FCC RF Test Report

APPLICANT	:	Sony Corporation
EQUIPMENT	:	Tablet Device
BRAND NAME	:	SONY
MODEL NAME	:	SGPT1311
FCC ID	:	AK8SGPT1311
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DSS) Spread Spectrum Transmitter

The product was received on Jun. 13, 2012 and completely tested on Jun. 23, 2012. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory 1190

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TABLE OF CONTENTS

REVISION HISTORY **3**

SUMMARY OF TEST RESULT **4**

1 GENERAL DESCRIPTION **5**

1.1 Applicant 5
1.2 Manufacturer 5
1.3 Feature of Equipment Under Test 5
1.4 Testing Site 6
1.5 Applied Standards 6
1.6 Ancillary Equipment List 7

2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST **8**

2.1 RF Output Power 8
2.2 Test Mode 9
2.3 Connection Diagram of Test System 10
2.4 RF Utility 11

3 TEST RESULT **12**

3.1 Number of Channel Measurement 12
3.2 Hopping Channel Separation Measurement 14
3.3 Dwell Time Measurement 17
3.4 20dB and 99% Bandwidth Measurement 19
3.5 Peak Output Power Measurement 32
3.6 Conducted Band Edges Measurement 35
3.7 Conducted Spurious Emission Measurement 37
3.8 Radiated Band Edges Measurement 41
3.9 Radiated Spurious Emission Measurement 51
3.10 AC Conducted Emission Measurement 59
3.11 Antenna Requirements 65

4 LIST OF MEASURING EQUIPMENT **66**

5 UNCERTAINTY OF EVALUATION **67**

APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR261317A	Rev. 01	Initial issue of report	Jul. 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(b)	Hopping Channel Separation	≥ 2/3 of 20dB BW	Pass	-
3.3	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	≤ 0.4sec in 31.6sec period	Pass	-
3.4	15.247(a)(1)	A8.1(a)	20dB Bandwidth	NA	Pass	-
3.4	-	Gen 4.6.1	99% Bandwidth	-	Pass	-
3.5	15.247(b)(1)	A8.1(b)	Peak Output Power	≤ 125 mW	Pass	-
3.6	15.247(d)	A8.5	Conducted Band Edges	≤ 20dBc	Pass	-
3.7	15.247(d)	A8.5	Conducted Spurious Emission	≤ 20dBc	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 9.83 dB at 30.270 MHz
3.10	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 7.90 dB at 0.198 MHz
3.11	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Sony Corporation
1-7-1 Konan, Minato-ku Tokyo, 108-0075 Japan

1.2 Manufacturer

HON HAI PRECISION IND., CO., LTD.
3F, No. 2, Ziyou St., Tucheng Dist., New Taipei City 236, Taiwan, R.O.C.

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Tablet Device
Brand Name	SONY
Model Name	SGPT1311
Integrated Module	Brand Name: SAMSUNG Model Name: SWB-A51H
FCC ID	AK8SGPT1311
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/ WLAN 11abgn / Bluetooth
EUT Stage	Identical Prototype

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

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) : 2.34 dBm (0.0017 W) Bluetooth EDR (2Mbps) : 0.97 dBm (0.0013 W) Bluetooth EDR (3Mbps) : 1.45 dBm (0.0014 W)
99% Occupied Bandwidth	Bluetooth (1Mbps) : 0.852MHz Bluetooth EDR (2Mbps) : 1.168MHz Bluetooth EDR (3Mbps) : 1.176MHz
Antenna Type	Inverted-F Antenna with gain 2.72 dBi
Type of Modulation	GFSK, π/4-DQPSK, 8-DPSK

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.			
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH02-HY	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 and ANSI C63.10-2009
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
4.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
5.	Notebook	DELL	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 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	-0.50	2.34	0.19

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.

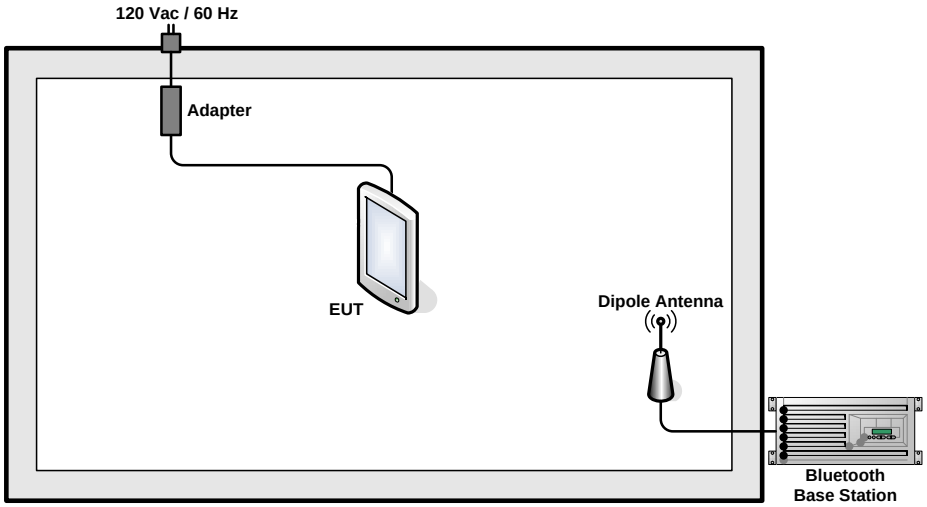
Test Cases			
Test Item	**Data Rate / Modulation**		
	Bluetooth 1Mbps GFSK	**Bluetooth EDR 2Mbps π/4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
Conducted TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	N/A	N/A
AC Conducted Emission	Mode 1 :WLAN (2.4G) Link + Bluetooth Link + Earphone + H Pattern + USB Cable (Charging from Adapter) Mode 2 :WLAN (5G) Link + Bluetooth Link + Earphone + Camera + USB Cable (Charging from Adapter) Mode 3 :WLAN (2.4G) Link + Bluetooth Link + Earphone + MPEG4 + USB Cable (Charging from Adapter) Mode 4 :WLAN (5G) Link + Bluetooth Link + Earphone + GPS Rx + USB Cable (Charging from Adapter)		

Remark:

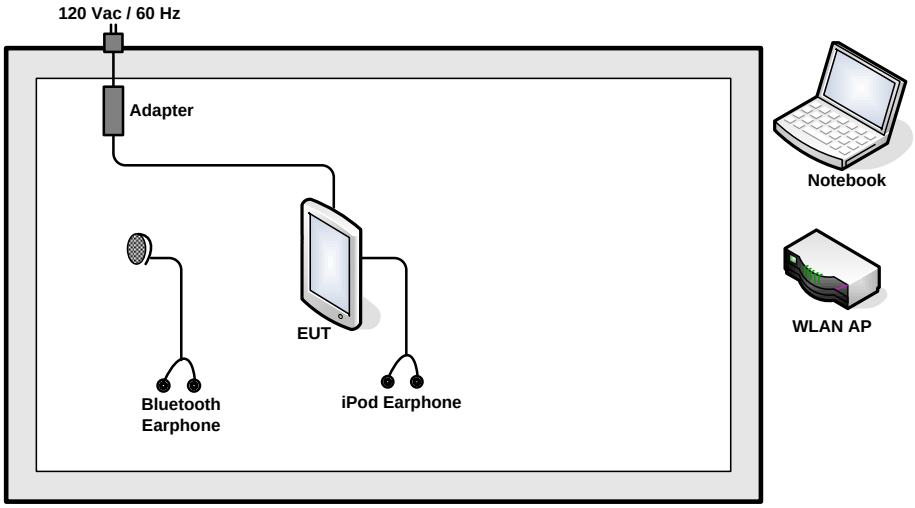
1. For radiated TCs, the data rate was set in 1Mbps due to the highest RF output power; only the data of these modes was reported.
2. For conducted emission, the worst case is mode 3; only the test data of this mode was reported.

2.3 Connection Diagram of Test System

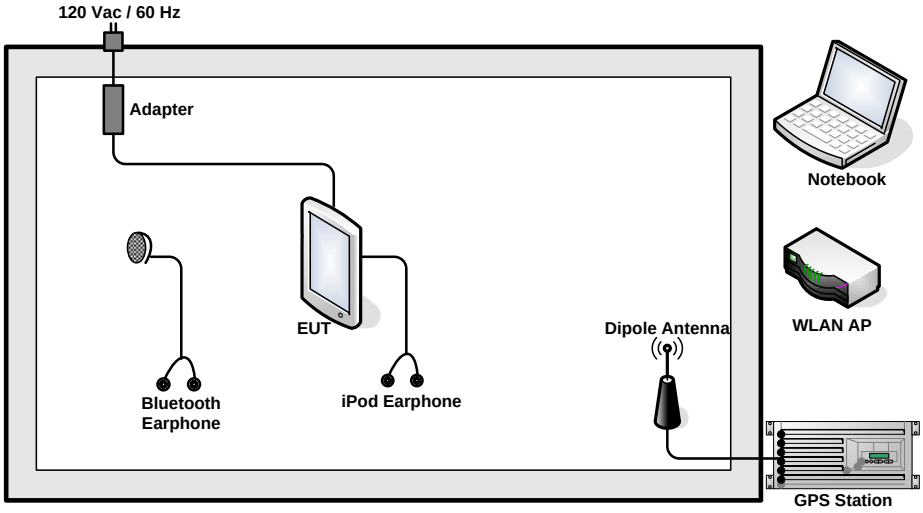
<Bluetooth Tx Mode>



<EUT with Adapter Mode>



<EUT with Adapter in GPS Rx Mode>



2.4 RF Utility

For Bluetooth function, the RF utility, “AT Command” was installed in Notebook which was programmed in order to make the EUT 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.

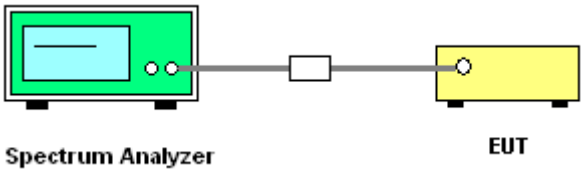
3.1.2 Measuring Instruments

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. The modulation types of EUT are irrelevant to number of hopping channels deviation.
   The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
4. The number of hopping frequency used is defined as the device has the numbers of total channel.

3.1.4 Test Setup

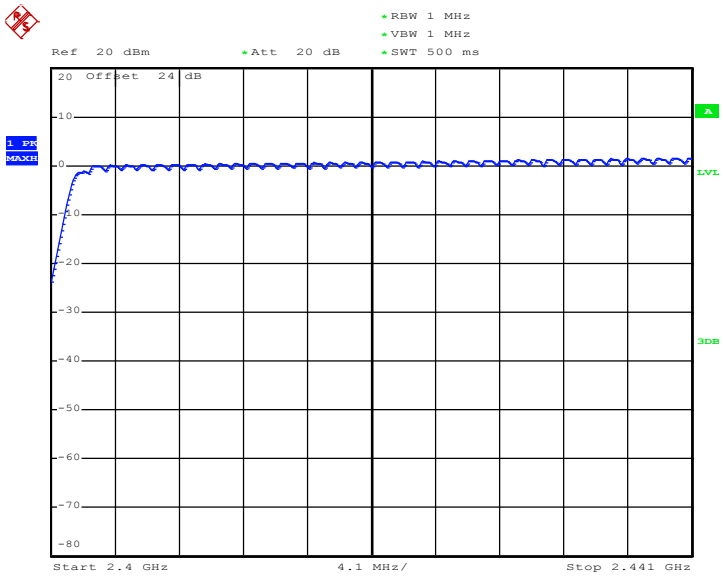


3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

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

Number of Hopping Channel Plot on Channel 00 - 78



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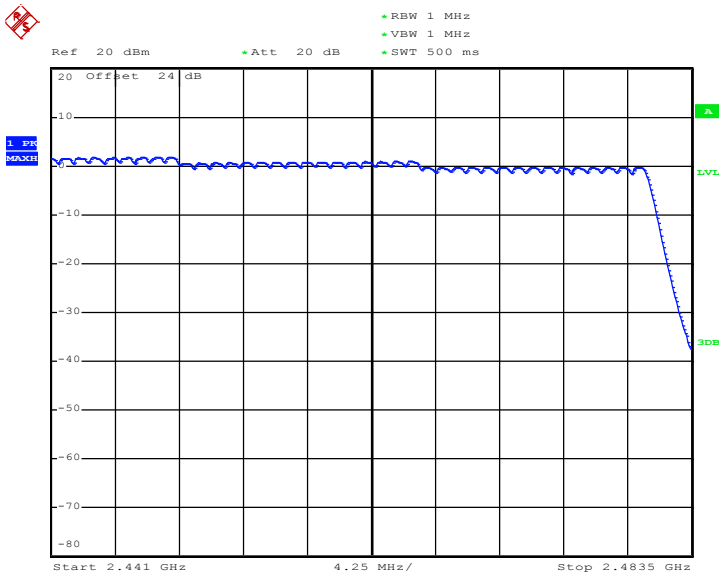


Date: 23.JUN.2012 14:06:03

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.

