



# FCC RF Test Report

APPLICANT : PEGATRON CORPORATION  
EQUIPMENT : Tablet  
BRAND NAME : TOSHIBA,Excite  
MODEL NAME : TOSHIBA AT270,Excite 7 AT270,Excite 7 AT275  
FCC ID : VUIPDS4330LB  
STANDARD : FCC Part 15 Subpart C §15.247  
CLASSIFICATION : (DSS) Spread Spectrum Transmitter

The product was received on Mar. 01, 2012 and completely tested on Apr. 02, 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.

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SPORTON INTERNATIONAL INC.

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FCC ID : VUIPDS4330LB

Page Number : 1 of 64

Report Issued Date : Apr. 13, 2012

Report Version : Rev. 01



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## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR231932A	Rev. 01	Initial issue of report	Apr. 13, 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	-
3.2	-	Gen 4.6.1	99% Bandwidth	-	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	-
3.7	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 16.00 dB at 0.726 MHz
3.9	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 5.67 dB at 2483.500 MHz
3.10	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

# 1 General Description

## 1.1 Applicant

PEGATRON CORPORATION

No. 76, Ligong St., Beitou District, Taipei City 11261

## 1.2 Manufacturer

PEGATRON CORPORATION

No. 76, Ligong St., Beitou District, Taipei City 11261

## 1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Tablet
Brand Name	TOSHIBA,Excite
Model Name	TOSHIBA AT270,Excite 7 AT270,Excite 7 AT275
Sample 1	EUT with 16G eMMC
Sample 2	EUT with 32G eMMC
Sample 3	EUT with 64G eMMC
FCC ID	VUIPDS4330LB
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) : 3.64 dBm (0.0023 W) Bluetooth EDR (2Mbps) : 3.36 dBm (0.0022 W) Bluetooth EDR (3Mbps) : 3.97 dBm (0.0025 W)
Antenna Type	FPC Antenna with gain 3.20 dBi
HW Version	3.01
SW Version	Android 4.0.3
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Identical Prototype

**Remark:**

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The model names (TOSHIBA AT270, Excite 7 AT270, Excite 7 AT275) are identical on hardware. The only difference is the label of different branding for different customer.

### 1.4 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL INC.		
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	CO05-HY	03CH07-HY	722060/4086B-1

### 1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC Public Notice DA 00-705
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 3

**Remark:**

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



### 1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
6.	Bluetooth Earphone	Sony Ericsson	MW600	PY70DA2029	N/A	N/A
7.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 1.2 m	N/A
8.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	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:

Band	Bluetooth RF Output Power		
Channel	00	39	78
Frequency	2402	2441	2480
Peak Power	3.28	3.97	3.32

**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 3Mbps 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 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).

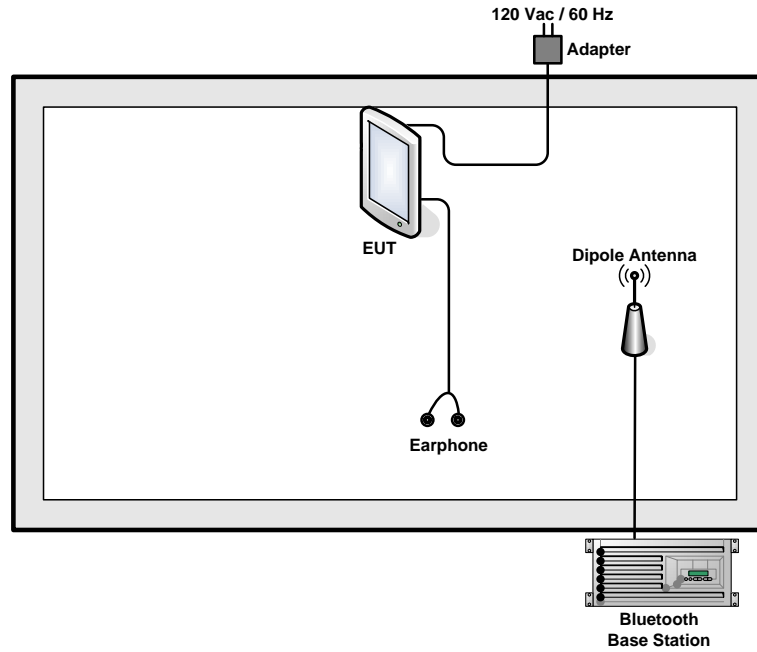
Pre-scanned tests were conducted to determine the final configuration from all possible combinations. Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations, laptop / tablet modes.

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

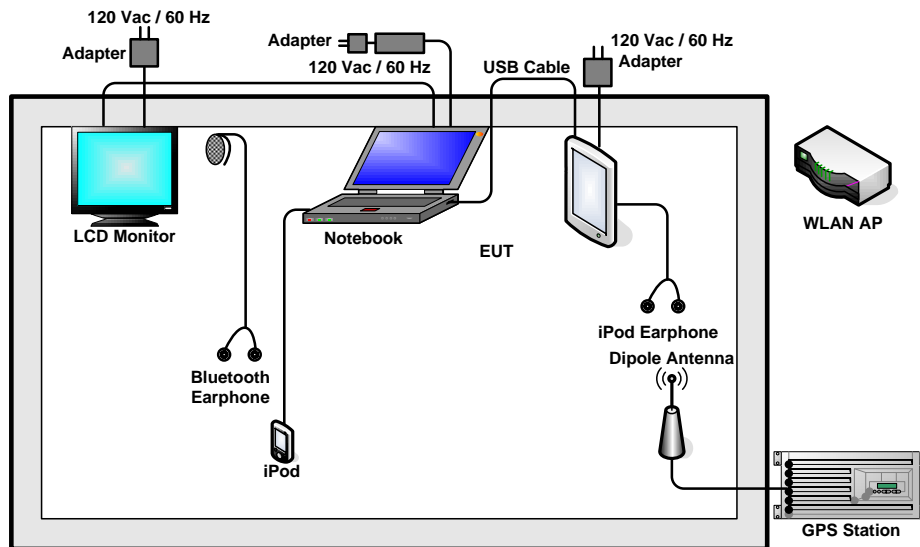
Test Cases			
Test Item	Data Rate / Modulation		
	Bluetooth 1Mbps GFSK	Bluetooth EDR 2Mbps $\pi/4$ -DQPSK	Bluetooth EDR 3Mbps 8-DPSK
<b>Conducted TCs</b>	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
<b>Radiated TCs</b>	N/A	N/A	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz
<b>AC Conducted Emission</b>	Mode 1 :WLAN Link + Bluetooth Link + GPS Rx + TC for Sample 1		
<b>Remark:</b> 1. TC stands for Test Configuration, and consists of earphone, USB Cable (Data Link with Notebook), adapter, and SD Card. 2. For radiated TCs, the data rate was set in 3Mbps due to the highest RF output power; only the data of these modes was reported.			

## 2.3 Connection Diagram of Test System

### <Bluetooth Tx Mode>



### <AC Conducted Emission Mode>





## **2.4 RF Utility**

For Bluetooth function, the RF utility, "bt\_test\_mode\_with\_tool.BAT" was installed in notebook which was programmed in order to make the EUT into the engineering modes to contact with Bluetooth base station for transmitting and receiving signals continuously.

### 3 Test Result

#### 3.1 Number of Channel Measurement

##### 3.1.1 Limits of Number of Hopping Frequency

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

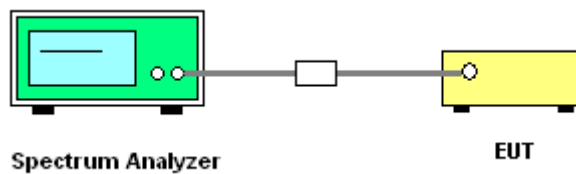
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The modulation types of EUT are irrelevant to number of hopping channels deviation.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:  
Span = the frequency band of operation; RBW  $\geq$  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

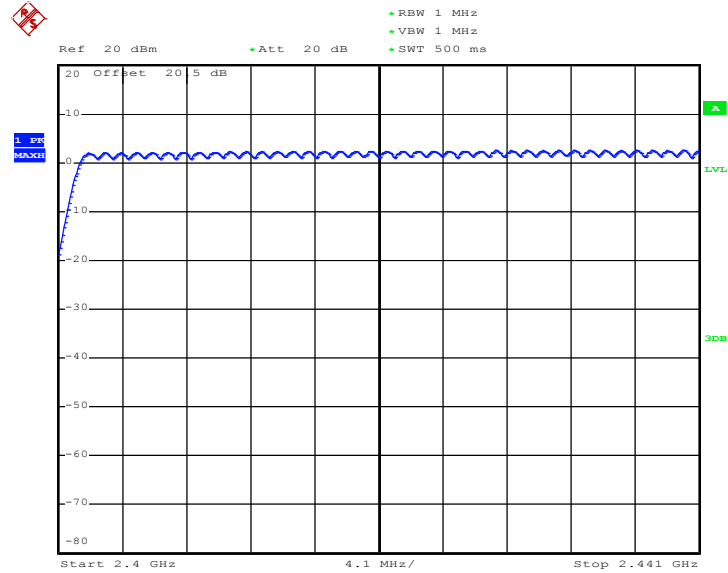


##### 3.1.5 Test Result of Number of Hopping Frequency

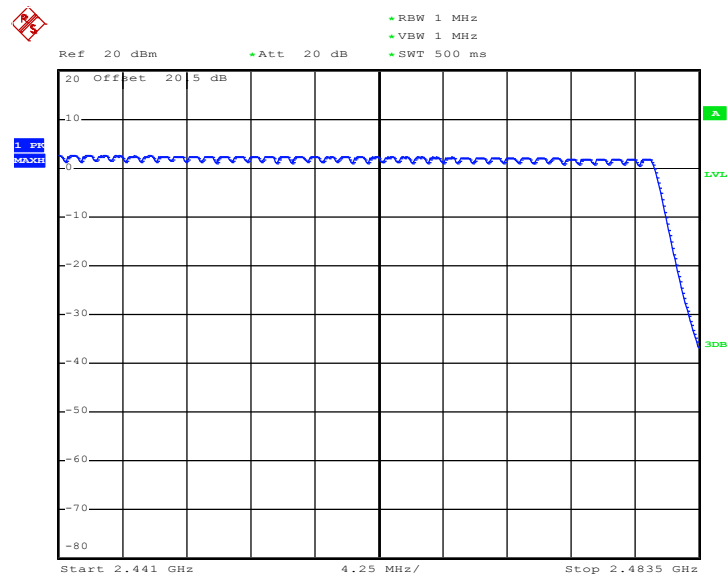
<b>Test Mode :</b>	Mode 7~9	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Reece Li	<b>Relative Humidity :</b>	50~53%
<b>Number of Hopping Channels (Channel)</b>		<b>Limits (Channel)</b>	<b>Pass/Fail</b>
79		> 15	Pass



Number of Hopping Channel Plot on Channel 00 - 78



Date: 14.MAR.2012 02:25:53



Date: 14.MAR.2012 01:52:06

## 3.2 20dB and 99% Bandwidth Measurement

### 3.2.1 Limit of 20dB Bandwidth

N/A

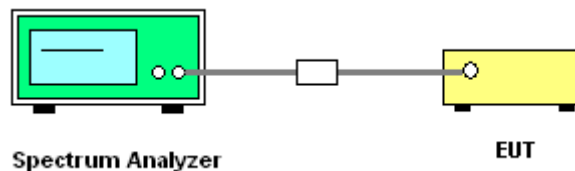
### 3.2.2 Measuring Instruments

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



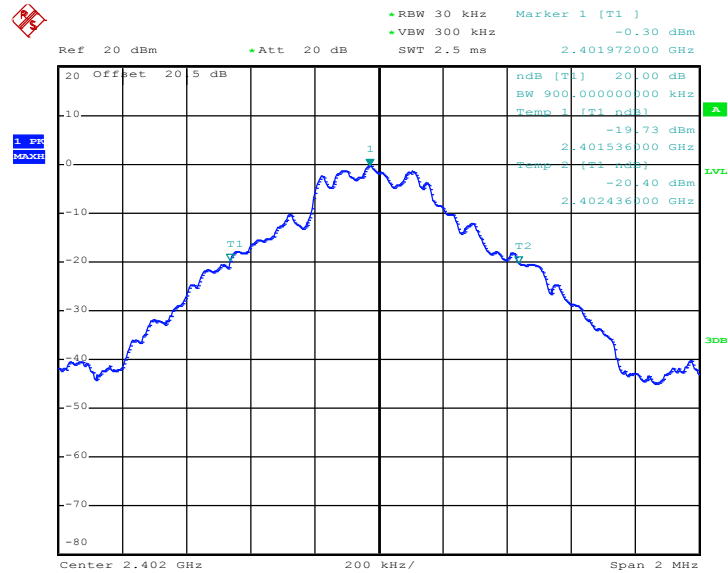


3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.900
39	2441	0.900
78	2480	0.904

