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J20H085
User Manual

Project Name	MT7650 IEEE802.11a/b/g/n 1×1 + Bluetooth3.0, WiFi+BT module
Approval Sheet Rev.	1.0
Foxconn Part No.	J20H085.00 J20H085.01
Sony Part No.	1-458-765-31 (J20H085.00) 1-458-765-21 (J20H085.01)

Prepared by	Reviewed by	Approved by
Clon Liu	Eddie Huang	

CONTENTS

1 Revision History

Date	Revision	Change Description
2014/10/18	1.0	Initial release

2 Manufacturing Information

Manufacture Country:
Made in China

Manufacturer:
Ambit Microsystems (Shanghai) LTD.

Manufacture Address:
No 1925, Nanle Road Songjiang Export Processing Zone Shanghai, China

3 Product Overview

The J20H085 802.11a/b/g/n and BT3.0 module provides wireless modem functionality utilizing direct sequence spread spectrum and OFDM/CCK technology. This module is based on MTK MT7650U solution .It fully complies with IEEE 802.11n,IEEE 802.11 a/b/g and ,Bluetooth v2.1+EDR, v3.0 standard, offering feature-rich wireless connectivity at high standards, and delivering reliable, cost-effective throughput from an extended distance. Optimized RF architecture and baseband algorithms provide superb performance and low power consumption. Intelligent MAC design deploys a high efficient DMA engine and hardware data processing accelerators which offloads the host processor.

3.1 Application scope

The wireless LAN is compliant to IEEE 802.11n,IEEE 802.11 a/b/g standards. The data rate of 802.11b is up to 11Mbps and fallback rates of 5.5, 2, 1Mbps. The data rate of 802.11a/g is up to 54Mbps and fallback rates of 48,36,24,18,12,9, 6Mbps. The data rate of 802.11n HT20 is up to 65Mbps and fallback rates of 58.5, 52, 39, 26, 19.5, 13, 6.5Mbps; The data rate of 802.11n HT40 is up to 130Mbps and fallback rates of 117, 104, 78, 52, 39, 26, 13Mbps;

The BT Module is compliant to Bluetooth 3.0 and EDR standard:
Carrier Frequency: 2402MHz ~ 2480 MHz
Carrier Spacing: 1.0MHz
Duplexing: TDD
Modulation: FHSS
GFSK, pi/4-DQPSK, 8DPSK
Symbol Rate: 1Mbps (GFSK), 2Mbps (pi/4-DQPSK), 3Mbps (8DPSK)

3.2 Regulation of each countries

Country	Approval	Certification	Certification No.	Description
United States	Module	FCC Part 15C/E		
Canada	Module	RSS-210 issue8		
Europe	Plug-in	EN 300 328 v1.8.1 EN 301 893 v1.7.1 EN 301 489 EN 60950 EN 62311		
Russia	Module	FAC		
Japan	Module	TECEC		
Taiwan	Module	NCC		
Malaysia	Module	SIRIM		
South Africa	Module	ICASA		
UAE	Module	TRA		

4 Module Hardware Overview

4.1 Block Diagram

The general HW architecture is shown below Figure:

