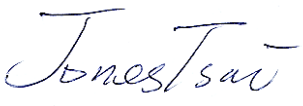
FCC RF Test Report

APPLICANT	:	FUJITSU LIMITED
EQUIPMENT	:	STYLISTIC Q series
BRAND NAME	:	FUJITSU
MODEL NAME	:	Q736
FCC ID	:	EJE-WB0097
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure

This is a partial report which is included the RF conducted power, radiated band edges, radiated spurious emission, and AC conducted emission test items. The product was received on Oct. 06, 2015 and testing was completed on Nov. 05, 2015. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance 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 District, Tao Yuan City, Taiwan, R.O.C.

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5O0601D	Rev. 01	Initial issue of report	Nov. 06, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.407(b)	Unwanted Emissions	≤ -17, -27 dBm (depend on band)&15.209(a)	Pass	Under limit 0.34 dB at 216.03 MHz
3.2	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 14.90 dB at 0.190 MHz
3.3	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

FUJITSU LIMITED

1-1, Kamikonadaka 4-chome, Nakahara-ku, Kawasaki, 211-8588 Japan

1.2 Manufacturer

FUJITSU LIMITED

1-1, Kamikonadaka 4-chome, Nakahara-ku, Kawasaki, 211-8588 Japan

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	STYLISTIC Q series
Brand Name	FUJITSU
Model Name	Q736
FCC ID	EJE-WB0097
Integrated the WLAN Module	Brand Name: Intel Model Name: 8260NGW FCC ID: PD98260NG, PD98260NGU
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth v4.0 EDR/LE
EUT Stage	Pre-Production Unit

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

1.4 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 and 5660 MHz ~ 5700 MHz
Maximum Output Power	**<5180 MHz ~ 5240 MHz>** **<Ant. 1>** 802.11a : 13.49 dBm / 0.0223 W **SISO <Ant. 1>** 802.11n HT20 : 13.46 dBm / 0.0222 W 802.11n HT40 : 13.41 dBm / 0.0219 W 802.11ac VHT20: 13.34 dBm / 0.0216 W 802.11ac VHT40: 13.37 dBm / 0.0217 W 802.11ac VHT80: 13.39 dBm / 0.0218 W **<Ant. 2>** 802.11a : 13.49 dBm / 0.0223 W **SISO <Ant. 2>** 802.11n HT20 : 13.49 dBm / 0.0223 W 802.11n HT40 : 13.29 dBm / 0.0213 W 802.11ac VHT20: 13.32 dBm / 0.0215 W 802.11ac VHT40: 13.28 dBm / 0.0213 W 802.11ac VHT80: 13.20 dBm / 0.0209 W **MIMO <Ant. 1 + 2>** 802.11n HT20 : 16.42 dBm / 0.0439 W 802.11n HT40 : 16.24 dBm / 0.0421 W 802.11ac VHT20: 16.46 dBm / 0.0443 W 802.11ac VHT40: 16.15 dBm / 0.0412 W 802.11ac VHT80: 14.94 dBm / 0.0312 W
	<5260 MHz ~ 5320 MHz> **<Ant. 1>** 802.11a : 13.38 dBm / 0.0218 W **SISO <Ant. 1>** 802.11n HT20 : 13.40 dBm / 0.0219 W 802.11n HT40 : 13.30 dBm / 0.0214 W 802.11ac VHT20: 13.19 dBm / 0.0208 W 802.11ac VHT40: 13.26 dBm / 0.0212 W 802.11ac VHT80: 11.79 dBm / 0.0151 W **<Ant. 2>** 802.11a : 13.46 dBm / 0.0222 W **SISO <Ant. 2>** 802.11n HT20 : 13.46 dBm / 0.0222 W 802.11n HT40 : 13.34 dBm / 0.0216 W 802.11ac VHT20: 13.28 dBm / 0.0213 W 802.11ac VHT40: 13.32 dBm / 0.0215 W 802.11ac VHT80: 9.95 dBm / 0.0099 W **MIMO <Ant. 1 + 2>** 802.11n HT20 : 16.30 dBm / 0.0427 W 802.11n HT40 : 16.34 dBm / 0.0431 W 802.11ac VHT20: 16.24 dBm / 0.0421 W 802.11ac VHT40: 16.19 dBm / 0.0416 W 802.11ac VHT80: 12.89 dBm / 0.0195 W

