FCC RF Test Report

APPLICANT	**:**	**CT Asia**
EQUIPMENT	**:**	**mobile phone**
BRAND NAME	**:**	**BLU**
MODEL NAME	**:**	**SPEED**
FCC ID	**:**	**YHLBLUSPEED**
STANDARD	**:**	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	**:**	**Digital Spread Spectrum (DSS)**

The product was received on Oct. 29, 2010 and completely tested on Nov. 15, 2010. 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Anderson Chiu

Anderson Chiu / Deputy Manager

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR0O2916A	Rev. 01	Initial issue of report	Nov. 24, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(1)	A8.4(2)	Number of Channels	≥ 15Chs	Pass	-
3.2	15.247(a)(1)	A8.1(a)	20dB Bandwidth	NA	Pass	-
3.3	15.247(a)(1)	A8.1(b)	Channel Separation	≥ 2/3 of 20dB BW	Pass	-
3.4	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	≤ 0.4sec in 31.6sec period	Pass	-
3.5	15.247(b)(1)	A8.1(b)	Peak Output Power	≤ 1W	Pass	-
3.6	15.247(d)	A8.5	Frequency Band Edges	≤ 20dBc	Pass	-
3.7	15.247(d)	A8.5	Spurious Emission	< 20 dBc	Pass	-
3.8	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 11.76 dB at 0.59 MHz
3.9	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 0.84 dB at 2483.5 MHz
3.10	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

CT Asia
RMA2011, 20/F., GOLDEN CENTRAL TOWER, NO. 3037# JINTIAN ROAD , FUTIAN DISTRICT

1.2 Manufacturer

CT Asia
RMA2011, 20/F., GOLDEN CENTRAL TOWER, NO. 3037# JINTIAN ROAD , FUTIAN DISTRICT

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	mobile phone
Brand Name	BLU
Model Name	SPEED
FCC ID	YHLBLUSPEED
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Channel Spacing	1 MHz
Maximum Output Power to Antenna	Bluetooth (1Mbps) : 6.14 dBm (0.004 W) Bluetooth EDR (2Mbps) : 6.17 dBm (0.004 W) Bluetooth EDR (3Mbps) : 6.19 dBm (0.004 W)
Antenna Type	Fixed Internal Antenna with gain 1 dBi
Type of Antenna Connector	N/A
HW Version	V3.0
SW Version	ZW91B_37A0_V_1_0_7
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π /4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Production Unit

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Spread Spectrum (DSS).
3. 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 (KUNSHAN) INC.	
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958	
Test Site No.	Sporton Site No.	
	CO01-KS	03CH01-KS

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 Public Notice DA 00-705
- ANSI C63.4-2003
- IC RSS-210 Issue 7

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 (DoC), recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Base Station	Anritsu	8852B	N/A	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Nokia	HS-12W	PYAHS-12W	N/A	N/A
4.	Router	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 RF Output Power

Preliminary tests were performed in different data rate and recorded the RF output power in the following table:

Channel	Frequency	Bluetooth RF Output Power		
		Data Rate / Modulation		
		GFSK	π /4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	5.10 dBm	5.16 dBm	5.14 dBm
Ch39	2441MHz	6.14 dBm	6.17 dBm	**6.19 dBm**
Ch78	2480MHz	4.18 dBm	4.19 dBm	4.28 dBm

Remark:

1. The data rate was set in 3Mbps for all the test items due to the highest RF output power.

2. The EUT is programmed to transmit signals continuously for all testing.

2.2 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: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

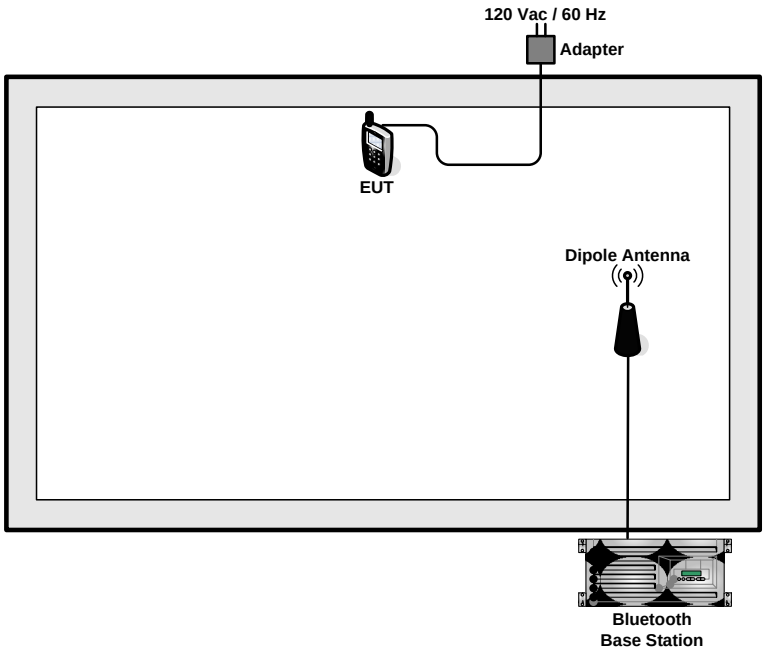
Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations, The following tables are showing the test modes as the worst cases and recorded in this report.

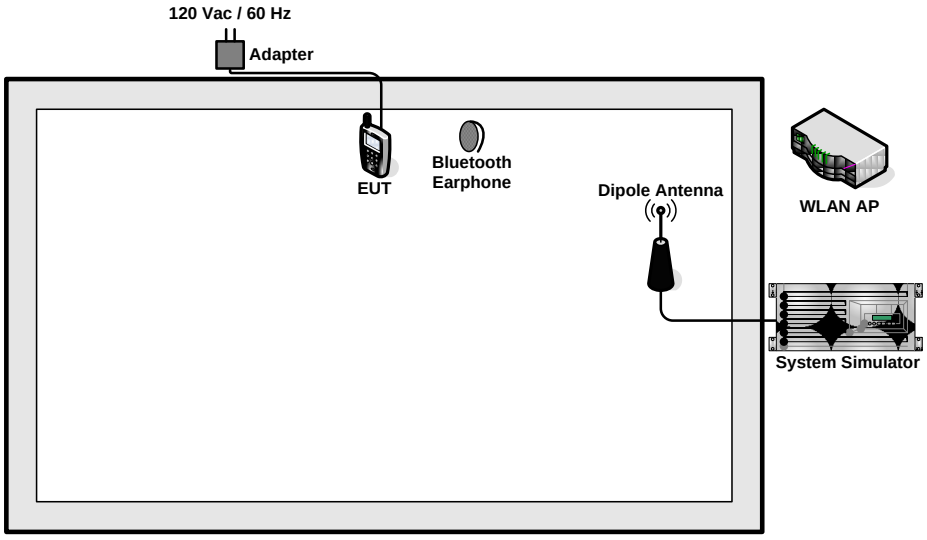
Test Cases			
Test Item	**Data Rate / Modulation**		
	Bluetooth 1Mbps GFSK	**Bluetooth EDR 2Mbps π /4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
Conducted TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated TCs	N/A	N/A	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz
AC Conducted Emission	Mode 1 :GSM850 Idle + WLAN Link + Bluetooth Link + Adapter + Camera		
Remark: **1.** For radiated TCs, the data rate was set in 3Mbps due to the highest RF output power; only the data of these modes was reported.			

2.3 Connection Diagram of Test System

<Radiated Emission>



<Conduction Emission>



2.4 RF Utility

For Bluetooth function, enter keys "＊＃510818＃" to make the EUT into the engineering modes to contact with Bluetooth base station for transmitting and receiving signals continuously.

3 Test Result

3.1 Number of Channel Measurement

3.1.1 Limits of Number of Hopping Frequency

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

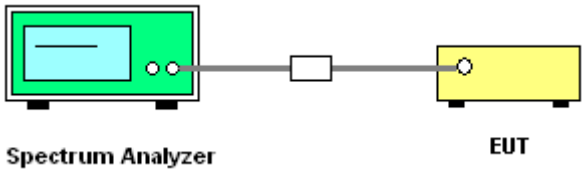
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The modulation types of EUT are irrelevant to number of hopping channels deviation.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
5. The number of hopping frequency used is defined as the device has the numbers of total channel.

