

FCC RF Test Report

APPLICANT : VIZIO
EQUIPMENT : Bluetooth Stereo Headphone
BRAND NAME : VIZIO
MODEL NAME : VHB100
FCC ID : YLY-VHB100
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Spread Spectrum (DSS)

The product was received on Jun. 17, 2010 and completely tested on Jun. 23, 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:



Roy Wu / Manager



SPORTON INTERNATIONAL INC.

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SPORTON INTERNATIONAL INC.

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FCC ID : YLY-VHB100

Page Number : 1 of 64

Report Issued Date : Aug. 06, 2010

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	6
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	7
2.1 RF Output Power	7
2.2 Test Mode	8
2.3 Connection Diagram of Test System	9
2.4 RF Utility	9
3 TEST RESULT	10
3.1 Number of Channel Measurement	10
3.2 20dB and 99% Bandwidth Measurement	12
3.3 Hopping Channel Separation Measurement	25
3.4 Dwell Time Measurement	28
3.5 Peak Output Power Measurement	30
3.6 Band Edges Measurement	33
3.7 Spurious Emission Measurement	44
3.8 AC Conducted Emission Measurement	48
3.9 Radiated Emission Measurement	52
3.10 Antenna Requirements	61
4 LIST OF MEASURING EQUIPMENT	62
5 UNCERTAINTY OF EVALUATION	63
APPENDIX A. PHOTOGRAPHS OF EUT	
APPENDIX B. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR061724	Rev. 01	Initial issue of report	Aug. 06, 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	$\geq 15\text{Chs}$	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	$\geq 2/3$ 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	$\leq 1\text{W}$	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 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 14.2 dB at 0.398 MHz
3.9	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.47 dB at 4804 MHz
3.10	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

VIZIO

39 Tesla Irvine, CA 92618

1.2 Manufacturer

Merry Electronics (Shenzhen) CO., LTD.

No. 50, MeiBao Road, Dalang Street, BaoAn District, Shenzhen City, Guangdong Province, China

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Bluetooth Stereo Headphone
Brand Name	VIZIO
Model Name	VHB100
FCC ID	YLY-VHB100
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) : 1.60 dBm (1.45 mW) Bluetooth EDR (2Mbps) : 1.34 dBm (1.36 mW) Bluetooth EDR (3Mbps) : 1.62 dBm (1.45 mW)
Antenna Type	Chip Antenna with gain -2.5 dBi
Type of Antenna Connector	N/A
HW Version	Mainboard V4; Secondary Board V3
SW Version	BHC_201_RC20100604-01
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π /4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Production Unit

Remark:

1. This test report recorded only product characteristics and test results of Digital Spread Spectrum (DSS).
2. 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 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	03CH07-HY	TW1022/4086B-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.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
3.	Mobile Phone	Motorola	V9	IHDT56HN2	N/A	Unshielded, 1.8 m
4.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
5.	iPod	Apple	A1199	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:

Channel	Frequency	Bluetooth RF Output Power		
		Data Rate / Modulation		
		GFSK	π /4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	1.31 dBm	1.07 dBm	1.09 dBm
Ch39	2441MHz	1.60 dBm	1.34 dBm	1.62 dBm
Ch78	2480MHz	1.16 dBm	1.30 dBm	1.44 dBm

Remark:

1. The data rate was set in 3Mbps 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

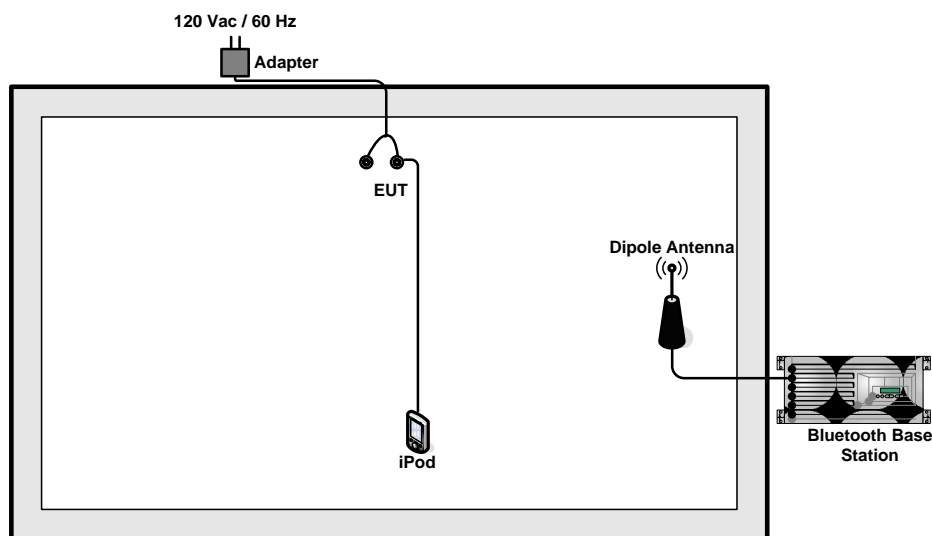
The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest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

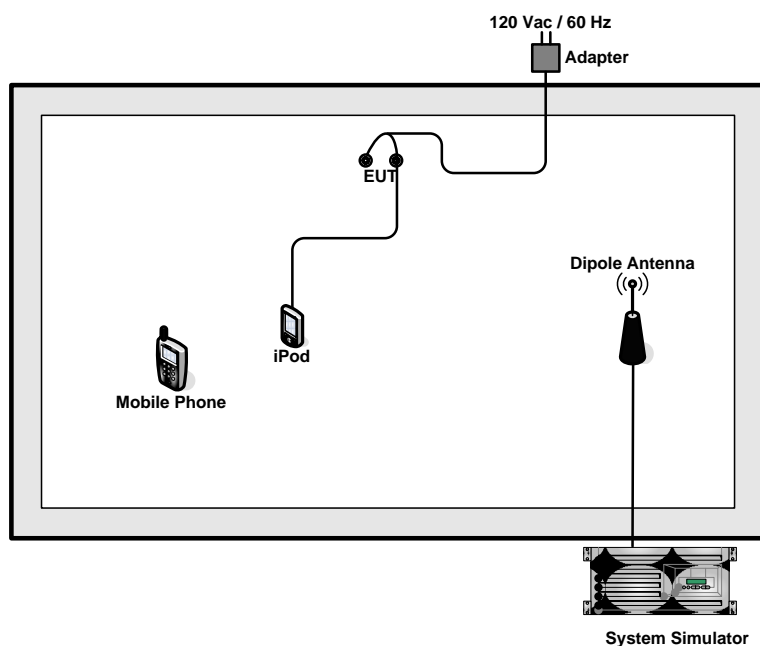
Test Cases			
Test Item	Data Rate / Modulation		
	Bluetooth 1Mbps GFSK	Bluetooth EDR 2Mbps π /4-DQPSK	Bluetooth EDR 3Mbps 8-DPSK
Conducted TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated TCs	N/A	N/A	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz
AC Conducted Emission	Mode 1 : GSM850 Link + Bluetooth Link + USB Cable (Charging from Adapter) + Mobile Phone		
Remark:			
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.			

2.3 Connection Diagram of Test System

<Bluetooth Tx Mode>



<EUT with Adapter Mode>



2.4 RF Utility

Turn on the Bluetooth to make the EUT 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.

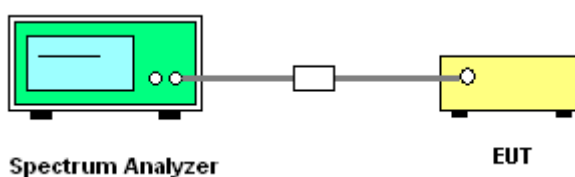
3.1.2 Measuring Instruments

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.

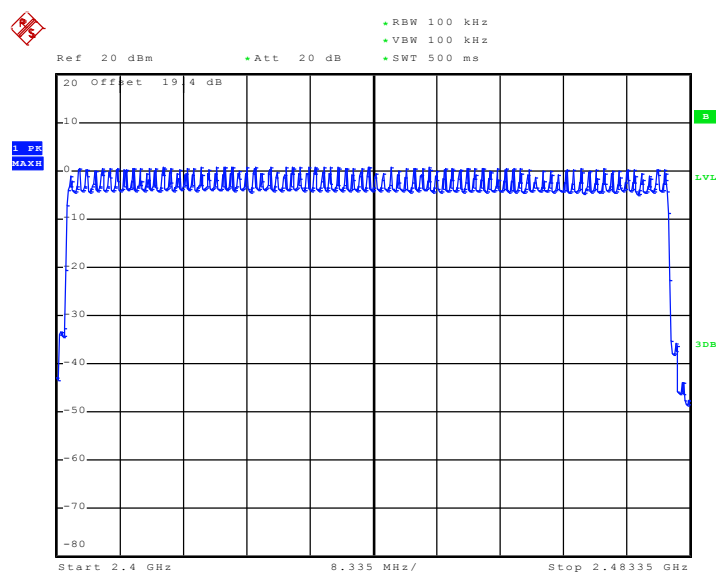
3.1.4 Test Setup



3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	Mode 7~9	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%
Number of Hopping Channels (Channel)		Limits (Channel)	Pass/Fail
79		> 15	Pass

Number of Hopping Channel Plot on Channel 00 - 78



Date: 23.JUN.2010 00:55:33

3.2 20dB and 99% Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

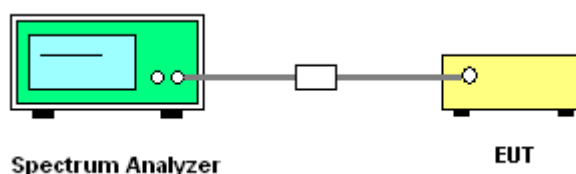
3.2.2 Measuring Instruments

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

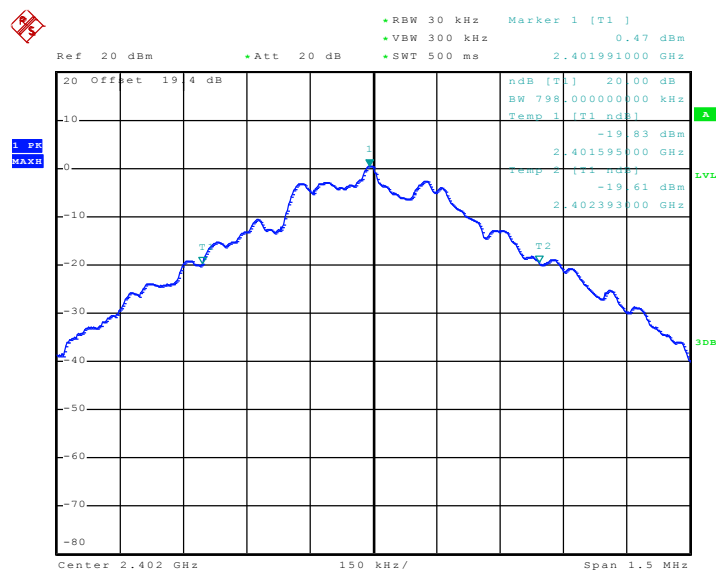


3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.798
39	2441	0.792
78	2480	0.795

