

# FCC RF Test Report

APPLICANT : CT Asia  
EQUIPMENT : GSM / WCDMA mobile phone  
BRAND NAME : BLU  
MODEL NAME : VIVO 4.3  
FCC ID : YHLBLUVIVO43  
STANDARD : FCC Part 15 Subpart C §15.247  
CLASSIFICATION : (DSS) Spread Spectrum Transmitter

The product was received on Aug. 15, 2012 and completely tested on Aug. 28, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures 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:



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Jones Tsai / Manager



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

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## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR281501A	Rev. 01	Initial issue of report	Aug. 29, 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	$\geq 15\text{Chs}$	Pass	-
3.2	15.247(a)(1)	A8.1(b)	Hopping Channel Separation	$\geq 2/3$ of 20dB BW	Pass	-
3.3	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	$\leq 0.4\text{sec}$ in 31.6sec period	Pass	-
3.4	15.247(a)(1)	A8.1(a)	20dB Bandwidth	NA	Pass	-
3.5	15.247(b)(1)	A8.1(b)	Peak Output Power	$\leq 1\text{ w}$ for 1Mbps $\leq 125\text{ Mw}$ for 2, 3Mbps	Pass	-
3.6	15.247(d)	A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
3.7	15.247(d)	A8.5	Conducted Spurious Emission	$\leq 20\text{dBc}$	Pass	-
3.8	15.247(d)	A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	-
3.9	15.247(d)	A8.5	Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 5.09 dB at 35.750 MHz
0	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 15.26 dB at 26.000 MHz
3.11	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

Gionee Communication Equipment Co., Ltd.

32F, Tower A, East Pacific International Center, No.7888, Shennan Avenue, Futian District, Shenzhen-518040, China

## 1.3 Feature of Equipment Under Test

Product Feature	
Equipment	GSM / WCDMA mobile phone
Brand Name	BLU
Model Name	VIVO 4.3
FCC ID	YHLBLUVIVO43
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/WLAN 11bg/Bluetooth
HW Version	GN868H_Mainboard_P3
SW Version	GN868H_0301_v1014
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.

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Maximum Output Power to Antenna	Bluetooth (1Mbps) : 3.42 dBm (0.0022 W) Bluetooth EDR (2Mbps) : 2.75 dBm (0.0019 W) Bluetooth EDR (3Mbps) : 3.14 dBm (0.0021 W)
Antenna Type	PIFA Antenna with gain 1.60 dBi
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth 2.1 EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth 2.1 EDR (3Mbps) : 8-DPSK

## 1.4 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.			
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
<b>Test Site No.</b>	<b>Sporton Site No.</b>			<b>FCC/IC Registration No.</b>
	TH01-KS	CO01-KS	03CH01-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 and ANSI C63.10-2009
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

### Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Base Station	R&S	CBT	FCC DoC	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 0.9 DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A
6.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	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	$\pi/4$ -DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	2.11 dBm	1.36 dBm	1.75 dBm
Ch39	2441MHz	<b>3.42 dBm</b>	2.75 dBm	3.14 dBm
Ch78	2480MHz	2.28 dBm	1.63 dBm	1.99 dBm

**Remark:**

1. All the test data for each data rate were verified, but only the worst case was reported.
2. The data rate was set in 1Mbps for all the test items due to the highest RF output power.
3. 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 ANSI C63.10-2009 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, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

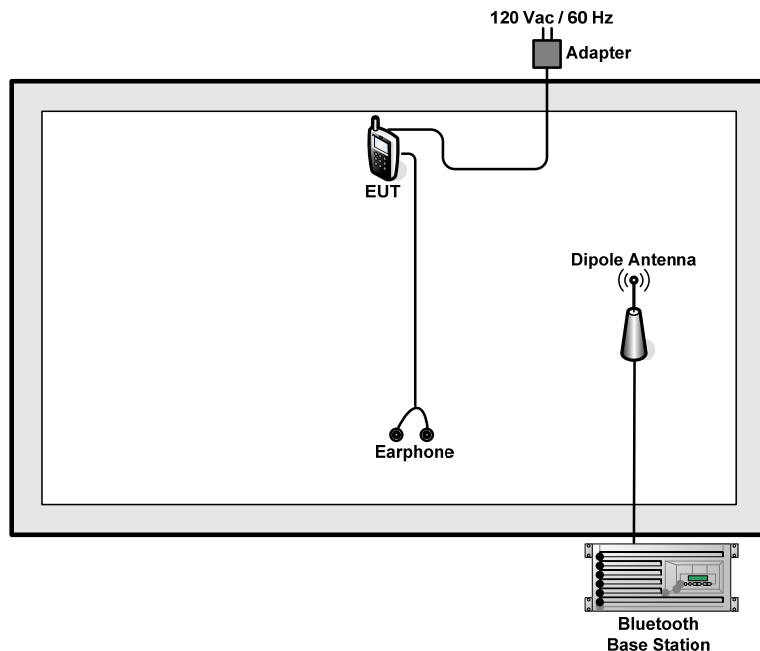
The following tables are showing the test modes as the worst cases (Z plane) and recorded in this report.

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	Pretest	Pretest
AC Conducted Emission	Mode 1 :GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone		
Remark:  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.			

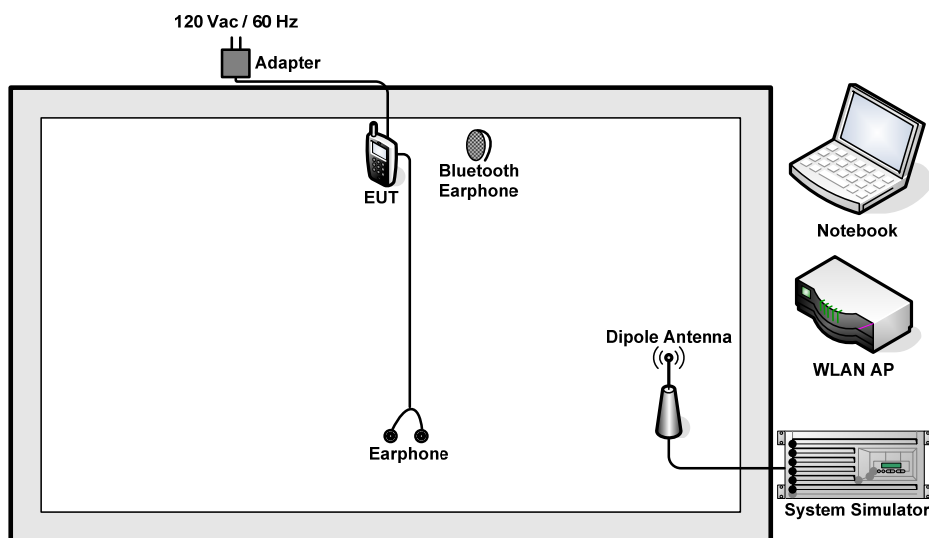


## 2.3 Connection Diagram of Test System

### <Bluetooth Tx Mode>



### <AC Conducted Emission Mode>



## 2.4 RF Utility

For Bluetooth function, key in “\* #446633 #” on the EUT directly. Then, the EUT will get into the engineering modes to contact with Bluetooth base station for continuous transmitting and receiving signals.

### 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.

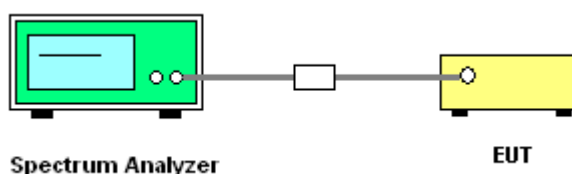
##### 3.1.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. 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.
6. The number of hopping frequency used is defined as the number of total channel.

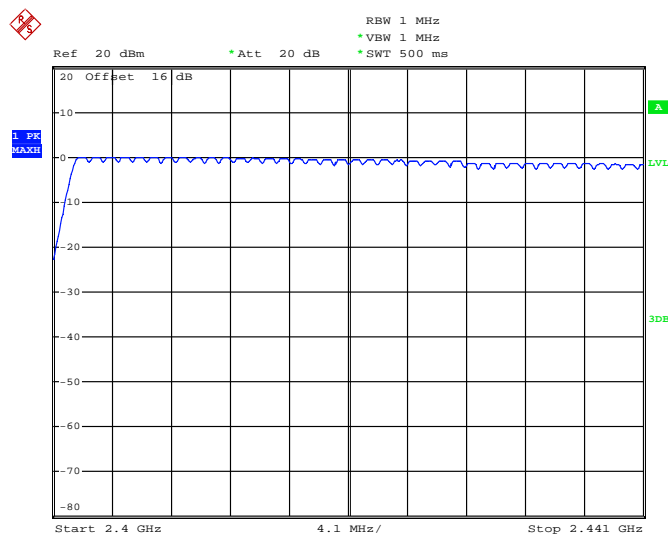
##### 3.1.4 Test Setup



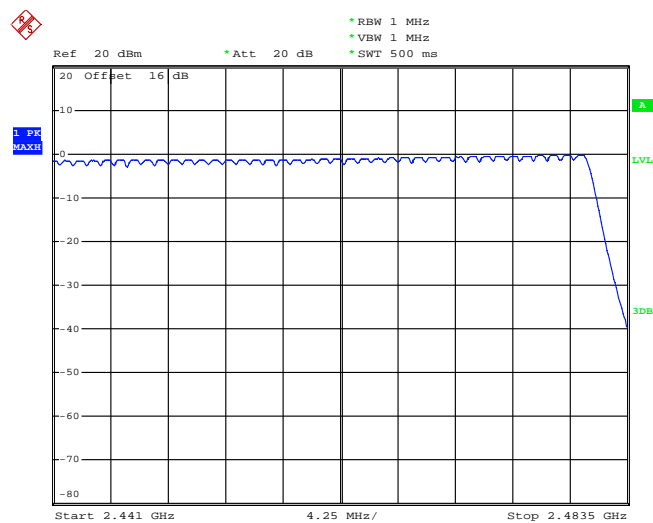
### 3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	1Mbps	Temperature :	21~22℃
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%
Number of Hopping Channels (Channel)		Limits (Channel)	Pass/Fail
79		> 15	Pass

**Number of Hopping Channel Plot on Channel 00 - 78**



Date: 20.AUG.2012 22:57:39



Date: 20.AUG.2012 22:46:57

## 3.2 Hopping Channel Separation Measurement

### 3.2.1 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.

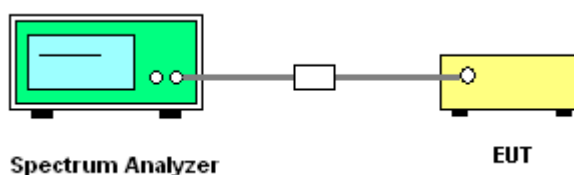
### 3.2.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. 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.

