

FCC/IC RF Test Report

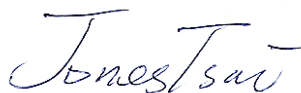
APPLICANT : Kilpatrick LLC
EQUIPMENT : Tablet PC
MODEL NAME : C9R6QM
FCC ID : S2F-8560
IC : 10888A-8560
STANDARD : FCC Part 15 Subpart E §15.407
IC RSS-210 issue 8
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product testing was completed on Aug. 30, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR332726-04C	Rev. 01	Initial issue of report	Aug. 23, 2013
FR332726-04C	Rev. 02	Update report for description of EBW instead of 26dB Bandwidth for straddle channel in section 3.1.5	Aug. 30, 2013
FR332726-04C	Rev. 03	Update report for adding WLAN MIMO Tx Mode of conduction test data in section 2.3 and 3.5.5	Sep. 05, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	RSS-210 A9.2	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	RSS-210 A9.2	Maximum Conducted Output Power	≤ 17, 24, 30 dBm (depend on band)	Pass	-
3.3	15.407(a)	RSS-210 A9.2	Power Spectral Density	≤ 4, 11, 17 dBm (depend on band)	Pass	-
3.4	15.407(a)(6)	RSS-210 A9.3	Peak Excursion Ratio	≤ 13dB	Pass	-
3.5	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 8.20 dB at 0.158 MHz
3.7	15.407(c)	RSS-210 A9.4	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.7	15.203 & 15.407(a)	RSS-210 A9.2	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Kilpatrick LLC
102 S. Tejon Street
Suite 1100
Colorado Springs, Colorado 80903

1.2 Feature of Equipment Under Test

Product Feature	
Equipment	Tablet PC
Model Name	C9R6QM
FCC ID	S2F-8560
IC	10888A-8560
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 Bluetooth v3.0

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.3 Product Specification of Equipment Under Test

Product Specification subjective to this standard										
Tx/Rx Channel Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5580 MHz 5660 MHz ~ 5720 MHz									
Maximum Output Power	<5180 MHz ~ 5240 MHz> 802.11a : 14.6 dBm / 0.0288 W 802.11n HT20 : 14.6 dBm / 0.0288 W 802.11n HT40 : 14.5 dBm / 0.0282 W <5260 MHz ~ 5320 MHz> 802.11a : 14.6 dBm / 0.0288 W 802.11n HT20 : 14.4 dBm / 0.0275 W 802.11n HT40 : 14.6 dBm / 0.0288 W <5500 MHz ~ 5580 MHz and 5660 MHz ~ 5720 MHz > 802.11a : 14.8 dBm / 0.0302 W 802.11n HT20 : 14.7 dBm / 0.0295 W 802.11n HT40 : 14.7 dBm / 0.0295 W									
99% Occupied Bandwidth	802.11a : 17.65 MHz 802.11n HT20 : 18.65 MHz 802.11n HT40 : 36.72 MHz									
Antenna Type	<5180 MHz ~ 5240 MHz> Ant. 1 : Fixed internal Antenna with gain 2.70 dBi Ant. 2 : Fixed internal Antenna with gain 4.10 dBi <5260 MHz ~ 5320 MHz> Ant. 1 : Fixed internal Antenna with gain 3.00 dBi Ant. 2 : Fixed internal Antenna with gain 4.20 dBi <5500 MHz ~ 5580 MHz and 5660 MHz ~ 5720 MHz > Ant. 1 : Fixed internal Antenna with gain 3.80 dBi Ant. 2 : Fixed internal Antenna with gain 1.70 dBi									
Type of Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)									
Antenna Function Description	<table border="1"> <thead> <tr> <th></th> <th>Ant. 1</th> <th>Ant. 2</th> </tr> </thead> <tbody> <tr> <td>802.11 a MIMO</td> <td>V</td> <td>V</td> </tr> <tr> <td>802.11 n MIMO</td> <td>V</td> <td>V</td> </tr> </tbody> </table>		Ant. 1	Ant. 2	802.11 a MIMO	V	V	802.11 n MIMO	V	V
	Ant. 1	Ant. 2								
802.11 a MIMO	V	V								
802.11 n MIMO	V	V								

1.4 Modification of EUT

No modifications are made to the EUT during all test items.

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL INC.			
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH02-HY	CO05-HY	03CH08-HY	636805/4086B

The test site complies with ANSI C63.4 2003 requirement.

1.6 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart E
- ♦ FCC KDB 789033 D01 General UNII Test Procedures v01r03
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02.
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issued 8
- ♦ IC RSS-Gen Issue 3
- ♦ NOTICE 2012-DRS0126

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, "Receivers Excluded from Industry Canada Requirements", only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz).

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted test shown in section 2.3.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5150-5250 MHz Band 1	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5250-5350 MHz Band 2	52	5260	60	5300
	54	5270	62	5310
	56	5280	64	5320

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5500-5580 MHz and 5660-5720 MHz Band 3	100	5500	132	5660
	102	5510	134	5670
	104	5520	136	5680
	108	5540	140	5700
	110	5550	142	5710
	112	5560	144	5720
	116	5580	-	-

Note: The above Frequency and Channel in boldface were 802.11n HT40.

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and antenna configurations as following table and the highest power data rates were chosen for full test in the following tables.

MIMO <Ant. 1+2>

5GHz 802.11a mode								
Data Rate (Mbps)	6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
Power (dBm) <5180 ~ 5240 MHz >	14.6	14.4	14.3	14.3	14.2	14.2	14.2	14.2
Power (dBm) <5260 ~ 5320 MHz >	14.6	14.0	14.0	14.1	14.0	14.2	14.1	14.2
Power (dBm) <5500 ~ 5580 and 5660 ~ 5720 MHz>	14.8	14.2	13.9	14.1	14.1	14.3	14.4	14.4

5GHz 802.11n HT20 mode								
Data Rate (Mbps)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power (dBm) <5180 ~ 5240 MHz >	14.6	14.4	14.3	14.4	14.3	14.4	14.3	14.3
Power (dBm) <5260 ~ 5320 MHz >	14.4	14.2	14.2	14.2	14.2	14.3	14.3	14.3
Power (dBm) <5500 ~ 5580 and 5660 ~ 5720 MHz>	14.7	14.6	14.5	14.6	14.6	14.6	14.6	14.6

5GHz 802.11n HT20 mode								
Data Rate (Mbps)	MCS 8	MCS 9	MCS 10	MCS 11	MCS 12	MCS 13	MCS 14	MCS15
Power (dBm) <5180 ~ 5240 MHz >	14.4	14.3	14.3	14.4	14.3	14.4	14.3	14.3
Power (dBm) <5260 ~ 5320 MHz >	13.9	13.9	13.9	13.9	13.9	14.1	14.1	14.1
Power (dBm) <5500 ~ 5580 and 5660 ~ 5720 MHz>	14.3	14.4	14.4	14.5	14.4	14.5	14.4	14.3

5GHz 802.11n HT40 mode								
Data Rate (Mbps)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power (dBm) <5180 ~ 5240 MHz >	14.5	14.1	14.2	13.0	13.0	13.0	13.0	13.0
Power (dBm) <5260 ~ 5320 MHz >	14.6	14.0	14.0	12.2	13.0	12.9	13.0	12.9
Power (dBm) <5500 ~ 5580 and 5660 ~ 5720 MHz>	14.7	14.4	14.5	13.4	13.6	13.4	13.5	13.5

5GHz 802.11n HT40 mode								
Data Rate (Mbps)	MCS 8	MCS 9	MCS 10	MCS 11	MCS 12	MCS 13	MCS 14	MCS15
Power (dBm) <5180 ~ 5240 MHz >	14.2	14.1	14.1	12.8	12.8	12.9	12.9	12.9
Power (dBm) <5260 ~ 5320 MHz >	13.9	12.7	12.6	11.6	11.5	11.6	11.6	11.7
Power (dBm) <5500 ~ 5580 and 5660 ~ 5720 MHz>	14.4	13.3	13.2	12.1	12.0	12.1	12.0	12.1

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

2.3 Test Mode

Final results of test modes, data rates and test channels are shown as following table.

