FCC/IC RF Test Report

APPLICANT	:	**Sony Mobile Communications AB**
EQUIPMENT	:	**Smart phone**
BRAND NAME	:	**SONY**
MODEL NAME	:	**D2104**
TYPE NAME	:	**PM-0673-BV**
FCC ID	:	**PY7PM-0673**
IC	:	**4170B-PM0673**
STANDARD	:	**FCC Part 15 Subpart C §15.247** **IC RSS-210 issue 8**
CLASSIFICATION	:	**(DSS) Spread Spectrum Transmitter**

The product was received on Oct. 29, 2013 and testing was completed on Dec. 02, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant 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: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

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

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 Product Specification of Equipment Under Test 6
1.5 Modification of EUT 7
1.6 Testing Site 7
1.7 Applied Standards 7

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

2.1 Descriptions of Test Mode 8
2.2 Test Mode 9
2.3 Connection Diagram of Test System 10
2.4 Support Unit used in test configuration and system 11
2.5 EUT Operation Test Setup 11
2.6 Measurement Results Explanation Example 11

3 TEST RESULT **12**

3.1 Number of Channel Measurement 12
3.2 Hopping Channel Separation Measurement 14
3.3 Dwell Time Measurement 21
3.4 20dB and 99% Bandwidth Measurement 24
3.5 Peak Output Power Measurement 37
3.6 Conducted Band Edges Measurement 39
3.7 Conducted Spurious Emission Measurement 46
3.8 Radiated Band Edges and Spurious Emission Measurement 65
3.9 AC Conducted Emission Measurement 108
3.10 Antenna Requirements 114

4 LIST OF MEASURING EQUIPMENT **115**

5 UNCERTAINTY OF EVALUATION **117**

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3O2909A	Rev. 01	Initial issue of report	Dec. 18, 2013
FR3O2909A	Rev. 02	Revising description of HW version in section 1.4 Details of Tested Sample (EUT) Information	Dec. 30, 2013
FR3O2909A	Rev. 03	Revising description of GPRS/EGPRS multi slot class 12 to 33.	Jan. 08, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(1)	RSS-210 A8.4(2)	Number of Channels	≥ 15Chs	Pass	-
3.2	15.247(a)(1)	RSS-210 A8.1(b)	Hopping Channel Separation	≥ 2/3 of 20dB BW	Pass	-
3.3	15.247(a)(1)	RSS-210 A8.1(d)	Dwell Time of Each Channel	≤ 0.4sec in 31.6sec period	Pass	-
3.4	15.247(a)(1)	RSS-210 A8.1(a)	20dB Bandwidth	NA	Pass	-
3.4	-	RSS-Gen 4.6.1	99% Bandwidth	-	Pass	-
3.5	15.247(b)(1)	RSS-210 A8.1(b)	Peak Output Power	≤ 125 mW	Pass	-
3.6	15.247(d)	RSS-210 A8.5	Conducted Band Edges	≤ 20dBc	Pass	-
3.7	15.247(d)	RSS-210 A8.5	Conducted Spurious Emission	≤ 20dBc	Pass	-
3.8	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 10.42 dB at 2483.500 MHz
3.9	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 11.60 dB at 0.406 MHz
3.10	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Sony Mobile Communications AB
Nya Vattentornet, 22188 Lund, Sweden

1.2 Manufacturer

Arima Communications Corp.
6F., No. 866, Jhongjheng Rd., Jhonghe Dist., New Taipei City 23586, Taiwan

1.3 Feature of Equipment Under Test

The Equipment Under Test (hereafter called: EUT) is smart phone supporting, GSM / WCDMA / Wi-Fi 2.4GHz 802.11b/g/n, Bluetooth with FM Receiver, and GPS features, and below is details of information.

General Information of Equipment Under Test	
Equipment	Smart phone
Brand Name	SONY
Model Name	D2104
Type Name	PM-0673-BV
FCC ID	PY7PM-0673
IC	4170B-PM0673
GSM Operating Band(s)	GSM 850/900/1800/1900MHz
GPRS / EGPRS Multi Slot Class	GPRS Class 33, EGPRS Class 33
WCDMA Operating Band(s)	FDD Band I / II / V
WCDMA Rel. Version	Rel. 7
Wi-Fi Specification	802.11b/g/n (HT20)
Bluetooth Version	v3.0+EDR / v4.0-LE
Power Supply	Battery / AC Adapter / Car Charger

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

1.4 Product Specification of Equipment Under Test

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 BR(1Mbps) : 6.85 dBm (0.0048 W) Bluetooth EDR (2Mbps) : 6.90 dBm (0.0049 W) Bluetooth EDR (3Mbps) : 7.31 dBm (0.0054 W)
Antenna Type	PIFA Antenna type with gain 1.24 dBi
Type of Modulation	Bluetooth BR (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π /4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT #1	IMEI : 00440214-707873-1 S/N : WUJ016LPSP
EUT #2	IMEI : 00440214-707857-4 S/N : WUJ016LPD8
EUT #3	IMEI 1 : 00440214-707917-6 IMEI 2 : 00440214-707918-4 S/N : WUJ016MS4B
HW Version	A
SW Version	20.0.B.0.26
EUT Stage	Production Unit

Accessory List	
AC Adapter	Model No. : EP800
	Type No. : CAA-0002016-US B
Battery	Model No. : BA900
	Type No. : AB-0500
Earphone	Model No. : MH410c
	Type No. : AG-1100
USB Cable	Model No. : EC450
	Part No. : 1242-6715.3 12W45

Note:

1. Above EUT list and accessory list used are electrically identical per declared by manufacturer.
2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report.
3. For other wireless features of this EUT, test report will be issued separately.

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 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

Note: The test site complies with ANSI C63.4 2003 requirement.

1.7 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
- NOTICE 2012-DRS0126

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.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, " Receivers Excluded from Industry Canada Requirements", only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

2 Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

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

Channel	Frequency	Bluetooth RF Output Power		
		Data Rate / Modulation		
		GFSK	π/4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	6.58 dBm	6.48 dBm	6.92 dBm
Ch39	2441MHz	6.62 dBm	6.59 dBm	6.98 dBm
Ch78	2480MHz	6.85 dBm	6.90 dBm	**7.31** dBm

Remark: All the test data for each data rate were verified, but only the worst case was reported.

a. The EUT has been associated with peripherals 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, and different data rates were conducted to determine the final configuration (X plane as worst plane) from all possible combinations, and the worst mode of radiated spurious emissions is Bluetooth 3Mbps mode, and recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

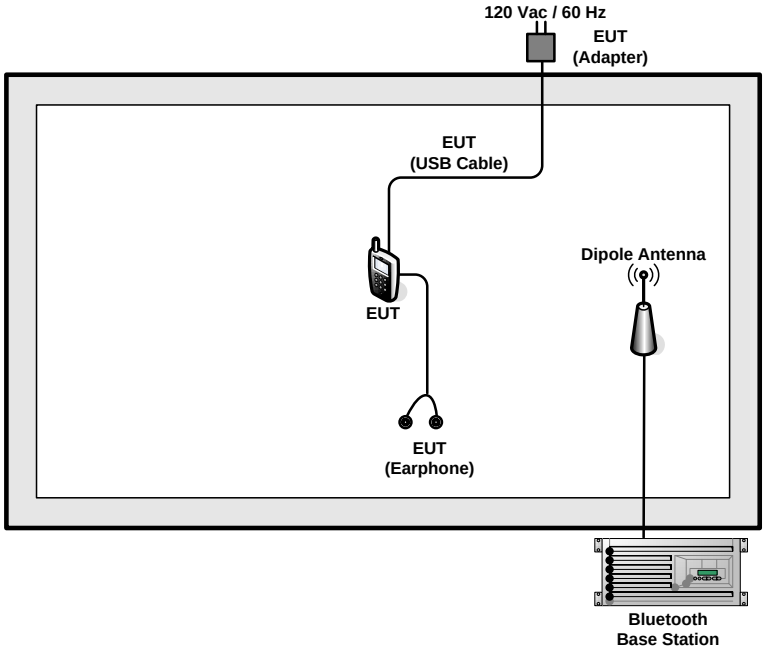
2.2 Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

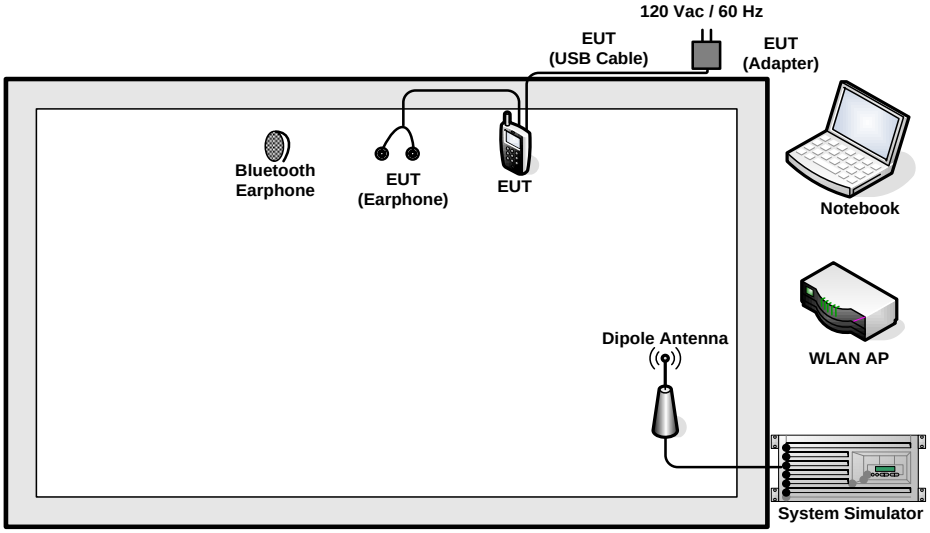
Summary table of Test Cases			
Test Item	**Data Rate / Modulation**		
	Bluetooth BR 1Mbps GFSK	**Bluetooth EDR 2Mbps π /4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
Conducted Test Cases	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated Test Cases	**Bluetooth BR 1Mbps GFSK**	**Bluetooth EDR 2Mbps π /4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
	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
AC Conducted Emission	Mode 1 :GSM1900 Idle + Bluetooth Link + WLAN Idle + MP3 + Earphone + Battery + USB Cable (Charging from Adapter) + SIM 1 Mode 2 :GSM1900 Idle + Bluetooth Idle + WLAN Link + MP3 + Earphone + Battery + USB Cable (Charging from Adapter) + SIM 1		

2.3 Connection Diagram of Test System

<Bluetooth Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
6.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

For Bluetooth test items, an engineering test program was provided and enabled to make EUT contact with Bluetooth base station for continuous transmitting and receiving signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

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

The measuring equipment is listed in the section 4 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 RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. The number of hopping frequency used is defined as the number of total channel.
7. Record the measurement data derived from spectrum analyzer.

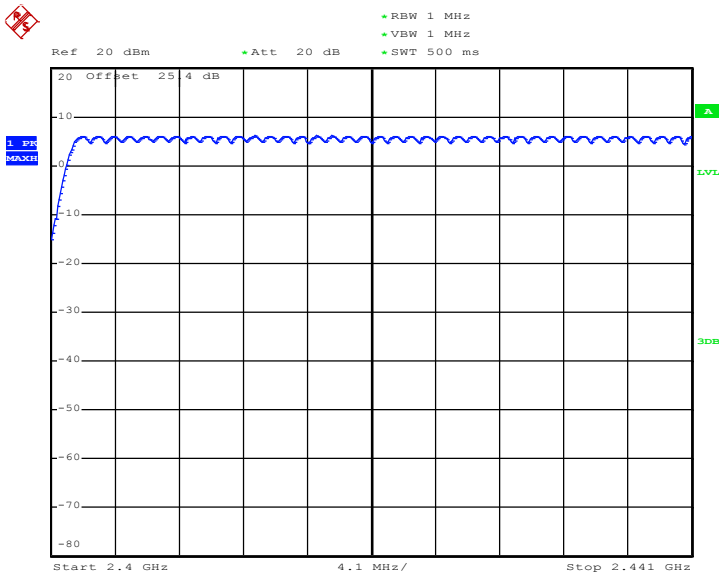
3.1.4 Test Setup

3.1.5 Test Result of Number of Hopping Frequency

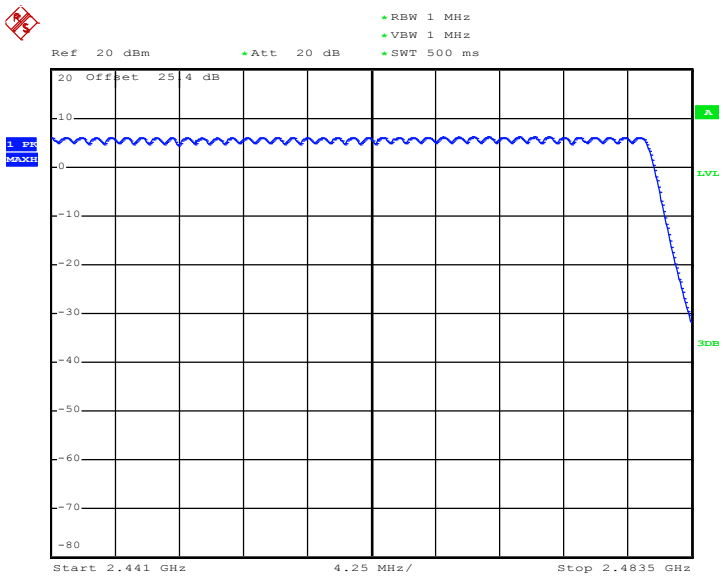
Test Mode :	3Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

Number of Hopping (Channel)	Adaptive Frequency Hopping (Channel)	Limits (Channel)	Pass/Fail
79	20	> 15	Pass

Number of Hopping Channel Plot on Channel 00 - 78



Date: 4.NOV.2013 14:50:57



Date: 4.NOV.2013 14:55:40

Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

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.

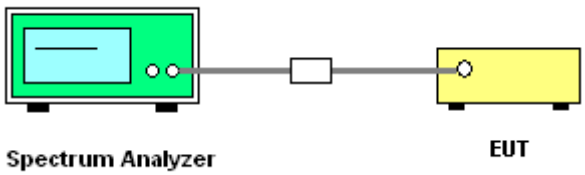
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 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 RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. Measure and record the results in the test report.

3.2.4 Test Setup

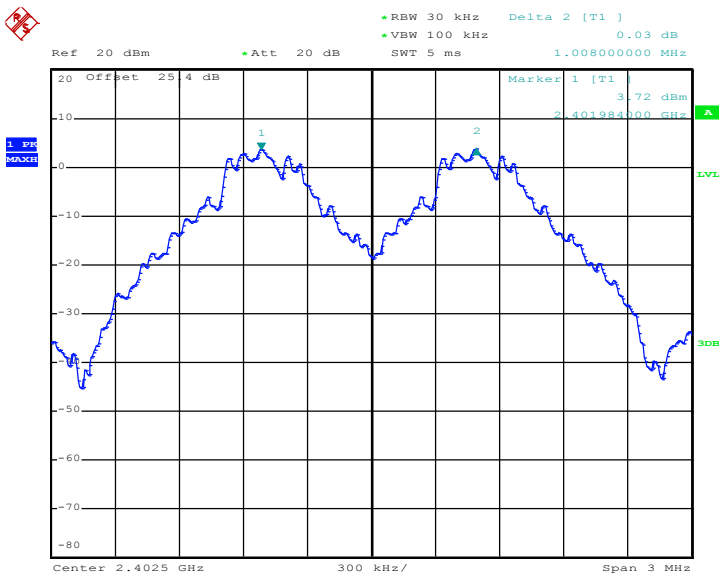


3.2.5 Test Result of Hopping Channel Separation

Test Mode :	1Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

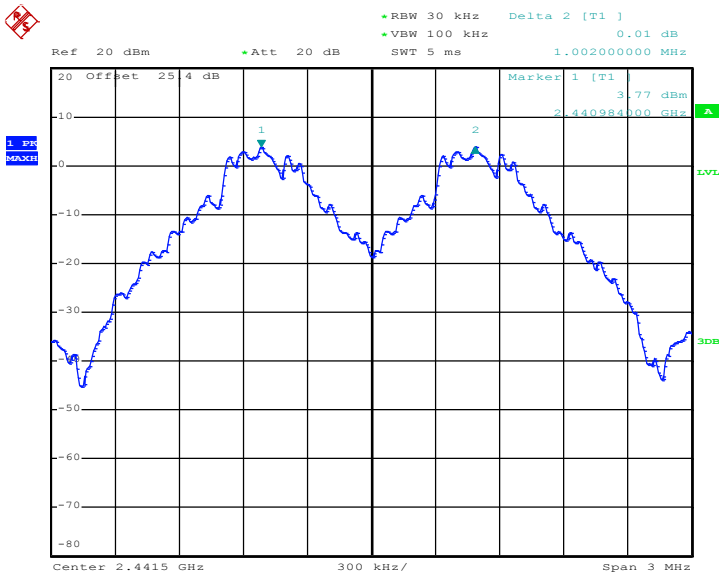
Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.008	0.6240	Pass
39	2441	1.002	0.6213	Pass
78	2480	1.002	0.6240	Pass

Channel Separation Plot on Channel 00 - 01



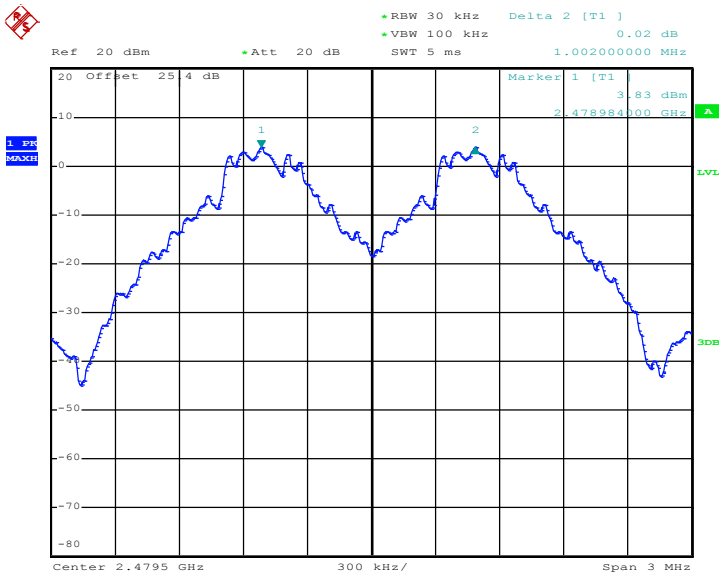
Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

Channel Separation Plot on Channel 39 - 40



Date: 4.NOV.2013 15:05:04

Channel Separation Plot on Channel 77 - 78

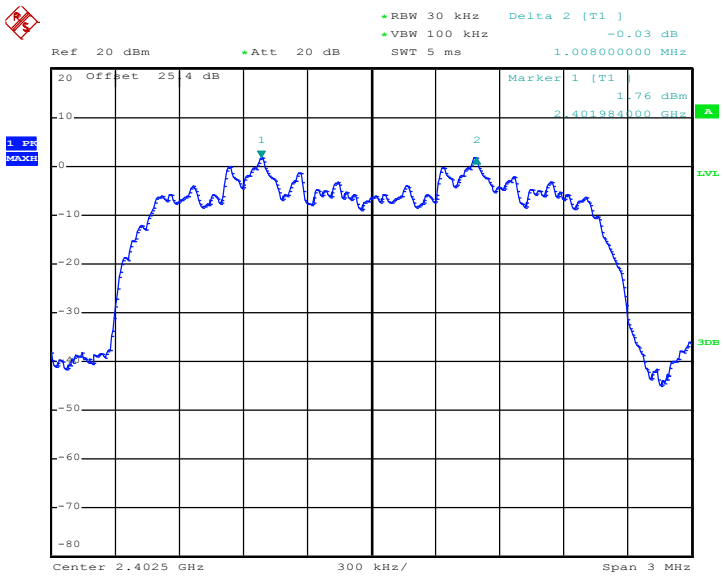


Date: 4.NOV.2013 15:06:18

Test Mode :	2Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

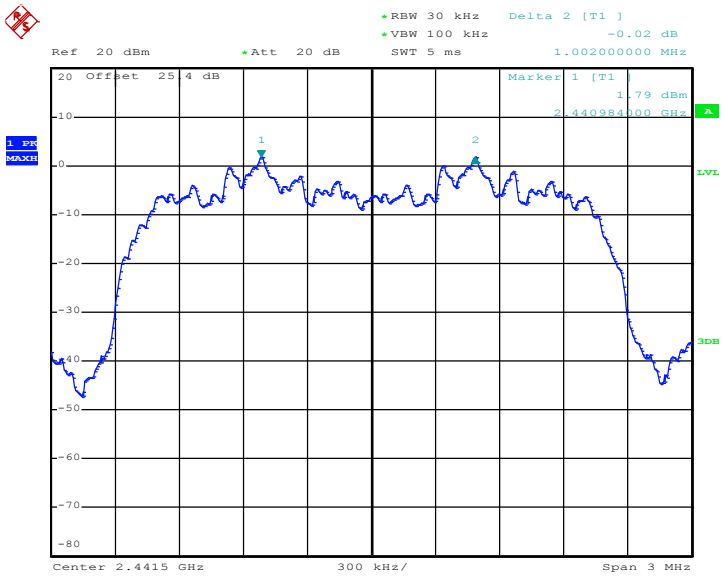
Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.008	0.8480	Pass
39	2441	1.002	0.8440	Pass
78	2480	1.002	0.8440	Pass

Channel Separation Plot on Channel 00 - 01



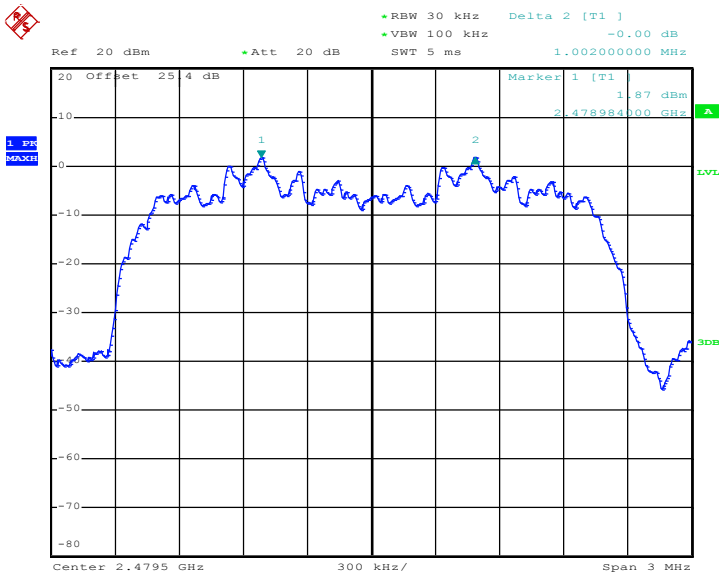
Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

Channel Separation Plot on Channel 39 - 40



Date: 4.NOV.2013 14:07:11

Channel Separation Plot on Channel 77 - 78

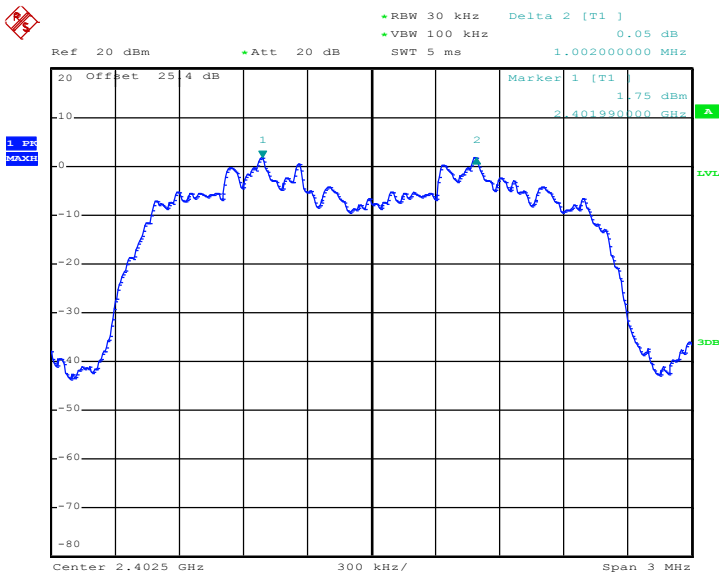


Date: 4.NOV.2013 14:07:54

Test Mode :	3Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.8280	Pass
39	2441	1.008	0.8240	Pass
78	2480	1.002	0.8280	Pass

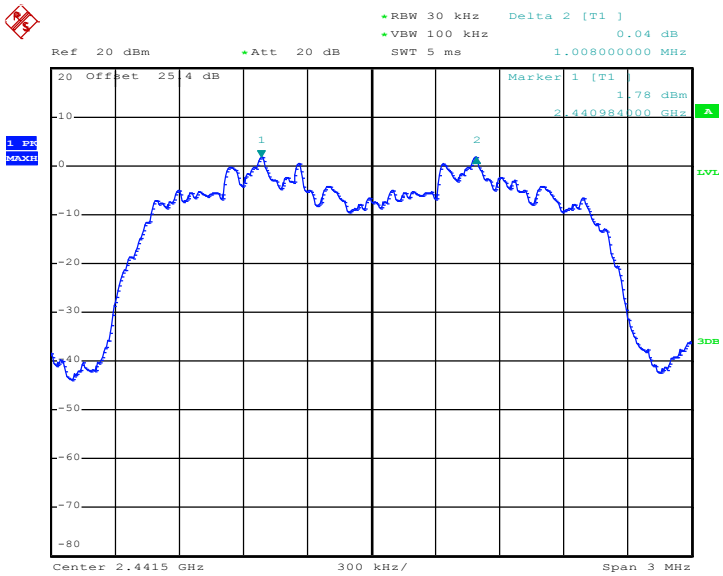
Channel Separation Plot on Channel 00 - 01



Date: 4.NOV.2013 14:13:48

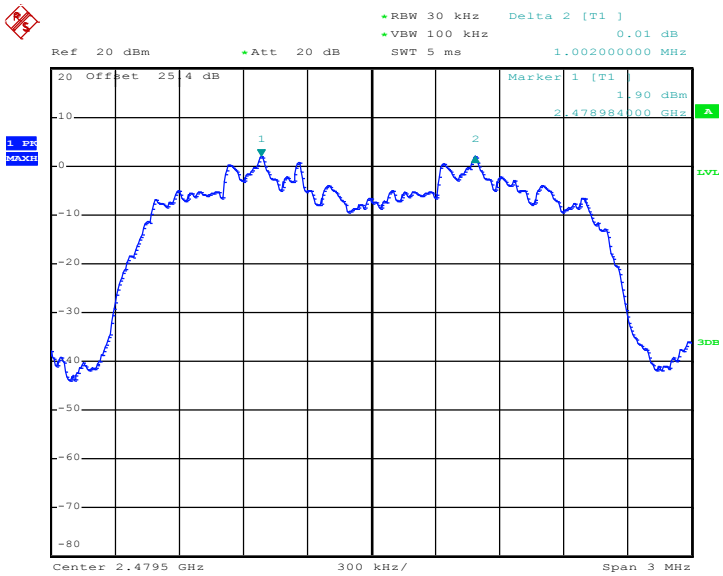
Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

Channel Separation Plot on Channel 39 - 40



Date: 4.NOV.2013 14:19:38

Channel Separation Plot on Channel 77 - 78



Date: 4.NOV.2013 14:22:48

3.3 Dwell Time Measurement

3.3.1 Limit of Dwell Time

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

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 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 RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
6. Measure and record the results in the test report.

