

FCC RF Test Report

APPLICANT : Intel Corp.
EQUIPMENT : Android Smart Phone
BRAND NAME : Intel
MODEL NAME : Black Bay/XOLO
MARKETING NAME : AZ510
FCC ID : O2Z-AZ510
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DSS) Spread Spectrum Transmitter

The product was received on Sep. 26, 2012 and completely tested on Oct. 07, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR232306-04A	Rev. 01	Initial issue of report	Nov. 12, 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(b)	Hopping Channel Separation	$\geq 2/3$ of 20dB BW	Pass	-
3.3	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	$\leq 0.4\text{sec}$ in 31.6sec period	Pass	-
3.4	15.247(a)(1)	A8.1(a)	20dB Bandwidth	NA	Pass	-
3.5	15.247(b)(1)	A8.1(b)	Peak Output Power	$\leq 1\text{ w}$ for 1Mbps $\leq 125\text{ Mw}$ for 2, 3Mbps	Pass	-
3.6	15.247(d)	A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
3.7	15.247(d)	A8.5	Conducted Spurious Emission	$\leq 20\text{dBc}$	Pass	-
3.8	15.247(d)	A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 5.37 dB at 2483.500 MHz
3.9	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 4.90 dB at 3.990 MHz
3.10	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Intel Corp.

SC1-20, 2200 Mission College Blvd, Santa Clara, CA 95054, USA

1.2 Manufacturer

Chi Mei Communication Systems, Inc.

No. 4, Mingsheng Street, Tucheng City, New Taipei City 23678, Taiwan

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Android Smart Phone
Brand Name	Intel
Model Name	Black Bay/XOLO
Marketing Name	AZ510
FCC ID	O2Z-AZ510
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA WLAN 11abgn / Bluetooth
HW Version	PR3.3
SW Version	6892
EUT Stage	Identical Prototype

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

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Maximum Output Power to Antenna	Bluetooth (1Mbps) : 7.65 dBm (0.0058 W) Bluetooth EDR (2Mbps) : 7.62 dBm (0.0058 W) Bluetooth EDR (3Mbps) : 8.23 dBm (0.0067 W)
Antenna Type	PIFA Antenna type with gain 1.93 dBi
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth 2.1 EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth 2.1 EDR (3Mbps) : 8-DPSK

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.
	TH02-HY	CO05-HY	03CH07-HY	722060/4086B-1

1.5 Applied Standards

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

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

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	LCD Monitor	Dell	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
6.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m

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	6.83 dBm	6.72 dBm	7.41 dBm
Ch39	2441MHz	7.53 dBm	7.44 dBm	8.13 dBm
Ch78	2480MHz	7.65 dBm	7.62 dBm	8.23 dBm

Remark:

1. All the test data for each data rate were verified, but only the worst case was reported.
2. The data rate was set in 3Mbps for all the test items due to the highest RF output power.
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 ANSI C63.10-2009 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 KHz to 30 MHz), radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

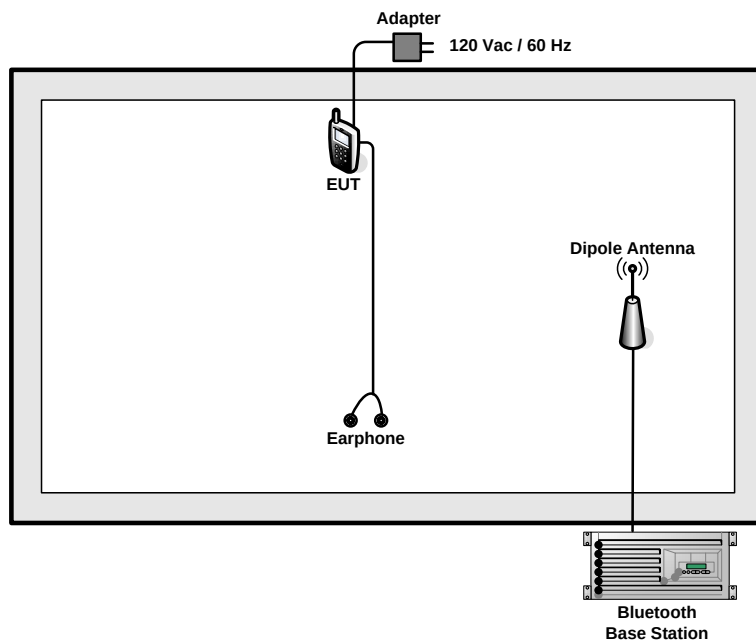
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

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

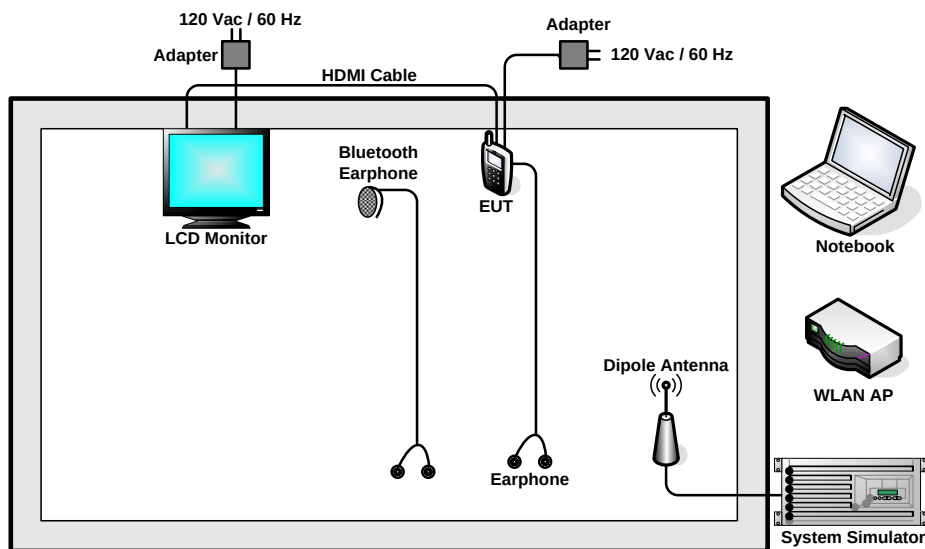
Test Cases			
Test Item	Data Rate / Modulation		
	Bluetooth 1Mbps GFSK	Bluetooth EDR 2Mbps $\pi/4$ -DQPSK	Bluetooth EDR 3Mbps 8-DPSK
Conducted TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated TCs	Pretest	Pretest	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz
AC Conducted Emission	Mode 1 :GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable		
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>



<AC Conducted Emission Mode>



2.4 RF Utility

For Bluetooth function, the RF utility, "Intel bt/wi-fi tools" was installed in EUT which was programmed in order to make the EUT contact with Bluetooth base station for continuous transmitting and receiving signals.

3 Test Result

3.1 Number of Channel Measurement

3.1.1 Limits of Number of Hopping Frequency

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

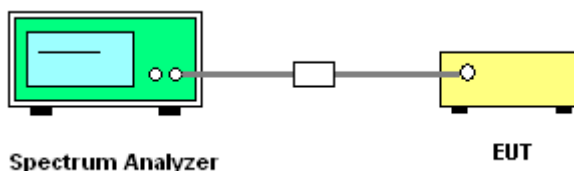
3.1.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW $\geq$ 1% of the span; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. The number of hopping frequency used is defined as the number of total channel.

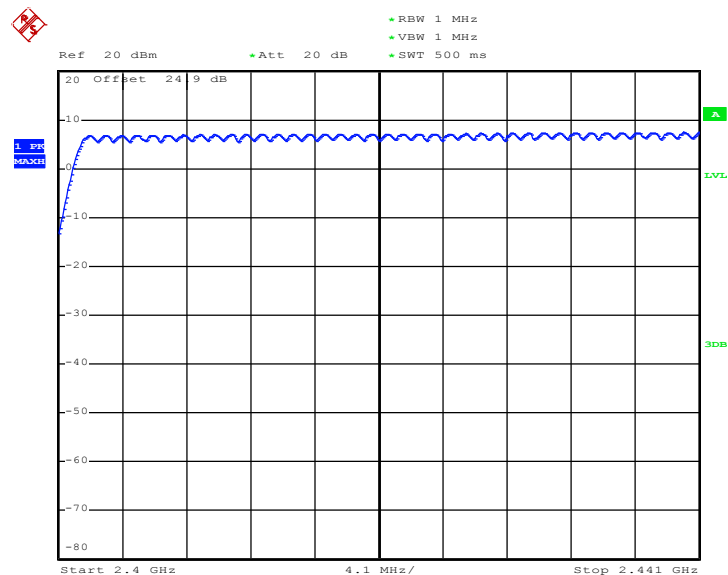
3.1.4 Test Setup



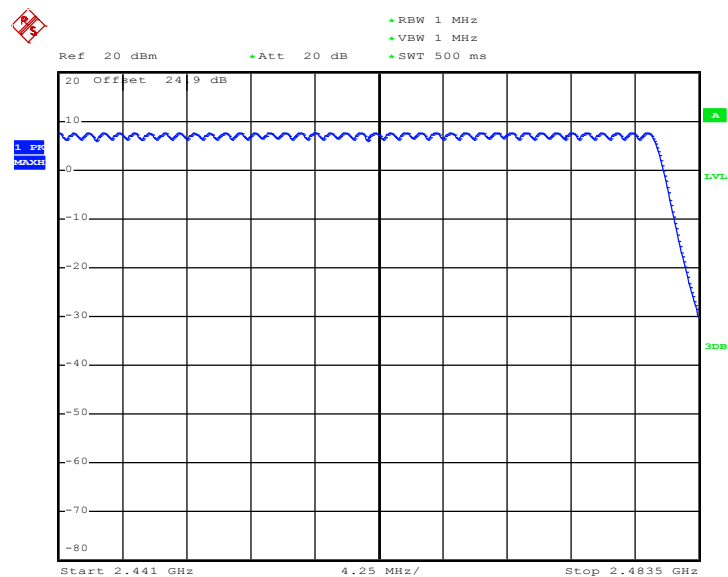
3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	3Mbps	Temperature :	24~26°C
Test Engineer :	Coyote 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: 3.OCT.2012 18:10:58



Date: 3.OCT.2012 18:16:02

3.2 Hopping Channel Separation Measurement

3.2.1 Limit of Hopping Channel Separation

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

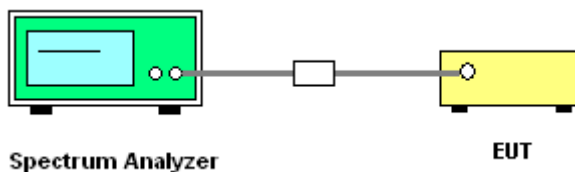
3.2.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels; $RBW \geq 1\%$ of the span;
 $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold.

3.2.4 Test Setup

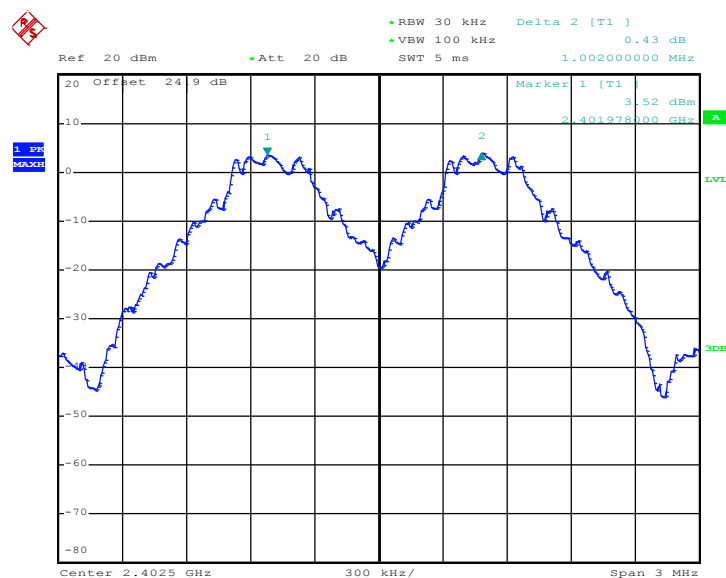


3.2.5 Test Result of Hopping Channel Separation

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

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.6027	Pass
39	2441	1.002	0.6027	Pass
78	2480	1.002	0.6027	Pass

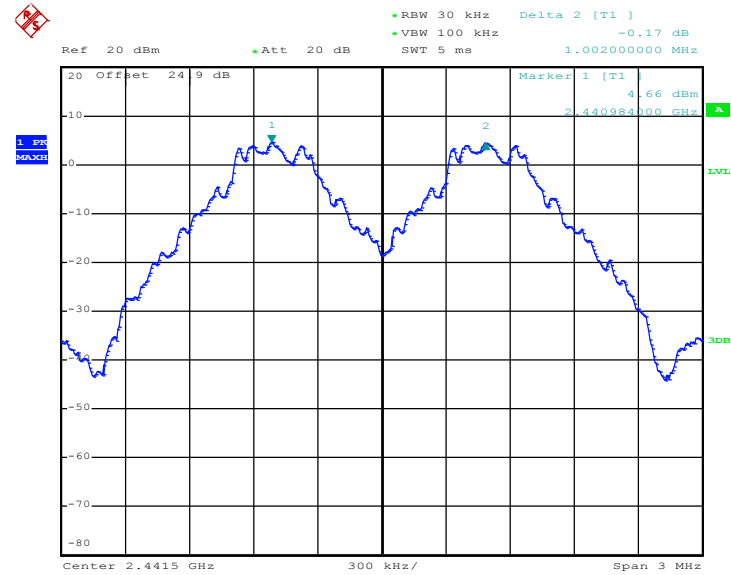
Channel Separation Plot on Channel 00 - 01



