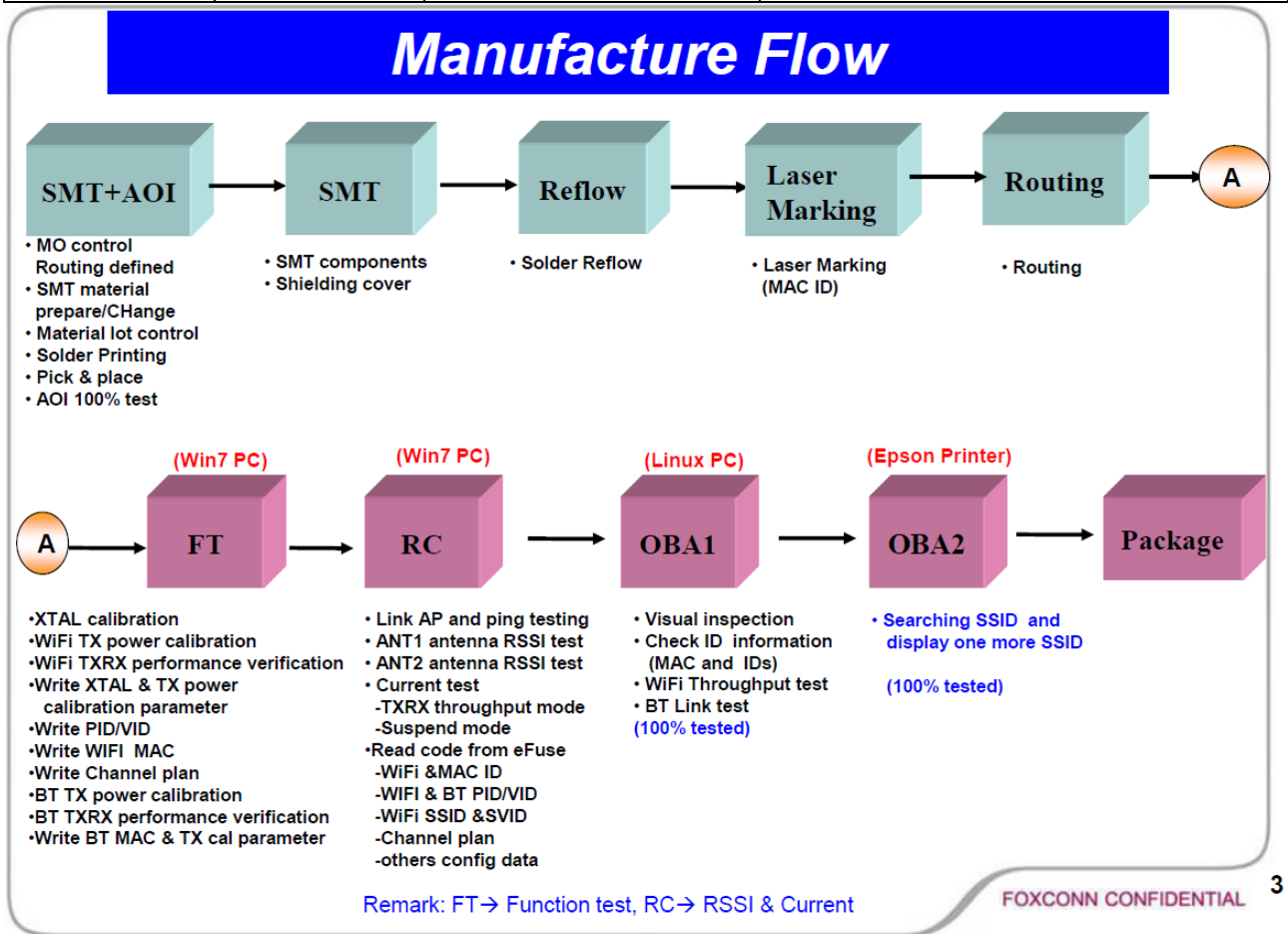
The product quality must be followed-up by Foxconn factory quality control system. In accordance with SEIKO EPSON Group's requirements specified by the latest "Electronic Component Quality Requirements Standard" and "WiFi+BT Combo Module Quality Requirements Specification Rev.B" , the product shall be managed Quality control.

