

FCC RF Test Report

APPLICANT : PEGATRON CORPORATION
EQUIPMENT : Tablet
BRAND NAME : TOSHIBA, Excite
MODEL NAME : TOSHIBA AT330, Excite 13 AT330, Excite 13 AT335
FCC ID : VUIPDT4330LB
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DSS) Spread Spectrum Transmitter

The product was received on Mar. 15, 2012 and completely tested on Apr. 22, 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 / Manager



SPORTON INTERNATIONAL INC.

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

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : VUIPDT4330LB

Page Number : 1 of 57

Report Issued Date : Apr. 30, 2012

Report Version : Rev. 01



TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Feature of Equipment Under Test	5
1.4 Testing Site	6
1.5 Applied Standards	6
1.6 Ancillary Equipment List	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 RF Output Power	8
2.2 Test Mode	9
2.3 Connection Diagram of Test System	10
2.4 RF Utility	11
3 TEST RESULT	12
3.1 Number of Channel Measurement	12
3.2 20dB and 99% Bandwidth Measurement	14
3.3 Hopping Channel Separation Measurement	27
3.4 Dwell Time Measurement	30
3.5 Peak Output Power Measurement	32
3.6 Band Edges Measurement	35
3.7 Spurious Emission Measurement	39
3.8 AC Conducted Emission Measurement	43
3.9 Radiated Emission Measurement	47
3.10 Antenna Requirements	54
4 LIST OF MEASURING EQUIPMENT	55
5 UNCERTAINTY OF EVALUATION	56
APPENDIX A. PHOTOGRAPHS OF EUT	
APPENDIX B. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR232266A	Rev. 01	Initial issue of report	Apr. 30, 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	$\geq 15\text{Chs}$	Pass	-
3.2	15.247(a)(1)	A8.1(a)	20dB Bandwidth	NA	Pass	-
3.2	-	Gen 4.6.1	99% Bandwidth	-	Pass	-
3.3	15.247(a)(1)	A8.1(b)	Channel Separation	$\geq 2/3$ of 20dB BW	Pass	-
3.4	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	$\leq 0.4\text{sec}$ in 31.6sec period	Pass	-
3.5	15.247(b)(1)	A8.1(b)	Peak Output Power	$\leq 125\text{ mW}$	Pass	-
3.6	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.7	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.8	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 8.70 dB at 0.182 MHz
3.9	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.01 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

PEGATRON CORPORATION

No. 76, Ligong St., Beitou District, Taipei City 11261

1.2 Manufacturer

PEGATRON CORPORATION

No. 76, Ligong St., Beitou District, Taipei City 11261

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Tablet
Brand Name	TOSHIBA, Excite
Model Name	TOSHIBA AT330, Excite 13 AT330, Excite 13 AT335
FCC ID	VUIPDT4330LB
Sample 1	EUT with 16G eMMC
Sample 2	EUT with 32G eMMC
Sample 3	EUT with 64G eMMC
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) : 2.37 dBm (0.0017 W) Bluetooth EDR (2Mbps) : 2.01 dBm (0.0016 W) Bluetooth EDR (3Mbps) : 2.51 dBm (0.0018 W)
Antenna Type	Chip Antenna with gain 4.20 dBi
Type of Antenna Connector	I-PEX connector
HW Version	1.02
SW Version	Android 4.0.3
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The model names (TOSHIBA AT330, Excite 13 AT330, Excite 13 AT335) are identical on hardware. The only difference is the label of different branding for different customer.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st 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 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.	Bluetooth Base Station	R&S	CBT32	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	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	LCD Monitor	HANNspree	ST19ZOO_CN	N/A	Shielded, 1.6 m	Unshielded, 1.8 m
6.	Bluetooth Earphone	Sony Ericsson	MW600	PY70DA2029	N/A	N/A
7.	Earphone	Ergotech	ET-E200	FCC DoC	Unshielded, 1.8 m	N/A
8.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 1.0 m	N/A
9.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Output Power

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

Band	Bluetooth RF Output Power		
Channel	00	39	78
Frequency	2402	2441	2480
Peak Power	1.57	2.51	2.27

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).

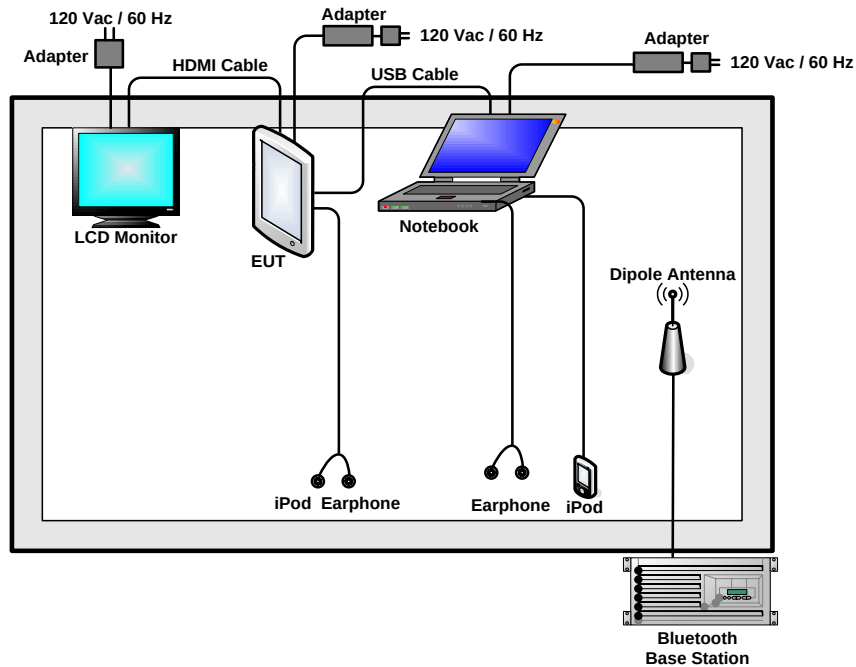
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations, laptop / tablet modes.

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

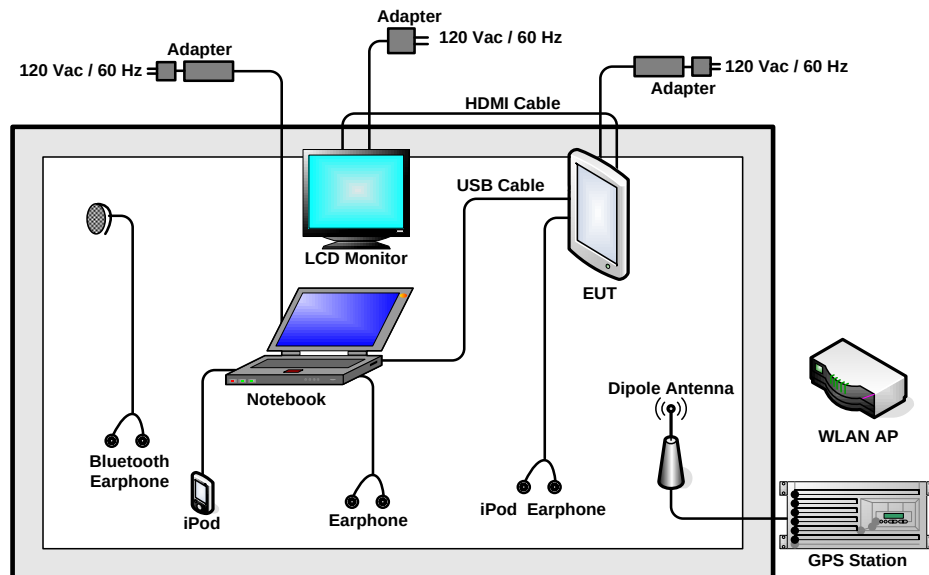
Test Cases			
Test Item	Data Rate / Modulation		
	Bluetooth 1Mbps GFSK	Bluetooth EDR 2Mbps $\pi/4$ -DQPSK	Bluetooth EDR 3Mbps 8-DPSK
Conducted TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated TCs	N/A	N/A	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz
AC Conducted Emission	Mode 1 : WLAN Link + Bluetooth Link + GPS Rx + Adapter 1 + TC for Sample 2 Mode 2 : WLAN Link + Bluetooth Link + MPEG4 + Adapter 2 + TC for Sample 1 Mode 3 : WLAN Link + Bluetooth Link + Camera + Adapter 3 + TC for Sample 1 Mode 4 : WLAN Link + Bluetooth Link + H-Pattern + Adapter 4 + TC for Sample 3		
Remark:			
1. TC stands for Test Configuration, and consists of HDMI Cable, iPod earphone, USB Cable (Data Link with NB), and SD Card.			
2. For radiated TCs, the data rate was set in 3Mbps due to the highest RF output power; only the data of these modes was reported.			
3. For conducted emission, the worst case is mode 1; only the test data of this mode was reported.			
4. Link with Notebook means data application transferred mode between EUT and Notebook.			
5. For radiated TCs, all the tests were performance with Adapter 4 and Sample 2.			

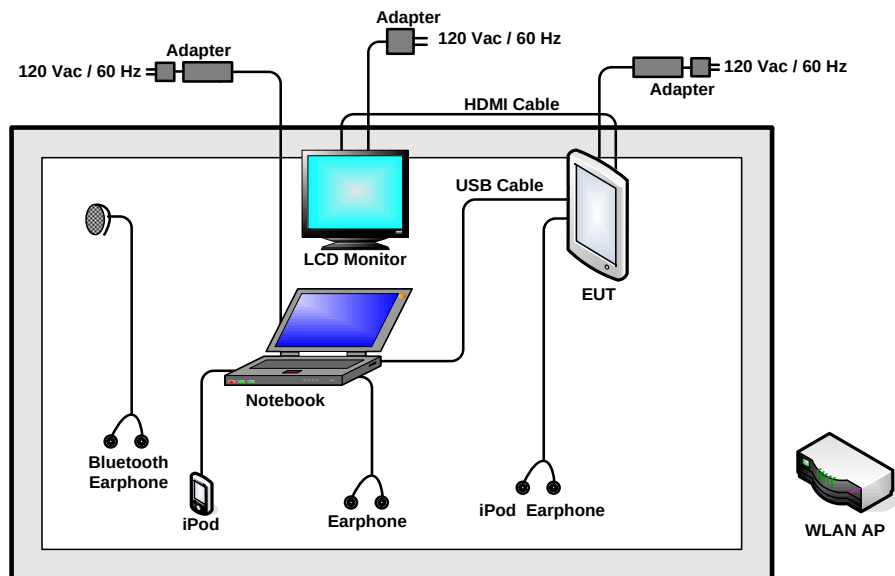
2.3 Connection Diagram of Test System

<Bluetooth Tx Mode>



<AC Conducted Emission in GPS Rx Mode>



<AC Conducted Emission Mode>


2.4 RF Utility

For Bluetooth function, the RF utility, execute “ADB” was installed in EUT which was programmed in order to make the EUT 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.

