SGS-CSTC Standards Technical Services (Shanghai)Co., Ltd.

588 West Jindu Road, Songjiang District, Shanghai, China

Telephone: +86 (0) 21 6191 5666
Fax: +86 (0) 21 6191 5655
Tino.Pan@sgs.com

TEST REPORT

Application No. :	SHEMO10030022502
Applicant:	Shanghai Longcheer3g Technology Co.,Ltd
FCC ID:	WLPW660
IC ID :	8858A-W660
Operating Frequency :	2.402GHz to 2.480GHz
Equipment Under Test (EUT):	
Product Name:	GSM/GPRS/EDGE/WCDMA/HSDPA Handhold Phone
Model Name:	W660
Standards:	FCC PART 15:2008 Subpart C RSS-210 Issue 7 ;RSS Gen Issue 2
Date of Receipt:	Mar 09, 2010
Date of Test:	Mar 19, 2010 to Mar 24, 2010
Date of Issue:	Mar 24, 2010
Test Result :	PASS *

* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further detail.

Tino Pan
E&E Section Manager
SGS-CSTC(Shanghai) Co., Ltd.

Jack Wu
Project Engineer
SGS-CSTC(Shanghai) Co., Ltd.

2 Test Summary

Test items	FCC Rules	IC Standard	Result
Occupied Bandwidth	Section 15.247 (a1)	RSS 210 issue 7 Annex 8.1(a)	PASS
Carrier Frequencies Separated	Section 15.247(a)(1)	RSS 210 issue 7 Annex 8.1(b)	PASS
Hopping Channel Number	Section 15.247(a)(1)(iii)	RSS 210 issue 7 Annex 8.1(d)	PASS
Dwell Time	Section 15.247(a)(1)(iii)	RSS 210 issue 7 Annex 8.1(d)	PASS
Maximum Peak Output Power	Section 15.247(b)(1)	RSS 210 issue 7 Annex 8.4(2)	PASS
Conducted Emission	Section 15.207	RSS Gen Issue 2 Section 7.2.2	PASS
Conducted Spurious Emission (30MHz to 25GHz)	Section 15.209 &15.247(d)	RSS 210 issue 7 Annex 8.5	PASS
Radiated Spurious Emission (30MHz to 25GHz)	Section 15.209 &15.247(d)	RSS 210 issue 7 Annex 8.5	PASS
Band Edges Measurement	Section 15.247 (d) &15.205	RSS 210 issue 7 Annex 8.5	PASS

3 Contents

4 General Information

4.1 Client Information

Applicant:	Shanghai Longcheer3g Technology Co.,Ltd
Address of Applicant:	No.1,Building 5, 299 Bisheng Rd, Zhangjiang Hi-Tech Park, Pudong, Shanghai, P.R. China
Manufacturer:	Shanghai Longcheer3g Technology Co.,Ltd
Address of Manufacturer:	No.1,Building 5, 299 Bisheng Rd, Zhangjiang Hi-Tech Park, Pudong, Shanghai, P.R. China

4.2 General Description of E.U.T.

Product Name:	GSM/GPRS/EDGE/WCDMA/HSDPA Handhold Phone
Model Name:	W660
Number of Channels	79 Channels
Channel Separation	1 MHz
Type of Modulation	FHSS (Frequency Hopping Spread Spectrum)
Dwell time	Per channel is less than 0.4s.
Antenna Type	integral/dedicated
Battery Information:	Model:BL-75 3.7V/1000mAh (3.7Wh) S/N:BAK0809111200554
Adapter information	Model: ASUC1-050050 Input: AC 100-240VAC, 50/60Hz, 0.3A Output :5.0VDC, 500mA S/N:0904003375
IMEI:	352129049999833
Hardware Version:	W660_344
Software Version:	LQARZ01_240005_0.0.4

4.3 Description of Support Units

None.

4.4 Standards Applicable for Testing

The customer requested FCC/IC tests for the EUT.

The standard used was FCC PART 15 Subpart C, ANSI C63.4:2003, RSS-210 Issue 7 ,RSS Gen Issue 2

4.5 Test Location

Tests were performed at:

SGS-CSTC EMC Laboratory, No.588 West Jindu Road,Songjiang District,Shanghai,China
Tel:+86 21 6191 5666 Fax:+86 21 6191 5655

4.6 Other Information Requested by the Customer

None.

4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2011-07-29.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2011-09-29.

5 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2009-6-4	2010-6-3
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2009-6-4	2010-6-3
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2009-4-11	2010-4-10
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2009-6-4	2010-6-3
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2009-10-9	2010-10-8
6	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY－2003P	--	2009-10-15	2010-10-14
7	CLAMP METER	FLUKE	316	86080010	2009-04-27	2010-04-26
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2009-10-15	2010-10-14
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2009-6-18	2010-6-17
10	DC power	KIKUSUI	PMC35－3	NF100260	2010-1-16	2011-1-15
11	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2009-5-8	2010-5-7
12	Power meter	Rohde & Schwarz	NRP	101641	2009-5-5	2010-5-4
13	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2009-6-4	2010-6-3
14	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2009-4-11	2010-4-10
15	CBT	Rohde & Schwarz	10082	EMC0070	2009-12-23	2010-12-22

6 Test Results

6.1 E.U.T. test conditions

Power supply:	AC adapter or battery inside.
Requirements:	15.31(e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.
Type of antenna:	integral/dedicated
Operating Environment:	
Temperature:	20.0 -25.0 °C
Humidity:	38-52% RH
Atmospheric Pressure:	992 -1010 mbar

