FCC/IC RF Test Report

APPLICANT	:	Sony Mobile Communications AB
EQUIPMENT	:	Smart phone
BRAND NAME	:	Sony
MODEL NAME	:	PM-0261-BV
MARKETING NAME	:	C1604
FCC ID	:	PY7PM-0261
IC	:	4170B-PM0261
STANDARD	:	FCC 47 CFR Part 15:2012 Subpart C IC RSS-210 issue 8 IC RSS-GEN issue 3
CLASSIFICATION	:	(DSS) Spread Spectrum Transmitter

The product was received on Sep. 04, 2012 and completely tested on Oct. 08, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory 1190

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

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR290405A	Rev. 01	Initial issue of report	Nov. 09, 2012
FR290405A	Rev. 02	Update report for revising IC ID	Nov. 28, 2012
FR290405A	Rev. 03	Update report as below: 1. Adding RSS-GEN, Issue 3 standards at front page. 2. Updating IC rule of Summary. 3. Updating typo antenna type from “PIFI” to “PIFA” 4. Adding explanation of limit line at section 3.7.5	Nov. 30, 2012
FR290405A	Rev. 04	Update report for adding radiated band edges and spurious emission plots in section 3.8.7 and 3.8.8	Dec. 11, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result (PASS/FAIL)	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	N/A	Pass	-
3.4	N/A	RSS-Gen 4.6.1	99% Bandwidth	N/A	Pass	-
3.5	15.247(b)(1)	RSS-210 A8.1(b)	Peak Output Power	≤ 1 W for 1Mbps ≤ 125 mW for 2, 3Mbps	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 12.44 dB at 32.970 MHz
3.9	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 12.10 dB at 0.462 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 City, Taipei County 23586, Taiwan

1.3 Feature of Equipment Under Test

The Equipment Under Test (hereafter called: EUT) is mobile 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	PM-0261-BV
Marketing Name	C1604
FCC ID	PY7PM-0261
IC	4170B-PM0261
GSM Operating Band(s)	GSM 850/900/1800/1900MHz
WCDMA Operating Band(s)	FDD Band I / II / V
WCDMA Rel. Version	Rel. 6
GPRS / EGPRS Multi Slot Class	GPRS Class 12 , EGPRS Class 12
Wi-Fi Specification	802.11b/g/n (HT20)
Bluetooth Version	V2.1 + EDR / V3.0
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 Details of Tested Sample (EUT) Information

Product Specification subjective to this standard	
Transmitter / Receiver Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Maximum Output Power to Antenna	Bluetooth (1Mbps) : 5.21 dBm (0.0033 W) Bluetooth EDR (2Mbps) : 6.04 dBm (0.0040 W) Bluetooth EDR (3Mbps) : 6.50 dBm (0.0045 W)
99% Occupied Bandwidth	Bluetooth (1Mbps) : 0.888MHz Bluetooth EDR (2Mbps) : 1.192MHz Bluetooth EDR (3Mbps) : 1.196MHz
Antenna Type / Gain	PIFA Antenna with gain 0.80 dBi
Type of Modulation	Bluetooth : GFSK, π/4-DQPSK, 8-DPSK
EUT #1	IMEI : 00440214-621325-5 S/N : WUJ012D9FV
EUT #2	IMEI : 00440214-621361-0 S/N : WUJ012D9F8
H/W :	SP
S/W :	11.1.A.0.21
EUT Stage	Production Unit

Accessory List	
AC Adapter	Model No. : EP800
	Type No. : CAA-00002016-BV B
Battery	Model No. : BA700
	Type No. : CBA-0002025
Earphone	Model No. : MH410c
	Type No. : AG-1100
USB Cable	Model No. : EC450
	Part No. : 1242-6715.2

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. No modifications are made to the EUT during all test items.
4. For other wireless features of this EUT, test report will be issued separately.

1.5 Testing Facility

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	03CH05-HY	722060/4086B-1

1.6 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC Public Notice DA 00-705
- ANSI C63.4-2003 and ANSI C63.10-2009
- IC RSS-210 Issue 8
- RSS-GEN Issue 3 with NOTICE 2012-DRS0126

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. 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

a. 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	4.67 dBm	5.44 dBm	5.90 **dBm**
Ch39	2441MHz	5.17 dBm	5.97 dBm	6.40 dBm
Ch78	2480MHz	5.21 dBm	6.04 dBm	**6.50 dBm**

Remark:

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

2. The data rate was set in 3Mbps for all the test items due to the highest RF output power.

b. The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and ANSI C63.10-2009 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 KHz to 30 MHz), radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests, X, Y, Z in three orthogonal panels, 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.

c. The AC power line Conducted Emissions was tested under the Bluetooth set in maxiumun output power.

The following summary table is showing all test modes to demonstrate in compliance with the standard of FCC 15.247.

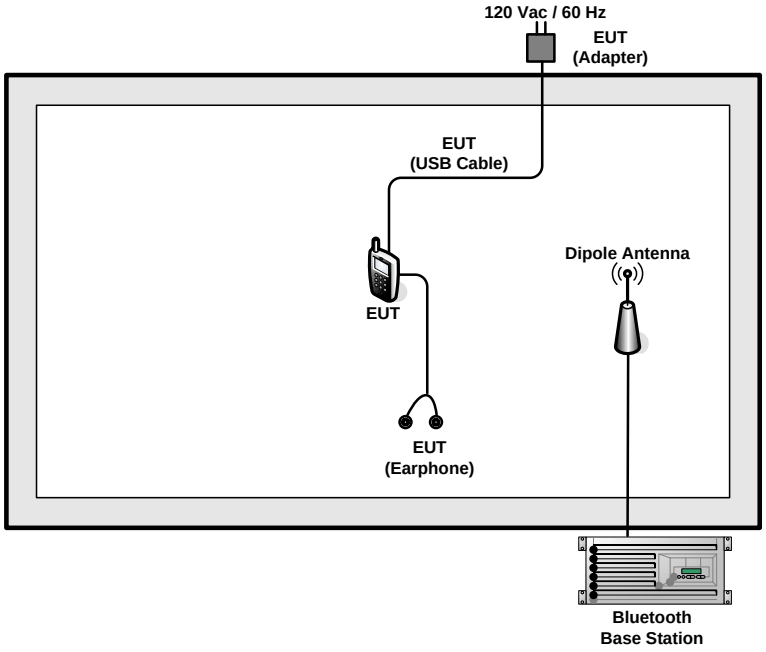
Summary table of Test Cases			
Test Item	**Data Rate / Modulation**		
	Bluetooth 1Mbps GFSK	**Bluetooth EDR 2Mbps π/4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
Conducted Test Cases	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated Test Cases	CH00_2402 MHz(*) CH39_2441 MHz(*) CH78_2480 MHz(*)	CH00_2402 MHz(*) CH39_2441 MHz(*) CH78_2480 MHz(*)	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz
AC Conducted Emission	Mode 1 :GSM850 Idle + Bluetooth Link + WLAN Link + MPEG4 + Earphone + Battery + USB Cable (Charging from Adapter) + SIM 1		

Remark:

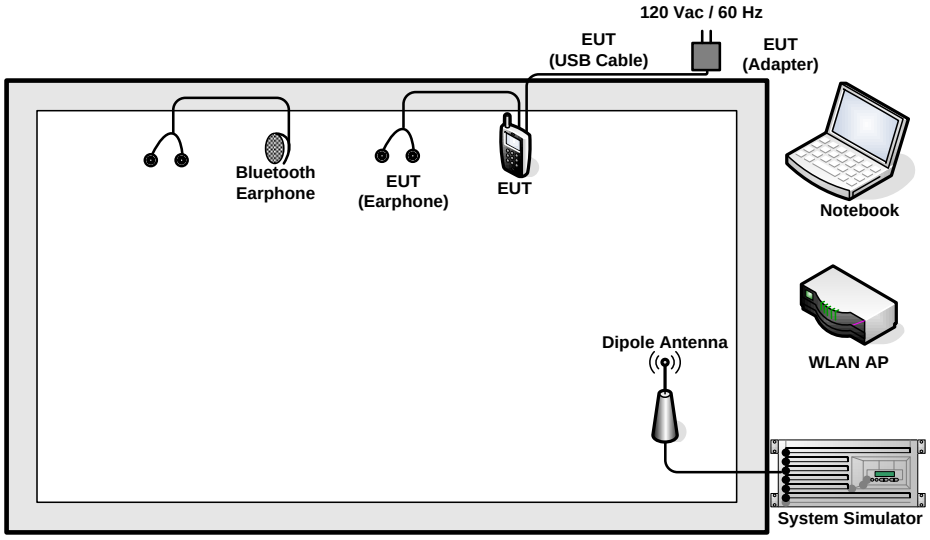
1. For radiated test cases, the worst mode data rate 3Mbps was reported only, because its has the highest RF output power at preliminary tests, and the conducted spurious emissions (*) for each data rates has no significantly wosre than the 3Mbps data rate, and other frequencies found.
2. The band edge for different data rates is fully performed by conducted measurement, and is compliance with the limie line, and thus the data rate 3Mbps is used for radiated spurious emissions measurement due to maximum output power, and no non-compliance found during Conducted band edge measurement.

2.2 Connection Diagram of EUT Test Configurations

<Bluetooth Tx Mode>



<AC Conducted Emission Mode>



2.3 Supported 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.	Bluetooth Earphone	Sony Ericsson	MW600	PY70DA2029	N/A	N/A
5.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.4 Description of EUT Operation Test Setup

For Bluetooth function, the RF utility, “QRCT” was installed in the notebook which was programmed in order to make the EUT contact with Bluetooth base station for continuous transmitting under maximum output power and receiving signals.

3 Test Result

3.1 Number of Channel Measurement

3.1.1 Limits of Number of Hopping Frequency

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

3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

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.

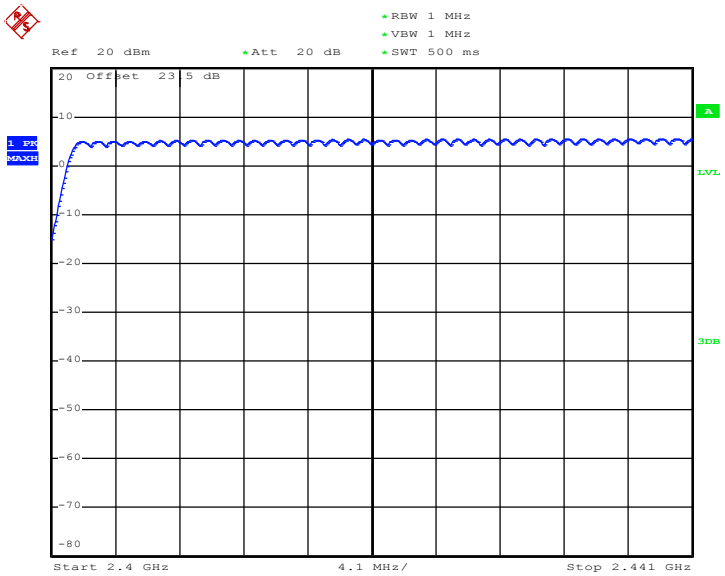
3.1.4 Test Setup

3.1.5 Test Result of Number of Hopping Frequency

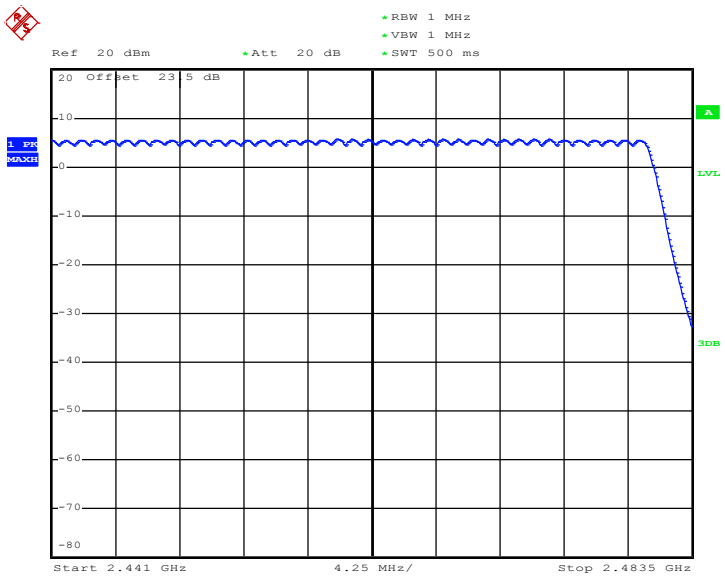
Test Mode :	3Mbps	**Temperature :**	24~26℃
Test Engineer :	Reece Li	**Relative Humidity :**	50~53%

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

Number of Hopping Channel Plot on Channel 00 - 78



Date: 21.SEP.2012 15:37:46



Date: 21.SEP.2012 15:42:25

Note: The total loss is 23.5dB 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 section 4.0 of List of Measuring Equipment of this test report is used for test.

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.

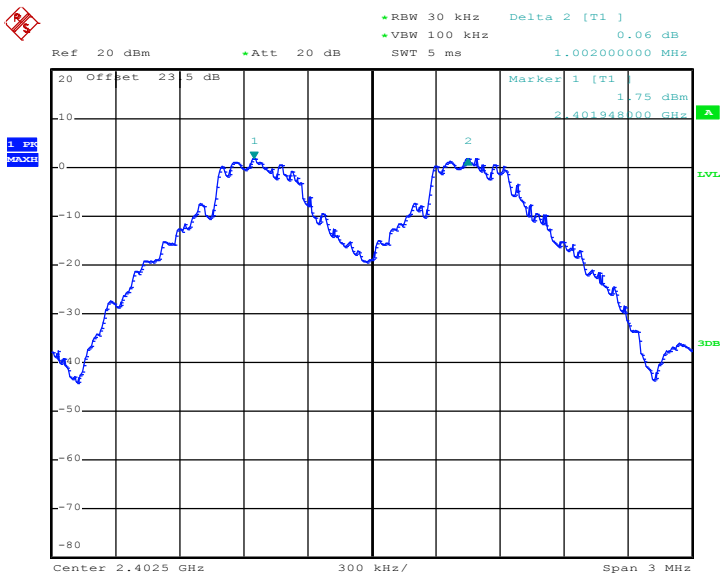
3.2.4 Test Setup

3.2.5 Test Result of Hopping Channel Separation

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

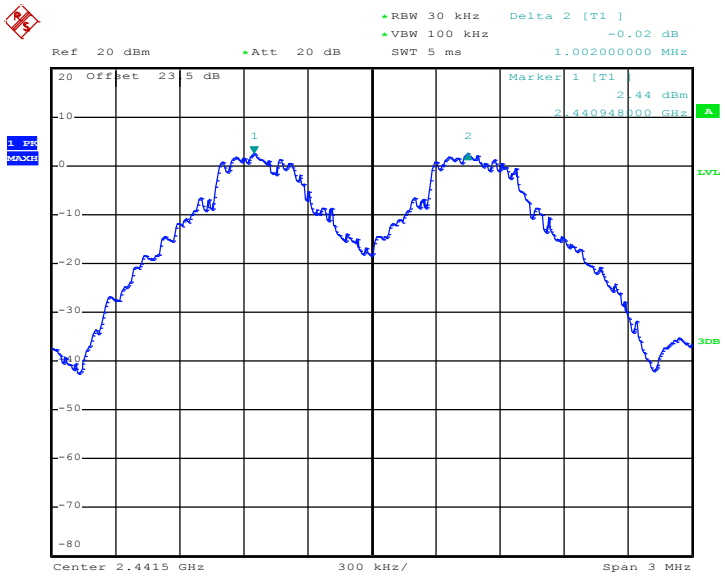
Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.6267	Pass
39	2441	1.002	0.6053	Pass
78	2480	1.002	0.6267	Pass

Channel Separation Plot on Channel 00 - 01



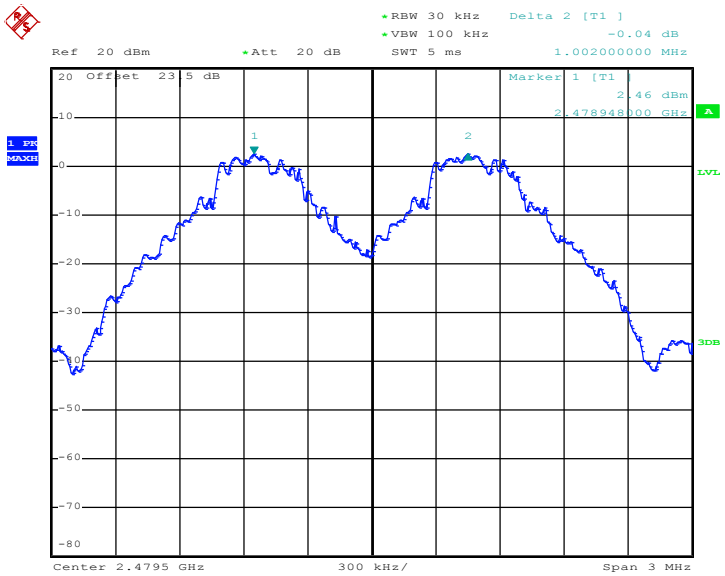
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

Channel Separation Plot on Channel 39 - 40



Date: 12.SEP.2012 15:35:52

Channel Separation Plot on Channel 77 - 78

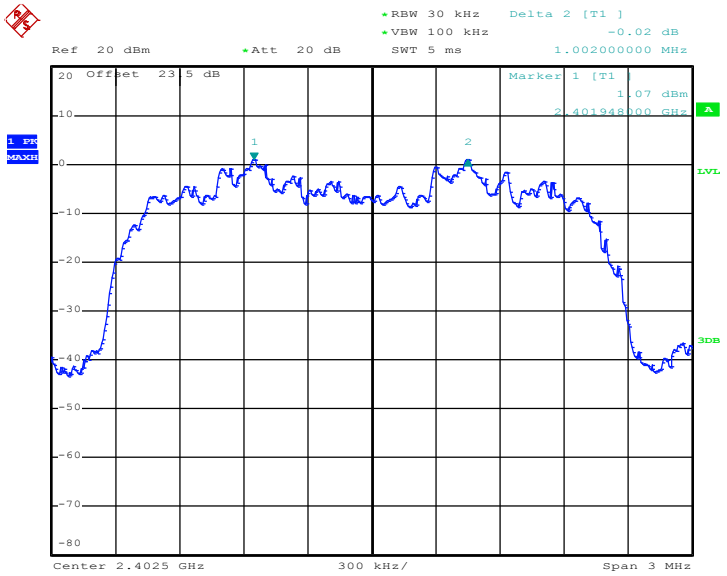


Date: 12.SEP.2012 15:39:21

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

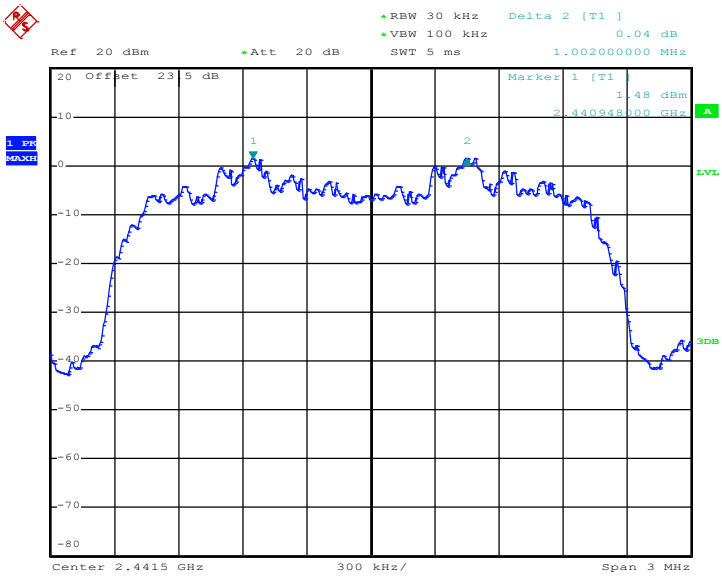
Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.8560	Pass
39	2441	1.002	0.8520	Pass
78	2480	1.002	0.8560	Pass

Channel Separation Plot on Channel 00 - 01



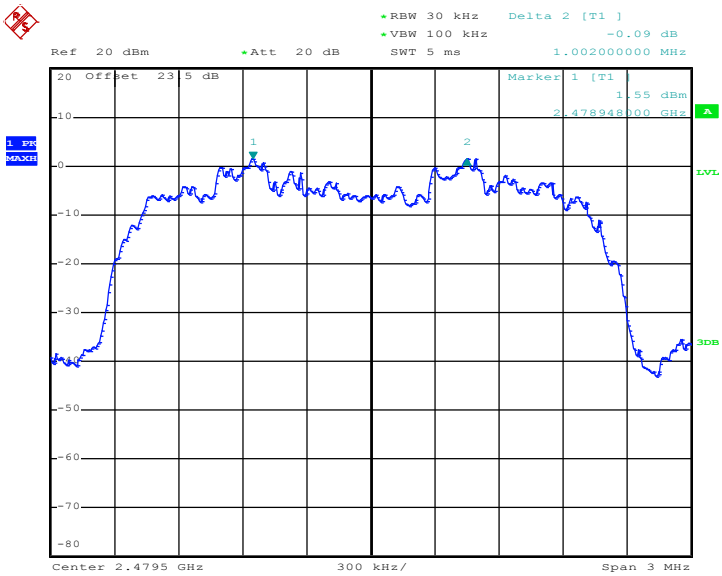
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

Channel Separation Plot on Channel 39 - 40



Date: 12.SEP.2012 16:00:38

Channel Separation Plot on Channel 77 - 78

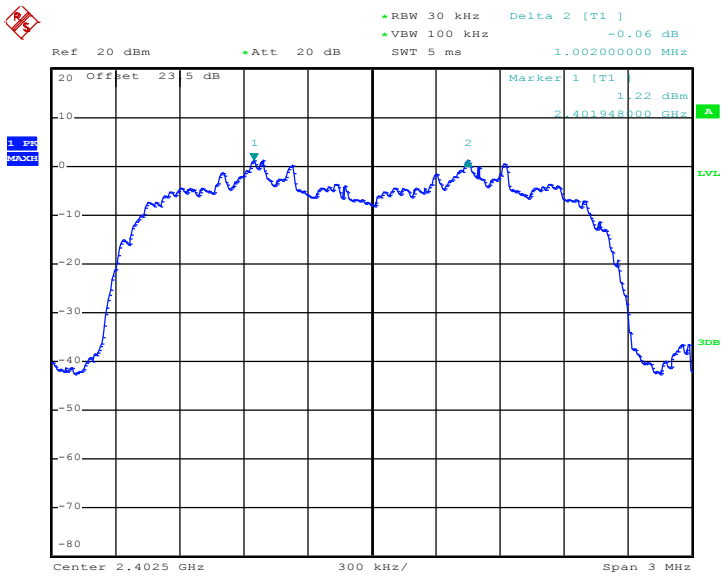


Date: 12.SEP.2012 16:04:23

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

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.8800	Pass
39	2441	1.008	0.8840	Pass
78	2480	1.002	0.8800	Pass

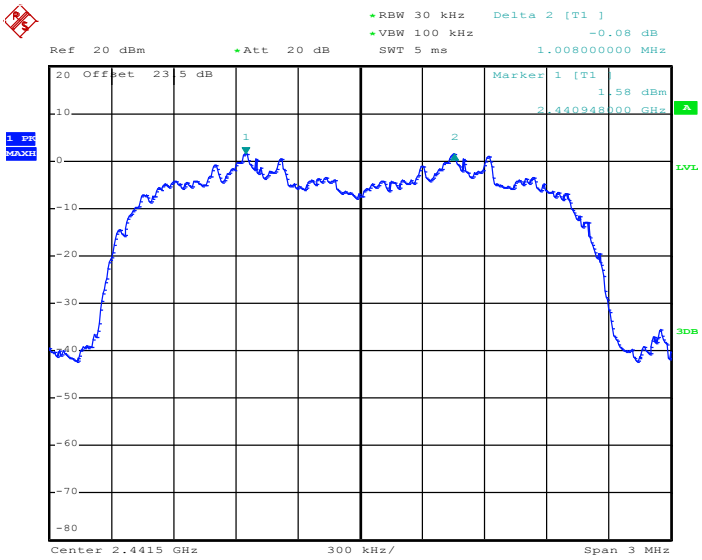
Channel Separation Plot on Channel 00 - 01



Date: 18.SEP.2012 18:05:04

Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

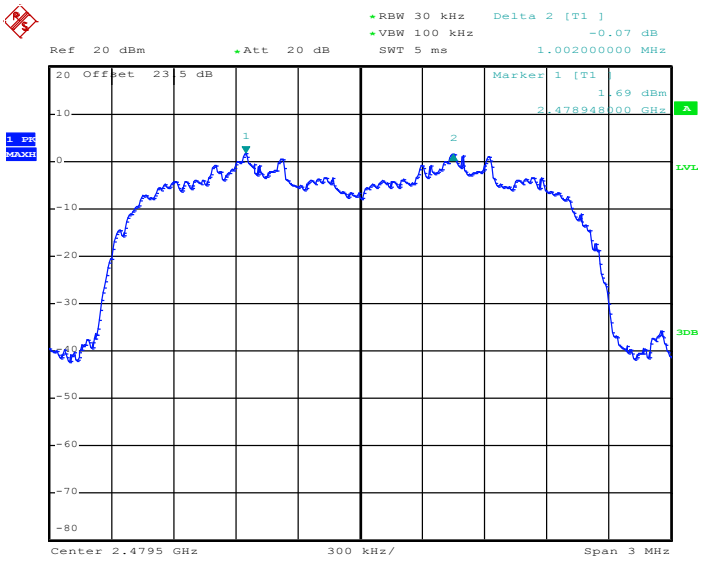
Channel Separation Plot on Channel 39 - 40



test 15E DT 802.a06 5180

:11

Channel Separation Plot on Channel 77 - 78



test 15E DT 802.a06 5180

:23

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.

