

# **FCC Test Report**

FCC ID : NKR-SY30

Equipment : WLAN/BT Module

Model No. : DHSR-SY30

Brand Name : Wistron NeWeb Corp.

Applicant : Wistron NeWeb Corp.

Address : 20 Park Avenue II, Hsinchu Science Park,

Hsinchu 308, Taiwan, R.O.C.

Standard : 47 CFR FCC Part 15.247

Received Date : Dec. 07, 2015

Tested Date : Dec. 11, 2015 ~ Jan. 15, 2016

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:

Gary Chang / Manager

ilac-MRA



Report No.: FR5D0701AC Report Version: Rev. 01 Page: 1 of 58



# **Table of Contents**

1	GENERAL DESCRIPTION	5
1.1	Information	5
1.2	Local Support Equipment List	
1.3	Test Setup Chart	
1.4	The Equipment List	
1.5	Test Standards	12
1.6	Measurement Uncertainty	12
2	TEST CONFIGURATION	13
2.1	Testing Condition	13
2.2	The Worst Test Modes and Channel Details	13
3	TRANSMITTER TEST RESULTS	14
3.1	Conducted Emissions	14
3.2	6dB and Occupied Bandwidth	
3.3	RF Output Power	
3.4	Power Spectral Density	22
3.5	Unwanted Emissions into Restricted Frequency Bands	24
3.6	Emissions in Non-Restricted Frequency Bands	48
4	TEST LABORATORY INFORMATION	58



# **Release Record**

Report No.	Version	Description	Issued Date
FR5D0701AC	Rev. 01	Initial issue	Jan. 29, 2016

Report No.: FR5D0701AC Page: 3 of 58



# **Summary of Test Results**

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 21.035MHz 17.71 (Margin -32.29dB) - AV	Pass
15.247(d)	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz	Pass
15.209	Tradiated Effissions	52.93 (Margin -1.07dB) - AV	1 055
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 23.42	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

Report No.: FR5D0701AC Page: 4 of 58



# 1 General Description

# 1.1 Information

# 1.1.1 Specification of the Equipment under Test (EUT)

RF General Information							
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N <sub>TX</sub> )	Data Rate / MCS		
2400-2483.5	b	2412-2462	1-11 [11]	1	1-11 Mbps		
2400-2483.5	g	2412-2462	1-11 [11]	1	6-54 Mbps		
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	1	MCS 0-7		

Note 1: RF output power specifies that Maximum Peak Conducted Output Power.

Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.

Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

Report No.: FR5D0701AC Page: 5 of 58



### 1.1.2 Antenna Details

Ant. No.	Model	Typo	Connector	Frequency band (MHz) / Antenna Gain (dBi)		
Ant. No.	Model	Туре	Connector	2400~2483.5	5150~5250	5725~5850
1	Antenna 1 (Green PCB, Cable 1)	Dipole	UFL	0.21	-2.06	-0.95
2	Antenna 2 (Blue PCB, Cable 2)	Dipole	UFL	1.25	1.39	-0.3

Note: Antenna 2 with highest gain was chosen for final test.

The following antenna cables are used in this EUT. The only difference is cable length. For Antenna 1 (Green PCB, Cable 1)

Cable No.	Model (Cable Color: Black)	Cable No.	Model (Cable Color: Gray)	Cable Length (mm)
1	8JJEKQ199000001H1	22	8JJEKR199000001H1	199
2	8JJEKQ210000001H1	23	8JJEKR210000001H1	210
3	8JJEKQ220000001H1	24	8JJEKR220000001H1	220
4	8JJEKQ230000001H1	25	8JJEKR230000001H1	230
5	8JJEKQ240000001H1	26	8JJEKR240000001H1	240
6	8JJEKQ250000001H1	27	8JJEKR250000001H1	250
7	8JJEKQ260000001H1	28	8JJEKR260000001H1	260
8	8JJEKQ270000001H1	29	8JJEKR270000001H1	270
9	8JJEKQ280000001H1	30	8JJEKR280000001H1	280
10	8JJEKQ290000001H1	31	8JJEKR290000001H1	290
11	8JJEKQ300000001H1	32	8JJEKR300000001H1	300
12	8JJEKQ310000001H1	33	8JJEKR310000001H1	310
13	8JJEKQ320000001H1	34	8JJEKR320000001H1	320
14	8JJEKQ330000001H1	35	8JJEKR330000001H1	330
15	8JJEKQ340000001H1	36	8JJEKR340000001H1	340
16	8JJEKQ350000001H1	37	8JJEKR350000001H1	350
17	8JJEKQ360000001H1	38	8JJEKR360000001H1	360
18	8JJEKQ370000001H1	39	8JJEKR370000001H1	370
19	8JJEKQ380000001H1	40	8JJEKR380000001H1	380
20	8JJEKQ390000001H1	41	8JJEKR390000001H1	390
21	8JJEKQ400000001H1	42	8JJEKR400000001H1	400

Report No.: FR5D0701AC Page: 6 of 58



## For Antenna 2 (Blue PCB, Cable 2)

Cable No.	Model (Cable Color: Black)	Cable No.	Model (Cable Color: Gray)	Cable No.	Model (Cable Color: White)	Cable Length (mm)
1	8JJEKQ400000001H1	52	8JJEKR400000001H1	103	8JJEKP4000000001H1	400
2	8JJEKQ4100000001H1	53	8JJEKR4100000001H1	104	8JJEKP4100000001H1	410
3	8JJEKQ420000001H1	54	8JJEKR4200000001H1	105	8JJEKP4200000001H1	420
4	8JJEKQ430000001H1	55	8JJEKR4300000001H1	106	8JJEKP4300000001H1	430
5	8JJEKQ4400000001H1	56	8JJEKR4400000001H1	107	8JJEKP4400000001H1	440
6	8JJEKQ4500000001H1	57	8JJEKR4500000001H1	108	8JJEKP4500000001H1	450
7	8JJEKQ4600000001H1	58	8JJEKR4600000001H1	109	8JJEKP4600000001H1	460
8	8JJEKQ470000001H1	59	8JJEKR4700000001H1	110	8JJEKP4700000001H1	470
9	8JJEKQ480000001H1	60	8JJEKR4800000001H1	111	8JJEKP4800000001H1	480
10	8JJEKQ490000001H1	61	8JJEKR4900000001H1	112	8JJEKP4900000001H1	490
11	8JJEKQ500000001H1	62	8JJEKR5000000001H1	113	8JJEKP5000000001H1	500
12	8JJEKQ5100000001H1	63	8JJEKR5100000001H1	114	8JJEKP5100000001H1	510
13	8JJEKQ5200000001H1	64	8JJEKR5200000001H1	115	8JJEKP5200000001H1	520
14	8JJEKQ530000001H1	65	8JJEKR530000001H1	116	8JJEKP530000001H1	530
15	8JJEKQ540000001H1	66	8JJEKR540000001H1	117	8JJEKP540000001H1	540
16	8JJEKQ5500000001H1	67	8JJEKR5500000001H1	118	8JJEKP5500000001H1	550
17	8JJEKQ5600000001H1	68	8JJEKR5600000001H1	119	8JJEKP5600000001H1	560
18	8JJEKQ5700000001H1	69	8JJEKR5700000001H1	120	8JJEKP5700000001H1	570
19	8JJEKQ5800000001H1	70	8JJEKR5800000001H1	121	8JJEKP5800000001H1	580
20	8JJEKQ590000001H1	71	8JJEKR590000001H1	122	8JJEKP5900000001H1	590
21	8JJEKQ600000001H1	72	8JJEKR6000000001H1	123	8JJEKP6000000001H1	600
22	8JJEKQ6100000001H1	73	8JJEKR6100000001H1	124	8JJEKP6100000001H1	610
23	8JJEKQ6200000001H1	74	8JJEKR6200000001H1	125	8JJEKP6200000001H1	620
24	8JJEKQ6300000001H1	75	8JJEKR6300000001H1	126	8JJEKP6300000001H1	630
25	8JJEKQ640000001H1	76	8JJEKR640000001H1	127	8JJEKP6400000001H1	640
26	8JJEKQ6500000001H1	77	8JJEKR6500000001H1	128	8JJEKP6500000001H1	650
27	8JJEKQ6600000001H1	78	8JJEKR6600000001H1	129	8JJEKP6600000001H1	660
28	8JJEKQ670000001H1	79	8JJEKR6700000001H1	130	8JJEKP6700000001H1	670
29	8JJEKQ6800000001H1	80	8JJEKR6800000001H1	131	8JJEKP6800000001H1	680
30	8JJEKQ690000001H1	81	8JJEKR6900000001H1	132	8JJEKP6900000001H1	690
31	8JJEKQ700000001H1	82	8JJEKR700000001H1	133	8JJEKP7000000001H1	700
32	8JJEKQ7100000001H1	83	8JJEKR7100000001H1	134	8JJEKP7100000001H1	710
33	8JJEKQ720000001H1	84	8JJEKR720000001H1	135	8JJEKP7200000001H1	720
34	8JJEKQ730000001H1	85	8JJEKR730000001H1	136	8JJEKP7300000001H1	730
35	8JJEKQ740000001H1	86	8JJEKR740000001H1	137	8JJEKP7400000001H1	740
36	8JJEKQ7500000001H1	87	8JJEKR7500000001H1	138	8JJEKP7500000001H1	750
37	8JJEKQ7600000001H1	88	8JJEKR7600000001H1	139	8JJEKP7600000001H1	760