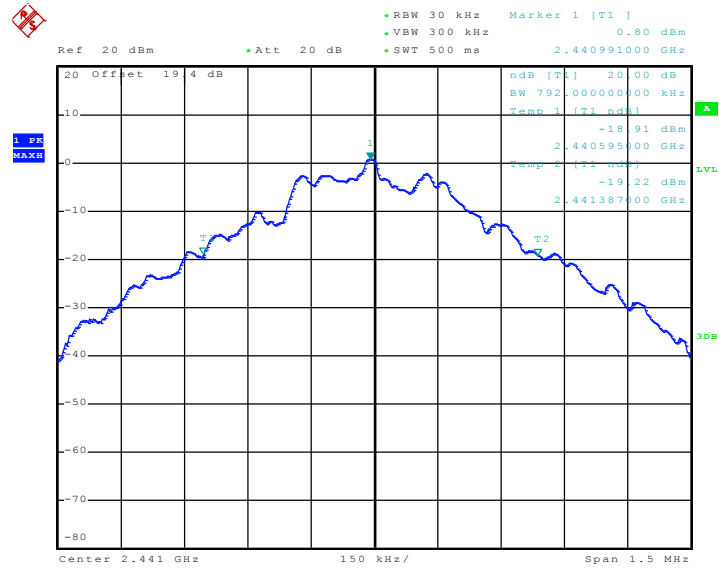
20 dB Bandwidth Plot on Channel 00



Date: 22.JUN.2010 23:40:35

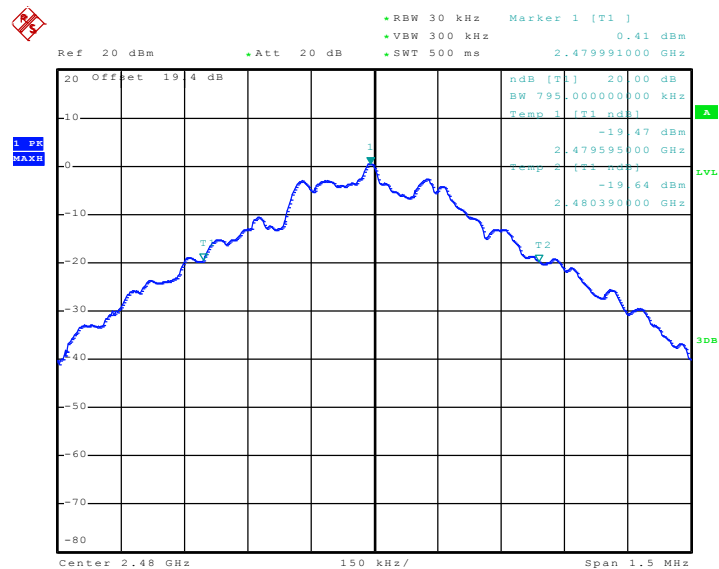


20 dB Bandwidth Plot on Channel 39



Date: 22.JUN.2010 23:40:55

20 dB Bandwidth Plot on Channel 78



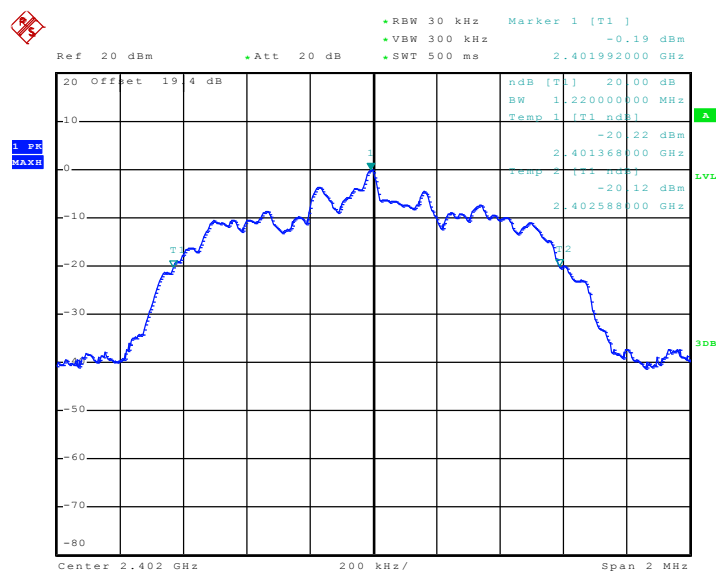
Date: 22.JUN.2010 23:41:18



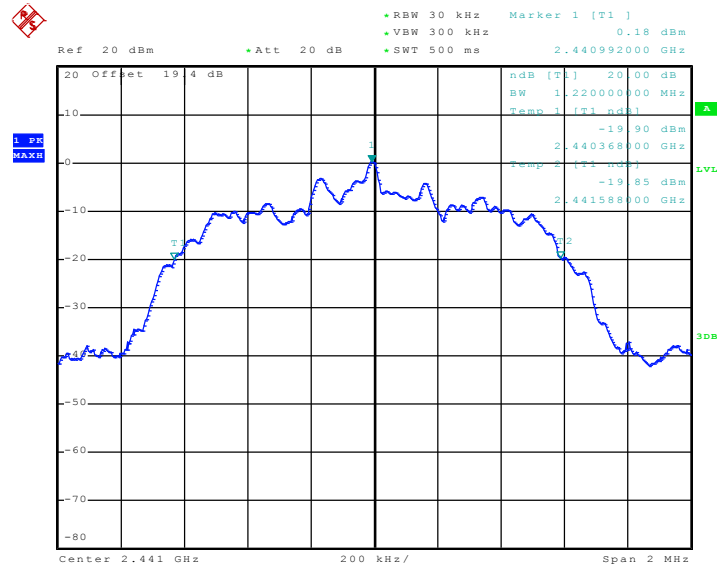
Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.220
39	2441	1.220
78	2480	1.216

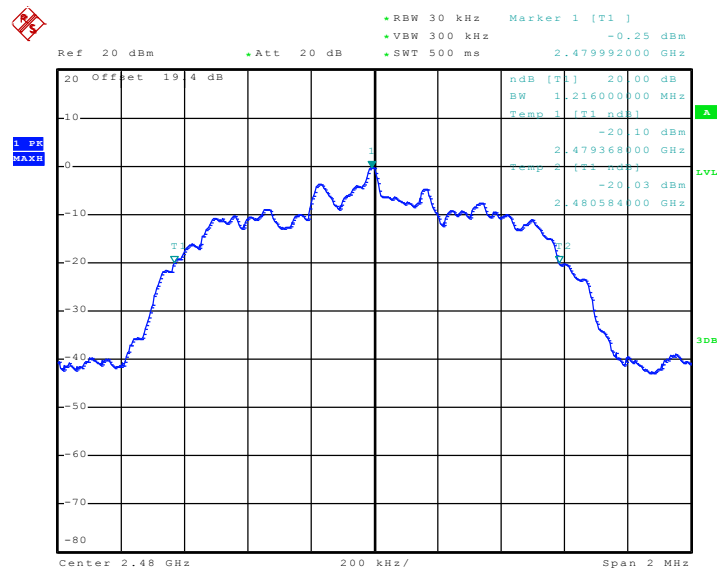
20 dB Bandwidth Plot on Channel 00



Date: 22.JUN.2010 23:42:34

20 dB Bandwidth Plot on Channel 39


Date: 22.JUN.2010 23:42:10

20 dB Bandwidth Plot on Channel 78


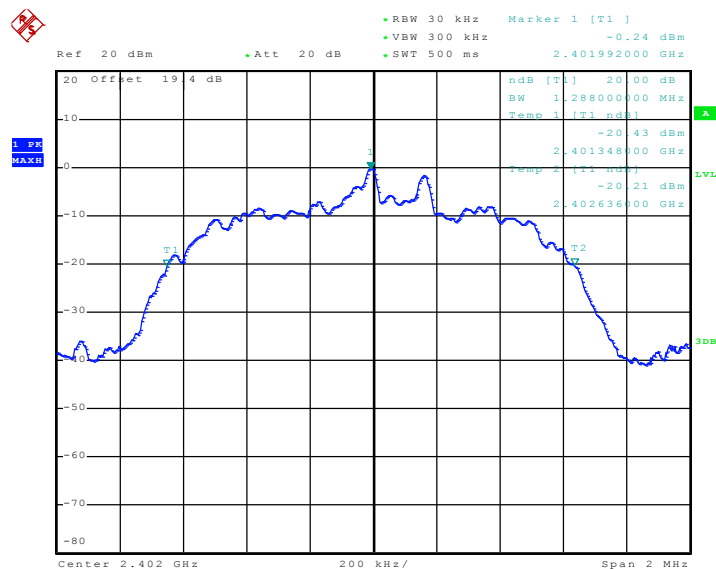
Date: 22.JUN.2010 23:41:47



Test Mode :	Mode 7, 8, 9	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.288
39	2441	1.280
78	2480	1.272