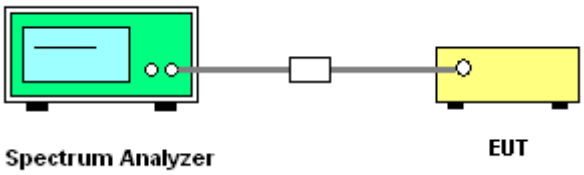
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

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

3.2.4 Test Setup

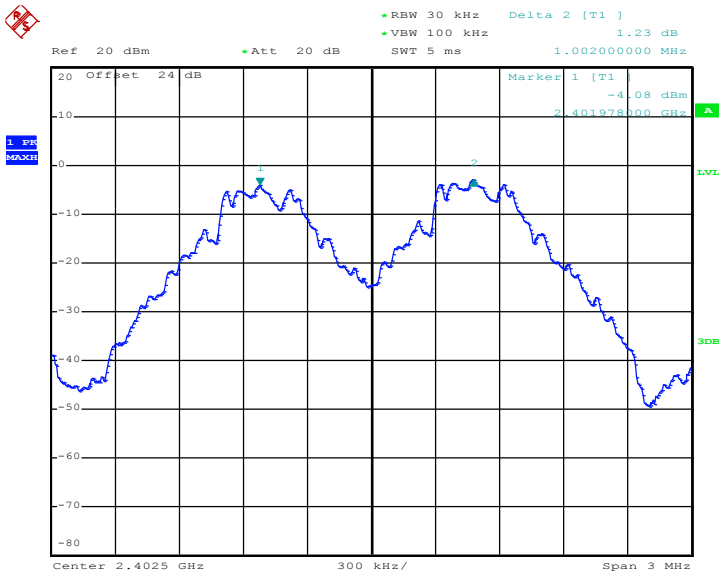


3.2.5 Test Result of Hopping Channel Separation

Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

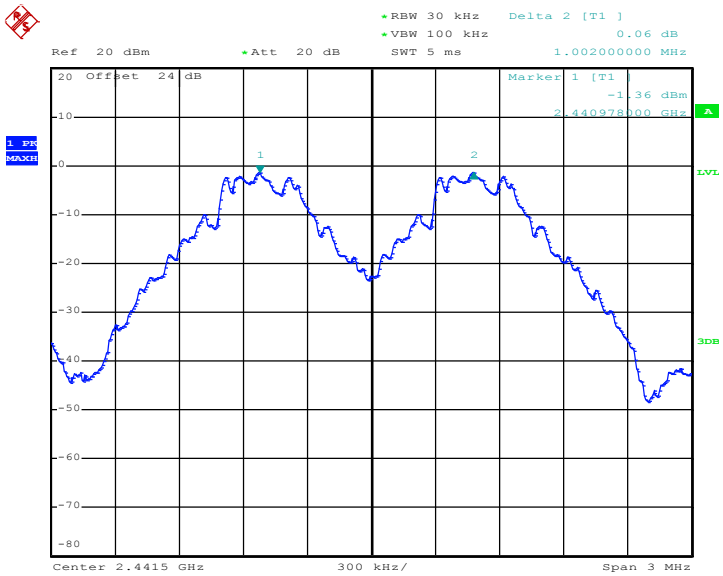
Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.6240	Pass
39	2441	1.002	0.6027	Pass
78	2480	1.002	0.6027	Pass

Channel Separation Plot on Channel 00 - 01



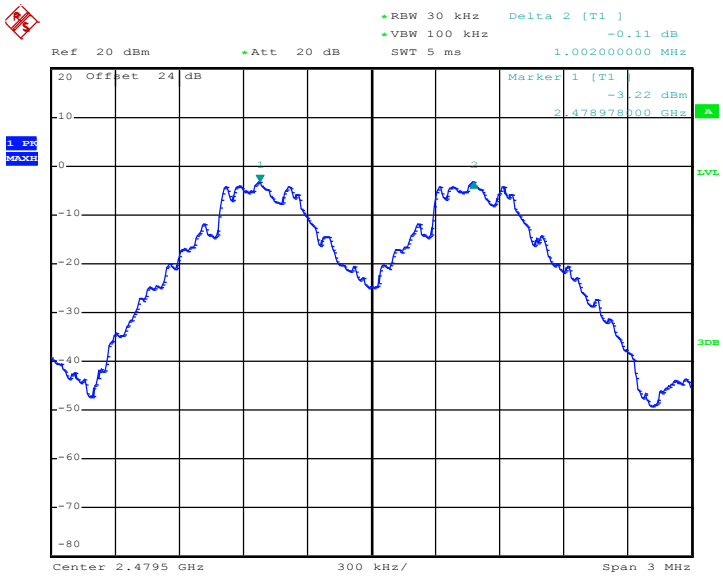
Date: 23.JUN.2012 12:53:26

Channel Separation Plot on Channel 39 - 40



Date: 23.JUN.2012 12:56:23

Channel Separation Plot on Channel 77 - 78



Date: 23.JUN.2012 13:09:50

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.

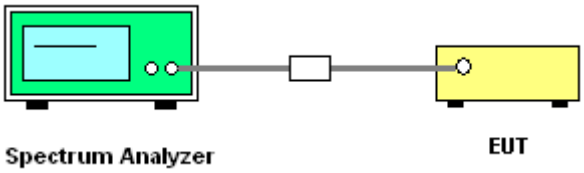
3.3.2 Measuring Instruments

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 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.

3.3.4 Test Setup



3.3.5 Test Result of Dwell Time

Test Mode :	DH5	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
DH5	3.30	2980.00	0.31	0.4	Pass

Remark:

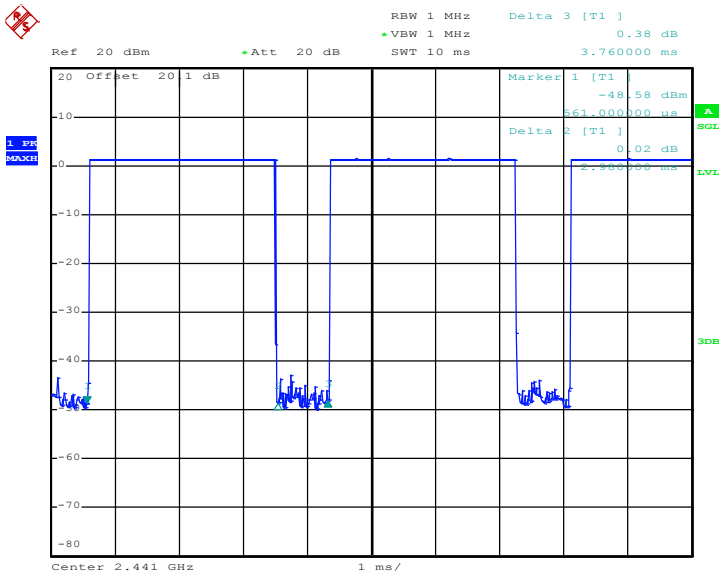
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time

2. 79 channels come from the Hopping Channel number.

3. Average Hopping Channel = hops/sweep time

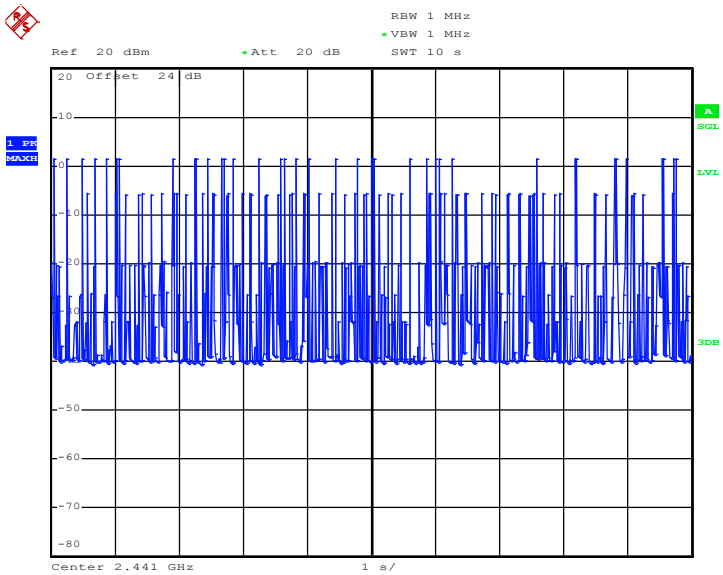
4. T: Package Transfer Time(us)

DH5 Dwell Time (One Pulse) Plot on Channel 39



Date: 15.JUN.2012 17:26:38

DH5 Dwell Time (Count Pulses) Plot on Channel 39



Date: 23.JUN.2012 13:47:08

3.4 20dB and 99% Bandwidth Measurement

3.4.1 Limit of 20dB Bandwidth

N/A

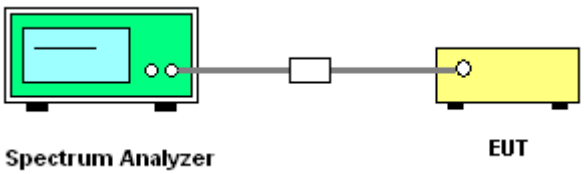
3.4.2 Measuring Instruments

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. Use the following spectrum analyzer settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;
   RBW ≥ 1% of the 20 dB bandwidth; VBW ≥ RBW; Sweep = auto; Detector function = peak;
   Trace = max hold.
5. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

3.4.4 Test Setup

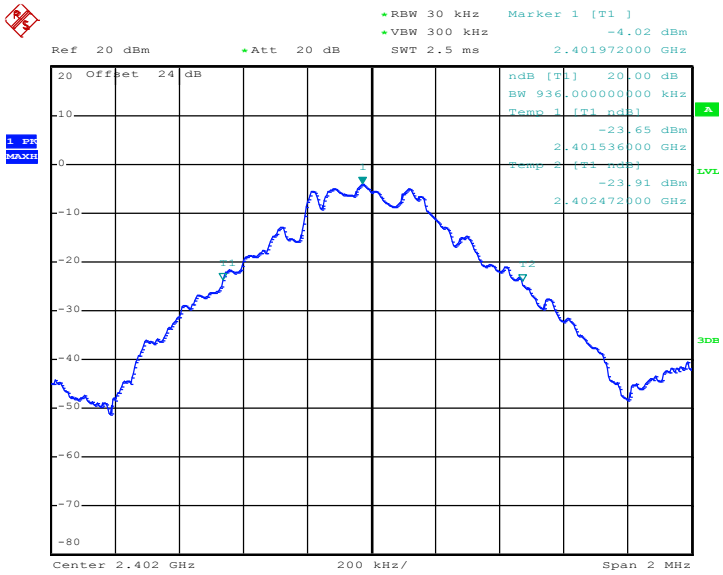


3.4.5 Test Result of 20dB Bandwidth

Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

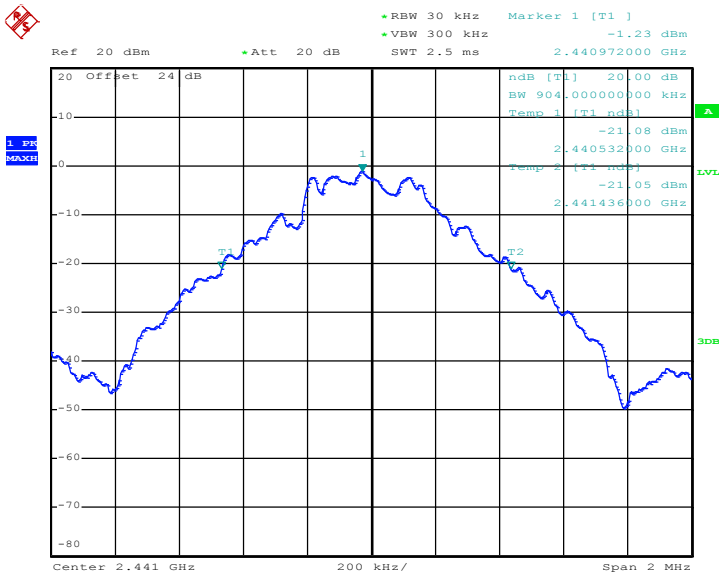
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.936
39	2441	0.904
78	2480	0.904

20 dB Bandwidth Plot on Channel 00



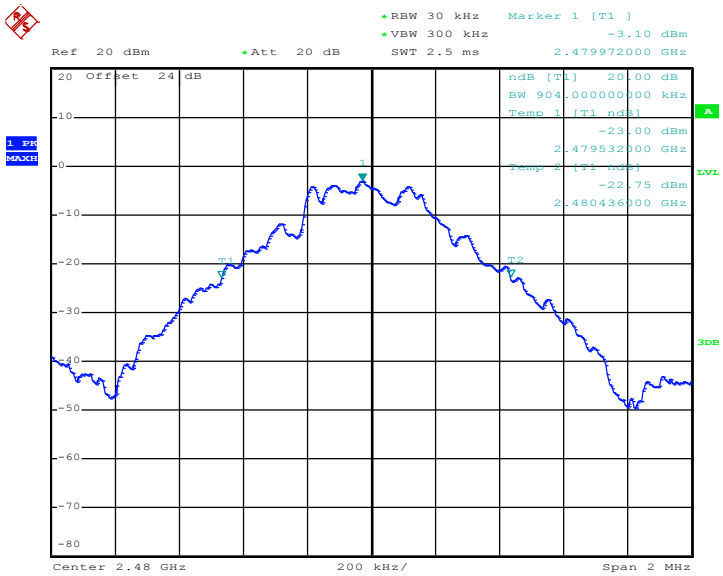
Date: 23.JUN.2012 12:52:34

20 dB Bandwidth Plot on Channel 39



Date: 23.JUN.2012 12:56:57

20 dB Bandwidth Plot on Channel 78

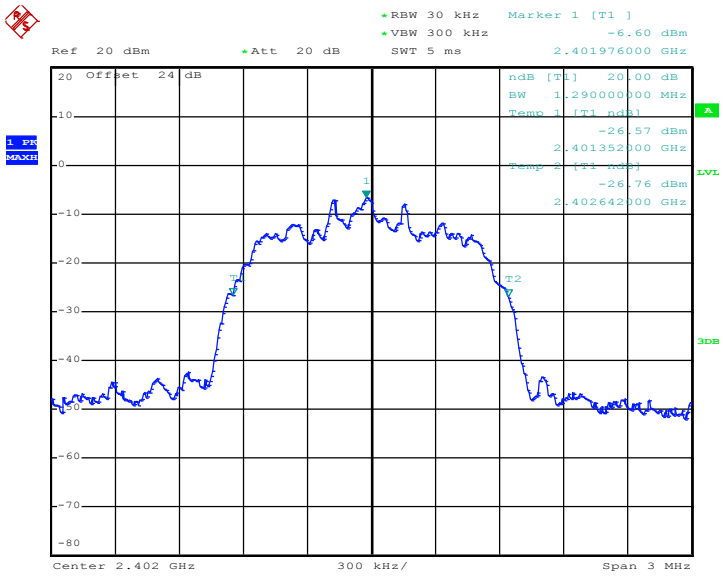


Date: 23.JUN.2012 13:11:01

Test Mode :	2Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.290
39	2441	1.320
78	2480	1.320