3.3.4 Test Setup

3.3.5 Test Result of Dwell Time

Test Mode :	DH5	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

Mode	Hopping Channel Number	Hops Over Occupancy Time(hops)	Package Transfer Time (msec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
Normal	79	106.67	2.90	0.31	0.4	Pass
AFH	20	53.33	2.90	0.15	0.4	Pass

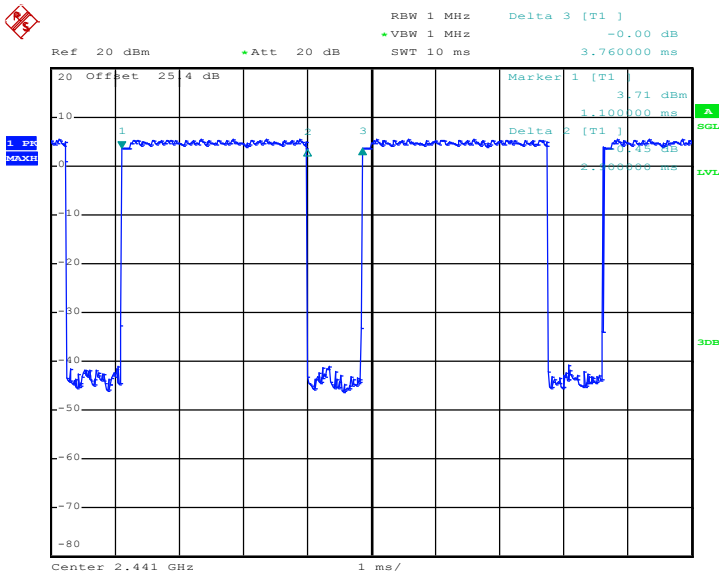
Remark:

1. In normal mode, hopping rate is 1600hops/s with 6 slots in 79 hopping channels.
With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4 x 79) (s),
Hops Over Occupancy Time comes to (1600 / 6 / 79) x (0.4 x 79) = 106.67 hops.

2. In AFH mode, hopping rate is 800hops/s with 6 slots in 20 hopping channels.
With channel hopping rate (800 / 6 / 20) in Occupancy Time Limit (0.4 x 20) (s),
Hops Over Occupancy Time comes to (800 / 6 / 20) x (0.4 x 20) = 53.33 hops.

3. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time

Package Transfer Time Plot



Date: 31.OCT.2013 22:19:53

3.4 20dB and 99% Bandwidth Measurement

3.4.1 Limit of 20dB and 99% Bandwidth

Reporting only

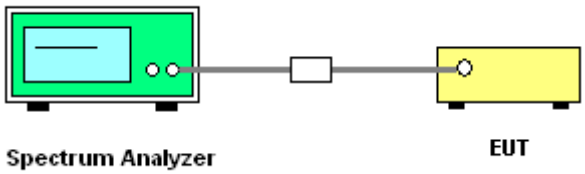
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 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 RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings for 20dB Bandwidth measurement.
   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. Use the following spectrum analyzer settings for 99 % Bandwidth measurement.
   For 99% Bandwidth measurement, the RBW=30kHz, and VBW = 100kHz. Sweep = auto ;
   Detector function = sample. Trace = max hold.
6. Measure and record the results in the test report.

3.4.4 Test Setup

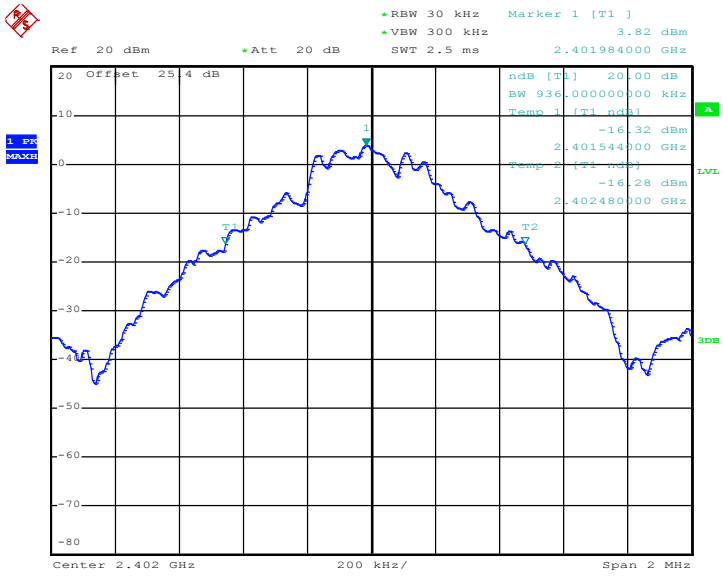


3.4.5 Test Result of 20dB Bandwidth

Test Mode :	1Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

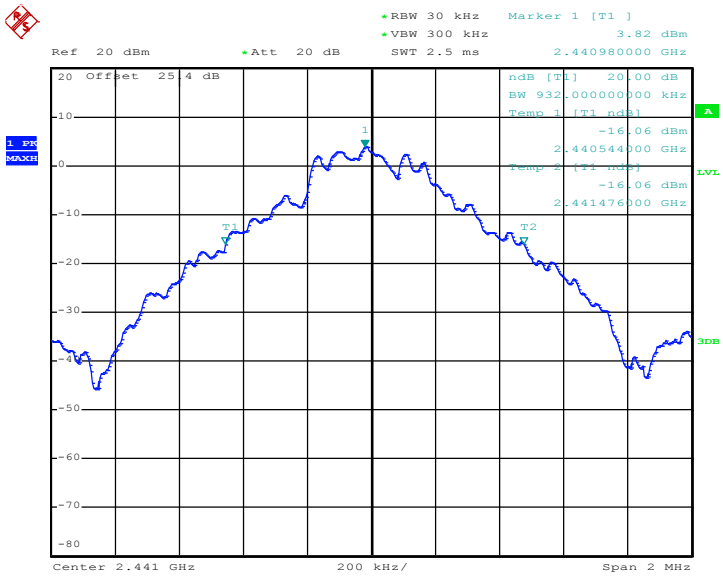
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.936
39	2441	0.932
78	2480	0.936

20 dB Bandwidth Plot on Channel 00



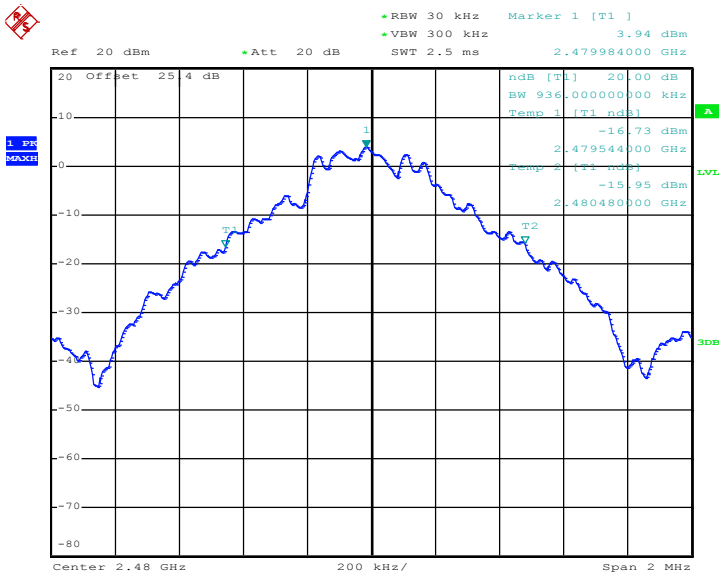
Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

20 dB Bandwidth Plot on Channel 39



Date: 4.NOV.2013 14:24:49

20 dB Bandwidth Plot on Channel 78

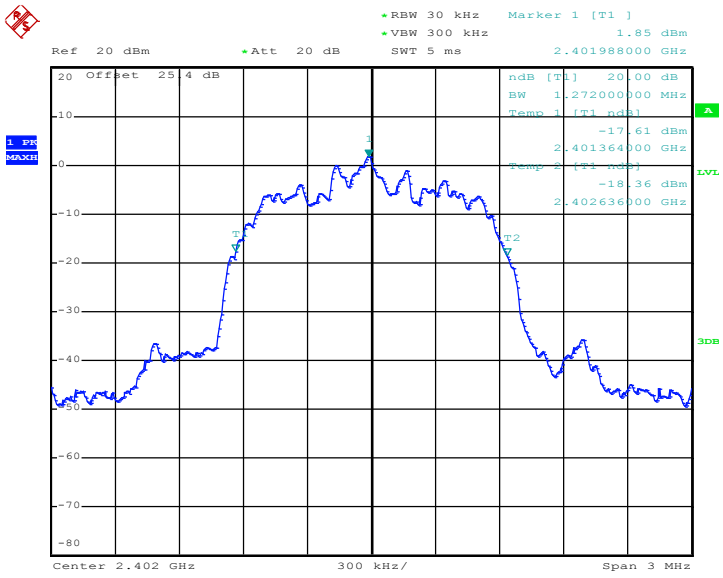


Date: 4.NOV.2013 14:25:26

Test Mode :	2Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.272
39	2441	1.266
78	2480	1.266

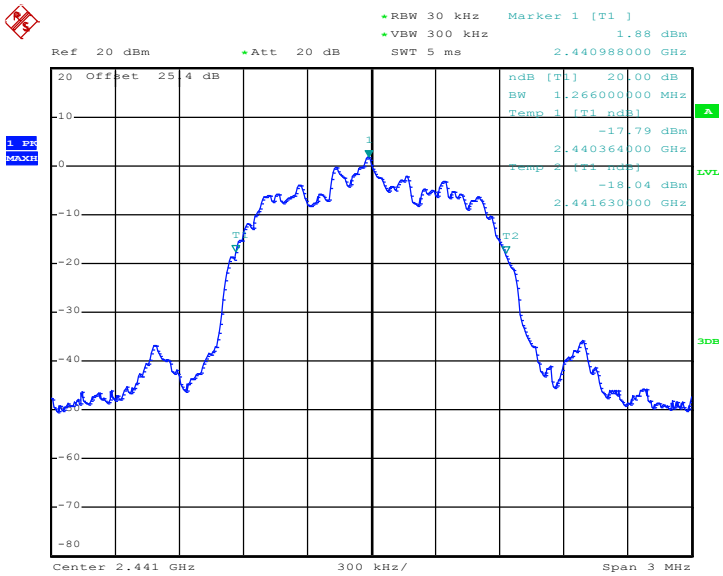
20 dB Bandwidth Plot on Channel 00



Date: 4.NOV.2013 14:33:03

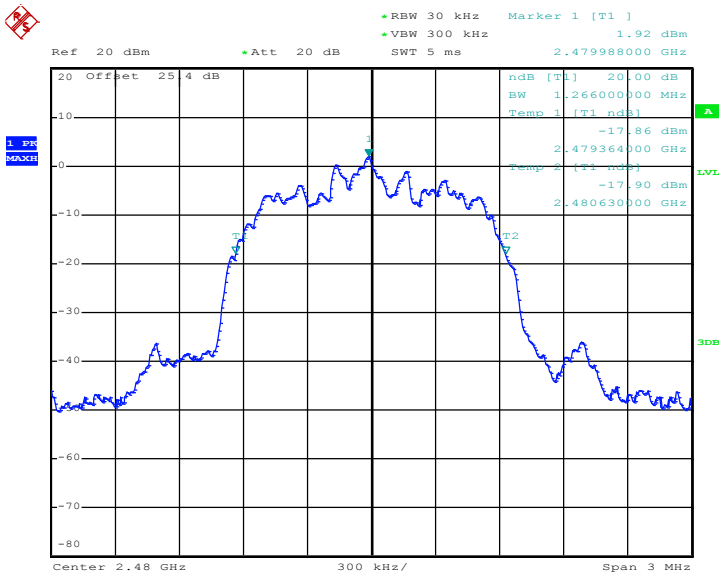
Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

20 dB Bandwidth Plot on Channel 39



Date: 4.NOV.2013 14:33:46

20 dB Bandwidth Plot on Channel 78

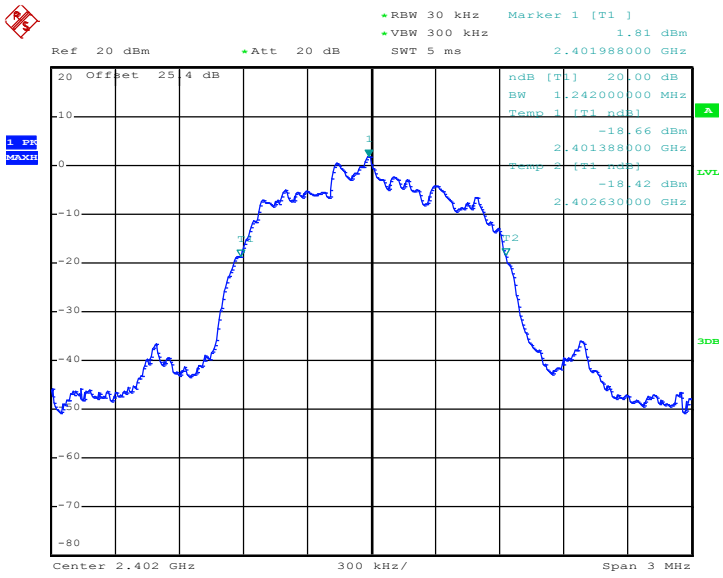


Date: 4.NOV.2013 14:34:15

Test Mode :	3Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

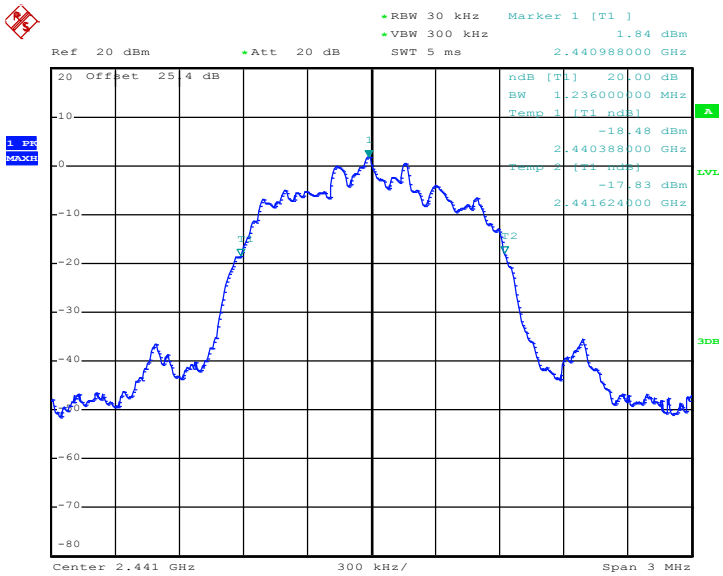
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.242
39	2441	1.236
78	2480	1.242

20 dB Bandwidth Plot on Channel 00



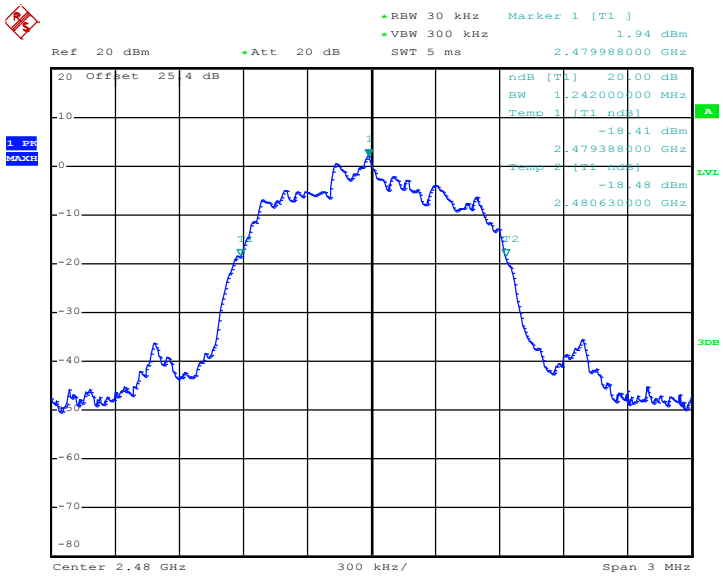
Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

20 dB Bandwidth Plot on Channel 39



Date: 4.NOV.2013 14:35:30

20 dB Bandwidth Plot on Channel 78



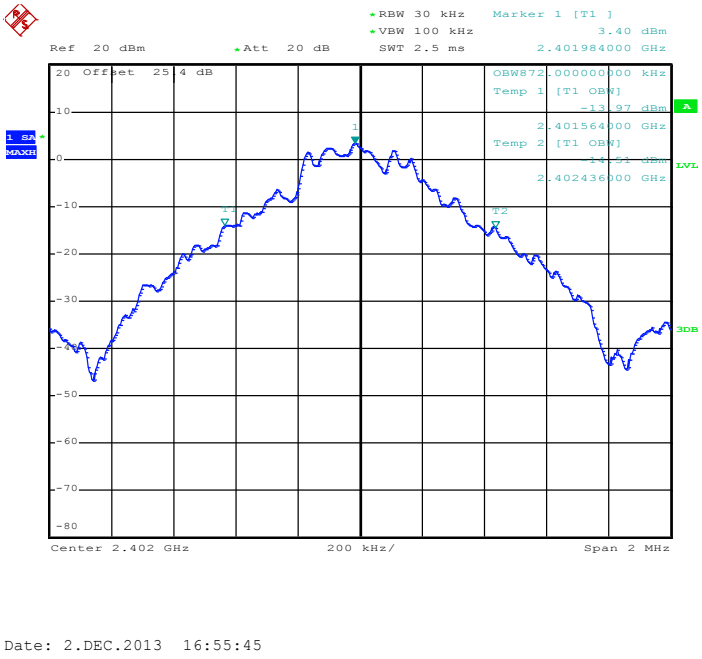
Date: 4.NOV.2013 14:35:59

3.4.6 Test Result of 99% Occupied Bandwidth

Test Mode :	1Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

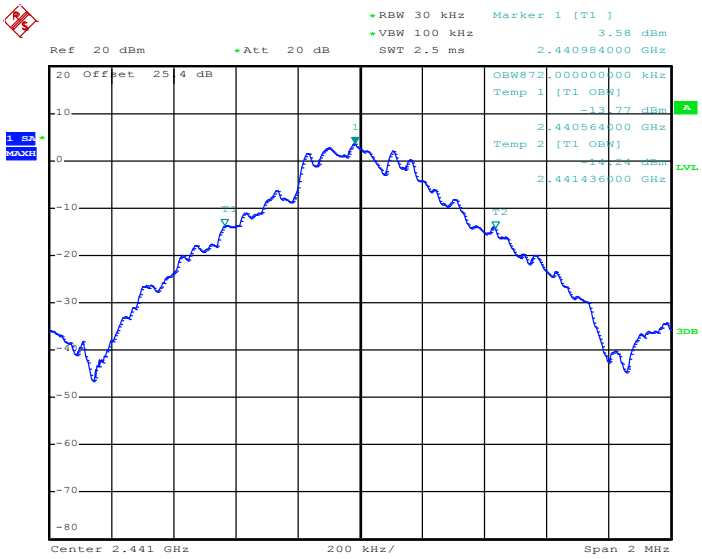
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	0.872
39	2441	0.872
78	2480	0.872

99% Occupied Bandwidth Plot on Channel 00



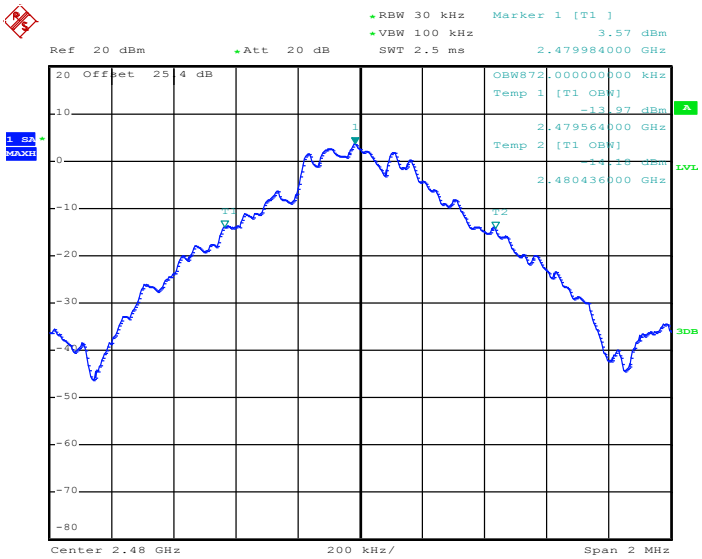
Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

99% Occupied Bandwidth Plot on Channel 39



Date: 2.DEC.2013 16:54:20

99% Occupied Bandwidth Plot on Channel 78

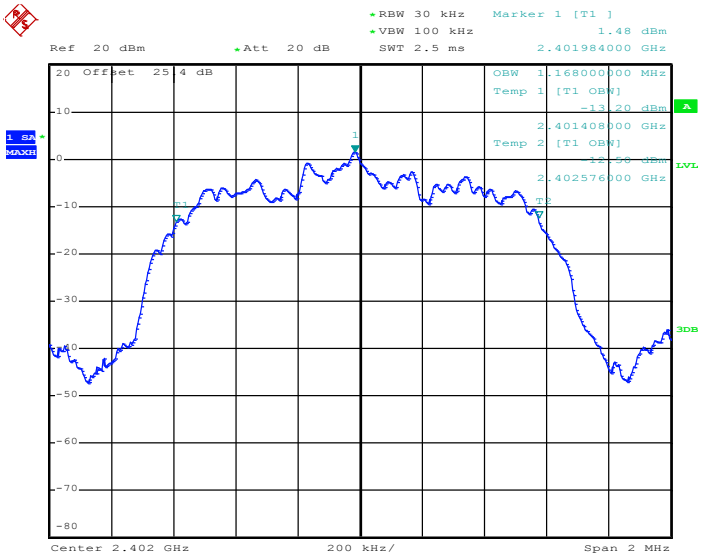


Date: 2.DEC.2013 16:56:39

Test Mode :	2Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

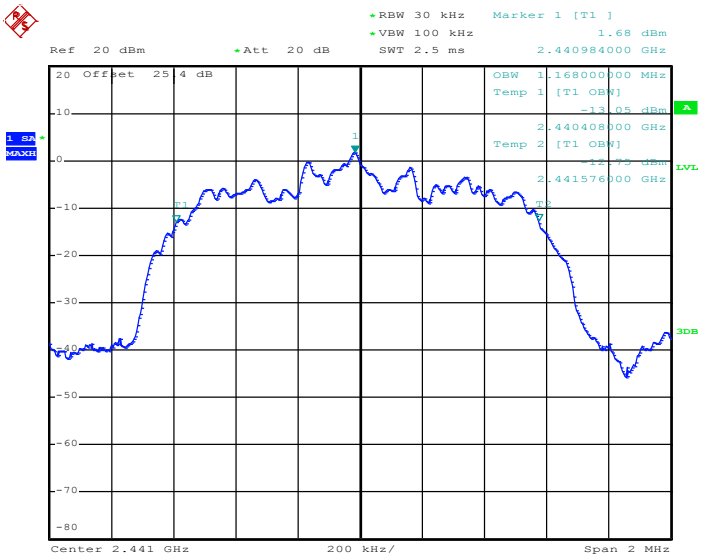
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.168
39	2441	1.168
78	2480	1.164