Report No.: FR5D0701AC Page: 7 of 58



38	8JJEKQ7700000001H1	89	8JJEKR7700000001H1	140	8JJEKP7700000001H1	770
39	8JJEKQ780000001H1	90	8JJEKR7800000001H1	141	8JJEKP7800000001H1	780
40	8JJEKQ790000001H1	91	8JJEKR7900000001H1	142	8JJEKP7900000001H1	790
41	8JJEKQ8000000001H1	92	8JJEKR8000000001H1	143	8JJEKP8000000001H1	800
42	8JJEKQ8100000001H1	93	8JJEKR8100000001H1	144	8JJEKP8100000001H1	810
43	8JJEKQ8200000001H1	94	8JJEKR8200000001H1	145	8JJEKP8200000001H1	820
44	8JJEKQ8300000001H1	95	8JJEKR8300000001H1	146	8JJEKP8300000001H1	830
45	8JJEKQ840000001H1	96	8JJEKR840000001H1	147	8JJEKP840000001H1	840
46	8JJEKQ8500000001H1	97	8JJEKR8500000001H1	148	8JJEKP8500000001H1	850
47	8JJEKQ8600000001H1	98	8JJEKR8600000001H1	149	8JJEKP8600000001H1	860
48	8JJEKQ8700000001H1	99	8JJEKR8700000001H1	150	8JJEKP8700000001H1	870
49	8JJEKQ880000001H1	100	8JJEKR880000001H1	151	8JJEKP8800000001H1	880
50	8JJEKQ890000001H1	101	8JJEKR8900000001H1	152	8JJEKP8900000001H1	890
51	8JJEKQ900000001H1	102	8JJEKR900000001H1	153	8JJEKP900000001H1	900

# 1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	DC 4V/1A
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### 1.1.4 Accessories

N/A

### 1.1.5 Channel List

Channel	Frequency(MHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

Report No.: FR5D0701AC Page: 8 of 58



# 1.1.6 Test Tool and Duty Cycle

Test Tool	WCN Combo Tool, version: W1417				
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)		
	11b	100.00%	0.00		
	11g	94.23%	0.26		
	HT20	93.33%	0.30		

# 1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	20.5
11b	2437	20.5
11b	2462	20.5
11g	2412	20.5
11g	2437	21
11g	2462	21
HT20	2412	19.5
HT20	2437	21
HT20	2462	20

Report No.: FR5D0701AC Page: 9 of 58

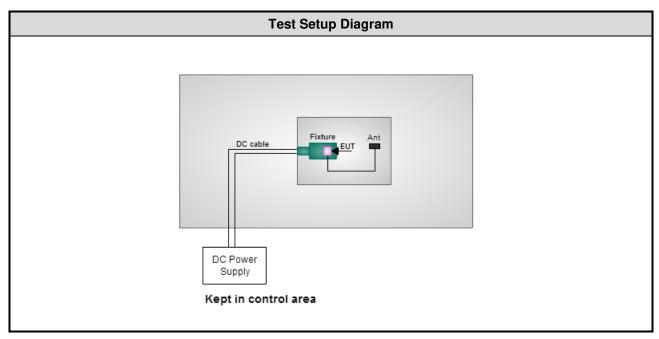


# 1.2 Local Support Equipment List

	Support Equipment List										
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)					
1	Notebook	DELL	Latitude E6440	2ZC4Z52	DoC						
2	DC Power Supply	GW INSTEK	GPC-3060D	EM884797							
3	Fixture										

Note: Fixture was supplied by applicant.

# 1.3 Test Setup Chart



Note: The support notebook was disconnected from EUT and removed from test table when EUT is set to transmit continuously.

Report No.: FR5D0701AC Page: 10 of 58



# 1.4 The Equipment List

Test Item	Conducted Emission											
Test Site	Conduction room 1 / (	Conduction room 1 / (CO01-WS)										
Tested Date	Dec. 31, 2015	Dec. 31, 2015										
Instrument	Manufacturer	Manufacturer Model No. Serial No. Calibration Date Calibration Until										
EMC Receiver	R&S	ESCS 30	100169	Oct. 21, 2015	Oct. 20, 2016							
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 13, 2015	Nov. 12, 2016							
RF Cable-CON	EMC	EMCCFD300-BM-B M-6000	50821	Dec. 21, 2015	Dec. 20, 2016							
Measurement Software	AUDIX e3 6.120210k NA NA											

Test Item	Radiated Emission	Radiated Emission									
Test Site	966 chamber1 / (03CH	966 chamber1 / (03CH01-WS)									
Tested Date	Dec. 11, 2015 ~ Jan. 15, 2016										
Instrument	Manufacturer Model No. Serial No. Calibration Date Calibration Unti										
Spectrum Analyzer	R&S	FSV40	101063	Feb. 03, 2015	Feb. 02, 2016						
Receiver	R&S	ESR3	101658	Nov. 04, 2015	Nov. 03, 2016						
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 20, 2015	Aug. 19, 2016						
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1095	Oct. 07, 2015	Oct. 06, 2016						
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 04, 2015	Nov. 03, 2016						
Loop Antenna	R&S	HFH2-Z2	11900	Nov. 16, 2015	Nov. 15, 2016						
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 10, 2015	Dec. 09, 2016						
Preamplifier	Burgeon	BPA-530	SN:100219	Sep. 10, 2015	Sep. 09, 2016						
Preamplifier	Agilent	83017A	MY39501308	Oct. 02, 2015	Oct. 01, 2016						
Preamplifier	EMC	EMC184045B	980192	Sep. 01, 2015	Aug. 31, 2016						
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 10, 2015	Dec. 09, 2016						
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 10, 2015	Dec. 09, 2016						
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 10, 2015	Dec. 09, 2016						
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 10, 2015	Dec. 09, 2016						
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 10, 2015	Dec. 09, 2016						
Measurement Software											
Note: Calibration Inter	val of instruments listed	d above is one year.									

Report No.: FR5D0701AC Page: 11 of 58



Test Item	RF Conducted	RF Conducted									
Test Site	(TH01-WS)	TH01-WS)									
Tested Date	Jan. 11 ~ Jan. 15, 201	lan. 11 ~ Jan. 15, 2016									
Instrument	Manufacturer	Manufacturer Model No. Serial No. Calibration Date Calibration Until									
Spectrum Analyzer	R&S	FSV40	101063	Feb. 03, 2015	Feb. 02, 2016						
Power Meter	Anritsu ML2495A 1241002 Sep. 21, 2015 Sep. 20, 20										
Power Sensor	Anritsu	MA2411B	1207366	Sep. 21, 2015	Sep. 20, 2016						
DC POWER SOURCE	GW INSTEK	GPC-3060D	EM884797	Oct. 20, 2015	Oct. 19, 2016						
Measurement Software	Sporton	Sporton Sporton_1 1.3.30 NA NA									
Note: Calibration Inter	Note: Calibration Interval of instruments listed above is one year.										

### 1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247 ANSI C63.10-2013 FCC KDB 558074 D01 DTS Meas Guidance v03r04

# 1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty							
Parameters	Uncertainty						
Bandwidth	±34.134 Hz						
Conducted power	±0.808 dB						
Power density	±0.463 dB						
Conducted emission	±2.670 dB						
AC conducted emission	±2.90 dB						
Radiated emission ≤ 1GHz	±3.66 dB						
Radiated emission > 1GHz	±5.63 dB						

Report No.: FR5D0701AC Page: 12 of 58



# 2 Test Configuration

# 2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	20°C / 59%	Peter Lin
Radiated Emissions	03CH01-WS	21-23°C / 61-65%	Anderson Hung
RF Conducted	TH01-WS	21°C / 64%	Alex Huang

➤ FCC site registration No.: 657002➤ IC site registration No.: 10807A-1

### 2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate
Conducted Emissions	11g	2437	6 Mbps
Radiated Emissions ≤1GHz	11g	2437	6 Mbps
Radiated Emissions >1GHz			
Maximum Output Power	11b	2412 / 2437 / 2462	1 Mbps
6dB bandwidth	11g HT20	2412 / 2437 / 2462 2412 / 2437 / 2462	6 Mbps MCS 0
Power spectral density	11120	21127210172402	10.000

#### NOTE:

- 1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement X, Y, and Z-plane. The **Y-plane** result was found as the worst case and was shown in this report.
- 2. See item 1.1.2 antenna sheet list. **cable length 400mm & 900mm** were selected for radiated emission below 1GHz test. **Cable length 400mm** was for radiated emission above 1GHz test.
- 3. Test configurations are listed as below:
  - 1) Configuration 1: Antenna cable length: 400mm.
  - 2) Configuration 2: Antenna cable length: 900mm.

Report No.: FR5D0701AC Page: 13 of 58



## 3 Transmitter Test Results

### 3.1 Conducted Emissions

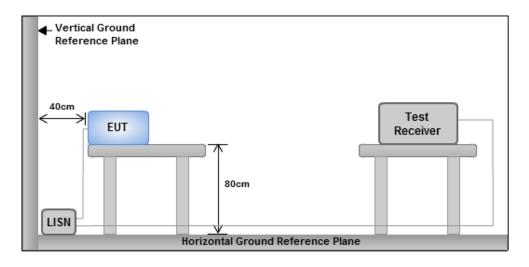
#### 3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit							
Frequency Emission (MHz) Quasi-Peak Average							
0.15-0.5	66 - 56 *	56 - 46 *					
0.5-5	56	46					
5-30	60	50					
Note 1: * Decreases with the logarith	m of the frequency.						

#### 3.1.2 Test Procedures

- 1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
- 2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50  $\Omega$  LISN port.
- 3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
- 4. This measurement was performed with AC 120V / 60Hz.

#### 3.1.3 Test Setup



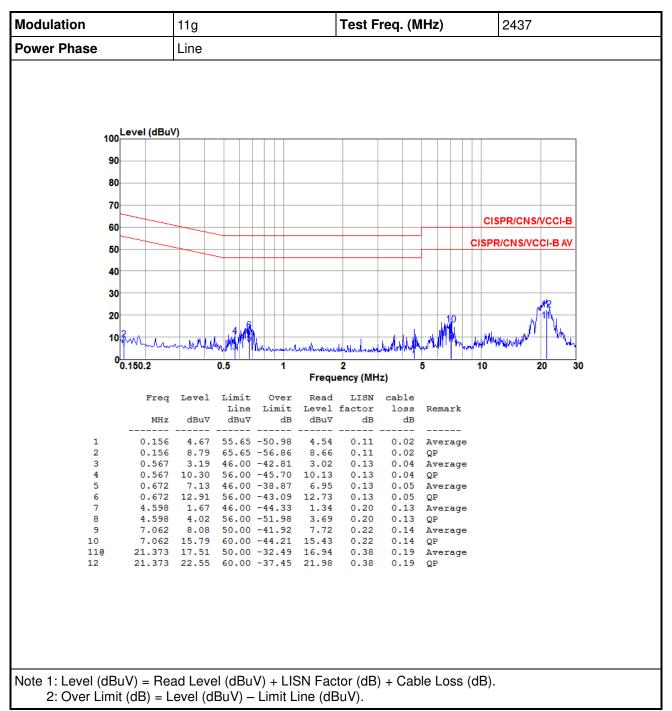
Note: 1. Support units were connected to second LISN.

Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

Report No.: FR5D0701AC Page: 14 of 58

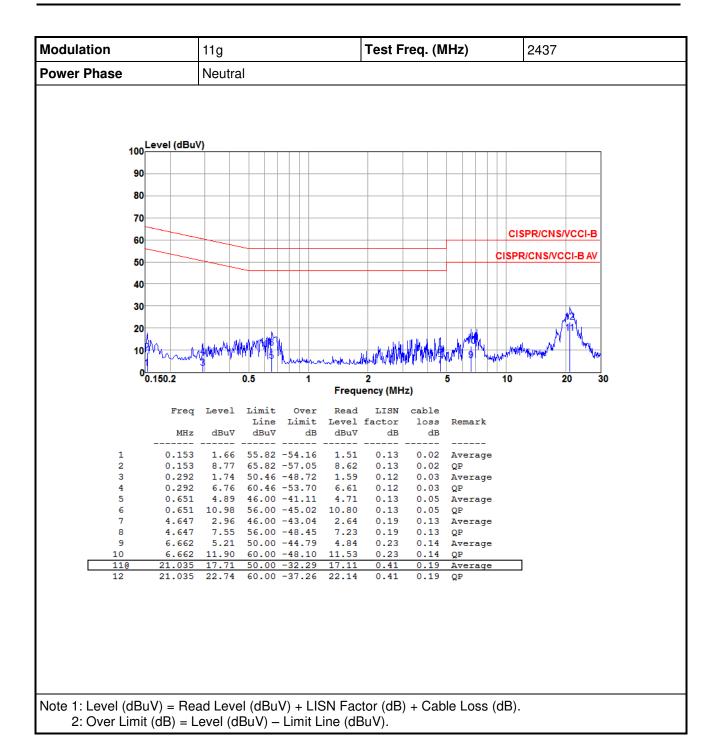


#### 3.1.4 Test Result of Conducted Emissions



Report No.: FR5D0701AC Page: 15 of 58





Report No.: FR5D0701AC Page: 16 of 58



# 3.2 6dB and Occupied Bandwidth

#### 3.2.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

#### 3.2.2 Test Procedures

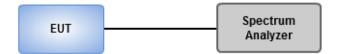
#### 6dB Bandwidth

- 1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
- 2. Detector = Peak, Trace mode = max hold.
- 3. Sweep = auto couple, Allow the trace to stabilize.
- 4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

#### **Occupied Bandwidth**

- 1. Set resolution bandwidth (RBW) = 300 kHz, Video bandwidth = 1 MHz.
- 2. Detector = Sample, Trace mode = max hold.
- 3 Sweep = auto couple, Allow the trace to stabilize.
- 4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

#### 3.2.3 Test Setup

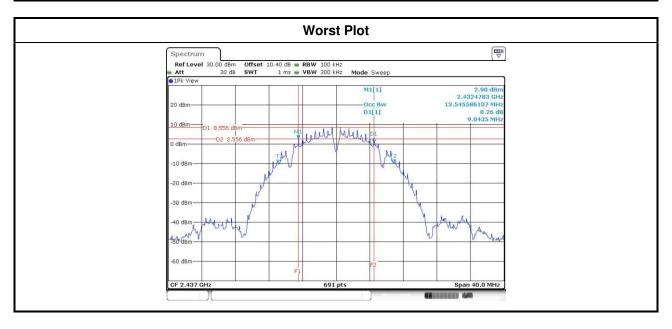


Report No.: FR5D0701AC Page: 17 of 58



# 3.2.4 Test Result of 6dB and Occupied Bandwidth

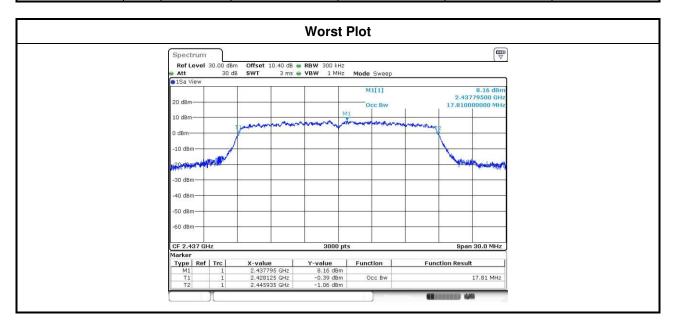
Modulation	N	Eros (MU=)			Limit (kHz)		
Mode	N <sub>TX</sub>	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	LIIIII (KIIZ)
11b	1	2412	9.04				500
11b	1	2437	9.04				500
11b	1	2462	9.04				500
11g	1	2412	15.54				500
11g	1	2437	15.36				500
11g	1	2462	15.36				500
HT20	1	2412	15.94				500
HT20	1	2437	15.88				500
HT20	1	2462	15.88				500



Report No.: FR5D0701AC Page: 18 of 58



Modulation	N	Freq.		99% Occupied E	Bandwidth (MHz)	
Mode	N <sub>TX</sub>	(MHz)	Chain 0	Chain 1	Chain 2	Chain 3
11b	1	2412	13.70			
11b	1	2437	13.59			
11b	1	2462	13.52			
11g	1	2412	16.90			
11g	1	2437	16.90			
11g	1	2462	16.88			
HT20	1	2412	17.78			
HT20	1	2437	17.81			
HT20	1	2462	17.78			



Report No.: FR5D0701AC Page: 19 of 58



## 3.3 RF Output Power

### 3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.

Antenna gain > 6dBi

Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB

Fixed, point to point operations
Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations, no any corresponding reduction is in transmitter peak output power

#### 3.3.2 Test Procedures

Maximum Peak Conducted Output Power

#### 

- 1. Set RBW = 1MHz, VBW = 3MHz, Detector = Peak.
- 2. Sweep time = auto, Trace mode = max hold, Allow trace to fully stabilize.
- 3. Use the spectrum analyzer channel power measurement function with the band limits set equal to the DTS bandwidth edges.

#### Nower meter

- A broadband Peak RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.
- Maximum Conducted Output Power (For reference only)

#### Nower meter

 A broadband Average RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

#### 3.3.3 Test Setup



Report No.: FR5D0701AC Page: 20 of 58



# 3.3.4 Test Result of Maximum Output Power

	N <sub>TX</sub>			Peak conducted Output Power (dBm)						Ant		EIRP
Modulation Mode		N <sub>TX</sub> Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Total Power (mW)	Total Power (dBm)	Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	Limit (dBm)
11b	1	2412	19.14				82.035	19.14	30.00	1.25	20.39	36.00
11b	1	2437	18.86				76.913	18.86	30.00	1.25	20.11	36.00
11b	1	2462	18.75				74.989	18.75	30.00	1.25	20.00	36.00
11g	1	2412	23.23				210.378	23.23	30.00	1.25	24.48	36.00
11g	1	2437	23.42				219.786	23.42	30.00	1.25	24.67	36.00
11g	1	2462	23.36				216.770	23.36	30.00	1.25	24.61	36.00
HT20	1	2412	22.79				190.108	22.79	30.00	1.25	24.04	36.00
HT20	1	2437	23.25				211.349	23.25	30.00	1.25	24.50	36.00
HT20	1	2462	23.08				203.236	23.08	30.00	1.25	24.33	36.00

Modulation	N <sub>TX</sub>	Freq.	Condi	ucted (Average)	Output Power	(dBm)	Total	Total	Limit
Mode		(MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Power (mW)	Power (dBm)	(dBm)
11b	1	2412	16.91				49.091	16.91	
11b	1	2437	16.71				46.881	16.71	
11b	1	2462	16.52				44.875	16.52	
11g	1	2412	16.69				46.666	16.69	
11g	1	2437	16.98				49.888	16.98	
11g	1	2462	16.68				46.559	16.68	
HT20	1	2412	15.78				37.844	15.78	
HT20	1	2437	16.89				48.865	16.89	
HT20	1	2462	15.89				38.815	15.89	

Note: Conducted average output power is for reference only.

Report No.: FR5D0701AC Page: 21 of 58



# 3.4 Power Spectral Density

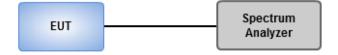
### 3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

#### 3.4.2 Test Procedures

- Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.
  - Set the RBW = 3kHz, VBW = 10kHz.
  - Detector = Peak, Sweep time = auto couple.
  - 3. Trace mode = max hold, allow trace to fully stabilize.
  - 4. Use the peak marker function to determine the maximum amplitude level.
- Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit.
  - Set the RBW = 100kHz, VBW = 300 kHz.
  - 2. Detector = RMS, Sweep time = auto couple.
  - 3. Set the sweep time to: ≥ 10 x (number of measurement points in sweep) x (maximum data rate per stream).
  - 4. Perform the measurement over a single sweep.
  - 5. Use the peak marker function to determine the maximum amplitude level.