<table>
<tr><th colspan="2">Product Specification subjective to this standard</th></tr>
<tr><td>Maximum Output Power</td><td>5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz
<Ant. 1>
802.11a : 13.47 dBm / 0.0222 W
SISO <Ant. 1>
802.11n HT20 : 13.49 dBm / 0.0223 W
802.11n HT40 : 13.28 dBm / 0.0213 W
802.11ac VHT20: 13.28 dBm / 0.0213 W
802.11ac VHT40: 13.25 dBm / 0.0211 W
802.11ac VHT80: 13.23 dBm / 0.0210 W
<Ant. 2>
802.11a : 13.47 dBm / 0.0222 W
SISO <Ant. 2>
802.11n HT20 : 13.48 dBm / 0.0223 W
802.11n HT40 : 13.46 dBm / 0.0222 W
802.11ac VHT20: 13.31 dBm / 0.0214 W
802.11ac VHT40: 13.36 dBm / 0.0217 W
802.11ac VHT80: 13.25 dBm / 0.0211 W
MIMO <Ant. 1 + 2>
802.11n HT20 : 16.38 dBm / 0.0435 W
802.11n HT40 : 16.16 dBm / 0.0413 W
802.11ac VHT20: 16.32 dBm / 0.0429 W
802.11ac VHT40: 16.13 dBm / 0.0410 W
802.11ac VHT80: 16.32 dBm / 0.0429 W</td></tr>
<tr><td>Type of Modulation</td><td>802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)</td></tr>
<tr><td>Antenna Type</td><td>Ant. 1 : PIFA Antenna
Ant. 2 : PIFA Antenna</td></tr>
<tr><td>Antenna Gain</td><td><510 MHz ~ 5250 MHz>
Ant. 1 : 0.05 dBi
Ant. 2 : 2.47 dBi
<5250 MHz ~ 5350 MHz>
Ant. 1 : -0.15 dBi
Ant. 2 : 2.89 dBi
<5470 MHz ~ 5725 MHz>
Ant. 1 : -1.32 dBi
Ant. 2 : 2.46 dBi</td></tr>
<tr><td>Antenna Function Description</td><td>
<table>
<tr><td></td><td>Ant. 1</td><td>Ant. 2</td></tr>
<tr><td>802.11 a</td><td>V</td><td>V</td></tr>
<tr><td>802.11 n/ac SISO</td><td>V</td><td>V</td></tr>
<tr><td>802.11 n/ac MIMO</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

1.5 Modification of EUT

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

1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	**Sporton Site No.**	
	TH02-HY	CO05-HY

Note: The test site complies with ANSI C63.4 2009 requirement.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH11-HY

Note: The test site complies with ANSI C63.4 2009 requirement.

1.7 Applicable 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 D02 General UNII Test Procedures New Rules v01
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- FCC KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01
- ANSI C63.10-2009

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.

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) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

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 and radiated tests shown in section 2.3.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38	**5190**	**46**	**5230**
	40	5200	48	5240
	42	5210		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5250-5350 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	54	**5270**	**62**	**5310**
	56	5280	64	5320
	58	5290		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5470-5600 MHz and 5650-5725 MHz Band 3 (U-NII-2C)	100	5500	112	5560
	102	**5510**	116	5580
	104	5520	132	5660
	106	5530	**134**	**5670**
	108	5540	136	5680
	110	**5550**	140	5700

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
Straddle Channel	144	5720	**142**	**5710**
	138	5690		

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 data rate associated with the highest power were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

<Ant. 1>

Channel	Frequency	5GHz 802.11a Average Power (dBm)
		Data Rate
		6 Mbps
CH 36	5180 MHz	13.35
CH 44	5220 MHz	13.46
CH 48	5240 MHz	**13.49**
CH 52	5260 MHz	13.38
CH 60	5300 MHz	13.37
CH 64	5320 MHz	13.36
CH 100	5500 MHz	13.40
CH 116	5580 MHz	13.34
CH 140	5700 MHz	13.47

SISO <Ant. Port 1>

Channel	Frequency	5GHz 802.11n HT20 Average Power (dBm) (800ns)
		Data Rate
		MCS0
CH 36	5180 MHz	13.43
CH 44	5220 MHz	13.46
CH 48	5240 MHz	13.44
CH 52	5260 MHz	13.36
CH 60	5300 MHz	13.40
CH 64	5320 MHz	13.38
CH 100	5500 MHz	13.48
CH 116	5580 MHz	**13.49**
CH 140	5700 MHz	13.37

Channel	Frequency	5GHz 802.11n HT40 Average Power (dBm) (800ns)
		Data Rate
		MCS0
CH 38	5190MHz	**13.41**
CH 46	5230MHz	13.29
CH 54	5270MHz	13.30
CH 62	5310MHz	12.67
CH 102	5510MHz	13.28
CH 110	5550MHz	13.27
CH 134	5670MHz	13.24