20 dB Bandwidth Plot on Channel 00



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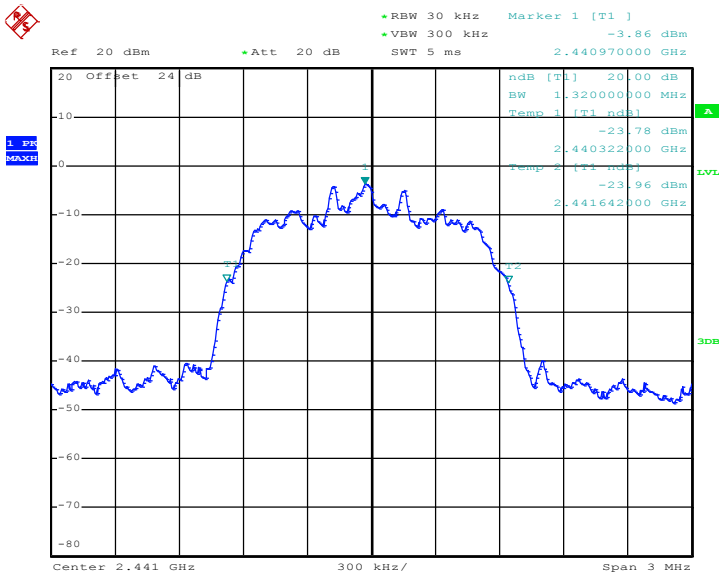
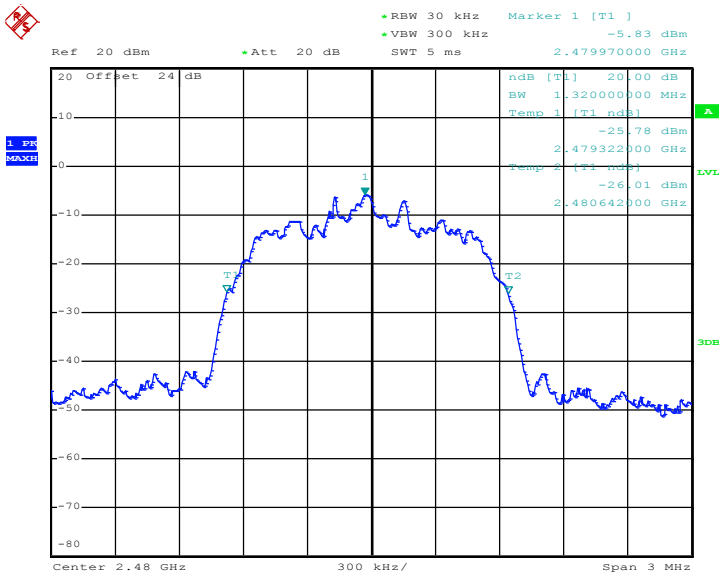
20 dB Bandwidth Plot on Channel 39



Date: 23.JUN.2012 13:18:39

20 dB Bandwidth Plot on Channel 78

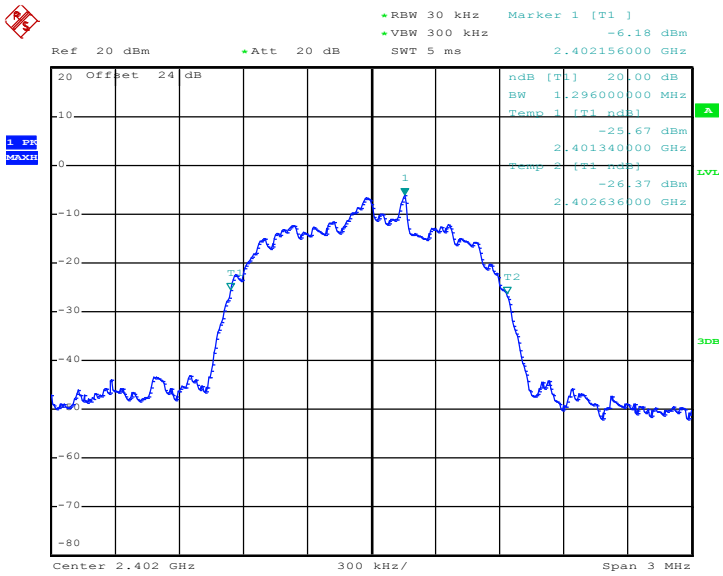


Date: 23.JUN.2012 13:15:09

Test Mode :	3Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.296
39	2441	1.302
78	2480	1.296

20 dB Bandwidth Plot on Channel 00



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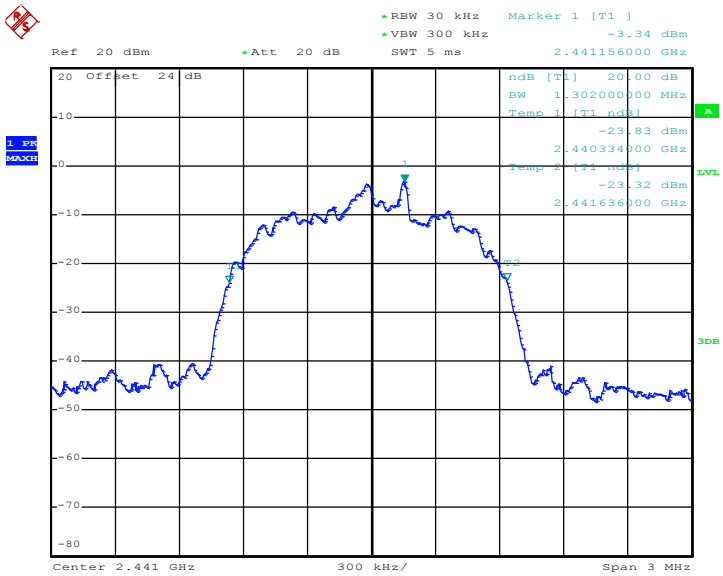
20 dB Bandwidth Plot on Channel 39



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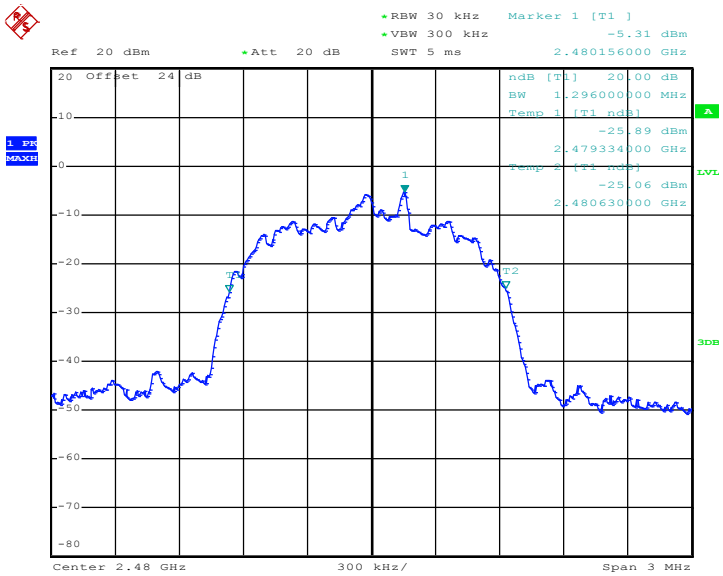
20 dB Bandwidth Plot on Channel 78



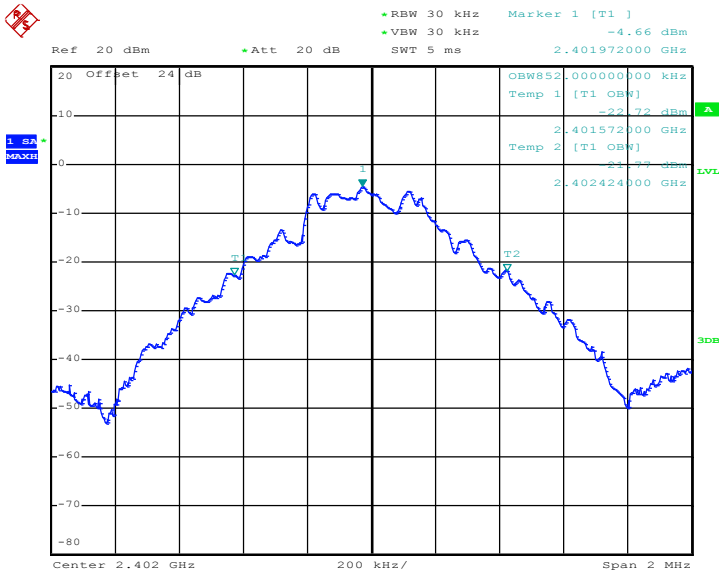
Date: 23.JUN.2012 13:38:29

3.4.6 Test Result of 99% Occupied Bandwidth

Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

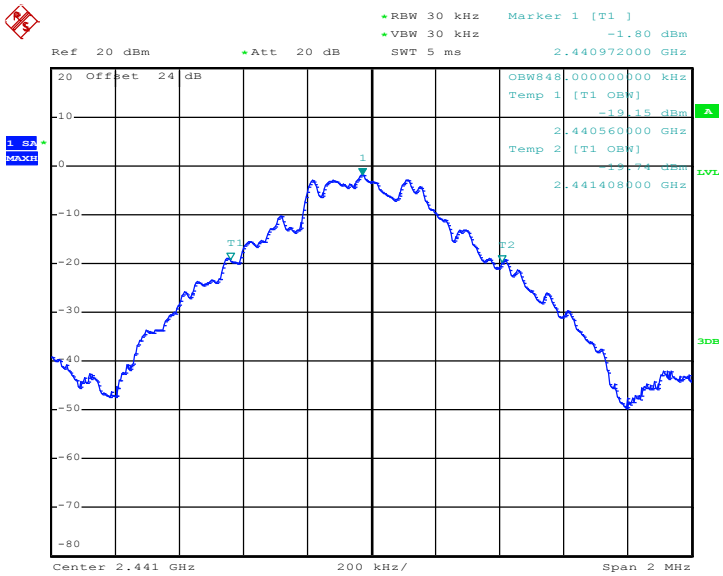
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	0.852
39	2441	0.848
78	2480	0.848

99% Bandwidth Plot on Channel 00



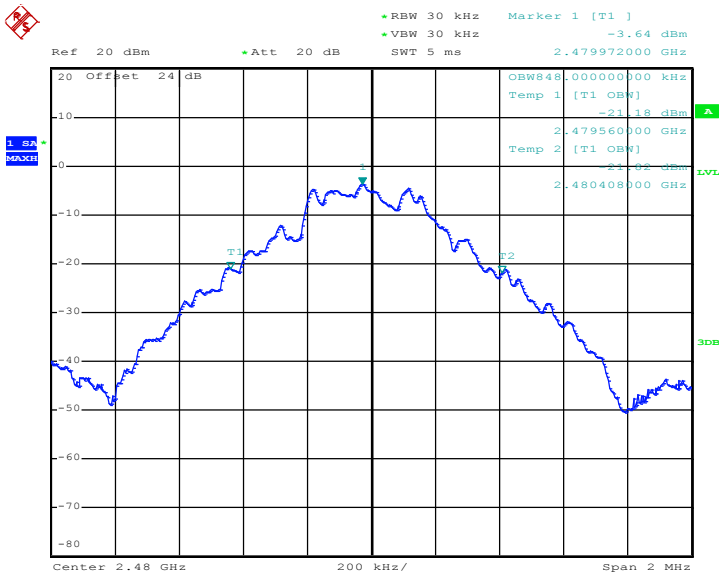
Date: 23.JUN.2012 12:54:41

99% Occupied Bandwidth Plot on Channel 39



Date: 23.JUN.2012 12:57:32

99% Occupied Bandwidth Plot on Channel 78

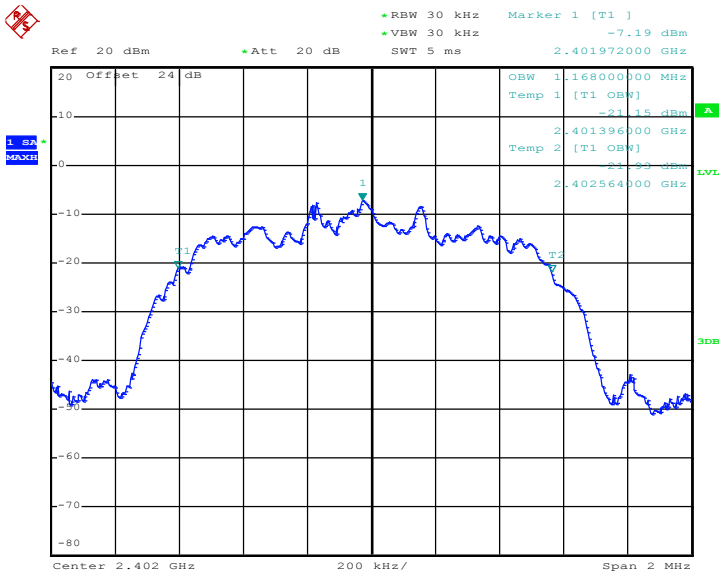


Date: 23.JUN.2012 13:11:43

Test Mode :	2Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

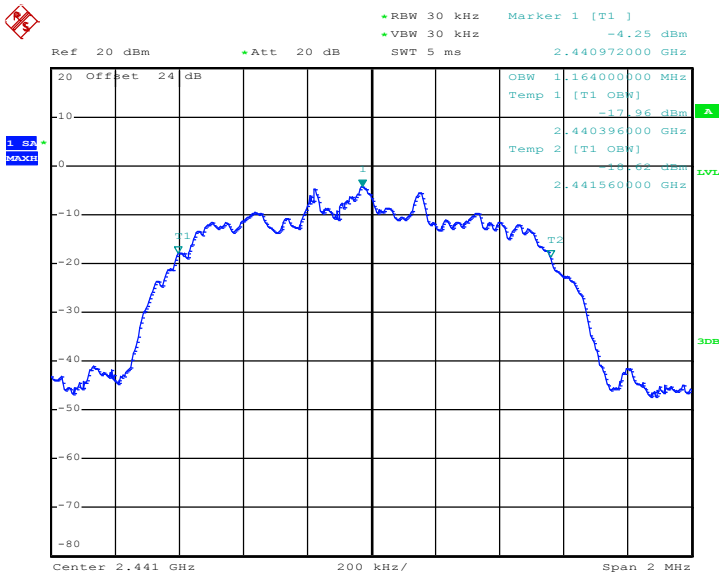
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.168
39	2441	1.164
78	2480	1.164