9.1 QC Flow Chart

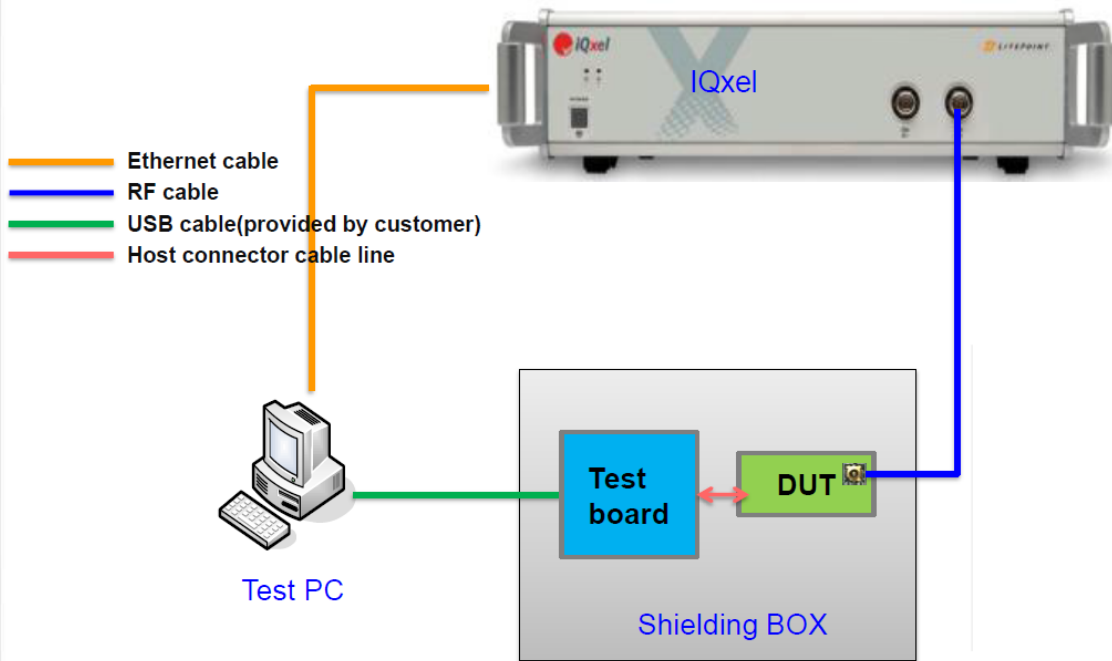
9.2 Visual Inspection Standard

9.3 PVT Mfg. Test Plan

Date	Version	Author	Change Description
2017/08/7	1.7	Fly Huang	Initial released



FT Test setup



Remark:
From PVT, remove ANT2 RF switch connector, only check ANT1 conductive RF performance.

FT Wi-Fi Test Item and Spec

Station	Test Items	Channel	Data Rate	ANT	Spec
FT Calibration	Crystal CAL	Single Tone		ANT1	+/-2ppm
	2.4GHz TX power CAL	CH 1, 7, 13	11n_HT40_MCS7	ANT1	13dBm± 0.5dB
		CH 1, 7, 13	CCK_11Mbps	ANT1	16dBm± 0.5dB
5GHz TX power CAL	Ch38,46,54,62,102,118,134,142,151,159	11n_HT40_MCS7	ANT1	12dBm± 0.5dB	
FT Verification 2.4GHz 11b/g/n (TX)	TX Power Verification	CH1/CH7/CH13	11b_11Mbps	ANT1	16dBm± 1.5dB
		CH1/CH7/CH13	11g_9Mbps	ANT1	16dBm± 1.5dB
		CH1/CH7/CH13	11g_54Mbps	ANT1	14dBm± 1.5dB
		CH1/CH7/CH13	HT20_MCS1	ANT1	15dBm± 1.5dB
		CH1/CH7/CH13	HT20_MCS7	ANT1	13dBm± 1.5dB
	TX Mask	CH1/CH7/CH13	11b_11Mbps	ANT1	margin delta >0dB than IEEE spec
		CH1/CH7/CH13	11g_9&54Mbps	ANT1	
		CH1/CH7/CH13	HT20_MCS1&MCS7	ANT1	
	TX EVM	CH1/CH7/CH13	11b_11Mbps	ANT1	≤ -10dB
		CH1/CH7/CH13	11g_9Mbps	ANT1	≤ -8dB
		CH1/CH7/CH13	11g_54Mbps	ANT1	≤ -25dB
		CH1/CH7/CH13	HT20_MCS1	ANT1	≤ -10dB
		CH1/CH7/CH13	HT20_MCS7	ANT1	≤ -27dB
	TX Frequency test	CH1/CH7/CH13	11b_11Mbps	ANT1	±10 ppm
		CH1/CH7/CH13	11g_9&54Mbps	ANT1	±10 ppm
CH1/CH7/CH13		HT20_MCS1&MCS7	ANT1	±10 ppm	