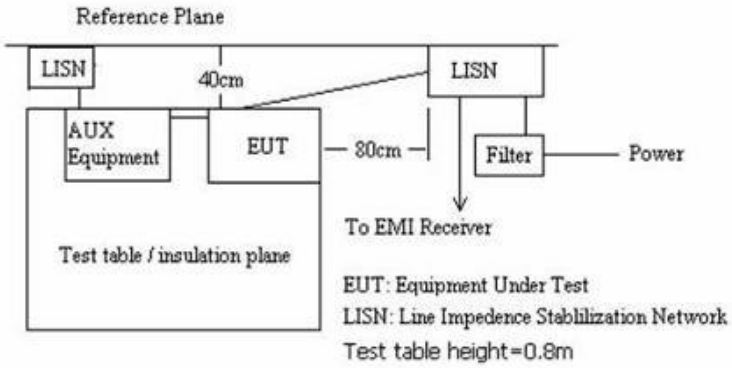
6.2 Conducted Emissions at Mains Terminals

Test Requirement:	FCC Part 15.207/ RSS Gen Issue 2 Section 7.2.2
Test Method:	ANSI C63.4
Test Date:	Mar 19, 2010
Frequency Range:	150KHz to 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)
	Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit
EUT Operation:	Test the EUT in Bluetooth mode connected with adapter

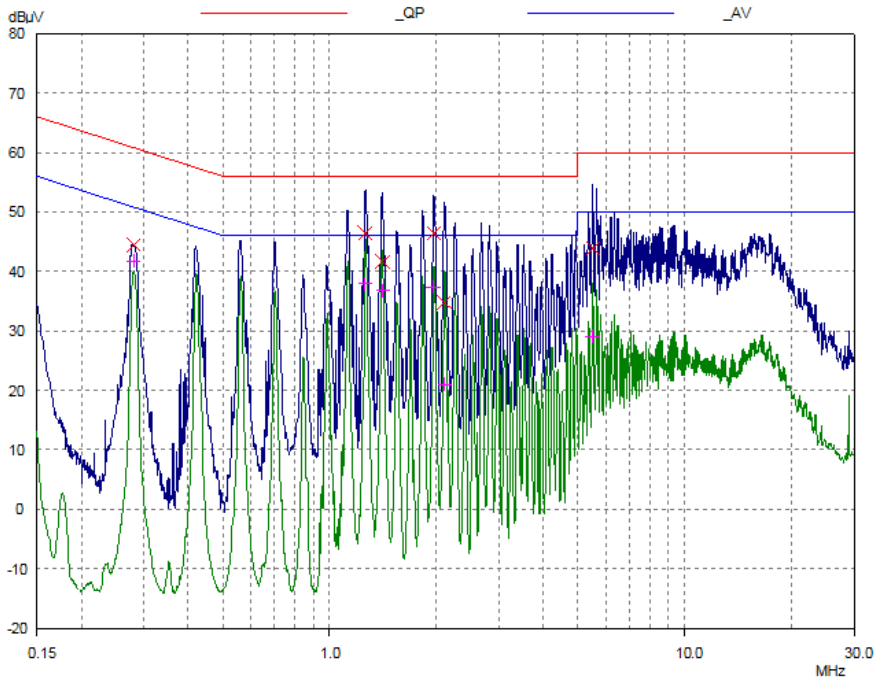
An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Test Setup:



Live line:

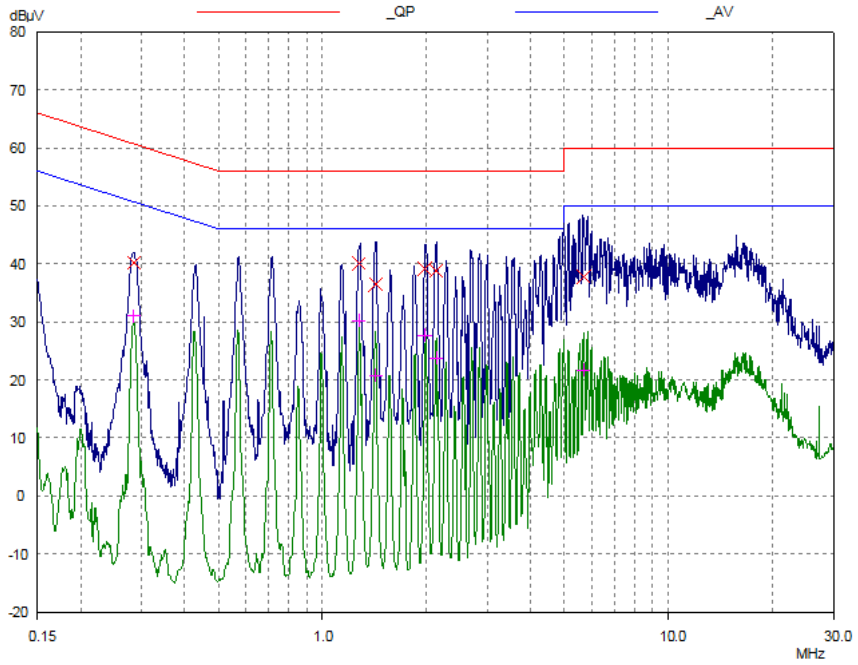


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.28072	44.40	60.79	16.39
1.25938	46.48	56.00	9.52
1.40832	41.65	56.00	14.35
1.96156	46.46	56.00	9.54
2.1077	34.77	56.00	21.23
5.49414	43.84	60.00	16.16

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.28072	41.70	50.79	9.09
1.25938	37.88	46.00	8.12
1.40832	36.73	46.00	9.27
1.96156	37.33	46.00	8.67
2.1077	21.04	46.00	24.96
5.49414	29.00	50.00	21.00

Neutral line:



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.2841	40.18	60.70	20.52
1.27456	40.06	56.00	15.94
1.42529	36.44	56.00	19.56
1.97728	39.17	56.00	16.83
2.13309	38.86	56.00	17.14
5.69512	37.84	60.00	22.16

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.2841	30.95	50.70	19.75
1.27456	30.25	46.00	15.75
1.42529	20.76	46.00	25.24
1.97728	27.61	46.00	18.39
2.13309	23.73	46.00	22.27
5.69512	21.65	50.00	28.35

6.3 Occupied Bandwidth

Test Requirement: FCC Part 15 C/ RSS-210 Issue 7

Test Method: Based on FCC Part15 C Section 15.247

Test Date: March 19, 2010

Test Status: Test in fixing operating frequency at lowest, Middle, highest channel.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centered on the hopping channel;
3. Set the spectrum analyzer: RBW >= 1% of the 20dB bandwidth (set 10kHz normal mode). VBW >= RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -20dB points.