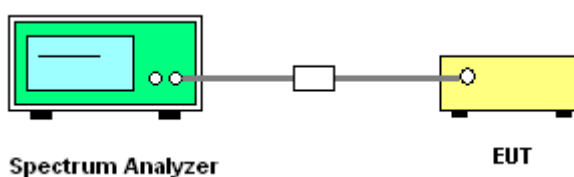
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

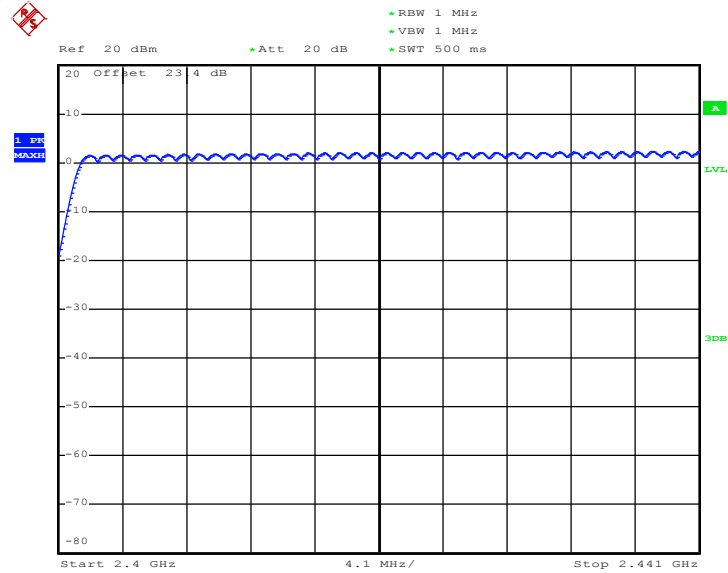
1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The modulation types of EUT are irrelevant to number of hopping channels deviation.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = the frequency band of operation; RBW $\geq$ 1% of the span; VBW $\geq$ 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

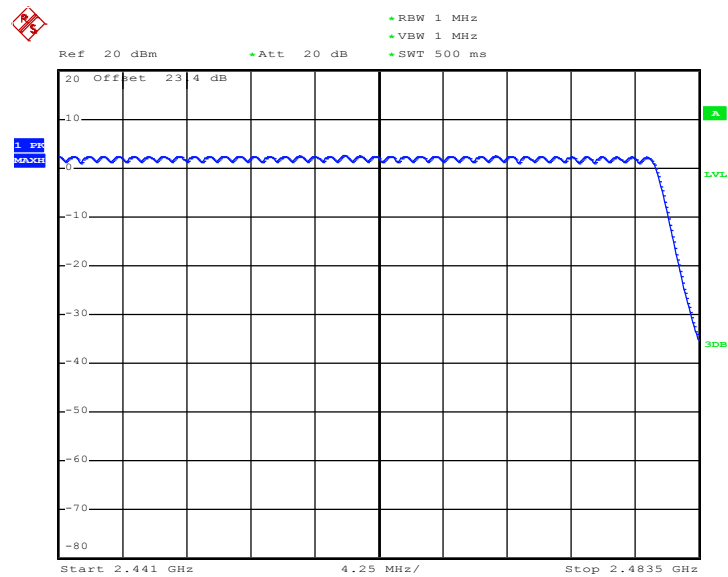


3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	Mode 7~9	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%
Number of Hopping Channels (Channel)		Limits (Channel)	Pass/Fail
79		> 15	Pass

Number of Hopping Channel Plot on Channel 00 - 78


Date: 19.MAR.2012 21:17:38



Date: 19.MAR.2012 21:24:45

3.2 20dB and 99% Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

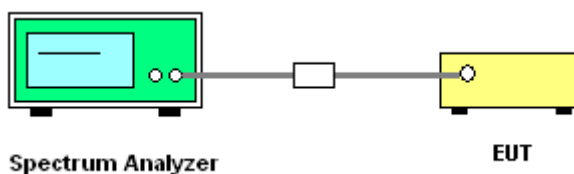
3.2.2 Measuring Instruments

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 $\geq$ 1% of the 20 dB bandwidth; VBW $\geq$ 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

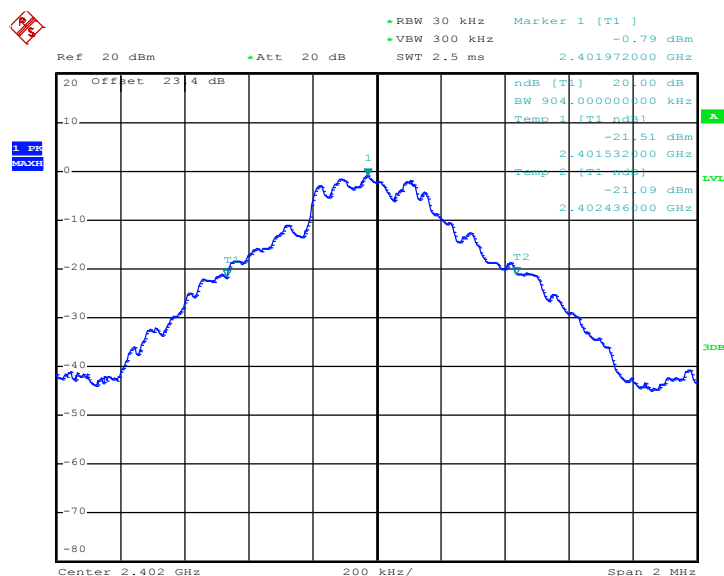


3.2.5 Test Result of 20dB Bandwidth

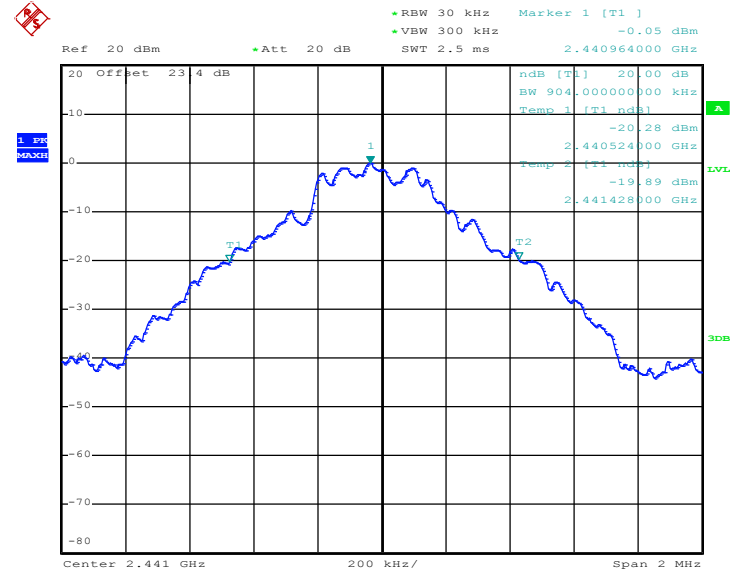
Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.904
39	2441	0.904
78	2480	0.900

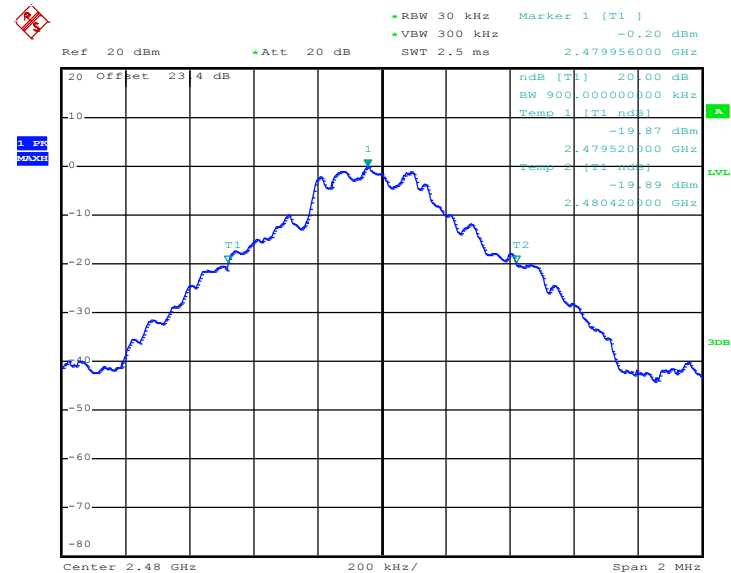
20 dB Bandwidth Plot on Channel 00



Date: 19.MAR.2012 20:44:42

20 dB Bandwidth Plot on Channel 39


Date: 19.MAR.2012 20:45:05

20 dB Bandwidth Plot on Channel 78


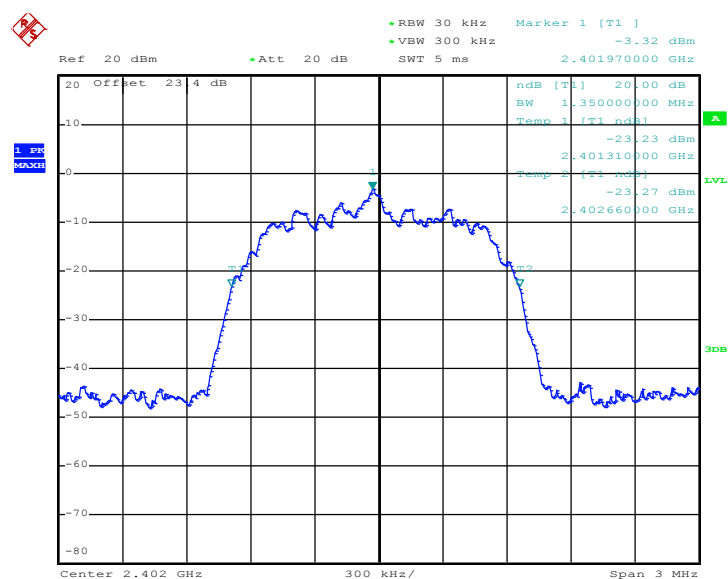
Date: 19.MAR.2012 20:45:43



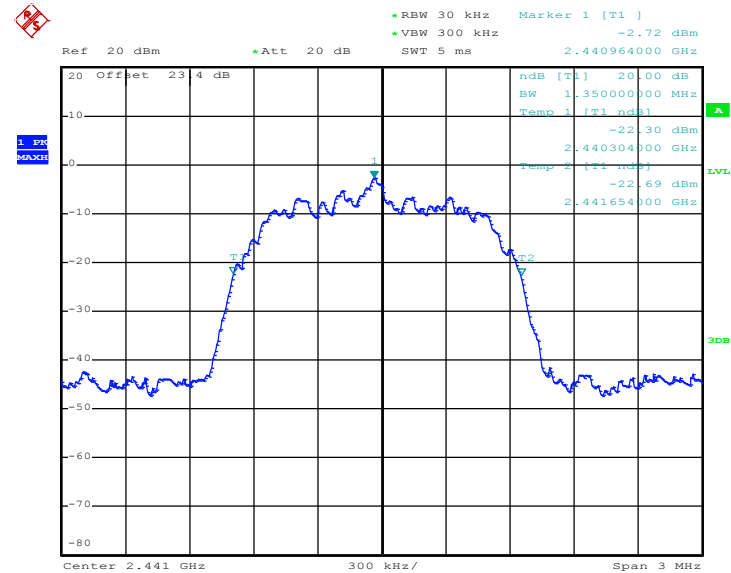
Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.350
39	2441	1.350
78	2480	1.350

