



FCC RF Test Report

APPLICANT : Motorola Mobility, Inc.
EQUIPMENT : Quad-Band GSM/GPRS/EDGE and Dual-Band
WCDMA Mobile Phone with BT/Wifi
BRAND NAME : Motorola
MODEL NAME /
MARKET NAME : XT560
TYPE NAME : M0CB0
GPPD NUMBER : 3248
FCC ID : IHDT56NB2
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DSS) Spread Spectrum Transmitter

The product was received on Dec. 29, 2011 and completely tested on Feb. 10, 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



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR211216A	Rev. 01	Initial issue of report	Mar. 07, 2012



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	≤ 125 mW	Pass	-
3.6	15.247(d)	A8.5	Frequency Band Edges	≤ 20dBc	Pass	-
0	15.247(d)	A8.5	Spurious Emission	< 20 dBc	Pass	-
3.8	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 7.49 dB at 1.800 MHz
3.9	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.31 dB at 4960.000 MHz
3.10	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Motorola Mobility, Inc.

No. 1, Wang Jing East Road, Chao Yang District, 100102 Beijing, P. R. China

1.2 Manufacturer

Foxconn (TianJin) Precision Industry Co., Ltd.

No. 207, Nanhai Road, TEDA, Tianjin, P.R. China, 300457

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Quad-Band GSM/GPRS/EDGE and Dual-Band WCDMA Mobile Phone with BT/Wifi
Brand Name	Motorola
Model Name / Marketing Name	XT560
Type Name	M0CB0
FCC ID	IHDT56NB2
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) : 8.17 dBm (0.0066 W) Bluetooth EDR (2Mbps) : 7.84 dBm (0.0061 W) Bluetooth EDR (3Mbps) : 8.13 dBm (0.0065 W)
Antenna Type	PIFA Antenna with gain -4.00 dBi
HW Version	PR2.5
SW Version	1_400_9000
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Production Unit

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

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978	
Test Site No.	Sporton Site No.	FCC/IC Registration No.
	03CH07-HY	722060/4086B-1

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. :	FCC/IC Registration No.
	CO01-KS	149928/4086E-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 Public Notice DA 00-705
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 8

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.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
3.	Router	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
4.	Notebook	Acer	Travel Mate 2413Lci	QDS-BRCM1016	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A

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	$\pi/4$ -DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	8.01 dBm	7.62 dBm	7.50 dBm
Ch39	2441MHz	8.17 dBm	7.84 dBm	8.13 dBm
Ch78	2480MHz	7.32 dBm	7.06 dBm	7.51 dBm

Remark:

1. The data rate was set in 1Mbps 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).

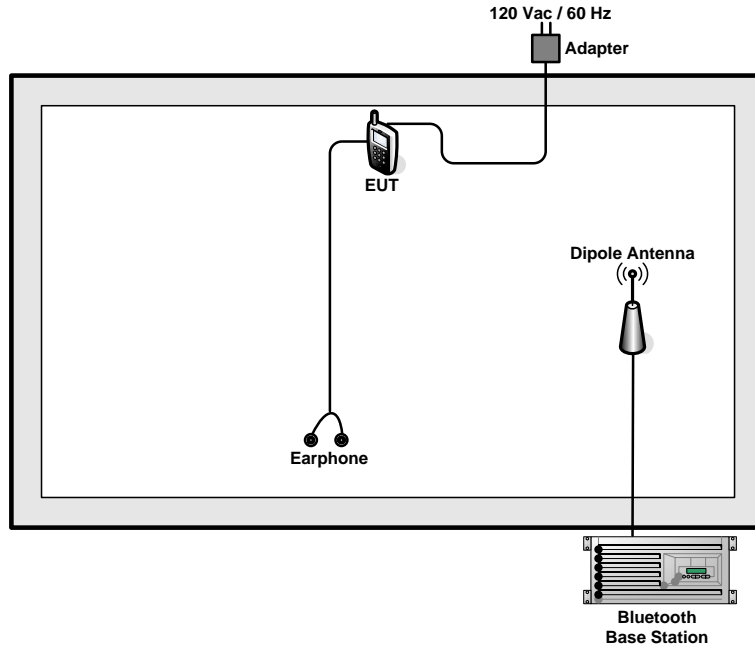
Pre-scanned tests were conducted to determine the final configuration from all possible combinations. Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

The following tables are showing the test modes as the worst cases (Y plane) and recorded in this report.

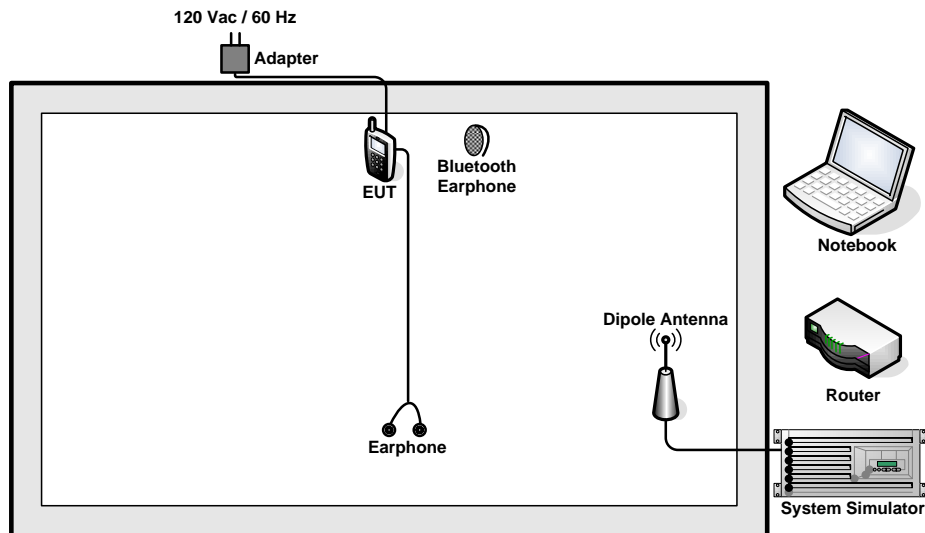
Test Cases			
Test Item	Data Rate / Modulation		
	Bluetooth 1Mbps GFSK	Bluetooth EDR 2Mbps $\pi/4$ -DQPSK	Bluetooth EDR 3Mbps 8-DPSK
Conducted TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	N/A	N/A
AC Conducted Emission	Mode 1 :GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone + Camera Mode 2 GSM1900 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone + MPEG4		
Remark: <ol style="list-style-type: none"> For radiated TCs, the data rate was set in 1Mbps due to the highest RF output power; only the data of these modes was reported. For radiated TCs, the test was performance with adapter, USB cable, and earphone. For conducted emission, the worst case is mode 1; only the test data of this mode was reported. 			

2.3 Connection Diagram of Test System

<Bluetooth Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

For Bluetooth function, key in “* # * # 373 # * # *” on the EUT directly. Then, the EUT will get 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.

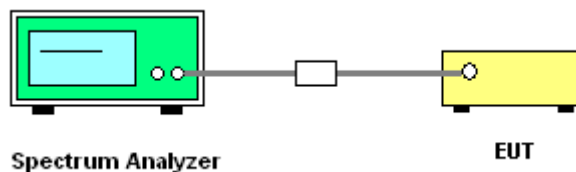
3.1.2 Measuring Instruments

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 \geq 1% of the span; VBW \geq 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

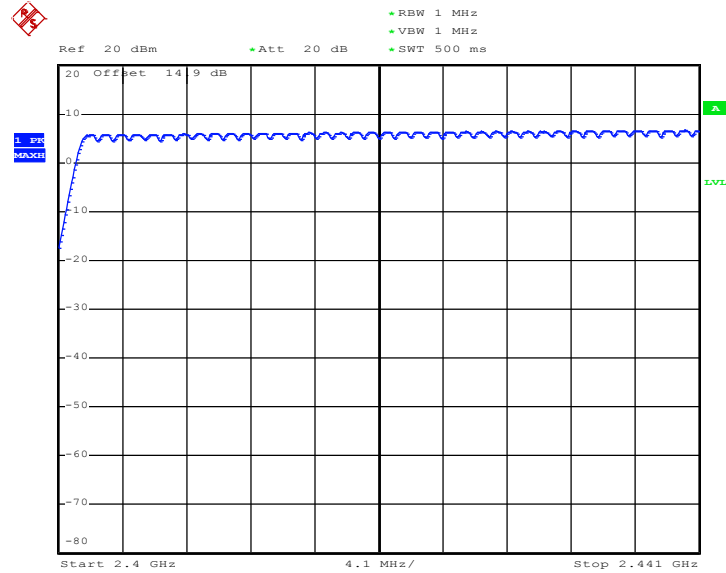


3.1.5 Test Result of Number of Hopping Frequency

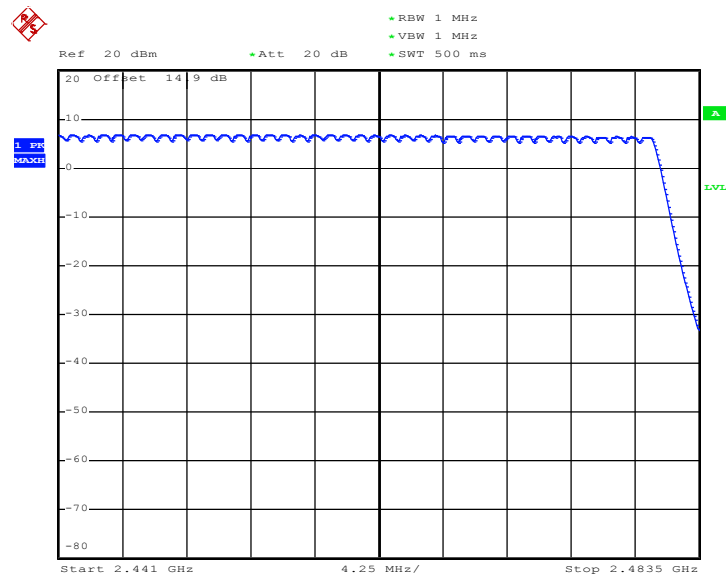
Test Mode :	Mode 1~3	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%
Number of Hopping Channels (Channel)		Limits (Channel)	Pass/Fail
79		> 15	Pass



Number of Hopping Channel Plot on Channel 00 - 78



Date: 2.FEB.2012 10:34:08



Date: 2.FEB.2012 10:39:13

3.2 20dB Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

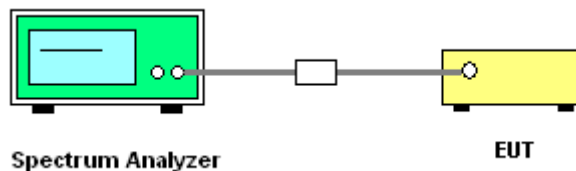
3.2.2 Measuring Instruments

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 \geq 1% of the 20 dB bandwidth; VBW \geq 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