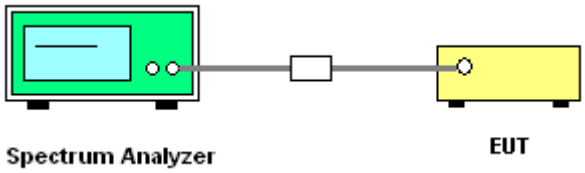
3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

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.

3.3.4 Test Setup



3.3.5 Test Result of Dwell Time

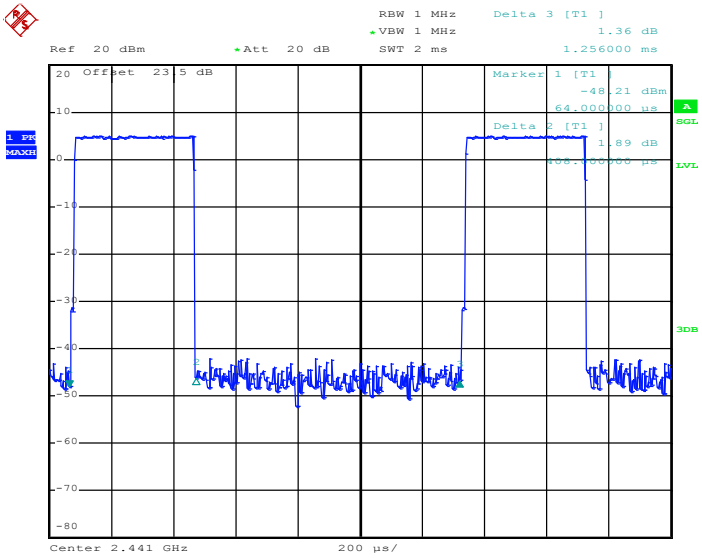
Test Mode :	1Mbps	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
DH1	8.80	408.00	0.11	0.4	Pass
DH3	4.90	1690.00	0.26	0.4	Pass
DH5	3.40	2980.00	0.32	0.4	Pass

Remark:

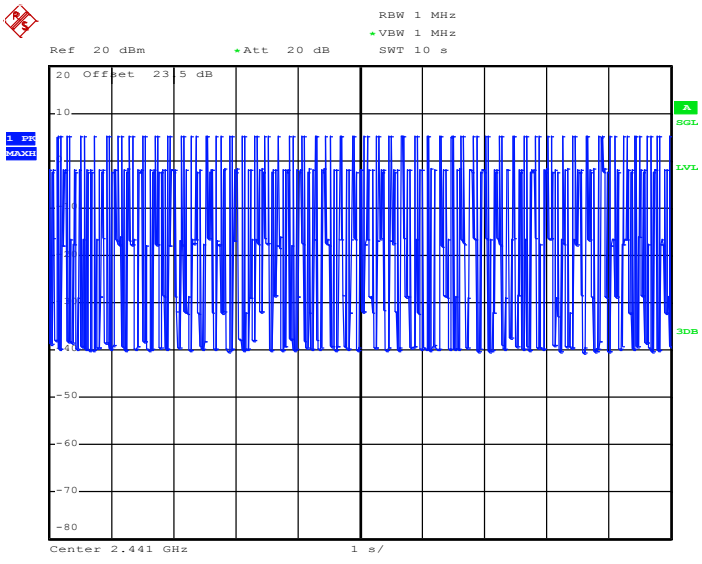
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. T: Package Transfer Time(us)

DH1 Dwell Time (One Pulse) Plot on Channel 39



Date: 21.SEP.2012 14:48:49

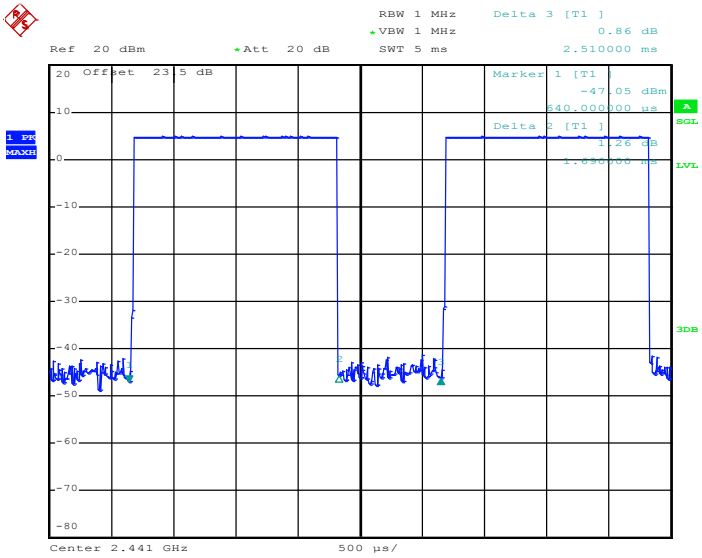
DH1 Dwell Time (Count Pulses) Plot on Channel 39



Date: 21.SEP.2012 15:30:15

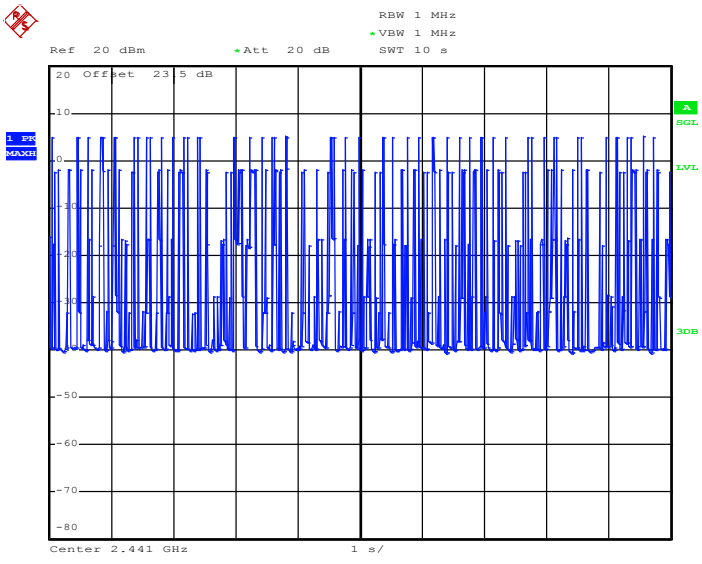
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

DH3 Dwell Time (One Pulse) Plot on Channel 39



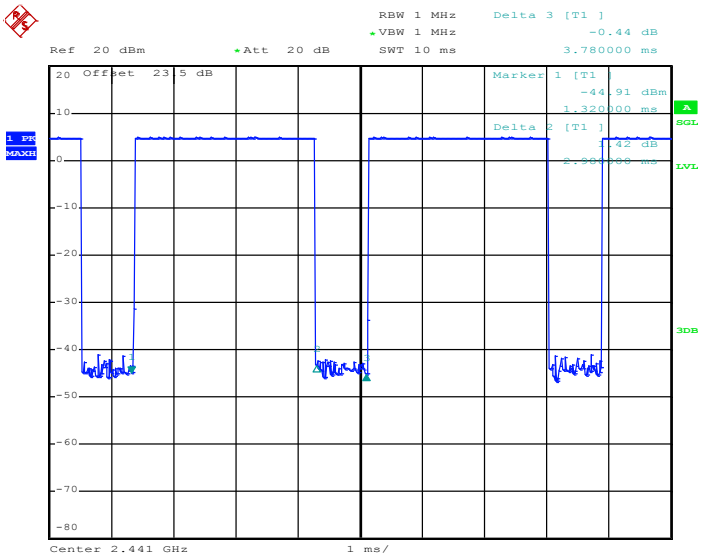
Date: 21.SEP.2012 14:47:57

DH3 Dwell Time (Count Pulses) Plot on Channel 39



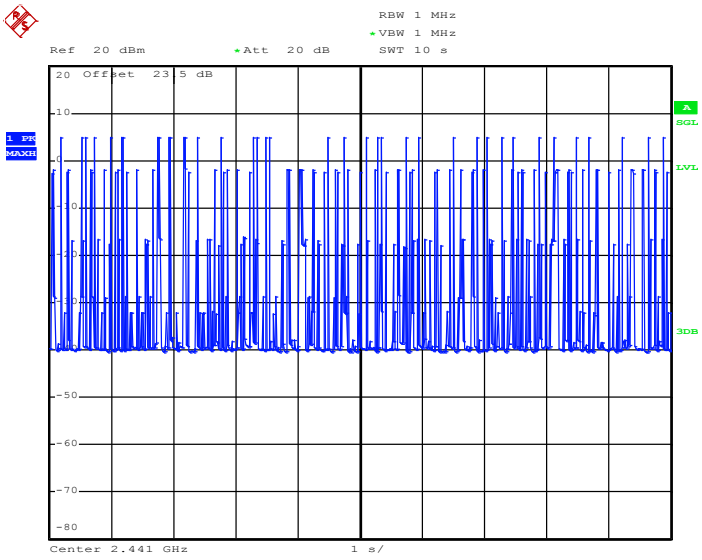
Date: 21.SEP.2012 15:30:42

DH5 Dwell Time (One Pulse) Plot on Channel 39



Date: 21.SEP.2012 14:46:21

DH5 Dwell Time (Count Pulses) Plot on Channel 39



Date: 21.SEP.2012 15:31:06

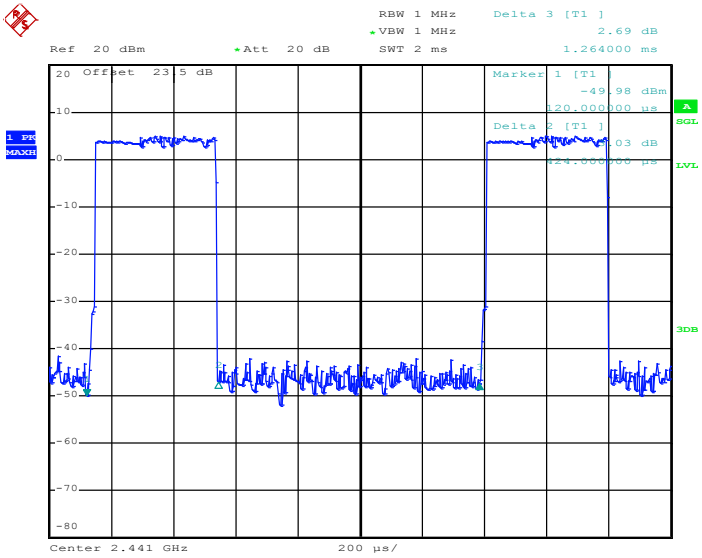
Test Mode :	2Mbps	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
2DH1	8.80	424.00	0.12	0.4	Pass
2DH3	4.70	1690.00	0.25	0.4	Pass
2DH5	3.90	2960.00	0.36	0.4	Pass

Remark:

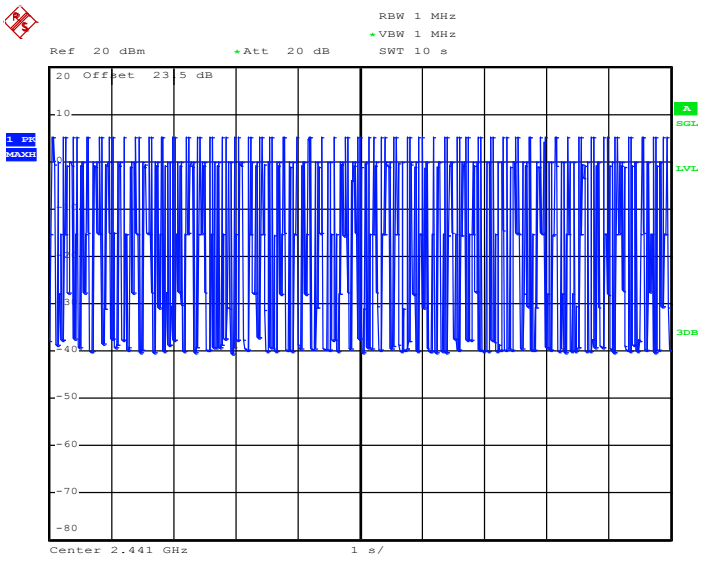
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. T: Package Transfer Time(us)

2DH1 Dwell Time (One Pulse) Plot on Channel 39



Date: 21.SEP.2012 14:45:32

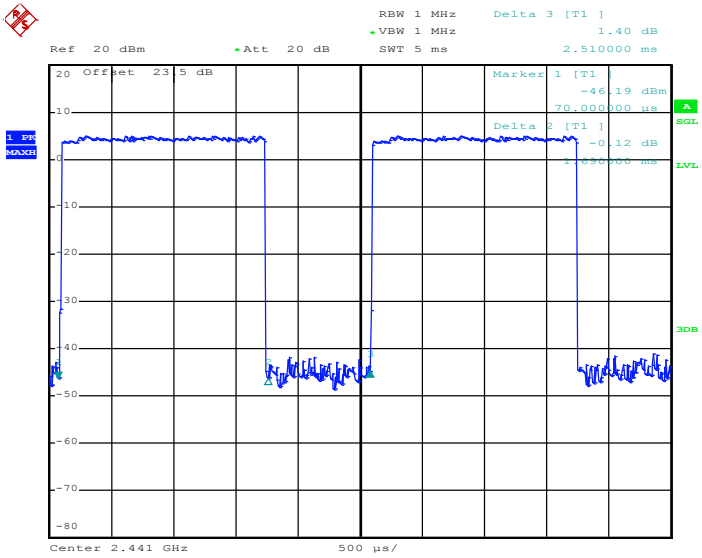
2DH1 Dwell Time (Count Pulses) Plot on Channel 39



Date: 21.SEP.2012 15:31:30

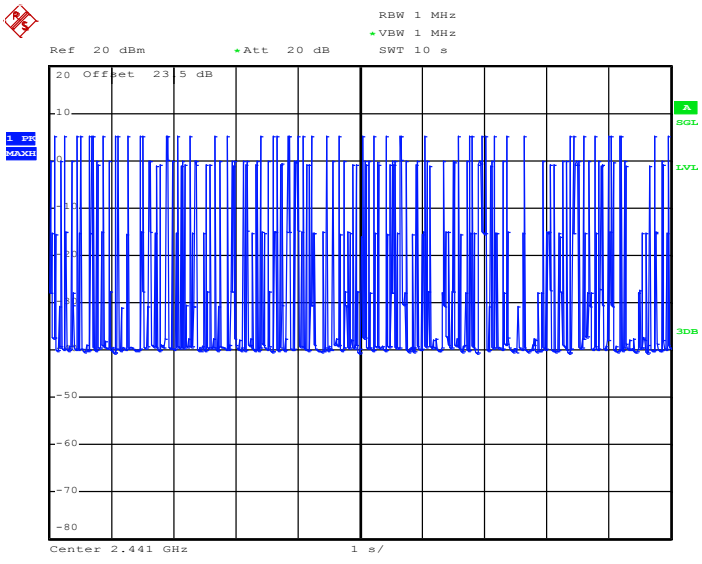
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

2DH3 Dwell Time (One Pulse) Plot on Channel 39



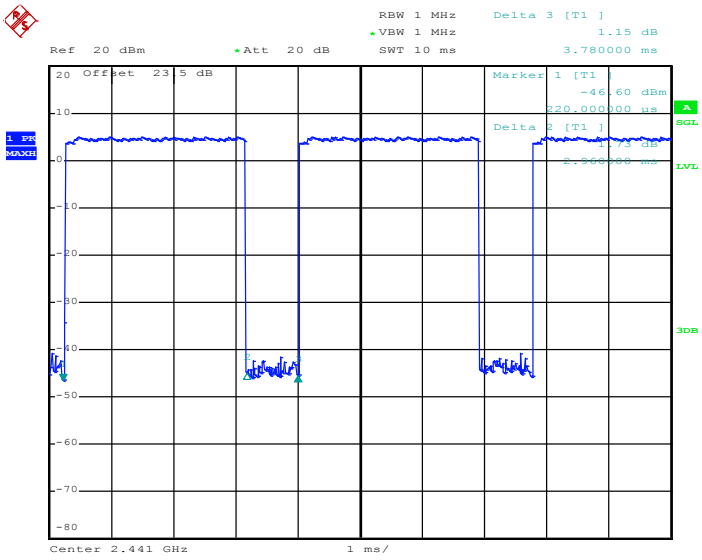
Date: 21.SEP.2012 14:44:19

2DH3 Dwell Time (Count Pulses) Plot on Channel 39



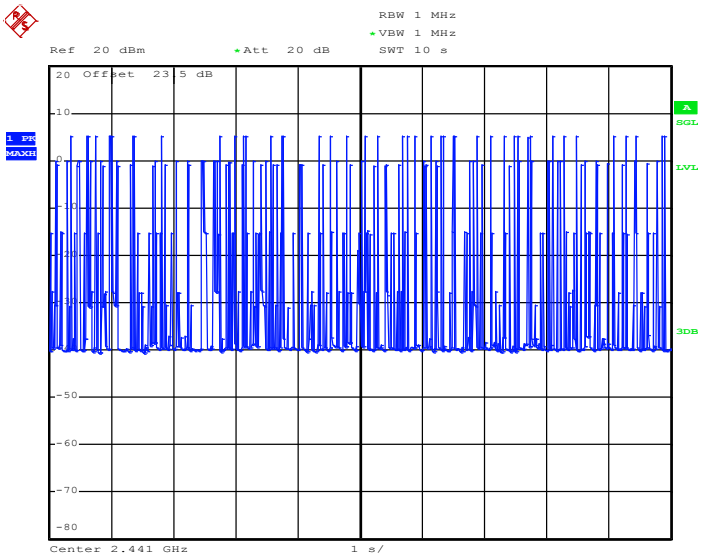
Date: 21.SEP.2012 15:32:02

2DH5 Dwell Time (One Pulse) Plot on Channel 39



Date: 21.SEP.2012 14:43:37

2DH5 Dwell Time (Count Pulses) Plot on Channel 39



Date: 21.SEP.2012 15:32:29

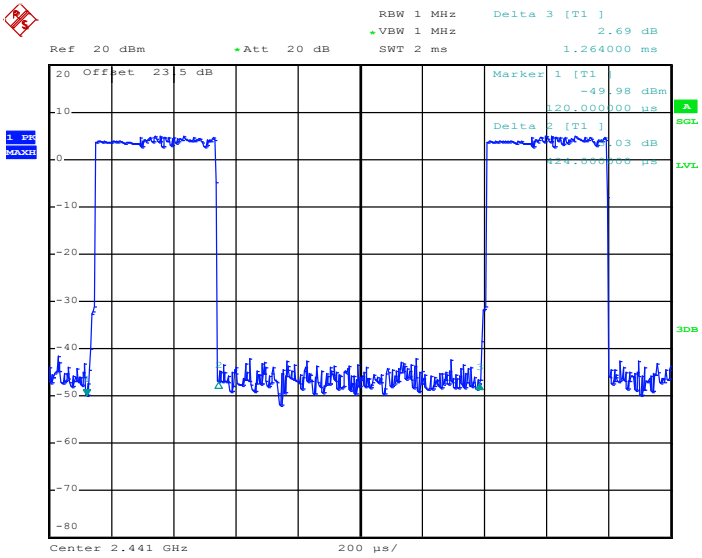
Test Mode :	3Mbps	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
3DH1	8.60	412.00	0.11	0.4	Pass
3DH3	4.60	1690.00	0.25	0.4	Pass
3DH5	3.10	2960.00	0.29	0.4	Pass

Remark:

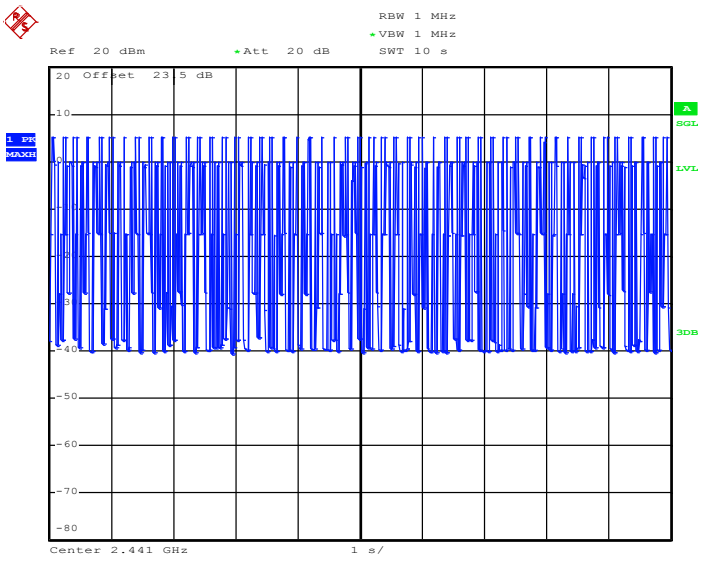
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. T: Package Transfer Time(us)

3DH1 Dwell Time (One Pulse) Plot on Channel 39



Date: 21.SEP.2012 14:45:32

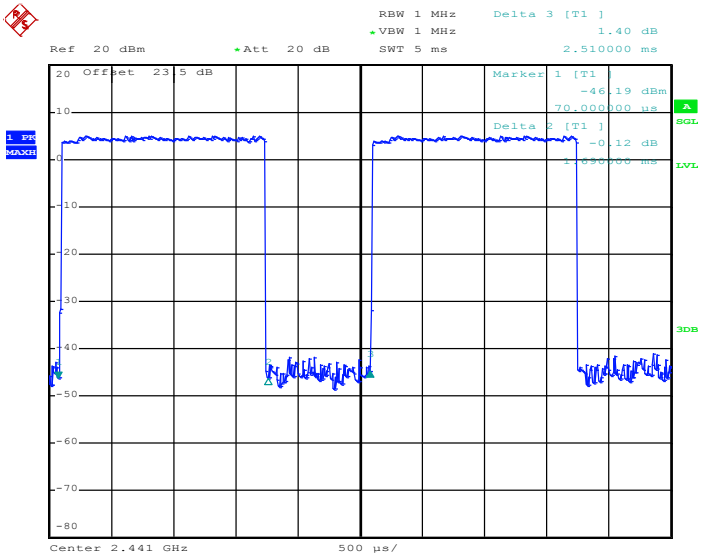
3DH1 Dwell Time (Count Pulses) Plot on Channel 39



Date: 21.SEP.2012 15:31:30

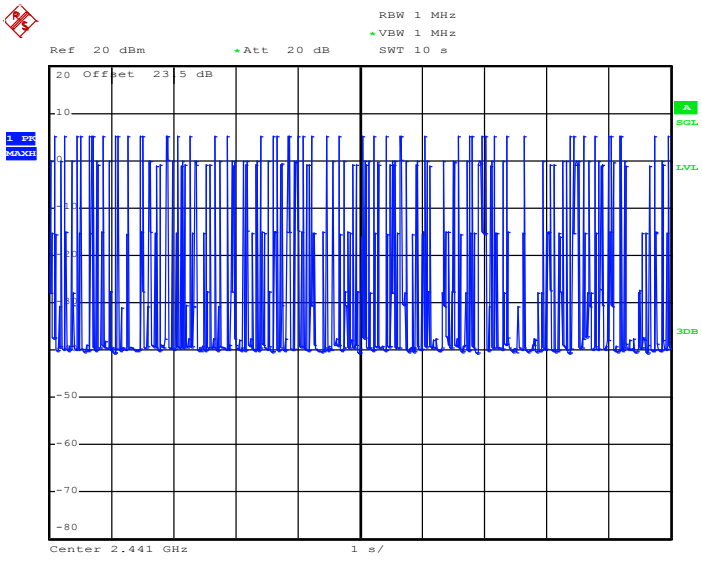
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

3DH3 Dwell Time (One Pulse) Plot on Channel 39



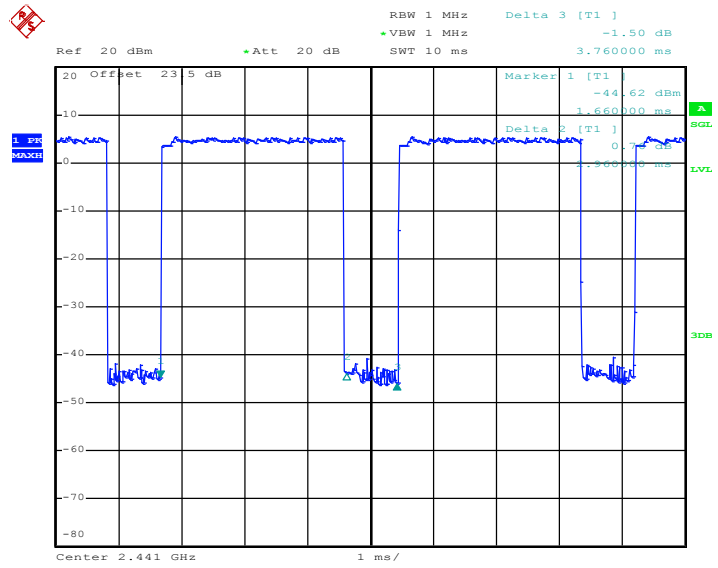
Date: 21.SEP.2012 14:44:19

3DH3 Dwell Time (Count Pulses) Plot on Channel 39



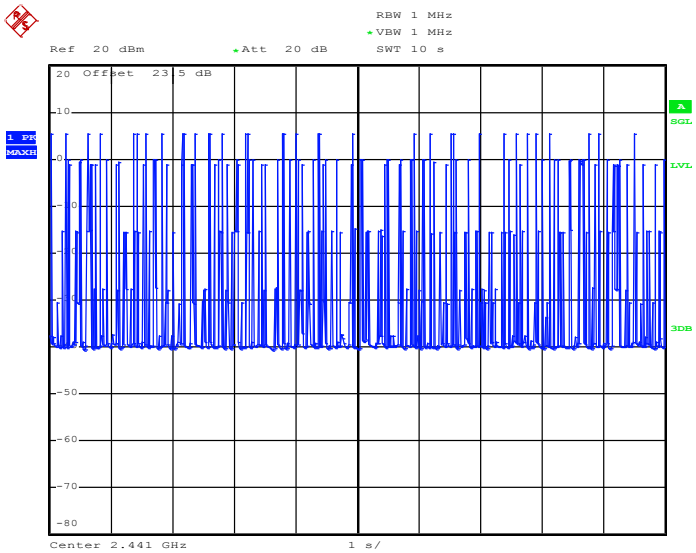
Date: 21.SEP.2012 15:32:02

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



Date: 21.SEP.2012 14:41:35

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



Date: 21.SEP.2012 15:33:52

3.4 20dB and 99% Bandwidth Measurement

3.4.1 Limit of 20dB and 99% Bandwidth

Reporting only

3.4.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

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 and 99 % 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.
   For 99% Bandwidth measurement, the RBW=30KHz, and VBW ≥ RBW. Sweep = auto ;
   Detector function = sample. Trace = max hold.

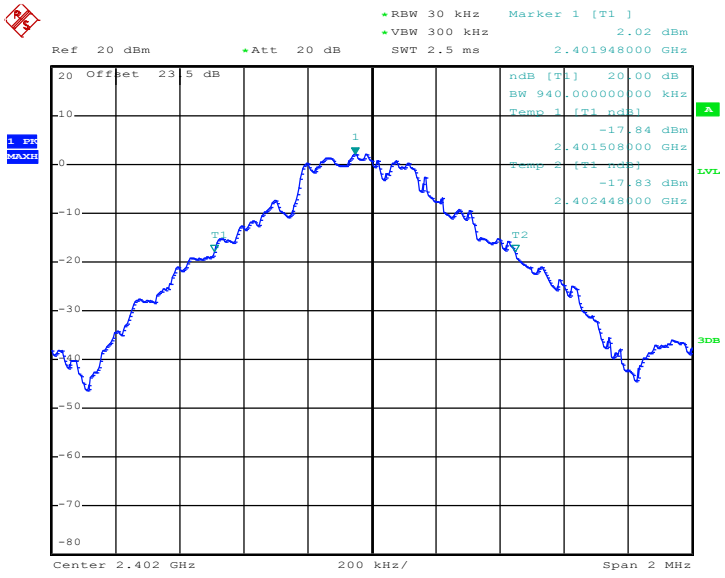
3.4.4 Test Setup

3.4.5 Test Result of 20dB Bandwidth

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

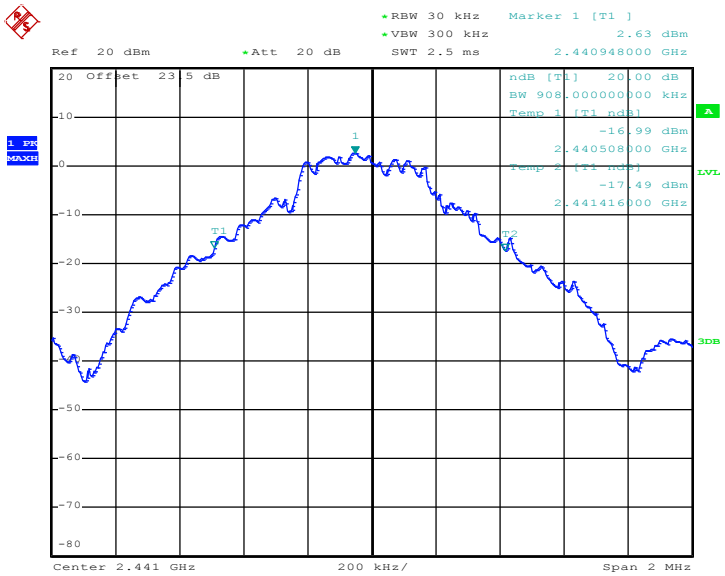
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.940
39	2441	0.908
78	2480	0.940

20 dB Bandwidth Plot on Channel 00



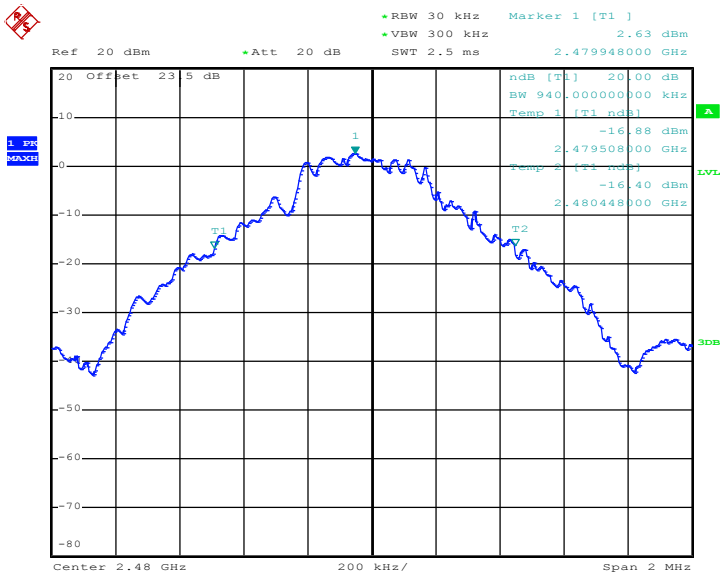
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

20 dB Bandwidth Plot on Channel 39



Date: 12.SEP.2012 15:33:55

20 dB Bandwidth Plot on Channel 78

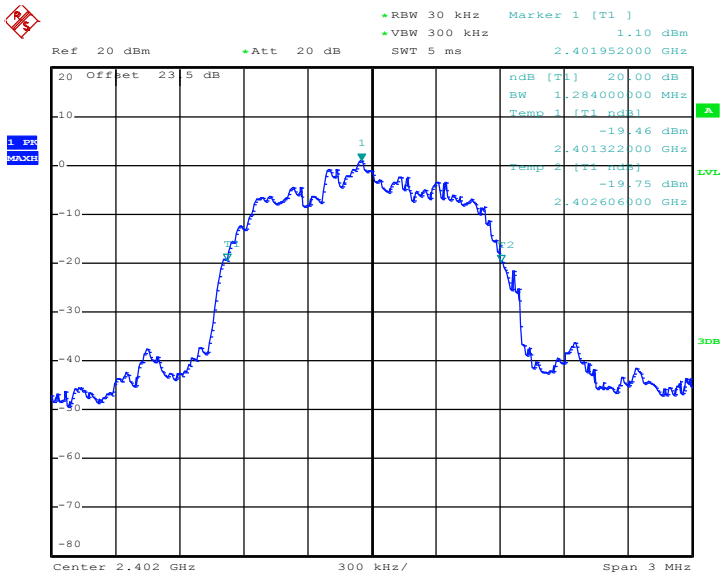


Date: 12.SEP.2012 15:36:24

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

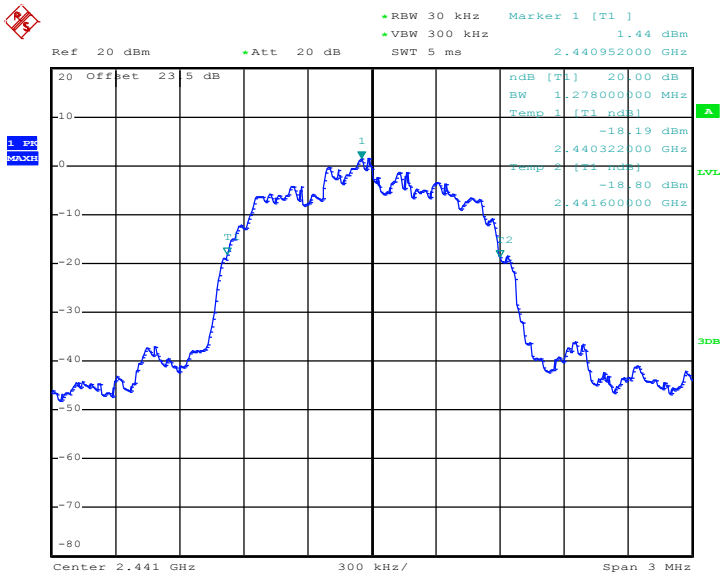
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.284
39	2441	1.278
78	2480	1.284

20 dB Bandwidth Plot on Channel 00



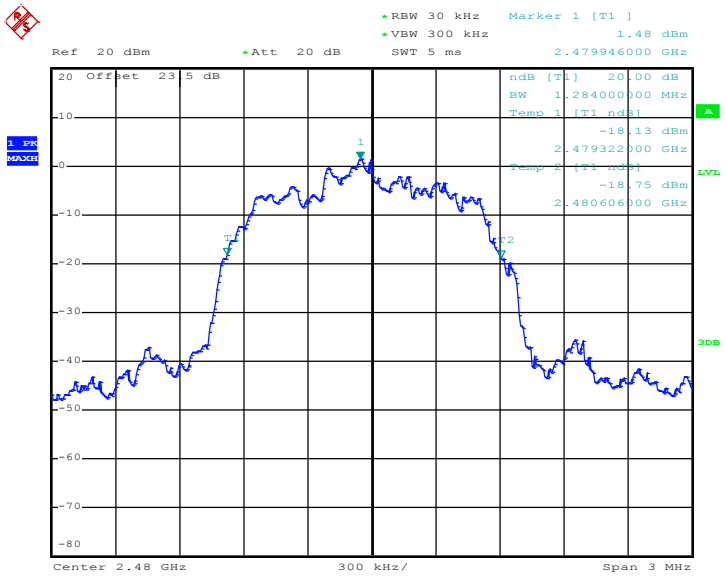
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

20 dB Bandwidth Plot on Channel 39



Date: 12.SEP.2012 15:44:13

20 dB Bandwidth Plot on Channel 78

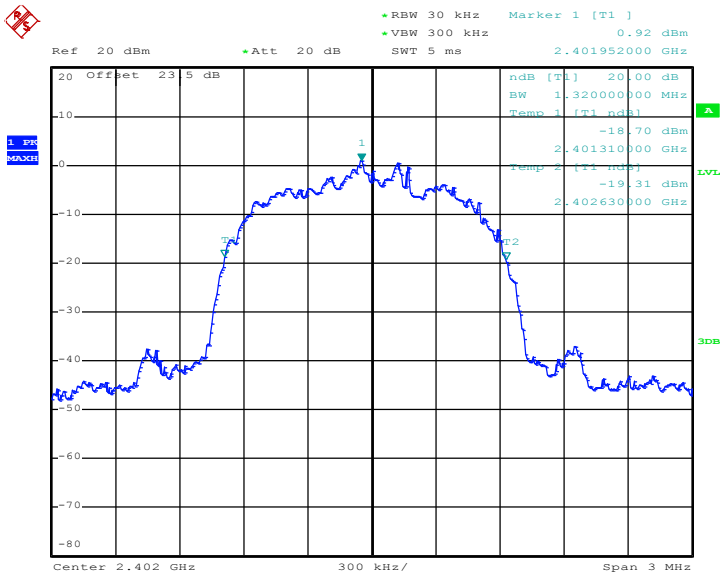


Date: 12.SEP.2012 16:01:12

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

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.320
39	2441	1.326
78	2480	1.320

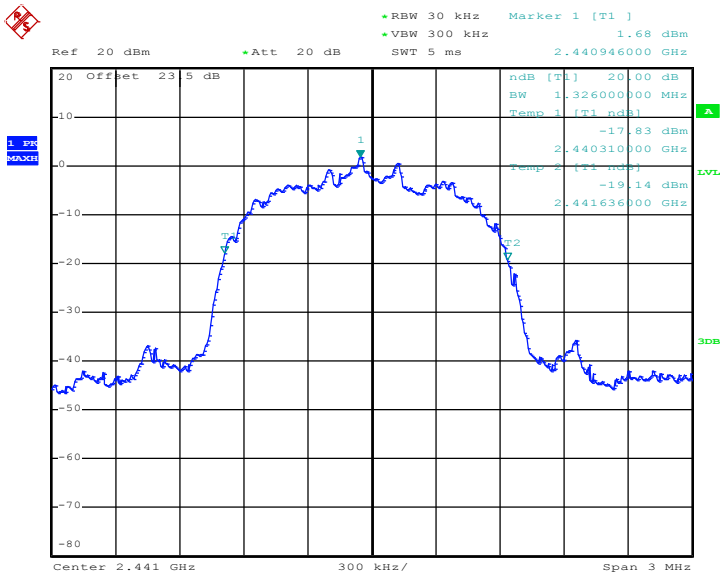
20 dB Bandwidth Plot on Channel 00



Date: 21.SEP.2012 11:30:38

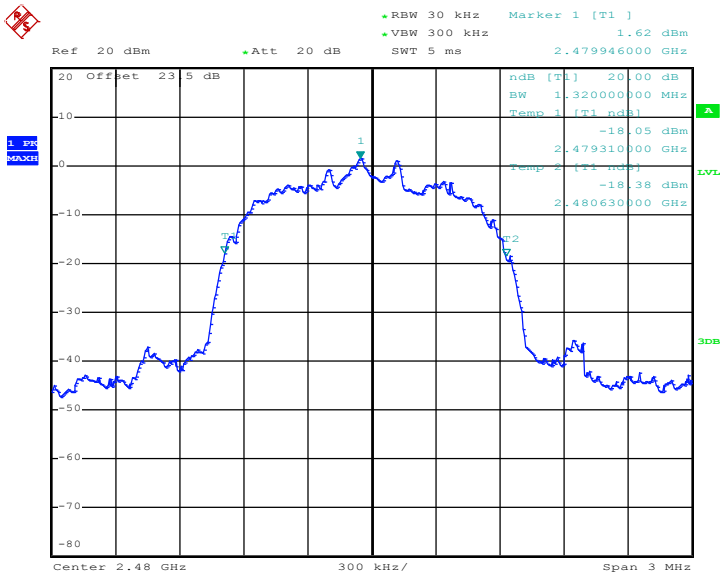
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

20 dB Bandwidth Plot on Channel 39



Date: 18.SEP.2012 18:07:39

20 dB Bandwidth Plot on Channel 78



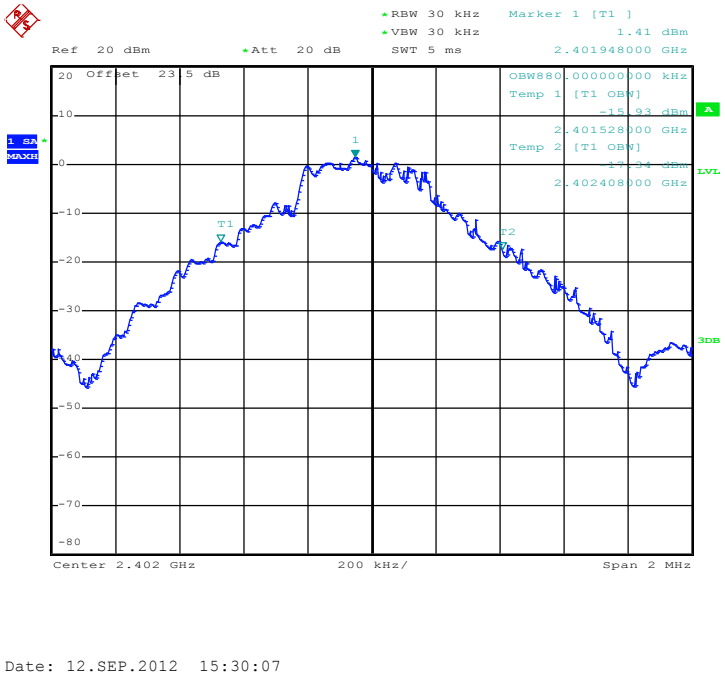
Date: 21.SEP.2012 11:56:31

3.4.6 Test Result of 99% Occupied Bandwidth

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

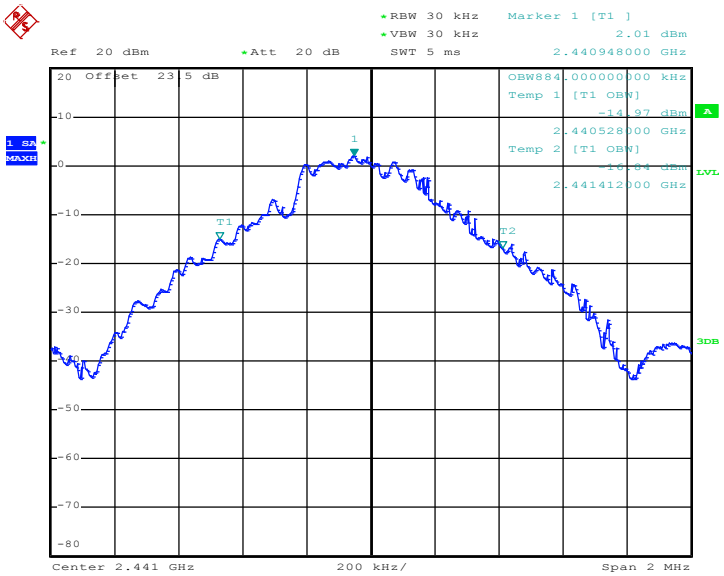
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	0.880
39	2441	0.884
78	2480	0.888