Date: 3.OCT.2012 17:30:03

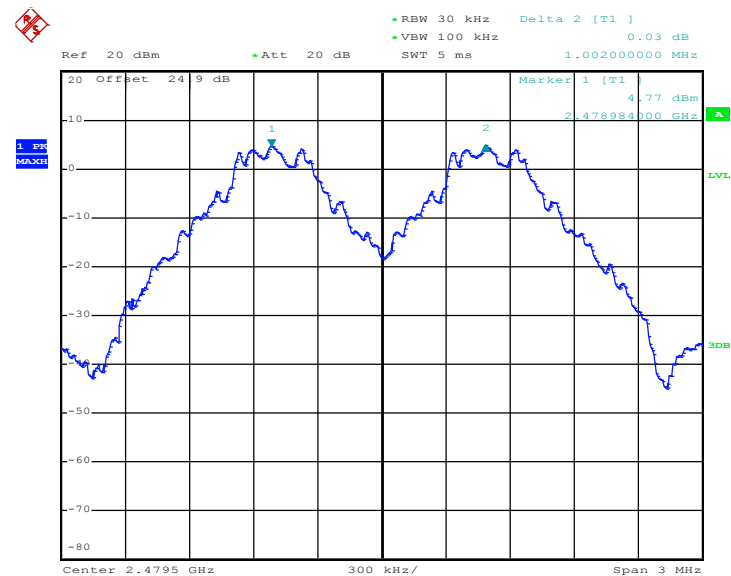


Channel Separation Plot on Channel 39 - 40



Date: 3.OCT.2012 17:30:43

Channel Separation Plot on Channel 77 - 78



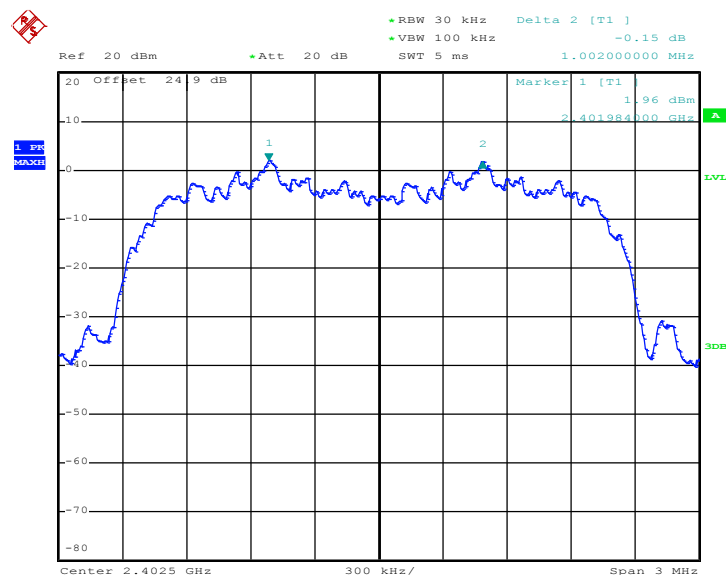
Date: 3.OCT.2012 17:31:52



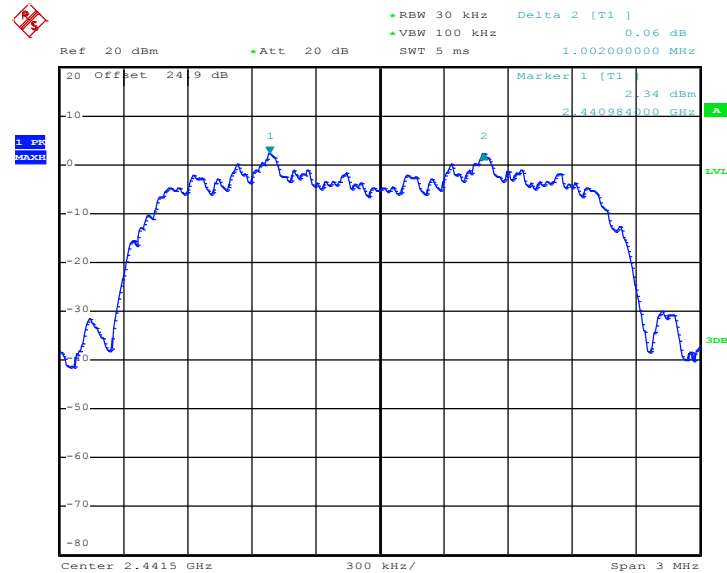
Test Mode :	2Mbps	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

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	0.9000	Pass
78	2480	1.002	0.9000	Pass

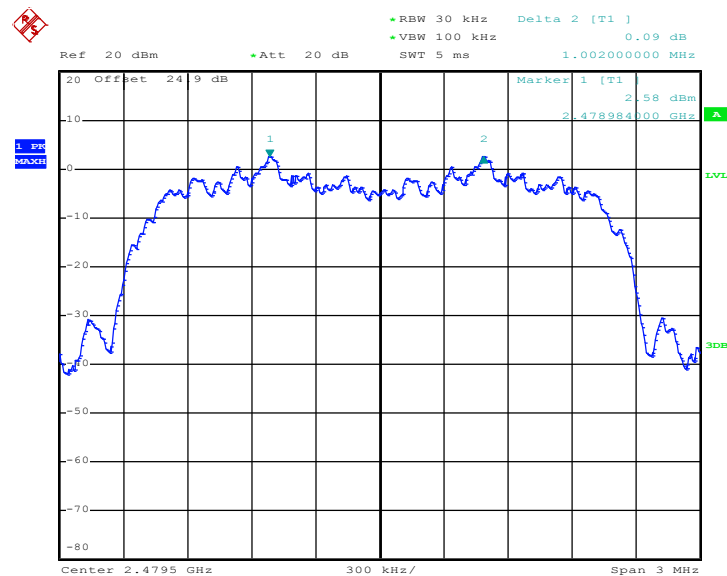
Channel Separation Plot on Channel 00 - 01



Date: 3.OCT.2012 17:33:48

Channel Separation Plot on Channel 39 - 40


Date: 3.OCT.2012 17:34:27

Channel Separation Plot on Channel 77 - 78


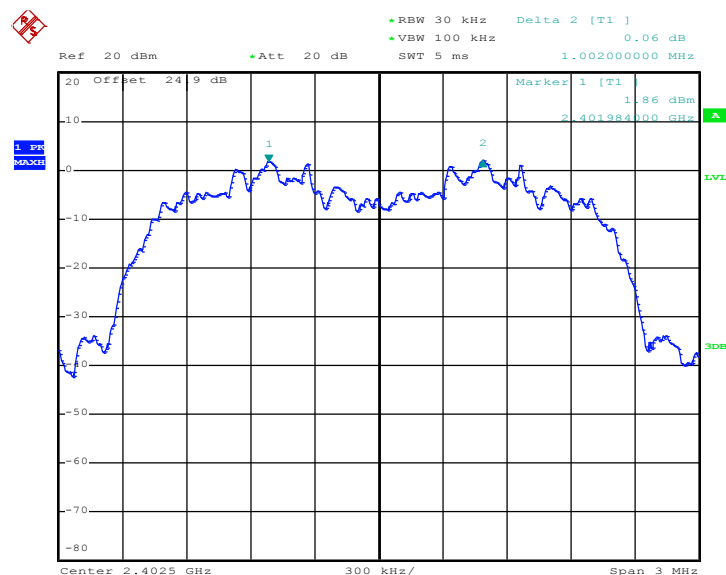
Date: 3.OCT.2012 17:35:48



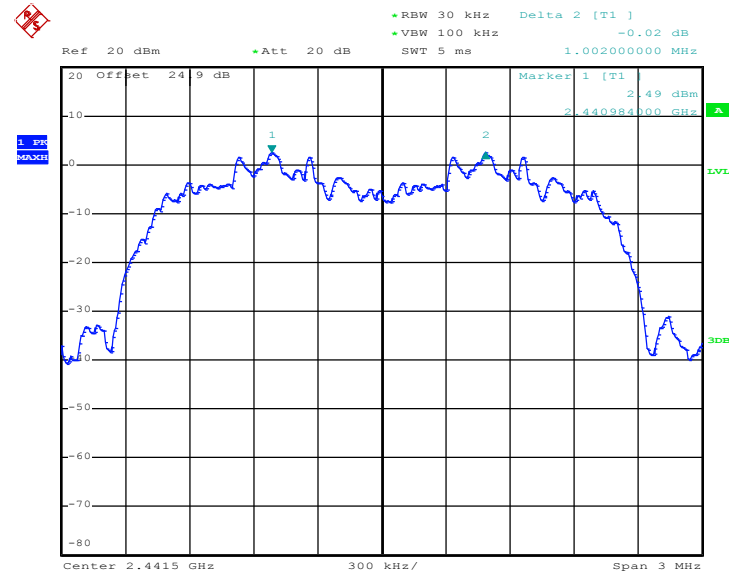
Test Mode :	3Mbps	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.8520	Pass
39	2441	1.002	0.8560	Pass
78	2480	1.002	0.8600	Pass

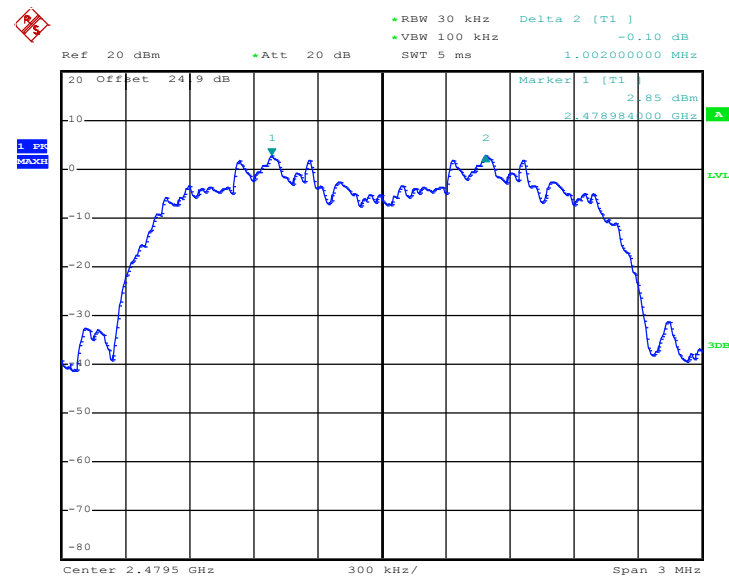
Channel Separation Plot on Channel 00 - 01



Date: 3.OCT.2012 17:36:27

Channel Separation Plot on Channel 39 - 40


Date: 3.OCT.2012 17:39:10

Channel Separation Plot on Channel 77 - 78


Date: 3.OCT.2012 17:41:22

3.3 Dwell Time Measurement

3.3.1 Limit of Dwell Time

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

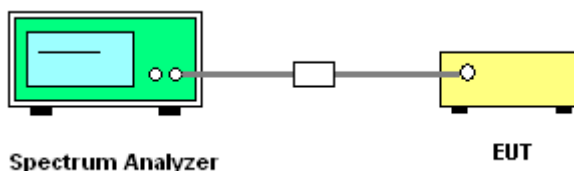
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output connector was connected to the spectrum analyzer through a low loss cable.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW $\geq$ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.

3.3.4 Test Setup



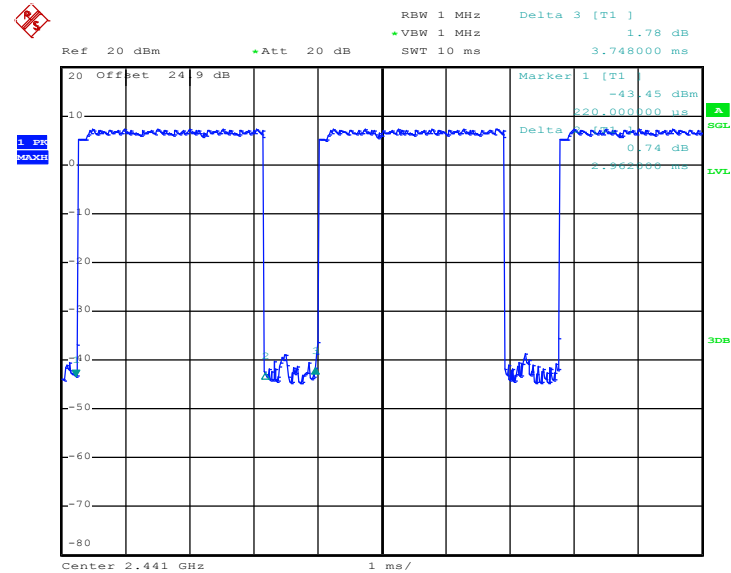
3.3.5 Test Result of Dwell Time

Test Mode :	3DH5	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

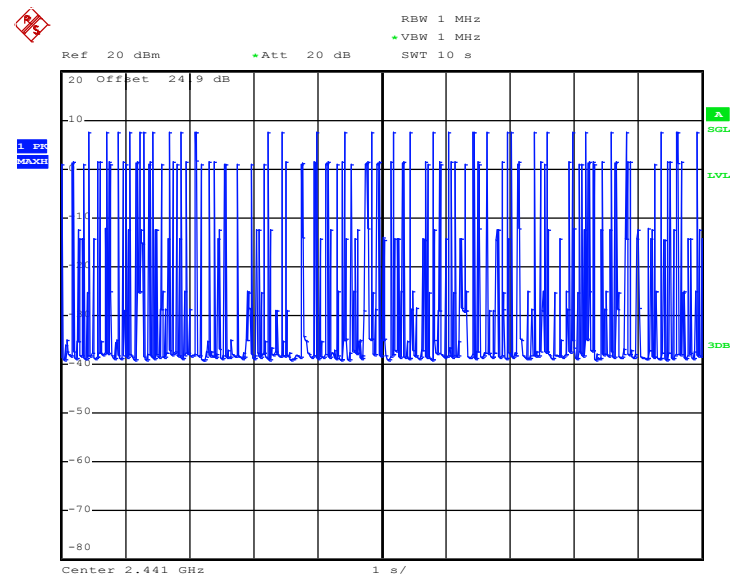
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
3DH5	3.20	2962.00	0.30	0.4	Pass

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: 3.OCT.2012 17:28:19

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


Date: 3.OCT.2012 17:43:35

3.4 20dB Bandwidth Measurement

3.4.1 Limit of 20dB Bandwidth

Reporting only

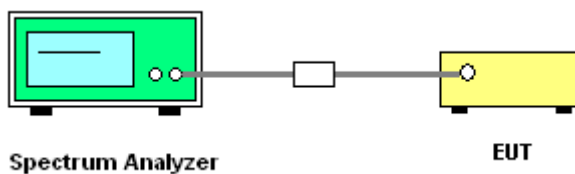
3.4.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
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.