### 3.4.3 Test Setup

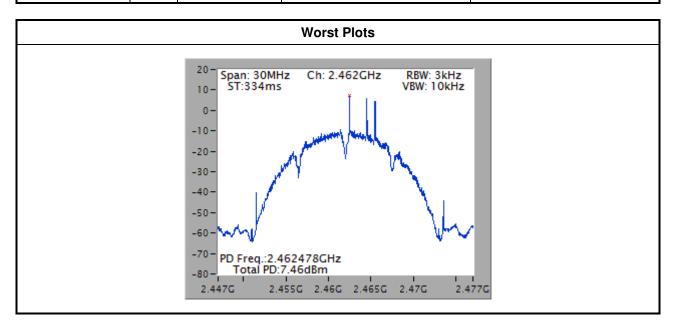


Report No.: FR5D0701AC Page: 22 of 58



## 3.4.4 Test Result of Power Spectral Density

Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	1	2412	7.36	8.00
11b	1	2437	7.31	8.00
11b	1	2462	7.46	8.00
11g	1	2412	-9.47	8.00
11g	1	2437	-9.80	8.00
11g	1	2462	-9.98	8.00
HT20	1	2412	-9.88	8.00
HT20	1	2437	-9.03	8.00
HT20	1	2462	-9.46	8.00



Report No.: FR5D0701AC Page: 23 of 58



## 3.5 Unwanted Emissions into Restricted Frequency Bands

### 3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

	Restricted Band	Emissions Limit	
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

#### Note 1:

Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit **Note 2**:

Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

#### 3.5.2 Test Procedures

- 1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
- 2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
- 3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

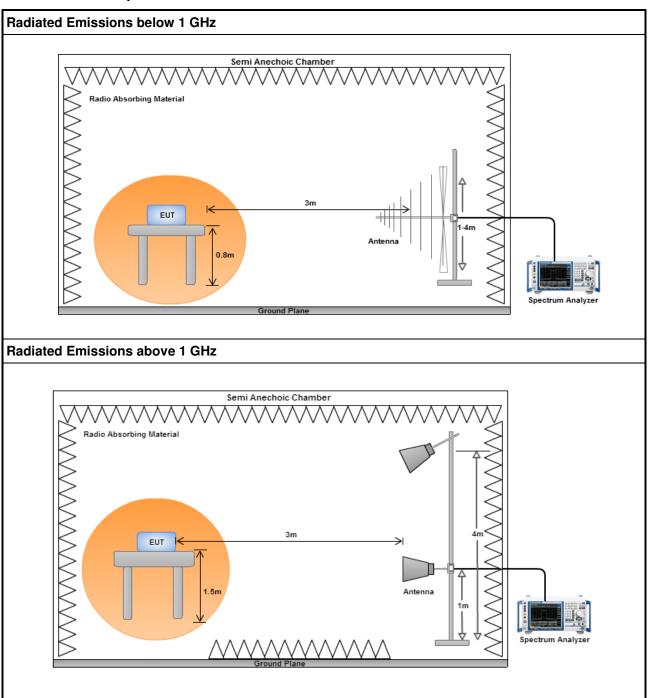
#### Note:

- 1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
- 2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
- RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

Report No.: FR5D0701AC Page: 24 of 58



## 3.5.3 Test Setup



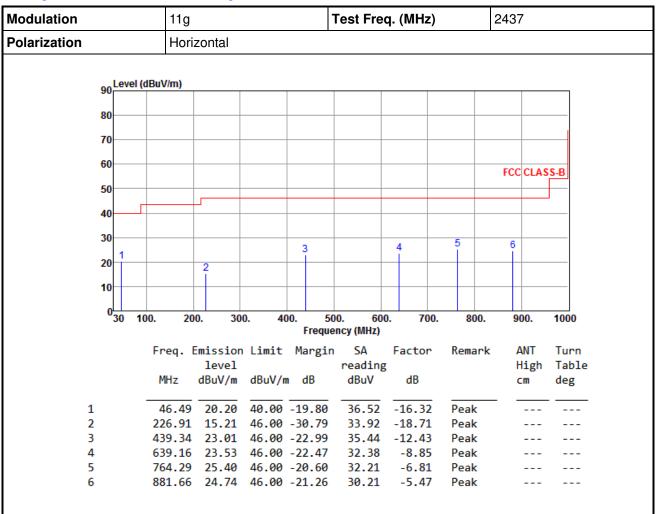
Report No.: FR5D0701AC

Page: 25 of 58



### 3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

#### Configuration 1: Antenna cable length: 400mm



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

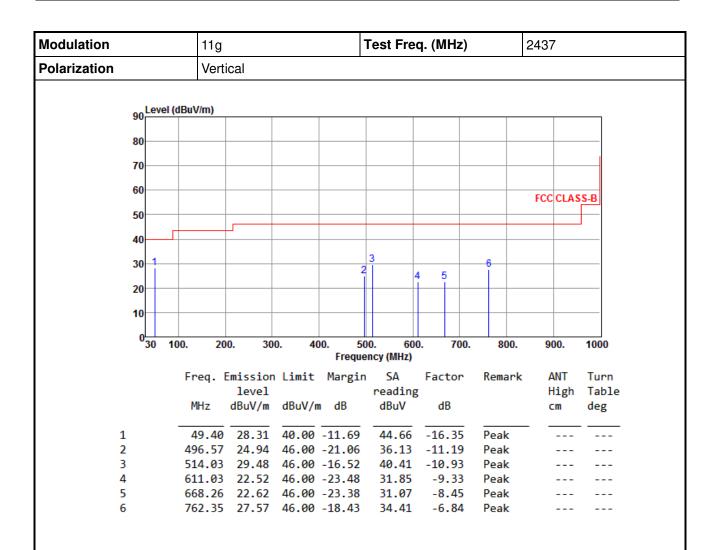
\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR5D0701AC Page: 26 of 58





Note 1: Emission Level  $(dBuV/m) = SA Reading (dBuV/m) + Factor^* (dB)$ 

\*Factor includes antenna factor, cable loss and amplifier gain

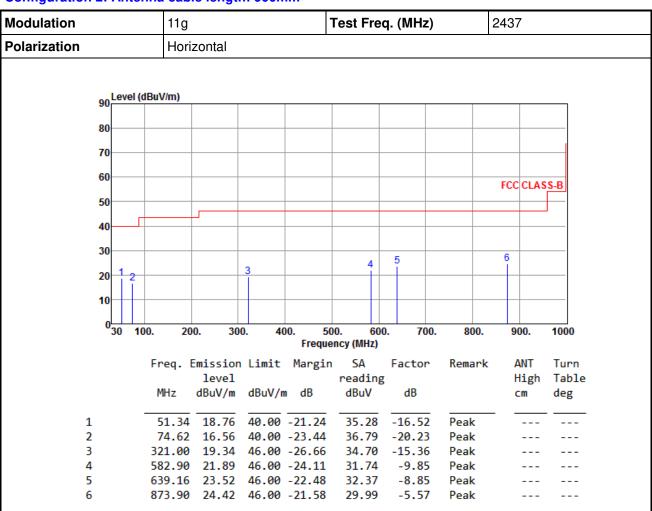
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR5D0701AC Page: 27 of 58



#### Configuration 2: Antenna cable length: 900mm



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR5D0701AC Page: 28 of 58



Modulation			11g			-	Test Fre	q. (MHz)		2437	7			
Polarization			Vert	Vertical										
	1.	evel (	dBuV/m)											
	90	7010												
	80													
	70													
	70													
	60									FCC	CLAS	S-B		
	50										02710			
		Г										J		
	40													
	30	1					4	5		6				
	20				3					_Ĭ				
			2		Ĭ									
	10													
	03	0 1	00. 20	0. 30	0 40	00. 50	00. 60	0. 700.	800.	0/	00.	1000		
	,	0 1	00. 20	0. 30	U. 41		ncy (MHz)	0. 700.	000.	31	υυ.	1000		
			Freq. I	Emission	Limit	Margin	SA	Factor	Remark	4	ANT	Turn		
				level			reading			H	ligh	Table		
			MHz	dBuV/m	dBuV/r	n dB	dBuV	dB		C	m	deg		
1			51 3/	26.18	10 00	-13.82	42.70	-16.52	Peak					
2			145.43			-29.53		-16.84	Peak					
3			321.00	17.48	46.00	-28.52	32.84		Peak					
4			515.00	25.37	46.00	-20.63	36.29	-10.92	Peak					

639.16 23.70 46.00 -22.30 32.55 -8.85

875.84 24.60 46.00 -21.40 30.14 -5.54

Peak

Peak

Note 1: Emission Level  $(dBuV/m) = SA Reading (dBuV/m) + Factor^* (dB)$ 

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

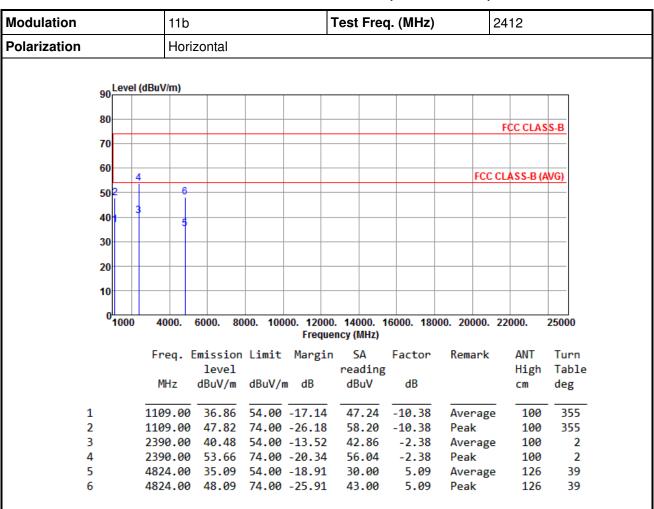
Report No.: FR5D0701AC Page: 29 of 58

Report Version: Rev. 01

5



## 3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11b



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

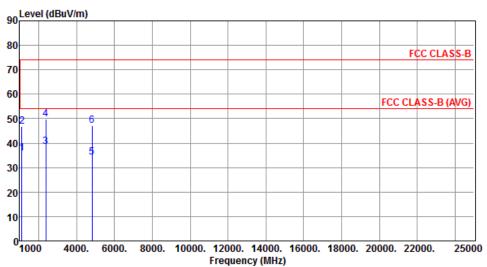
\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Report No.: FR5D0701AC Page: 30 of 58



Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



		Emission level		Ū	SA reading		Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		CM	deg
4	1100 00	25.72	<u></u>	10 20	46 40	10.20	<u> </u>	210	70
1	1109.00	35.72	54.00	-18.28	46.10	-10.38	Average	210	76
2	1109.00	46.76	74.00	-27.24	57.14	-10.38	Peak	210	76
3	2390.00	38.37	54.00	-15.63	40.75	-2.38	Average	277	91
4	2390.00	49.79	74.00	-24.21	52.17	-2.38	Peak	277	91
5	4824.00	34.12	54.00	-19.88	29.03	5.09	Average	222	273
6	4824.00	47.27	74.00	-26.73	42.18	5.09	Peak	222	273