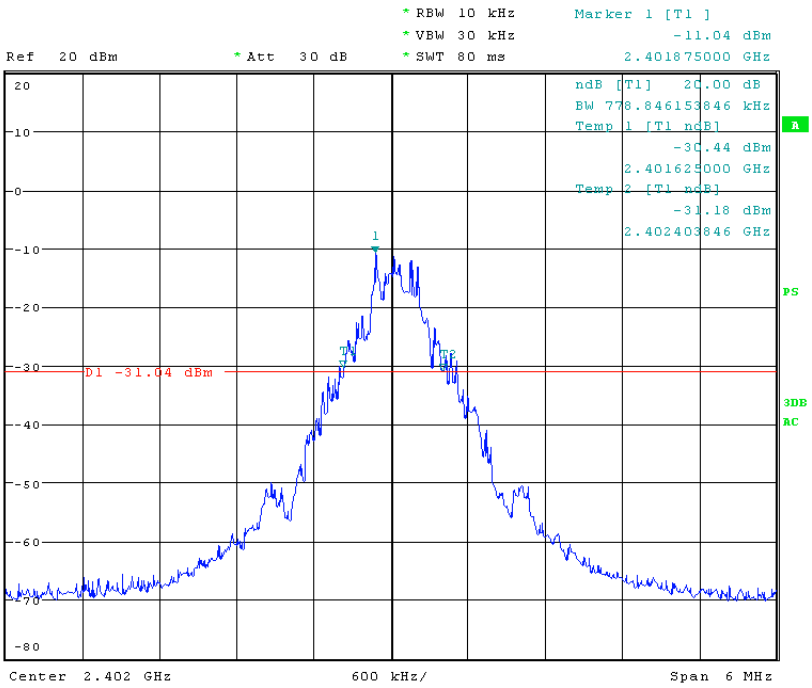
Test result:

Normal mode:

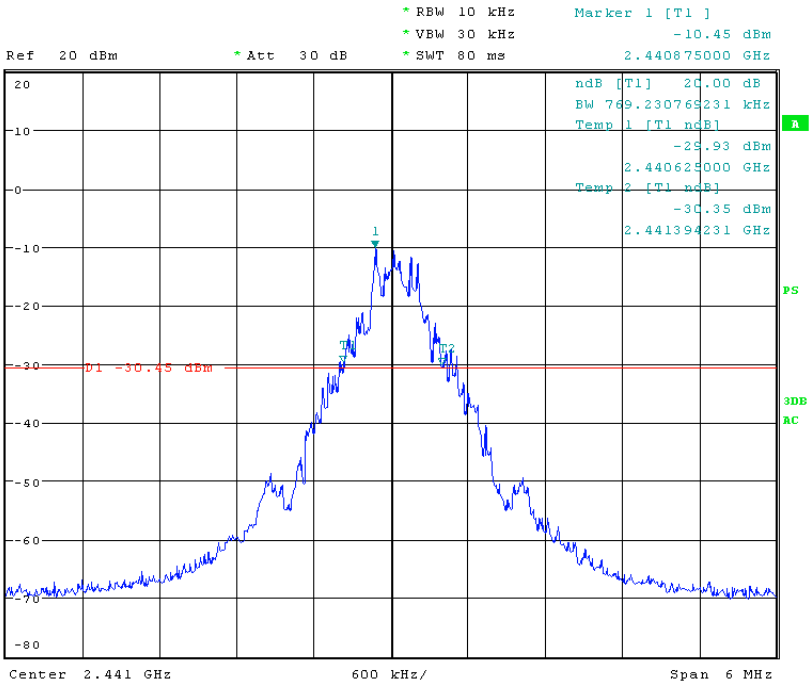
Test Channel	Bandwidth(kHz)
Low	778.85
Middle	769.23
High	769.23

Result plot as follows:

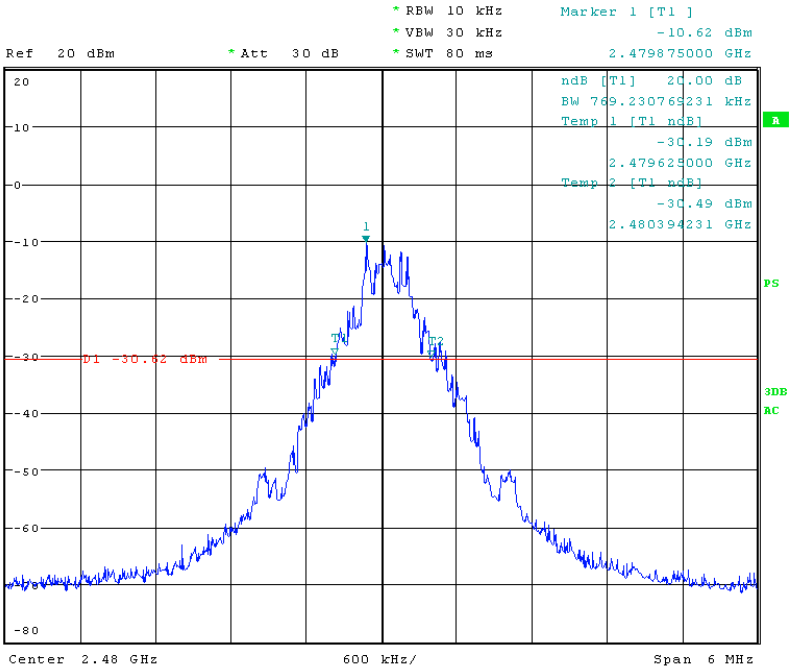
Lowest Channel：



Middle Channel：



Highest Channel:



6.4 Carrier Frequencies Separated

Test Requirement: FCC Part 15 C/ RSS-210 Issue 7

Test Method: Based on FCC Part15 C Section 15.247

Test Date: Mar 19, 2010

Test requirements: Regulation 15.247(a),(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Test Status: Test in hopping operating mode.