### 3.2.4 Test Setup

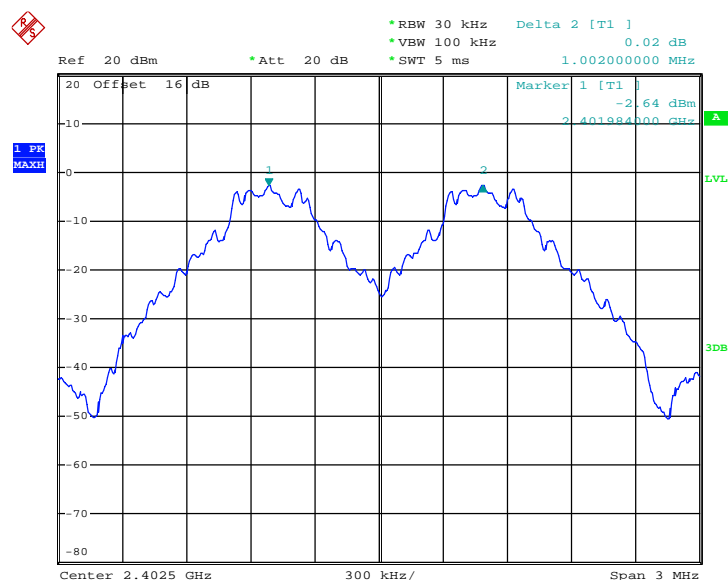


### 3.2.5 Test Result of Hopping Channel Separation

Test Mode :	1Mbps	Temperature :	21~22℃
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.5387	Pass
39	2441	0.996	0.6053	Pass
78	2480	1.002	0.5333	Pass

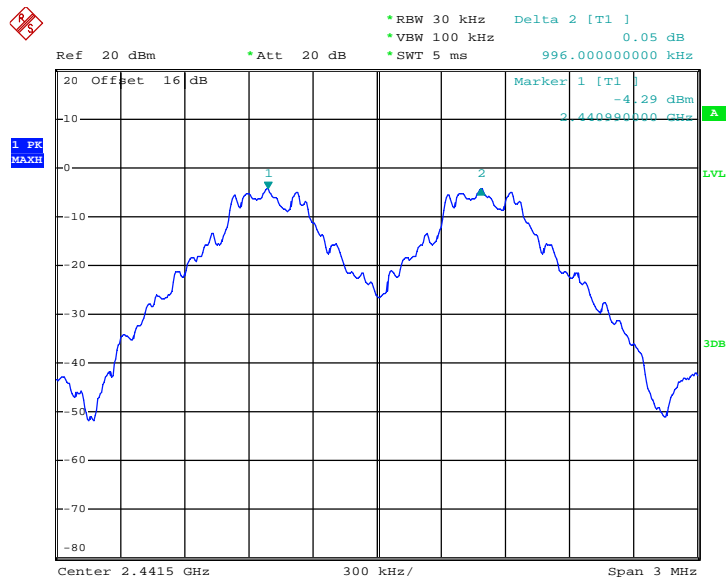
**Channel Separation Plot on Channel 00 - 01**



Date: 20.AUG.2012 23:09:59

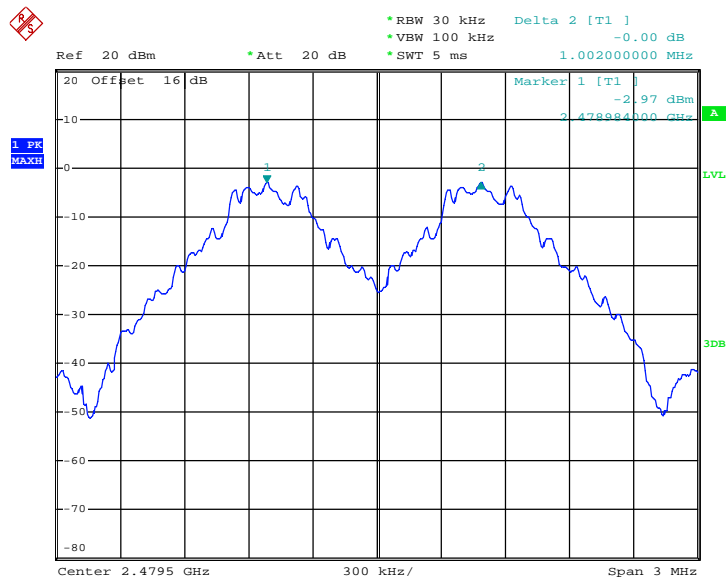


Channel Separation Plot on Channel 39 - 40



Date: 20.AUG.2012 23:08:59

Channel Separation Plot on Channel 77 - 78



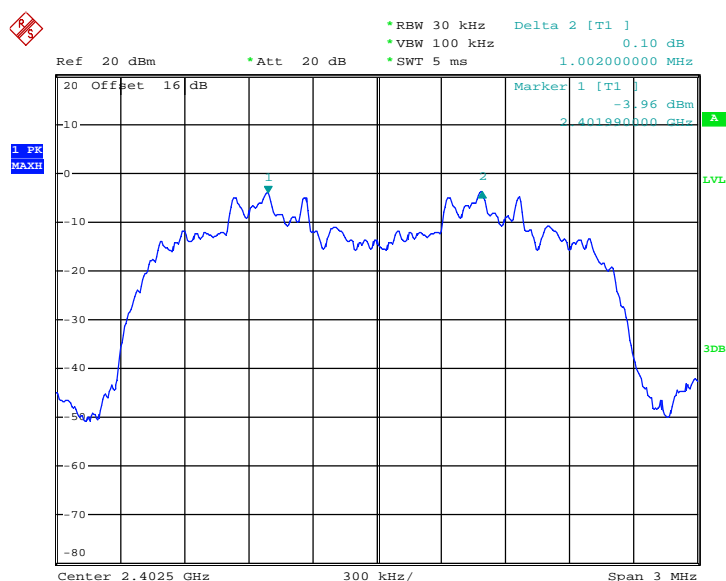
Date: 20.AUG.2012 23:10:58



<b>Test Mode :</b>	3Mbps	<b>Temperature :</b>	21~22°C
<b>Test Engineer :</b>	Zhi Lu	<b>Relative Humidity :</b>	41~42%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.8187	Pass
39	2441	1.008	0.8187	Pass
78	2480	0.996	0.8187	Pass

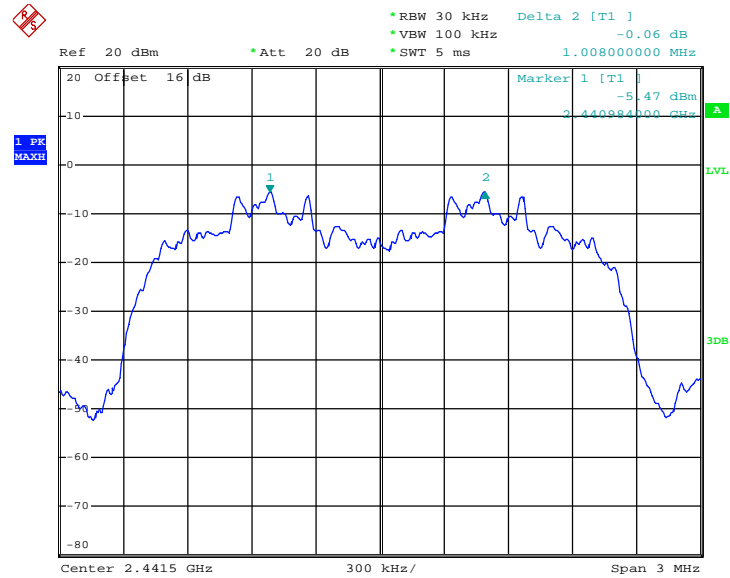
**Channel Separation Plot on Channel 00 - 01**



Date: 20.AUG.2012 23:15:32

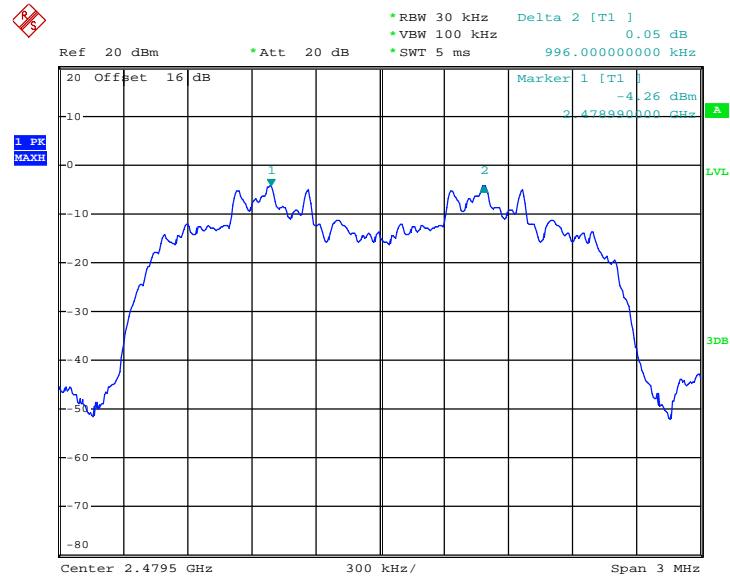


Channel Separation Plot on Channel 39 - 40



Date: 20.AUG.2012 23:16:57

Channel Separation Plot on Channel 77 - 78



Date: 20.AUG.2012 23:17:48



### 3.3 Dwell Time Measurement

#### 3.3.1 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.

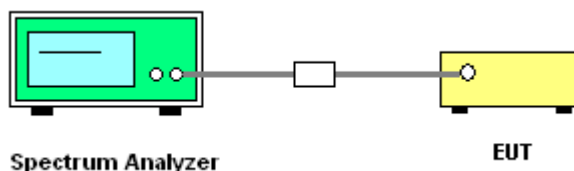
#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output connector was connected to the spectrum analyzer through a low loss cable.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW  $\geq$  RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.

#### 3.3.4 Test Setup



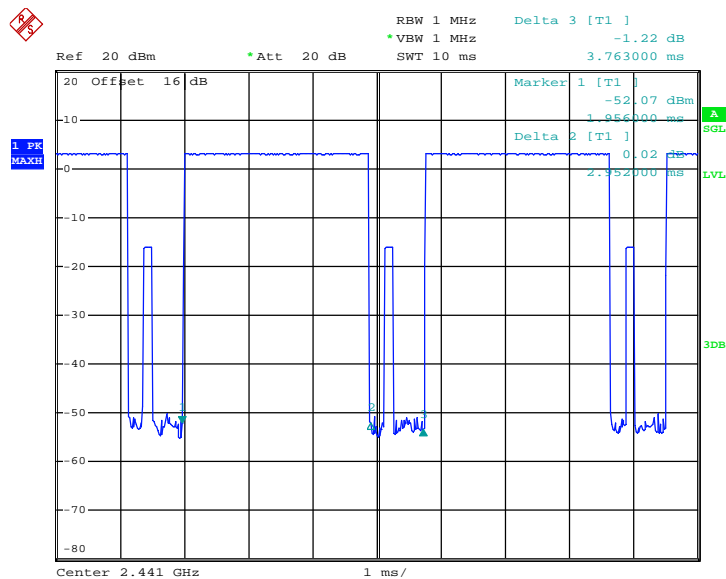
#### 3.3.5 Test Result of Dwell Time

<b>Test Mode :</b>	DH5	<b>Temperature :</b>	21~22℃
<b>Test Engineer :</b>	Zhi Lu	<b>Relative Humidity :</b>	41~42%

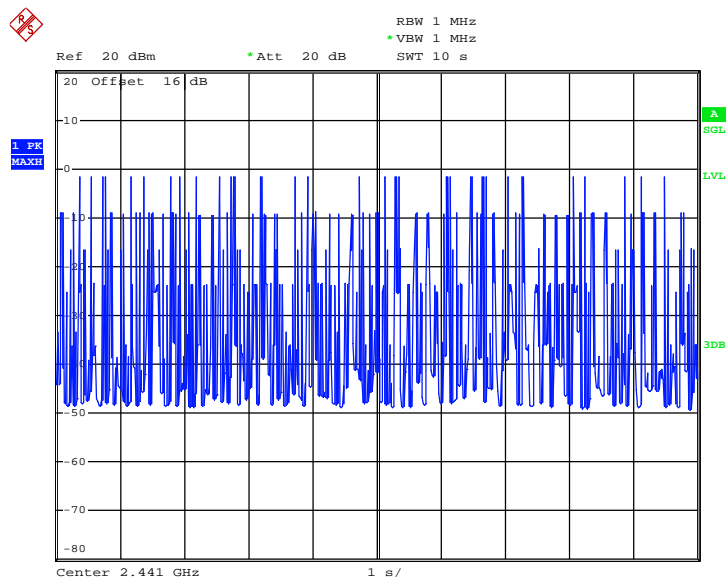
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
DH5	3.10	2952.00	0.29	0.4	Pass

**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: 24.AUG.2012 01:00:38

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


Date: 20.AUG.2012 23:01:37

### 3.4 20dB Bandwidth Measurement

#### 3.4.1 Limit of 20dB Bandwidth

Reporting only

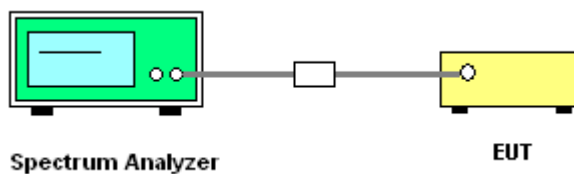
#### 3.4.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
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.