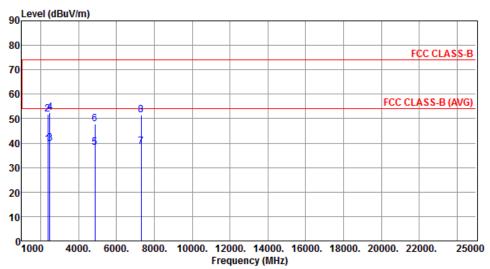
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 31 of 58



Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Ū	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.55	54.00	-14.45	41.93	-2.38	Average	103	0
2	2390.00	51.95	74.00	-22.05	54.33	-2.38	Peak	103	0
3	2483.50	39.93	54.00	-14.07	42.29	-2.36	Average	103	0
4	2483.50	52.41	74.00	-21.59	54.77	-2.36	Peak	103	0
5	4874.00	38.12	54.00	-15.88	32.84	5.28	Average	138	26
6	4874.00	47.96	74.00	-26.04	42.68	5.28	Peak	138	26
7	7311.00	38.43	54.00	-15.57	28.83	9.60	Average	182	345
8	7311.00	51.60	74.00	-22.40	42.00	9.60	Peak	182	345

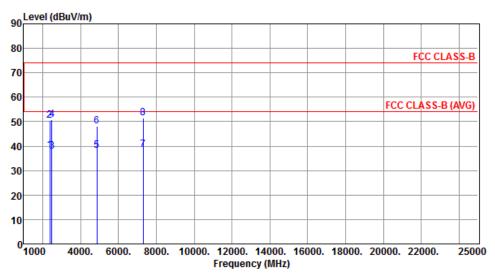
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 32 of 58



Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



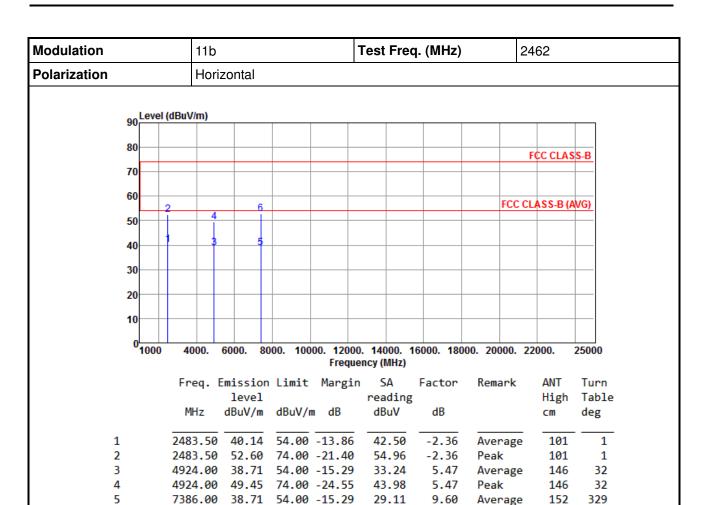
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2390.00	38.10	54.00	-15 90	40.48	-2.38	Average	281	94
2	2390.00		74.00		53.01	-2.38	Peak	281	94
3	2483.50	38.02	54.00	-15.98	40.38	-2.36	Average	281	94
4	2483.50	50.94	74.00	-23.06	53.30	-2.36	Peak	281	94
5	4874.00	38.07	54.00	-15.93	32.79	5.28	Average	186	233
6	4874.00	48.14	74.00	-25.86	42.86	5.28	Peak	186	233
7	7311.00	38.44	54.00	-15.56	28.84	9.60	Average	220	224
8	7311.00	51.62	74.00	-22.38	42.02	9.60	Peak	220	224

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 33 of 58





43.06

9.60

Peak

152

329

Note 1: Emission Level  $(dBuV/m) = SA Reading (dBuV/m) + Factor^* (dB)$ 

7386.00 52.66 74.00 -21.34

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 34 of 58

Report Version: Rev. 01

6



1

2

3

4

5

6

Modulation			11b	)				Tes	Freq	. (MH	lz)		246	62	
Polarization			Ver	tical											
	90Le	vel (dBu	V/m)												
	80														
	70												FC	CC CLAS	S-B
	60				6							FC	C CLA	ASS-B (A	(VG)
	50	2	4		1										-
	40	+	+ 3	3	-5										
	30—	+													
	20														
	0														
	<sup>0</sup> 10	00 4	1000.	6000.	800	0. 100	000. 120 Fred	00. 14 Juency (		6000.	18000.	20000	). 220	000.	25000
				lev	el		Marg	rea	ding	Facto	or I	Remar	k	ANT High	Turn Table
		1	MHz	dBuV	/m	dBuV/	m dB	dl	BuV	dB				CM	deg

40.99

53.10

32.97

42.98

28.95

42.58

-2.36

-2.36

5.47

5.47

9.60

9.60

Average

Peak Average

Peak

Peak

Average

277

277

287

287

196

196

100

100

158

158

352

352

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB) \*Factor includes antenna factor, cable loss and amplifier gain

2483.50 38.63 54.00 -15.37

7386.00 52.18 74.00 -21.82

38.44

48.45

38.55

2483.50

4924.00

4924.00

7386.00

50.74 74.00 -23.26

54.00 -15.56

74.00 -25.55

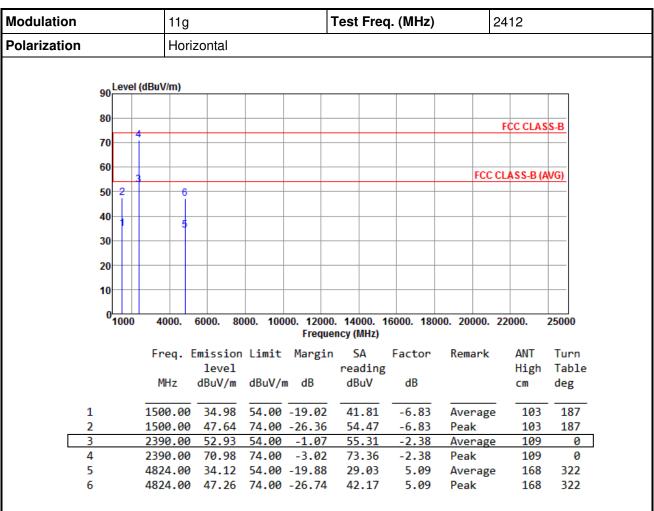
54.00 -15.45

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 35 of 58



## 3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Report No.: FR5D0701AC Page: 36 of 58



2

3

4

5

6

Modulation			11g				Test Fi	req. (MHz)	)	2412	
Polarization			Vert	ical			•			<u> </u>	
	90 Lev	rel (dBu	V/m)								
	80										
	70	4								FCC CLAS	SS-B
	60								ECC	C CLASS-B (A	WG
	50 2	3	6						100	C CLA33-D (A	
	40		5								
	30										
	20										
	10										
	<sup>0</sup> 100	00 4	1000.	6000. 80	00. 100		00. 14000 uency (MH	. 16000. 18 z)	000. 20000.	22000.	25000
		Fi	req. I	Emission level	Limit	Marg	in SA		Remark		Turn
		1	MHz	dBuV/m	dBuV/r	n dB	readi dBuV	_		High cm	Table deg
1		150	00.00	34.64	54.00	-19.3	6 41.4	7 -6.83	Averag	ge 123	242

54.79

50.75

70.36

28.47

42.37

-6.83

-2.38

-2.38

5.09

5.09

Peak

Peak

Peak

Average

Average

242

254

254

316

316

123

226

226

193

193

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)
\*Factor includes antenna factor, cable loss and amplifier gain

1500.00 47.96 74.00 -26.04

4824.00 33.56 54.00 -20.44

4824.00 47.46 74.00 -26.54

54.00 -5.63

67.98 74.00 -6.02

2390.00 48.37

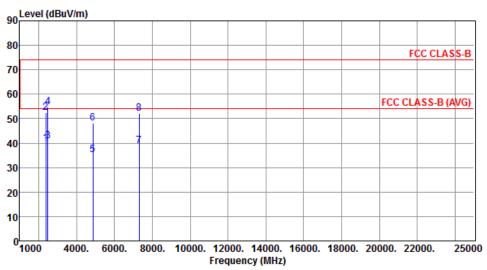
2390.00

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 37 of 58



Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



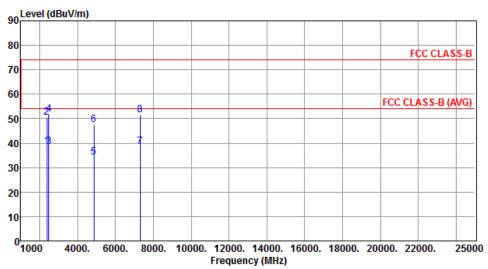
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Ū	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.69	54.00	-14.31	42.07	-2.38	Average	100	359
2	2390.00	52.31	74.00	-21.69	54.69	-2.38	Peak	100	359
3	2483.50	40.91	54.00	-13.09	43.27	-2.36	Average	100	359
4	2483.50	54.66	74.00	-19.34	57.02	-2.36	Peak	100	359
5	4874.00	35.11	54.00	-18.89	29.83	5.28	Average	161	338
6	4874.00	48.24	74.00	-25.76	42.96	5.28	Peak	161	338
7	7311.00	38.98	54.00	-15.02	29.38	9.60	Average	226	11
8	7311.00	52.23	74.00	-21.77	42.63	9.60	Peak	226	11