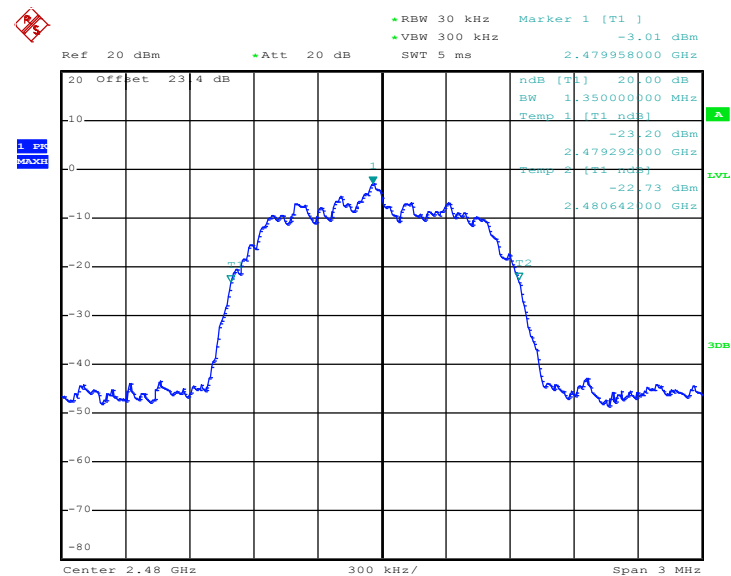
20 dB Bandwidth Plot on Channel 00



Date: 19.MAR.2012 20:46:26

20 dB Bandwidth Plot on Channel 39


Date: 19.MAR.2012 20:47:09

20 dB Bandwidth Plot on Channel 78


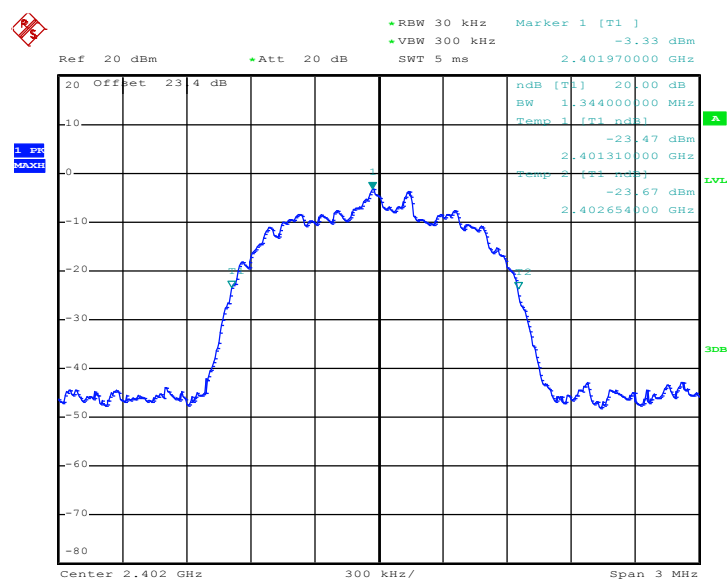
Date: 19.MAR.2012 20:47:38



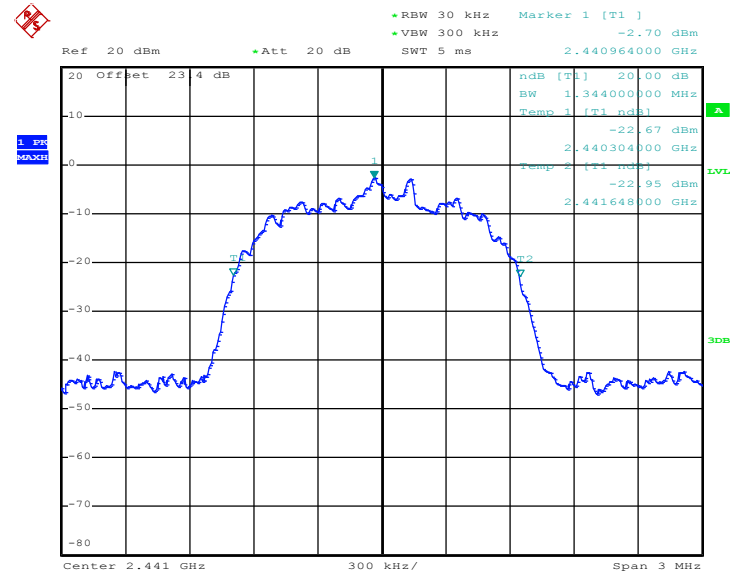
Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.344
39	2441	1.344
78	2480	1.338

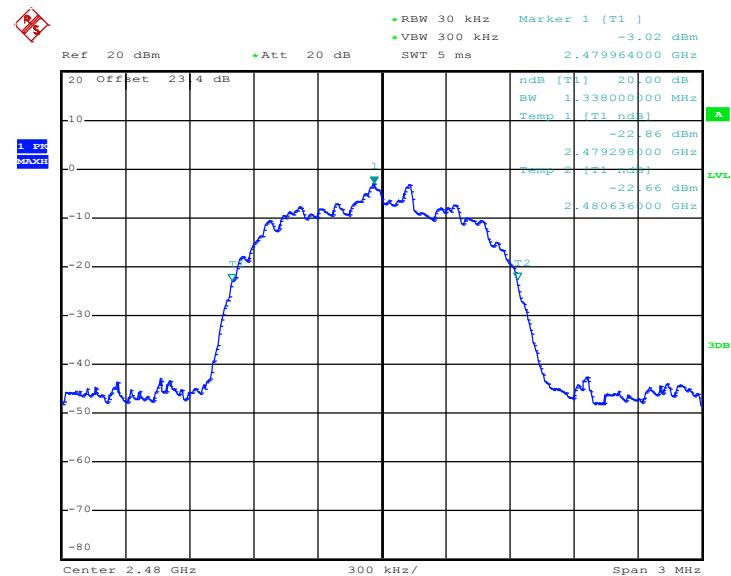
20 dB Bandwidth Plot on Channel 00



Date: 19.MAR.2012 20:48:26

20 dB Bandwidth Plot on Channel 39


Date: 19.MAR.2012 20:49:31

20 dB Bandwidth Plot on Channel 78


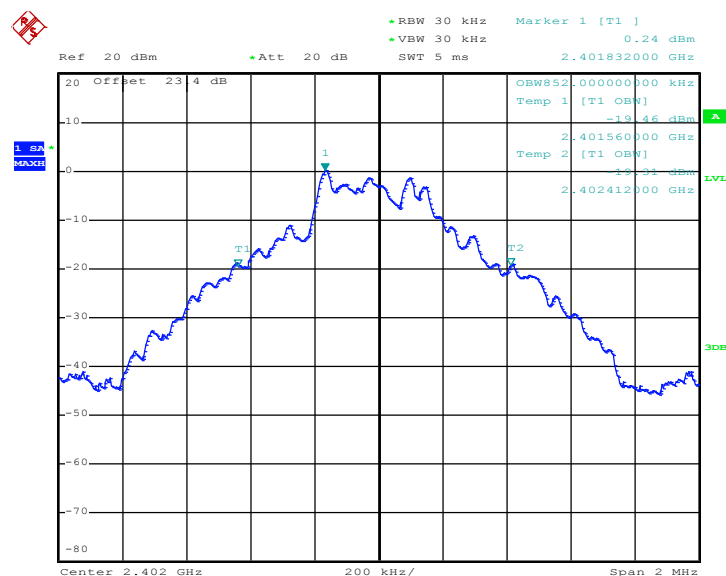
Date: 19.MAR.2012 20:49:53

3.2.6 Test Result of 99% Occupied Bandwidth

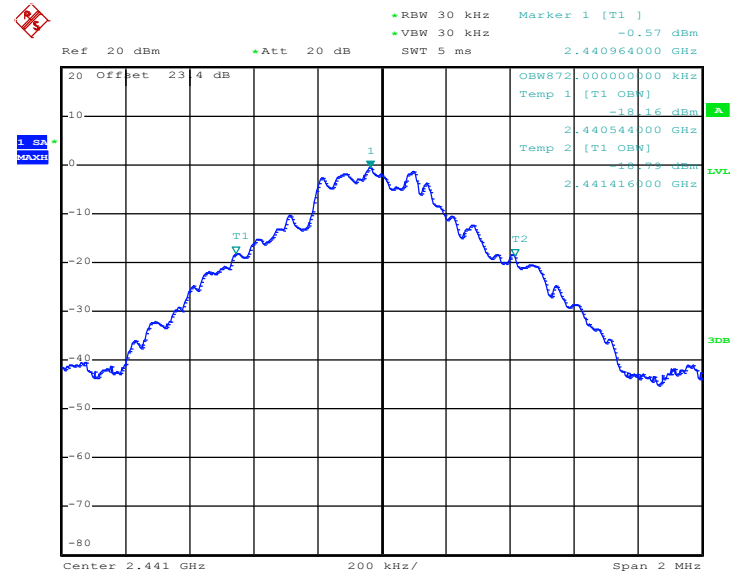
Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	0.852
39	2441	0.872
78	2480	0.872