99% Occupied Bandwidth Plot on Channel 00



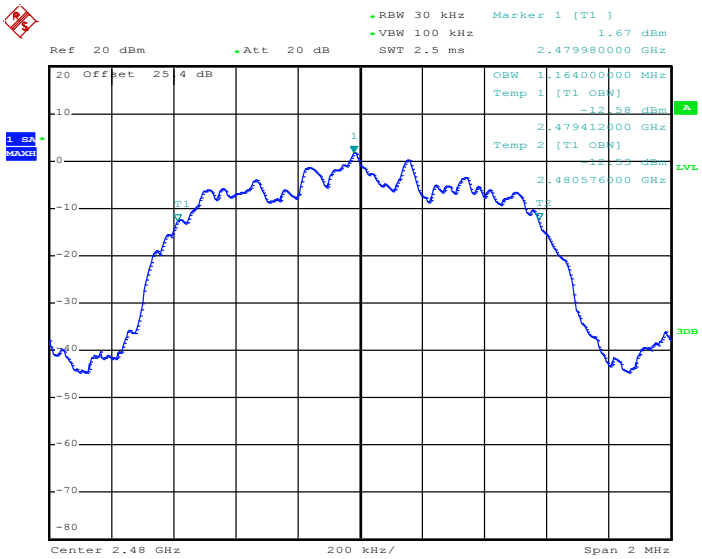
Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

99% Occupied Bandwidth Plot on Channel 39



Date: 2.DEC.2013 16:58:52

99% Occupied Bandwidth Plot on Channel 78

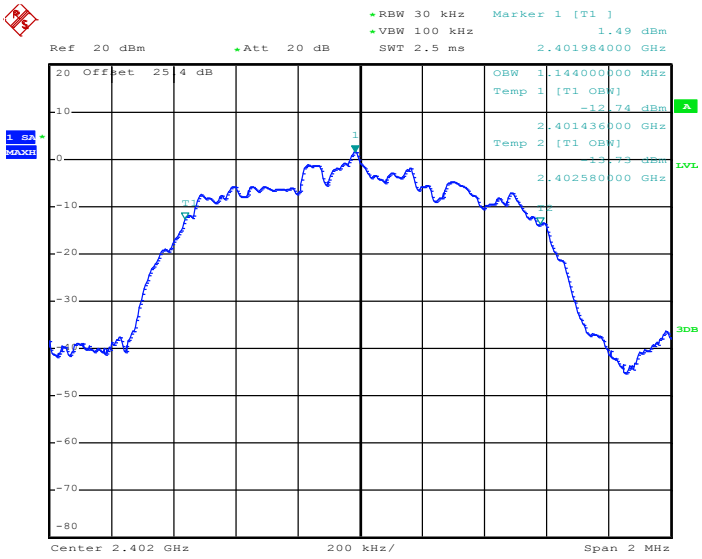


Date: 2.DEC.2013 16:58:05

Test Mode :	3Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

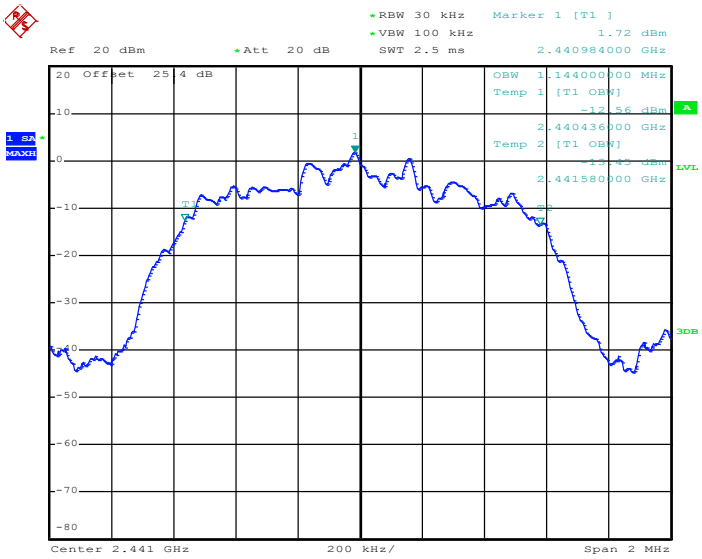
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.144
39	2441	1.144
78	2480	1.148

99% Occupied Bandwidth Plot on Channel 00



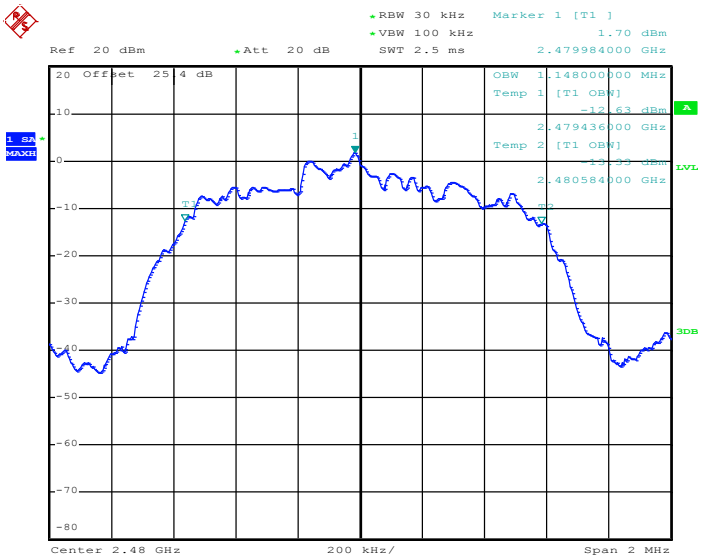
Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

99% Occupied Bandwidth Plot on Channel 39



Date: 2.DEC.2013 17:01:37

99% Occupied Bandwidth Plot on Channel 78



Date: 2.DEC.2013 17:02:24

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, 3Mbps and AFH are 0.125 watts.

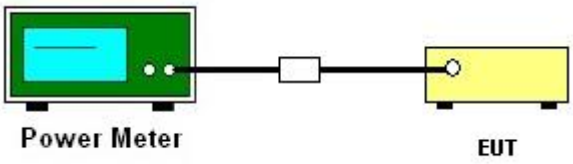
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 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 power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power with cable loss and record the results in the test report.
5. Measure and record the results in the test report.

3.5.4 Test Setup



3.5.5 Test Result of Peak Output Power

Test Mode :	1Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	6.58	20.97	Pass
39	2441	6.62	20.97	Pass
78	2480	6.85	20.97	Pass

Note: For AFH mode using 20 hopping channels, the maximum output power limit is 20.97dBm.

Test Mode :	2Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

Channel	Frequency (MHz)	RF Power (dBm)		
		π /4-DQPSK	Max. Limits (dBm)	Pass/Fail
		2 Mbps		
00	2402	6.48	20.97	Pass
39	2441	6.59	20.97	Pass
78	2480	6.90	20.97	Pass

Test Mode :	3Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits (dBm)	Pass/Fail
		3 Mbps		
00	2402	6.92	20.97	Pass
39	2441	6.98	20.97	Pass
78	2480	7.31	20.97	Pass

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

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

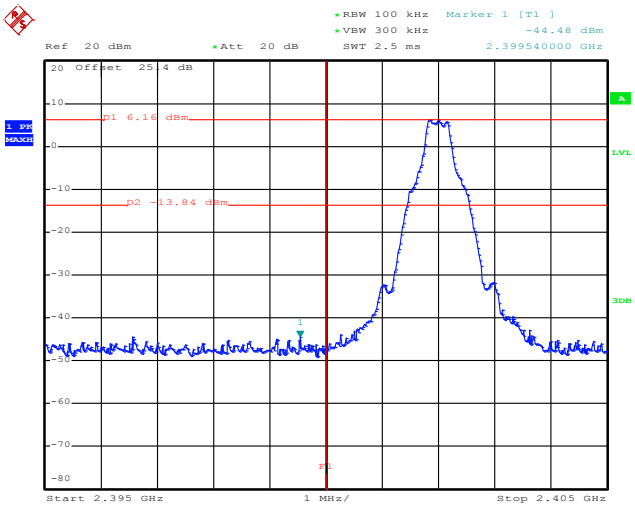
1. The testing follows the guidelines in Band-edge Compliance of RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 100kHz (≥ 1% span=10MHz), VBW = 300kHz (≥ RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.
4. Enable hopping function of the EUT and then repeat step 2. and 3.
5. Measure and record the results in the test report.

3.6.4 Test Setup

3.6.6 Test Result of Conducted Band Edges

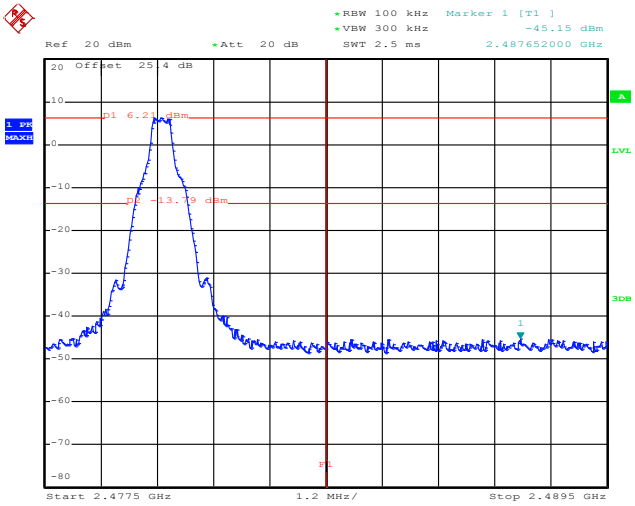
Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Channel :	00 and 78	**Relative Humidity :**	48~51%
Test Engineer :	Rover Lee		

Low Band Edge Plot on Channel 00



Date: 4.NOV.2013 15:55:35

High Band Edge Plot on Channel 78

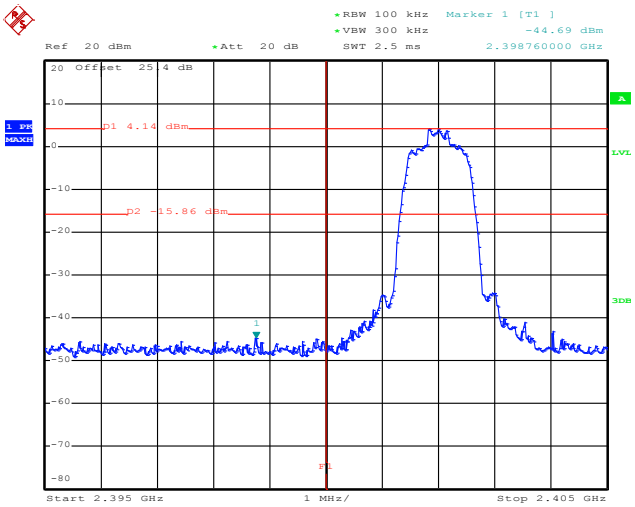


Date: 4.NOV.2013 15:56:21

Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

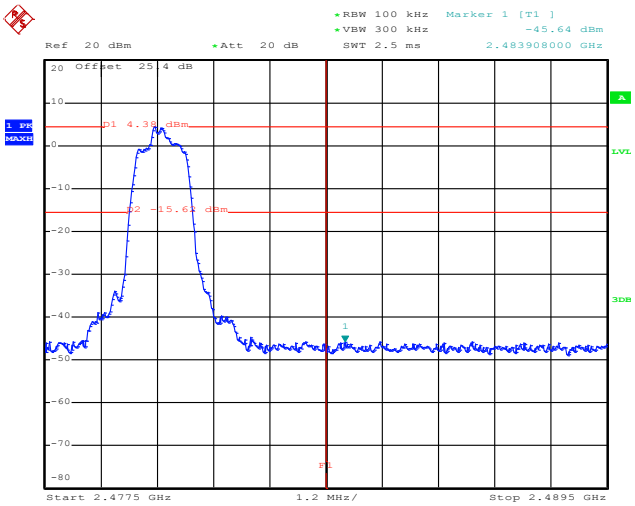
Test Mode :	2Mbps	Temperature :	24~26℃
Test Channel :	00 and 78	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

Low Band Edge Plot on Channel 00



Date: 4.NOV.2013 15:57:38

High Band Edge Plot on Channel 78

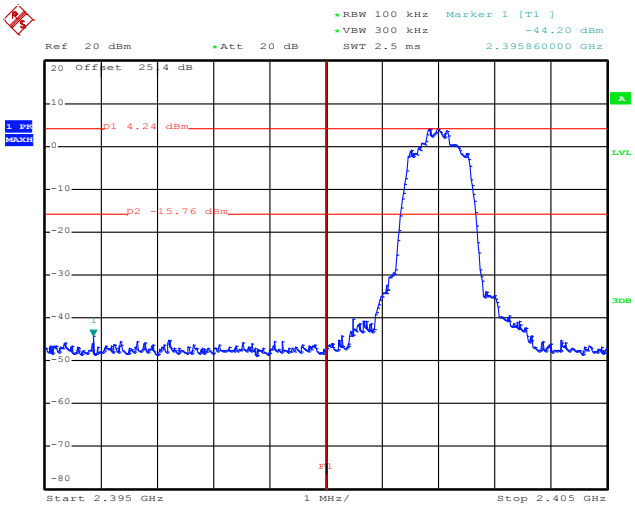


Date: 4.NOV.2013 15:57:08

Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

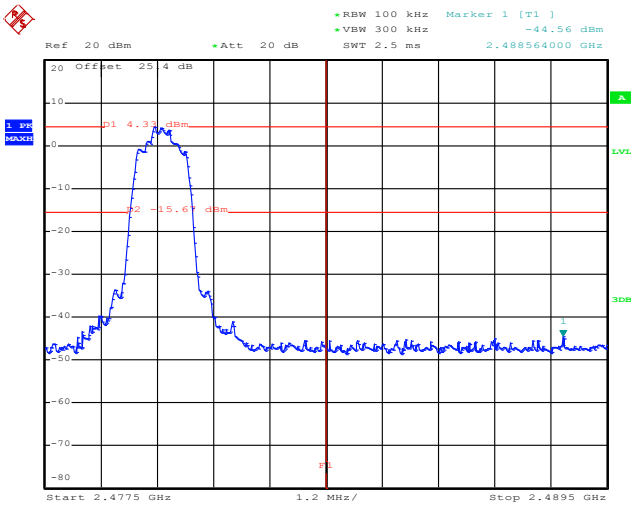
Test Mode :	3Mbps	Temperature :	24~26℃
Test Channel :	00 and 78	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

Low Band Edge Plot on Channel 00



Date: 4.NOV.2013 15:58:15

High Band Edge Plot on Channel 78



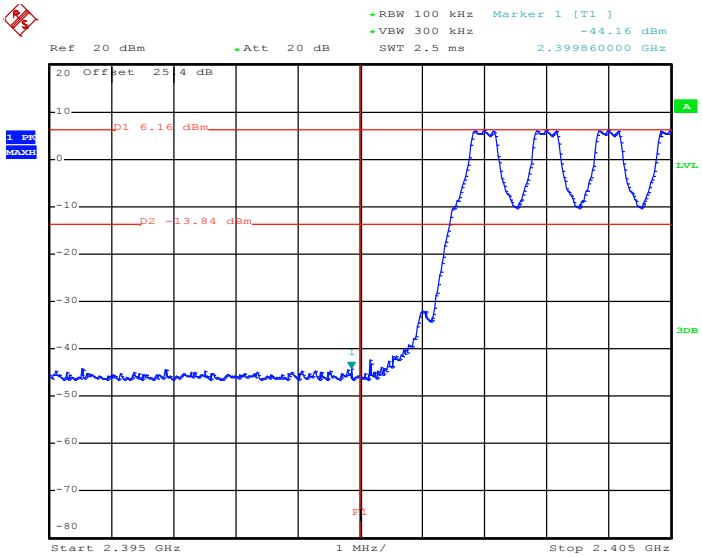
Date: 4.NOV.2013 15:58:47

Note: The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

3.6.7 Test Result of Conducted Hopping Mode Band Edges

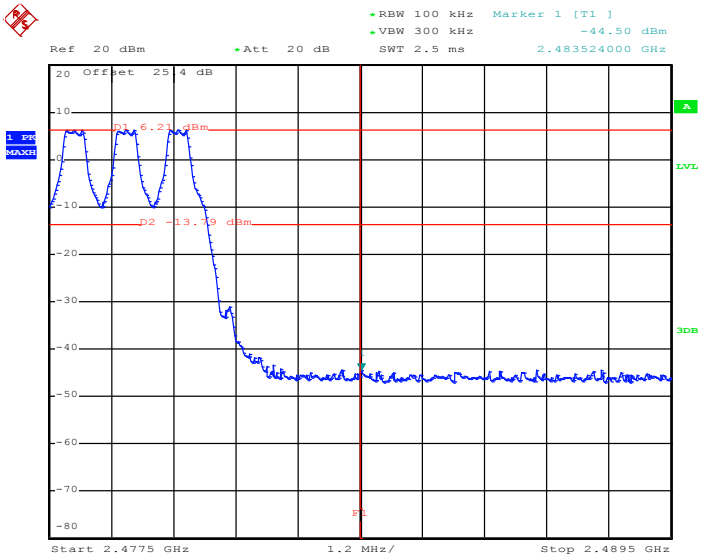
Test Mode :	1Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

1Mbps Hopping Mode Low Band Edge Plot



Date: 4.NOV.2013 15:22:47

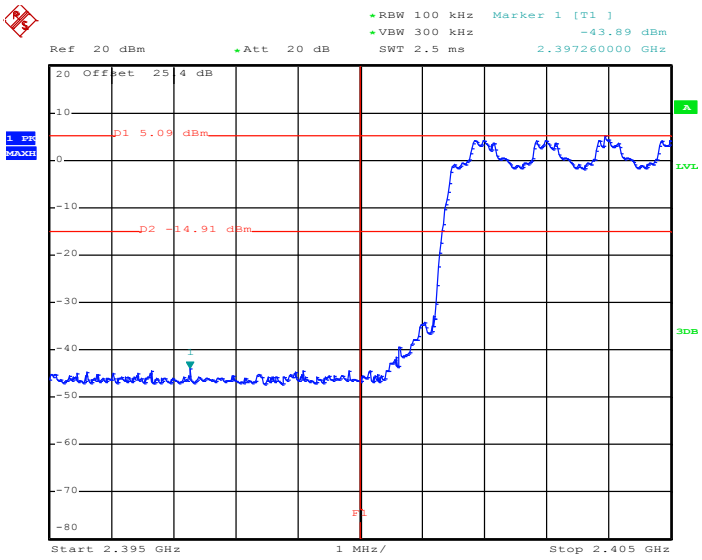
1Mbps Hopping Mode High Band Edge Plot



Date: 4.NOV.2013 15:26:22

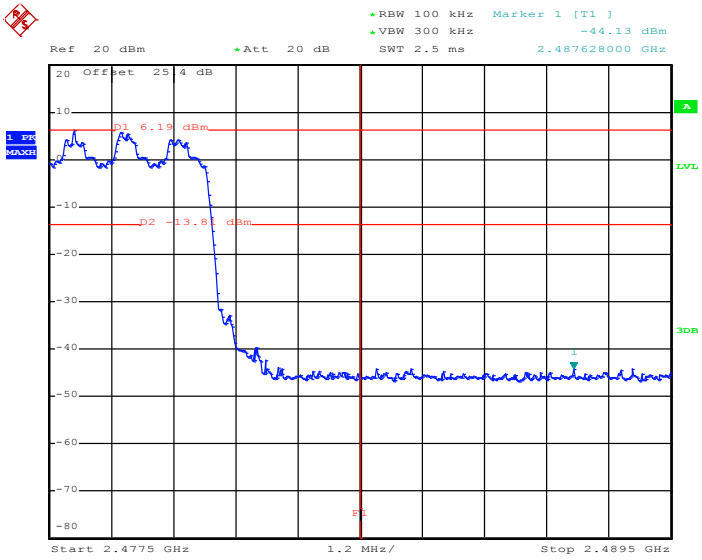
Test Mode :	2Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

2Mbps Hopping Mode Low Band Edge Plot



Date: 4.NOV.2013 15:47:54

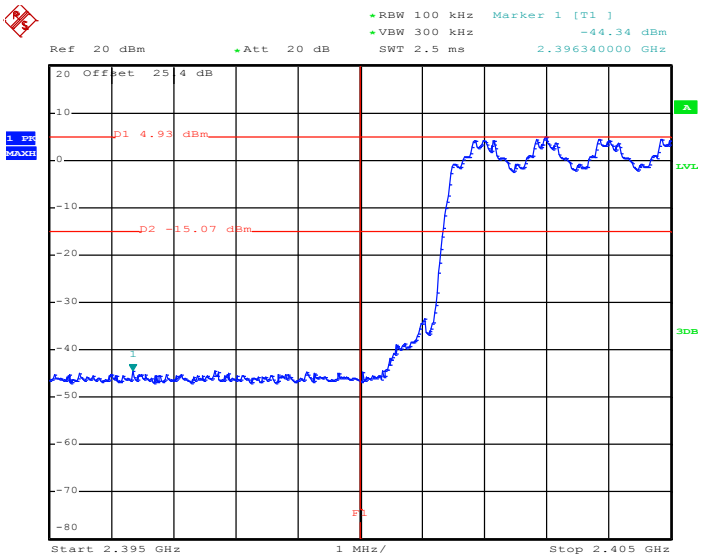
2Mbps Hopping Mode High Band Edge Plot



Date: 4.NOV.2013 15:34:03

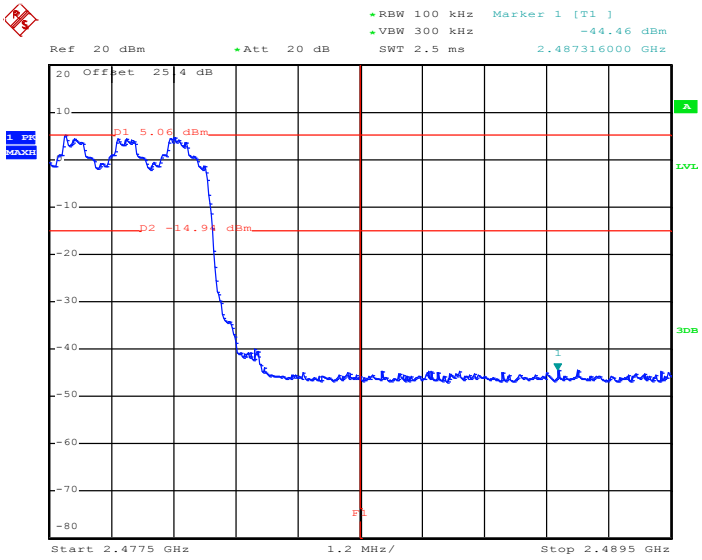
Test Mode :	3Mbps	Temperature :	24~26℃
Test Engineer :	Rover Lee	Relative Humidity :	48~51%

3Mbps Hopping Mode Low Band Edge Plot



Date: 4.NOV.2013 15:51:45

3Mbps Hopping Mode High Band Edge Plot



Date: 4.NOV.2013 15:54:19

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

The measuring equipment is listed in the section 4 of this test report.