3.1.4 Test Setup

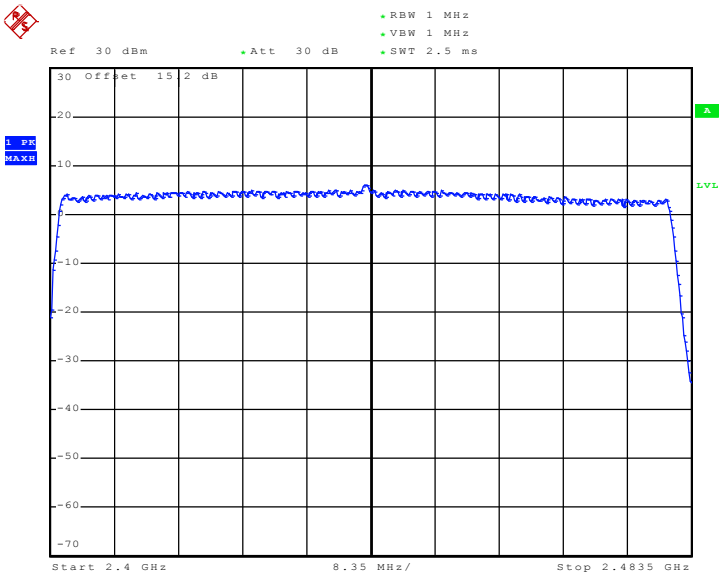


3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	Mode 7~9	Temperature :	22~25℃
Test Engineer :	Eric Hum	Relative Humidity :	45~46%

Number of Hopping Channels (Channel)	Limits (Channel)	Pass/Fail
79	> 15	Pass

Number of Hopping Channel Plot on Channel 00 - 78



Date: 8.NOV.2010 10:04:18

3.2 20dB Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

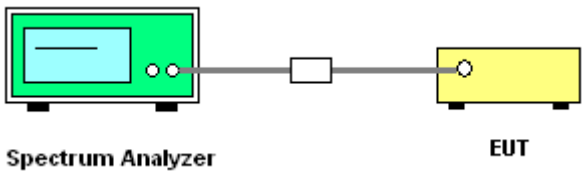
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;
   RBW ≥ 1% of the 20 dB bandwidth; VBW ≥ RBW; Sweep = auto; Detector function = peak;
   Trace = max hold.
5. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

3.2.4 Test Setup

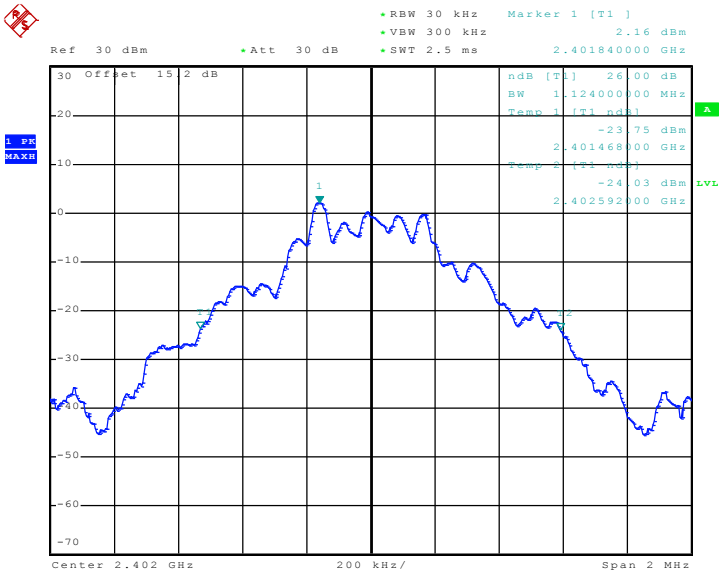


3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	22~25℃
Test Engineer :	Eric Hum	Relative Humidity :	45~46%

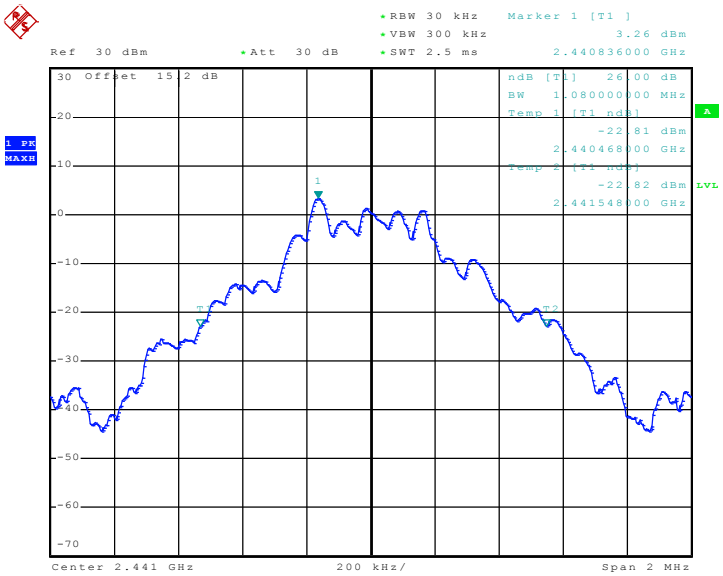
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.124
39	2441	1.080
78	2480	1.120

20 dB Bandwidth Plot on Channel 00



Date: 8.NOV.2010 08:46:50

20 dB Bandwidth Plot on Channel 39



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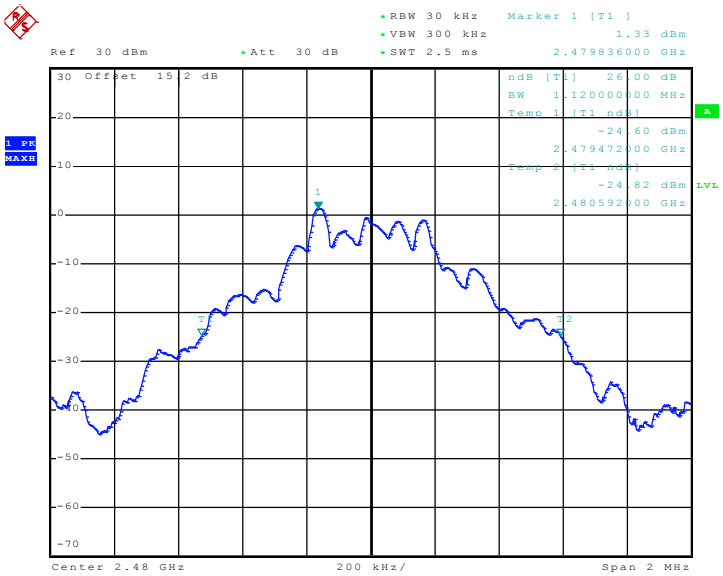
20 dB Bandwidth Plot on Channel 78

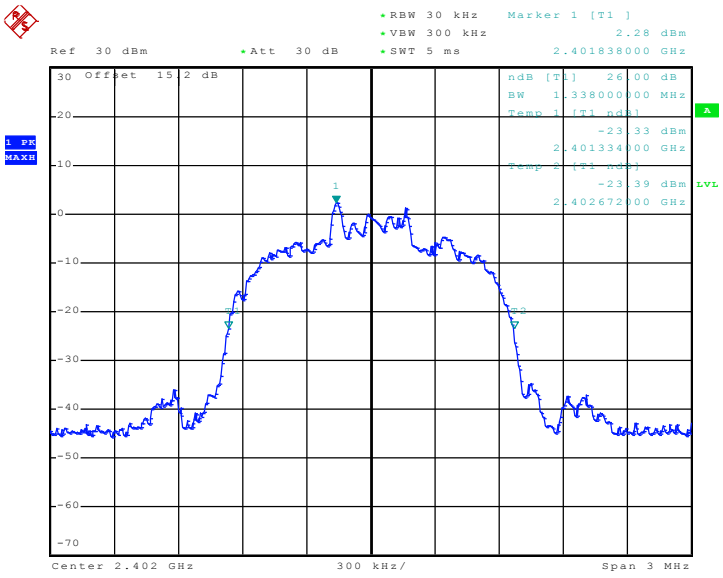


Date: 8.NOV.2010 08:45:37

Test Mode :	Mode 4, 5, 6	Temperature :	22~25℃
Test Engineer :	Eric Hum	Relative Humidity :	45~46%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.338
39	2441	1.344
78	2480	1.332

20 dB Bandwidth Plot on Channel 00



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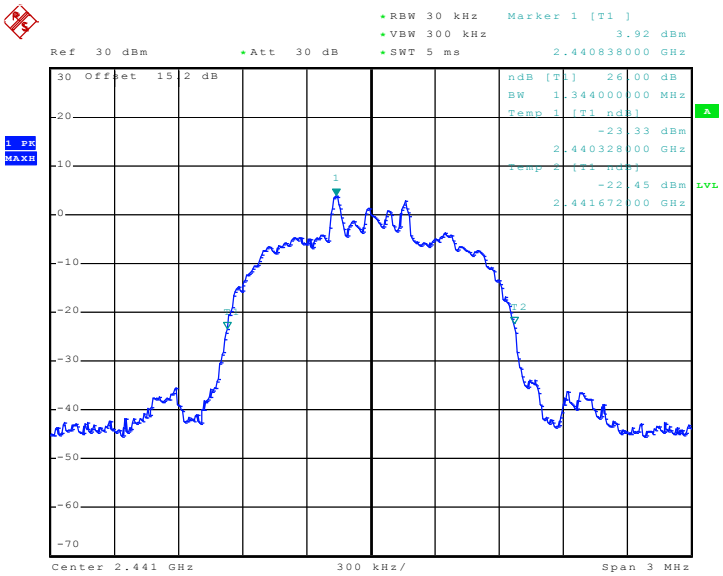
20 dB Bandwidth Plot on Channel 39



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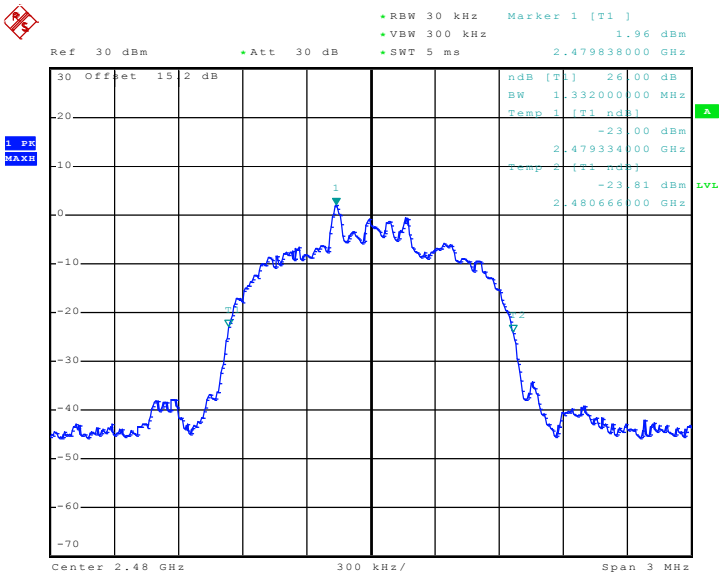
20 dB Bandwidth Plot on Channel 78