Remark: CH1=2412MHz;CH7=2442MHz; CH13=2472MHz;

FT Wi-Fi Test Item and Spec

Station	Test Items	Channel	Data Rate	ANT	Spec
FT Verification 2.4GHz 11b/g/n (RX)	RX Sensitivity	CH1/CH7/CH13	11b_11Mbps	ANT1	-83dBm@PER ≤ 8%
		CH1/CH7/CH13	11g_54Mbps	ANT1	-70dBm@PER ≤ 10%
		CH1/CH7/CH13	HT20_MCS7	ANT1	-67dBm@PER ≤ 10%

Remark: CH1=2412MHz;CH7=2442MHz; CH13=2472MHz;

FOXCONN CONFIDENTIAL 6

FT Wi-Fi Test Item and Spec

Station	Test Items	Channel	Data Rate	ANT	Spec
FT Verification 5GHz 11a/an	TX Power Verification	CH36/CH100/CH165	11a_6Mbps	ANT1	16dBm+1.5/-2dB
		CH36/CH100/CH165	11a_54Mbps	ANT1	13dBm+1.5/-2dB
		CH36/CH100/CH165	HT20_MCS0	ANT1	15dBm+1.5/-2dB
		CH36/CH100/CH165	HT20_MCS7	ANT1	12dBm+1.5/-2dB
		CH38/CH102/CH159	HT40_MCS0	ANT1	15dBm+1.5/-2dB
		CH38/CH102/CH159	HT40_MCS7	ANT1	12dBm+1.5/-2dB
	TX Mask	CH36/CH100/CH165	11a_6Mbps	ANT1	margin delta >0dB than IEEE spec
		CH36/CH100/CH165	11a_54Mbps	ANT1	
		CH36/CH100/CH165	HT20_MCS0	ANT1	
		CH36/CH100/CH165	HT20_MCS7	ANT1	
		CH38/CH102/CH159	HT40_MCS0	ANT1	
		CH38/CH102/CH159	HT40_MCS7	ANT1	
	TX EVM	CH36/CH100/CH165	11a_6Mbps	ANT1	≤ -5dB
		CH36/CH100/CH165	11a_54Mbps	ANT1	≤ -25dB
		CH36/CH100/CH165	HT20_MCS0	ANT1	≤ -5dB
		CH36/CH100/CH165	HT20_MCS7	ANT1	≤ -27dB
		CH38/CH102/CH159	HT40_MCS0	ANT1	≤ -5dB
		CH38/CH102/CH159	HT40_MCS7	ANT1	≤ -27dB

Remark: CH36=5180MHz;CH38=5190MHz; CH100=5500MHz; CH102=5510MHz; CH159=5795MHz; CH165=5825MHz;

FOXCONN CONFIDENTIAL 7

FT Wi-Fi Test Item and Spec

Station	Test Items	Channel	Data Rate	ANT	Spec
FT Verification 5GHz 11a/an	TX Frequency test	CH36/CH100/CH165	11a_6Mbps&54Mbps	ANT1	±10 ppm
		CH36/CH100/CH165	HT20_MC0	ANT1	±10 ppm
		CH36/CH100/CH165	HT20_MCS7	ANT1	±10 ppm
		CH38/CH102/CH159	HT40_MCS0	ANT1	±10 ppm
		CH38/CH102/CH159	HT40_MCS7	ANT1	±10 ppm
	RX Sensitivity	CH36/CH100/CH165	11a_54Mbps	ANT1	-70dBm@PER ≤ 10%
		CH36/CH100/CH165	HT20_MCS7	ANT1	-67dBm@PER ≤ 10%
		CH38/CH102/CH159	HT40_MCS7	ANT1	-64dBm@PER ≤ 10%

Remark: CH36=5180MHz;CH38=5190MHz; CH100=5500MHz; CH102=5510MHz;
CH159=5795MHz; CH165=5825MHz;