#### 3.4.4 Test Setup

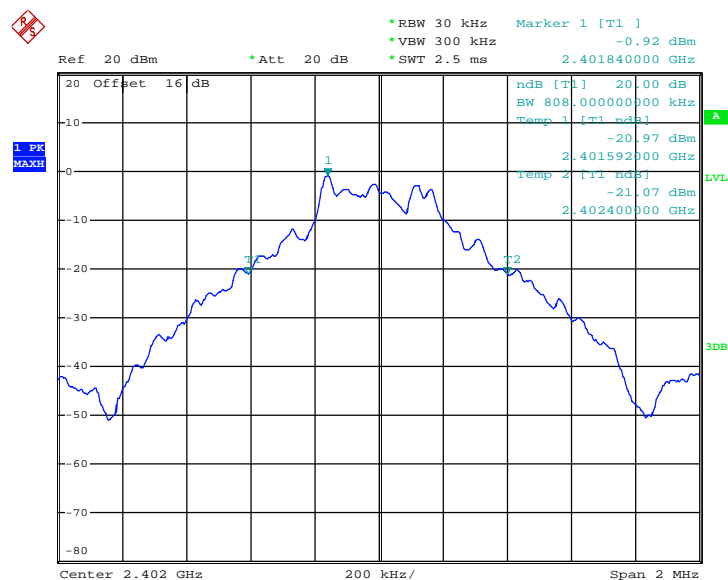


### 3.4.5 Test Result of 20dB Bandwidth

Test Mode :	1Mbps	Temperature :	21~22℃
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.808
39	2441	0.908
78	2480	0.800

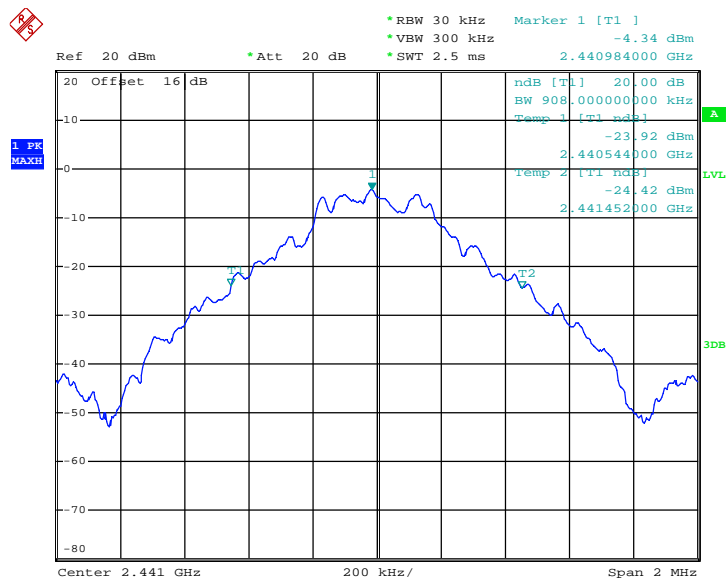
**20 dB Bandwidth Plot on Channel 00**



Date: 21.AUG.2012 00:03:09

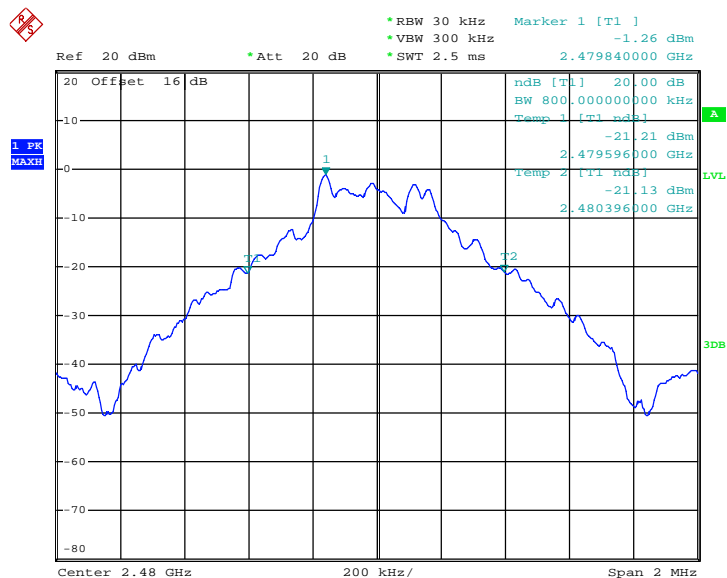


### 20 dB Bandwidth Plot on Channel 39



Date: 20.AUG.2012 23:59:34

### 20 dB Bandwidth Plot on Channel 78



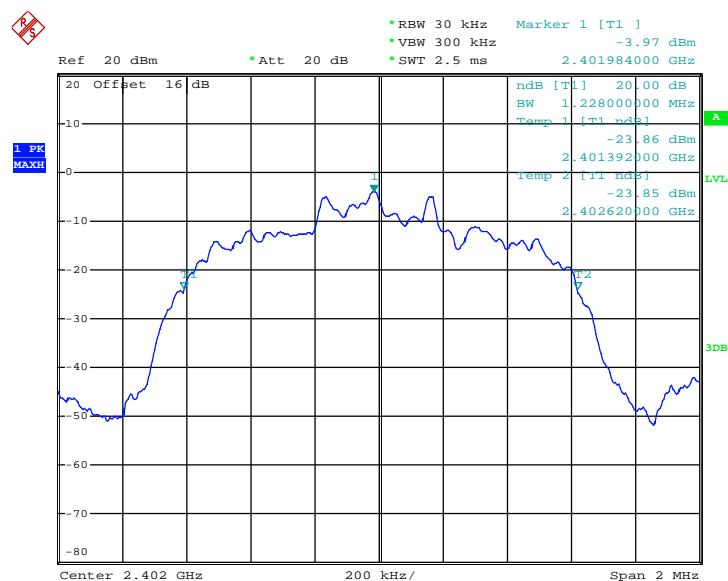
Date: 20.AUG.2012 23:58:54



<b>Test Mode :</b>	3Mbps	<b>Temperature :</b>	21~22℃
<b>Test Engineer :</b>	Zhi Lu	<b>Relative Humidity :</b>	41~42%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.228
39	2441	1.228
78	2480	1.228

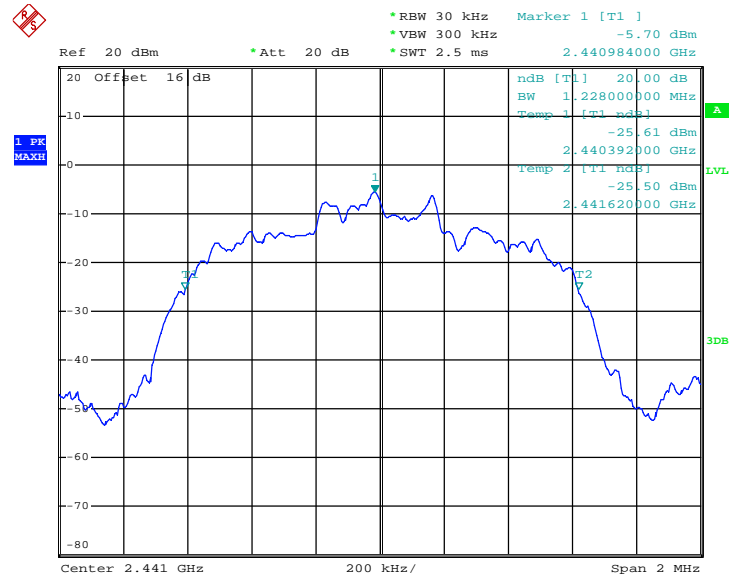
**20 dB Bandwidth Plot on Channel 00**



Date: 21.AUG.2012 00:01:57

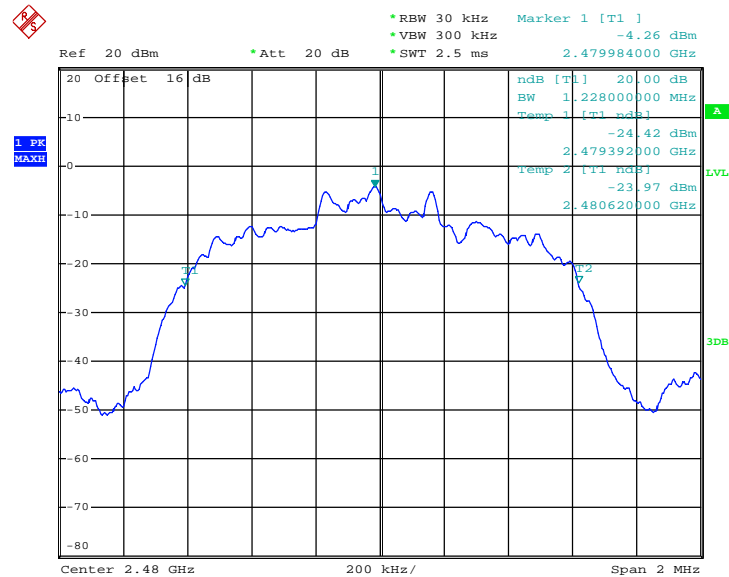


20 dB Bandwidth Plot on Channel 39



Date: 21.AUG.2012 00:00:34

20 dB Bandwidth Plot on Channel 78



Date: 20.AUG.2012 23:57:39

### 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.

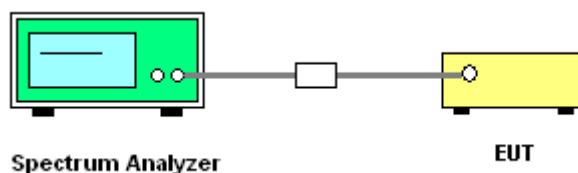
#### 3.5.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

#### 3.5.4 Test Setup



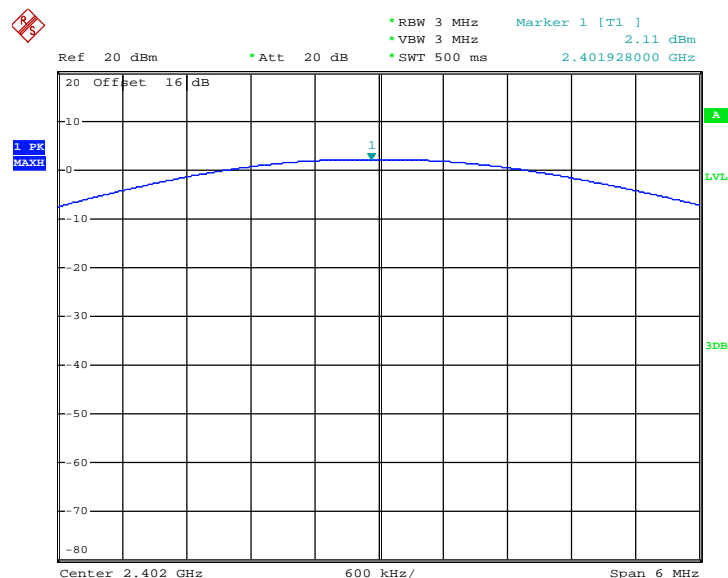


### 3.5.5 Test Result of Peak Output Power

Test Mode :	1Mbps	Temperature :	21~22℃
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	2.11	30.00	Pass
39	2441	3.42	30.00	Pass
78	2480	2.28	30.00	Pass

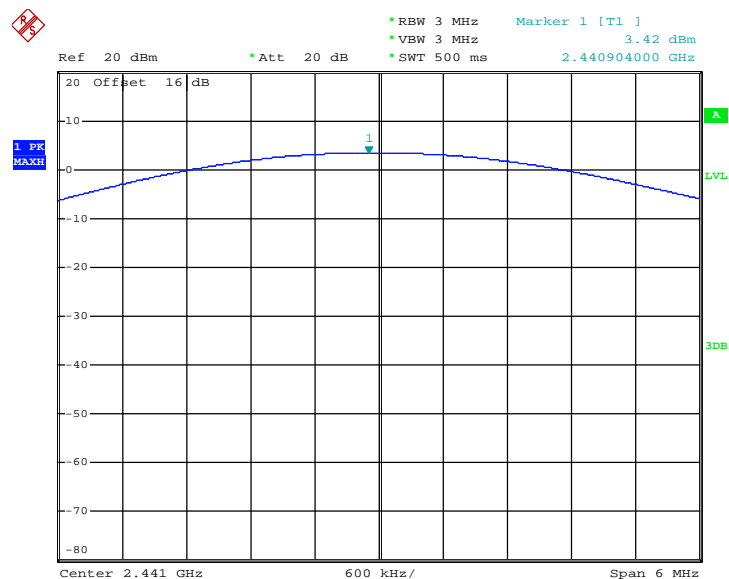
**Peak Output Power Plot on Channel 00**



Date: 24.AUG.2012 00:16:32

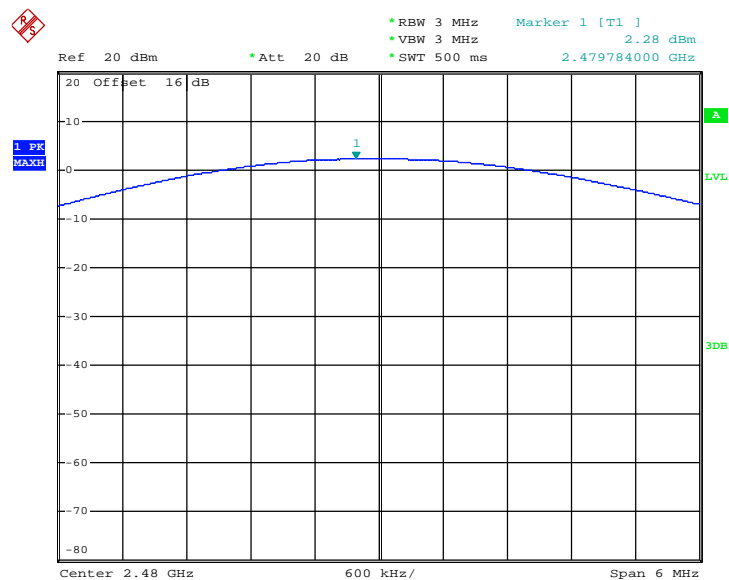


### Peak Output Power Plot on Channel 39



Date: 24.AUG.2012 00:15:45

### Peak Output Power Plot on Channel 78



Date: 24.AUG.2012 00:21:53

## 3.6 Conducted 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.

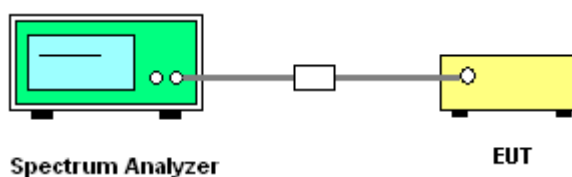
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

1. The testing follows the guidelines in Band-edge Compliance of RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 300KHz ( $\geq 1\%$  span=30MHz ), VBW = 300KHz ( $\geq$  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.
4. Enable hopping function of the EUT and then repeat step 2. and 3.
5. Record the results in the test report.