99% Bandwidth Plot on Channel 00



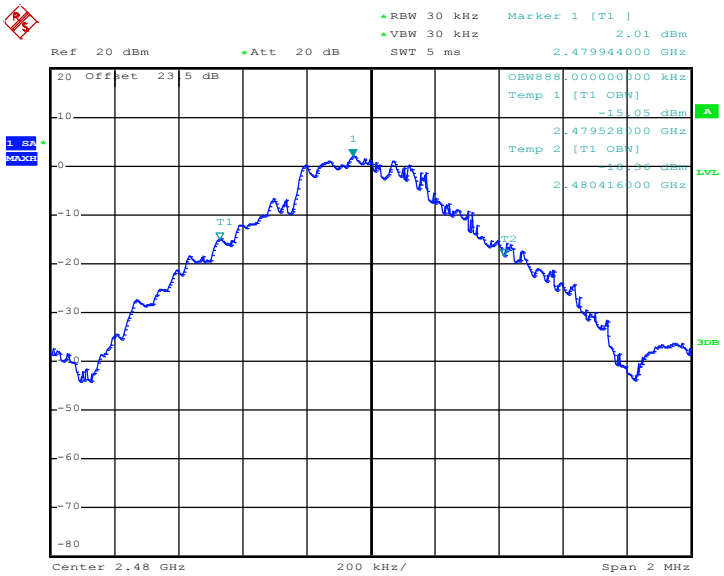
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

99% Occupied Bandwidth Plot on Channel 39



Date: 12.SEP.2012 15:34:37

99% Occupied Bandwidth Plot on Channel 78

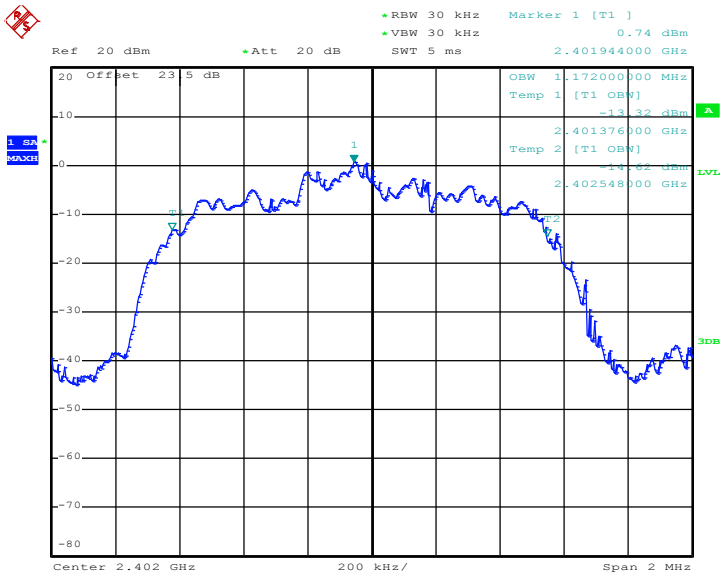


Date: 12.SEP.2012 15:37:20

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

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.172
39	2441	1.192
78	2480	1.184

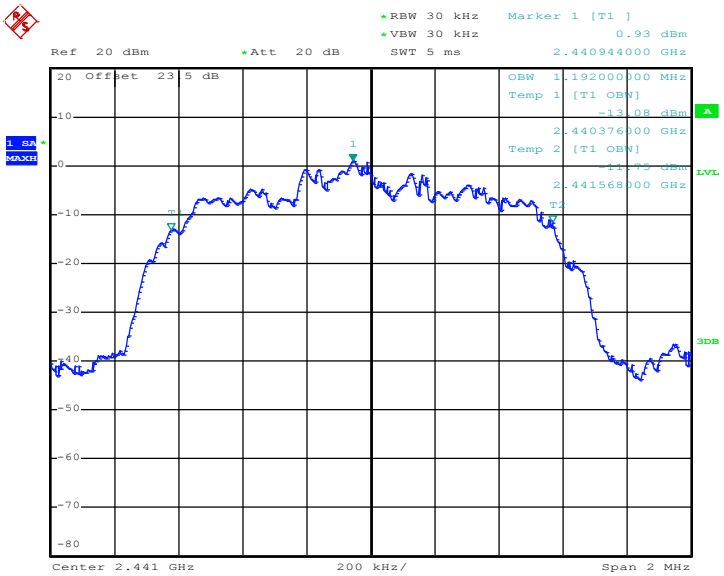
99% Bandwidth Plot on Channel 00



Date: 21.SEP.2012 11:26:30

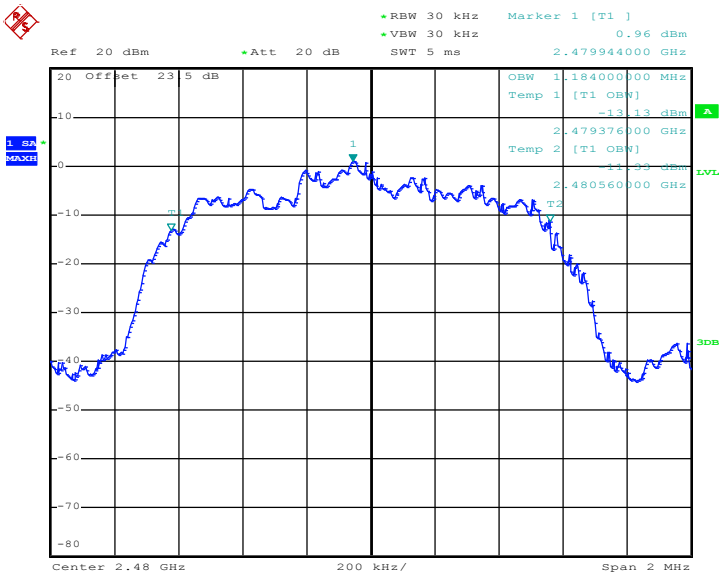
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

99% Occupied Bandwidth Plot on Channel 39



Date: 12.SEP.2012 15:44:51

99% Occupied Bandwidth Plot on Channel 78

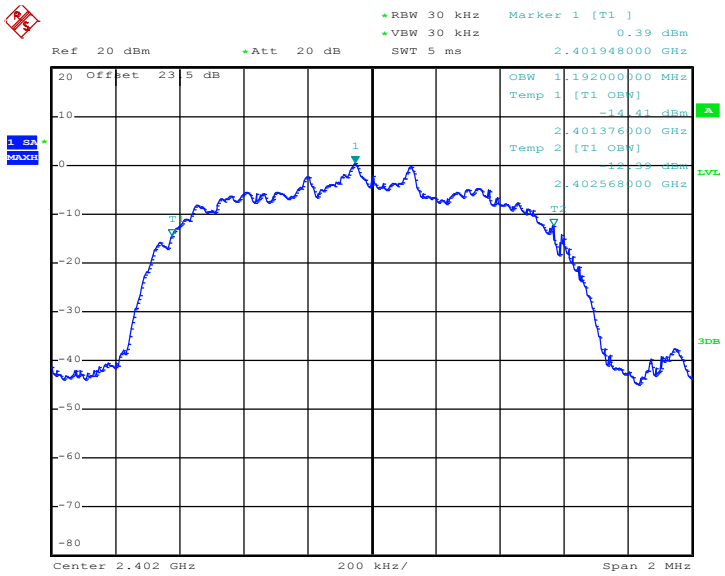


Date: 12.SEP.2012 16:02:53

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

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.192
39	2441	1.192
78	2480	1.196

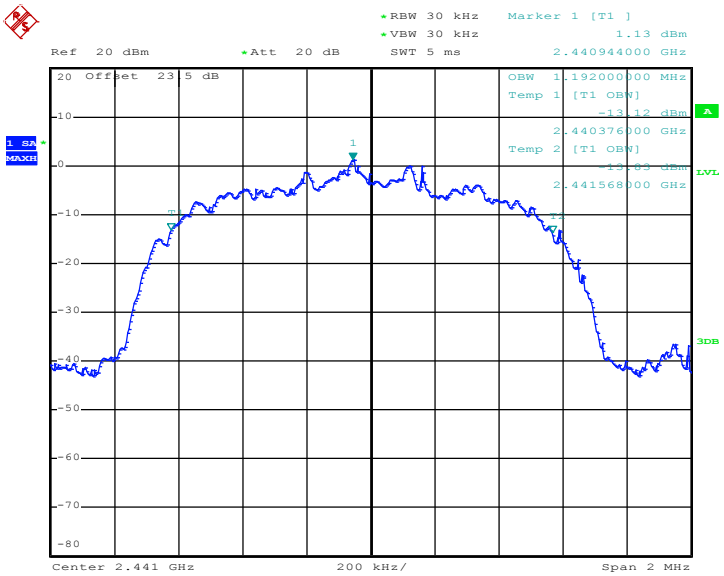
99% Bandwidth Plot on Channel 00



Date: 12.SEP.2012 16:16:10

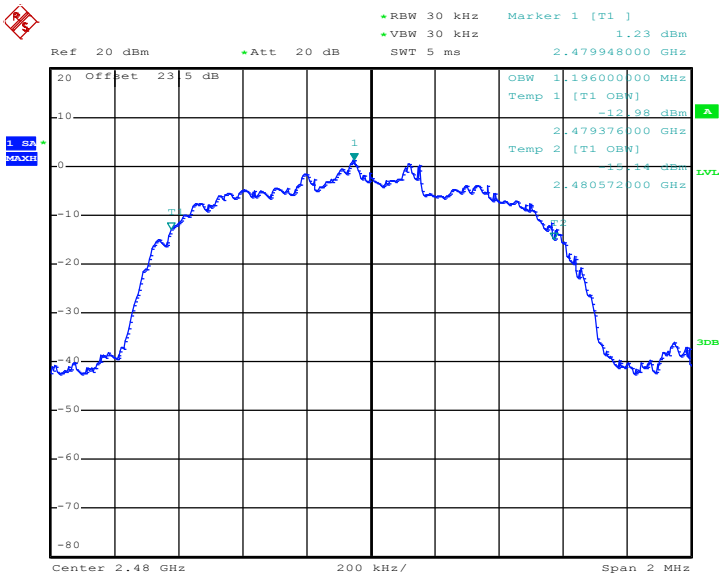
Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

99% Occupied Bandwidth Plot on Channel 39



Date: 18.SEP.2012 18:09:37

99% Occupied Bandwidth Plot on Channel 78



Date: 21.SEP.2012 11:57:30

3.5 Peak Output Power Measurement

3.5.1 Limit of Peak Output Power

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

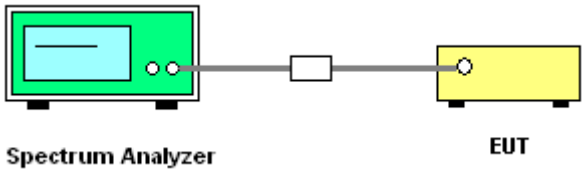
3.5.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.5.3 Test Procedures

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

3.5.4 Test Setup

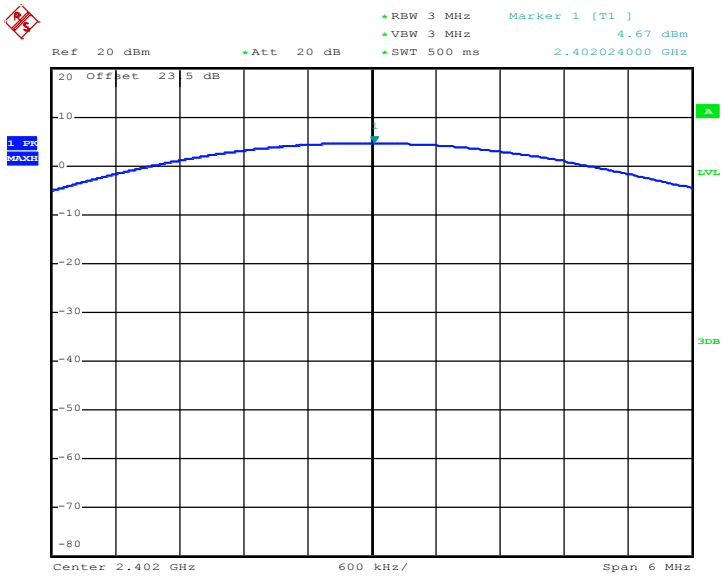


3.5.5 Test Result of Peak Output Power

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

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	4.67	30.00	Pass
39	2441	5.17	30.00	Pass
78	2480	5.21	30.00	Pass

Peak Output Power Plot on Channel 00

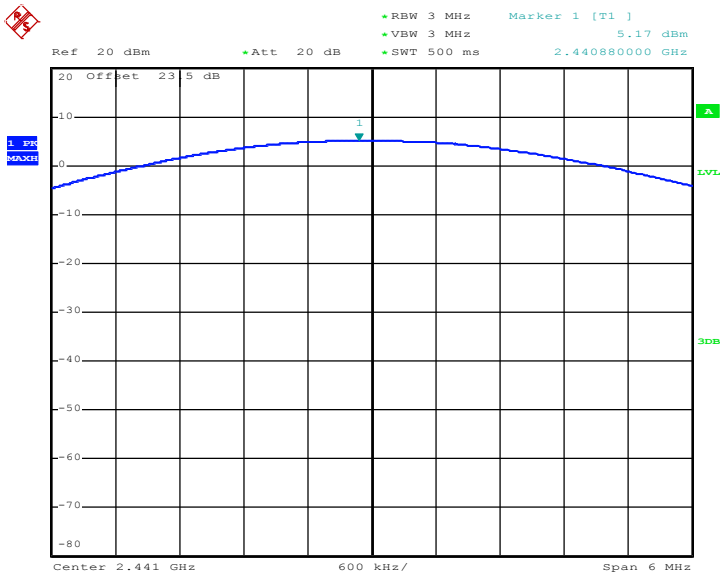


Date: 11.SEP.2012 20:10:02

Note:

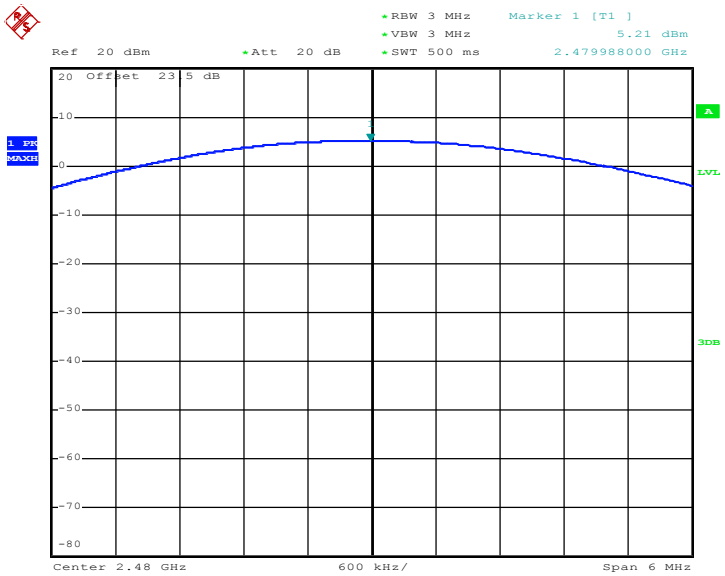
1. The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. Peak Output Power is not required to add the duty cycle factor.

Peak Output Power Plot on Channel 39



Date: 11.SEP.2012 20:14:39

Peak Output Power Plot on Channel 78

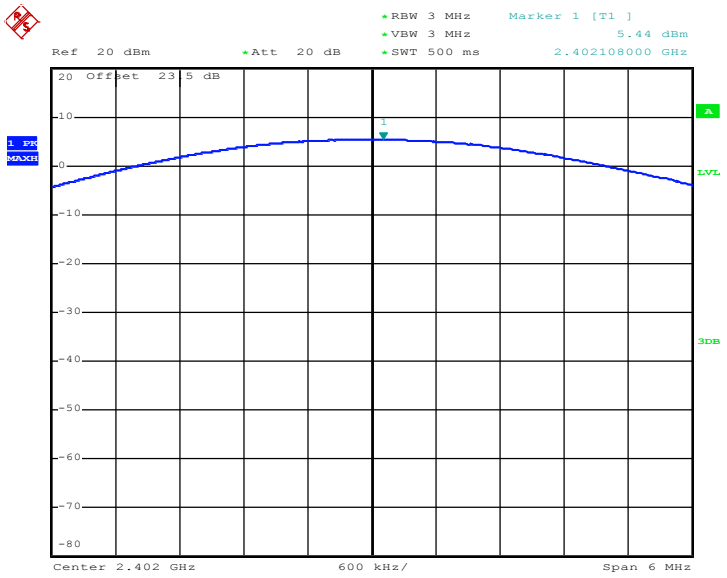


Date: 11.SEP.2012 20:18:40

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

Channel	Frequency (MHz)	RF Power (dBm)		
		π /4-DQPSK 2 Mbps	Max. Limits (dBm)	Pass/Fail
00	2402	5.44	20.97	Pass
39	2441	5.97	20.97	Pass
78	2480	6.04	20.97	Pass

Peak Output Power Plot on Channel 00

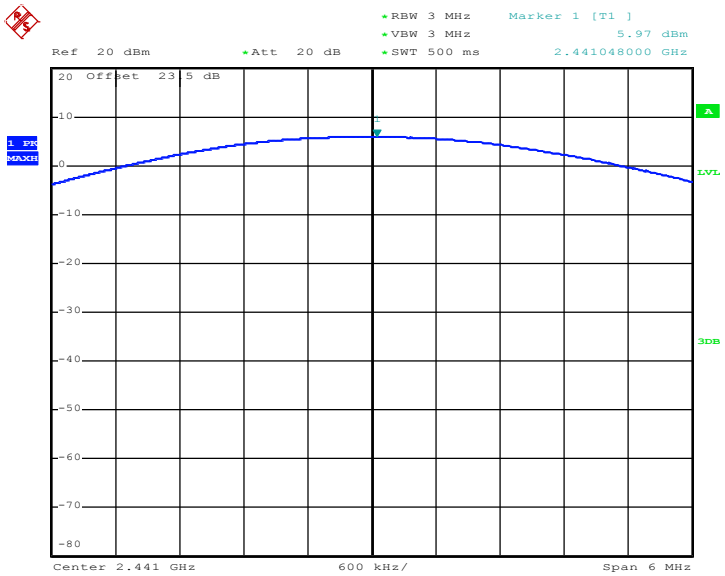


Date: 11.SEP.2012 20:12:53

Note:

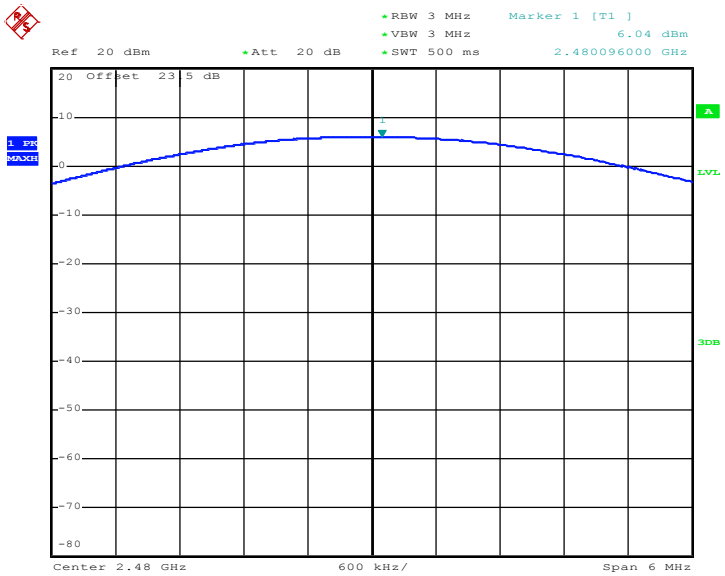
1. The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. Peak Output Power is not required to add the duty cycle factor.

Peak Output Power Plot on Channel 39



Date: 11.SEP.2012 20:15:16

Peak Output Power Plot on Channel 78

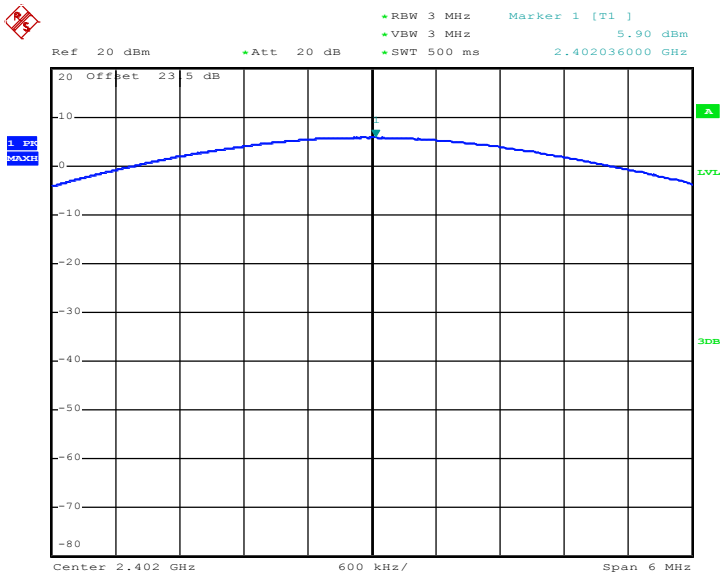


Date: 11.SEP.2012 20:20:05

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

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits	Pass/Fail
		3 Mbps	(dBm)	
00	2402	5.90	20.97	Pass
39	2441	6.40	20.97	Pass
78	2480	6.50	20.97	Pass

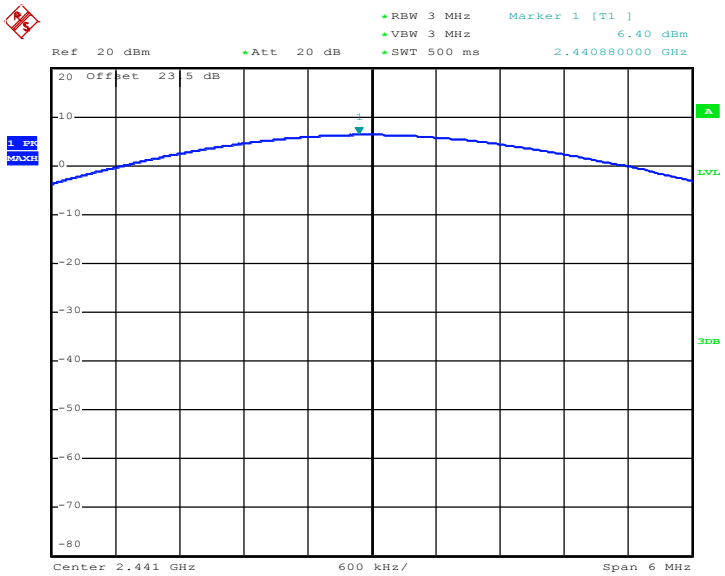
Peak Output Power Plot on Channel 00



Note:

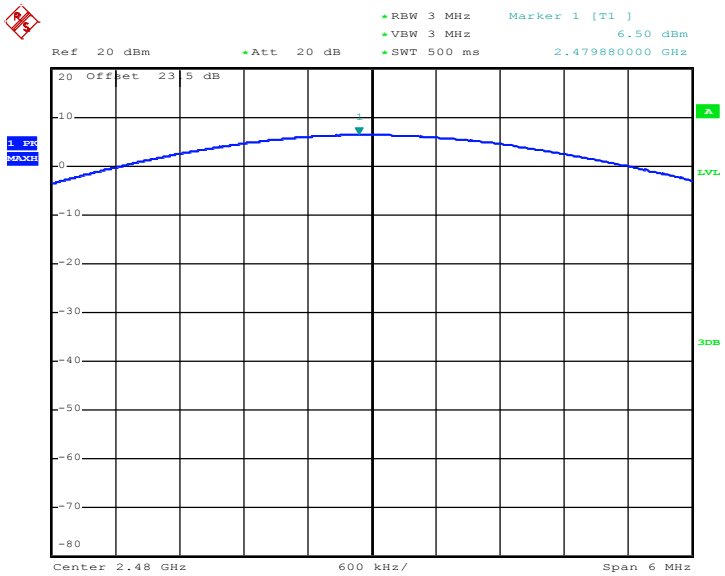
1. The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.
2. Peak Output Power is not required to add the duty cycle factor.