Channel	Frequency	5GHz 802.11ac VHT20 Average Power (dBm)
		Data Rate
		MCS0
CH 36	5180 MHz	**13.34**
CH 44	5220 MHz	13.24
CH 48	5240 MHz	13.23
CH 52	5260 MHz	13.18
CH 60	5300 MHz	13.19
CH 64	5320 MHz	13.17
CH 100	5500 MHz	13.28
CH 116	5580 MHz	13.25
CH 140	5700 MHz	13.12

Channel	Frequency	5GHz 802.11ac VHT40 Average Power (dBm)
		Data Rate
		MCS0
CH 38	5190MHz	**13.37**
CH 46	5230MHz	13.20
CH 54	5270MHz	13.26
CH 62	5310MHz	12.88
CH 102	5510MHz	13.23
CH 110	5550MHz	13.25
CH 134	5670MHz	13.18

Channel	Frequency	5GHz 802.11ac VHT80 Average Power (dBm)
		Data Rate
		MCS0
CH 42	5210MHz	**13.39**
CH 58	5290MHz	11.79
CH 106	5530MHz	12.72
CH 122	5610MHz	13.23

<Ant. 2>

Channel	Frequency	5GHz 802.11a Average Power (dBm)
		Data Rate
		6 Mbps
CH 36	5180 MHz	13.45
CH 44	5220 MHz	**13.49**
CH 48	5240 MHz	13.36
CH 52	5260 MHz	13.40
CH 60	5300 MHz	13.46
CH 64	5320 MHz	13.37
CH 100	5500 MHz	13.34
CH 116	5580 MHz	13.35
CH 140	5700 MHz	13.47

SISO <Ant. Port 2>

Channel	Frequency	5GHz 802.11n HT20 Average Power (dBm) (800ns)
		Data Rate
		MCS0
CH 36	5180 MHz	**13.49**
CH 44	5220 MHz	13.48
CH 48	5240 MHz	13.43
CH 52	5260 MHz	13.45
CH 60	5300 MHz	13.46
CH 64	5320 MHz	13.41
CH 100	5500 MHz	13.48
CH 116	5580 MHz	13.47
CH 140	5700 MHz	13.40

Channel	Frequency	5GHz 802.11n HT40 Average Power (dBm) (800ns)
		Data Rate
		MCS0
CH 38	5190MHz	13.29
CH 46	5230MHz	13.18
CH 54	5270MHz	13.34
CH 62	5310MHz	13.24
CH 102	5510MHz	13.25
CH 110	5550MHz	13.38
CH 134	5670MHz	**13.46**

Channel	Frequency	5GHz 802.11ac VHT20 Average Power (dBm)
		Data Rate
		MCS0
CH 36	5180 MHz	**13.32**
CH 44	5220 MHz	13.21
CH 48	5240 MHz	13.18
CH 52	5260 MHz	13.28
CH 60	5300 MHz	13.24
CH 64	5320 MHz	13.12
CH 100	5500 MHz	13.20
CH 116	5580 MHz	13.17
CH 140	5700 MHz	13.31

Channel	Frequency	5GHz 802.11ac VHT40 Average Power (dBm)
		Data Rate
		MCS0
CH 38	5190MHz	13.28
CH 46	5230MHz	13.15
CH 54	5270MHz	13.32
CH 62	5310MHz	13.23
CH 102	5510MHz	13.24
CH 110	5550MHz	13.35
CH 134	5670MHz	**13.36**

Channel	Frequency	5GHz 802.11ac VHT80 Average Power (dBm)
		Data Rate
		MCS0
CH 42	5210MHz	13.20
CH 58	5290MHz	9.95
CH 106	5530MHz	13.17
CH 122	5610MHz	**13.25**

MIMO <Ant. 1+2>

Channel	Frequency	5GHz 802.11n HT20 Average Power (dBm) (800ns)
		Data Rate
		MCS0
CH 36	5180 MHz	**16.42**
CH 44	5220 MHz	16.29
CH 48	5240 MHz	16.30
CH 52	5260 MHz	16.30
CH 60	5300 MHz	16.18
CH 64	5320 MHz	16.18
CH 100	5500 MHz	16.38
CH 116	5580 MHz	16.13
CH 140	5700 MHz	16.27

Channel	Frequency	5GHz 802.11n HT40 Average Power (dBm) (800ns)
		Data Rate
		MCS0
CH 38	5190MHz	16.24
CH 46	5230MHz	16.13
CH 54	5270MHz	**16.34**
CH 62	5310MHz	15.46
CH 102	5510MHz	15.79
CH 110	5550MHz	16.15
CH 134	5670MHz	16.16