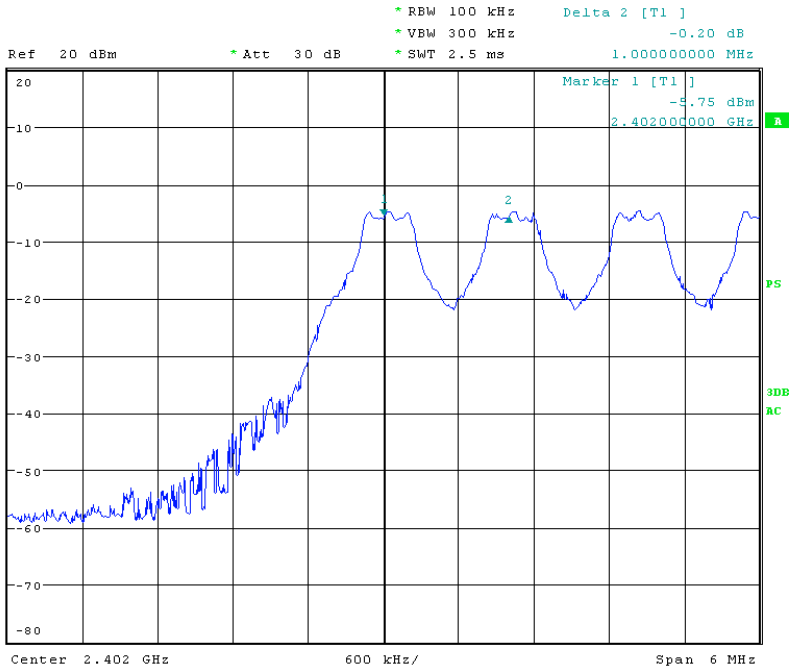
Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW >= 1% of the span (set 100 kHz). VBW >= RBW , Span = 6MHz. Sweep = auto; Detector Function = Peak. Trace = Max,hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

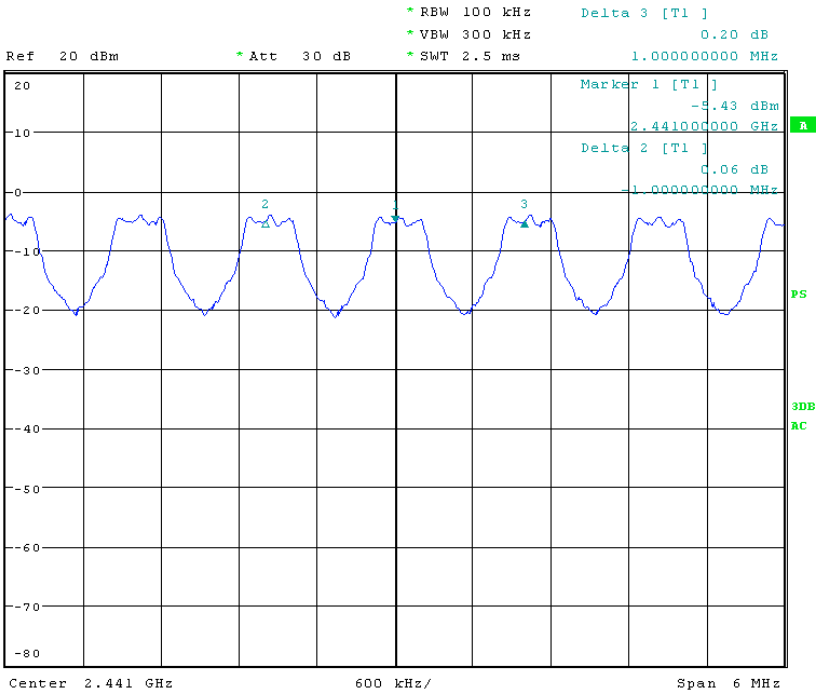
Test result:

Test Channel	Carrier Frequencies Separated	PASS/FAIL
Lower Channels (channel 0 and channel 1)	1.0000MHz	PASS
Middle Channels (channel 39 and channel 40)	1.0000MHz	PASS
Upper Channels (channel 77 and channel 78)	1.0000MHz	PASS

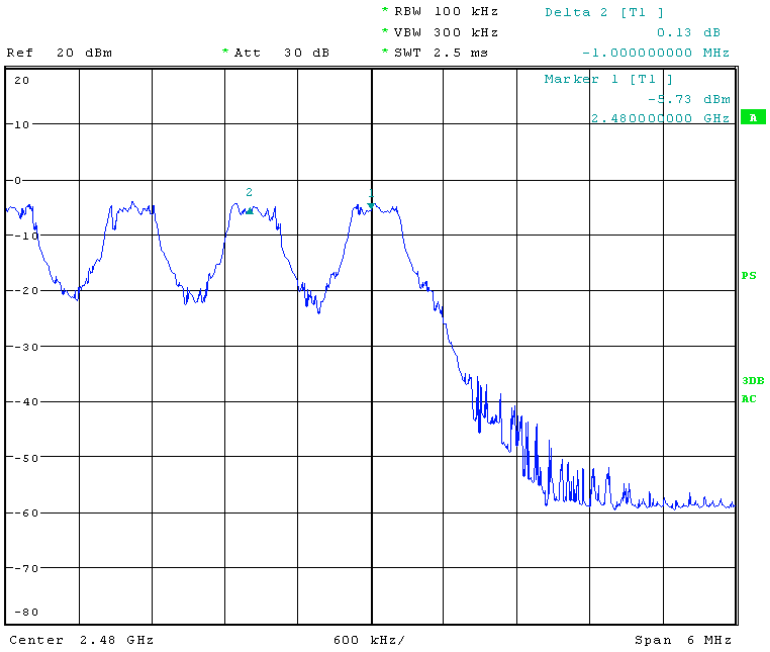
Low Channels:



Middle Channels:



High Channels:



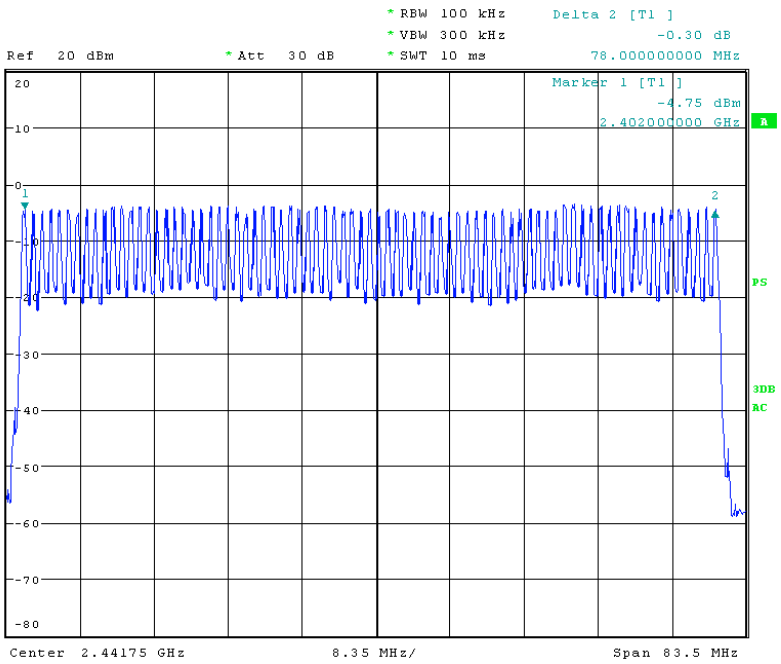
6.5 Hopping Channel Number

Test Requirement:	FCC Part15 C/ RSS-210 Issue 7
Test Method:	Based on FCC Part15 C Section 15.247
Test Date:	Mar 19,2010
Requirements:	Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Status:	Test in hopping operating mode.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 300 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

Test result: Total channels are 79 channels.



6.6 Dwell Time

Test Requirement:	FCC Part 15 C/ RSS-210 Issue 7
Test Method:	Based on FCC Part15 C Section 15.247 & DA 00-705
Test Date:	Mar 19, 2010
Test requirements:	Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.
Test Status:	Test in fixed channel operating mode.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. centered on a hopping channel;
3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

Test Result:Dwell time = Pulse wide x (Hopping rate / Number of channels) x Period

Normal mode: The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

1. Channel 0: 2.402GHz

time slot = 2.9006 (ms) * (1600/(6*79)) * 31.6 = 309 ms

2. Channel 39: 2.441GHz

time slot = 2.9006 (ms) * (1600/(6*79)) * 31.6 = 309 ms

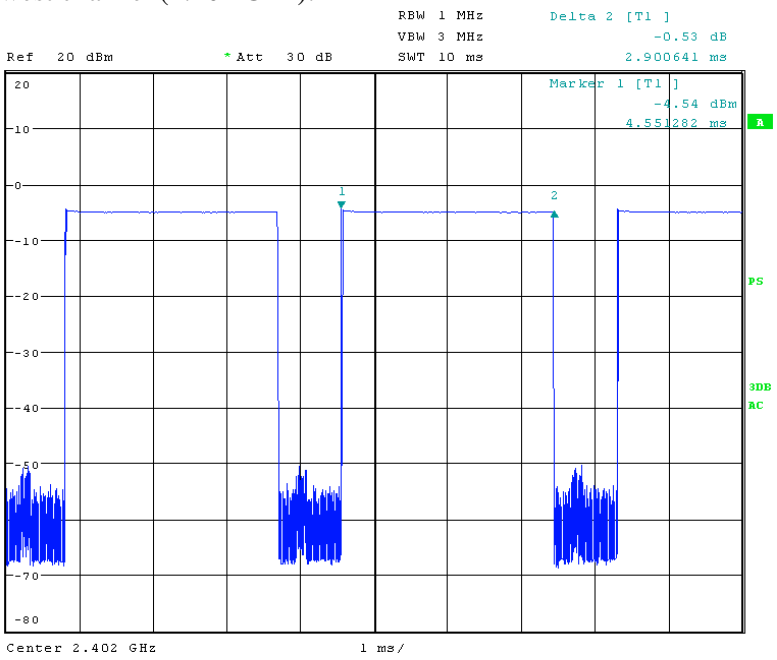
3. Channel 78: 2.480GHz

time slot = 2.9006 (ms) * (1600/(6*79)) * 31.6 = 309 ms

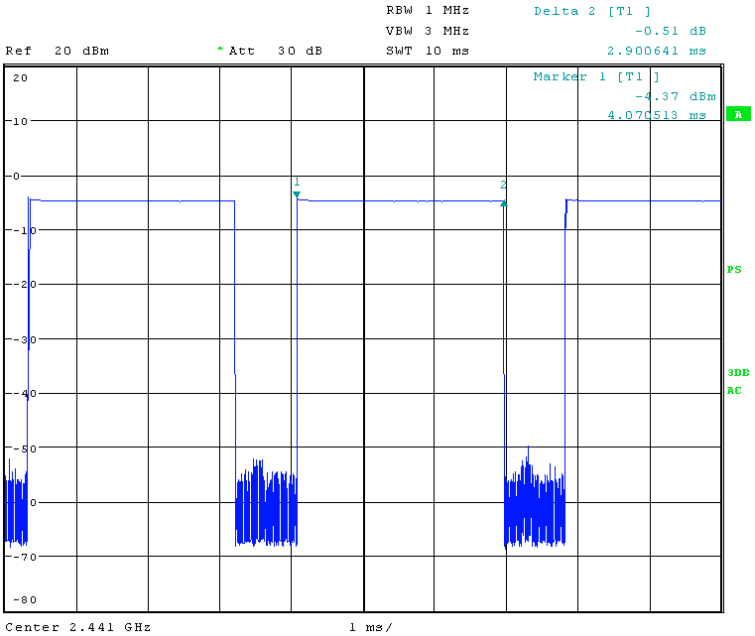
The results are not greater than 0.4 seconds.