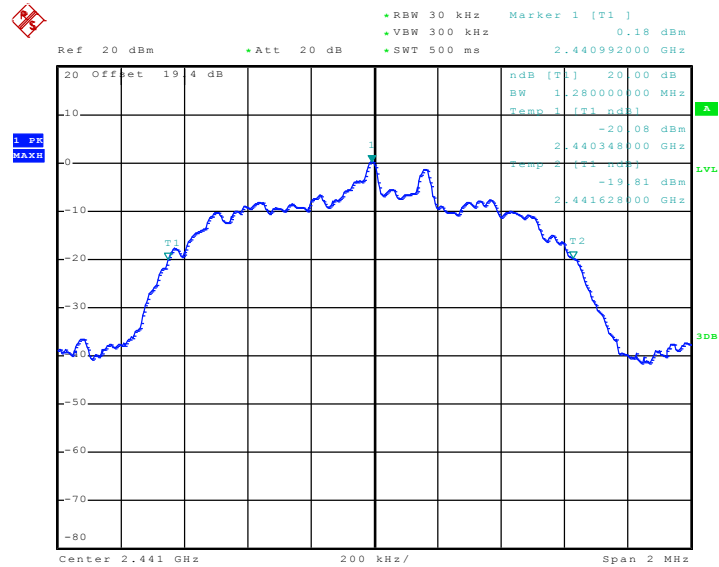
20 dB Bandwidth Plot on Channel 00



Date: 22.JUN.2010 23:43:05

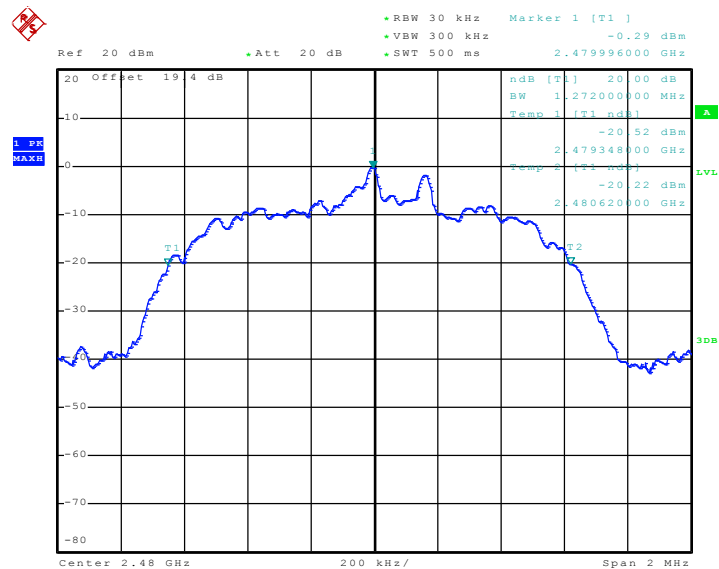


20 dB Bandwidth Plot on Channel 39



Date: 22.JUN.2010 23:43:37

20 dB Bandwidth Plot on Channel 78



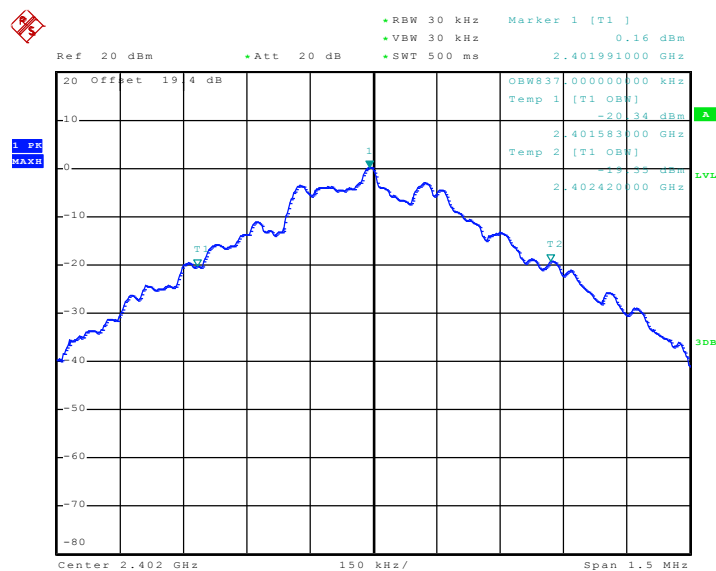
Date: 22.JUN.2010 23:44:26

3.2.6 Test Result of 99% Occupied Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	0.837
39	2441	0.834
78	2480	0.837

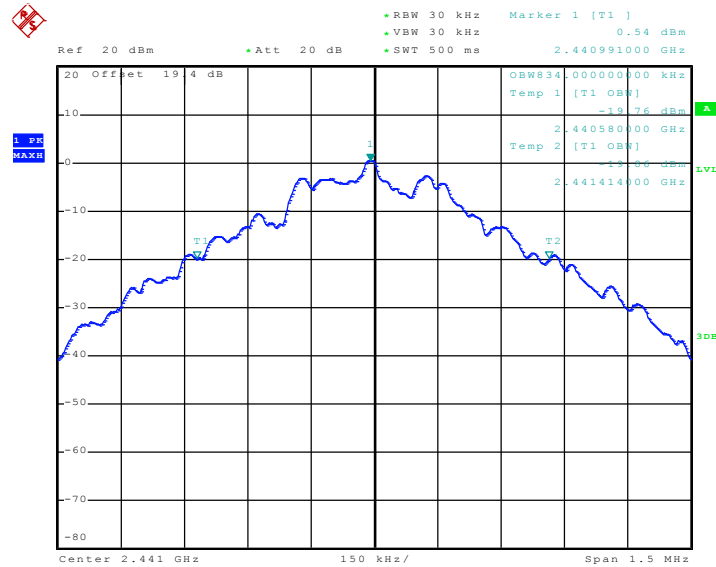
99% Bandwidth Plot on Channel 00



Date: 22.JUN.2010 23:49:18

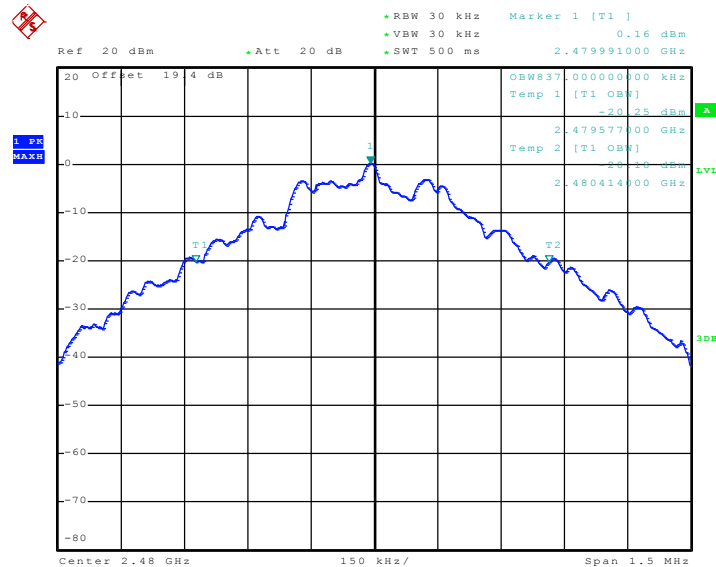


99% Occupied Bandwidth Plot on Channel 39



Date: 22.JUN.2010 23:48:47

99% Occupied Bandwidth Plot on Channel 78



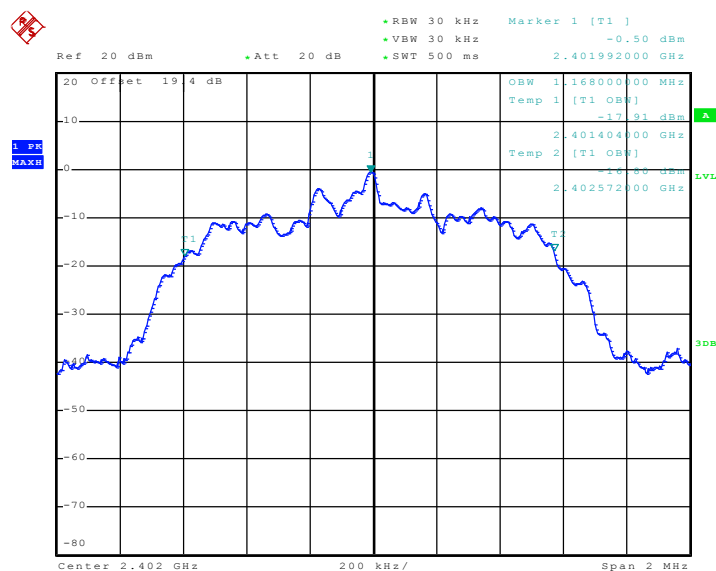
Date: 22.JUN.2010 23:48:20



Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%

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

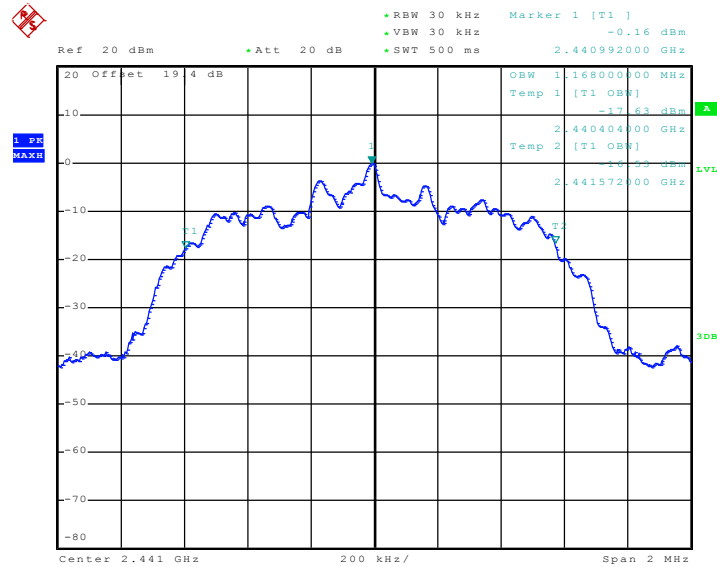
99% Bandwidth Plot on Channel 00



Date: 22.JUN.2010 23:46:37

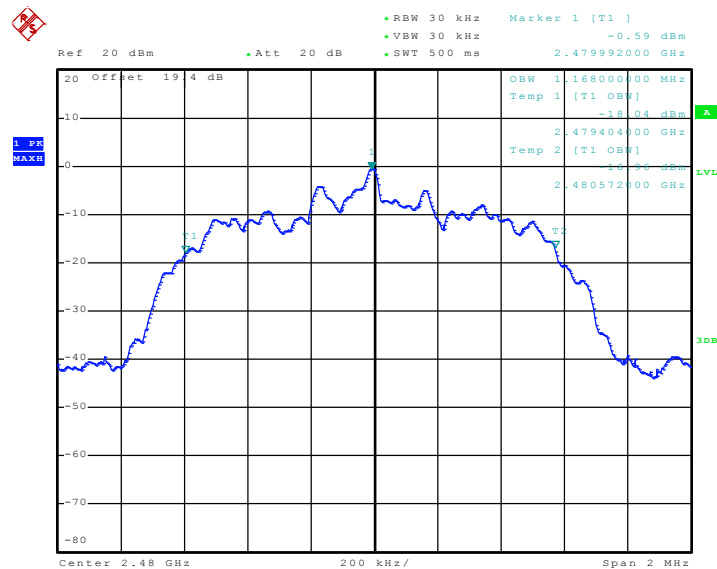


99% Occupied Bandwidth Plot on Channel 39



Date: 22.JUN.2010 23:47:13

99% Occupied Bandwidth Plot on Channel 78



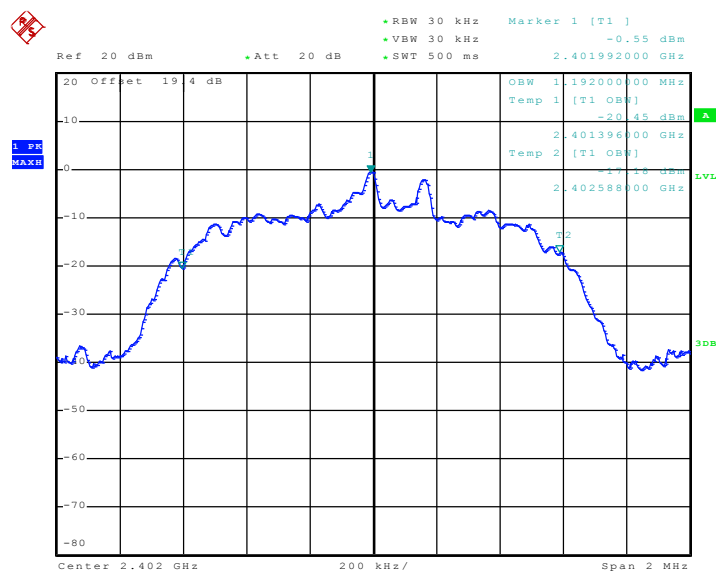
Date: 22.JUN.2010 23:47:50



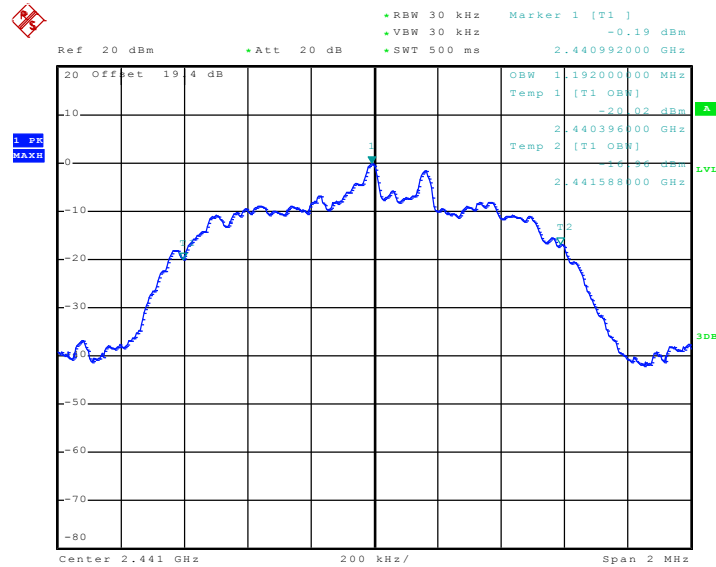
Test Mode :	Mode 7, 8, 9	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%

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

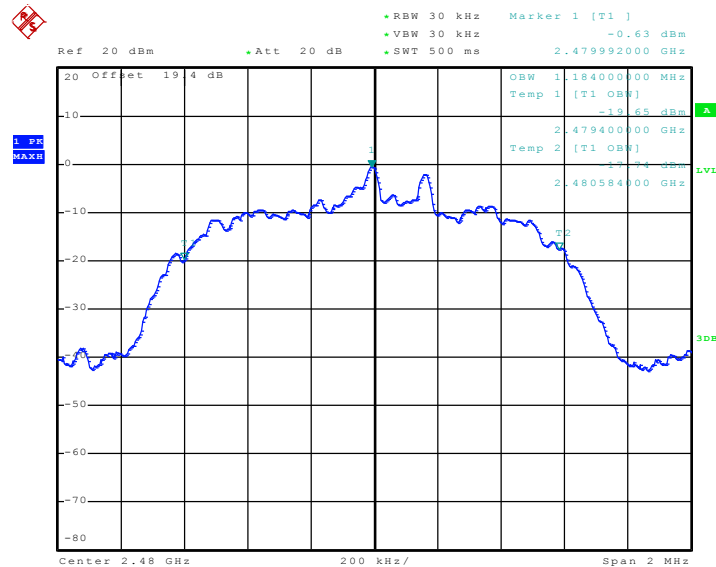
99% Bandwidth Plot on Channel 00



Date: 22.JUN.2010 23:46:07

99% Occupied Bandwidth Plot on Channel 39


Date: 22.JUN.2010 23:45:43

99% Occupied Bandwidth Plot on Channel 78


Date: 22.JUN.2010 23:45:07

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.