Channel	Frequency	5GHz 802.11ac VHT20 Average Power (dBm)
		Data Rate
		MCS0
CH 36	5180 MHz	16.37
CH 44	5220 MHz	16.28
CH 48	5240 MHz	**16.46**
CH 52	5260 MHz	16.24
CH 60	5300 MHz	16.17
CH 64	5320 MHz	16.14
CH 100	5500 MHz	16.32
CH 116	5580 MHz	16.23
CH 140	5700 MHz	16.23

Channel	Frequency	5GHz 802.11ac VHT40 Average Power (dBm)
		Data Rate
		MCS0
CH 38	5190MHz	16.15
CH 46	5230MHz	16.12
CH 54	5270MHz	**16.19**
CH 62	5310MHz	15.41
CH 102	5510MHz	15.65
CH 110	5550MHz	16.13
CH 134	5670MHz	16.13

Channel	Frequency	5GHz 802.11ac VHT80 Average Power (dBm)
		Data Rate
		MCS0
CH 42	5210MHz	14.94
CH 58	5290MHz	12.89
CH 106	5530MHz	14.31
CH 122	5610MHz	**16.32**

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 test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

Single Antenna

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT80	MCS0

MIMO Antenna

Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT80	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + TC + TF

Remark:

1. TC stands for Test Configuration, and consists of USB HD, SD Card, HDMI Cable, iPod Earphone, and Adapter.
2. TF stands for Test Function, and consists of H Pattern, Camera, MPEG4, and Bluetooth Link.

Ch. #		Band I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5600 MHz and 5650-5725MHz
		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 I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5600 MHz and 5650-5725MHz
		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 I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5600 MHz and 5650-5725MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134
Straddle		-	-	142

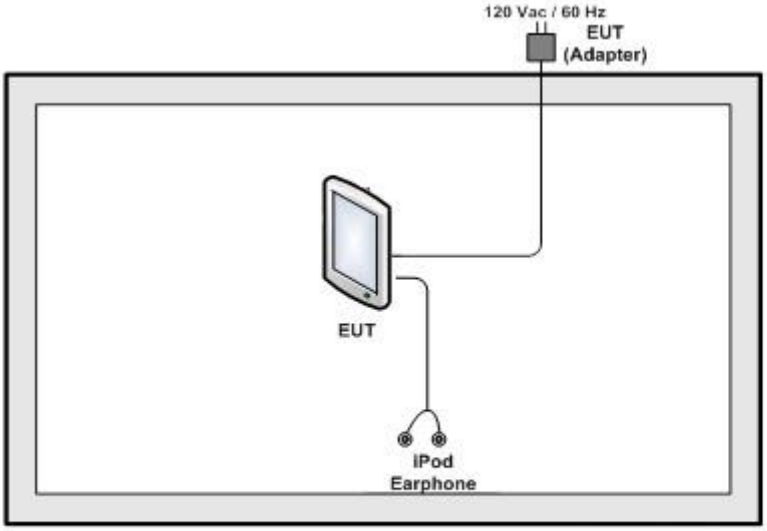
Ch. #		Band I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5600 MHz and 5650-5725MHz
		802.11ac VHT20	802.11ac VHT20	802.11ac VHT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

Ch. #		Band I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5600 MHz and 5650-5725MHz
		802.11ac VHT40	802.11ac VHT40	802.11ac VHT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134
Straddle		-	-	142

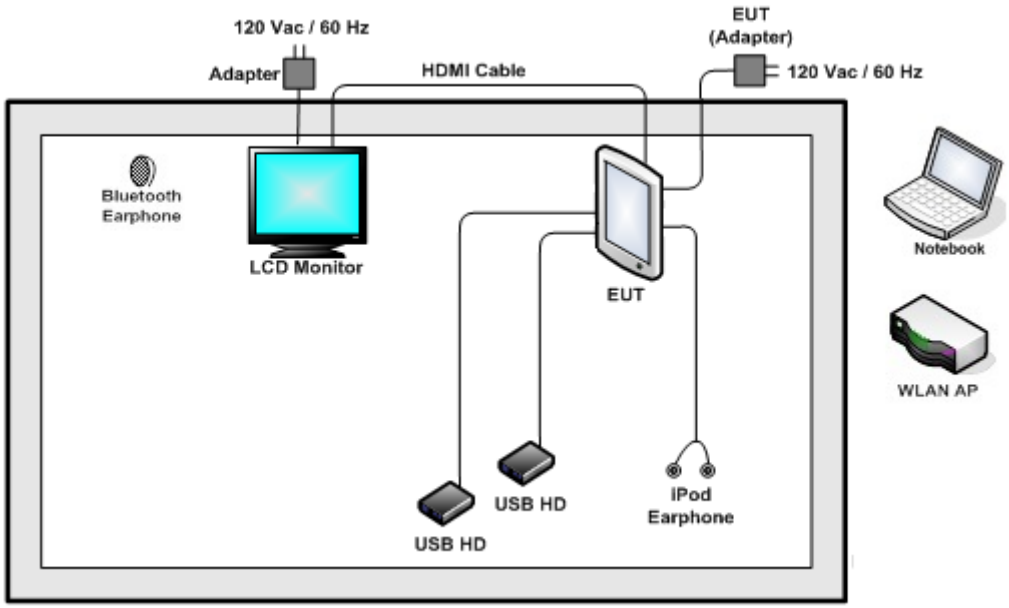
Ch. #		Band I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5600 MHz and 5650-5725MHz
		802.11ac VHT80	802.11ac VHT80	802.11ac VHT80
L	Low	-	-	-
M	Middle	42	58	106
H	High	-	-	-
Straddle				138