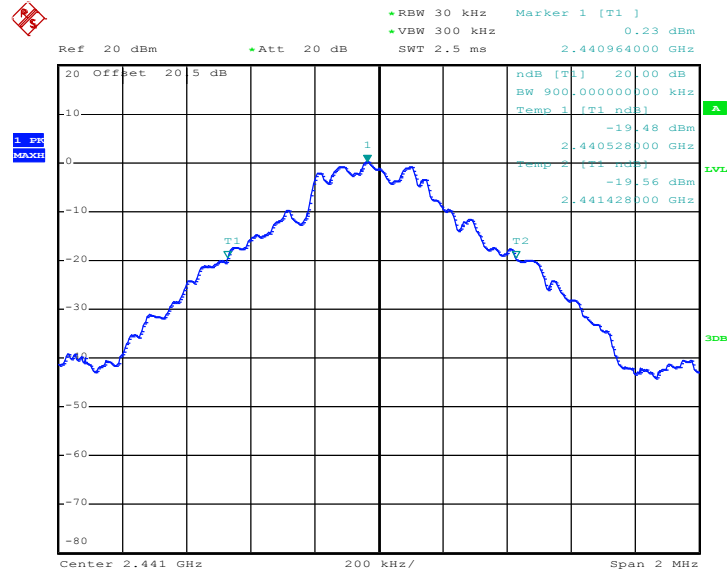
20 dB Bandwidth Plot on Channel 00



Date: 14.MAR.2012 02:13:52

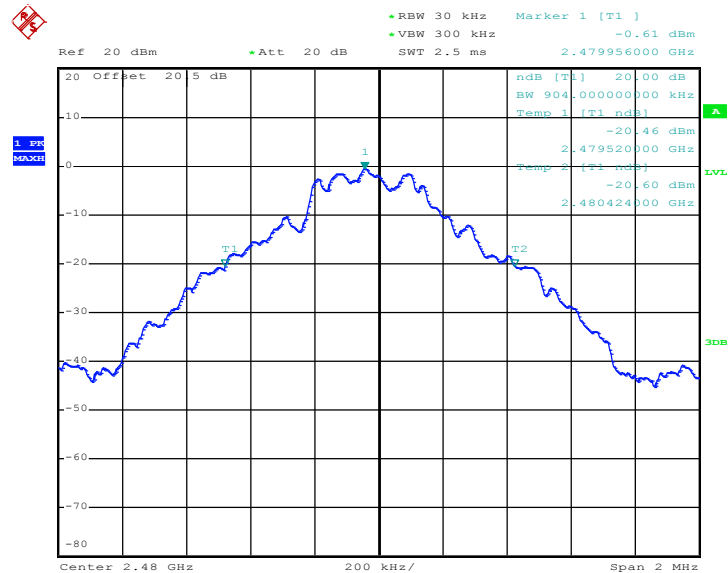


20 dB Bandwidth Plot on Channel 39



Date: 14.MAR.2012 02:14:41

20 dB Bandwidth Plot on Channel 78



Date: 14.MAR.2012 02:15:20

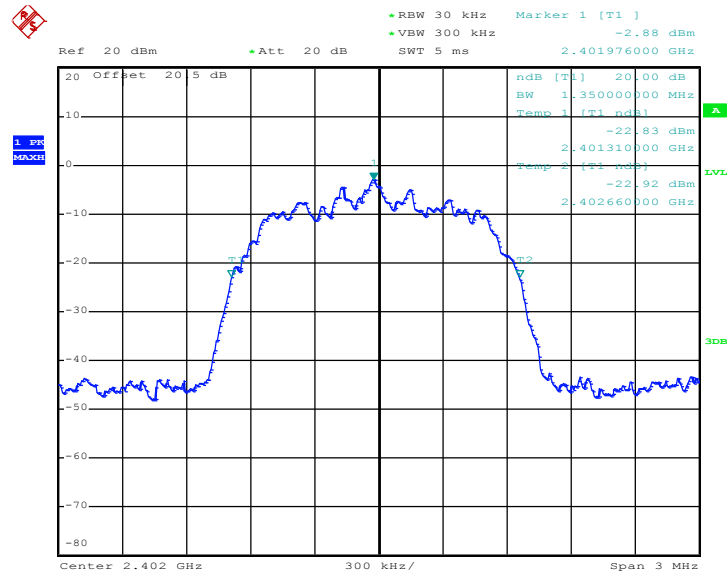




Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Reece Li	Relative Humidity :	50~53%

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

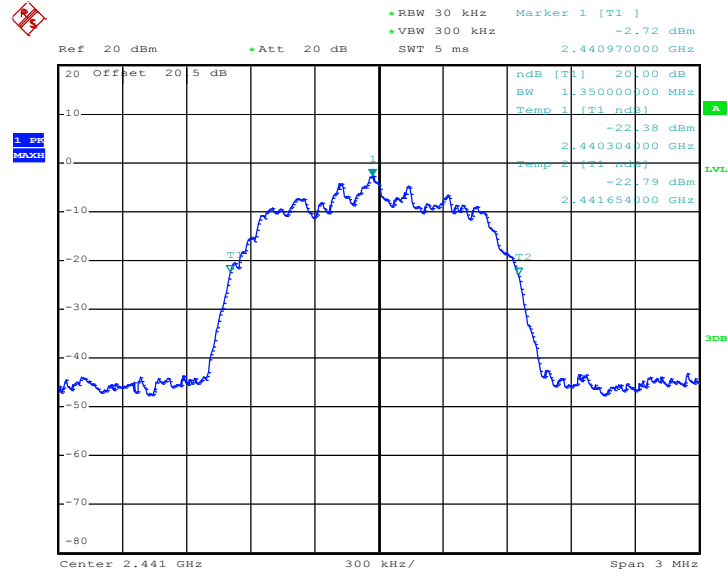
20 dB Bandwidth Plot on Channel 00



Date: 14.MAR.2012 02:15:54

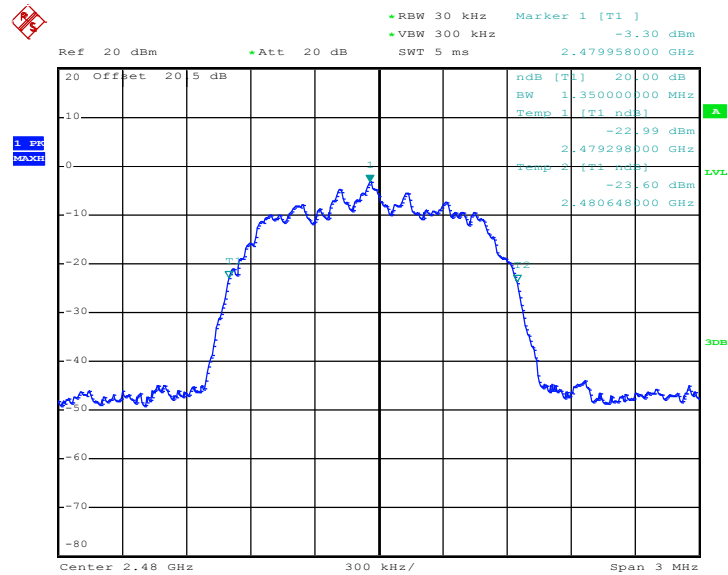


20 dB Bandwidth Plot on Channel 39



Date: 14.MAR.2012 02:16:25

20 dB Bandwidth Plot on Channel 78



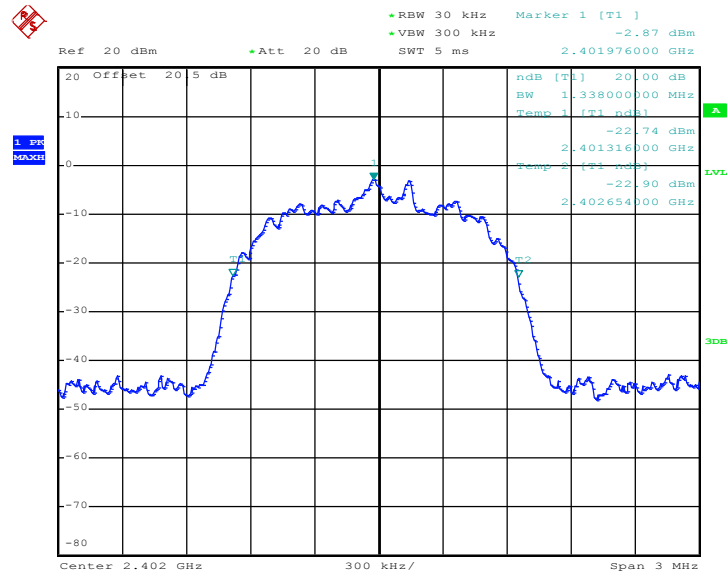
Date: 14.MAR.2012 02:17:07



Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Reece Li	Relative Humidity :	50~53%