3.4.4 Test Setup

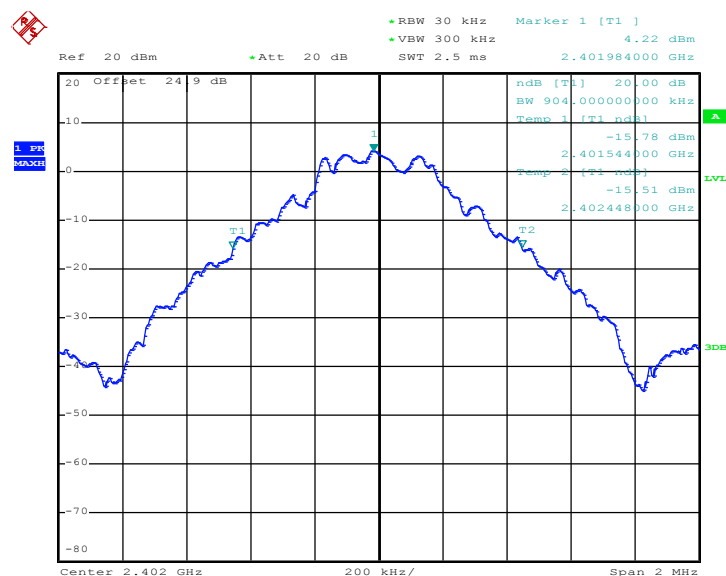


3.4.5 Test Result of 20dB Bandwidth

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

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

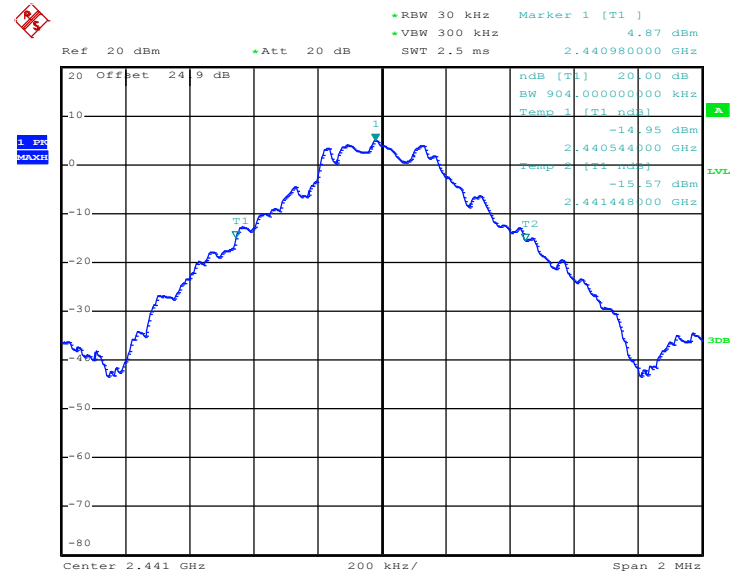
20 dB Bandwidth Plot on Channel 00



Date: 3.OCT.2012 17:47:09

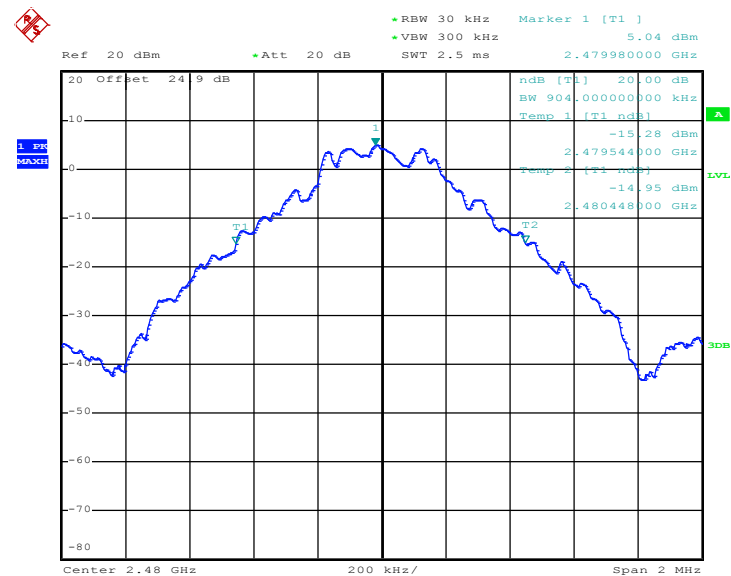


20 dB Bandwidth Plot on Channel 39



Date: 3.OCT.2012 17:47:51

20 dB Bandwidth Plot on Channel 78



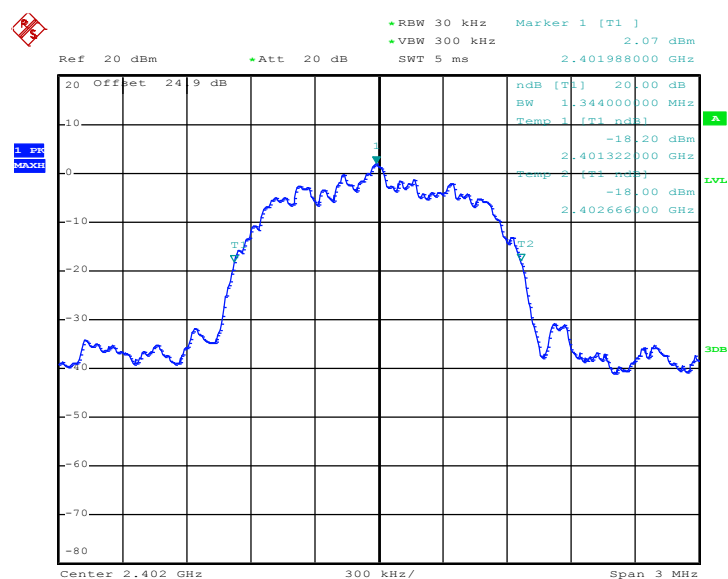
Date: 3.OCT.2012 17:49:03



Test Mode :	2Mbps	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.344
39	2441	1.350
78	2480	1.350

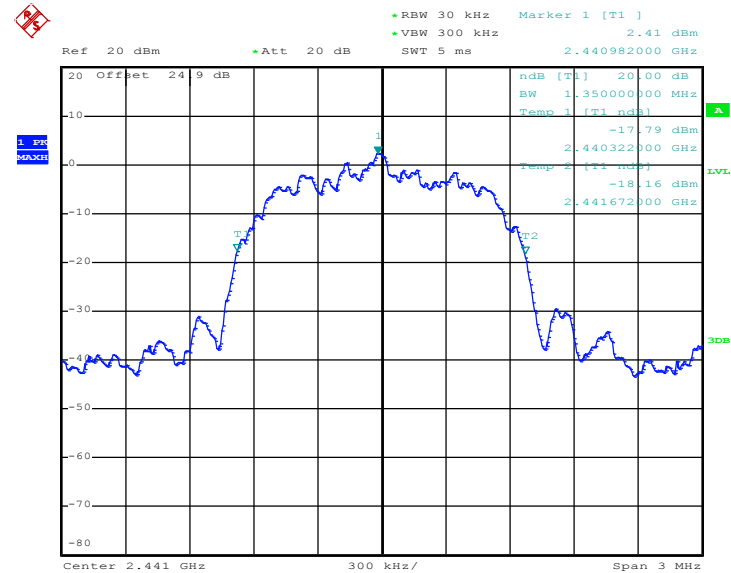
20 dB Bandwidth Plot on Channel 00



Date: 3.OCT.2012 17:51:19

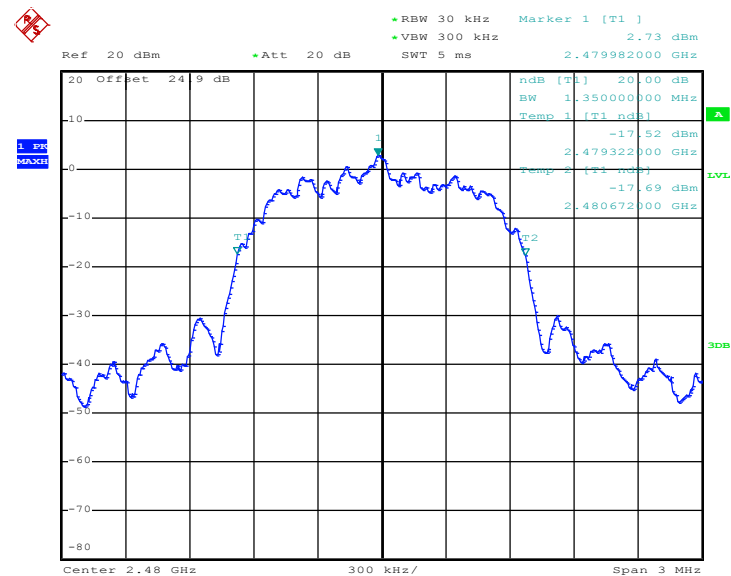


20 dB Bandwidth Plot on Channel 39



Date: 3.OCT.2012 17:52:45

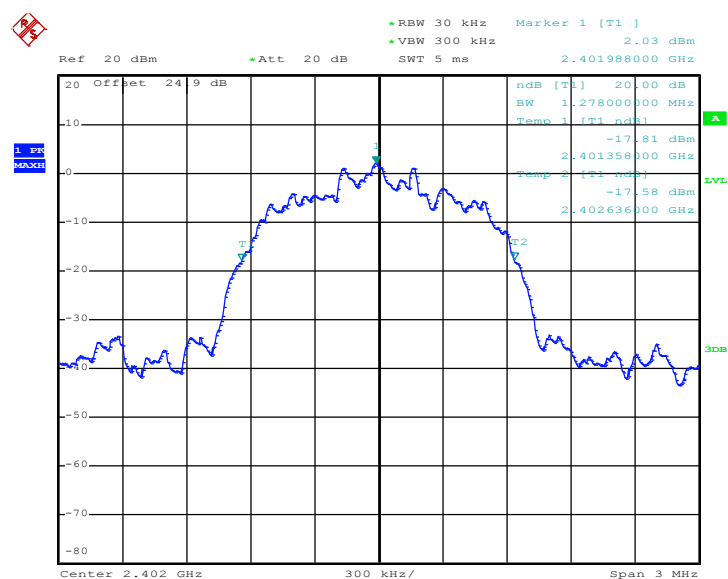
20 dB Bandwidth Plot on Channel 78



Date: 3.OCT.2012 17:54:47

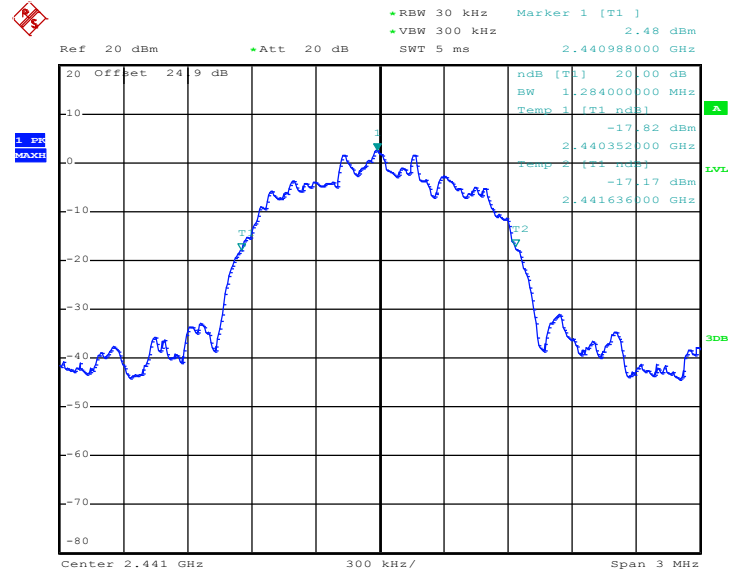
Test Mode :	3Mbps	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.278
39	2441	1.284
78	2480	1.290

20 dB Bandwidth Plot on Channel 00


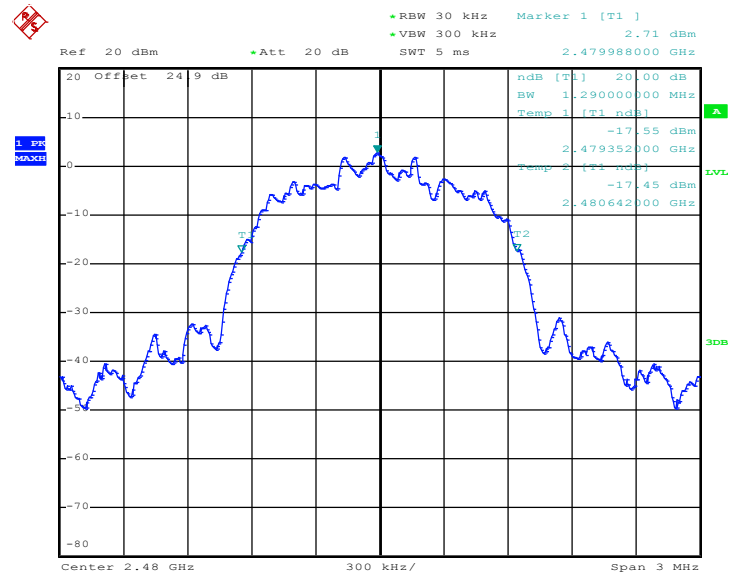
Date: 3.OCT.2012 17:56:27

20 dB Bandwidth Plot on Channel 39



Date: 3.OCT.2012 17:57:08

20 dB Bandwidth Plot on Channel 78



Date: 3.OCT.2012 17:59:06

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.