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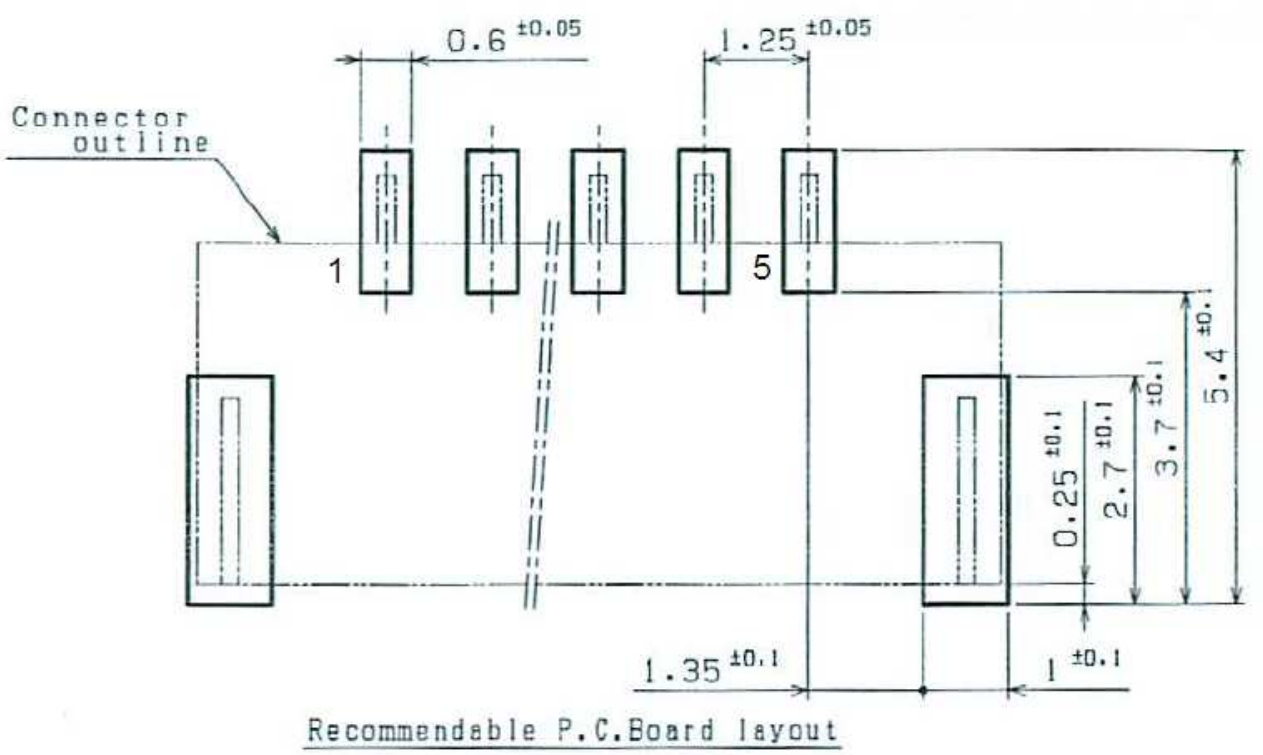
4.2 Features

- IEEE802.11a/b/g/n (1X1) based on MTK MT7650U solution.
- Support BT3.0
- USB 2.0 Interface, High and Full Speeds supported.
- Module is powered by the host with a 5.0V +/- 10% supply.
- External PCB printed antennas.
- 4 layers through hole PCB design with FR4 with TG-150 material

4.3 Interface and Connector

- **Pin definition:**
- **Vendor: JST**
- **Vendor P/N: SM05B-GHS-TB**



Pin Number	Symbol Name	Status	Pin definition
1	GND		Ground
2	DP	I/O	USB positive data
3	DM	I/O	USB negative data
4	UV+	P	USB +5V power input
5	GND		Ground
S1	GND		Ground
S2	GND		Ground

5 General Specification

Item		Specification
Frequency Range		2400MHz~2483.5MHz
		5150MHz~5250MHz
		5250MHz~5350MHz
		5470MHz~5725MHz
		5725MHz~5850MHz
PCB Case Temperature		~94.4℃@Ta=60℃
IC Case Measurement Temperature		~96.8℃@Ta=60℃
Maximum Ripple on Supplied Voltage: Oscillograph		550mVpp max
Antenna Port Impedance		50 ohm typ.
Return Loss	Antenna 1	<-10dB
	Antenna 2	<-10dB
	BT connecter CON1	<-10dB
Temperature	Operating Temperature	-10℃~60℃
	Storage Temperature	-40℃~85℃
Humidity	Operating Humidity	20%~90% (Non-condensing)
	Storage Humidity	20%~90% (Non-condensing)