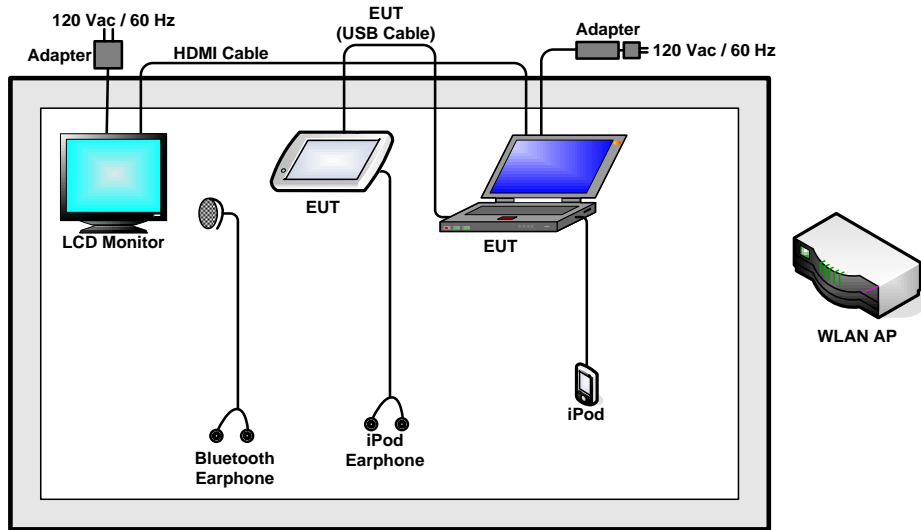
Test Cases				
	Test Items	Mode	Data rate	Test Channel
Conducted TCs	26dB and 99% BW Power Spectral Density	802.11a	6 Mbps	L/M/H/Straddle
		802.11n HT20	MCS0	L/M/H/Straddle
		802.11n HT40	MCS0	L/M/H/Straddle
	Output Power	802.11a	6 Mbps	L/M/H/Straddle
		802.11n HT20	MCS0	L/M/H/Straddle
		802.11n HT40	MCS0	L/M/H/Straddle
	Peak Excursion	802.11a	6 Mbps	L
		802.11n HT20	MCS0	L
		802.11n HT40	MCS0	L
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + Bluetooth Link + Earphone + USB Cable (Data Link With Notebook) + Camera <Fig. 1> Mode 2 : WLAN (5GHz) MIMO Tx + Earphone + USB Cable (Data Link With Notebook) + Camera <Fig. 2>			

Ch. #		Band 1 : 5150-5250 MHz	Band 2 : 5250-5350 MHz	Band 3 : 5500-5580 MHz and 5660-5720 MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

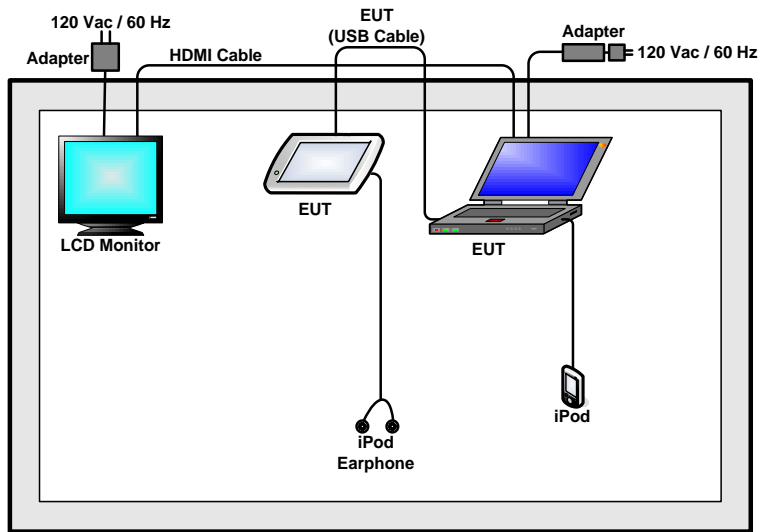
Ch. #		Band 1 : 5150-5250 MHz	Band 2 : 5250-5350 MHz	Band 3 : 5500-5580 MHz and 5660-5720 MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

Ch. #		Band 1 : 5150-5250 MHz	Band 2 : 5250-5350 MHz	Band 3 : 5500-5580 MHz and 5660-5720 MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134
Straddle		-	-	142

2.4 Connection Diagram of Test System



<Fig. 1>



<Fig. 2>

2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
3.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	iPod	Apple	A1285	DoC	Shielded, 1.0 m	N/A
5.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 1.0 m	N/A
6.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
7.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.6 Description of RF Function Operation Test Setup

For WLAN function, programmed RF utility, “ADB” installed in the EUT make the EUT provides functions like channel selection and power level for continuous transmitting and receiving signals.

2.7 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 4.2 + 10 = 14.2 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 26dB & 99% Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

There is no restriction limits for bandwidth. The maximum conducted output power can be limited by measured emission bandwidth (B).

For the band 5150-5250 MHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B.

For the bands 5250-5350 MHz, 5500 MHz ~ 5580 MHz and 5660 MHz ~ 5720 MHz, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B.

U-NII limits were applied for straddle channel in accordance with FCC KDB 644545 D01.

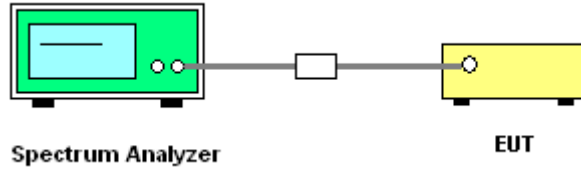
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.
Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.
Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) $\geq 3 * RBW$.
8. Measure and record the results in the test report.

