FCC RF Test Report

APPLICANT	**:**	**HTC Corporation**
EQUIPMENT	**:**	**Windows Phone**
MODEL NAME	**:**	**PD29150**
FCC ID	**:**	**NM8PD29150**
STANDARD	**:**	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	**:**	**Digital Spread Spectrum (DSS)**

The product was received on Oct. 26, 2010 and completely tested on Nov. 06, 2010. 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:

Anderson Chiu

Anderson Chiu / Deputy Manager

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
FR0D1442A	Rev. 01	Initial issue of report	Dec. 20, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(1)	A8.4(2)	Number of Channels	≥ 15Chs	Pass	-
3.2	15.247(a)(1)	A8.1(a)	20dB Bandwidth	NA	Pass	-
3.2	-	Gen 4.4.1	99% Bandwidth	-	Pass	-
3.3	15.247(a)(1)	A8.1(b)	Channel Separation	≥ 2/3 of 20dB BW	Pass	-
3.4	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	≤ 0.4sec in 31.6sec period	Pass	-
3.5	15.247(b)(1)	A8.1(b)	Peak Output Power	≤ 1W	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 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 9.1 dB at 0.254 MHz
3.9	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.33 dB at 2483.5 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, Taoyuan County 330, Taiwan

1.2 Manufacturer

HTC Corporation
No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Windows Phone
Model Name	PD29150
FCC ID	NM8PD29150
Sample 1	EUT with LCM-Main and Camera 1
Sample 2	EUT with LCM-2nd and 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 (1Mbps) : 3.27 dBm (0.0021 W) Bluetooth EDR (2Mbps) : 5.96 dBm (0.0039 W) Bluetooth EDR (3Mbps) : 3.82 dBm (0.0024 W)
Antenna Type	PIFA Antenna with gain -4.1 dBi
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π /4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Production Unit

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Spread Spectrum (DSS).
3. 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	03CH06-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 7

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 (DoC), 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.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
6.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	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:

Channel	Frequency	Bluetooth RF Output Power		
		Data Rate / Modulation		
		GFSK	π /4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	2.27 dBm	4.95 dBm	2.67 dBm
Ch39	2441MHz	2.87 dBm	5.59 dBm	3.28 dBm
Ch78	2480MHz	3.27 dBm	**5.96 dBm**	3.82 dBm

Remark:

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

2. 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).

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

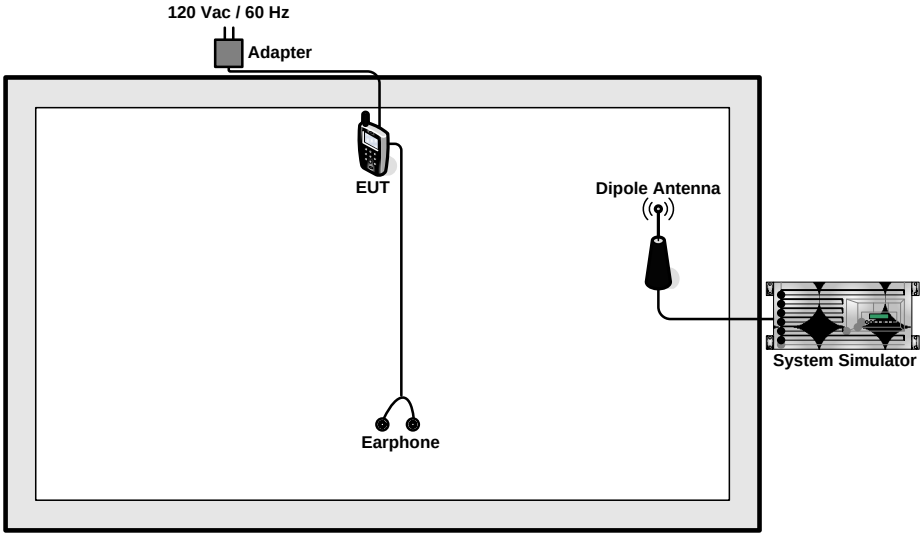
Test Cases			
Test Item	**Data Rate / Modulation**		
	Bluetooth 1Mbps GFSK	**Bluetooth EDR 2Mbps π /4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
Conducted TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated TCs	N/A	Mode 1: CH00_2402 MHz for Sample 1 Mode 2: CH39_2441 MHz for Sample 1 Mode 3: CH78_2480 MHz for Sample 1 Mode 4: CH78_2480 MHz for Sample 2	N/A
AC Conducted Emission	Mode 1 :GSM850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 1 + Battery 1 + USB Cable 1 (Charging from Adapter 1) for Sample 1 Mode 2 :WCDMA850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 2 + Battery 2 + USB Cable 2 (Charging from Adapter 2) for Sample 2		

Remark:

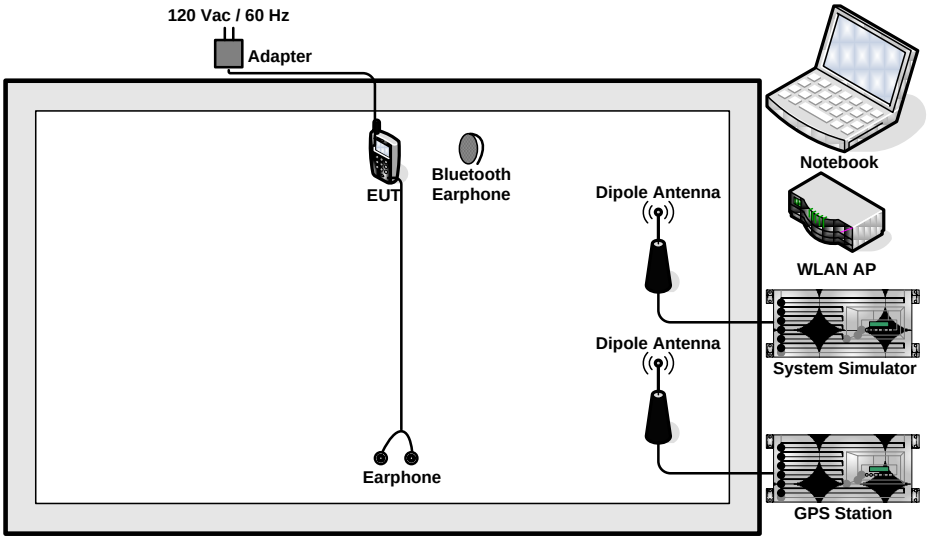
1. TC stands for Test Configuration, and consists of battery, earphone, USB cable, camera, and adapter.
2. For radiated TCs, the data rate was set in 2Mbps due to the highest RF output power; only the data of these modes was reported.
3. For conducted emission, the worst case is mode 2; only the test data of this mode was reported.

2.3 Connection Diagram of Test System

<Radiation Test>



<Conduction Test>



2.4 RF Utility

For Bluetooth function, the EUT 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.

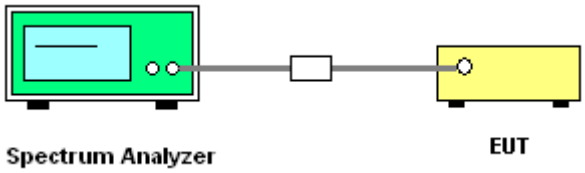
3.1.2 Measuring Instruments

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

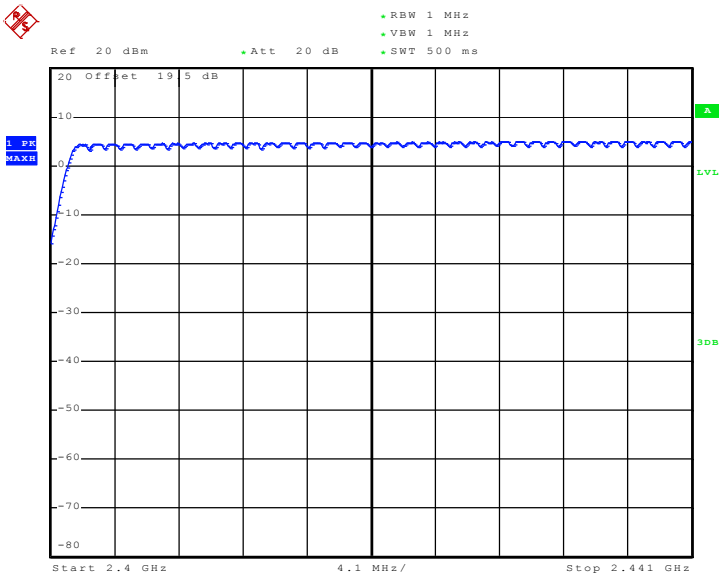


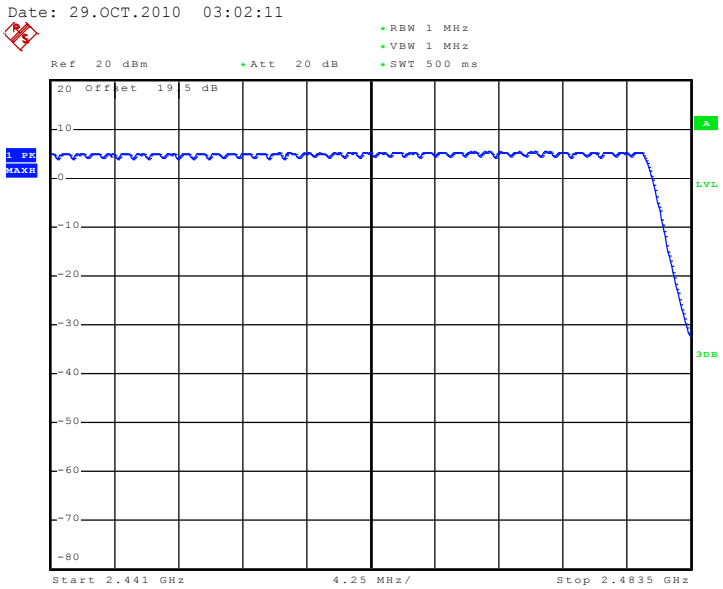
3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	Mode 4~6	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	40~43%

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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3.2 20dB and 99% Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;
   RBW ≥ 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.