6 Electrical Specification

6.1 Absolute maximum rating

Element	Symbol	Min	Typ	Max	Unit
DC supply voltage	UV+		5.0	6.5	(V)

6.2 Recommended operating rating

Element	Symbol	Min	Typ	Max	Unit
DC supply voltage	UV+	4.5	5.0	5.5	(V)

6.3 DC Characteristics

Symbol	Parameter	Min	Typ.	Max	Unit
UV+	Supply voltage	4.5	5.0	5.5	(V)
	2.4GHz Tx Current(1M/15dBm)		200		(mA)
	2.4GHz Tx Current(54M/15dBm)		220		(mA)
	2.4GHz Tx Current(MCS0/15Bm/HT20)		220		(mA)
	2.4GHz Tx Current(MCS7/15dBm/HT20)		220		(mA)
	Rx Current		80		(mA)
	5GHz Tx Current(MCS7/12dBm/HT40)		300		(mA)

6.4 ESD Information

Mode	Level	Unit
HBM	+/-1000	V

6.5 Environment Storage Condition

Environment condition	
Temperature	Operating Temperature: -10 deg.C ~60 deg.C
	Storage Temperature: -40 deg.C ~85 deg.C
Humidity	Operating Humidity: 20% ~90%
	Storage Humidity: 20% ~90%

7 RF Specification

7.1 IEEE802.11b

Items	Contents			
Specification	IEEE802.11b			
Mode	DSSS / CCK			
Channel	CH1 to CH13			
Temperature	-10℃~60℃			
Data rate	1, 2, 5.5, 11Mbps			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (Calibrated)				
1) Target Power@1Mbps	13.5	15	16.5	dBm
2) Target Power@2Mbps	13.5	15	16.5	dBm
3) Target Power@5.5Mbps	13.5	15	16.5	dBm
4) Target Power@11Mbps	13.5	15	16.5	dBm
2. Spectrum Mask @15dBm				
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@25℃	-10	-	+10	ppm
4 Modulation Accuracy(EVM)@15dBm				
1) 1Mbps	-		-10	dB
2) 2Mbps	-		-10	dB
3) 5.5Mbps	-		-10	dB
4) 11Mbps	-		-10	dB
RX Characteristics	Min.	Typ.	Max.	Unit
5 Minimum Input Level Sensitivity				
1) 1Mbps (FER≦8%)	-	-92	-91	dBm
2) 2Mbps (FER≦8%)	-	-91	-89	dBm
3) 5.5Mbps (FER≦8%)	-	-90	-87	dBm
4) 11Mbps (FER≦8%)	-	-89	-85	dBm
6 Maximum Input Level (FER≦8%)	-10	-5	-	dBm

*Frequency Error tolerance @ 25℃= ±10ppm

7.2 IEEE802.11g

Items	Contents			
Specification	IEEE802.11g			
Mode	OFDM			
Channel	CH1 to CH13			
Temperature	-10℃~60℃			
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (Calibrated)				
1) Target Power@6Mbps	13.5	15	16.5	dBm
2) Target Power@9Mbps	13.5	15	16.5	dBm
3) Target Power@12Mbps	13.5	15	16.5	dBm
4) Target Power@18Mbps	13.5	15	16.5	dBm
5) Target Power@24Mbps	13.5	15	16.5	dBm
6) Target Power@36Mbps	13.5	15	16.5	dBm
7) Target Power@48Mbps	13.5	15	16.5	dBm
8) Target Power@54Mbps	13.5	15	16.5	dBm
2. Spectrum Mask @15dBm				
1) at fc +/- 11MHz	-	-	-20	dBr
2) at fc +/- 20MHz	-	-	-28	dBr
3) at fc > +/-30MHz	-	-	-40	dBr
3 Modulation Accuracy(EVM)@15dBm				
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	-	-28	-25	dB
4 Frequency Error@25℃	-10	-	+10	ppm
RX Characteristics	Min.	Typ.	Max.	Unit
5 Minimum Input Level Sensitivity				
1) 6Mbps (PER <10%)	-	-92	-83	dBm
2) 9Mbps (PER < 10%)	-	-91	-81	dBm
3) 12Mbps (PER < 10%)	-	-90	-79	dBm
4) 18Mbps (PER < 10%)	-	-87	-77	dBm
5) 24Mbps (PER < 10%)	-	-85	-75	dBm
6) 36Mbps (PER < 10%)	-	-80	-73	dBm
7) 48Mbps (PER < 10%)	-	-77	-71	dBm
8) 54Mbps (PER < 10%)	-	-75	-69	dBm
6 Maximum Input Level (PER < 10%)	-20	-11	-	dBm