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
5.	USB HD	WD	WDBAAR3200ABK -PESN	FCC DoC	Unshielded, 0.5 m	N/A
6.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
7.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.6 EUT Operation Test Setup

The programmed RF utility “DRTU”, is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

3 Test Result

3.1 Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

3.1.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

Note: The following formula is used to convert the EIRP to field strength.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3

(3) KDB789033 v01 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

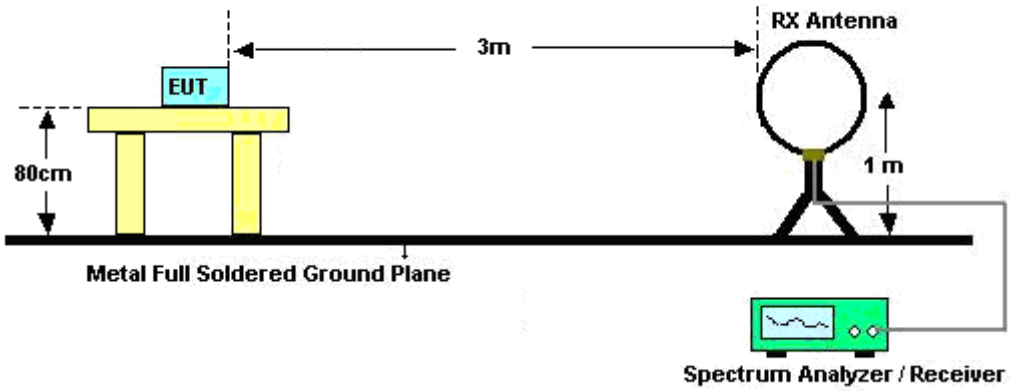
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Antenna	Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting
1	802.11a	98.58	-	-	10Hz
1	5GHz 802.11n HT20	98.47	-	-	
1+2	5GHz 802.11n HT20 for Ant 1	96.12	990.00	1.01	3kHz
1+2	5GHz 802.11n HT20 for Ant 2	96.08	980.00	1.02	
1	5GHz 802.11n HT40	95.96	950.00	1.05	
1+2	5GHz 802.11n HT40 for Ant 1	92.45	490.00	2.04	
1+2	5GHz 802.11n HT40 for Ant 2	92.52	495.00	2.02	
1	5GHz 802.11ac VHT80	91.49	430.00	2.33	
2	5GHz 802.11ac VHT80	93.62	440.00	2.27	
1+2	5GHz 802.11ac VHT80 for Ant 1	86.21	250.00	4.00	10kHz
1+2	5GHz 802.11ac VHT80 for Ant 2	86.21	250.00	4.00	

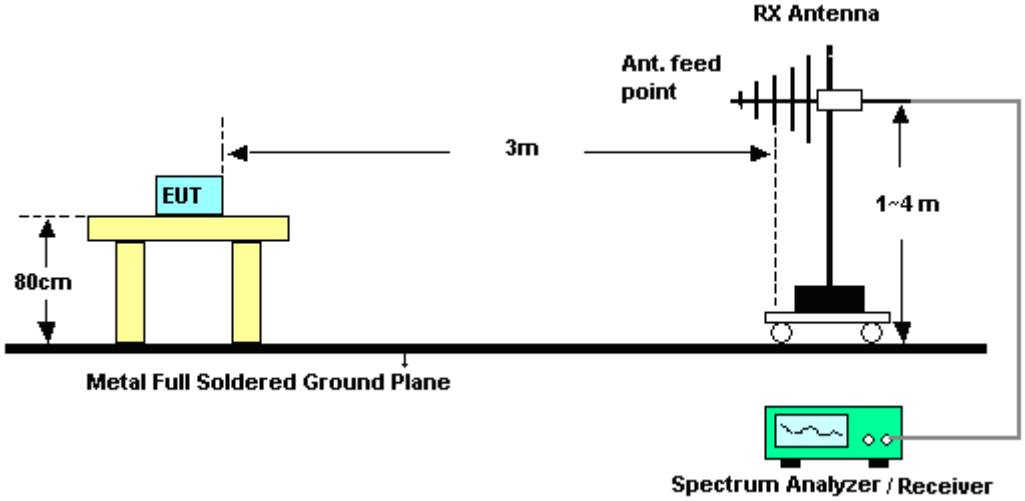
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.1.4 Test Setup

