FCC RF Test Report

APPLICANT	**:**	**HTC Corporation**
EQUIPMENT	**:**	**Smartphone**
MODEL NAME	**:**	**CDMA_HTI13**
FCC ID	**:**	**NM8CDMAHTI13**
STANDARD	**:**	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	**:**	**(DSS) Spread Spectrum Transmitter**

The product was received on Feb. 09, 2012 and completely tested on Mar. 10, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

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

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory 1190

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR220352A	Rev. 01	Initial issue of report	Apr. 03, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(1)	A8.4(2)	Number of Channels	≥ 15Chs	Pass	-
3.2	15.247(a)(1)	A8.1(a)	20dB Bandwidth	NA	Pass	-
3.3	15.247(a)(1)	A8.1(b)	Channel Separation	≥ 2/3 of 20dB BW	Pass	-
3.4	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	≤ 0.4sec in 31.6sec period	Pass	-
3.5	15.247(b)(1)	A8.1(b)	Peak Output Power	≤ 125 mW	Pass	-
3.6	15.247(d)	A8.5	Frequency Band Edges	≤ 20dBc	Pass	-
3.7	15.247(d)	A8.5	Spurious Emission	< 20 dBc	Pass	-
3.8	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 13.60 dB at 1.230 MHz
3.9	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.44 dB at 2483.500 MHz
3.10	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

HTC Corporation
No. 23, Xinghua Rd., Taoyuan City, Taiwan

1.2 Manufacturer

HTC Corporation
1F., No. 6-3, Baoqiang Rd., Xindian City, Taipei, Taiwan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Smartphone
Model Name	CDMA_HTI13
FCC ID	NM8CDMAHTI13
Sample 1	EUT with LCD Panel 1, Main Camera 1, and 2nd Camera 1
Sample 2	EUT with LCD Panel 1, Main Camera 2, and 2nd Camera 2
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Channel Spacing	1 MHz
Maximum Output Power to Antenna	Bluetooth : Bluetooth (1Mbps) : 1.27 dBm (0.0013 W) Bluetooth EDR (2Mbps) : 1.95 dBm (0.0016 W) Bluetooth EDR (3Mbps) : 2.32 dBm (0.0017 W) Bluetooth 4.0 : Bluetooth (1Mbps) : 1.31 dBm (0.0014 W)
Antenna Type	PIFA Antenna with gain 1.22 dBi
Type of Modulation	Bluetooth (1Mbps) : GFSK / Bluetooth 4.0 (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π/4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Production Unit

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

1.4 Testing Site

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

1.5 Applied Standards

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

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

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	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	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Sony Ericsson	MW600	PY70DA2029	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Output Power

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

Band	Bluetooth RF Output Power		
Channel	00	39	78
Frequency	2402	2441	2480
Peak Power	1.95	2.32	0.86

Band	Bluetooth 4.0 RF Output Power		
Channel	00	19	39
Frequency	2402	2440	2480
Peak Power	0.55	1.31	-0.16

Remark:

1. All the test data for each data rate were verified, but only the worst case was reported.
2. The data rate was set in 3Mbps for all the test items due to the highest RF output power.
3. The EUT is programmed to transmit signals continuously for all testing.

2.2 Test Mode

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

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

The following tables are showing the test modes as the worst cases (Y plane for Bluetooth and Z plan for Bluetooth 4.0) and recorded in this report.

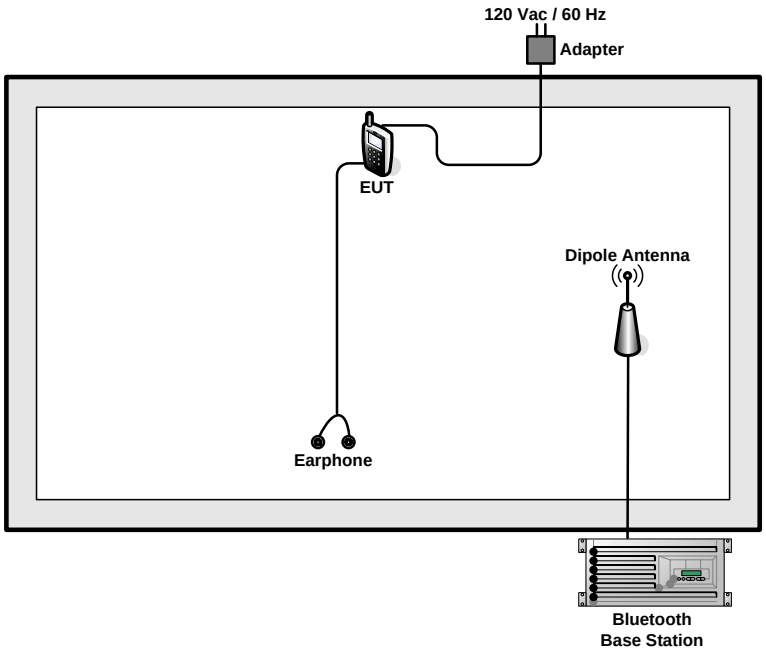
Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth 1Mbps / GFSK Bluetooth EDR 2Mbps / π/4-DQPSK Bluetooth EDR 3Mbps / 8-DPSK Bluetooth 4.0 1Mbps / GFSK
Conducted TCs	Mode 1: Bluetooth Tx CH00 Mode_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH39 Mode_2441 MHz_1Mbps Mode 3: Bluetooth Tx CH78 Mode_2480 MHz_1Mbps Mode 4: Bluetooth Tx CH00 Mode_2402 MHz_2Mbps Mode 5: Bluetooth Tx CH39 Mode_2441 MHz_2Mbps Mode 6: Bluetooth Tx CH78 Mode_2480 MHz_2Mbps Mode 7: Bluetooth Tx CH00 Mode_2402 MHz_3Mbps Mode 8: Bluetooth Tx CH39 Mode_2441 MHz_3Mbps Mode 9: Bluetooth Tx CH78 Mode_2480 MHz_3Mbps Mode 10: Bluetooth 4.0 Tx CH00 Mode_2402 MHz_1Mbps Mode 11: Bluetooth 4.0 Tx CH19 Mode_2440 MHz_1Mbps Mode 12: Bluetooth 4.0 Tx CH39 Mode_2480 MHz_1Mbps
Radiated TCs	Mode 1: Bluetooth Rx CH00 Mode_2402 MHz_3Mbps Mode 2: Bluetooth Rx CH39 Mode_2441 MHz_3Mbps Mode 3: Bluetooth Rx CH78 Mode_2480 MHz_3Mbps Mode 4: Bluetooth 4.0 Rx CH00 Mode_2402 MHz_1Mbps Mode 5: Bluetooth 4.0 Rx CH19 Mode_2440 MHz_1Mbps Mode 6: Bluetooth 4.0 Rx CH39 Mode_2480 MHz_1Mbps
AC Conducted Emission	Mode 1 :GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + NFC On + Earphone + Battery 1 + USB Cable (Charging from Adapter) Mode 2 :GSM850 Idle + Bluetooth Link + WLAN (5G) Link + NFC On + Earphone + Battery 1 + USB Cable (Charging from Adapter)

Remark:

1. For conducted emission, the worst case is mode 1; only the test data of this mode was reported.
2. All the cases of Radiation Emission were only for Sample 1 and Battery 1.
3. All the cases of Conduction Emission were only for Sample 1.

2.3 Connection Diagram of Test System

<Bluetooth Tx Mode>



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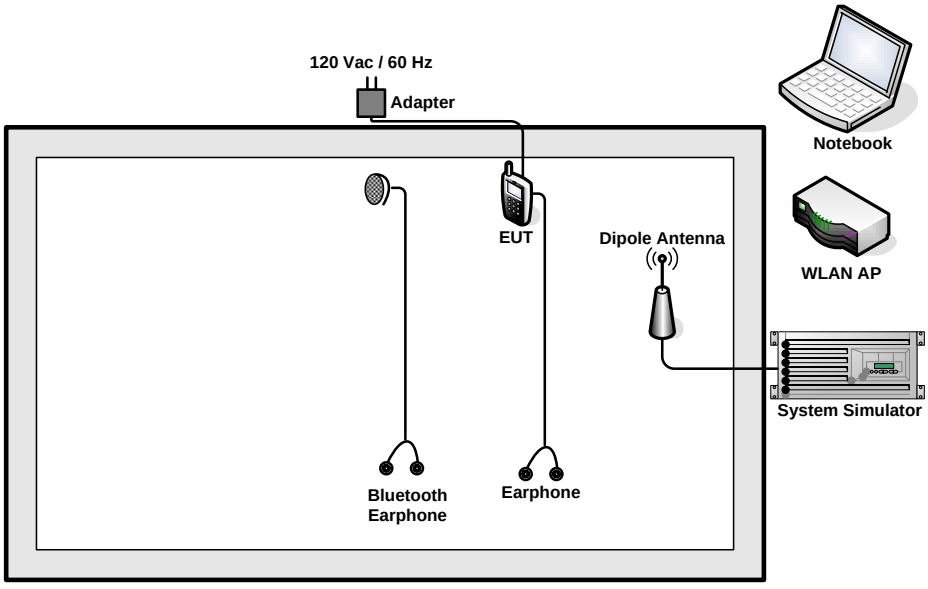


2.4 RF Utility

For Bluetooth function, the RF utility, ”HTC SSD Test Tool ==> Bluetooth Test Mode”, was installed in EUT which was programmed in order to make the EUT into the engineering modes to contact with Bluetooth base station for transmitting and receiving signals continuously.

For Bluetooth 4.0 function, the RF utility, ”HTC SSD Test Tool ==> BT Router “==> ”QRCT.exe ==> BT LE test was installed in EUT which was programmed in order to make the EUT into the engineering modes to contact with Bluetooth base station for transmitting and receiving signals continuously.

3 Test Result

3.1 Number of Channel Measurement

3.1.1 Limits of Number of Hopping Frequency

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

3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The modulation types of EUT are irrelevant to number of hopping channels deviation.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
5. The number of hopping frequency used is defined as the device has the numbers of total channel.

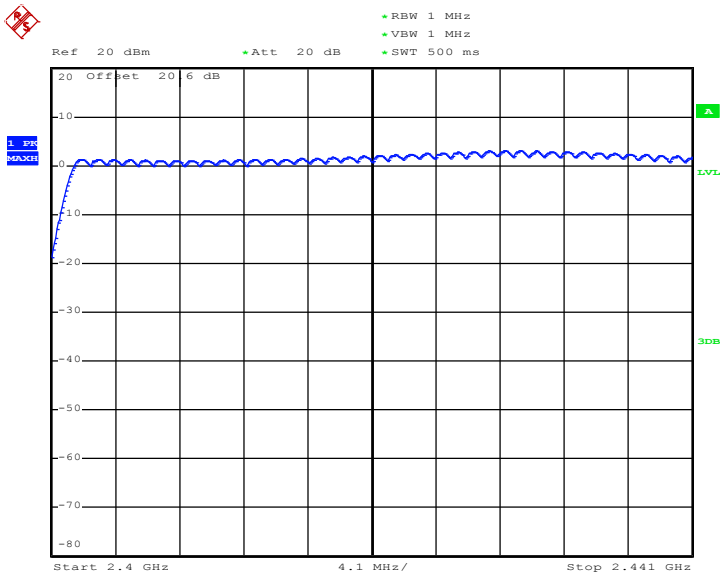
3.1.4 Test Setup

3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	Mode 7~9	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	51~53%

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

Number of Hopping Channel Plot on Channel 00 - 78



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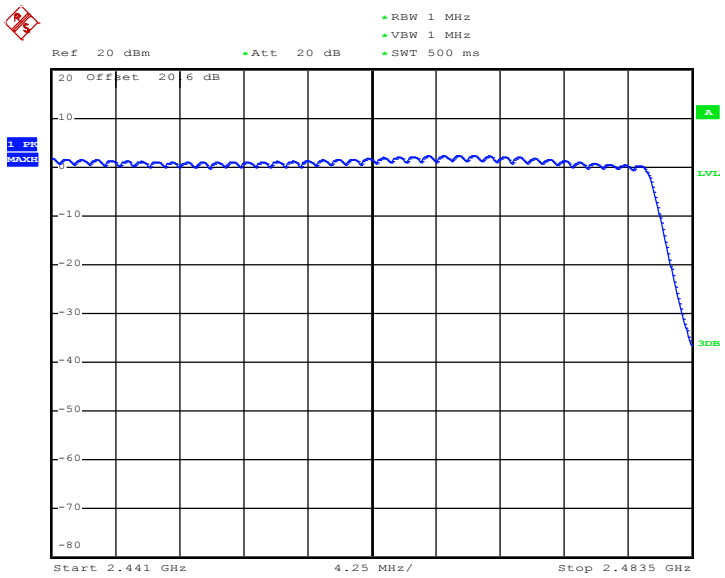

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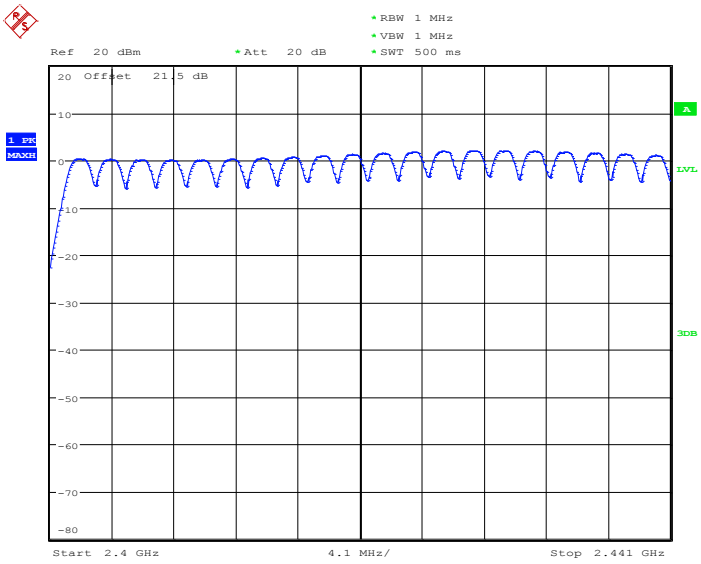
Test Mode :	Mode 10~12	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	58~61%

Number of Hopping Channels (Channel)	Limits (Channel)	Pass/Fail
40	> 15	Pass

Number of Hopping Channel Plot on Channel 00 - 39



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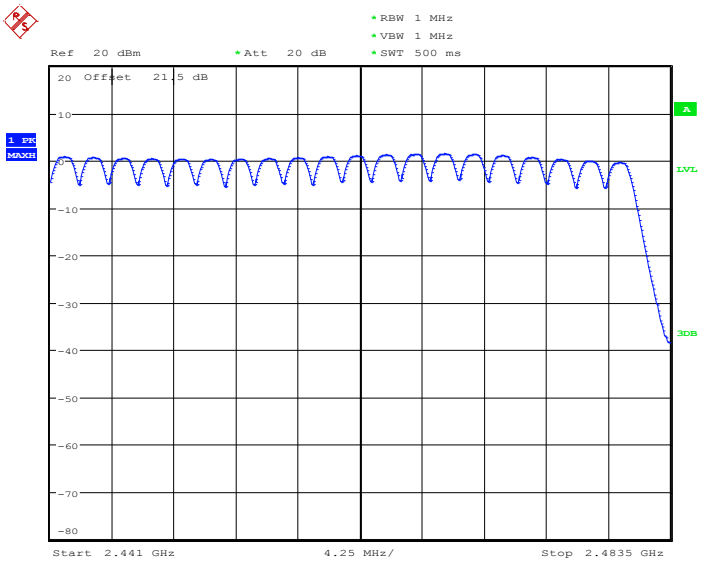