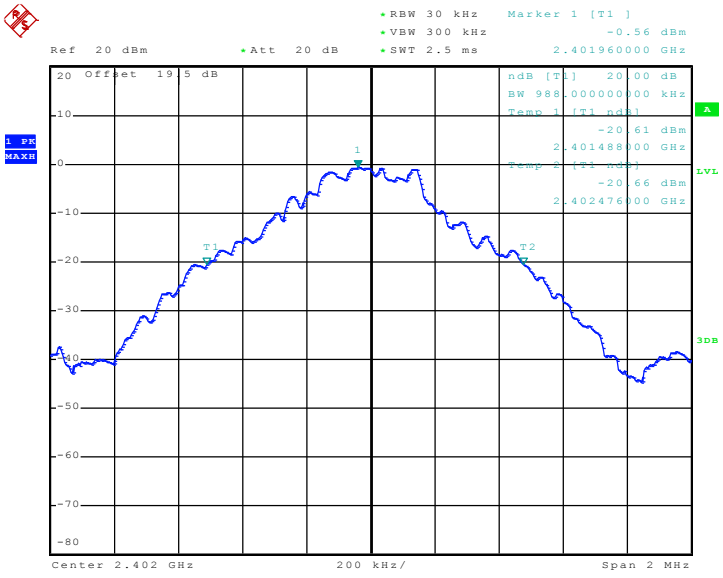
3.2.4 Test Setup

3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	40~43%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.988
39	2441	1.000
78	2480	1.012

20 dB Bandwidth Plot on Channel 00



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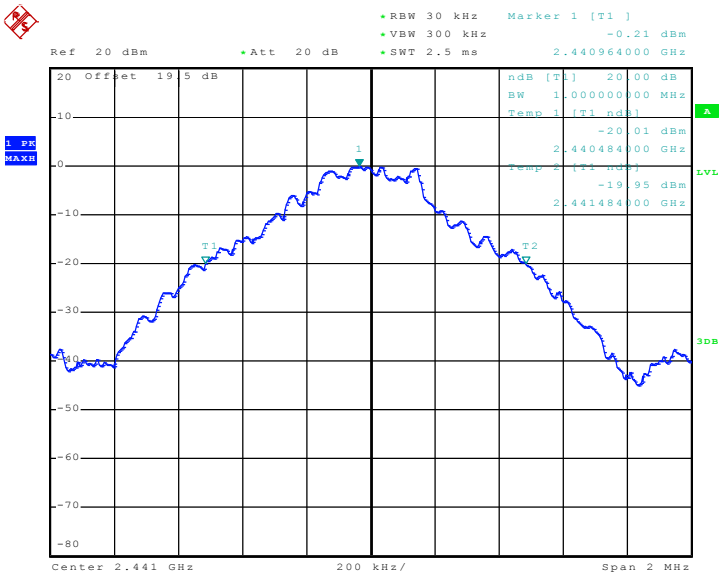
20 dB Bandwidth Plot on Channel 39



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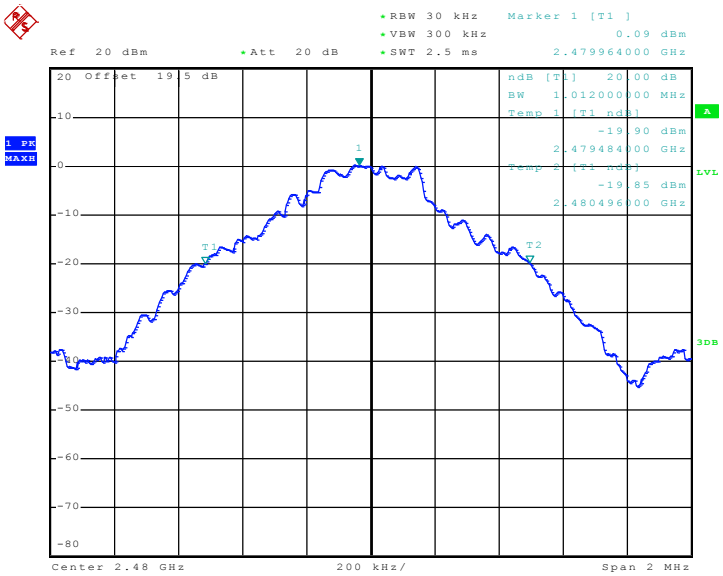
20 dB Bandwidth Plot on Channel 78



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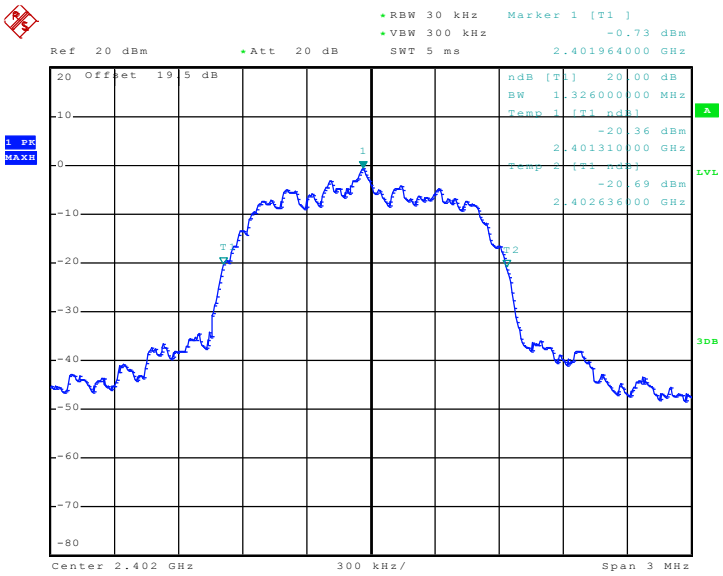
Test Mode :	Mode 4, 5, 6	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	40~43%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.326
39	2441	1.332
78	2480	1.332

20 dB Bandwidth Plot on Channel 00



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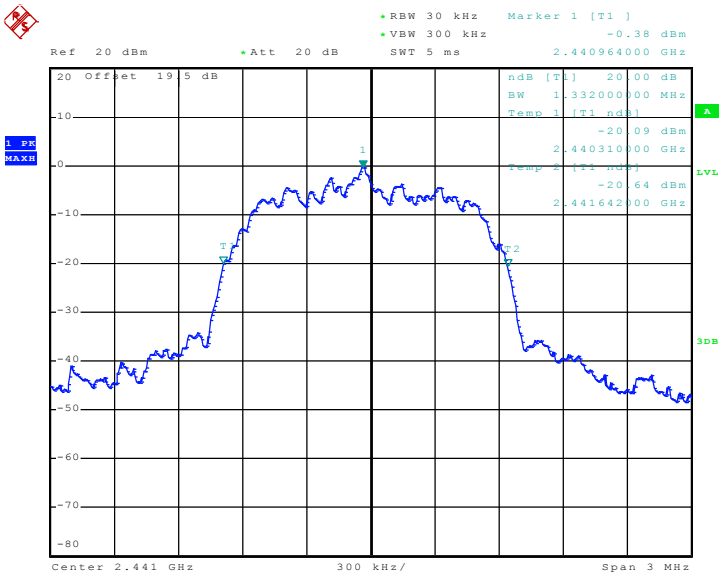
20 dB Bandwidth Plot on Channel 39



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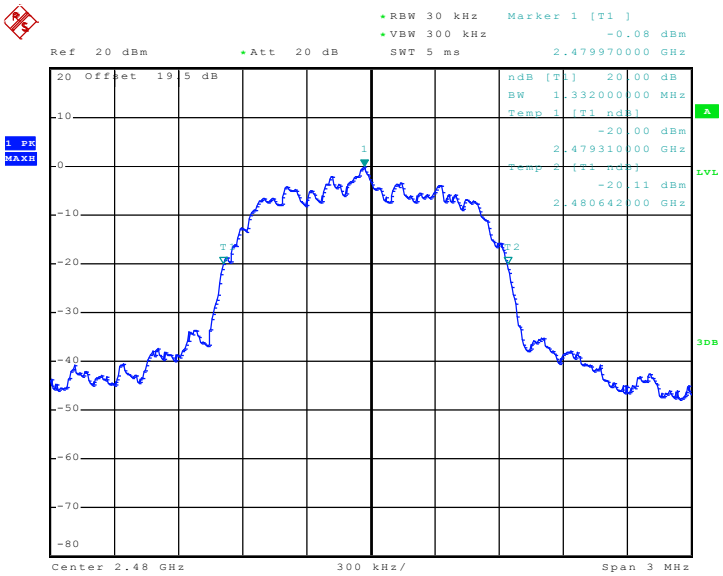
20 dB Bandwidth Plot on Channel 78

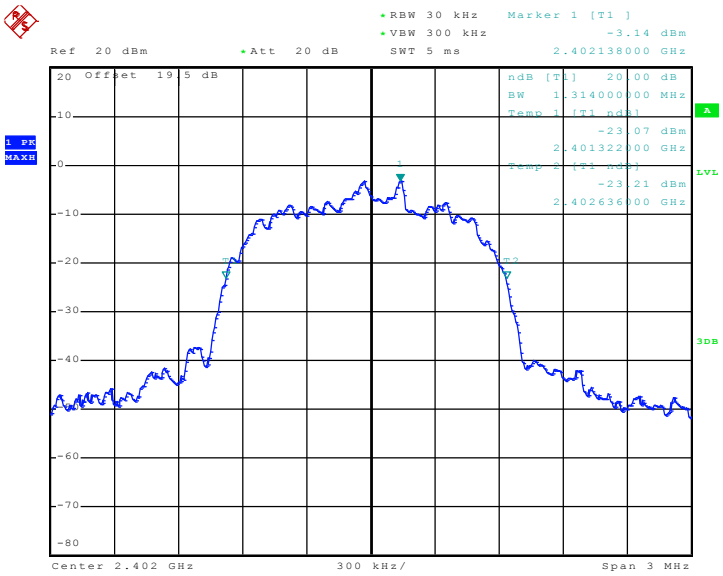


Date: 29.OCT.2010 01:54:08

Test Mode :	Mode 7, 8, 9	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	40~43%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.314
39	2441	1.314
78	2480	1.314

20 dB Bandwidth Plot on Channel 00



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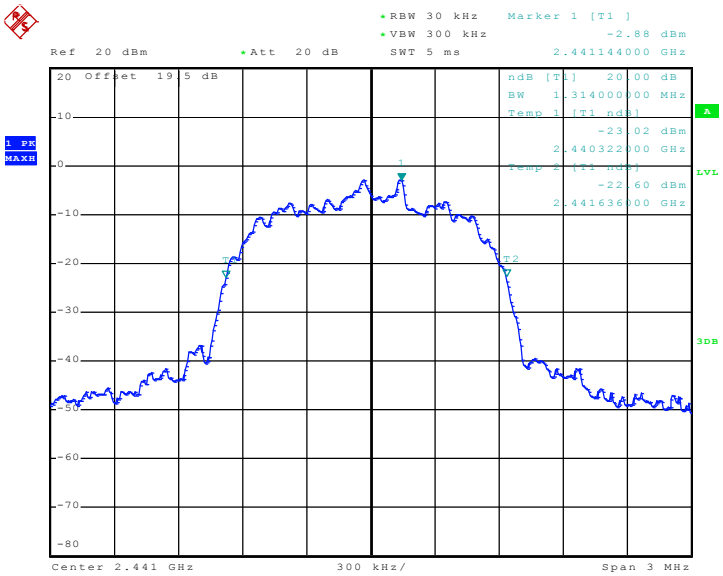
20 dB Bandwidth Plot on Channel 39



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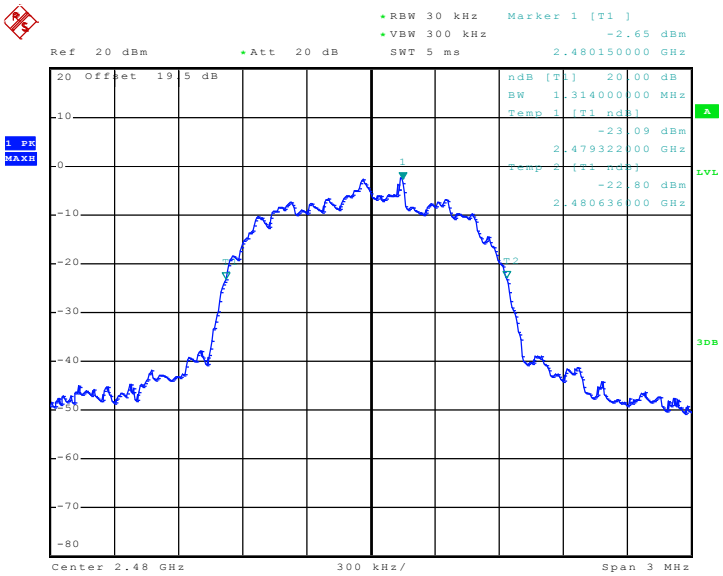
20 dB Bandwidth Plot on Channel 78