3.1.4 Test Setup



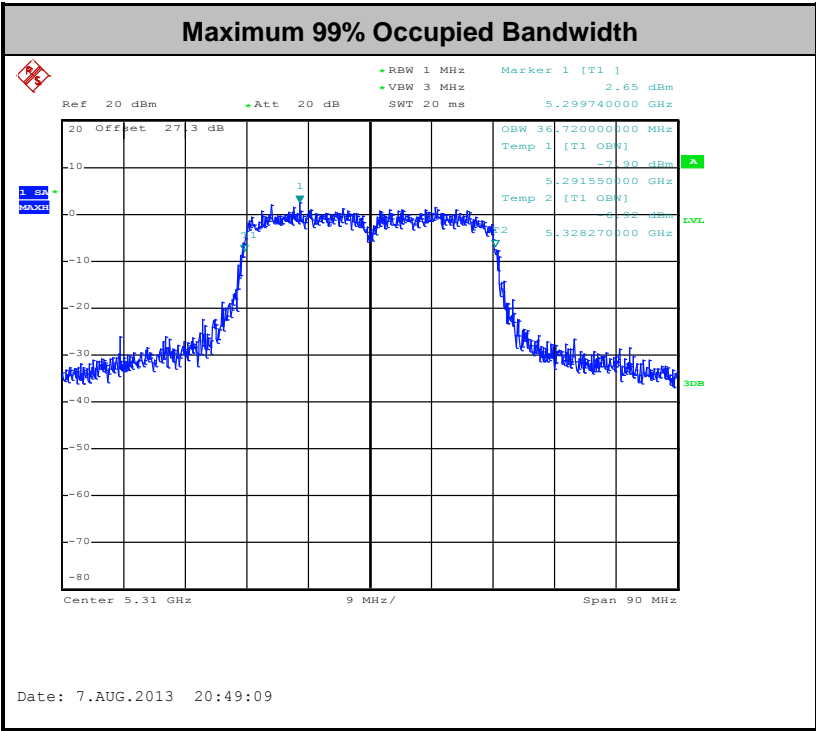
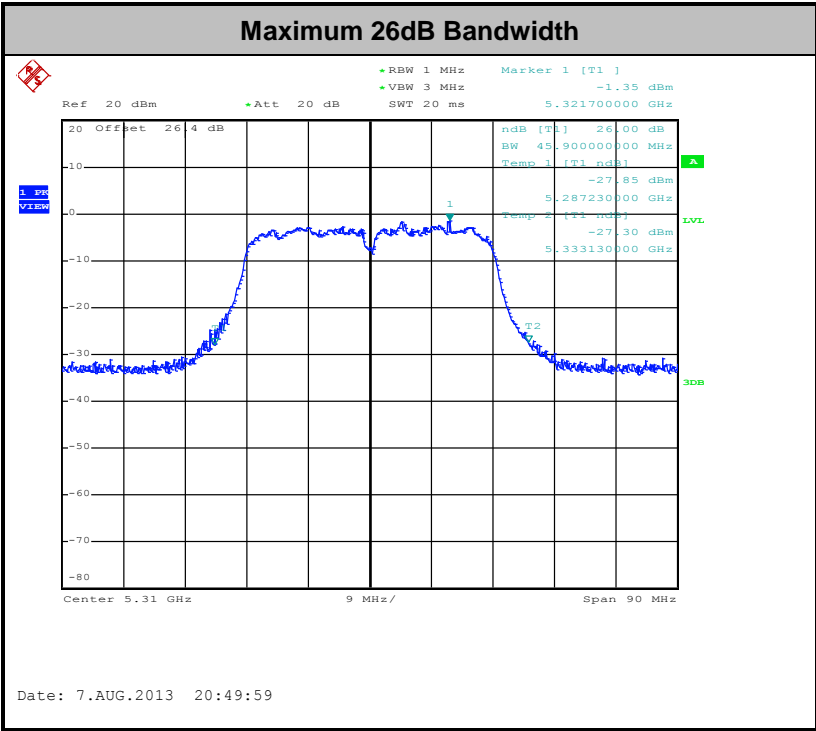
3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

Test Band :	5GHz band 1,2,3	Temperature :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	45~49%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)
					Ant. 1	Ant. 2	Ant.1	Ant. 2		
11a	6Mbps	2	36	5180	17.40	17.30	21.55	20.80	22.41	17
11a	6Mbps	2	44	5220	17.40	17.20	21.50	20.55	22.41	17
11a	6Mbps	2	48	5240	17.40	17.25	21.40	20.55	22.41	17
HT20	MCS0	2	36	5180	18.45	18.25	21.95	21.60	22.66	17
HT20	MCS0	2	44	5220	18.50	18.30	22.50	21.95	22.67	17
HT20	MCS0	2	48	5240	18.45	18.25	22.35	21.45	22.66	17
HT40	MCS0	2	38	5190	36.09	36.00	43.11	42.48	23.00	17
HT40	MCS0	2	46	5230	36.09	36.09	44.64	42.84	23.00	17

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)
					Ant. 1	Ant. 2	Ant. 1	Ant. 2		
11a	6Mbps	2	52	5260	17.45	17.60	21.90	21.65	29.46	24
11a	6Mbps	2	60	5300	17.65	17.15	23.50	20.65	29.47	24
11a	6Mbps	2	64	5320	17.60	17.25	22.90	20.60	29.46	24
HT20	MCS0	2	52	5260	18.45	18.25	22.70	21.75	29.66	24
HT20	MCS0	2	60	5300	18.60	18.20	23.80	21.30	29.70	24
HT20	MCS0	2	64	5320	18.65	18.25	23.60	21.30	29.71	24
HT40	MCS0	2	54	5270	36.09	36.00	45.09	42.57	30.00	24
HT40	MCS0	2	62	5310	36.72	36.72	44.91	45.90	30.00	24

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)
					Ant. 1	Ant. 2	Ant. 1	Ant. 2		
11a	6Mbps	2	100	5500	17.50	17.20	21.35	20.75	29.43	24
11a	6Mbps	2	116	5580	17.40	17.25	21.45	20.50	29.41	24
11a	6Mbps	2	140	5700	17.35	17.20	21.35	20.35	29.39	24
HT20	MCS0	2	100	5500	18.40	18.20	22.65	21.20	29.65	24
HT20	MCS0	2	116	5580	18.40	18.20	22.60	21.20	29.65	24
HT20	MCS0	2	140	5700	18.40	18.20	22.55	21.45	29.65	24
HT40	MCS0	2	102	5510	36.09	35.91	43.02	42.84	30.00	24
HT40	MCS0	2	110	5550	36.18	36.00	44.19	42.84	30.00	24
HT40	MCS0	2	134	5670	36.09	35.91	43.65	42.75	30.00	24



Test Band :	Straddle Channel	Temperature :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	45~49%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)		Emission Bandwidth (MHz)		IC 99% Bandwidth EIRP Limit (dBm)	FCC Emission Bandwidth Power Limit (dBm)
					Ant. 1	Ant. 2	Ant. 1	Ant. 2		
11a	6Mbps	2	144	5720	17.35	17.20	20.95	20.20	-	-
11a	6Mbps	2	144	Lower	13.75	13.65	15.40	15.20	28.38	22.88
11a	6Mbps	2	144	Upper	3.60	3.55	5.55	5.00	28.56	24.44
HT20	MCS0	2	144	5720	18.25	18.25	21.95	21.15	-	-
HT20	MCS0	2	144	Lower	14.20	14.20	16.10	15.70	28.52	23.07
HT20	MCS0	2	144	Upper	4.05	4.05	5.85	5.45	29.07	24.67
HT40	MCS0	2	142	5710	36.00	35.91	43.56	42.84	-	-
HT40	MCS0	2	142	Lower	33.09	33.09	37.32	36.60	30.00	24.00
HT40	MCS0	2	142	Upper	2.91	2.82	6.24	6.24	27.64	24.95

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5150-5250 MHz, the maximum conducted output power shall not exceed the lesser of 50 mW (17dBm) or $4 \text{ dBm} + 10\log B$, where B is the 26 dB emissions bandwidth in 1-MHz. If transmitting antenna directional gain is greater than 6 dBi, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the bands 5250-5350 MHz, 5500 MHz ~ 5580 MHz and 5660 MHz ~ 5720 MHz, the maximum conducted output power shall not exceed the lesser of 250 mW (24dBm) or $11 \text{ dBm} + 10\log B$, where B is the 26 dB emissions bandwidth in 1-MHz. If transmitting antenna directional gain is greater than 6 dBi, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

For normal channel, the testing follows Method PM of FCC KDB 789033 D01 General UNII Test Procedures v01r03. Method PM (Measurement using an RF average power meter):

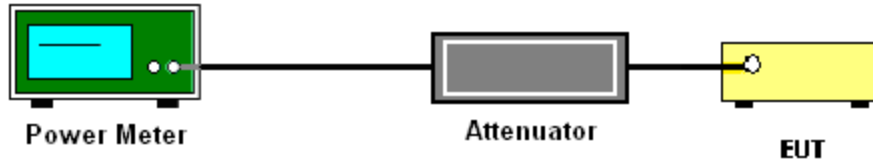
1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with a factor, $10 \log(1/x)$, where x is the duty cycle.