99% Bandwidth Plot on Channel 00



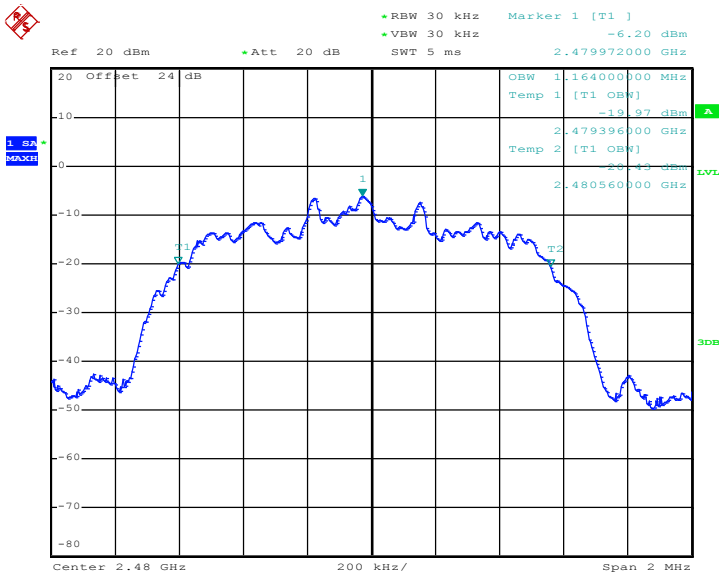
Date: 23.JUN.2012 13:24:31

99% Occupied Bandwidth Plot on Channel 39



Date: 23.JUN.2012 13:19:15

99% Occupied Bandwidth Plot on Channel 78

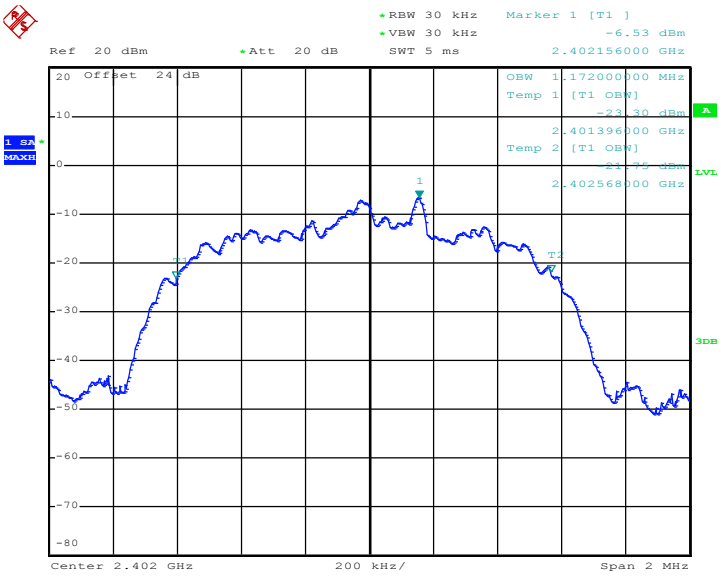


Date: 23.JUN.2012 13:14:25

Test Mode :	3Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

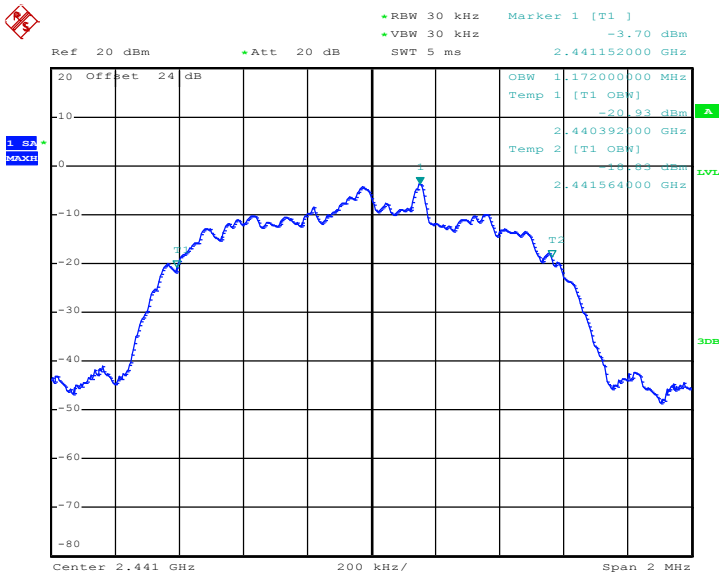
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.172
39	2441	1.172
78	2480	1.176

99% Bandwidth Plot on Channel 00



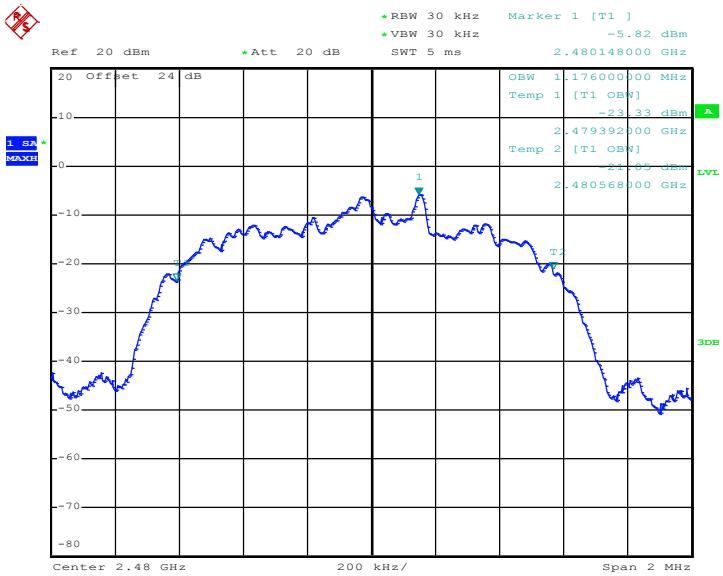
Date: 23.JUN.2012 13:29:04

99% Occupied Bandwidth Plot on Channel 39



Date: 23.JUN.2012 13:35:23

99% Occupied Bandwidth Plot on Channel 78



Date: 23.JUN.2012 13:39:30

3.5 Peak Output Power Measurement

3.5.1 Limit of Peak Output Power

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

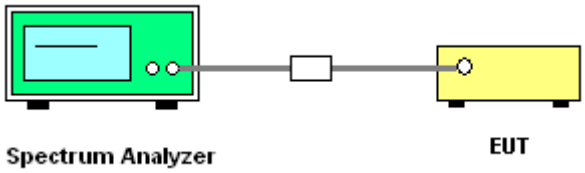
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup

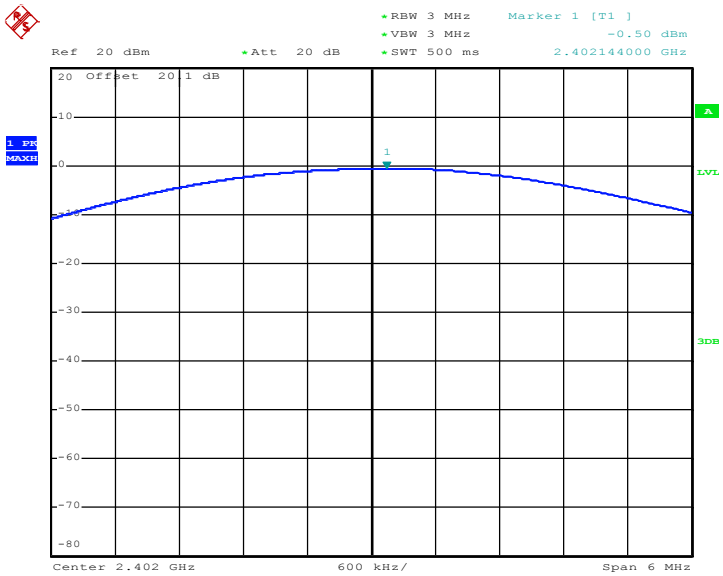


3.5.5 Test Result of Peak Output Power

Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

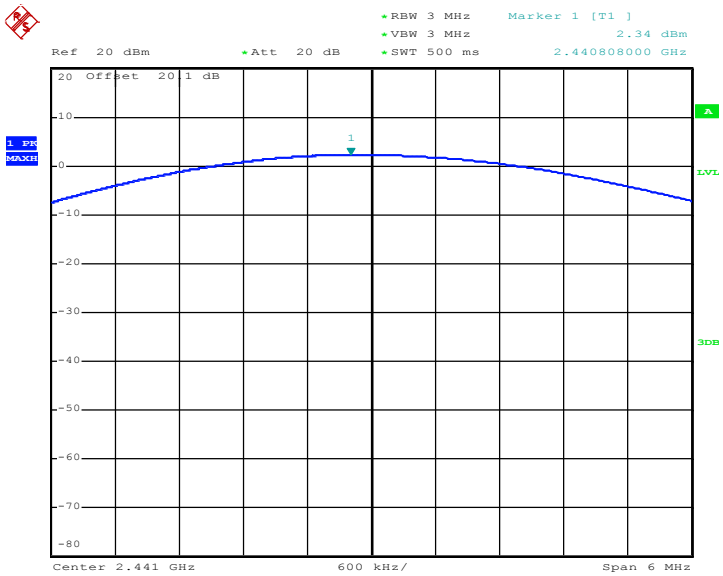
Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	-0.50	30.00	Pass
39	2441	2.34	30.00	Pass
78	2480	0.19	30.00	Pass

Peak Output Power Plot on Channel 00



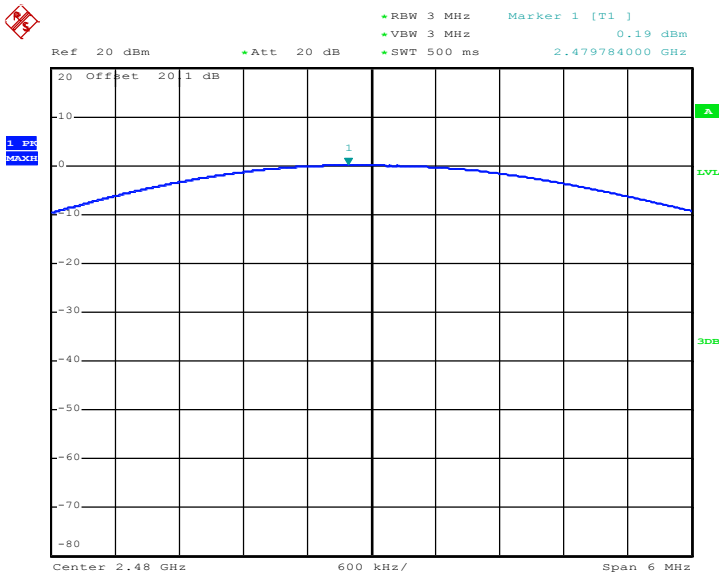
Date: 16.JUN.2012 21:20:23

Peak Output Power Plot on Channel 39



Date: 16.JUN.2012 21:21:37

Peak Output Power Plot on Channel 78



Date: 16.JUN.2012 21:22:50

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.

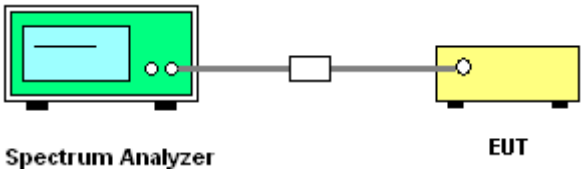
3.6.2 Measuring Instruments

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 RBW = 300KHz (≥ 1% span=30MHz), VBW = 300KHz (≥ 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. 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.

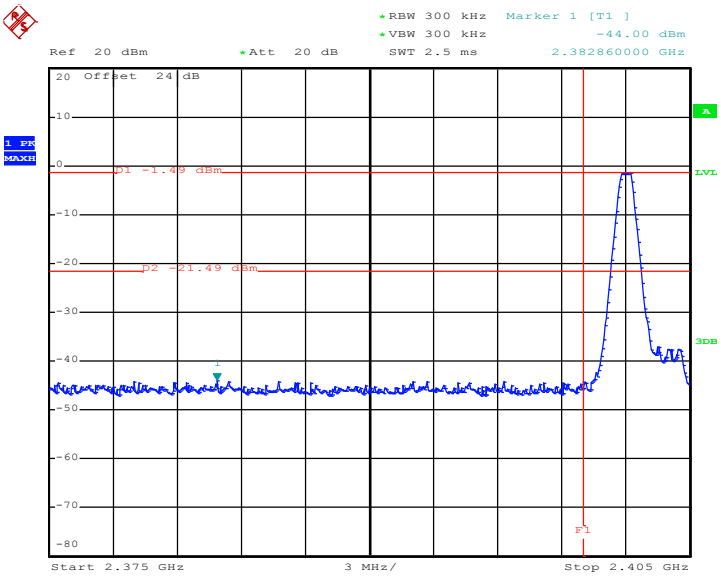
3.6.4 Test Setup



2.6.5 Test Result of Conducted Band Edges

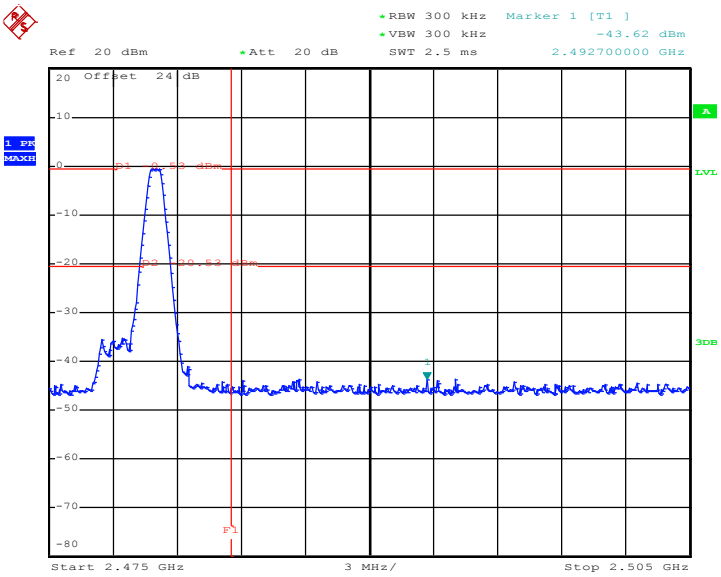
Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Channel :	00 and 78	**Relative Humidity :**	50~53%
		Test Engineer :	Reece Li

Low Band Edge Plot on Channel 00



Date: 23.JUN.2012 12:53:51

High Band Edge Plot on Channel 78



Date: 23.JUN.2012 13:10:36

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.