FOXCONN CONFIDENTIAL 8

FT Wi-Fi Test Item and Spec

Station	Test Items	Channel	Data Rate	ANT	Spec
FT Verification 5GHz 11ac	TX Power Verification	CH36/CH100/CH165	VHT20_MCS8	ANT1	11dBm+1.5/-2dB
		CH38/CH102/CH159	VHT40_MCS9	ANT1	10dBm+1.5/-2dB
		CH42/CH122/CH155	VHT80_MCS0	ANT1	15dBm+1.5/-2dB
		CH42/CH122/CH155	VHT80_MCS9	ANT1	10dBm+1.5/-2dB
	TX Mask	CH36/CH100/CH165	VHT20_MCS8	ANT1	margin delta >0dB than IEEE spec
		CH38/CH102/CH159	VHT40_MCS9	ANT1	
		CH42/CH122/CH155	VHT80_MCS0	ANT1	
		CH42/CH122/CH155	VHT80_MCS9	ANT1	
	TX EVM	CH36/CH100/CH165	VHT20_MCS8	ANT1	≤ -30dB(enable full-packet)
		CH38/CH102/CH159	VHT40_MCS9	ANT1	≤ -32dB(enable full-packet)
		CH42/CH122/CH155	VHT80_MCS0	ANT1	≤ -5dB(enable full-packet)
		CH42/CH122/CH155	VHT80_MCS9	ANT1	≤ -32dB(enable full-packet)
	TX Frequency test	CH36/CH100/CH165	VHT20_MCS8	ANT1	±10 ppm
		CH38/CH102/CH159	VHT40_MCS9	ANT1	±10 ppm
		CH42/CH122/CH155	VHT80_MCS0	ANT1	±10 ppm
		CH42/CH122/CH155	VHT80_MCS9	ANT1	±10 ppm
	RX Sensitivity	CH36/CH100/CH165	VHT20_MCS8	ANT1	-63dBm@PER≤10%
		CH38/CH102/CH159	VHT40_MCS9	ANT1	-57dBm@PER≤10%
		CH42/CH122/CH155	VHT80_MCS9	ANT1	-52dBm@PER≤10%
FT_WiFi_OTP programming	XTAL & power cal data, Write WIFI MAC, Customer ID (PID/ VID & Channel plan) or other configure code			Should pass	

Remark:CH36=5180MHz;CH38=5190MHz; CH42=5210MHz; CH100=5500MHz; CH102=5510MHz;
CH122=5610MHz; CH155=5775MHz; CH159=5795MHz; CH165=5825MHz;

FOXCONN CONFIDENTIAL 9

FT BT Test Item and Spec

Station	Test Items	Channel	Condition	Spec
FT Verification Bluetooth BDR mode	BT TX power calibration	TX Channel:Ch39 Single tone Channel: 10,32,52,72	1Mbps/2Mbps/3M bps/LE	Should pass
	Output power test	CH0/CH39/CH78	1-DH5	0~+6dBm
	Initial Carrier Frequency Tolerance	CH0/CH39/CH78	1-DH5	-25KHz ≤ f0 ≤ 25KHz
	Carrier Frequency Drift Test	CH0/CH39/CH78	1-DH5	Max Drift Rate with 50us: <20kHz DH5: +/- 40kHz
	Modulation Characteristics Test	CH0/CH39/CH78	1-DH5	140kHz ≤ Δf1avg ≤ 175kHz Δf2max ≥ 115kHz Δf2avg/Δf1avg ≥ 0.8
	20dB Bandwidth Test	CH0/CH39/CH78	1-DH5	Δf = fH - fL ≤ 1.0 MHz
	BDR Sensitivity	CH0/CH39/CH78	1-DH5	-85dBm@BER<0.1%
FT Verification Bluetooth EDR mode	Output power test	CH0/CH39/CH78	2DH5; 3DH5	0~+6dBm
	Modulation Characteristics	CH0/CH39/CH78	2DH5 3DH5	-10kHz ≤ ω0 ≤ 10kHz -75 kHz ≤ ωi ≤ 75 kHz -75 kHz ≤ (ωi + ω0) ≤ 75 kHz
		CH0/CH39/CH78	2DH5	RMS DEVM ≤ 0.20, for all π/4-DQPSK blocks Peak DEVM ≤ 0.35, for all π/4-DQPSK symbols
		CH0/CH39/CH78	3DH5	RMS DEVM ≤ 0.13, for all 8DPSK blocks Peak DEVM ≤ 0.25, for all 8DPSK symbols
	EDR Sensitivity	CH0/CH39/CH78	2DH5	-80dBm@BER<0.01%
3DH5			-80dBm@BER<0.01%	