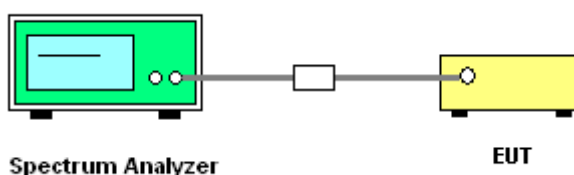
3.3.2 Measuring Instruments

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

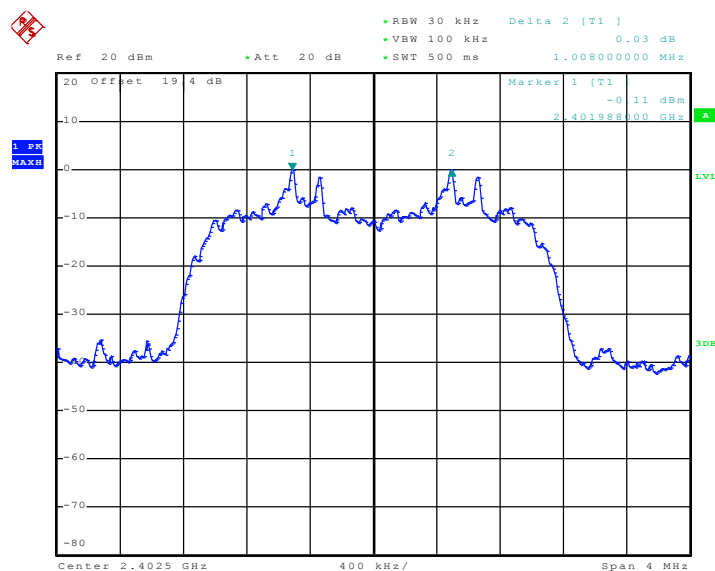


3.3.5 Test Result of Hopping Channel Separation

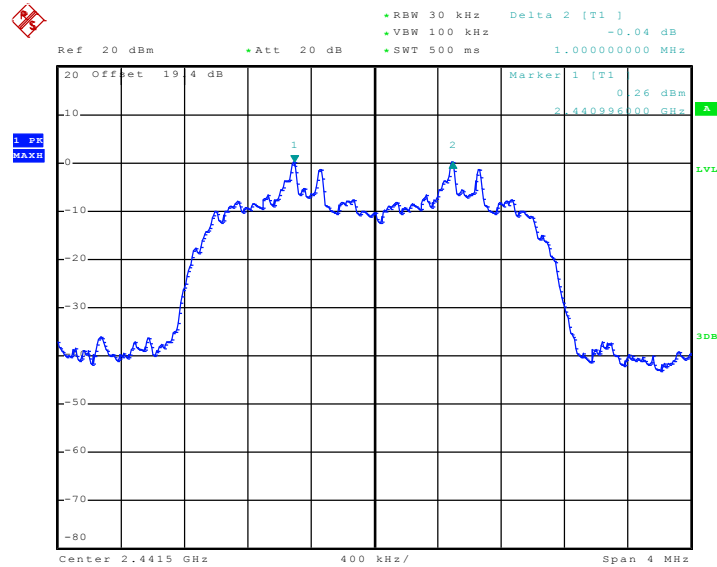
Test Mode :	Mode 7, 8, 9	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.008	0.859	Pass
39	2441	1.000	0.853	Pass
78	2480	1.008	0.848	Pass

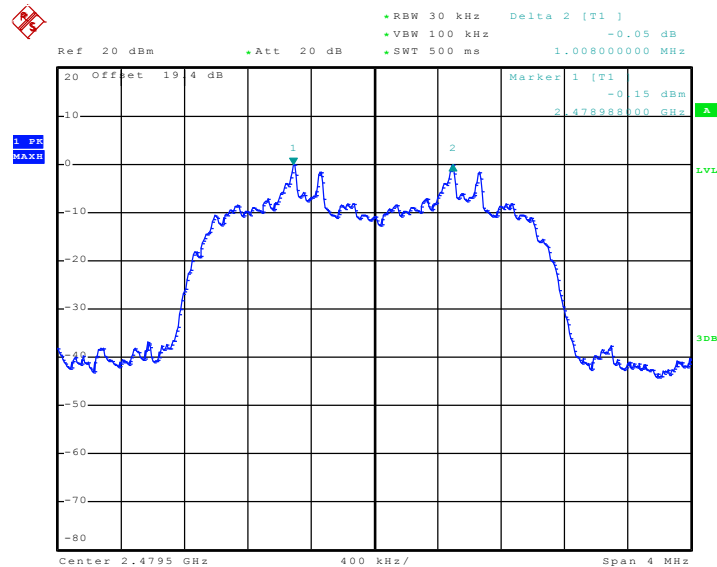
Channel Separation Plot on Channel 00 - 01



Date: 22.JUN.2010 23:54:50

Channel Separation Plot on Channel 39 - 40


Date: 22.JUN.2010 23:56:49

Channel Separation Plot on Channel 77 - 78


Date: 22.JUN.2010 23:57:44

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.

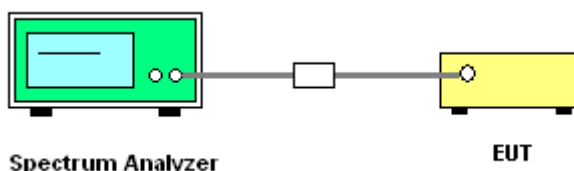
3.4.2 Measuring Instruments

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



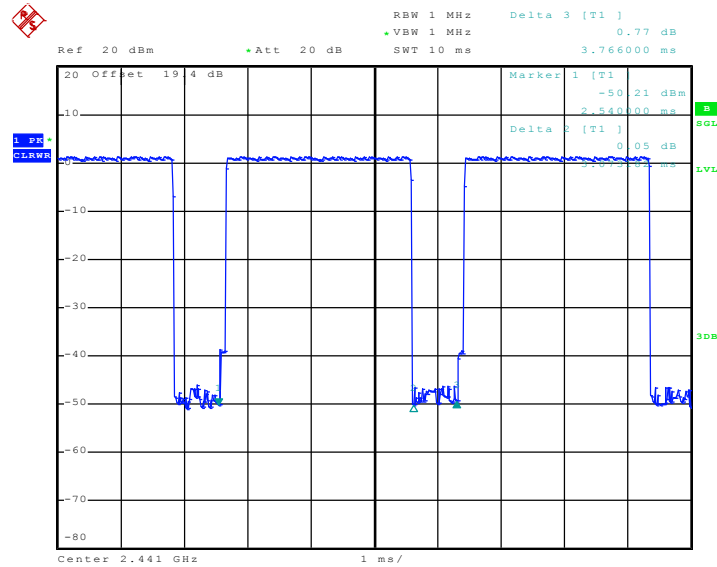
3.4.5 Test Result of Dwell Time

Test Mode :	Mode 8	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%

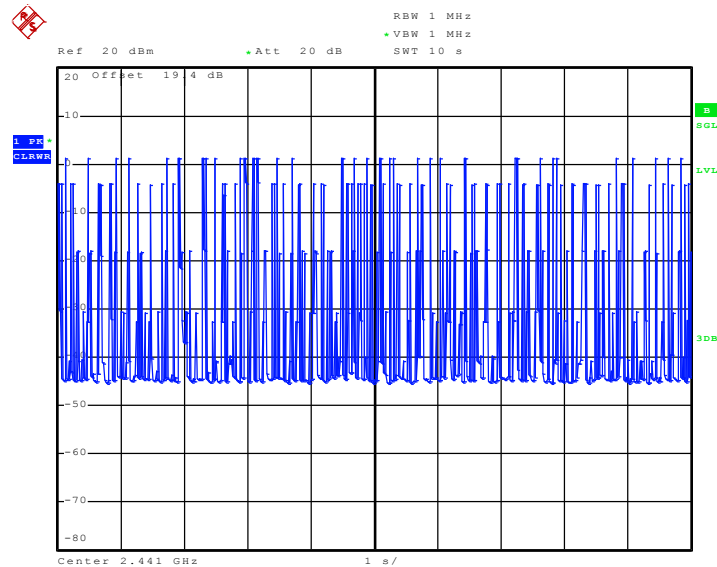
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
3DH5	3.40	3073.18	0.33	0.4	Pass

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: 23.JUN.2010 01:12:02

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


Date: 23.JUN.2010 01:03:10

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 employing at least 75 non-overlapping hopping channels: 1W (30 dBm).

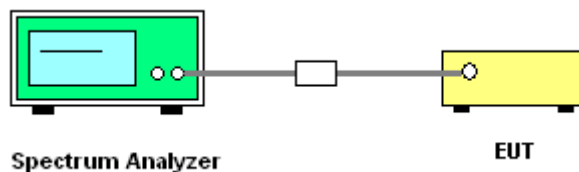
3.5.2 Measuring Instruments

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.

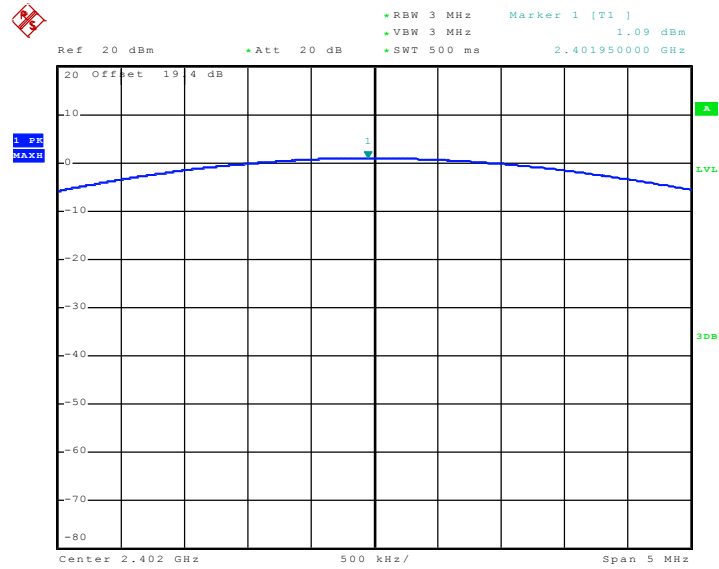
3.5.4 Test Setup



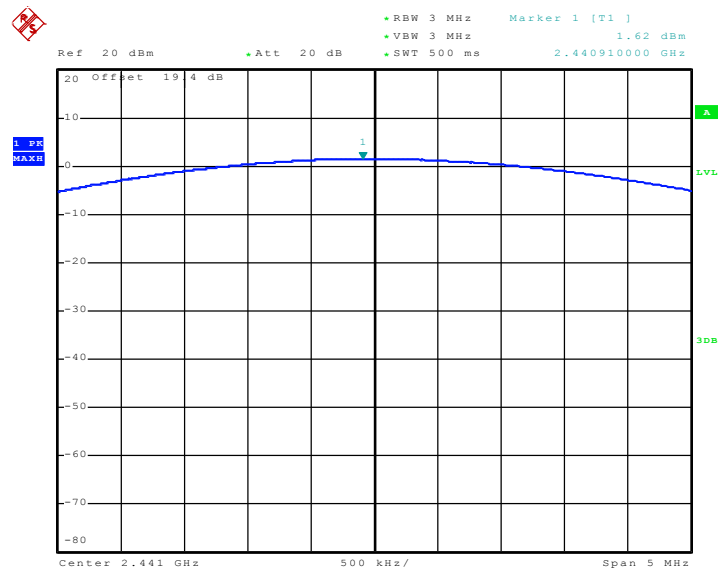
3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 7, 8, 9	Temperature :	25~27°C
Test Engineer :	Lacelot Chen	Relative Humidity :	39~42%

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits (dBm)	Pass/Fail
		3 Mbps		
00	2402	1.09	30	Pass
39	2441	1.62	30	Pass
78	2480	1.44	30	Pass

Peak Output Power Plot on Channel 00


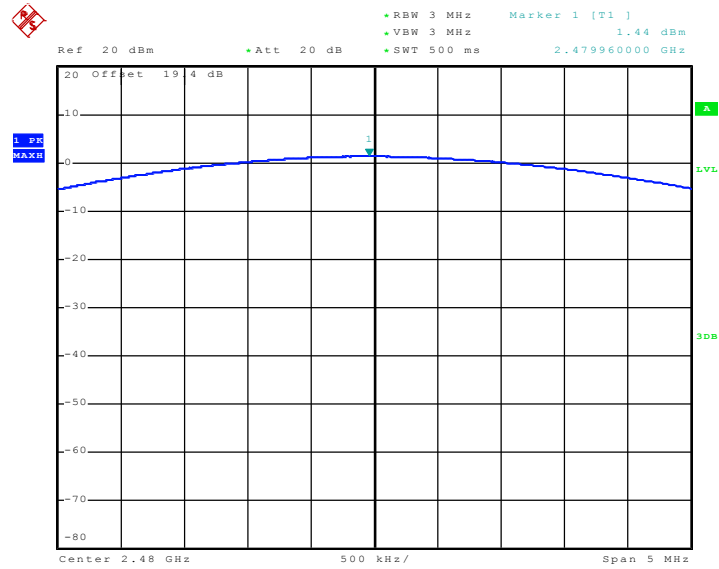
Date: 22.JUN.2010 23:24:10

Peak Output Power Plot on Channel 39


Date: 22.JUN.2010 23:37:15



Peak Output Power Plot on Channel 78



Date: 22.JUN.2010 23:23:25

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

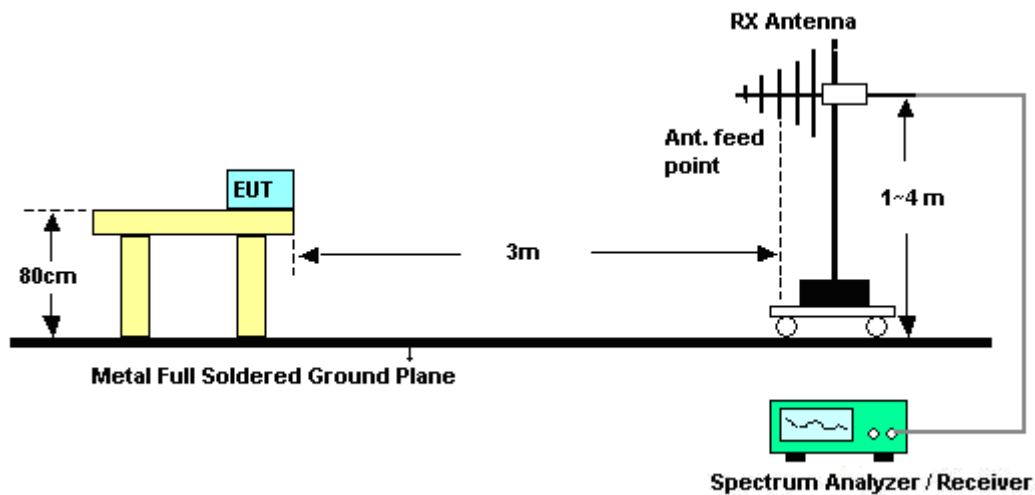
See list of measuring instruments of this test report.