3.7.3 Test Procedure

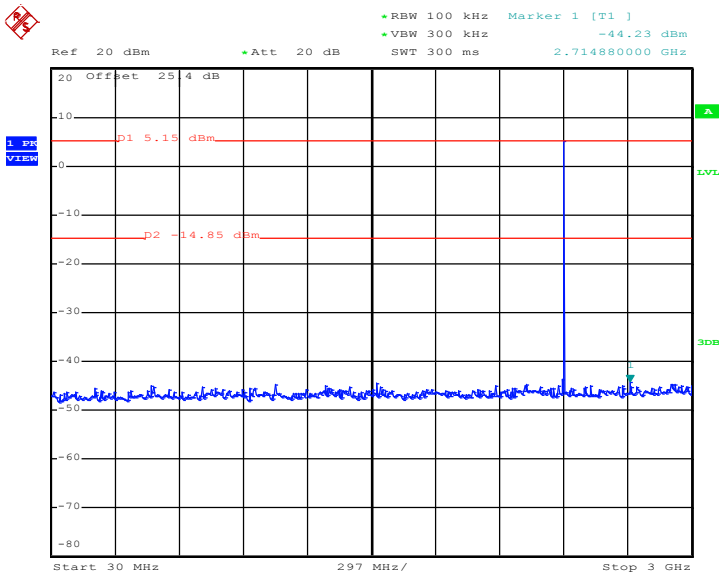
1. The testing follows the guidelines in Spurious RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW = 300kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.7.4 Test Setup

3.7.5 Test Result of Conducted Spurious Emission

Test Mode :	1Mbps	Temperature :	24~26℃
Test Channel :	00	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

1Mbps CSE Plot on Ch 00 between 30 MHz ~ 3 GHz

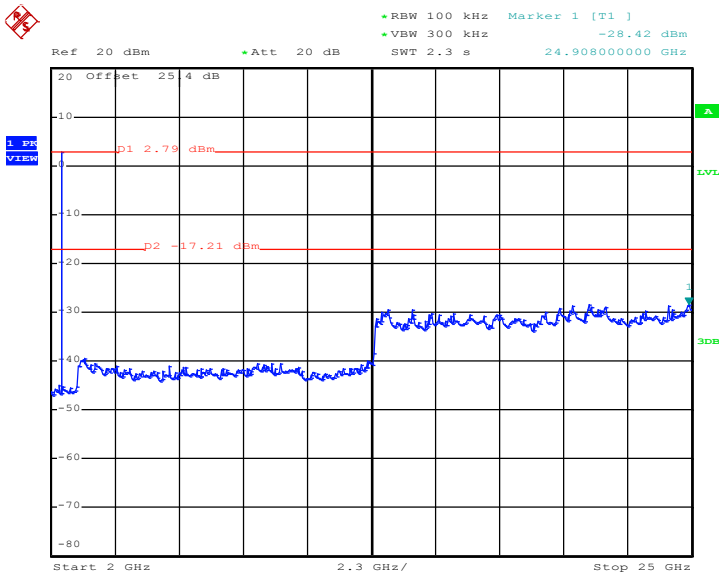


Date: 4.NOV.2013 15:09:18

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

1Mbps CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



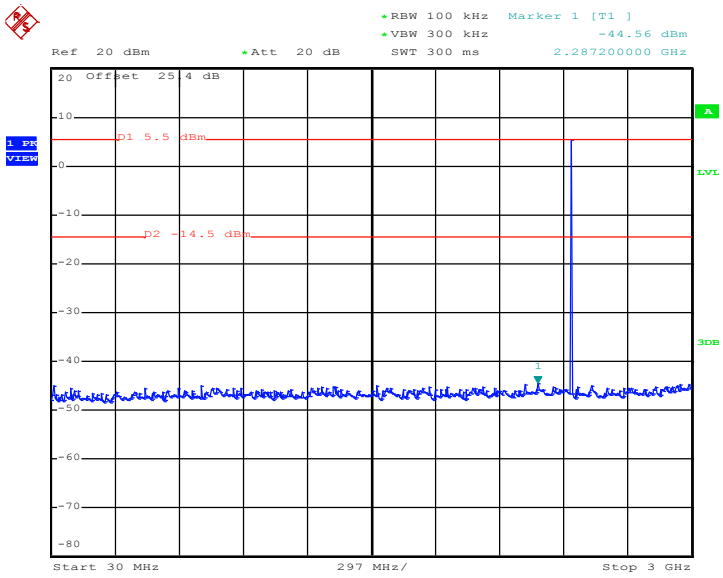
Date: 4.NOV.2013 15:09:40

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Test Mode :	1Mbps	Temperature :	24~26℃
Test Channel :	39	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

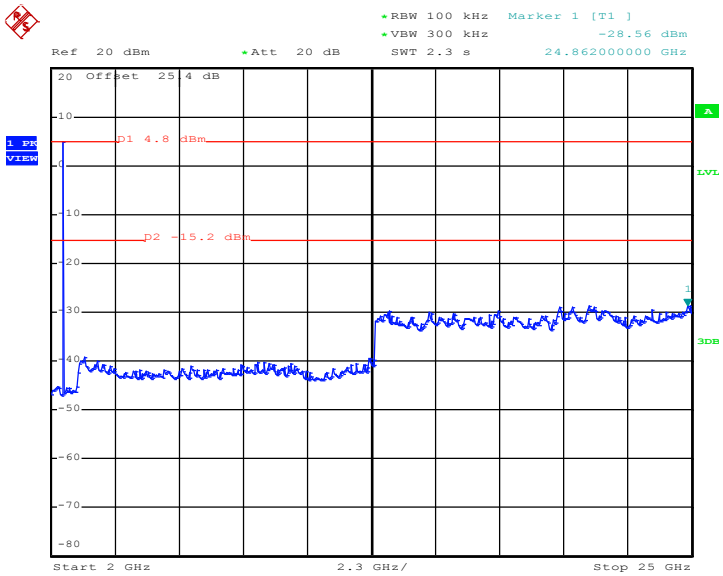
1Mbps CSE Plot on Ch 39 between 30 MHz ~ 3 GHz



Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

1Mbps CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



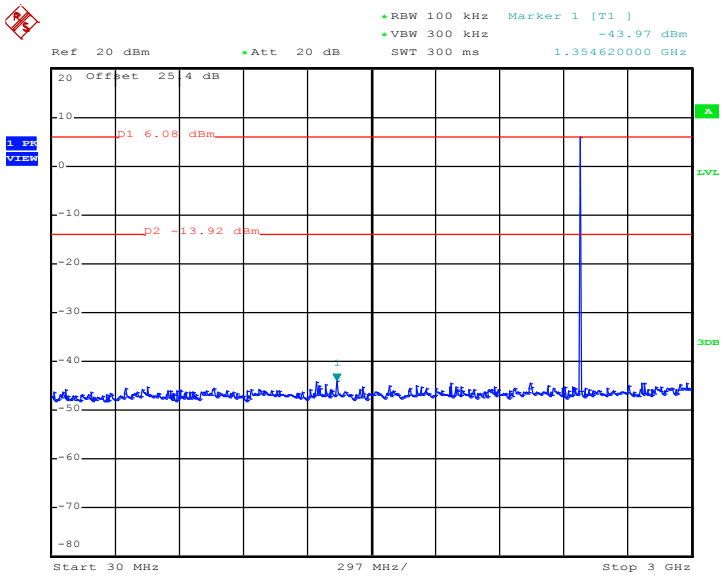
Date: 4.NOV.2013 15:11:01

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Test Mode :	1Mbps	Temperature :	24~26℃
Test Channel :	78	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

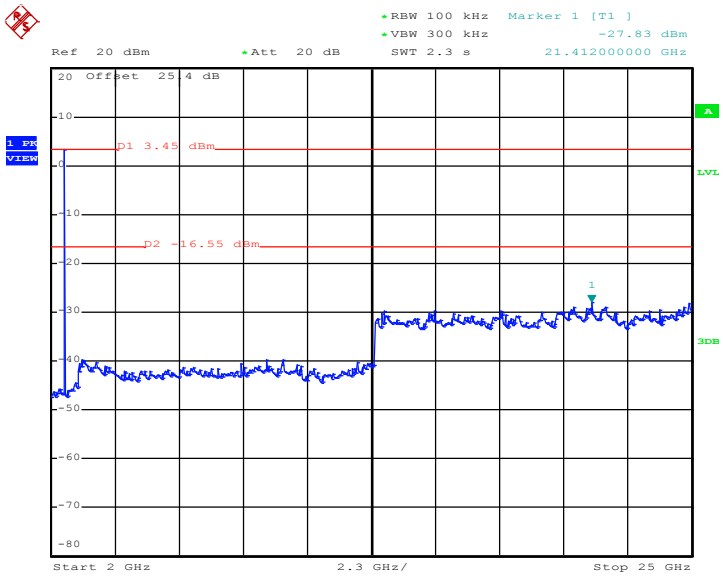
1Mbps CSE Plot on Ch 78 between 30 MHz ~ 3 GHz



Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

1Mbps CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



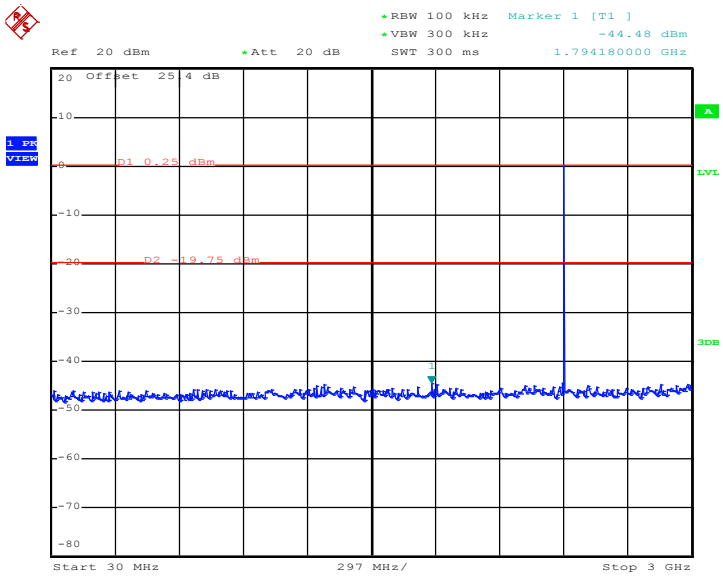
Date: 4.NOV.2013 15:12:16

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Test Mode :	2Mbps	Temperature :	24~26℃
Test Channel :	00	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

2Mbps CSE Plot on Ch 00 between 30 MHz ~ 3 GHz

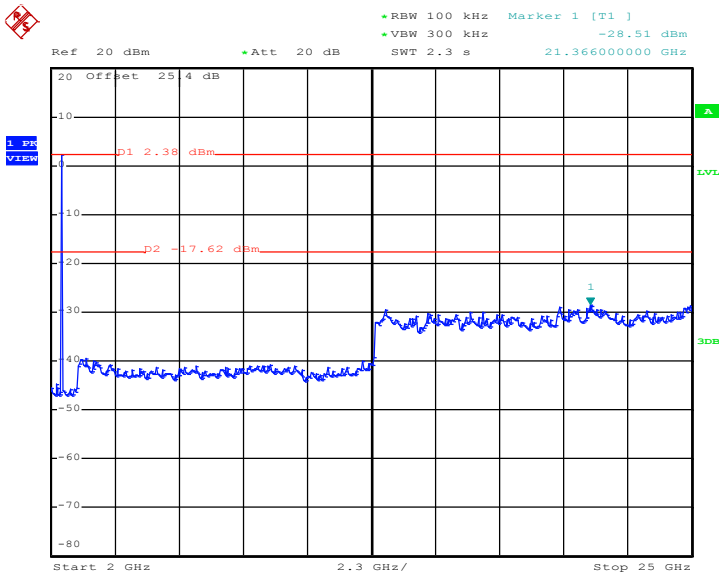


Date: 4.NOV.2013 15:13:09

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

2Mbps CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



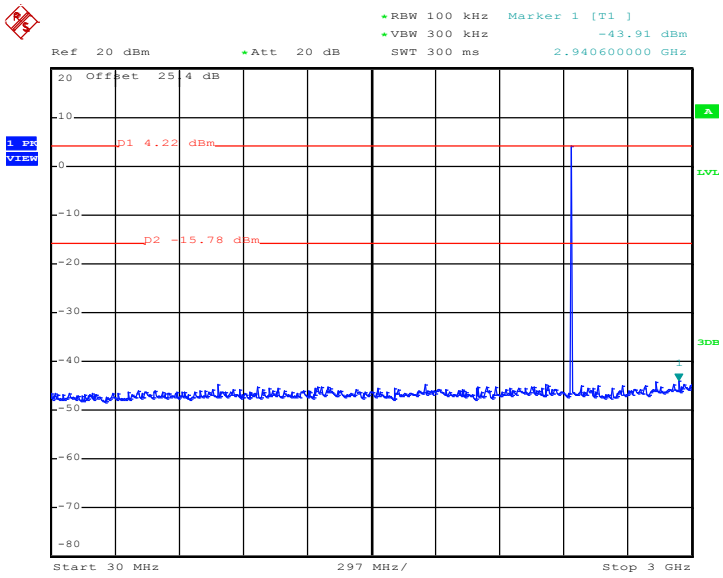
Date: 4.NOV.2013 15:13:31

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Test Mode :	2Mbps	Temperature :	24~26℃
Test Channel :	39	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

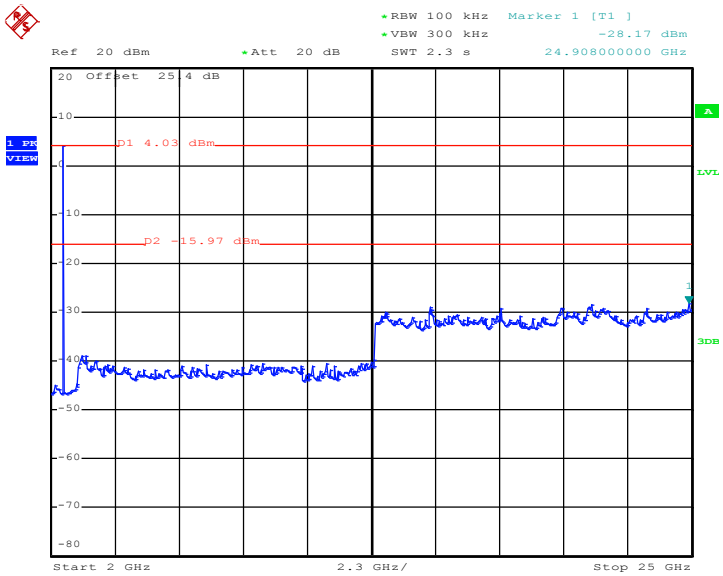
2Mbps CSE Plot on Ch 39 between 30 MHz ~ 3 GHz



Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

2Mbps CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



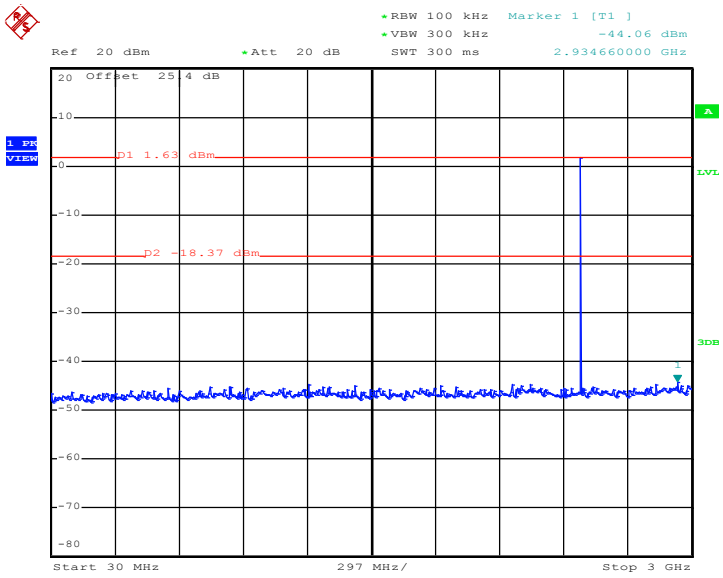
Date: 4.NOV.2013 15:14:30

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Test Mode :	2Mbps	Temperature :	24~26℃
Test Channel :	78	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

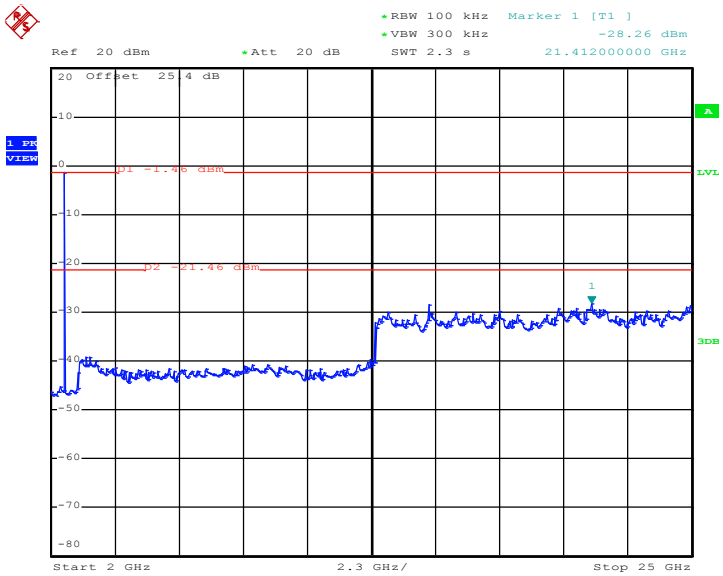
2Mbps CSE Plot on Ch 78 between 30 MHz ~ 3 GHz



Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

2Mbps CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



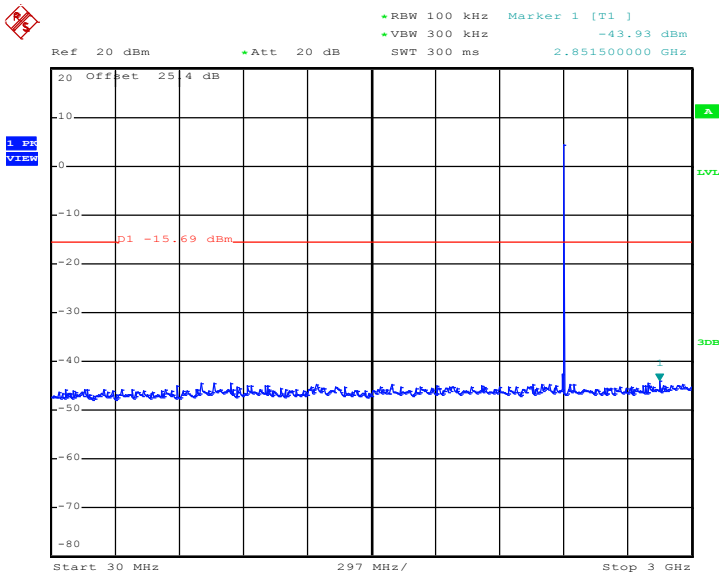
Date: 4.NOV.2013 15:15:57

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Test Mode :	3Mbps	Temperature :	24~26℃
Test Channel :	00	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

3Mbps CSE Plot on Ch 00 between 30 MHz ~ 3 GHz

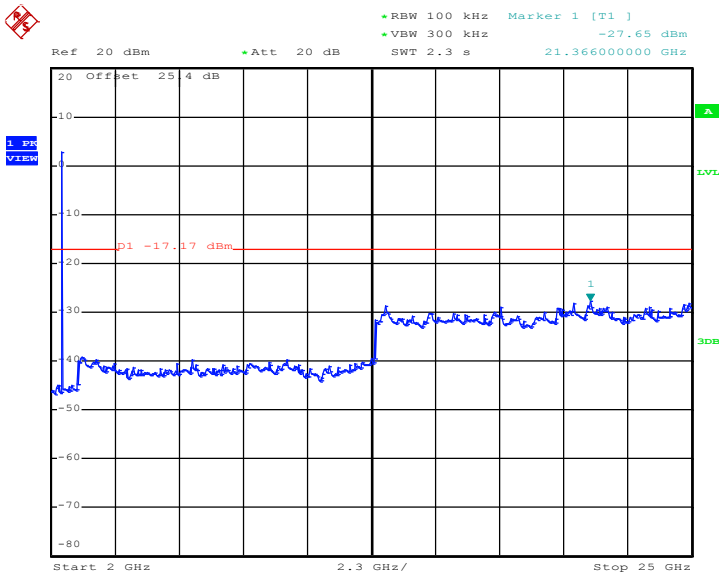


Date: 4.NOV.2013 14:42:20

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3Mbps CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



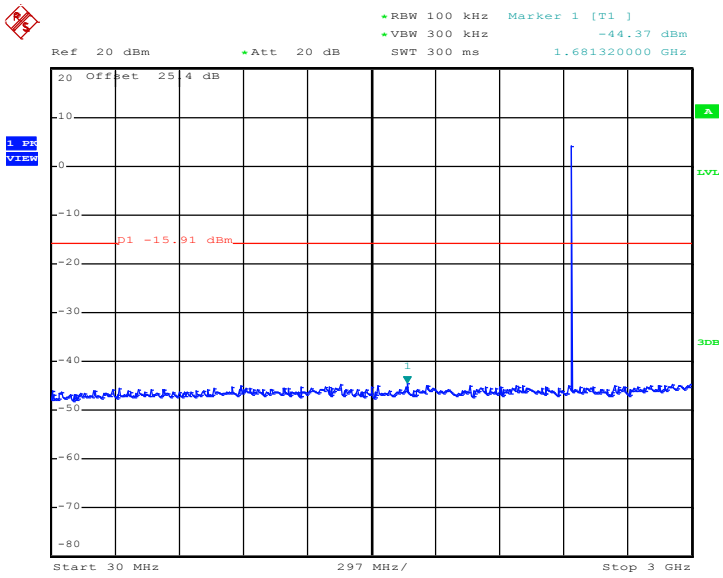
Date: 4.NOV.2013 14:43:12

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Test Mode :	3Mbps	Temperature :	24~26℃
Test Channel :	39	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

3Mbps CSE Plot on Ch 39 between 30 MHz ~ 3 GHz

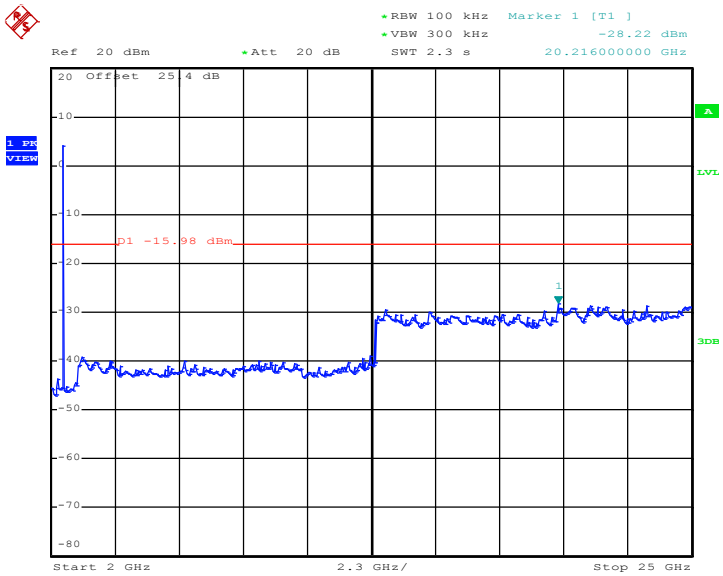


Date: 4.NOV.2013 14:44:04

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3Mbps CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



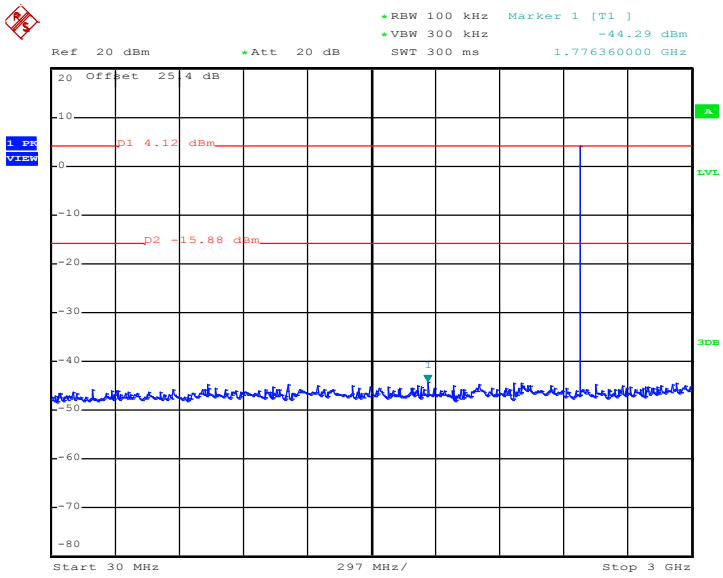
Date: 4.NOV.2013 14:44:56

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Test Mode :	3Mbps	Temperature :	24~26℃
Test Channel :	78	Relative Humidity :	48~51%
Test Engineer :	Rover Lee		

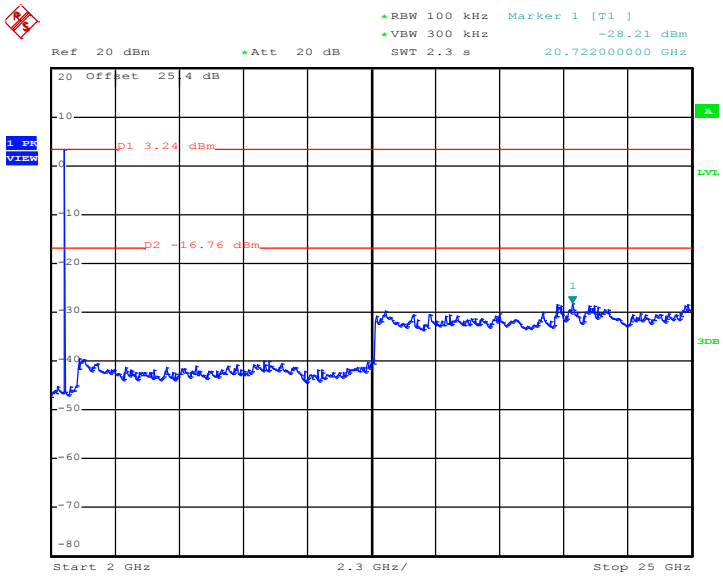
3Mbps CSE Plot on Ch 78 between 30 MHz ~ 3 GHz



Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3Mbps CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



Date: 4.NOV.2013 14:57:03

Note:

1. The total loss is 25.4 dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.8 Radiated Band Edges and Spurious Emission Measurement

3.8.1 Limit of Radiated Band Edges and Spurious 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

3.8.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

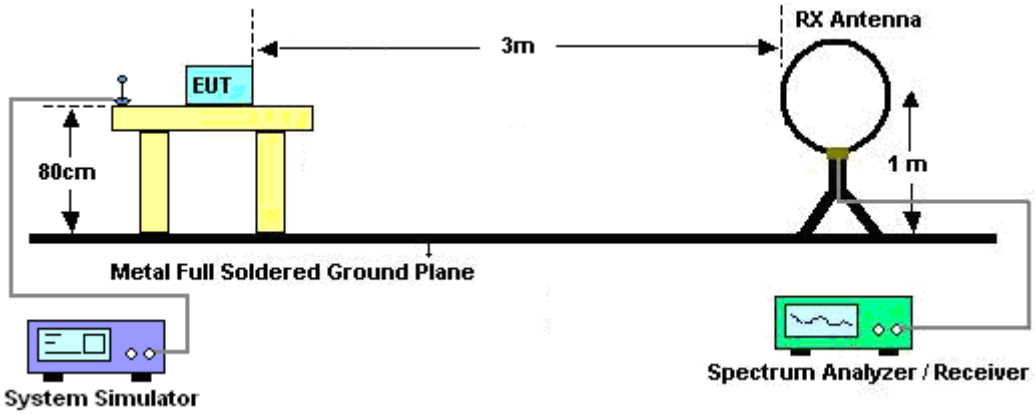
3.8.3 Test Procedures

1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz, RBW=1MHz for f>1GHz ; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
   (3) For average measurement: use duty cycle correction factor method per 15.35(c).
   Duty cycle = On time/100 milliseconds
   On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+N_n*L_n$
   Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.
   Average Emission Level = Peak Emission Level + 20*log(Duty cycle)
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