Remark: BT BDR/EDR Channel CH0=2402MHz;CH39=2441MHz; CH78=2480MHz;

FOXCONN CONFIDENTIAL 10

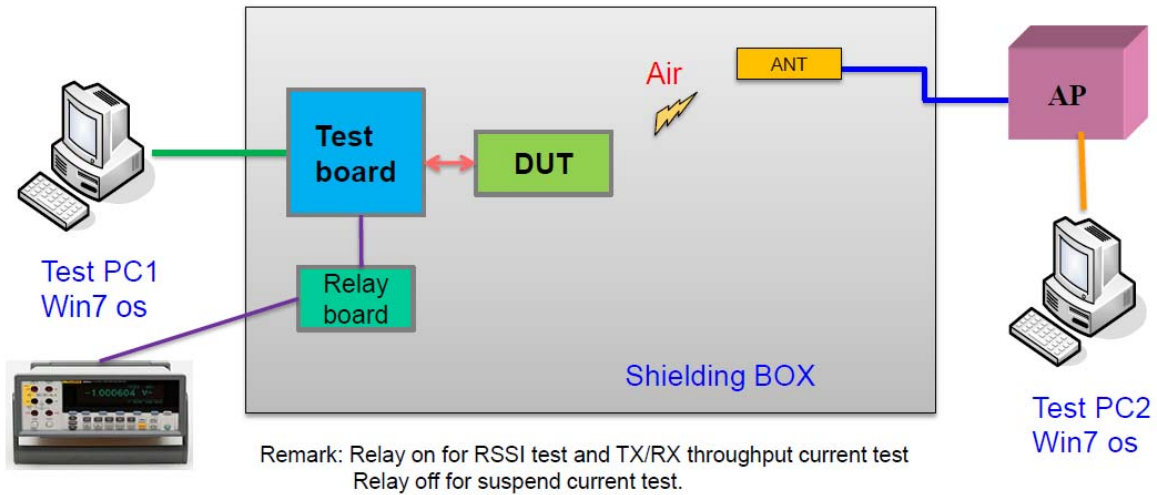
FT BT Test Item and Spec

Station	Test Items	Channel	Condition	Spec
FT Verification Bluetooth LE mode	Output power test	CH0/CH19/CH39	LE_1Mbps	0~+6dBm
	Modulation Characteristics	CH0/CH19/CH39	LE_1Mbps	DELTA_F1_AVG : 225 kHz ≤ Δf1avg ≤ 275 kHz
		CH0/CH19/CH39	LE_1Mbps	DELTA_F2_MAX : >185KHz
		CH0/CH19/CH39	LE_1Mbps	DELTA_F2_F1_AV_RATIO : > 0.8
		CH0/CH19/CH39	LE_1Mbps	DELTA_F2_AVERAGE: (185, 275)KHz
	Frequency offset and drift test	CH0/CH19/CH39	LE_1Mbps	FREQ_OFFSET: (-150, 150) KHz
		CH0/CH19/CH39	LE_1Mbps	f0 - fn ≤ 50 kHz
		CH0/CH19/CH39	LE_1Mbps	f1 - f0 ≤ 20 kHz fn - fn-5 ≤ 20 kHz
LE Sensitivity	CH0/CH19/CH39	LE_1Mbps	-90dBm@PER<30.8%	
FT BT_OTP programming	BT MAC, BT TX power calibration data Other config data(thermal index/BT Modem tx gain compensation etc.)			Should PASS

Remark: BT BLE Channel CH0=2402MHz;CH19=2440MHz; CH39=2480MHz;

FOXCONN CONFIDENTIAL 11

RC Test Setup



- Ethernet cable
- RF cable
- USB cable(Provided by customer)
- Host connector cable line
- DC power cable