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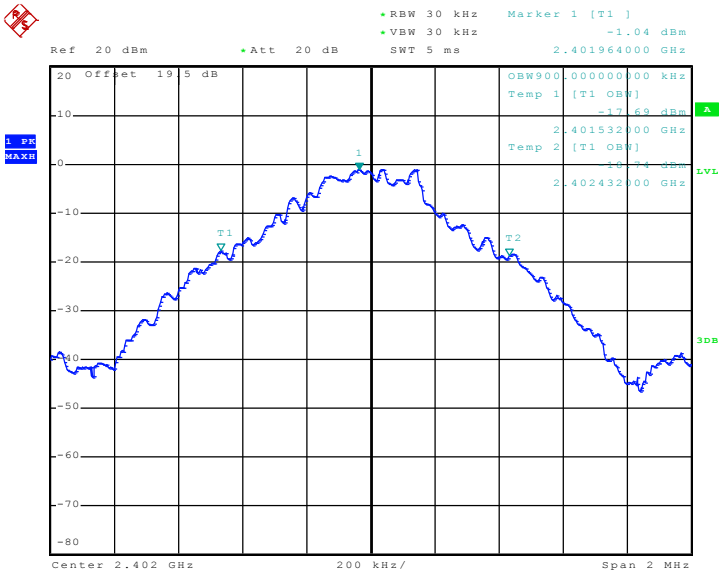
3.2.6 Test Result of 99% Occupied Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	40~43%

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	0.900
39	2441	0.904
78	2480	0.912

99% Bandwidth Plot on Channel 00



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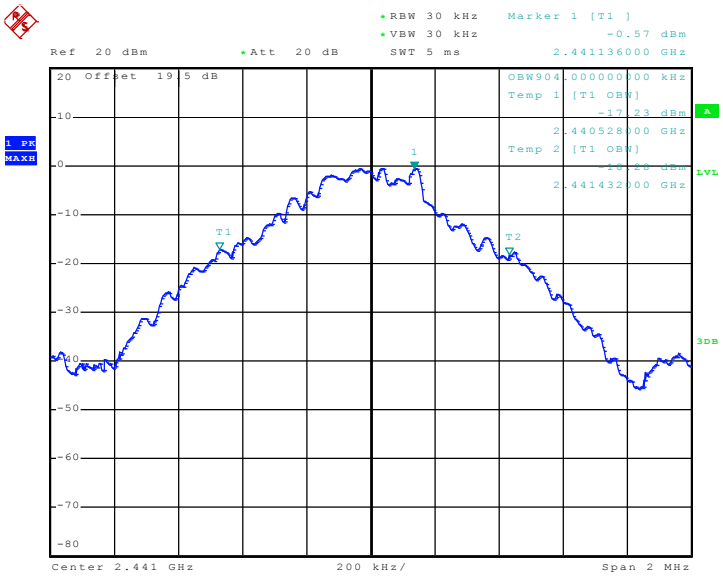
99% Occupied Bandwidth Plot on Channel 39



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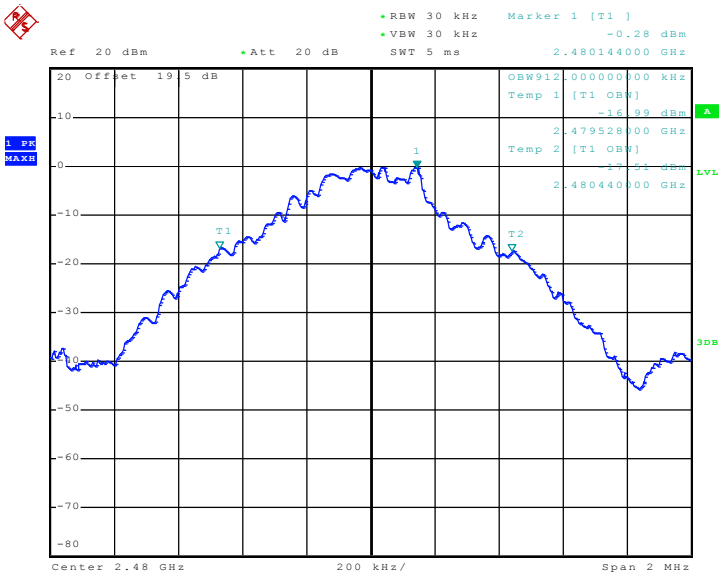
99% Occupied Bandwidth Plot on Channel 78

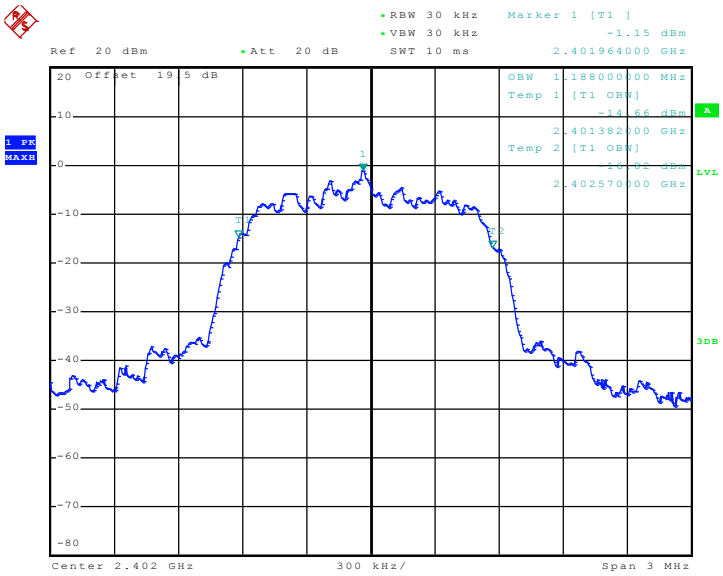


Date: 29.OCT.2010 02:00:04

Test Mode :	Mode 4, 5, 6	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	40~43%

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.188
39	2441	1.188
78	2480	1.194

99% Bandwidth Plot on Channel 00



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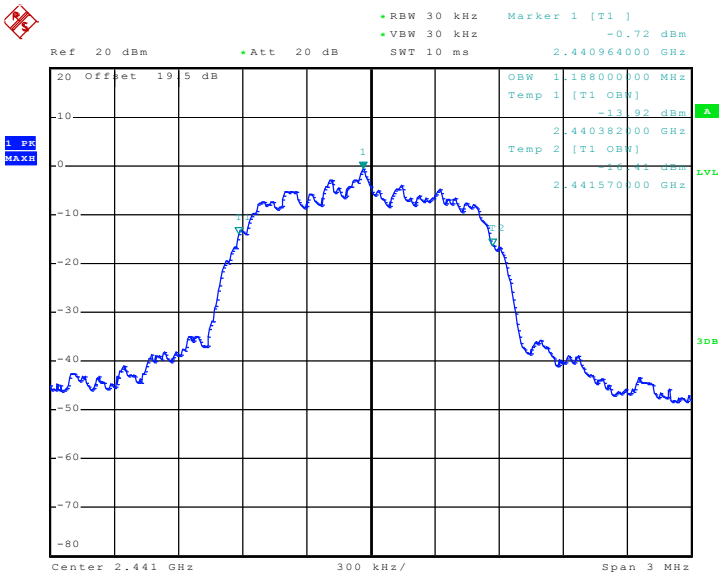
99% Occupied Bandwidth Plot on Channel 39



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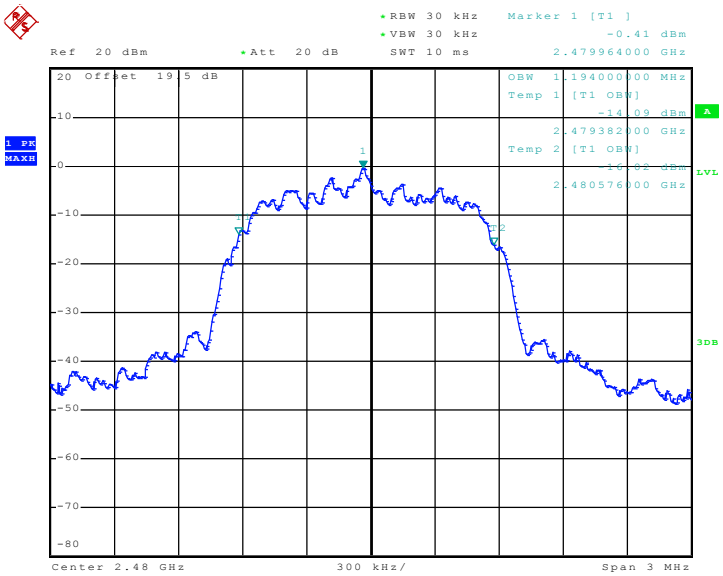
99% Occupied Bandwidth Plot on Channel 78

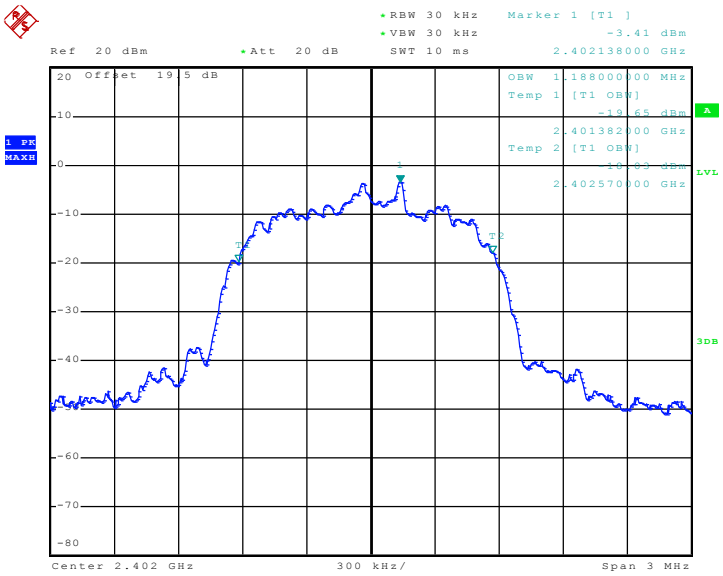


Date: 29.OCT.2010 01:59:30

Test Mode :	Mode 7, 8, 9	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	40~43%

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.188
39	2441	1.182
78	2480	1.182

99% Bandwidth Plot on Channel 00



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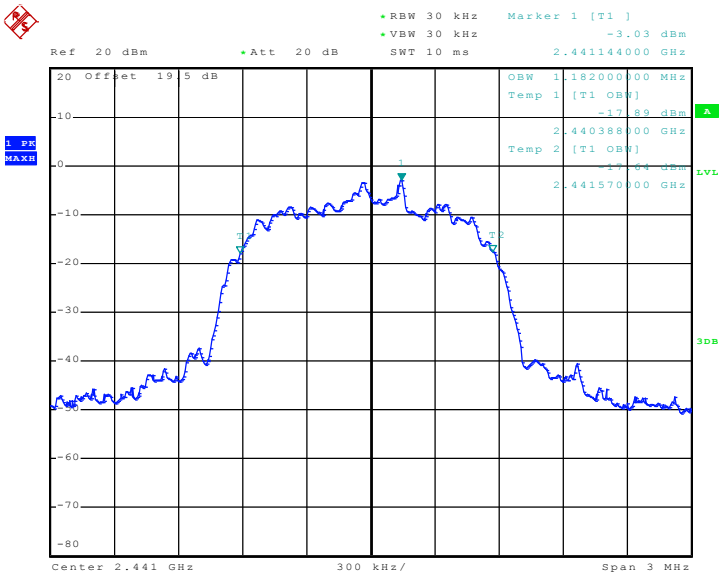
99% Occupied Bandwidth Plot on Channel 39



