Partial FCC RF Test Report

APPLICANT	:	Acer Incorporated
EQUIPMENT	:	Notebook Computer
BRAND NAME	:	Acer
MODEL NAME	:	Z09
MARKETING NAME	:	Aspire M5 series
FCC ID	:	HLZ-Z09A
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

This is a partial report which is included the Radiated Emissions test and RF Power. The product was received on Apr. 19, 2012 and completely tested on May 18, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the 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:

Jones Tsai / Manager

Testing Laboratory 1190

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

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR241954B	Rev. 01	Initial issue of report	May 24, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	A8.5	Frequency Band Edges	≤ 20dBc	Pass	-
3.2	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 0.24 dB at 11650.000 MHz
3.3	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Acer Incorporated

8F., No. 88, Sec. 1, Xintai 5th Rd., New Taipei City 22181, Taiwan, R.O.C.

1.2 Manufacturer

Quanta Computer Inc.

1. No. 2, Lane 58, Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
2. No. 4, Wen Ming 1st Street, Kuei Shan Hsiang, Taoyuan Shien, Taiwan, R.O.C. 333
3. No. 8, Dongjing Rd., Songjiang Industrial Zone, Shanghai, P.R. China
4. No. 4, Lane 58 Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
5. North to Songsheng. Road, Songjiang Industrial Zone, Shanghai, P.R. China
6. B#, No. 1, South Rongteng Road, Songjiang Export Processing Zone, Shanghai, P.R. China
7. Standard Factory, South to Valqua, Rongxin Road, Songjiang Export Processing Zone, Shanghai, P.R. China
8. C#, No. 1, South Rongteng Road, Songhjang Export Processing Zone, Shanghai, P.R. China
9. No. 6, Lane 66 Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
10. No. 5, Lane 58 Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
11. Huade Building, No. 18, ChuangYe Rd., ShandDi Zone, HaiDian District, Beijing, P.R.C.
12. No. 68, Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
13. 2F., C Building, XinYe Rd., Export Processing District In Torch, Zhongshan, Guangdong, P.R.C.

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Notebook Computer
Brand Name	Acer
Model Name	Z09
Marketing Name	Aspire M5 series
Integrated Module	Brand Name : Atheros Model Name : AR5B22
FCC ID	HLZ-Z09A
Tx/Rx Frequency Range	802.11b/g/n : 2400 MHz ~ 2483.5 MHz 802.11a/n : 5725 MHz ~ 5850 MHz
Channel Spacing	802.11b/g/n : 5 MHz 802.11a/n : 20 MHz
Antenna Type	**<Main Antenna>** 802.11b/g/n : PIFA Antenna with gain -1.09 dBi 802.11a/n : PIFA Antenna with gain -0.60 dBi **<Aux. Antenna>** 802.11b/g/n : PIFA Antenna with gain -0.15 dBi 802.11a/n : PIFA Antenna with gain 0.04 dBi
HW Version	M/B : C
SW Version	BIOS :V0.24n
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

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 Testing Site

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1st 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.
	03CH05HY	722060/4086B-1

1.5 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance DR01
- ANSI C63.4-2003
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

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.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	iPod Earphone	Apple	N/A	FCC DoC	Shielded, 1.0 m	N/A
2.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
3.	LCD Monitor	Acer	H223HQ	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	Notebook	DELL	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

For 20MHz bandwidth systems, use Channel 1~11.

For 40MHz bandwidth systems, use Channel 3~9.

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

For 20MHz bandwidth systems, use Channel 149, 157, 165.

For 40MHz bandwidth systems, use Channel 151, 159.

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5825 MHz Band 4	149	5745	159	5795
	151	5755	165	5825
	157	5785		

2.2 Maximum Peak Conducted Output Power:

<2.4GHz RF Power>

Peak Power (dBm)	802.11b for Ant. 1	802.11b for Ant. 0+1	802.11b for Ant. 0+1 (0)	802.11b for Ant. 0+1(1)
CH01	19.81	21.76	18.50	18.98
CH06	21.73	21.74	18.75	18.71
CH11	20.83	**21.89**	18.82	18.93

Peak Power	802.11g for Ant. 1	802.11g for Ant. 0+1	802.11g for Ant. 0+1 (0)	802.11g for Ant. 0+1(1)
CH01	25.34	25.66	22.54	22.76
CH06	26.73	**28.75**	25.99	25.47
CH11	25.45	25.54	21.77	23.17

Peak Power (dBm)	802.11g/n (BW 20MHz) for Ant. 1+0	802.11g/n (BW 20MHz) for Ant. 0+1 (0)	802.11g/n (BW 20MHz) for Ant. 0+1 (1)
CH01	25.54	22.54	22.52
CH06	**28.77**	25.66	25.85
CH11	24.73	21.21	22.18

Peak Power (dBm)	802.11g/n (BW 40MHz) for Ant. 0+1	802.11g/n (BW 40MHz) for Ant. 0+1 (0)	802.11g/n (BW 40MHz) for Ant. 0+1 (1)
CH03	21.90	17.92	19.69
CH06	**26.81**	23.69	23.91
CH09	24.10	20.24	21.80

<5GHz RF Power>

Peak Power (dBm)	802.11a for Ant. 1	802.11a for Ant. 0+1	802.11a for Ant. 0+1 (0)	802.11a for Ant. 0+1 (1)
CH149	20.22	**23.08**	20.35	19.77
CH157	20.48	22.74	20.22	19.18
CH165	20.62	22.95	20.28	19.56