Please refer the graph as below:

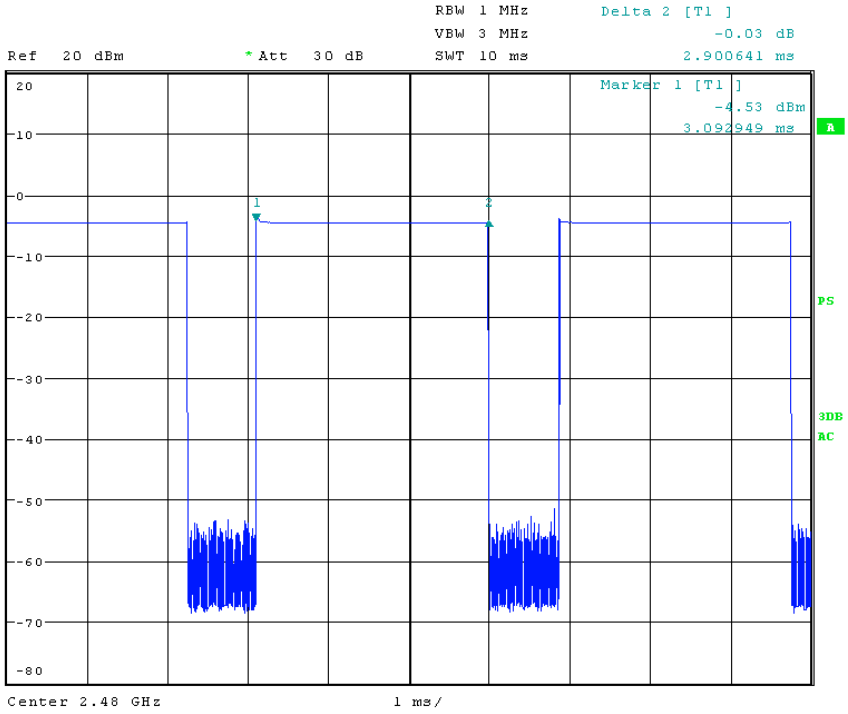
.Lowest channel (2.402 GHz):



Middle Channel (2.441GHz)



Highest Channel (2.480GHz)



6.7 Maximum Peak Output Power

Test Requirement: FCC Part 15.247/ RSS 210 issue 7 Annex 8.4(2)

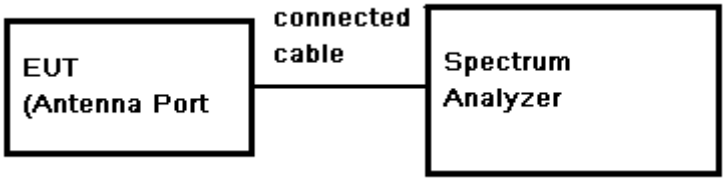
Test Method: Base on ANSI 63.4.

Test Date: Mar 19, 2010

Test Limit: Regulation 15.247 (b)(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.
Refer to the result "Hopping channel number" of this document. The 1 watt (30.0dBm) limit applies.

Test mode: Test in fixing frequency transmitting mode.

Test Configuration:



Test Procedure:

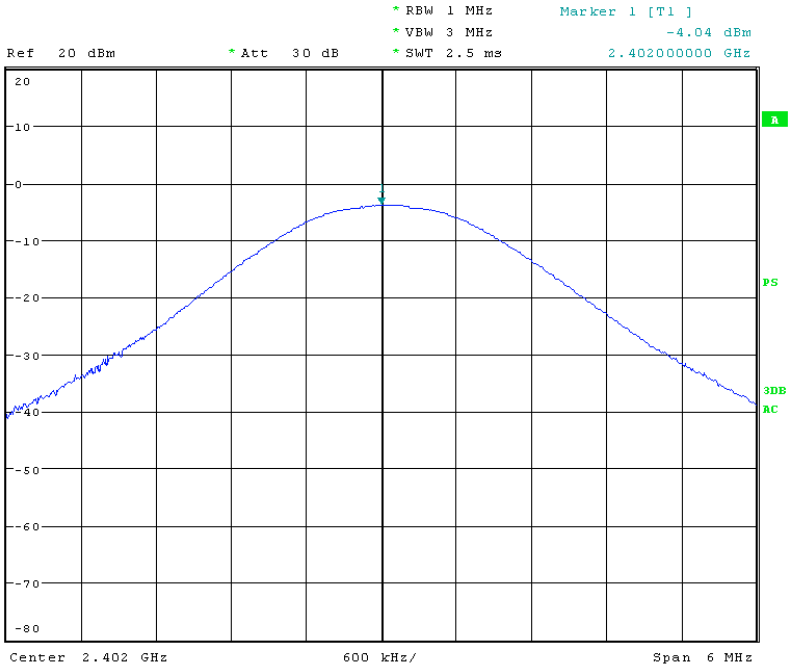
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW >= 1 MHz. VBW >= RBW MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

Test Result:

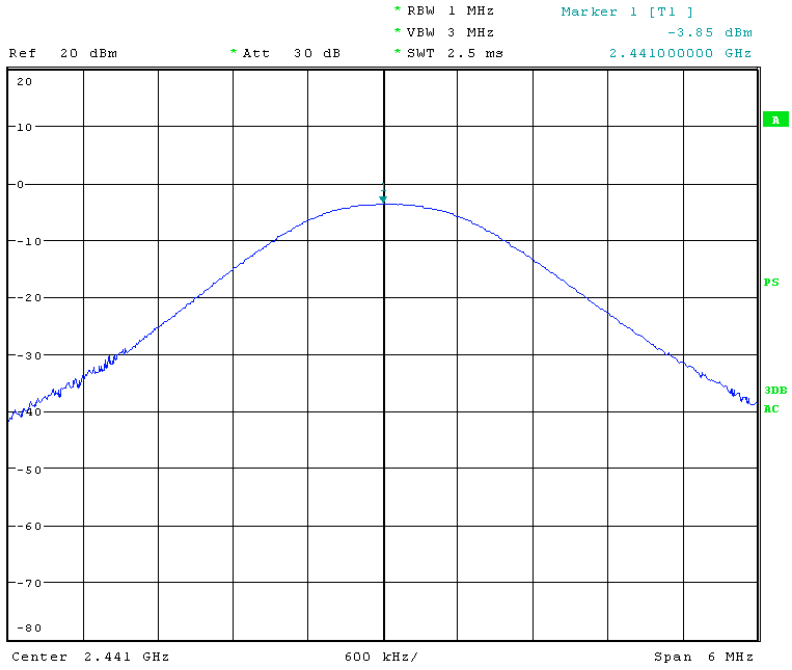
Test Channel	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2.402	-4.04	1.10	-2.94	30.0	32.94
Middle	2.441	-3.85	1.10	-2.75	30.0	32.75
High	2.480	-3.99	1.10	-2.89	30.0	32.89

Test result plot as follows:

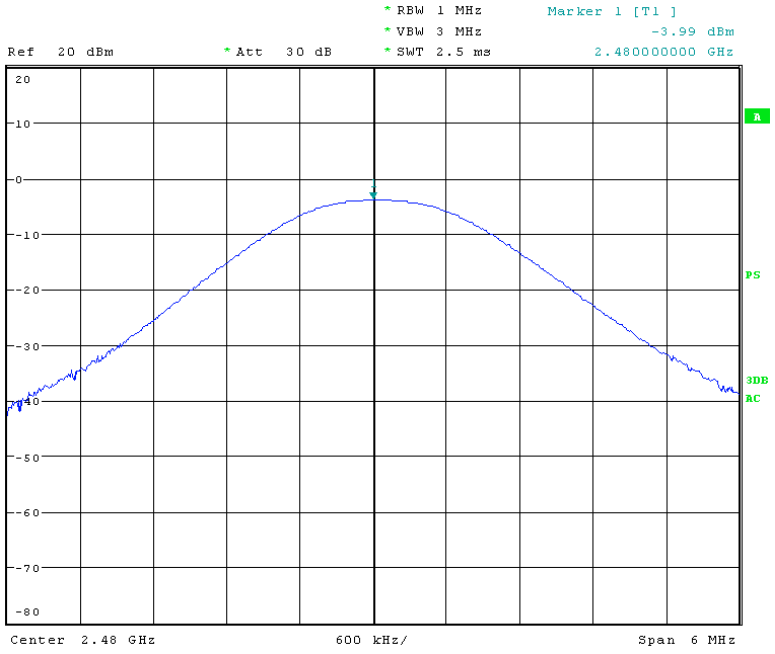
Low Channel:



Middle Channel:



High Channel:



6.8 RF Exposure Compliance Requirement

6.8.1 Standard requirement

15.247(b)(4) requirement:

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section. if transmitting antennas of directional gain greater than 6 dBi are used. the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1). (b)(2). and (b)(3) of this section. as appropriate. by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TCB Exclusion List (7 July 2002)

Exposure category	low threshold	high threshold
general population	(60/fGHz) mW. d < 2.5 cm (120/fGHz) mW. d ≥ 2.5 cm	(900/fGHz) mW. d < 20 cm
occupational	(375/fGHz) mW. d < 2.5 cm (900/fGHz) mW. d ≥ 2.5 cm	(2250/fGHz) mW. d < 20 cm

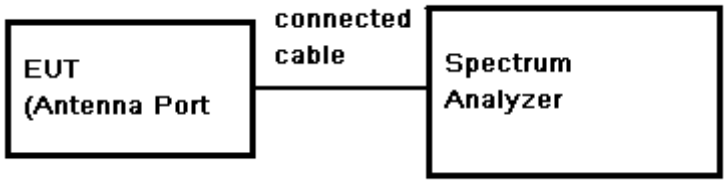
6.8.2 EUT RF Exposure

The Max Conducted Peak Output Power is -2.75dBm;
And the max antenna gain is -1.46 dBi in the actual used.
According to the formula. calculate the EIRP test result:
EIRP= -2.75+(-1.46)= -4.21dBm①
SAR requirement:
S= 60 / f(GHz) = 60/2.4 = 25 mW=14.0dBm ② ;
① < ②.
So the SAR report is not required.

6.9 Conducted Spurious Emissions

Test Requirement:	FCC Part 15.247/ RSS 210 issue 7 Annex 8.5
Test Method:	Based on FCC Part15 C Section 15.247&15.209:
Test Date:	Mar 19, 2010
Test requirements:	(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. based on either an RF conducted or a radiated measurement. provided the transmitter demonstrates compliance with the peak conducted power limits.
Test Status:	Test the low. Middle, high channel transmitting mode.