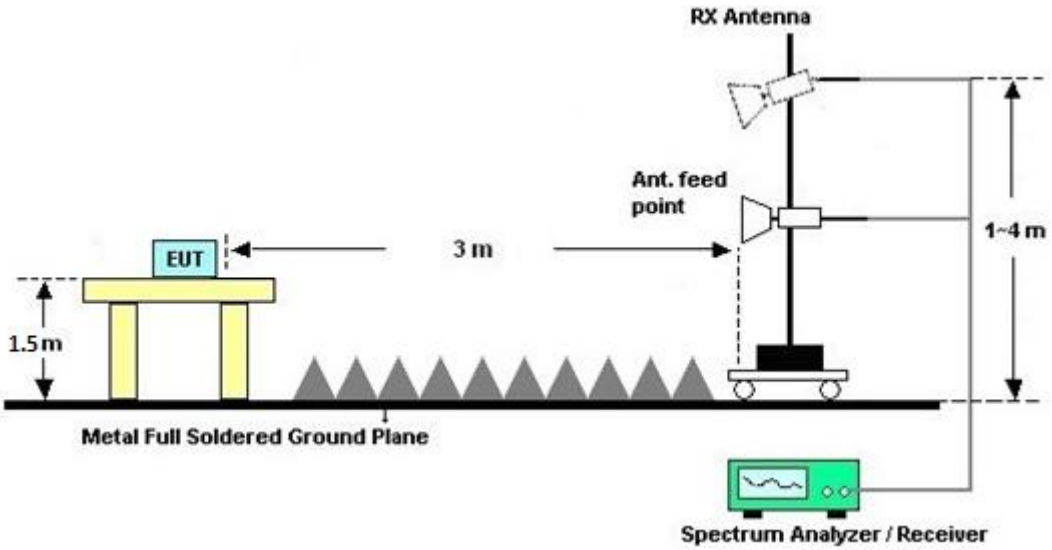
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.1.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.1.6 Test Result of Radiated Band Edges

Please refer to Appendix A.

3.1.7 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix A.

3.2 AC Conducted Emission Measurement

3.2.1 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 (dBμV)	
	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.

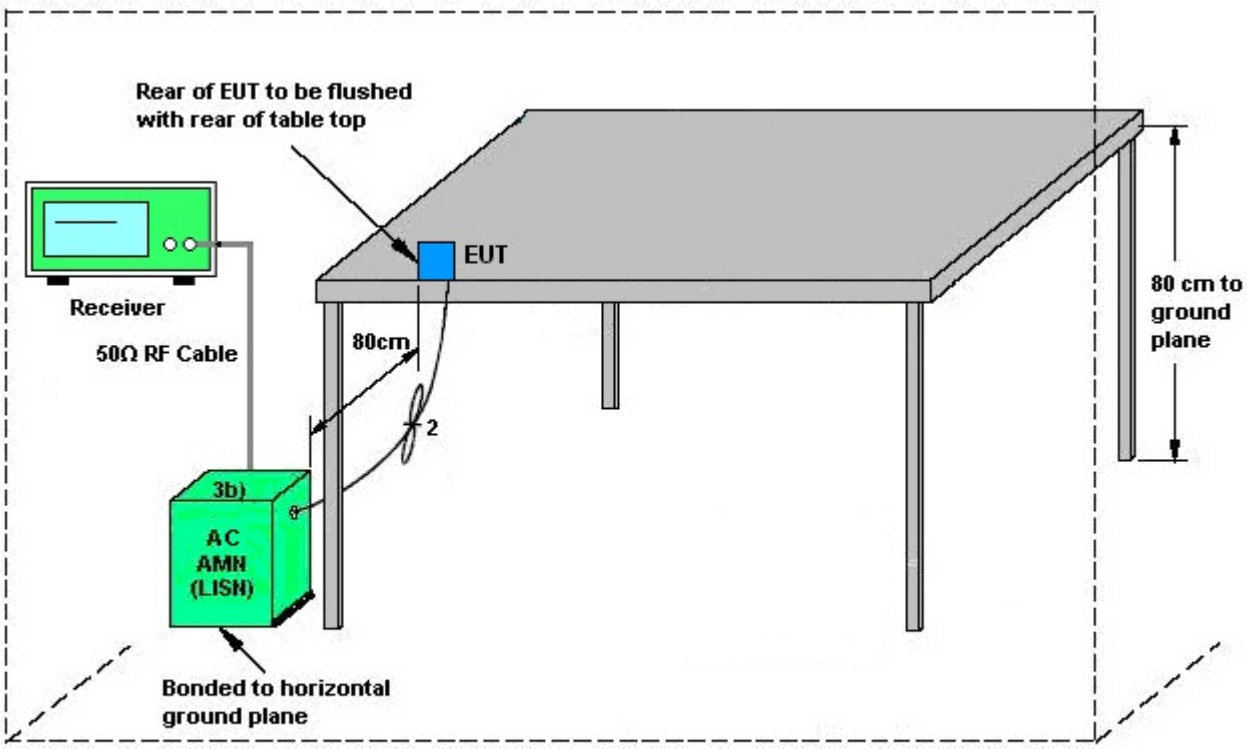
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 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.