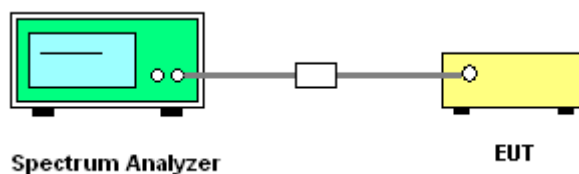
3.5.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.5.4 Test Setup

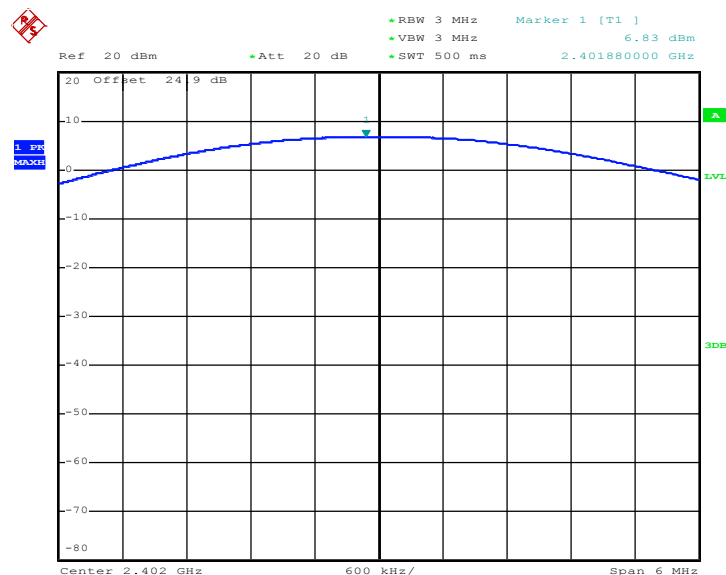


3.5.5 Test Result of Peak Output Power

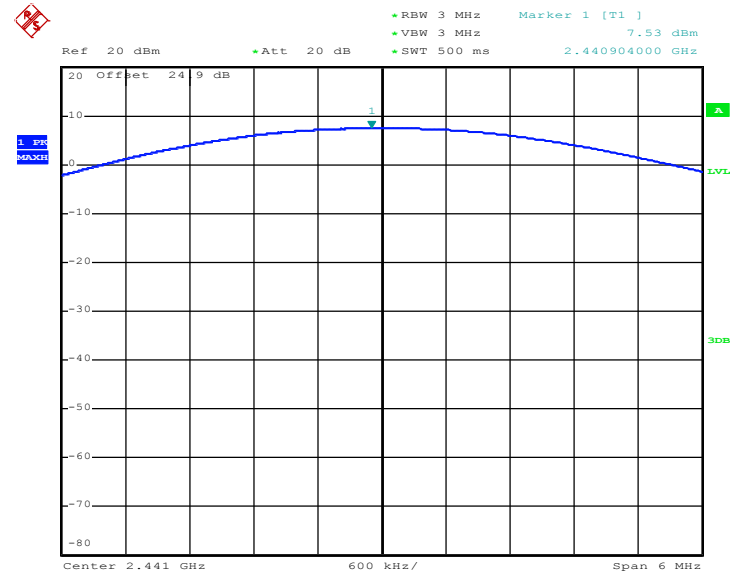
Test Mode :	1Mbps	Temperature :	24~26℃
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	6.83	30.00	Pass
39	2441	7.53	30.00	Pass
78	2480	7.65	30.00	Pass

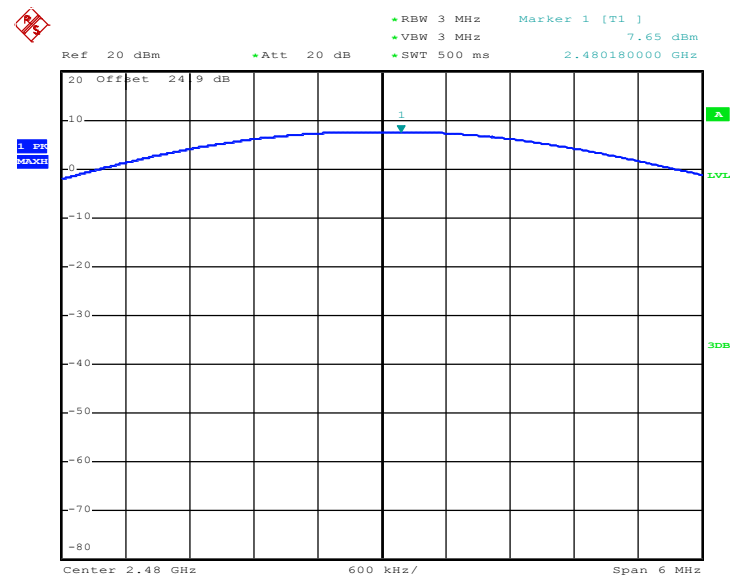
Peak Output Power Plot on Channel 00



Date: 3.OCT.2012 17:05:44

Peak Output Power Plot on Channel 39


Date: 3.OCT.2012 17:06:59

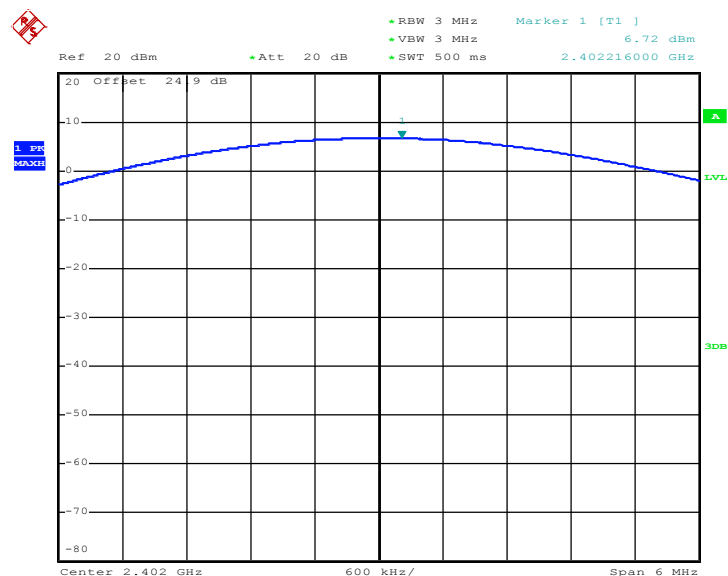
Peak Output Power Plot on Channel 78


Date: 3.OCT.2012 17:08:13

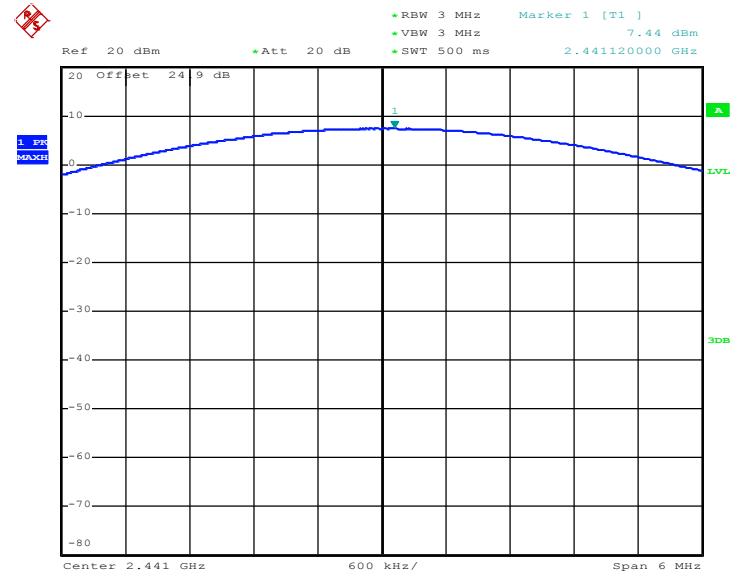


Test Mode :	2Mbps	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

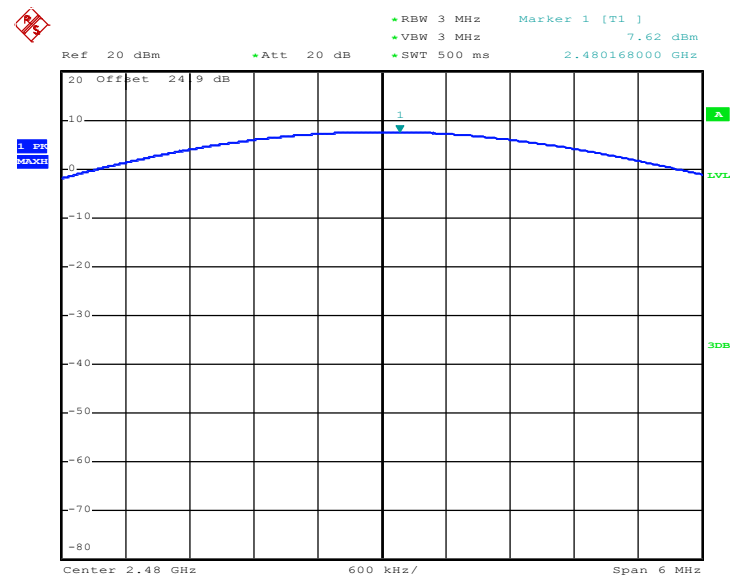
Channel	Frequency (MHz)	RF Power (dBm)		
		π /4-DQPSK	Max. Limits (dBm)	Pass/Fail
		2 Mbps		
00	2402	6.72	20.97	Pass
39	2441	7.44	20.97	Pass
78	2480	7.62	20.97	Pass

Peak Output Power Plot on Channel 00

Date: 3.OCT.2012 17:06:17

Peak Output Power Plot on Channel 39


Date: 3.OCT.2012 17:07:32

Peak Output Power Plot on Channel 78


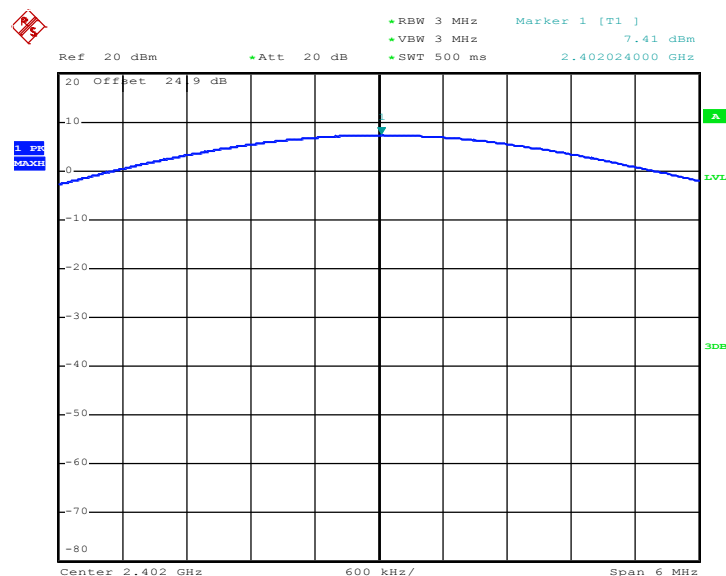
Date: 3.OCT.2012 17:08:46



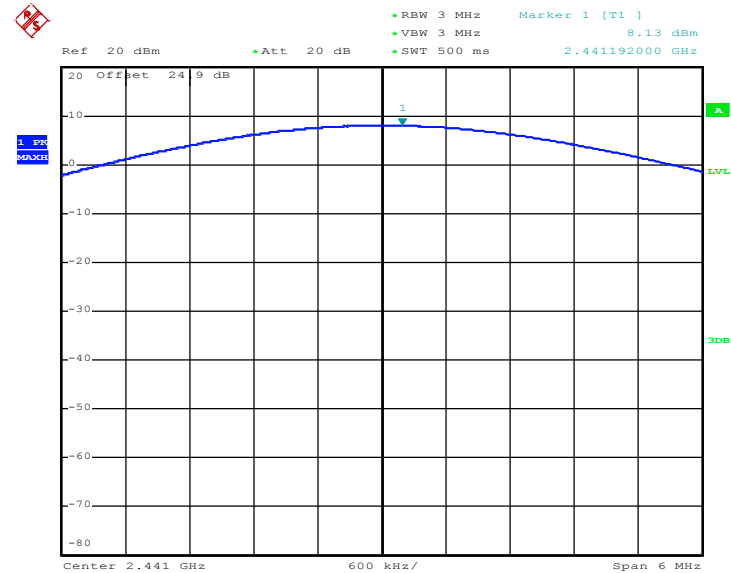
Test Mode :	3Mbps	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits (dBm)	Pass/Fail
		3 Mbps		
00	2402	7.41	20.97	Pass
39	2441	8.13	20.97	Pass
78	2480	8.23	20.97	Pass

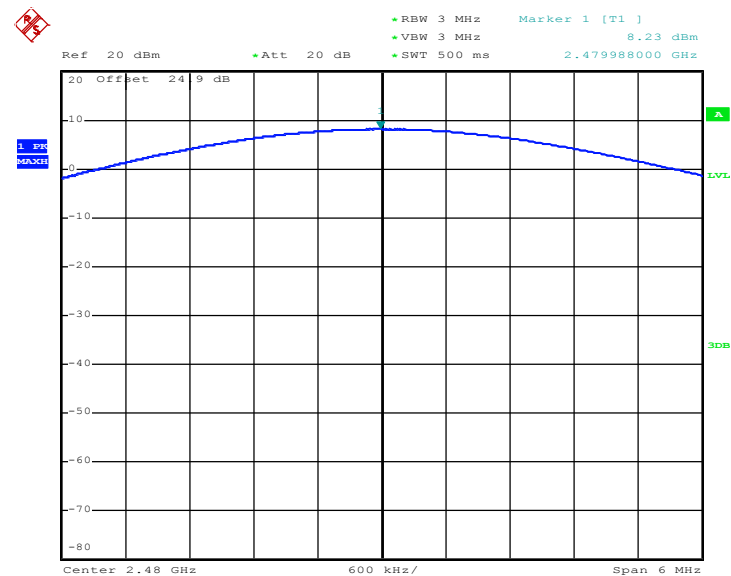
Peak Output Power Plot on Channel 00



Date: 3.OCT.2012 17:06:34

Peak Output Power Plot on Channel 39


Date: 3.OCT.2012 17:07:48

Peak Output Power Plot on Channel 78


Date: 3.OCT.2012 17:09:03

3.6 Conducted Band Edges Measurement

3.6.1 Limit of Band Edges

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

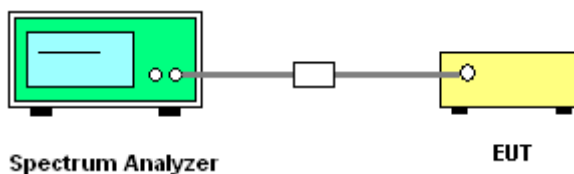
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The testing follows the guidelines in Band-edge Compliance of RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 300KHz ($\geq 1\%$ span=30MHz), VBW = 300KHz ($\geq$ RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 300KHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.
4. Enable hopping function of the EUT and then repeat step 2. and 3.
5. Record the results in the test report.