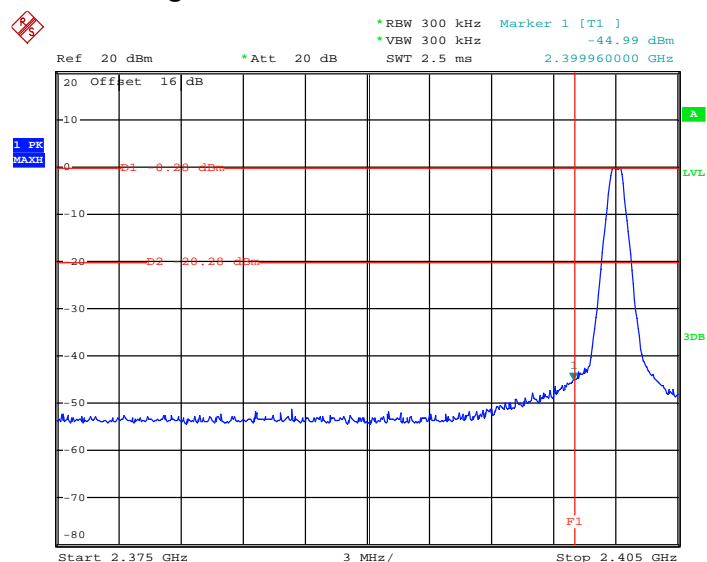
### 3.6.4 Test Setup



### 3.6.5 Test Result of Conducted Band Edges

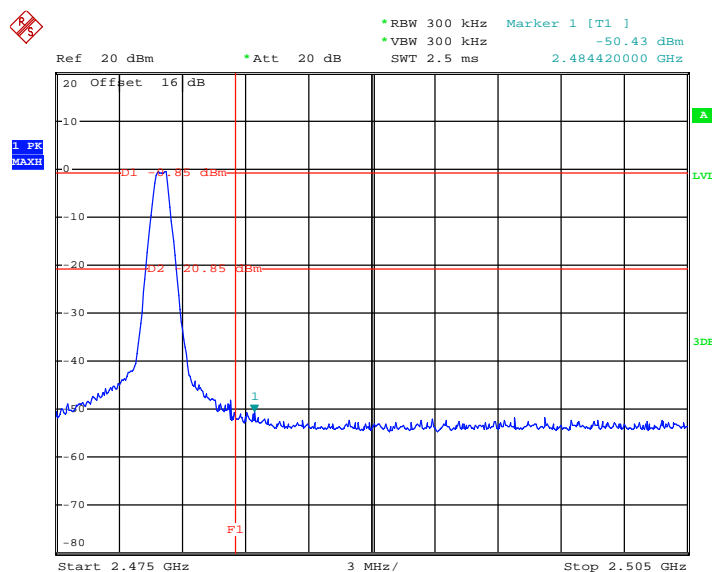
Test Mode :	1Mbps	Temperature :	21~22°C
Test Channel :	00 and 78	Relative Humidity :	41~42%
		Test Engineer :	Zhi Lu

**Low Band Edge Plot on Channel 00**



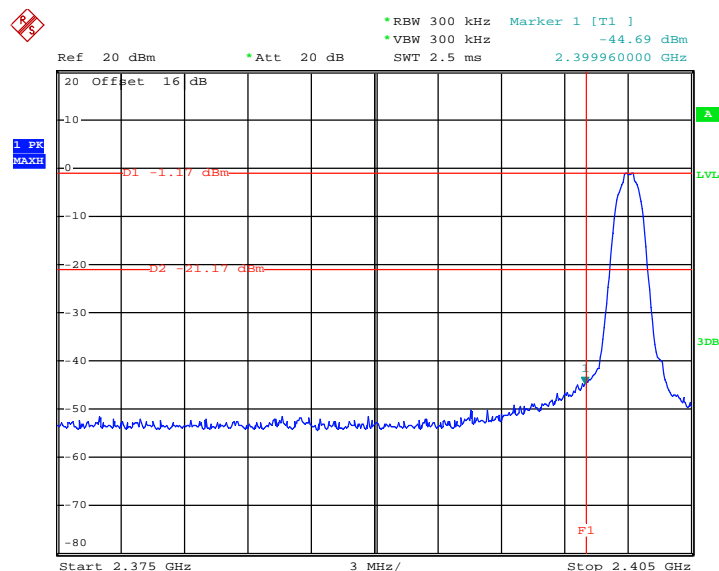
Date: 20.AUG.2012 23:34:44

**High Band Edge Plot on Channel 78**

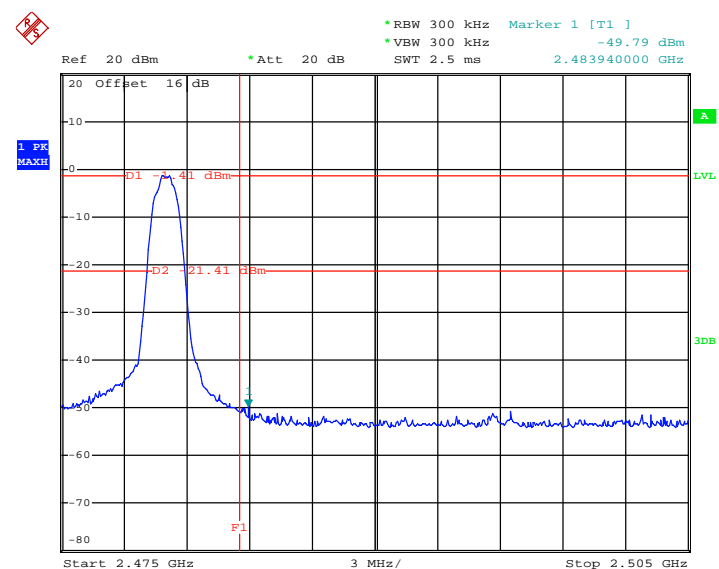


Date: 20.AUG.2012 23:38:31

<b>Test Mode :</b>	3Mbps	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	00 and 78	<b>Relative Humidity :</b>	41~42%
		<b>Test Engineer :</b>	Zhi Lu

**Low Band Edge Plot on Channel 00**


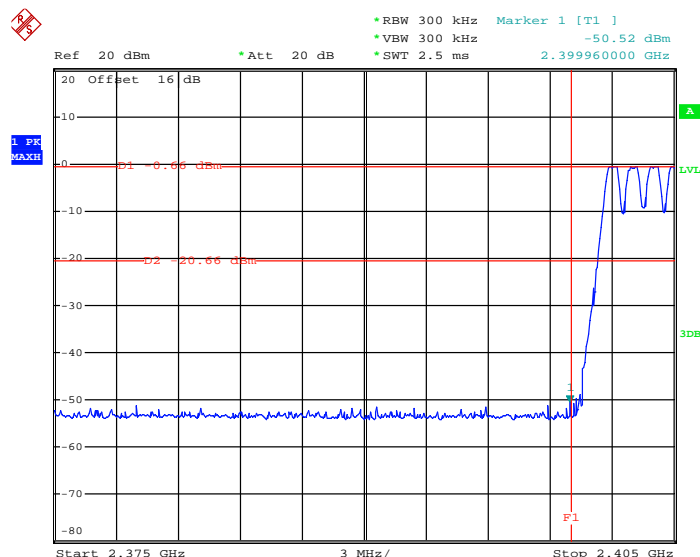
Date: 20.AUG.2012 22:25:37

**High Band Edge Plot on Channel 78**


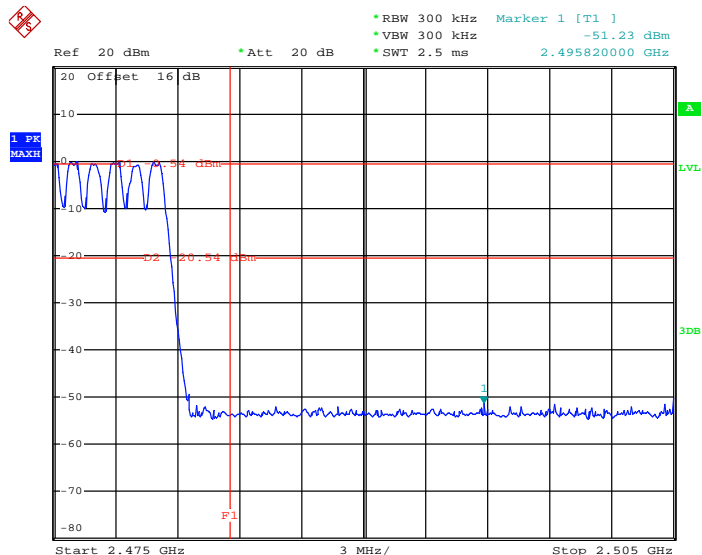
Date: 20.AUG.2012 22:29:12

### 3.6.6 Test Result of Conducted Hopping Mode Band Edges

Test Mode :	1Mbps	Temperature :	21~22℃
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

**Hopping Mode Low Band Edge Plot**


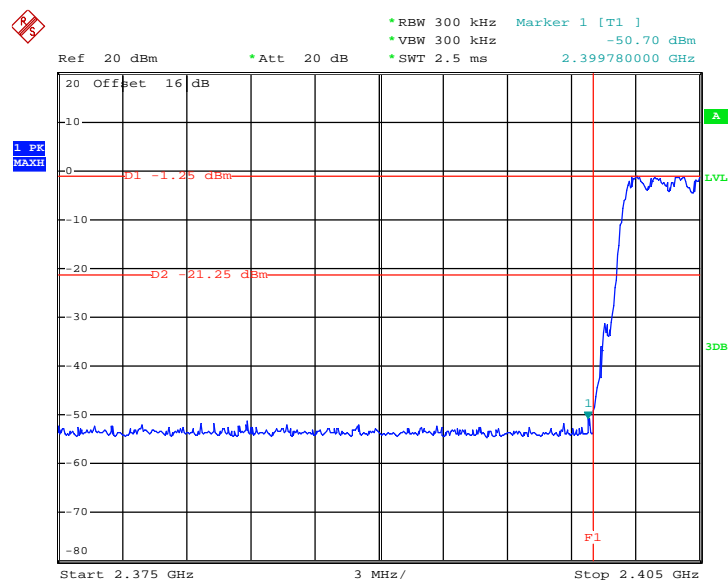
Date: 28.AUG.2012 06:14:21

**Hopping Mode High Band Edge Plot**


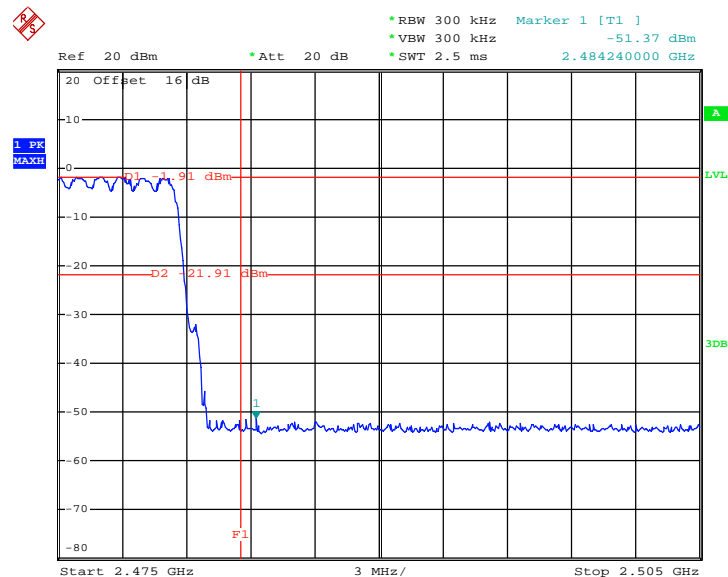
Date: 28.AUG.2012 06:22:47



Test Mode :	3Mbps	Temperature :	21~22℃
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

**Hopping Mode Low Band Edge Plot**

Date: 28.AUG.2012 06:36:31

**Hopping Mode High Band Edge Plot**

Date: 28.AUG.2012 06:34:44

## 3.7 Conducted Spurious Emission Measurement

### 3.7.1 Limit of Spurious Emission Measurement

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.