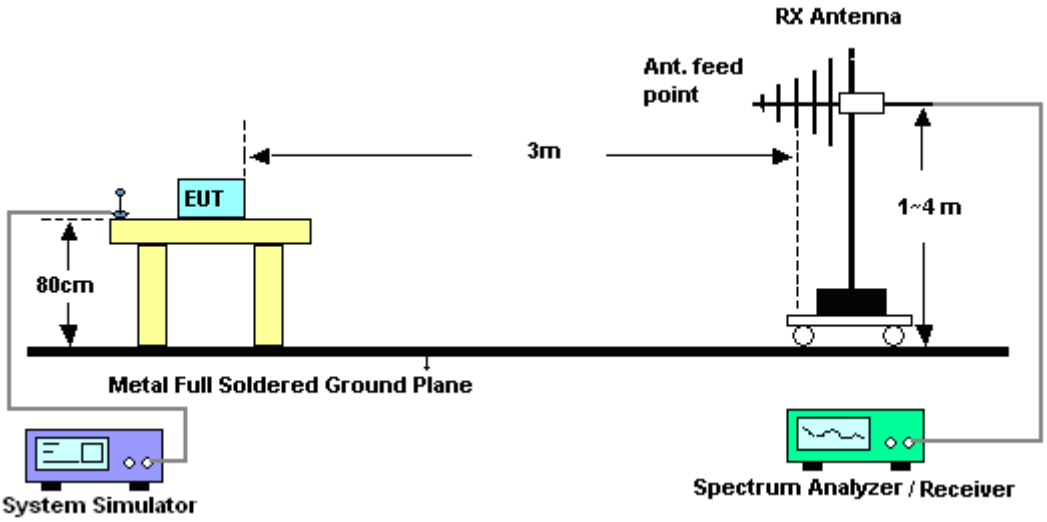
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

3.8.4 Test Setup

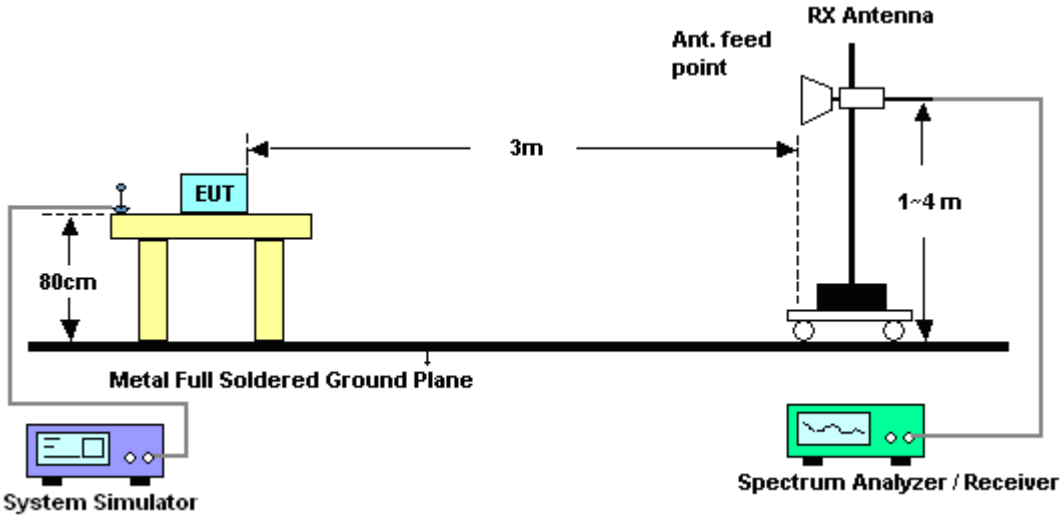
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

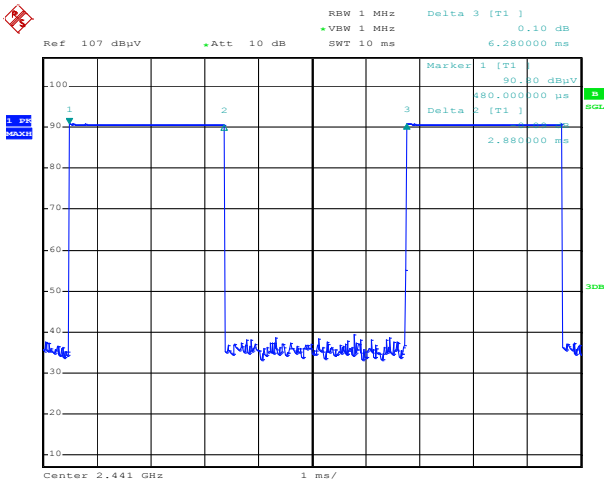


3.8.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

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.

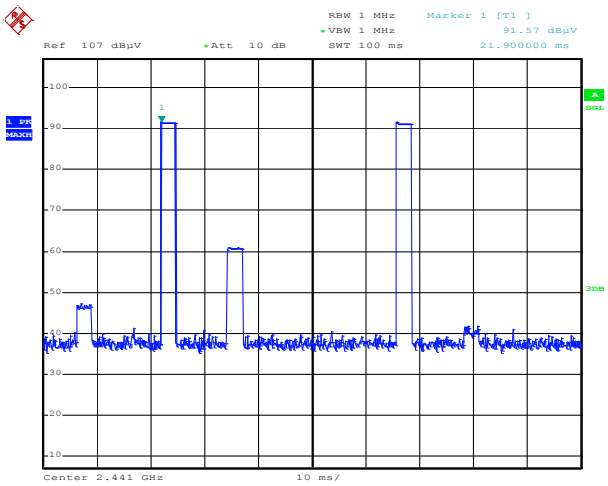
3.8.6 Duty cycle correction factor for average measurement

DH5 on time (One Pulse) Plot on Channel 39



Date: 7.NOV.2013 01:39:37

DH5 on time (Count Pulses) Plot on Channel 39

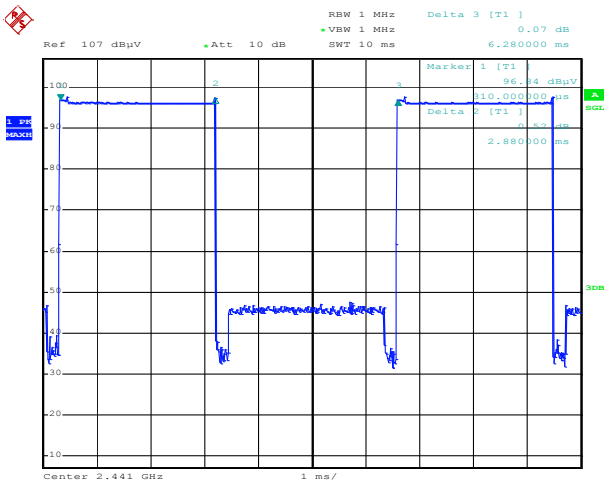


Date: 7.NOV.2013 00:31:59

Note:

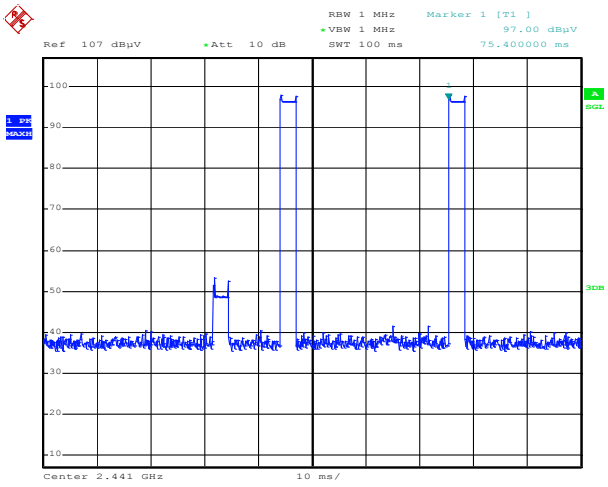
1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. DH5 has the highest duty cycle worst case and is reported.

2DH5 on time (One Pulse) Plot on Channel 39



Date: 7.NOV.2013 00:26:37

2DH5 on time (Count Pulses) Plot on Channel 39

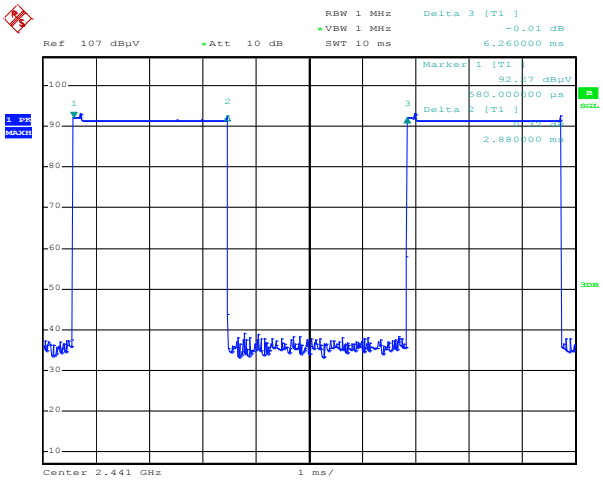


Date: 7.NOV.2013 00:31:07

Note:

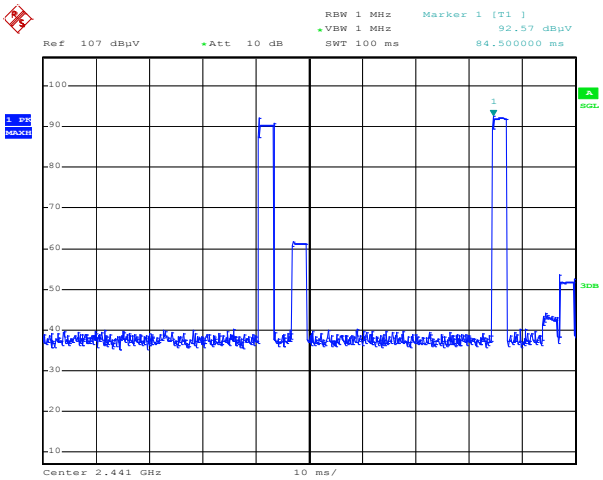
1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. 2DH5 has the highest duty cycle worst case and is reported.

3DH5 on time (One Pulse) Plot on Channel 39



Date: 7.NOV.2013 01:44:09

3DH5 on time (Count Pulses) Plot on Channel 39



Date: 7.NOV.2013 00:19:41

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. 3DH5 has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

2.88 ms x 20 channels = 57.6 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100ms / 57.6ms] = 2 hops

Thus, the maximum possible ON time:

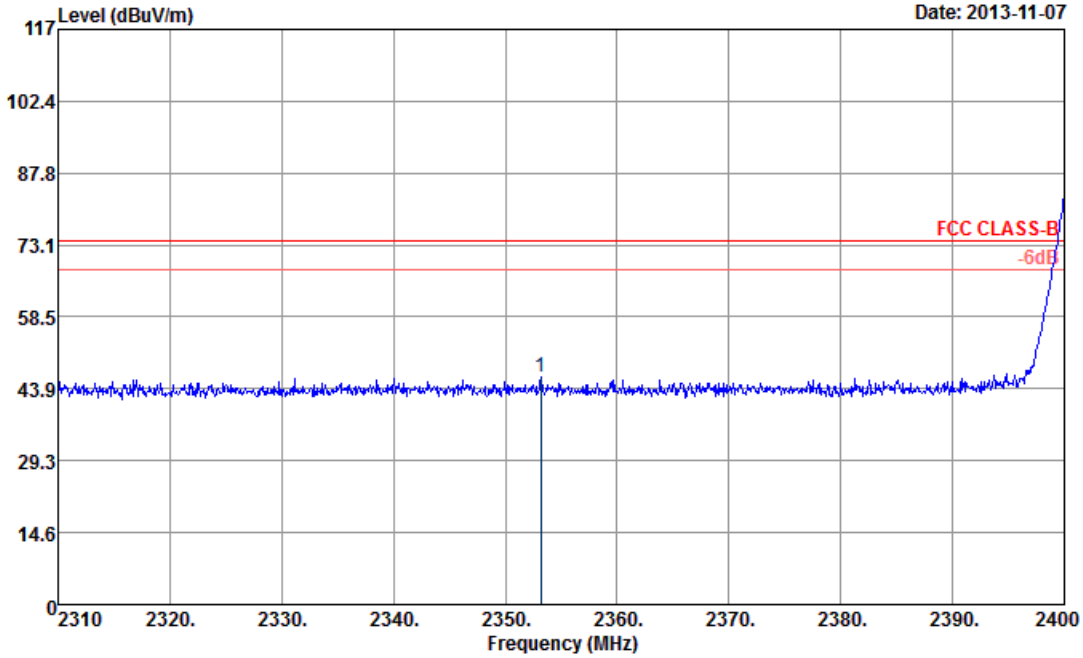
2.88 ms x 2 = 5.76 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100ms) = -24.79 dB

3.8.7 Test Result of Radiated Spurious at Band Edges

Test Mode :	1Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 HORIZONTAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

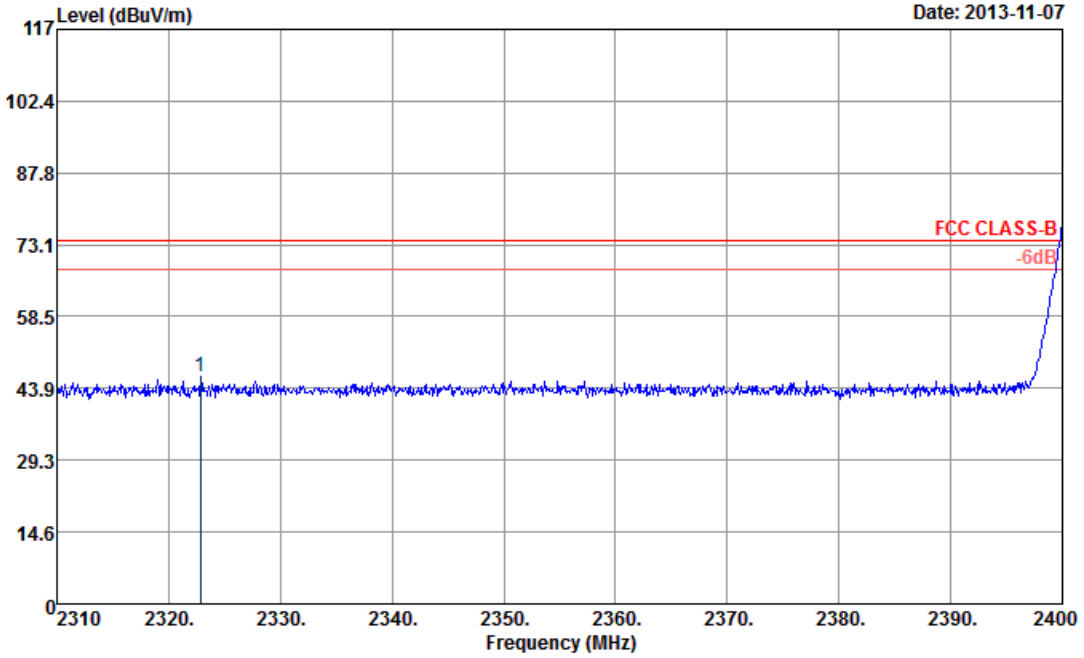
ANTENNA POLARITY : HORIZONTAL

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
2353.2	46.44	-27.56	74	41.59	32.26	6.84	34.25	176	115	Peak
2353.2	21.65	-32.35	54	-	-	-	-	-	-	Average

Note:

1. The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from 20log (dwell time/100ms).
   For example: Average level = 46.44dBuV/m – 24.79 (dB) = 21.65dBuV/m.
2. Worst case measurement on 2353.2 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2310-2390MHz. And, 2390-2400 MHz is non-restricted band which limit line is 20dB below the fundamental frequency emission level which is tested by conducted spurious emission. Both the test results are compliance with the FCC limit line.

Test Mode :	1Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



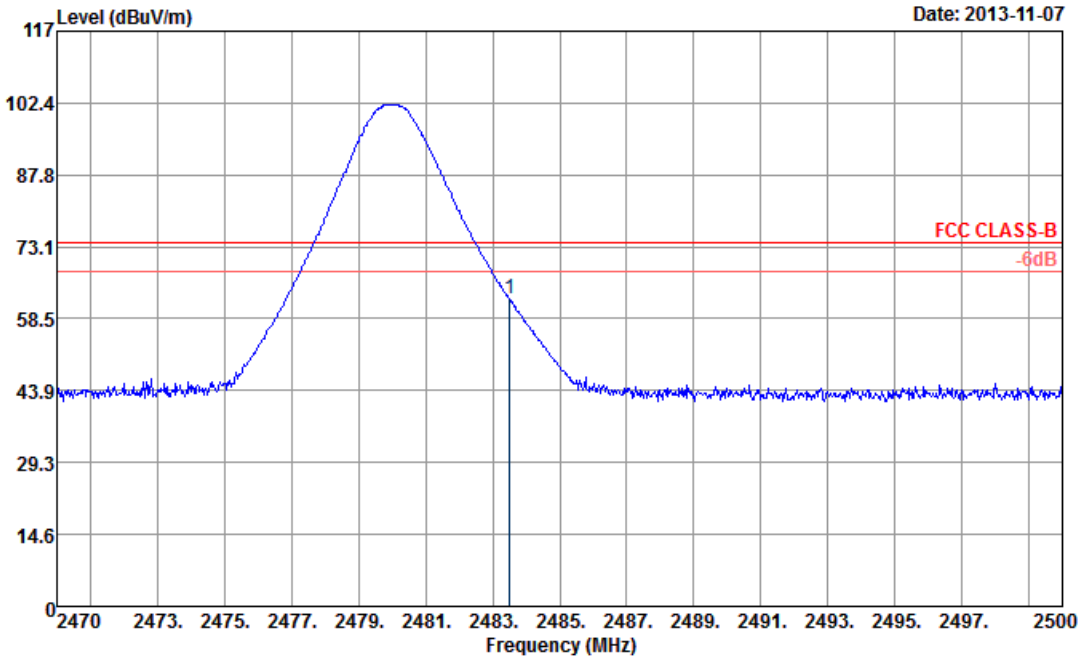
Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 VERTICAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

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
2322.87	46.3	-27.7	74	41.49	32.23	6.8	34.22	100	0	Peak
2322.87	21.51	-32.49	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2322.87 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2310-2390MHz. And, 2390-2400 MHz is non-restricted band which limit line is 20dB below the fundamental frequency emission level which is tested by conducted spurious emission. Both the test results are compliance with the FCC limit line.

Test Mode :	1Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



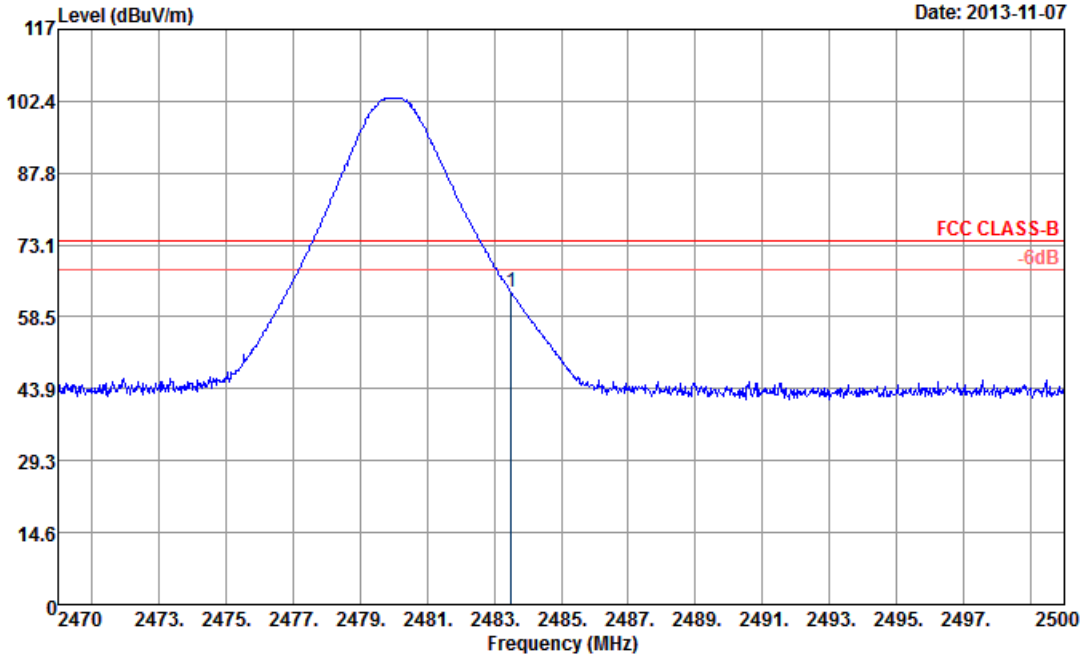
Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 HORIZONTAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

ANTENNA POLARITY : HORIZONTAL

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	62.54	-11.46	74	57.53	32.38	7.06	34.43	129	300	Peak
2483.5	37.75	-16.25	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2483.5 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2483.5-2500MHz. And, 2480-2483.5MHz is within the operating band and not within the restricted band. The test result is compliance with the FCC limit line.

Test Mode :	1Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



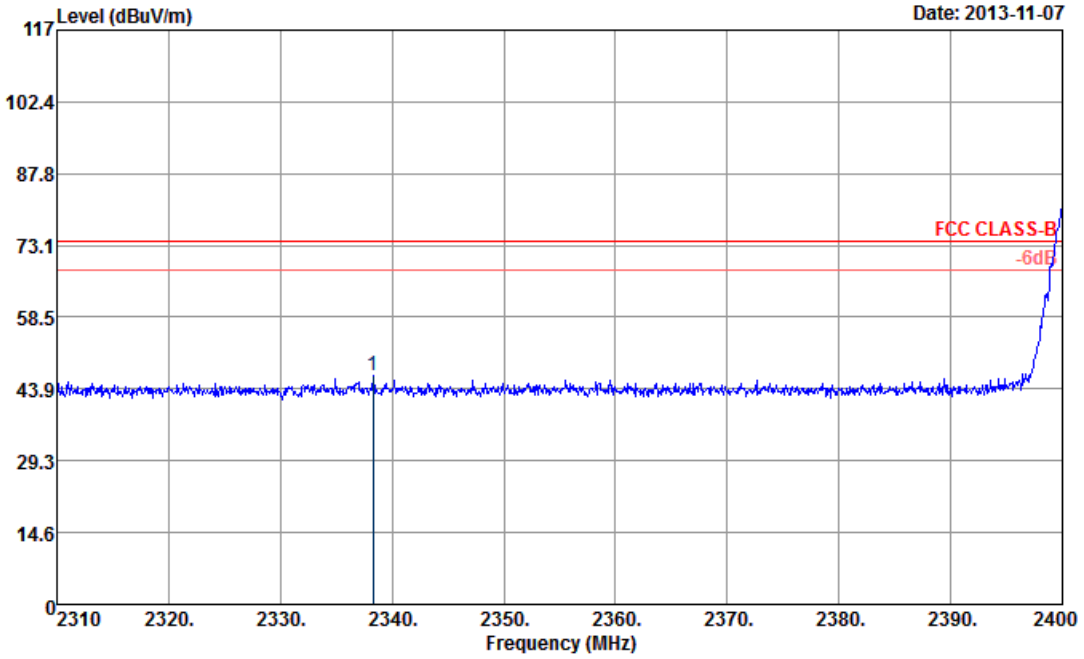
Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 VERTICAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limity Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	63.58	-10.42	74	58.57	32.38	7.06	34.43	104	6	Peak
2483.5	38.79	-15.21	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2483.5 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2483.5-2500MHz. And, 2480-2483.5MHz is within the operating band and not within the restricted band. The test result is compliance with the FCC limit line.

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 HORIZONTAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

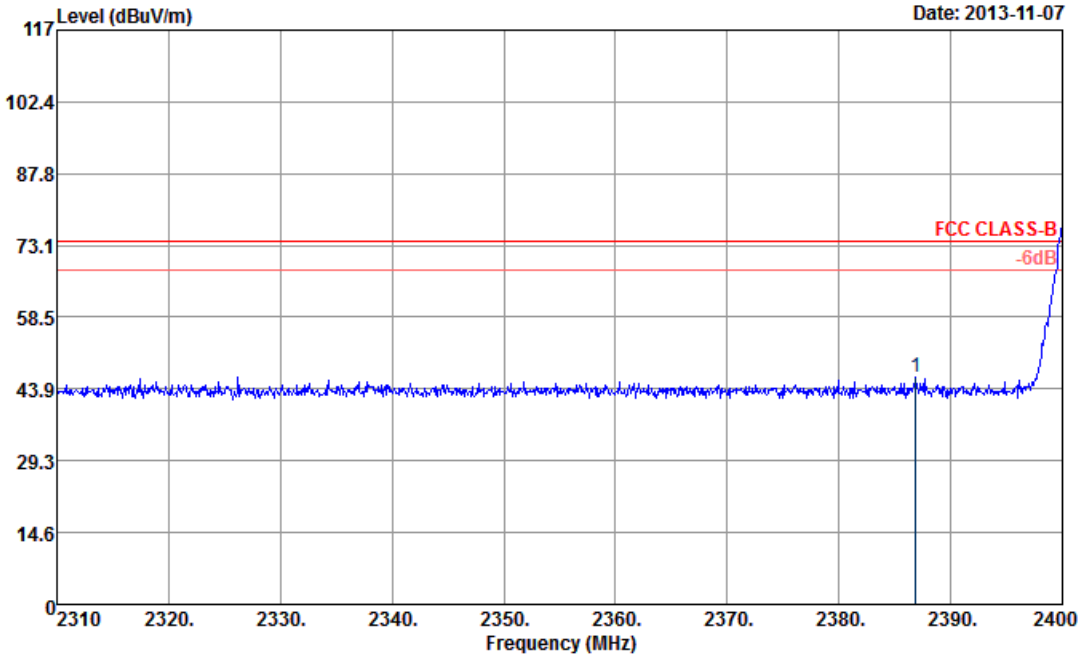
ANTENNA POLARITY : HORIZONTAL

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
2338.26	46.7	-27.3	74	41.84	32.24	6.84	34.22	176	115	Peak
2338.26	21.91	-32.09	54	-			-	-	-	Average

Note:

1. The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from 20log (dwell time/100ms).
   For example: Average level = 46.7dBuV/m – 24.79 (dB) = 21.91dBuV/m.
2. Worst case measurement on 2338.26 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2310-2390MHz. And, 2390-2400 MHz is non-restricted band which limit line is 20dB below the fundamental frequency emission level which is tested by conducted spurious emission. Both the test results are compliance with the FCC limit line.