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

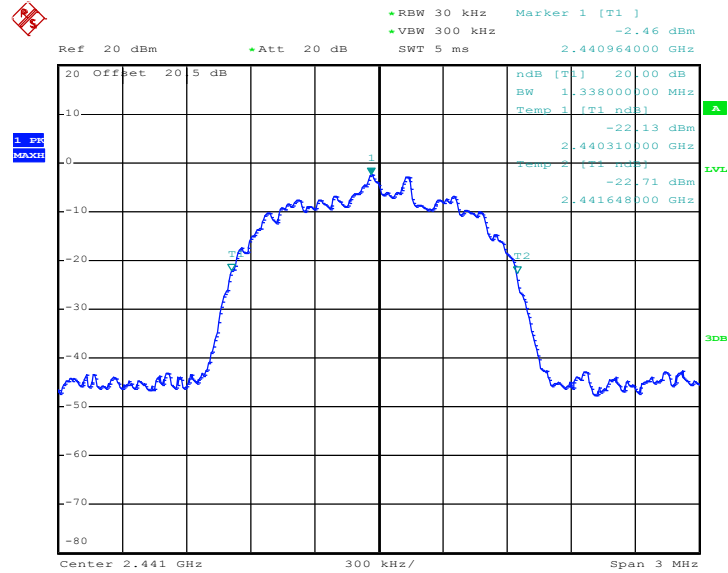
20 dB Bandwidth Plot on Channel 00



Date: 14.MAR.2012 02:17:46

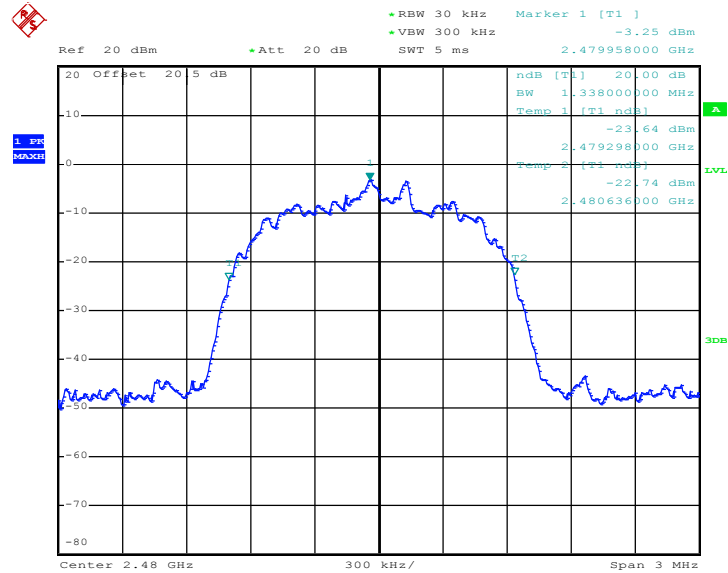


20 dB Bandwidth Plot on Channel 39



Date: 14.MAR.2012 02:18:23

20 dB Bandwidth Plot on Channel 78



Date: 14.MAR.2012 02:19:01

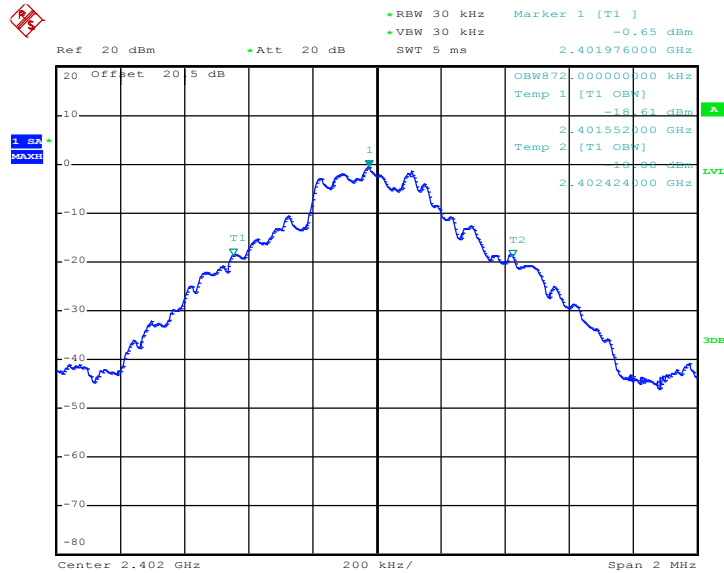


3.2.6 Test Result of 99% Occupied Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	0.872
39	2441	0.872
78	2480	0.872

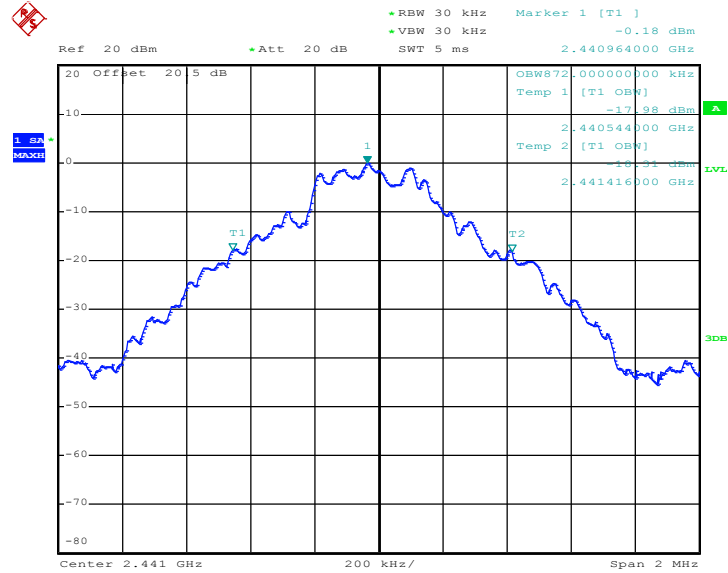
99% Bandwidth Plot on Channel 00



Date: 14.MAR.2012 03:22:00

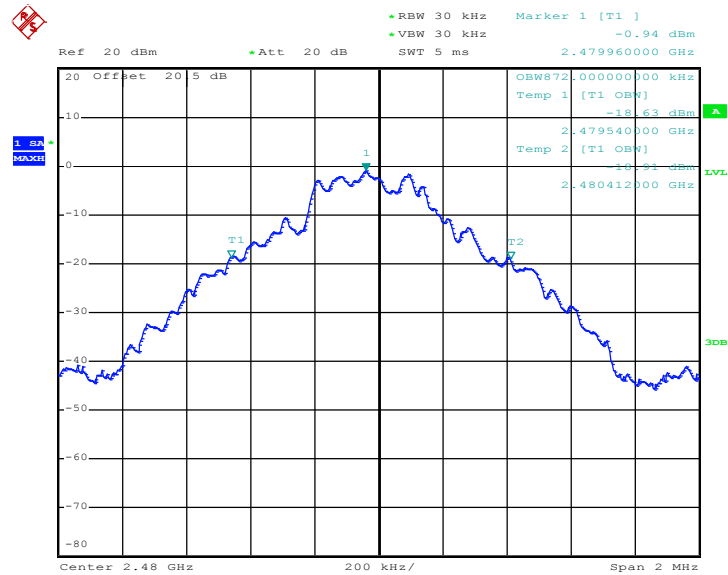


### 99% Occupied Bandwidth Plot on Channel 39



Date: 14.MAR.2012 03:22:38

### 99% Occupied Bandwidth Plot on Channel 78



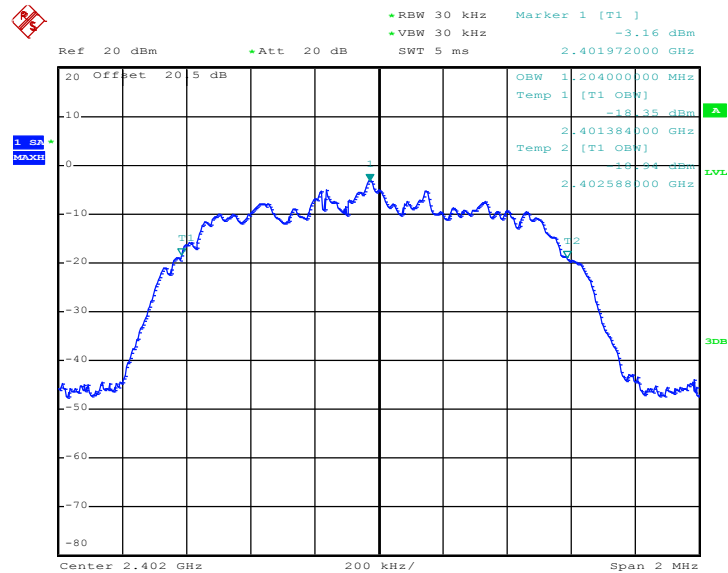
Date: 14.MAR.2012 03:23:15



Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.204
39	2441	1.200
78	2480	1.200

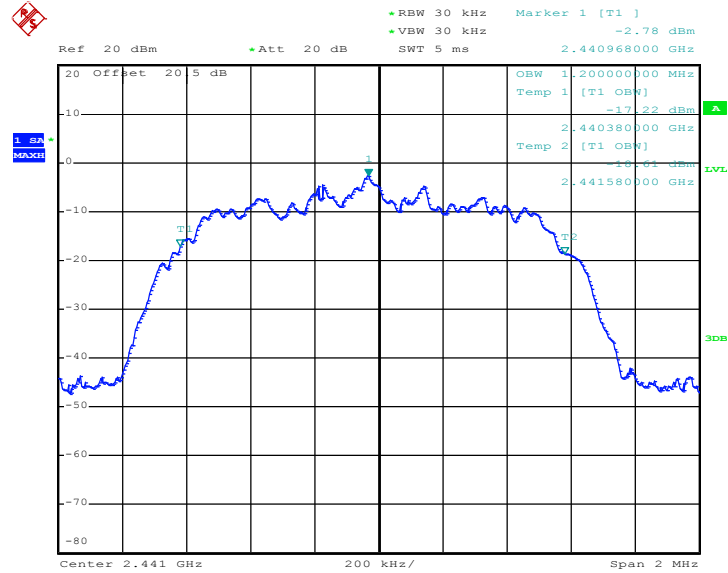
99% Bandwidth Plot on Channel 00



Date: 14.MAR.2012 03:25:30

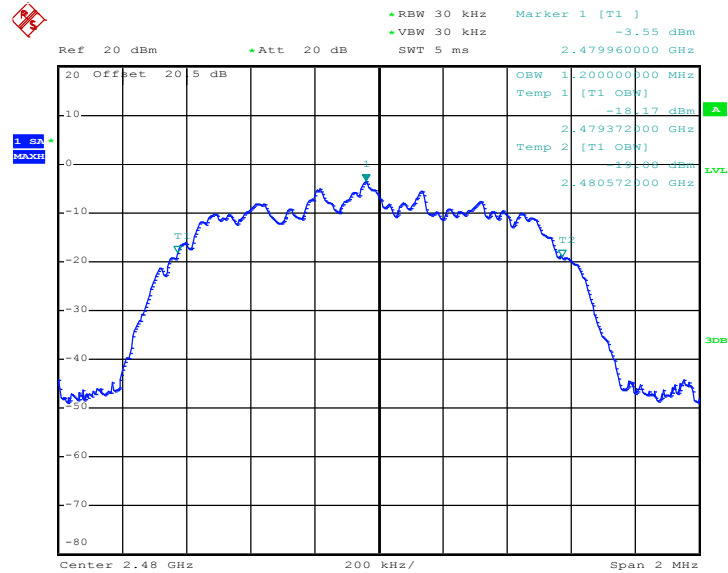


99% Occupied Bandwidth Plot on Channel 39



Date: 14.MAR.2012 03:24:34

99% Occupied Bandwidth Plot on Channel 78



Date: 14.MAR.2012 03:23:57

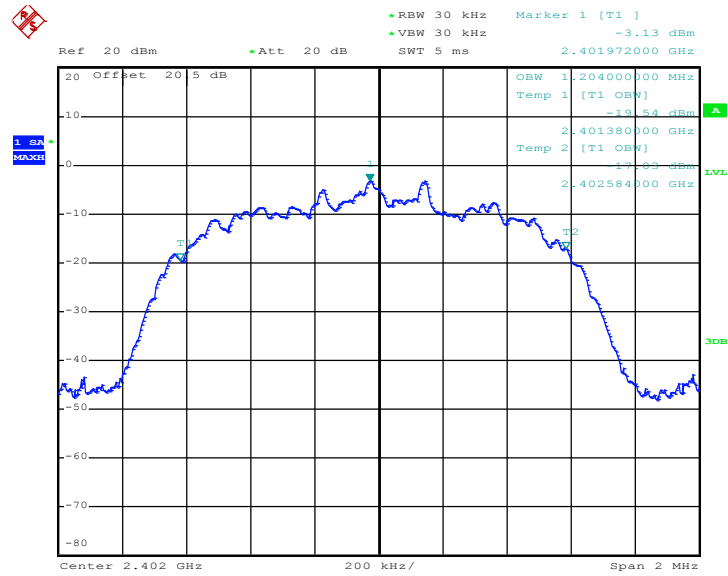




Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.204
39	2441	1.204
78	2480	1.204