Peak Power (dBm)	802.11a/n (BW 20MHz) for Ant. 0+1	802.11a/n (BW 20MHz) for Ant. 0+1 (0)	802.11a/n (BW 20MHz) for Ant. 0+1 (1)
CH149	23.80	21.23	20.30
CH157	23.83	21.16	20.44
CH165	**24.13**	21.53	20.67

Peak Power (dBm)	802.11a/n (BW 40MHz) for Ant. 0+1	802.11a/n (BW 40MHz) for Ant. 0+1 (0)	802.11a/n (BW 40MHz) for Ant. 0+1 (1)
CH151	**22.99**	18.83	20.89
CH159	21.96	18.51	19.34

Remark:

1. The peak power is measured by the test method, 7.2.1.3 Option 3(peak power meter method), in DTS Meas. Guidance DR01.
2. The EUT is programmed to transmit signals continuously.
3. The data rates of WLAN 802.11b/g/n/a were set in 1Mbps for 802.11b Ant. (0+1), 6Mbps for 802.11g (0+1), 6.5Mbps for 802.11g/n (BW 20MHz) (0+1), 13.5Mbps for 802.11g/n (BW 40MHz) (0+1), 6Mbps for 802.11a(0+1), 6.5Mbps for 802.11a/n (BW 20MHz) (0+1), 6.5Mbps for 802.11a/n (BW 40MHz) (0+1) for all the test cases due to the highest RF output power.

2.3 Maximum Average Conducted Output Power:

<2.4GHz RF Power>

Average Power (dBm)	802.11b for Ant. 1	802.11b for Ant. 0+1	802.11b for Ant. 0+1(0)	802.11b for Ant. 0+1(1)
CH01	17.59	19.57	16.28	16.82
CH06	19.59	19.59	16.55	16.61
CH11	18.66	**19.70**	16.63	16.74

Average Power (dBm)	802.11g for Ant. 1	802.11g for Ant. 0+1	802.11g for Ant. 0+1(0)	802.11g for Ant. 0+1(1)
CH01	16.09	15.52	12.56	12.45
CH06	19.68	**19.38**	16.69	16.02
CH11	15.87	15.29	11.92	12.61

Average Power (dBm)	802.11g/n (BW 20MHz) for Ant. 0+1	802.11g/n (BW 20MHz) for Ant. 0+1(0)	802.11g/n (BW 20MHz) for Ant. 0+1(1)
CH01	15.49	12.55	12.41
CH06	**19.59**	16.58	16.57
CH11	14.36	11.02	11.65

Average Power (dBm)	802.11g/n (BW 40MHz) for Ant. 0+1	802.11g/n (BW 40MHz) for Ant. 0+1(0)	802.11g/n (BW 40MHz) for Ant. 0+1(1)
CH03	12.03	8.74	9.28
CH06	**16.72**	13.70	13.72
CH09	13.60	10.22	10.93

<5GHz RF Power>

Average Power (dBm)	802.11a for Ant. 1	802.11a for Ant. 0+1	802.11a for Ant. 0+1(0)	802.11a for Ant. 0+1(1)
CH149	14.14	15.12	12.33	11.87
CH157	14.22	15.20	12.53	11.81
CH165	15.07	**15.44**	12.63	12.23

Average Power (dBm)	802.11a/n (BW 20MHz) for Ant. 0+1	802.11a/n (BW 20MHz) for Ant. 0+1(0)	802.11a/n (BW 20MHz) for Ant. 0+1(1)
CH149	16.32	13.67	12.91
CH157	16.57	13.96	13.12
CH165	16.81	14.17	13.39

Average Power (dBm)	802.11a/n (BW 40MHz) for Ant. 0+1	802.11a/n (BW 40MHz) for Ant. 0+1(0)	802.11a/n (BW 40MHz) for Ant. 0+1(1)
CH151	17.20	13.36	14.89
CH159	16.94	13.78	14.08

Remark:

1. The average power, which is used by the test method, 7.2.2.3 Option 3(average power meter method), in DTS Meas. Guidance DR01, is reporting only.
2. The EUT is programmed to transmit signals continuously.