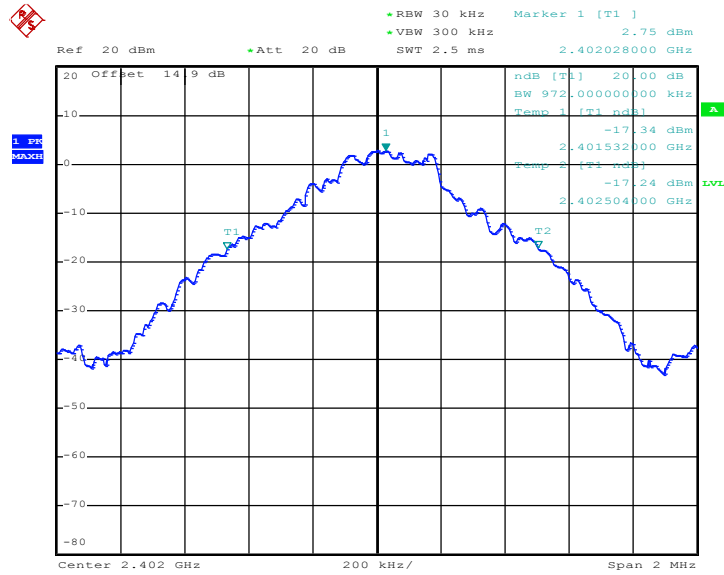


3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.972
39	2441	0.964
78	2480	0.972

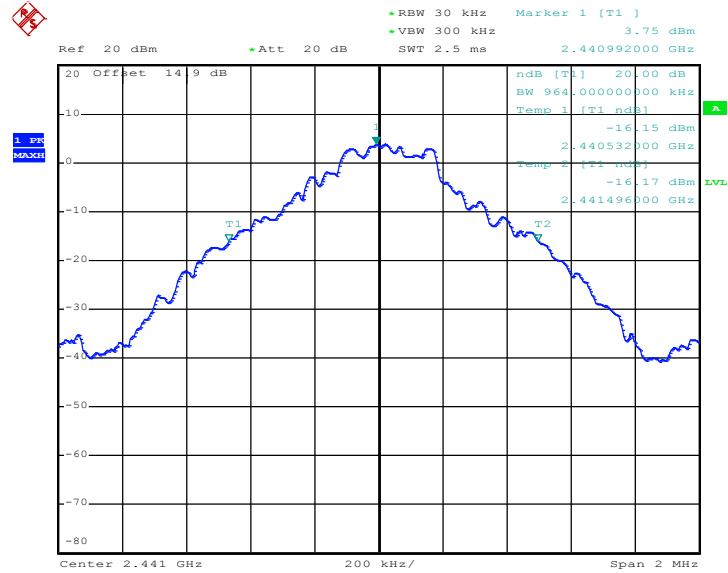
20 dB Bandwidth Plot on Channel 00



Date: 2.FEB.2012 10:08:21

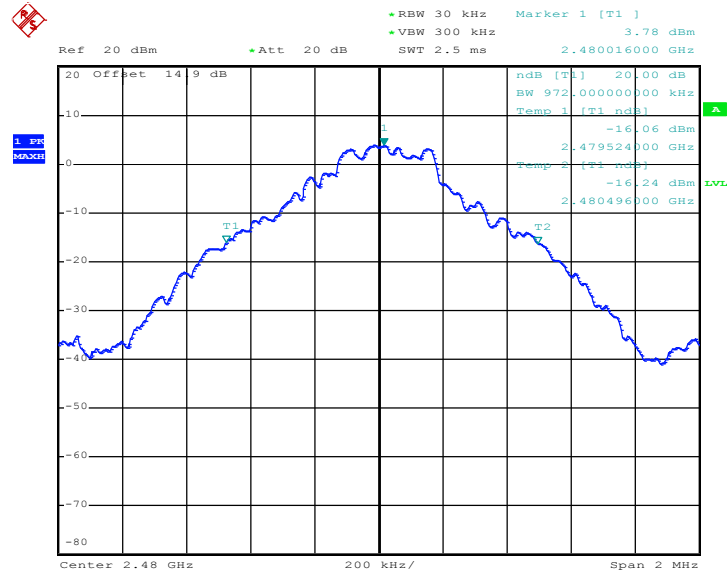


20 dB Bandwidth Plot on Channel 39



Date: 2.FEB.2012 10:09:00

20 dB Bandwidth Plot on Channel 78



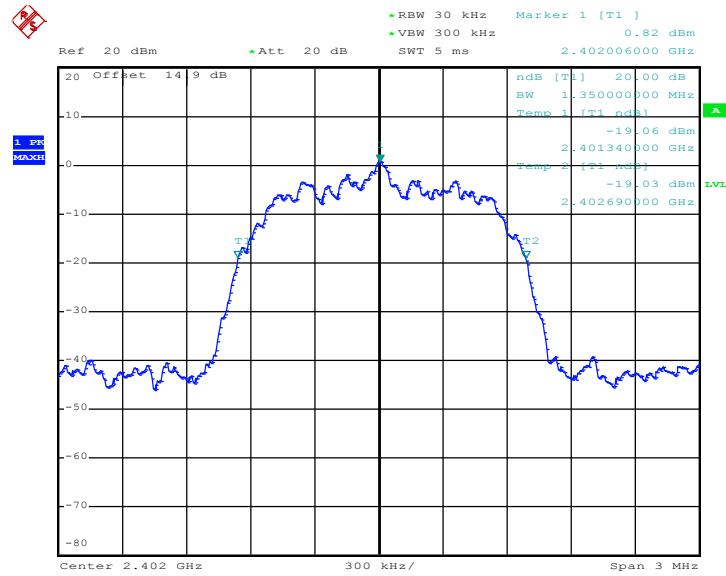
Date: 2.FEB.2012 10:09:46



Test Mode :	Mode 4, 5, 6	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.350
39	2441	1.350
78	2480	1.356