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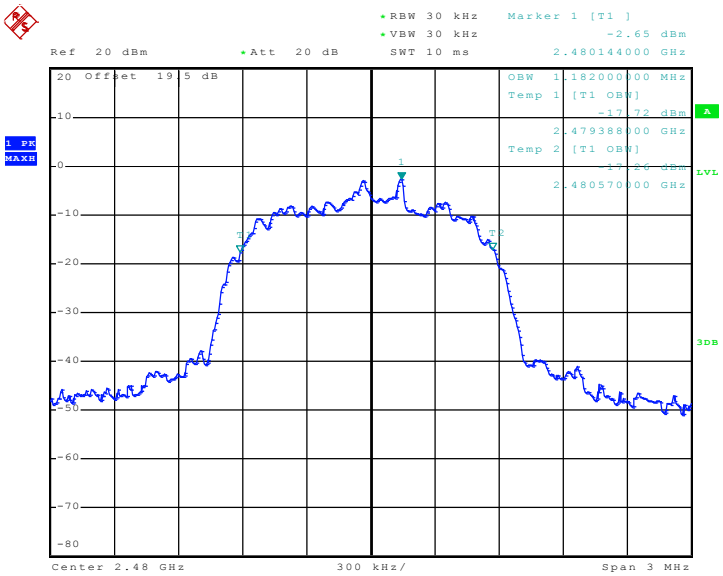
99% Occupied Bandwidth Plot on Channel 78



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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.

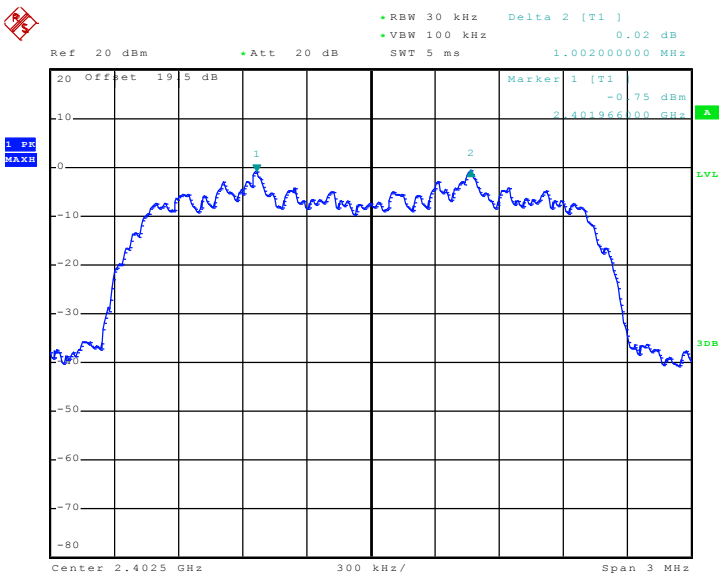
3.3.4 Test Setup

3.3.5 Test Result of Hopping Channel Separation

Test Mode :	Mode 4, 5, 6	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	40~43%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.884	Pass
39	2441	1.008	0.888	Pass
78	2480	1.014	0.888	Pass

Channel Separation Plot on Channel 00 - 01



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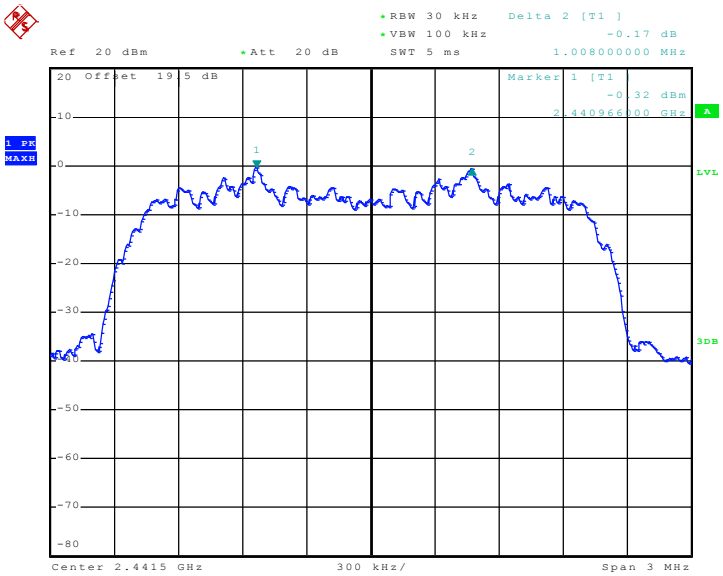
Channel Separation Plot on Channel 39 - 40



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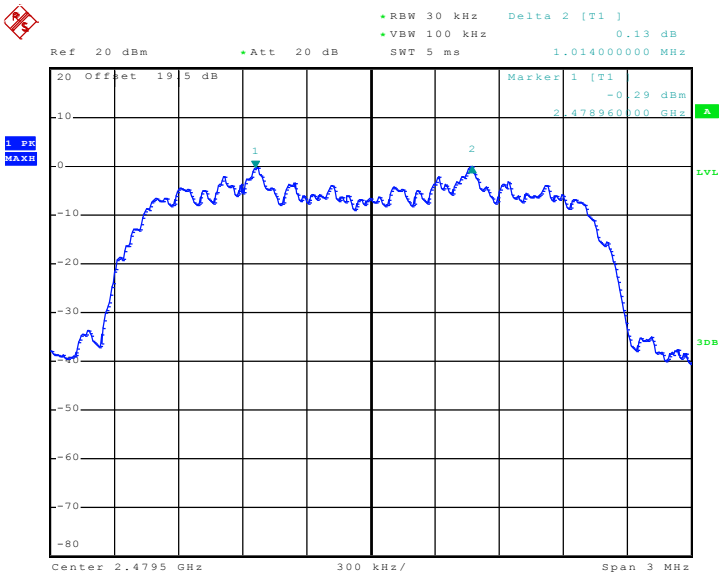
Channel Separation Plot on Channel 77 - 78



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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 6	**Temperature :**	25~27℃
Test Engineer :	Ken Hsu	**Relative Humidity :**	40~43%

Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
2-DH5	3.00	2974.00	0.28	< 0.4s	Pass

Remark:

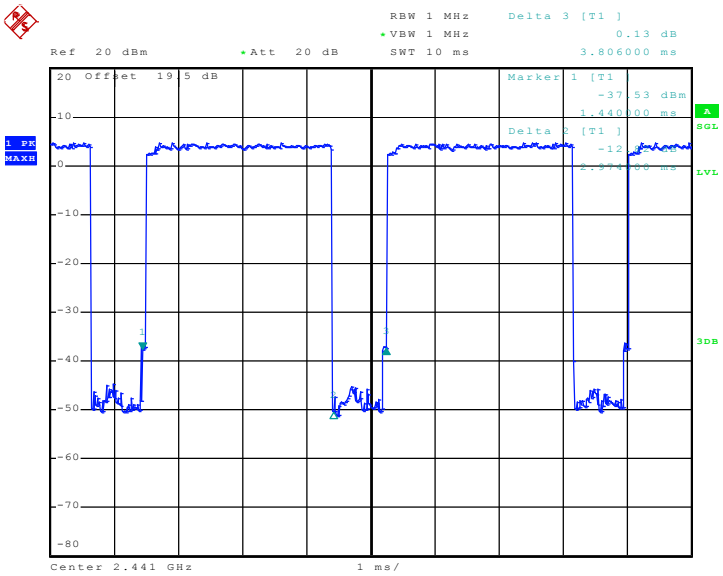
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time

2. 79 channels come from the Hopping Channel number.

3. Average Hopping Channel = hops/sweep time

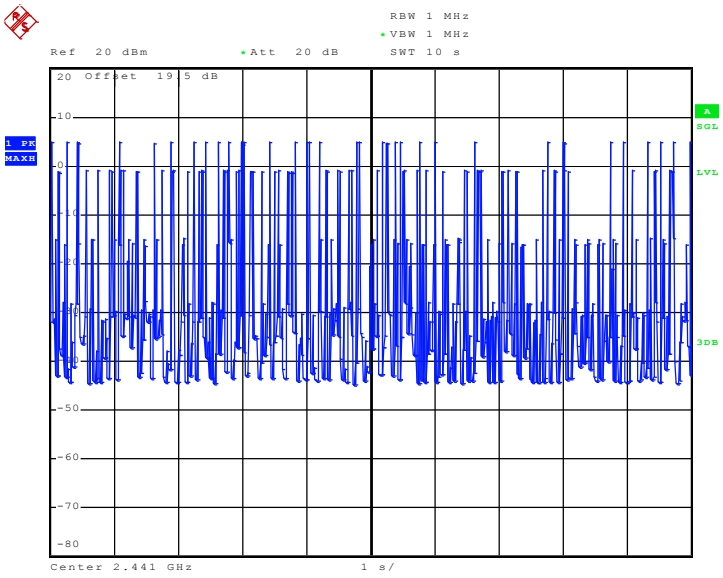
4. t: Package Transfer Time(us)

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



Date: 29.OCT.2010 02:37:21

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



Date: 29.OCT.2010 02:42:40

3.5 Peak Output Power Measurement

3.5.1 Limit of Peak Output Power

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, provided the systems operate with an output power no greater than 125 mW (20.97dBm).

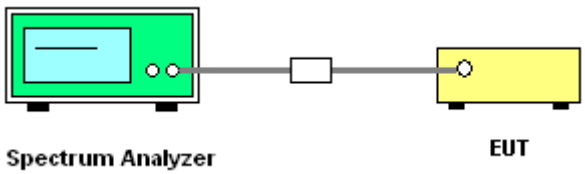
3.5.2 Measuring Instruments

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

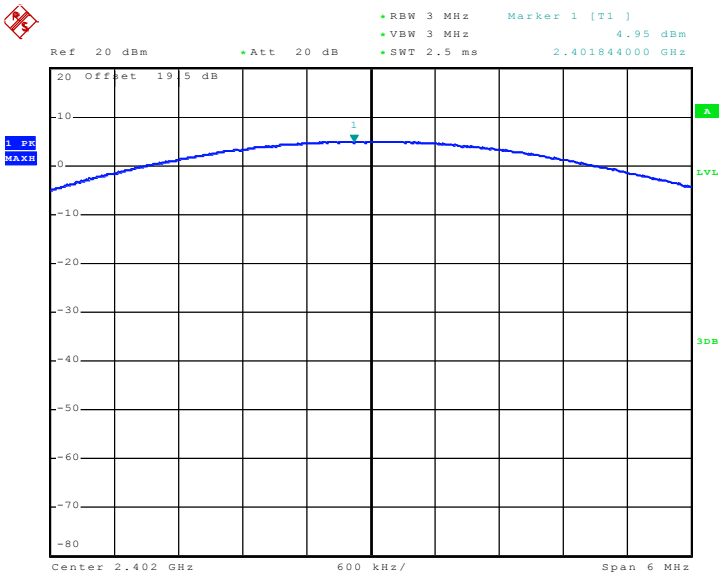


3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 4, 5, 6	**Temperature :**	25~27℃
Test Engineer :	Ken Hsu	**Relative Humidity :**	40~43%