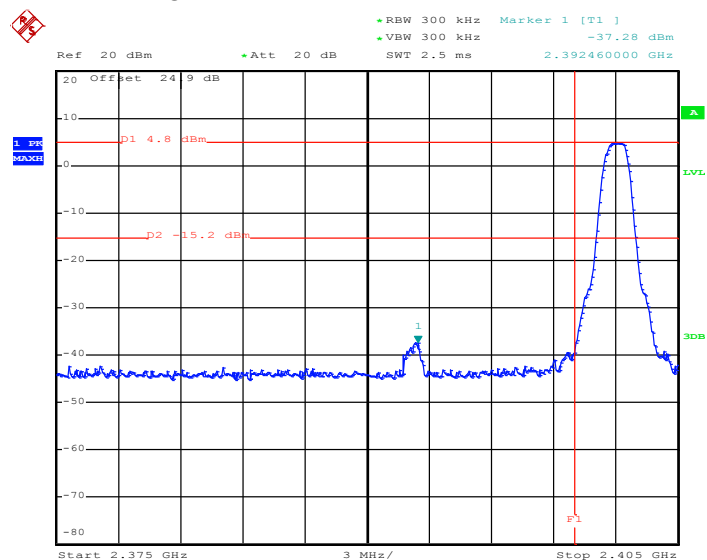
3.6.4 Test Setup



3.6.5 Test Result of Conducted Band Edges

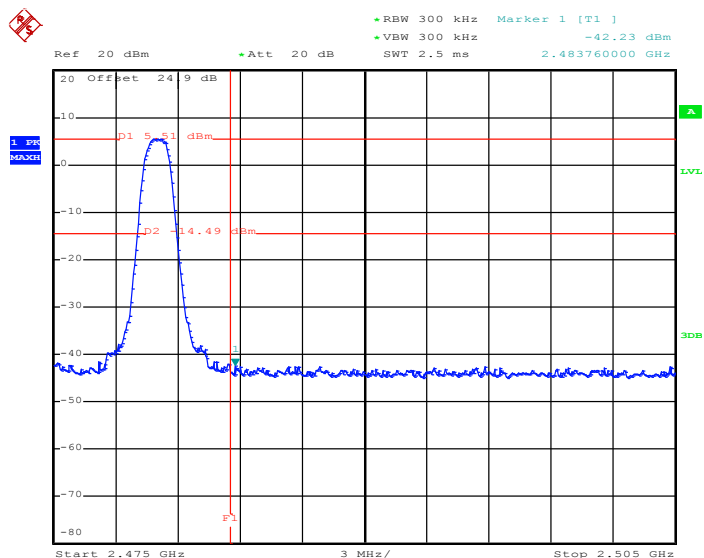
Test Mode :	3Mbps	Temperature :	24~26°C
Test Channel :	00 and 78	Relative Humidity :	50~53%
		Test Engineer :	Coyote Lin

Low Band Edge Plot on Channel 00



Date: 3.OCT.2012 18:03:48

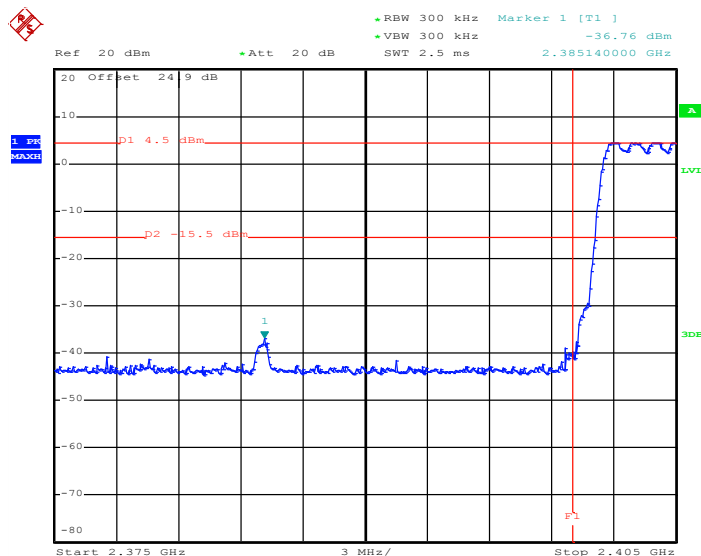
High Band Edge Plot on Channel 78



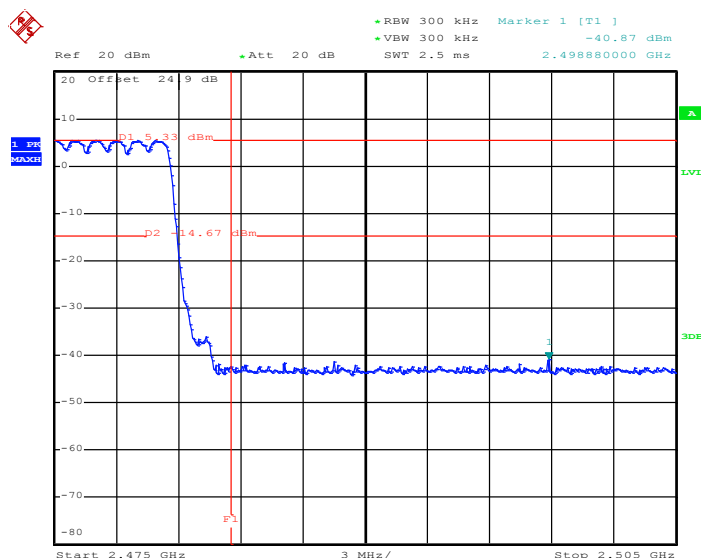
Date: 3.OCT.2012 18:04:51

3.6.6 Test Result of Conducted Hopping Mode Band Edges

Test Mode :	3Mbps	Temperature :	24~26°C
Test Engineer :	Coyote Lin	Relative Humidity :	50~53%

Hopping Mode Low Band Edge Plot


Date: 1.OCT.2012 10:11:29

Hopping Mode High Band Edge Plot


Date: 1.OCT.2012 10:49:17

3.7 Conducted Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

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

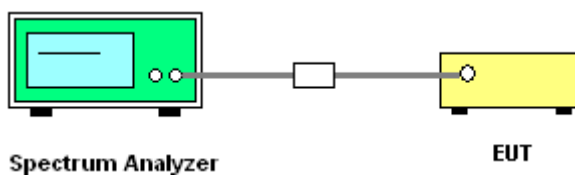
3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedure

1. The testing follows the guidelines in Spurious RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines
2. The transmitter output was connected to the spectrum analyzer via a low lose cable.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 KHz, VBW = 300KHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 KHz RBW.
5. Record the results in the test report.

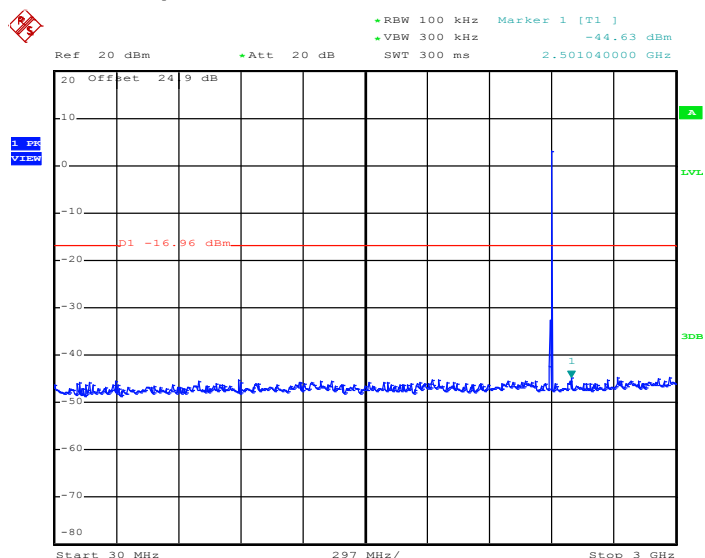
3.7.4 Test Setup



3.7.5 Test Result

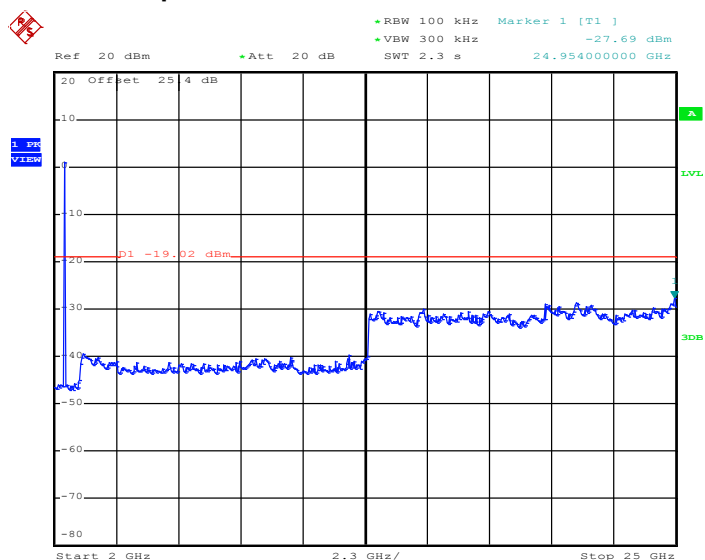
Test Mode :	3Mbps	Temperature :	24~26°C
Test Channel :	00	Relative Humidity :	50~53%
		Test Engineer :	Coyote Lin

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 3.OCT.2012 18:59:48

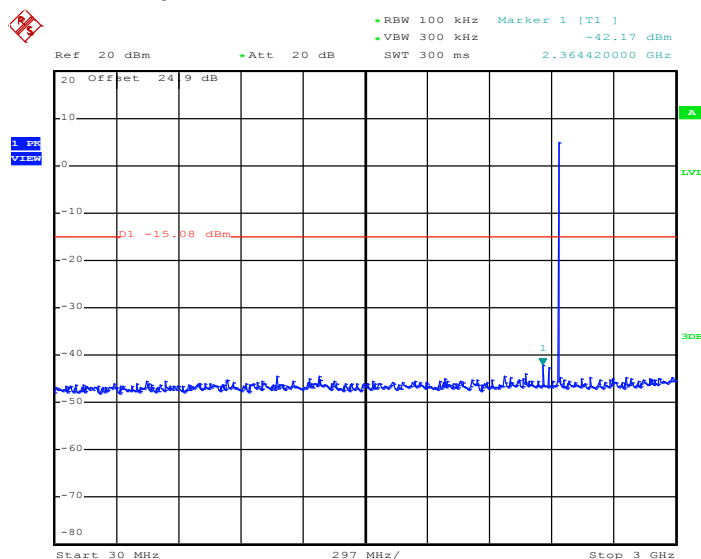
Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz



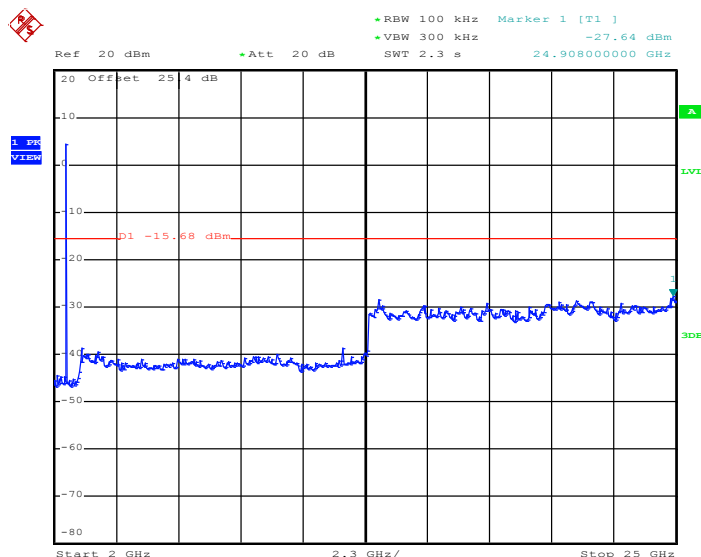
Date: 3.OCT.2012 19:00:10



Test Mode :	3Mbps	Temperature :	24~26°C
Test Channel :	39	Relative Humidity :	50~53%
		Test Engineer :	Coyote Lin