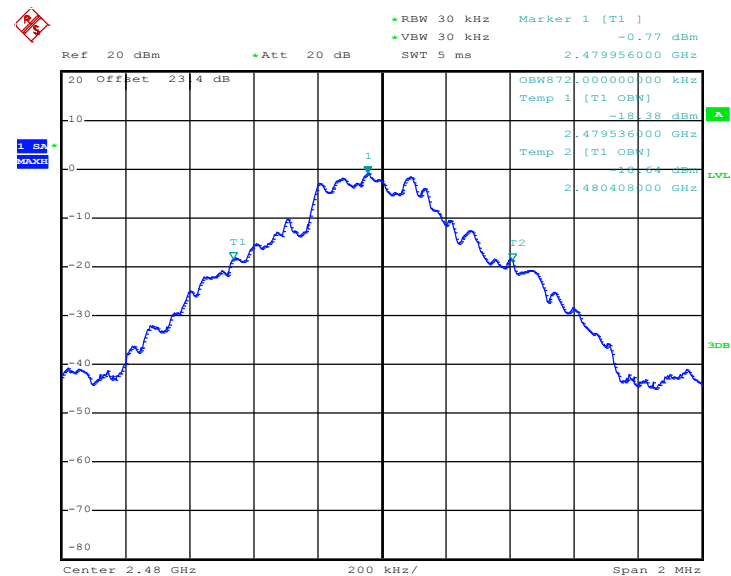
99% Bandwidth Plot on Channel 00



Date: 19.MAR.2012 20:56:20

99% Occupied Bandwidth Plot on Channel 39


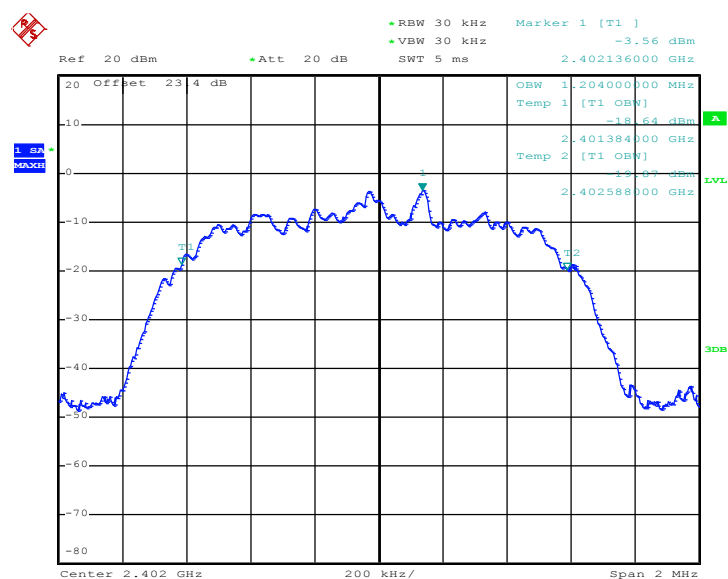
Date: 19.MAR.2012 20:56:57

99% Occupied Bandwidth Plot on Channel 78


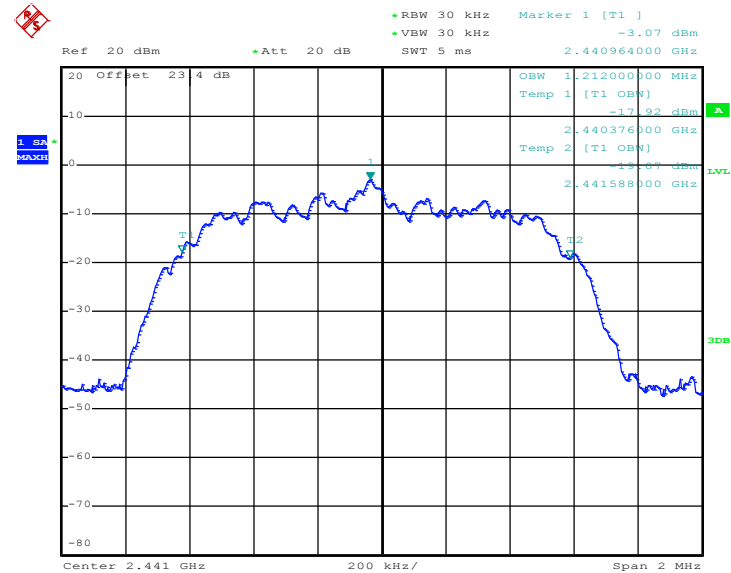
Date: 19.MAR.2012 20:57:33

Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

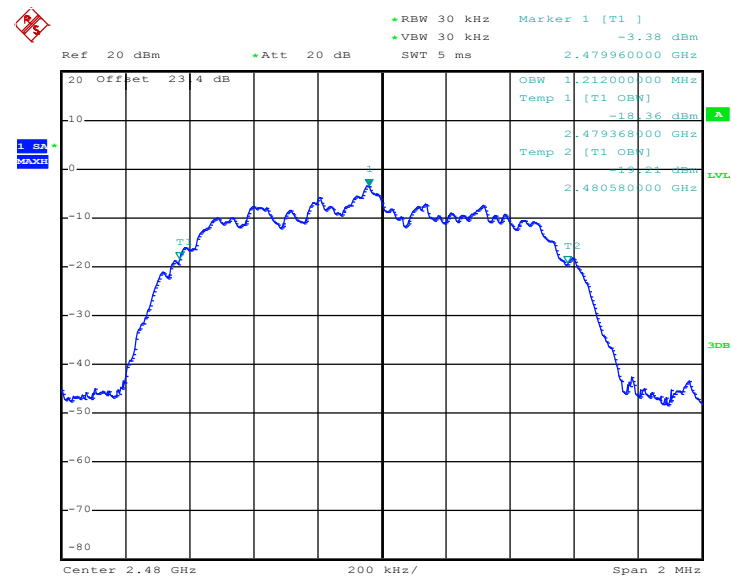
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.204
39	2441	1.212
78	2480	1.212

99% Bandwidth Plot on Channel 00


Date: 19.MAR.2012 20:58:09

99% Occupied Bandwidth Plot on Channel 39


Date: 19.MAR.2012 20:58:46

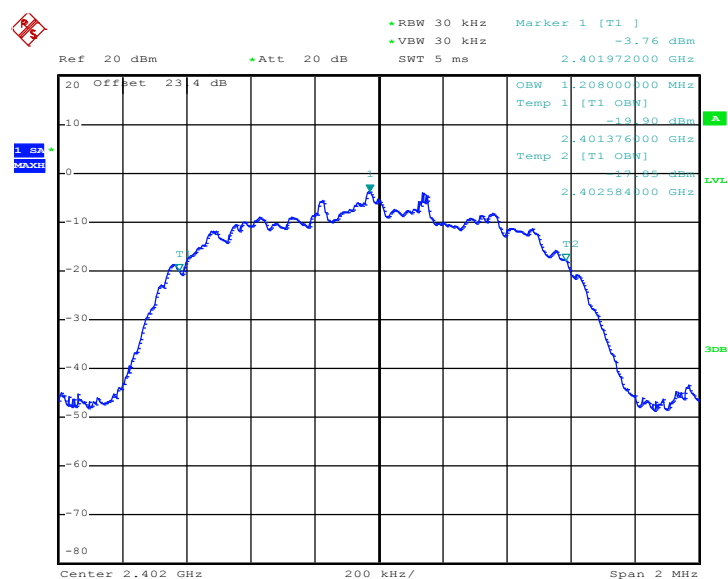
99% Occupied Bandwidth Plot on Channel 78


Date: 19.MAR.2012 20:59:22

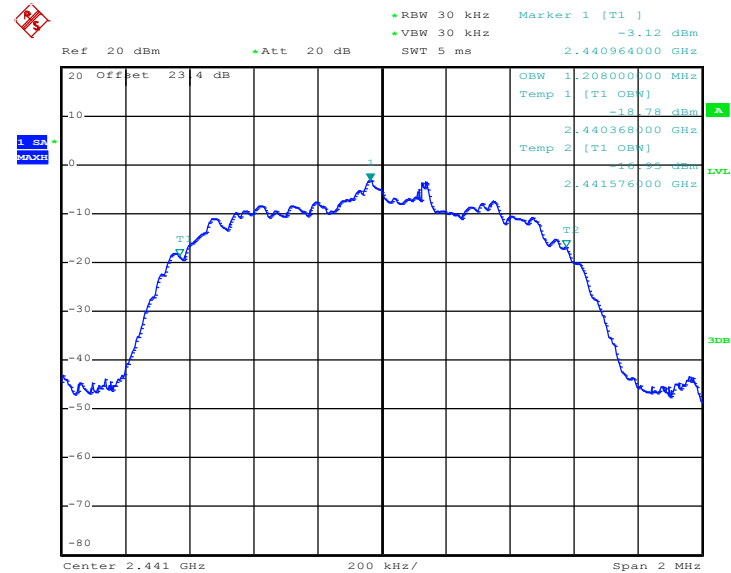


Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

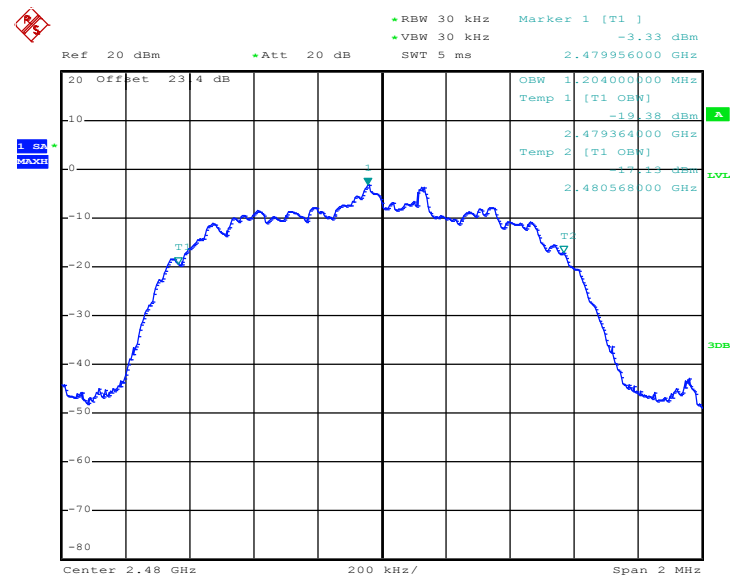
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.208
39	2441	1.208
78	2480	1.204

99% Bandwidth Plot on Channel 00

Date: 19.MAR.2012 20:59:58

99% Occupied Bandwidth Plot on Channel 39


Date: 19.MAR.2012 21:00:34

99% Occupied Bandwidth Plot on Channel 78


Date: 19.MAR.2012 21:01:10

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.

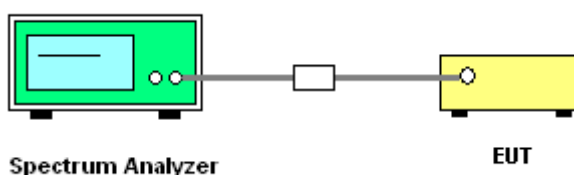
3.3.2 Measuring Instruments

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; $RBW \geq 1\%$ of the span;
 $VBW \geq RBW$; 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

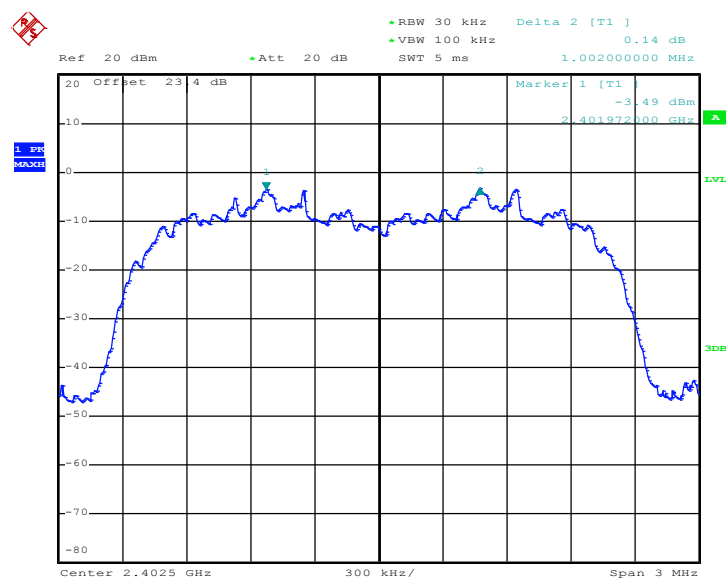


3.3.5 Test Result of Hopping Channel Separation

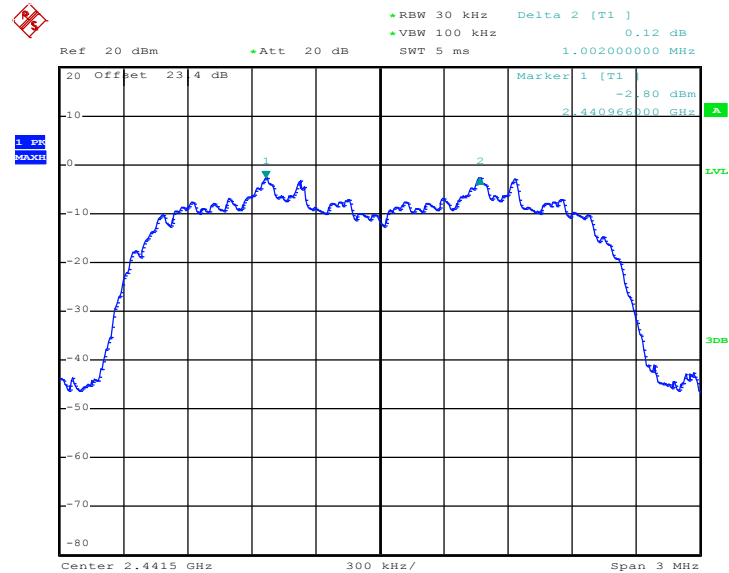
Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.8960	Pass
39	2441	1.002	0.8960	Pass
78	2480	1.008	0.8920	Pass

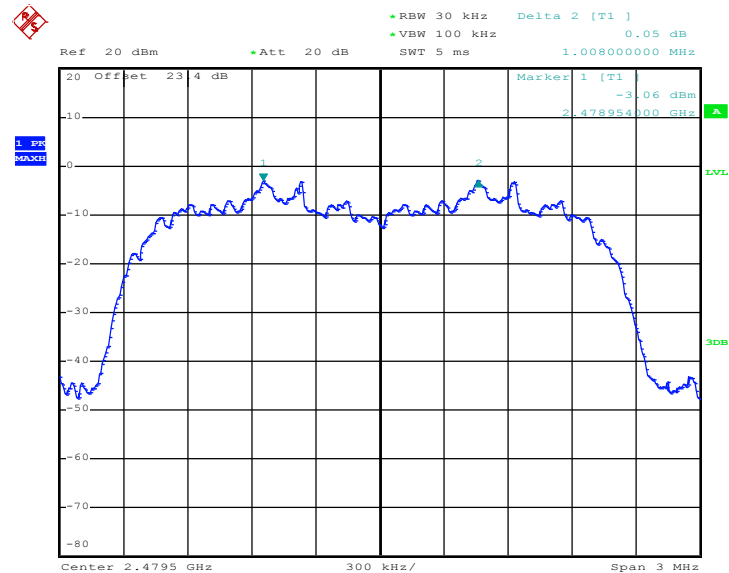
Channel Separation Plot on Channel 00 - 01



Date: 19.MAR.2012 20:42:27

Channel Separation Plot on Channel 39 - 40


Date: 19.MAR.2012 20:43:24

Channel Separation Plot on Channel 77 - 78


Date: 19.MAR.2012 20:44:16

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.