*Frequency Error tolerance @ 25℃= ±10ppm

7.3 IEEE 802.11n HT20

Items	Contents			
Specification	IEEE802.11n HT20			
Mode	OFDM			
Channel	CH1~CH13			
Temperature	-10℃~60℃			
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (Calibrated)				
1) Target Power@MCS0	13.5	15	16.5	dBm
2) Target Power@ MCS1	13.5	15	16.5	dBm
3) Target Power@ MCS2	13.5	15	16.5	dBm
4) Target Power@ MCS3	13.5	15	16.5	dBm
5) Target Power@ MCS4	13.5	15	16.5	dBm
6) Target Power@ MCS5	13.5	15	16.5	dBm
7) Target Power@ MCS6	13.5	15	16.5	dBm
8) Target Power@ MCS7	13.5	15	16.5	dBm
2. Spectrum Mask @15dBm				
1) at fc +/- 11MHz	-	-	-20	dBr
2) at fc +/- 20MHz	-	-	-28	dBr
3) at fc > +/-30MHz	-	-	-45	dBr
3. Modulation Accuracy(EVM)@15dBm				
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@25℃	-10	-	+10	ppm
RX Characteristics	Min.	Typ.	Max.	Unit
5. Minimum Input Level Sensitivity				
1) MCS0 (PER < 10%)	-	-91	-81	dBm
2) MCS1 (PER < 10%)	-	-89	-79	dBm
3) MCS2 (PER < 10%)	-	-87	-77	dBm
4) MCS3 (PER < 10%)	-	-84	-75	dBm
5) MCS4 (PER < 10%)	-	-80	-73	dBm
6) MCS5 (PER < 10%)	-	-75	-71	dBm
7) MCS6 (PER < 10%)	-	-74	-69	dBm
8) MCS7 (PER < 10%)	-	-72	-67	dBm
6. Maximum Input Level (PER < 10%)	-20	-10	-	dBm

*Frequency Error tolerance @ 25℃= ±10ppm

7.4 IEEE 802.11a

Items	Contents			
Specification	IEEE802.11a			
Mode	OFDM			
Channel	CH36 to CH165			
Temperature	-10℃~60℃			
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (Calibrated)				
1) Target Power@6Mbps	10.5	12	13.5	dBm
2) Target Power@9Mbps	10.5	12	13.5	dBm
3) Target Power@12Mbps	10.5	12	13.5	dBm
4) Target Power@18Mbps	10.5	12	13.5	dBm
5) Target Power@24Mbps	10.5	12	13.5	dBm
6) Target Power@36Mbps	10.5	12	13.5	dBm
7) Target Power@48Mbps	10.5	12	13.5	dBm
8) Target Power@54Mbps	10.5	12	13.5	dBm
2. Spectrum Mask @12dBm				
1) at fc +/- 11MHz	-	-	-20	dBr
2) at fc +/- 20MHz	-	-	-28	dBr
3) at fc > +/-30MHz	-	-	-40	dBr
3 Modulation Accuracy(EVM)@12dBm				
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	-	-28	-25	dB
4 Frequency Error@25℃	-10	-	+10	ppm
RX Characteristics	Min.	Typ.	Max.	Unit
5 Minimum Input Level Sensitivity				
1) 6Mbps (PER <10%)	-	-92	-83	dBm
2) 9Mbps (PER < 10%)	-	-91	-81	dBm
3) 12Mbps (PER < 10%)	-	-90	-79	dBm
4) 18Mbps (PER < 10%)	-	-87	-77	dBm
5) 24Mbps (PER < 10%)	-	-85	-75	dBm
6) 36Mbps (PER < 10%)	-	-80	-73	dBm
7) 48Mbps (PER < 10%)	-	-77	-71	dBm
8) 54Mbps (PER < 10%)	-	-75	-69	dBm
6 Maximum Input Level (PER < 10%)	-20	-11	-	dBm