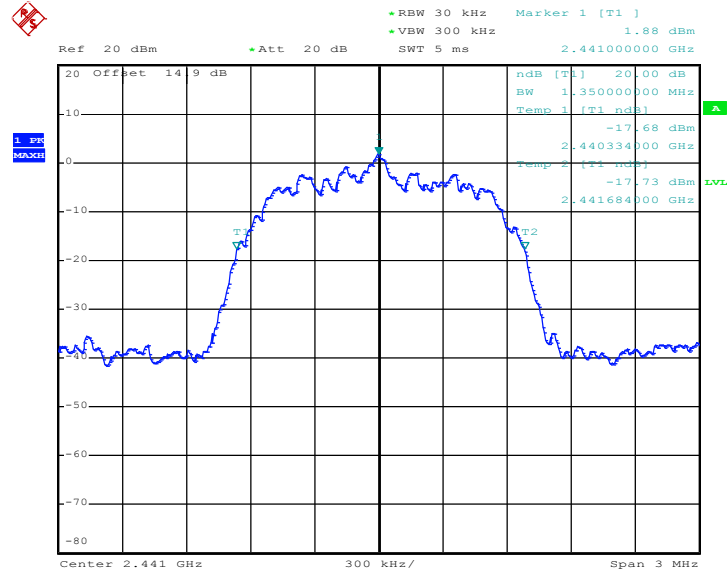
20 dB Bandwidth Plot on Channel 00



Date: 2.FEB.2012 10:10:15

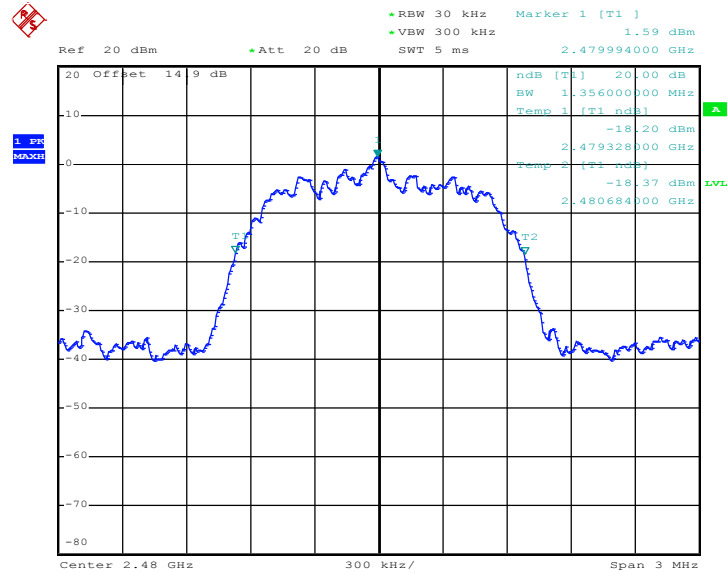


20 dB Bandwidth Plot on Channel 39



Date: 2.FEB.2012 10:10:40

20 dB Bandwidth Plot on Channel 78



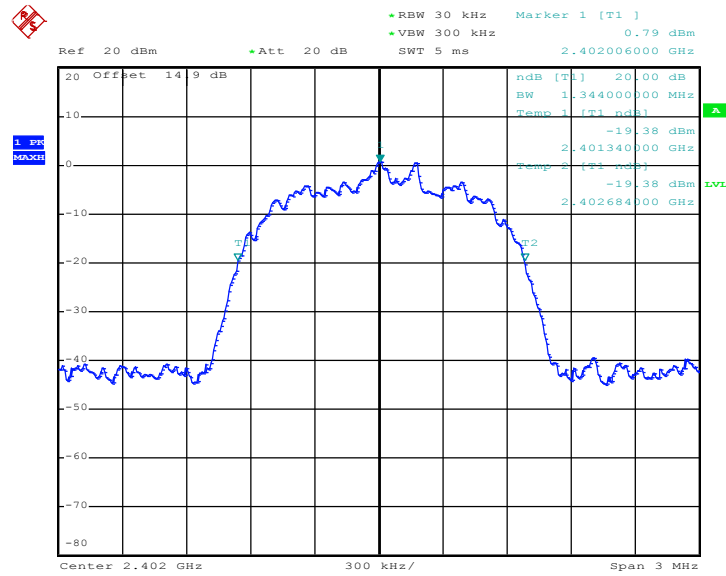
Date: 2.FEB.2012 10:11:05



Test Mode :	Mode 7, 8, 9	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

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

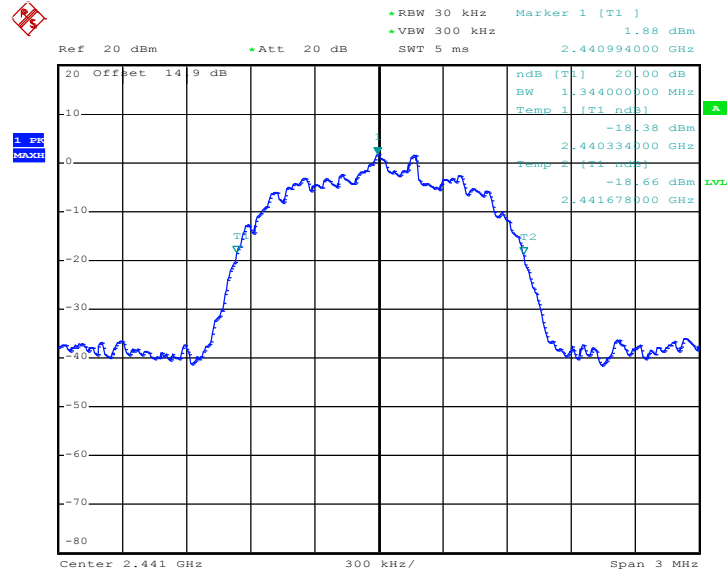
20 dB Bandwidth Plot on Channel 00



Date: 2.FEB.2012 10:11:42

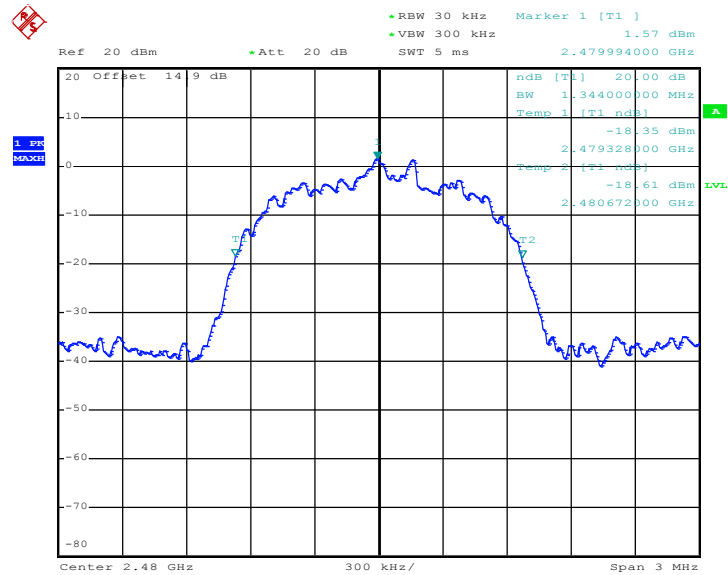


20 dB Bandwidth Plot on Channel 39



Date: 2.FEB.2012 10:12:46

20 dB Bandwidth Plot on Channel 78



Date: 2.FEB.2012 10:13:35

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.

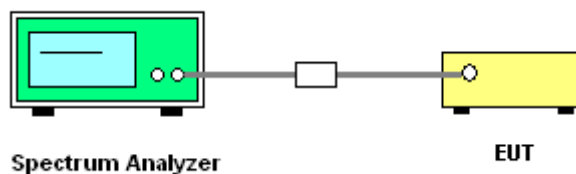
3.3.2 Measuring Instruments

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; $RBW \geq 1\%$ of the span;
VBW \geq 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



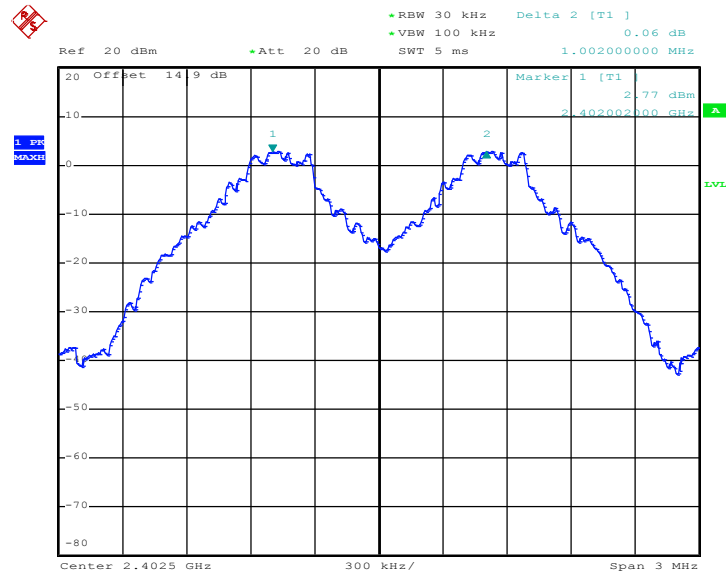


3.3.5 Test Result of Hopping Channel Separation

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.648	Pass
39	2441	1.002	0.643	Pass
78	2480	1.008	0.648	Pass

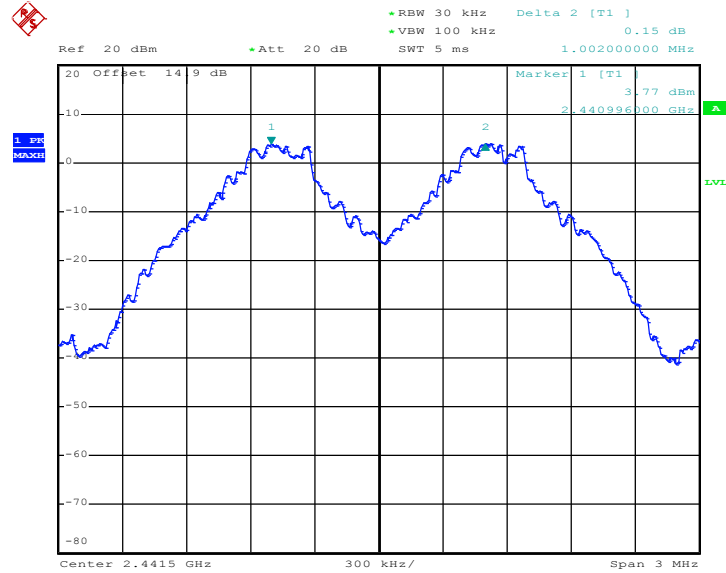
Channel Separation Plot on Channel 00 - 01



Date: 2.FEB.2012 09:56:07

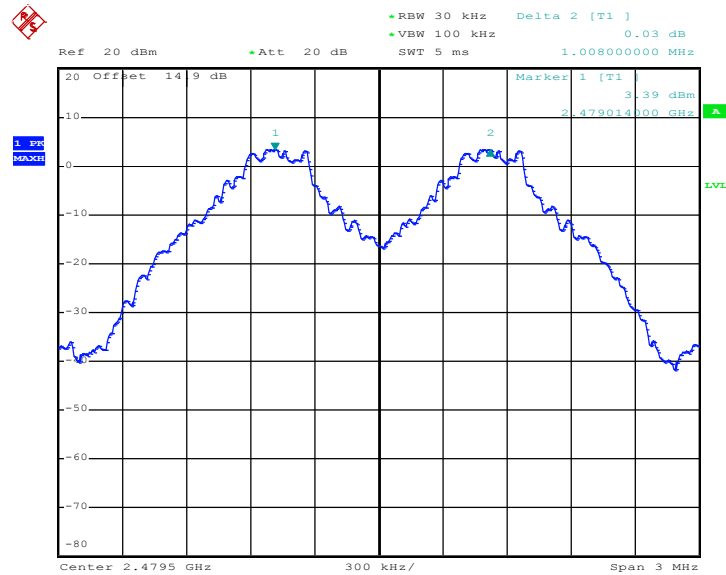


Channel Separation Plot on Channel 39 - 40



Date: 2.FEB.2012 09:56:47

Channel Separation Plot on Channel 77 - 78



Date: 2.FEB.2012 09:58:34

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.

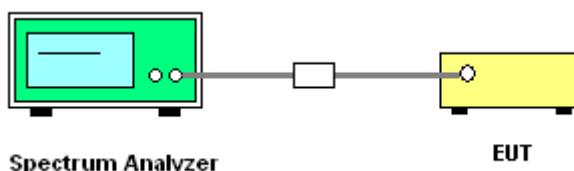
3.4.2 Measuring Instruments

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

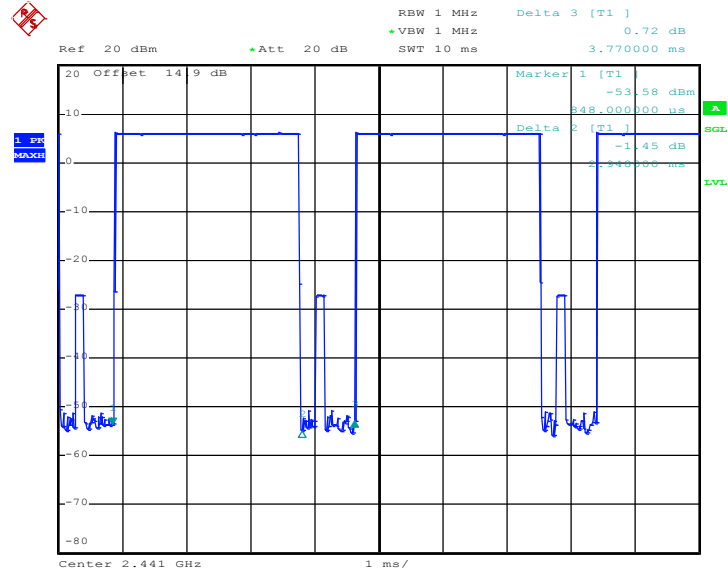
Test Mode :	Mode 2	Temperature :	23~24°C		
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%		
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
DH5	2.80	2948.00	0.26	0.4	Pass

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)

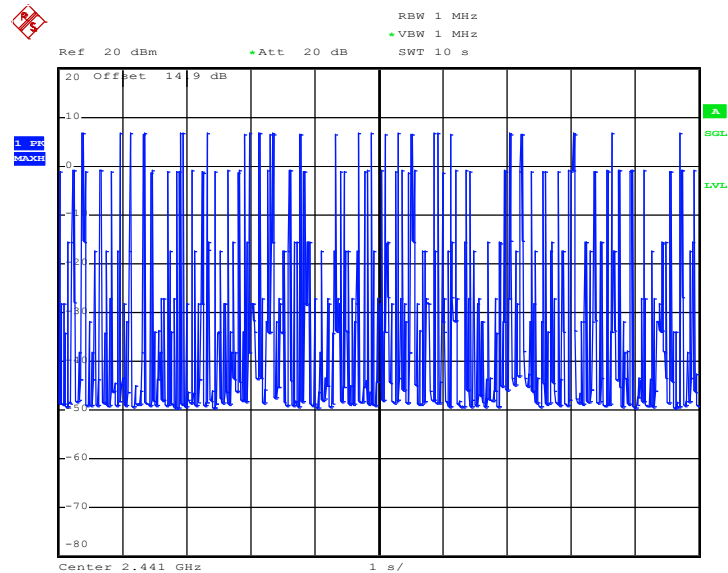


DH5 Dwell Time (One Pulse) Plot on Channel 39



Date: 2.FEB.2012 09:52:14

DH5 Dwell Time (Count Pulses) Plot on Channel 39



Date: 2.FEB.2012 10:06:27

3.5 Peak Output Power Measurement

3.5.1 Limit of Peak Output Power

Section 15.247 (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts. The power limit for 1Mbps is 1watt, and for 2Mbps, and 3Mbps are 0.125 watts.