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 38 of 58



Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		

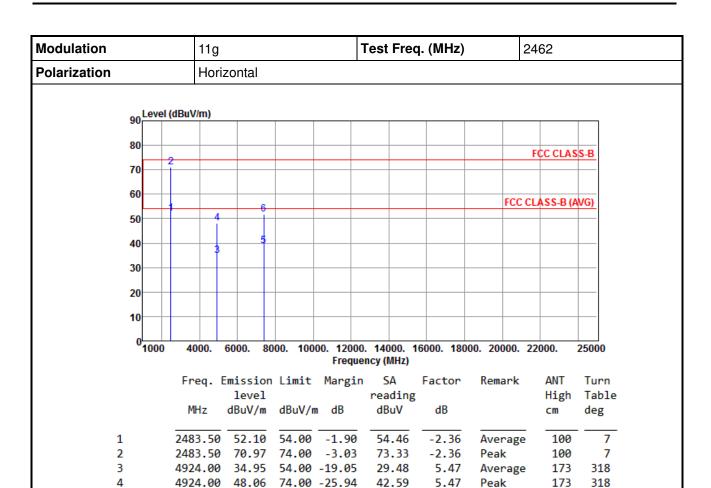


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m		SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.41	54.00	-15.59	40.79	-2.38	Average	142	11
2	2390.00	50.56	74.00	-23.44	52.94	-2.38	Peak	142	11
3	2483.50	38.40	54.00	-15.60	40.76	-2.36	Average	142	11
4	2483.50	51.73	74.00	-22.27	54.09	-2.36	Peak	142	11
5	4874.00	34.32	54.00	-19.68	29.04	5.28	Average	198	326
6	4874.00	47.55	74.00	-26.45	42.27	5.28	Peak	198	326
7	7311.00	38.61	54.00	-15.39	29.01	9.60	Average	214	138
8	7311.00	51.48	74.00	-22.52	41.88	9.60	Peak	214	138

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 39 of 58





\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 40 of 58

Report Version: Rev. 01

5

6

7386.00

38.72

7386.00 51.94 74.00 -22.06

54.00 -15.28

29.12

42.34

9.60

9.60

Average

Peak

233

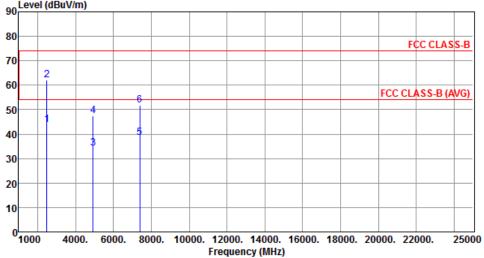
233

15

15



Modulation 11g		Test	Test Freq. (MHz)			24	2462			
Polarization		Vertical								
90	Level (dBu\	//m)								



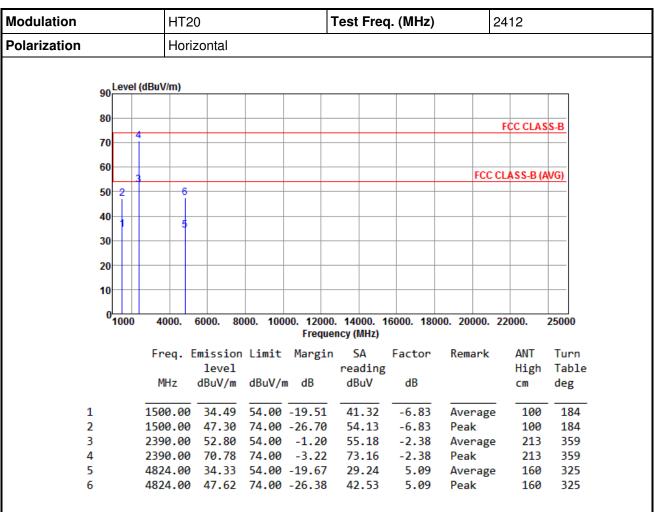
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2483.50	43.94	54.00	-10.06	46.30	-2.36	Average	351	133
2	2483.50	62.08	74.00	-11.92	64.44	-2.36	Peak	351	133
3	4924.00	34.12	54.00	-19.88	28.65	5.47	Average	192	324
4	4924.00	47.43	74.00	-26.57	41.96	5.47	Peak	192	324
5	7386.00	38.62	54.00	-15.38	29.02	9.60	Average	211	124
6	7386.00	51.89	74.00	-22.11	42.29	9.60	Peak	211	124

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 41 of 58



## 3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

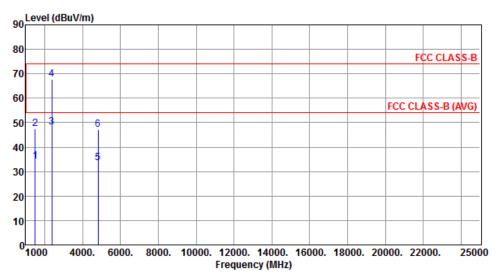
\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Report No.: FR5D0701AC Page: 42 of 58



Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



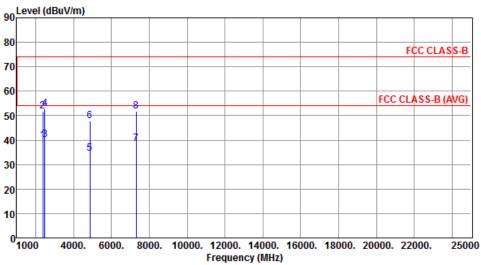
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Ü	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.29	54.00	-19.71	41.12	-6.83	Average	127	256
2	1500.00	47.48	74.00	-26.52	54.31	-6.83	Peak	127	256
3	2390.00	48.03	54.00	-5.97	50.41	-2.38	Average	222	266
4	2390.00	67.60	74.00	-6.40	69.98	-2.38	Peak	222	266
5	4824.00	33.62	54.00	-20.38	28.53	5.09	Average	196	322
6	4824.00	47.20	74.00	-26.80	42.11	5.09	Peak	196	322

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 43 of 58



Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		
on Level (dBu\	//m)		



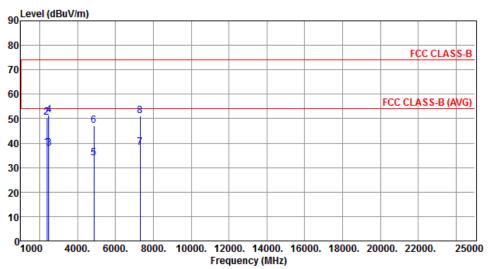
	Freq.	Emission level dBuV/m	Limit dBuV/m	Ū	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.79	54.00	-14.21	42.17	-2.38	Average	266	348
2	2390.00	51.71	74.00	-22.29	54.09	-2.38	Peak	266	348
3	2483.50	40.25	54.00	-13.75	42.61	-2.36	Average	266	348
4	2483.50	52.74	74.00	-21.26	55.10	-2.36	Peak	266	348
5	4874.00	34.68	54.00	-19.32	29.40	5.28	Average	165	334
6	4874.00	47.80	74.00	-26.20	42.52	5.28	Peak	165	334
7	7311.00	38.46	54.00	-15.54	28.86	9.60	Average	237	15
8	7311.00	51.72	74.00	-22.28	42.12	9.60	Peak	237	15

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 44 of 58



Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m		SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.13	54.00	-15.87	40.51	-2.38	Average	146	23
2	2390.00	50.35	74.00	-23.65	52.73	-2.38	Peak	146	23
3	2483.50	38.01	54.00	-15.99	40.37	-2.36	Average	146	23
4	2483.50	51.56	74.00	-22.44	53.92	-2.36	Peak	146	23
5	4874.00	33.84	54.00	-20.16	28.56	5.28	Average	194	321
6	4874.00	47.04	74.00	-26.96	41.76	5.28	Peak	194	321
7	7311.00	38.29	54.00	-15.71	28.69	9.60	Average	213	134
8	7311.00	51.11	74.00	-22.89	41.51	9.60	Peak	213	134

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 45 of 58



3

4

5

6

Modulation	HT20	HT20			Test Freq. (MHz)			2462		
Polarization	Horizo	Horizontal								
90 Level (	dBuV/m)								$\overline{}$	
80										
	,							FCC CLAS	S-B	
70 2										
60							FCC	CLASS-B (A	WG)	
50	4	6					100	CENSS-D (F		
		الٍا								
40	3									
30										
20										
10										
10										
01000	4000. 60	00. 800	00. 1000		). 14000. 1 ency (MHz)	6000. 180	00. 20000.	22000.	25000	
	Freq. Emi	ission	Limit	Margin	SA	Factor	Remark	ANT	Turn	
	]	level			reading			High	Tabl	
	MHz dE	BuV/m	dBuV/m	dB	dBuV	dB		cm	deg	
1	2483.50	52.47	54.00	-1.53	54.83	-2.36	Average	e 284	359	
2	2483.50					-2.36	Peak	284	359	

28.85

42.07

28.59

41.86

5.47

5.47

9.60

9.60

Average

Average

Peak

Peak

169

169

237

237

327

327

19

19

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB) \*Factor includes antenna factor, cable loss and amplifier gain

4924.00 34.32 54.00 -19.68

4924.00 47.54 74.00 -26.46

7386.00 38.19 54.00 -15.81

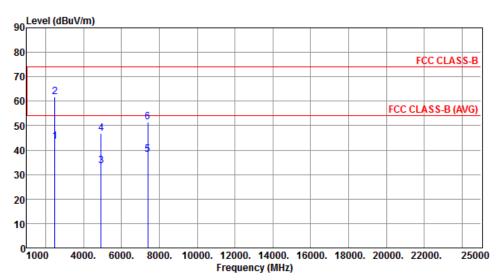
7386.00 51.46 74.00 -22.54

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Report No.: FR5D0701AC Page: 46 of 58



Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		



	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2483.50	43.41	54.00	-10.59	45.77	-2.36	Average	354	139
2	2483.50	61.70	74.00	-12.30	64.06	-2.36	Peak	354	139
3	4924.00	33.65	54.00	-20.35	28.18	5.47	Average	199	327
4	4924.00	46.87	74.00	-27.13	41.40	5.47	Peak	199	327
5	7386.00	38.11	54.00	-15.89	28.51	9.60	Average	217	131
6	7386.00	51.40	74.00	-22.60	41.80	9.60	Peak	217	131

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR5D0701AC Page: 47 of 58



# 3.6 Emissions in Non-Restricted Frequency Bands

### 3.6.1 Emissions in Non-Restricted Frequency Bands Limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz

### 3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

### 3.6.3 Test Procedures

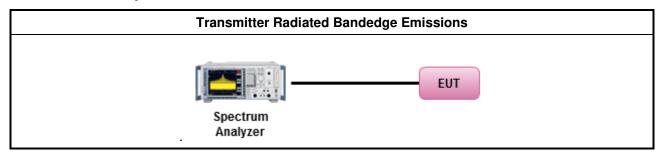
#### Reference level measurement

- 1. Set RBW=100kHz, VBW = 300kHz, Detector = Peak, Sweep time = Auto
- 2. Trace = max hold, Allow Trace to fully stabilize
- 3. Use the peak marker function to determine the maximum PSD level