For straddle channel, the testing follows Method PM of FCC KDB 789033 D01 General UNII Test Procedures v01r03. Method SA-3 (RMS detection with max hold)

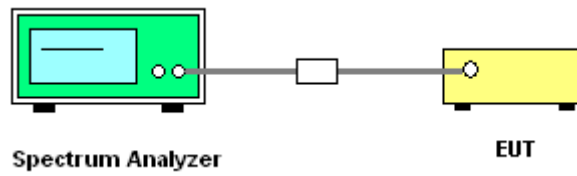
Compute power by integrating the spectrum across the 26dB occupied bandwidth of the signal using the instrument's band power measurement function.

3.2.4 Test Setup

For normal channel:



For straddle channel:



3.2.5 Test Result of Maximum Conducted Output Power

Test Band :	5GHz band 1,2,3	Temperature :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	45~49%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)			Power Limit (dBm)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Sum Power			
11a	6Mbps	2	36	5180	13.0	9.5	14.6	16.41	3.46	Pass
11a	6Mbps	2	44	5220	12.9	9.3	14.5	16.41	3.46	Pass
11a	6Mbps	2	48	5240	12.8	9.2	14.4	16.41	3.46	Pass
HT20	MCS0	2	36	5180	13.0	9.4	14.6	16.66	3.46	Pass
HT20	MCS0	2	44	5220	12.9	9.1	14.4	16.67	3.46	Pass
HT20	MCS0	2	48	5240	12.7	9.1	14.3	16.66	3.46	Pass
HT40	MCS0	2	38	5190	12.8	9.3	14.4	17.00	3.46	Pass
HT40	MCS0	2	46	5230	12.9	9.3	14.5	17.00	3.46	Pass

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	EIRP Power (dBm)	EIRP Limit (dBm)	DG (dBi)	Pass/Fail
					Sum Power			
11a	6Mbps	2	36	5180	18.0	22.41	3.46	Pass
11a	6Mbps	2	44	5220	17.9	22.41	3.46	Pass
11a	6Mbps	2	48	5240	17.8	22.41	3.46	Pass
HT20	MCS0	2	36	5180	18.0	22.66	3.46	Pass
HT20	MCS0	2	44	5220	17.9	22.67	3.46	Pass
HT20	MCS0	2	48	5240	17.7	22.66	3.46	Pass
HT40	MCS0	2	38	5190	17.9	23.00	3.46	Pass
HT40	MCS0	2	46	5230	17.9	23.00	3.46	Pass

Note:

1. Sum Power is a calculated result from sum of the power Ant. 1 and Ant.2.
2. For the band 5150-5250 MHz, the maximum conducted output power shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log (26dB BW).

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)			Power Limit (dBm)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Sum Power			
11a	6Mbps	2	52	5260	13.0	9.2	14.5	23.46	3.64	Pass
11a	6Mbps	2	60	5300	13.0	9.5	14.6	23.47	3.64	Pass
11a	6Mbps	2	64	5320	13.0	9.3	14.5	23.46	3.64	Pass
HT20	MCS0	2	52	5260	12.8	9.0	14.3	23.66	3.64	Pass
HT20	MCS0	2	60	5300	12.9	9.2	14.4	23.70	3.64	Pass
HT20	MCS0	2	64	5320	12.8	9.0	14.3	23.71	3.64	Pass
HT40	MCS0	2	54	5270	13.0	9.5	14.6	24.00	3.64	Pass
HT40	MCS0	2	62	5310	11.7	7.4	13.1	24.00	3.64	Pass

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	EIRP Power (dBm)	EIRP Limit (dBm)	DG (dBi)	Pass/Fail
					Sum Power			
11a	6Mbps	2	52	5260	18.1	29.46	3.64	Pass
11a	6Mbps	2	60	5300	18.2	29.47	3.64	Pass
11a	6Mbps	2	64	5320	18.2	29.46	3.64	Pass
HT20	MCS0	2	52	5260	17.9	29.66	3.64	Pass
HT20	MCS0	2	60	5300	18.1	29.70	3.64	Pass
HT20	MCS0	2	64	5320	17.9	29.71	3.64	Pass
HT40	MCS0	2	54	5270	18.3	30.00	3.64	Pass
HT40	MCS0	2	62	5310	16.7	30.00	3.64	Pass

Note:

1. Sum Power is a calculated result from sum of the power Ant. 1 and Ant.2.
2. For the band 5250-5350, the maximum conducted output power shall not exceed the lesser of 250 mW (24dBm) or $11 \text{ dBm} + 10\log(26\text{dB BW})$.

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)			Power Limit (dBm)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Sum Power			
11a	6Mbps	2	100	5500	13.0	10.0	14.8	23.43	2.88	Pass
11a	6Mbps	2	116	5580	13.0	10.0	14.8	23.41	2.88	Pass
11a	6Mbps	2	140	5700	12.9	9.7	14.6	23.39	2.88	Pass
HT20	MCS0	2	100	5500	12.9	9.9	14.7	23.65	2.88	Pass
HT20	MCS0	2	116	5580	13.0	9.2	14.5	23.65	2.88	Pass
HT20	MCS0	2	140	5700	13.0	10.0	14.7	23.65	2.88	Pass
HT40	MCS0	2	102	5510	9.6	5.9	11.1	24.00	2.88	Pass
HT40	MCS0	2	110	5550	12.9	10.0	14.7	24.00	2.88	Pass
HT40	MCS0	2	134	5670	12.9	9.7	14.6	24.00	2.88	Pass

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	EIRP Power (dBm)	EIRP Limit (dBm)	DG (dBi)	Pass/Fail
					Sum Power			
11a	6Mbps	2	100	5500	17.7	29.43	2.88	Pass
11a	6Mbps	2	116	5580	17.6	29.41	2.88	Pass
11a	6Mbps	2	140	5700	17.4	29.39	2.88	Pass
HT20	MCS0	2	100	5500	17.5	29.65	2.88	Pass
HT20	MCS0	2	116	5580	17.4	29.65	2.88	Pass
HT20	MCS0	2	140	5700	17.6	29.65	2.88	Pass
HT40	MCS0	2	102	5510	14.0	30.00	2.88	Pass
HT40	MCS0	2	110	5550	17.6	30.00	2.88	Pass
HT40	MCS0	2	110	5550	17.4	30.00	2.88	Pass

Note:

1. Sum Power is a calculated result from sum of the power Ant. 1 and Ant.2.
2. For the band 5500 MHz ~ 5580 MHz and 5660 MHz ~ 5720 MHz, the maximum conducted output power shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log (26dB BW).