*Frequency Error tolerance @ 25℃= ±10ppm

7.5 IEEE 802.11an HT20

Items	Contents			
Specification	IEEE802.11an HT20			
Mode	OFDM			
Channel	CH36 to CH165			
Temperature	-10℃~60℃			
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (Calibrated)				
1) Target Power@MCS0	10.5	12	13.5	dBm
2) Target Power@ MCS1	10.5	12	13.5	dBm
3) Target Power@ MCS2	10.5	12	13.5	dBm
4) Target Power@ MCS3	10.5	12	13.5	dBm
5) Target Power@ MCS4	10.5	12	13.5	dBm
6) Target Power@ MCS5	10.5	12	13.5	dBm
7) Target Power@ MCS6	10.5	12	13.5	dBm
8) Target Power@ MCS7	10.5	12	13.5	dBm
2. Spectrum Mask @12dBm				
1) at fc +/- 11MHz	-	-	-20	dBr
2) at fc +/- 20MHz	-	-	-28	dBr
3) at fc > +/-30MHz	-	-	-45	dBr
3. Modulation Accuracy(EVM)@12dBm				
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@25℃	-10	-	+10	ppm
RX Characteristics	Min.	Typ.	Max.	Unit
5. Minimum Input Level Sensitivity				
1) MCS0 (PER < 10%)	-	-91	-81	dBm
2) MCS1 (PER < 10%)	-	-89	-79	dBm
3) MCS2 (PER < 10%)	-	-87	-77	dBm
4) MCS3 (PER < 10%)	-	-84	-75	dBm
5) MCS4 (PER < 10%)	-	-80	-73	dBm
6) MCS5 (PER < 10%)	-	-75	-71	dBm
7) MCS6 (PER < 10%)	-	-74	-69	dBm
8) MCS7 (PER < 10%)	-	-72	-67	dBm
6. Maximum Input Level (PER < 10%)	-20	-10	-	dBm

*Frequency Error tolerance @ 25℃= ±10ppm

7.6 IEEE 802.11an HT40

Items	Contents			
Specification	IEEE802.11an HT40			
Mode	OFDM			
Channel	CH38 to CH159			
Temperature	-10℃~60℃			
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels (Calibrated)				
1) Target Power@MCS0	10.5	12	13.5	dBm
2) Target Power@ MCS1	10.5	12	13.5	dBm
3) Target Power@ MCS2	10.5	12	13.5	dBm
4) Target Power@ MCS3	10.5	12	13.5	dBm
5) Target Power@ MCS4	10.5	12	13.5	dBm
6) Target Power@ MCS5	10.5	12	13.5	dBm
7) Target Power@ MCS6	10.5	12	13.5	dBm
8) Target Power@ MCS7	10.5	12	13.5	dBm
2. Spectrum Mask @12dBm				
1) at fc +/- 21MHz	-	-	-20	dBr
2) at fc +/- 40MHz	-	-	-28	dBr
3) at fc > +/-60MHz	-	-	-45	dBr
3. Modulation Accuracy(EVM)@12dBm				
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@25℃	-10	-	+10	ppm
RX Characteristics	Min.	Typ.	Max.	Unit
5. Minimum Input Level Sensitivity				
1) MCS0 (PER < 10%)	-	-88	-78	dBm
2) MCS1 (PER < 10%)	-	-86	-76	dBm
3) MCS2 (PER < 10%)	-	-84	-74	dBm
4) MCS3 (PER < 10%)	-	-81	-72	dBm
5) MCS4 (PER < 10%)	-	-77	-70	dBm
6) MCS5 (PER < 10%)	-	-72	-68	dBm
7) MCS6 (PER < 10%)	-	-71	-66	dBm
8) MCS7 (PER < 10%)	-	-69	-64	dBm
6. Maximum Input Level (PER < 10%)	-20	-10	-	dBm