2.4 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

<table>
<tr><th colspan="2">Test Cases</th></tr>
<tr><td>Test Item</td><td>802.11b (Modulation : DSSS)
802.11g/n (Modulation : OFDM)
802.11a/n (Modulation : OFDM)</td></tr>
<tr><td>Radiated
TCs</td><td>
<table>
<tr><th>Test Mode</th><th>802.11b</th><th>802.11g</th><th>802.11g/n (BW 20MHz)</th></tr>
<tr><td>CH01</td><td>1</td><td>4</td><td>7</td></tr>
<tr><td>CH06</td><td>2</td><td>5</td><td>8</td></tr>
<tr><td>CH11</td><td>3</td><td>6</td><td>9</td></tr>
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<table>
<tr><th>Test Mode</th><th>802.11g/n (BW 40MHz)</th></tr>
<tr><td>CH03</td><td>10</td></tr>
<tr><td>CH06</td><td>11</td></tr>
<tr><td>CH09</td><td>12</td></tr>
</table>
<table>
<tr><th>Test Mode</th><th>802.11a</th><th>802.11a/n (BW 20MHz)</th></tr>
<tr><td>CH149</td><td>13</td><td>16</td></tr>
<tr><td>CH157</td><td>14</td><td>17</td></tr>
<tr><td>CH165</td><td>15</td><td>18</td></tr>
</table>
<table>
<tr><th>Test Mode</th><th>802.11a/n (BW 40MHz)</th></tr>
<tr><td>CH151</td><td>19</td></tr>
<tr><td>CH159</td><td>20</td></tr>
</table>
</td></tr>
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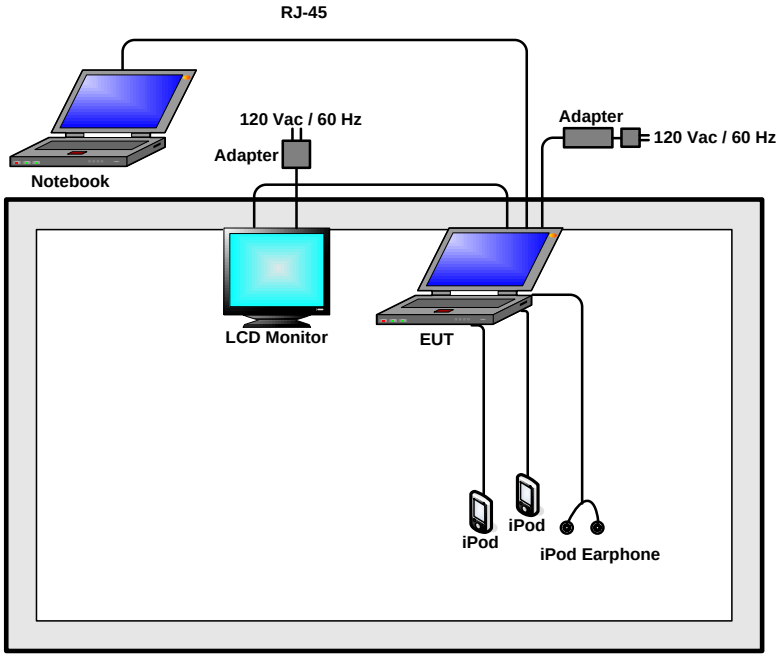
2.5 Connection Diagram of Test System



2.6 RF Utility

The programmed RF utility “artgui.exe” 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 Band Edges Measurement

3.1.1 Limit of Band Edges

In any 100 KHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

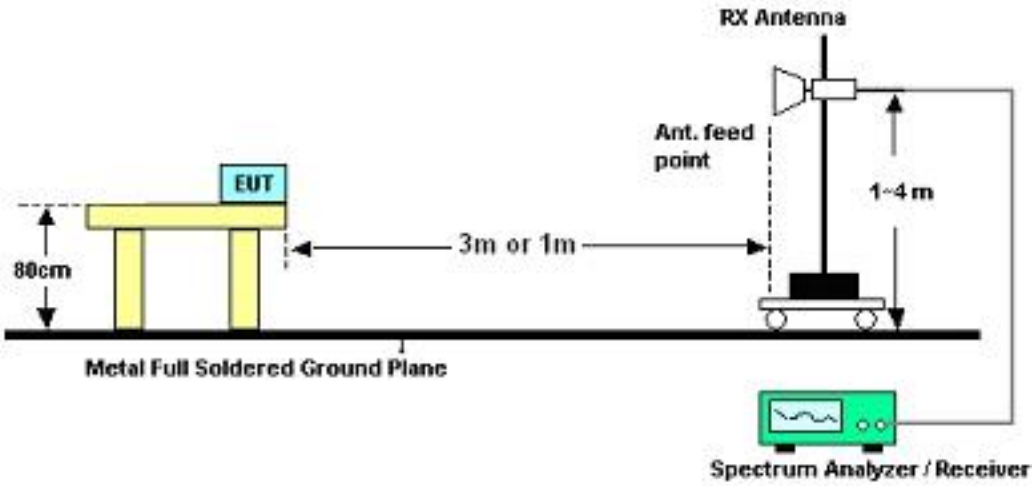
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows the guidelines in ANSI C63.4-2003 and the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance DR01.
2. Conducted emission test: Set RBW = 100 KHz, Video bandwidth (VBW) ≥ RBW. Out of the authorized frequency band emissions must be at least 20 dB lower than the highest emission level within the authorized band as measured with a 100 KHz RBW. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
3. Radiated emission test: Apply to band edge emissions that falling on the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, then modify the unit for continuous operation. Use the settings in this paragraph to correct the reading level by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation per 15.35(b) and (c).

3.1.4 Test Setup



3.1.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	**Temperature :**	20~22°C
Test Band :	802.11b	**Relative Humidity :**	40~42%
Test Channel :	01	**Test Engineer :**	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2386.76	51.28	-22.72	74	50.56	32.02	4.58	35.88	159	299	Peak
2386.76	41.7	-12.3	54	40.98	32.02	4.58	35.88	159	299	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2386.19	50.23	-23.77	74	49.51	32.02	4.58	35.88	137	140	Peak
2386.19	40.1	-13.9	54	39.38	32.02	4.58	35.88	137	140	Average

Test Mode :	Mode 3	**Temperature :**	20~22°C
Test Band :	802.11b	**Relative Humidity :**	40~42%
Test Channel :	11	**Test Engineer :**	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2487.84	53.87	-20.13	74	52.94	32.1	4.64	35.81	157	303	Peak
2487.84	43.97	-10.03	54	43.04	32.1	4.64	35.81	157	303	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2488.6	53.49	-20.51	74	52.56	32.1	4.64	35.81	100	19	Peak
2488.6	43.76	-10.24	54	42.83	32.1	4.64	35.81	100	19	Average