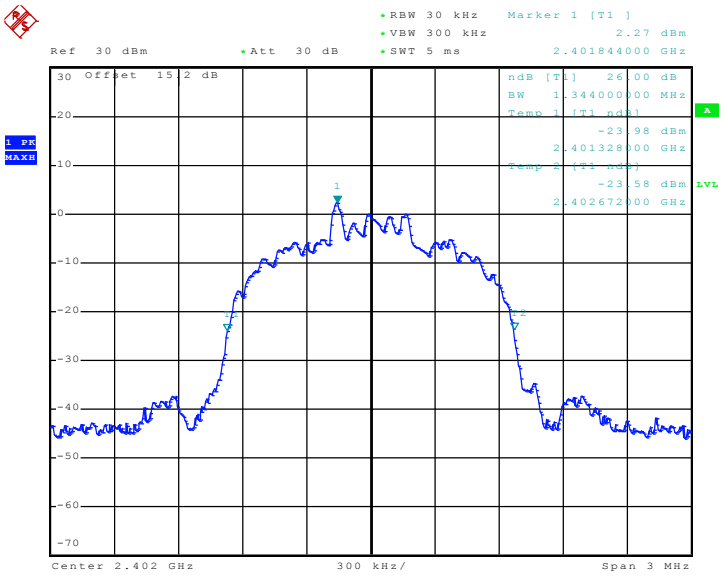


Date: 8.NOV.2010 08:53:57

Test Mode :	Mode 7, 8, 9	Temperature :	22~25℃
Test Engineer :	Eric Hum	Relative Humidity :	45~46%

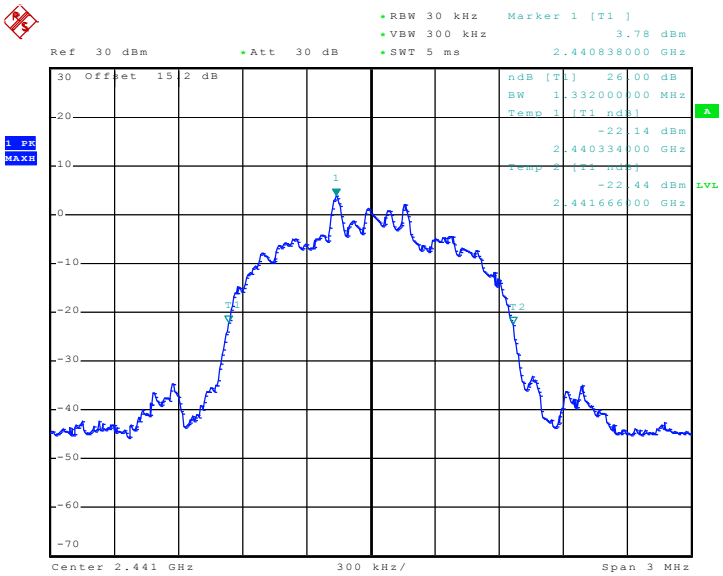
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.344
39	2441	1.332
78	2480	1.332

20 dB Bandwidth Plot on Channel 00



Date: 8.NOV.2010 08:55:43

20 dB Bandwidth Plot on Channel 39



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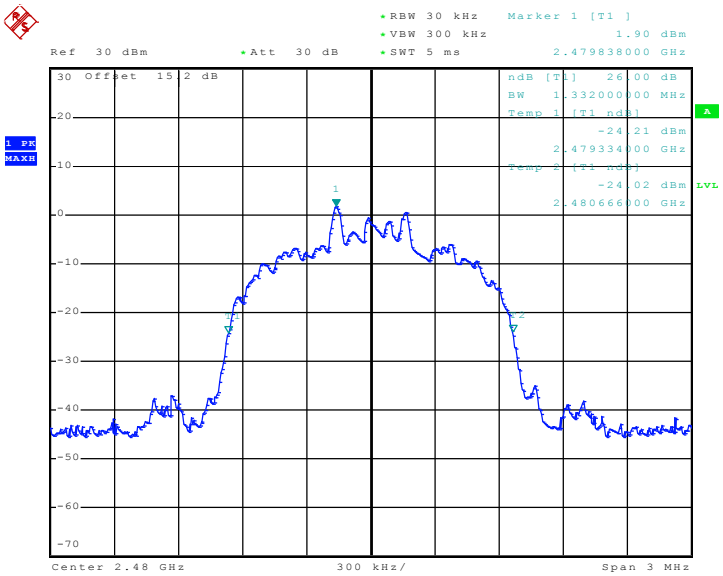
20 dB Bandwidth Plot on Channel 78



Date: 8.NOV.2010 08:57:54

3.3 Hopping Channel Separation Measurement

3.3.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. Please refer FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

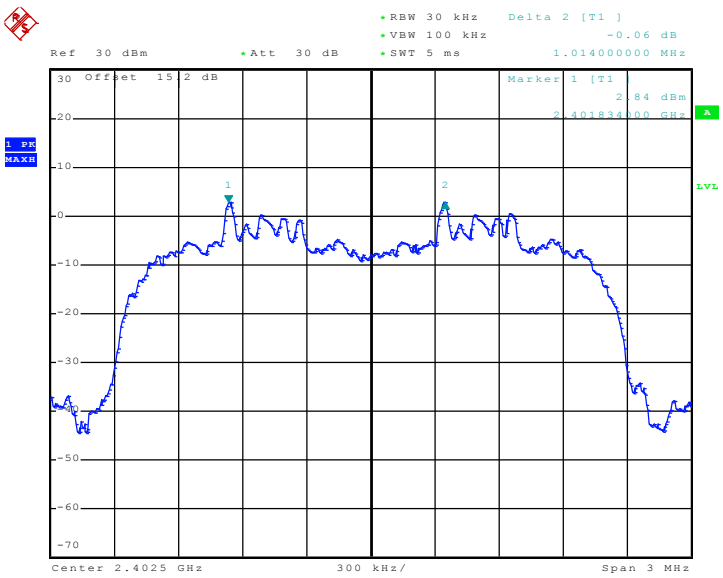
3.3.4 Test Setup

3.3.5 Test Result of Hopping Channel Separation

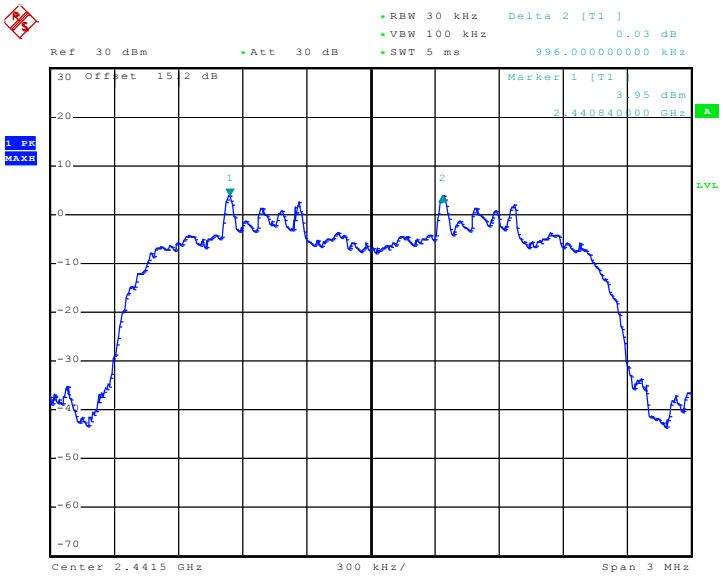
Test Mode :	Mode 7, 8, 9	Temperature :	22~25℃
Test Engineer :	Eric Hum	Relative Humidity :	45~46%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.014	0.896	Pass
39	2441	0.996	0.888	Pass
78	2480	1.014	0.888	Pass

Channel Separation Plot on Channel 00 - 01

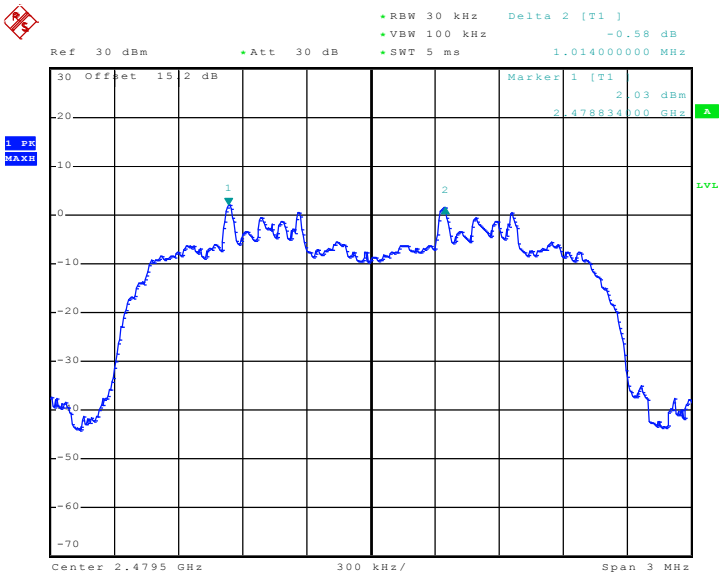


Channel Separation Plot on Channel 39 - 40



Date: 8.NOV.2010 10:10:46

Channel Separation Plot on Channel 77 - 78



Date: 8.NOV.2010 10:12:45

3.4 Dwell Time Measurement

3.4.1 Limit of Dwell Time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to calculate the dwell time.

3.4.4 Test Setup

3.4.5 Test Result of Dwell Time

Test Mode :	Mode 8	Temperature :	22~25℃
Test Engineer :	Eric Hum	Relative Humidity :	45~46%

Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
3DH5	3.50	2940.00	0.33	0.4	Pass

Remark:

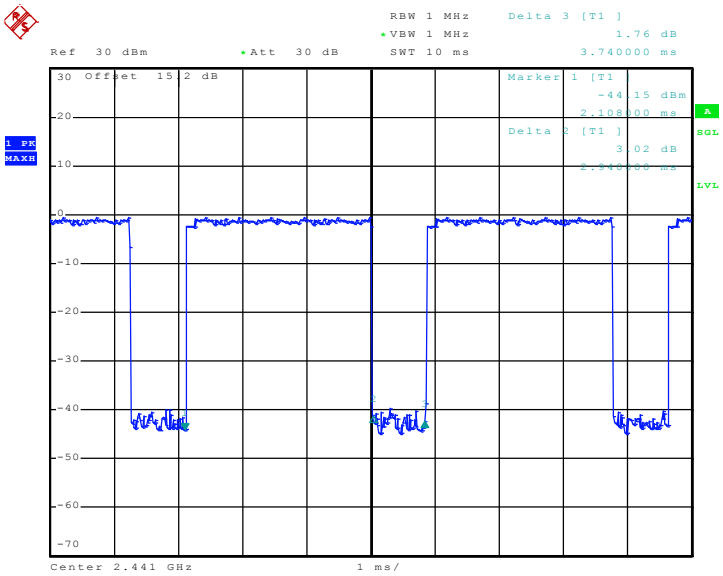
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time

2. 79 channels come from the Hopping Channel number.

3. Average Hopping Channel = hops/sweep time

4. t: Package Transfer Time(us)

3DH5 Dwell Time (One Pulse) Plot on Channel 39



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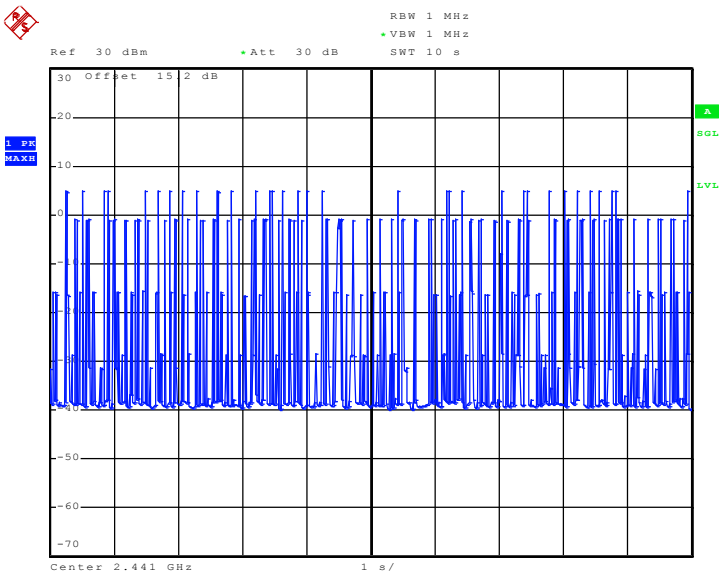
3DH5 Dwell Time (Count Pulses) Plot on Channel 39



Date: 8.NOV.2010 09:41:48

3.5 Peak Output Power Measurement

3.5.1 Limit of Peak Output Power

Frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1W (30 dBm).

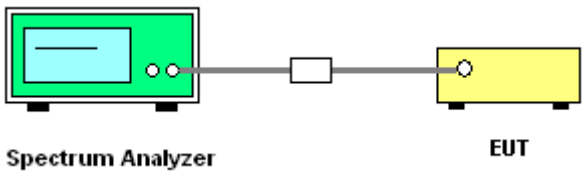
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.

3.5.4 Test Setup

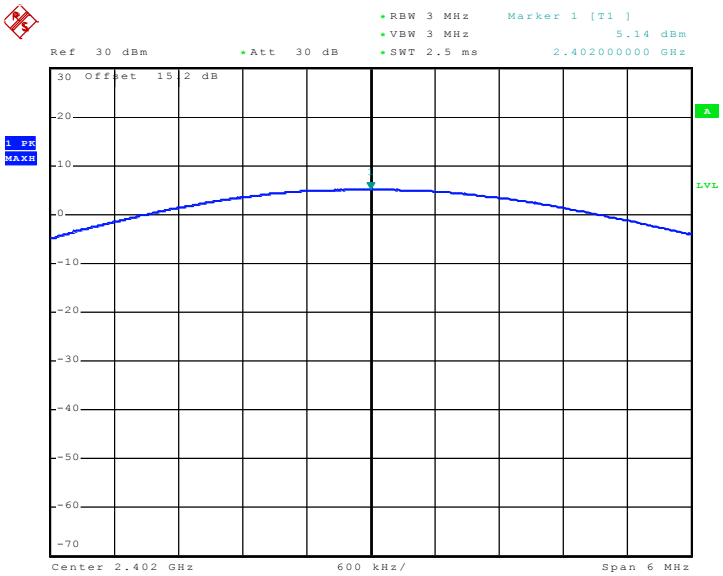


3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 7, 8, 9	Temperature :	22~25℃
Test Engineer :	Eric Hum	Relative Humidity :	45~46%

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits (dBm)	Pass/Fail
		3 Mbps		
00	2402	5.14	30	Pass
39	2441	6.19	30	Pass
78	2480	4.28	30	Pass

Peak Output Power Plot on Channel 00



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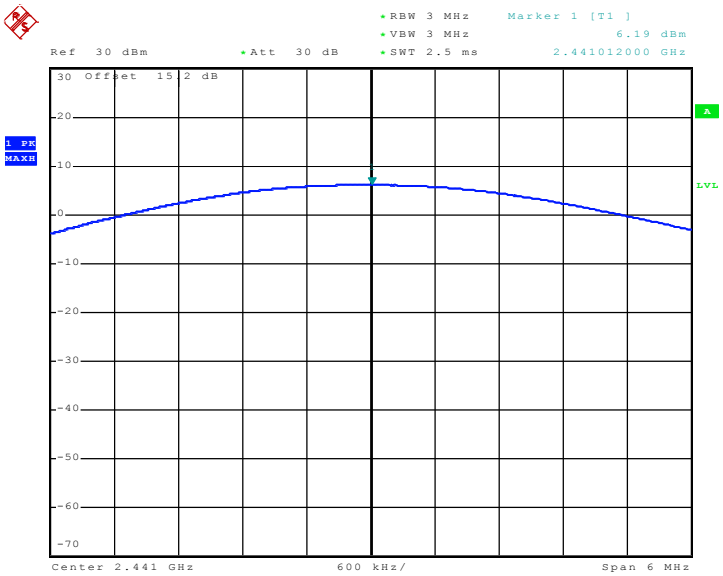
Peak Output Power Plot on Channel 39



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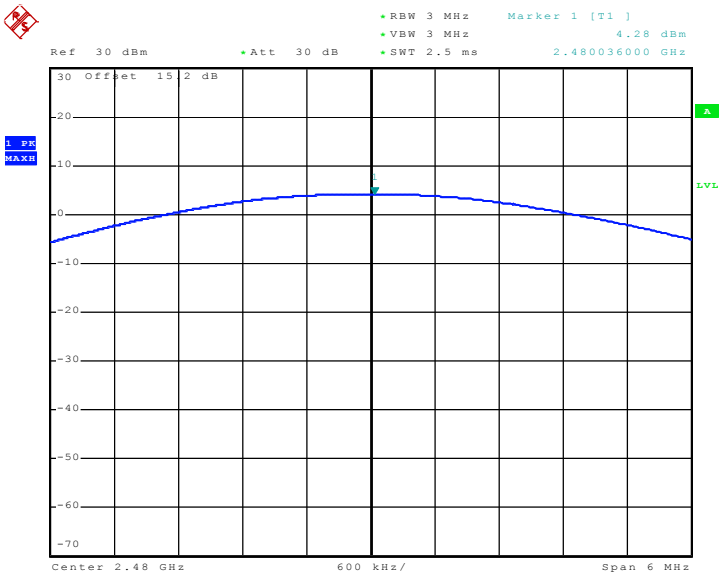
Peak Output Power Plot on Channel 78



Date: 8.NOV.2010 07:42:43

3.6 Band Edges Measurement

3.6.1 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. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

3.6.2 Measuring Instruments

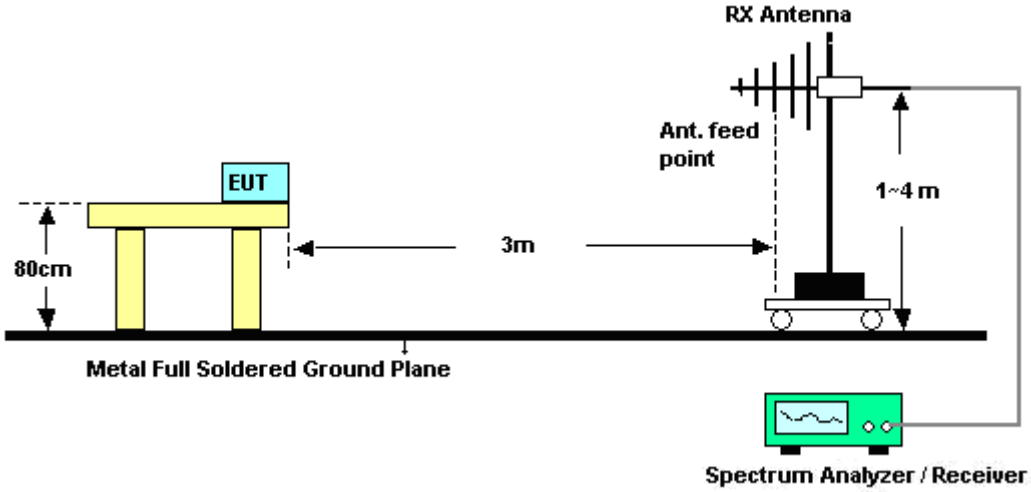
See list of measuring instruments of this test report.