*Frequency Error tolerance @ 25℃ = ±10ppm

7.7 Bluetooth 3.0

Parameter	Condition	Specification			Units
		Min	Typ	Max	
Basic Data Rate – Transmit Performance					
RF Transmit Power		2.5	5	7.5	dBm
Tx Output Spectrum	-20 dB Bandwidth			1	MHz
	Frequency range			79	
Initial Carrier Frequency Tolerance			±75		KHz
Carrier Frequency Drift	DH1/3/5 Drift rate		±20		kHz/50 μs
	DH1		±25		KHz
	DH3		±40		
	DH5		±40		
Modulation Characteristics	F1avg		140<Δf1avg<175		kHz
	F2max		≥ 115		
	F2avg/F1avg		80		%
Adjacent Channel Transmit Power	+/-500KHz		-27		dBc
	|M-N|=2			-20	dBm
	|M-N|≥3			-40	
Transmission Spurious Emission-1	f<2.387GHz			-26	dBm
	2.387 GHz< f<2.400 GHz			-16	
	2.4835 GHz<f<2.4965 GHz			-16	
	f>2.4965 GHz			-26	
Transmission Spurious Emission-2	700~805MHz			-130	dBm/ Hz
	869~894MHz			-135	
	925~960MHz			-135	
	1,805~1,880MHz			-135	
	1,930~1,990MHz			-135	
	2,110~2,170MHz			-135	
	1,574.4~1,576.4MHz			-150	
Enhanced Data Rate – Transmit Performance					
RF Transmit Power	π/4 DQPSK	2.5	5	7.5	dBm
	8DPSK	2.5	5	7.5	
Relative Transmit Power	Pdpsk	$(P_{GFSK}$-4 dB)<P_{DPSK}<(P_{GFSK}+1 dB)			
Carrier Frequency Stability	ωi	-75		75	kHz
	ω0	-10		10	
	ωi + ω0	-75		75	
Modulation Accuracy – RMS DEVM	π/4 DQPSK	≤ 20			%
	8DPSK	≤ 13			
Modulation Accuracy – Peak DEVM	π/4 DQPSK	≤ 35			
	8DPSK	≤ 25			
Modulation Accuracy – 99% DEVM	π/4 DQPSK	≤ 30			
	8DPSK	≤ 20			
In-band Spurious Emissions	f>f_0+3 MHz	≤ -40			dBm
	f<f_0-3 MHz	≤ -40			
	f=f_0-3 MHz	≤ -40			
	f=f_0-2 MHz	≤ -20			
	f=f_0-1 MHz	≤ -26			dBr
	f=f_0+1 MHz	≤ -26			
	f=f_0+2 MHz	≤ -20			dBm
	f=f_0+3 MHz	≤ -40			
EDR Differential Phase Coding		99			%

Transmission Spurious Emission-1	f<2.387GHz			-26	dBm
	2.387 GHz< f<2.400 GHz			-16	
	2.4835 GHz<f<2.4965 GHz			-16	
	f>2.4965 GHz			-26	