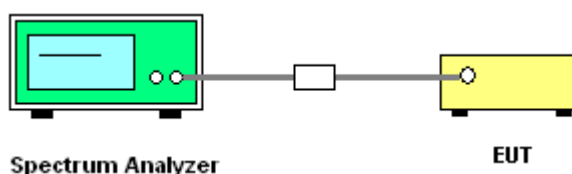
### 3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.7.3 Test Procedure

1. The testing follows the guidelines in Spurious RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines
2. The transmitter output was connected to the spectrum analyzer via a low lose cable.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 KHz, VBW = 300KHz, 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.
5. Record the results in the test report.

### 3.7.4 Test Setup

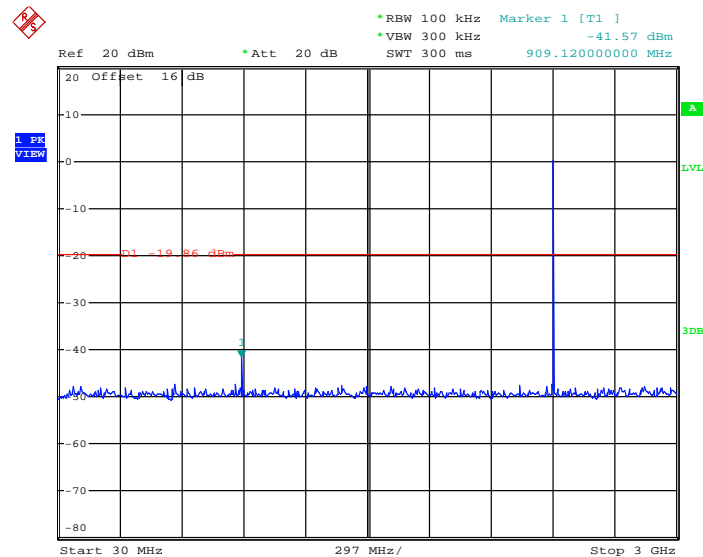




### 3.7.5 Test Result

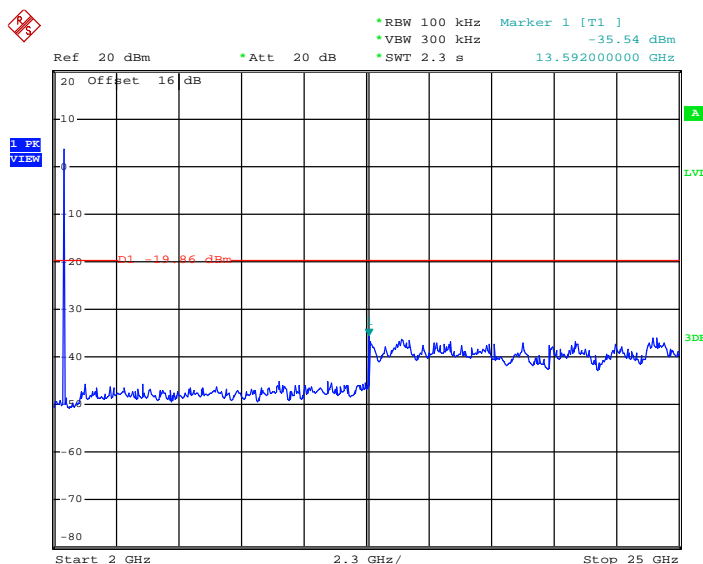
Test Mode :	1Mbps	Temperature :	21~22℃
Test Channel :	00	Relative Humidity :	41~42%
		Test Engineer :	Zhi Lu

#### Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.AUG.2012 21:53:18

#### Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

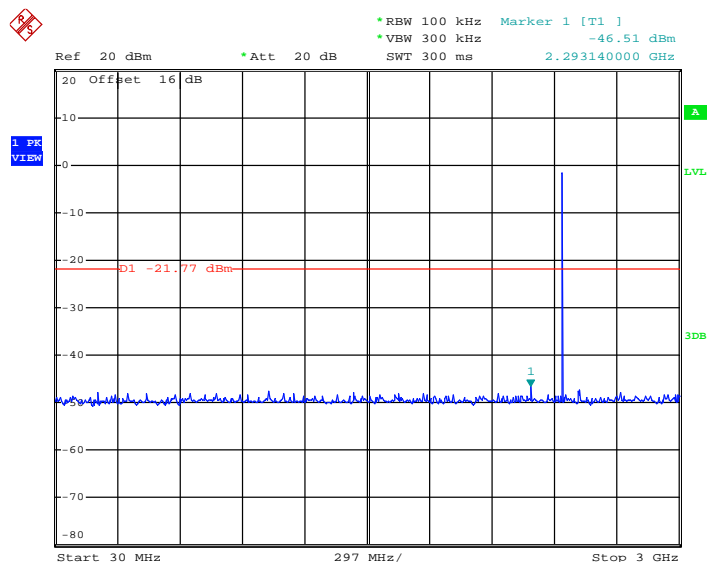


Date: 27.AUG.2012 07:52:33



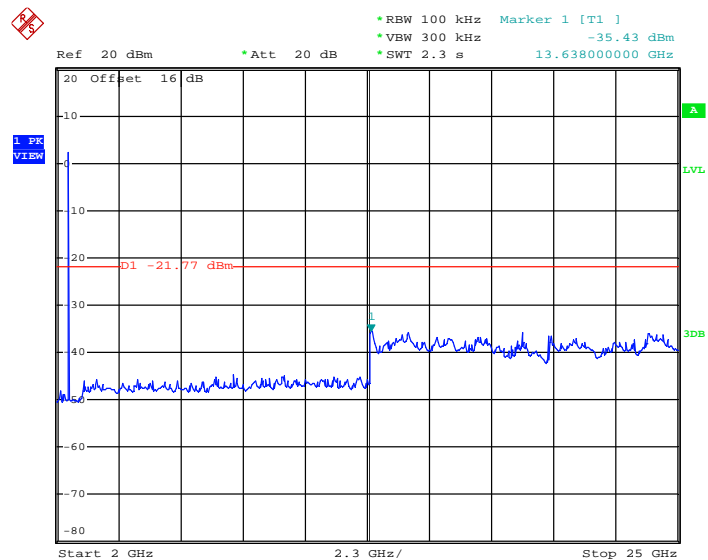
Test Mode :	1Mbps	Temperature :	21~22℃
Test Channel :	39	Relative Humidity :	41~42%
		Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



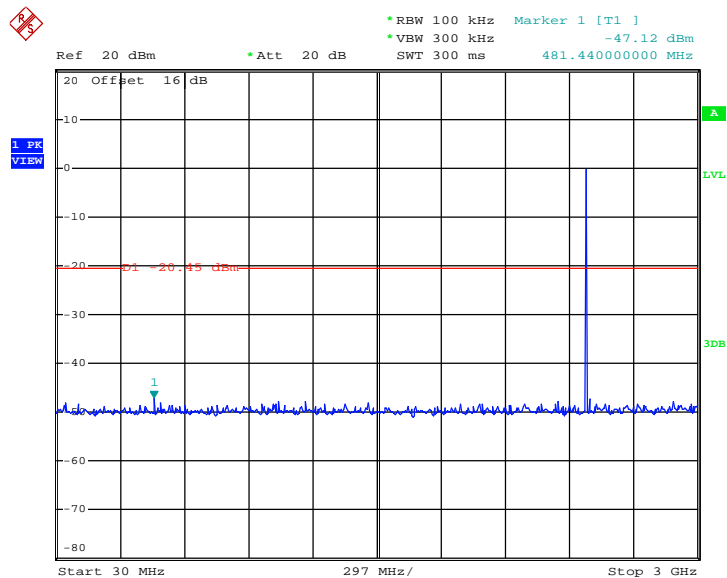
Date: 20.AUG.2012 21:58:31

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

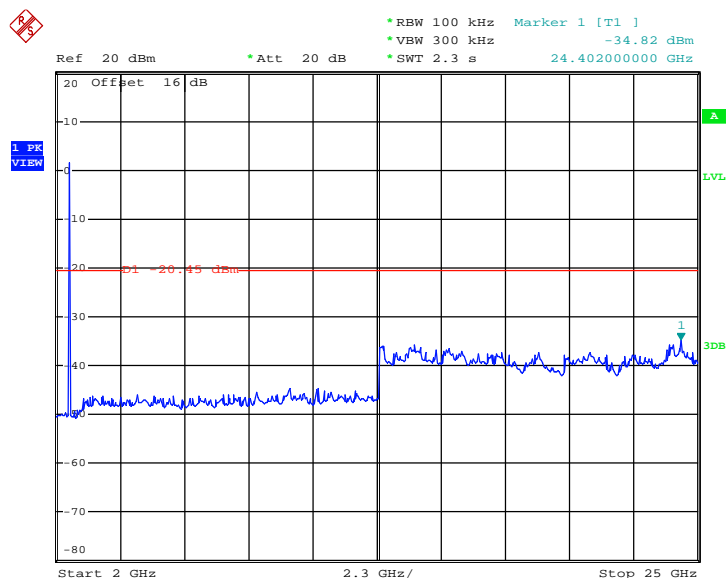


Date: 27.AUG.2012 07:54:17

Test Mode :	1Mbps	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	41~42%
		Test Engineer :	Zhi Lu

**Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**


Date: 20.AUG.2012 22:01:39

**Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz**


Date: 27.AUG.2012 07:55:08

### 3.8 Radiated Band Edges Measurement

#### 3.8.1 Limit of Radiated Band Edges

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

#### 3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.8.3 Test Procedures

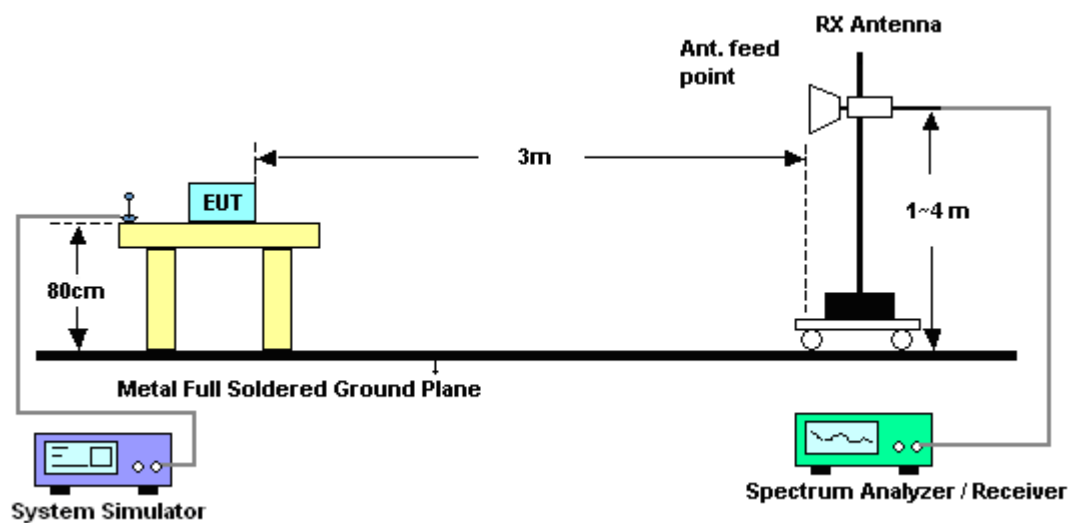
1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Applies to band edge emissions that fall in the restricted bands listed in FCC Section 15.205, the maximum permitted 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.
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Note: The average measurement for Bluetooth may calculate from the peak level corrected with duty cycle correction factor, derived from the appropriate duty cycle calculation per 15.35(b) and (c). The result by calculation method is no worse than direct measurement by using VBW=10Hz.