3.6.3 Test Procedures

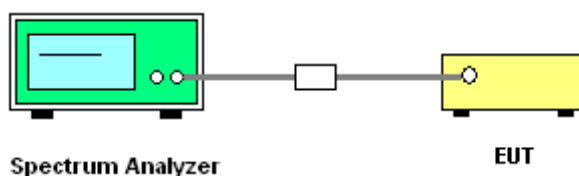
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300kHz, Video bandwidth (VBW) \geq RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as 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 :	24~25°C
Test Channel :	00	Relative Humidity :	49~50%
		Test Engineer :	Duncan Lin

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
2375.17	46.45	-27.55	74	41.85	32.11	5.75	33.26	153	77	Peak
2375.17	35.48	-18.52	54	30.88	32.11	5.75	33.26	153	77	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
2375.93	48.23	-25.77	74	43.63	32.11	5.75	33.26	100	203	Peak
2375.93	36.61	-17.39	54	32.01	32.11	5.75	33.26	100	203	Average

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	49~50%
		Test Engineer :	Duncan Lin

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	61.16	-12.84	74	56.2	32.27	5.9	33.21	190	228	Peak
2483.5	32.17	-21.83	54	27.21	32.27	5.9	33.21	190	228	Average

Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBμV/m)	Delta Result (dB)	Average Result (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
Single Carrier Mode	81.45	49.28	32.17	54	-21.83	Pass
Hopping Mode	81.45	51.65	29.8	54	-24.2	Pass

Note : Average result = Maximum field strength – Delta result

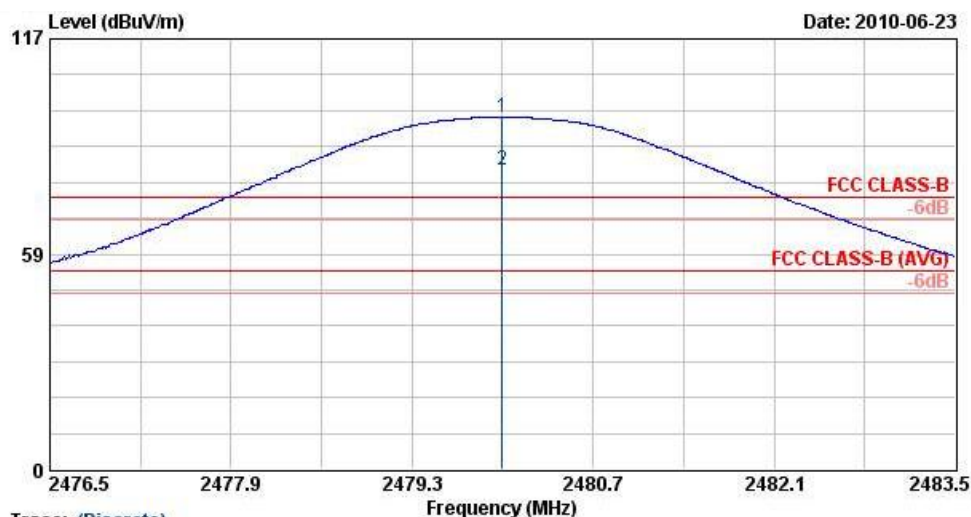
ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	63.66	-10.34	74	58.7	32.27	5.9	33.21	100	201	Peak
2483.5	32.86	-21.14	54	27.9	32.27	5.9	33.21	100	201	Average

Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBμV/m)	Delta Result (dB)	Average Result (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
Single Carrier Mode	83.8	50.94	32.86	54	-21.14	Pass
Hopping Mode	83.8	52.42	31.38	54	-22.62	Pass

Note : Average result = Maximum field strength – Delta result

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Horizontal



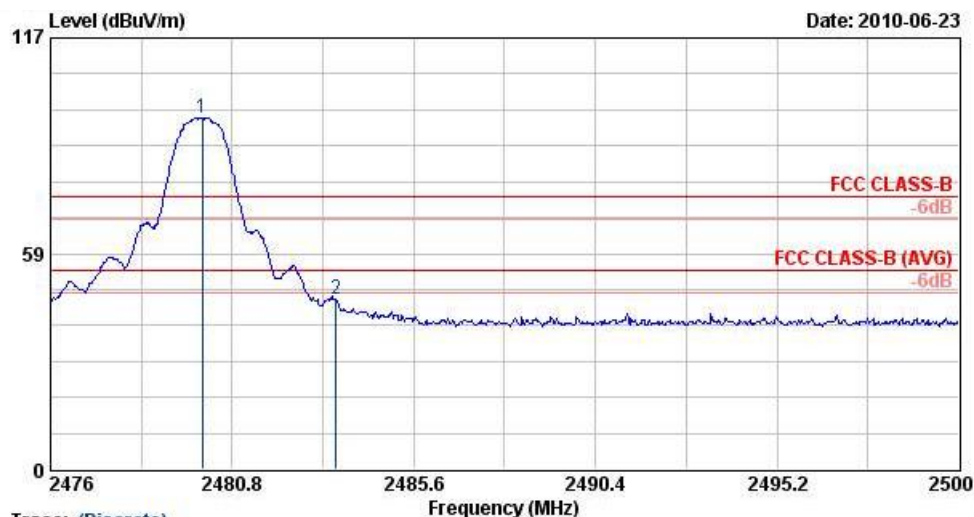
Trace: (Discrete)

Site : 03CH07-HY
Condition : FCC CLASS-B HF-ANT_100526 HORIZONTAL
Project : FR 061724
Mode : Mode 3

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	95.60	21.60	74.00	90.64	32.27	5.90	33.21	190	228	Peak
2 @	2480.00	81.45	27.45	54.00	76.49	32.27	5.90	33.21	190	228	Average

* Maximum field strength of the fundamental emission

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Horizontal



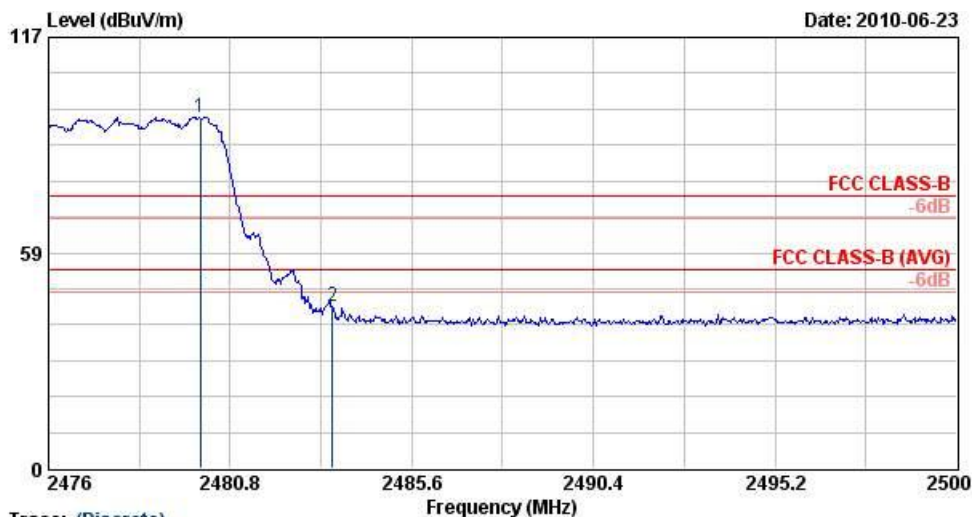
Trace: (Discrete)

Site : 03CH07-HY
Condition : FCC CLASS-B HF-ANT_100526 HORIZONTAL
Project : FR 061724
Mode : Mode 3

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	95.43	21.43	74.00	90.46	32.27	5.90	33.21	190	228	Peak
2	2483.54	46.15	-27.85	74.00	41.19	32.27	5.90	33.21	190	228	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 49.28 dB , single carrier Mode

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Horizontal



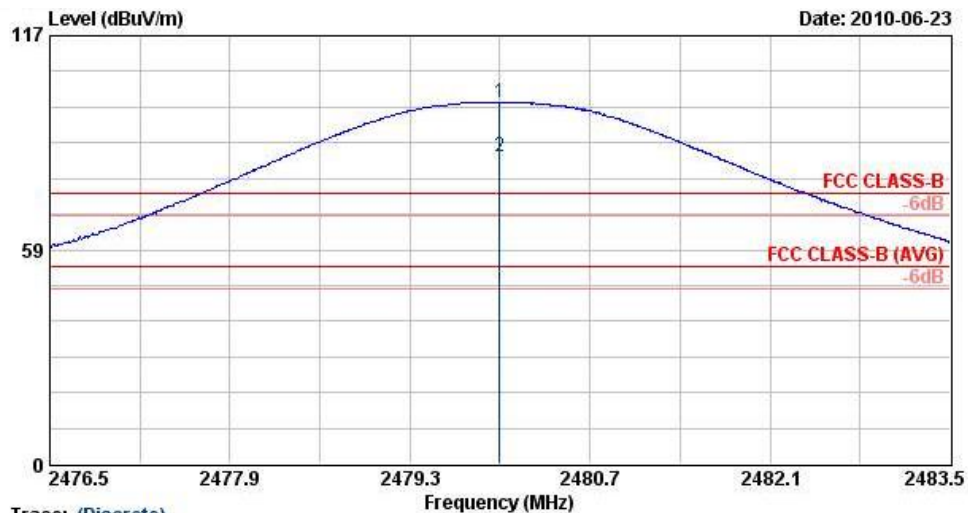
Trace: (Discrete)

Site : 03CH07-HY
Condition : FCC CLASS-B HF-ANT_100526 HORIZONTAL
Project : FR 061724
Mode : Mode 3

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	95.39	21.39	74.00	90.42	32.27	5.90	33.21	190	228	Peak
2	2483.50	43.74	-30.26	74.00	38.77	32.27	5.90	33.21	190	228	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 51.65 dB , Hopping Mode

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Vertical



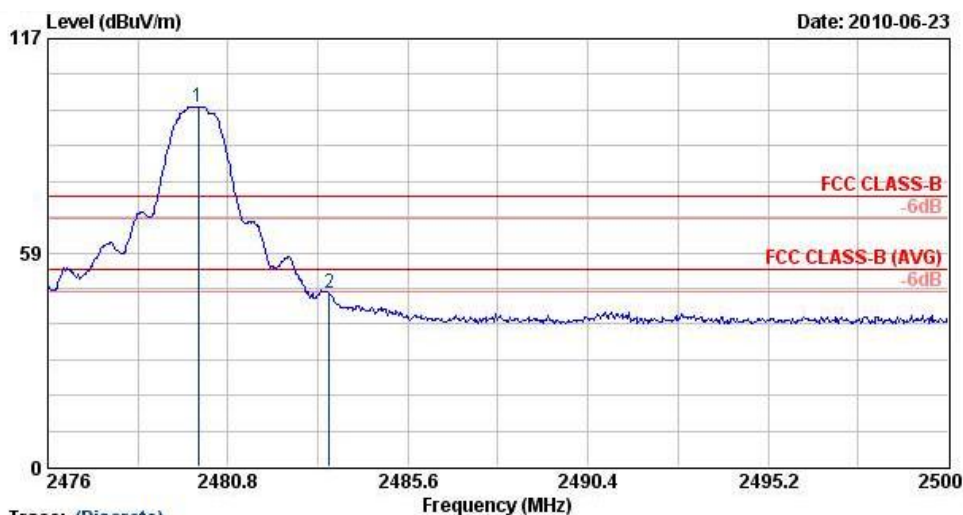
Trace: (Discrete)

Site : 03CH07-HY
Condition : FCC CLASS-B HF-ANT_100526 VERTICAL
Project : FR 061724
Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamplifier	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	2480.00	98.74	24.74	74.00	93.77	32.27	5.90	33.21	100	201 Peak
2 @	2480.00	83.80	29.80	54.00	78.84	32.27	5.90	33.21	100	201 Average