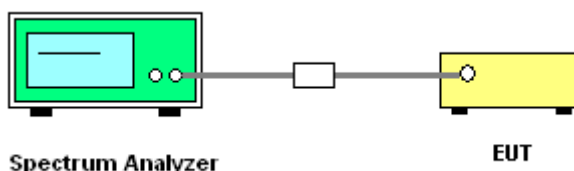
3.4.2 Measuring Instruments

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 $\geq$ 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



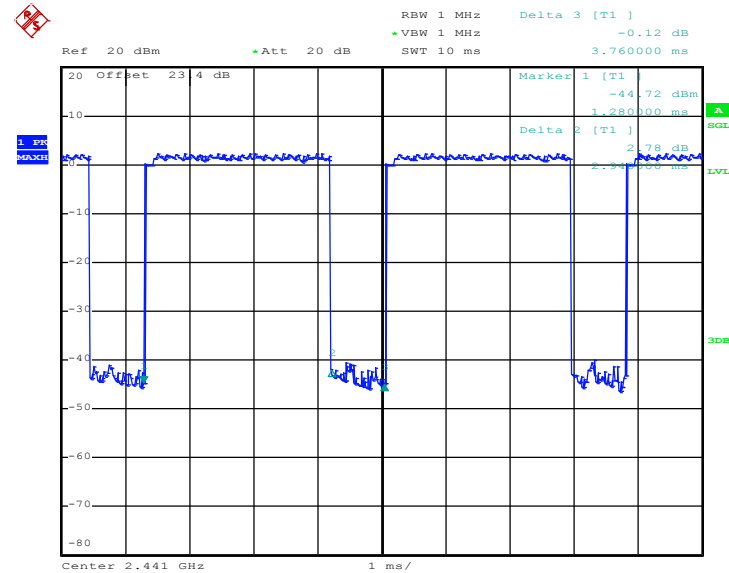
3.4.5 Test Result of Dwell Time

Test Mode :	Mode 8	Temperature :	24~26°C
Test Engineer :	Book Lin	Relative Humidity :	50~53%

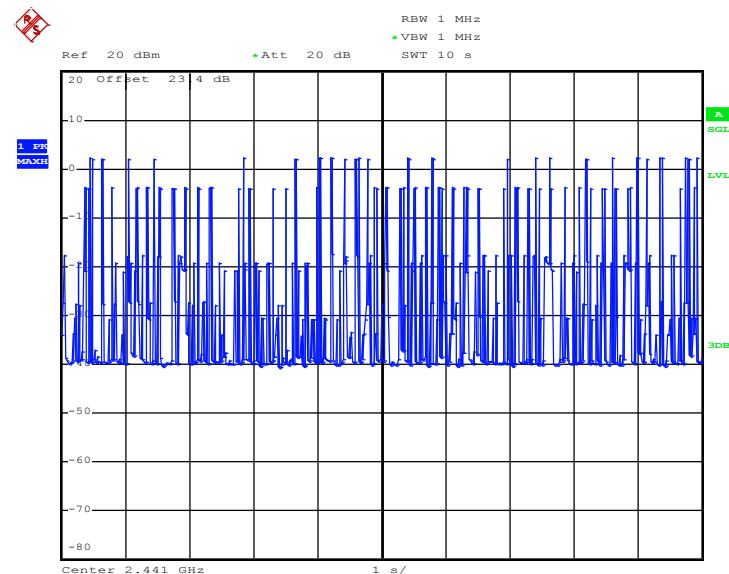
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
3DH5	2.70	2940.00	0.25	0.4	Pass

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: 19.MAR.2012 22:00:18

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


Date: 19.MAR.2012 21:07:02

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.

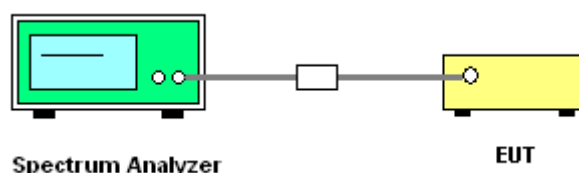
3.5.2 Measuring Instruments

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



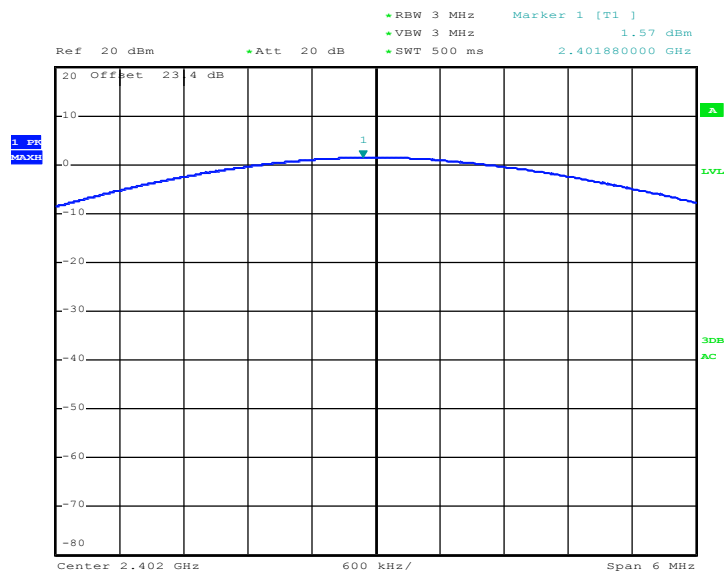
3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 7, 8, 9	Temperature :	24~26℃	
Test Engineer :	Book Lin	Relative Humidity :	50~53%	

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits (dBm)	Pass/Fail
		3 Mbps		
00	2402	1.57	20.97	Pass
39	2441	2.51	20.97	Pass
78	2480	2.27	20.97	Pass

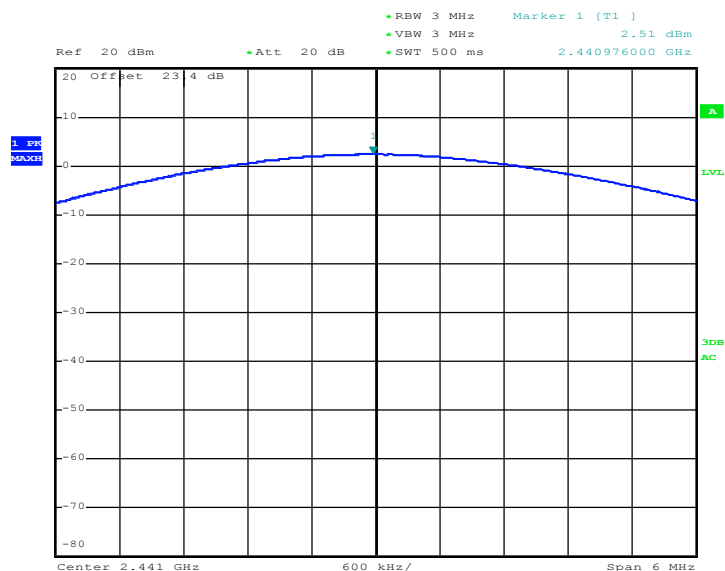


Peak Output Power Plot on Channel 00



Date: 15.MAR.2012 12:32:52

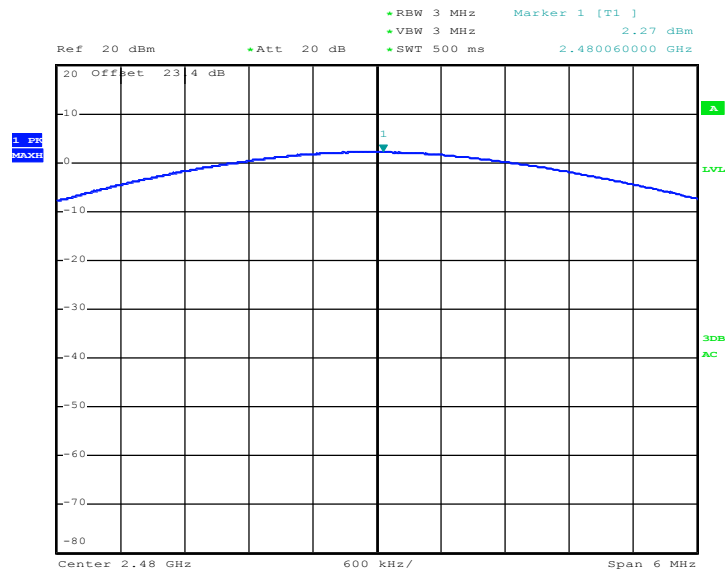
Peak Output Power Plot on Channel 39



Date: 15.MAR.2012 12:34:10



Peak Output Power Plot on Channel 78



Date: 15.MAR.2012 12:35:27

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

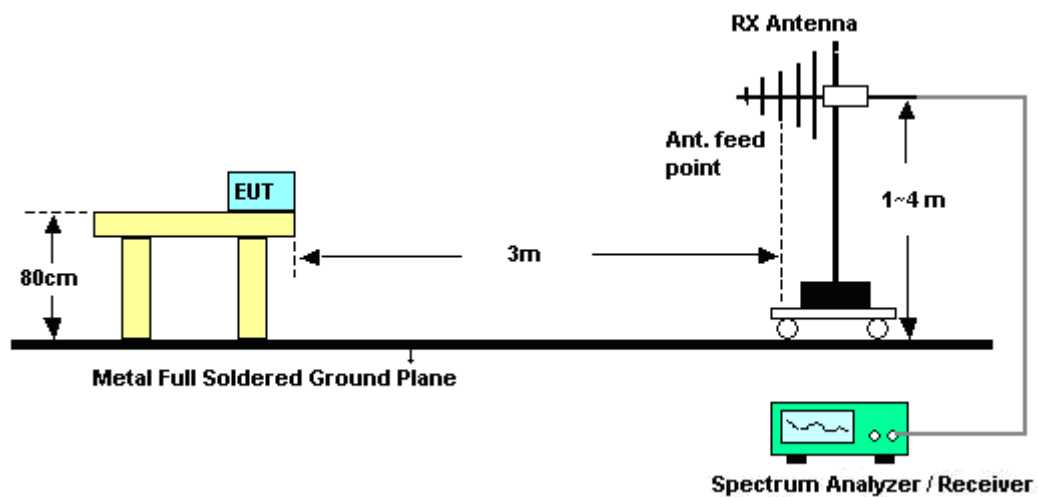
See list of measuring instruments of this test report.