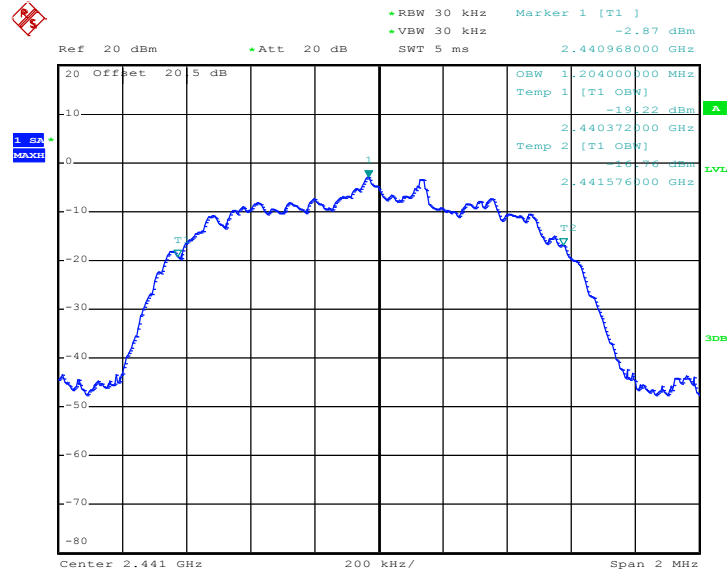
99% Bandwidth Plot on Channel 00



Date: 14.MAR.2012 03:26:09

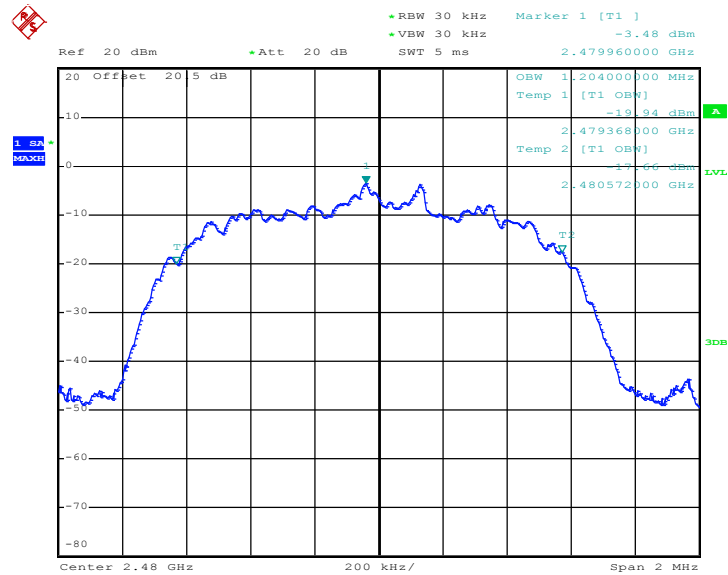


### 99% Occupied Bandwidth Plot on Channel 39



Date: 14.MAR.2012 03:26:57

### 99% Occupied Bandwidth Plot on Channel 78



Date: 14.MAR.2012 03:27:36

### 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.

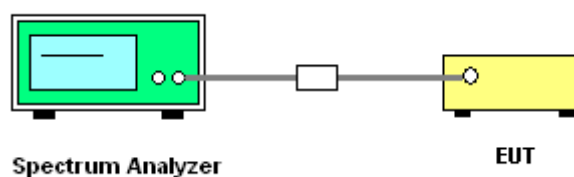
#### 3.3.2 Measuring Instruments

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



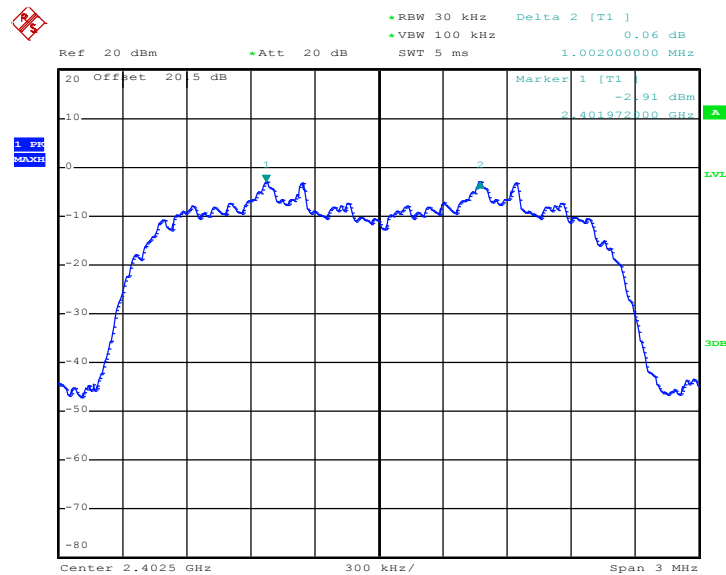


3.3.5 Test Result of Hopping Channel Separation

Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.8920	Pass
39	2441	1.002	0.8920	Pass
78	2480	1.002	0.8920	Pass

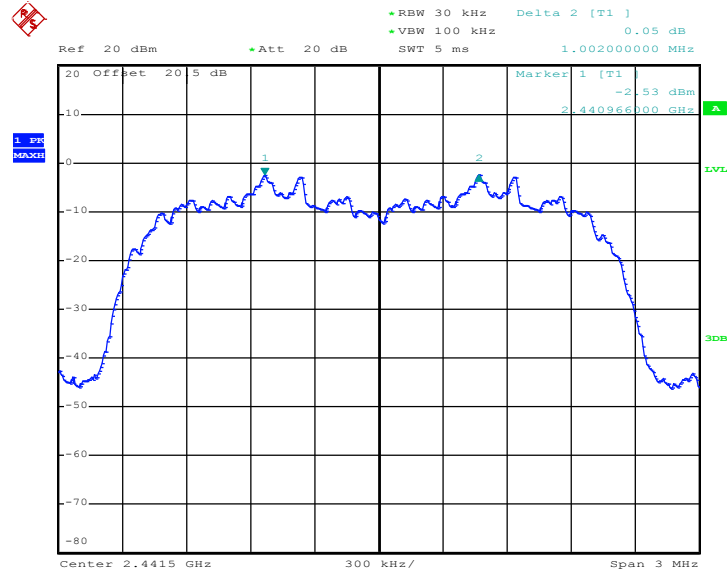
Channel Separation Plot on Channel 00 - 01



Date: 14.MAR.2012 02:08:05

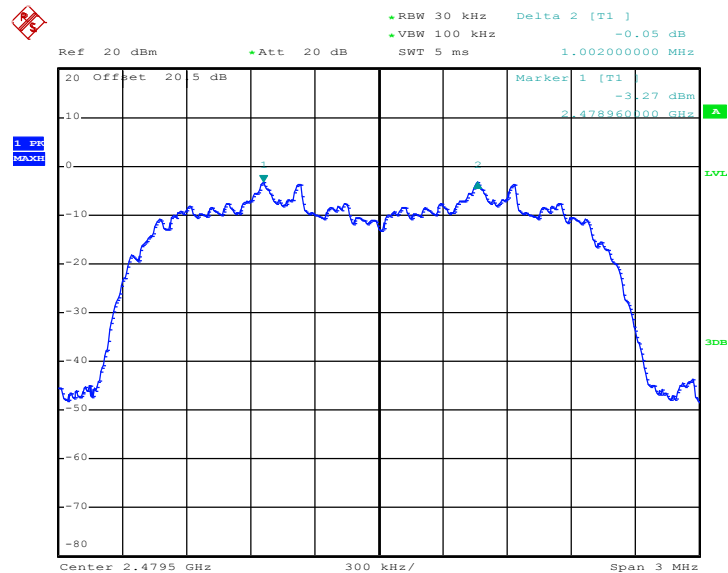


### Channel Separation Plot on Channel 39 - 40



Date: 14.MAR.2012 02:10:23

### Channel Separation Plot on Channel 77 - 78



Date: 14.MAR.2012 02:11:05

### 3.4 Dwell Time Measurement

#### 3.4.1 Limit of Dwell Time

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

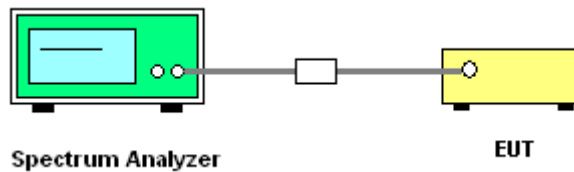
#### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.4.3 Test Procedures

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

#### 3.4.4 Test Setup



#### 3.4.5 Test Result of Dwell Time

Test Mode :	Mode 8	Temperature :	24~26°C
Test Engineer :	Reece Li	Relative Humidity :	50~53%

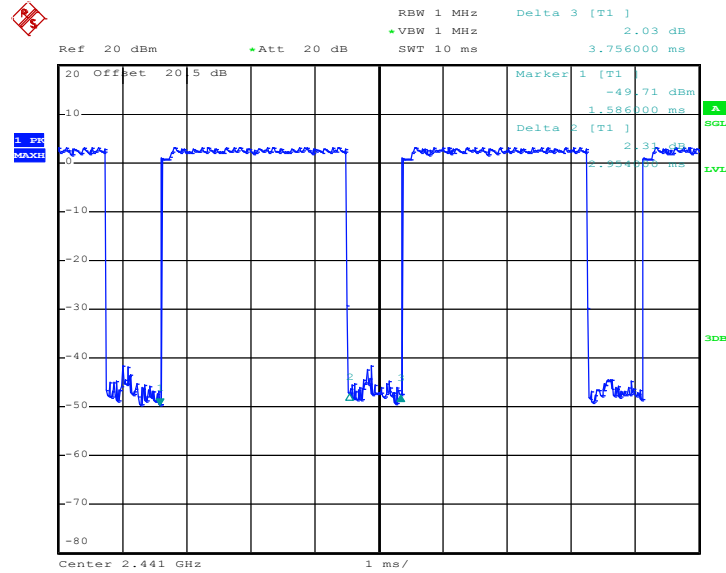
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
3DH5	3.10	2954.00	0.29	0.4	Pass

**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)

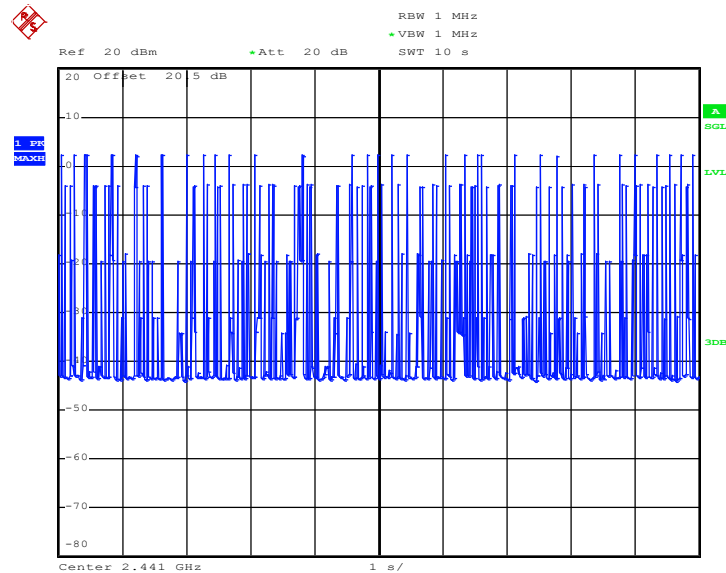


### 3DH5 Dwell Time (One Pulse) Plot on Channel 39



Date: 12.MAR.2012 23:03:44

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



Date: 14.MAR.2012 02:13:16

### 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.

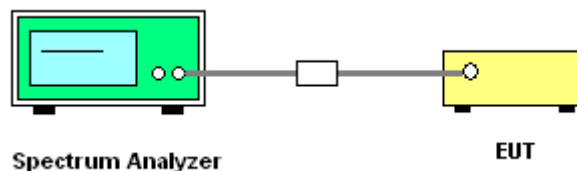
#### 3.5.2 Measuring Instruments

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

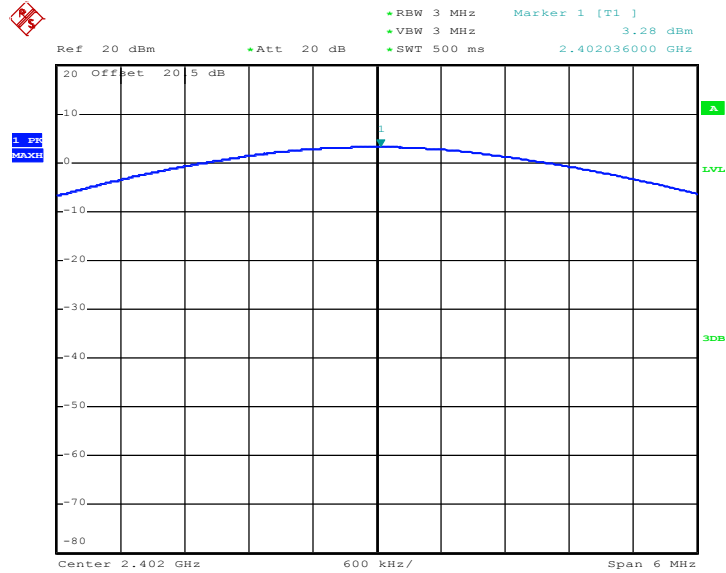
<b>Test Mode :</b>	Mode 7, 8, 9	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Reece Li	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits (dBm)	Pass/Fail
		3 Mbps		
00	2402	3.28	20.97	Pass
39	2441	3.97	20.97	Pass
78	2480	3.32	20.97	Pass