* Maximum field strength of the fundamental emission

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Vertical



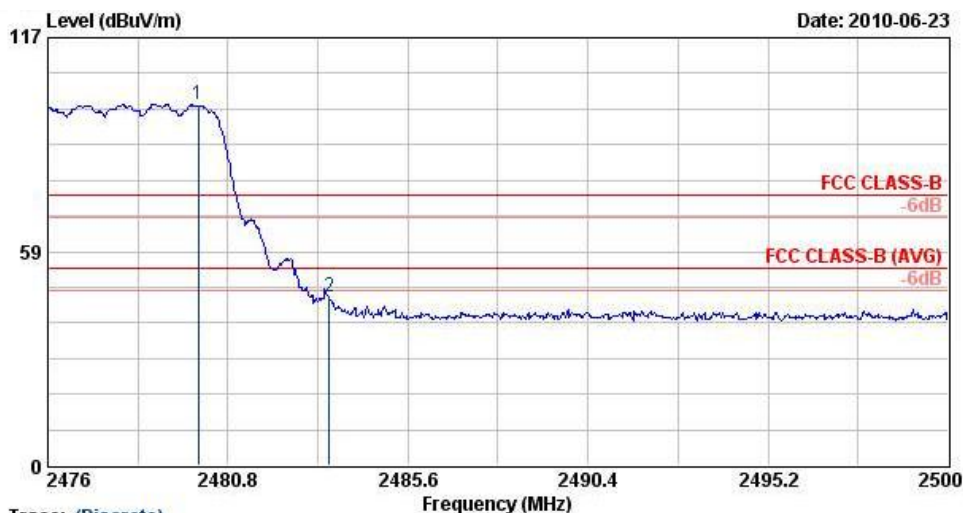
Trace: (Discrete)

Site : 03CH07-RY
Condition : FCC CLASS-B HF-ANT_100526 VERTICAL
Project : FR 061724
Mode : Mode 3

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	98.44	24.44	74.00	93.47	32.27	5.90	33.21	100	201	Peak
2	2483.50	47.50	-26.50	74.00	42.53	32.27	5.90	33.21	100	201	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 50.94 dB , single carrier Mode

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Vertical



Trace: (Discrete)

Site : 03CH07-HY
Condition : FCC CLASS-B HF-ANT_100526 VERTICAL
Project : FR 061724
Mode : Mode 3

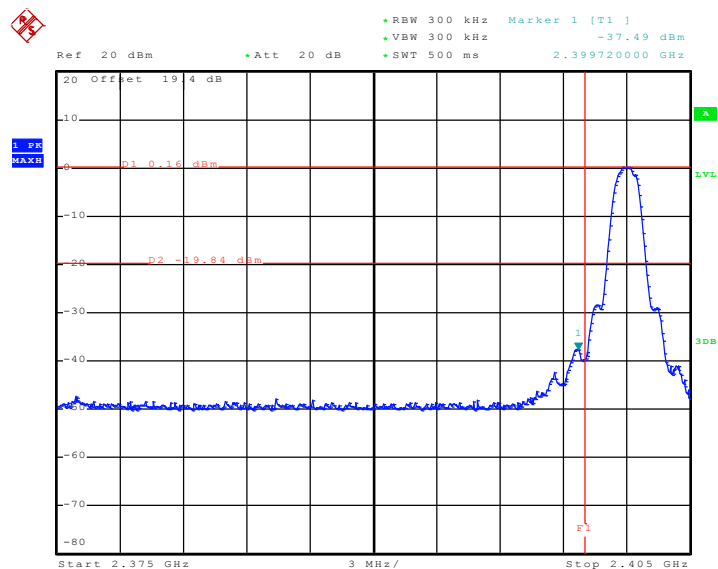
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	98.59	24.59	74.00	93.62	32.27	5.90	33.21	100	201	Peak
2	2483.50	46.17	-27.83	74.00	41.20	32.27	5.90	33.21	100	201	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 52.42 dB , Hopping Mode

3.6.6 Test Result of Conducted Band Edges

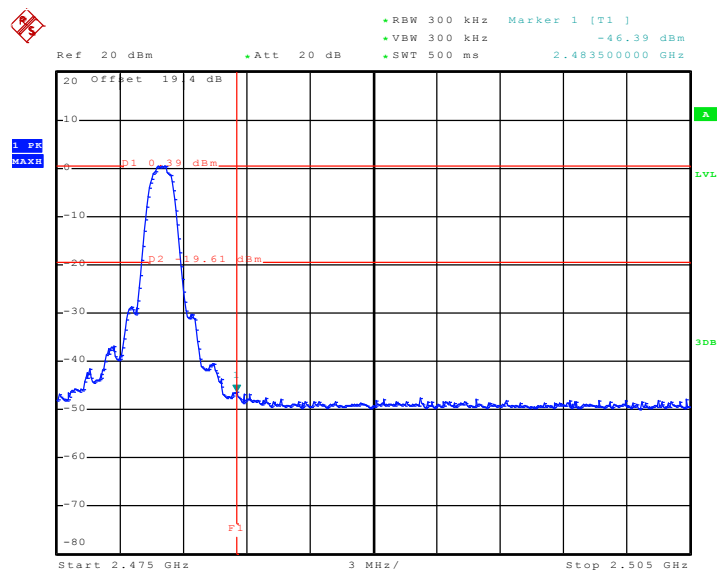
Test Mode :	Mode 7 and 9	Temperature :	25~27°C
Test Channel :	00 and 78	Relative Humidity :	39~42%
		Test Engineer :	Lacelot Chen

Low Band Edge Plot on Channel 00



Date: 23.JUN.2010 00:17:24

High Band Edge Plot on Channel 78



Date: 22.JUN.2010 23:59:40

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.

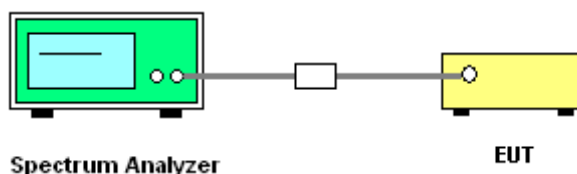
3.7.2 Measuring Instruments

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) \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.

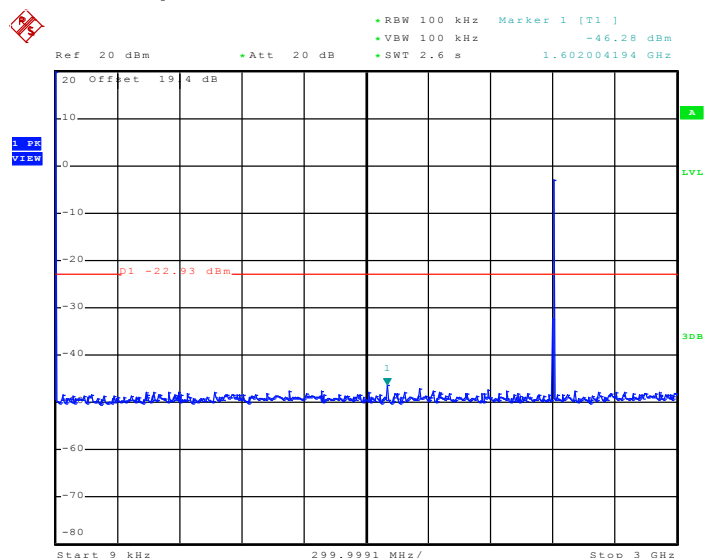
3.7.4 Test Setup



3.7.5 Test Result

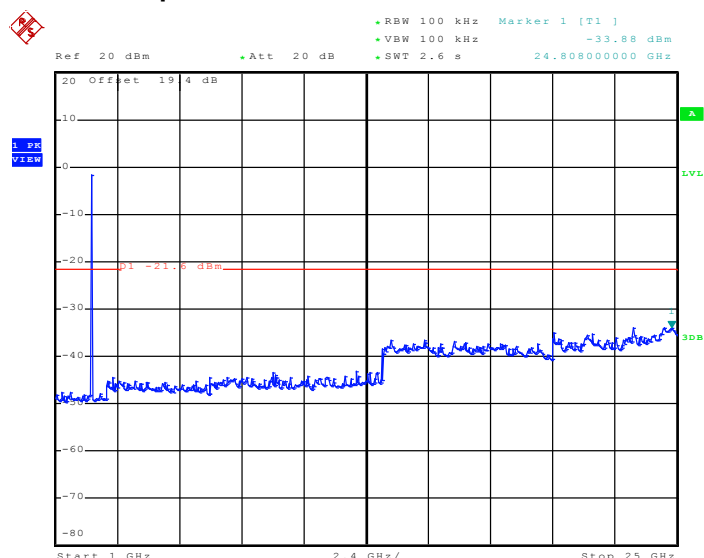
Test Mode :	Mode 7	Temperature :	25~27°C
Test Channel :	00	Relative Humidity :	39~42%
		Test Engineer :	Lacelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



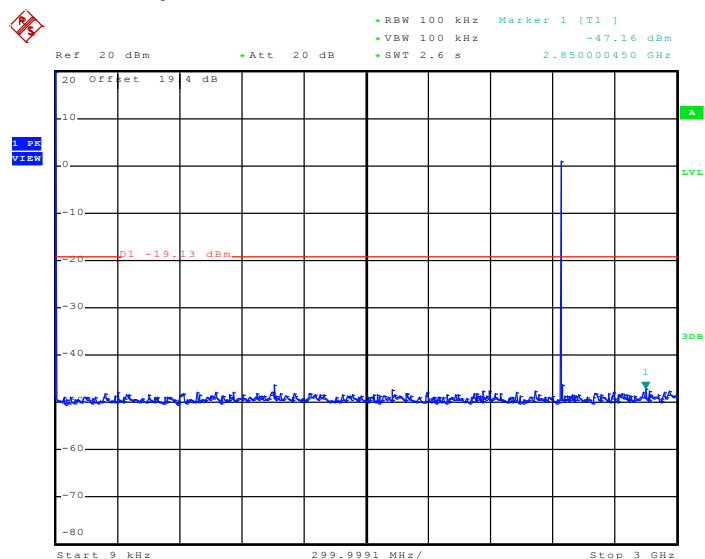
Date: 23.JUN.2010 01:30:46

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

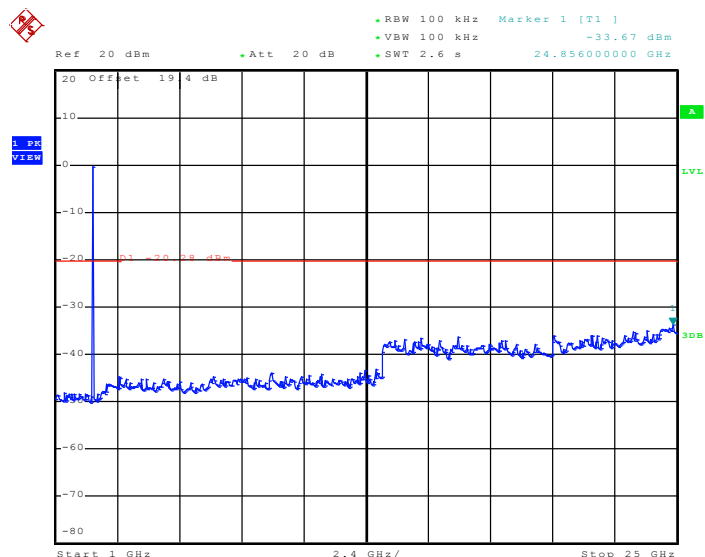


Date: 23.JUN.2010 01:26:37

Test Mode :	Mode 8	Temperature :	25~27°C
Test Channel :	39	Relative Humidity :	39~42%
		Test Engineer :	Lacelot Chen

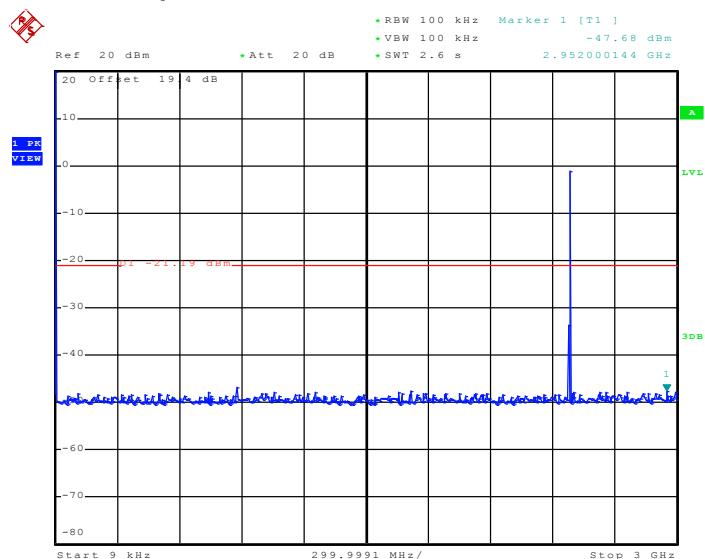
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 23.JUN.2010 01:27:11