3.6.3 Test Procedures

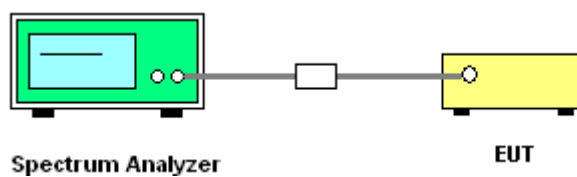
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300KHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band 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 :	21~25°C
Test Channel :	00	Relative Humidity :	51~55%
		Test Engineer :	Wii Chang

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
2325.58	45.96	-28.04	74	43.39	31.83	5.31	34.57	100	52	Peak
2325.58	32.94	-21.06	54	30.37	31.83	5.31	34.57	100	52	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
2319.5	46.04	-27.96	74	43.47	31.83	5.31	34.57	101	300	Peak
2319.5	32.96	-21.04	54	30.39	31.83	5.31	34.57	101	300	Average

Test Mode :	Mode 3	Temperature :	21~25°C
Test Channel :	78	Relative Humidity :	51~55%
		Test Engineer :	Wii Chang

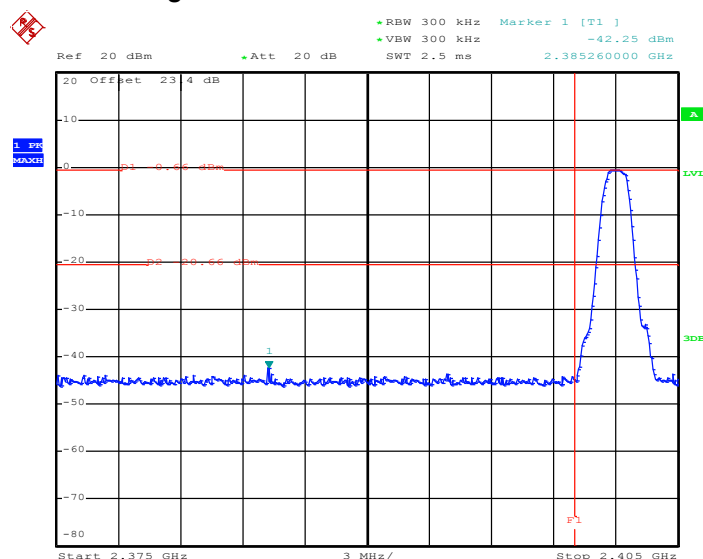
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	63.72	-10.28	74	60.77	31.98	5.52	34.55	102	105	Peak
2483.5	50.99	-3.01	54	48.04	31.98	5.52	34.55	102	105	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	62.57	-11.43	74	59.62	31.98	5.52	34.55	100	277	Peak
2483.5	49.83	-4.17	54	46.88	31.98	5.52	34.55	100	277	Average

3.6.6 Test Result of Conducted Band Edges

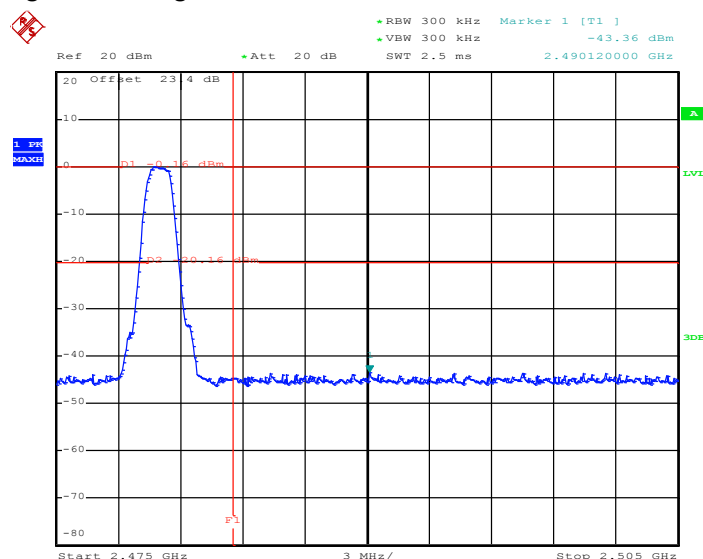
Test Mode :	Mode 7 and 9	Temperature :	24~26℃
Test Channel :	00 and 78	Relative Humidity :	50~53%
		Test Engineer :	Book Lin

Low Band Edge Plot on Channel 00



Date: 19.MAR.2012 20:54:38

High Band Edge Plot on Channel 78



Date: 19.MAR.2012 20:55:43

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.

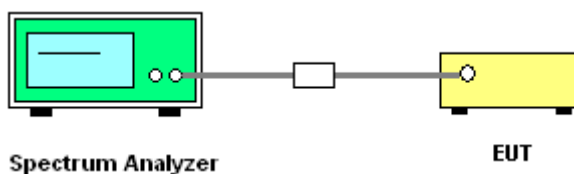
3.7.2 Measuring Instruments

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) $\geq$ 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.

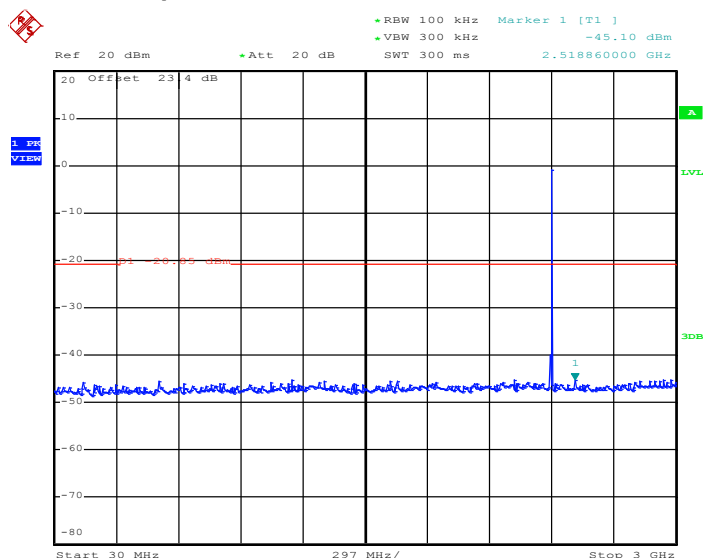
3.7.4 Test Setup



3.7.5 Test Result

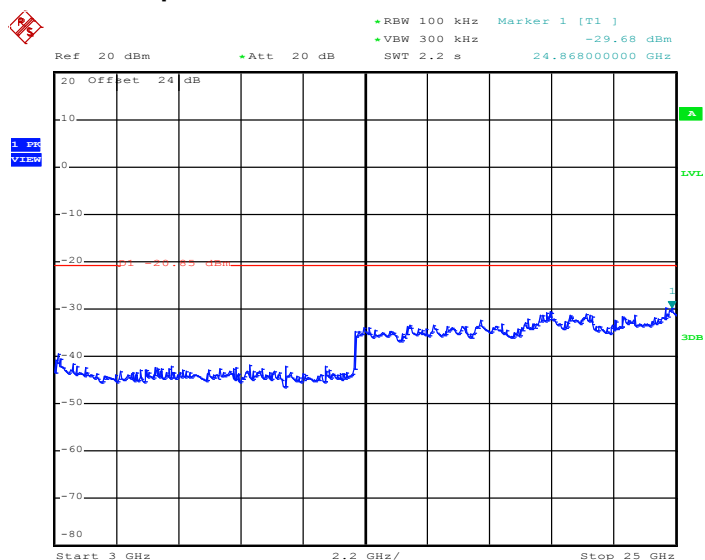
Test Mode :	Mode 7	Temperature :	24~26°C
Test Channel :	00	Relative Humidity :	50~53%
		Test Engineer :	Book Lin

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 19.MAR.2012 21:02:05

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

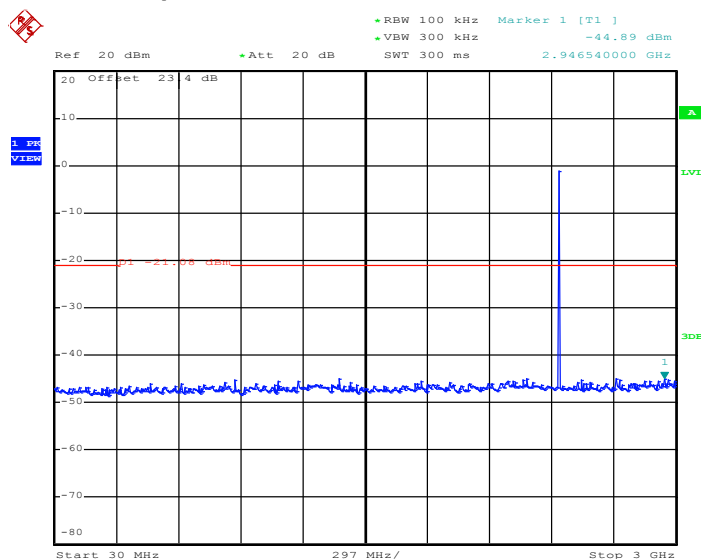


Date: 19.MAR.2012 21:02:18



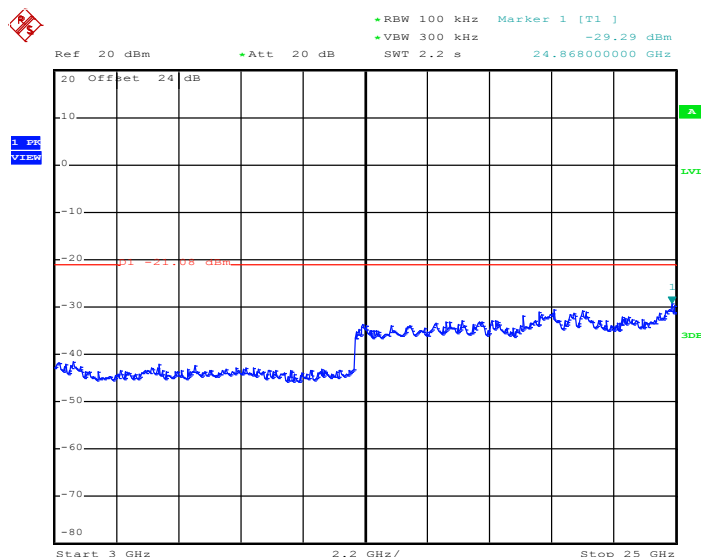
Test Mode :	Mode 8	Temperature :	24~26°C
Test Channel :	39	Relative Humidity :	50~53%
		Test Engineer :	Book Lin