FOXCONN CONFIDENTIAL 12

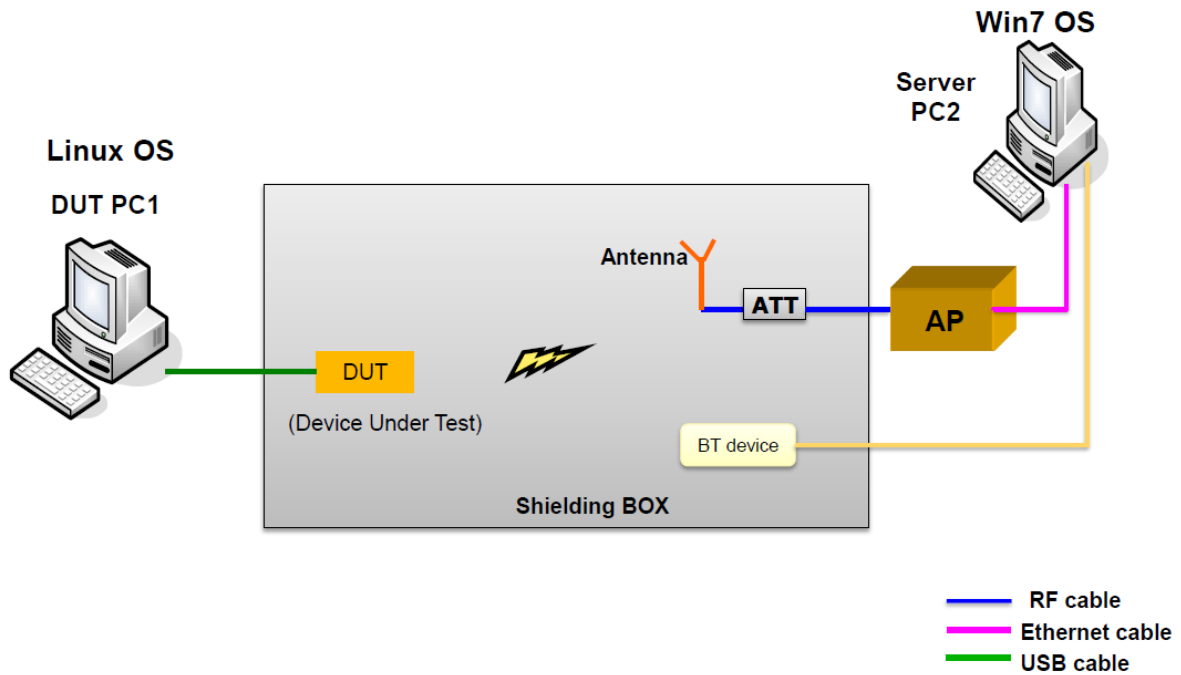
RC Test Item and Spec

Station	Test items	ANT	Band	Channel	Rate	Condition	Spec	
RC	WiFi_ RSSI test	ANT1	5G	CH149	11ac VHT20	Link AP and ping testing ok	-50dBm ± 6dB	
		ANT2	5G	CH149	11ac VHT20		-50dBm ± 6dB	
	TX/RX current test	Auto	5G	CH149	11ac VHT20	Link AP and TXRX throughput testing	<=400mA	
	Suspend current test	Disable WIFI & BT in normal driver						<=10mA
	Read code from eFuse	Wi-Fi MAC					Random value	Confirm MAC ID consistency in eFuse
		BT MAC					Random value	Confirm MAC ID consistency in eFuse
Calibration data(crystal/power)					Random value	Confirm eFuse Content not blank		
Other config code					Fix value	Confirm consistency PASS		
	PID: 0xC820 VID: 0x0BDA					Fix value	Confirm consistency PASS	
	Channel plan:0x7F					Fix value		

Remark: CH100=5500MHz;CH149=5745MHz;

FOXCONN CONFIDENTIAL 13

OBA1 Test Diagram



Remark: when measure WIFI throughput, BT just enable and NOT link to any other BT device(No traffic data from BT)