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

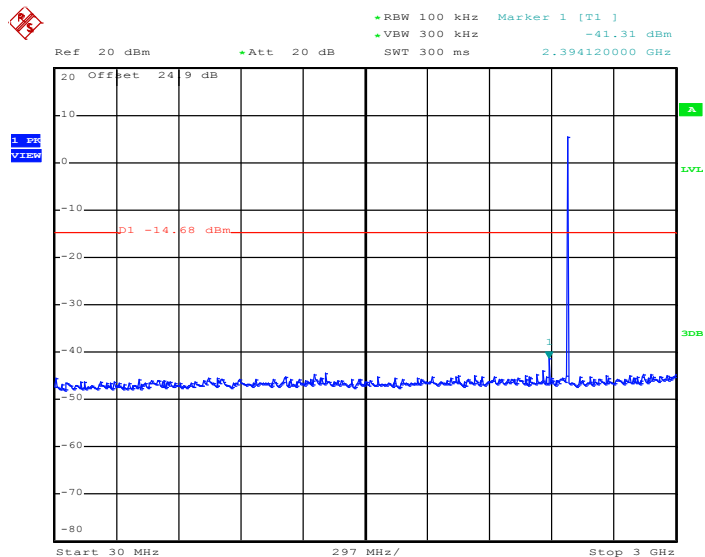
Date: 3.OCT.2012 18:24:28

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

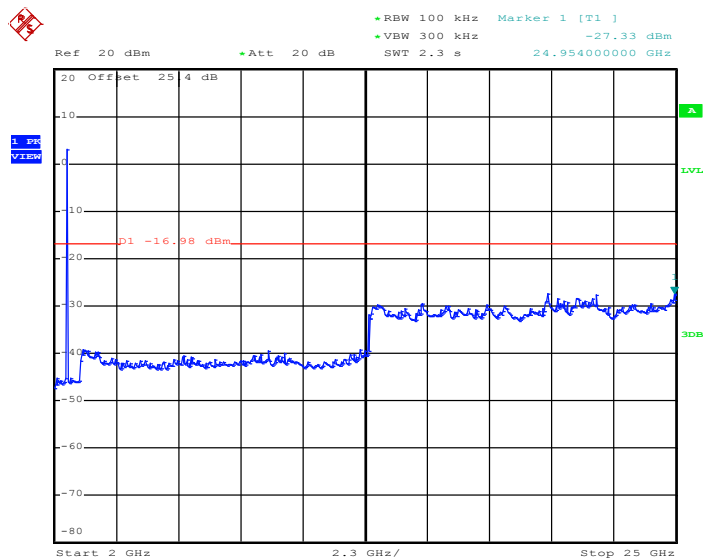
Date: 3.OCT.2012 18:25:20



Test Mode :	3Mbps	Temperature :	24~26°C
Test Channel :	78	Relative Humidity :	50~53%
		Test Engineer :	Coyote Lin

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

Date: 3.OCT.2012 18:26:12

Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

Date: 3.OCT.2012 18:27:04

3.8 Radiated Band Edges and Spurious Emission Measurement

3.8.1 Limit of Radiated Band Edges and Spurious 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

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

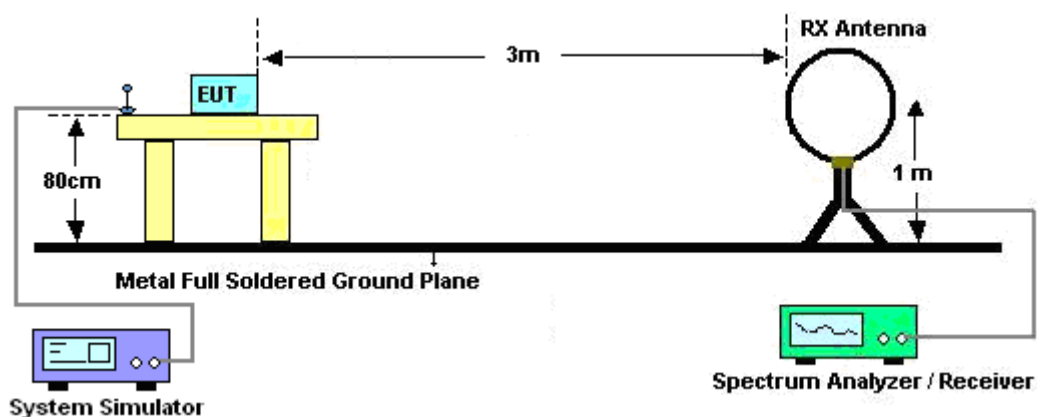
1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 KHz for $f < 1$ GHz, RBW=1MHz for $f > 1$ GHz ; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
 - (3) For average measurement: use duty cycle correction factor method per 15.35(c).
Duty cycle = On time/100 milliseconds
On time = $N_1 * L_1 + N_2 * L_2 + \dots + N_{n-1} * L_{n-1} + N_n * L_n$
Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.
Average Level = Peak Level + $20 * \log(\text{Duty cycle})$
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from $20 \log(\text{dwell time}/100\text{ms})$.

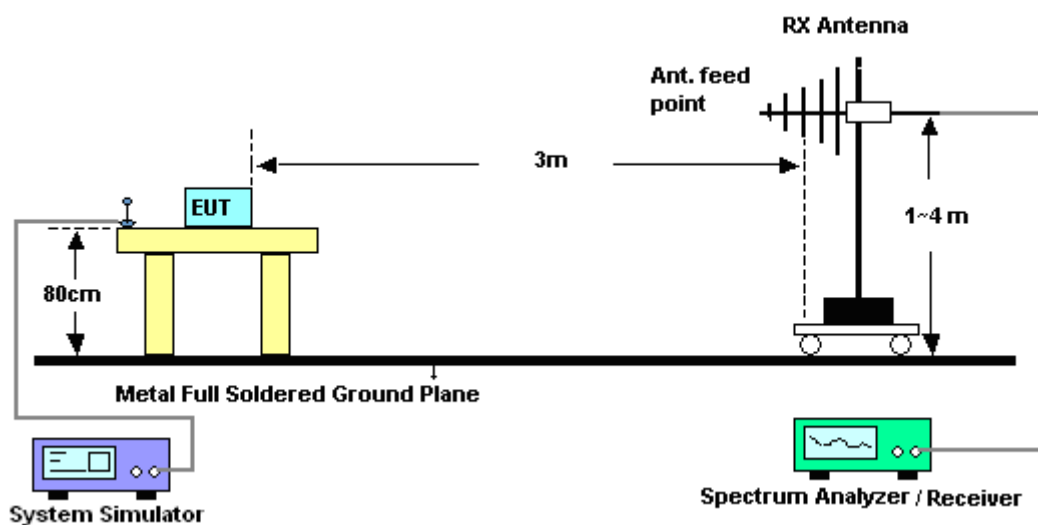
For example: Average level = 59.42dBuV/m – 24.79 (dB) = 34.63dBuV/m.

3.8.4 Test Setup

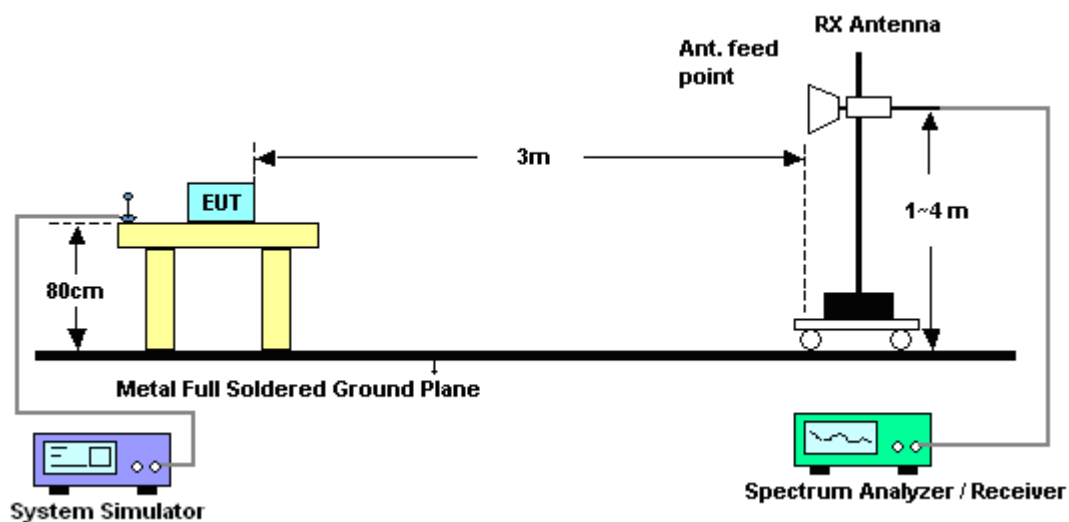
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

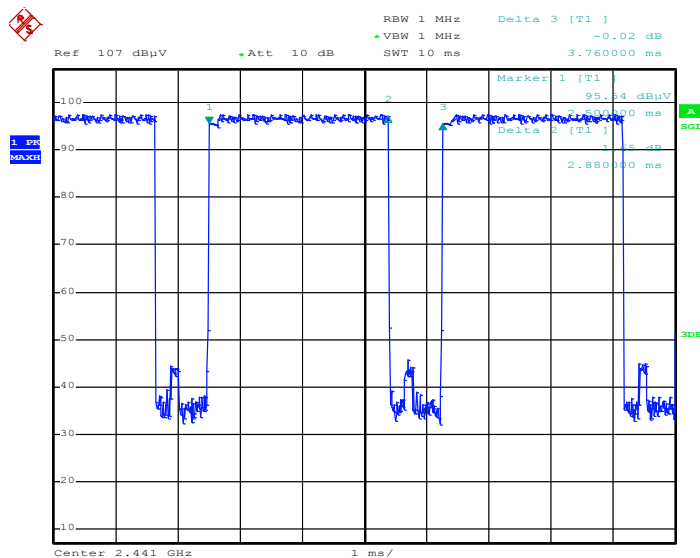


3.8.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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

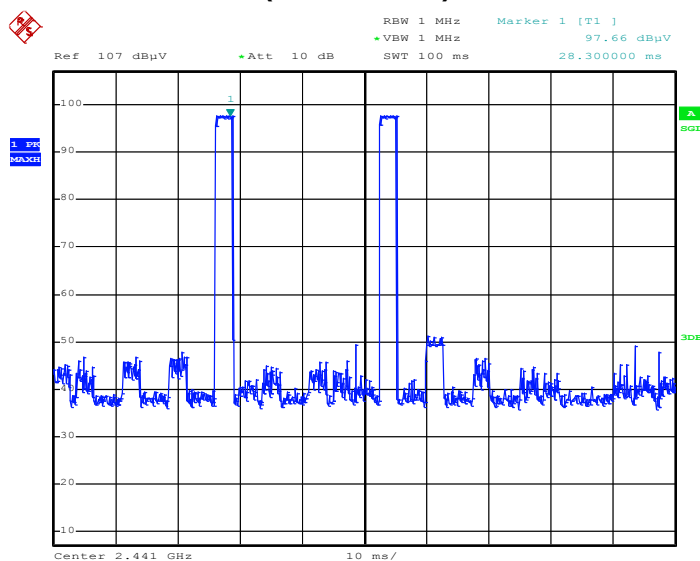
3.8.6 Duty cycle correction factor for average measurement

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



Date: 7.OCT.2012 09:21:57

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



Date: 7.OCT.2012 09:20:15

Note:

1. Duty cycle = on time/100 milliseconds = $2 * 2.88 / 100 = 5.76 \%$
2. Duty cycle correction factor = $20 * \log(\text{Duty cycle}) = -24.79 \text{ dB}$
3. 3DH5 has the highest duty cycle and is reported.

3.8.7 Test Result of Radiated Band Edges

Test Mode :	3Mbps	Temperature :	25~26°C
Test Channel :	00	Relative Humidity :	47~48%
		Test Engineer :	Gavin Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.3	59.42	-14.58	74	55.05	32.3	6.03	33.96	100	360	Peak
2388.3	34.63	-19.37	54	-	-	-	-	-	-	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
2387.67	56.38	-17.62	74	52.01	32.3	6.03	33.96	131	248	Peak
2387.67	31.59	-22.41	54	-	-	-	-	-	-	Average

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from $20\log(\text{dwell time}/100\text{ms})$.

For example: Average level = 59.42dBuV/m – 24.79 (dB) = 34.63dBuV/m.

Test Mode :	3Mbps	Temperature :	25~26°C
Test Channel :	78	Relative Humidity :	47~48%
		Test Engineer :	Gavin Wu

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	68.63	-5.37	74	64.07	32.38	6.18	34	174	27	Peak
2483.5	43.84	-10.16	54	-	-	-	-	-	-	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	65.41	-8.59	74	60.85	32.38	6.18	34	104	243	Peak
2483.5	40.62	-13.38	54	-	-	-	-	-	-	Average

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

Test Mode :	3Mbps	Temperature :	25~26°C
Test Channel :	00	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	105.95	-	-	101.58	32.3	6.03	33.96	100	360	Peak
2402	81.16	-	-	-	-	-	-	-	-	Average
4803	42.92	-31.08	74	57.3	33.98	9.11	57.47	100	0	Peak

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from $20\log(\text{dwell time}/100\text{ms})$.

For example: Average level = 105.95dBuV/m – 24.79 (dB) = 81.16dBuV/m.