Date: 23.FEB.2012 23:33:20

3.2 20dB Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

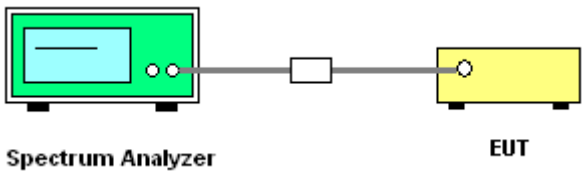
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;
   RBW ≥ 1% of the 20 dB bandwidth; VBW ≥ RBW; Sweep = auto; Detector function = peak;
   Trace = max hold.
5. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

3.2.4 Test Setup

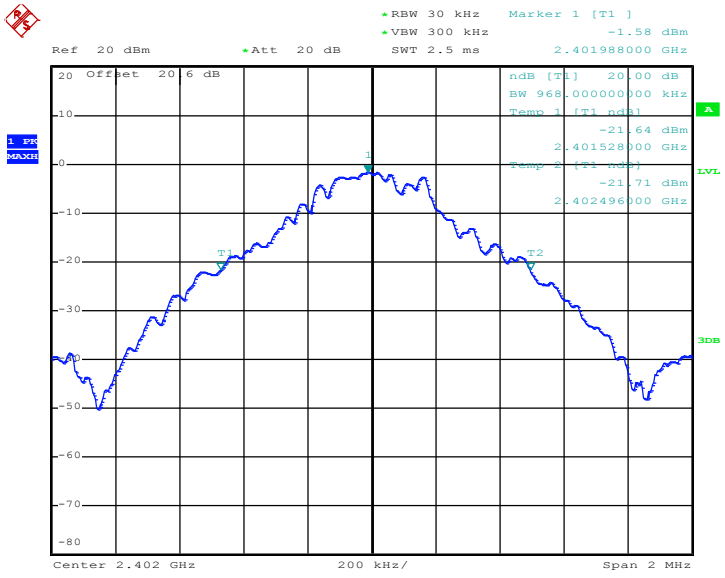


3.2.5 Test Result of 20dB Bandwidth

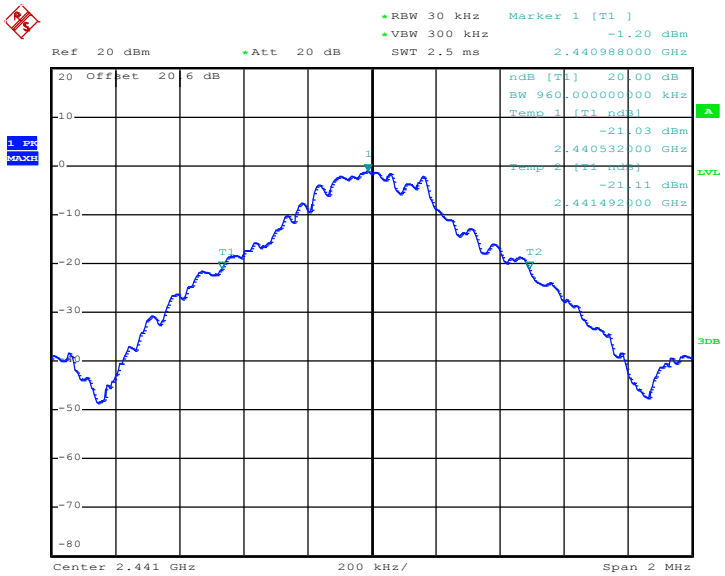
Test Mode :	Mode 1, 2, 3	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	51~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.968
39	2441	0.960
78	2480	0.968

20 dB Bandwidth Plot on Channel 00



20 dB Bandwidth Plot on Channel 39



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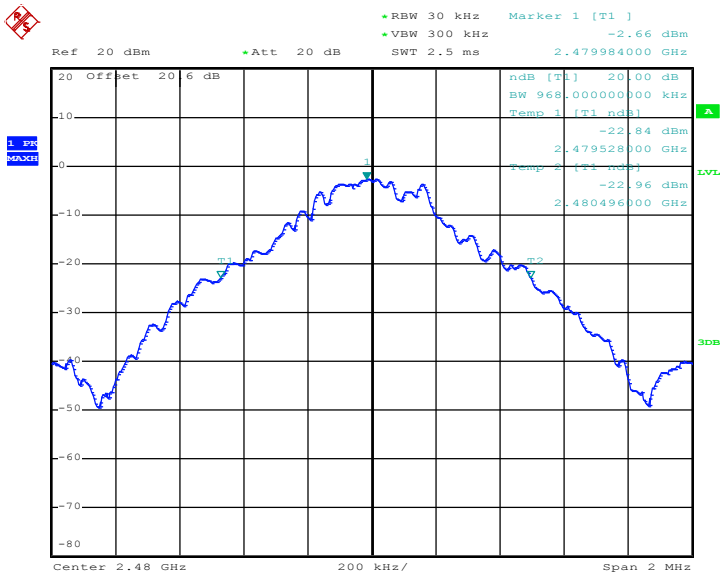
20 dB Bandwidth Plot on Channel 78



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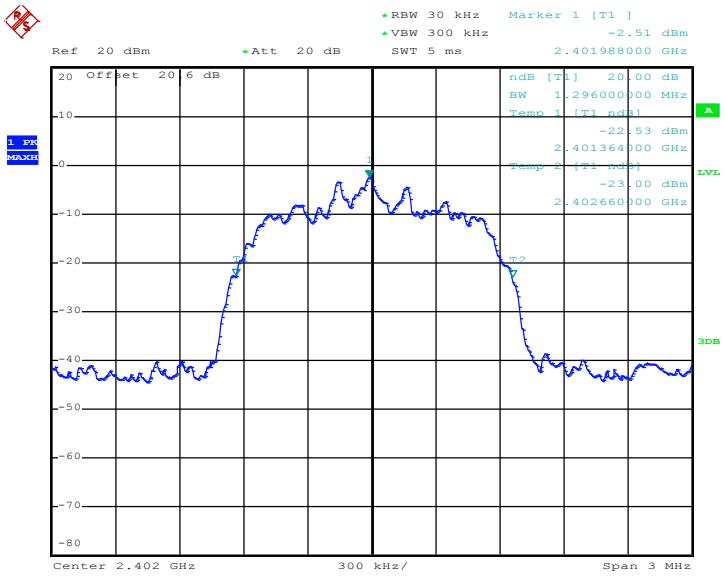
Test Mode :	Mode 4, 5, 6	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	51~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.296
39	2441	1.290
78	2480	1.290

20 dB Bandwidth Plot on Channel 00



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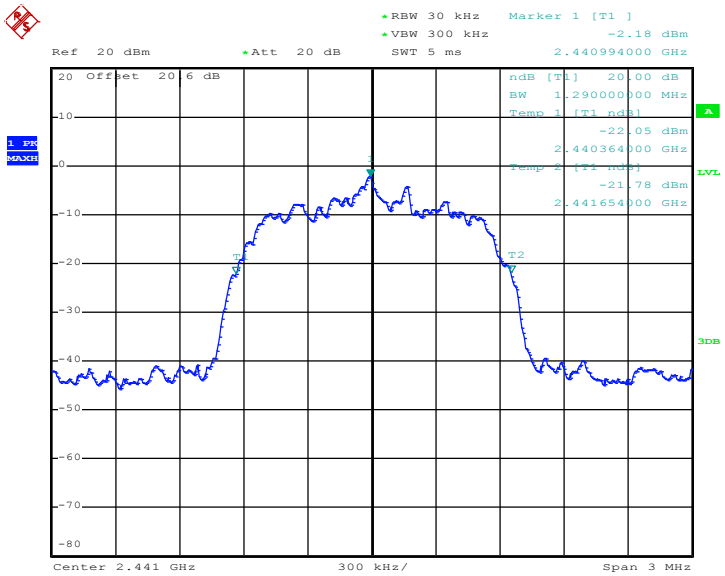
20 dB Bandwidth Plot on Channel 39



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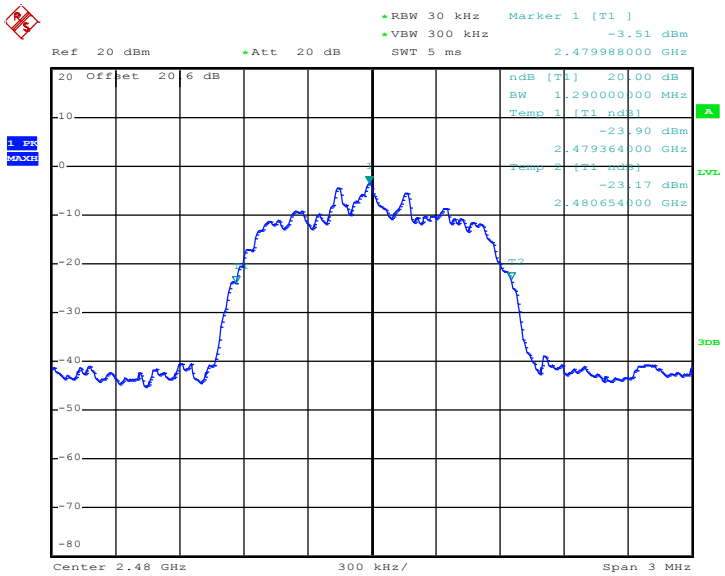
20 dB Bandwidth Plot on Channel 78



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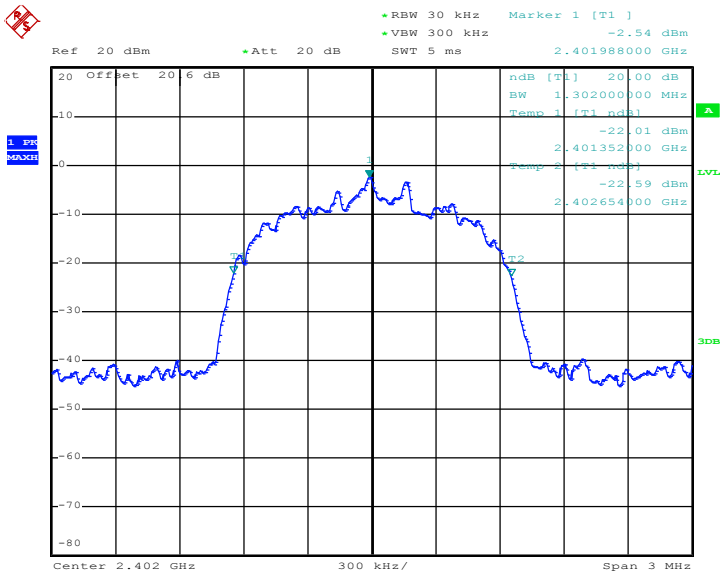
Test Mode :	Mode 7, 8, 9	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	51~53%

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

20 dB Bandwidth Plot on Channel 00



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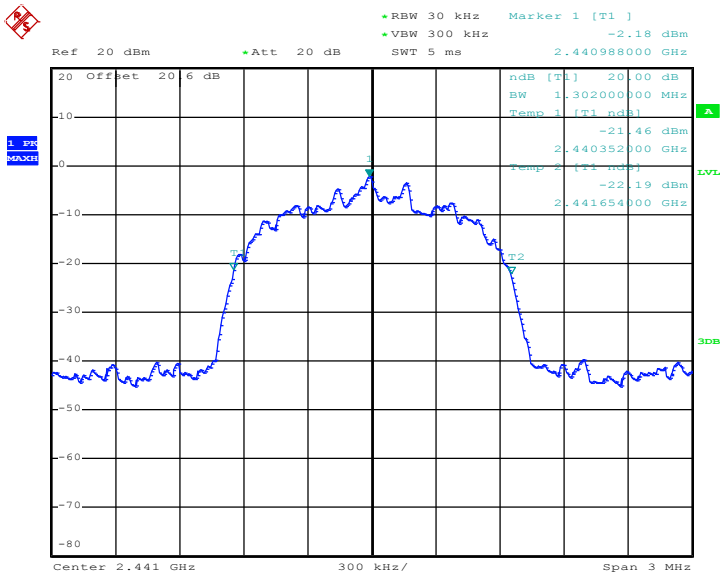
20 dB Bandwidth Plot on Channel 39



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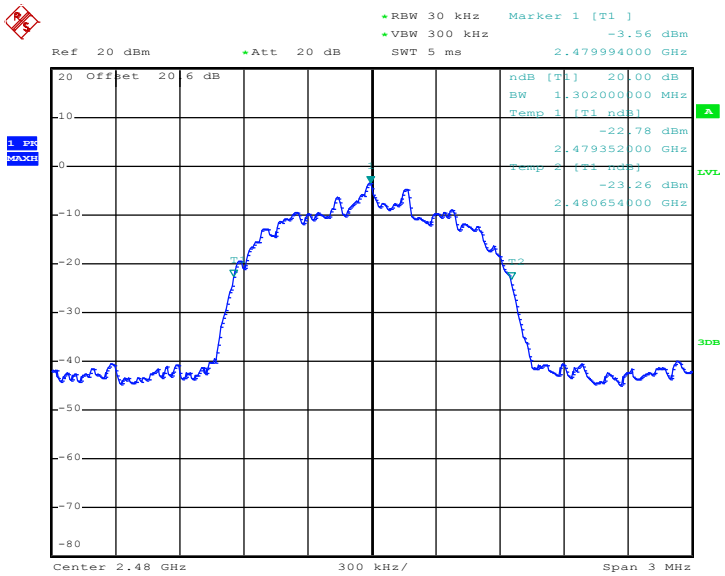
20 dB Bandwidth Plot on Channel 78