FOXCONN CONFIDENTIAL 14

OBA1 Test Item and Spec

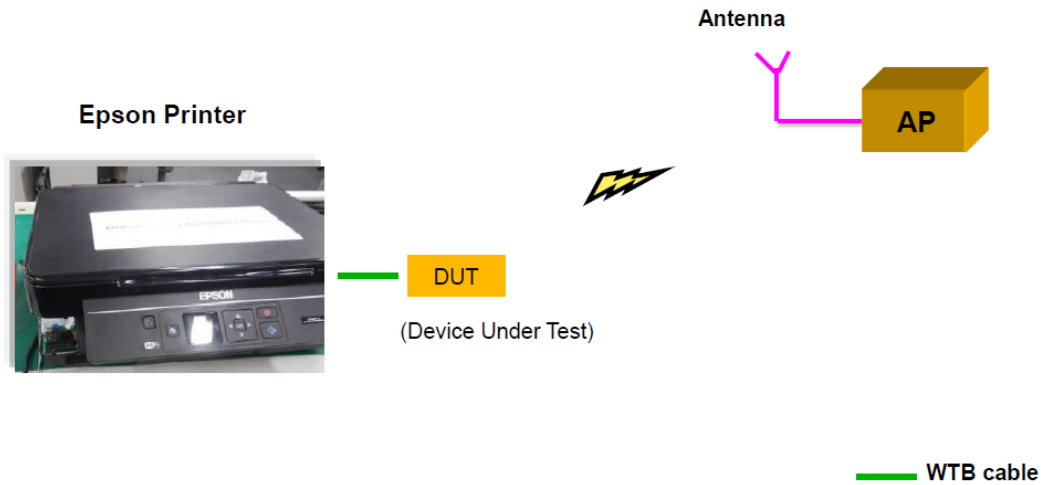
Test Station	Test Items	Test Condition	Test Spec and Comment
OBA1	CHECK MAC ID		Make sure consistency between programmed content and content of label on module
	CHECK VID&PID		Confirm consistency PASS
	WiFi Throughput Test	1. Client PC: Linux OS (Ubuntu 16.04, kernel: 4.4.27) Server PC with Gigabit LAN port: Win7 OS 2. Tool: Iperf 3. 2.4GHz/5G 11ac 2x2 AP 4. AP setting: Channel: Auto Data rate: 2.4G : 11n HT20 5G : 11ac-MCS9 5. BT only enable and no traffic data from BT	11n-2.4G Tx >= 40Mbps Rx >= 40Mbps 11ac-5G : Tx >= 160Mbps Rx >= 160Mbps
BT Link Test	scan other BT device and connected successfully	BT ping test	

OBA will base on C=0, AQL= 0.65 for sampling inspection from MP
 Sampling Plan:

Lot	2-8	9-15	16-25	26-50	51-90	91-150	151-280	281-500	501-1200	1201-3200	3201-10000	10001-35000	35001-150000
0.65	*	*	20	20	20	20	20	47	47	53	68	77	96

FOXCONN CONFIDENTIAL 15

OBA2 Test Diagram



FOXCONN CONFIDENTIAL 16

OBA2 Test Item and Spec

Test Station	Test Items	Test Condition	Test Spec and Comment
OBA2	Searching SSID Test	1. Epson printer: L485; 2. AP setting: Channel: Auto Data rate: Auto	1. Searching SSID 5 times and every time display one more SSID. → Follow Epson 's spec. <Printer Check Inspection Standard Rev02> 2. 100% tested for PVT

OBA will base on C=0, AQL= 0.65 for sampling inspection from MP
 Sampling Plan:

Lot	2-8	9-15	16-25	26-50	51-90	91-150	151-280	281-500	501-1200	1201-3200	3201-10000	10001-35000	35001-150000
0.65	*	*	20	20	20	20	20	47	47	53	68	77	96

FOXCONN CONFIDENTIAL 17

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.

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:

The antenna must be installed such that 20 cm is maintained between the antenna and users, and

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: **BKMFBJ26H005**". 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 ISED's licence-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée 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 ISED 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 ISED 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: 1052C-J26H005".

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: 1052C-J26H005".

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 be such that the equipment still complies with the e.i.r.p. limit;
- (iii) 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
- (iv) the worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in Section 6.2.2(3) shall be clearly indicated.
- (v) 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 5150-5250 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 de 5250 à 5350 MHz et de 5470 à 5725 MHz doit être conforme à la limite de la p.i.r.e.;
- (iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande de 5725 à 5850 MHz) doit être conforme à la limite de la p.i.r.e. spécifiée pour l'exploitation point à point et l'exploitation non point à point, selon le cas;
- (iv) les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la p.i.r.e. applicable au masque d'élévation, et énoncée à la section 6.2.2 3), doivent être clairement indiqués.
- (v) 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 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.