#### **Marker-Delta method in DA 00-705 :**

- (1) Use a 1 MHz RBW, a 1 MHz VBW, and a peak detector (as required by Section 15.35).  
Repeat the measurement with an average detector (i.e., 1 MHz RBW with 10 Hz VBW).
- (2) Set span = 10MHz, that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set RBW = 100KHz, 1% of the total span . Set VBW = 100KHz >= RBW.
- (3) Subtract the delta measured in step (2) from the field strengths measured in step (1).  
The resultant field strengths (peak/average) are then used to determine band-edge compliance as required by Section 15.205.

### 3.8.4 Test Setup



**3.8.5 Test Result of Radiated Band Edges**

<b>Test Mode :</b>	1Mbps	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	00	<b>Relative Humidity :</b>	46~47%
		<b>Test Engineer :</b>	Chenmy Cheng

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
2334.89	49.64	-24.36	74	47.47	32.78	3.33	33.94	108	100	Peak
2334.89	36.01	-17.99	54	33.84	32.78	3.33	33.94	108	100	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
2358.83	49.57	-24.43	74	47.36	32.81	3.38	33.98	110	120	Peak
2358.83	35.89	-18.11	54	33.68	32.81	3.38	33.98	110	120	Average



<b>Test Mode :</b>	1Mbps	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	78	<b>Relative Humidity :</b>	46~47%
		<b>Test Engineer :</b>	Chenmy Cheng

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2484.27	47.49	-26.51	74	45	33.01	3.68	34.2	100	92	Peak
2484.27	35.59	-18.41	54	33.1	33.01	3.68	34.2	100	92	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	91.24	55.65	35.59	54	-18.41	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
2483.61	47.96	-26.04	74	45.47	33.01	3.68	34.2	100	0	Peak
2483.61	33.95	-20.05	54	31.46	33.01	3.68	34.2	100	0	Average

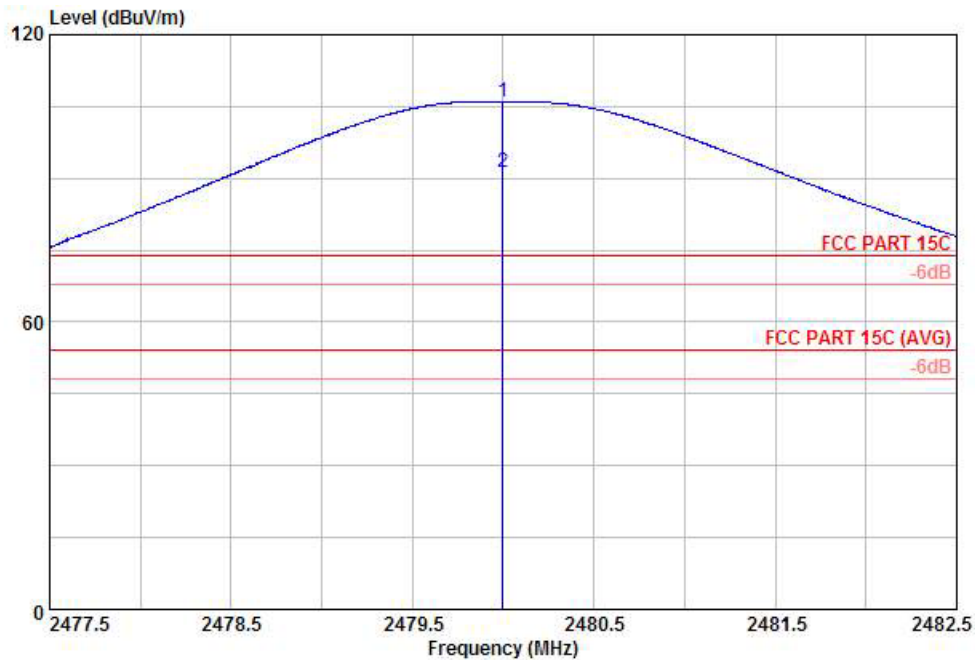
**Summary results of marker-delta method:**

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	85.07	51.12	33.95	54	-20.05	Pass

**Note :** Average result = Maximum field strength – Delta result



Test Mode :	1Mbps	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal



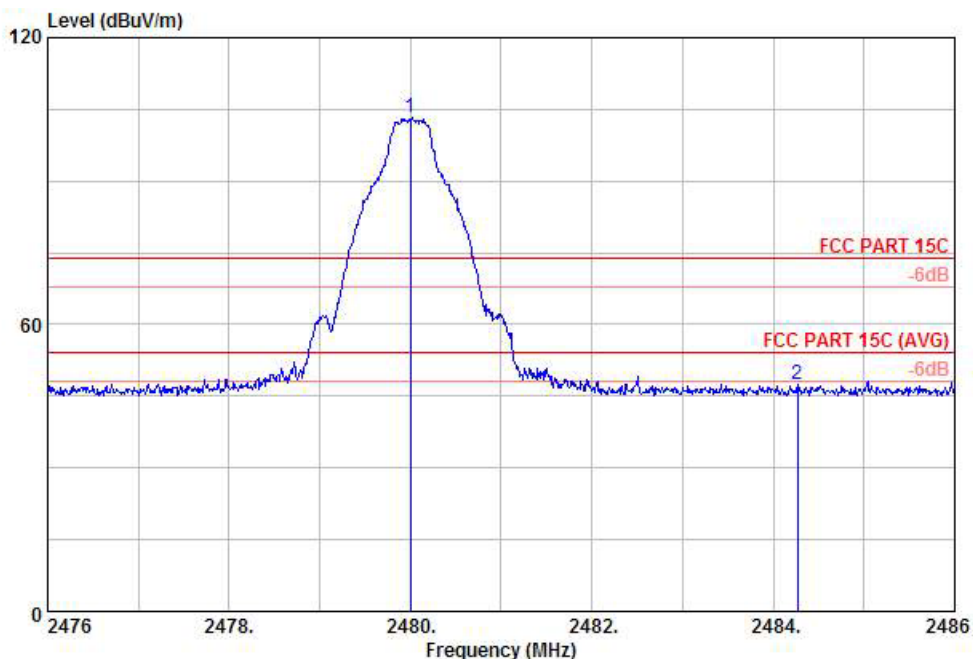
Site : 03CH01-KS  
Condition: FCC PART 15C 3m HF ANT-100803 HORIZONTAL

: DH5

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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	106.04	32.04	74.00	97.74	33.01	4.29	29.00	116	110	Peak
2 X	2480.00	91.24	37.24	54.00	82.94	33.01	4.29	29.00	116	110	Average

\* Maximum field strength of the fundamental emission

Test Mode :	1Mbps	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal



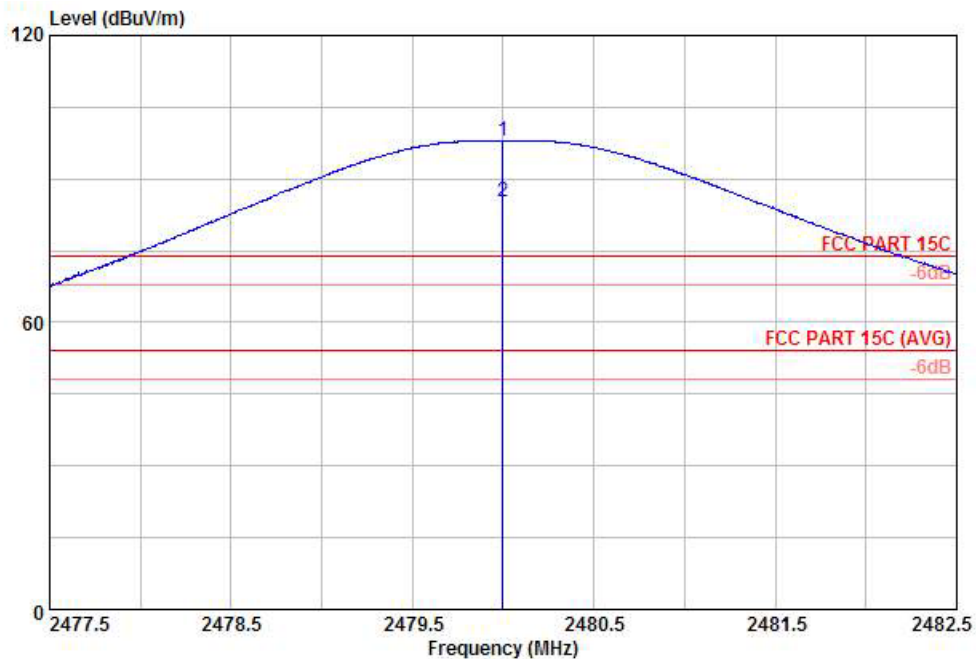
Site : 03CH01-KS  
Condition: FCC PART 15C 3m HF ANT-100803 HORIZONTAL

: DH5

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 X	2480.00	103.14	29.14	74.00	94.84	33.01	4.29	29.00	---	---	Peak
2	2484.27	47.49	-26.51	74.00	39.19	33.01	4.29	29.00	---	---	Peak

\* Marker-Delta Method (RBW/VBW=100KHz): 55.65 dB , single carrier Mode

Test Mode :	1Mbps	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical



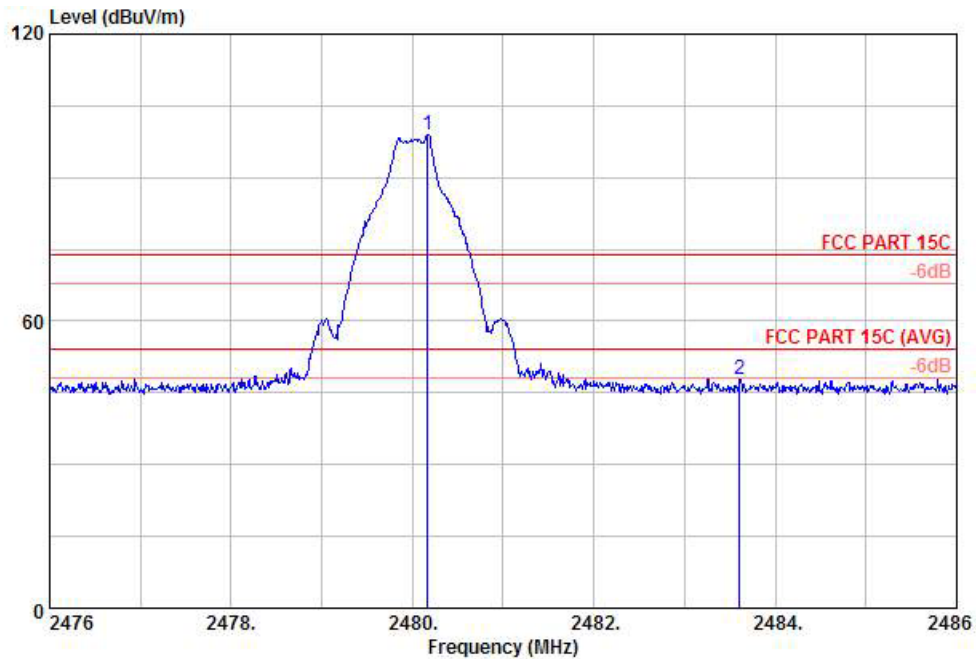
Site : 03CH01-KS  
Condition: FCC PART 15C 3m HF ANT-100803 VERTICAL

: DH5

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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	97.97	23.97	74.00	89.67	33.01	4.29	29.00	100	87	Peak
2 X	2480.00	85.07	31.07	54.00	76.77	33.01	4.29	29.00	100	87	Average

\* Maximum field strength of the fundamental emission

Test Mode :	1Mbps	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical



Site : 03CH01-KS  
Condition: FCC PART 15C 3m HF ANT-100803 VERTICAL

: DH5

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 X	2480.17	99.08	25.08	74.00	90.78	33.01	4.29	29.00	---	---	Peak
2	2483.61	47.96	-26.04	74.00	39.66	33.01	4.29	29.00	---	---	Peak