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



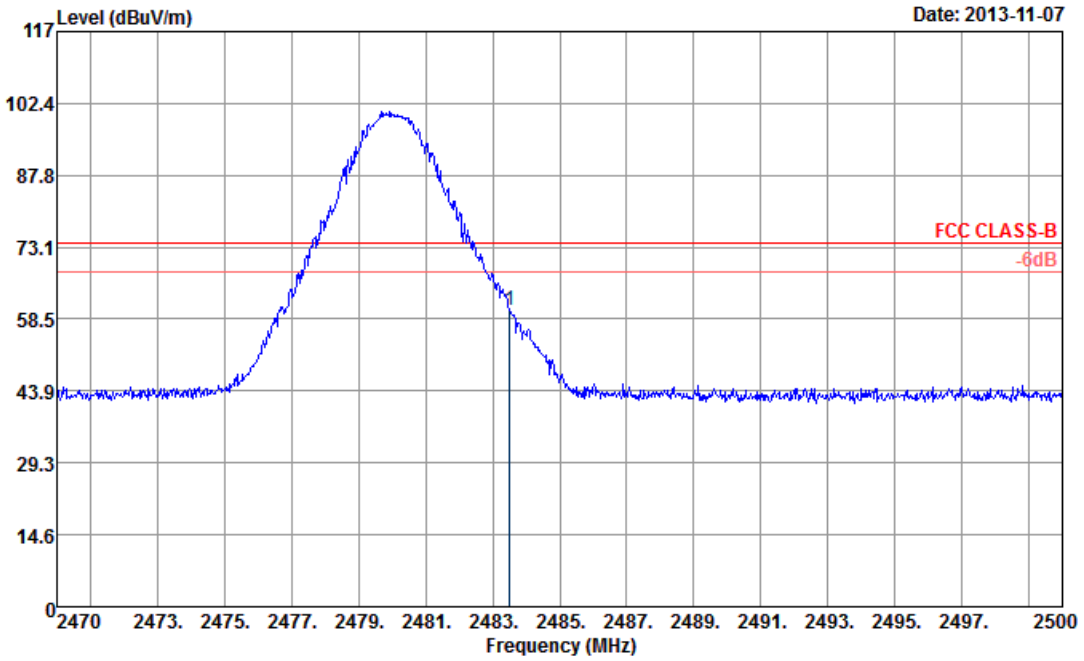
Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 VERTICAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

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
2386.86	46.37	-27.63	74	41.43	32.3	6.91	34.27	100	0	Peak
2386.86	21.58	-32.42	54	-			-	-	-	Average

Note: Worst case measurement on 2386.86 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2310-2390MHz. And, 2390-2400 MHz is non-restricted band which limit line is 20dB below the fundamental frequency emission level which is tested by conducted spurious emission. Both the test results are compliance with the FCC limit line.

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



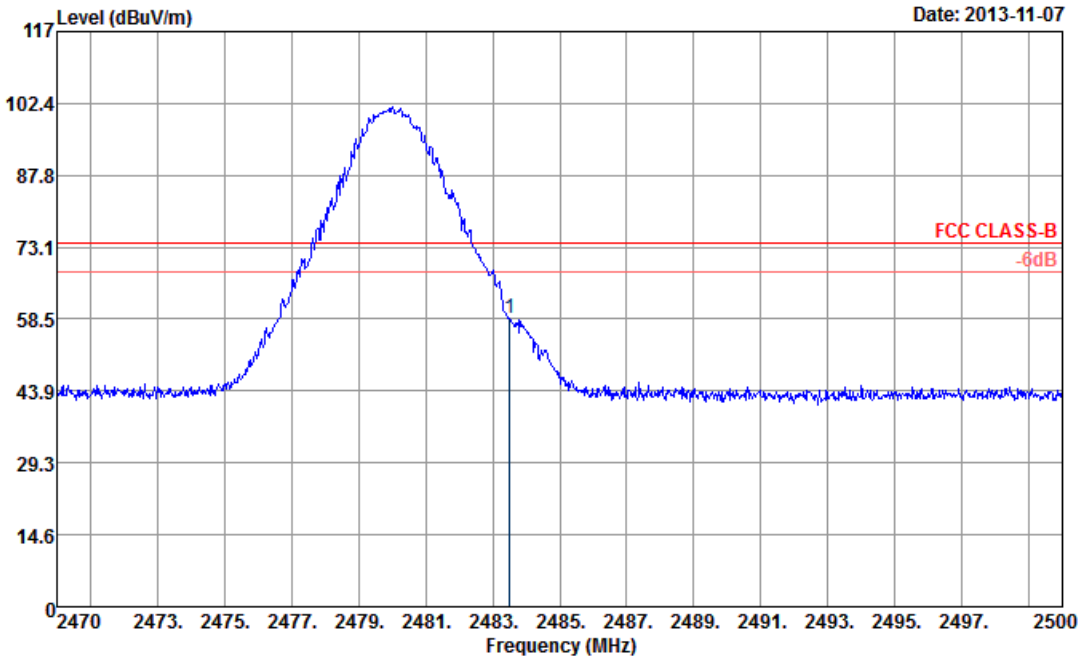
Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 HORIZONTAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

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	60.42	-13.58	74	55.41	32.38	7.06	34.43	128	294	Peak
2483.5	35.63	-18.37	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2483.5 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2483.5-2500MHz. And, 2480-2483.5MHz is within the operating band and not within the restricted band. The test result is compliance with the FCC limit line.

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



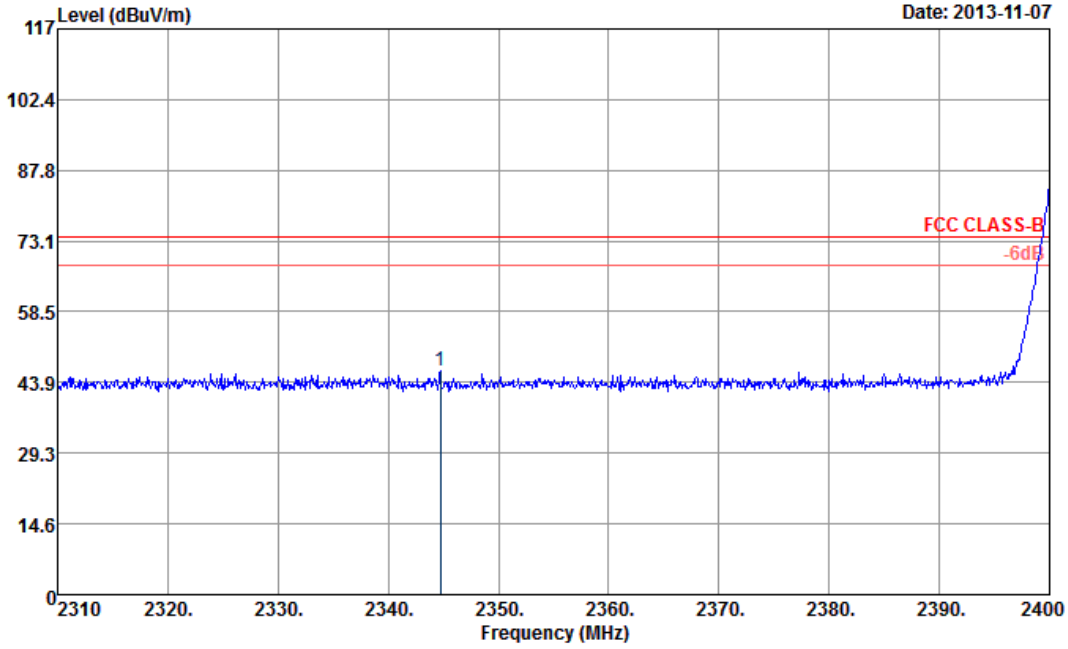
Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 VERTICAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limity Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	58.54	-15.46	74	53.53	32.38	7.06	34.43	103	6	Peak
2483.5	33.75	-20.25	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2483.5 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2483.5-2500MHz. And, 2480-2483.5MHz is within the operating band and not within the restricted band. The test result is compliance with the FCC limit line.

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 HORIZONTAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

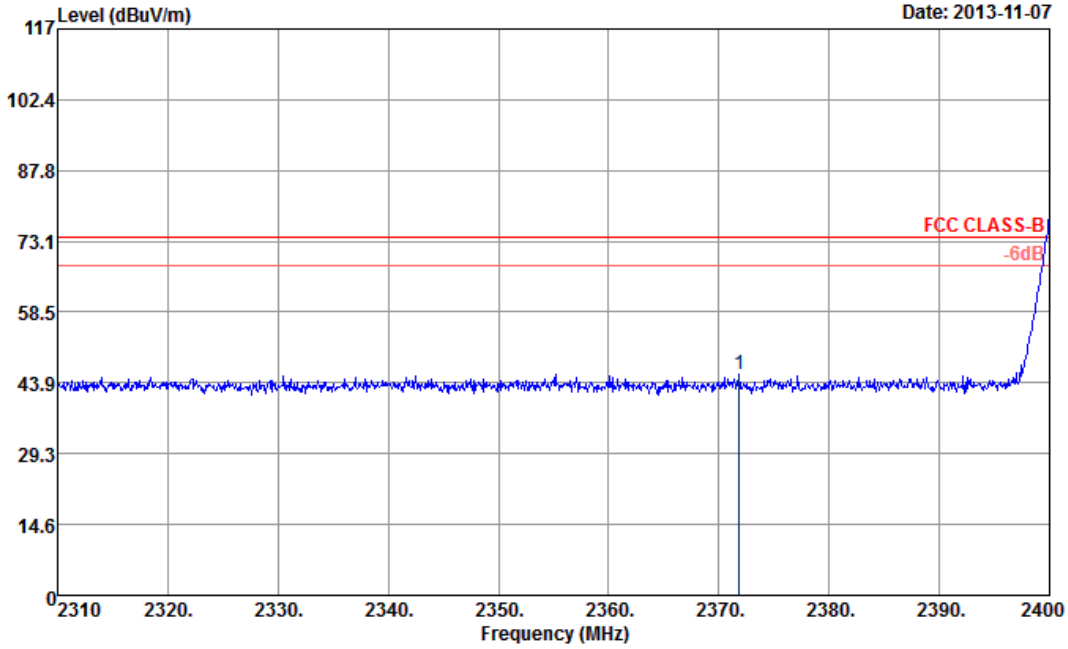
ANTENNA POLARITY : HORIZONTAL

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
2344.74	46.38	-27.62	74	41.55	32.24	6.84	34.25	176	115	Peak
2344.74	21.59	-32.41	54	-	-	-	-	-	-	Average

Note:

3. The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from 20log (dwell time/100ms).
   For example: Average level = 46.38dBuV/m – 24.79 (dB) = 21.59dBuV/m.
4. Worst case measurement on 2344.74 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2310-2390MHz. And, 2390-2400 MHz is non-restricted band which limit line is 20dB below the fundamental frequency emission level which is tested by conducted spurious emission. Both the test results are compliance with the FCC limit line.

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



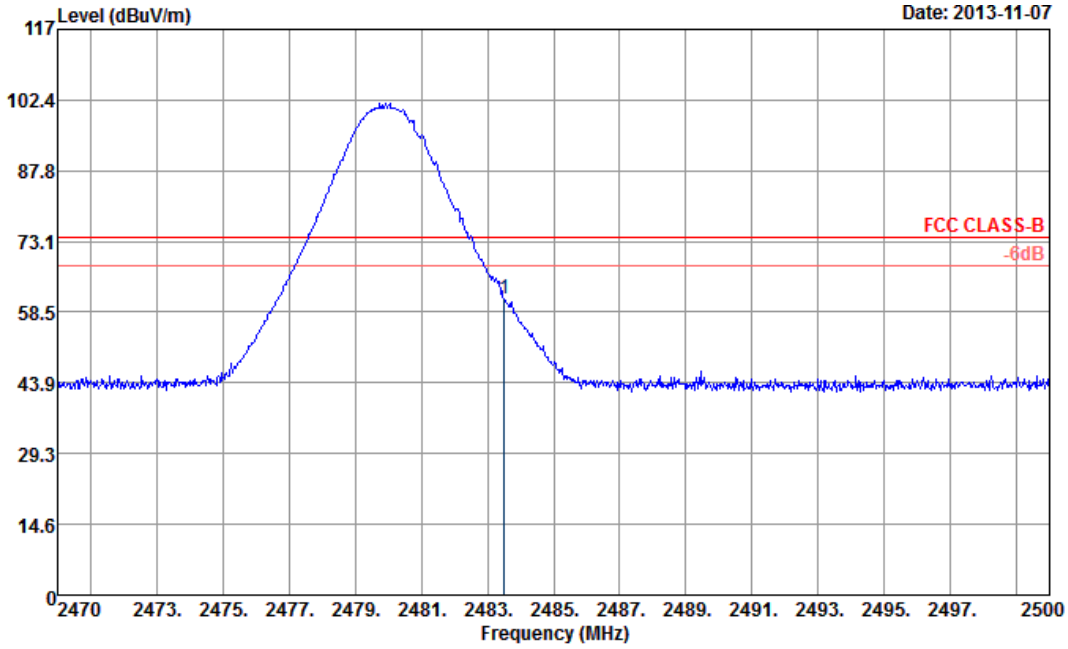
Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 VERTICAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

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
2371.83	45.78	-28.22	74	40.89	32.28	6.88	34.27	100	0	Peak
2371.83	20.99	-33.01	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2371.83 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2310-2390MHz. And, 2390-2400 MHz is non-restricted band which limit line is 20dB below the fundamental frequency emission level which is tested by conducted spurious emission. Both the test results are compliance with the FCC limit line.

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



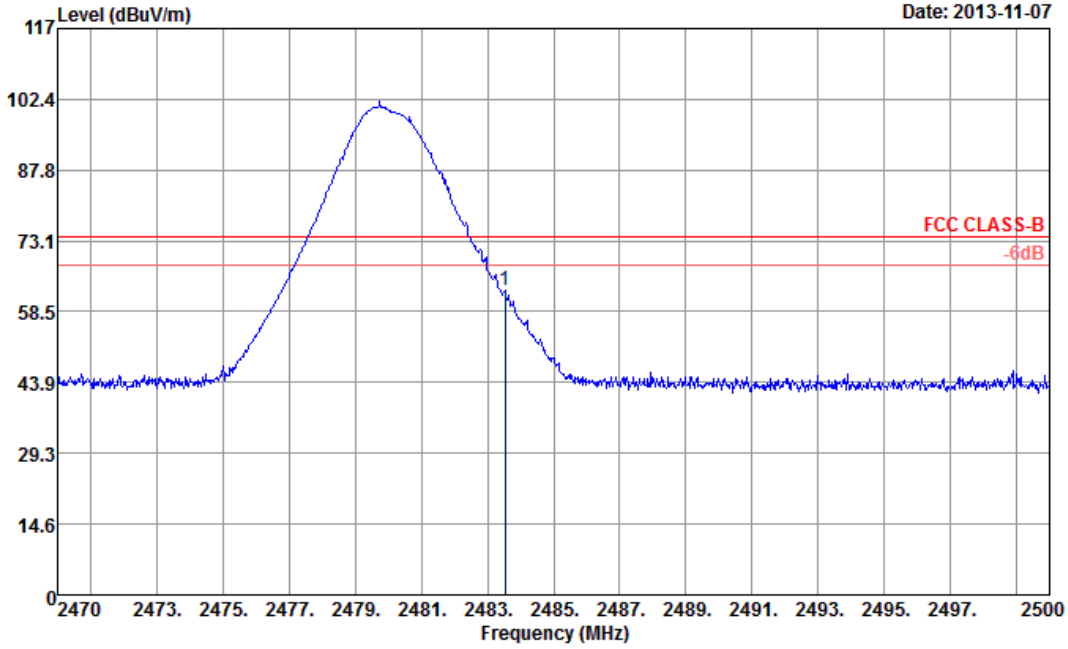
Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 HORIZONTAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

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	61.41	-12.59	74	56.4	32.38	7.06	34.43	128	295	Peak
2483.5	36.62	-17.38	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2483.5 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2483.5-2500MHz. And, 2480-2483.5MHz is within the operating band and not within the restricted band. The test result is compliance with the FCC limit line.

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		



Site : 03CH07-HY
Condition : FCC CLASS-B 3m HF-ANT_120823 VERTICAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

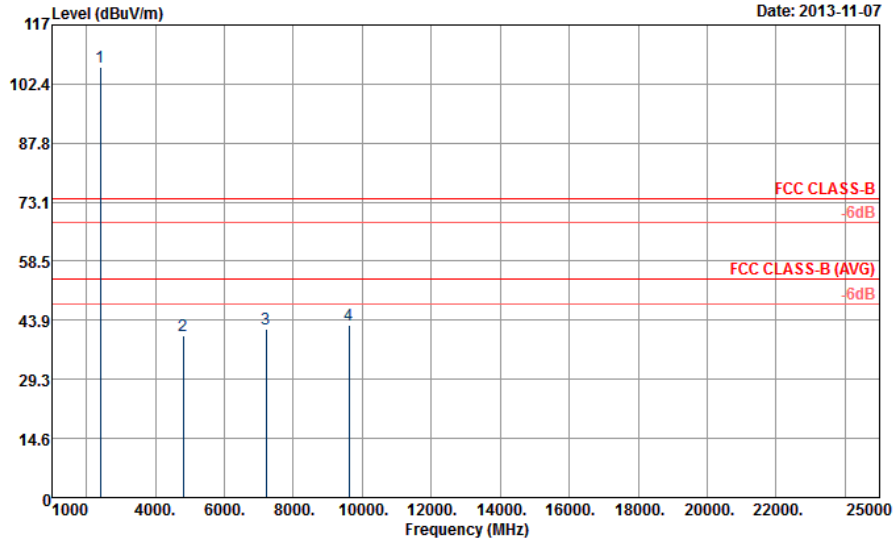
ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limity Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.53	62.98	-11.02	74	57.97	32.38	7.06	34.43	100	2	Peak
2483.53	38.19	-15.81	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2483.53 MHz is compliance with 74/54 dBuV/m (peak/average) limit and Edge Measurement in the restricted band 2483.5-2500MHz. And, 2480-2483.5MHz is within the operating band and not within the restricted band. The test result is compliance with the FCC limit line.

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

Test Mode :	1Mbps	**Temperature :**	21~23°C
Test Channel :	00	**Relative Humidity :**	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. 7206 MHz and 9609 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 106.56dBμV/m - 20dB = 86.56dBμV/m. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF HORIZONTAL

ANTENNA POLARITY : HORIZONTAL

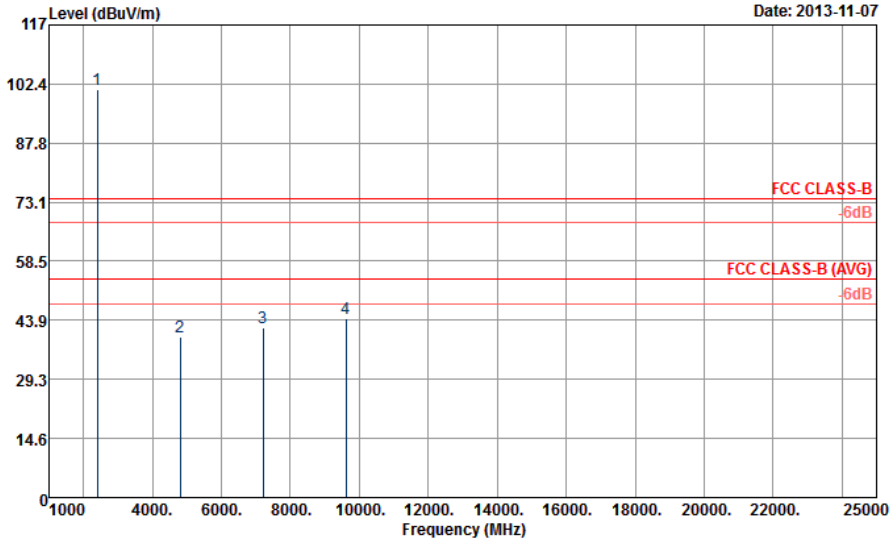
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	106.56	-	-	101.65	32.3	6.91	34.3	176	115	Peak
2402	81.77	-	-	-	-	-	-	-	-	Average
4803	40.07	-33.93	74	56.3	33.98	8.75	58.96	100	0	Peak
4803	15.28	-38.72	54	-	-	-	-	-	-	Average
7206	41.78	-44.78	86.56	53.04	35.56	10.81	57.63	100	0	Peak
9609	42.71	-43.85	86.56	51.25	36.44	13.7	58.68	100	0	Peak

Other harmonics are lower than background noise

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from 20log (dwell time/100ms).

For example: Average level = 106.56dBuV/m – 24.79 (dB) = 81.77dBuV/m.