#### **Emission level measurement**

- 1. Set RBW=100kHz, VBW = 300kHz, Detector = Peak, Sweep time = Auto
- 2. Trace = max hold, Allow Trace to fully stabilize
- 3. Scan Frequency range is up to 25GHz
- 4. Use the peak marker function to determine the maximum amplitude level

### 3.6.4 Test Setup

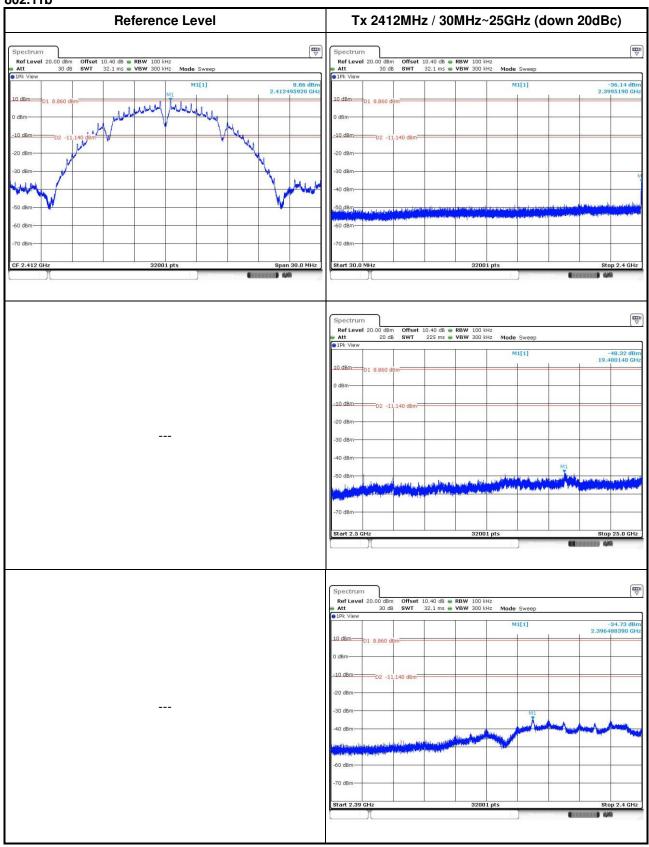


Report No.: FR5D0701AC Page: 48 of 58



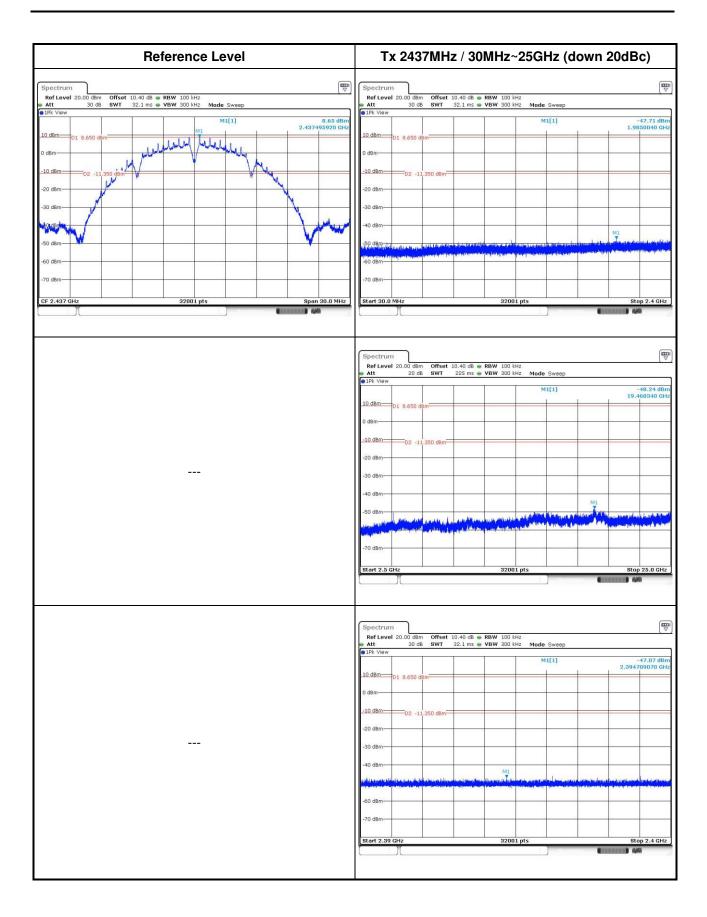
## 3.6.5 Unwanted Emissions into Non-Restricted Frequency Bands

### 802.11b



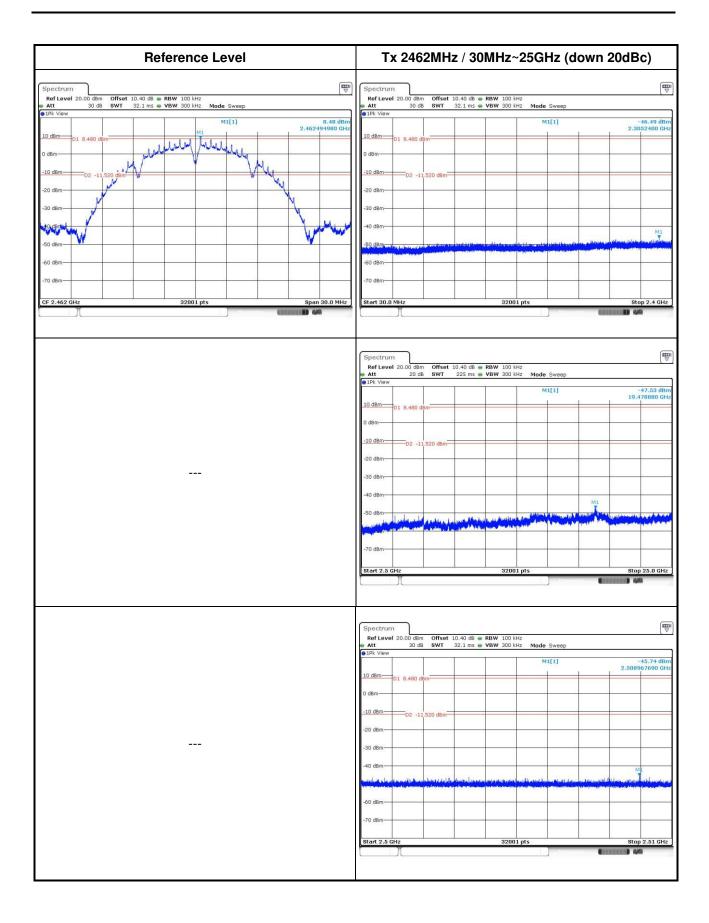
Report No.: FR5D0701AC Report Version: Rev. 01