\* Marker-Delta Method (RBW/VBW=100KHz): 51.12 dB , single carrier Mode

### 3.9 Radiated Spurious 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.

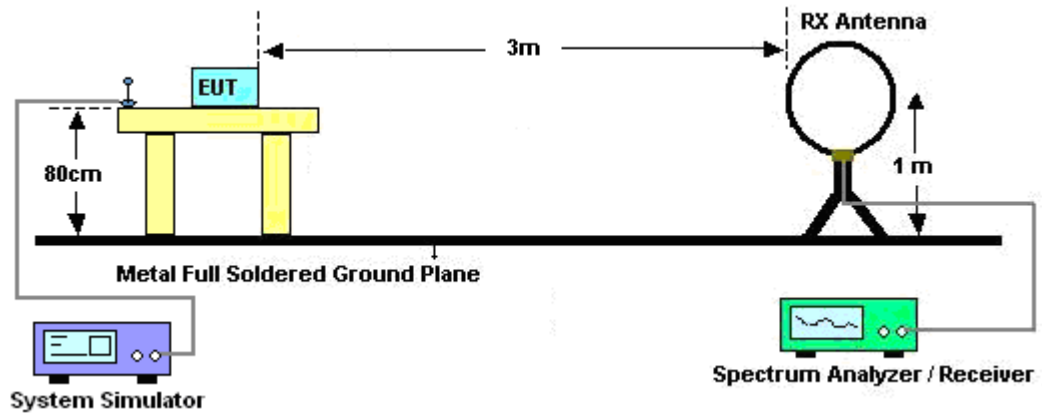
### 3.9.3 Test Procedures

1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 KHz for  $f < 1$  GHz, RBW=1MHz for  $f > 1$ GHz ; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak; Set RBW = 1MHz, VBW = 10 Hz, Sweep = auto for average.
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
8. For measurement below 1GHz, if the emission level of the EUT measured by the peak detector is more than 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement by using the quasi-peak detector will be reported.

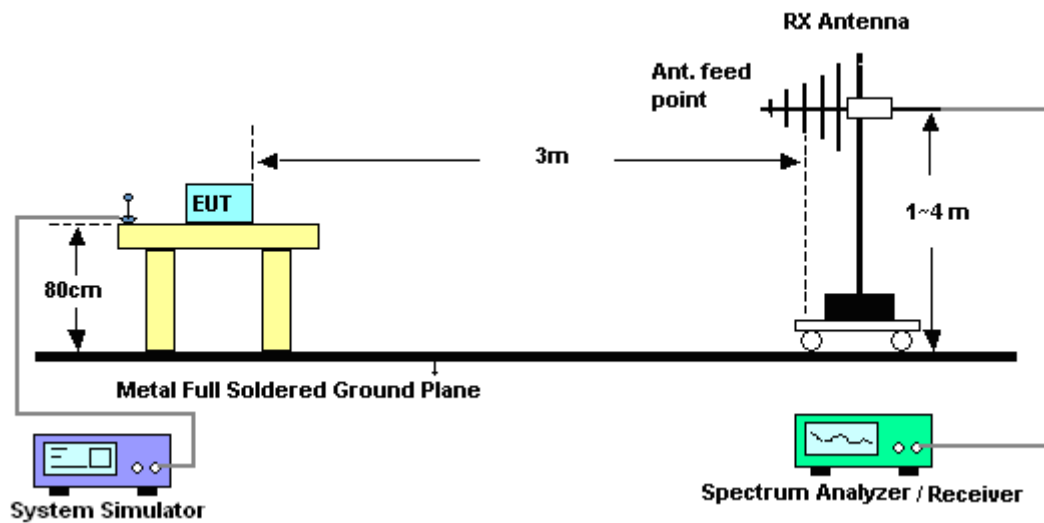
Note: The average measurement for Bluetooth may calculate from the peak level corrected with duty cycle correction factor, derived from the appropriate duty cycle calculation per 15.35(b) and (c). The result by calculation method is no worse than direct measurement by using VBW=10Hz.

### 3.9.4 Test Setup

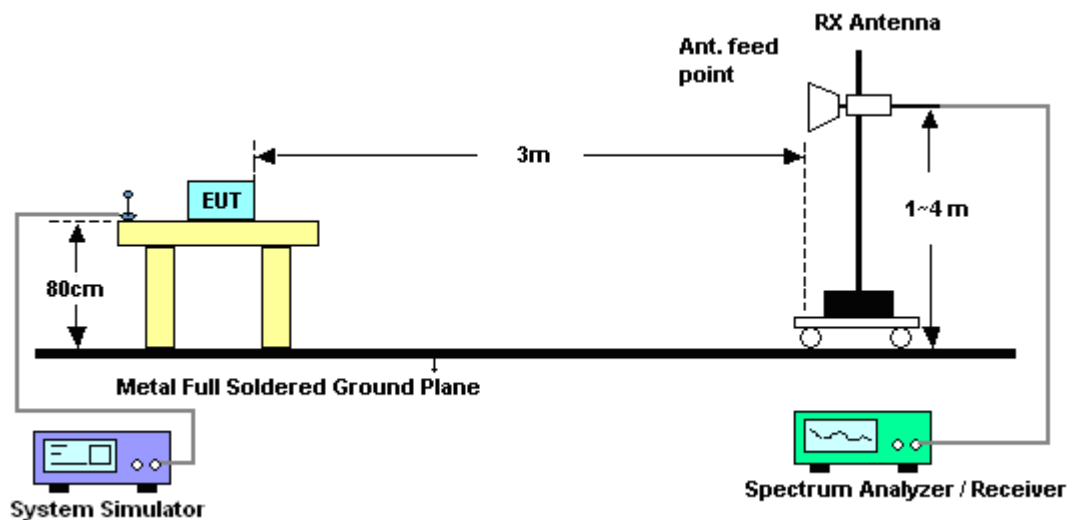
For radiated emissions below 30MHz



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 ~ 10<sup>th</sup> Harmonic)**

<b>Test Mode :</b>	1Mbps	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	00	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Chenmy Cheng	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
35.87	33.47	-6.53	40	48.67	14.65	0.23	30.08	124	240	Peak
139.85	21.15	-22.35	43.5	39.76	10.9	0.49	30	-	-	Peak
156.46	20.96	-22.54	43.5	40.63	9.76	0.52	29.95	-	-	Peak
226.1	20.49	-25.51	46	39.21	10.59	0.63	29.94	-	-	Peak
506.48	22.67	-23.33	46	34.13	17.31	0.96	29.73	-	-	Peak
665.8	25.91	-20.09	46	35.48	19	1.1	29.67	-	-	Peak
2334.89	36.01	-17.99	54	33.84	32.78	3.33	33.94	108	100	Average
2334.89	49.64	-24.36	74	47.47	32.78	3.33	33.94	108	100	Peak
2402	89.57	-	-	87.29	32.86	3.47	34.05	129	122	Average
2402	105.38	-	-	103.1	32.86	3.47	34.05	129	122	Peak
2490.31	36.29	-17.71	54	33.75	33.05	3.72	34.23	100	324	Average
2490.31	50	-24	74	47.46	33.05	3.72	34.23	100	324	Peak

<b>Test Mode :</b>	1Mbps	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	00	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Chenmy Cheng	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
35.62	29.37	-10.63	40	44.57	14.65	0.23	30.08	100	360	Peak
113.32	18.6	-24.9	43.5	36.33	11.8	0.44	29.97	-	-	Peak
130.38	18.1	-25.4	43.5	35.92	11.7	0.47	29.99	-	-	Peak
226.89	21.1	-24.9	46	39.73	10.67	0.63	29.93	-	-	Peak
340.78	20.66	-25.34	46	35.51	14.28	0.81	29.94	-	-	Peak
719.2	28.89	-17.11	46	37.88	19.52	1.15	29.66	-	-	Peak
2358.83	35.89	-18.11	54	33.68	32.81	3.38	33.98	110	120	Average
2358.83	49.57	-24.43	74	47.36	32.81	3.38	33.98	110	120	Peak
2402	82.03	-	-	79.75	32.86	3.47	34.05	121	131	Average
2402	96.23	-	-	93.95	32.86	3.47	34.05	121	131	Peak
2491.26	36.24	-17.76	54	33.7	33.05	3.72	34.23	100	360	Average
2491.26	49.45	-24.55	74	46.91	33.05	3.72	34.23	100	360	Peak

<b>Test Mode :</b>	1Mbps	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	39	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Chenmy Cheng	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
38.35	30.37	-9.63	40	47.18	12.98	0.25	30.04	115	100	Peak
158.11	24.61	-18.89	43.5	44.36	9.67	0.53	29.95	-	-	Peak
226.1	22.95	-23.05	46	41.67	10.59	0.63	29.94	-	-	Peak
313.28	22.84	-23.16	46	38.72	13.33	0.74	29.95	-	-	Peak
513.63	22.68	-23.32	46	33.93	17.5	0.97	29.72	-	-	Peak
670.49	25.57	-20.43	46	35.1	19.05	1.1	29.68	-	-	Peak
2359.02	37.04	-16.96	54	34.83	32.81	3.38	33.98	100	246	Average
2359.02	49.87	-24.13	74	47.66	32.81	3.38	33.98	100	246	Peak
2441	90.14	-	-	87.74	32.95	3.6	34.15	100	120	Average
2441	106.3	-	-	103.9	32.95	3.6	34.15	100	120	Peak
2488.6	37.49	-16.51	54	34.95	33.05	3.72	34.23	100	100	Average
2488.6	49.9	-24.1	74	47.36	33.05	3.72	34.23	100	100	Peak



<b>Test Mode :</b>	1Mbps	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	39	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Chenmy Cheng	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
35.87	29.75	-10.25	40	44.95	14.65	0.23	30.08	128	69	Peak
123.27	19.76	-23.74	43.5	37.5	11.77	0.46	29.97	-	-	Peak
225.31	22.68	-23.32	46	41.49	10.5	0.63	29.94	-	-	Peak
340.78	19.77	-26.23	46	34.62	14.28	0.81	29.94	-	-	Peak
582.74	26.14	-19.86	46	36.16	18.57	1.05	29.64	-	-	Peak
724.26	27.77	-18.23	46	36.66	19.6	1.15	29.64	-	-	Peak
2312.85	37.26	-16.74	54	35.17	32.73	3.22	33.86	110	340	Average
2312.85	49.94	-24.06	74	47.85	32.73	3.22	33.86	110	340	Peak
2441	82.87	-	-	80.47	32.95	3.6	34.15	118	320	Average
2441	96.51	-	-	94.11	32.95	3.6	34.15	118	320	Peak
2492.97	37.41	-16.59	54	34.87	33.05	3.72	34.23	110	89	Average
2492.97	49.47	-24.53	74	46.93	33.05	3.72	34.23	110	89	Peak

<b>Test Mode :</b>	1Mbps	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	78	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Chenmy Cheng	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
35.75	34.91	-5.09	40	50.11	14.65	0.23	30.08	100	120	Peak
58.61	26.38	-13.62	40	50.63	5.59	0.3	30.14	-	-	Peak
140.84	21.76	-21.74	43.5	40.45	10.82	0.49	30	-	-	Peak
219.84	21.4	-24.6	46	40.66	10.1	0.62	29.98	-	-	Peak
375.94	21.76	-24.24	46	35.51	15.3	0.83	29.88	-	-	Peak
672.84	26.93	-19.07	46	36.43	19.08	1.11	29.69	-	-	Peak
2318	49.09	-24.91	74	46.96	32.76	3.27	33.9	108	320	Peak
2318	36.16	-17.84	54	34.03	32.76	3.27	33.9	108	320	Average
2480	106.04	-	-	103.55	33.01	3.68	34.2	116	110	Peak
2480	91.24	-	-	88.75	33.01	3.68	34.2	116	110	Average
2484.27	47.49	-26.51	74	45	33.01	3.68	34.2	100	92	Peak
2484.27	35.59	-18.41	54	33.1	33.01	3.68	34.2	100	92	Average