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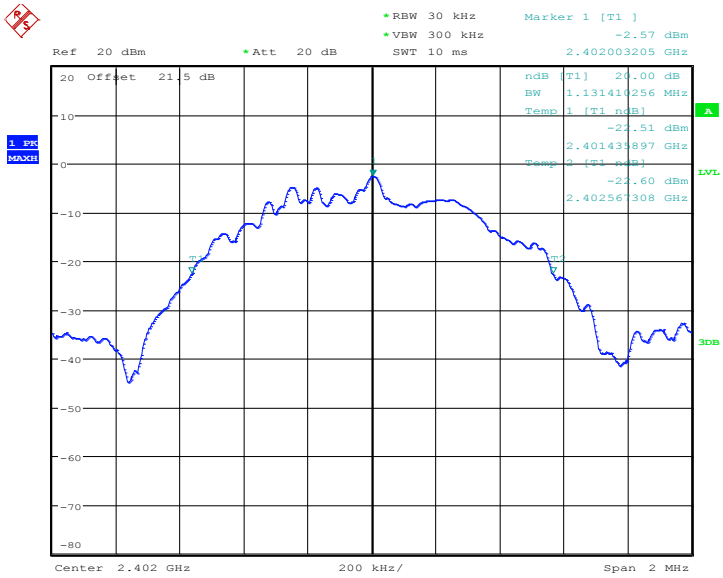
Test Mode :	Mode 10, 11, 12	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	58~61%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.131
19	2440	1.128
39	2480	1.128

20 dB Bandwidth Plot on Channel 00



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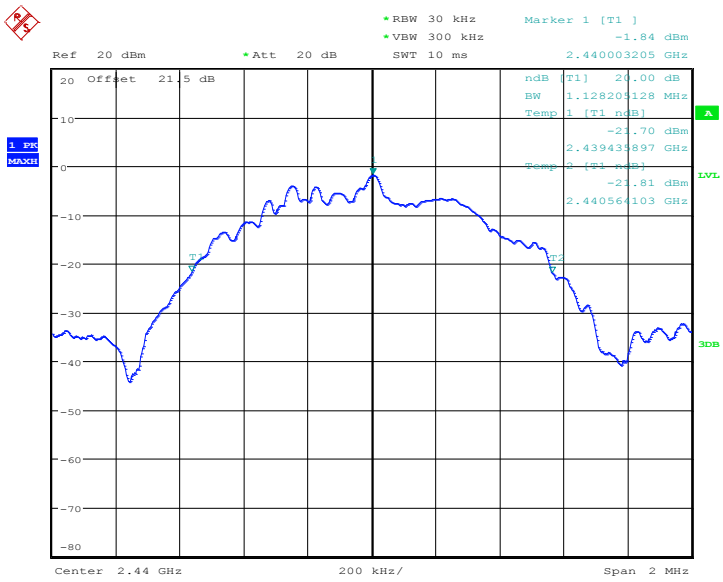
20 dB Bandwidth Plot on Channel 19



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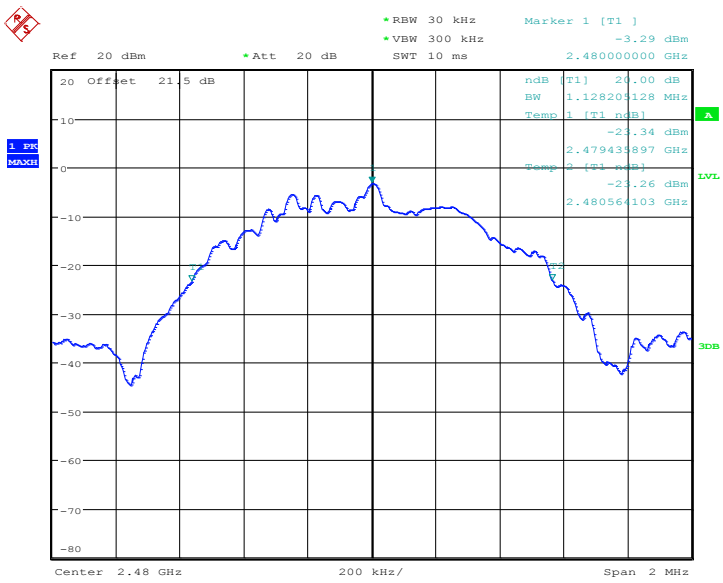
20 dB Bandwidth Plot on Channel 39



Date: 23.FEB.2012 23:09:41

3.3 Hopping Channel Separation Measurement

3.3.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 KHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

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

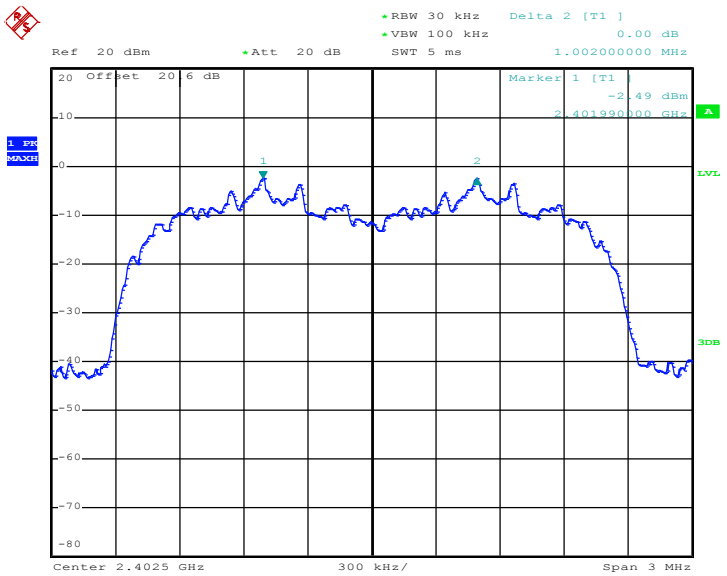
3.3.4 Test Setup

3.3.5 Test Result of Hopping Channel Separation

Test Mode :	Mode 7, 8, 9	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	51~53%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.868	Pass
39	2441	1.002	0.868	Pass
78	2480	1.002	0.868	Pass

Channel Separation Plot on Channel 00 - 01



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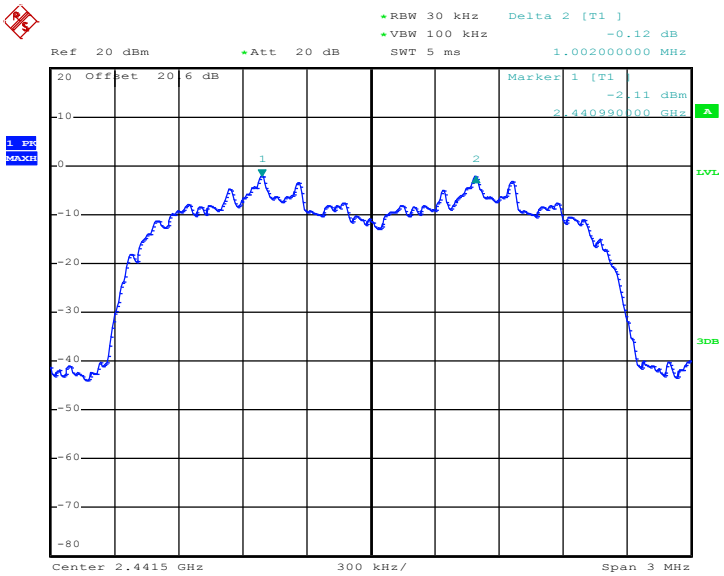
Channel Separation Plot on Channel 39 - 40



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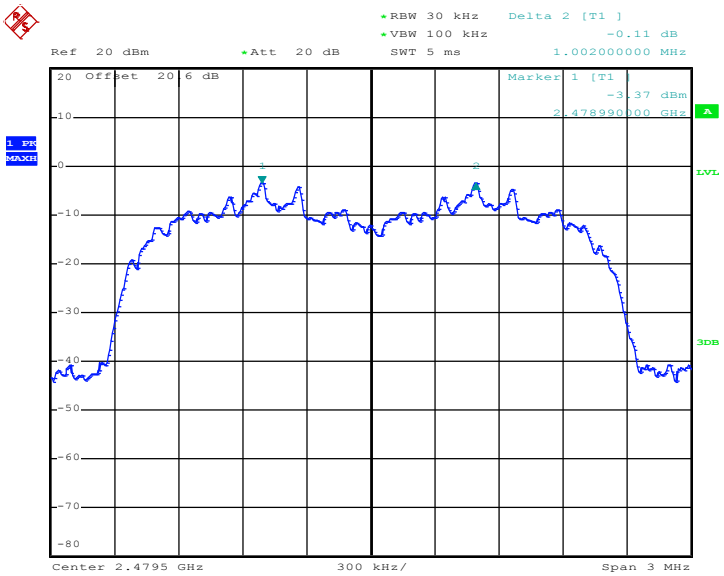
Channel Separation Plot on Channel 77 - 78



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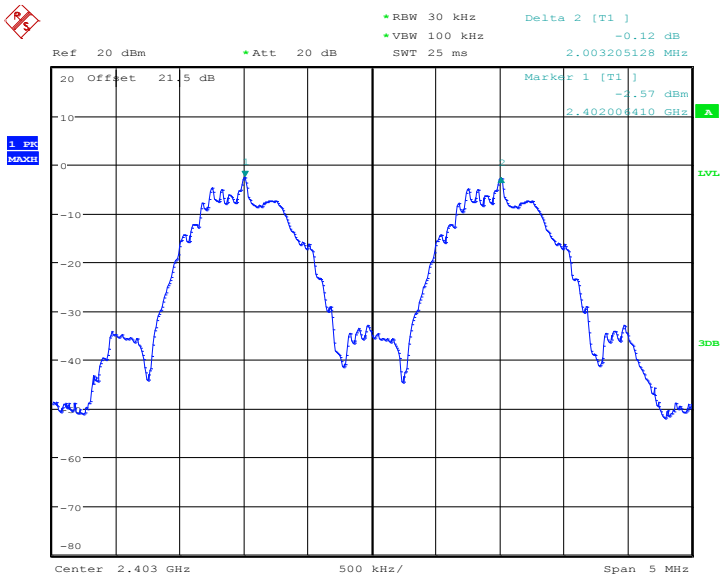
Test Mode :	Mode 10, 11, 12	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	58~61%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	2.003	0.754	Pass
19	2440	2.011	0.752	Pass
39	2480	2.011	0.752	Pass

Channel Separation Plot on Channel 00 - 01



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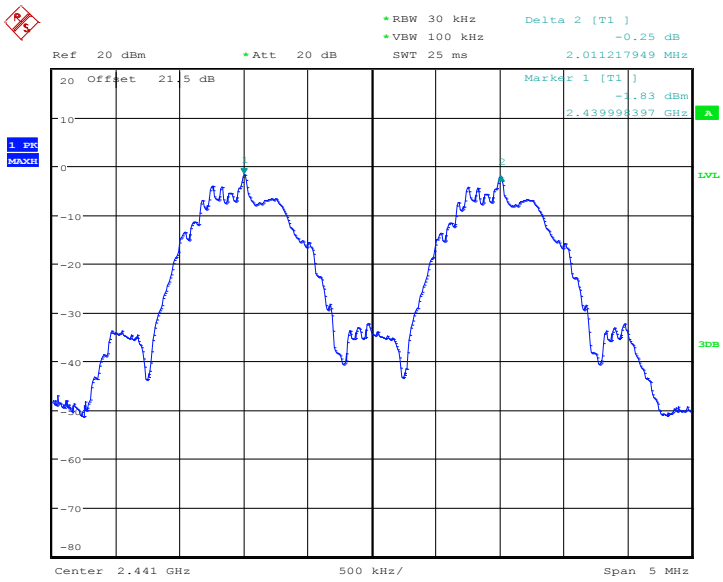
Channel Separation Plot on Channel 19 - 20



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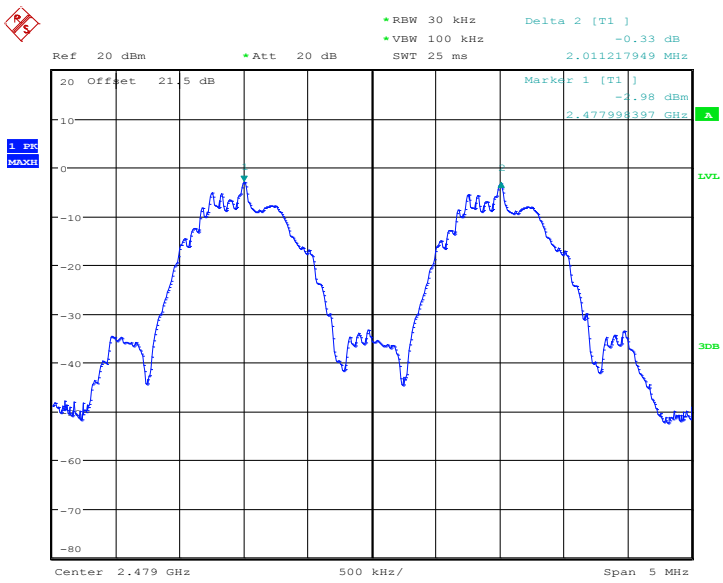
Channel Separation Plot on Channel 39 - 40



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3.4 Dwell Time Measurement

3.4.1 Limit of Dwell Time

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

3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

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

3.4.4 Test Setup

3.4.5 Test Result of Dwell Time

Test Mode :	Mode 8	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	51~53%

Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
3DH5	2.80	3022.00	0.27	0.4	Pass

Remark:

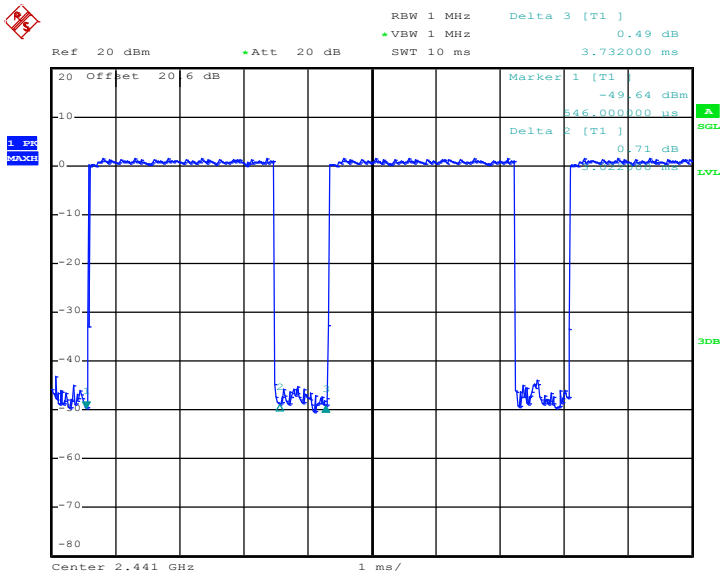
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time

2. 79 channels come from the Hopping Channel number.