Test Band :	Straddle Channel	Temperature :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	45~49%

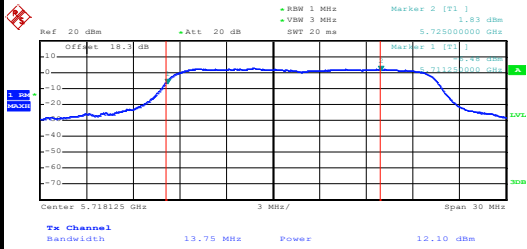
Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)			Power Limit (dBm)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Sum Power			
11a	6Mbps	2	144	5720	13.0	9.3	14.5	-	2.88	-
11a	6Mbps	2	144	Lower	12.1	8.4	13.6	22.88	2.88	Pass
11a	6Mbps	2	144	Upper	5.6	1.9	7.1	24.44	2.88	Pass
HT20	MCS0	2	144	5720	12.8	9.4	14.4	-	2.88	-
HT20	MCS0	2	144	Lower	11.9	8.5	13.5	23.07	2.88	Pass
HT20	MCS0	2	144	Upper	5.7	2.1	7.3	24.68	2.88	Pass
HT40	MCS0	2	142	5710	12.5	8.8	14.1	-	2.88	-
HT40	MCS0	2	142	Lower	12.3	8.6	13.9	24.00	2.88	Pass
HT40	MCS0	2	142	Upper	-1.1	-5.1	0.4	24.95	2.88	Pass

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	EIRP Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
					Sum Power			
11a	6Mbps	2	144	5720	17.4	-	2.88	-
11a	6Mbps	2	144	Lower	16.5	28.38	2.88	Pass
11a	6Mbps	2	144	Upper	10.0	28.56	2.88	Pass
HT20	MCS0	2	144	5720	17.3	-	2.88	-
HT20	MCS0	2	144	Lower	16.4	28.52	2.88	Pass
HT20	MCS0	2	144	Upper	10.2	29.07	2.88	Pass
HT40	MCS0	2	142	5710	16.9	-	2.88	-
HT40	MCS0	2	142	Lower	16.7	30.00	2.88	Pass
HT40	MCS0	2	142	Upper	3.2	27.64	2.88	Pass

Worst Case Straddle Channel Power

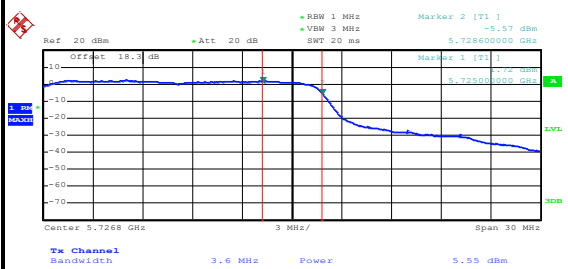
Ant. 1

Lower Band



Date: 15.AUG.2013 19:10:08

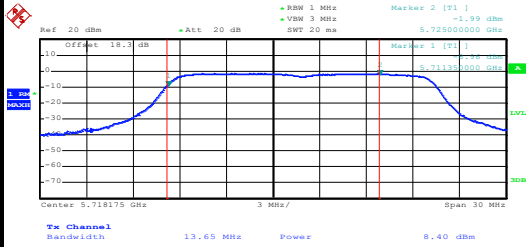
Upper Band



Date: 15.AUG.2013 19:11:30

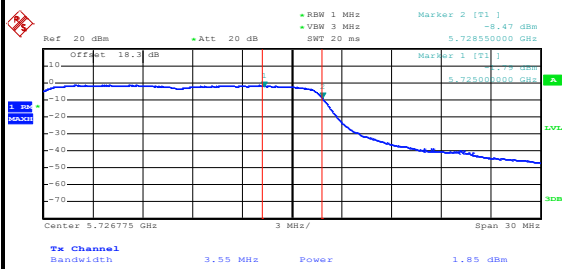
Ant. 2

Lower Band



Date: 15.AUG.2013 19:16:09

Upper Band



Date: 15.AUG.2013 19:17:53

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5150-5250 MHz, peak power spectral density shall not exceed 4 dBm in any 1-MHz.

For the bands 5250-5350 MHz, 5500 MHz ~ 5580 MHz and 5660 MHz ~ 5720 MHz, peak power spectral density shall not exceed 11 dBm in any 1-MHz.

3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Section F) Peak power spectral density (PPSD).

Note: Though the rule refers to “peak power spectral density”, the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission.

Method SA-2

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

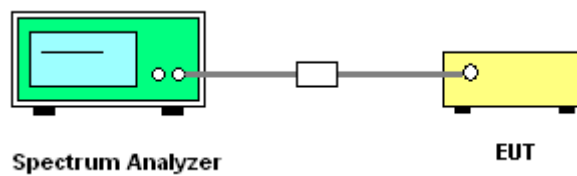
1. The testing follows Method SA-2 of FCC KDB 789033 D01 General UNII Test Procedures v01r03.
 - Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW \geq 3 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time = auto.
 - Detector = sample
 - Trace average at least 100 traces in power averaging mode.
 - Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

4. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02.

Method (1): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test Band :	5GHz band 1,2,3	Temperature :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	45~49%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Combined Power Density (dBm/MHz)	Max. Limits (dBm/MHz)	DG (dBi)	Pass/Fail
11a	6Mbps	2	36	5180	3.25	3.53	6.47	Pass
11a	6Mbps	2	44	5220	3.18	3.53	6.47	Pass
11a	6Mbps	2	48	5240	2.89	3.53	6.47	Pass
HT20	MCS0	2	36	5180	3.43	3.53	6.47	Pass
HT20	MCS0	2	44	5220	2.94	3.53	6.47	Pass
HT20	MCS0	2	48	5240	2.79	3.53	6.47	Pass
HT40	MCS0	2	38	5190	0.54	3.53	6.47	Pass
HT40	MCS0	2	46	5230	1.42	3.53	6.47	Pass

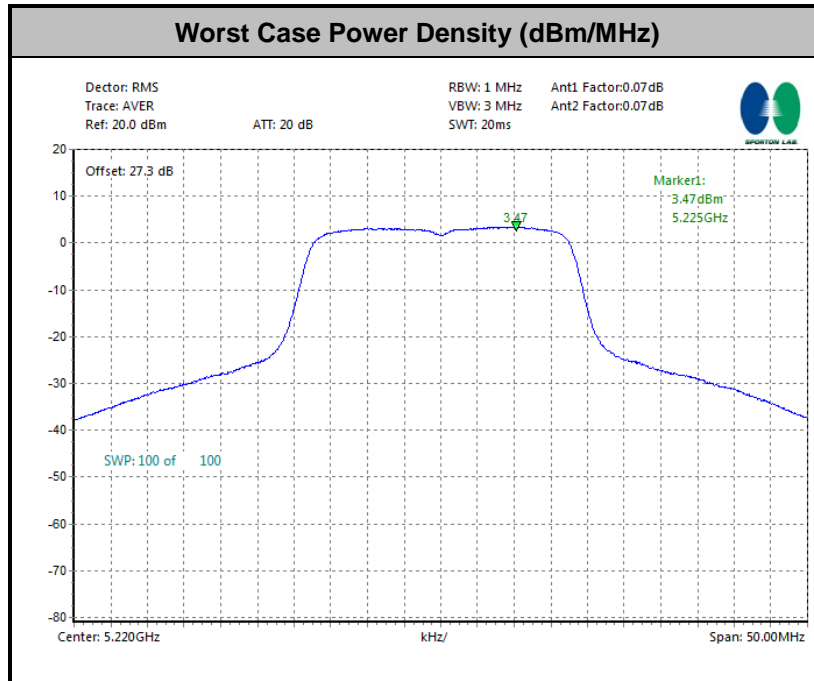
Note: Combined Power Density is a bin-by-bin combined of Ant. 1 and Ant.2.