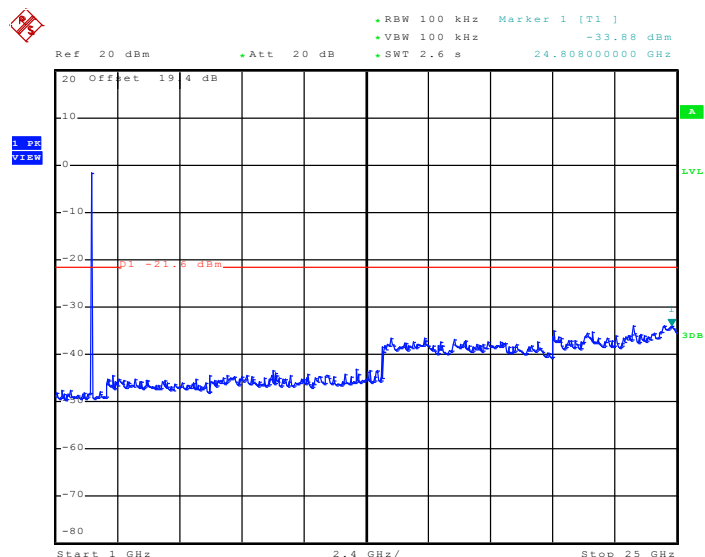
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 23.JUN.2010 01:27:38

Test Mode :	Mode 9	Temperature :	25~27°C
Test Channel :	78	Relative Humidity :	39~42%
		Test Engineer :	Lacelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 23.JUN.2010 01:28:06

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 23.JUN.2010 01:26:37

3.8 AC Conducted Emission Measurement

3.8.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

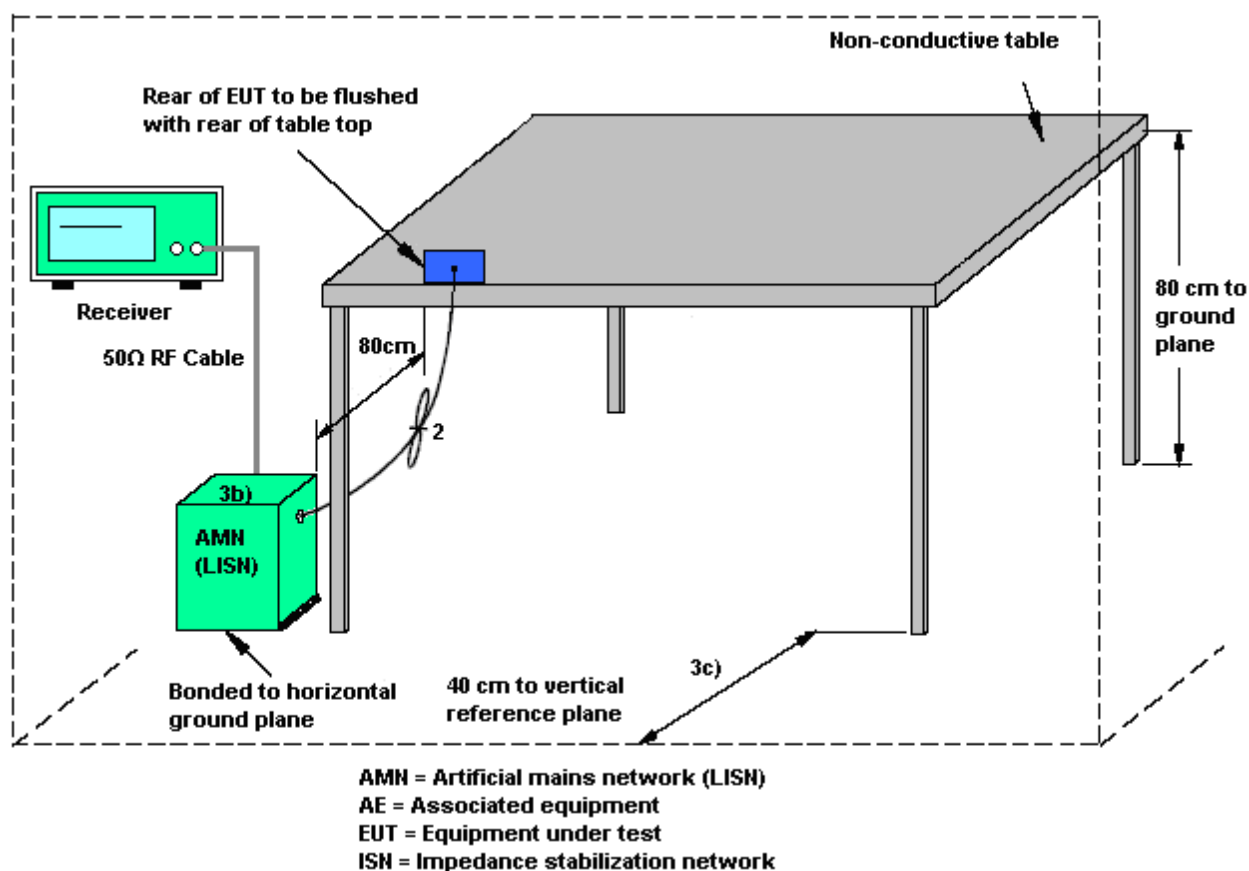
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

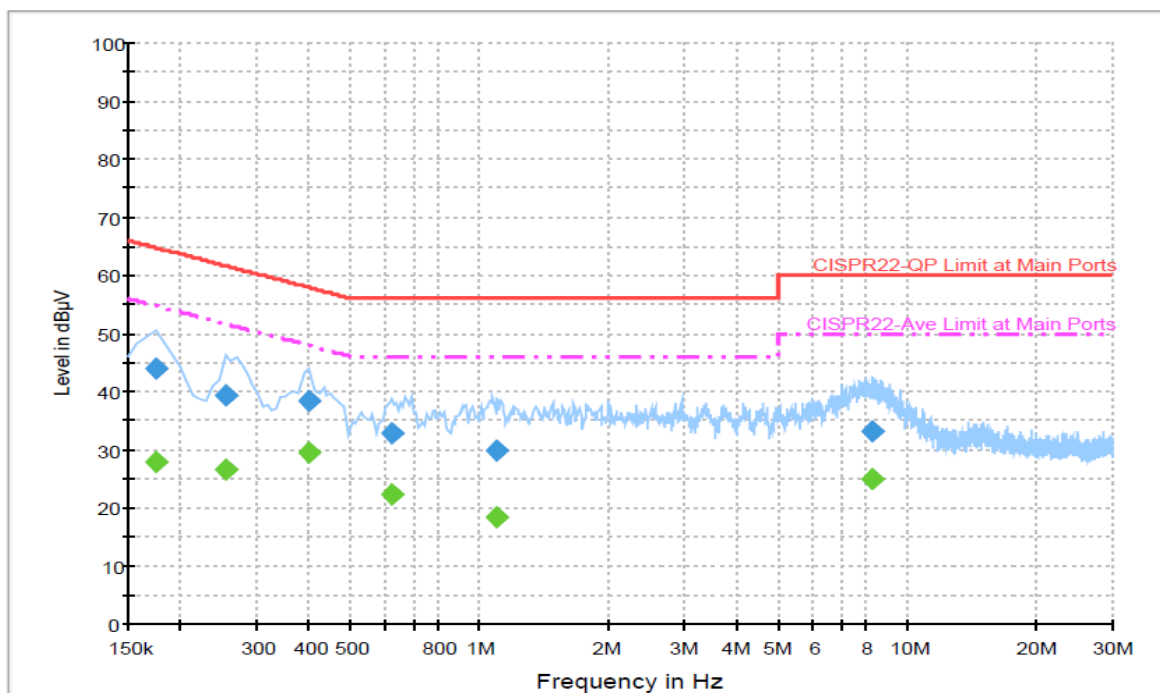
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All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

3.8.4 Test Setup



3.8.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Noivc Jiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Link + Bluetooth Link + USB Cable (Charging from Adapter) + Mobile Phone		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



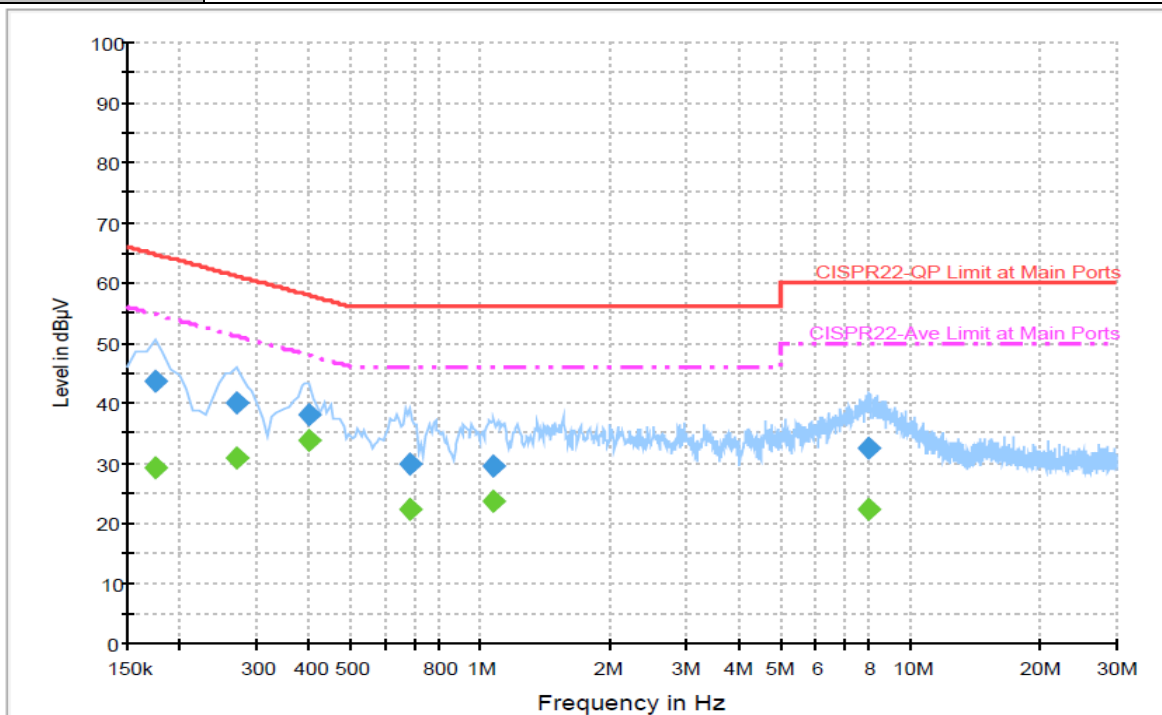
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.174000	43.8	Off	L1	19.3	21.0	64.8
0.254000	39.2	Off	L1	19.3	22.4	61.6
0.398000	38.5	Off	L1	19.4	19.4	57.9
0.622000	32.7	Off	L1	19.3	23.3	56.0
1.094000	29.7	Off	L1	19.4	26.3	56.0
8.246000	33.0	Off	L1	19.6	27.0	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.174000	27.9	Off	L1	19.3	26.9	54.8
0.254000	26.5	Off	L1	19.3	25.1	51.6
0.398000	29.5	Off	L1	19.4	18.4	47.9
0.622000	22.4	Off	L1	19.3	23.6	46.0
1.094000	18.2	Off	L1	19.4	27.8	46.0
8.246000	25.0	Off	L1	19.6	25.0	50.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Noivc Jiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Link + Bluetooth Link + USB Cable (Charging from Adapter) + Mobile Phone		
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)
0.174000	43.7	Off	N	19.3	21.1	64.8
0.270000	39.9	Off	N	19.3	21.2	61.1
0.398000	38.2	Off	N	19.4	19.7	57.9
0.686000	30.0	Off	N	19.5	26.0	56.0
1.062000	29.6	Off	N	19.4	26.4	56.0
7.998000	32.3	Off	N	19.6	27.7	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.174000	29.3	Off	N	19.3	25.5	54.8
0.270000	30.7	Off	N	19.3	20.4	51.1
0.398000	33.7	Off	N	19.4	14.2	47.9
0.686000	22.2	Off	N	19.5	23.8	46.0
1.062000	23.5	Off	N	19.4	22.5	46.0
7.998000	22.3	Off	N	19.6	27.7	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

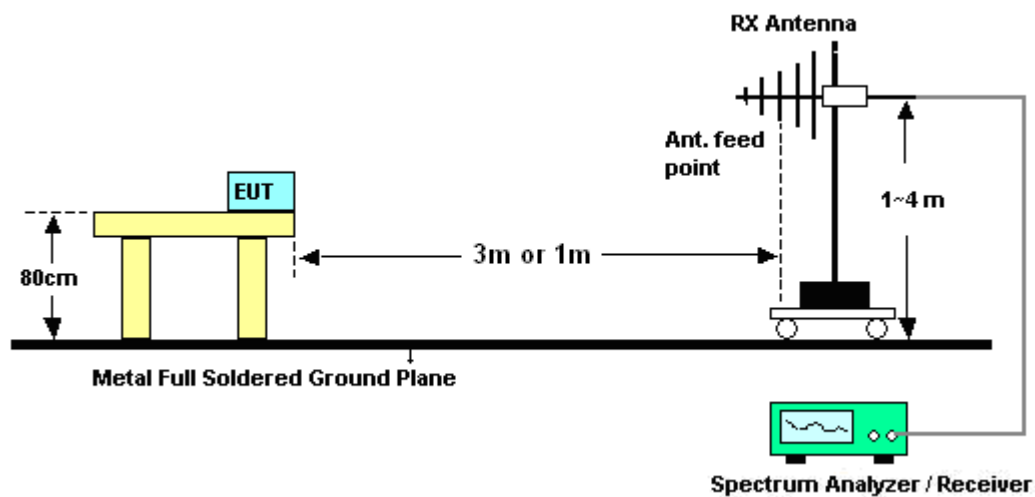
3.9.2 Measuring Instruments

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.