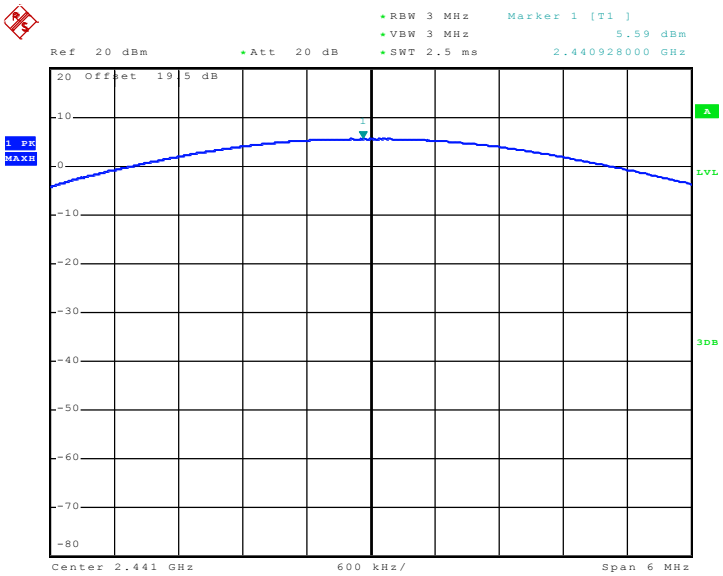
Channel	Frequency (MHz)	RF Power (dBm)		
		π /4-DQPSK 2 Mbps	Max. Limits (dBm)	Pass/Fail
00	2402	4.95	20.97	Pass
39	2441	5.59	20.97	Pass
78	2480	5.96	20.97	Pass

Peak Output Power Plot on Channel 00



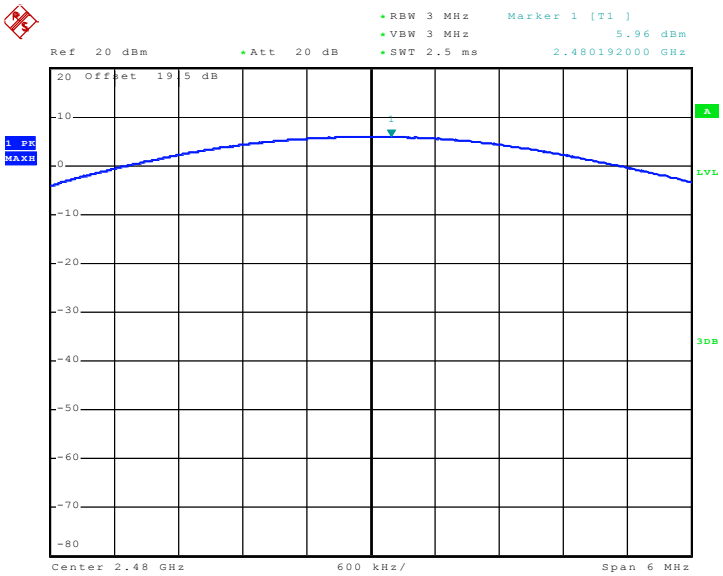
Date: 29.OCT.2010 01:28:55

Peak Output Power Plot on Channel 39



Date: 29.OCT.2010 01:31:27

Peak Output Power Plot on Channel 78



Date: 29.OCT.2010 01:47:47

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

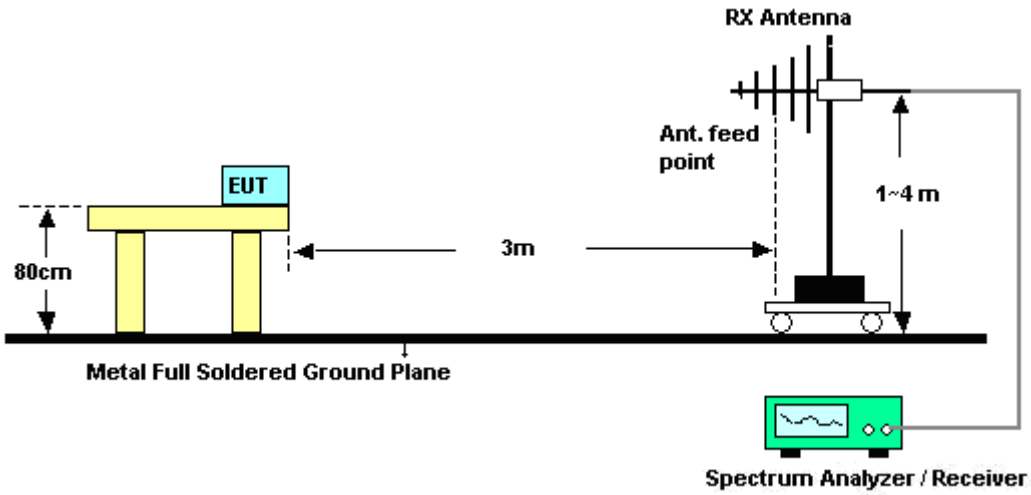
See list of measuring instruments of this test report.

3.6.3 Test Procedures

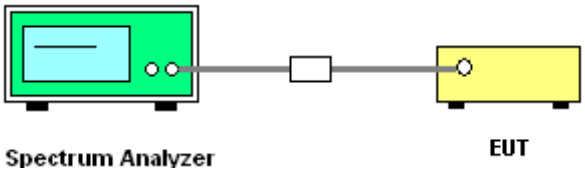
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300kHz, Video bandwidth (VBW) ≥ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured 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 :**	23~24 °C
Test Channel :	00	**Relative Humidity :**	46~47 %
		Test Engineer :	Kay Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBuV/m)**	**Over Limit (dB)**	**Limit Line (dBuV/m)**	**Read Level (dBuV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2353.89	52.31	-21.69	74	50.3	32.48	3.92	34.39	126	17	Peak
2353.89	37.13	-16.87	54	35.25	32.43	3.86	34.41	126	17	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBuV/m)**	**Over Limit (dB)**	**Limit Line (dBuV/m)**	**Read Level (dBuV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2369.85	49.66	-24.34	74	47.65	32.48	3.92	34.39	116	356	Peak
2369.85	36.73	-17.27	54	34.78	32.46	3.89	34.4	116	356	Average

Test Mode :	Mode 3	**Temperature :**	23~24 °C
Test Channel :	78	**Relative Humidity :**	46~47 %
		Test Engineer :	Kay Wu

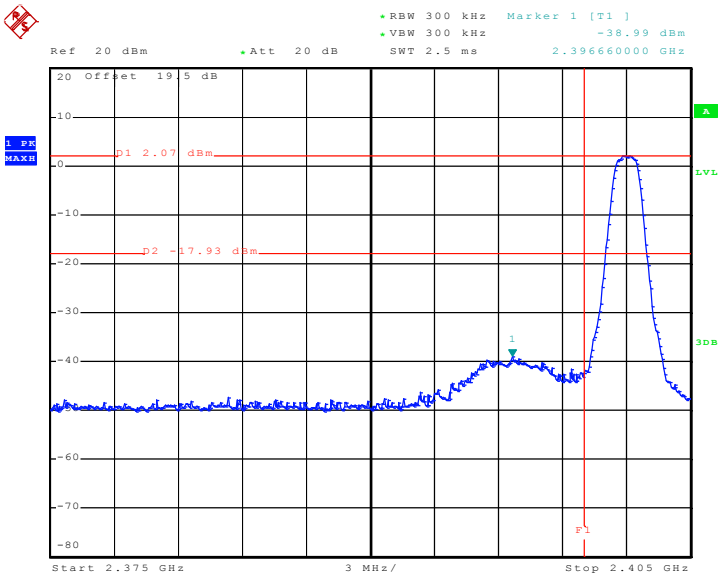
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBuV/m)**	**Over Limit (dB)**	**Limit Line (dBuV/m)**	**Read Level (dBuV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2483.5	62.9	-11.1	74	60.64	32.58	4.05	34.37	126	22	Peak
2483.5	50.61	-3.39	54	48.35	32.58	4.05	34.37	126	22	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBuV/m)**	**Over Limit (dB)**	**Limit Line (dBuV/m)**	**Read Level (dBuV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2483.5	60.87	-13.13	74	58.61	32.58	4.05	34.37	168	358	Peak
2483.5	49.18	-4.82	54	46.92	32.58	4.05	34.37	168	358	Average

3.6.6 Test Result of Conducted Band Edges

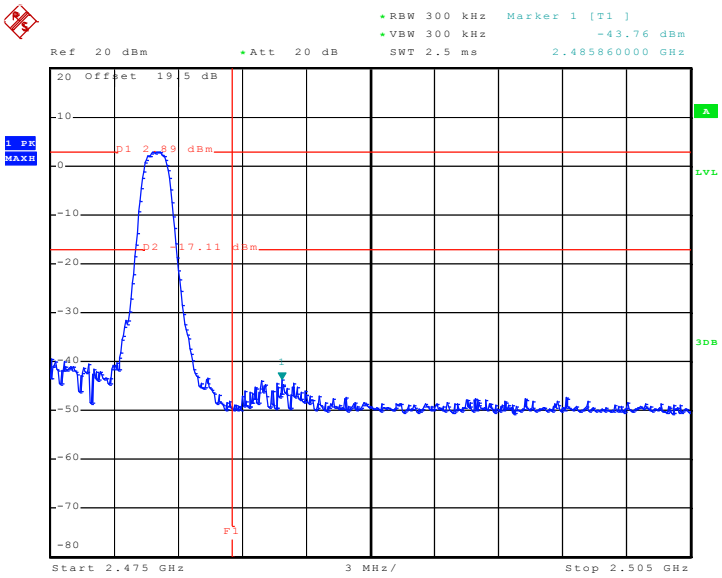
Test Mode :	Mode 4 and 6	Temperature :	25~27℃
Test Channel :	00 and 78	Relative Humidity :	40~43%
		Test Engineer :	Ken Hsu

Low Band Edge Plot on Channel 00



Date: 29.OCT.2010 02:26:24

High Band Edge Plot on Channel 78



Date: 29.OCT.2010 02:19:30

3.7 Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

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

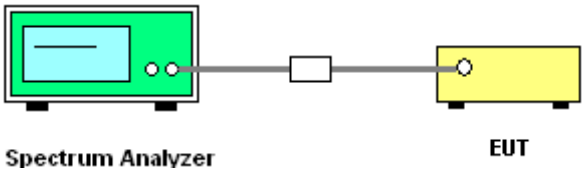
3.7.2 Measuring Instruments

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.