Test Mode :	Mode 4	Temperature :	20~22°C
Test Band :	802.11g	Relative Humidity :	40~42%
Test Channel :	01	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	68.45	-5.55	74	67.71	32.02	4.58	35.86	162	298	Peak
2389.99	48.49	-5.51	54	47.75	32.02	4.58	35.86	162	298	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	70.16	-3.84	74	69.42	32.02	4.58	35.86	100	116	Peak
2389.99	49.79	-4.21	54	49.05	32.02	4.58	35.86	100	116	Average

Test Mode :	Mode 6	Temperature :	20~22°C
Test Band :	802.11g	Relative Humidity :	40~42%
Test Channel :	11	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.04	72.26	-1.74	74	71.34	32.09	4.64	35.81	200	359	Peak
2484.04	47.69	-6.31	54	46.77	32.09	4.64	35.81	200	359	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.85	71.66	-2.34	74	70.74	32.09	4.64	35.81	100	193	Peak
2483.85	48.55	-5.45	54	47.63	32.09	4.64	35.81	100	193	Average

Test Mode :	Mode 7	Temperature :	20~22°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	40~42%
Test Channel :	01	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.8	61.33	-12.67	74	60.59	32.02	4.58	35.86	100	300	Peak
2389.8	42.92	-11.08	54	42.18	32.02	4.58	35.86	100	300	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.61	71.5	-2.5	74	70.76	32.02	4.58	35.86	159	11	Peak
2389.61	49.74	-4.26	54	49	32.02	4.58	35.86	159	11	Average

Test Mode :	Mode 9	Temperature :	20~22°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	40~42%
Test Channel :	11	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.04	67.63	-6.37	74	66.71	32.09	4.64	35.81	100	131	Peak
2484.04	43.4	-10.6	54	42.48	32.09	4.64	35.81	100	131	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.85	69.37	-4.63	74	68.45	32.09	4.64	35.81	100	41	Peak
2483.85	47.36	-6.64	54	46.44	32.09	4.64	35.81	100	41	Average

Test Mode :	Mode 10	Temperature :	20~22°C
Test Band :	802.11g/n (BW 40MHz)	Relative Humidity :	40~42%
Test Channel :	03	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.28	62.11	-11.89	74	61.39	32.02	4.58	35.88	102	137	Peak
2388.28	44.34	-9.66	54	43.62	32.02	4.58	35.88	102	137	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.9	61.51	-12.49	74	60.79	32.02	4.58	35.88	100	23	Peak
2387.9	41.96	-12.04	54	41.24	32.02	4.58	35.88	100	23	Average

Test Mode :	Mode 12	Temperature :	20~22°C
Test Band :	802.11g/n (BW 40MHz)	Relative Humidity :	40~42%
Test Channel :	09	Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	68.93	-5.07	74	68.01	32.09	4.64	35.81	100	131	Peak
2483.5	46.25	-7.75	54	45.33	32.09	4.64	35.81	100	131	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.04	70.3	-3.7	74	69.38	32.09	4.64	35.81	100	37	Peak
2484.04	49.87	-4.13	54	48.95	32.09	4.64	35.81	100	37	Average

3.2 Radiated Emission Measurement

3.2.1 Limit of Radiated Emission

In any 100 KHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2 Measuring Instruments

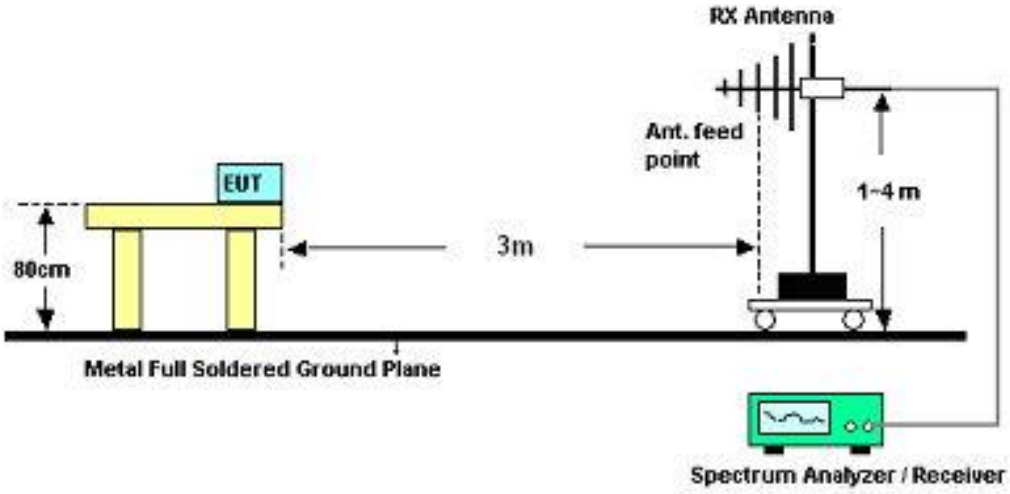
See list of measuring instruments of this test report.