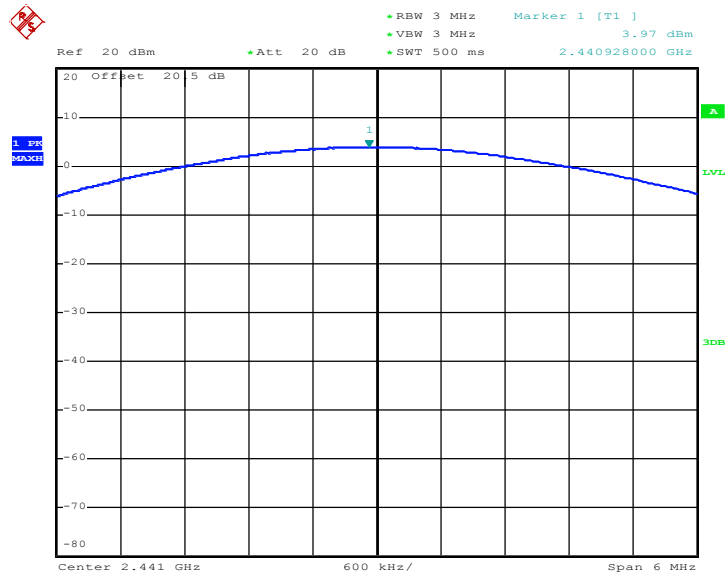


Peak Output Power Plot on Channel 00



Date: 12.MAR.2012 22:45:58

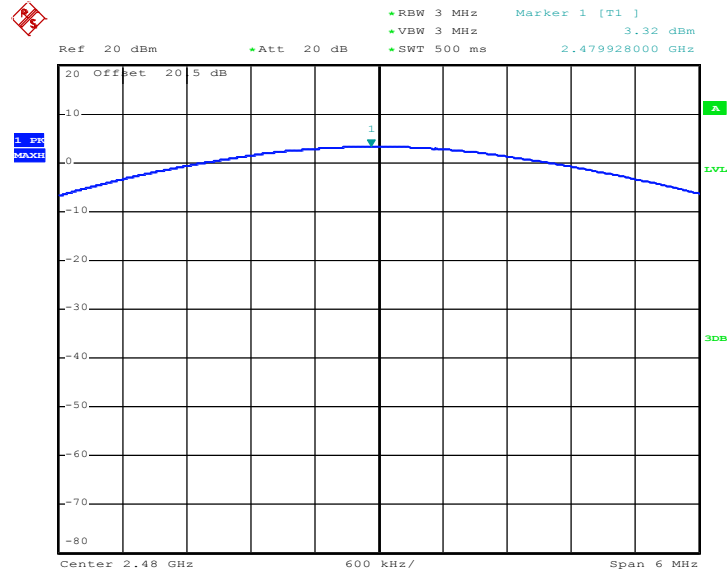
Peak Output Power Plot on Channel 39



Date: 12.MAR.2012 22:47:11



Peak Output Power Plot on Channel 78



Date: 12.MAR.2012 22:48:25



## **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**

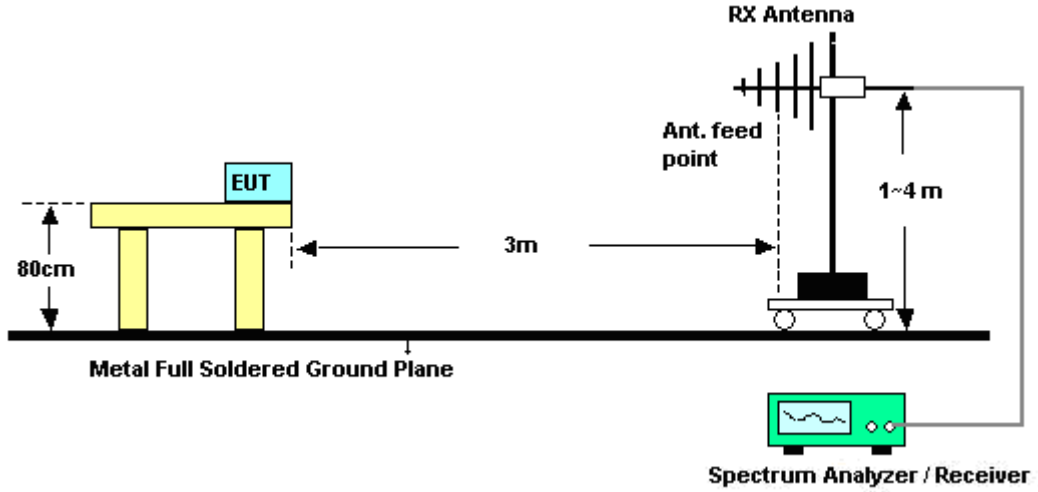
See list of measuring instruments of this test report.

### **3.6.3 Test Procedures**

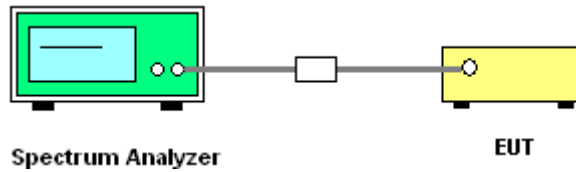
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300KHz, Video bandwidth (VBW)  $\geq$  RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band 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 :	22~24°C
Test Channel :	00	Relative Humidity :	54~56%
		Test Engineer :	Kyle Zhuang

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
2359.97	46.22	-27.78	74	42.17	32.01	5.99	33.95	113	326	Peak
2359.97	33.49	-20.51	54	29.44	32.01	5.99	33.95	113	326	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
2384.1	46.27	-27.73	74	42.17	32.03	6.03	33.96	176	26	Peak
2384.1	33.29	-20.71	54	29.19	32.03	6.03	33.96	176	26	Average



Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	54~56%
		Test Engineer :	Kyle Zhuang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	68.33	-5.67	74	63.97	32.18	6.18	34	135	331	Peak
2483.5	28.46	-25.54	54	24.1	32.18	6.18	34	135	331	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	85.83	57.37	28.46	54.00	-25.54	Pass
Hopping Mode	85.83	59.53	26.30	54.00	-27.70	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	60.4	-13.6	74	56.04	32.18	6.18	34	200	25	Peak
2483.5	27.01	-26.99	54	22.65	32.18	6.18	34	200	25	Average

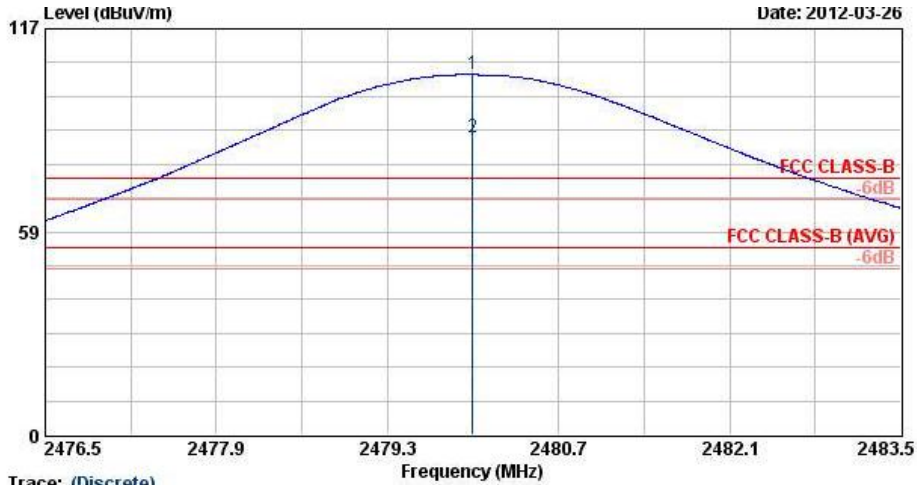
Summary results of marker-delta method:

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	79.50	52.75	26.75	54.00	-27.25	Pass
Hopping Mode	79.50	52.49	27.01	54.00	-26.99	Pass

Note : Average result = Maximum field strength – Delta result



Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	54~56%
Test Engineer :	Kyle Zhuang	Polarization :	Horizontal



Trace: (Discrete)

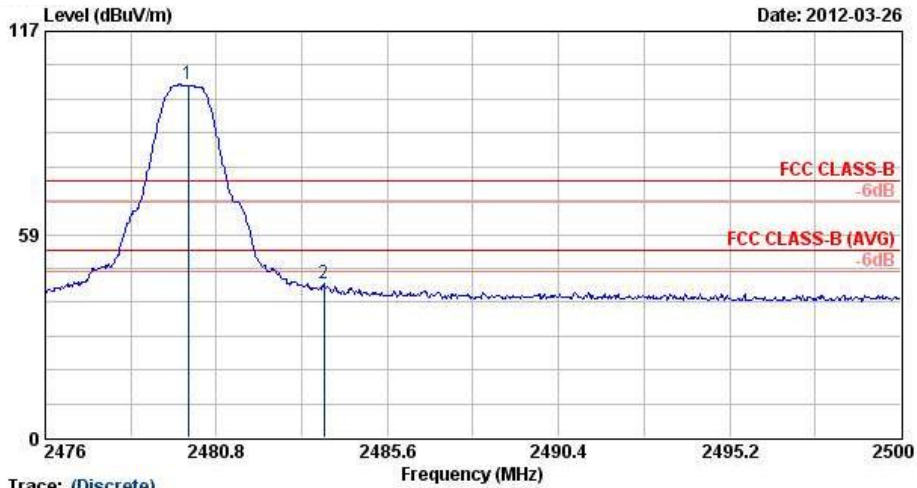
Site : 03CH07-HY  
 Condition : FCC CLASS-B HF-ANT\_110816 HORIZONTAL  
 EUT : Tablet PC  
 Power : 120Vac/60Hz  
 Model : Sphinx  
 Mode : Mode 3 BT\_Tx\_Ch78; 2480MHz  
 Plane : E2  
 Power : 3DH5  
 Sample : RSE Sample

	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 @	2480.00	103.83	29.83	74.00	99.48	32.18	6.18	34.00	135	331	Peak
2 @	2480.00	85.83	31.83	54.00	81.47	32.18	6.18	34.00	135	331	Average

\* Maximum field strength of the fundamental emission



Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	54~56%
Test Engineer :	Kyle Zhuang	Polarization :	Horizontal



Trace: (Discrete)

Site : 03CH07-HY  
 Condition : FCC CLASS-B HF-ANT\_110816 HORIZONTAL  
 EUT : Tablet PC  
 Power : 120Vac/60Hz  
 Model : Sphinx  
 Mode : Mode 3 BT\_T\*\_Ch78; 2480MHz  
 Plane : E2  
 Power : 3DH5  
 Sample : RSE Sample

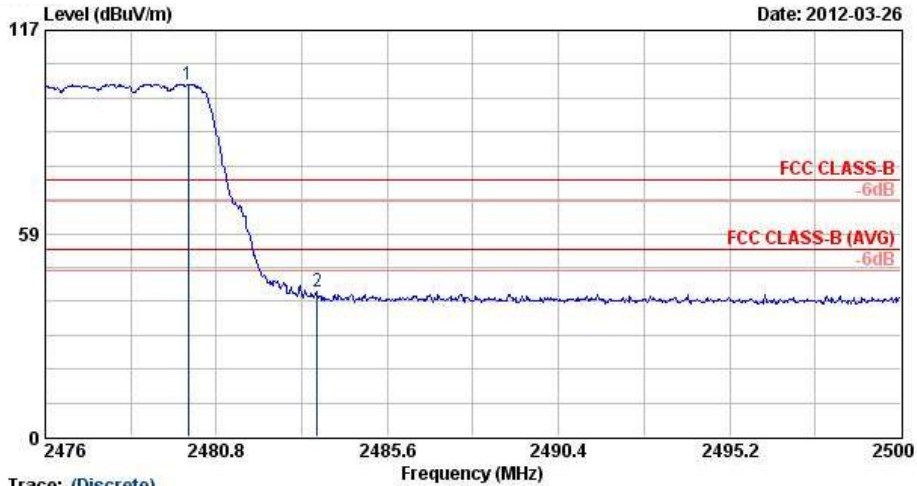
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	101.59	27.59	74.00	97.24	32.18	6.18	34.00	135	331	Peak
2	2483.82	44.22	-29.78	74.00	39.86	32.18	6.18	34.00	135	331	Peak

\* Marker-Delta Method (RBW/VBW=100KHz): 57.37 dB , single carrier Mode





Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	54~56%
Test Engineer :	Kyle Zhuang	Polarization :	Horizontal



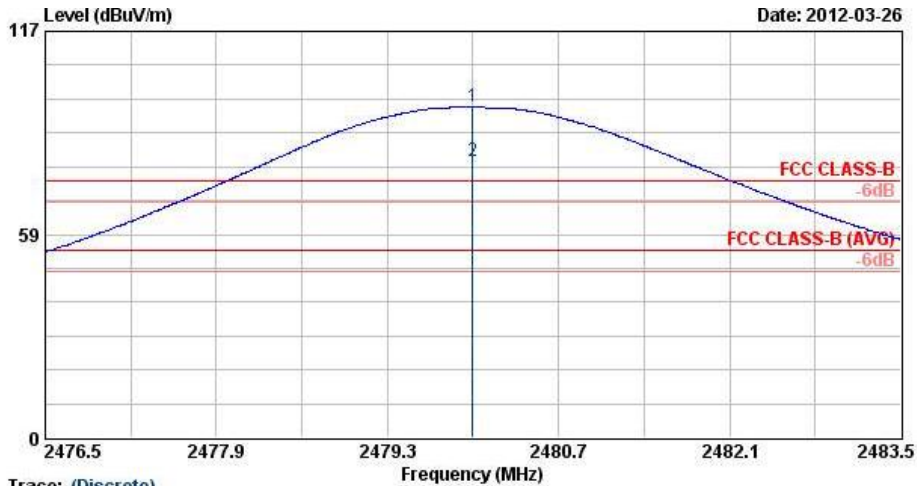
Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC CLASS-B HF-ANT\_110616 HORIZONTAL  
 EUT : Tablet PC  
 Power : 120Vac/60Hz  
 Model : Sphinx  
 Mode : Mode 3 BT\_Tx\_Ch78; 2480MHz  
 Plane : E2  
 Power : 3DH5  
 Sample : RSE Sample

	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	101.49	27.49	74.00	97.14	32.18	6.18	34.00	135	331	Peak
2	2483.63	41.96	-32.04	74.00	37.61	32.18	6.18	34.00	135	331	Peak

\* Marker-Delta Method (RBW/BW=100KHz): 59.53 dB , Hopping Mode



Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	54~56%
Test Engineer :	Kyle Zhuang	Polarization :	Vertical