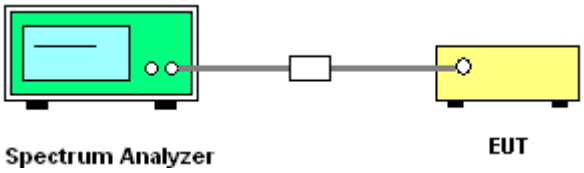
3.7.2 Measuring Instruments

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 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.

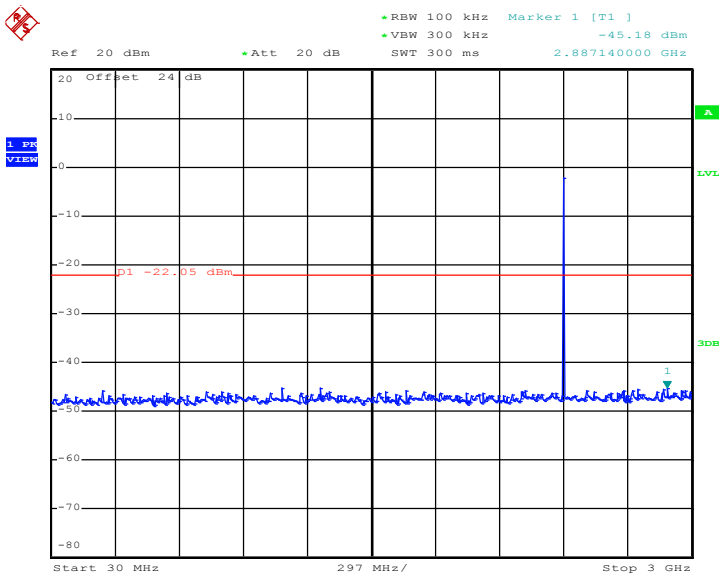
3.7.4 Test Setup



3.7.5 Test Result

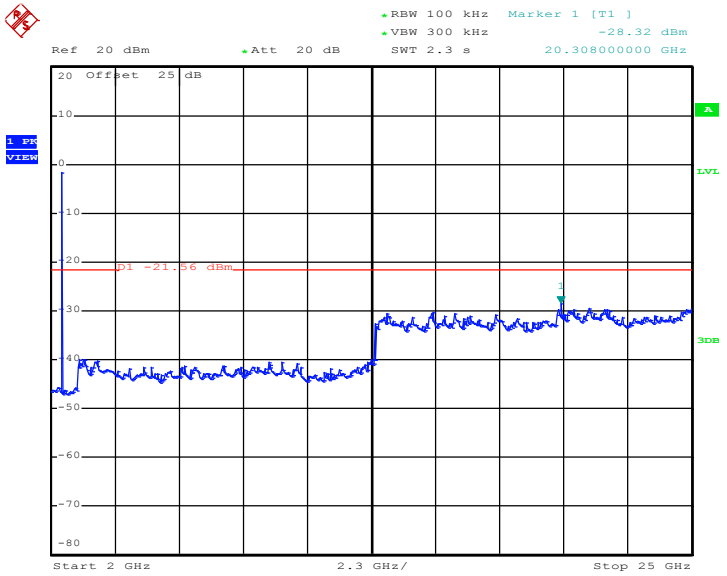
Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Channel :	00	**Relative Humidity :**	50~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 23.JUN.2012 12:55:05

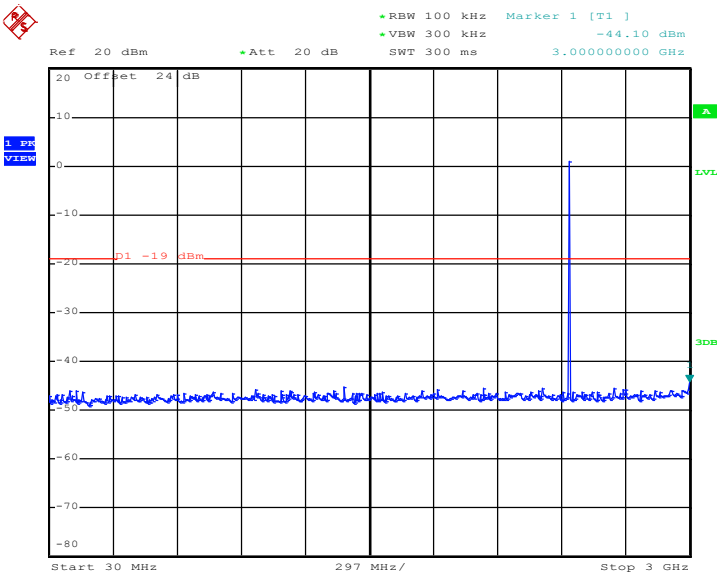
Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz



Date: 23.JUN.2012 12:55:27

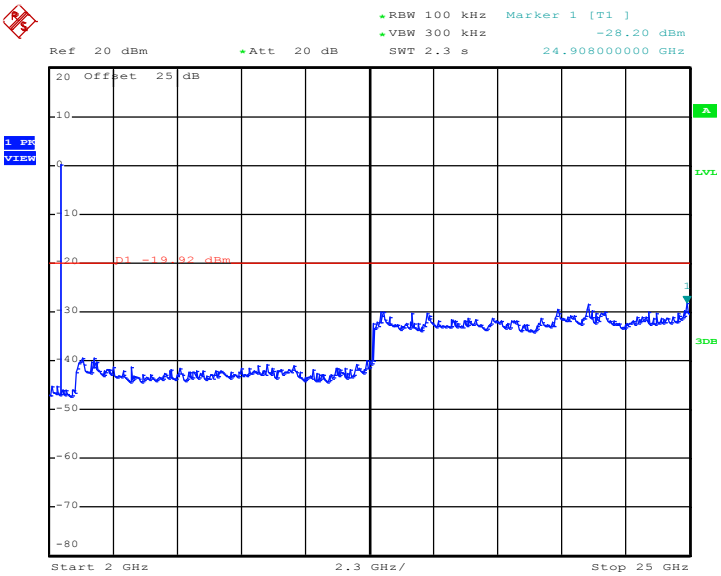
Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Channel :	39	**Relative Humidity :**	50~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 23.JUN.2012 12:59:57

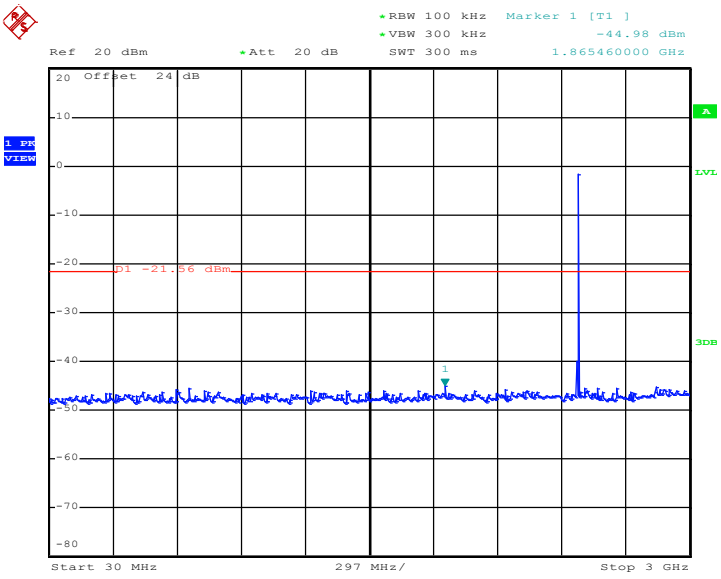
Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz



Date: 23.JUN.2012 13:00:19

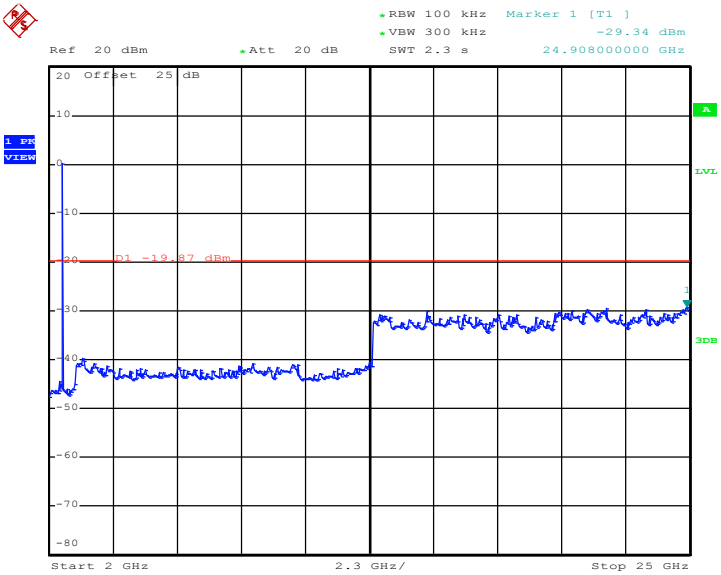
Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Channel :	78	**Relative Humidity :**	50~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 23.JUN.2012 13:12:08

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz



Date: 23.JUN.2012 13:12:31

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

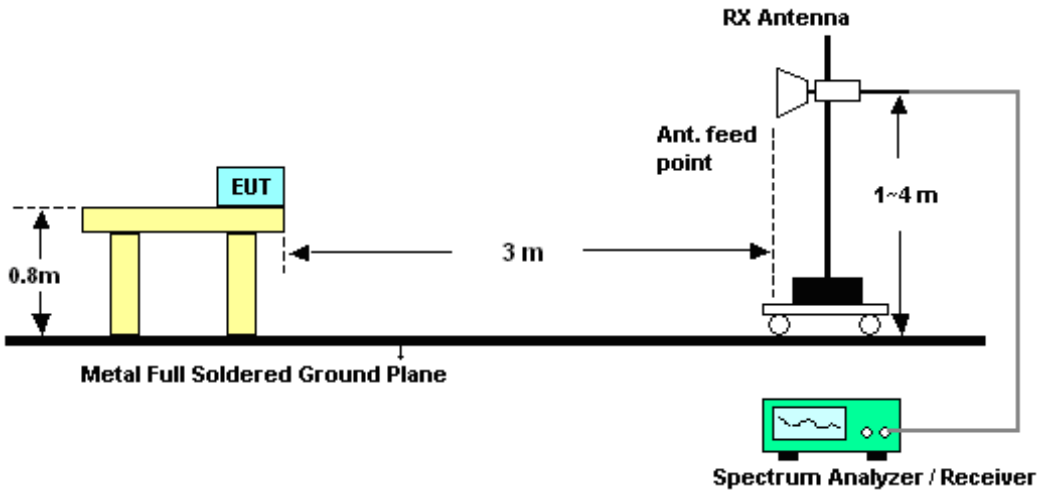
3.8.2 Measuring Instruments

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 test site requirement. 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.
2. 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).
3. 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.