Peak Output Power Plot on Channel 39



Date: 11.SEP.2012 20:18:12

Peak Output Power Plot on Channel 78



Date: 11.SEP.2012 20:22:05

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.

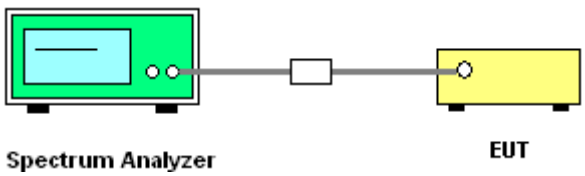
3.6.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

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. 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 = 300KHz (≥ 1% span=30MHz), VBW = 300KHz (≥ RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 300KHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.
5. Enable hopping function of the EUT and then repeat step 2. and 3.
6. Record the results in the test report.

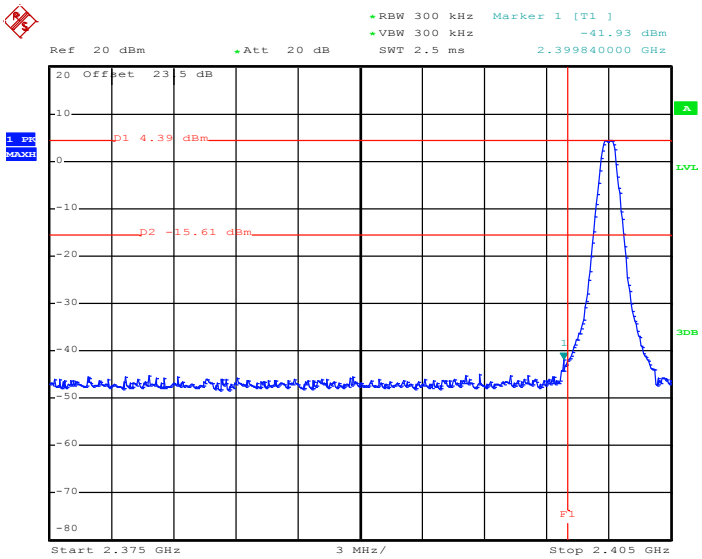
3.6.4 Test Setup



3.6.5 Test Result of Conducted Band Edges

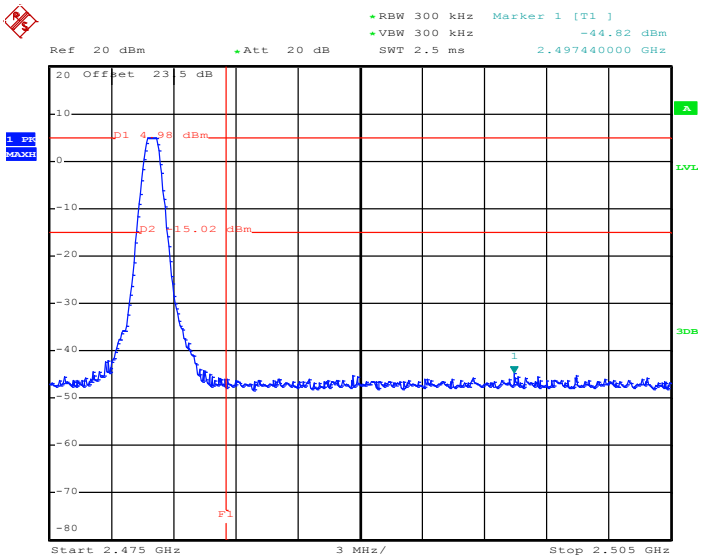
Test Mode :	1Mbps	Temperature :	24~26℃
Test Channel :	00 and 78	Relative Humidity :	50~53%
Test Engineer :	Reece Li		

Low Band Edge Plot on Channel 00



Date: 12.SEP.2012 15:29:18

High Band Edge Plot on Channel 78

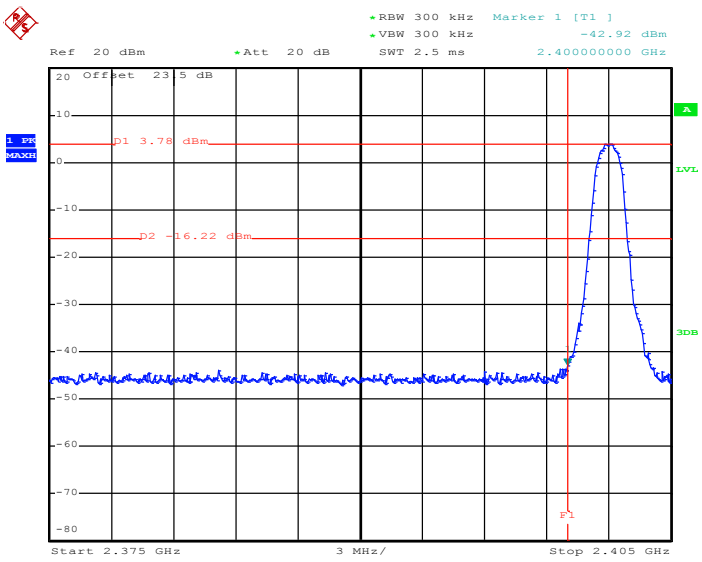


Date: 12.SEP.2012 15:36:46

Note: The total loss is 23.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer offset.

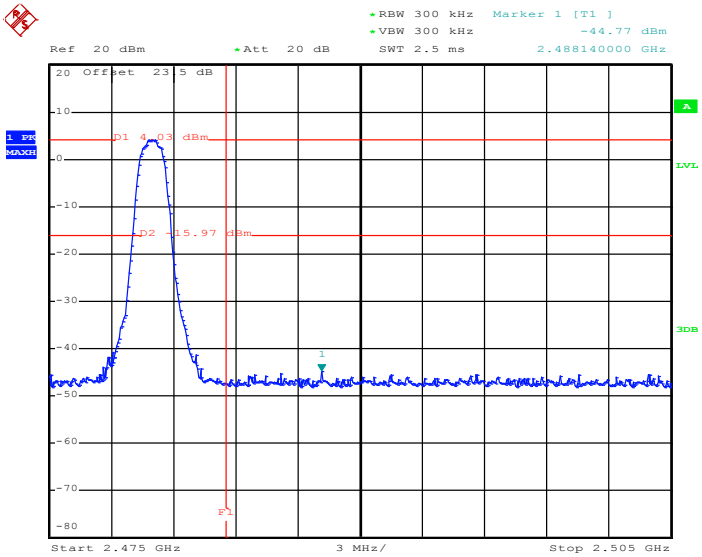
Test Mode :	2Mbps	**Temperature :**	24~26℃
Test Channel :	00 and 78	**Relative Humidity :**	50~53%
Test Engineer :	Reece Li		

Low Band Edge Plot on Channel 00



Date: 21.SEP.2012 11:25:39

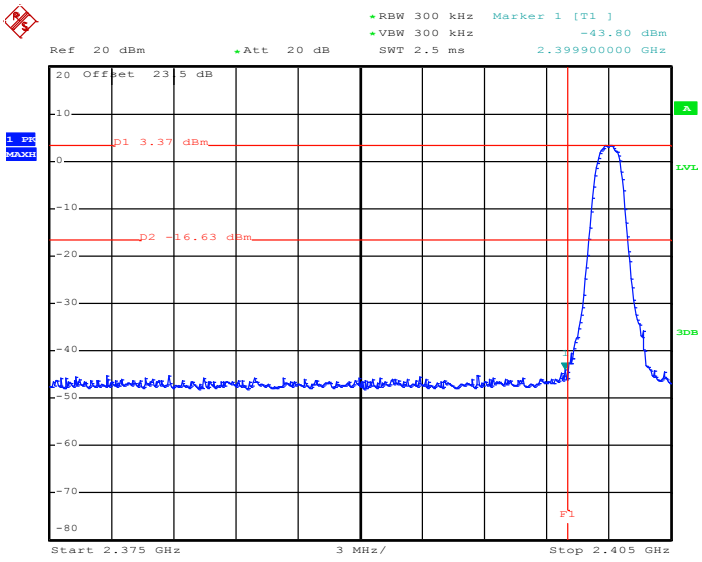
High Band Edge Plot on Channel 78



Date: 12.SEP.2012 16:02:12

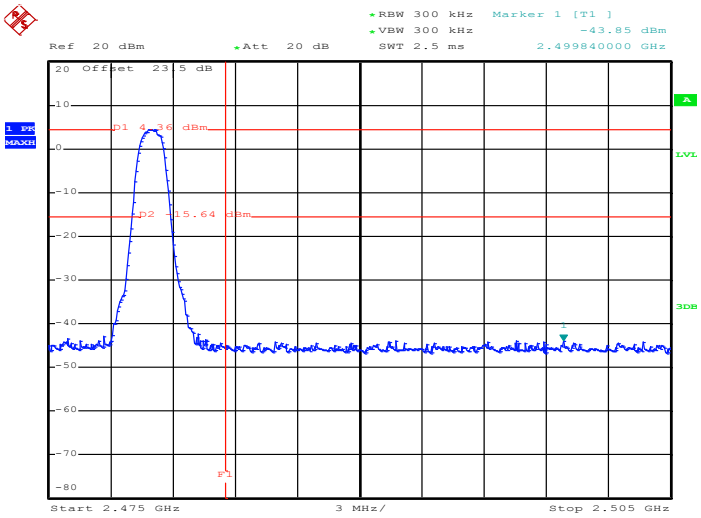
Test Mode :	3Mbps	**Temperature :**	24~26℃
Test Channel :	00 and 78	**Relative Humidity :**	50~53%
Test Engineer :	Reece Li		

Low Band Edge Plot on Channel 00



Date: 12.SEP.2012 16:15:22

High Band Edge Plot on Channel 78

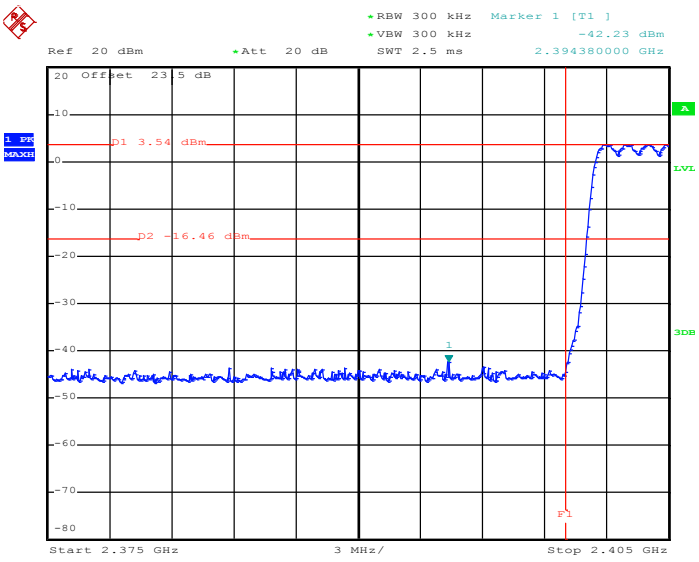


Date: 21.SEP.2012 11:56:54

3.6.6 Test Result of Conducted Hopping Mode Band Edges

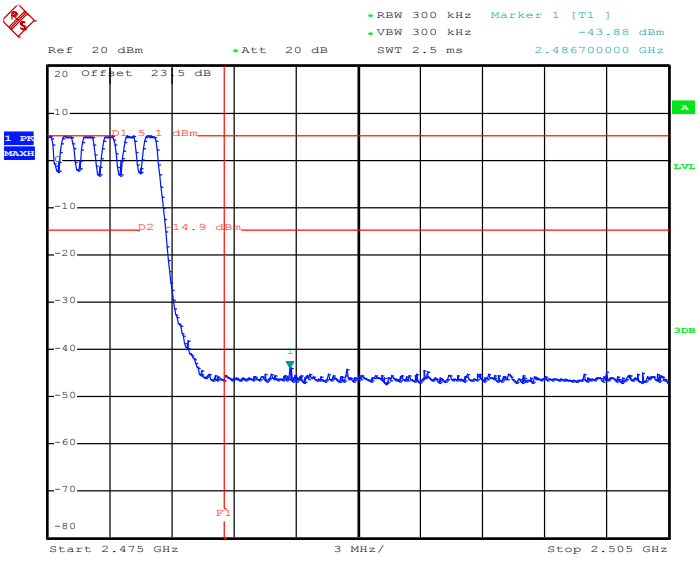
Test Mode :	1Mbps	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Hopping Mode Low Band Edge Plot



Date: 15.SEP.2012 15:33:27

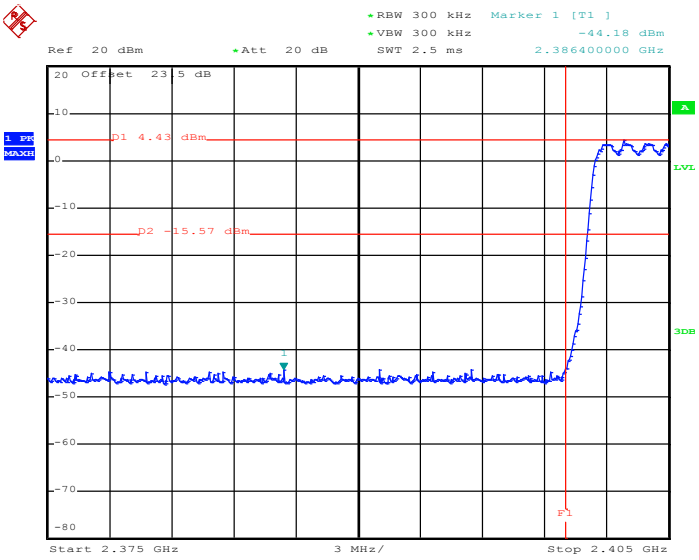
Hopping Mode High Band Edge Plot



Date: 15.SEP.2012 15:56:47

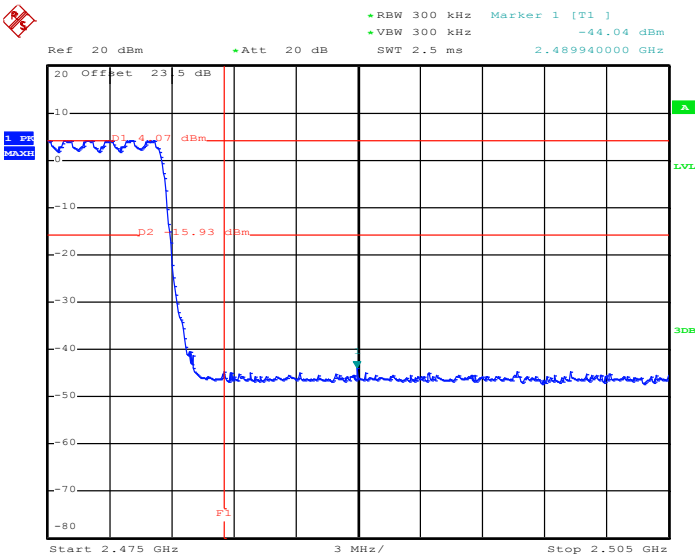
Test Mode :	2Mbps	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Hopping Mode Low Band Edge Plot



Date: 15.SEP.2012 15:40:20

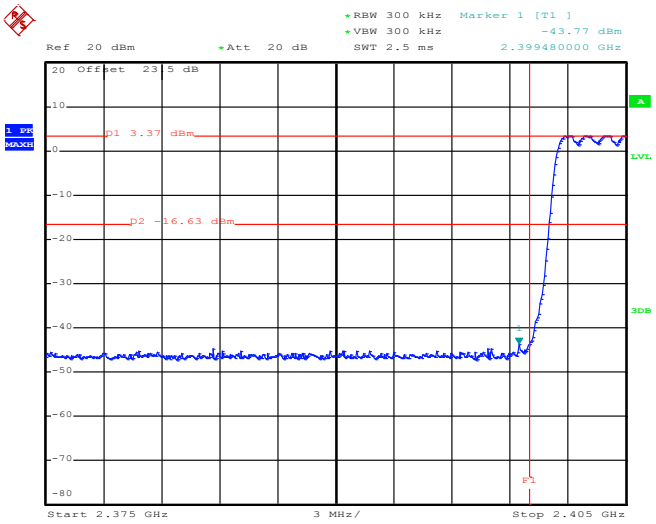
Hopping Mode High Band Edge Plot



Date: 15.SEP.2012 15:54:29

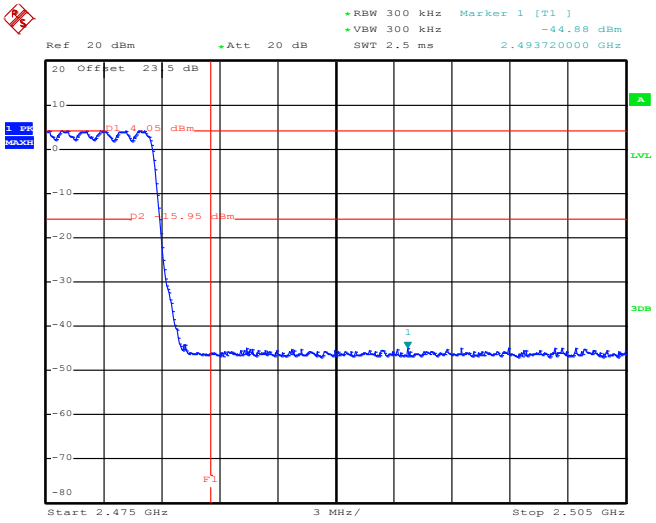
Test Mode :	3Mbps	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Hopping Mode Low Band Edge Plot



Date: 15.SEP.2012 15:46:07

Hopping Mode High Band Edge Plot



Date: 15.SEP.2012 15:51:33

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 section 4.0 of List of Measuring Equipment of this test report is used for test.

3.7.3 Test Procedure

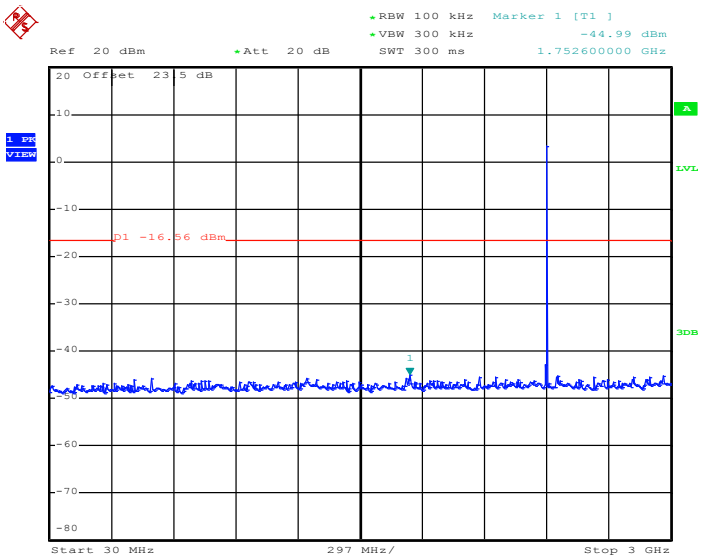
1. The testing follows the guidelines in Spurious RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum 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. Record the results in the test report.