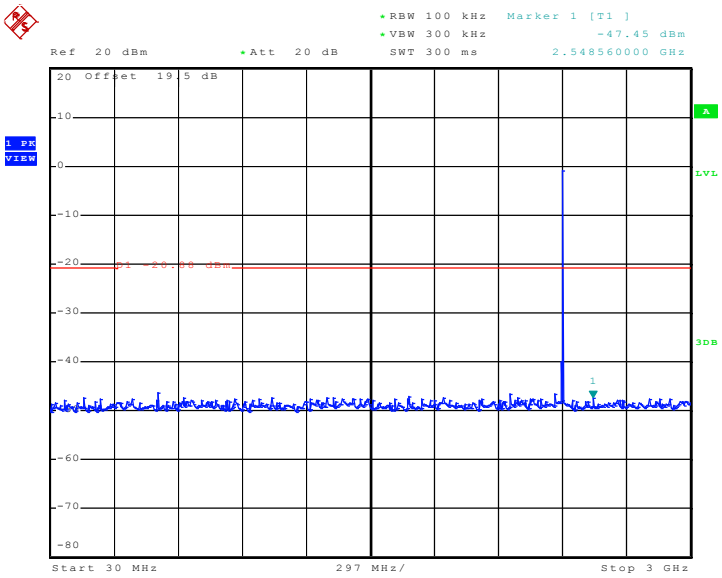
3.7.4 Test Setup



3.7.5 Test Result

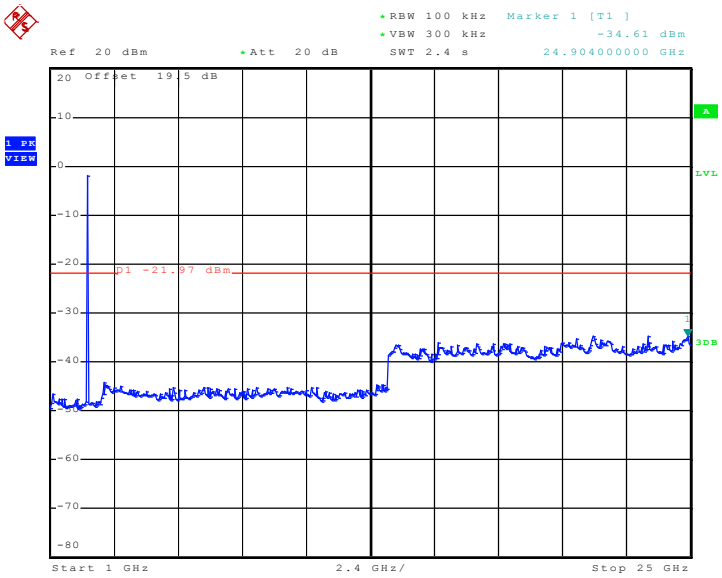
Test Mode :	Mode 4	Temperature :	25~27℃
Test Channel :	00	Relative Humidity :	40~43%
		Test Engineer :	Ken Hsu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.OCT.2010 03:13:57

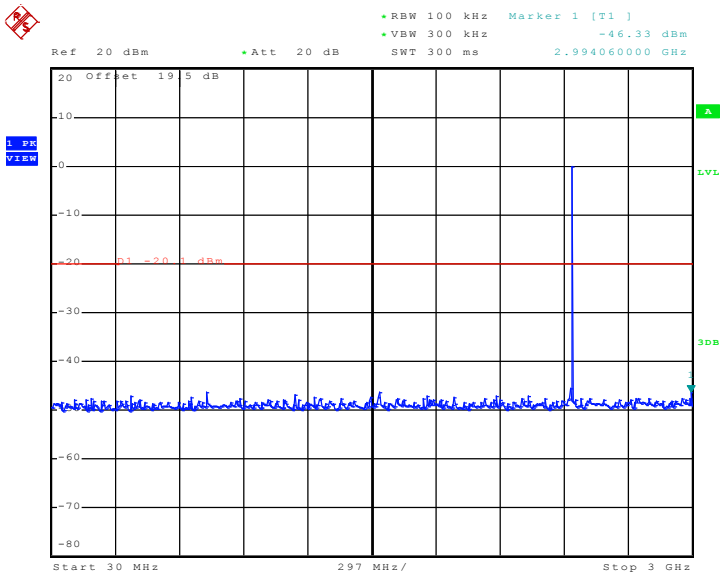
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



Date: 29.OCT.2010 03:14:22

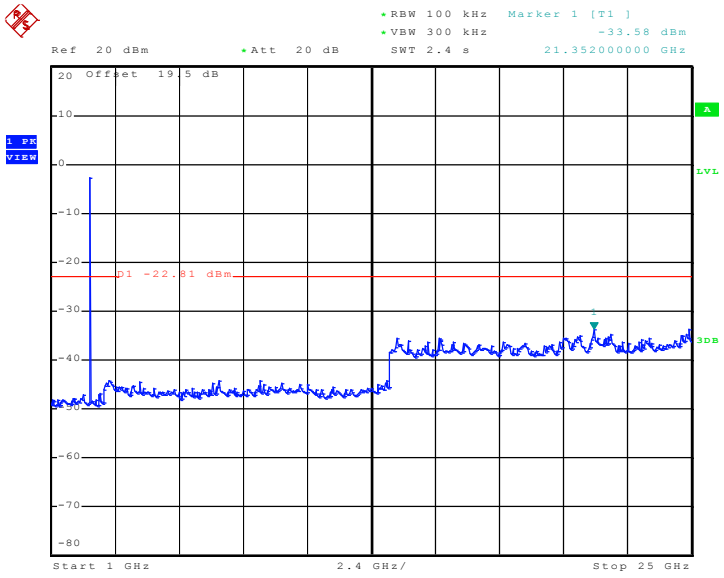
Test Mode :	Mode 5	**Temperature :**	25~27℃
Test Channel :	39	**Relative Humidity :**	40~43%
		Test Engineer :	Ken Hsu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.OCT.2010 03:14:38

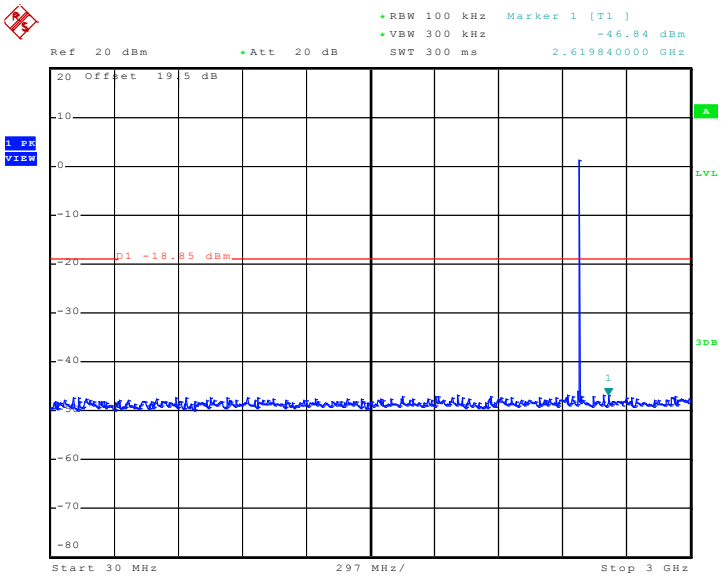
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



Date: 29.OCT.2010 03:15:01

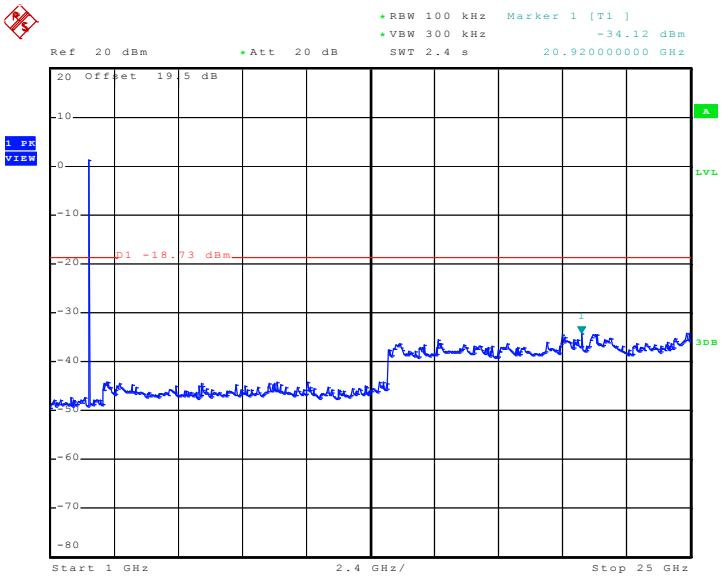
Test Mode :	Mode 6	Temperature :	25~27℃
Test Channel :	78	Relative Humidity :	40~43%
		Test Engineer :	Ken Hsu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.OCT.2010 03:15:42

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



Date: 29.OCT.2010 03:16:11

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.

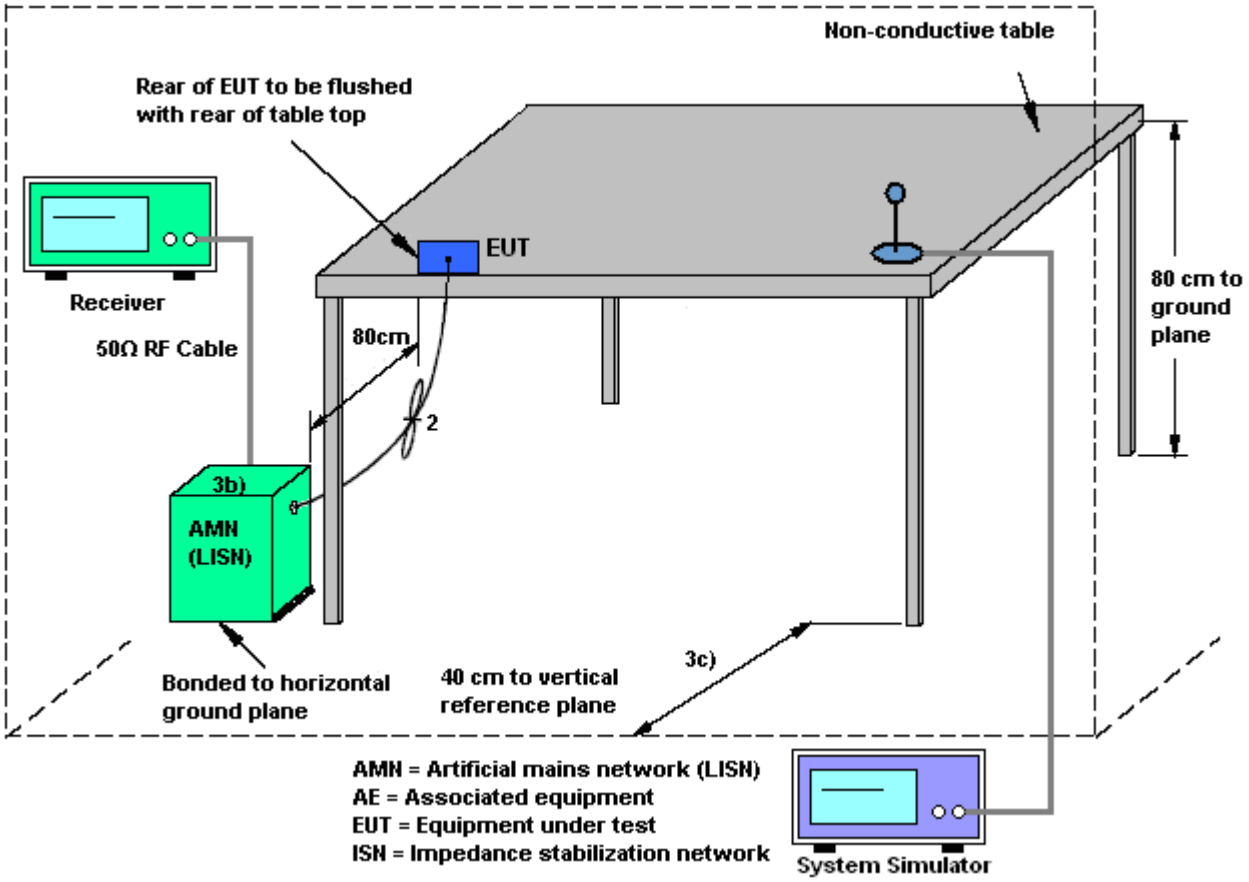
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