- RX Characteristics -	Min.	Typ.	Max.	Unit
1. Minimum Input Level Sensitivity				
GFSK (1Mbps)	-	-88	-79	dBm
π/4 DQPSK (2Mbps)	-	-88	-79	dBm
8DPSK (3Mbps)	-	-84	-76	dBm

7.8 Antenna Electrical Specification(J20H085.01)

Parameter	Value	Units
Operating frequency range	2.4 ~ 2.4835 5.15~5.85	GHz
Antenna gain (max)	-0.4 @2.4GHz 1.12 @5GHz	dBi (ANT1)
Antenna gain (max)	0.28 @2.4GHz 0.9 @5GHz	dBi (ANT2)

8 Handling Notice

1) ESD

There are semiconductors on the module, please handle the module under ESD protected and well-controlled environment (<1000V).

2) Storage and Usage Condition

1. Moisture barrier bag must be stored under 40℃, 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±5℃ /10%RH

9 4. Please keep the module at 30℃/70% RH.

17 Notification

When any change item happens in the product approval sheet, Foxconn will always inform in advance and get approval by Sony.

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:

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: MCLJ20H085”. 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:

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-J20H085”.

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-J20H085".

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.

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- EN 60950-1/A12: 2011
  Safety of Information Technology Equipment

- EN 62311: 2008 / Article 3(1)(a) and Article 2 2006/95/EC)
  Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz-300 GHz) (IEC 62311:2007 (Modified))

- EN 300 328 V1.8.1: 2012
  Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

- EN 301 893 V1.7.1: 2012
  Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

- EN 301 489-1 V1.9.2: 2011
  Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

- EN 301 489-17 V2.2.1: 2012
  Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment

cs Česky [Czech]	*[Jméno výrobce]* tímto prohlašuje, že tento *[typ zařízení]* je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
da Dansk [Danish]	Undertegnede *[fabrikantens navn]* erklærer herved, at følgende udstyr *[udstyrets typebetegnelse]* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
de Deutsch [German]	Hiermit erklärt *[Name des Herstellers]*, dass sich das Gerät *[Gerätetyp]* in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
et Eesti [Estonian]	Käesolevaga kinnitab *[tootja nimi = name of manufacturer]* seadme *[seadme tüüp = type of equipment]* vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
en English	Hereby, *[name of manufacturer]*, declares that this *[type of equipment]* is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
es Español [Spanish]	Por medio de la presente *[nombre del fabricante]* declara que el *[clase de equipo]* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
el Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *[name of manufacturer]* ΔΗΛΩΝΕΙ ΟΤΙ *[type of equipment]* ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
fr Français	Par la présente *[nom du fabricant]* déclare que l'appareil *[type d'appareil]* est conforme aux

[French]	exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente *[nome del costruttore]* dichiara che questo *[tipo di apparecchio]* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo *[name of manufacturer / izgatavotāja nosaukums]* deklarē, ka *[type of equipment / iekārtas tips]* atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo *[manufacturer name]* deklaruoja, kad šis *[equipment type]* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart *[naam van de fabrikant]* dat het toestel *[type van toestel]* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, *[isem tal-manifattur]*, jiddikjara li dan *[il-mudel tal-prodott]* jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, *[gyártó neve]* nyilatkozom, hogy a *[... típus]* megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Polski [Polish]	Niniejszym *[nazwa producenta]* oświadcza, że *[nazwa wyrobu]* jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
Português [Portuguese]	*[Nome do fabricante]* declara que este *[tipo de equipamento]* está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	*[Ime proizvajalca]* izjavlja, da je ta *[tip opreme]* v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	*[Meno výrobcu]* týmto vyhlasuje, že *[typ zariadenia]* spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	*[Valmistaja = manufacturer]* vakuuttaa täten että *[type of equipment = laitteen tyyppimerkintä]* tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar *[företag]* att denna *[utrustningstyp]* står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

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5.25-5.35秭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。