3.7.4 Test Setup

3.7.5 Test Result

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

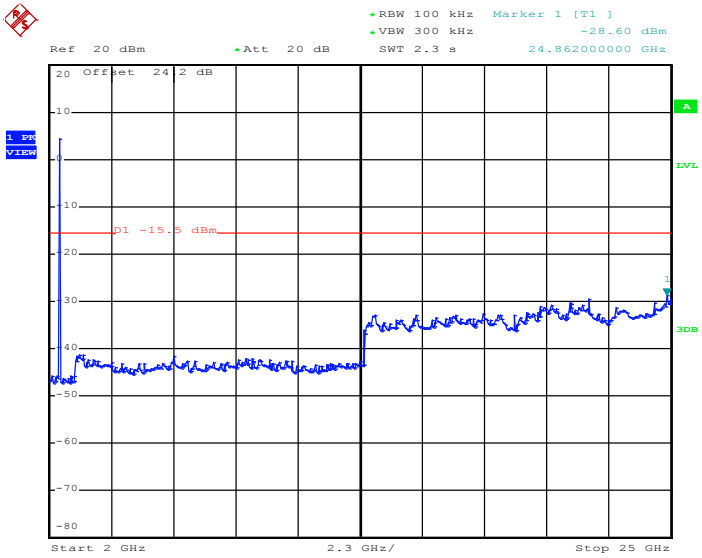
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Note:

1. The total loss is 23.5dB 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.

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

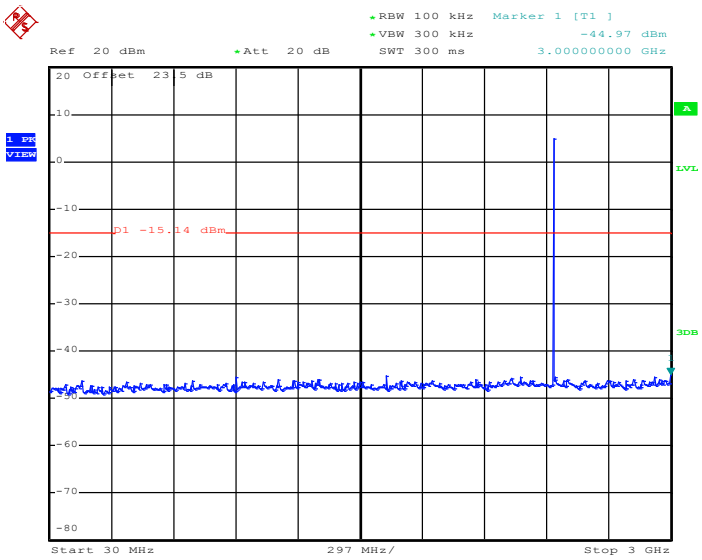


Note:

1. The total loss is 24.2dB 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 :	50~53%
Test Engineer :	Reece Li		

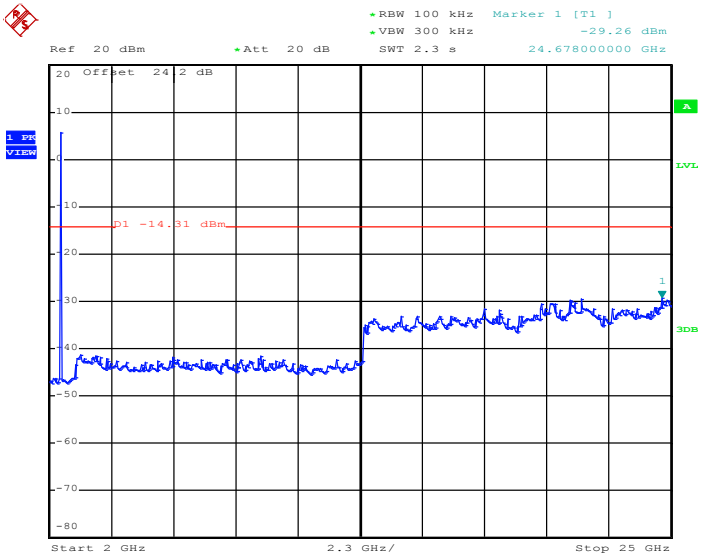
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Note:

1. The total loss is 23.5dB 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.

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

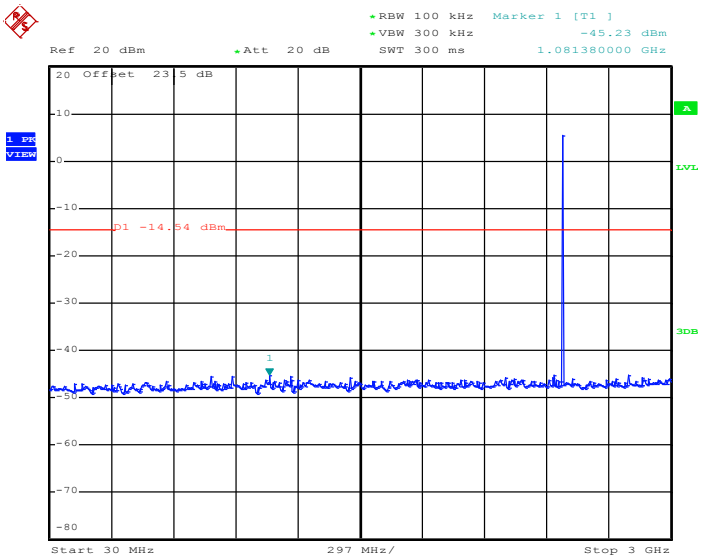


Note:

1. The total loss is 24.2dB 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 :**	50~53%
Test Engineer :	Reece Li		

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

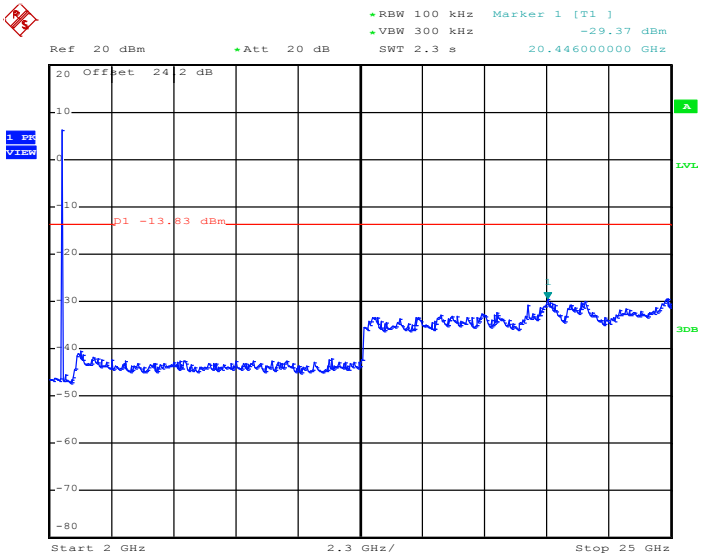


Date: 21.SEP.2012 11:18:14

Note:

1. The total loss is 23.5dB 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.

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

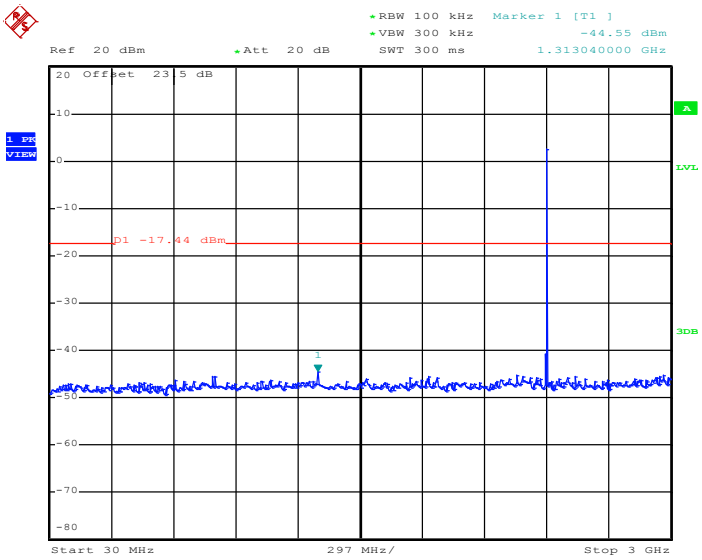


Note:

1. The total loss is 24.2dB 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 :	50~53%
Test Engineer :	Reece Li		

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

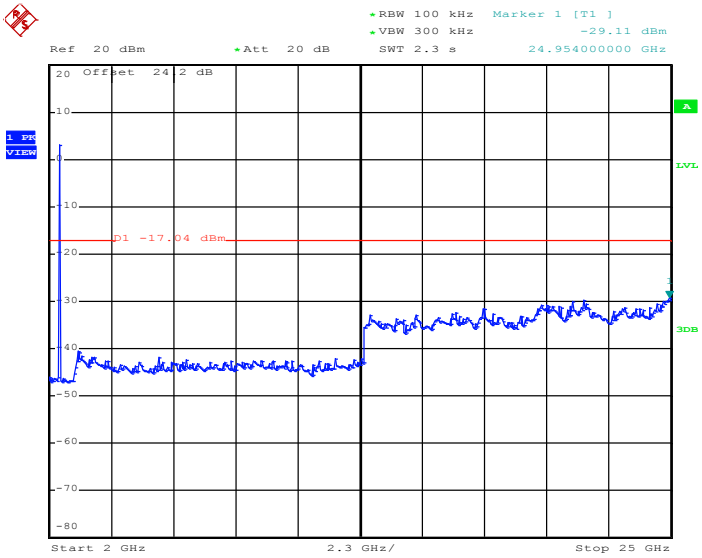


Date: 21.SEP.2012 11:26:54

Note:

1. The total loss is 23.5dB 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.

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz



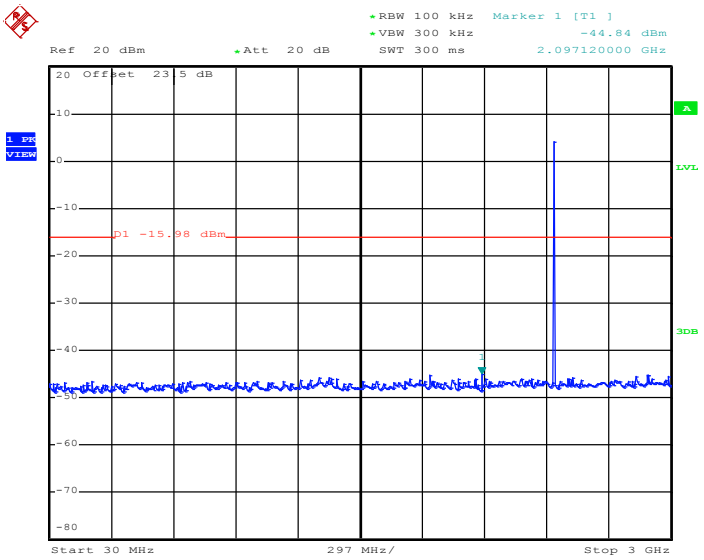
Date: 21.SEP.2012 11:27:15

Note:

1. The total loss is 24.2dB 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 :	50~53%
Test Engineer :	Reece Li		

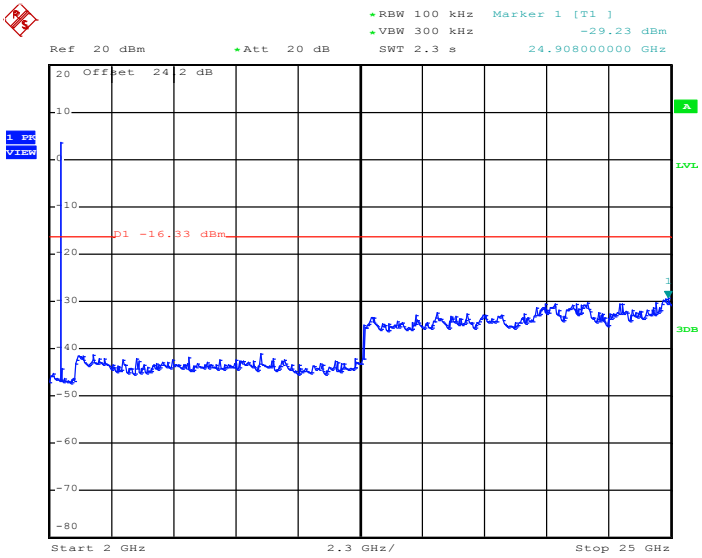
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Note:

1. The total loss is 23.5dB 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.

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz



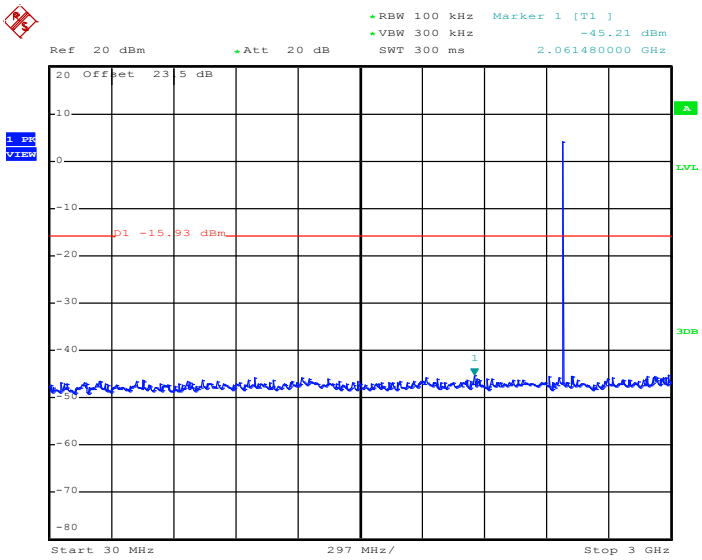
Date: 21.SEP.2012 11:23:38

Note:

1. The total loss is 24.2dB 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 :	50~53%
Test Engineer :	Reece Li		

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

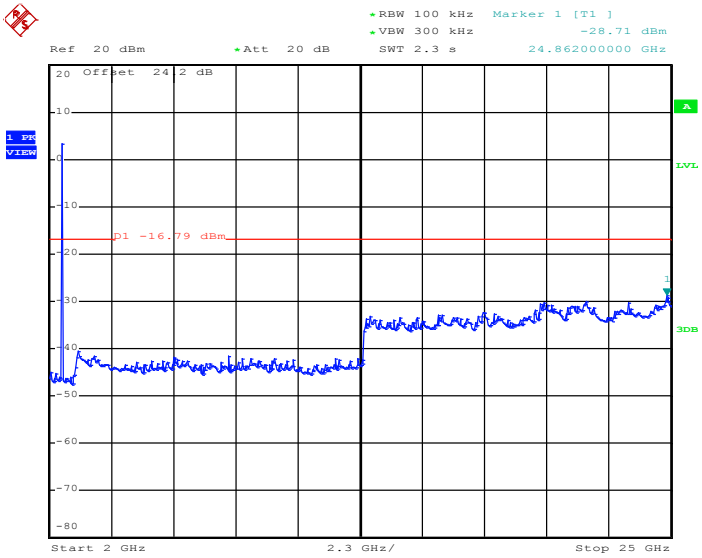


Date: 21.SEP.2012 11:24:13

Note:

1. The total loss is 23.5dB 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.

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

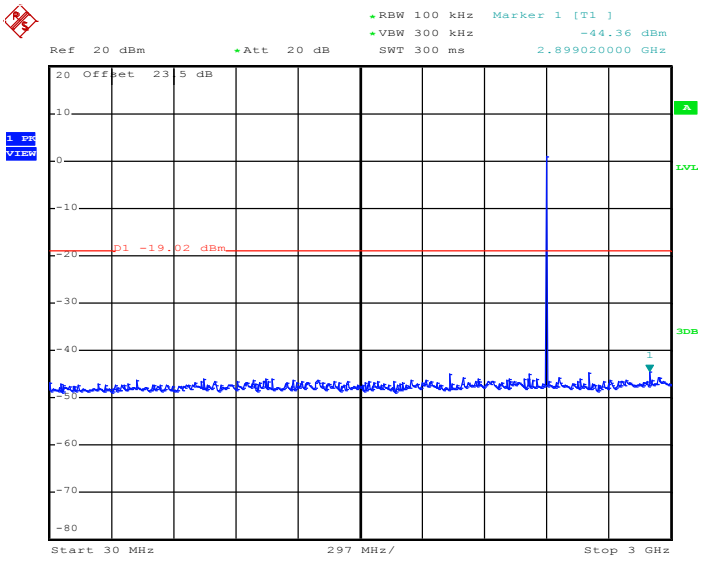


Note:

1. The total loss is 24.2dB 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 :	50~53%
Test Engineer :	Reece Li		

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

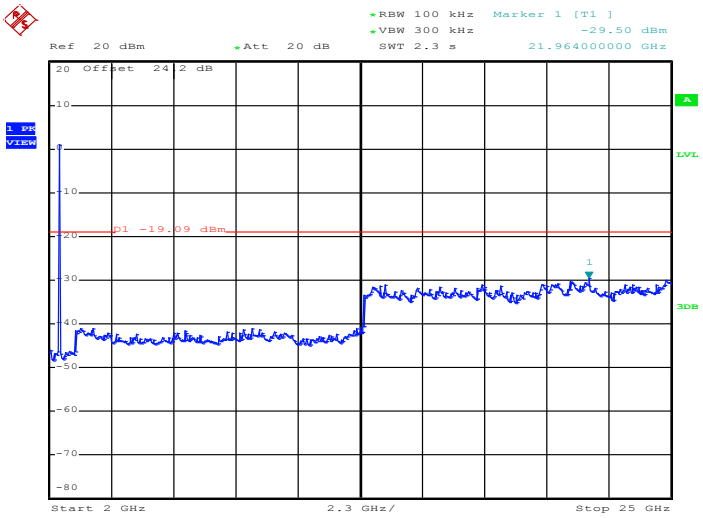


Date: 18.SEP.2012 18:06:28

Note:

1. The total loss is 23.5dB 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.

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz



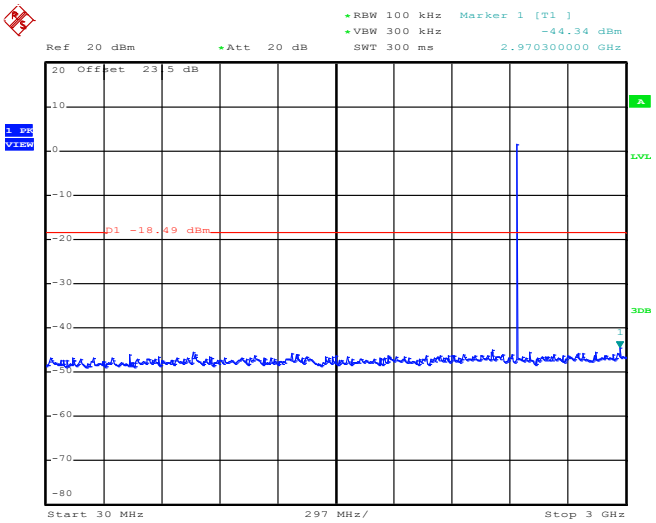
Date: 18.SEP.2012 18:06:49

Note:

1. The total loss is 24.2dB 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 :	50~53%
Test Engineer :	Reece Li		

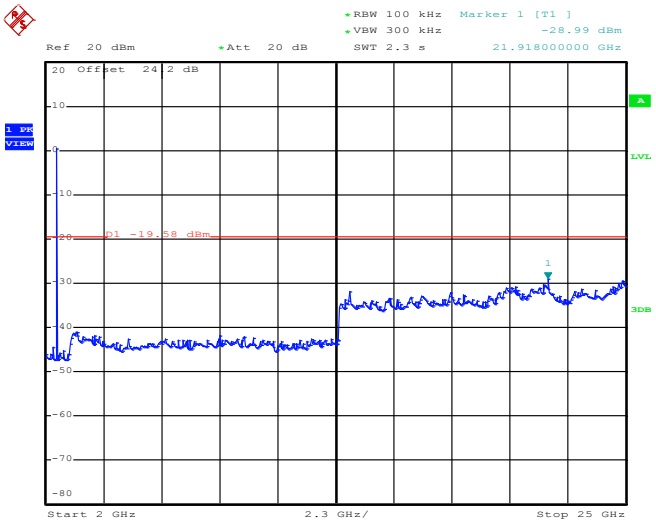
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Note:

1. The total loss is 23.5dB 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.

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

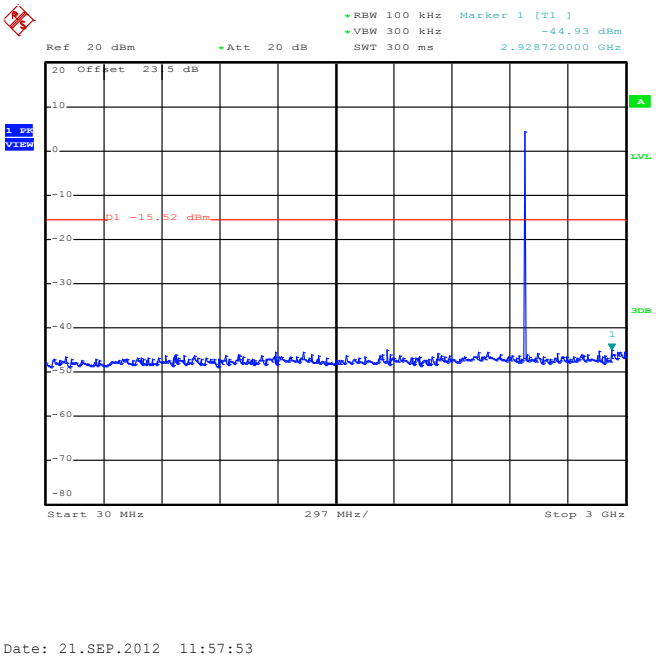


Note:

1. The total loss is 24.2dB 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 :	50~53%
Test Engineer :	Reece Li		

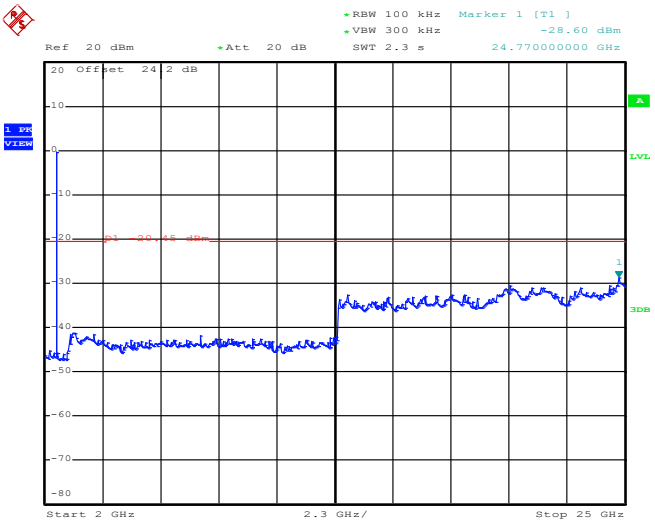
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Note:

1. The total loss is 23.5dB 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.

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz



Note:

1. The total loss is 24.2dB 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

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 section 4.0 of List of Measuring Equipment of this test report is used for test.