3.6.3 Test Procedures

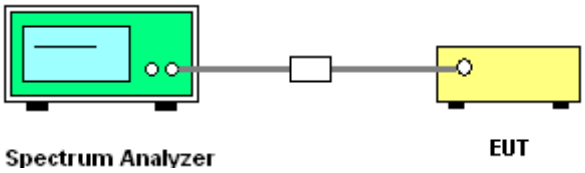
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300kHz, Video bandwidth (VBW) ≥ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 300k Hz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Applies to band edge emissions that fall in 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 measurements above 1 GHz, set RBW = 1MHz, VBW = 1MHz, Sweep: Auto for Peak; set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto for Average. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See FCC Section 15.35(b) and (c).
4. In case the emission is fail due to the used RBW / VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

3.6.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.6.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	00	Relative Humidity :	42~43%
		Test Engineer :	Peng Xi

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2361.11	48.71	-25.29	74	47.74	32.81	3.12	34.96	200	343	Peak
2361.11	33.32	-20.68	54	32.35	32.81	3.12	34.96	200	343	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2360.16	49.3	-24.7	74	48.33	32.81	3.12	34.96	120	360	Peak
2360.16	35.47	-18.53	54	34.5	32.81	3.12	34.96	120	360	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	42~43%
		Test Engineer :	Peng Xi

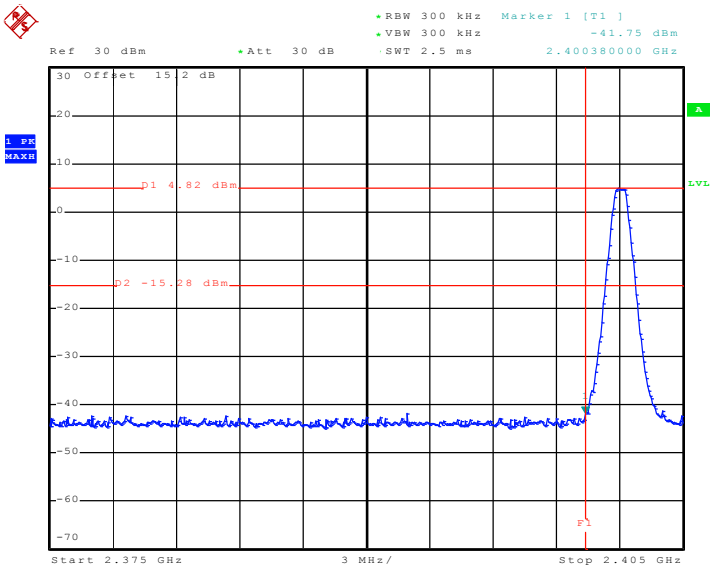
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	61.45	-12.55	74	60.18	33.01	3.2	34.94	200	11	Peak
2483.66	48.05	-5.95	54	46.78	33.01	3.2	34.94	200	11	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	61.34	-12.66	74	60.07	33.01	3.2	34.94	100	93	Peak
2483.5	53.16	-0.84	54	51.89	33.01	3.2	34.94	100	93	Average

3.6.6 Test Result of Conducted Band Edges

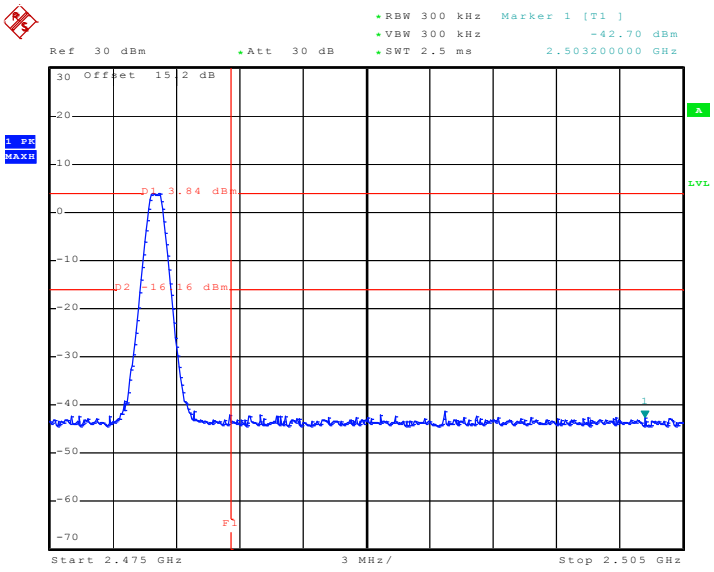
Test Mode :	Mode 7 and 9	Temperature :	22~25℃
Test Channel :	00 and 78	Relative Humidity :	45~46%
		Test Engineer :	Eric Hum

Low Band Edge Plot on Channel 00



Date: 8.NOV.2010 09:55:13

High Band Edge Plot on Channel 78



Date: 8.NOV.2010 10:01:56

3.7 Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band.

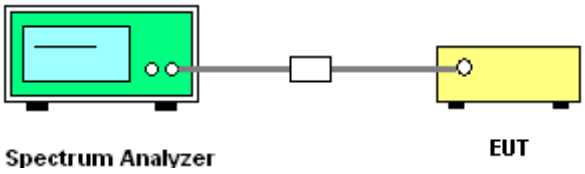
3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, Video bandwidth (VBW) ≥ RBW, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

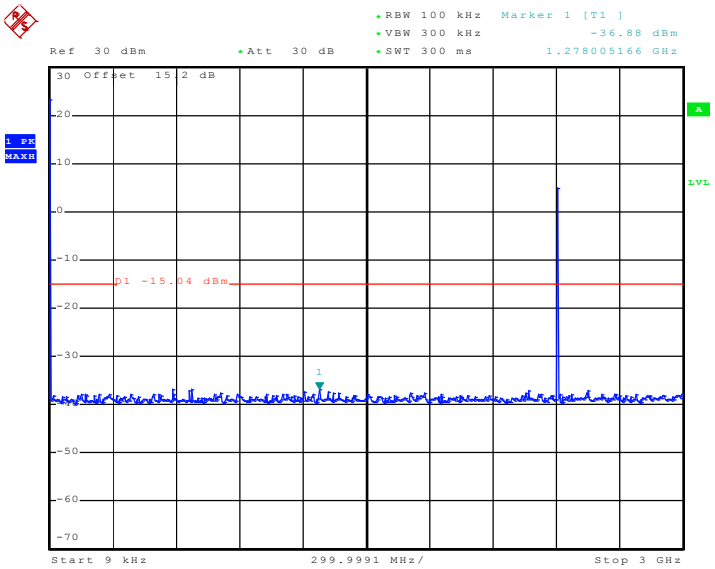
3.7.4 Test Setup



3.7.5 Test Result

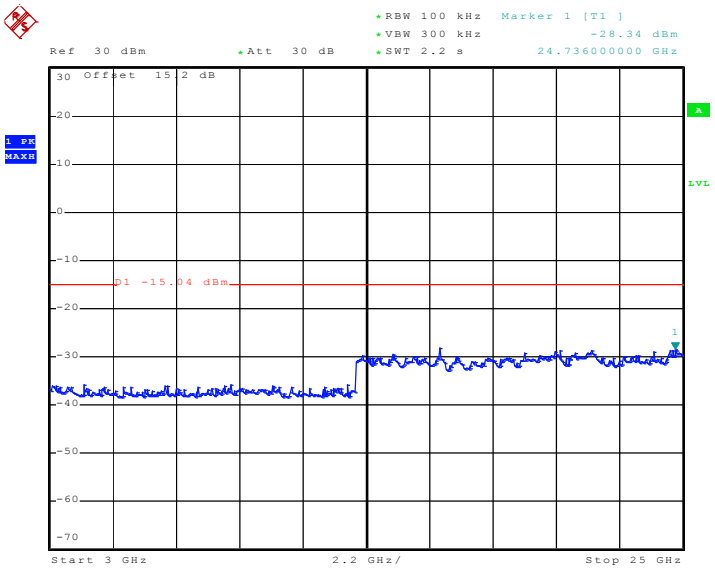
Test Mode :	Mode 7	Temperature :	22~25℃
Test Channel :	00	Relative Humidity :	45~46%
		Test Engineer :	Eric Hum