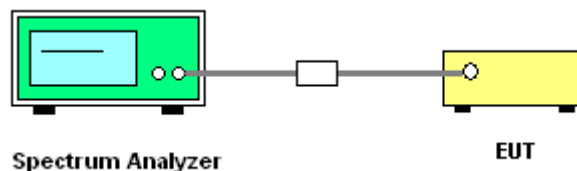
3.5.2 Measuring Instruments

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



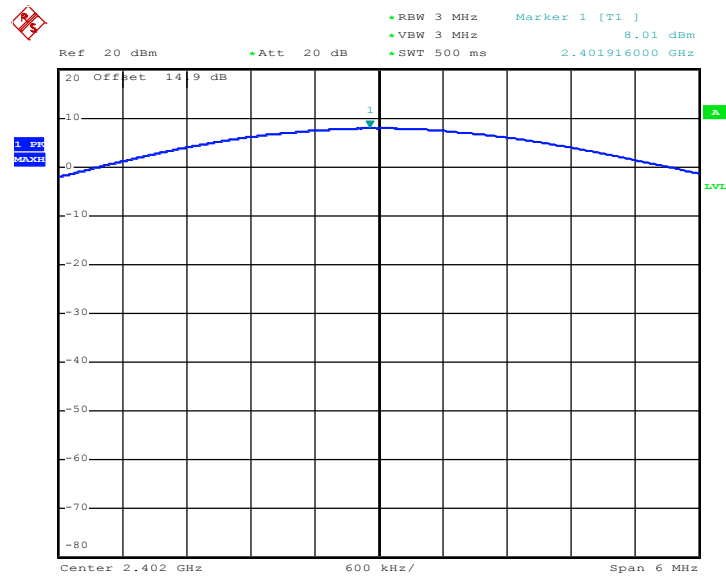


3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	8.01	30	Pass
39	2441	8.17	30	Pass
78	2480	7.32	30	Pass

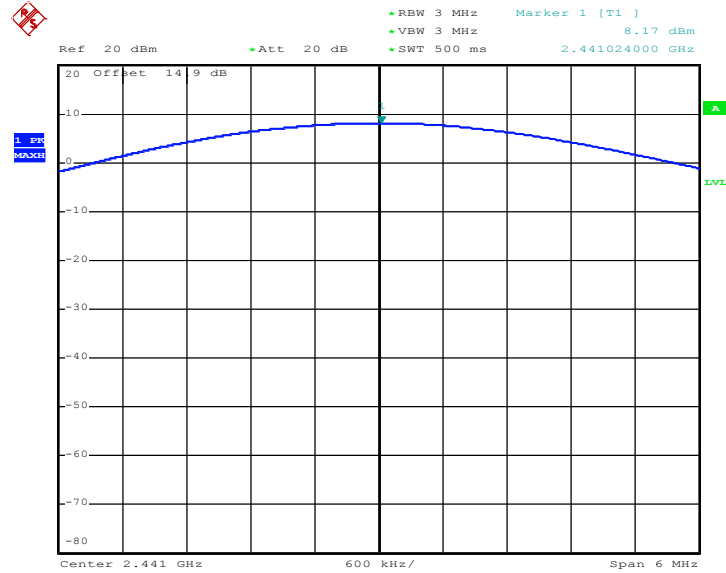
Peak Output Power Plot on Channel 00



Date: 20.JAN.2012 16:00:02

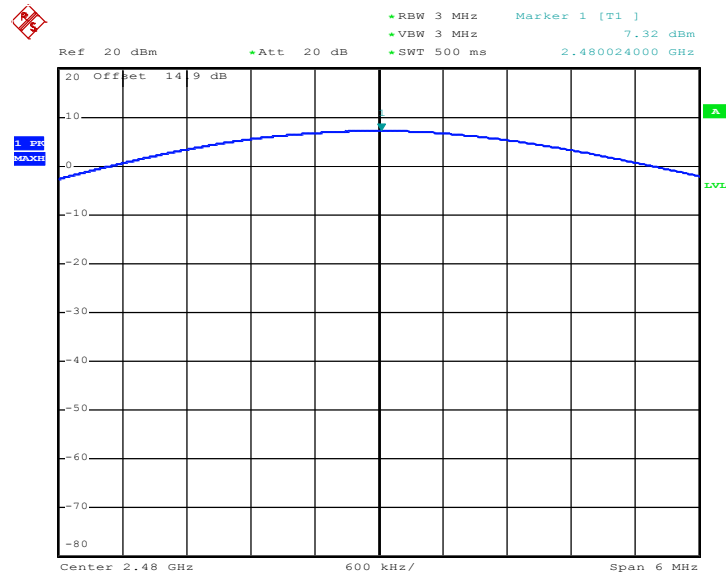


Peak Output Power Plot on Channel 39



Date: 20.JAN.2012 16:01:17

Peak Output Power Plot on Channel 78



Date: 20.JAN.2012 16:02:33



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

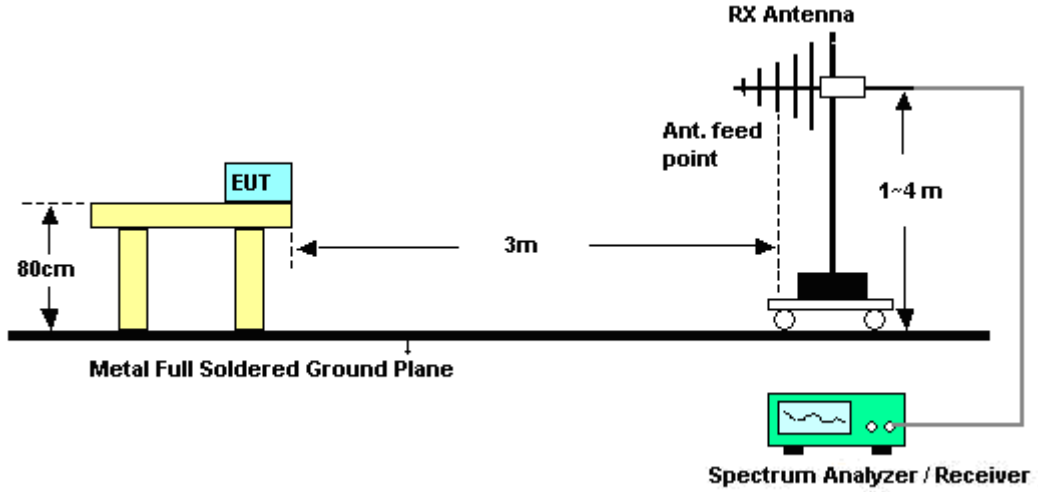
See list of measuring instruments of this test report.

3.6.3 Test Procedures

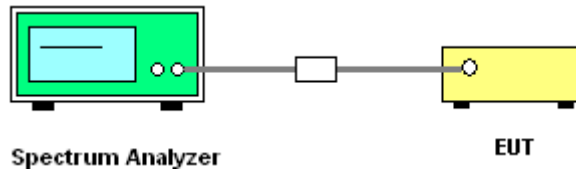
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300KHz, Video bandwidth (VBW) \geq RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as 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 :	22~23°C
Test Channel :	00	Relative Humidity :	50~52%
		Test Engineer :	David Yang

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
2389.61	45.45	-28.55	74	41.32	32.06	6.03	33.96	142	360	Peak
2389.61	32.51	-21.49	54	28.38	32.06	6.03	33.96	142	360	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
2388.66	44.62	-29.38	74	40.49	32.06	6.03	33.96	100	44	Peak
2388.66	32.33	-21.67	54	28.2	32.06	6.03	33.96	100	44	Average



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	50~52%
		Test Engineer :	David Yang

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	62.83	-11.17	74	58.47	32.18	6.18	34	138	4	Peak
2483.5	24.61	-29.39	54	20.25	32.18	6.18	34	138	4	Average

Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBµV/m)	Delta Result (dB)	Average Result (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
Single Carrier Mode	84.09	59.48	24.61	54	-29.39	Pass
Hopping Mode	84.09	59.97	24.12	54	29.88	Pass

Note : Average result = Maximum field strength – Delta result

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
2483.5	59.55	-14.45	74	55.19	32.18	6.18	34	100	49	Peak
2483.5	23.3	-30.7	54	18.94	32.18	6.18	34	100	49	Average

Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBµV/m)	Delta Result (dB)	Average Result (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
Single Carrier Mode	81.44	58.14	23.30	54	-30.70	Pass
Hopping Mode	81.44	59.3	22.14	54	-31.86	Pass

Note : Average result = Maximum field strength – Delta result



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal



Trace: (Discrete)

Site : 03CH07-HY
 Condition : FCC CLASS-B HF-ANT_110816 HORIZONTAL

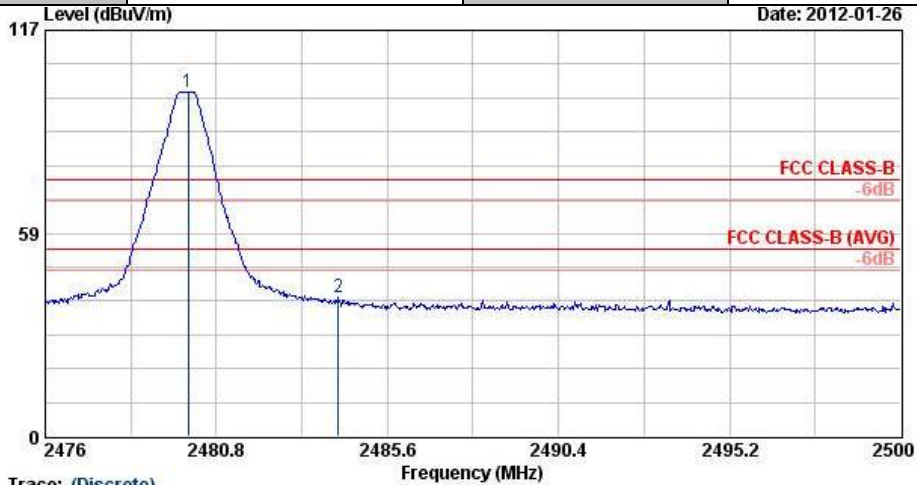
Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	99.39	25.39	74.00	95.03	32.18	6.18	34.00	138	4	Peak
2 @	2480.00	84.09	30.09	54.00	79.73	32.18	6.18	34.00	138	4	Average

* Maximum field strength of the fundamental emission



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal



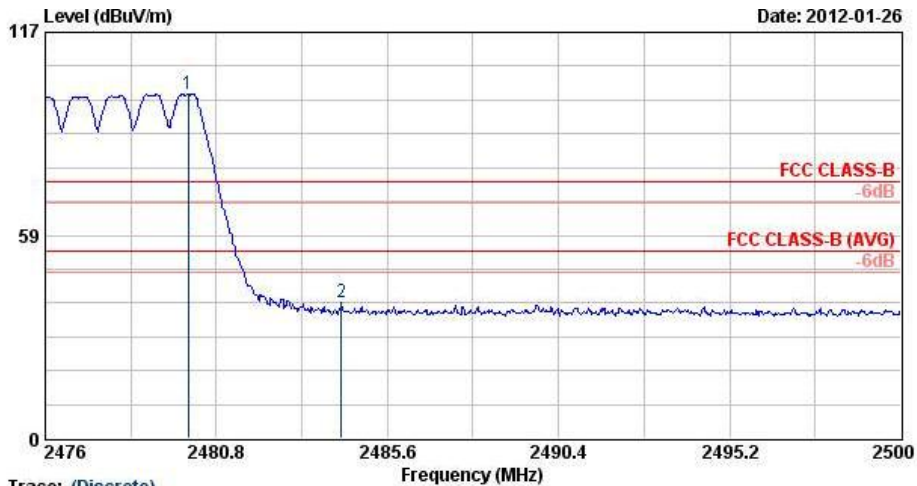
Trace: (Discrete)
 Site : 03CH07-HY
 Condition : FCC CLASS-B HP-ANT_110816 HORIZONTAL
 Mode : Mode 3