3. Average Hopping Channel = hops/sweep time

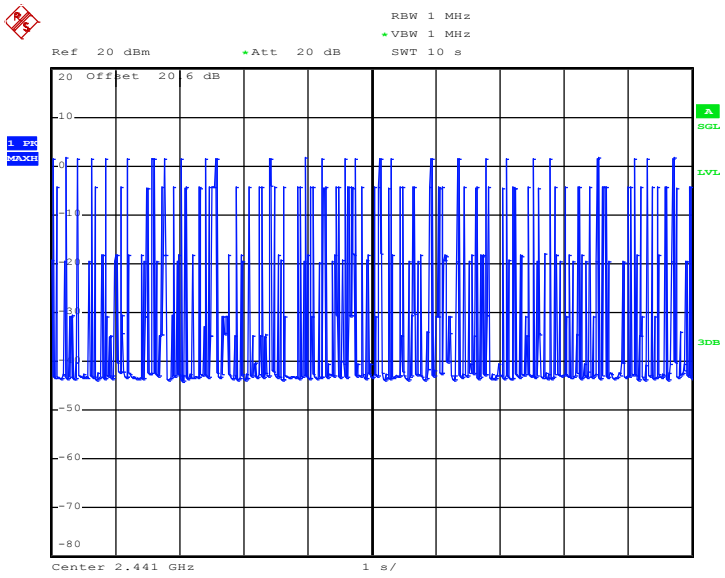
4. t: Package Transfer Time(us)

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



Date: 22.FEB.2012 00:54:15

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



Date: 22.FEB.2012 01:12:07

Test Mode :	Mode 11	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	58~61%

Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
LE	26.70	416.67	0.18	0.4	Pass

Remark:

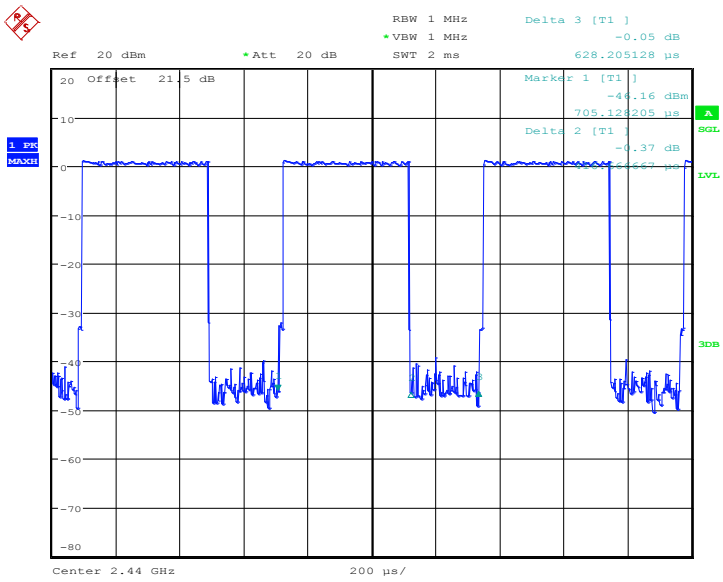
5. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time

6. 79 channels come from the Hopping Channel number.

7. Average Hopping Channel = hops/sweep time

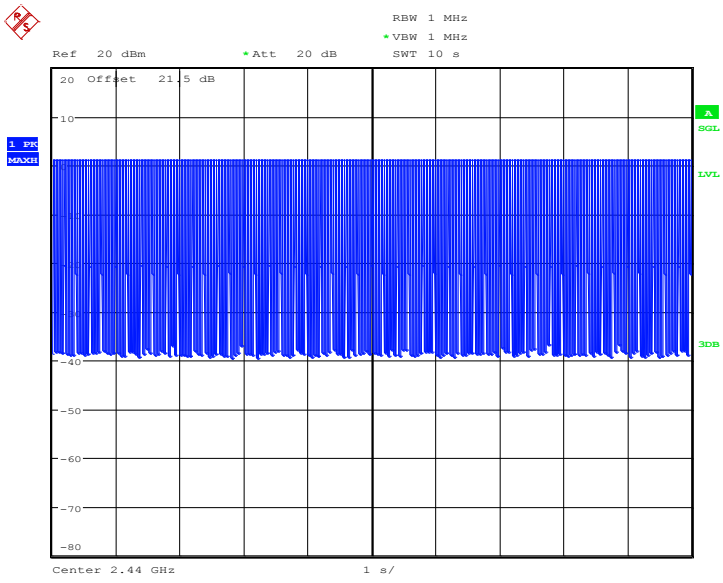
8. t: Package Transfer Time(us)

LE Dwell Time (One Pulse) Plot on Channel 39



Date: 23.FEB.2012 21:52:04

LE Dwell Time (Count Pulses) Plot on Channel 39



Date: 23.FEB.2012 23:33:37

3.5 Peak Output Power Measurement

3.5.1 Limit of Peak Output Power

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

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

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

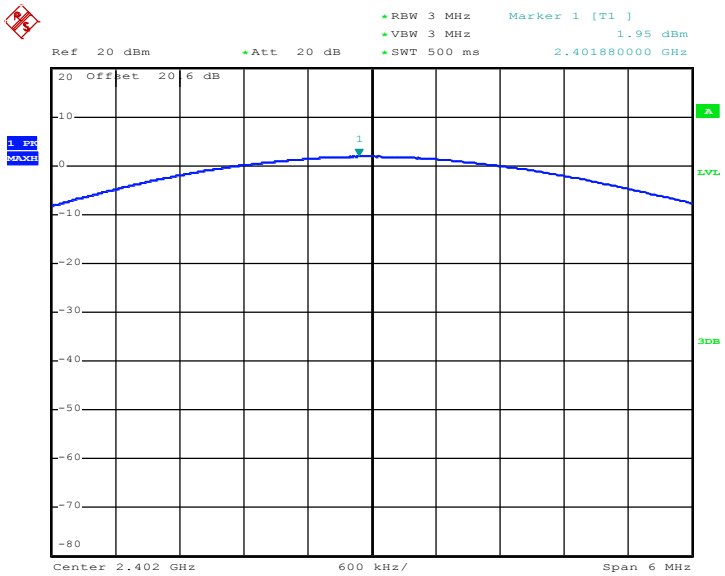
3.5.4 Test Setup

3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 7, 8, 9	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	51~53%

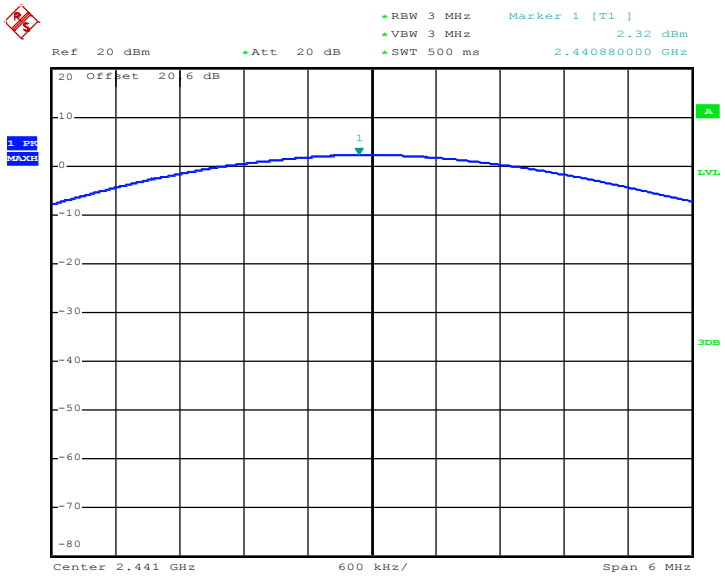
Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK 3 Mbps	Max. Limits (dBm)	Pass/Fail
00	2402	1.95	20.97	Pass
39	2441	2.32	20.97	Pass
78	2480	0.86	20.97	Pass

Peak Output Power Plot on Channel 00



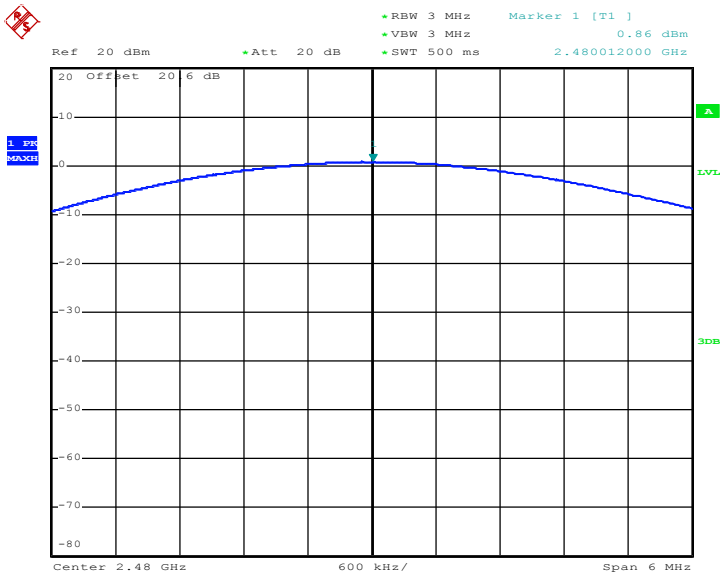
Date: 22.FEB.2012 00:37:08

Peak Output Power Plot on Channel 39



Date: 22.FEB.2012 00:38:22

Peak Output Power Plot on Channel 78

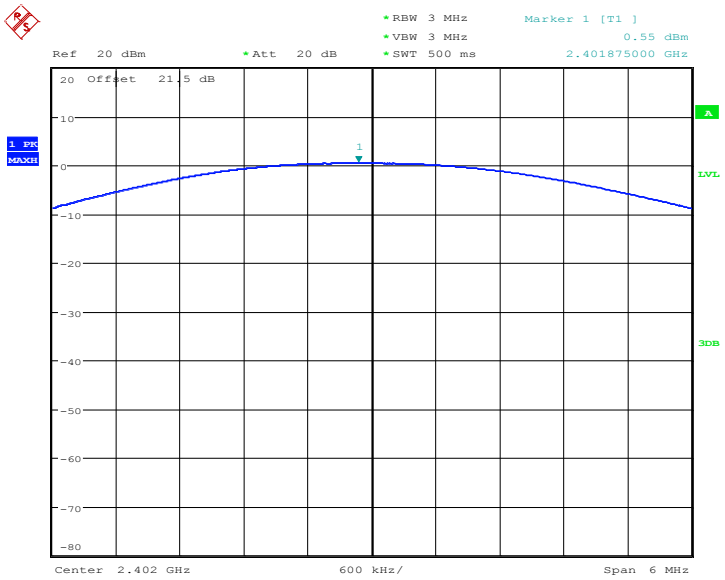


Date: 22.FEB.2012 00:39:36

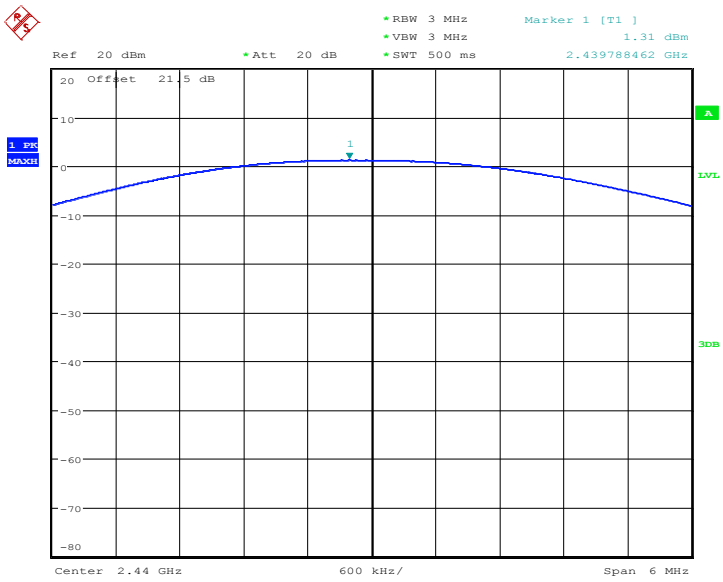
Test Mode :	Mode 10, 11, 12	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	58~61%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	0.55	30.00	Pass
19	2440	1.31	30.00	Pass
39	2480	-0.16	30.00	Pass

Peak Output Power Plot on Channel 00

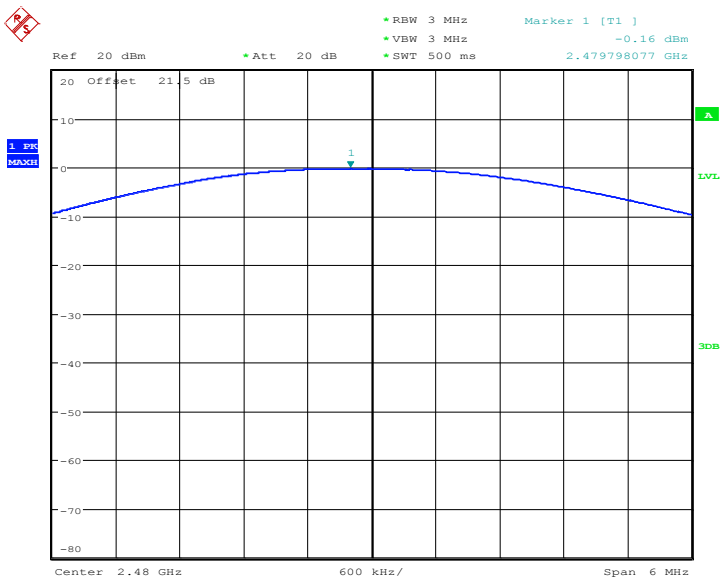


Peak Output Power Plot on Channel 19



Date: 23.FEB.2012 21:50:34

Peak Output Power Plot on Channel 39



Date: 23.FEB.2012 21:52:36

3.6 Band Edges Measurement

3.6.1 Limit of Band Edges

In any 100 KHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

3.6.2 Measuring Instruments

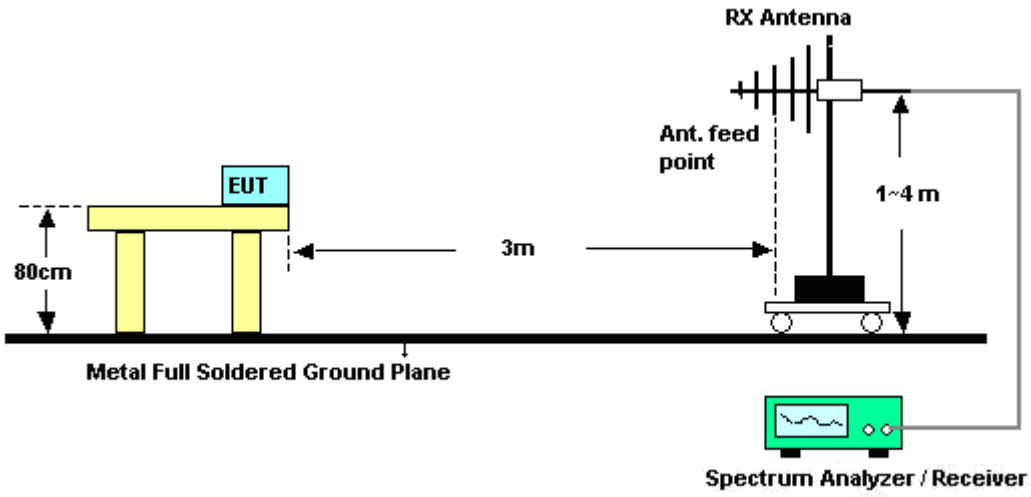
See list of measuring instruments of this test report.