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Combined Power Density (dBm/MHz)	Max. Limits (dBm/MHz)	DG (dBi)	Pass/Fail
11a	6Mbps	2	52	5260	1.40	10.35	6.65	Pass
11a	6Mbps	2	60	5300	1.55	10.35	6.65	Pass
11a	6Mbps	2	64	5320	1.21	10.35	6.65	Pass
HT20	MCS0	2	52	5260	1.04	10.35	6.65	Pass
HT20	MCS0	2	60	5300	1.10	10.35	6.65	Pass
HT20	MCS0	2	64	5320	1.10	10.35	6.65	Pass
HT40	MCS0	2	54	5270	-1.66	10.35	6.65	Pass
HT40	MCS0	2	62	5310	-5.12	10.35	6.65	Pass

Note: Combined Power Density is a bin-by-bin combined of Ant. 1 and Ant.2.

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Combined Power Density (dBm/MHz)	Max. Limits (dBm/MHz)	DG (dBi)	Pass/Fail
11a	6Mbps	2	100	5500	2.80	11	5.89	Pass
11a	6Mbps	2	116	5580	2.02	11	5.89	Pass
11a	6Mbps	2	140	5700	1.67	11	5.89	Pass
HT20	MCS0	2	100	5500	2.16	11	5.89	Pass
HT20	MCS0	2	116	5580	1.35	11	5.89	Pass
HT20	MCS0	2	140	5700	1.61	11	5.89	Pass
HT40	MCS0	2	102	5510	-3.76	11	5.89	Pass
HT40	MCS0	2	110	5550	-0.49	11	5.89	Pass
HT40	MCS0	2	134	5670	-0.96	11	5.89	Pass

Note: Combined Power Density is a bin-by-bin combined of Ant. 1 and Ant.2.



Test Band :	Straddle Channel	Temperature :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	45~49%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Combined Power Density (dBm/MHz)	Max. Limits (dBm/MHz)	DG (dBi)	Pass/Fail
11a	6Mbps	2	144	5720	-0.53	11	5.89	Pass
HT20	MCS0	2	144	5720	-0.34	11	5.89	Pass
HT40	MCS0	2	142	5710	-2.66	11	5.89	Pass

3.4 Peak Excursion Ratio Measurement

3.4.1 Limit of Peak Excursion Ratio

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

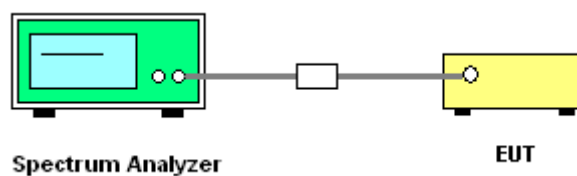
3.4.3 Test Procedures

The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Section G) Peak excursion measurement

1. The transmitter output is connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emission bandwidth.
3. Find the maximum of the peak-max-hold spectrum.
 - *Set RBW = 1MHz.
 - *Set VBW \geq 3MHz.
 - *Detector = peak.
 - *Trace mode = max-hold.
 - *Allow the sweeps to continue until the trace stabilizes.
 - *Use the peak search function to find the peak of the spectrum.
4. Use the procedure found under section 3.3 to measure the PPSD.
5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

3.4.4 Test Setup



3.4.5 Test Result of Peak Excursion Ratio

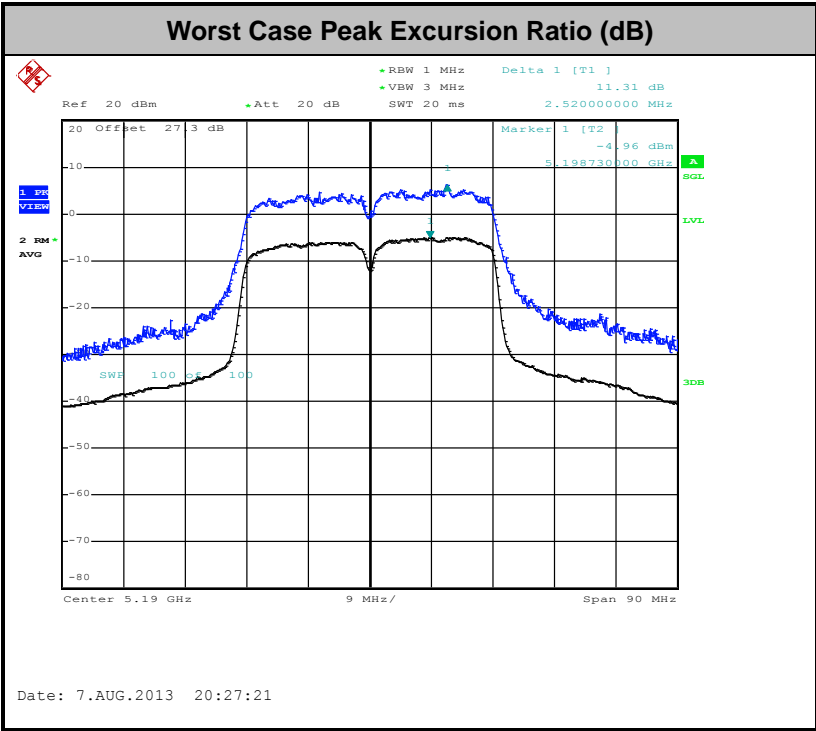
Test Band :	5GHz band 1,2,3	Temperature :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	45~49%

Mod.	N _{TX}	Channel	Freq. (MHz)	Peak Excursion Ratio (dB)					Max. Limits (dB)	Pass/Fail
				BPSK	QPSK	16QAM	64QAM	256QAM		
11a	2	36	5180	8.79	8.72	9.39	8.99	-	13	Pass
HT20	2	36	5180	8.56	9.32	8.89	9.40	-	13	Pass
HT40	2	38	5190	9.71	8.54	9.35	10.39	-	13	Pass

Mod.	N _{TX}	Channel	Freq. (MHz)	Peak Excursion Ratio (dB)					Max. Limits (dB)	Pass/Fail
				BPSK	QPSK	16QAM	64QAM	256QAM		
11a	2	52	5260	9.50	8.84	9.98	9.05	-	13	Pass
HT20	2	52	5260	8.99	9.71	9.46	9.88	-	13	Pass
HT40	2	54	5270	10.01	9.38	9.95	10.39	-	13	Pass

Mod.	N _{TX}	Channel	Freq. (MHz)	Peak Excursion Ratio (dB)					Max. Limits (dB)	Pass/Fail
				BPSK	QPSK	16QAM	64QAM	256QAM		
11a	2	100	5500	9.38	8.53	9.77	8.90	-	13	Pass
HT20	2	100	5500	8.90	9.38	8.98	9.99	-	13	Pass
HT40	2	102	5510	9.58	9.10	9.40	9.39	-	13	Pass

Note: All modulation measured based on the minimum data rate setting.