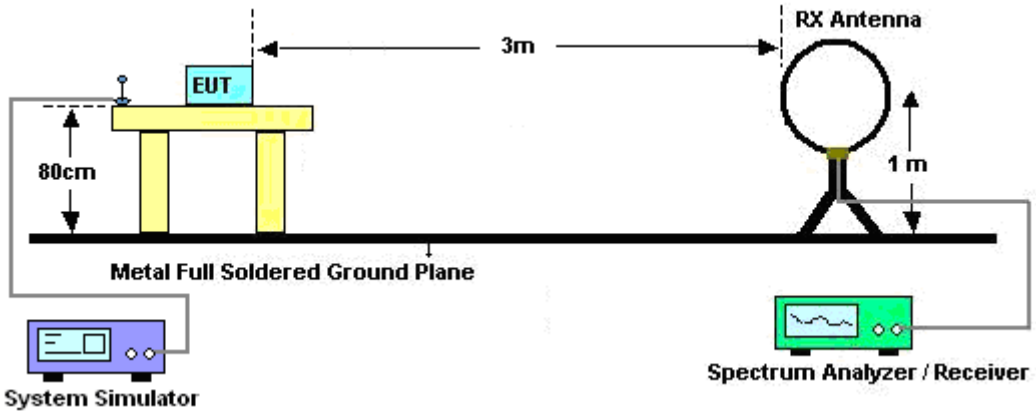
3.8.3 Test Procedures

1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. 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 Level = Peak Level + 20*log(Duty cycle)
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

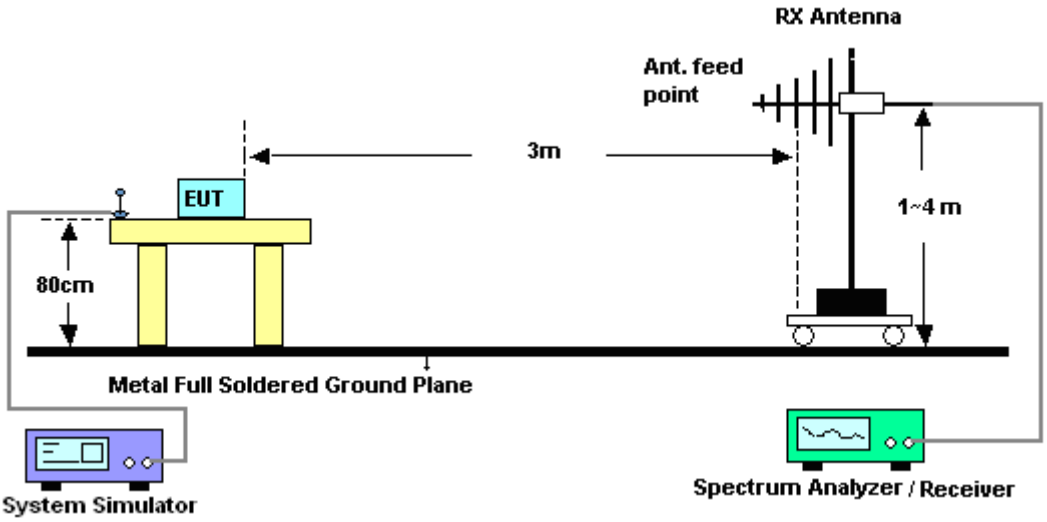
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.78dB) derived from 20log (dwell time/100ms).
For example: Average level = 46.26dBuV/m – 24.78 (dB) = 21.48dBuV/m.

3.8.4 Test Setup

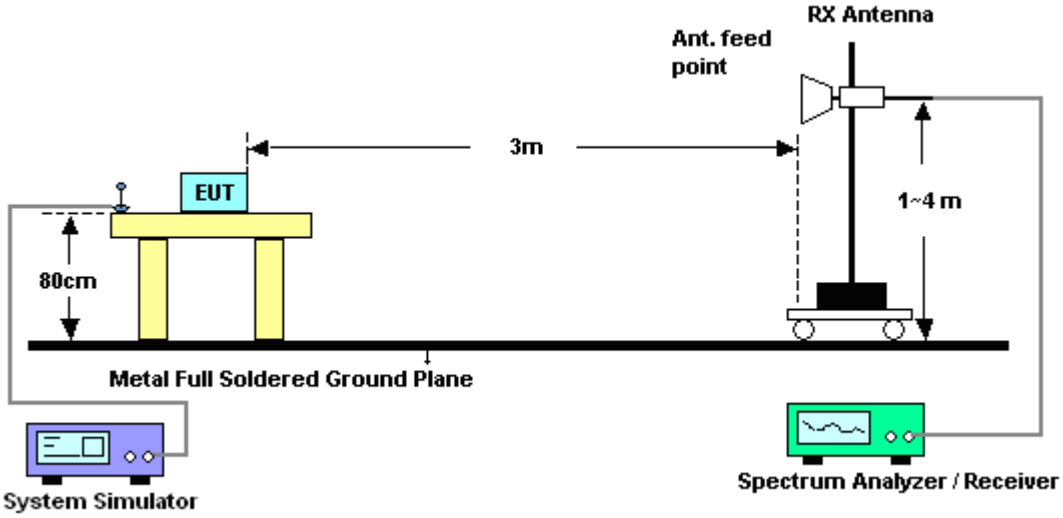
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

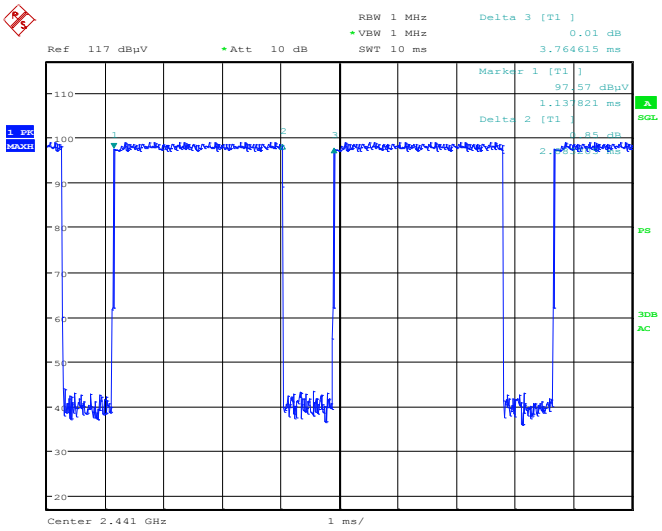


3.8.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

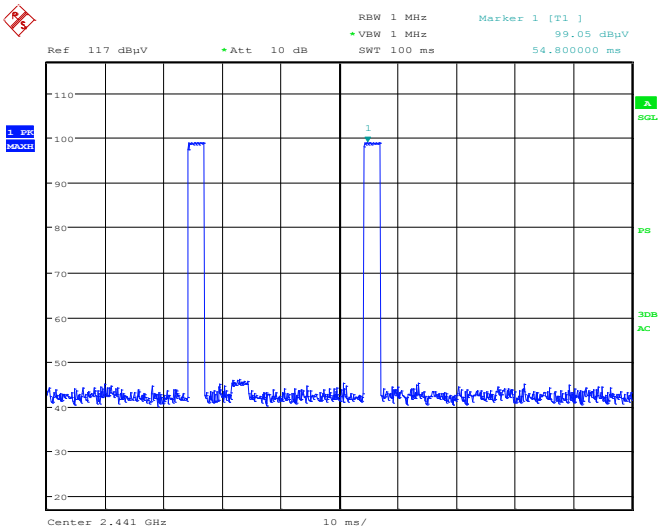
The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.8.6 Duty cycle correction factor for average measurement

3DH5 on time/100ms (One Pulse) Plot on Channel 39



3DH5 on time/100ms (Count Pulses) Plot on Channel 39

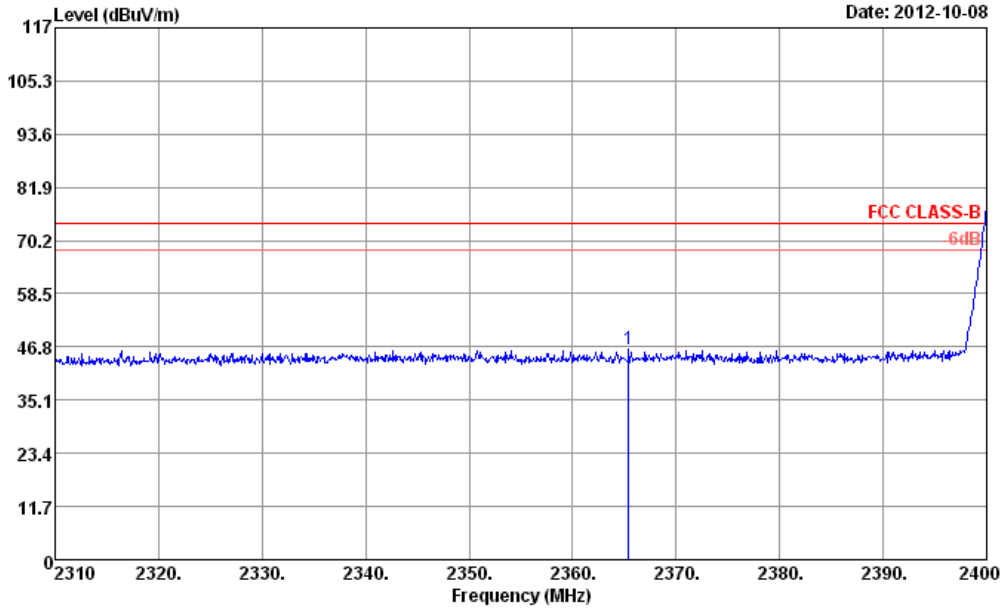


Note:

1. Duty cycle = on time/100 milliseconds = 2 * 2.883 / 100 = 5.77 %
2. Duty cycle correction factor = 20*log(Duty cycle) = -24.78 dB
3. 3DH5 has the highest duty cycle and is reported.

3.8.7 Test Result of Radiated Band Edges

Test Mode :	3Mbps	Temperature :	20~22°C
Test Channel :	00	Relative Humidity :	40~42%
Test Engineer :	David Ke		



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 HORIZONTAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

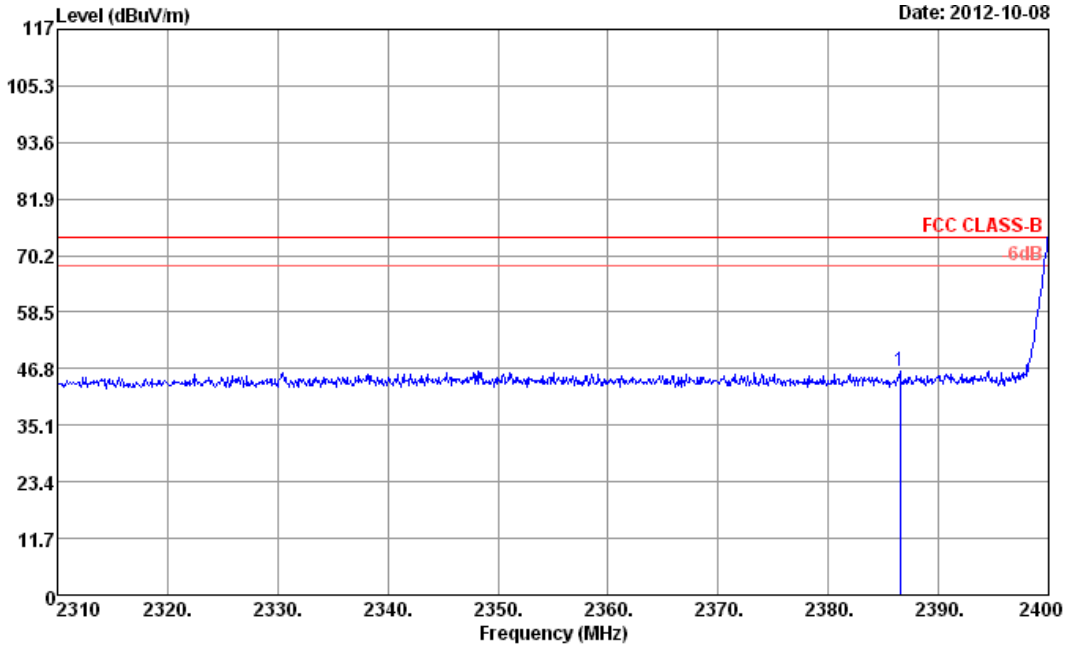
Detector : Peak

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
2365.44	46.26	-27.74	74	45.44	32.13	4.57	35.88	106	327	Peak
2365.44	21.48	-32.52	54	-	-	-	-	-	-	Average

Note:

1. The average levels were calculated from the peak level corrected with duty cycle correction factor (24.78dB) derived from 20log (dwell time/100ms).
   For example: Average level = 46.26dBuV/m – 24.78 (dB) = 21.48dBuV/m.
2. Worst case measurement on 2365.44 MHz is compliance with 74/54 dBuV/m (peak/average) limit and band 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 :	20~22°C
Test Channel :	00	Relative Humidity :	40~42%
Test Engineer :	David Ke		



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 VERTICAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

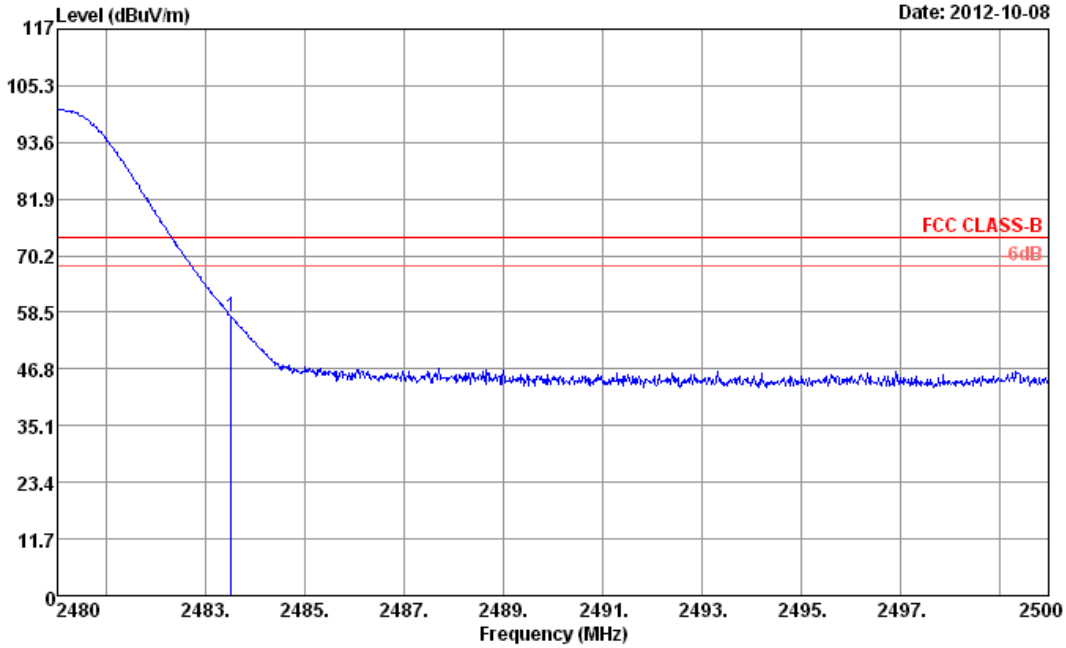
Detector : Peak

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
2386.5	46.42	-27.58	74	45.54	32.18	4.58	35.88	145	331	Peak
2386.5	21.64	-32.36	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2386.5 MHz is compliance with 74/54 dBuV/m (peak/average) limit and band 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 :	20~22°C
Test Channel :	78	Relative Humidity :	40~42%
Test Engineer :	David Ke		



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 HORIZONTAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

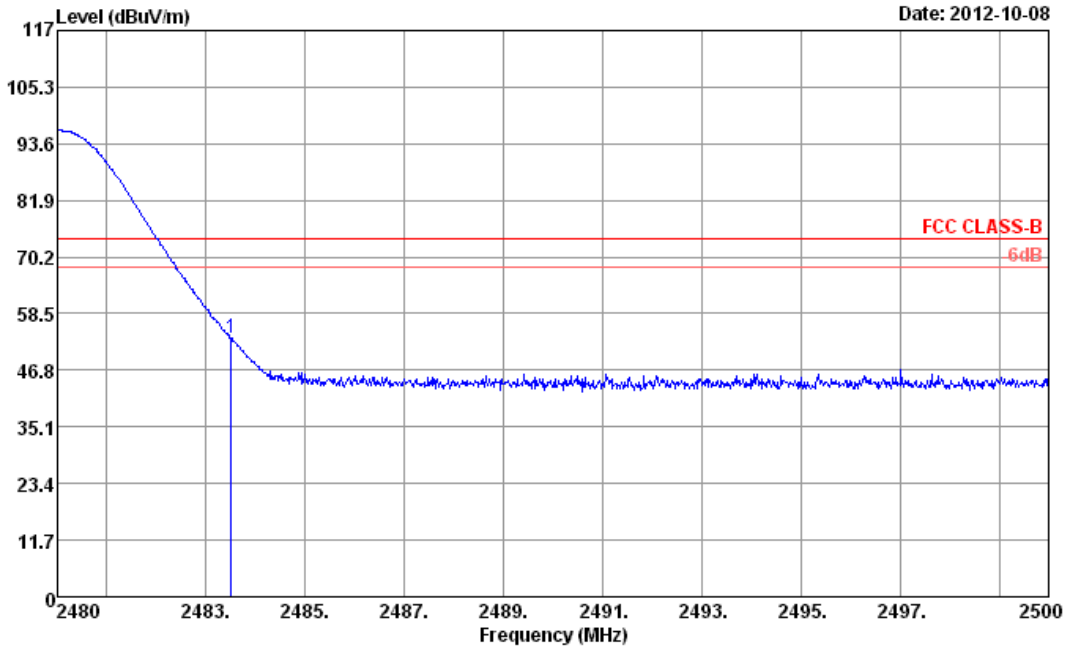
Detector : Peak

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	57.77	-16.23	74	56.66	32.28	4.64	35.81	130	121	Peak
2483.5	32.99	-21.01	54	-	-	-	-	-	-	Average

Note: Worst case measurement on 2483.5 MHz is compliance with 74/54 dBuV/m (peak/average) limit and band 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 :	20~22°C
Test Channel :	78	Relative Humidity :	40~42%
Test Engineer :	David Ke		



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 VERTICAL
: RBW:1000.000KHz VBW:1000.000KHz SWT:Auto

Detector : Peak

ANTENNA POLARITY : VERTICAL

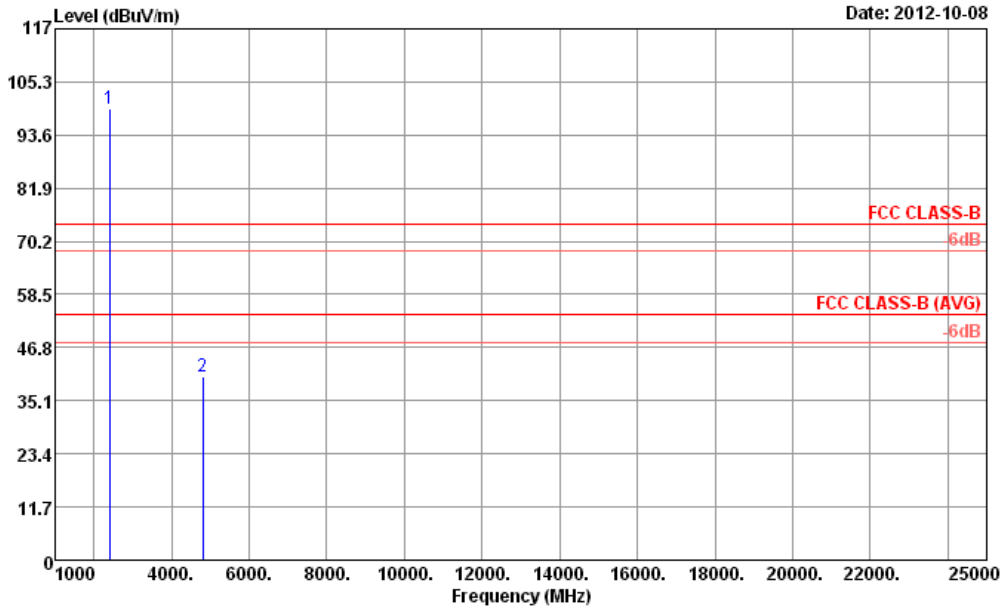
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	53.43	-20.57	74	52.32	32.28	4.64	35.81	193	86	Peak
2483.5	28.65	-25.35	54	-	-	-	-	-	-	Average

Note:

1. Worst case measurement on 2483.5 MHz is compliance with 74/54 dBuV/m (peak/average) limit and band 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.
2. The band edge for different data rates is fully performed by conducted measurement, and is compliance with the limie line, and thus the data rate 3Mbps is used for radiated spurious emissions measurement due to maximum output power, and no non-compliance found during Conducted band edge measurement.

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

Test Mode :	3Mbps	**Temperature :**	20~22°C
Test Channel :	00	**Relative Humidity :**	40~42%
Test Engineer :	David Ke		
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. The harmonic (3rd, 4th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



Site : 03CH05-HY
Condition : FCC CLASS-B 3m SHF_EHF_HORN_091208 HORIZONTAL

ANTENNA POLARITY : HORIZONTAL

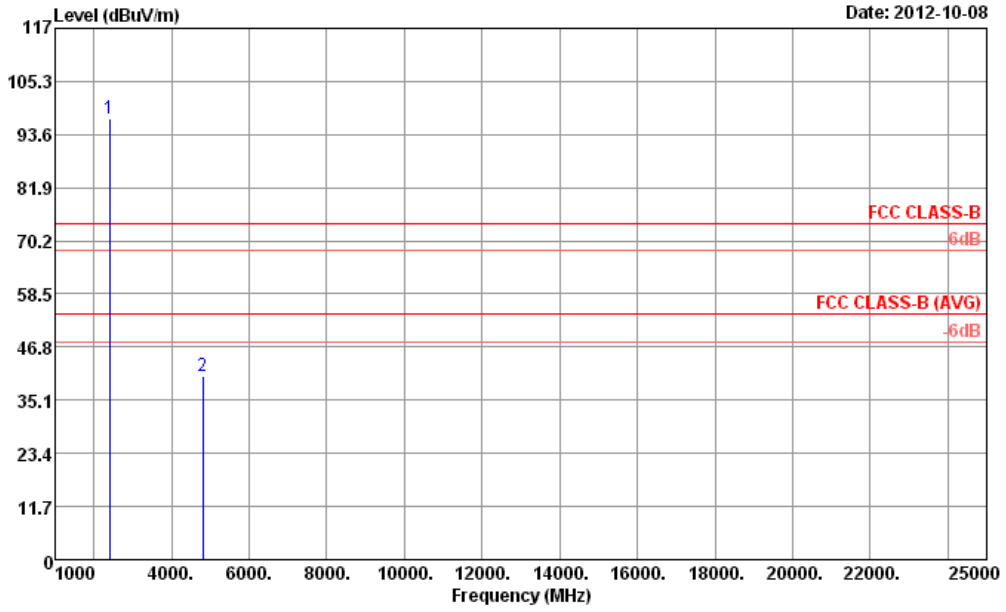
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	99.47	-	-	98.57	32.18	4.58	35.86	106	327	Peak
2402	74.69	-	-	-	-	-	-	-	-	Average
4804	40.37	-33.63	74	58.67	34.26	6.5	59.06	200	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 (24.78dB) derived from 20log (dwell time/100ms).

For example: Average level = 99.47dBuV/m – 24.78 (dB) = 40.37dBuV/m.