3.6.3 Test Procedures

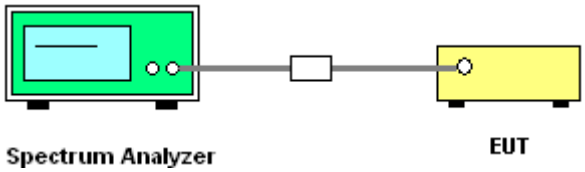
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300KHz, Video bandwidth (VBW) ≥ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 300k Hz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Applies to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 1MHz, Sweep: Auto for Peak; set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto for Average. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See FCC Section 15.35(b) and (c).
4. In case the emission is fail due to the used RBW / VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

3.6.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.6.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	22~24°C
Test Channel :	00	Relative Humidity :	51~53%
		Test Engineer :	David Yang

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
2388.66	45.33	-28.67	74	41.2	32.06	6.03	33.96	100	158	Peak
2388.66	33.2	-20.8	54	29.07	32.06	6.03	33.96	100	158	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
2368.33	46.29	-27.71	74	42.24	32.01	5.99	33.95	102	270	Peak
2368.33	33.12	-20.88	54	29.07	32.01	5.99	33.95	102	270	Average

Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	51~53%
		Test Engineer :	David Yang

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	57.04	-16.96	74	52.68	32.18	6.18	34	138	354	Peak
2483.5	45.8	-8.2	54	41.44	32.18	6.18	34	138	354	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
2483.5	61.99	-12.01	74	57.63	32.18	6.18	34	100	261	Peak
2483.5	49.56	-4.44	54	45.2	32.18	6.18	34	100	261	Average

Test Mode :	Mode 4	Temperature :	22~24°C
Test Channel :	00	Relative Humidity :	51~53%
		Test Engineer :	David Yang

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
2343.82	46.39	-27.61	74	42.4	31.98	5.95	33.94	101	235	Peak
2343.82	33.43	-20.57	54	29.44	31.98	5.95	33.94	101	235	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
2348.57	45.98	-28.02	74	41.99	31.98	5.95	33.94	100	40	Peak
2348.57	33.35	-20.65	54	29.36	31.98	5.95	33.94	100	40	Average

Test Mode :	Mode 6	Temperature :	22~24°C
Test Channel :	39	Relative Humidity :	51~53%
		Test Engineer :	David Yang

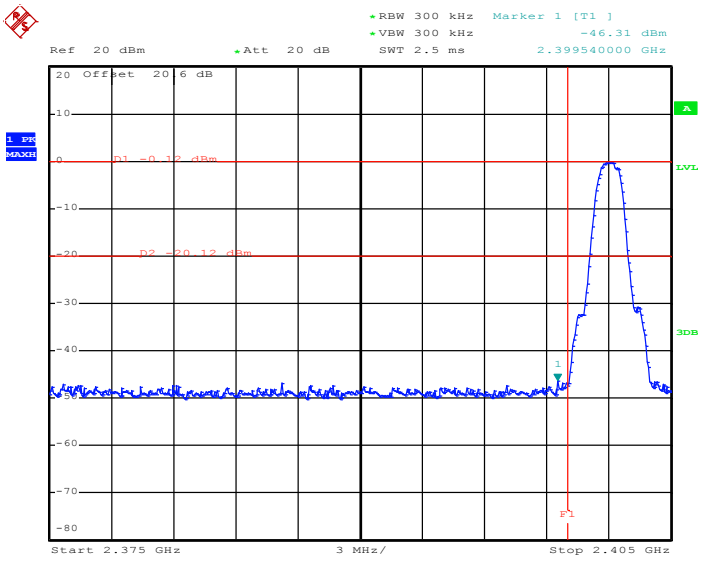
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	60.93	-13.07	74	56.57	32.18	6.18	34	100	170	Peak
2483.5	46.45	-7.55	54	42.09	32.18	6.18	34	100	170	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
2483.5	56.53	-17.47	74	52.17	32.18	6.18	34	166	118	Peak
2483.5	43.66	-10.34	54	39.3	32.18	6.18	34	166	118	Average

3.6.6 Test Result of Conducted Band Edges

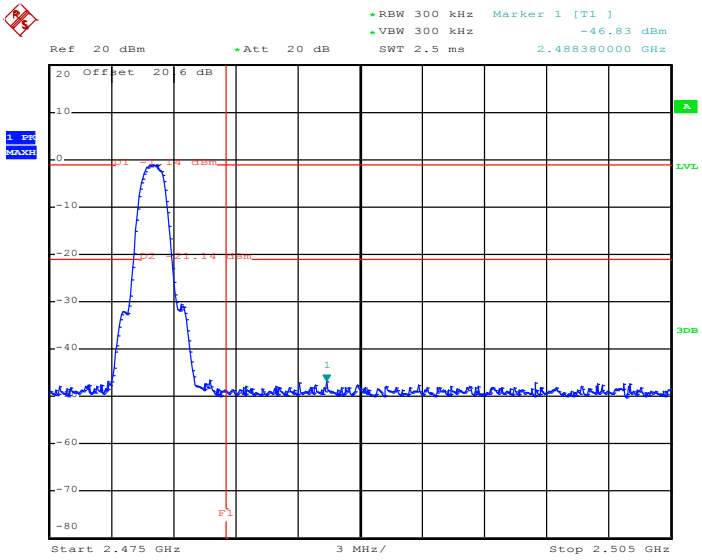
Test Mode :	Mode 7 and 9	**Temperature :**	21~25℃
Test Channel :	00 and 78	**Relative Humidity :**	51~53%
		Test Engineer :	Reece Li

Low Band Edge Plot on Channel 00



Date: 22.FEB.2012 02:20:09

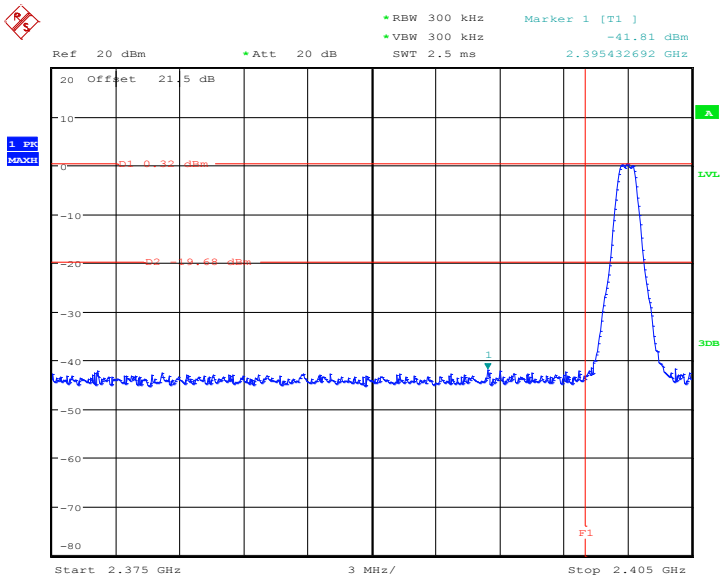
High Band Edge Plot on Channel 78



Date: 22.FEB.2012 02:24:10

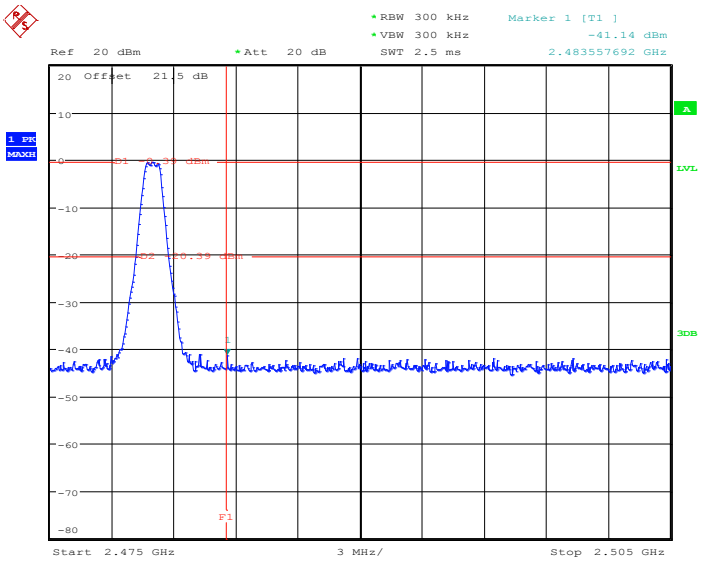
Test Mode :	Mode 10 and 12	**Temperature :**	24~26℃
Test Channel :	00 and 39	**Relative Humidity :**	58~61%
		Test Engineer :	Reece Li

Low Band Edge Plot on Channel 00



Date: 23.FEB.2012 22:30:57

High Band Edge Plot on Channel 39



Date: 23.FEB.2012 23:10:35

3.7 Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedure

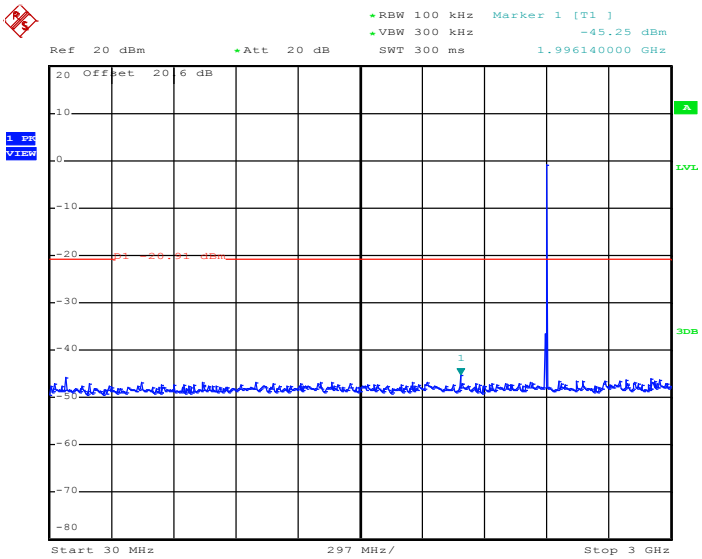
1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 KHz, Video bandwidth (VBW) ≥ RBW, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 KHz RBW.

3.7.4 Test Setup

3.7.5 Test Result

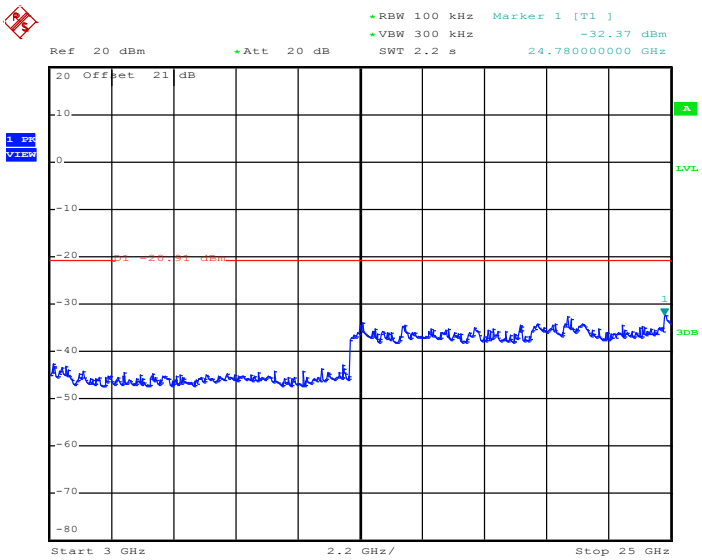
Test Mode :	Mode 7	Temperature :	21~25℃
Test Channel :	00	Relative Humidity :	51~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 22.FEB.2012 01:27:35

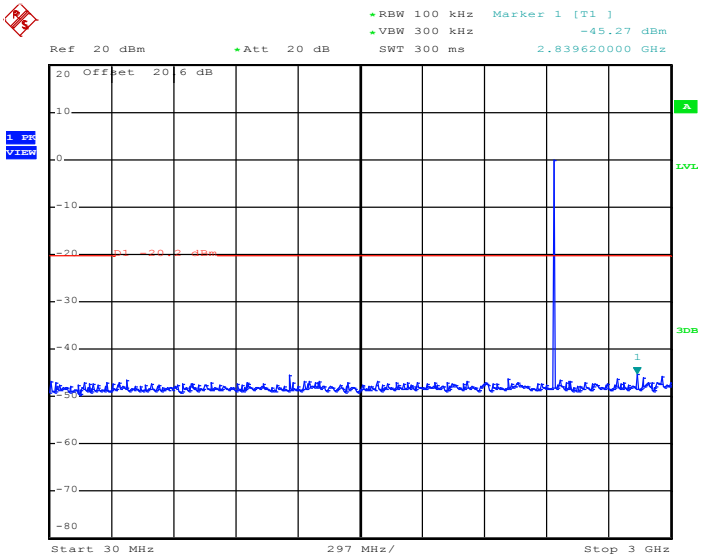
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 22.FEB.2012 01:27:47

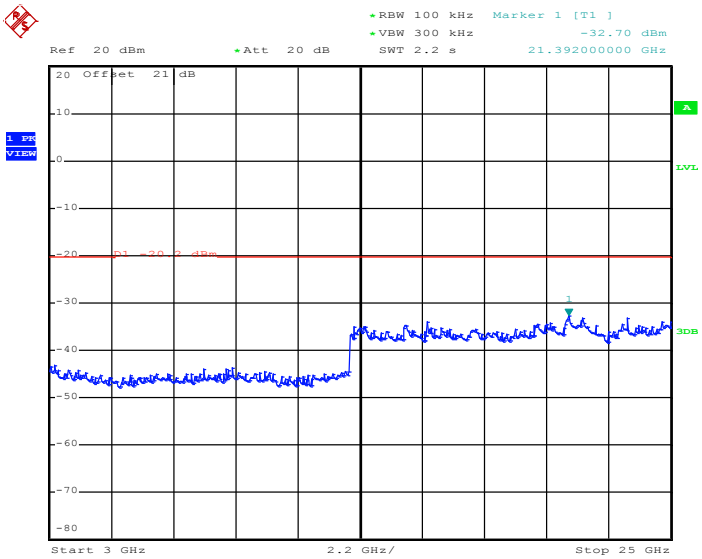
Test Mode :	Mode 8	**Temperature :**	21~25℃
Test Channel :	39	**Relative Humidity :**	51~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 22.FEB.2012 01:28:39

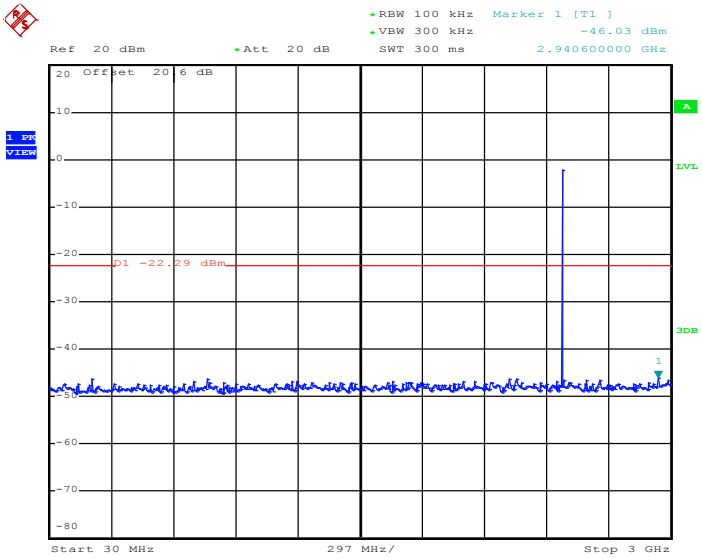
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 22.FEB.2012 01:28:51