Note: Peak Excursion Ratio (dB) = Peak – (Average + Duty Cycle Offset)

3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

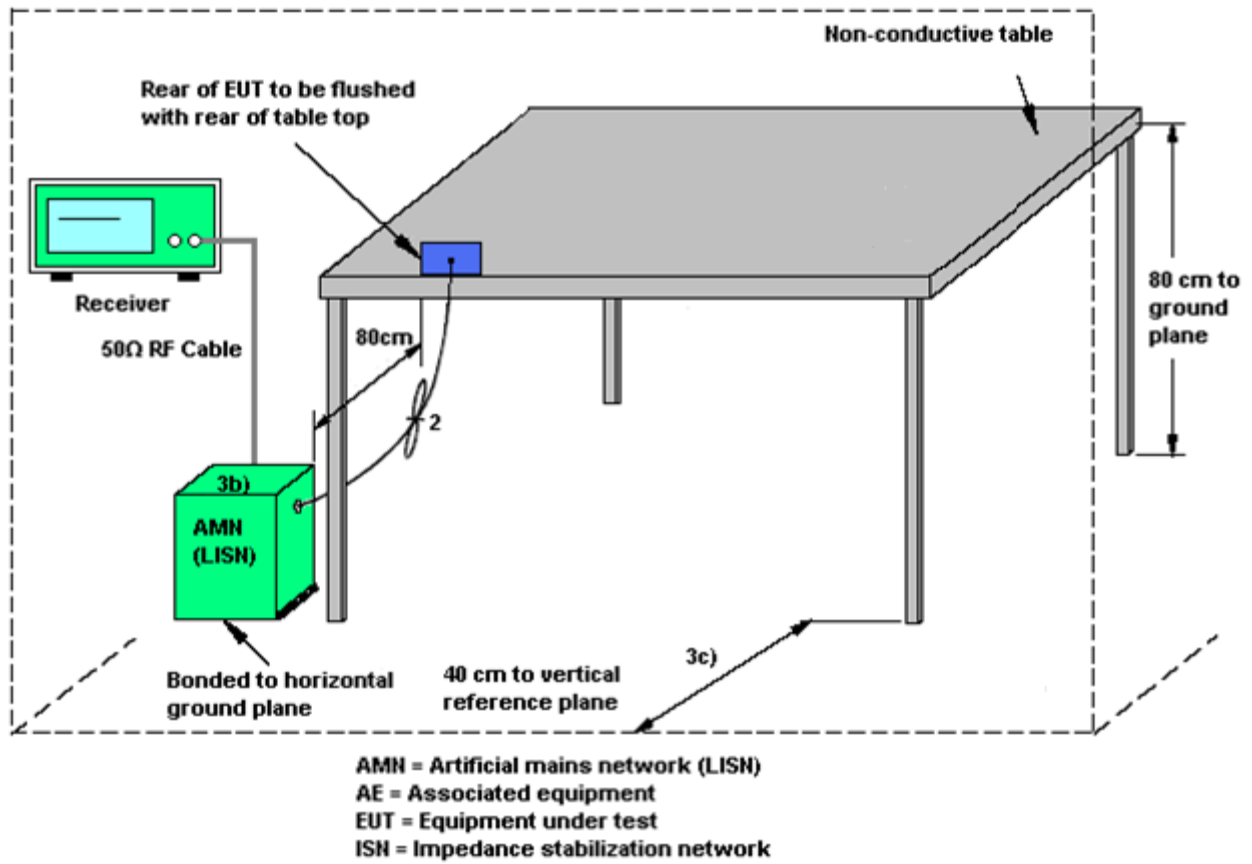
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

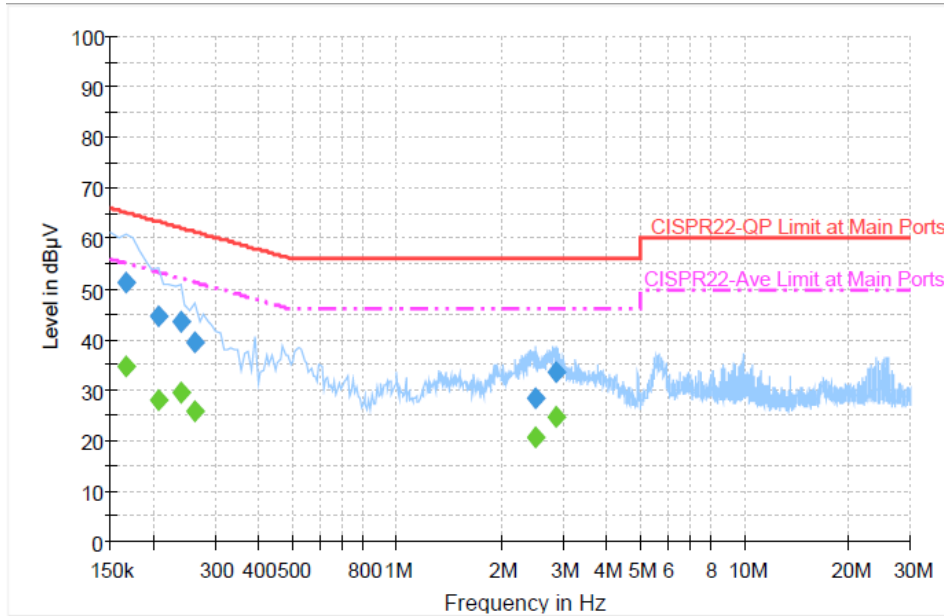
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (5GHz) Link + Bluetooth Link + Earphone + USB Cable (Data Link With Notebook) + Camera		



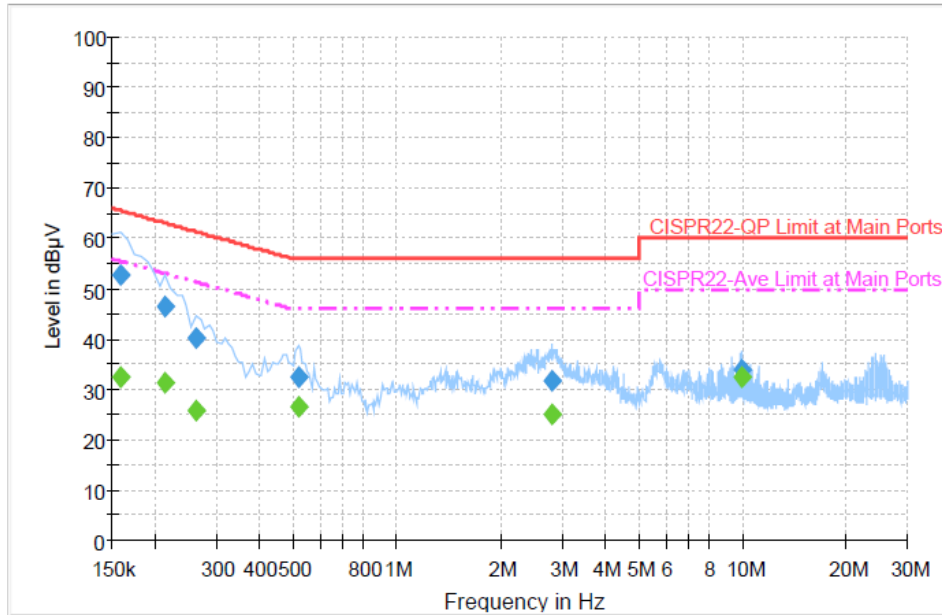
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	51.3	Off	L1	19.4	13.9	65.2
0.206000	44.5	Off	L1	19.4	18.9	63.4
0.238000	43.7	Off	L1	19.5	18.5	62.2
0.262000	39.5	Off	L1	19.4	21.9	61.4
2.502000	28.5	Off	L1	19.6	27.5	56.0
2.862000	33.5	Off	L1	19.6	22.5	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	34.6	Off	L1	19.4	20.6	55.2
0.206000	28.0	Off	L1	19.4	25.4	53.4
0.238000	29.4	Off	L1	19.5	22.8	52.2
0.262000	25.8	Off	L1	19.4	25.6	51.4
2.502000	20.8	Off	L1	19.6	25.2	46.0
2.862000	24.8	Off	L1	19.6	21.2	46.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (5GHz) Link + Bluetooth Link + Earphone + USB Cable (Data Link With Notebook) + Camera		