Test Mode :	3Mbps	Temperature :	20~22°C
Test Channel :	00	Relative Humidity :	40~42%
Test Engineer :	David Ke		
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. The harmonic (3rd, 4th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



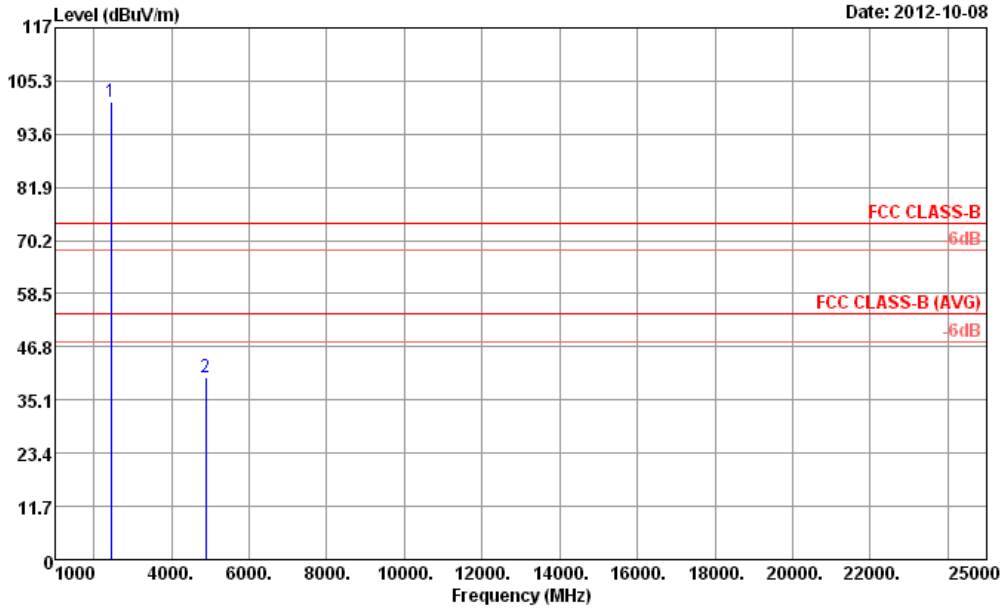
Site : 03CH05-HY
Condition : FCC CLASS-B 3m SHF_EHF_HORN_091208 VERTICAL

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	97.07	-	-	96.17	32.18	4.58	35.86	145	331	Peak
2402	72.29	-	-	-	-	-	-	-	-	Average
4804	40.31	-33.69	74	58.61	34.26	6.5	59.06	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	3Mbps	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke		
Remark :	1. 2442 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. The harmonic (3rd, 4th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



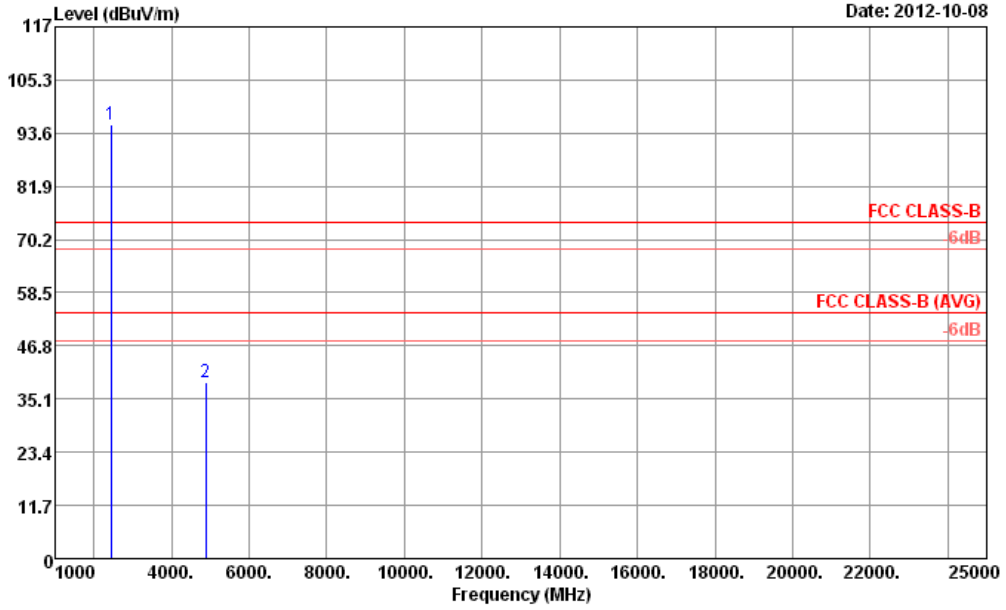
Site : 03CH05-HY
Condition : FCC CLASS-B 3m SHF_EHF_HORN_091208 HORIZONTAL

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	100.72	-	-	99.7	32.24	4.61	35.83	132	318	Peak
2442	75.94	-	-	-	-	-	-	-	-	Average
4882	40.07	-33.93	74	58.13	34.28	6.54	58.88	200	0	Peak

Other harmonics are lower than background noise

Test Mode :	3Mbps	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke		
Remark :	1. 2442 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. The harmonic (3rd, 4th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



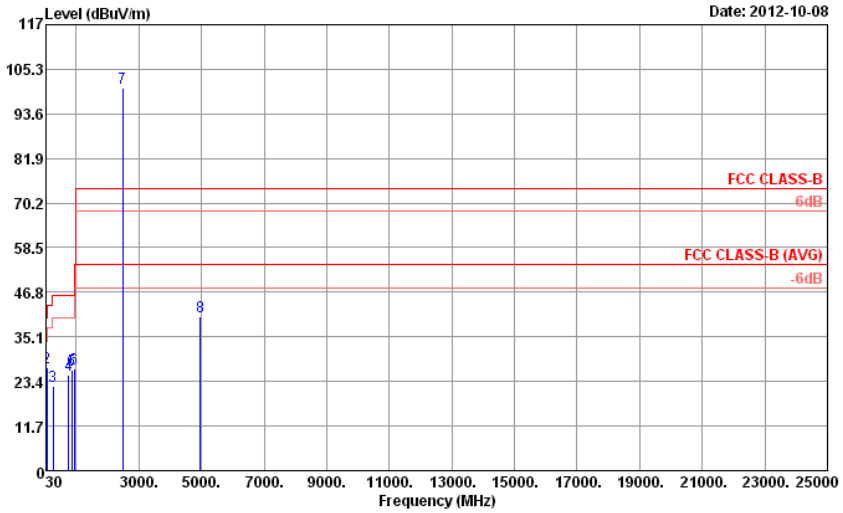
Site : 03CH05-HY
Condition : FCC CLASS-B 3m SHF_EHF_HORN_091208 VERTICAL

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	95.53	-	-	94.51	32.24	4.61	35.83	126	80	Peak
2442	70.75	-	-	-	-	-	-	-	-	Average
4882	38.83	-35.17	74	56.89	34.28	6.54	58.88	100	0	Peak

Other harmonics are lower than background noise

Test Mode :	3Mbps	Temperature :	20~22°C
Test Channel :	78	Relative Humidity :	40~42%
Test Engineer :	David Ke		
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. The harmonic (3rd, 4th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		

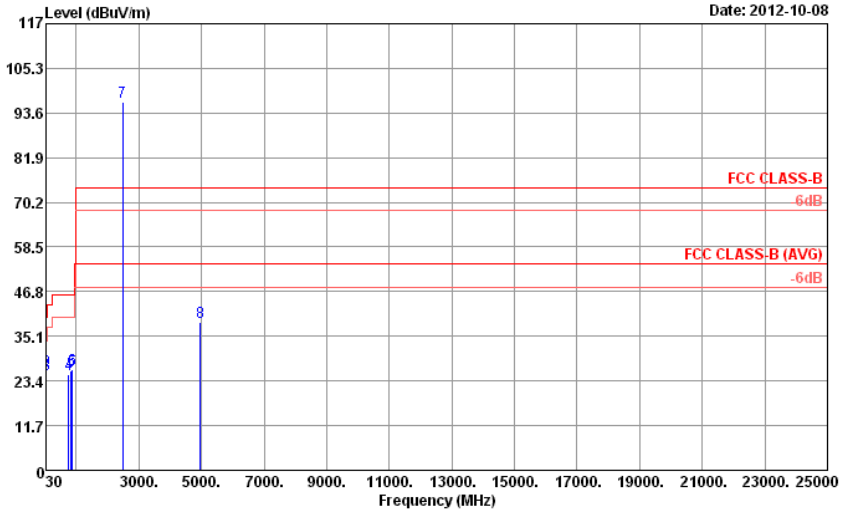


ANTENNA POLARITY : HORIZONTAL

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
30	22.62	-17.38	40	33.76	19.8	0.7	31.64	-	-	Peak
66.45	26.94	-13.06	40	51.52	6.06	0.89	31.53	110	236	Peak
258.15	22.18	-23.82	46	37.83	13.64	1.68	30.97	-	-	Peak
757.1	25.02	-20.98	46	30.07	22.33	2.76	30.14	-	-	Peak
843.9	26.56	-19.44	46	30.01	23.34	2.91	29.7	-	-	Peak
937.7	26.72	-19.28	46	29.23	24.52	3.05	30.08	-	-	Peak
2480	100.42	-	-	99.31	32.28	4.64	35.81	130	121	Peak
2480	75.64	-	-	-	-	-	-	-	-	Average
4960	40.38	-33.62	74	58.17	34.29	6.57	58.65	200	0	Peak

Other harmonics are lower than background noise

Test Mode :	3Mbps	Temperature :	20~22°C
Test Channel :	78	Relative Humidity :	40~42%
Test Engineer :	David Ke		
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. The harmonic (3rd, 4th,…etc.) and other spurious are not reported, because those levels are lower than average limit line and background noise.		



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
32.97	27.56	-12.44	40	40.71	17.76	0.72	31.63	111	205	Peak
34.86	26.06	-13.94	40	40.55	16.4	0.74	31.63	-	-	Peak
43.5	25.18	-14.82	40	44.97	10.98	0.77	31.54	-	-	Peak
760.6	25.05	-20.95	46	30.1	22.3	2.77	30.12	-	-	Peak
838.3	26.13	-19.87	46	29.69	23.26	2.9	29.72	-	-	Peak
869.1	26.31	-19.69	46	30.05	23.12	2.95	29.81	-	-	Peak
2480	96.46	-	-	95.35	32.28	4.64	35.81	193	86	Peak
2480	71.68	-	-	-	-	-	-	-	-	Average
4960	38.82	-35.18	74	56.61	34.29	6.57	58.65	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 (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

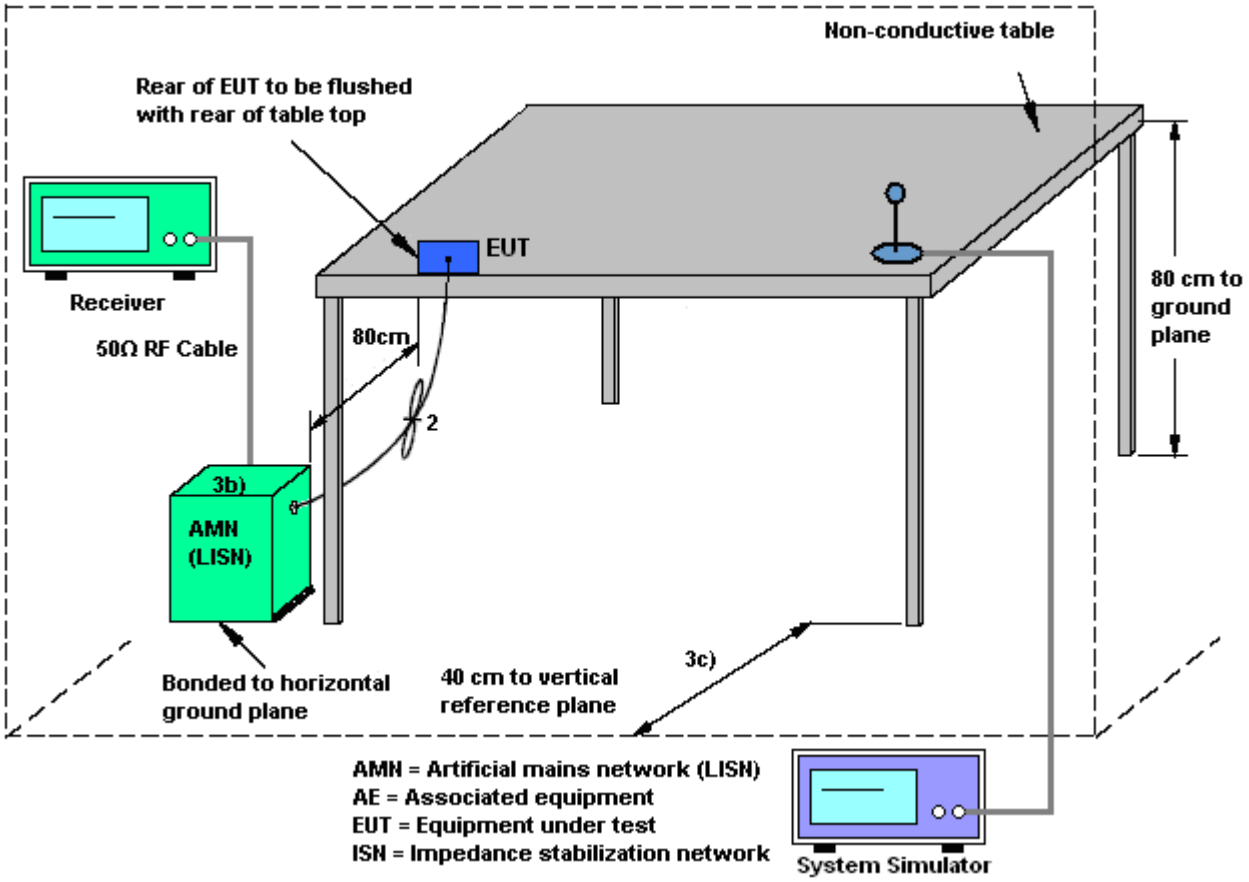
3.9.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.9.3 Test Procedures

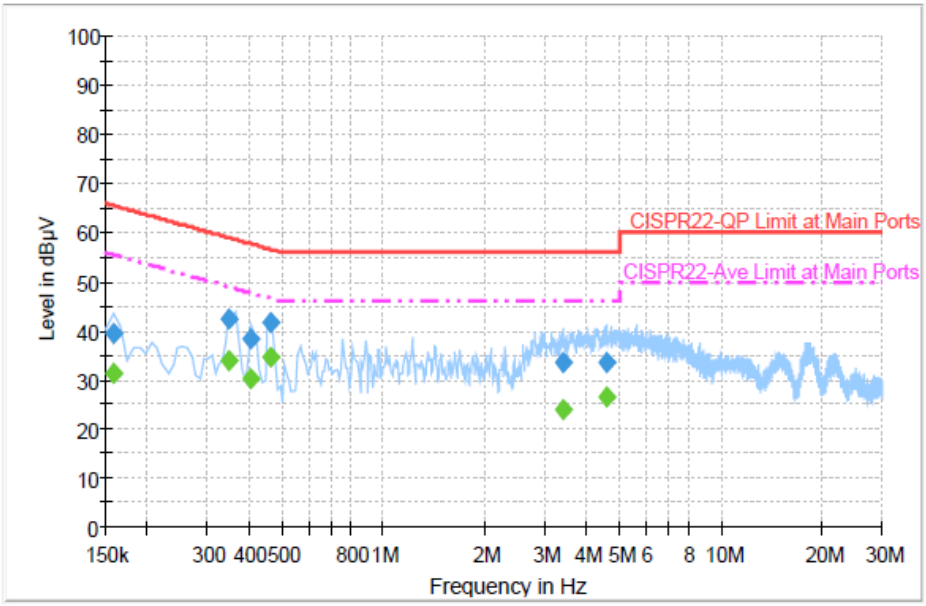
1. The test follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009 test site requirement.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 KHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.9.4 Test Setup



3.9.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Slash Huang	**Relative Humidity :**	45~47%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + MPEG4 + Earphone + Battery + USB Cable (Charging from Adapter) + SIM 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



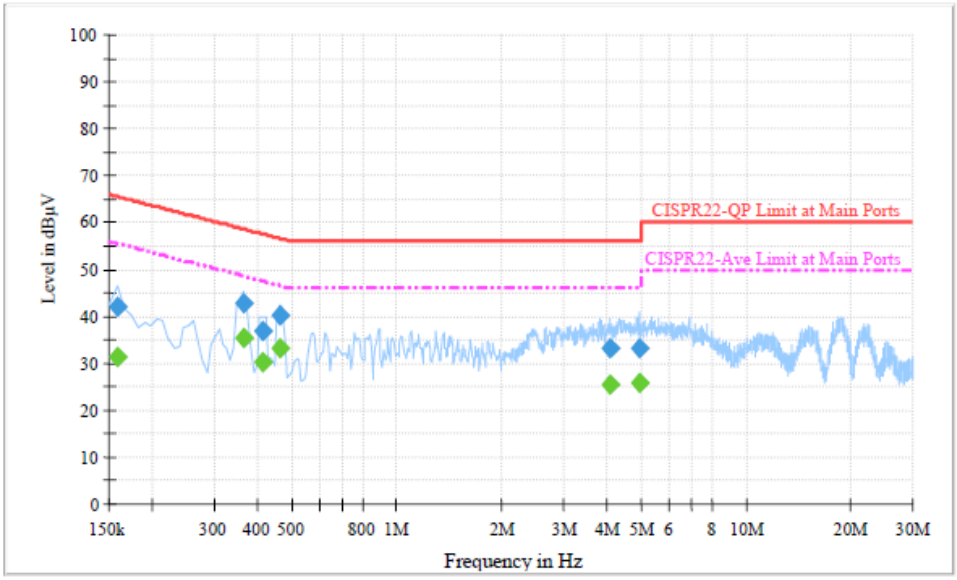
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	39.5	Off	L1	19.3	26.1	65.6
0.350000	42.5	Off	L1	19.4	16.5	59.0
0.406000	38.2	Off	L1	19.4	19.5	57.7
0.462000	41.7	Off	L1	19.3	15.0	56.7
3.414000	33.4	Off	L1	19.6	22.6	56.0
4.574000	33.7	Off	L1	19.6	22.3	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	31.5	Off	L1	19.3	24.1	55.6
0.350000	34.1	Off	L1	19.4	14.9	49.0
0.406000	30.2	Off	L1	19.4	17.5	47.7
0.462000	34.6	Off	L1	19.3	12.1	46.7
3.414000	24.2	Off	L1	19.6	21.8	46.0
4.574000	26.6	Off	L1	19.6	19.4	46.0

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + MPEG4 + Earphone + Battery + USB Cable (Charging from Adapter) + SIM 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	41.9	Off	N	19.3	23.7	65.6
0.366000	42.9	Off	N	19.4	15.7	58.6
0.414000	36.7	Off	N	19.4	20.9	57.6
0.462000	40.2	Off	N	19.3	16.5	56.7
4.086000	33.2	Off	N	19.6	22.8	56.0
4.934000	33.1	Off	N	19.7	22.9	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	31.4	Off	N	19.3	24.2	55.6
0.366000	35.5	Off	N	19.4	13.1	48.6
0.414000	30.3	Off	N	19.4	17.3	47.6
0.462000	33.2	Off	N	19.3	13.5	46.7
4.086000	25.4	Off	N	19.6	20.6	46.0
4.934000	25.8	Off	N	19.7	20.2	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 Connected 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	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Sep. 11, 2012 ~ Sep. 21, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Bluetooth Base Station	R&S	CBT32	100519	N/A	Jun. 05, 2012	Sep. 11, 2012 ~ Sep. 21, 2012	Jun. 06, 2013	Conducted (TH02-HY)
Thermometer	Wisewind	410	N/A	N/A	Nov. 22, 2011	Sep. 11, 2012 ~ Sep. 21, 2012	Nov. 21, 2012	Conducted (TH02-HY)
RF cable	HONOVA	MF86	N/A	N/A	Nov. 24, 2011	Sep. 11, 2012 ~ Sep. 21, 2012	Nov. 23 , 2012	Conducted (TH02-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz ~ 26.5GHz	Dec. 22, 2011	Oct. 07, 2012 ~ Oct. 08, 2012	Dec. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 2GHz	Oct. 22, 2011	Oct. 07, 2012 ~ Oct. 08, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 10, 2012	Oct. 07, 2012 ~ Oct. 08, 2012	Aug. 09, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A02665	1GHz~26.5GHz	Aug. 28, 2012	Oct. 07, 2012 ~ Oct. 08, 2012	Aug. 27, 2013	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Oct. 07, 2012 ~ Oct. 08, 2012	Sep. 27, 2013	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103	161075	10-1000MHz.32dB.GAIN	Feb. 27, 2012	Oct. 07, 2012 ~ Oct. 08, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Bluetooth Base Station	R&S	CBT32	100522	N/A	Feb. 09, 2012	Oct. 07, 2012 ~ Oct. 08, 2012	Feb. 08, 2014	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz ~ 30MHz	Jul. 03, 2012	Oct. 07, 2012 ~ Oct. 08, 2012	Jul. 02, 2014	Radiation (03CH05-HY)
Filter	WAINWRIGHT	WLKS1500-8SS	SN2	1.5G LPF	Dec.29 , 2011	Oct. 07, 2012 ~ Oct. 08, 2012	Dec.28 , 2012	Radiation (03CH05-HY)
Filter	WAINWRIGHT	WRCGV2400/2483-2390/2493-35/10SS	N/A	2.4G Notch Filter	Dec.29 , 2011	Oct. 07, 2012 ~ Oct. 08, 2012	Dec.28 , 2012	Radiation (03CH05-HY)
Filter	Microwave	H3G018G1	SN279268	3G HPF	Dec.29 , 2011	Oct. 07, 2012 ~ Oct. 08, 2012	Dec.28 , 2012	Radiation (03CH05-HY)
Filter	Microwave	H01G13G1	SN360979	1G HPF	Dec.29 , 2011	Oct. 07, 2012 ~ Oct. 08, 2012	Dec.28 , 2012	Radiation (03CH05-HY)
Thermometer	Wisewind	410	N/A	N/A	Dec.28 , 2011	Oct. 07, 2012 ~ Oct. 08, 2012	Dec.27 , 2012	Radiation (03CH05-HY)
Test Software	Audix	E3	Version 6.2009-8-24	N/A	N/A	Oct. 07, 2012 ~ Oct. 08, 2012	N/A	Radiation (03CH05-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Oct. 07, 2012 ~ Oct. 08, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD GmbH	MA 240	N/A	N/A	N/A	Oct. 07, 2012 ~ Oct. 08, 2012	N/A	Radiation (03CH05-HY)
RF Cable	Huber+Suhner	RG 142	NA	30M~1G	Nov.28 , 2011	Oct. 07, 2012 ~ Oct. 08, 2012	Nov.27 , 2012	Radiation (03CH05-HY)
RF Cable	Huber+Suhner	SF104	NA	1G~26.5G	Nov.28 , 2011	Oct. 07, 2012 ~ Oct. 08, 2012	Nov.27 , 2012	Radiation (03CH05-HY)
EMI Test Receiver	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Oct. 03, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Oct. 03, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Oct. 03, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Oct. 03, 2012	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Oct. 03, 2012	Jul. 27, 2013	Conduction (CO05-HY)
Test Software	N/A	EMC32	Version 8.40.0	N/A	N/A	Oct. 03, 2012	N/A	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))	**2.54**

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

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