Test Mode :	3Mbps	Temperature :	25~26°C
Test Channel :	00	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	102.29	-	-	97.92	32.3	6.03	33.96	131	248	Peak
2402	77.5	-	-	-	-	-	-	-	-	Average
4806	45.88	-28.12	74	60.25	33.98	9.12	57.47	100	0	Peak

Test Mode :	3Mbps	Temperature :	25~26°C
Test Channel :	39	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	1. 2441 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2441	107.26	-	-	102.78	32.35	6.11	33.98	179	29	Peak
2441	82.47	-	-	-	-	-	-	-	-	Average
4884	46.58	-27.42	74	60.97	33.95	9.14	57.48	100	0	Peak

Test Mode :	3Mbps	Temperature :	25~26°C
Test Channel :	39	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	1. 2441 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2441	102.3	-	-	97.82	32.35	6.11	33.98	104	240	Peak
2441	77.51	-	-	-	-	-	-	-	-	Average
4884	50.88	-23.12	74	65.27	33.95	9.14	57.48	100	0	Peak

Test Mode :	3Mbps	Temperature :	25~26°C
Test Channel :	78	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.54	23.94	-16.06	40	35.99	19.28	0.54	31.87	100	185	Peak
188.49	21.63	-21.87	43.5	42.67	8.98	1.27	31.29	-	-	Peak
284.88	28.24	-17.76	46	44.91	13.09	1.66	31.42	-	-	Peak
630.4	24.31	-21.69	46	31.92	20.04	2.78	30.43	-	-	Peak
793.5	24.21	-21.79	46	29.29	22	3.13	30.21	-	-	Peak
876.8	24.44	-21.56	46	28.96	22.87	3.31	30.7	-	-	Peak
2480	106.63	-	-	102.07	32.38	6.18	34	174	27	Peak
2480	81.84	-	-	-	-	-	-	-	-	Average
4962	50.39	-23.61	74	64.81	33.91	9.16	57.49	100	0	Peak

Test Mode :	3Mbps	Temperature :	25~26°C
Test Channel :	78	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.27	25.49	-14.51	40	36.83	20	0.53	31.87	-	-	Peak
163.65	30.71	-12.79	43.5	50.71	10.13	1.22	31.35	105	221	Peak
177.42	25.3	-18.2	43.5	46.27	9	1.24	31.21	-	-	Peak
513.5	25.39	-20.61	46	35.59	18.31	2.48	30.99	-	-	Peak
618.5	23.35	-22.65	46	31.12	19.95	2.75	30.47	-	-	Peak
885.2	25.96	-20.04	46	30.43	22.95	3.32	30.74	-	-	Peak
2480	103.18	-	-	98.62	32.38	6.18	34	104	243	Peak
2480	78.39	-	-	-	-	-	-	-	-	Average
4962	55.39	-18.61	74	69.81	33.91	9.16	57.49	100	0	Peak
4962	30.6	-23.4	54	-	-	-	-	-	-	Average

3.9 AC Conducted Emission Measurement

3.9.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

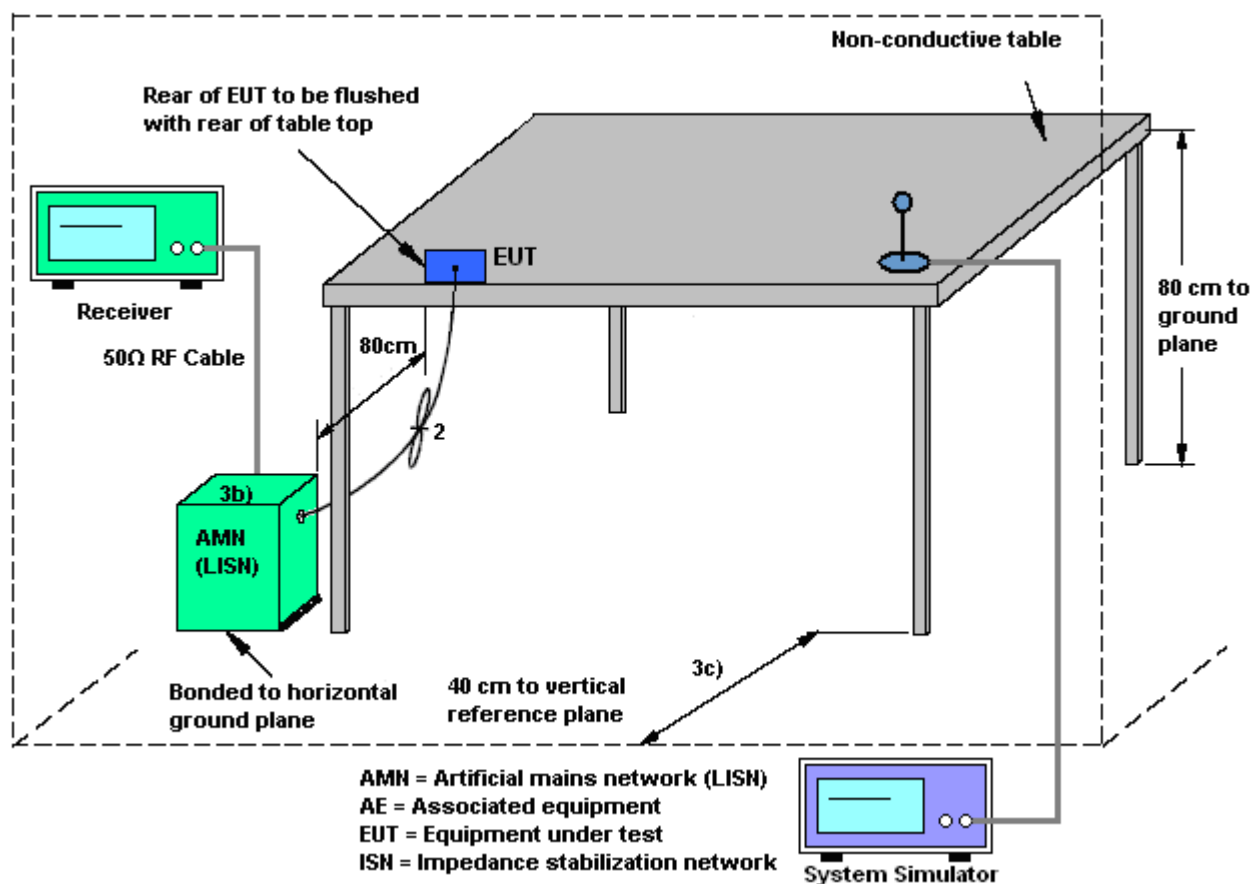
3.9.2 Measuring Instruments

See list of measuring instruments of this test report.

3.9.3 Test Procedures

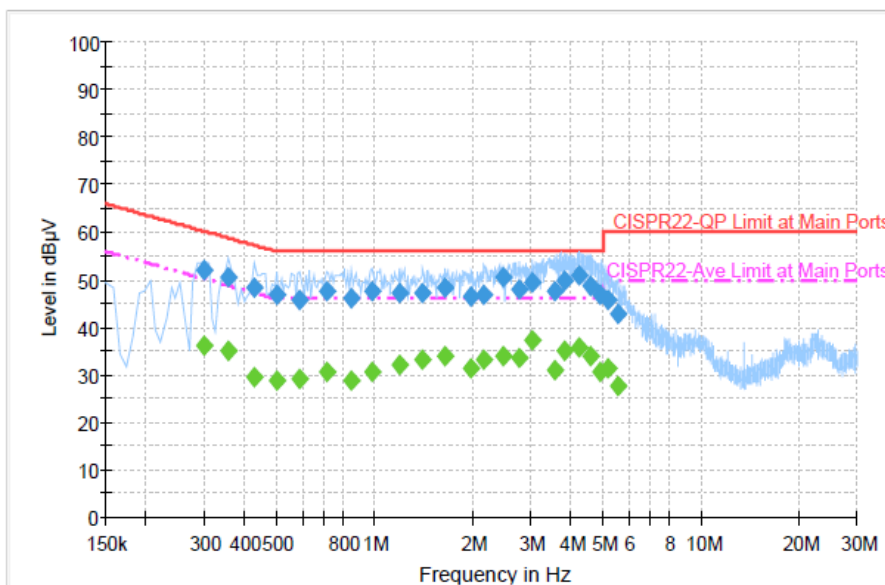
1. The test follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009 test site requirement.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line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

3.9.4 Test Setup



3.9.5 Test Result of AC Conducted Emission

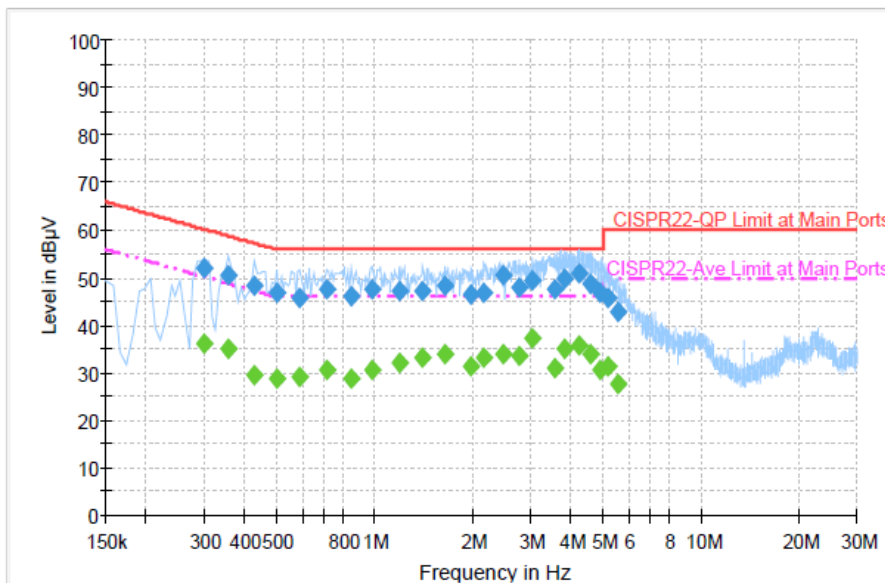
Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Quasi-Peak

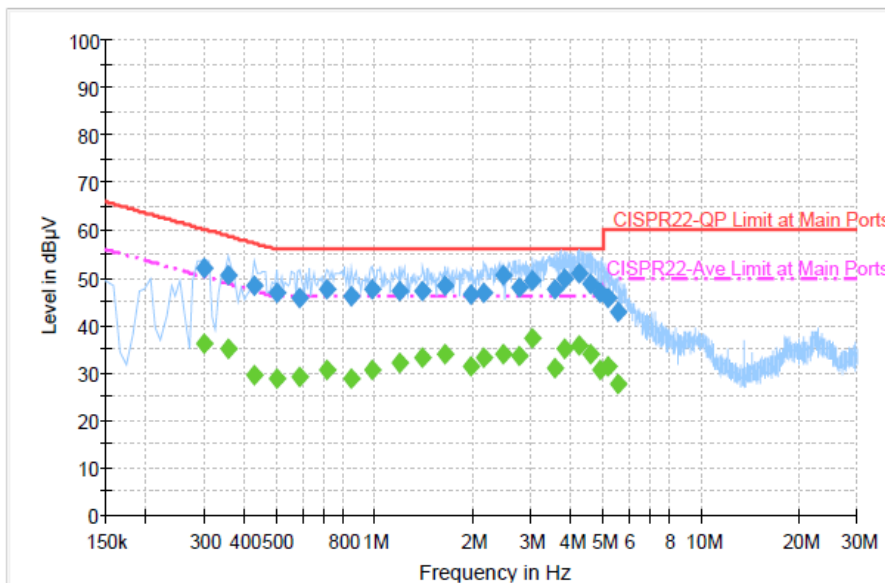
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.302000	51.9	Off	L1	19.3	8.3	60.2
0.358000	50.4	Off	L1	19.4	8.4	58.8
0.430000	48.3	Off	L1	19.4	9.0	57.3
0.502000	47.0	Off	L1	19.3	9.0	56.0
0.590000	45.6	Off	L1	19.4	10.4	56.0
0.718000	47.5	Off	L1	19.5	8.5	56.0
0.846000	46.1	Off	L1	19.5	9.9	56.0
0.982000	47.6	Off	L1	19.5	8.4	56.0
1.190000	47.2	Off	L1	19.5	8.8	56.0
1.406000	47.4	Off	L1	19.4	8.6	56.0
1.646000	48.2	Off	L1	19.5	7.8	56.0
1.974000	46.3	Off	L1	19.5	9.7	56.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Quasi-Peak

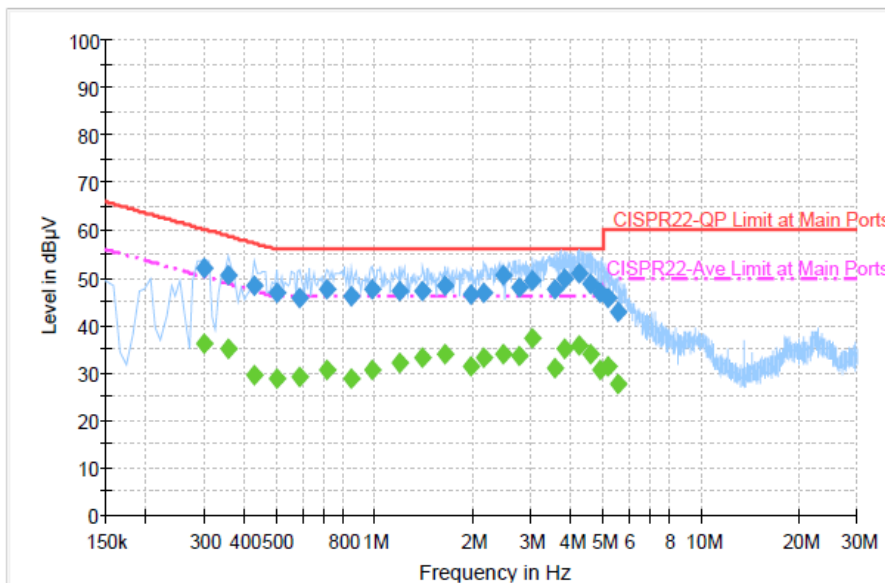
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.166000	46.9	Off	L1	19.6	9.1	56.0
2.470000	50.7	Off	L1	19.6	5.3	56.0
2.766000	48.1	Off	L1	19.6	7.9	56.0
3.054000	49.3	Off	L1	19.6	6.7	56.0
3.550000	47.6	Off	L1	19.6	8.4	56.0
3.806000	49.9	Off	L1	19.6	6.1	56.0
4.222000	50.7	Off	L1	19.6	5.3	56.0
4.558000	48.7	Off	L1	19.6	7.3	56.0
4.918000	46.7	Off	L1	19.6	9.3	56.0
5.198000	45.6	Off	L1	19.5	14.4	60.0
5.526000	42.7	Off	L1	19.6	17.3	60.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Average