Trace: (Discrete)

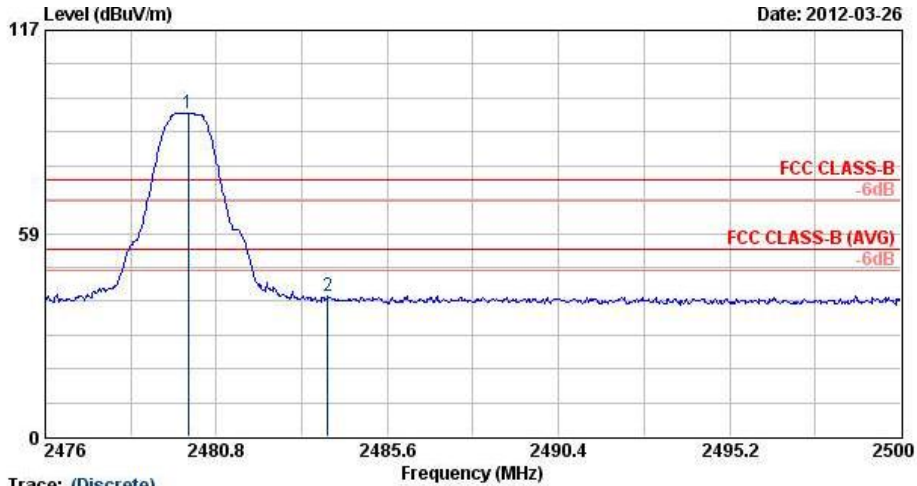
Site : 03CH07-HY  
 Condition : FCC CLASS-B HF-ANT\_110816 VERTICAL  
 EUT : Tablet PC  
 Power : 120Vac/60Hz  
 Model : Sphinx  
 Mode : Mode 3 BT\_T\*\_Ch78; 2480MHz  
 Plane : E2  
 Power : 3DH5  
 Sample : RSE Sample

	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	95.24	21.24	74.00	90.88	32.18	6.18	34.00	200	25	Peak
2 @	2480.00	79.50	25.50	54.00	75.14	32.18	6.18	34.00	200	25	Average

\* Maximum field strength of the fundamental emission



Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	54~56%
Test Engineer :	Kyle Zhuang	Polarization :	Vertical



Trace: (Discrete)

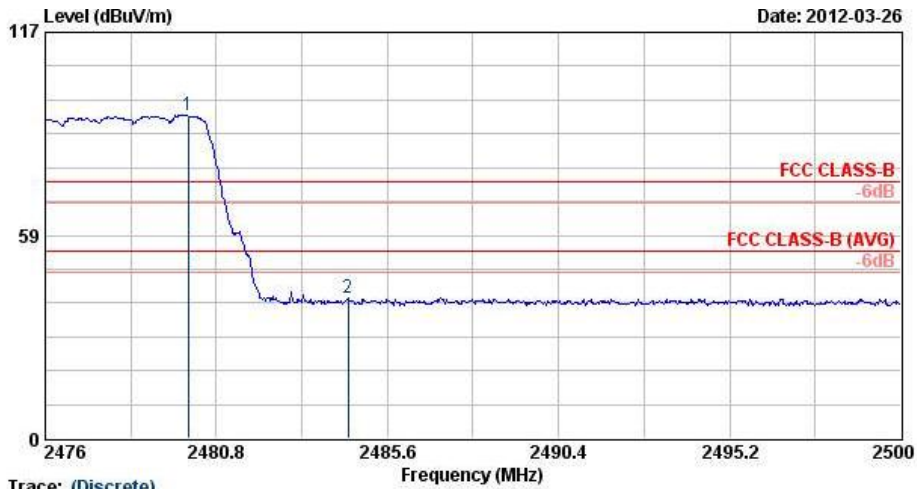
Site : 03CH07-HY  
 Condition : FCC CLASS-B HR-ANT\_110816 VERTICAL  
 EUT : Tablet PC  
 Power : 120Vac/60Hz  
 Model : Sphinx  
 Mode : Mode 3 BT\_Tx\_Ch78; 2480MHz  
 Plane : E2  
 Power : 3DH5  
 Sample : RSE Sample

	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	93.17	19.17	74.00	88.81	32.18	6.18	34.00	200	25	Peak
2	2483.92	40.42	-33.58	74.00	36.07	32.18	6.18	34.00	200	25	Peak

\* Marker-Delta Method (RBW/BW=100KHz): 52.75 dB , single carrier Mode



Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	54~56%
Test Engineer :	Kyle Zhuang	Polarization :	Vertical



Trace: (Discrete)

Site : 03CH07-HY  
 Condition : FCC CLASS-B HF-ANT\_110616 VERTICAL  
 EUT : Tablet PC  
 Power : 120Vac/60Hz  
 Model : Sphinx  
 Mode : Mode 3 BT\_T\*\_Ch78; 2480MHz  
 Plane : E2  
 Power : 3DH5  
 Sample : RSE Sample

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	Level	Factor	Loss	Factor	Pos	Pos	
					dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	92.97	18.97	74.00	88.62	32.18	6.18	34.00	200	25	Peak
2	2484.50	40.48	-33.52	74.00	36.13	32.18	6.18	34.00	200	25	Peak

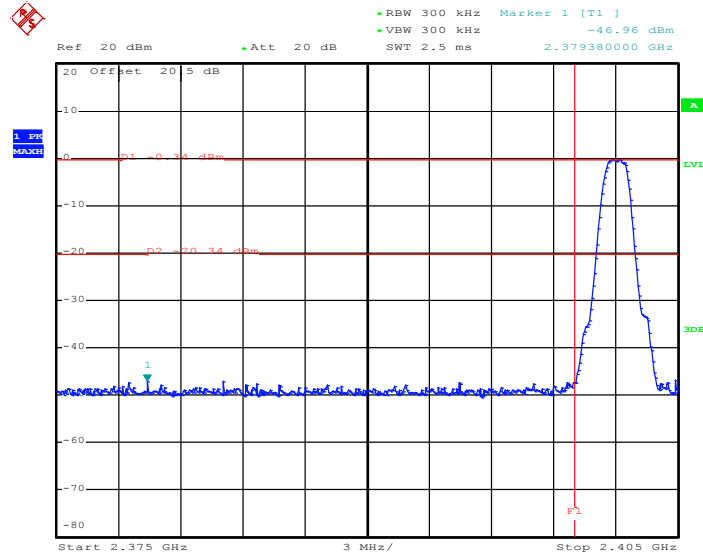
\* Marker-Delta Method (RBW/BW=100KHz): 52.49 dB , Hopping Mode



### 3.6.6 Test Result of Conducted Band Edges

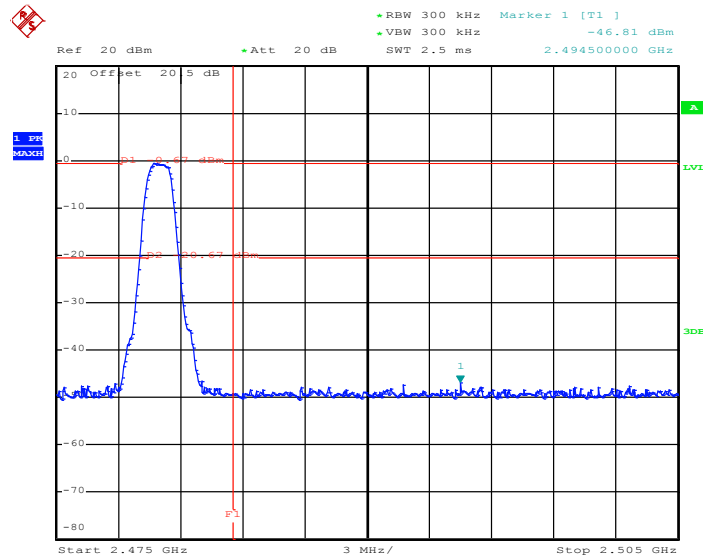
Test Mode :	Mode 7 and 9	Temperature :	24~26°C
Test Channel :	00 and 78	Relative Humidity :	50~53%
		Test Engineer :	Reece Li

Low Band Edge Plot on Channel 00



Date: 14.MAR.2012 02:30:52

High Band Edge Plot on Channel 78



Date: 14.MAR.2012 02:32:48

## 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.

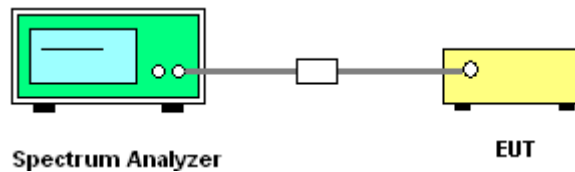
### 3.7.2 Measuring Instruments

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

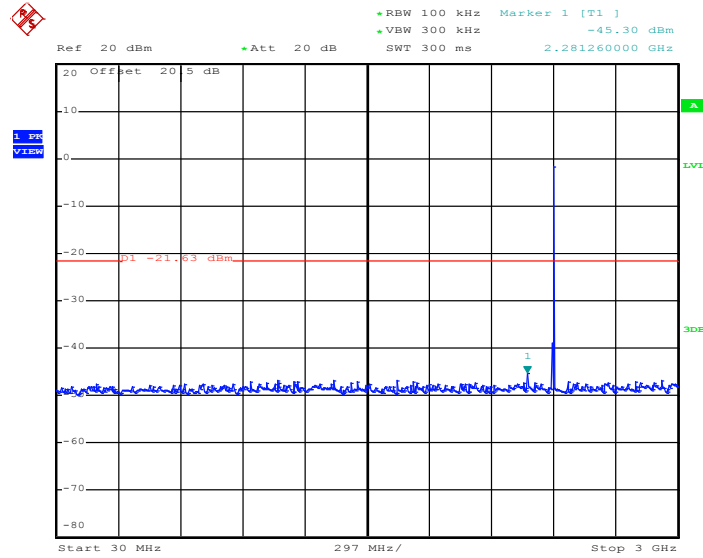




3.7.5 Test Result

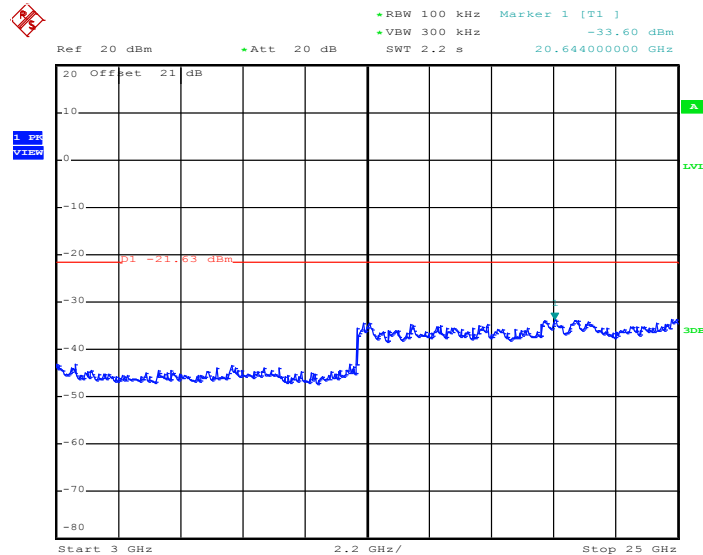
Test Mode :	Mode 7	Temperature :	24~26°C
Test Channel :	00	Relative Humidity :	50~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAR.2012 02:38:05