3.2.3 Test Procedures

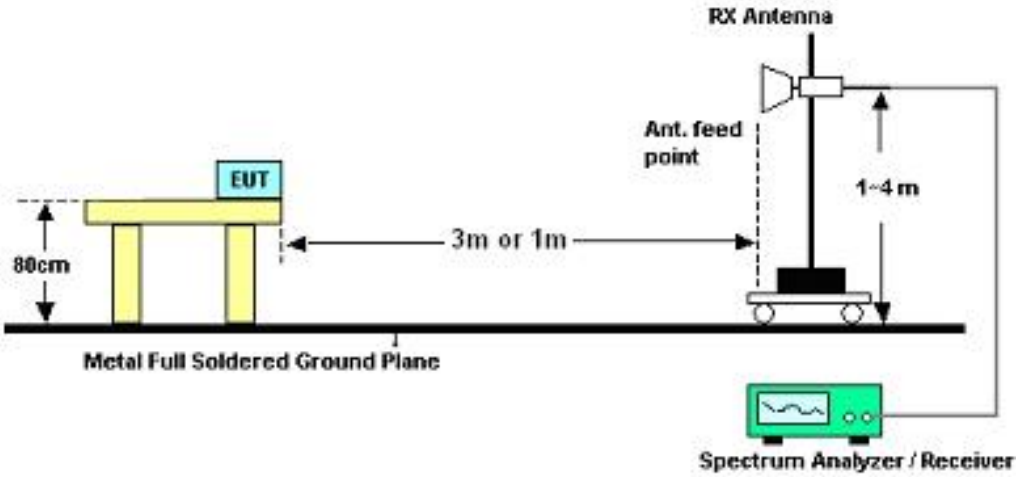
1. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW = 1 MHz for f ≥ 1 GHz, 100 KHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Measurement above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB per decade from 3m to 1m.
   Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB)
2. Maximize the emission by rotating the EUT for three orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines in ANSI C63.4-2003.

3.2.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

Test Mode :	Mode 1	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.76	41.7	-12.3	54	40.98	32.02	4.58	35.88	159	299	Average
2386.76	51.28	-22.72	74	50.56	32.02	4.58	35.88	159	299	Peak
2412	99.65	-	-	98.89	32.03	4.59	35.86	159	299	Average
2412	102.93	-	-	102.17	32.03	4.59	35.86	159	299	Peak
2496	36.97	-17.03	54	36.03	32.1	4.64	35.8	159	299	Average
2496	49.04	-24.96	74	48.1	32.1	4.64	35.8	159	299	Peak
4824	43.92	-30.08	74	62.6	33.83	6.51	59.02	100	0	Peak

Test Mode :	Mode 1	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.19	40.1	-13.9	54	39.38	32.02	4.58	35.88	137	140	Average
2386.19	50.23	-23.77	74	49.51	32.02	4.58	35.88	137	140	Peak
2412	99.66	-	-	98.9	32.03	4.59	35.86	137	140	Average
2412	102.89	-	-	102.13	32.03	4.59	35.86	137	140	Peak
2498	36.95	-17.05	54	36.01	32.1	4.64	35.8	137	140	Average
2498	50.08	-23.92	74	49.14	32.1	4.64	35.8	137	140	Peak
4824	45.47	-28.53	74	64.15	33.83	6.51	59.02	100	0	Peak

Test Mode :	Mode 2	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
164.46	29.67	-13.83	43.5	49.38	10.1	1.36	31.17	-	-	Peak
216.03	33.36	-12.64	46	53.62	9.26	1.53	31.05	100	87	Peak
225.75	31.68	-14.32	46	51.21	9.84	1.56	30.93	-	-	Peak
344.8	25.61	-20.39	46	40.54	14.3	1.89	31.12	-	-	Peak
480.6	26.01	-19.99	46	36.79	17.72	2.2	30.7	-	-	Peak
787.9	24.36	-21.64	46	29.51	21.95	2.81	29.91	-	-	Peak
4874	49.19	-24.81	74	67.72	33.82	6.53	58.88	100	0	Peak

Test Mode :	Mode 2	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	33.2	-6.8	40	44.34	19.8	0.7	31.64	-	-	Peak
176.88	37.42	-6.08	43.5	58.01	9.03	1.39	31.01	100	124	Peak
227.37	32.13	-13.87	46	51.56	9.93	1.57	30.93	-	-	Peak
358.1	25.37	-20.63	46	39.94	14.58	1.92	31.07	-	-	Peak
492.5	27.47	-18.53	46	37.93	17.95	2.22	30.63	-	-	Peak
664.7	27.3	-18.7	46	34.58	20.25	2.61	30.14	-	-	Peak
4874	50.91	-3.09	54	69.44	33.82	6.53	58.88	112	14	Average
4874	52.19	-21.81	74	70.72	33.82	6.53	58.88	112	14	Peak
7311	48.58	-25.42	74	62.55	35.6	8.42	57.99	100	0	Peak

Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386	37.39	-16.61	54	36.67	32.02	4.58	35.88	157	303	Average
2386	48.45	-25.55	74	47.73	32.02	4.58	35.88	157	303	Peak
2462	102.42	-	-	101.56	32.07	4.62	35.83	157	303	Average
2462	105.13	-	-	104.27	32.07	4.62	35.83	157	303	Peak
2487.84	43.97	-10.03	54	43.04	32.1	4.64	35.81	157	303	Average
2487.84	53.87	-20.13	74	52.94	32.1	4.64	35.81	157	303	Peak
4924	50.32	-23.68	74	68.7	33.81	6.55	58.74	100	0	Peak
7386	44.93	-29.07	74	58.91	35.6	8.55	58.13	100	0	Peak

Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386	37.01	-16.99	54	36.29	32.02	4.58	35.88	100	19	Average
2386	48.36	-25.64	74	47.64	32.02	4.58	35.88	100	19	Peak
2462	101.6	-	-	100.74	32.07	4.62	35.83	100	19	Average
2462	105.31	-	-	104.45	32.07	4.62	35.83	100	19	Peak
2488.6	43.76	-10.24	54	42.83	32.1	4.64	35.81	100	19	Average
2488.6	53.49	-20.51	74	52.56	32.1	4.64	35.81	100	19	Peak
4924	50.73	-3.27	54	69.11	33.81	6.55	58.74	100	9	Average
4924	53.54	-20.46	74	71.92	33.81	6.55	58.74	100	9	Peak
7386	47.81	-26.19	74	61.79	35.6	8.55	58.13	100	0	Peak