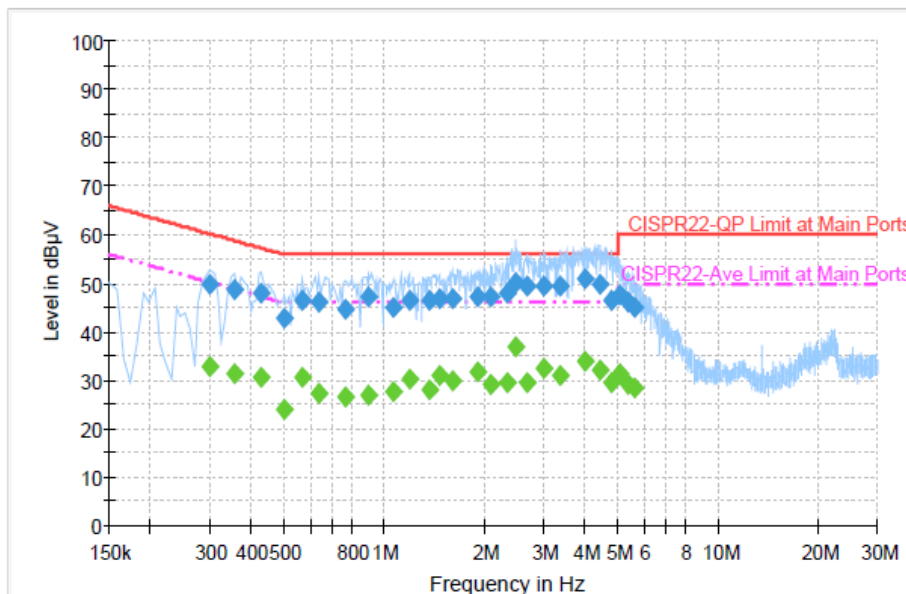
Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.302000	36.3	Off	L1	19.3	13.9	50.2
0.358000	35.1	Off	L1	19.4	13.7	48.8
0.430000	29.4	Off	L1	19.4	17.9	47.3
0.502000	28.9	Off	L1	19.3	17.1	46.0
0.590000	29.2	Off	L1	19.4	16.8	46.0
0.718000	30.7	Off	L1	19.5	15.3	46.0
0.846000	28.7	Off	L1	19.5	17.3	46.0
0.982000	30.5	Off	L1	19.5	15.5	46.0
1.190000	32.2	Off	L1	19.5	13.8	46.0
1.406000	33.1	Off	L1	19.4	12.9	46.0
1.646000	34.1	Off	L1	19.5	11.9	46.0
1.974000	31.4	Off	L1	19.5	14.6	46.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Average

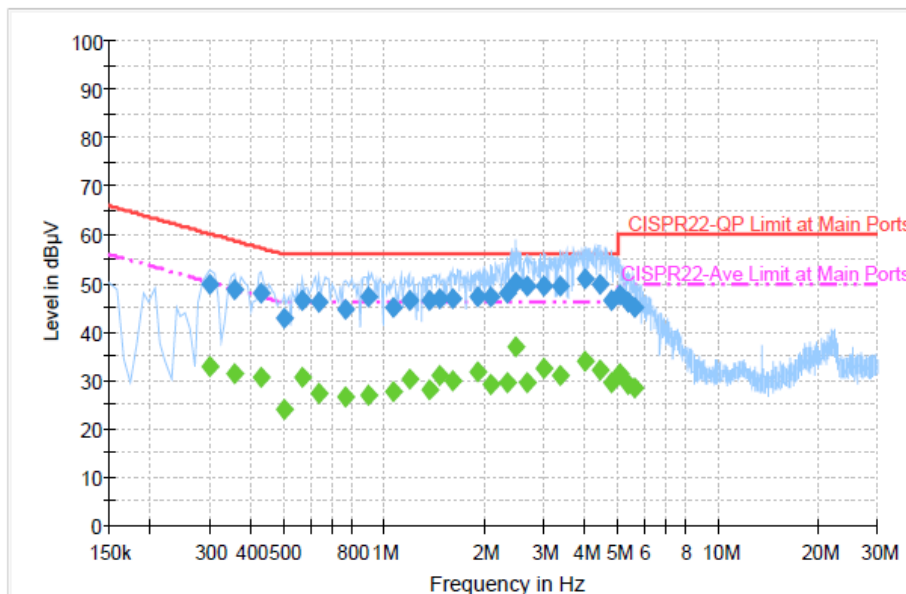
Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.166000	33.2	Off	L1	19.6	12.8	46.0
2.470000	34.0	Off	L1	19.6	12.0	46.0
2.766000	33.7	Off	L1	19.6	12.3	46.0
3.054000	37.3	Off	L1	19.6	8.7	46.0
3.550000	31.1	Off	L1	19.6	14.9	46.0
3.806000	34.9	Off	L1	19.6	11.1	46.0
4.222000	35.6	Off	L1	19.6	10.4	46.0
4.558000	34.0	Off	L1	19.6	12.0	46.0
4.918000	30.8	Off	L1	19.6	15.2	46.0
5.198000	31.5	Off	L1	19.5	18.5	50.0
5.526000	27.7	Off	L1	19.6	22.3	50.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Quasi-Peak

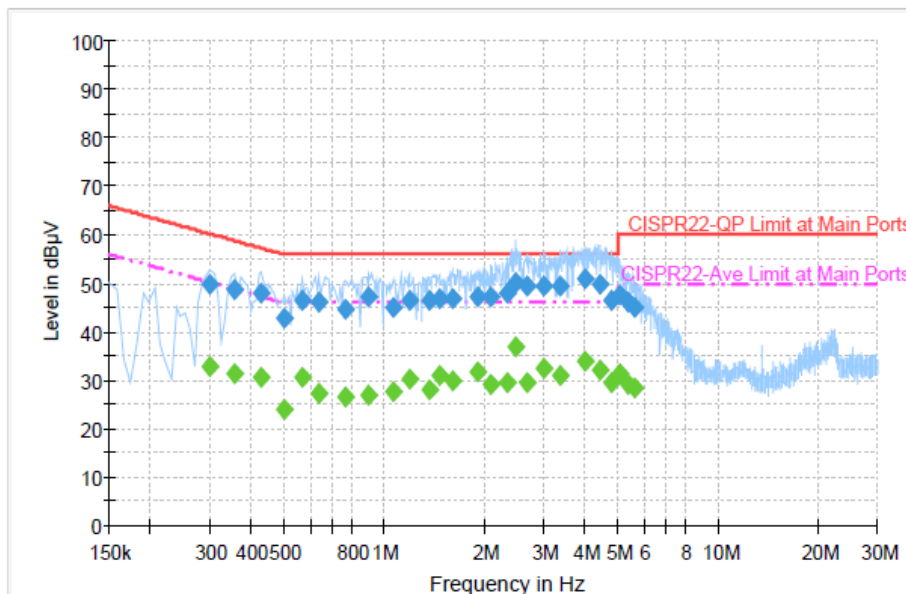
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.302000	50.0	Off	N	19.4	10.2	60.2
0.358000	48.7	Off	N	19.4	10.1	58.8
0.430000	48.1	Off	N	19.4	9.2	57.3
0.502000	42.6	Off	N	19.4	13.4	56.0
0.566000	46.6	Off	N	19.4	9.4	56.0
0.638000	46.0	Off	N	19.4	10.0	56.0
0.766000	44.8	Off	N	19.5	11.2	56.0
0.902000	47.1	Off	N	19.5	8.9	56.0
1.062000	45.1	Off	N	19.4	10.9	56.0
1.190000	46.6	Off	N	19.5	9.4	56.0
1.366000	46.4	Off	N	19.5	9.6	56.0
1.462000	46.8	Off	N	19.5	9.2	56.0
1.598000	46.7	Off	N	19.5	9.3	56.0
1.910000	47.3	Off	N	19.5	8.7	56.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Quasi-Peak

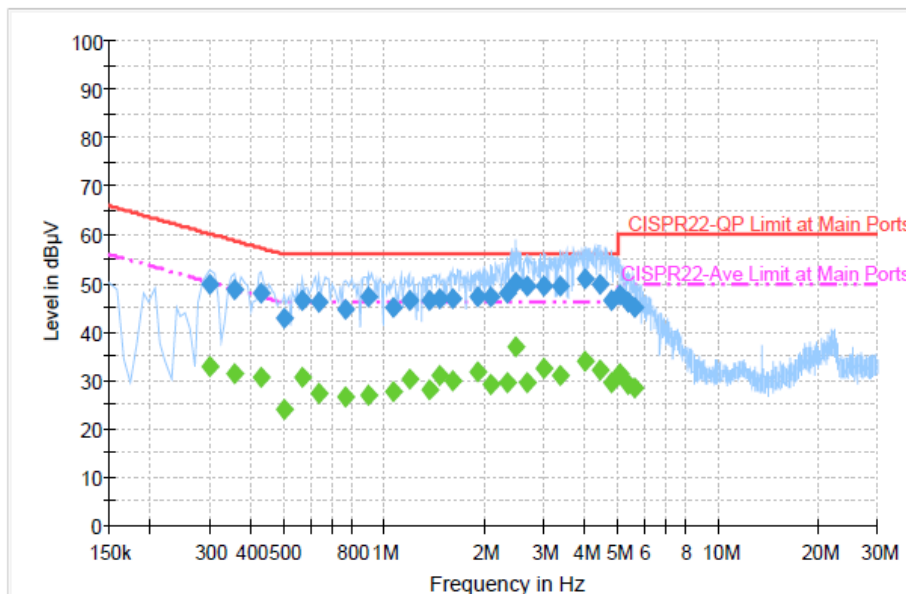
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.086000	47.3	Off	N	19.6	8.7	56.0
2.342000	48.0	Off	N	19.6	8.0	56.0
2.470000	50.1	Off	N	19.6	5.9	56.0
2.678000	49.4	Off	N	19.6	6.6	56.0
3.006000	49.5	Off	N	19.6	6.5	56.0
3.382000	49.3	Off	N	19.7	6.7	56.0
3.990000	51.1	Off	N	19.6	4.9	56.0
4.438000	49.8	Off	N	19.6	6.2	56.0
4.774000	46.7	Off	N	19.6	9.3	56.0
5.054000	47.6	Off	N	19.6	12.4	60.0
5.374000	46.1	Off	N	19.6	13.9	60.0
5.590000	45.0	Off	N	19.7	15.0	60.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.302000	32.9	Off	N	19.4	17.3	50.2
0.358000	31.5	Off	N	19.4	17.3	48.8
0.430000	30.4	Off	N	19.4	16.9	47.3
0.502000	24.1	Off	N	19.4	21.9	46.0
0.566000	30.7	Off	N	19.4	15.3	46.0
0.638000	27.3	Off	N	19.4	18.7	46.0
0.766000	26.4	Off	N	19.5	19.6	46.0
0.902000	26.9	Off	N	19.5	19.1	46.0
1.062000	27.8	Off	N	19.4	18.2	46.0
1.190000	30.2	Off	N	19.5	15.8	46.0
1.366000	28.2	Off	N	19.5	17.8	46.0
1.462000	31.0	Off	N	19.5	15.0	46.0
1.598000	29.9	Off	N	19.5	16.1	46.0
1.910000	31.6	Off	N	19.5	14.4	46.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.086000	29.0	Off	N	19.6	17.0	46.0
2.342000	29.6	Off	N	19.6	16.4	46.0
2.470000	37.0	Off	N	19.6	9.0	46.0
2.678000	29.7	Off	N	19.6	16.3	46.0
3.006000	32.6	Off	N	19.6	13.4	46.0
3.382000	30.8	Off	N	19.7	15.2	46.0
3.990000	33.9	Off	N	19.6	12.1	46.0
4.438000	32.0	Off	N	19.6	14.0	46.0
4.774000	29.4	Off	N	19.6	16.6	46.0
5.054000	31.3	Off	N	19.6	18.7	50.0
5.374000	29.1	Off	N	19.6	20.9	50.0
5.590000	28.3	Off	N	19.7	21.7	50.0



3.10 Antenna Requirements

3.10.1 Standard Applicable

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

3.10.2 Antenna Connected Construction

Non-standard connector used.

3.10.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Oct. 01, 2012 ~ Oct. 07, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Bluetooth Base Station	R&S	CBT32	100519	N/A	Jun. 05, 2012	Oct. 01, 2012 ~ Oct. 07, 2012	Jun. 06, 2013	Conducted (TH02-HY)
EMI Test Receiver	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Oct. 02, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Oct. 02, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Oct. 02, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	Oct. 02, 2012	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	116457	N/A	Jun. 24, 2011	Oct. 02, 2012	Jun. 23, 2013	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	Oct. 06, 2012~ Oct. 07, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Oct. 06, 2012~ Oct. 07, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2012	Oct. 06, 2012~ Oct. 07, 2012	Jul. 31, 2013	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz ~ 26.5GHz	Dec. 05, 2011	Oct. 06, 2012~ Oct. 07, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Feb. 27, 2012	Oct. 06, 2012~ Oct. 07, 2012	Feb. 26, 2013	Radiation (03CH07-HY)
Signal Analyzer	Rohde & Schwarz	FSQ	200578/026	20Hz~26.5GHz	Feb. 06, 2012	Oct. 06, 2012~ Oct. 07, 2012	Feb. 05, 2013	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-0 0101800-3 0-10P	159088	1GHz ~ 18GHz	Mar. 10, 2012	Oct. 06, 2012~ Oct. 07, 2012	Mar. 09, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA91702 51	15GHz ~ 40GHz	Oct. 21, 2011	Oct. 06, 2012~ Oct. 07, 2012	Oct. 20, 2012	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	100315	9KHz ~ 30MHz	May 14, 2012	Oct. 06, 2012~ Oct. 07, 2012	May 13, 2013	Radiation (03CH07-HY)
Bluetooth Base Station	R&S	CBT32	100522	N/A	Feb. 09, 2012	Oct. 06, 2012~ Oct. 07, 2012	Feb. 08, 2014	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.26
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP232306-04 as below.