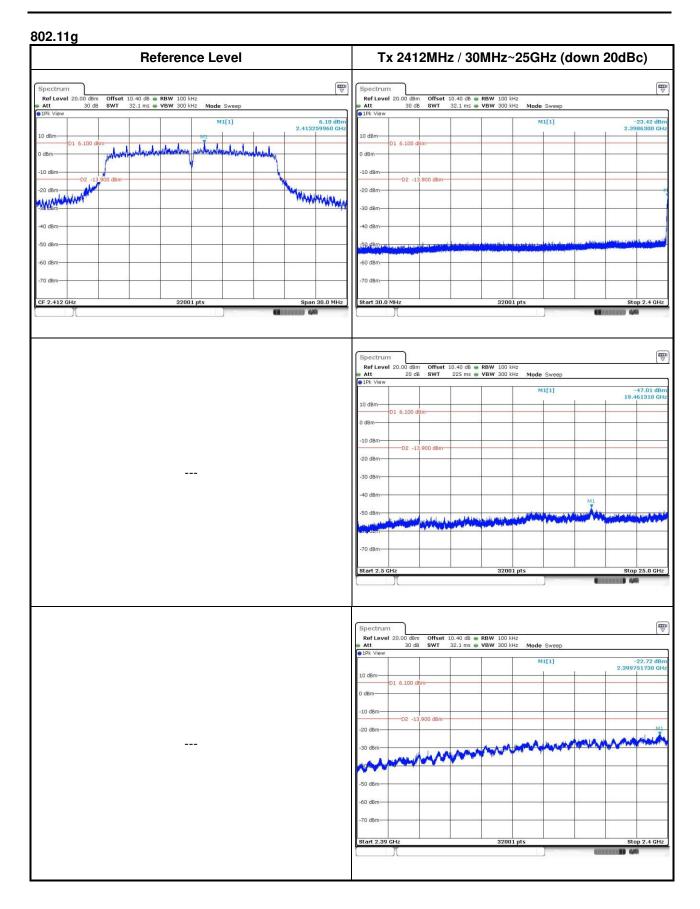
Report No.: FR5D0701AC Page: 50 of 58





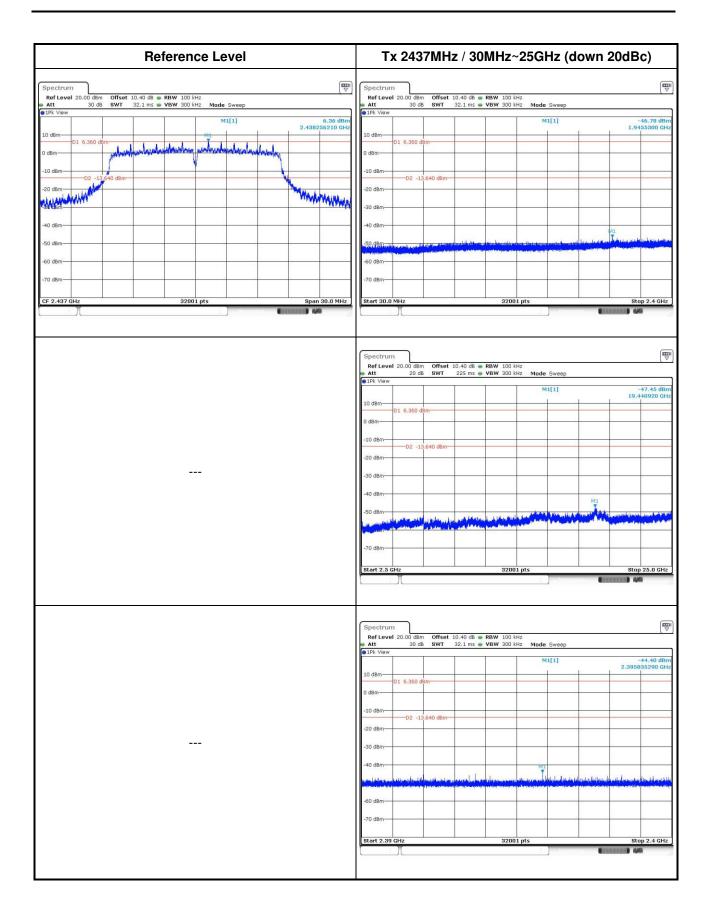
Report No.: FR5D0701AC Page: 51 of 58





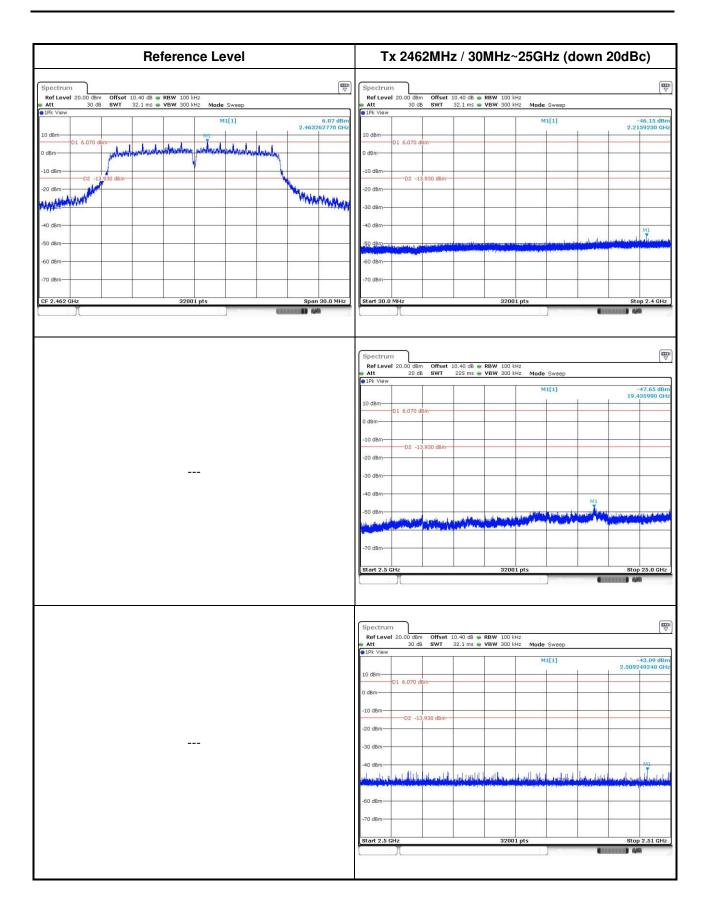
Report No.: FR5D0701AC Page: 52 of 58





Report No.: FR5D0701AC Page: 53 of 58

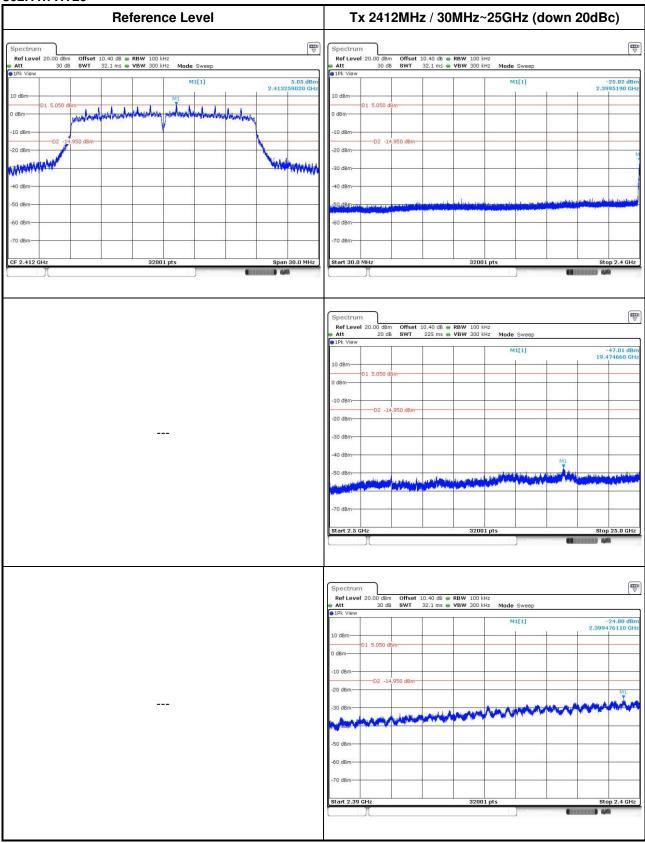




Report No.: FR5D0701AC Page: 54 of 58

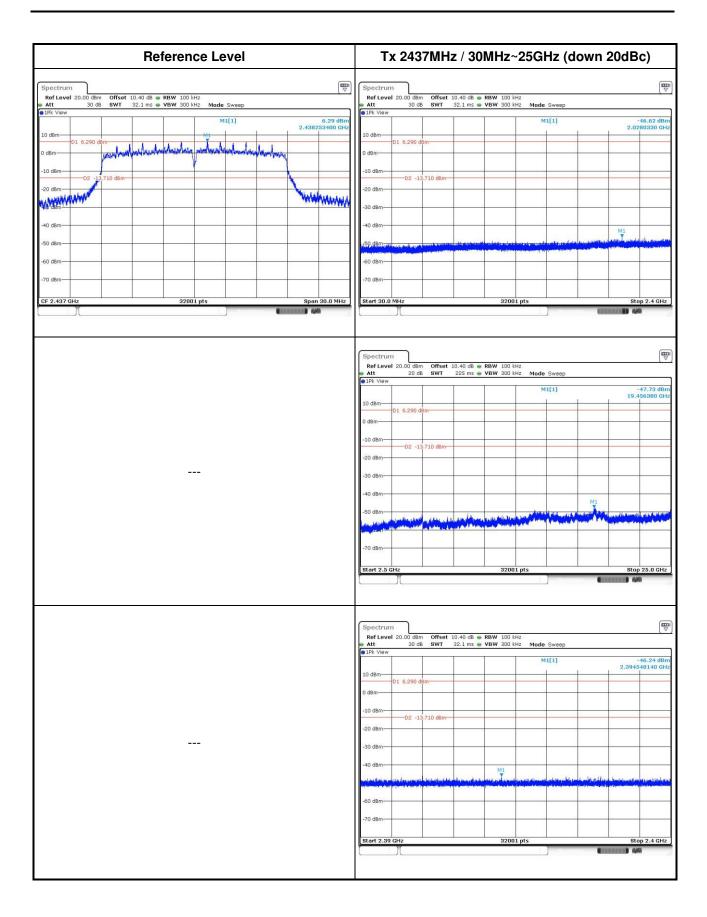


## 802.11n HT20



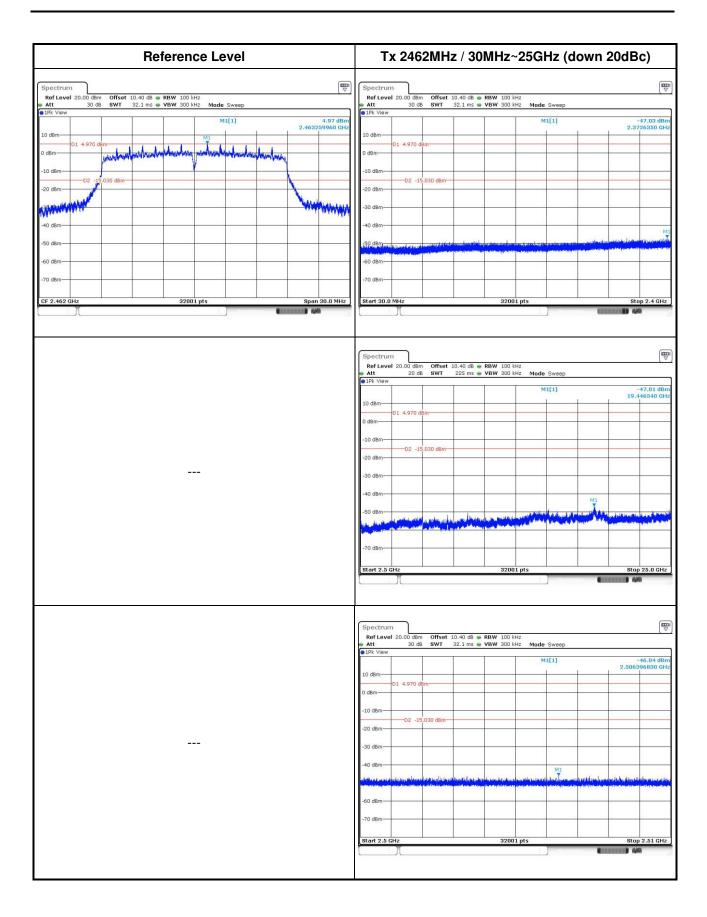
Report No.: FR5D0701AC Page: 55 of 58





Report No.: FR5D0701AC Page: 56 of 58





Report No.: FR5D0701AC Page: 57 of 58



# 4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website <a href="http://www.icertifi.com.tw">http://www.icertifi.com.tw</a>.

Linkou

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan,

R.O.C.

Kwei Shan

Tel: 886-3-271-8666 No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan

Hsien 333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666 Fax: 886-3-318-0155

Email: ICC\_Service@icertifi.com.tw

==END==

Report No.: FR5D0701AC Page: 58 of 58