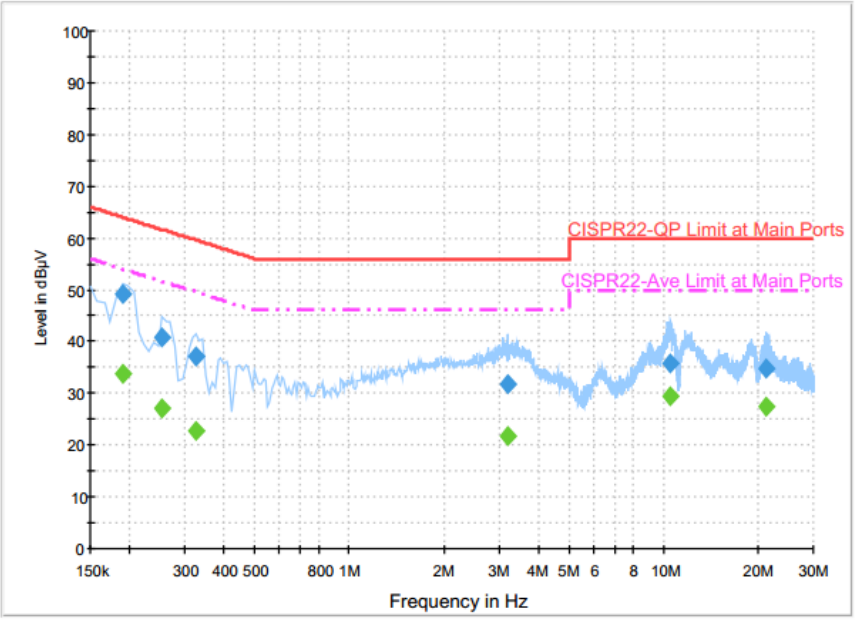
3.2.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.2.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Derreck Chen	Relative Humidity :	55~56%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (5GHz) Link + TC + TF		



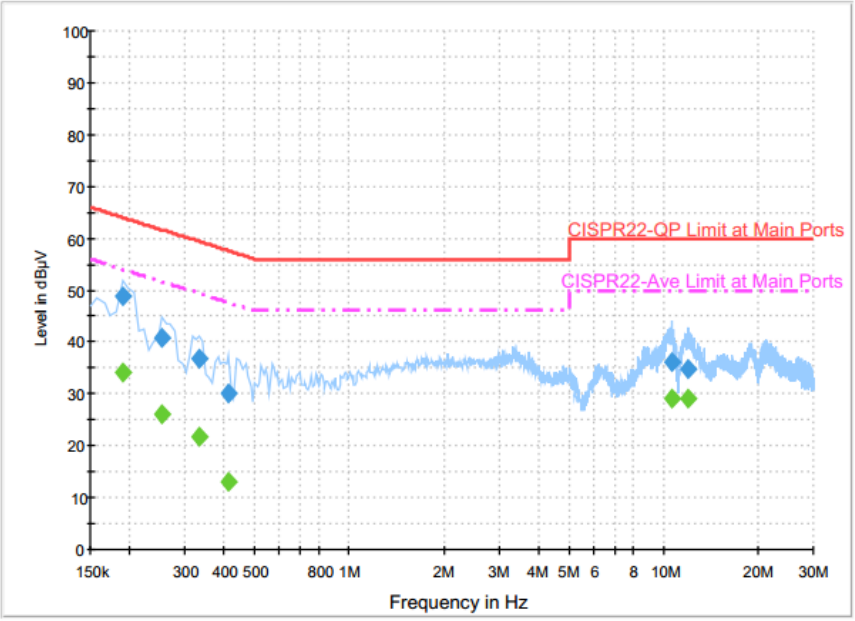
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	49.1	Off	L1	19.5	14.9	64.0
0.254000	40.9	Off	L1	19.6	20.7	61.6
0.326000	37.2	Off	L1	19.6	22.4	59.6
3.190000	31.8	Off	L1	19.7	24.2	56.0
10.582000	35.9	Off	L1	19.8	24.1	60.0
21.174000	34.7	Off	L1	20.0	25.3	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	33.8	Off	L1	19.5	20.2	54.0
0.254000	27.0	Off	L1	19.6	24.6	51.6
0.326000	22.8	Off	L1	19.6	26.8	49.6
3.190000	21.8	Off	L1	19.7	24.2	46.0
10.582000	29.4	Off	L1	19.8	20.6	50.0
21.174000	27.6	Off	L1	20.0	22.4	50.0