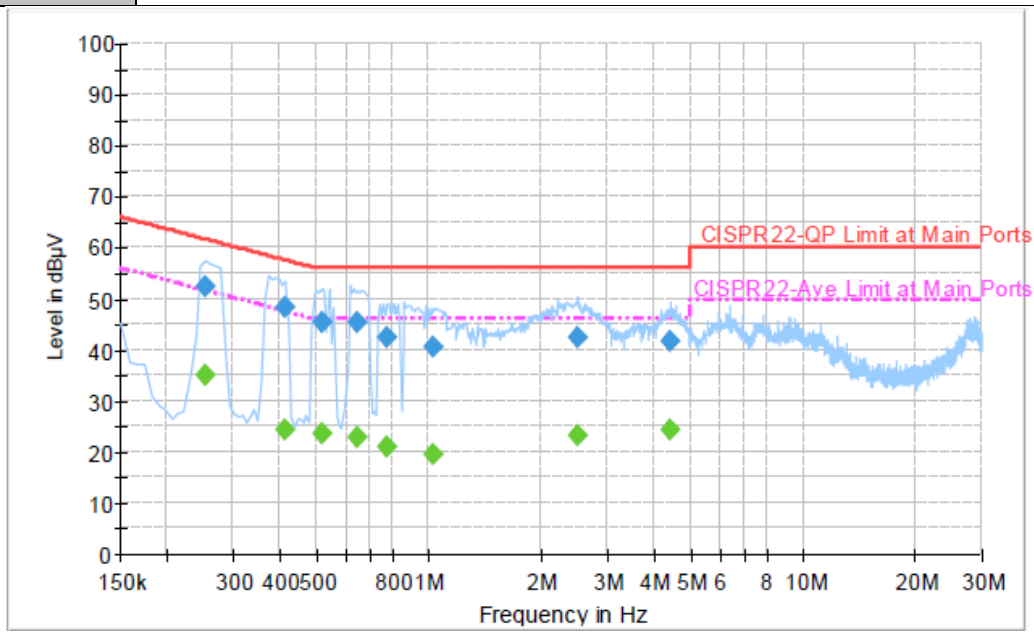
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All 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 2	**Temperature :**	20~22℃
Test Engineer :	Novic Chiang	**Relative Humidity :**	42~44%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WCDMA850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 2 + Battery 2 + USB Cable 2 (Charging from Adapter 2) for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



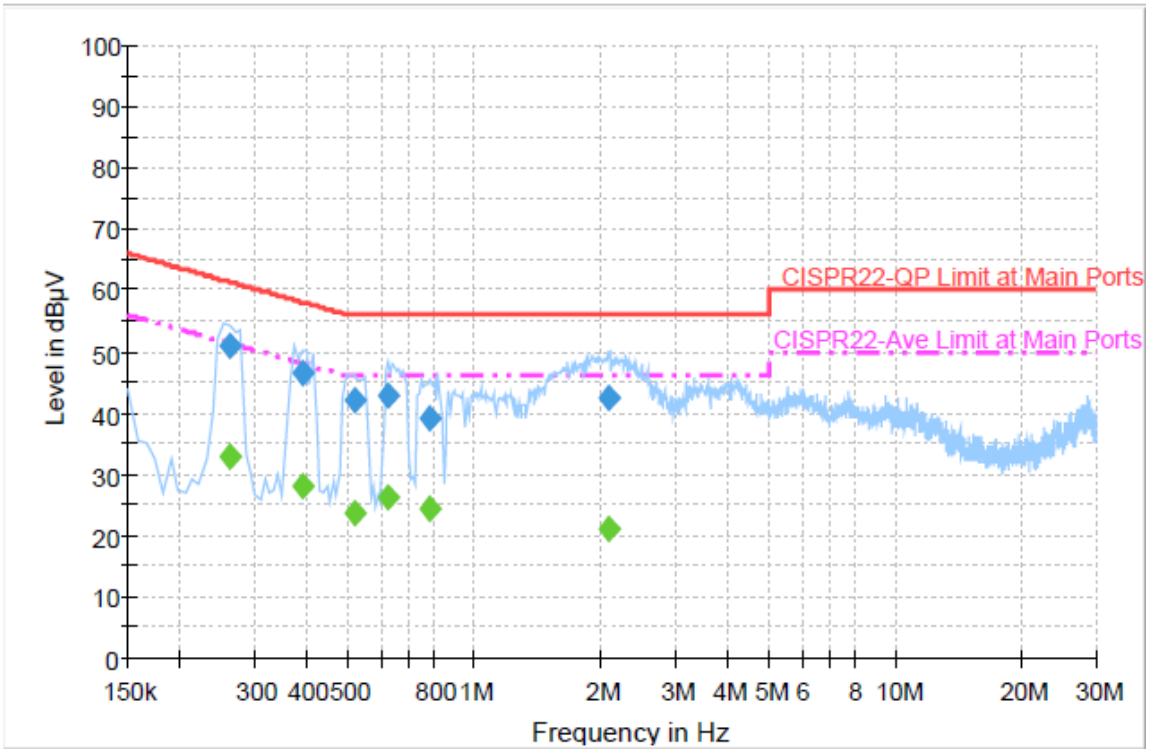
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.254000	52.5	Off	L1	19.3	9.1	61.6
0.414000	48.3	Off	L1	19.4	9.3	57.6
0.518000	45.3	Off	L1	19.3	10.7	56.0
0.646000	45.3	Off	L1	19.3	10.7	56.0
0.774000	42.4	Off	L1	19.4	13.6	56.0
1.030000	40.4	Off	L1	19.4	15.6	56.0
2.494000	42.3	Off	L1	19.4	13.7	56.0
4.422000	41.6	Off	L1	19.5	14.4	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.254000	34.9	Off	L1	19.3	16.7	51.6
0.414000	24.3	Off	L1	19.4	23.3	47.6
0.518000	23.7	Off	L1	19.3	22.3	46.0
0.646000	23.1	Off	L1	19.3	22.9	46.0
0.774000	20.9	Off	L1	19.4	25.1	46.0
1.030000	19.7	Off	L1	19.4	26.3	46.0
2.494000	23.1	Off	L1	19.4	22.9	46.0
4.422000	24.2	Off	L1	19.5	21.8	46.0

Test Mode :	Mode 2	Temperature :	20~22℃
Test Engineer :	Novic Chiang	Relative Humidity :	42~44%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 2 + Battery 2 + USB Cable 2 (Charging from Adapter 2) for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.262000	50.8	Off	N	19.4	10.6	61.4
0.390000	46.4	Off	N	19.4	11.7	58.1
0.518000	42.0	Off	N	19.3	14.0	56.0
0.622000	42.7	Off	N	19.3	13.3	56.0
0.782000	39.3	Off	N	19.4	16.7	56.0
2.078000	42.5	Off	N	19.5	13.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.262000	33.0	Off	N	19.4	18.4	51.4
0.390000	27.9	Off	N	19.4	20.2	48.1
0.518000	23.7	Off	N	19.3	22.3	46.0
0.622000	26.0	Off	N	19.3	20.0	46.0
0.782000	24.4	Off	N	19.4	21.6	46.0
2.078000	21.0	Off	N	19.5	25.0	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

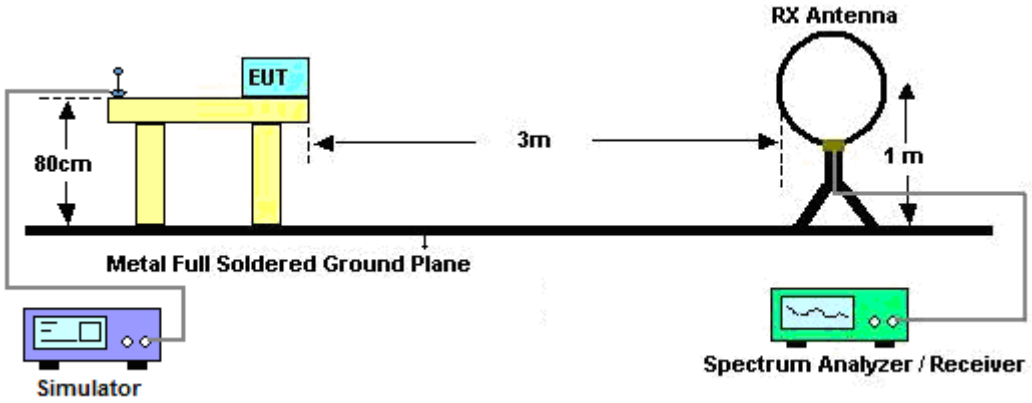
See list of measuring instruments of this test report.

3.9.3 Test Procedures

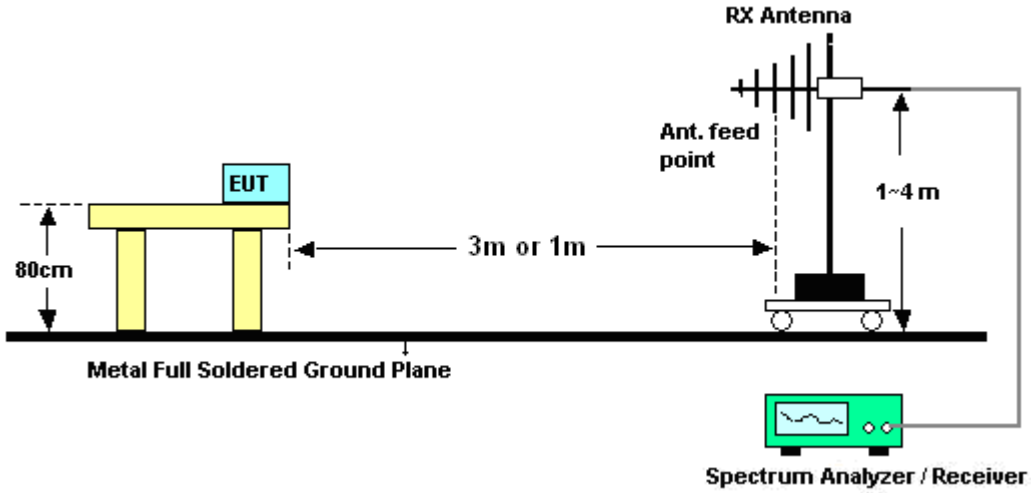
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
   (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function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

3.9.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



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

Test Engineer :	Kay Wu	Temperature :	23~24 °C
		Relative Humidity :	46~47 %

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

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

Test Mode :	Mode 1	**Temperature :**	23~24 °C
Test Channel :	00	**Relative Humidity :**	46~47 %
Test Engineer :	Kay Wu	**Polarization :**	Horizontal
Remark :	2402 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
39.99	21.44	-18.56	40	39.44	12.81	0.81	31.62	100	69	Peak
90.48	22.88	-20.62	43.5	44.44	8.93	1.14	31.63	-	-	Peak
149.88	24.84	-18.66	43.5	44.46	10.3	1.46	31.38	-	-	Peak
460.3	24.13	-21.87	46	36.33	16.76	2.54	31.5	-	-	Peak
549.9	23.07	-22.93	46	33.71	18.09	2.85	31.58	-	-	Peak
875.4	24.51	-21.49	46	31.36	20.57	3.65	31.07	-	-	Peak
2353.89	52.31	-21.69	74	50.3	32.48	3.92	34.39	126	17	Peak
2353.89	37.13	-16.87	54	35.25	32.43	3.86	34.41	126	17	Average
2402	98.67	-	-	96.64	32.5	3.92	34.39	126	17	Peak
2402	83.04	-	-	81.01	32.5	3.92	34.39	126	17	Average
2494	47.78	-26.22	74	45.5	32.6	4.05	34.37	126	17	Peak
2494	36.38	-17.62	54	34.1	32.6	4.05	34.37	126	17	Average
8277	54.51	-19.49	74	45.05	36.14	7.33	34.01	100	152	Peak
8277	41.48	-12.52	54	32.02	36.14	7.33	34.01	100	152	Average