3.8.4 Test Setup



3.8.5 Test Result of Radiated Band Edges

Test Mode :	1Mbps	**Temperature :**	24~25°C
Test Channel :	00	**Relative Humidity :**	41~42%
		Test Engineer :	Gavin Wu

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
2362.38	44.93	-29.07	74	40.88	32.01	5.99	33.95	138	336	Peak
2362.38	32.46	-21.54	54	28.41	32.01	5.99	33.95	138	336	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
2330.88	45.01	-28.99	74	41.06	31.96	5.92	33.93	166	60	Peak
2330.88	32.55	-41.45	54	28.6	31.96	5.92	33.93	166	60	Average

Test Mode :	1Mbps	**Temperature :**	24~25°C
Test Channel :	78	**Relative Humidity :**	41~42%
		Test Engineer :	Gavin Wu

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	60.39	-13.61	74	56.03	32.18	6.18	34	158	163	Peak
2483.5	26.92	-27.08	54	22.56	32.18	6.18	34	158	163	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	85.29	58.37	26.92	54	-27.08	Pass
Hopping Mode	85.29	59.28	26.01	54	-27.99	Pass

Note : Average result = Maximum field strength – Delta result

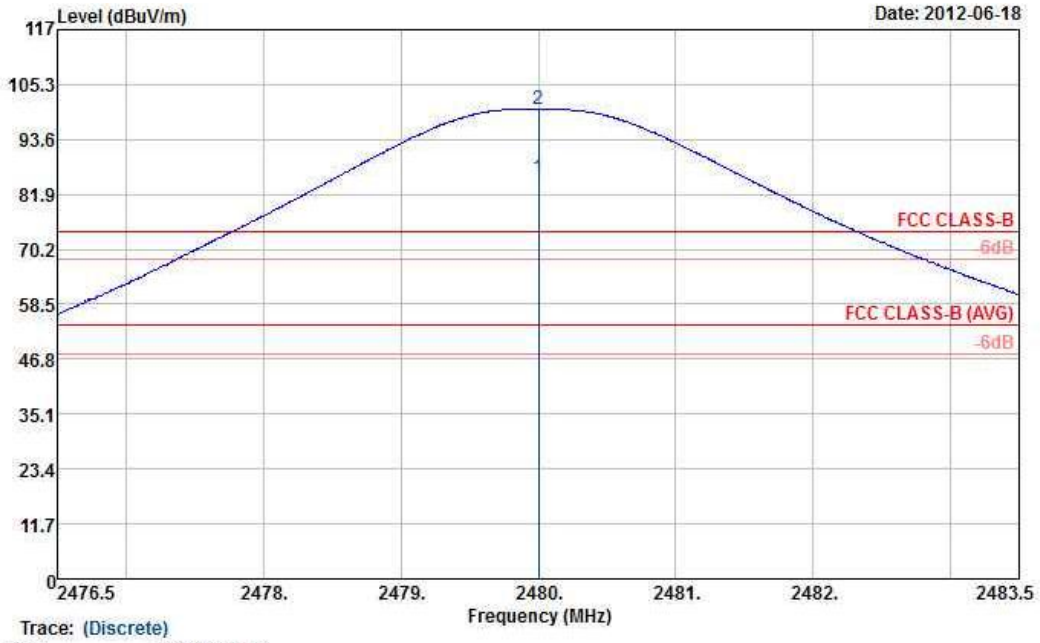
ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	57.44	-16.56	74	53.08	32.18	6.18	34	166	69	Peak
2483.5	26.05	-27.95	54	21.69	32.18	6.18	34	166	69	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	82.98	56.93	26.05	54	-27.95	Pass
Hopping Mode	82.98	57.19	25.79	54	-28.21	Pass

Note : Average result = Maximum field strength – Delta result

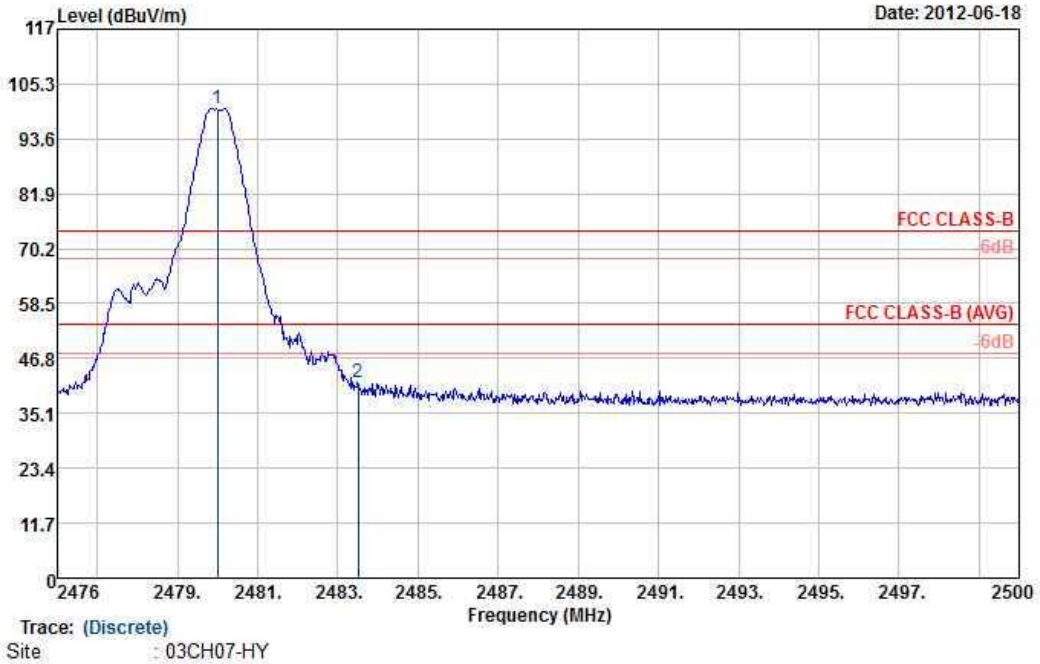
Test Mode :	Mode 3	**Temperature :**	24~25°C
Test Channel :	78	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 *	2480.00	85.29	11.29	74.00	80.93	32.18	6.18	34.00	158	163	Average
2 *	2480.00	100.07	26.07	74.00	95.71	32.18	6.18	34.00	158	163	Peak

* Maximum field strength of the fundamental emission

Test Mode :	Mode 3	**Temperature :**	24~25°C
Test Channel :	78	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Horizontal

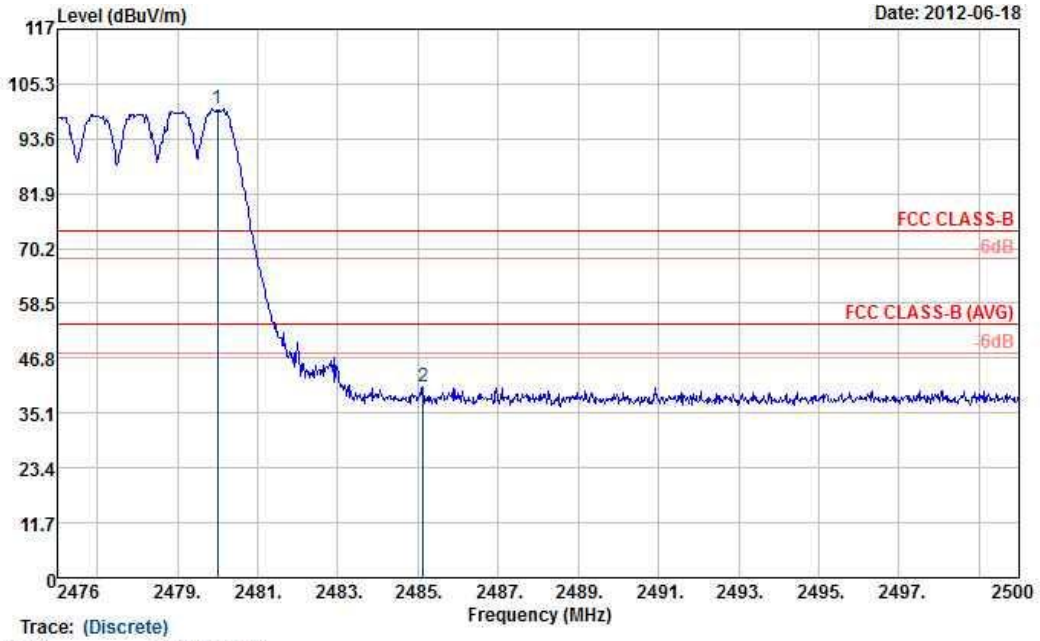


Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_110816 HORIZONTAL

		Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	*	2480.00	100.05	26.05	74.00	95.69	32.18	6.18	34.00	158	163	Peak
2		2483.50	41.68	-32.32	74.00	37.32	32.18	6.18	34.00	158	163	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 58.37 dB , single carrier Mode

Test Mode :	Mode 3	**Temperature :**	24~25°C
Test Channel :	78	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Horizontal

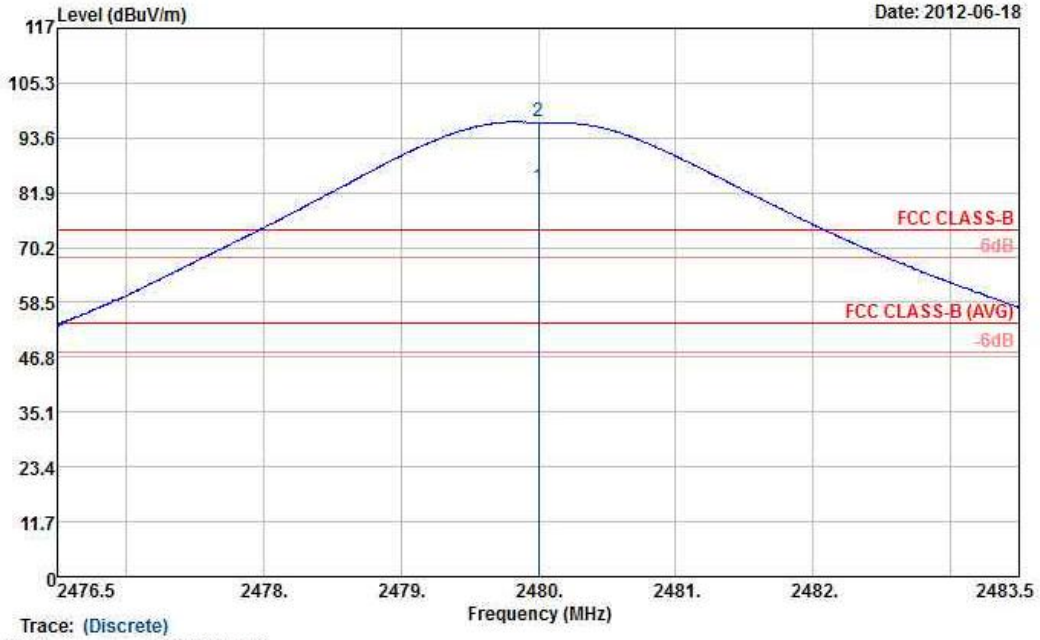


Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_110816 HORIZONTAL

		Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	*	2480.00	99.95	25.95	74.00	95.59	32.18	6.18	34.00	158	163	Peak
2		2485.12	40.67	-33.33	74.00	36.31	32.18	6.18	34.00	158	163	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 59.28 dB , Hopping Mode

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	41~42%
Test Engineer :	Gavin Wu	Polarization :	Vertical

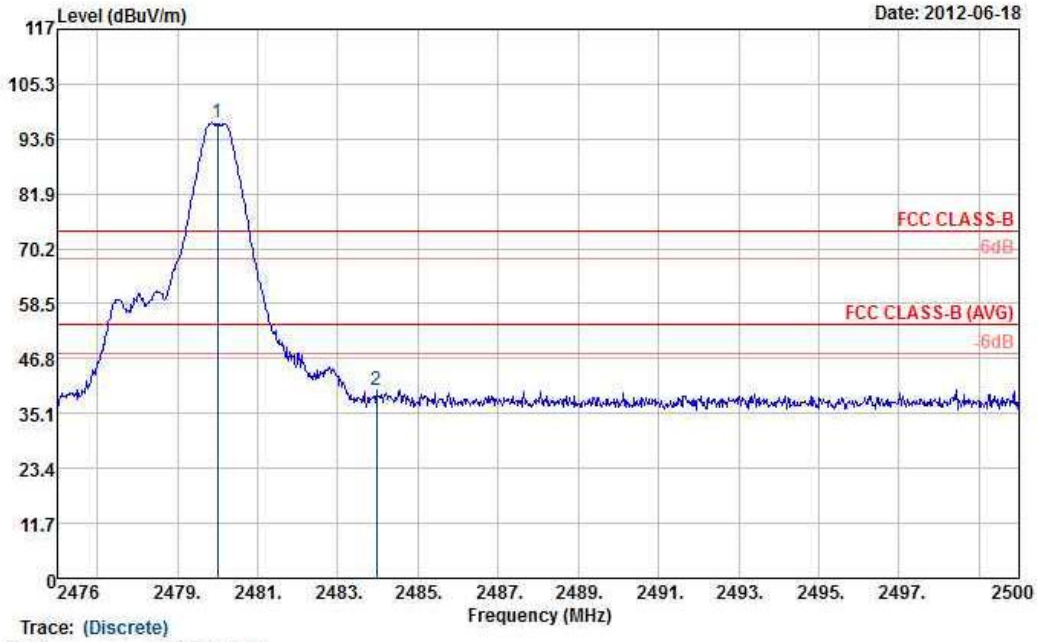


Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_110816 VERTICAL

		Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	*	2480.00	82.98	8.98	74.00	78.62	32.18	6.18	34.00	166	69	Average
2	*	2480.00	97.02	23.02	74.00	92.66	32.18	6.18	34.00	166	69	Peak

* Maximum field strength of the fundamental emission

Test Mode :	Mode 3	**Temperature :**	24~25°C
Test Channel :	78	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Vertical

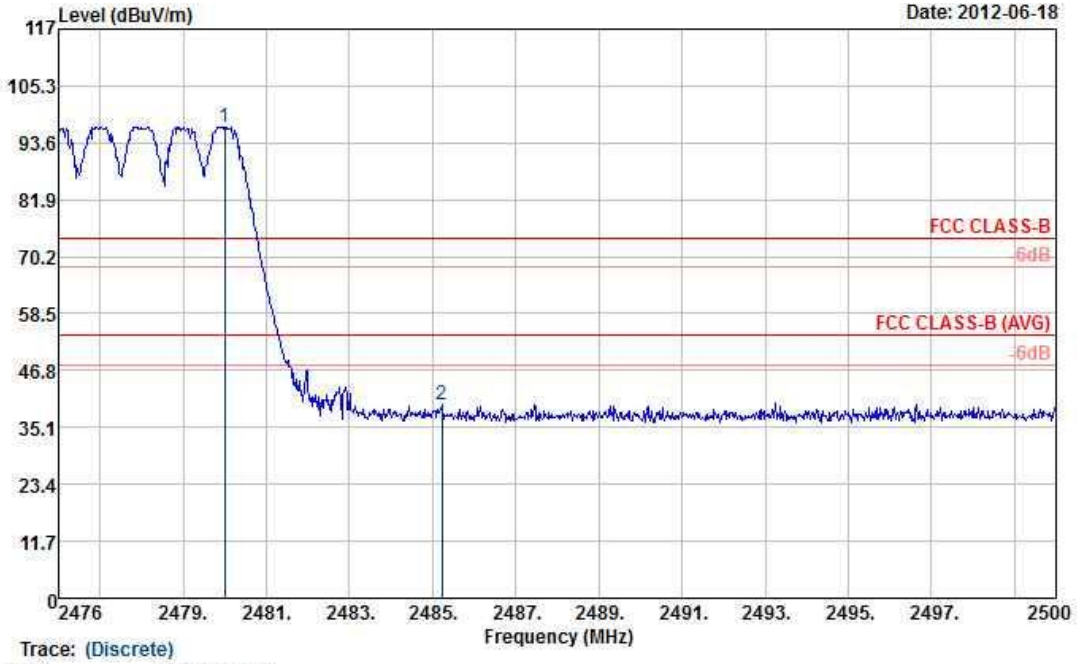


Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_110816 VERTICAL

		Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	*	2480.00	97.02	23.02	74.00	92.66	32.18	6.18	34.00	166	69	Peak
2		2483.97	40.09	-33.91	74.00	35.73	32.18	6.18	34.00	166	69	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 56.93 dB , single carrier Mode