3.9.4 Test Setup



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

Test Engineer :	Duncan Lin	Temperature :	24~25°C	
		Relative Humidity :	49~50%	

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 = $40 \log (\text{specific distance} / \text{test distance})$ (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 :	24~25°C
Test Channel :	00	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Horizontal
Remark :	1. 2402 MHz is Fundamental Signals which can be ignored. 2. 9608 MHz is not within a restricted band.		

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
41.61	21.55	-18.45	40	39.63	12.8	0.63	31.51	100	350	Peak
207.93	24.74	-18.76	43.5	45.93	8.93	1.35	31.47	-	-	Peak
273.54	23.33	-22.67	46	39.96	13.09	1.64	31.36	-	-	Peak
400.1	23.18	-22.82	46	36.09	16.13	2.14	31.18	-	-	Peak
883.8	26.52	-19.48	46	30.89	23.02	3.32	30.71	-	-	Peak
993	27.59	-26.41	54	30.08	24.59	3.5	30.58	-	-	Peak
2375.17	46.45	-27.55	74	41.85	32.11	5.75	33.26	153	77	Peak
2375.17	35.48	-18.52	54	30.88	32.11	5.75	33.26	153	77	Average
2402	97.4	-	-	92.74	32.13	5.78	33.25	153	77	Peak
2402	82.77	-	-	78.11	32.13	5.78	33.25	153	77	Average
2500	33.32	-20.68	54	28.32	32.3	5.9	33.2	153	77	Average
2500	45.06	-28.94	74	40.06	32.3	5.9	33.2	153	77	Peak
4804	57.4	-16.6	74	48.32	34.2	8.52	33.64	103	10	Peak
4804	48.04	-5.96	54	38.95	34.2	8.53	33.64	103	10	Average
8454	57.33	-16.67	74	43.03	36	11.77	33.47	100	251	Peak
8454	44.45	-9.55	54	30.15	36	11.77	33.47	100	251	Average
9608	40.8	-36.6	77.4	71.71	-10.38	12.71	33.24	100	0	Peak

Test Mode :	Mode 1	Temperature :	24~25°C
Test Channel :	00	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Vertical
Remark :	1. 2402 MHz is Fundamental Signals which can be ignored. 2. 9608 MHz is not within a restricted band.		

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
91.02	25.5	-18	43.5	47.04	9.03	0.95	31.52	100	145	Peak
191.73	24.13	-19.37	43.5	45.44	8.9	1.29	31.5	-	-	Peak
275.97	21.85	-24.15	46	38.43	13.14	1.64	31.36	-	-	Peak
433.7	21.15	-24.85	46	33.21	16.81	2.26	31.13	-	-	Peak
825	25.61	-20.39	46	30.65	22.46	3.21	30.71	-	-	Peak
996.5	27.92	-26.08	54	30.36	24.63	3.51	30.58	-	-	Peak
2375.93	48.23	-25.77	74	43.63	32.11	5.75	33.26	100	203	Peak
2375.93	36.61	-17.39	54	32.01	32.11	5.75	33.26	100	203	Average
2402	100.01	-	-	95.31	32.16	5.78	33.24	100	203	Peak
2402	85.25	-	-	80.59	32.13	5.78	33.25	100	203	Average
2492	33.39	-20.61	54	28.39	32.3	5.9	33.2	100	203	Average
2492	45.26	-28.74	74	40.26	32.3	5.9	33.2	100	203	Peak
4804	58.88	-15.12	74	49.8	34.2	8.52	33.64	137	177	Peak
4804	50.53	-3.47	54	41.44	34.2	8.53	33.64	137	177	Average
8394	58.18	-15.82	74	43.91	36	11.71	33.44	100	214	Peak
8394	44.14	-9.86	54	29.87	36	11.71	33.44	100	214	Average
9608	40.51	-39.5	80.01	71.42	-10.38	12.71	33.24	100	0	Peak

Test Mode :	Mode 2	Temperature :	24~25°C
Test Channel :	39	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Horizontal
Remark :	1. 2441 MHz is Fundamental Signals which can be ignored. 2. 9764 MHz is not within a restricted band.		

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
41.61	24.15	-15.85	40	42.23	12.8	0.63	31.51	100	210	Peak
171.21	26.66	-16.84	43.5	47.42	9.53	1.23	31.52	-	-	Peak
272.46	21.49	-24.51	46	38.13	13.08	1.64	31.36	-	-	Peak
366.5	24.68	-21.32	46	38.63	15.24	2.07	31.26	-	-	Peak
788.6	25.13	-20.87	46	30.63	22.06	3.12	30.68	-	-	Peak
990.9	27.4	-26.6	54	29.92	24.56	3.5	30.58	-	-	Peak
2364	45.28	-28.72	74	40.71	32.08	5.75	33.26	137	149	Peak
2364	33.5	-20.5	54	28.93	32.08	5.75	33.26	137	149	Average
2441	96.92	-	-	92.08	32.22	5.84	33.22	137	149	Peak
2441	82.51	-	-	77.67	32.22	5.84	33.22	137	149	Average
2500	44.59	-29.41	74	39.59	32.3	5.9	33.2	137	149	Peak
2500	33.31	-20.69	54	28.31	32.3	5.9	33.2	137	149	Average
4882	54.49	-19.51	74	45.41	34.2	8.5	33.62	145	11	Peak
4882	45.75	-8.25	54	36.67	34.2	8.5	33.62	145	11	Average
8454	57.19	-16.81	74	42.89	36	11.77	33.47	100	112	Peak
8454	44.88	-9.12	54	30.58	36	11.77	33.47	100	112	Average
9764	43.16	-33.76	76.92	73.58	-10.08	12.71	33.05	100	0	Peak

Test Mode :	Mode 2	Temperature :	24~25°C
Test Channel :	39	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	Polarization :	Vertical
Remark :	1. 2441 MHz is Fundamental Signals which can be ignored. 2. 9764 MHz is not within a restricted band.		

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
41.61	25.27	-14.73	40	43.35	12.8	0.63	31.51	100	85	Peak
91.02	25.88	-17.62	43.5	47.42	9.03	0.95	31.52	-	-	Peak
180.93	24.9	-18.6	43.5	46.15	9.03	1.25	31.53	-	-	Peak
388.2	20.51	-25.49	46	33.81	15.8	2.12	31.22	-	-	Peak
775.3	24.81	-21.19	46	30.53	21.87	3.1	30.69	-	-	Peak
993.7	27.01	-26.99	54	29.49	24.6	3.5	30.58	-	-	Peak
2372	44.81	-29.19	74	40.21	32.11	5.75	33.26	100	201	Peak
2372	33.56	-20.44	54	28.96	32.11	5.75	33.26	100	201	Average
2441	100.72	-	-	95.88	32.22	5.84	33.22	100	201	Peak
2441	85.87	-	-	81.03	32.22	5.84	33.22	100	201	Average
2500	44.4	-29.6	74	39.4	32.3	5.9	33.2	100	201	Peak
2500	33.43	-20.57	54	28.43	32.3	5.9	33.2	100	201	Average
4882	56.74	-17.26	74	47.66	34.2	8.5	33.62	182	146	Peak
4882	48.66	-5.34	54	39.58	34.2	8.5	33.62	182	146	Average
8313	57.2	-16.8	74	42.94	36	11.65	33.39	100	98	Peak
8313	44.55	-9.45	54	30.29	36	11.65	33.39	100	98	Average
9764	42.08	-38.64	80.72	72.5	-10.08	12.71	33.05	100	0	Peak

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	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
41.61	21.41	-18.59	40	39.49	12.8	0.63	31.51	100	144	Peak
191.73	22.76	-20.74	43.5	44.07	8.9	1.29	31.5	-	-	Peak
298.65	23.23	-22.77	46	39.35	13.45	1.76	31.33	-	-	Peak
394.5	23.55	-22.45	46	36.63	15.98	2.13	31.19	-	-	Peak
648.6	22.51	-23.49	46	30.1	20.44	2.84	30.87	-	-	Peak
995.8	26.92	-27.08	54	29.36	24.63	3.51	30.58	-	-	Peak
2358	45.09	-28.91	74	40.52	32.08	5.75	33.26	190	228	Peak
2358	33.53	-20.47	54	28.96	32.08	5.75	33.26	190	228	Average
2480	81.22	-	-	76.26	32.27	5.9	33.21	190	228	Average
2480	95.59	-	-	90.63	32.27	5.9	33.21	190	228	Peak
2483.5	61.16	-12.84	74	56.2	32.27	5.9	33.21	190	228	Peak
2483.5	32.17	-21.83	54	27.21	32.27	5.9	33.21	190	228	Average
8481	57.02	-16.98	74	42.72	36	11.79	33.49	100	74	Peak
8481	44.77	-9.23	54	30.47	36	11.79	33.49	100	74	Average

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Duncan Lin	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
37.02	25.56	-14.44	40	40.79	15.66	0.6	31.49	100	21	Peak
91.02	26.25	-17.25	43.5	47.79	9.03	0.95	31.52	-	-	Peak
202.53	22.88	-20.62	43.5	44.18	8.85	1.33	31.48	-	-	Peak
382.6	22.08	-23.92	46	35.53	15.67	2.11	31.23	-	-	Peak
788.6	25.2	-20.8	46	30.7	22.06	3.12	30.68	-	-	Peak
982.5	28.11	-25.89	54	30.77	24.43	3.49	30.58	-	-	Peak
2382	45.85	-28.15	74	41.22	32.11	5.78	33.26	100	201	Peak
2382	33.62	-20.38	54	28.99	32.11	5.78	33.26	100	201	Average
2480	83.39	-	-	78.43	32.27	5.9	33.21	100	201	Average
2480	98.65	-	-	93.69	32.27	5.9	33.21	100	201	Peak
2483.5	63.66	-10.34	74	58.7	32.27	5.9	33.21	100	201	Peak
2483.5	32.86	-21.14	54	27.9	32.27	5.9	33.21	100	201	Average
8349	57.09	-16.91	74	42.83	36	11.67	33.41	100	251	Peak
8349	45.06	-8.94	54	30.8	36	11.67	33.41	100	251	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	Due Date	Remark
Spectrum Analyzer	R&S	FSP30	101329	9kHz~30GHz	Apr. 26, 2010	Apr. 25, 2011	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 17, 2009	Sep. 16, 2010	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 10, 2009	Sep. 09, 2010	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 05, 2009	Aug. 04, 2010	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)
System Simulator	R&S	CMU200	105934	N/A	Nov. 11, 2008	Nov. 10, 2010	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 04, 2009	Dec. 03, 2010	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec.09,2009	Dec. 08, 2010	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB.GAIN	Mar. 27, 2010	Mar. 26, 2011	Radiation (03CH07-HY)
Bluetooth Base Station	R&S	CBT32	100519	N/A	May 12, 2009	May 11, 2011	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty $U_c(y)$	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 EP061724 as below.