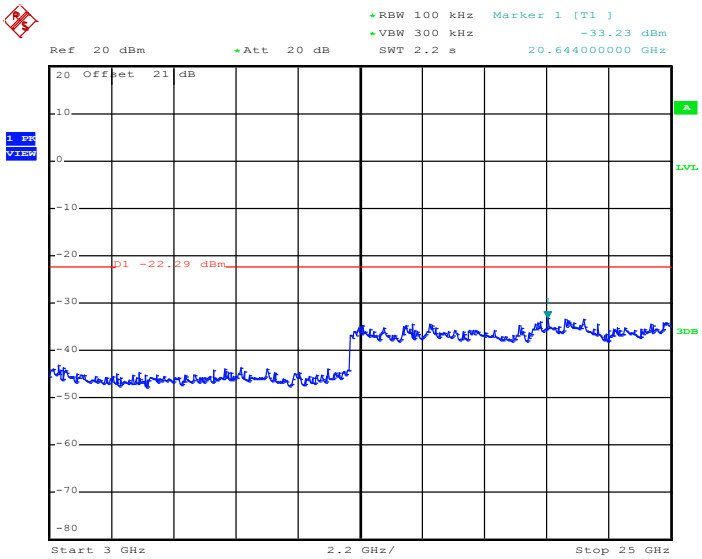
Test Mode :	Mode 9	Temperature :	21~25℃
Test Channel :	78	Relative Humidity :	51~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 22.FEB.2012 01:29:43

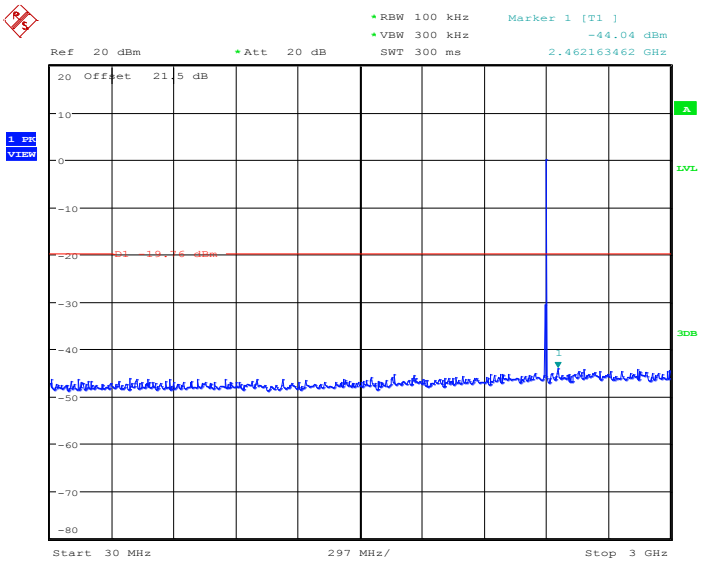
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 22.FEB.2012 01:29:55

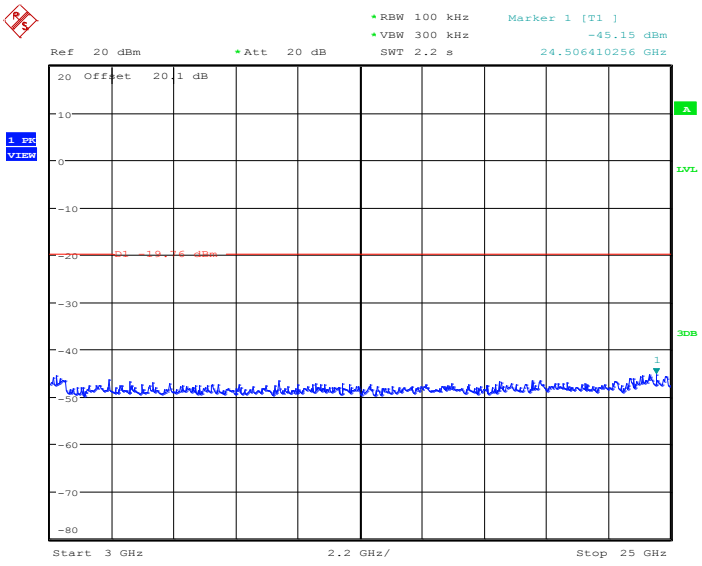
Test Mode :	Mode 10	Temperature :	24~26℃
Test Channel :	00	Relative Humidity :	58~61%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 23.FEB.2012 22:33:15

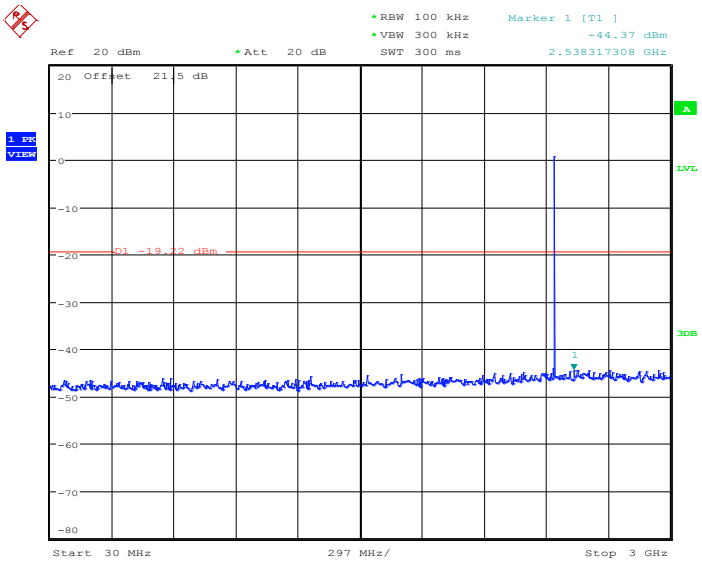
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 23.FEB.2012 22:33:37

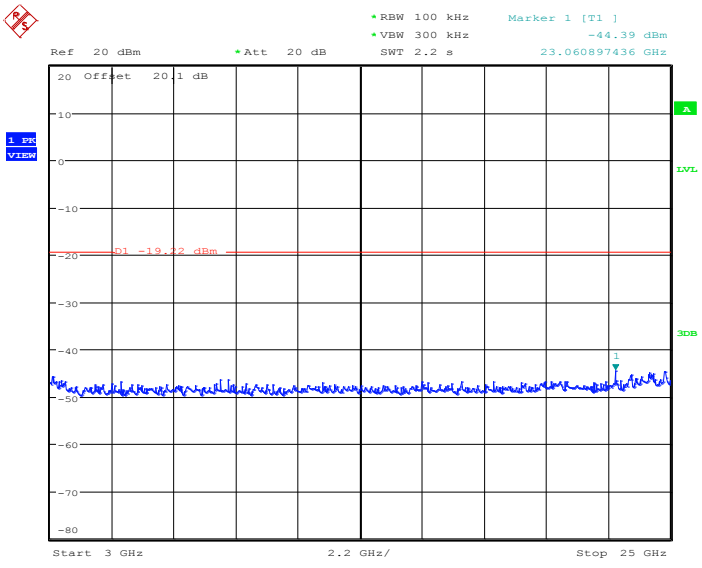
Test Mode :	Mode 11	**Temperature :**	24~26℃
Test Channel :	19	**Relative Humidity :**	58~61%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 23.FEB.2012 22:58:53

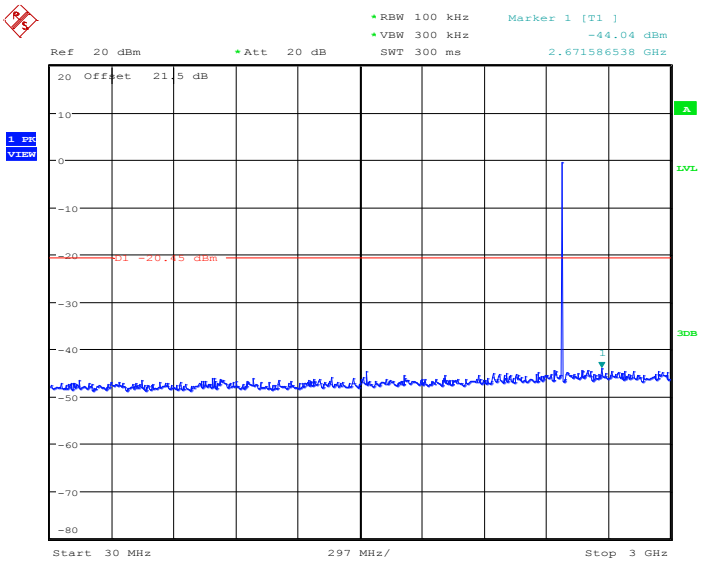
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 23.FEB.2012 22:59:15

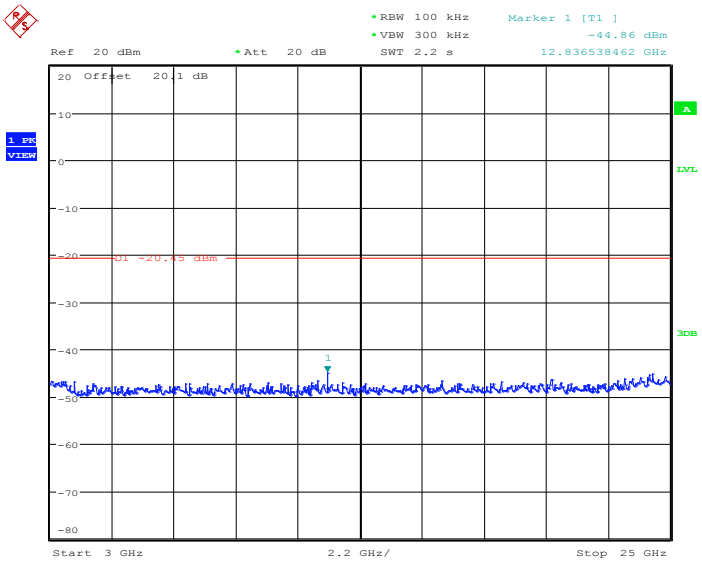
Test Mode :	Mode 12	**Temperature :**	24~26℃
Test Channel :	39	**Relative Humidity :**	58~61%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 23.FEB.2012 23:11:47

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 23.FEB.2012 23:12:09

3.8 AC Conducted Emission Measurement

3.8.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 KHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

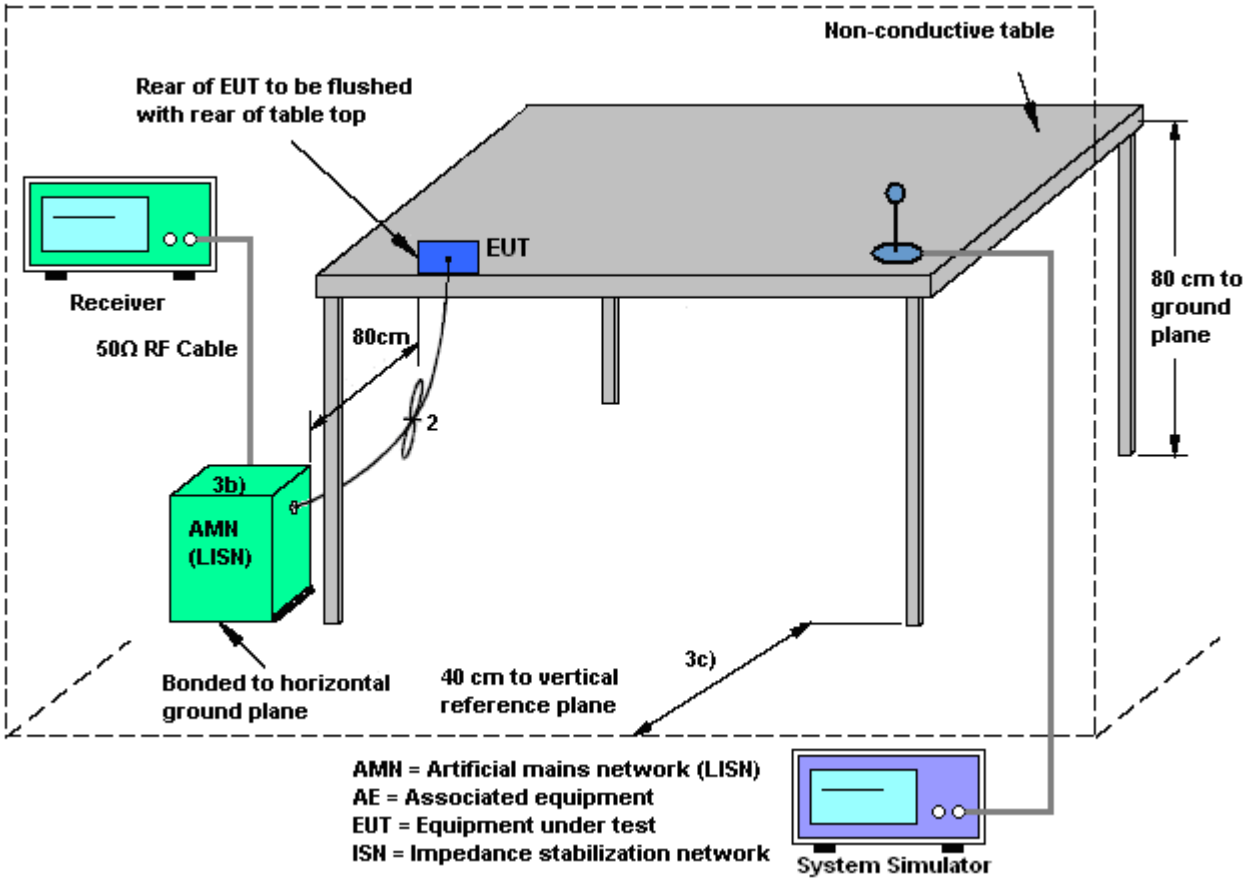
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