Test Mode :	Mode 4	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	48.49	-5.51	54	47.75	32.02	4.58	35.86	162	298	Average
2389.99	68.45	-5.55	74	67.71	32.02	4.58	35.86	162	298	Peak
2412	96.29	-	-	95.53	32.03	4.59	35.86	162	298	Average
2412	103.85	-	-	103.09	32.03	4.59	35.86	162	298	Peak
2494	37.34	-16.66	54	36.4	32.1	4.64	35.8	162	298	Average
2494	49.72	-24.28	74	48.78	32.1	4.64	35.8	162	298	Peak
4824	43.04	-30.96	74	61.72	33.83	6.51	59.02	100	0	Peak

Test Mode :	Mode 4	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	49.79	-4.21	54	49.05	32.02	4.58	35.86	100	116	Average
2389.99	70.16	-3.84	74	69.42	32.02	4.58	35.86	100	116	Peak
2412	93.77	-	-	93.01	32.03	4.59	35.86	100	116	Average
2412	104.14	-	-	103.38	32.03	4.59	35.86	100	116	Peak
2494	37	-17	54	36.06	32.1	4.64	35.8	100	116	Average
2494	50.32	-23.68	74	49.38	32.1	4.64	35.8	100	116	Peak
4824	46.68	-27.32	74	65.36	33.83	6.51	59.02	100	0	Peak

Test Mode :	Mode 5	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
4874	49.22	-24.78	74	67.75	33.82	6.53	58.88	100	0	Peak
7311	39.25	-14.75	54	53.22	35.6	8.42	57.99	100	15	Average
7311	51.52	-22.48	74	65.49	35.6	8.42	57.99	100	15	Peak
12185	49.3	-24.7	74	55.88	38.89	10.6	56.07	100	0	Peak

Test Mode :	Mode 5	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
4874	40	-14	54	58.53	33.82	6.53	58.88	100	13	Average
4874	53.06	-20.94	74	71.59	33.82	6.53	58.88	100	13	Peak
7311	42.28	-11.72	54	56.25	35.6	8.42	57.99	100	24	Average
7311	54.61	-19.39	74	68.58	35.6	8.42	57.99	100	24	Peak
12185	49.52	-24.48	74	56.1	38.89	10.6	56.07	100	0	Peak

Test Mode :	Mode 6	Temperature :	20~22°C
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2330	36.25	-17.75	54	35.66	31.96	4.53	35.9	200	359	Average
2330	48.38	-25.62	74	47.79	31.96	4.53	35.9	200	359	Peak
2462	96.29	-	-	95.43	32.07	4.62	35.83	200	359	Average
2462	103.67	-	-	102.81	32.07	4.62	35.83	200	359	Peak
2484.04	47.69	-6.31	54	46.77	32.09	4.64	35.81	200	359	Average
2484.04	72.26	-1.74	74	71.34	32.09	4.64	35.81	200	359	Peak
4924	46.14	-27.86	74	64.51	33.81	6.56	58.74	100	0	Peak
7386	49.89	-24.11	74	63.87	35.6	8.55	58.13	100	0	Peak

Test Mode :	Mode 6	Temperature :	20~22°C
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2384	36.38	-17.62	54	35.68	32	4.58	35.88	100	193	Average
2384	48.6	-25.4	74	47.9	32	4.58	35.88	100	193	Peak
2462	94.44	-	-	93.58	32.07	4.62	35.83	100	193	Average
2462	104.95	-	-	104.09	32.07	4.62	35.83	100	193	Peak
2483.85	48.55	-5.45	54	47.63	32.09	4.64	35.81	100	193	Average
2483.85	71.66	-2.34	74	70.74	32.09	4.64	35.81	100	193	Peak
4924	48.57	-25.43	74	66.95	33.81	6.55	58.74	100	0	Peak
7386	33.21	-20.79	54	47.19	35.6	8.55	58.13	100	36	Average
7386	51.43	-22.57	74	65.41	35.6	8.55	58.13	100	36	Peak

Test Mode :	Mode 7	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.8	42.92	-11.08	54	42.18	32.02	4.58	35.86	100	300	Average
2389.8	61.33	-12.67	74	60.59	32.02	4.58	35.86	100	300	Peak
2412	94.18	-	-	93.42	32.03	4.59	35.86	100	300	Average
2412	104.94	-	-	104.18	32.03	4.59	35.86	100	300	Peak
2496	37.23	-16.77	54	36.29	32.1	4.64	35.8	100	300	Average
2496	51.22	-22.78	74	50.28	32.1	4.64	35.8	100	300	Peak

Test Mode :	Mode 7	Temperature :	20~22°C
Test Channel :	01	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.61	49.74	-4.26	54	49	32.02	4.58	35.86	159	11	Average
2389.61	71.5	-2.5	74	70.76	32.02	4.58	35.86	159	11	Peak
2412	96.31	-	-	95.55	32.03	4.59	35.86	159	11	Average
2412	105.15	-	-	104.39	32.03	4.59	35.86	159	11	Peak
2488	37.94	-16.06	54	37.01	32.1	4.64	35.81	159	11	Average
2488	50.42	-23.58	74	49.49	32.1	4.64	35.81	159	11	Peak

Test Mode :	Mode 8	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
4874	46.85	-27.15	74	65.38	33.82	6.53	58.88	100	0	Peak