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Derreck Chen	Relative Humidity :	55~56%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (5GHz) Link + TC + TF		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	48.9	Off	N	19.5	15.1	64.0
0.254000	40.7	Off	N	19.6	20.9	61.6
0.334000	36.6	Off	N	19.5	22.8	59.4
0.414000	30.3	Off	N	19.5	27.3	57.6
10.630000	36.0	Off	N	19.8	24.0	60.0
12.022000	34.9	Off	N	19.9	25.1	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	34.0	Off	N	19.5	20.0	54.0
0.254000	26.0	Off	N	19.6	25.6	51.6
0.334000	21.6	Off	N	19.5	27.8	49.4
0.414000	13.0	Off	N	19.5	34.6	47.6
10.630000	29.0	Off	N	19.8	21.0	50.0
12.022000	29.0	Off	N	19.9	21.0	50.0

3.3 Antenna Requirements

3.3.1 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.

3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.3.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

$$Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k / 20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

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.

	Ant 1 (dBi)	Ant 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band I	0.05	2.47	4.35	4.35	0.00	0.00
Band II	-0.15	2.89	4.51	4.51	0.00	0.00
Band III	-1.32	2.46	3.78	3.78	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Jul. 29, 2015	Oct. 06, 2015 ~ Oct. 29, 2015	Jul. 28, 2016	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Jul. 29, 2015	Oct. 06, 2015 ~ Oct. 29, 2015	Jul. 28, 2016	Conducted (TH02-HY)
Bilog Antenna	Teseq GmbH	CBL6112D	35379	30MHz~2GHz	Oct. 15, 2015	Oct. 20, 2015 ~ Nov. 05, 2015	Oct. 14, 2016	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Oct. 12, 2015	Oct. 20, 2015 ~ Nov. 05, 2015	Oct. 11, 2016	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Oct. 20, 2015 ~ Nov. 05, 2015	Sep. 01, 2016	Radiation (03CH11-HY)
EMI Test Receiver	Agilent Technologies	N9038A	MY53290045	20Hz ~ 8.4GHz	Feb. 03, 2015	Oct. 20, 2015 ~ Nov. 05, 2015	Feb. 02, 2016	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 24, 2014	Oct. 20, 2015 ~ Nov. 05, 2015	Nov. 23, 2015	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Oct. 08, 2015	Oct. 20, 2015 ~ Nov. 05, 2015	Oct. 07, 2016	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 20, 2014	Oct. 20, 2015 ~ Nov. 05, 2015	Nov. 19, 2015	Radiation (03CH11-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1902247	1GHz~18GHz	Jul. 01, 2015	Oct. 20, 2015 ~ Nov. 05, 2015	Jun. 30, 2016	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHZ	Sep. 24, 2015	Oct. 20, 2015 ~ Nov. 05, 2015	Sep. 23, 2016	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Oct. 20, 2015 ~ Nov. 05, 2015	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0-360 degree	N/A	Oct. 20, 2015 ~ Nov. 05, 2015	N/A	Radiation (03CH11-HY)
Preamplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	Oct. 20, 2015 ~ Nov. 05, 2015	Jun. 01, 2016	Radiation (03CH11-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz – 2.75GHz	Dec. 01, 2014	Oct. 23, 2015	Nov. 30, 2015	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2014	Oct. 23, 2015	Dec. 01, 2015	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Oct. 23, 2015	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**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.9**