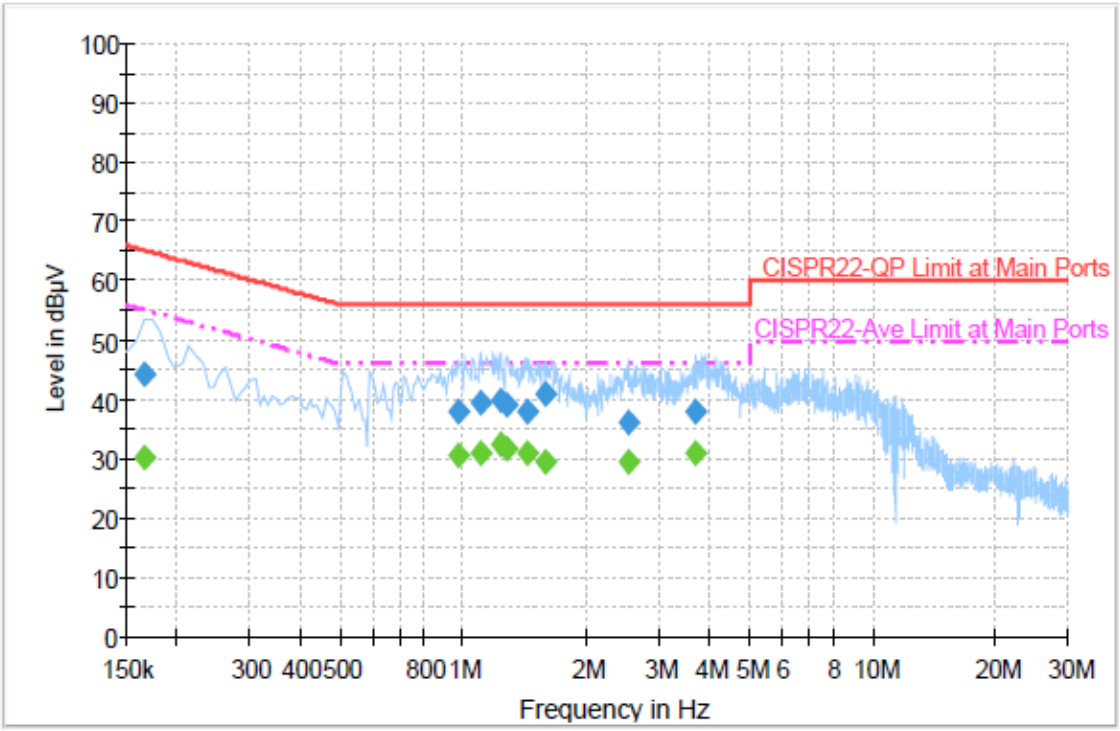
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All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

3.8.4 Test Setup



3.8.5 Test Result of AC Conducted Emission

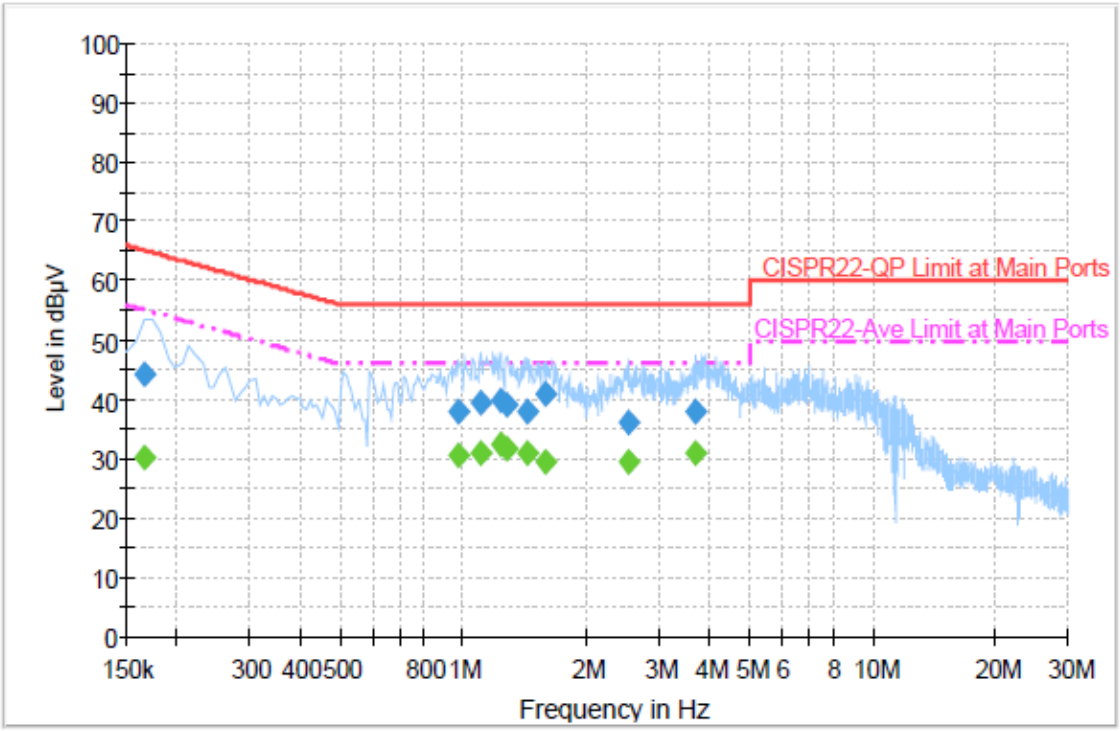
Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Hayden Wu	**Relative Humidity :**	46~48%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + NFC On + Earphone + Battery 1 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	44.2	Off	L1	19.3	21.0	65.2
0.974000	38.1	Off	L1	19.4	17.9	56.0
1.102000	39.7	Off	L1	19.4	16.3	56.0
1.230000	39.9	Off	L1	19.4	16.1	56.0
1.278000	39.2	Off	L1	19.4	16.8	56.0
1.438000	37.9	Off	L1	19.4	18.1	56.0
1.590000	41.1	Off	L1	19.4	14.9	56.0
2.518000	36.2	Off	L1	19.4	19.8	56.0
3.694000	38.1	Off	L1	19.5	17.9	56.0

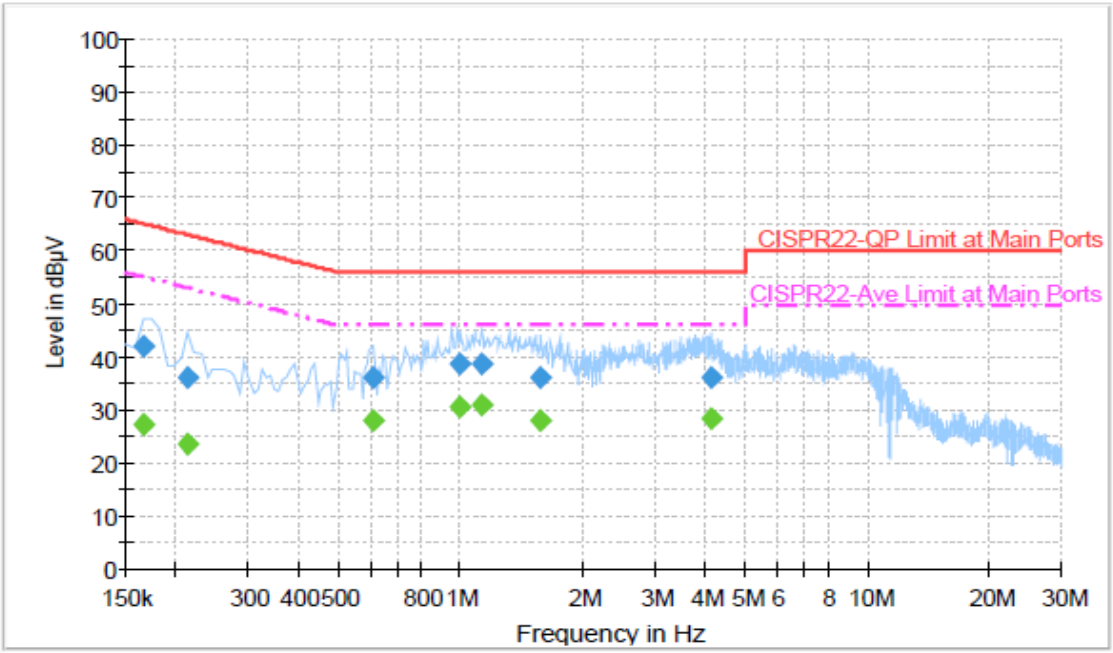
Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Hayden Wu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + NFC On + Earphone + Battery 1 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	30.3	Off	L1	19.3	24.9	55.2
0.974000	30.7	Off	L1	19.4	15.3	46.0
1.102000	31.1	Off	L1	19.4	14.9	46.0
1.230000	32.4	Off	L1	19.4	13.6	46.0
1.278000	31.9	Off	L1	19.4	14.1	46.0
1.438000	31.2	Off	L1	19.4	14.8	46.0
1.590000	29.5	Off	L1	19.4	16.5	46.0
2.518000	29.6	Off	L1	19.4	16.4	46.0
3.694000	30.9	Off	L1	19.5	15.1	46.0

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Hayden Wu	**Relative Humidity :**	46~48%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + NFC On + Earphone + Battery 1 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	42.1	Off	N	19.3	23.1	65.2
0.214000	36.2	Off	N	19.4	26.8	63.0
0.606000	36.2	Off	N	19.4	19.8	56.0
0.998000	38.8	Off	N	19.4	17.2	56.0
1.126000	38.9	Off	N	19.4	17.1	56.0
1.574000	36.0	Off	N	19.4	20.0	56.0
4.142000	36.0	Off	N	19.5	20.0	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	27.3	Off	N	19.3	27.9	55.2
0.214000	23.6	Off	N	19.4	29.4	53.0
0.606000	28.0	Off	N	19.4	18.0	46.0
0.998000	30.7	Off	N	19.4	15.3	46.0
1.126000	31.0	Off	N	19.4	15.0	46.0
1.574000	28.1	Off	N	19.4	17.9	46.0
4.142000	28.6	Off	N	19.5	17.4	46.0

3.9 Radiated Emission Measurement

3.9.1 Limit of Radiated Emission

In any 100 KHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.9.2 Measuring Instruments

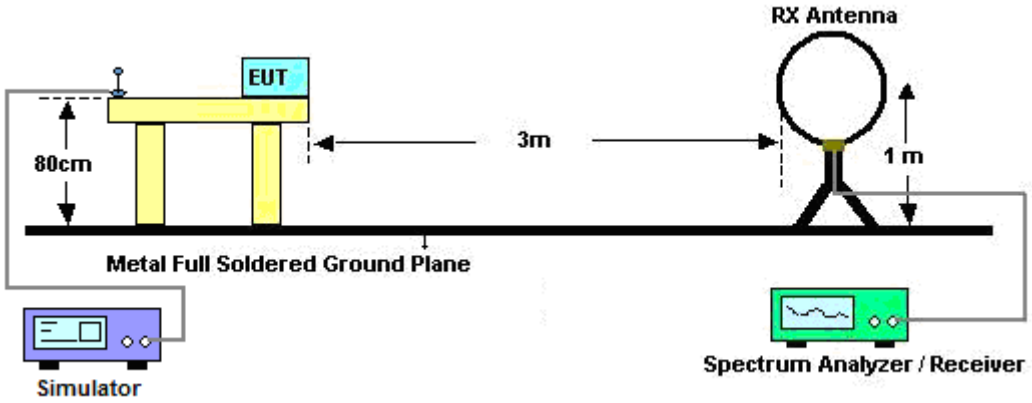
See list of measuring instruments of this test report.

3.9.3 Test Procedures

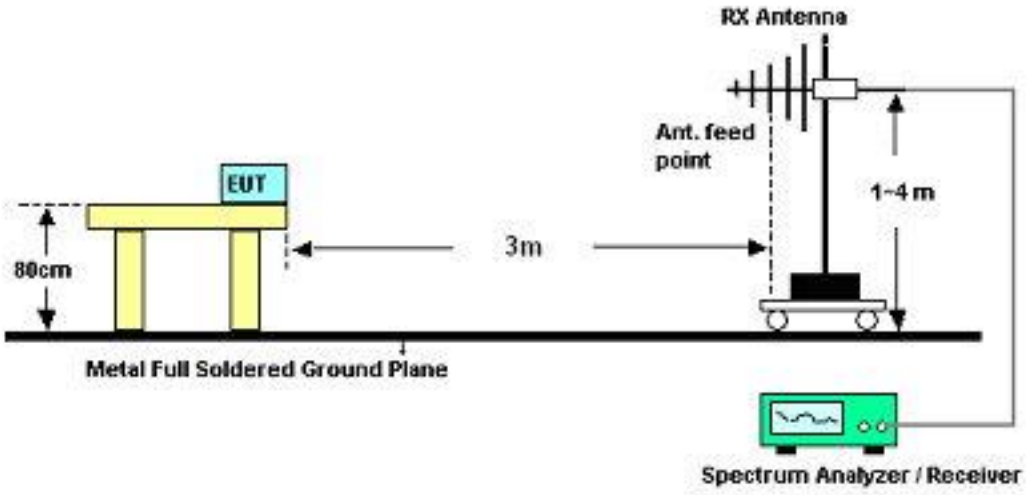
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
   (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for f ≥ 1 GHz, 100 KHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
   (2) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
   Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB)
3. Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.
4. Measured average value for the peak value is greater than 54 dBuv/m

3.9.4 Test Setup

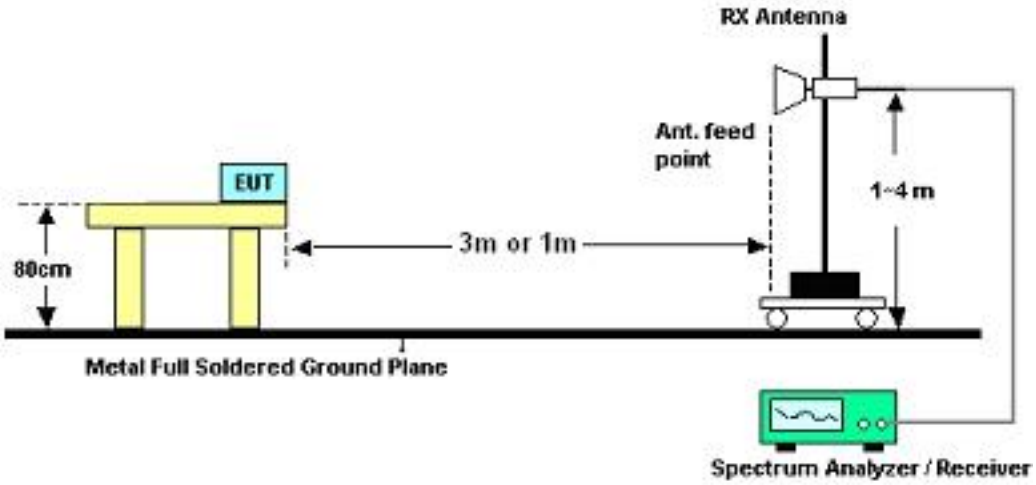
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