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



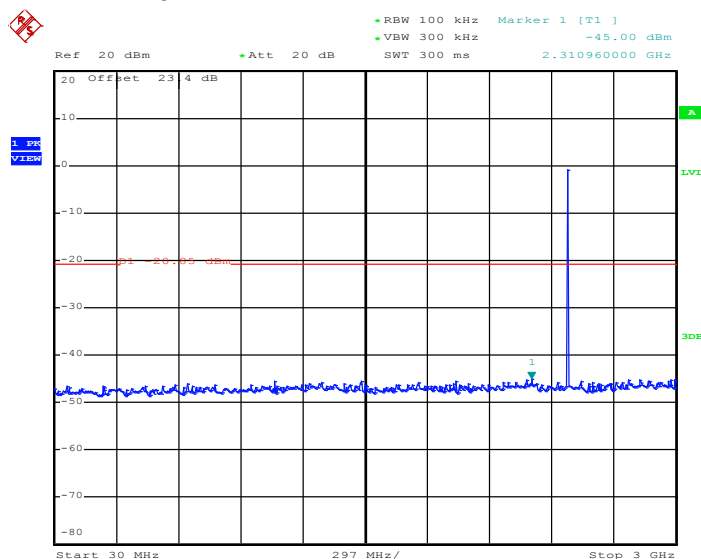
Date: 19.MAR.2012 21:03:10

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

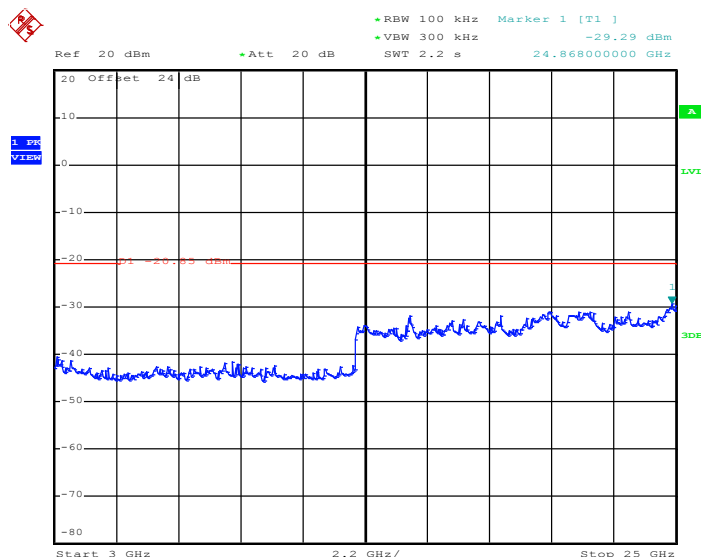


Date: 19.MAR.2012 21:03:23

Test Mode :	Mode 9	Temperature :	24~26°C
Test Channel :	78	Relative Humidity :	50~53%
		Test Engineer :	Book Lin

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 19.MAR.2012 21:04:16

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 19.MAR.2012 21:04:28

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.

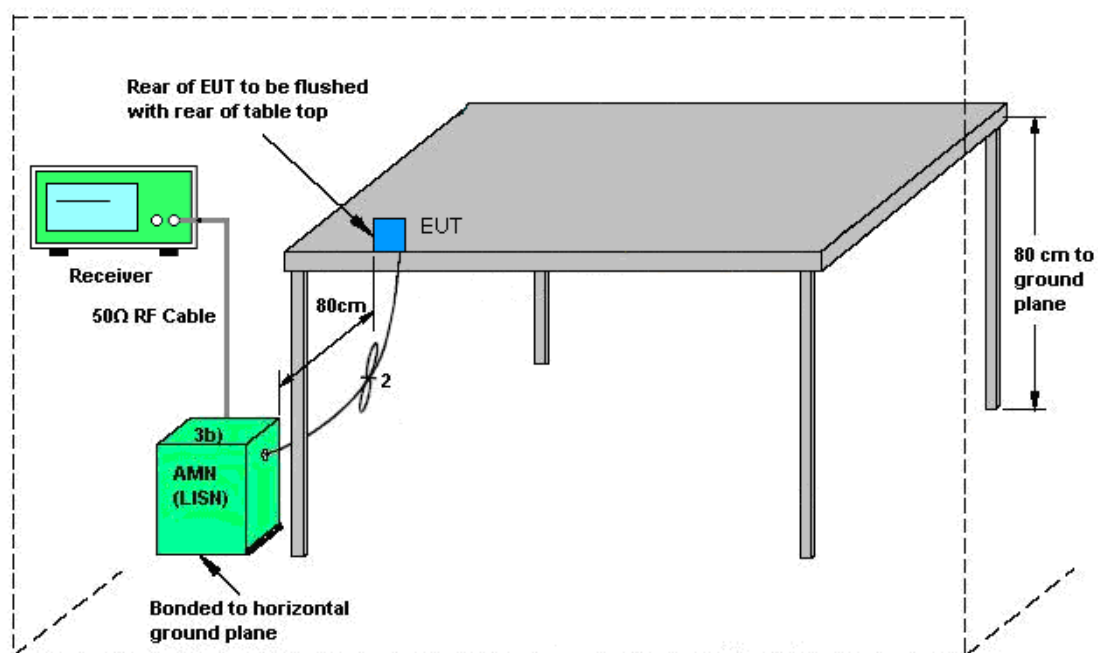
3.8.2 Measuring Instruments

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.

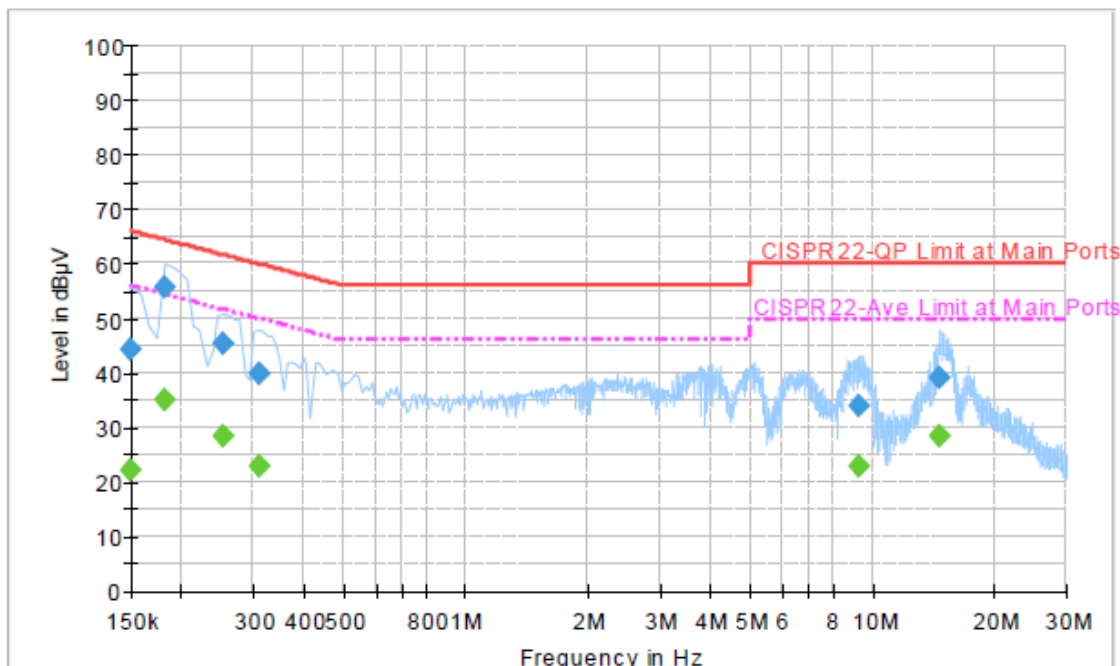
3.8.4 Test Setup



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

3.8.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter 1 + TC for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



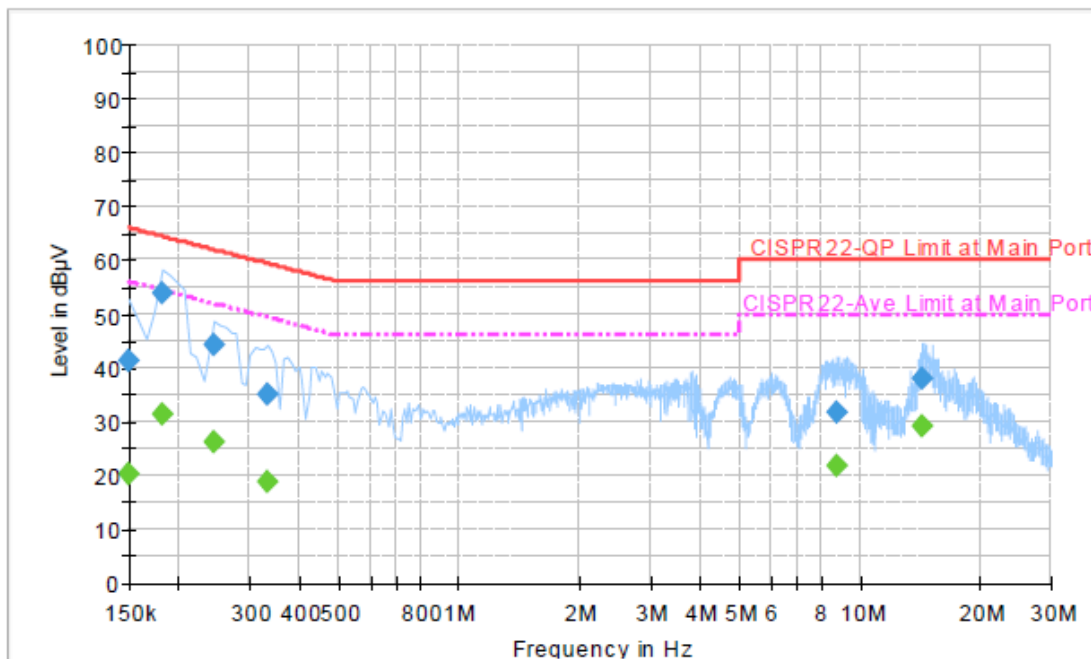
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	44.1	Off	L1	19.4	21.9	66.0
0.182000	55.7	Off	L1	19.4	8.7	64.4
0.254000	45.2	Off	L1	19.3	16.4	61.6
0.310000	39.8	Off	L1	19.3	20.2	60.0
9.270000	34.0	Off	L1	19.5	26.0	60.0
14.614000	39.1	Off	L1	19.8	20.9	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	22.2	Off	L1	19.4	33.8	56.0
0.182000	35.1	Off	L1	19.4	19.3	54.4
0.254000	28.4	Off	L1	19.3	23.2	51.6
0.310000	22.9	Off	L1	19.3	27.1	50.0
9.270000	22.9	Off	L1	19.5	27.1	50.0
14.614000	28.4	Off	L1	19.8	21.6	50.0

Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter 1 + TC for Sample 2		
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)
0.150000	41.3	Off	N	19.4	24.7	66.0
0.182000	53.7	Off	N	19.4	10.7	64.4
0.246000	44.3	Off	N	19.4	17.6	61.9
0.334000	35.2	Off	N	19.3	24.2	59.4
8.790000	31.8	Off	N	19.7	28.2	60.0
14.310000	37.9	Off	N	19.8	22.1	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	20.1	Off	N	19.4	35.9	56.0
0.182000	31.4	Off	N	19.4	23.0	54.4
0.246000	26.2	Off	N	19.4	25.7	51.9
0.334000	18.7	Off	N	19.3	30.7	49.4
8.790000	21.7	Off	N	19.7	28.3	50.0
14.310000	29.3	Off	N	19.8	20.7	50.0

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

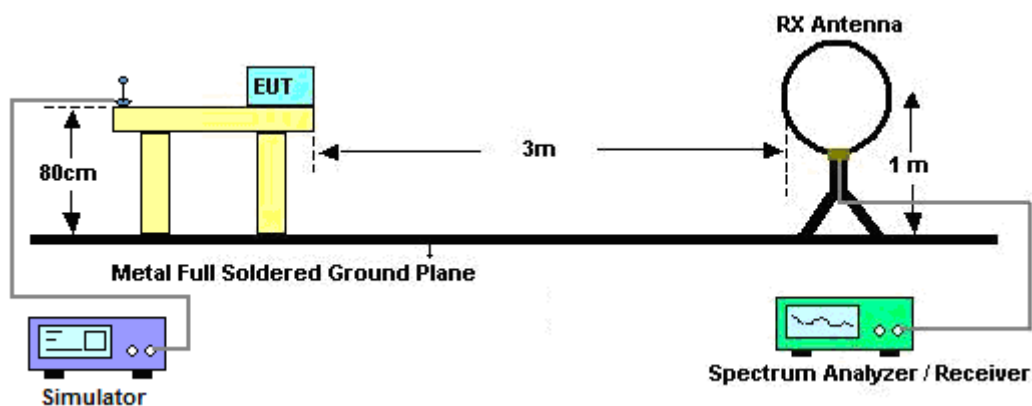
See list of measuring instruments of this test report.