Test Mode :	Mode 3	**Temperature :**	24~25°C
Test Channel :	78	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Vertical



Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_110816 VERTICAL

		Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	*	2480.00	96.93	22.93	74.00	92.57	32.18	6.18	34.00	166	69	Peak
2		2485.22	39.74	-34.26	74.00	35.38	32.18	6.18	34.00	166	69	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 57.19 dB , Hopping 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

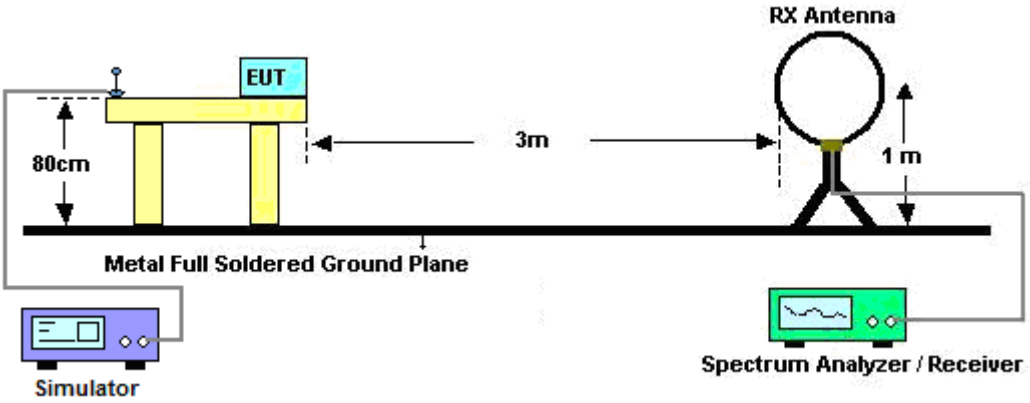
See list of measuring instruments of this test report.

3.9.3 Test Procedures

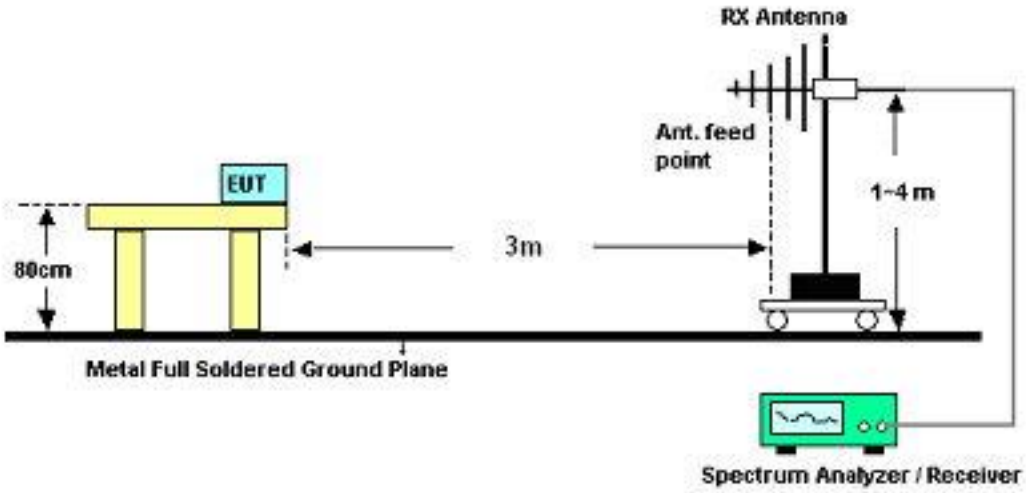
1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines and fulfills ANSI C63.4-2003 test site requirement.
2. Applies to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average 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).
3. Follow the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009 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 if the peak value is greater than 54 dBuv/m

3.9.4 Test Setup

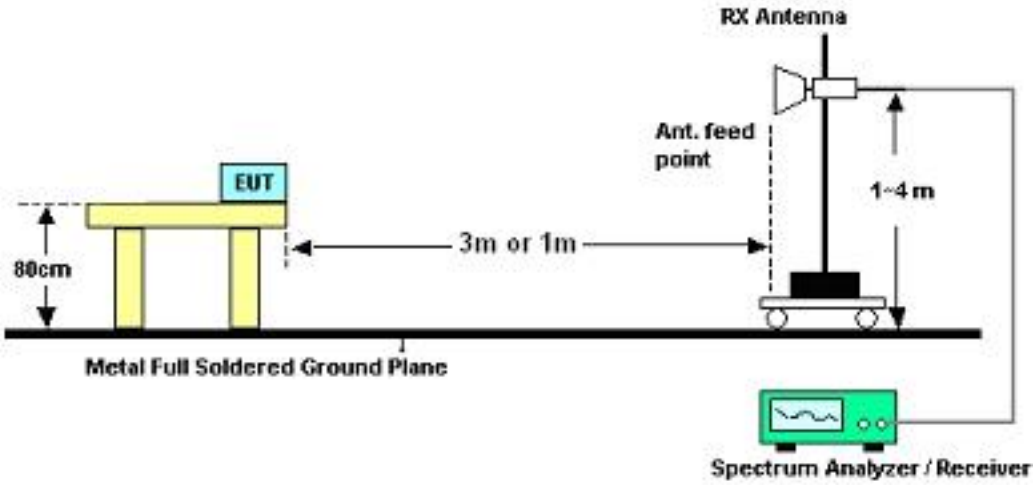
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

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

Test Mode :	1Mbps	**Temperature :**	24~25°C
Test Channel :	00	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Horizontal
Remark :	2402 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2362.38	32.46	-21.54	54	28.41	32.01	5.99	33.95	138	336	Average
2362.38	44.93	-29.07	74	40.88	32.01	5.99	33.95	138	336	Peak
2402	82.34	-	-	78.21	32.06	6.03	33.96	138	336	Average
2402	95.87	-	-	91.74	32.06	6.03	33.96	138	336	Peak
2490	32.09	-21.91	54	27.71	32.2	6.18	34	138	336	Average
2490	43.4	-30.6	74	39.02	32.2	6.18	34	138	336	Peak

Test Mode :	1Mbps	**Temperature :**	24~25°C
Test Channel :	00	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Vertical
Remark :	2402 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2330.88	32.55	-41.45	54	28.6	31.96	5.92	33.93	166	60	Average
2330.88	45.01	-28.99	74	41.06	31.96	5.92	33.93	166	60	Peak
2402	81.53	-	-	77.4	32.06	6.03	33.96	166	60	Average
2402	95.4	-	-	91.27	32.06	6.03	33.96	166	60	Peak
2494	32.31	-41.69	54	27.93	32.2	6.18	34	166	60	Average
2494	44.22	-29.78	74	39.84	32.2	6.18	34	166	60	Peak

Test Mode :	1Mbps	**Temperature :**	24~25°C
Test Channel :	39	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Horizontal
Remark :	2441 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2340	32.74	-21.26	54	28.75	31.98	5.95	33.94	192	270	Average
2340	44.33	-29.67	74	40.34	31.98	5.95	33.94	192	270	Peak
2441	82.58	-	-	78.32	32.13	6.11	33.98	192	270	Average
2441	97.28	-	-	93.02	32.13	6.11	33.98	192	270	Peak
2484	32.34	-21.66	54	27.98	32.18	6.18	34	192	270	Average
2484	43.8	-30.2	74	39.44	32.18	6.18	34	192	270	Peak

Test Mode :	1Mbps	**Temperature :**	24~25°C
Test Channel :	39	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Vertical
Remark :	2441 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2318	32.63	-21.37	54	28.68	31.96	5.92	33.93	198	67	Average
2318	43.47	-30.53	74	39.52	31.96	5.92	33.93	198	67	Peak
2441	83.67	-	-	79.41	32.13	6.11	33.98	198	67	Average
2441	97.83	-	-	93.57	32.13	6.11	33.98	198	67	Peak
2486	32.44	-21.56	54	28.08	32.18	6.18	34	198	67	Average
2486	44.39	-29.61	74	40.03	32.18	6.18	34	198	67	Peak

Test Mode :	1Mbps	**Temperature :**	24~25°C
Test Channel :	78	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Horizontal
Remark :	2480 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.89	21.15	-18.85	40	33.91	18.56	0.55	31.87	-	-	Peak
169.86	21.93	-21.57	43.5	42.41	9.57	1.23	31.28	-	-	Peak
207.12	28.92	-14.58	43.5	49.32	9.64	1.35	31.39	100	82	Peak
314	25.78	-20.22	46	41.46	13.69	1.8	31.17	-	-	Peak
646.5	22.6	-23.4	46	29.97	20.17	2.83	30.37	-	-	Peak
834.8	24.47	-21.53	46	29.22	22.45	3.23	30.43	-	-	Peak
2322	32.4	-21.6	54	28.45	31.96	5.92	33.93	158	163	Average
2322	43.7	-30.3	74	39.75	31.96	5.92	33.93	158	163	Peak
2480	85.29	-	-	80.93	32.18	6.18	34	158	163	Average
2480	99.84	-	-	95.48	32.18	6.18	34	158	163	Peak
2483.5	26.92	-27.08	54	22.56	32.18	6.18	34	158	163	Average
2483.5	60.39	-13.61	74	56.03	32.18	6.18	34	158	163	Peak

Test Mode :	1Mbps	**Temperature :**	24~25°C
Test Channel :	78	**Relative Humidity :**	41~42%
Test Engineer :	Gavin Wu	**Polarization :**	Vertical
Remark :	2480 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.27	30.17	-9.83	40	41.51	20	0.53	31.87	100	82	Peak
81.3	27.44	-12.56	40	50.48	7.79	0.89	31.72	-	-	Peak
170.94	24.92	-18.58	43.5	45.49	9.47	1.23	31.27	-	-	Peak
339.2	19.62	-26.38	46	34.76	14.37	1.89	31.4	-	-	Peak
616.4	22.67	-23.33	46	30.48	19.93	2.74	30.48	-	-	Peak
867	25.11	-20.89	46	29.69	22.77	3.29	30.64	-	-	Peak
2330	32.38	-21.62	54	28.43	31.96	5.92	33.93	166	69	Average
2330	43.05	-30.95	74	39.1	31.96	5.92	33.93	166	69	Peak
2480	82.98	-	-	78.62	32.18	6.18	34	166	69	Average
2480	96.96	-	-	92.6	32.18	6.18	34	166	69	Peak
2483.5	26.05	-27.95	54	21.69	32.18	6.18	34	166	69	Average
2483.5	57.44	-16.56	74	53.08	32.18	6.18	34	166	69	Peak

3.10 AC 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.

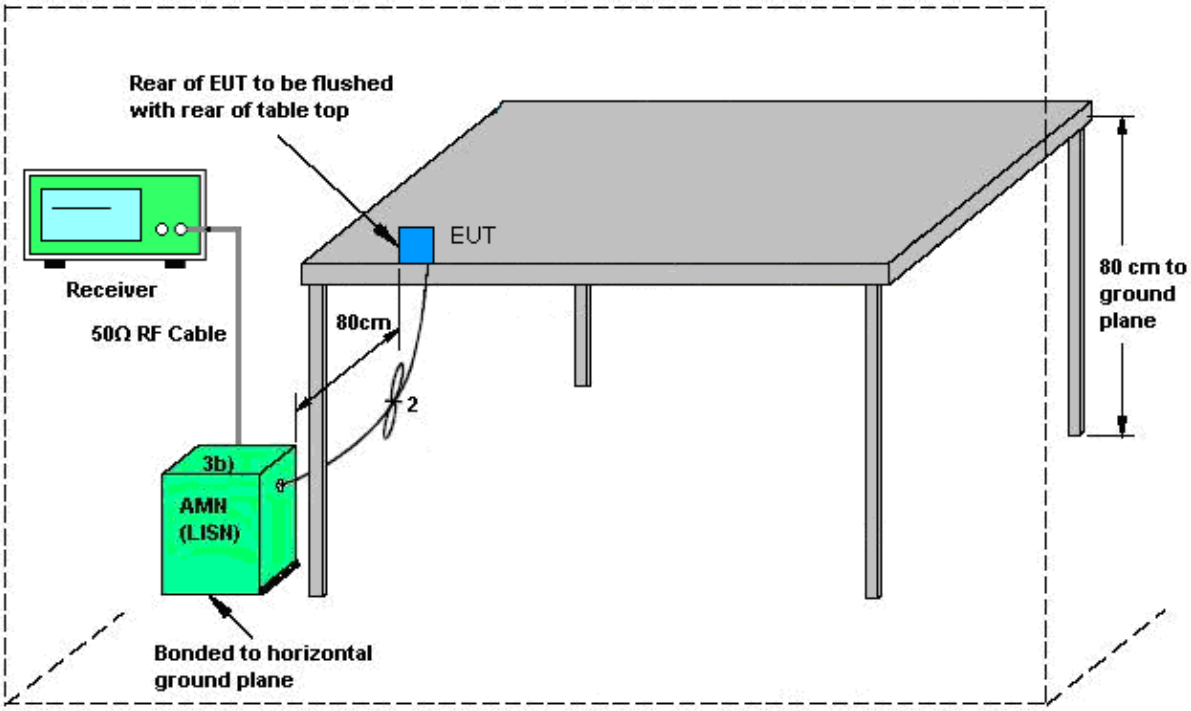
3.10.2 Measuring Instruments

See list of measuring instruments of this test report.