Test Mode :	1Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. 7206 MHz and 9609 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



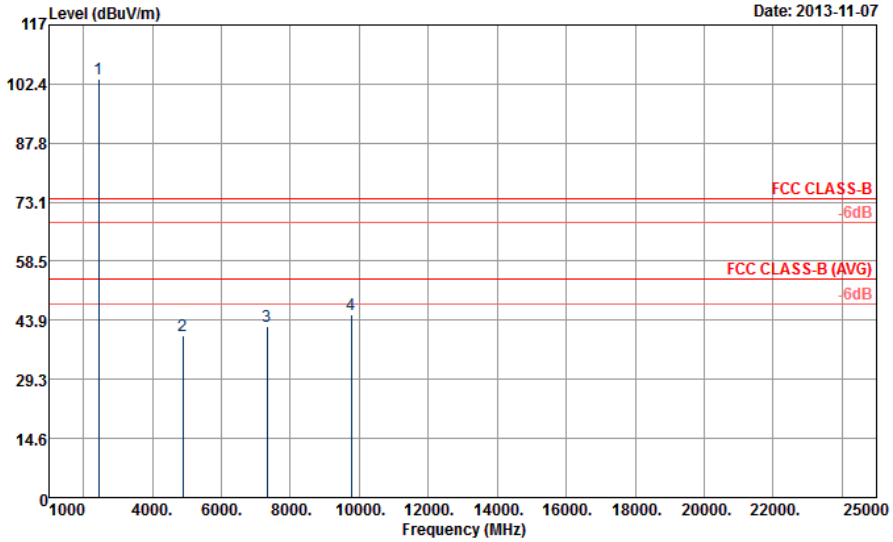
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF VERTICAL

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
2402	101.03	-	-	96.12	32.3	6.91	34.3	100	0	Peak
2402	76.24	-	-	-	-	-	-	-	-	Average
4803	39.65	-34.35	74	55.88	33.98	8.75	58.96	100	0	Peak
4803	14.86	-39.14	54	-	-	-	-	-	-	Average
7206	41.99	-39.04	81.03	53.25	35.56	10.81	57.63	100	0	Peak
9609	44.22	-36.81	81.03	52.76	36.44	13.7	58.68	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	1Mbps	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2442 MHz is fundamental signal which can be ignored. 2. 9765 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



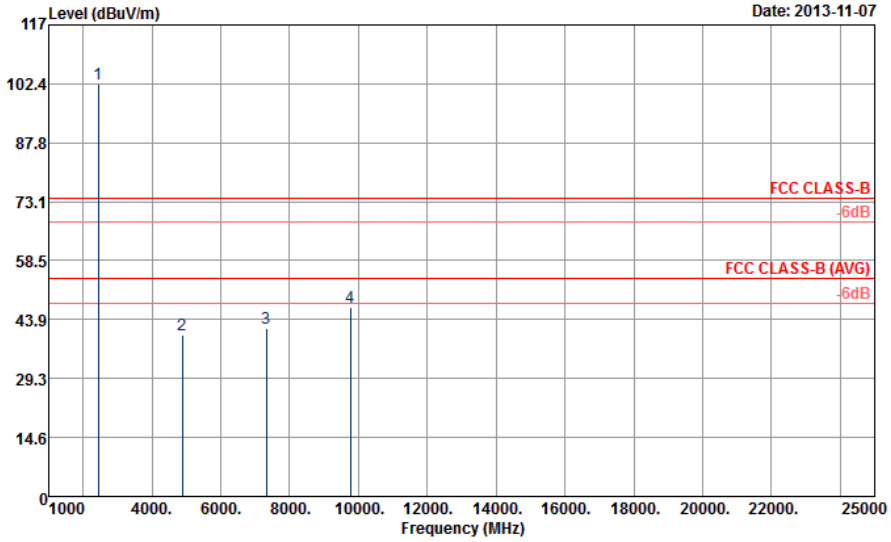
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF HORIZONTAL

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
2442	103.78	-	-	98.83	32.35	6.99	34.39	199	302	Peak
2442	78.99	-	-	-	-	-	-	-	-	Average
4881	40.06	-33.94	74	56.09	33.95	8.85	58.83	100	0	Peak
4881	15.27	-38.73	54	-	-	-	-	-	-	Average
7323	42.43	-31.57	74	53.73	35.53	10.91	57.74	100	0	Peak
7323	17.64	-36.36	54	-	-	-	-	-	-	Average
9765	45.14	-38.64	83.78	53.49	36.69	13.69	58.73	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	1Mbps	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2442 MHz is fundamental signal which can be ignored. 2. 9765 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



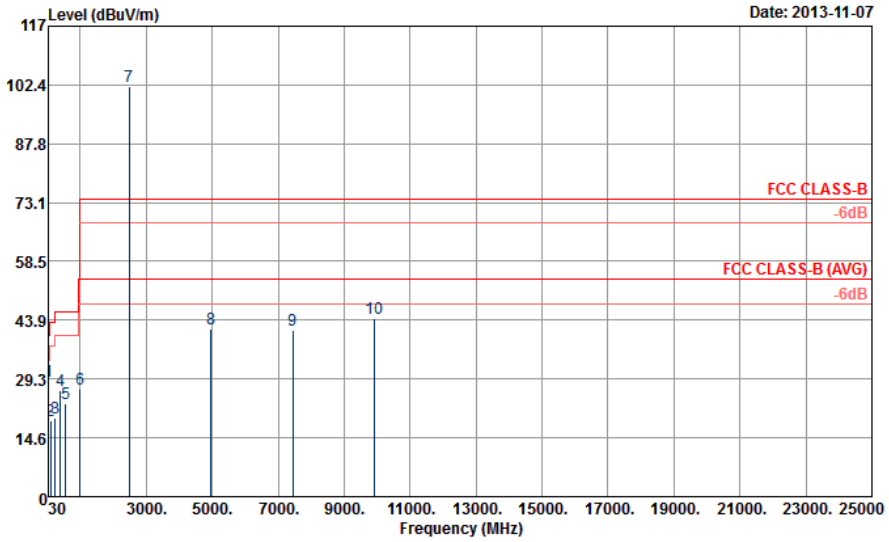
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF VERTICAL

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
2442	102.47	-	-	97.52	32.35	6.99	34.39	101	2	Peak
2442	77.68	-	-	-	-	-	-	-	-	Average
4881	40.17	-33.83	74	56.2	33.95	8.85	58.83	100	0	Peak
4881	15.38	-38.62	54	-	-	-	-	-	-	Average
7323	41.87	-32.13	74	53.17	35.53	10.91	57.74	100	0	Peak
7323	17.08	-36.92	54	-	-	-	-	-	-	Average
9765	46.81	-35.66	82.47	55.16	36.69	13.69	58.73	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	1Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. 9921 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



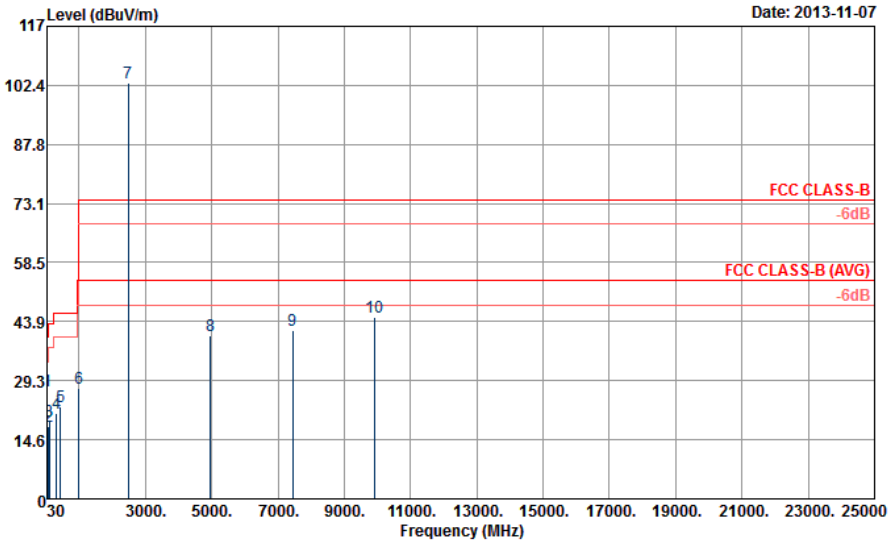
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF HORIZONTAL

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
42.96	28.61	-11.39	40	47.27	11.9	0.64	31.2	125	32	Peak
107.49	18.77	-24.73	43.5	38.23	10.68	1.04	31.18	-	-	Peak
240.06	19.4	-26.6	46	37.47	11.4	1.53	31	-	-	Peak
400.1	26.33	-19.67	46	39.16	15.93	2.14	30.9	-	-	Peak
553.4	23.22	-22.78	46	31.56	19.88	2.56	30.78	-	-	Peak
983.9	26.72	-27.28	54	28.57	24.93	3.49	30.27	-	-	Peak
2480	101.95	-	-	96.94	32.38	7.06	34.43	129	300	Peak
2480	77.16	-	-	-	-	-	-	-	-	Average

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
4959	41.57	-32.43	74	57.4	33.91	8.92	58.66	100	0	Peak
4959	16.78	-37.22	54	-	-	-	-	-	-	Average
7440	41.49	-32.51	74	52.79	35.51	11.04	57.85	100	0	Peak
7440	16.7	-37.3	54	-	-	-	-	-	-	Average
9921	44.43	-37.52	81.95	52.63	36.9	13.68	58.78	100	0	Peak
Other harmonics are lower than background noise										

Test Mode :	1Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. 9921 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



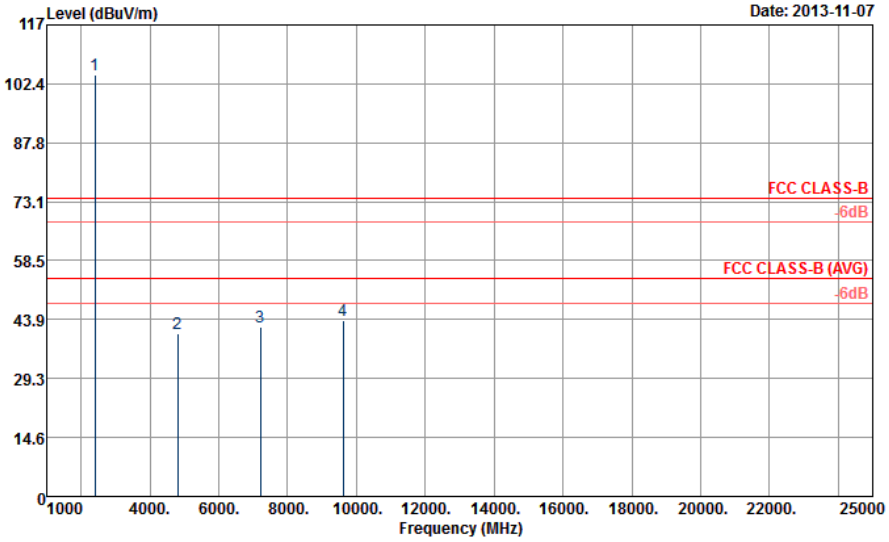
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF VERTICAL

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
44.31	26.84	-13.16	40	46.89	10.5	0.65	31.2	136	111	Peak
76.71	17.82	-22.18	40	41.29	6.87	0.86	31.2	-	-	Peak
106.95	19.09	-24.41	43.5	38.61	10.62	1.03	31.17	-	-	Peak
325.9	21.04	-24.96	46	36.57	13.64	1.83	31	-	-	Peak
437.9	22.96	-23.04	46	34.42	16.98	2.27	30.71	-	-	Peak
983.2	27.31	-26.69	54	29.16	24.93	3.49	30.27	-	-	Peak
2480	102.99	-	-	97.98	32.38	7.06	34.43	104	6	Peak
2480	78.2	-	-	-	-	-	-	-	-	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
4959	40.33	-33.67	74	56.16	33.91	8.92	58.66	100	0	Peak
4959	15.54	-38.46	54	-	-	-	-	-	-	Average
7440	41.79	-32.21	74	53.09	35.51	11.04	57.85	100	0	Peak
7440	17	-37	54	-	-	-	-	-	-	Average
9921	45	-37.99	82.99	53.2	36.9	13.68	58.78	100	0	Peak
Other harmonics are lower than background noise										

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. 7206 MHz and 9606 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF HORIZONTAL

ANTENNA POLARITY : HORIZONTAL

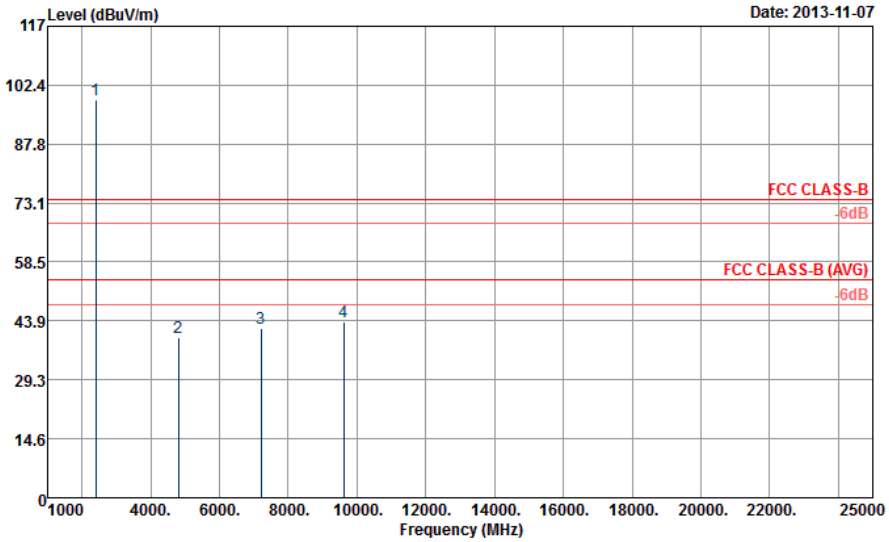
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	104.54	-	-	99.63	32.3	6.91	34.3	176	115	Peak
2402	79.75	-	-	-	-	-	-	-	-	Average
4803	40.28	-33.72	74	56.51	33.98	8.75	58.96	100	0	Peak
4803	15.49	-38.51	54	-	-	-	-	-	-	Average
7206	42.08	-42.46	84.54	53.34	35.56	10.81	57.63	100	0	Peak
9609	43.83	-40.71	84.54	52.37	36.44	13.7	58.68	100	0	Peak

Other harmonics are lower than background noise

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from 20log (dwell time/100ms).

For example: Average level = 104.54dBuV/m – 24.79 (dB) = 79.75dBuV/m.

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. 7206 MHz and 9609 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



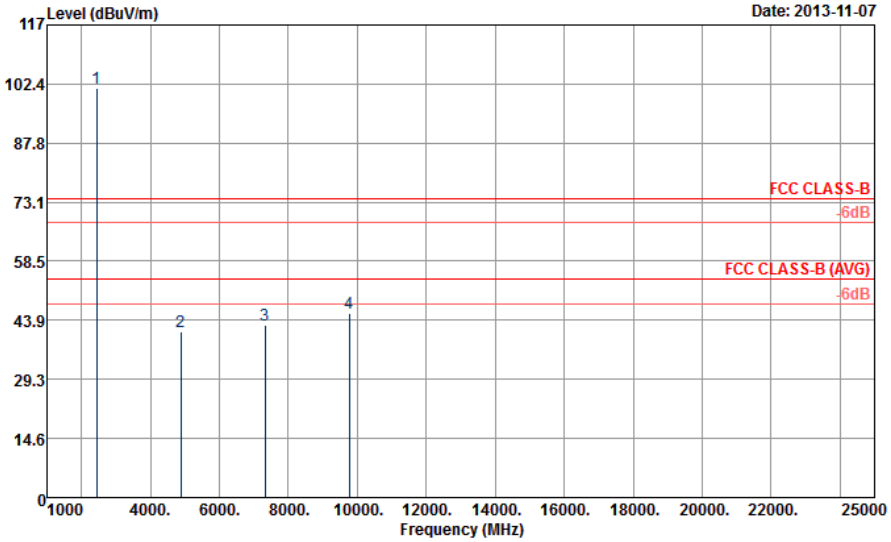
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF VERTICAL

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
2402	98.89	-	-	93.98	32.3	6.91	34.3	100	0	Peak
2402	74.1	-	-	-	-	-	-	-	-	Average
4803	39.9	-34.1	74	56.13	33.98	8.75	58.96	100	0	Peak
4803	15.11	-38.89	54	-	-	-	-	-	-	Average
7206	42.17	-36.72	78.89	53.43	35.56	10.81	57.63	100	0	Peak
9609	43.54	-35.35	78.89	52.08	36.44	13.7	58.68	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2442 MHz is fundamental signal which can be ignored. 2. 9765 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



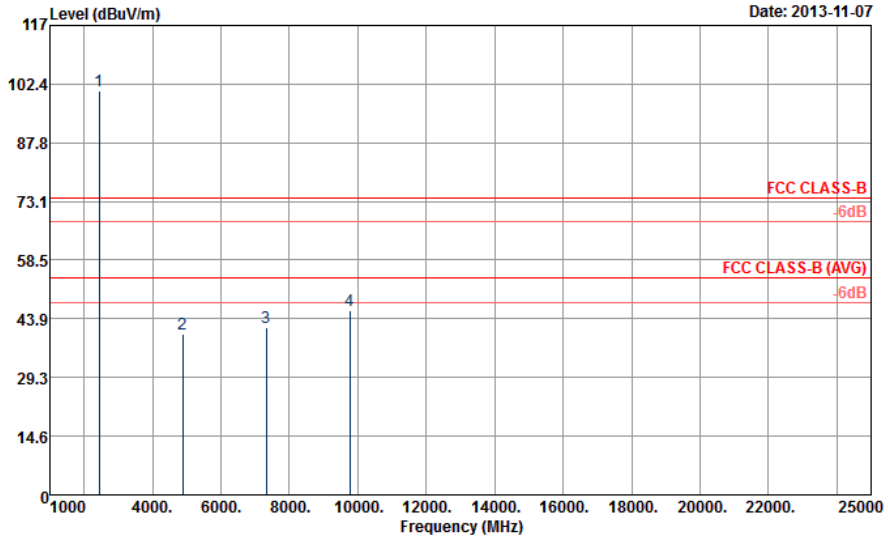
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF HORIZONTAL

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
2442	101.29	-	-	96.34	32.35	6.99	34.39	200	302	Peak
2442	76.5	-	-	-	-	-	-	-	-	Average
4881	40.98	-33.02	74	57.01	33.95	8.85	58.83	100	0	Peak
4881	16.19	-37.81	54	-	-	-	-	-	-	Average
7323	42.86	-31.14	74	54.16	35.53	10.91	57.74	100	0	Peak
7323	18.07	-35.93	54	-	-	-	-	-	-	Average
9765	45.66	-35.63	81.29	54.01	36.69	13.69	58.73	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2442 MHz is fundamental signal which can be ignored. 2. 9765 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



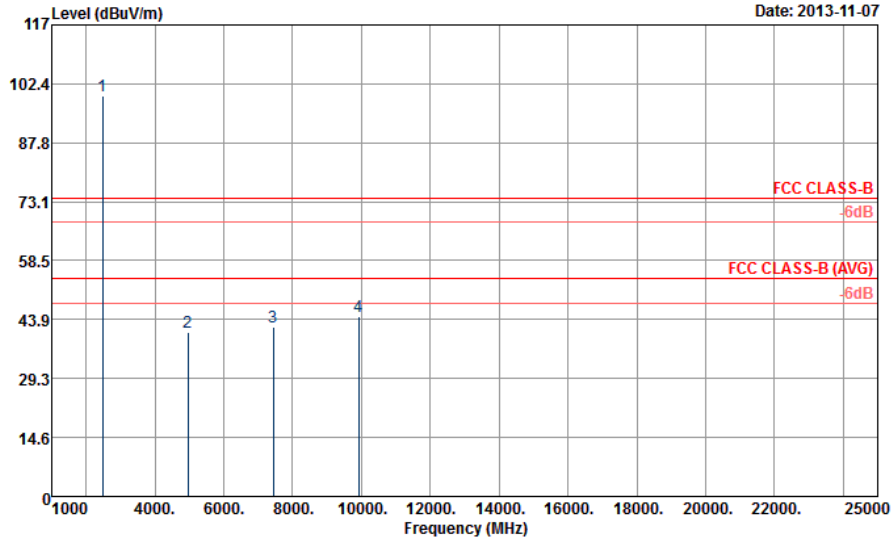
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF VERTICAL

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
2442	100.76	-	-	95.81	32.35	6.99	34.39	104	2	Peak
2442	75.97	-	-	-	-	-	-	-	-	Average
4881	40.21	-33.79	74	56.24	33.95	8.85	58.83	100	0	Peak
4881	15.42	-38.58	54	-	-	-	-	-	-	Average
7323	41.7	-32.3	74	53	35.53	10.91	57.74	100	0	Peak
7323	16.91	-37.09	54	-	-	-	-	-	-	Average
9765	45.84	-34.92	80.76	54.19	36.69	13.69	58.73	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. 9921 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5^{th}, 6^{th}, 7^{th},…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



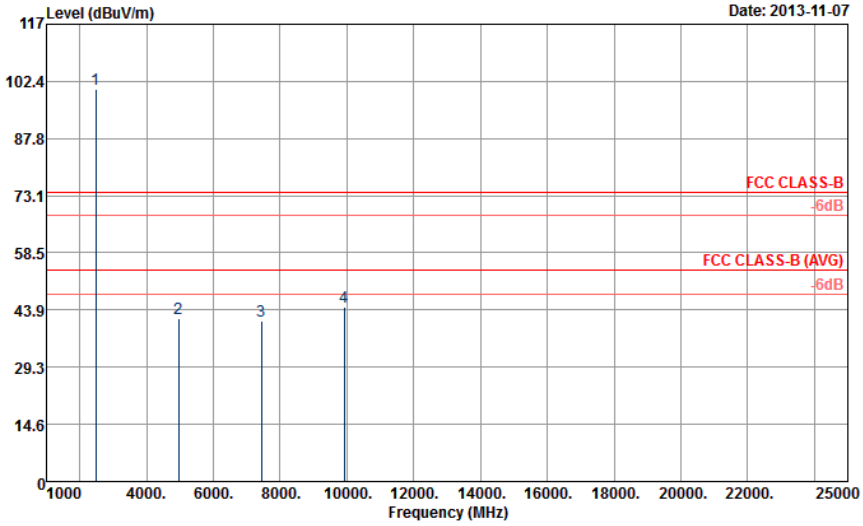
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF HORIZONTAL

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
2480	99.47	-	-	94.46	32.38	7.06	34.43	128	294	Peak
2480	74.68	-	-	-	-	-	-	-	-	Average
4959	40.76	-33.24	74	56.59	33.91	8.92	58.66	100	0	Peak
4959	15.97	-38.03	54	-	-	-	-	-	-	Average
7440	41.97	-32.03	74	53.27	35.51	11.04	57.85	100	0	Peak
7440	17.18	-36.82	54	-	-	-	-	-	-	Average
9921	44.49	-34.98	79.47	52.69	36.9	13.68	58.78	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	2Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. 9921 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



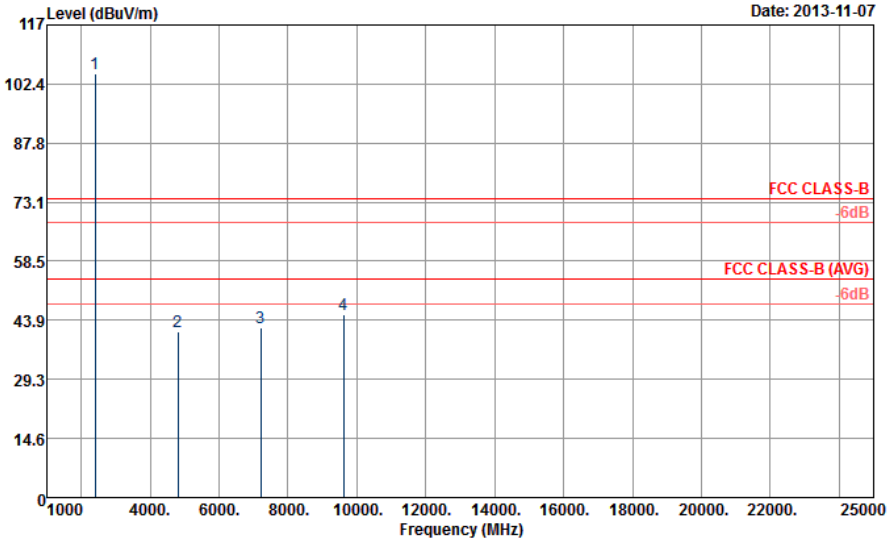
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF VERTICAL
Project : FR 3O2909

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
2480	100.51	-	-	95.5	32.38	7.06	34.43	103	6	Peak
2480	75.72	-	-	-	-	-	-	-	-	Average
4959	41.67	-32.33	74	57.5	33.91	8.92	58.66	100	0	Peak
4959	16.88	-37.12	54	-	-	-	-	-	-	Average
7440	41.08	-32.92	74	52.38	35.51	11.04	57.85	100	0	Peak
7440	16.29	-37.71	54	-	-	-	-	-	-	Average
9921	44.56	-35.95	80.51	52.76	36.9	13.68	58.78	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. 7206 MHz and 9608 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF HORIZONTAL

ANTENNA POLARITY : HORIZONTAL

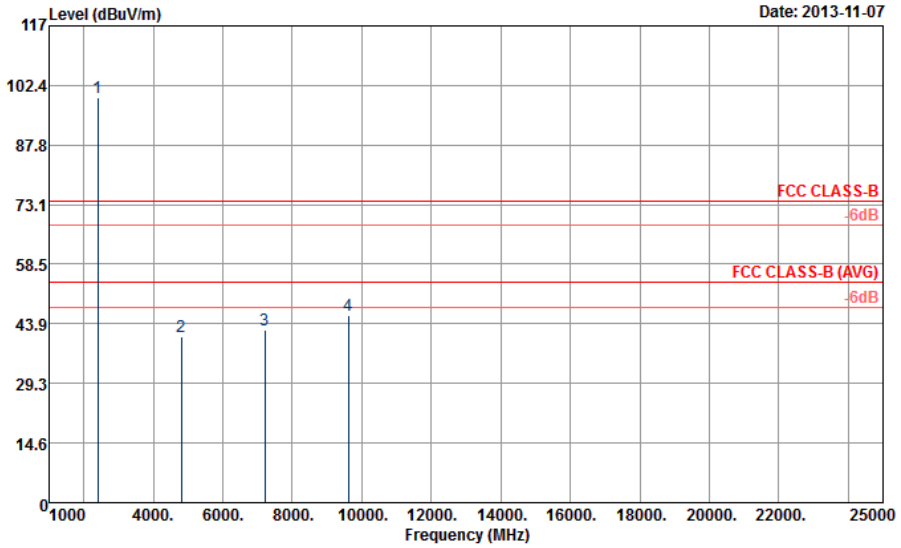
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	104.98	-	-	100.07	32.3	6.91	34.3	176	115	Peak
2402	80.19	-	-	-	-	-	-	-	-	Average
4804	41.2	-32.8	74	57.43	33.98	8.75	58.96	100	0	Peak
4804	16.41	-37.59	54	-	-	-	-	-	-	Average
7206	42.05	-42.93	84.98	53.31	35.56	10.81	57.63	100	0	Peak
9608	45.23	-39.75	84.98	53.77	36.44	13.7	58.68	100	0	Peak

Other harmonics are lower than background noise

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from 20log (dwell time/100ms).

For example: Average level = 104.98dBuV/m – 24.79 (dB) = 80.19dBuV/m.