Conducted Spurious Emission Plot between 9KHz ~ 3 GHz



Date: 8.NOV.2010 13:43:35

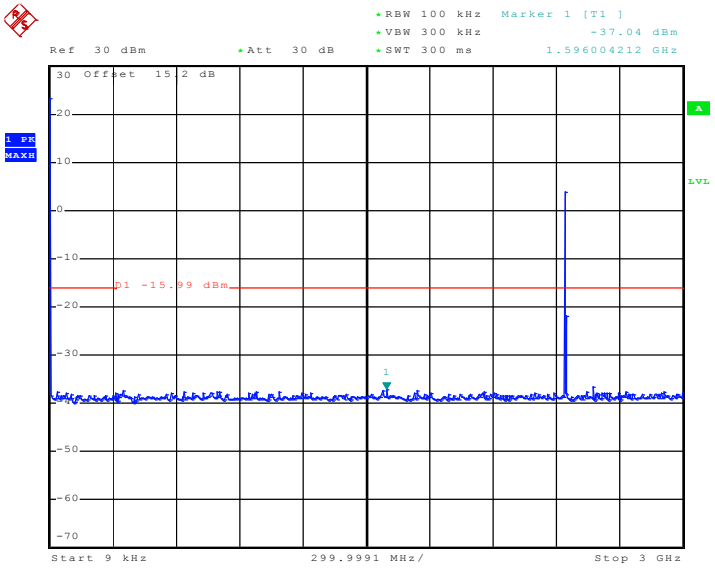
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 8.NOV.2010 13:45:14

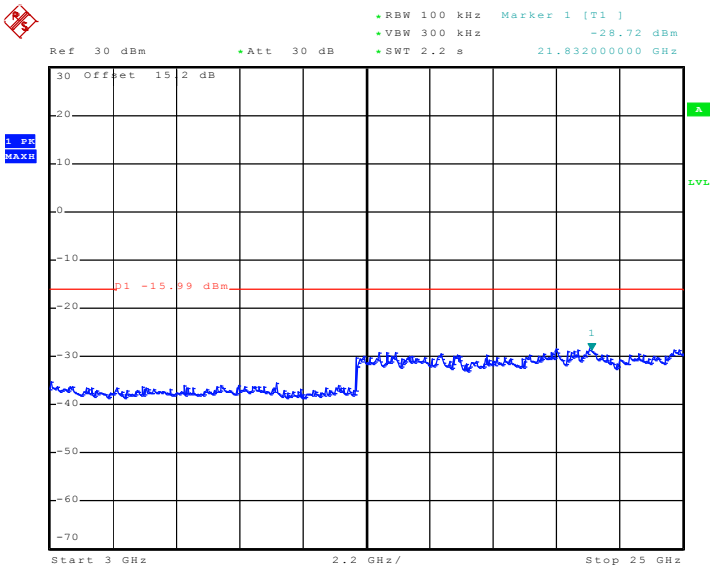
Test Mode :	Mode 8	Temperature :	22~25℃
Test Channel :	39	Relative Humidity :	45~46%
		Test Engineer :	Eric Hum

Conducted Spurious Emission Plot between 9KHz ~ 3 GHz



Date: 8.NOV.2010 13:38:53

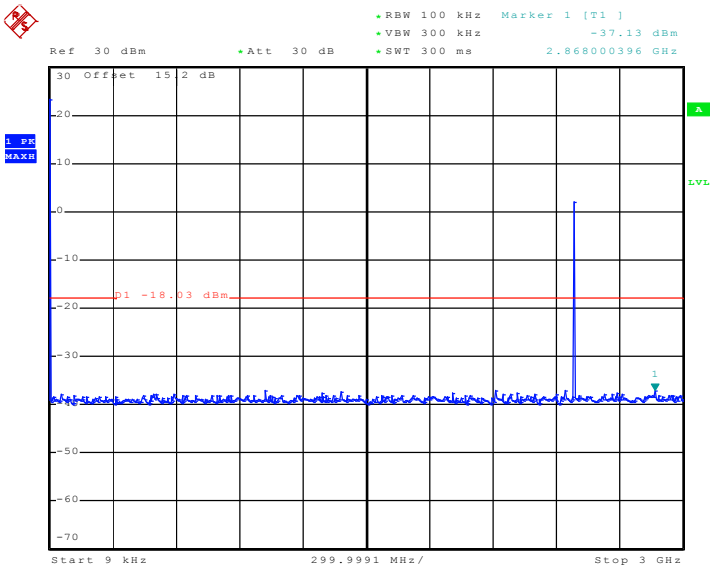
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 8.NOV.2010 13:40:21

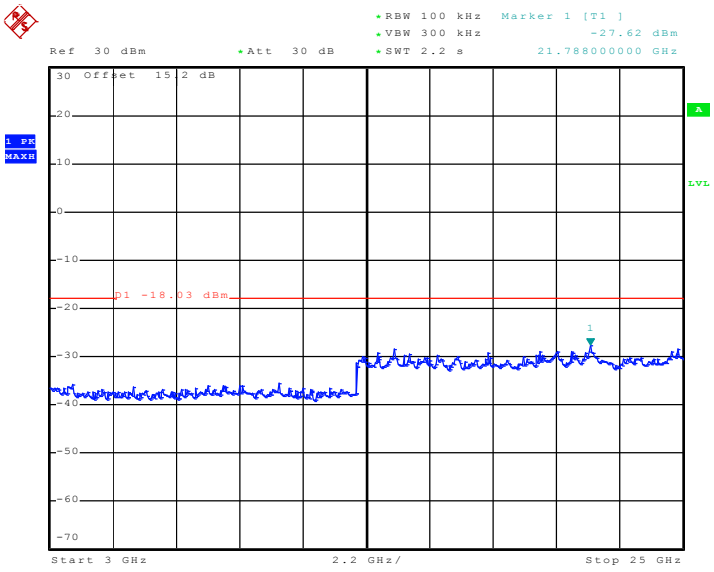
Test Mode :	Mode 9	**Temperature :**	22~25℃
Test Channel :	78	**Relative Humidity :**	45~46%
		Test Engineer :	Eric Hum

Conducted Spurious Emission Plot between 9KHz ~ 3 GHz



Date: 8.NOV.2010 13:48:19

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 8.NOV.2010 13:49:18

3.8 AC Conducted Emission Measurement

3.8.1 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 (dBuV)	
	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.

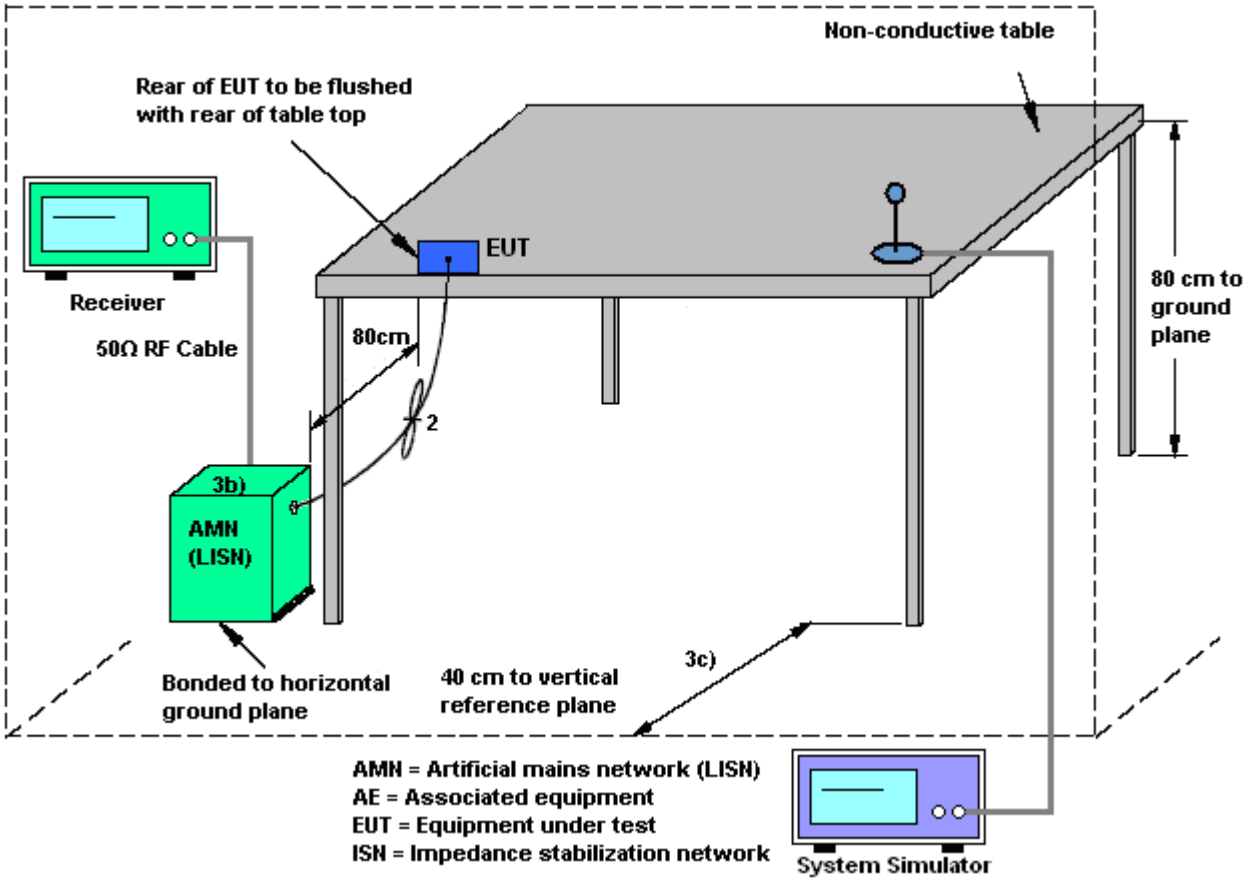
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