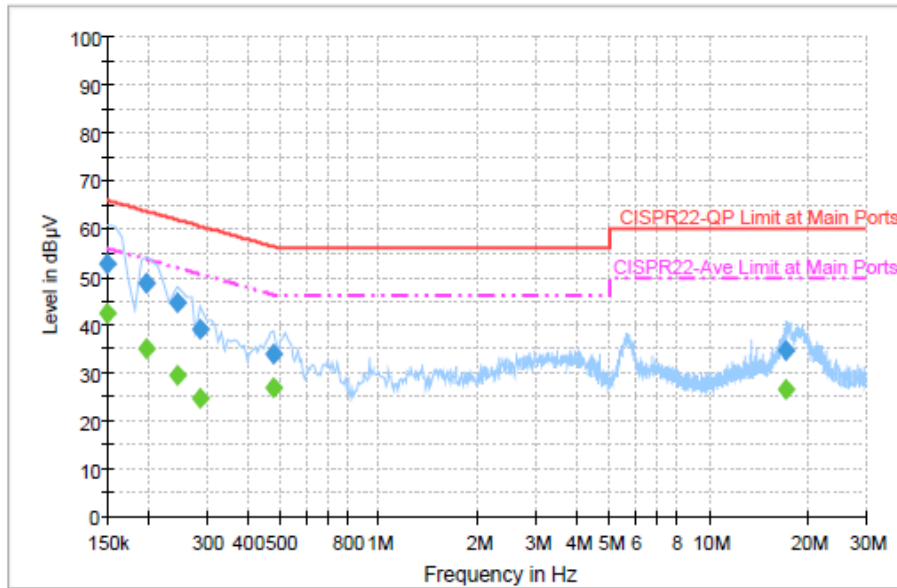
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	52.6	Off	N	19.3	13.0	65.6
0.214000	46.5	Off	N	19.4	16.5	63.0
0.262000	40.4	Off	N	19.4	21.0	61.4
0.518000	32.5	Off	N	19.4	23.5	56.0
2.798000	31.6	Off	N	19.7	24.4	56.0
9.878000	33.9	Off	N	19.7	26.1	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	32.5	Off	N	19.3	23.1	55.6
0.214000	31.5	Off	N	19.4	21.5	53.0
0.262000	25.9	Off	N	19.4	25.5	51.4
0.518000	26.6	Off	N	19.4	19.4	46.0
2.798000	24.9	Off	N	19.7	21.1	46.0
9.878000	32.4	Off	N	19.7	17.6	50.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (5GHz) MIMO Tx + Earphone + USB Cable (Data Link With Notebook) + Camera		



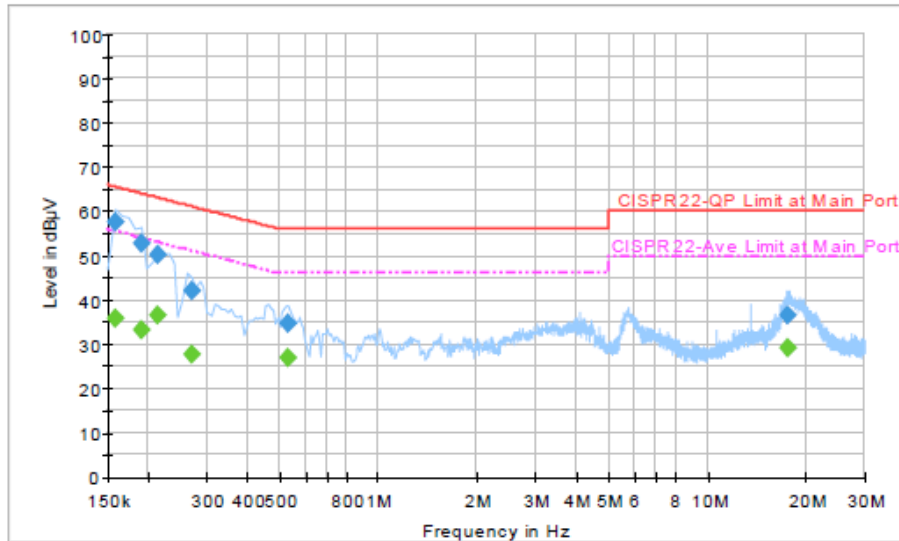
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	52.8	Off	L1	19.4	13.2	66.0
0.198000	48.7	Off	L1	19.3	15.0	63.7
0.246000	44.5	Off	L1	19.4	17.4	61.9
0.286000	39.3	Off	L1	19.4	21.3	60.6
0.478000	33.9	Off	L1	19.4	22.5	56.4
17.222000	34.9	Off	L1	19.8	25.1	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	42.5	Off	L1	19.4	13.5	56.0
0.198000	34.9	Off	L1	19.3	18.8	53.7
0.246000	29.6	Off	L1	19.4	22.3	51.9
0.286000	24.8	Off	L1	19.4	25.8	50.6
0.478000	26.9	Off	L1	19.4	19.5	46.4
17.222000	26.6	Off	L1	19.8	23.4	50.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (5GHz) MIMO Tx + Earphone + USB Cable (Data Link With Notebook) + Camera		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	57.4	Off	N	19.3	8.2	65.6
0.190000	52.8	Off	N	19.4	11.2	64.0
0.214000	50.1	Off	N	19.4	12.9	63.0
0.270000	42.2	Off	N	19.4	18.9	61.1
0.534000	34.7	Off	N	19.4	21.3	56.0
17.502000	36.4	Off	N	20.0	23.6	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	35.7	Off	N	19.3	19.9	55.6
0.190000	33.3	Off	N	19.4	20.7	54.0
0.214000	36.6	Off	N	19.4	16.4	53.0
0.270000	27.5	Off	N	19.4	23.6	51.1
0.534000	26.9	Off	N	19.4	19.1	46.0
17.502000	29.2	Off	N	20.0	20.8	50.0

3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

3.7 Antenna Requirements

3.7.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.7.2 Antenna Connected Construction

Embedded in Antenna.

3.7.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT}/N_{SS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

The EUT supports CDD mode.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

			DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant 1 (dBi)	Ant 2 (dBi)				
Band 1	2.70	4.10	3.46	6.47	0.00	0.47
Band 2	3.00	4.20	3.64	6.65	0.00	0.65
Band 3	3.80	1.70	2.88	5.89	0.00	0.00

Power limit reduction = Composite gain – 6dBi, (min = 0)

PSD limit reduction = Composite gain + PSD Array gain – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 07, 2013	Jul. 30, 2013~ Aug. 21, 2013	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	Jul. 30, 2013~ Aug. 21, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	Jul. 30, 2013~ Aug. 21, 2013	Sep. 07, 2013	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 13, 2012	Jun. 24, 2013~ Aug. 30, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Jun. 24, 2013~ Aug. 30, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Jun. 24, 2013~ Aug. 30, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	Jun. 24, 2013~ Aug. 30, 2013	N/A	Conduction (CO05-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.26
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