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

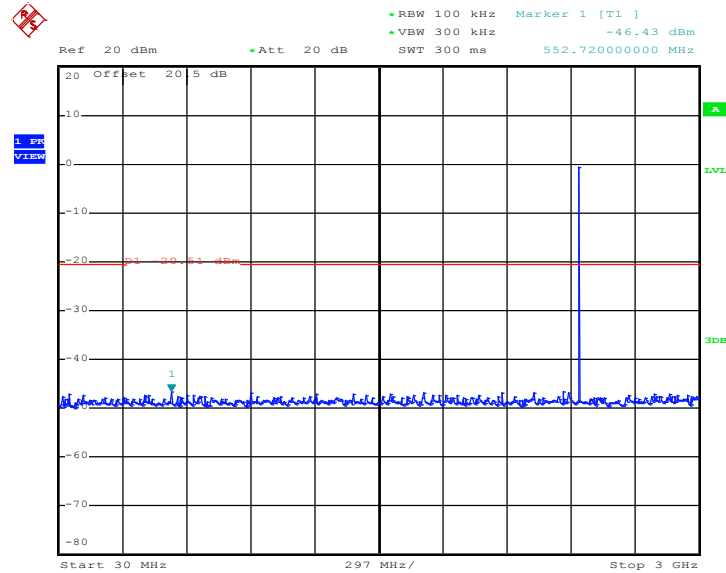


Date: 14.MAR.2012 02:38:27



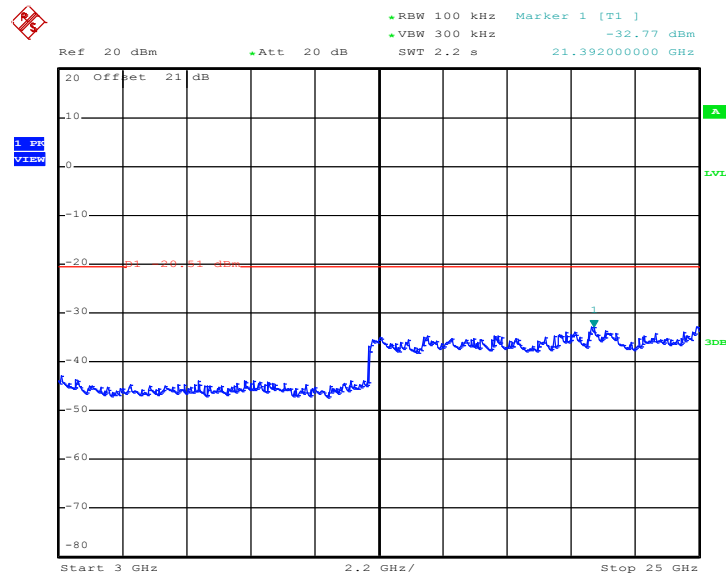
Test Mode :	Mode 8	Temperature :	24~26°C
Test Channel :	39	Relative Humidity :	50~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAR.2012 02:37:17

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



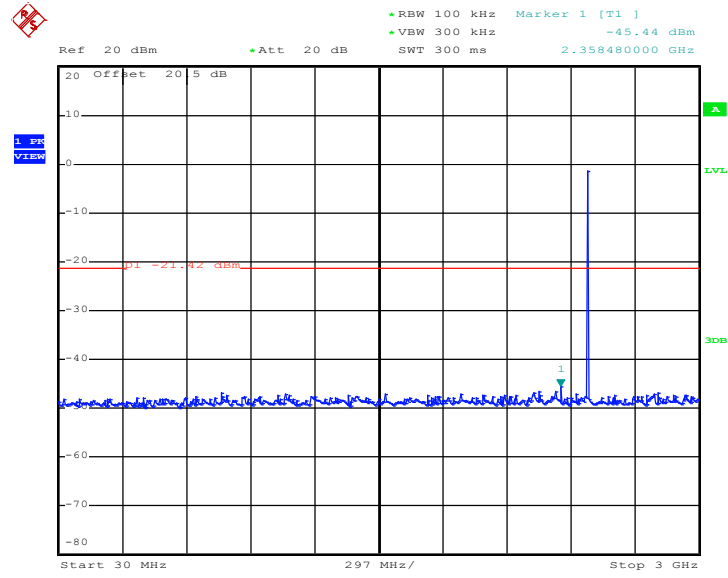
Date: 14.MAR.2012 02:37:39





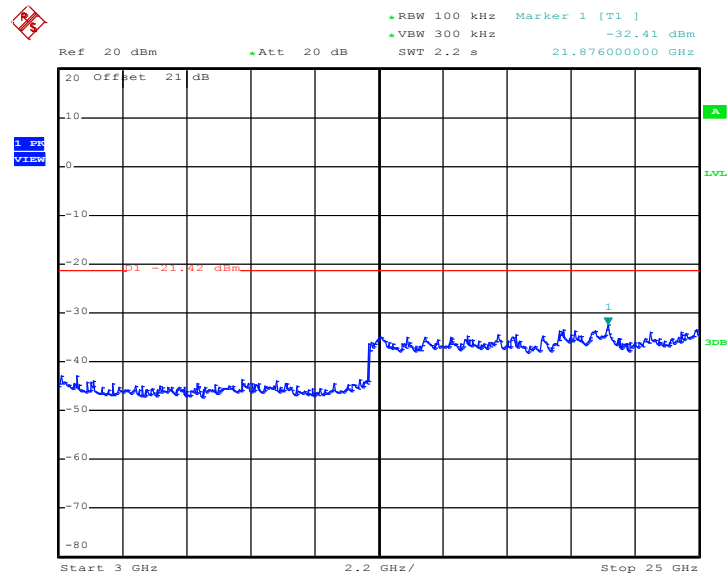
Test Mode :	Mode 9	Temperature :	24~26°C
Test Channel :	78	Relative Humidity :	50~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAR.2012 02:36:15

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 14.MAR.2012 02:36:37

### 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.

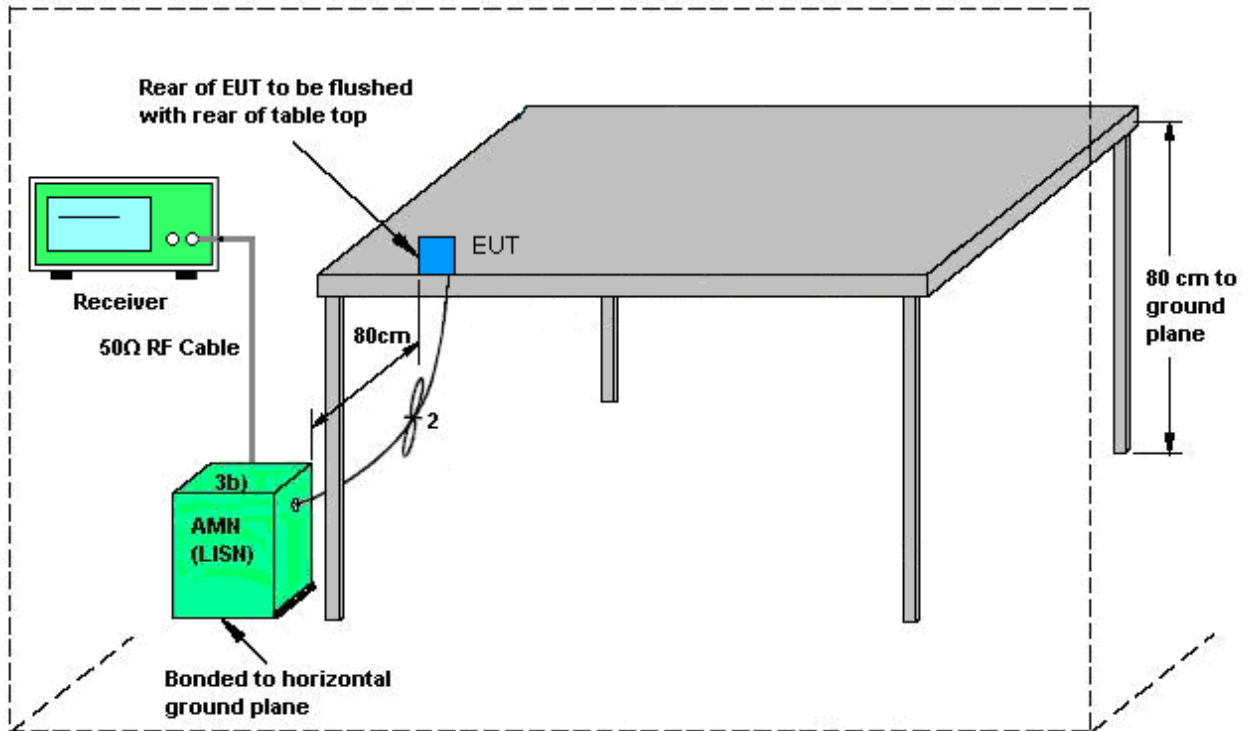
#### 3.8.2 Measuring Instruments

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.

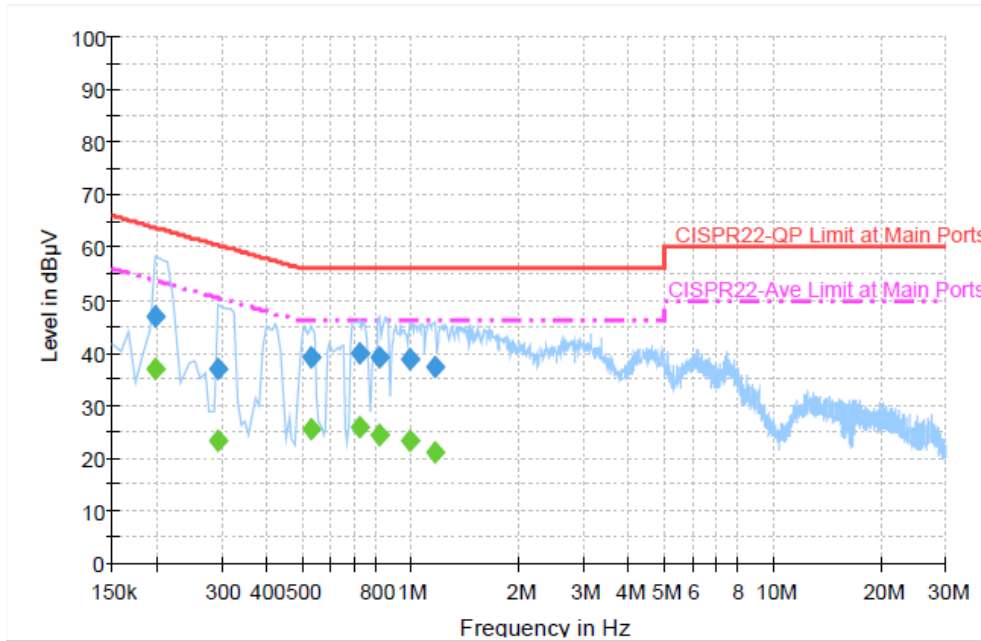
### 3.8.4 Test Setup



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

3.8.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	50~52%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + TC for Sample 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : QuasiPeak

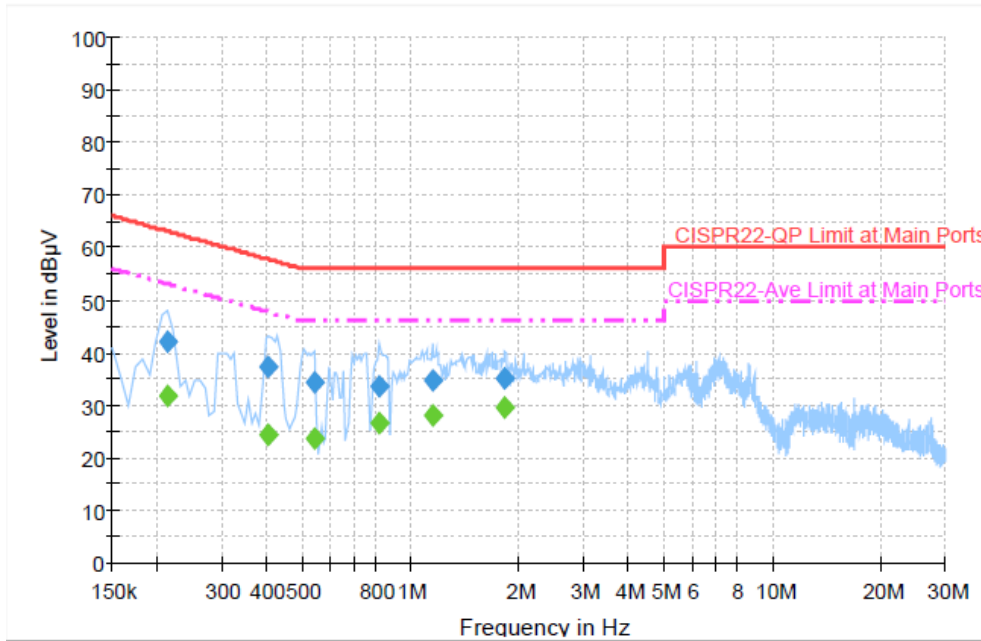
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	46.8	Off	L1	19.3	16.9	63.7
0.294000	37.0	Off	L1	19.3	23.4	60.4
0.534000	39.3	Off	L1	19.3	16.7	56.0
0.726000	40.0	Off	L1	19.4	16.0	56.0
0.822000	39.0	Off	L1	19.5	17.0	56.0
0.990000	38.7	Off	L1	19.4	17.3	56.0
1.166000	37.2	Off	L1	19.4	18.8	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	37.0	Off	L1	19.3	16.7	53.7
0.294000	23.2	Off	L1	19.3	27.2	50.4
0.534000	25.6	Off	L1	19.3	20.4	46.0
0.726000	25.8	Off	L1	19.4	20.2	46.0
0.822000	24.2	Off	L1	19.5	21.8	46.0
0.990000	23.4	Off	L1	19.4	22.6	46.0
1.166000	21.2	Off	L1	19.4	24.8	46.0



Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	50~52%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + TC for Sample 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



**Final Result : QuasiPeak**

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.214000	42.0	Off	N	19.4	21.0	63.0
0.406000	37.3	Off	N	19.4	20.4	57.7
0.542000	34.2	Off	N	19.3	21.8	56.0
0.822000	33.4	Off	N	19.5	22.6	56.0
1.150000	34.8	Off	N	19.5	21.2	56.0
1.822000	35.2	Off	N	19.5	20.8	56.0

**Final Result : Average**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.214000	31.6	Off	N	19.4	21.4	53.0
0.406000	24.4	Off	N	19.4	23.3	47.7
0.542000	23.8	Off	N	19.3	22.2	46.0
0.822000	26.7	Off	N	19.5	19.3	46.0
1.150000	28.1	Off	N	19.5	17.9	46.0
1.822000	29.7	Off	N	19.5	16.3	46.0

### 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

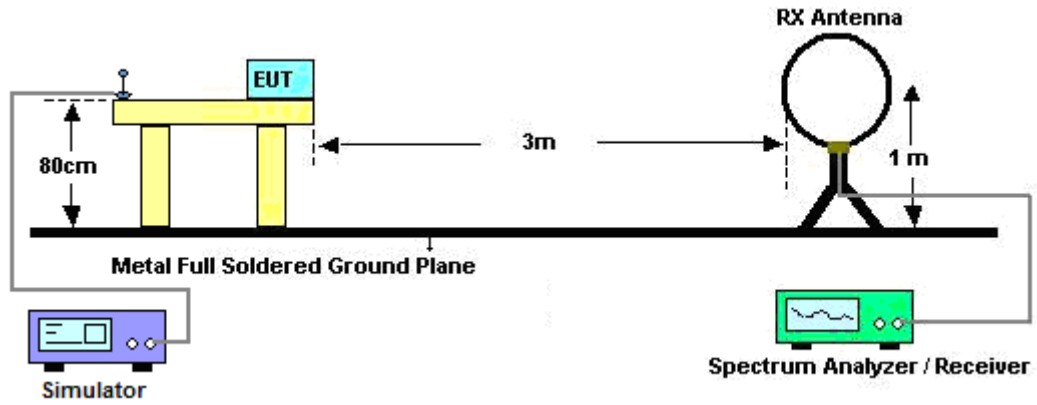
See list of measuring instruments of this test report.

#### 3.9.3 Test Procedures

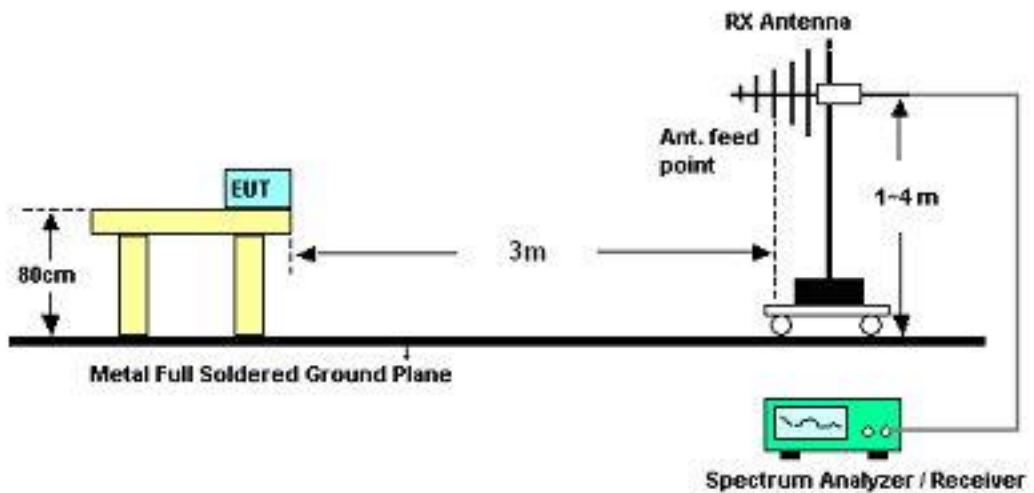
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
  - (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for  $f \geq 1$  GHz, 100 KHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = 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

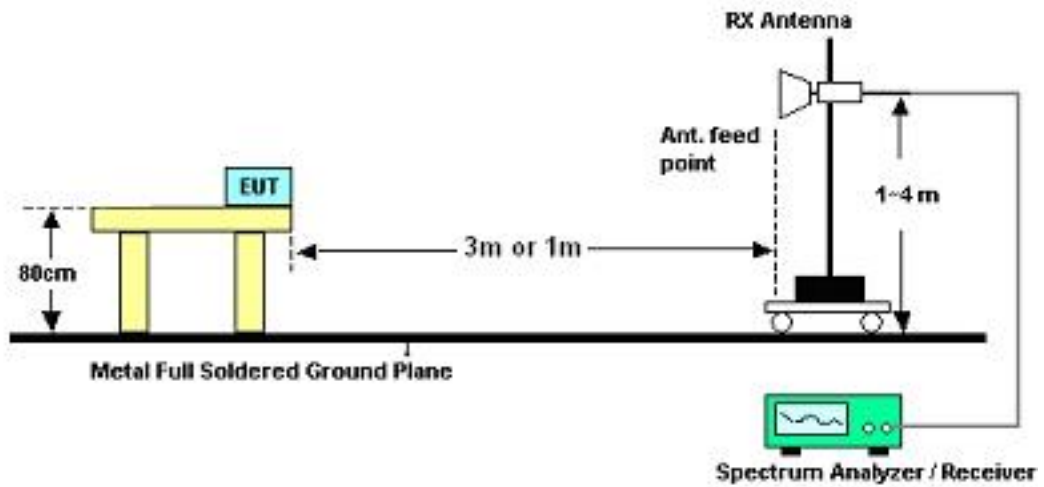
For radiated emissions below 30MHz



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

Test Mode :	Mode 1	Temperature :	22~24°C
Test Channel :	00	Relative Humidity :	54~56%
Test Engineer :	Kyle Zhuang	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
2359.97	46.22	-27.78	74	42.17	32.01	5.99	33.95	113	326	Peak
2359.97	33.49	-20.51	54	29.44	32.01	5.99	33.95	113	326	Average
2402	102.01	-	-	97.86	32.08	6.03	33.96	113	326	Peak
2402	84.46	-	-	80.33	32.06	6.03	33.96	113	326	Average
2486	32.58	-21.42	54	28.22	32.18	6.18	34	113	326	Average
2486	45.18	-28.82	74	40.82	32.18	6.18	34	113	326	Peak

Test Mode :	Mode 1	Temperature :	22~24°C
Test Channel :	00	Relative Humidity :	54~56%
Test Engineer :	Kyle Zhuang	Polarization :	Vertical
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
2384.1	46.27	-27.73	74	42.17	32.03	6.03	33.96	176	26	Peak
2384.1	33.29	-20.71	54	29.19	32.03	6.03	33.96	176	26	Average
2402	93.99	-	-	89.84	32.08	6.03	33.96	176	26	Peak
2402	78.49	-	-	74.36	32.06	6.03	33.96	176	26	Average
2492	32.64	-21.36	54	28.26	32.2	6.18	34	176	26	Average
2492	45.36	-28.64	74	40.98	32.2	6.18	34	176	26	Peak



<b>Test Mode :</b>	Mode 2	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	39	<b>Relative Humidity :</b>	54~56%
<b>Test Engineer :</b>	Kyle Zhuang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2441 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
2388	46	-28	74	41.87	32.06	6.03	33.96	111	328	Peak
2388	33.34	-20.66	54	29.21	32.06	6.03	33.96	111	328	Average
2441	103.24	-	-	98.98	32.13	6.11	33.98	111	328	Peak
2441	85.19	-	-	80.93	32.13	6.11	33.98	111	328	Average
2492	45.28	-28.72	74	40.9	32.2	6.18	34	111	328	Peak
2492	32.83	-21.17	54	28.45	32.2	6.18	34	111	328	Average

<b>Test Mode :</b>	Mode 2	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	39	<b>Relative Humidity :</b>	54~56%
<b>Test Engineer :</b>	Kyle Zhuang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	2441 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
2334	45.06	-28.94	74	41.09	31.96	5.95	33.94	175	30	Peak
2334	33.16	-20.84	54	29.19	31.96	5.95	33.94	175	30	Average
2441	95.29	-	-	91.03	32.13	6.11	33.98	175	30	Peak
2441	79.41	-	-	75.15	32.13	6.11	33.98	175	30	Average
2486	45.18	-28.82	74	40.82	32.18	6.18	34	175	30	Peak
2486	32.66	-21.34	54	28.3	32.18	6.18	34	175	30	Average



Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	54~56%
Test Engineer :	Kyle Zhuang	Polarization :	Horizontal
Remark :	2480 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
30	19.73	-20.27	40	30.66	20	0.53	31.46	100	35	Peak
138.81	20.26	-23.24	43.5	39.19	11.42	1.2	31.55	-	-	Peak
224.94	22.04	-23.96	46	41.19	10.85	1.45	31.45	-	-	Peak
310.5	20.24	-25.76	46	36.19	13.59	1.79	31.33	-	-	Peak
545	22.97	-23.03	46	32.56	18.86	2.54	30.99	-	-	Peak
985.3	26.37	-27.63	54	29.07	24.38	3.5	30.58	-	-	Peak
2316	45.33	-28.67	74	41.41	31.93	5.92	33.93	135	331	Peak
2316	33.11	-20.89	54	29.19	31.93	5.92	33.93	135	331	Average
2480	103.55	-	-	99.19	32.18	6.18	34	135	331	Peak
2480	85.83	-	-	81.47	32.18	6.18	34	135	331	Average
2483.5	68.33	-5.67	74	63.97	32.18	6.18	34	135	331	Peak
2483.5	28.46	-25.54	54	24.1	32.18	6.18	34	135	331	Average



<b>Test Mode :</b>	Mode 3	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	78	<b>Relative Humidity :</b>	54~56%
<b>Test Engineer :</b>	Kyle Zhuang	<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
34.86	25.43	-14.57	40	39.92	16.4	0.58	31.47	-	-	Peak
139.62	29.24	-14.26	43.5	48.19	11.4	1.2	31.55	100	85	Peak
224.94	28.15	-17.85	46	47.3	10.85	1.45	31.45	-	-	Peak
466.6	19.48	-26.52	46	30.82	17.39	2.34	31.07	-	-	Peak
727.7	23.55	-22.45	46	30.28	21.01	3.01	30.75	-	-	Peak
839.7	24.68	-21.32	46	29.66	22.5	3.24	30.72	-	-	Peak
2366	45.8	-28.2	74	41.75	32.01	5.99	33.95	200	25	Peak
2366	33.25	-20.75	54	29.2	32.01	5.99	33.95	200	25	Average
2480	95.34	-	-	90.98	32.18	6.18	34	200	25	Peak
2480	79.5	-	-	75.14	32.18	6.18	34	200	25	Average
2483.5	60.4	-13.6	74	56.04	32.18	6.18	34	200	25	Peak
2483.5	27.01	-26.99	54	22.65	32.18	6.18	34	200	25	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 FPC 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	100055	9kHz~40GHz	Jun. 13, 2011	Mar. 12, 2012~ Mar. 14, 2012	Jun. 12, 2012	Conducted (TH02-HY)
Bluetooth Base Station	R&S	CBT32	100522	N/A	Feb. 09, 2012	Mar. 12, 2012~ Mar. 14, 2012	Feb. 08, 2013	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Mar. 01, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Mar. 01, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Mar. 01, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Mar. 01, 2012	N/A	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	Mar. 26, 2012~ Apr. 02, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Mar. 26, 2012~ Apr. 02, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	Mar. 26, 2012~ Apr. 02, 2012	Aug. 09, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A023 62	1GHz ~ 26.5GHz	Dec. 05, 2011	Mar. 26, 2012~ Apr. 02, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz ~ 7GHz	Aug. 22, 2011	Mar. 26, 2012~ Apr. 02, 2012	Aug. 21, 2012	Radiation (03CH07-HY)
Bluetooth Base Station	R&S	CBT32	100522	N/A	Feb. 09, 2012	Mar. 26, 2012~ Apr. 02, 2012	Feb. 08, 2013	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/00 1	9 kHz~30 MHz	Jul. 29, 2010	Mar. 26, 2012~ Apr. 02, 2012	Jul. 28, 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
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.13</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.26</b>		

### 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
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.27</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.54</b>		



**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
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>2.36</b>				
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>4.72</b>				





## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP231932 as below.