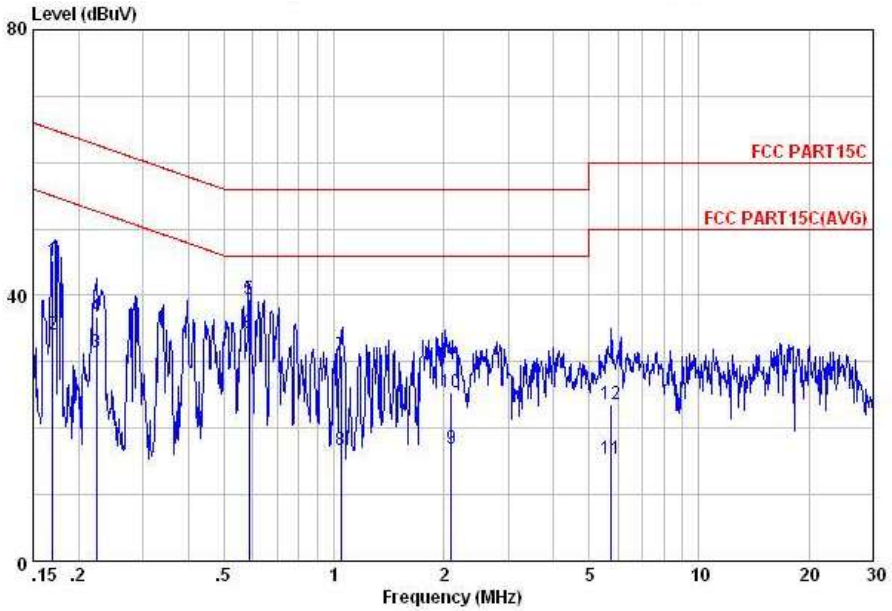
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.8.4 Test Setup



3.8.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Lewis Lu	Relative Humidity :	42~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + WLAN Link + Bluetooth Link + Adapter + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

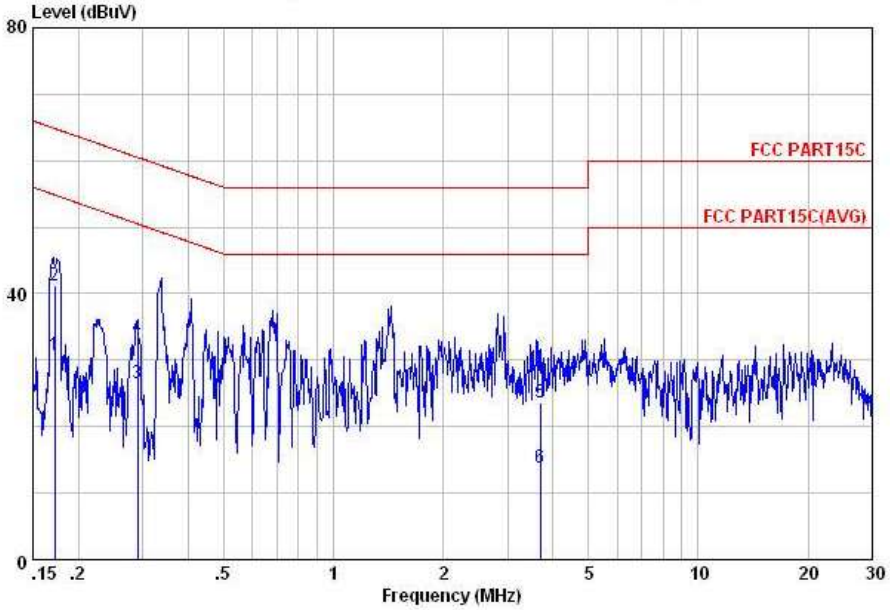


Site : CO01-KS
Condition: FCC PART15C LISN-100807 LINE

mode : MODE1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17	45.17	-19.79	64.96	35.10	-0.07	10.14	QP
2	0.17	34.07	-20.89	54.96	24.00	-0.07	10.14	Average
3	0.22	31.48	-21.19	52.67	21.40	-0.07	10.15	Average
4	0.22	36.68	-25.99	62.67	26.60	-0.07	10.15	QP
5	0.59	39.54	-16.46	56.00	29.40	-0.08	10.22	QP
6	0.59	34.24	-11.76	46.00	24.10	-0.08	10.22	Average
7	1.05	31.07	-24.93	56.00	20.90	-0.10	10.27	QP
8	1.05	16.67	-29.33	46.00	6.50	-0.10	10.27	Average
9	2.10	17.02	-28.98	46.00	6.80	-0.11	10.33	Average
10	2.10	25.42	-30.58	56.00	15.20	-0.11	10.33	QP
11	5.75	15.38	-34.62	50.00	5.10	-0.13	10.41	Average
12	5.75	23.68	-36.32	60.00	13.40	-0.13	10.41	QP

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Lewis Lu	Relative Humidity :	42~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + WLAN Link + Bluetooth Link + Adapter + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-100807 NEUTRAL
Project : [FR] 002710
mode : MODE1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17	30.66	-24.18	54.84	20.60	-0.08	10.14	Average
2	0.17	41.16	-23.68	64.84	31.10	-0.08	10.14	QP
3	0.29	26.60	-23.93	50.53	16.50	-0.07	10.17	Average
4	0.29	33.50	-27.03	60.53	23.40	-0.07	10.17	QP
5	3.70	23.56	-32.44	56.00	13.31	-0.13	10.38	QP
6	3.70	13.76	-32.24	46.00	3.51	-0.13	10.38	Average

3.9 Radiated Emission Measurement

3.9.1 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. 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)
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

3.9.2 Measuring Instruments

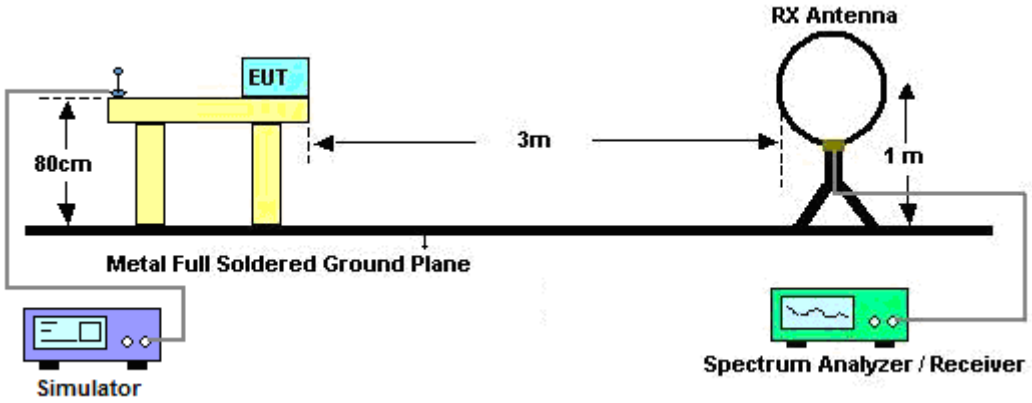
See list of measuring instruments of this test report.

3.9.3 Test Procedures

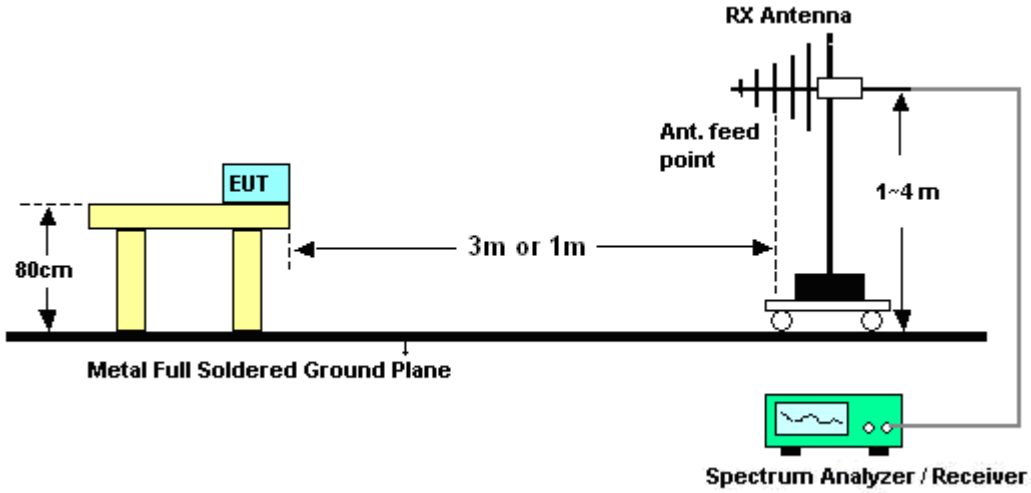
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
   (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
   (2) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
   Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB)
3. Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