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	99.33	25.33	74.00	94.97	32.18	6.18	34.00	138	4	Peak
2	2484.23	39.85	-34.15	74.00	35.49	32.18	6.18	34.00	138	4	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 59.48 dB , single carrier Mode



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal



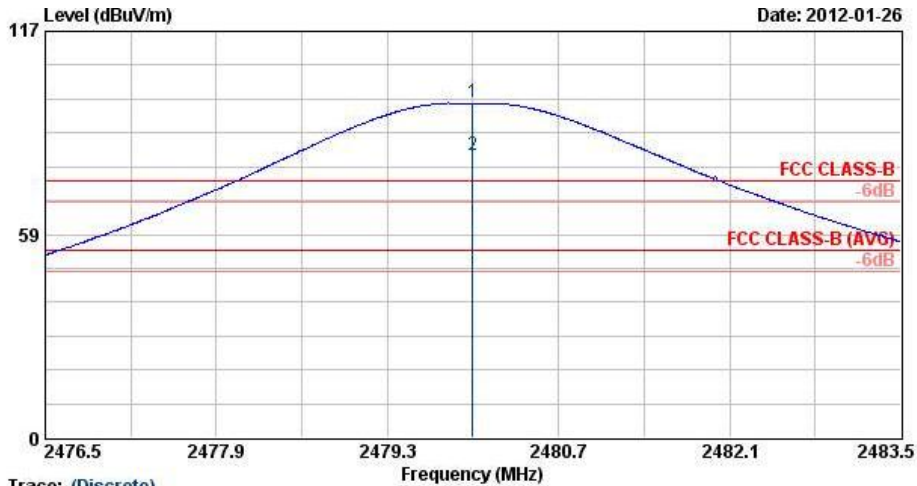
Trace: (Discrete)
 Site : 03CH07-HY
 Condition : FCC CLASS-B HF-ANT_110616 HORIZONTAL
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg	
1 @	2480.00	99.10	25.10	74.00	94.75	32.18	6.18	34.00	138	4 Peak
2	2484.30	39.13	-34.87	74.00	34.77	32.18	6.18	34.00	138	4 Peak

* Marker-Delta Method (RBW/VBW=100KHz): 59.97 dB , Hopping Mode



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical



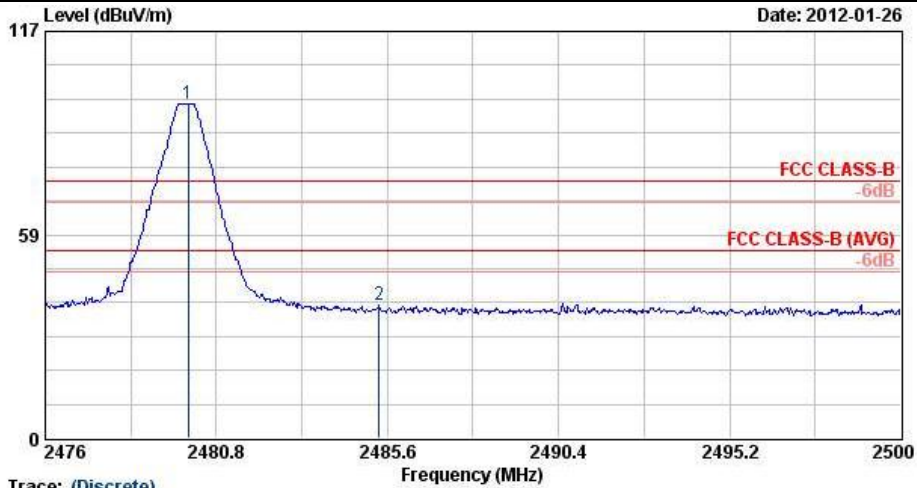
Trace: (Discrete)
 Site : 03CH07-HY
 Condition : FCC CLASS-B HF-ANT_110616 VERTICAL
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 X	2480.00	96.35	22.35	74.00	91.99	32.18	6.18	34.00	100	49 Peak
2 @	2480.00	81.44	27.44	54.00	77.08	32.18	6.18	34.00	100	49 Average

* Maximum field strength of the fundamental emission



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical



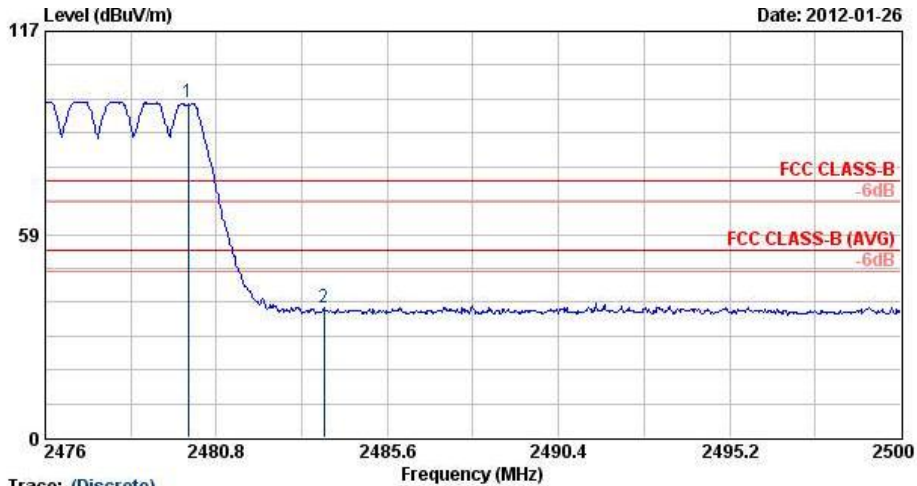
Trace: (Discrete)
 Site : 03CH07-HY
 Condition : FCC CLASS-B HF-ANT_110816 VERTICAL
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 X	2480.00	96.29	22.29	74.00	91.94	32.18	6.18	34.00	100	49	Peak
2	2485.36	38.15	-35.85	74.00	33.79	32.18	6.18	34.00	100	49	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 58.14 dB , single carrier Mode



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical



Trace: (Discrete)
 Site : 03CH07-HY
 Condition : FCC CLASS-B HF-ANT_110816 VERTICAL
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	96.73	22.73	74.00	92.37	32.18	6.18	34.00	100	49	Peak
2	2483.82	37.43	-36.57	74.00	33.07	32.18	6.18	34.00	100	49	Peak

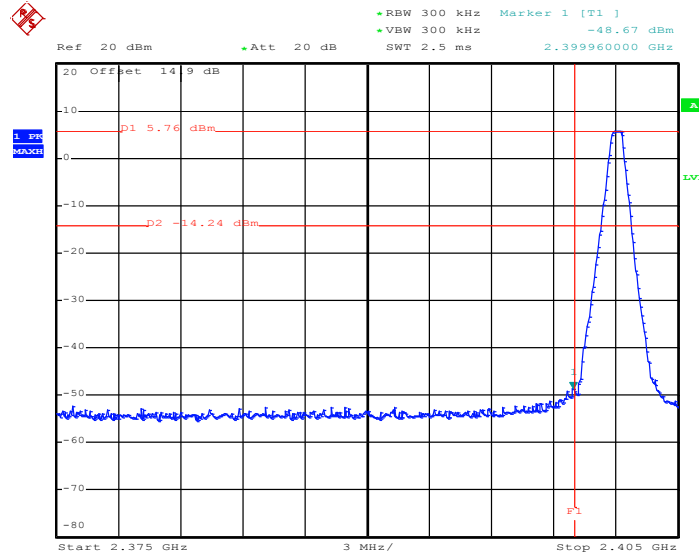
* Marker-Delta Method (RBW/VBW=100KHz): 59.30 dB , Hopping Mode



3.6.6 Test Result of Conducted Band Edges

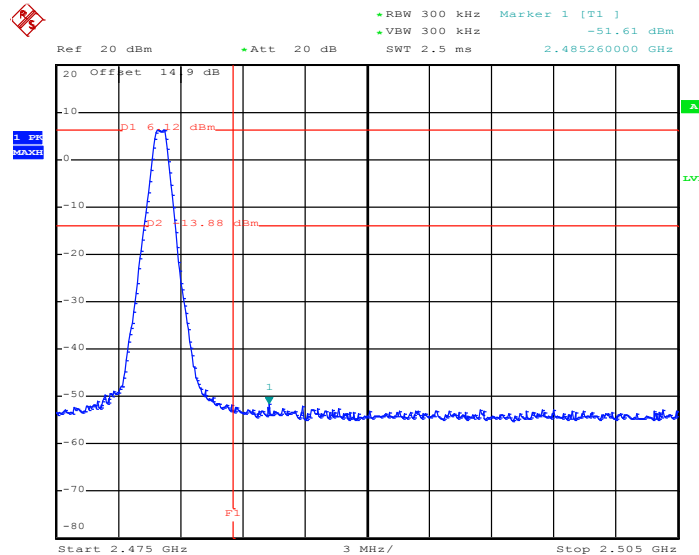
Test Mode :	Mode 1 and 3	Temperature :	23~24°C
Test Channel :	00 and 78	Relative Humidity :	47~48%
		Test Engineer :	Zhi Lu

Low Band Edge Plot on Channel 00



Date: 2.FEB.2012 10:14:29

High Band Edge Plot on Channel 78



Date: 2.FEB.2012 10:15:32

3.7 Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

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

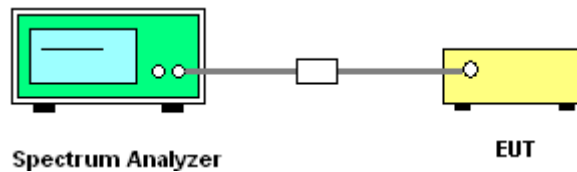
3.7.2 Measuring Instruments

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) \geq 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