Test Mode :	Mode 8	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
4874	46.67	-27.33	74	65.2	33.82	6.53	58.88	100	0	Peak
7311	50.02	-23.98	74	63.99	35.6	8.42	57.99	100	0	Peak

Test Mode :	Mode 9	Temperature :	20~22°C
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2332	35.73	-18.27	54	35.12	31.96	4.55	35.9	100	131	Average
2332	47.92	-26.08	74	47.31	31.96	4.55	35.9	100	131	Peak
2462	94.68	-	-	93.82	32.07	4.62	35.83	100	131	Average
2462	104.76	-	-	103.9	32.07	4.62	35.83	100	131	Peak
2484.04	43.4	-10.6	54	42.48	32.09	4.64	35.81	100	131	Average
2484.04	67.63	-6.37	74	66.71	32.09	4.64	35.81	100	131	Peak

Test Mode :	Mode 9	Temperature :	20~22°C
Test Channel :	11	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2360	35.97	-18.03	54	35.3	31.99	4.57	35.89	100	41	Average
2360	48.36	-25.64	74	47.69	31.99	4.57	35.89	100	41	Peak
2462	95.37	-	-	94.49	32.07	4.62	35.81	100	41	Average
2462	106.2	-	-	105.32	32.07	4.62	35.81	100	41	Peak
2483.85	47.36	-6.64	54	46.44	32.09	4.64	35.81	100	41	Average
2483.85	69.37	-4.63	74	68.45	32.09	4.64	35.81	100	41	Peak

Test Mode :	Mode 10	Temperature :	20~22°C
Test Channel :	03	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2422 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.28	44.34	-9.66	54	43.62	32.02	4.58	35.88	102	137	Average
2388.28	62.11	-11.89	74	61.39	32.02	4.58	35.88	102	137	Peak
2422	89.43	-	-	88.62	32.04	4.61	35.84	102	137	Average
2422	99.5	-	-	98.69	32.04	4.61	35.84	102	137	Peak
2486	37.71	-16.29	54	36.79	32.09	4.64	35.81	102	137	Average
2486	50.63	-23.37	74	49.71	32.09	4.64	35.81	102	137	Peak

Test Mode :	Mode 10	Temperature :	20~22°C
Test Channel :	03	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2422 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.9	41.96	-12.04	54	41.24	32.02	4.58	35.88	100	23	Average
2387.9	61.51	-12.49	74	60.79	32.02	4.58	35.88	100	23	Peak
2422	90.46	-	-	89.63	32.06	4.61	35.84	100	23	Average
2422	100.51	-	-	99.68	32.06	4.61	35.84	100	23	Peak
2496	38.23	-15.77	54	37.29	32.1	4.64	35.8	100	23	Average
2496	50.26	-23.74	74	49.32	32.1	4.64	35.8	100	23	Peak

Test Mode :	Mode 11	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	42.59	-11.41	54	41.85	32.02	4.58	35.86	103	145	Average
2390	64.14	-9.86	74	63.4	32.02	4.58	35.86	103	145	Peak
2437	93.52	-	-	92.71	32.04	4.61	35.84	103	145	Average
2437	103.57	-	-	102.76	32.04	4.61	35.84	103	145	Peak
2484	46.73	-7.27	54	45.81	32.09	4.64	35.81	103	145	Average
2484	65.81	-8.19	74	64.89	32.09	4.64	35.81	103	145	Peak

Test Mode :	Mode 11	Temperature :	20~22°C
Test Channel :	06	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	47.53	-6.47	54	46.79	32.02	4.58	35.86	161	14	Average
2390	64	-10	74	63.26	32.02	4.58	35.86	161	14	Peak
2437	94.99	-	-	94.15	32.06	4.61	35.83	161	14	Average
2437	104.75	-	-	103.91	32.06	4.61	35.83	161	14	Peak
2484	42.17	-11.83	54	41.25	32.09	4.64	35.81	161	14	Average
2484	65.17	-8.83	74	64.25	32.09	4.64	35.81	161	14	Peak

Test Mode :	Mode 12	Temperature :	20~22°C
Test Channel :	09	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	2452 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	36.05	-17.95	54	35.31	32.02	4.58	35.86	100	131	Average
2390	51.42	-22.58	74	50.68	32.02	4.58	35.86	100	131	Peak
2452	91.4	-	-	90.52	32.07	4.62	35.81	100	131	Average
2452	102.34	-	-	101.46	32.07	4.62	35.81	100	131	Peak
2483.5	46.25	-7.75	54	45.33	32.09	4.64	35.81	100	131	Average
2483.5	68.93	-5.07	74	68.01	32.09	4.64	35.81	100	131	Peak

Test Mode :	Mode 12	Temperature :	20~22°C
Test Channel :	09	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	2452 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	36.62	-17.38	54	35.88	32.02	4.58	35.86	100	37	Average
2390	49.81	-24.19	74	49.07	32.02	4.58	35.86	100	37	Peak
2452	92.31	-	-	91.45	32.07	4.62	35.83	100	37	Average
2452	103.3	-	-	102.44	32.07	4.62	35.83	100	37	Peak
2484.04	49.87	-4.13	54	48.95	32.09	4.64	35.81	100	37	Average
2484.04	70.3	-3.7	74	69.38	32.09	4.64	35.81	100	37	Peak

Test Mode :	Mode 13	Temperature :	20~22°C
Test Channel :	149	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11490	44.8	-9.2	54	51.76	37.99	10.26	55.21	100	255	Average
11490	55.46	-18.54	74	62.42	37.99	10.26	55.21	100	255	Peak