3.9.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



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

Test Engineer :	Peng Xi	Temperature :	21~22°C
		Relative Humidity :	42~43%

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

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

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	00	Relative Humidity :	42~43%
Test Engineer :	Peng Xi	Polarization :	Horizontal
Remark :	2402 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	16.85	-23.15	40	29.57	18	0.25	30.97	-	-	Peak
116.13	12.96	-30.54	43.5	31.2	11.8	0.46	30.5	-	-	Peak
250.86	13.38	-32.62	46	30.32	12.01	0.73	29.68	-	-	Peak
522.6	20.38	-25.62	46	33.05	17.77	0.99	31.43	-	-	Peak
896.4	25.18	-20.82	46	32.78	20.45	1.29	29.34	132	45	Peak
948.2	29.64	-24.36	54	36.35	20.73	1.32	28.76	-	-	Peak
2361.11	48.71	-25.29	74	47.74	32.81	3.12	34.96	200	343	Peak
2361.11	33.32	-20.68	54	32.35	32.81	3.12	34.96	200	343	Average
2402	97.77	-	-	96.74	32.86	3.15	34.98	180	39	Peak
2402	86.33	-	-	85.3	32.86	3.15	34.98	180	39	Average
2494.11	35.46	-18.54	54	34.13	33.05	3.21	34.93	100	58	Average
2494.11	48.8	-25.2	74	47.47	33.05	3.21	34.93	100	58	Peak

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	00	Relative Humidity :	42~43%
Test Engineer :	Peng Xi	Polarization :	Vertical
Remark :	2402 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
35.4	29.4	-10.6	40	45.35	14.65	0.28	30.88	100	94	Peak
45.12	27.81	-12.19	40	49.05	9.25	0.3	30.79	-	-	Peak
58.62	17.94	-22.06	40	42.93	5.44	0.34	30.77	-	-	Peak
828.5	23.48	-22.52	46	32.18	20.24	1.24	30.18	-	-	Peak
937.7	27.4	-18.6	46	34.26	20.68	1.31	28.85	-	-	Peak
948.2	28.75	-25.25	54	35.46	20.73	1.32	28.76	-	-	Peak
2360.16	49.3	-24.7	74	48.33	32.81	3.12	34.96	120	360	Peak
2360.16	35.47	-18.53	54	34.5	32.81	3.12	34.96	120	360	Average
2402	85.39	-	-	84.36	32.86	3.15	34.98	124	332	Average
2402	100.17	-	-	99.14	32.86	3.15	34.98	124	332	Peak
2483.85	48.86	-25.14	74	47.59	33.01	3.2	34.94	100	352	Peak
2483.85	33.28	-20.72	54	32.01	33.01	3.2	34.94	100	352	Average

Test Mode :	Mode 2	Temperature :	21~22°C
Test Channel :	39	Relative Humidity :	42~43%
Test Engineer :	Peng Xi	Polarization :	Horizontal
Remark :	2441 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	16.92	-23.08	40	29.64	18	0.25	30.97	100	0	Peak
137.19	12.65	-30.85	43.5	31.36	11.05	0.56	30.32	-	-	Peak
270.3	13.78	-32.22	46	30.29	12.39	0.75	29.65	-	-	Peak
937.7	22.67	-23.33	46	29.53	20.68	1.31	28.85	-	-	Peak
948.2	28.07	-25.93	54	34.78	20.73	1.32	28.76	-	-	Peak
953.1	27.1	-26.9	54	33.75	20.75	1.32	28.72	-	-	Peak
2319.88	49.02	-24.98	74	48.09	32.76	3.1	34.93	200	360	Peak
2319.88	35.4	-18.6	54	34.47	32.76	3.1	34.93	200	360	Average
2441	83.29	-	-	82.11	32.95	3.18	34.95	109	11	Average
2441	98.9	-	-	97.72	32.95	3.18	34.95	109	11	Peak
2493.54	49.05	-24.95	74	47.72	33.05	3.21	34.93	120	343	Peak
2493.54	35.34	-18.66	54	34.01	33.05	3.21	34.93	120	343	Average

Test Mode :	Mode 2	Temperature :	21~22°C
Test Channel :	39	Relative Humidity :	42~43%
Test Engineer :	Peng Xi	Polarization :	Vertical
Remark :	2441 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
35.13	26.95	-13.05	40	42.45	15.1	0.28	30.88	120	200	Peak
45.39	26.02	-13.98	40	47.26	9.25	0.3	30.79	-	-	Peak
69.42	19.87	-20.13	40	44.89	5.3	0.37	30.69	-	-	Peak
891.5	23.23	-22.77	46	30.87	20.46	1.29	29.39	-	-	Peak
948.2	28.15	-25.85	54	34.86	20.73	1.32	28.76	-	-	Peak
953.8	27.74	-26.26	54	34.39	20.75	1.32	28.72	-	-	Peak
2317.79	49.18	-24.82	74	48.25	32.76	3.1	34.93	182	0	Peak
2317.79	36.08	-17.92	54	35.15	32.76	3.1	34.93	182	0	Average
2441	86.15	-	-	84.97	32.95	3.18	34.95	119	360	Average
2441	101	-	-	99.82	32.95	3.18	34.95	119	360	Peak
2493.92	48.62	-25.38	74	47.29	33.05	3.21	34.93	100	59	Peak
2493.92	36.34	-17.66	54	35.01	33.05	3.21	34.93	100	59	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	42~43%
Test Engineer :	Peng Xi	Polarization :	Horizontal
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.81	16.71	-23.29	40	30.11	17.29	0.26	30.95	-	-	Peak
114.51	12.73	-30.77	43.5	30.98	11.8	0.46	30.51	-	-	Peak
276.51	13.69	-32.31	46	30.03	12.56	0.76	29.66	-	-	Peak
580	20.6	-25.4	46	32.52	18.56	1.05	31.53	-	-	Peak
937.7	26.48	-19.52	46	33.34	20.68	1.31	28.85	123	235	Peak
953.8	29.53	-24.47	54	36.18	20.75	1.32	28.72	-	-	Peak
2386.19	49.07	-24.93	74	48.05	32.86	3.13	34.97	100	0	Peak
2386.19	35.47	-18.53	54	34.45	32.86	3.13	34.97	100	0	Average
2480	85.44	-	-	84.17	33.01	3.2	34.94	160	338	Average
2480	100.38	-	-	99.11	33.01	3.2	34.94	160	338	Peak
2483.66	61.45	-12.55	74	60.18	33.01	3.2	34.94	200	11	Peak
2483.66	48.05	-5.95	54	46.78	33.01	3.2	34.94	200	11	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	42~43%
Test Engineer :	Peng Xi	Polarization :	Vertical
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
35.94	28.41	-11.59	40	44.36	14.65	0.28	30.88	105	85	Peak
46.2	25.75	-14.25	40	47.36	8.88	0.3	30.79	-	-	Peak
61.86	20.39	-19.61	40	45.54	5.27	0.34	30.76	-	-	Peak
730.5	20.71	-25.29	46	31	19.69	1.16	31.14	-	-	Peak
937.7	26.15	-19.85	46	33.01	20.68	1.31	28.85	-	-	Peak
948.2	28.97	-25.03	54	35.68	20.73	1.32	28.76	-	-	Peak
2378.59	48.83	-25.17	74	47.84	32.83	3.13	34.97	120	156	Peak
2378.59	46.56	-7.44	54	45.57	32.83	3.13	34.97	120	156	Average
2480	98.56	-	-	97.29	33.01	3.2	34.94	100	92	Peak
2480	85.34	-	-	84.07	33.01	3.2	34.94	100	92	Average
2483.5	61.34	-12.66	74	60.07	33.01	3.2	34.94	100	93	Peak
2483.5	53.16	-0.84	54	51.89	33.01	3.2	34.94	100	93	Average

3.10 Antenna Requirements

3.10.1 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. 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.

3.10.2 Antenna Connected Construction

The antennas type used in this product is Fixed Internal Antenna without connector and it is considered to meet antenna requirement.

3.10.3 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	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 18, 2010	Jan. 17, 2011	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 24, 2010	Aug. 23, 2011	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 24, 2010	Aug. 23, 2011	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 28, 2009	Dec. 27, 2010	Conducted (TH01-KS)
DC Power Supply	TOPWARD	3306D	N/A	N/A	N/A	N/A	Conducted (TH01-KS)
EMI Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 17, 2009	Nov. 16, 2010	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Jan. 18, 2010	Jan. 17, 2011	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Jan. 18, 2010	Jan. 17, 2011	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 26, 2009	Nov. 25, 2010	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESCI	100724	9kHz – 2.75GHz	Mar. 09, 2010	Mar. 08, 2011	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Feb. 02, 2010	Feb. 01, 2011	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Actice hore antenna	com-power	AHA-118	701023	1G-18GHz	Nov. 09, 2010	Nov. 08, 2011	Radiation (03CH01-KS)
Signal Generator	R&S	SMR40	100455	10MHz~40GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15-40GHz	Oct. 15, 2010	Oct.14, 2011	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH01-KS)
System Simulator	R&S	CMU200	837587/066	Full-Band	Jan. 08, 2009	Jan. 07, 2011	-
Bluetooth Base Station	ANRITSU	MT8852B	6K00004935	BT EDR	Sep. 17, 2010	Sep. 16, 2011	-

5 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty Uc(y)	**1.13**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**		

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

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 (1 GHz ~ 40 GHz)

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 EP0O2916 as below.