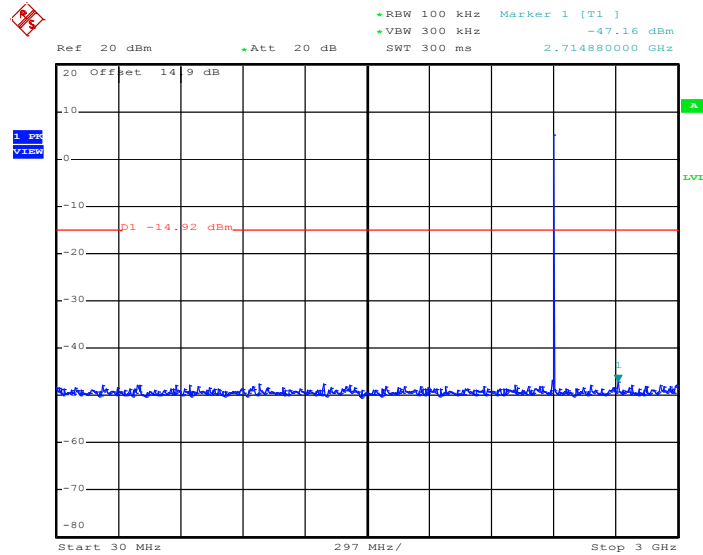




3.7.5 Test Result

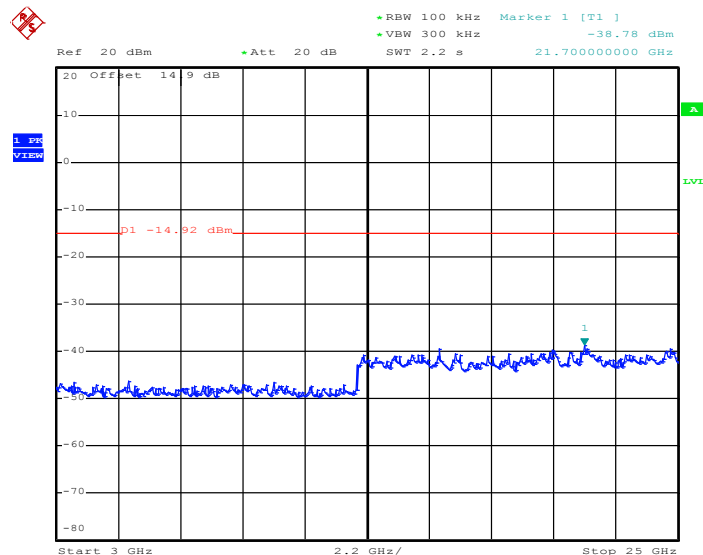
Test Mode :	Mode 1	Temperature :	23~24°C
Test Channel :	00	Relative Humidity :	47~48%
		Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 2.FEB.2012 10:25:42

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

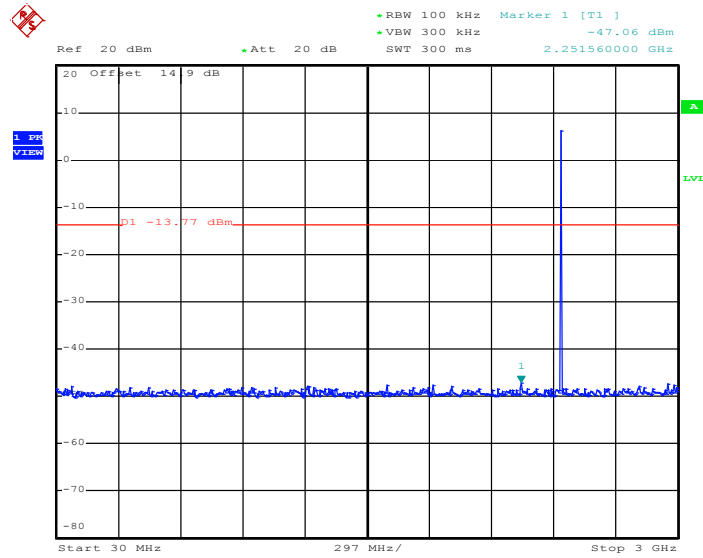


Date: 2.FEB.2012 10:25:54



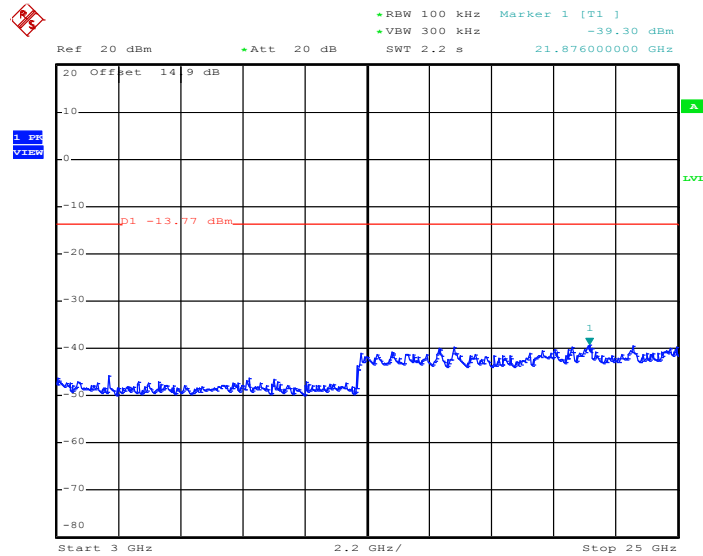
Test Mode :	Mode 2	Temperature :	23~24°C
Test Channel :	39	Relative Humidity :	47~48%
		Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 2.FEB.2012 10:26:47

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

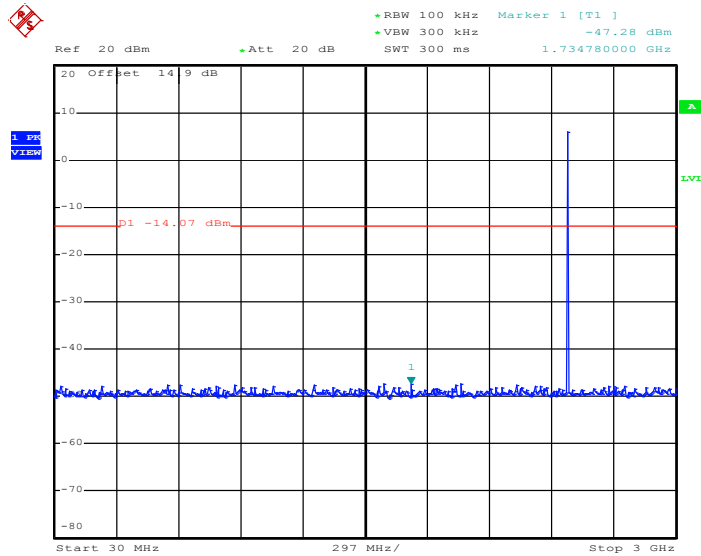


Date: 2.FEB.2012 10:26:59



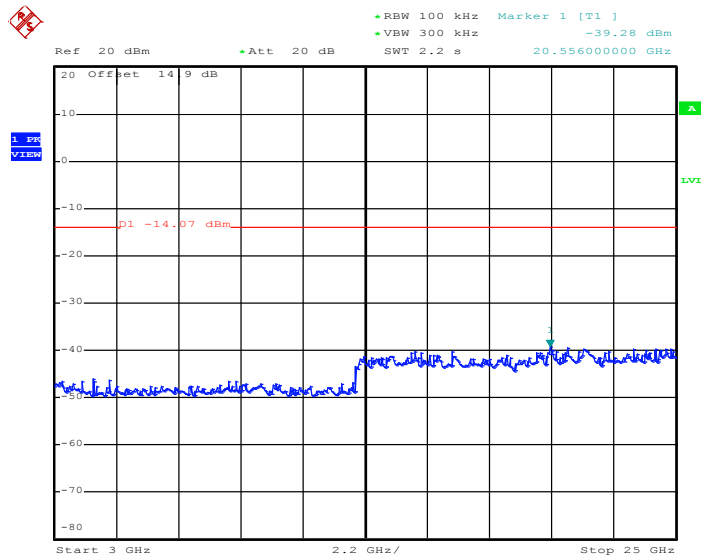
Test Mode :	Mode 3	Temperature :	23~24°C
Test Channel :	78	Relative Humidity :	47~48%
		Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 2.FEB.2012 10:27:51

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 2.FEB.2012 10:28:03

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.

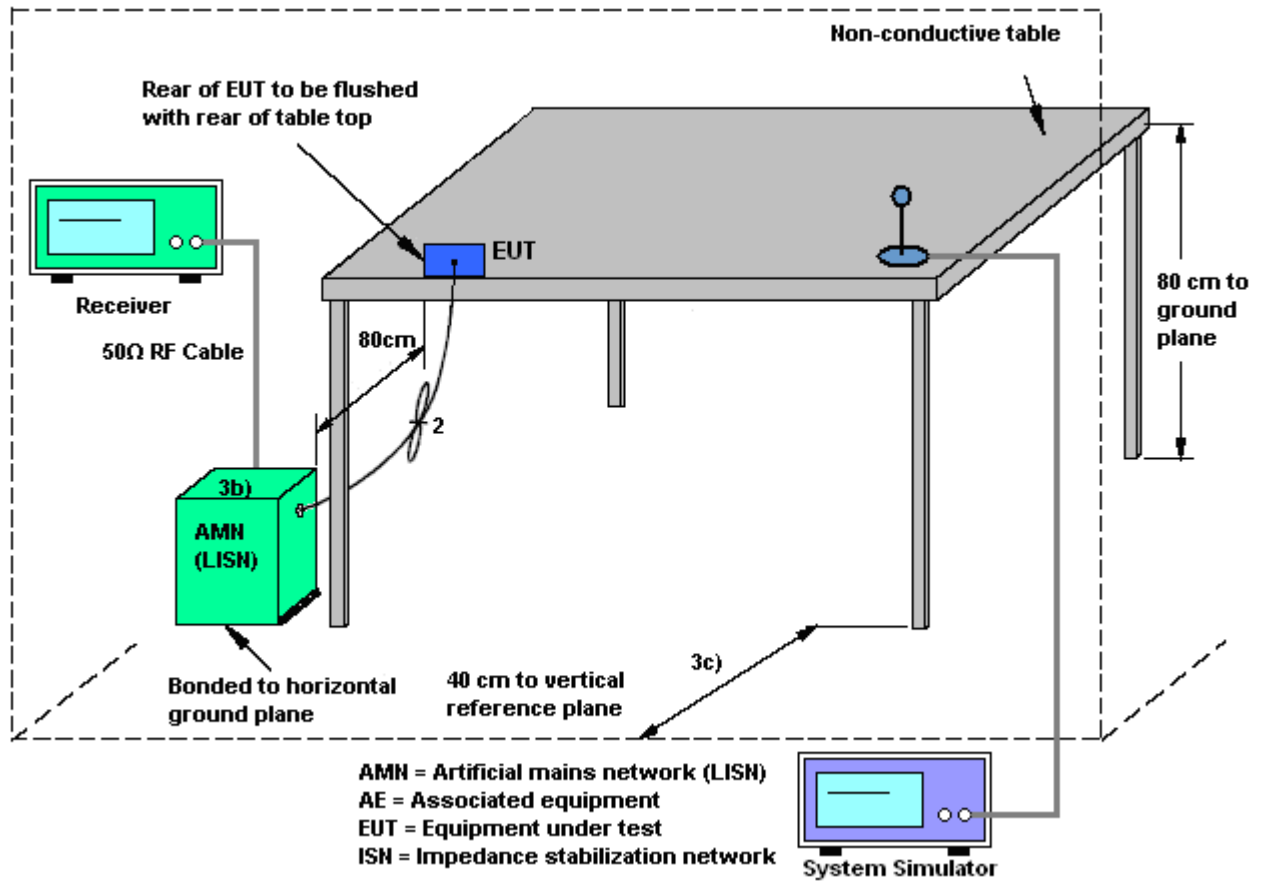
3.8.2 Measuring Instruments

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.