<b>Test Mode :</b>	1Mbps	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	78	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Chenmy Cheng	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
37.29	32.41	-7.59	40	48.53	13.7	0.24	30.06	110	320	Peak
113.32	18.68	-24.82	43.5	36.41	11.8	0.44	29.97	-	-	Peak
189.74	20.05	-23.45	43.5	40.91	8.5	0.58	29.94	-	-	Peak
338.4	20.09	-25.91	46	35	14.23	0.8	29.94	-	-	Peak
580.7	25.9	-20.1	46	35.92	18.57	1.05	29.64	-	-	Peak
719.2	28.75	-17.25	46	37.74	19.52	1.15	29.66	-	-	Peak
2340	49.63	-24.37	74	47.46	32.78	3.33	33.94	100	247	Peak
2340	36.01	-17.99	54	33.84	32.78	3.33	33.94	100	247	Average
2480	97.97	-	-	95.48	33.01	3.68	34.2	100	87	Peak
2480	85.07	-	-	82.58	33.01	3.68	34.2	100	87	Average
2483.61	47.96	-26.04	74	45.47	33.01	3.68	34.2	100	0	Peak
2483.61	33.95	-20.05	54	31.46	33.01	3.68	34.2	100	0	Average

### 3.10AC Conducted Emission Measurement

#### 3.10.1 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.

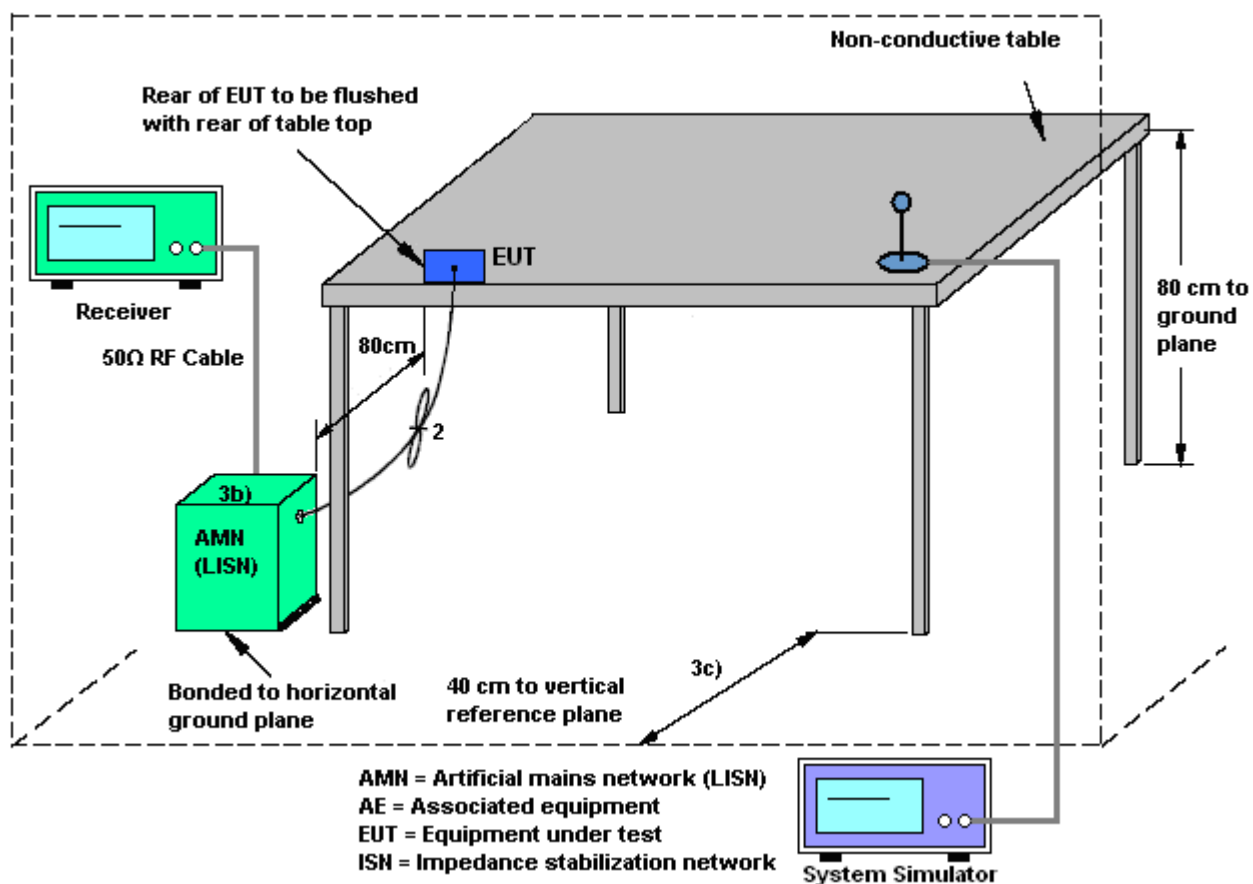
#### 3.10.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.10.3 Test Procedures

1. The test follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009 test site requirement.
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.

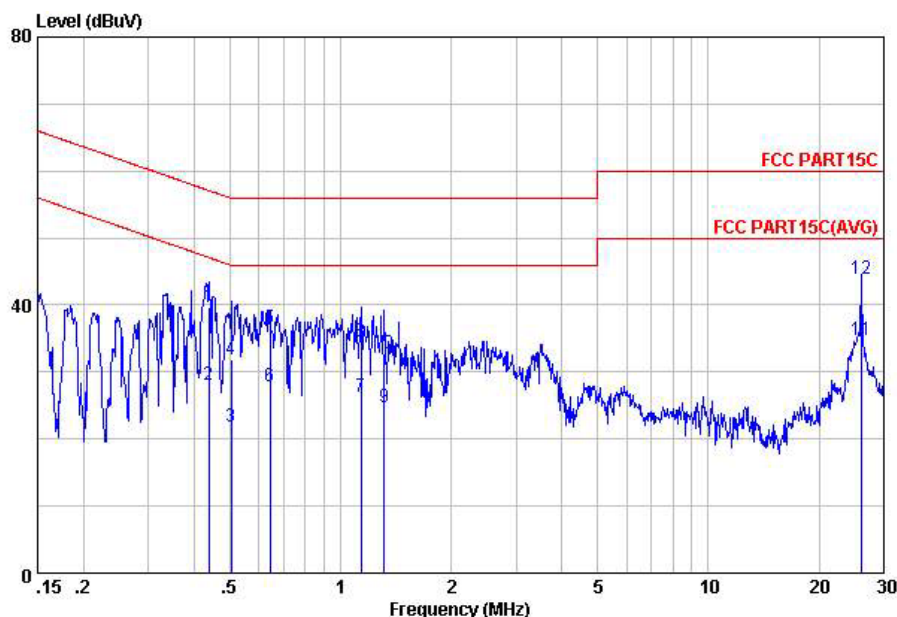
### 3.10.4 Test Setup





### 3.10.5 Test Result of AC Conducted Emission

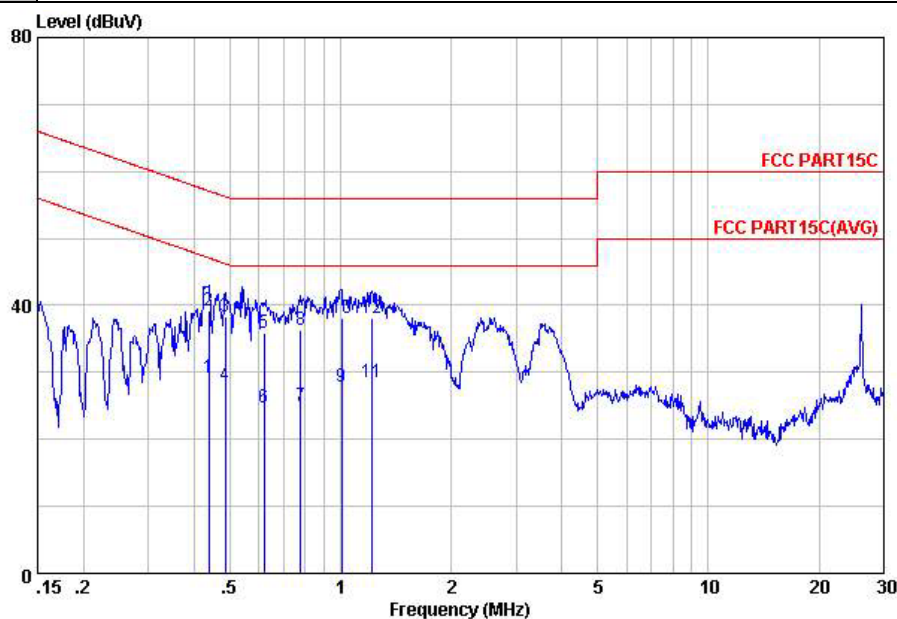
Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS  
Condition: FCC PART15C LISN-111230 LINE  
mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
1	0.44	39.74	-17.37	57.11	29.20	-0.08	10.62	QP
2	0.44	28.14	-18.97	47.11	17.60	-0.08	10.62	Average
3	0.50	21.94	-24.06	46.00	11.40	-0.08	10.62	Average
4	0.50	31.84	-24.16	56.00	21.30	-0.08	10.62	QP
5	0.64	36.45	-19.55	56.00	25.90	-0.09	10.64	QP
6	0.64	27.95	-18.05	46.00	17.40	-0.09	10.64	Average
7	1.14	26.35	-19.65	46.00	15.79	-0.10	10.66	Average
8	1.14	34.55	-21.45	56.00	23.99	-0.10	10.66	QP
9	1.32	24.76	-21.24	46.00	14.19	-0.10	10.67	Average
10	1.32	32.76	-23.24	56.00	22.19	-0.10	10.67	QP
11	26.00	34.74	-15.26	50.00	23.40	0.20	11.14	Average
12	26.00	43.94	-16.06	60.00	32.60	0.20	11.14	QP

<b>Test Mode :</b>	Mode 1	<b>Temperature :</b>	19~20℃
<b>Test Engineer :</b>	Tom Wang	<b>Relative Humidity :</b>	39~40%
<b>Test Voltage :</b>	120Vac / 60Hz	<b>Phase :</b>	Neutral
<b>Function Type :</b>	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone		
<b>Remark :</b>	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS  
Condition: FCC PART15C LISN-111230 NEUTRAL  
mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.44	29.24	-17.87	47.11	18.70	-0.08	10.62	Average
2	0.44	39.14	-17.97	57.11	28.60	-0.08	10.62	QP
3	0.49	38.34	-17.89	56.23	27.80	-0.08	10.62	QP
4	0.49	28.04	-18.19	46.23	17.50	-0.08	10.62	Average
5	0.62	35.95	-20.05	56.00	25.40	-0.08	10.63	QP
6	0.62	24.75	-21.25	46.00	14.20	-0.08	10.63	Average
7	0.78	25.06	-20.94	46.00	14.50	-0.08	10.64	Average
8	0.78	36.26	-19.74	56.00	25.70	-0.08	10.64	QP
9	1.00	27.96	-18.04	46.00	17.40	-0.09	10.65	Average
10	1.00	38.16	-17.84	56.00	27.60	-0.09	10.65	QP
11	1.22	28.57	-17.43	46.00	18.00	-0.09	10.66	Average
12	1.22	38.17	-17.83	56.00	27.60	-0.09	10.66	QP

## **3.11 Antenna Requirements**

### **3.11.1 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.

### **3.11.2 Antenna Connected Construction**

Non-standard connector used.

### **3.11.3 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	Aug. 20, 2012~ Aug. 28, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	Aug. 20, 2012~ Aug. 28, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	Aug. 20, 2012~ Aug. 28, 2012	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Aug. 20, 2012~ Aug. 28, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	Aug. 20, 2012~ Aug. 28, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Bluetooth Base Station	R&S	CBT	100783	N/A	Aug. 17, 2012	Aug. 20, 2012~ Aug. 28, 2012	Aug. 16, 2013	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Aug. 28, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Aug. 28, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Aug. 28, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/ 001	9 kHz~30 MHz	Jul. 03, 2012	Aug. 28, 2012	Jul. 02, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Aug. 28, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	Aug. 28, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Aug. 28, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2011	Aug. 28, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Oct. 11, 2011	Aug. 28, 2012	Oct.10, 2012	Radiation (03CH01-KS)
Bluetooth Base Station	R&S	CBT	100783	N/A	Aug. 17, 2012	Aug. 28, 2012	Aug. 16, 2013	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 01, 2012	Aug. 20, 2012	May 31, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 30, 2011	Aug. 20, 2012	Dec. 29, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 30, 2011	Aug. 20, 2012	Dec. 29, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 16, 2011	Aug. 20, 2012	Nov. 15, 2012	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 30, 2011	Aug. 20, 2012	Dec. 29, 2012	Conduction (CO01-KS)

## 5 Uncertainty of Evaluation

### Uncertainty of Conducted Emission Measurement (150 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.26
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.54
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.72
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## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP281501 as below.