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

Test Mode :	Mode 1	Temperature :	22~24°C
Test Channel :	00	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2402 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.54	20.45	-19.55	40	32.09	19.28	0.54	31.46	131	102	Peak
103.98	16.46	-27.04	43.5	36.83	10.16	1.01	31.54	-	-	Peak
280.29	20.94	-25.06	46	37.62	13.03	1.64	31.35	-	-	Peak
396.6	18.64	-27.36	46	31.78	15.92	2.13	31.19	-	-	Peak
540.1	20.03	-25.97	46	29.72	18.78	2.53	31	-	-	Peak
780.9	23.29	-22.71	46	29.06	21.81	3.11	30.69	-	-	Peak
2388.66	45.33	-28.67	74	41.2	32.06	6.03	33.96	100	158	Peak
2388.66	33.2	-20.8	54	29.07	32.06	6.03	33.96	100	158	Average
2402	94.02	-	-	89.87	32.08	6.03	33.96	100	158	Peak
2402	78.85	-	-	74.72	32.06	6.03	33.96	100	158	Average
2484	32.49	-21.51	54	28.13	32.18	6.18	34	100	158	Average
2484	44.28	-29.72	74	39.92	32.18	6.18	34	100	158	Peak

Test Mode :	Mode 1	Temperature :	22~24°C
Test Channel :	00	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2402 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	30.03	-9.97	40	40.96	20	0.53	31.46	100	152	Peak
42.69	27.64	-12.36	40	46.8	11.7	0.64	31.5	-	-	Peak
101.82	25.59	-17.91	43.5	46.15	9.98	1	31.54	-	-	Peak
343.4	15.55	-30.45	46	30.45	14.48	1.92	31.3	-	-	Peak
525.4	18.75	-27.25	46	28.74	18.53	2.5	31.02	-	-	Peak
791.4	23.26	-22.74	46	28.84	21.97	3.13	30.68	-	-	Peak
2368.33	46.29	-27.71	74	42.24	32.01	5.99	33.95	102	270	Peak
2368.33	33.12	-20.88	54	29.07	32.01	5.99	33.95	102	270	Average
2402	99.72	-	-	95.57	32.08	6.03	33.96	102	270	Peak
2402	82.92	-	-	78.79	32.06	6.03	33.96	102	270	Average
2486	32.46	-21.54	54	28.1	32.18	6.18	34	102	270	Average
2486	44.33	-29.67	74	39.97	32.18	6.18	34	102	270	Peak

Test Mode :	Mode 2	Temperature :	22~24°C
Test Channel :	39	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2441 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	20.74	-19.26	40	31.67	20	0.53	31.46	121	144	Peak
103.98	16.53	-26.97	43.5	36.9	10.16	1.01	31.54	-	-	Peak
236.01	18.73	-27.27	46	37.06	11.59	1.51	31.43	-	-	Peak
393.8	19.51	-26.49	46	32.74	15.84	2.13	31.2	-	-	Peak
578.6	21.12	-24.88	46	30	19.44	2.63	30.95	-	-	Peak
763.4	22.34	-23.66	46	28.4	21.55	3.08	30.69	-	-	Peak
2366	45.35	-28.65	74	41.3	32.01	5.99	33.95	102	129	Peak
2366	33.09	-20.91	54	29.04	32.01	5.99	33.95	102	129	Average
2441	93.24	-	-	88.98	32.13	6.11	33.98	102	129	Peak
2441	77.69	-	-	73.43	32.13	6.11	33.98	102	129	Average
2484	44.58	-29.42	74	40.22	32.18	6.18	34	102	129	Peak
2484	32.48	-21.52	54	28.12	32.18	6.18	34	102	129	Average

Test Mode :	Mode 2	Temperature :	22~24°C
Test Channel :	39	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2441 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	30.48	-9.52	40	41.41	20	0.53	31.46	103	35	Peak
43.5	30.1	-9.9	40	49.86	11.1	0.64	31.5	-	-	Peak
101.01	24.74	-18.76	43.5	45.39	9.89	1	31.54	-	-	Peak
309.8	17.77	-28.23	46	33.75	13.56	1.79	31.33	-	-	Peak
483.4	18.32	-27.68	46	29.25	17.74	2.39	31.06	-	-	Peak
729.8	22.39	-23.61	46	29.09	21.04	3.01	30.75	-	-	Peak
2366	45.6	-28.4	74	41.55	32.01	5.99	33.95	100	277	Peak
2366	33.06	-20.94	54	29.01	32.01	5.99	33.95	100	277	Average
2441	98.54	-	-	94.28	32.13	6.11	33.98	100	277	Peak
2441	81.54	-	-	77.28	32.13	6.11	33.98	100	277	Average
2494	44.9	-29.1	74	40.52	32.2	6.18	34	100	277	Peak
2494	32.53	-21.47	54	28.15	32.2	6.18	34	100	277	Average

Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2480 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	20.85	-19.15	40	31.78	20	0.53	31.46	136	277	Peak
103.17	16.91	-26.59	43.5	37.37	10.07	1.01	31.54	-	-	Peak
278.13	16.82	-29.18	46	33.53	13	1.64	31.35	-	-	Peak
388.9	18.85	-27.15	46	32.23	15.71	2.12	31.21	-	-	Peak
601	20.87	-25.13	46	29.29	19.81	2.69	30.92	-	-	Peak
797.7	23.6	-22.4	46	29.08	22.06	3.14	30.68	-	-	Peak
2348	46.4	-27.6	74	42.41	31.98	5.95	33.94	138	354	Peak
2348	33.09	-20.91	54	29.1	31.98	5.95	33.94	138	354	Average
2480	76.1	-	-	71.74	32.18	6.18	34	138	354	Average
2480	92.47	-	-	88.11	32.18	6.18	34	138	354	Peak
2483.5	57.04	-16.96	74	52.68	32.18	6.18	34	138	354	Peak
2483.5	45.8	-8.2	54	41.44	32.18	6.18	34	138	354	Average

Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	78	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2480 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	29.85	-10.15	40	40.78	20	0.53	31.46	107	323	Peak
42.69	28.07	-11.93	40	47.23	11.7	0.64	31.5	-	-	Peak
101.82	24.52	-18.98	43.5	45.08	9.98	1	31.54	-	-	Peak
405.7	16.58	-29.42	46	29.47	16.12	2.16	31.17	-	-	Peak
587	20.25	-25.75	46	28.97	19.57	2.65	30.94	-	-	Peak
758.5	22.2	-23.8	46	28.36	21.47	3.07	30.7	-	-	Peak
2334	46.03	-27.97	74	42.06	31.96	5.95	33.94	100	261	Peak
2334	32.89	-21.11	54	28.92	31.96	5.95	33.94	100	261	Average
2480	81.27	-	-	76.91	32.18	6.18	34	100	261	Average
2480	97.63	-	-	93.27	32.18	6.18	34	100	261	Peak
2483.5	61.99	-12.01	74	57.63	32.18	6.18	34	100	261	Peak
2483.5	49.56	-4.44	54	45.2	32.18	6.18	34	100	261	Average

Test Mode :	Mode 4	Temperature :	22~24°C
Test Channel :	00	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2402 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.54	20.28	-19.72	40	31.92	19.28	0.54	31.46	133	301	Peak
105.33	16.66	-26.84	43.5	36.84	10.34	1.03	31.55	-	-	Peak
298.38	17.19	-28.81	46	33.47	13.29	1.76	31.33	-	-	Peak
396.6	19.37	-26.63	46	32.51	15.92	2.13	31.19	-	-	Peak
573	21.39	-24.61	46	30.39	19.34	2.61	30.95	-	-	Peak
722.1	21.86	-24.14	46	28.71	20.93	2.99	30.77	-	-	Peak
2343.82	46.39	-27.61	74	42.4	31.98	5.95	33.94	101	235	Peak
2343.82	33.43	-20.57	54	29.44	31.98	5.95	33.94	101	235	Average
2402	97.39	-	-	93.24	32.08	6.03	33.96	101	235	Peak
2402	73.49	-	-	69.36	32.06	6.03	33.96	101	235	Average
2486	32.88	-21.12	54	28.52	32.18	6.18	34	101	235	Average
2486	45.31	-28.69	74	40.95	32.18	6.18	34	101	235	Peak

Test Mode :	Mode 4	Temperature :	22~24°C
Test Channel :	00	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2402 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	30	-10	40	40.93	20	0.53	31.46	-	-	Peak
43.77	30.05	-9.95	40	49.81	11.1	0.64	31.5	100	178	Peak
101.01	24.62	-18.88	43.5	45.27	9.89	1	31.54	-	-	Peak
304.2	20.04	-25.96	46	36.16	13.43	1.78	31.33	-	-	Peak
438.6	17.41	-28.59	46	29.45	16.81	2.27	31.12	-	-	Peak
668.2	20.87	-25.13	46	28.5	20.34	2.88	30.85	-	-	Peak
2348.57	45.98	-28.02	74	41.99	31.98	5.95	33.94	100	40	Peak
2348.57	33.35	-20.65	54	29.36	31.98	5.95	33.94	100	40	Average
2402	94.77	-	-	90.62	32.08	6.03	33.96	100	40	Peak
2402	71.69	-	-	67.56	32.06	6.03	33.96	100	40	Average
2484	32.82	-21.18	54	28.46	32.18	6.18	34	100	40	Average
2484	45.09	-28.91	74	40.73	32.18	6.18	34	100	40	Peak

Test Mode :	Mode 5	Temperature :	22~24°C
Test Channel :	19	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2440 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.89	20.71	-19.29	40	33.06	18.56	0.55	31.46	112	213	Peak
105.33	16.02	-27.48	43.5	36.2	10.34	1.03	31.55	-	-	Peak
231.42	15.4	-30.6	46	34.03	11.32	1.49	31.44	-	-	Peak
383.3	18.69	-27.31	46	32.26	15.55	2.11	31.23	-	-	Peak
590.5	20.78	-25.22	46	29.42	19.63	2.66	30.93	-	-	Peak
730.5	22.62	-23.38	46	29.31	21.05	3.01	30.75	-	-	Peak
2348	45.59	-28.41	74	41.6	31.98	5.95	33.94	100	234	Peak
2348	33.55	-20.45	54	29.56	31.98	5.95	33.94	100	234	Average
2440	98.67	-	-	94.41	32.13	6.11	33.98	100	234	Peak
2440	73.99	-	-	69.73	32.13	6.11	33.98	100	234	Average
2486	45.6	-28.4	74	41.24	32.18	6.18	34	100	234	Peak
2486	33.07	-20.93	54	28.71	32.18	6.18	34	100	234	Average

Test Mode :	Mode 5	Temperature :	22~24°C
Test Channel :	19	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2440 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	31.14	-8.86	40	42.07	20	0.53	31.46	100	309	Peak
43.5	28.42	-11.58	40	48.18	11.1	0.64	31.5	-	-	Peak
101.82	24.37	-19.13	43.5	44.93	9.98	1	31.54	-	-	Peak
313.3	19.25	-26.75	46	35.1	13.67	1.8	31.32	-	-	Peak
564.6	21.51	-24.49	46	30.69	19.19	2.59	30.96	-	-	Peak
792.1	23.76	-22.24	46	29.33	21.98	3.13	30.68	-	-	Peak
2390	45.63	-28.37	74	41.5	32.06	6.03	33.96	176	126	Peak
2390	33.65	-20.35	54	29.52	32.06	6.03	33.96	176	126	Average
2440	94.96	-	-	90.7	32.13	6.11	33.98	176	126	Peak
2440	72	-	-	67.74	32.13	6.11	33.98	176	126	Average
2492	44.78	-29.22	74	40.4	32.2	6.18	34	176	126	Peak
2492	32.97	-21.03	54	28.59	32.2	6.18	34	176	126	Average

Test Mode :	Mode 6	Temperature :	22~24°C
Test Channel :	39	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2480 MHz is fundamental signals which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.81	20.98	-19.02	40	32.62	19.28	0.54	31.46	140	156	Peak
105.06	16.11	-27.39	43.5	36.39	10.25	1.02	31.55	-	-	Peak
267.33	18.88	-27.12	46	35.79	12.85	1.63	31.39	-	-	Peak
383.3	18.94	-27.06	46	32.51	15.55	2.11	31.23	-	-	Peak
595.4	21.05	-24.95	46	29.58	19.72	2.68	30.93	-	-	Peak
806.1	22.58	-23.42	46	27.95	22.16	3.16	30.69	-	-	Peak
2366	45.08	-28.92	74	41.03	32.01	5.99	33.95	100	170	Peak
2366	33.05	-20.95	54	29	32.01	5.99	33.95	100	170	Average
2480	72.19	-	-	67.83	32.18	6.18	34	100	170	Average
2480	95.56	-	-	91.2	32.18	6.18	34	100	170	Peak
2483.5	60.93	-13.07	74	56.57	32.18	6.18	34	100	170	Peak
2483.5	46.45	-7.55	54	42.09	32.18	6.18	34	100	170	Average

Test Mode :	Mode 6	Temperature :	22~24°C
Test Channel :	39	Relative Humidity :	51~53%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2480 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	29.82	-10.18	40	40.75	20	0.53	31.46	100	109	Peak
44.85	29.6	-10.4	40	49.95	10.5	0.65	31.5	-	-	Peak
101.82	24.33	-19.17	43.5	44.89	9.98	1	31.54	-	-	Peak
346.9	20.86	-25.14	46	35.62	14.58	1.95	31.29	-	-	Peak
503	18.97	-27.03	46	29.42	18.15	2.46	31.06	-	-	Peak
710.2	22.06	-23.94	46	29.15	20.75	2.96	30.8	-	-	Peak
2316	45.15	-28.85	74	41.23	31.93	5.92	33.93	166	118	Peak
2316	32.98	-21.02	54	29.06	31.93	5.92	33.93	166	118	Average
2480	69.24	-	-	64.88	32.18	6.18	34	166	118	Average
2480	91.04	-	-	86.68	32.18	6.18	34	166	118	Peak
2483.5	56.53	-17.47	74	52.17	32.18	6.18	34	166	118	Peak
2483.5	43.66	-10.34	54	39.3	32.18	6.18	34	166	118	Average

3.10 Antenna Requirements

3.10.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.10.2 Antenna Connected Construction

The antennas type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement.

3.10.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	Feb. 22, 2012 ~ Feb. 23, 2012	Jun. 12, 2012	Conducted (TH02-HY)
Bluetooth Base Station	R&S	CBT32	100519	N/A	Jun. 01, 2011	Feb. 22, 2012 ~ Feb. 23, 2012	May 31, 2012	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Mar. 06, 2012 ~ Mar. 10, 2012	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 21, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Oct. 20, 2012	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Aug. 09, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz ~ 26.5GHz	Dec. 05, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10 ~ 1000MHz 32dB GAIN	Mar 29, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Mar 28, 2012	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz ~ 7GHz	Aug. 22, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Aug. 21, 2012	Radiation (03CH07-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	Jul. 17, 2012	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Mar. 06, 2012 ~ Mar. 10, 2012	Jul. 28, 2012	Radiation (03CH07-HY)
Bluetooth Base Station	R&S	CBT32	100519	N/A	Jun. 01, 2011	Mar. 06, 2012 ~ Mar. 10, 2012	May 31, 2012	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty Uc(y)	**1.13**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**		

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty Uc(y)	**1.27**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**		

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

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	±1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	±0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site Imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	**2.36**				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**				