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. 7206 MHz and 9608 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



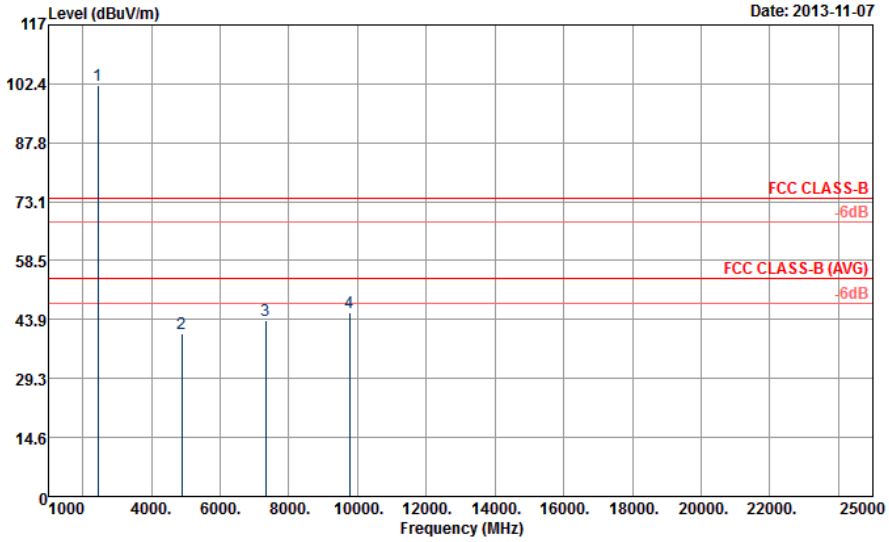
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF VERTICAL

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
2402	99.42	-	-	94.51	32.3	6.91	34.3	100	0	Peak
2402	74.63	-	-	-	-	-	-	-	-	Average
4804	40.6	-33.4	74	56.83	33.98	8.75	58.96	100	0	Peak
4804	15.81	-38.19	54	-	-	-	-	-	-	Average
7206	42.36	-37.06	79.42	53.62	35.56	10.81	57.63	100	0	Peak
9608	45.83	-33.59	79.42	54.37	36.44	13.7	58.68	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2442 MHz is fundamental signal which can be ignored. 2. 9765 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



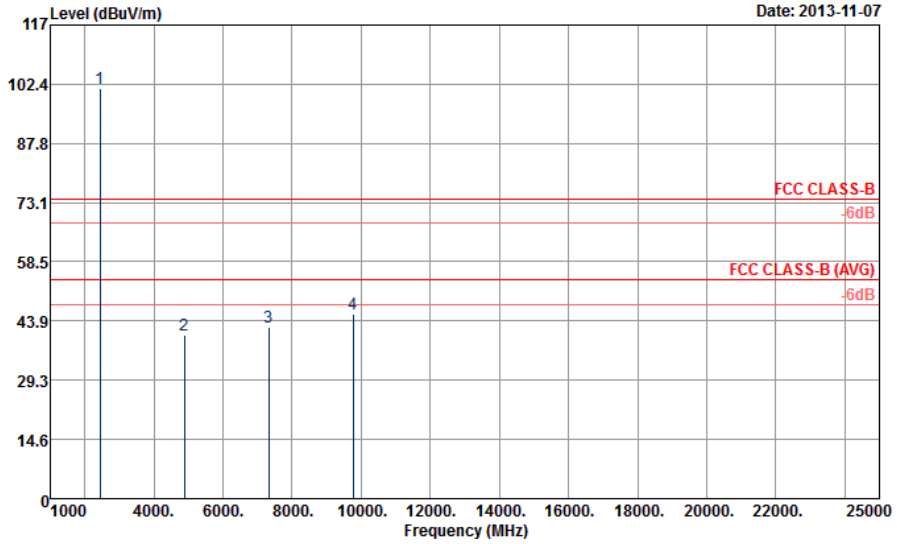
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF HORIZONTAL

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
2442	102.12	-	-	97.17	32.35	6.99	34.39	199	297	Peak
2442	77.33	-	-	-	-	-	-	-	-	Average
4881	40.57	-33.43	74	56.6	33.95	8.85	58.83	100	0	Peak
4881	15.78	-38.22	54	-	-	-	-	-	-	Average
7323	43.83	-30.17	74	55.13	35.53	10.91	57.74	100	0	Peak
7323	19.04	-34.96	54	-	-	-	-	-	-	Average
9765	45.67	-36.45	82.12	54.02	36.69	13.69	58.73	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2442 MHz is fundamental signal which can be ignored. 2. 9765 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



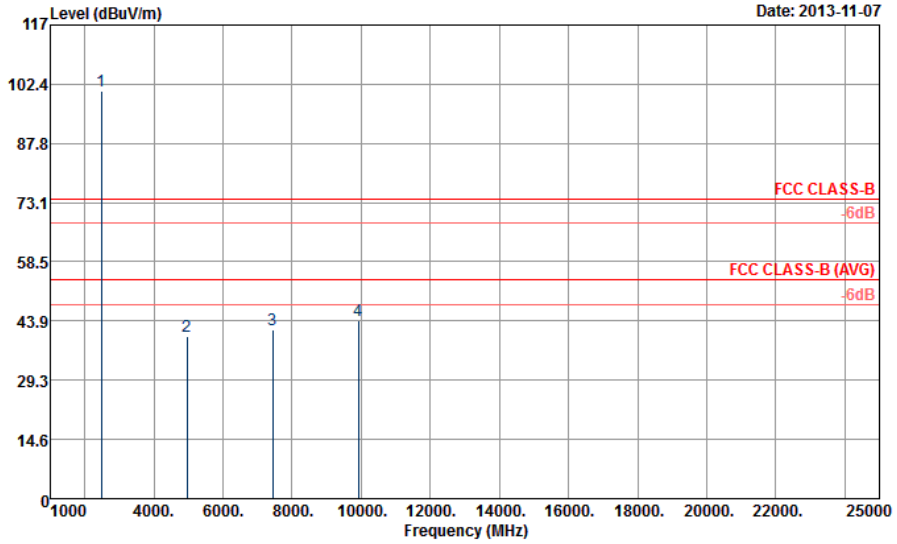
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF VERTICAL

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
2442	101.27	-	-	96.32	32.35	6.99	34.39	104	4	Peak
2442	76.48	-	-	-	-	-	-	-	-	Average
4881	40.4	-33.6	74	56.43	33.95	8.85	58.83	100	0	Peak
4881	15.61	-38.39	54	-	-	-	-	-	-	Average
7323	42.24	-31.76	74	53.54	35.53	10.91	57.74	100	0	Peak
7323	17.45	-36.55	54	-	-	-	-	-	-	Average
9765	45.73	-35.54	81.27	54.08	36.69	13.69	58.73	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. 9921 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



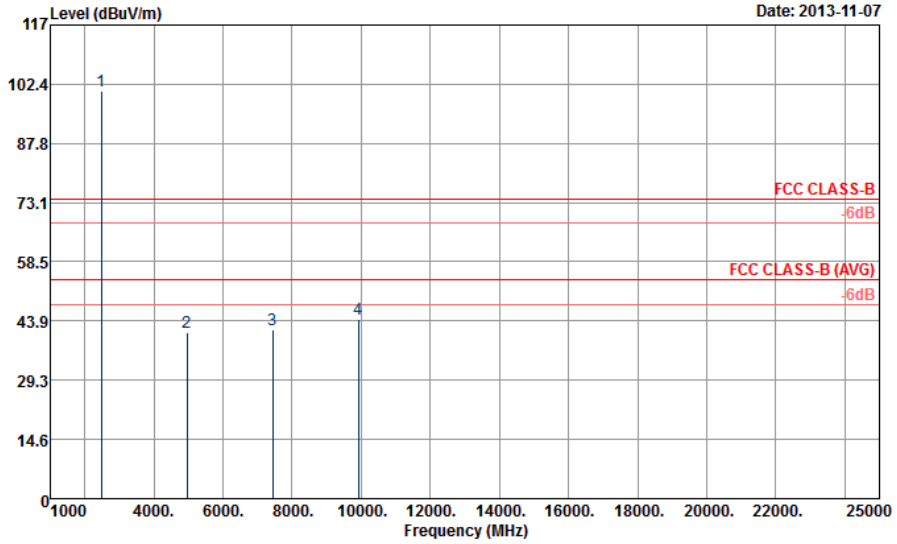
Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF HORIZONTAL

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
2480	100.67	-	-	95.66	32.38	7.06	34.43	128	295	Peak
2480	75.88	-	-	-	-	-	-	-	-	Average
4959	39.94	-34.06	74	55.77	33.91	8.92	58.66	100	0	Peak
4959	15.15	-38.85	54	-	-	-	-	-	-	Average
7440	41.79	-32.21	74	53.09	35.51	11.04	57.85	100	0	Peak
7440	17	-37	54	-	-	-	-	-	-	Average
9921	43.89	-36.78	80.67	52.09	36.9	13.68	58.78	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	3Mbps	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~51%
Test Engineer :	Eric Shih		
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. 9921 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. The harmonic (5th, 6th, 7th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



Site : 03CH07-HY
Condition : FCC CLASS-B 3m SHF-EHF VERTICAL

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
2480	100.86	-	-	95.85	32.38	7.06	34.43	100	2	Peak
2480	76.07	-	-	-	-	-	-	-	-	Average
4959	41.04	-32.96	74	56.87	33.91	8.92	58.66	100	0	Peak
4959	16.25	-37.75	54	-	-	-	-	-	-	Average
7440	41.73	-32.27	74	53.03	35.51	11.04	57.85	100	0	Peak
7440	16.94	-37.06	54	-	-	-	-	-	-	Average
9921	44.28	-36.58	80.86	52.48	36.9	13.68	58.78	100	0	Peak

Other harmonics are lower than background noise

3.9 AC Conducted Emission Measurement

3.9.1 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 (dBμV)	
	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.

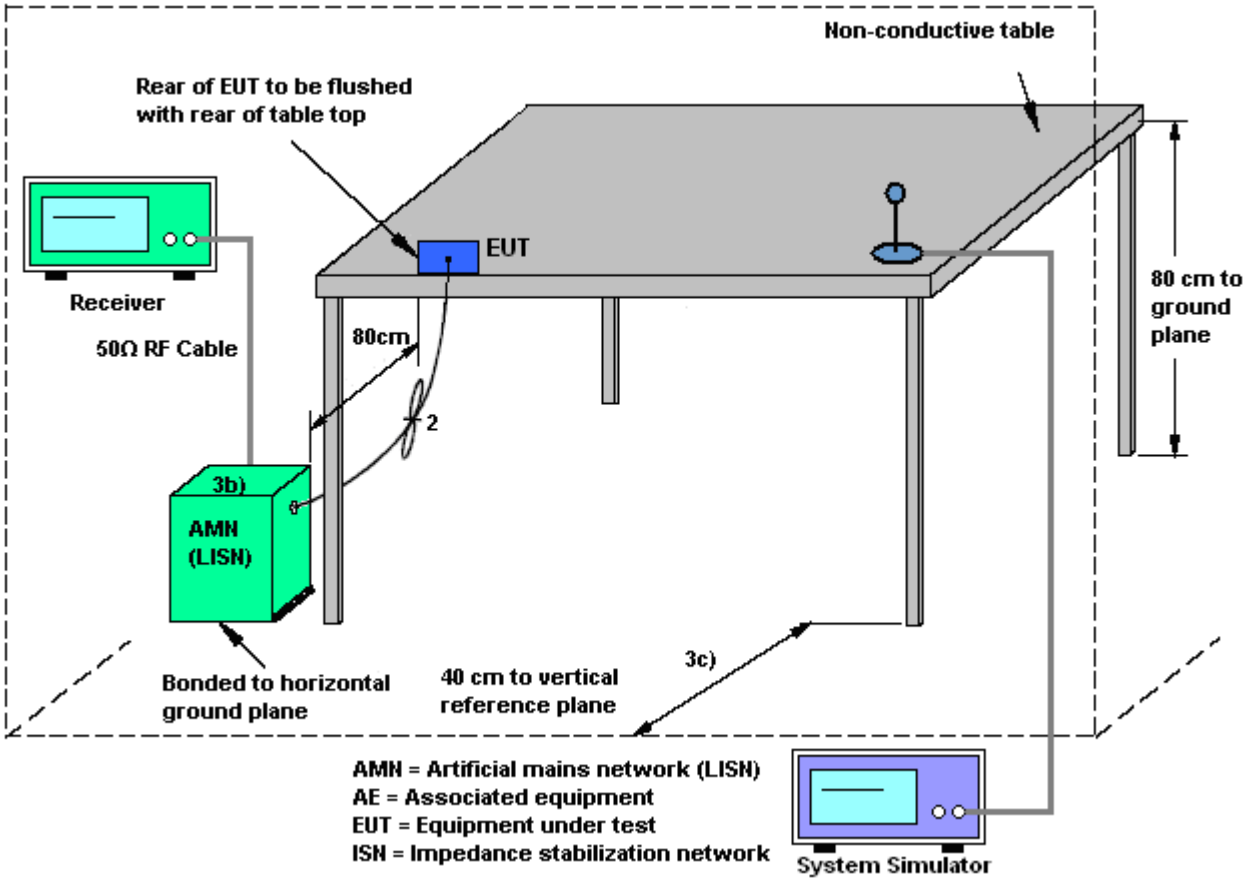
3.9.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.9.3 Test Procedures

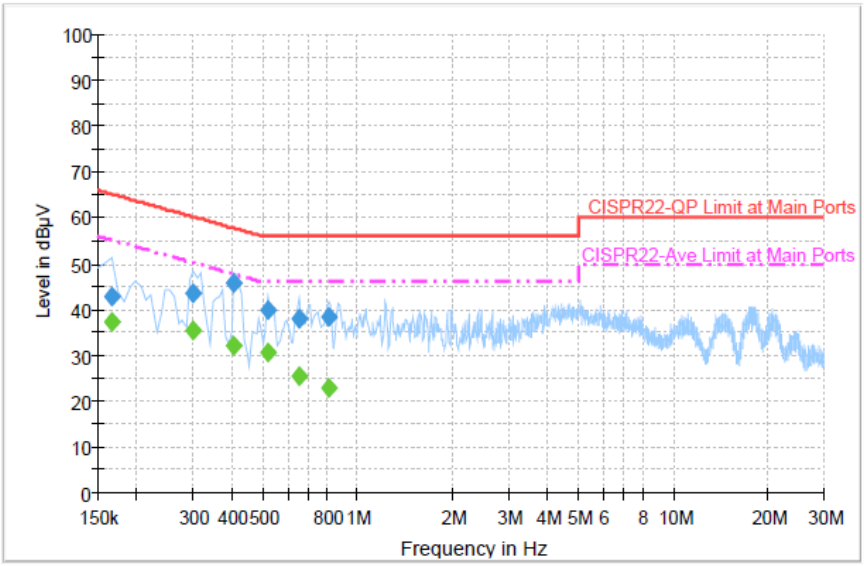
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.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

3.9.4 Test Setup



3.9.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Idle + MP3 + Earphone + Battery + USB Cable (Charging from Adapter) + SIM 1		



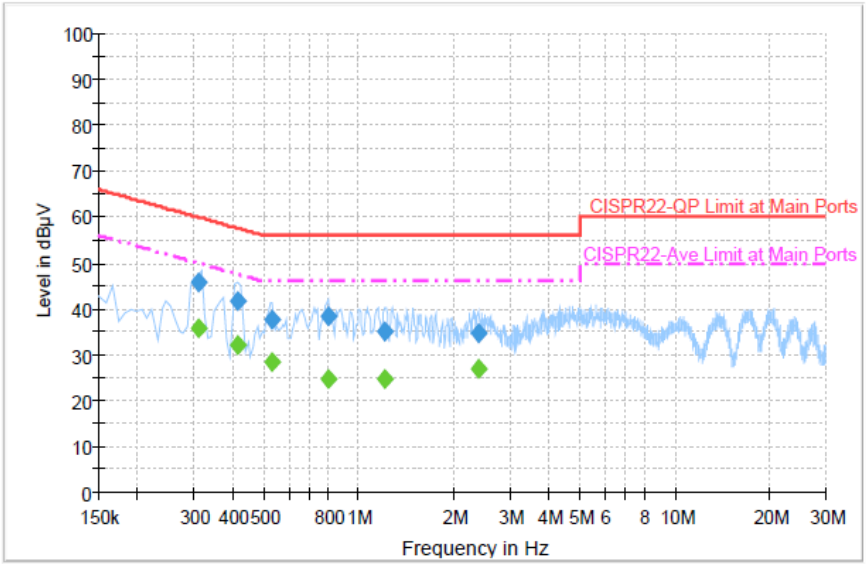
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	42.9	Off	L1	19.4	22.3	65.2
0.302000	43.7	Off	L1	19.3	16.5	60.2
0.406000	45.8	Off	L1	19.4	11.9	57.7
0.518000	39.8	Off	L1	19.4	16.2	56.0
0.654000	38.1	Off	L1	19.4	17.9	56.0
0.814000	38.5	Off	L1	19.5	17.5	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	37.2	Off	L1	19.4	18.0	55.2
0.302000	35.6	Off	L1	19.3	14.6	50.2
0.406000	32.1	Off	L1	19.4	15.6	47.7
0.518000	30.5	Off	L1	19.4	15.5	46.0
0.654000	25.3	Off	L1	19.4	20.7	46.0
0.814000	23.0	Off	L1	19.5	23.0	46.0

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Idle + MP3 + Earphone + Battery + USB Cable (Charging from Adapter) + SIM 1		



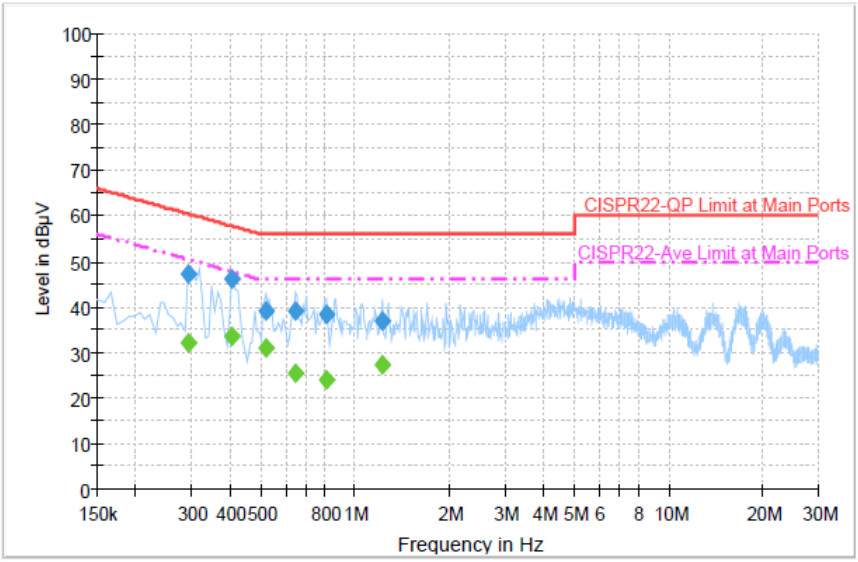
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.310000	45.9	Off	N	19.4	14.1	60.0
0.414000	41.6	Off	N	19.4	16.0	57.6
0.534000	37.8	Off	N	19.4	18.2	56.0
0.798000	38.3	Off	N	19.5	17.7	56.0
1.206000	35.1	Off	N	19.5	20.9	56.0
2.382000	34.8	Off	N	19.7	21.2	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.310000	35.8	Off	N	19.4	14.2	50.0
0.414000	32.1	Off	N	19.4	15.5	47.6
0.534000	28.4	Off	N	19.4	17.6	46.0
0.798000	24.6	Off	N	19.5	21.4	46.0
1.206000	24.6	Off	N	19.5	21.4	46.0
2.382000	27.0	Off	N	19.7	19.0	46.0

Test Mode :	Mode 2	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Idle + WLAN Link + MP3 + Earphone + Battery + USB Cable (Charging from Adapter) + SIM 1		



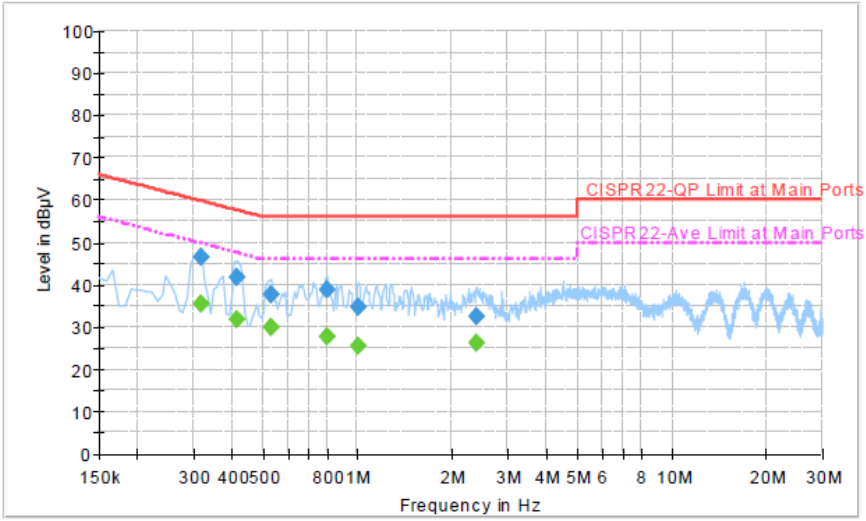
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.294000	47.2	Off	L1	19.4	13.2	60.4
0.406000	46.1	Off	L1	19.4	11.6	57.7
0.518000	39.0	Off	L1	19.4	17.0	56.0
0.646000	39.2	Off	L1	19.4	16.8	56.0
0.814000	38.3	Off	L1	19.5	17.7	56.0
1.214000	37.1	Off	L1	19.5	18.9	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.294000	32.1	Off	L1	19.4	18.3	50.4
0.406000	33.7	Off	L1	19.4	14.0	47.7
0.518000	31.1	Off	L1	19.4	14.9	46.0
0.646000	25.4	Off	L1	19.4	20.6	46.0
0.814000	24.1	Off	L1	19.5	21.9	46.0
1.214000	27.3	Off	L1	19.5	18.7	46.0

Test Mode :	Mode 2	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Idle + WLAN Link + MP3 + Earphone + Battery + USB Cable (Charging from Adapter) + SIM 1		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.318000	46.4	Off	N	19.4	13.4	59.8
0.414000	41.7	Off	N	19.4	15.9	57.6
0.534000	37.8	Off	N	19.4	18.2	56.0
0.798000	38.7	Off	N	19.5	17.3	56.0
1.006000	34.7	Off	N	19.4	21.3	56.0
2.382000	32.5	Off	N	19.7	23.5	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.318000	35.4	Off	N	19.4	14.4	49.8
0.414000	31.9	Off	N	19.4	15.7	47.6
0.534000	29.8	Off	N	19.4	16.2	46.0
0.798000	27.7	Off	N	19.5	18.3	46.0
1.006000	25.4	Off	N	19.4	20.6	46.0
2.382000	26.2	Off	N	19.7	19.8	46.0

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 Anti-Replacement Construction

Non-standard connector used.

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	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 07, 2013	Oct. 31, 2013 ~ Dec. 02, 2013	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	300MHz~40GHz	Feb. 05, 2013	Oct. 31, 2013 ~ Dec. 02, 2013	Feb. 04, 2014	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	300MHz~40GHz	Feb. 05, 2013	Oct. 31, 2013 ~ Dec. 02, 2013	Feb. 04, 2014	Conducted (TH02-HY)
Hygrometer	Testo	608-H1	34897199	N/A	May 07, 2013	Oct. 31, 2013 ~ Dec. 02, 2013	May 06, 2014	Conducted (TH02-HY)
RF cable	HONOVA	MF86	N/A	N/A	Nov. 26, 2012	Oct. 31, 2013 ~ Dec. 02, 2013	Nov. 25, 2013	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 06, 2013	Nov. 07, 2013	Sep. 05, 2014	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9KHz~30GHz	Nov. 30, 2012	Nov. 07, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/0001	9 kHz~30 MhZ	Jul. 03, 2012	Nov. 07, 2013	Jul. 03, 2014	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 10, 2013	Nov. 07, 2013	Oct. 09, 2014	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz~18GHz	Aug. 22, 2013	Nov. 07, 2013	Aug. 21, 2014	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 03, 2013	Nov. 07, 2013	Oct. 02, 2014	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	30MHz~1GHz	Feb. 26, 2013	Nov. 07, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Dec. 01, 2012	Nov. 07, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	159088	DC~18G High Gain	Feb. 27, 2013	Nov. 07, 2013	Feb. 26, 2014	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Nov. 07, 2013	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	ChainTek 3000	N/A	N/A	N/A	Nov. 07, 2013	N/A	Radiation (03CH07-HY)
High Pass Filter	Microwave	H03G18G3	N/A	3GHz HPF	Nov. 26, 2012	Nov. 07, 2013	Nov. 25, 2013	Radiation (03CH07-HY)
High Pass Filter	Microwave	H07G18G3	282388	7GHz HPF	Nov. 29, 2012	Nov. 07, 2013	Nov. 28, 2013	Radiation (03CH07-HY)
Low Pass Filter	Wainwright	WLKS1200-8SS	SN2	1.2GHz LPF	Nov. 29, 2012	Nov. 07, 2013	Nov. 28, 2013	Radiation (03CH07-HY)
HF RF Cable	HUBER SUHNER	SUCOFLEX 104	38411/6	1GHz ~ 18GHz	Dec. 04 , 2012	Nov. 07, 2013	Dec. 03, 2013	Radiation (03CH07-HY)
LF RF Cable	Warison+HUBER SUHNER	WCBA-WC04NM.NM2	N/A	30MHz ~ 1GHz	Dec. 04 , 2012	Nov. 07, 2013	Dec. 03, 2013	Radiation (03CH07-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Test Software	Audix	E3	Version 6.2009-08-24	N/A	N/A	Nov. 07, 2013	N/A	Radiation (03CH07-HY)
Hygrometer	Testo	608-H1	34897197	N/A	May 07, 2013	Nov. 07, 2013	May 06, 2014	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 13, 2012	Nov. 06, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Nov. 06, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Nov. 06, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	Nov. 06, 2013	N/A	Conduction (CO05-HY)
Test Software	N/A	EMC32	8.40.0	N/A	N/A	Nov. 06, 2013	N/A	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Apr. 25, 2013,	Nov. 06, 2013	Apr. 24, 2014	Conduction (CO05-HY)
LF Cable	Shuner	RG-402	N/A	N/A	Oct. 17, 2013	Nov. 06, 2013	Oct. 16, 2014	Conduction (CO05-HY)

Note: Test equipment calibration is traceable to the procedure of ISO17025.

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))	**4.50**