3.10.3 Test Procedures

1. Please follow 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.

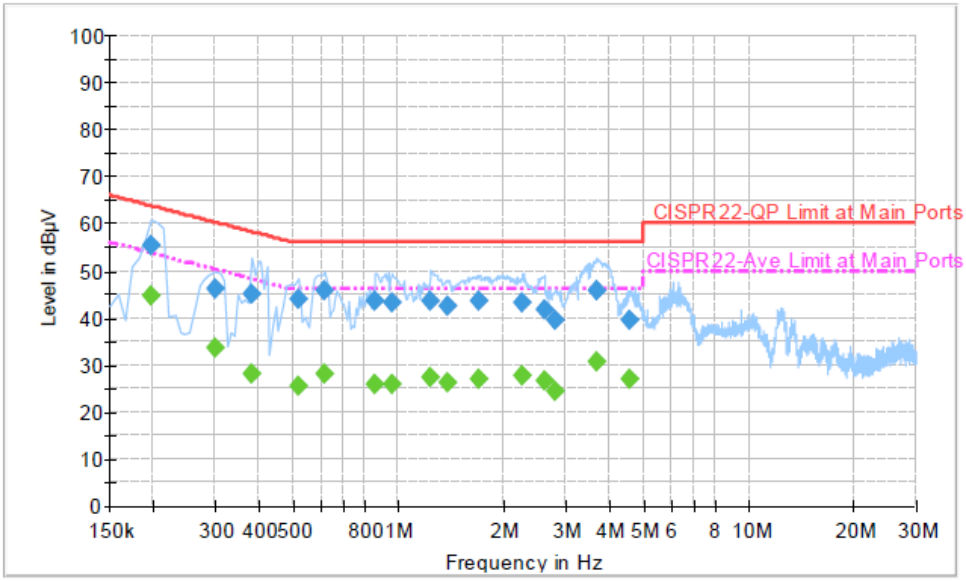
3.10.4 Test Setup



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

3.10.5 Test Result of AC Conducted Emission

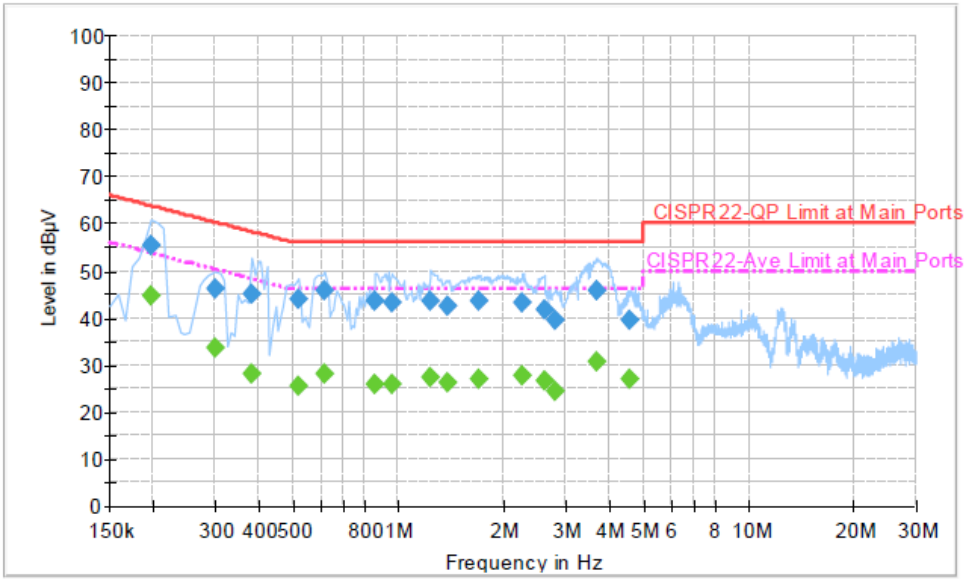
Test Mode :	Mode 3	**Temperature :**	21~22℃
Test Engineer :	Kai-Chun Chu	**Relative Humidity :**	50~51%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WLAN (2.4G) Link + Bluetooth Link + Earphone + MPEG4 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	55.2	Off	L1	19.3	8.5	63.7
0.302000	46.2	Off	L1	19.3	14.0	60.2
0.382000	44.8	Off	L1	19.4	13.4	58.2
0.518000	44.0	Off	L1	19.4	12.0	56.0
0.614000	45.9	Off	L1	19.4	10.1	56.0
0.862000	43.7	Off	L1	19.5	12.3	56.0
0.958000	43.0	Off	L1	19.4	13.0	56.0
1.238000	43.5	Off	L1	19.5	12.5	56.0
1.382000	42.3	Off	L1	19.5	13.7	56.0
1.694000	43.6	Off	L1	19.5	12.4	56.0
2.270000	43.2	Off	L1	19.6	12.8	56.0
2.606000	41.8	Off	L1	19.6	14.2	56.0
2.806000	39.4	Off	L1	19.6	16.6	56.0
3.670000	45.8	Off	L1	19.6	10.2	56.0
4.582000	39.5	Off	L1	19.7	16.5	56.0

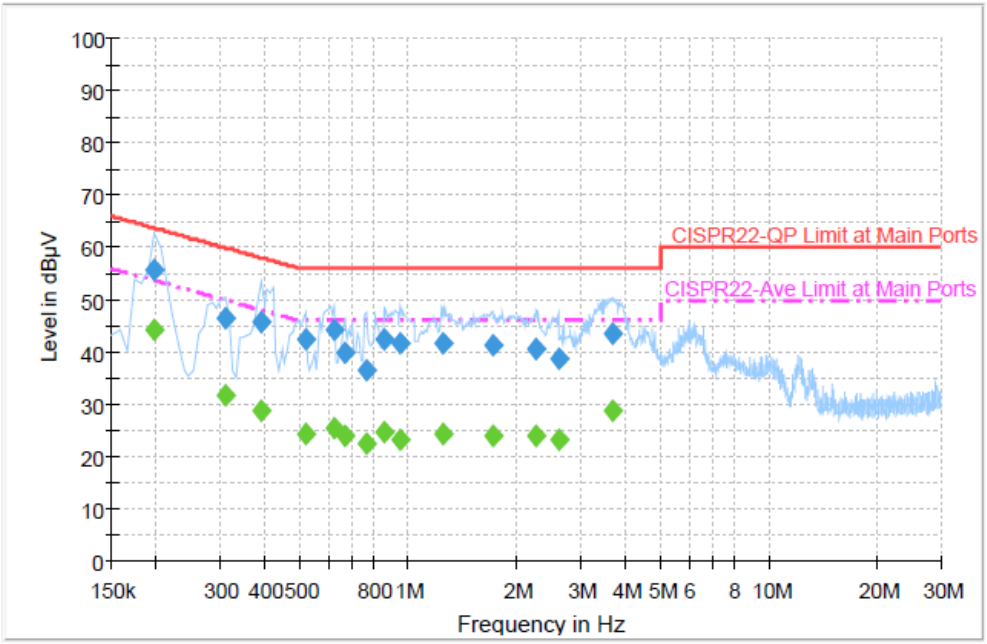
Test Mode :	Mode 3	**Temperature :**	21~22℃
Test Engineer :	Kai-Chun Chu	**Relative Humidity :**	50~51%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WLAN (2.4G) Link + Bluetooth Link + Earphone + MPEG4 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	44.7	Off	L1	19.3	9.0	53.7
0.302000	33.5	Off	L1	19.3	16.7	50.2
0.382000	28.2	Off	L1	19.4	20.0	48.2
0.518000	25.5	Off	L1	19.4	20.5	46.0
0.614000	28.0	Off	L1	19.4	18.0	46.0
0.862000	26.0	Off	L1	19.5	20.0	46.0
0.958000	25.9	Off	L1	19.4	20.1	46.0
1.238000	27.4	Off	L1	19.5	18.6	46.0
1.382000	26.3	Off	L1	19.5	19.7	46.0
1.694000	27.1	Off	L1	19.5	18.9	46.0
2.270000	27.7	Off	L1	19.6	18.3	46.0
2.606000	26.5	Off	L1	19.6	19.5	46.0
2.806000	24.2	Off	L1	19.6	21.8	46.0
3.670000	30.7	Off	L1	19.6	15.3	46.0
4.582000	26.9	Off	L1	19.7	19.1	46.0

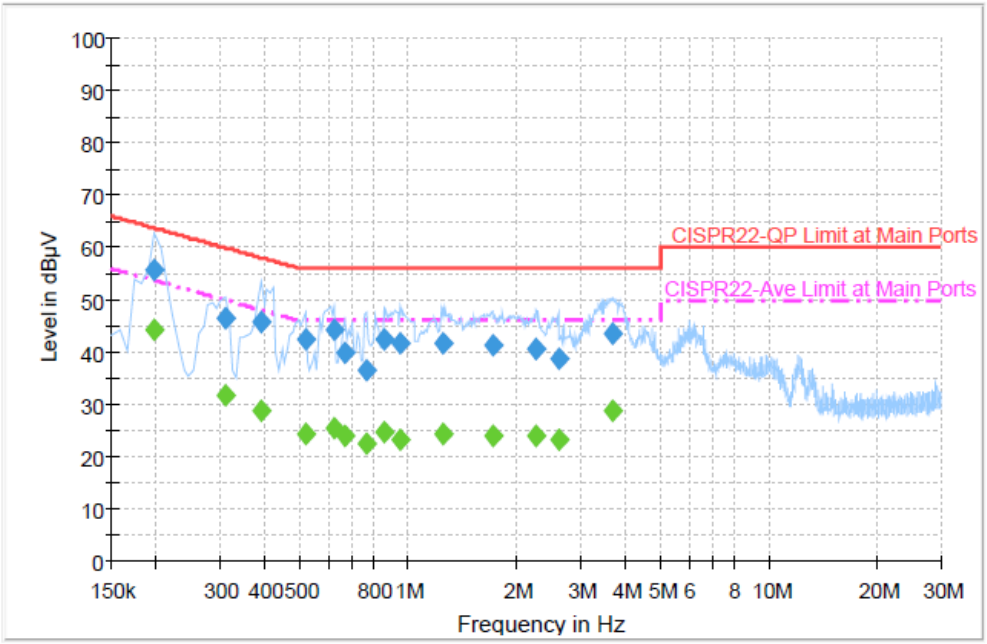
Test Mode :	Mode 3	**Temperature :**	21~22℃
Test Engineer :	Kai-Chun Chu	**Relative Humidity :**	50~51%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WLAN (2.4G) Link + Bluetooth Link + Earphone + MPEG4 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	55.8	Off	N	19.3	7.9	63.7
0.310000	46.5	Off	N	19.4	13.5	60.0
0.390000	45.7	Off	N	19.4	12.4	58.1
0.518000	42.4	Off	N	19.4	13.6	56.0
0.622000	44.5	Off	N	19.4	11.5	56.0
0.670000	39.8	Off	N	19.5	16.2	56.0
0.766000	36.7	Off	N	19.5	19.3	56.0
0.854000	42.6	Off	N	19.6	13.4	56.0
0.950000	41.5	Off	N	19.4	14.5	56.0
1.254000	41.6	Off	N	19.5	14.4	56.0
1.718000	41.5	Off	N	19.5	14.5	56.0
2.262000	40.7	Off	N	19.6	15.3	56.0
2.606000	38.8	Off	N	19.6	17.2	56.0
3.686000	43.5	Off	N	19.6	12.5	56.0

Test Mode :	Mode 3	**Temperature :**	21~22℃
Test Engineer :	Kai-Chun Chu	**Relative Humidity :**	50~51%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WLAN (2.4G) Link + Bluetooth Link + Earphone + MPEG4 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	44.2	Off	N	19.3	9.5	53.7
0.310000	31.9	Off	N	19.4	18.1	50.0
0.390000	28.8	Off	N	19.4	19.3	48.1
0.518000	24.2	Off	N	19.4	21.8	46.0
0.622000	25.5	Off	N	19.4	20.5	46.0
0.670000	23.9	Off	N	19.5	22.1	46.0
0.766000	22.5	Off	N	19.5	23.5	46.0
0.854000	24.6	Off	N	19.6	21.4	46.0
0.950000	23.4	Off	N	19.4	22.6	46.0
1.254000	24.4	Off	N	19.5	21.6	46.0
1.718000	23.9	Off	N	19.5	22.1	46.0
2.262000	24.2	Off	N	19.6	21.8	46.0
2.606000	23.1	Off	N	19.6	22.9	46.0
3.686000	28.8	Off	N	19.6	17.2	46.0

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	100055	9kHz~40GHz	Jun. 06, 2012	Jun. 15, 2012 ~ Jun. 23, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Bluetooth Base Station	R&S	CBT32	100522	N/A	Feb. 09, 2012	Jun. 15, 2012 ~ Jun. 23, 2012	Feb. 08, 2014	Conducted (TH02-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	Jun. 18, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Jun. 18, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	Jun. 18, 2012	Aug. 09, 2012	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 251	15GHz ~ 40GHz	Oct. 21, 2011	Jun. 18, 2012	Oct. 20, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A0236 2	1GHz ~ 26.5GHz	Dec. 05, 2011	Jun. 18, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Feb. 27, 2012	Jun. 18, 2012	Feb. 26, 2013	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz ~ 7GHz	Aug. 22, 2011	Jun. 18, 2012	Aug. 21, 2012	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159088	1GHz ~ 18GHz	Mar. 10, 2012	Jun. 18, 2012	Mar. 09, 2013	Radiation (03CH07-HY)
Bluetooth Base Station	R&S	CBT32	100522	N/A	Feb. 09, 2012	Jun. 18, 2012	Feb. 08, 2014	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jun. 18, 2012	Jul. 28, 2012	Radiation (03CH07-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Jun. 18, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Jun. 18, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Jun. 18, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Jun. 18, 2012	N/A	Conduction (CO05-HY)
GPS Station	Pendulum	GSG-54	N/A	N/A	N/A	Jun. 18, 2012	N/A	Conduction (CO05-HY)

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.54

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.72

Appendix A. Photographs of EUT

Please refer to Sporton report number EP261317 as below.