Test Mode :	Mode 13	Temperature :	20~22°C
Test Channel :	149	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11490	45.13	-8.87	54	52.09	37.99	10.26	55.21	100	28	Average
11490	55.81	-18.19	74	62.77	37.99	10.26	55.21	100	28	Peak

Test Mode :	Mode 14	Temperature :	20~22°C
Test Channel :	157	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11570	51.93	-2.07	54	58.83	38.1	10.3	55.3	100	264	Average
11570	64.93	-9.07	74	71.83	38.1	10.3	55.3	100	264	Peak

Test Mode :	Mode 14	Temperature :	20~22°C
Test Channel :	157	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11570	51.94	-2.06	54	58.84	38.1	10.3	55.3	100	26	Average
11570	65.05	-8.95	74	71.95	38.1	10.3	55.3	100	26	Peak

Test Mode :	Mode 15	Temperature :	20~22°C
Test Channel :	165	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11650	52.63	-1.37	54	59.46	38.19	10.37	55.39	100	251	Average
11650	65.07	-8.93	74	71.9	38.19	10.37	55.39	100	251	Peak

Test Mode :	Mode 15	Temperature :	20~22°C
Test Channel :	165	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11650	52.14	-1.86	54	58.97	38.19	10.37	55.39	100	26	Average
11650	64.59	-9.41	74	71.42	38.19	10.37	55.39	100	26	Peak

Test Mode :	Mode 16	Temperature :	20~22°C
Test Channel :	149	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11490	44.3	-9.7	54	51.26	37.99	10.26	55.21	100	258	Average
11490	56.67	-17.33	74	63.63	37.99	10.26	55.21	100	258	Peak

Test Mode :	Mode 16	Temperature :	20~22°C
Test Channel :	149	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11490	46.48	-7.52	54	53.44	37.99	10.26	55.21	101	28	Average
11490	58.81	-15.19	74	65.77	37.99	10.26	55.21	101	28	Peak

Test Mode :	Mode 17	Temperature :	20~22°C
Test Channel :	157	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11570	49.8	-4.2	54	56.7	38.1	10.3	55.3	100	255	Average
11570	62.13	-11.87	74	69.03	38.1	10.3	55.3	100	255	Peak

Test Mode :	Mode 17	Temperature :	20~22°C
Test Channel :	157	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11570	52.38	-1.62	54	59.28	38.1	10.3	55.3	113	33	Average
11570	64.69	-9.31	74	71.59	38.1	10.3	55.3	113	33	Peak

Test Mode :	Mode 18	Temperature :	20~22°C
Test Channel :	165	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11650	51.41	-2.59	54	58.24	38.19	10.37	55.39	100	254	Average
11650	64.56	-9.44	74	71.39	38.19	10.37	55.39	100	254	Peak

Test Mode :	Mode 18	Temperature :	20~22°C
Test Channel :	165	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11650	53.76	-0.24	54	60.59	38.19	10.37	55.39	105	30	Average
11650	66.91	-7.09	74	73.74	38.19	10.37	55.39	105	30	Peak

Test Mode :	Mode 19	Temperature :	20~22°C
Test Channel :	151	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11510	42.43	-11.57	54	49.36	38	10.27	55.2	100	24	Average
11510	54.51	-19.49	74	61.44	38	10.27	55.2	100	24	Peak

Test Mode :	Mode 19	Temperature :	20~22°C
Test Channel :	151	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11510	46.5	-7.5	54	53.43	38	10.27	55.2	100	24	Average
11510	58.58	-15.42	74	65.51	38	10.27	55.2	100	24	Peak

Test Mode :	Mode 20	Temperature :	20~22°C
Test Channel :	159	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11590	51.45	-2.55	54	58.33	38.12	10.32	55.32	100	245	Average
11590	62.65	-11.35	74	69.53	38.12	10.32	55.32	100	245	Peak

Test Mode :	Mode 20	Temperature :	20~22°C
Test Channel :	159	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
11590	52.76	-1.24	54	59.64	38.12	10.32	55.32	101	45	Average
11590	63.97	-10.03	74	70.85	38.12	10.32	55.32	101	45	Peak

3.3 Antenna Requirements

3.3.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.3.2 Antenna Connected Construction

The antennas type used in this product is PIFA Antenna with non-standard connector and it is considered to meet antenna requirement.

3.3.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 18, 2011	May 18, 2012	Sep. 17, 2012	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 18, 2011	May 18, 2012	Sep. 17, 2012	Conducted (TH02-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz ~ 26.5GHz	Dec. 22, 2011	May 16, 2012 ~ May 18, 2012	Dec. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 2GHz	Oct. 22, 2011	May 16, 2012 ~ May 18, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	May 16, 2012 ~ May 18, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	May 16, 2012 ~ May 18, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz ~ 18GHz	Aug. 04, 2011	May 16, 2012 ~ May 18, 2012	Aug. 03, 2012	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103A	161075	10Hz ~ 1000MHz Gain:32dB	Feb. 27, 2012	May 16, 2012 ~ May 18, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159087	1GHz~18GHz	Feb. 27, 2012	May 16, 2012 ~ May 18, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A019 17	1GHz~26.5GHz	Aug. 30, 2011	May 16, 2012 ~ May 18, 2012	Aug. 29, 2012	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty Uc(y)	**1.27**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**		

Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	±1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	±0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site Imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	**2.36**				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**				

Appendix A. Photographs of EUT

Please refer to Sporton report number EP241954 as below.