Test Mode :	Mode 1	Temperature :	23~24 °C
Test Channel :	00	Relative Humidity :	46~47 %
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	2402 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
35.13	24.23	-15.77	40	39.21	15.88	0.74	31.6	-	-	Peak
48.63	27.01	-12.99	40	46.89	10.91	0.84	31.63	100	82	Peak
139.89	23.78	-19.72	43.5	42.77	11.1	1.44	31.53	-	-	Peak
579.3	27.74	-18.26	46	38.04	18.46	2.89	31.65	-	-	Peak
677.3	28.95	-17.05	46	38.31	19.12	3.17	31.65	-	-	Peak
911.8	24.97	-21.03	46	31.29	20.78	3.77	30.87	-	-	Peak
2369.85	49.66	-24.34	74	47.65	32.48	3.92	34.39	116	356	Peak
2369.85	36.73	-17.27	54	34.78	32.46	3.89	34.4	116	356	Average
2402	96.36	-	-	94.33	32.5	3.92	34.39	116	356	Peak
2402	80.92	-	-	78.91	32.48	3.92	34.39	116	356	Average
2494	47.6	-26.4	74	45.32	32.6	4.05	34.37	116	356	Peak
2494	36.36	-17.64	54	34.08	32.6	4.05	34.37	116	356	Average
8277	55.02	-18.98	74	45.56	36.14	7.33	34.01	100	139	Peak
8277	41.95	-12.05	54	32.49	36.14	7.33	34.01	100	139	Average

Test Mode :	Mode 2	Temperature :	23~24 °C
Test Channel :	39	Relative Humidity :	46~47 %
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	2441 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.48	24.37	-15.63	40	40.56	14.65	0.77	31.61	-	-	Peak
89.94	24.49	-19.01	43.5	46.05	8.93	1.14	31.63	-	-	Peak
152.58	26.31	-17.19	43.5	45.98	10.26	1.46	31.39	100	283	Peak
542.9	22.54	-23.46	46	33.27	18.01	2.83	31.57	-	-	Peak
624.8	24.44	-21.56	46	34.27	18.85	2.98	31.66	-	-	Peak
941.9	24.7	-21.3	46	30.66	20.9	3.79	30.65	-	-	Peak
2334	48.43	-25.57	74	46.59	32.39	3.86	34.41	100	16	Peak
2334	36.67	-17.33	54	34.83	32.39	3.86	34.41	100	16	Average
2441	99.3	-	-	97.15	32.54	3.99	34.38	100	16	Peak
2441	83.76	-	-	81.61	32.54	3.99	34.38	100	16	Average
2492	47.66	-26.34	74	45.38	32.6	4.05	34.37	100	16	Peak
2492	36.44	-17.56	54	34.16	32.6	4.05	34.37	100	16	Average
8202	55.14	-18.86	74	45.59	36.16	7.38	33.99	100	193	Peak
8202	41.61	-12.39	54	32.06	36.16	7.38	33.99	100	193	Average

Test Mode :	Mode 2	Temperature :	23~24 °C
Test Channel :	39	Relative Humidity :	46~47 %
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	2441 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.78	23.67	-16.33	40	38.14	16.41	0.74	31.62	100	282	Peak
39.18	22.84	-17.16	40	40.24	13.42	0.8	31.62	-	-	Peak
149.34	24.13	-19.37	43.5	43.69	10.37	1.46	31.39	-	-	Peak
621.3	26.98	-19.02	46	36.84	18.83	2.98	31.67	-	-	Peak
747.3	28.06	-17.94	46	36.7	19.63	3.35	31.62	-	-	Peak
838.3	29.48	-16.52	46	36.92	20.32	3.5	31.26	-	-	Peak
2342	48.88	-25.12	74	47.02	32.41	3.86	34.41	144	17	Peak
2342	36.67	-17.33	54	34.81	32.41	3.86	34.41	144	17	Average
2441	96.84	-	-	94.69	32.54	3.99	34.38	144	17	Peak
2441	81.66	-	-	79.51	32.54	3.99	34.38	144	17	Average
2486	48.1	-25.9	74	45.84	32.58	4.05	34.37	144	17	Peak
2486	36.37	-17.63	54	34.11	32.58	4.05	34.37	144	17	Average
8214	54.65	-19.35	74	45.11	36.16	7.37	33.99	100	48	Peak
8214	41.62	-12.38	54	32.08	36.16	7.37	33.99	100	48	Average

Test Mode :	Mode 3	Temperature :	23~24 °C
Test Channel :	78	Relative Humidity :	46~47 %
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	19.35	-20.65	40	31.8	18.51	0.72	31.68	-	-	Peak
89.13	21.73	-21.77	43.5	43.45	8.77	1.13	31.62	-	-	Peak
144.48	25.58	-17.92	43.5	44.85	10.74	1.45	31.46	100	36	Peak
460.3	24.78	-21.22	46	36.98	16.76	2.54	31.5	-	-	Peak
619.9	27.49	-18.51	46	37.37	18.82	2.97	31.67	-	-	Peak
875.4	24.88	-21.12	46	31.73	20.57	3.65	31.07	-	-	Peak
2324	48.28	-25.72	74	46.48	32.39	3.82	34.41	126	22	Peak
2324	36.57	-17.43	54	34.77	32.39	3.82	34.41	126	22	Average
2480	98.39	-	-	96.13	32.58	4.05	34.37	126	22	Peak
2480	82.58	-	-	80.32	32.58	4.05	34.37	126	22	Average
2483.5	62.9	-11.1	74	60.64	32.58	4.05	34.37	126	22	Peak
2483.5	50.61	-3.39	54	48.35	32.58	4.05	34.37	126	22	Average
8205	54.52	-19.48	74	44.97	36.16	7.38	33.99	100	293	Peak
8205	41.14	-12.86	54	31.59	36.16	7.38	33.99	100	293	Average

Test Mode :	Mode 3	Temperature :	23~24 °C
Test Channel :	78	Relative Humidity :	46~47 %
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
34.59	25.41	-14.59	40	40.39	15.88	0.74	31.6	100	209	Peak
142.59	27.06	-16.44	43.5	46.22	10.88	1.45	31.49	-	-	Peak
176.88	23.07	-20.43	43.5	43.59	9.44	1.56	31.52	-	-	Peak
460.3	21.83	-24.17	46	34.03	16.76	2.54	31.5	-	-	Peak
619.9	26.69	-19.31	46	36.57	18.82	2.97	31.67	-	-	Peak
904.8	25.22	-20.78	46	31.63	20.75	3.76	30.92	-	-	Peak
2358	48.86	-25.14	74	46.94	32.43	3.89	34.4	168	358	Peak
2358	36.74	-17.26	54	34.82	32.43	3.89	34.4	168	358	Average
2480	96.07	-	-	93.81	32.58	4.05	34.37	168	358	Peak
2480	80.42	-	-	78.16	32.58	4.05	34.37	168	358	Average
2483.5	60.87	-13.13	74	58.61	32.58	4.05	34.37	168	358	Peak
2483.5	49.18	-4.82	54	46.92	32.58	4.05	34.37	168	358	Average
8229	54.76	-19.24	74	45.22	36.16	7.37	33.99	100	189	Peak
8229	41.68	-12.32	54	32.14	36.16	7.37	33.99	100	189	Average

Test Mode :	Mode 4	Temperature :	23~24 °C
Test Channel :	78	Relative Humidity :	46~47 %
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
89.94	30.58	-12.92	43.5	51.99	9.08	1.14	31.63	-	-	Peak
141.24	31.72	-11.78	43.5	50.51	11.27	1.44	31.5	100	78	Peak
207.39	29.7	-13.8	43.5	49.62	9.86	1.69	31.47	-	-	Peak
462.4	26.33	-19.67	46	38.24	17.05	2.54	31.5	-	-	Peak
616.4	28.39	-17.61	46	37.89	19.21	2.96	31.67	-	-	Peak
703.9	29.12	-16.88	46	38.08	19.44	3.28	31.68	-	-	Peak
2342	48.48	-25.52	74	46.62	32.41	3.86	34.41	100	31	Peak
2342	36.7	-17.3	54	34.84	32.41	3.86	34.41	100	31	Average
2480	98.81	-	-	96.55	32.58	4.05	34.37	100	31	Peak
2480	82.65	-	-	80.39	32.58	4.05	34.37	100	31	Average
2483.5	63.37	-10.63	74	61.11	32.58	4.05	34.37	100	31	Peak
2483.5	50.67	-3.33	54	48.41	32.58	4.05	34.37	100	31	Average
8229	54.25	-19.75	74	44.71	36.16	7.37	33.99	100	251	Peak
8229	41.09	-12.91	54	31.55	36.16	7.37	33.99	100	251	Average

Test Mode :	Mode 4	Temperature :	23~24 °C
Test Channel :	78	Relative Humidity :	46~47 %
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.08	31.89	-8.11	40	45.52	17.31	0.72	31.66	-	-	Peak
41.88	26.98	-13.02	40	46.02	11.78	0.81	31.63	-	-	Peak
137.19	36.72	-6.78	43.5	55.35	11.47	1.43	31.53	100	39	Peak
300	25.5	-20.5	46	41.45	13.46	2.06	31.47	-	-	Peak
547.8	27.81	-18.19	46	38.08	18.47	2.84	31.58	-	-	Peak
701.8	30.25	-15.75	46	39.24	19.42	3.27	31.68	-	-	Peak
2310	48.36	-25.64	74	46.58	32.37	3.82	34.41	131	7	Peak
2310	36.68	-17.32	54	34.9	32.37	3.82	34.41	131	7	Average
2480	97.69	-	-	95.43	32.58	4.05	34.37	131	7	Peak
2480	81.78	-	-	79.52	32.58	4.05	34.37	131	7	Average
2483.5	62.31	-11.69	74	60.05	32.58	4.05	34.37	131	7	Peak
2483.5	49.9	-4.1	54	47.64	32.58	4.05	34.37	131	7	Average
8022	54.47	-19.53	74	44.72	36.2	7.5	33.95	100	116	Peak
8022	41.04	-12.96	54	31.29	36.2	7.5	33.95	100	116	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	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Mar. 19, 2009	Mar. 18, 2011	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 13, 2010	Sep. 12, 2011	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 14, 2010	Sep. 13, 2011	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 30,2010	Jul. 29, 2011	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 16, 2010	Aug. 15, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz~30MHz	Nov. 30, 2009	Nov. 29, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 23, 2009	Nov. 22, 2010	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000MHz	Apr. 28, 2010	Apr. 27, 2011	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 31, 2010	Oct. 31, 2011	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 02, 2010	Aug. 01, 2011	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Oct. 20,2010	Oct.19,2011	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH06-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**				