3.9.3 Test Procedures

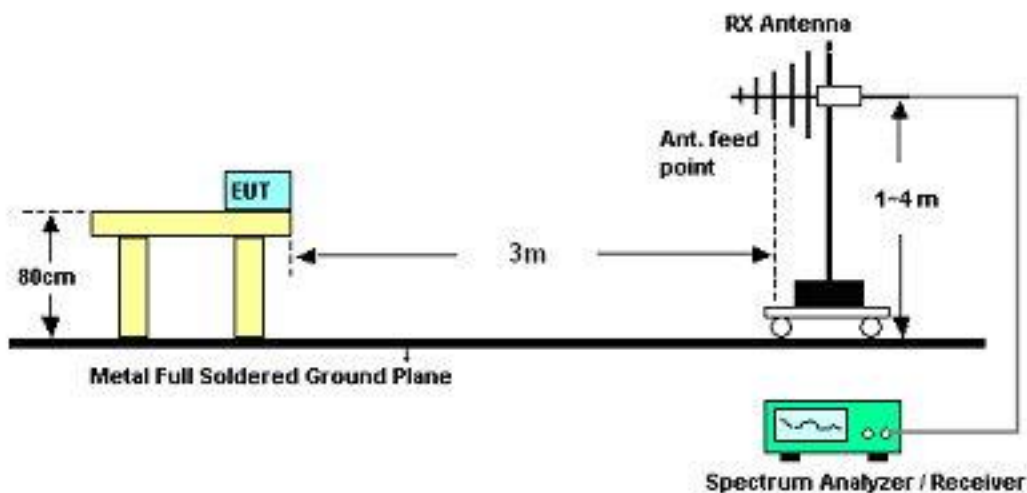
- The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 KHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
 - 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 = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB)
- 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.
- Measured average value for the peak value is greater than 54 dBuV/m

3.9.4 Test Setup

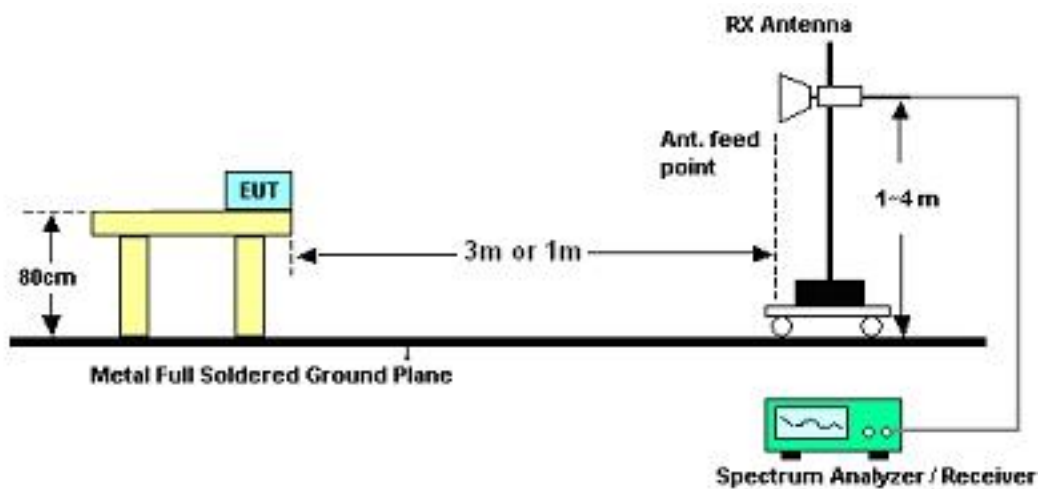
For radiated emissions below 30MHz



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 :	21~25°C
Test Channel :	00	Relative Humidity :	51~55%
Test Engineer :	Wii Chang	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
2325.58	32.94	-21.06	54	30.37	31.83	5.31	34.57	100	52	Average
2325.58	45.96	-28.04	74	43.39	31.83	5.31	34.57	100	52	Peak
2402	79.9	-	-	77.16	31.9	5.4	34.56	100	52	Average
2402	97.84	-	-	95.09	31.91	5.4	34.56	100	52	Peak
2494	45.51	-28.49	74	42.54	32	5.52	34.55	100	52	Peak
2494	32.63	-21.37	54	29.66	32	5.52	34.55	100	52	Average

Test Mode :	Mode 1	Temperature :	21~25°C
Test Channel :	00	Relative Humidity :	51~55%
Test Engineer :	Wii Chang	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
2319.5	32.96	-21.04	54	30.39	31.83	5.31	34.57	101	300	Average
2319.5	46.04	-27.96	74	43.47	31.83	5.31	34.57	101	300	Peak
2402	77.97	-	-	75.23	31.9	5.4	34.56	101	300	Average
2402	94.56	-	-	91.81	31.91	5.4	34.56	101	300	Peak
2484	44.93	-29.07	74	41.98	31.98	5.52	34.55	101	300	Peak
2484	32.74	-21.26	54	29.79	31.98	5.52	34.55	101	300	Average

Test Mode :	Mode 2	Temperature :	21~25°C
Test Channel :	39	Relative Humidity :	51~55%
Test Engineer :	Wii Chang	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
2342	45.79	-28.21	74	43.17	31.84	5.34	34.56	100	56	Peak
2342	33.03	-20.97	54	30.41	31.84	5.34	34.56	100	56	Average
2441	98.92	-	-	96.07	31.95	5.46	34.56	100	56	Peak
2441	81.07	-	-	78.22	31.95	5.46	34.56	100	56	Average
2494	44.88	-29.12	74	41.91	32	5.52	34.55	100	56	Peak
2494	32.69	-21.31	54	29.72	32	5.52	34.55	100	56	Average

Test Mode :	Mode 2	Temperature :	21~25°C
Test Channel :	39	Relative Humidity :	51~55%
Test Engineer :	Wii Chang	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
2350	44.75	-29.25	74	42.13	31.84	5.34	34.56	104	275	Peak
2350	32.97	-21.03	54	30.35	31.84	5.34	34.56	104	275	Average
2441	97.27	-	-	94.42	31.95	5.46	34.56	104	275	Peak
2441	79.89	-	-	77.04	31.95	5.46	34.56	104	275	Average
2500	45.12	-28.88	74	42.15	32	5.52	34.55	104	275	Peak
2500	32.66	-21.34	54	29.69	32	5.52	34.55	104	275	Average

Test Mode :	Mode 3	Temperature :	21~25°C
Test Channel :	78	Relative Humidity :	51~55%
Test Engineer :	Wii Chang	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
78.87	26.17	-13.83	40	50.15	6.8	0.92	31.7	-	-	Peak
137.19	25.82	-17.68	43.5	44.85	11.26	1.41	31.7	-	-	Peak
197.94	24.68	-18.82	43.5	45.22	9.18	1.93	31.65	-	-	Peak
432.3	36.15	-9.85	46	48.96	16.53	2.5	31.84	-	-	Peak
623.4	37.21	-8.79	46	46.91	19.14	3.21	32.05	114	298	Peak
890.8	33.52	-12.48	46	40.69	20.7	3.78	31.65	-	-	Peak
2340	45.26	-28.74	74	42.64	31.84	5.34	34.56	102	105	Peak
2340	33.05	-20.95	54	30.43	31.84	5.34	34.56	102	105	Average
2480	100	-	-	97.05	31.98	5.52	34.55	102	105	Peak
2480	81.27	-	-	78.32	31.98	5.52	34.55	102	105	Average
2483.5	63.72	-10.28	74	60.77	31.98	5.52	34.55	102	105	Peak
2483.5	50.99	-3.01	54	48.04	31.98	5.52	34.55	102	105	Average

Test Mode :	Mode 3	Temperature :	21~25°C
Test Channel :	78	Relative Humidity :	51~55%
Test Engineer :	Wii Chang	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
128.55	31.66	-11.84	43.5	50.18	11.8	1.38	31.7	-	-	Peak
143.94	28.79	-14.71	43.5	48.22	10.83	1.44	31.7	-	-	Peak
198.48	21.55	-21.95	43.5	42.02	9.24	1.94	31.65	-	-	Peak
491.8	33.9	-12.1	46	45.2	17.6	2.88	31.78	-	-	Peak
526.8	34.69	-11.31	46	45.65	17.91	2.96	31.83	-	-	Peak
623.4	36.1	-9.9	46	45.8	19.14	3.21	32.05	149	133	Peak
2390	45.13	-28.87	74	42.39	31.9	5.4	34.56	100	277	Peak
2390	33.13	-20.87	54	30.39	31.9	5.4	34.56	100	277	Average
2480	97.75	-	-	94.8	31.98	5.52	34.55	100	277	Peak
2480	80.38	-	-	77.43	31.98	5.52	34.55	100	277	Average
2483.5	62.57	-11.43	74	59.62	31.98	5.52	34.55	100	277	Peak
2483.5	49.83	-4.17	54	46.88	31.98	5.52	34.55	100	277	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 Chip 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	Mar. 15, 2012 ~ Mar. 19, 2012	Jun. 12, 2012	Conducted (TH02-HY)
Bluetooth Base Station	R&S	CBT32	100522	N/A	Feb. 09, 2012	Mar. 15, 2012 ~ Mar. 19, 2012	Feb. 08, 2013	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Mar. 19, 2012 ~ Apr. 20, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Mar. 19, 2012 ~ Apr. 20, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Mar. 19, 2012 ~ Apr. 20, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Mar. 19, 2012 ~ Apr. 20, 2012	N/A	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	Mar. 19, 2012 ~ Apr. 20, 2012	N/A	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz ~ 26.5GHz	Nov. 23, 2011	Apr. 21, 2012 ~ Apr. 22, 2012	Nov. 22, 2012	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz-30GHz	Nov. 01, 2011	Apr. 21, 2012 ~ Apr. 22, 2012	Oct. 31, 2012	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz ~ 1000MHz	May 10, 2011	Apr. 21, 2012 ~ Apr. 22, 2012	May 09, 2012	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz ~ 2GHz	Oct. 22, 2011	Apr. 21, 2012 ~ Apr. 22, 2012	Oct. 21, 2012	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2011	Apr. 21, 2012 ~ Apr. 22, 2012	Jul. 31, 2012	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Oct. 21, 2011	Apr. 21, 2012 ~ Apr. 22, 2012	Oct. 20, 2012	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 13, 2012	Apr. 21, 2012 ~ Apr. 22, 2012	Apr. 12, 2013	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz ~ 1GHz	Apr. 11, 2012	Apr. 21, 2012 ~ Apr. 22, 2012	Apr. 10, 2013	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2011	Apr. 21, 2012 ~ Apr. 22, 2012	Jul. 17, 2012	Radiation (03CH06-HY)
Bluetooth Base Station	R&S	CBT32	100522	N/A	Feb. 09, 2012	Apr. 21, 2012 ~ Apr. 22, 2012	Feb. 08, 2013	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Apr. 21, 2012 ~ Apr. 22, 2012	Jul. 28, 2012	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 $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	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 $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	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 $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP232266 as below.