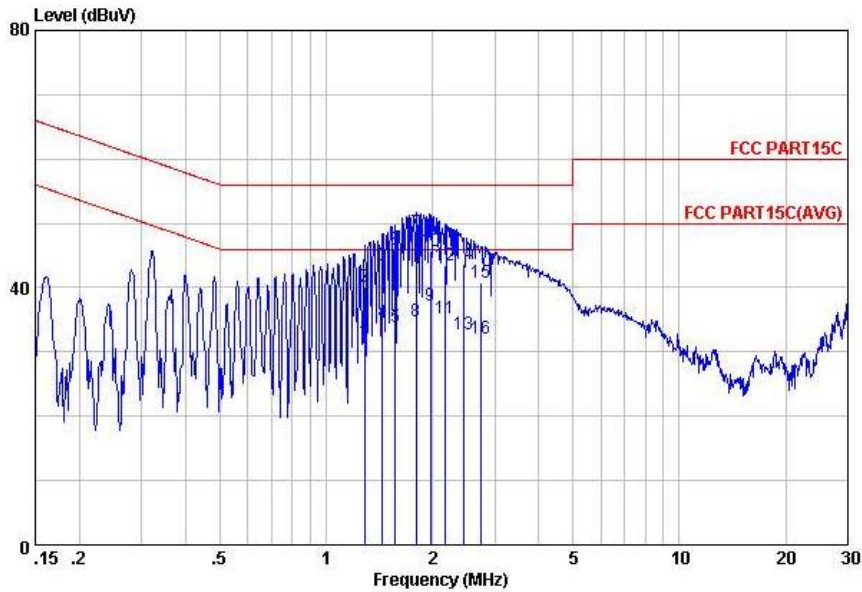
3.8.4 Test Setup





3.8.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~22°C
Test Engineer :	Jack Li	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



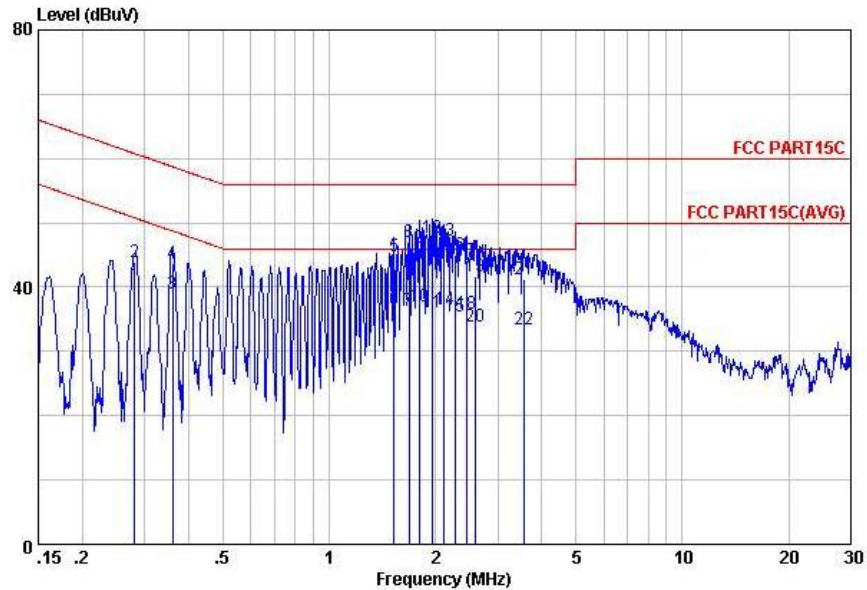
Site : C001-KS
 Condition: FCC PART15C LISN-100807 LINE

Mode : mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	1.28	31.58	-14.42	46.00	21.40	-0.10	10.28	Average
2	1.28	40.08	-15.92	56.00	29.90	-0.10	10.28	QP
3	1.44	43.39	-12.61	56.00	33.20	-0.11	10.30	QP
4	1.44	34.49	-11.51	46.00	24.30	-0.11	10.30	Average
5	1.57	33.90	-12.10	46.00	23.71	-0.11	10.30	Average
6	1.57	46.00	-10.00	56.00	35.81	-0.11	10.30	QP
7	1.80	48.51	-7.49	56.00	38.30	-0.11	10.32	QP
8	1.80	34.81	-11.19	46.00	24.60	-0.11	10.32	Average
9	1.97	37.12	-8.88	46.00	26.90	-0.11	10.33	Average
10	1.97	45.62	-10.38	56.00	35.40	-0.11	10.33	QP
11	2.18	35.13	-10.87	46.00	24.90	-0.11	10.34	Average
12	2.18	43.53	-12.47	56.00	33.30	-0.11	10.34	QP
13	2.45	32.84	-13.16	46.00	22.60	-0.11	10.35	Average
14	2.45	43.74	-12.26	56.00	33.50	-0.11	10.35	QP
15	2.75	40.75	-15.25	56.00	30.51	-0.12	10.36	QP
16	2.75	32.05	-13.95	46.00	21.81	-0.12	10.36	Average



Test Mode :	Mode 1	Temperature :	21~22°C
Test Engineer :	Jack Li	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone + 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

Mode : mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.28	40.29	-10.47	50.76	30.19	-0.07	10.17	Average
2	0.28	43.79	-16.97	60.76	33.69	-0.07	10.17	QP
3	0.36	39.11	-9.63	48.74	29.01	-0.08	10.18	Average
4	0.36	43.71	-15.03	58.74	33.61	-0.08	10.18	QP
5	1.53	44.80	-11.20	56.00	34.60	-0.10	10.30	QP
6	1.53	36.50	-9.50	46.00	26.30	-0.10	10.30	Average
7	1.68	36.41	-9.59	46.00	26.21	-0.11	10.31	Average
8	1.68	47.01	-8.99	56.00	36.81	-0.11	10.31	QP
9	1.80	46.11	-9.89	56.00	35.90	-0.11	10.32	QP
10	1.80	37.01	-8.99	46.00	26.80	-0.11	10.32	Average
11	1.96	36.12	-9.88	46.00	25.90	-0.11	10.33	Average
12	1.96	47.72	-8.28	56.00	37.50	-0.11	10.33	QP
13	2.12	47.33	-8.67	56.00	37.10	-0.11	10.34	QP
14	2.12	36.63	-9.37	46.00	26.40	-0.11	10.34	Average
15	2.28	35.33	-10.67	46.00	25.10	-0.11	10.34	Average
16	2.28	44.93	-11.07	56.00	34.70	-0.11	10.34	QP
17	2.45	44.04	-11.96	56.00	33.80	-0.11	10.35	QP
18	2.45	35.84	-10.16	46.00	25.60	-0.11	10.35	Average
19	2.59	41.74	-14.26	56.00	31.49	-0.11	10.36	QP
20	2.59	33.84	-12.16	46.00	23.59	-0.11	10.36	Average
21	3.57	41.26	-14.74	56.00	31.00	-0.12	10.38	QP
22	3.57	33.36	-12.64	46.00	23.10	-0.12	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

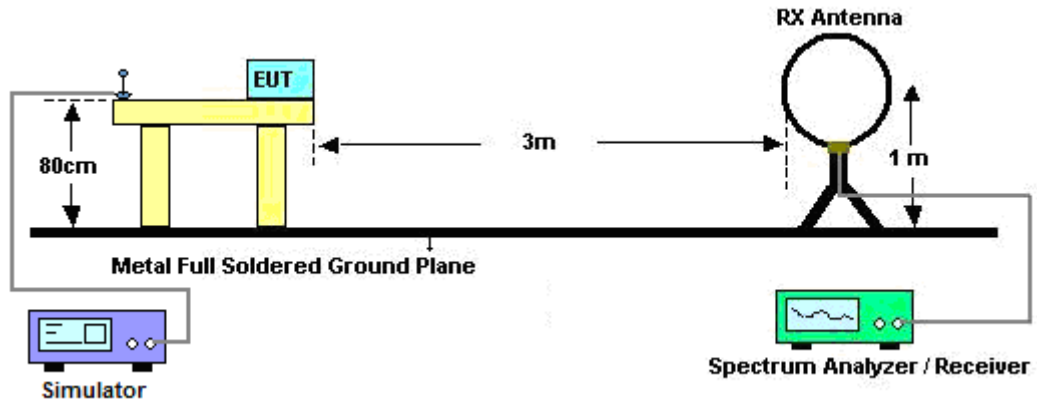
See list of measuring instruments of this test report.

3.9.3 Test Procedures

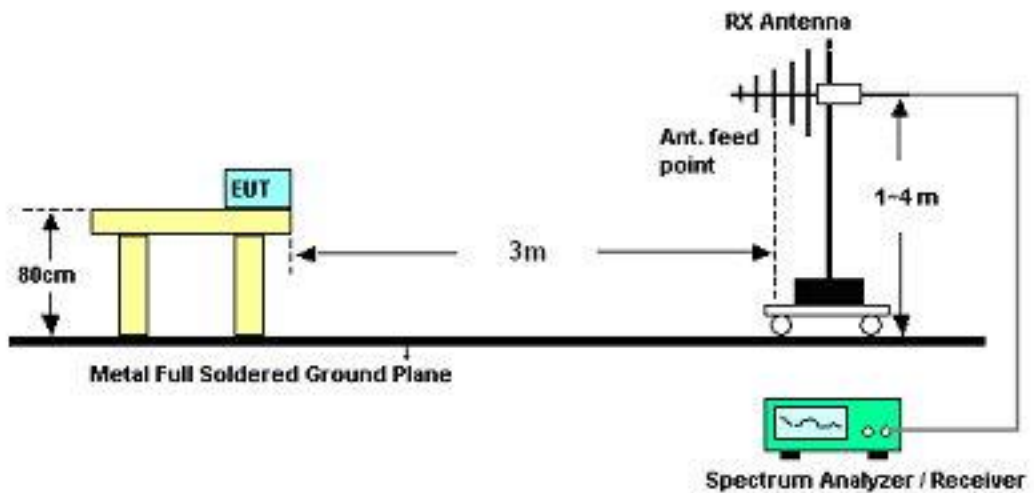
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
 - (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 KHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector 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 = $20 \log(\text{specific distance [3m]} / \text{test distance [1m]})$ (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.
4. Measured average value for the peak value is greater than 54 dBuV/m

3.9.4 Test Setup

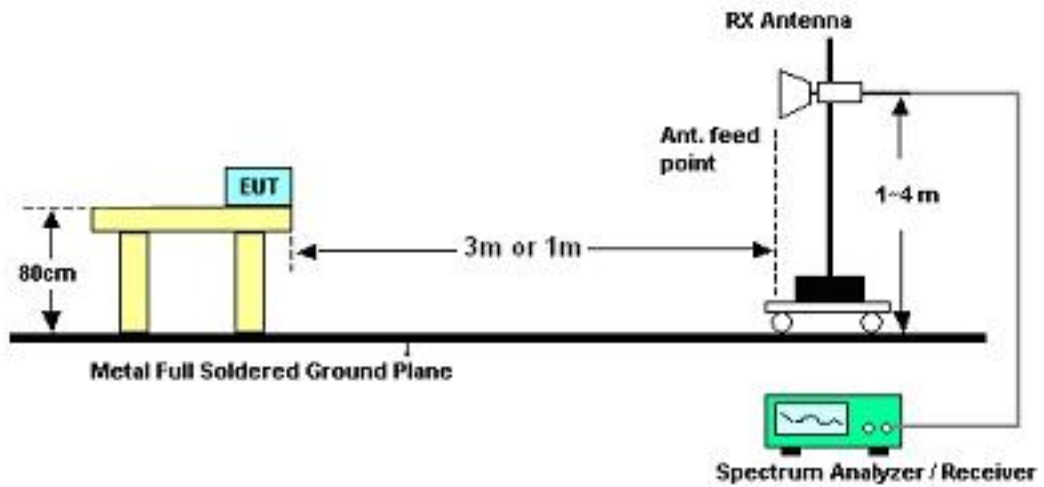
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

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

Test Mode :	Mode 1	Temperature :	22~23°C
Test Channel :	00	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2402 MHz is fundamental signals 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
179.58	19.82	-23.68	43.5	41.17	8.93	1.25	31.53	-	-	Peak
240.33	24.79	-21.21	46	42.75	11.93	1.53	31.42	-	-	Peak
285.69	25.72	-20.28	46	42.27	13.11	1.67	31.33	125	141	Peak
380.5	19.41	-26.59	46	33.07	15.48	2.1	31.24	-	-	Peak
559.7	19.07	-26.93	46	28.35	19.11	2.58	30.97	-	-	Peak
755.7	23.19	-22.81	46	29.39	21.43	3.07	30.7	-	-	Peak
2389.61	45.45	-28.55	74	41.32	32.06	6.03	33.96	142	360	Peak
2389.61	32.51	-21.49	54	28.38	32.06	6.03	33.96	142	360	Average
2402	102.5	-	-	98.35	32.08	6.03	33.96	142	360	Peak
2402	86.74	-	-	82.61	32.06	6.03	33.96	142	360	Average
2494	30.28	-23.72	54	25.9	32.2	6.18	34	142	360	Average
2494	42.12	-31.88	74	37.74	32.2	6.18	34	142	360	Peak
4804	46.27	-27.73	74	62.19	34.1	9.12	59.14	100	0	Peak



Test Mode :	Mode 1	Temperature :	22~23°C
Test Channel :	00	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2402 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
31.89	26.34	-13.66	40	38.69	18.56	0.55	31.46	103	251	Peak
97.5	23.62	-19.88	43.5	44.6	9.56	0.99	31.53	-	-	Peak
196.05	27.79	-15.71	43.5	48.92	9.06	1.3	31.49	-	-	Peak
324.5	22.92	-23.08	46	38.43	13.98	1.83	31.32	-	-	Peak
553.4	19.58	-26.42	46	28.99	19.01	2.56	30.98	-	-	Peak
775.3	22.32	-23.68	46	28.19	21.72	3.1	30.69	-	-	Peak
2388.66	44.62	-29.38	74	40.49	32.06	6.03	33.96	100	44	Peak
2388.66	32.33	-21.67	54	28.2	32.06	6.03	33.96	100	44	Average
2402	100.86	-	-	96.71	32.08	6.03	33.96	100	44	Peak
2402	85.57	-	-	81.44	32.06	6.03	33.96	100	44	Average
2484	30.3	-23.7	54	25.94	32.18	6.18	34	100	44	Average
2484	42.53	-31.47	74	38.17	32.18	6.18	34	100	44	Peak
4804	48.39	-25.61	74	64.31	34.1	9.12	59.14	100	0	Peak



Test Mode :	Mode 2	Temperature :	22~23°C
Test Channel :	39	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2441 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
31.62	20.3	-19.7	40	32.65	18.56	0.55	31.46	163	201	Peak
256.26	24.71	-21.29	46	41.88	12.68	1.57	31.42	-	-	Peak
277.05	25.96	-20.04	46	42.7	12.98	1.64	31.36	-	-	Peak
386.1	23.14	-22.86	46	36.62	15.63	2.11	31.22	-	-	Peak
596.1	19.79	-26.21	46	28.3	19.73	2.68	30.92	-	-	Peak
792.1	22.83	-23.17	46	28.4	21.98	3.13	30.68	-	-	Peak
2390	41.87	-32.13	74	37.74	32.06	6.03	33.96	140	7	Peak
2390	31.91	-22.09	54	27.78	32.06	6.03	33.96	140	7	Average
2441	86.08	-	-	81.82	32.13	6.11	33.98	140	7	Average
2441	101.44	-	-	97.18	32.13	6.11	33.98	140	7	Peak
2500	41.87	-32.13	74	37.49	32.2	6.18	34	140	7	Peak
2500	30.26	-23.74	54	25.88	32.2	6.18	34	140	7	Average
4882	49.92	-24.08	74	65.72	34.1	9.14	59.04	100	0	Peak



Test Mode :	Mode 2	Temperature :	22~23°C
Test Channel :	39	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2441 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
31.89	25.81	-14.19	40	38.16	18.56	0.55	31.46	100	174	Peak
74.82	23.48	-16.52	40	47.23	6.94	0.85	31.54	-	-	Peak
281.1	29.8	-16.2	46	46.47	13.04	1.64	31.35	-	-	Peak
313.3	19.23	-26.77	46	35.08	13.67	1.8	31.32	-	-	Peak
554.1	23.4	-22.6	46	32.81	19.01	2.56	30.98	-	-	Peak
758.5	23.33	-22.67	46	29.49	21.47	3.07	30.7	-	-	Peak
2334	43.03	-30.97	74	39.06	31.96	5.95	33.94	100	47	Peak
2334	31.45	-22.55	54	27.48	31.96	5.95	33.94	100	47	Average
2441	99.14	-	-	94.88	32.13	6.11	33.98	100	47	Peak
2441	84.28	-	-	80.02	32.13	6.11	33.98	100	47	Average
2492	41.21	-32.79	74	36.83	32.2	6.18	34	100	47	Peak
2492	30.25	-23.75	54	25.87	32.2	6.18	34	100	47	Average
4882	55.19	-18.81	74	70.99	34.1	9.14	59.04	100	306	Peak
4882	47.33	-6.67	54	63.13	34.1	9.14	59.04	100	306	Average



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2480 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
30.81	19.82	-20.18	40	31.46	19.28	0.54	31.46	135	155	Peak
235.74	23.21	-22.79	46	41.54	11.59	1.51	31.43	-	-	Peak
270.3	21.36	-24.64	46	38.2	12.89	1.64	31.37	-	-	Peak
351.8	19.46	-26.54	46	34.03	14.72	1.99	31.28	-	-	Peak
604.5	20.07	-25.93	46	28.46	19.83	2.7	30.92	-	-	Peak
800.5	23.29	-22.71	46	28.73	22.1	3.14	30.68	-	-	Peak
2380	43.35	-30.65	74	39.25	32.03	6.03	33.96	138	4	Peak
2380	31.47	-22.53	54	27.37	32.03	6.03	33.96	138	4	Average
2480	84.09	-	-	79.73	32.18	6.18	34	138	4	Average
2480	99.36	-	-	95	32.18	6.18	34	138	4	Peak
2483.5	62.83	-11.17	74	58.47	32.18	6.18	34	138	4	Peak
2483.5	24.61	-29.39	54	20.25	32.18	6.18	34	138	4	Average
4960	51.09	-22.91	74	66.74	34.1	9.16	58.91	104	350	Peak
4960	46.28	-7.72	54	61.93	34.1	9.16	58.91	104	350	Average



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2480 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
31.89	25.7	-14.3	40	38.05	18.56	0.55	31.46	109	214	Peak
98.58	23.96	-19.54	43.5	44.83	9.68	0.99	31.54	-	-	Peak
233.85	25.78	-20.22	46	44.25	11.46	1.5	31.43	-	-	Peak
326.6	25.67	-20.33	46	41.11	14.03	1.84	31.31	-	-	Peak
344.1	25.27	-20.73	46	40.13	14.51	1.92	31.29	-	-	Peak
719.3	22.03	-23.97	46	28.92	20.89	2.99	30.77	-	-	Peak
2380	43.15	-30.85	74	39.05	32.03	6.03	33.96	100	49	Peak
2380	31.5	-22.5	54	27.4	32.03	6.03	33.96	100	49	Average
2480	81.44	-	-	77.08	32.18	6.18	34	100	49	Average
2480	96.46	-	-	92.1	32.18	6.18	34	100	49	Peak
2483.5	59.55	-14.45	74	55.19	32.18	6.18	34	100	49	Peak
2483.5	23.3	-30.7	54	18.94	32.18	6.18	34	100	49	Average
4960	57.42	-16.58	74	73.07	34.1	9.16	58.91	100	301	Peak
4960	49.69	-4.31	54	65.34	34.1	9.16	58.91	100	301	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 PIFA 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	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Jan. 20, 2012~ Feb. 02, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY451015 55	N/A	Aug. 23, 2011	Jan. 20, 2012~ Feb. 02, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY444211 98	N/A	Aug. 23, 2011	Jan. 20, 2012~ Feb. 02, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Bluetooth Base Station	R&S	CBT	100783	N/A	Aug. 18, 2011	Jan. 20, 2012~ Feb. 02, 2012	Aug. 17, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 02, 2011	Dec. 29, 2011	Jun. 01, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Jan. 07, 2011	Dec. 29, 2011	Jan. 06, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Jan. 07, 2011	Dec. 29, 2011	Jan. 06, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	N/A	Nov. 16, 2011	Dec. 29, 2011	Nov. 15, 2012	Conduction (CO01-KS)
System Simulator	R&S	CMU200	116456	Full-Band	Sep. 20, 2011	Dec. 29, 2011	Sep. 19, 2012	Conduction (CO01-KS)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	Jan. 26, 2012~ Feb. 10, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Jan. 26, 2012~ Feb. 10, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	Jan. 26, 2012~ Feb. 10, 2012	Aug. 09, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A023 62	1GHz~ 26.5GHz	Dec. 05, 2011	Jan. 26, 2012~ Feb. 10, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Mar. 29, 2011	Jan. 26, 2012~ Feb. 10, 2012	Mar. 28, 2012	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Jan. 26, 2012~ Feb. 10, 2012	Aug. 21, 2012	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159088	1GHz ~ 18GHz	Feb. 21, 2011	Jan. 26, 2012~ Feb. 10, 2012	Feb. 20, 2012	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/00 1	9 kHz~30 MHz	Jul. 29, 2010	Jan. 26, 2012~ Feb. 10, 2012	Jul. 28, 2012	Radiation (03CH07-HY)
Bluetooth Base Station	R&S	CBT	100783	N/A	Aug. 18, 2011	Jan. 26, 2012~ Feb. 10, 2012	Aug. 17, 2012	Radiation (03CH07-HY)

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 $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	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 $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	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 $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				