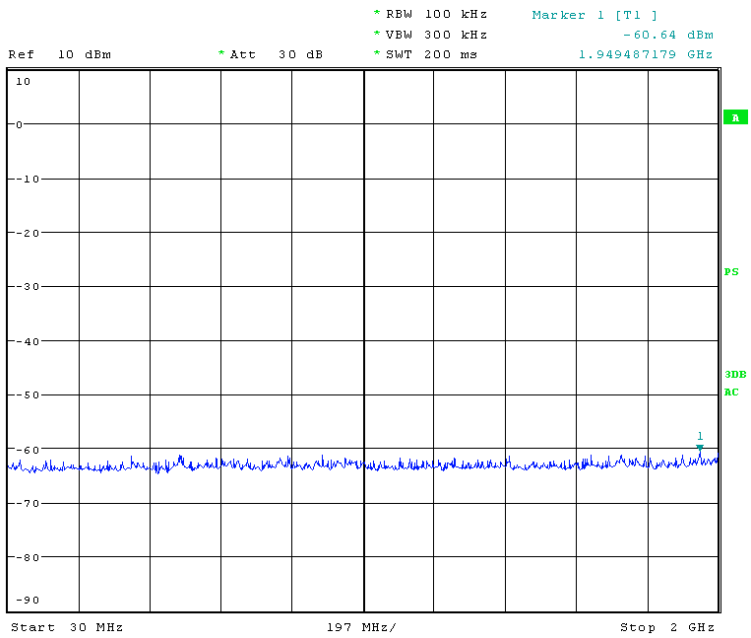
Test Configuration:

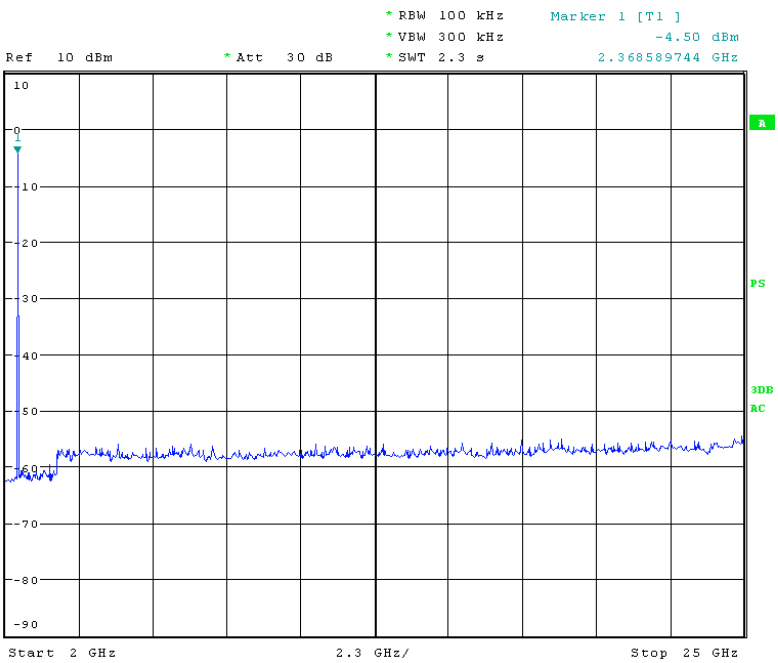


Test Procedure:

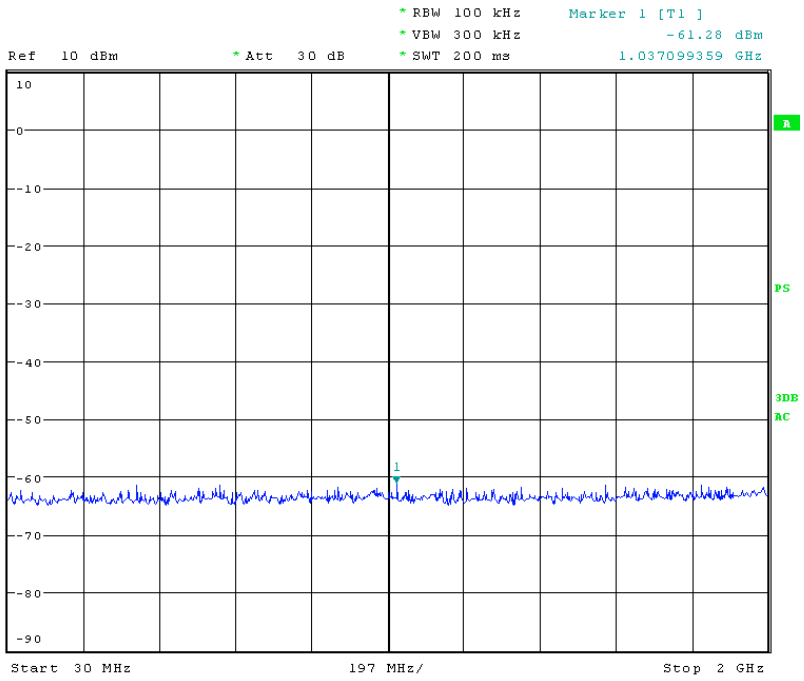
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).

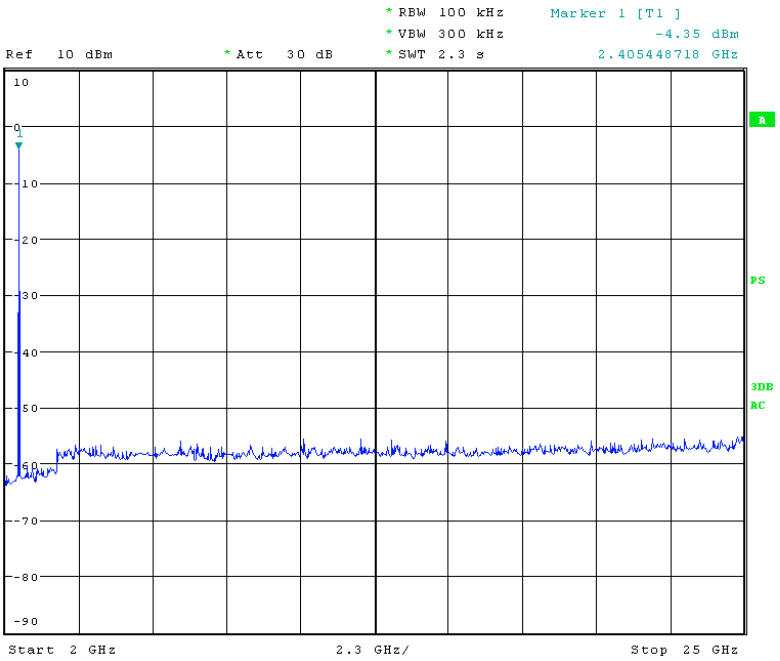
Low Channel:



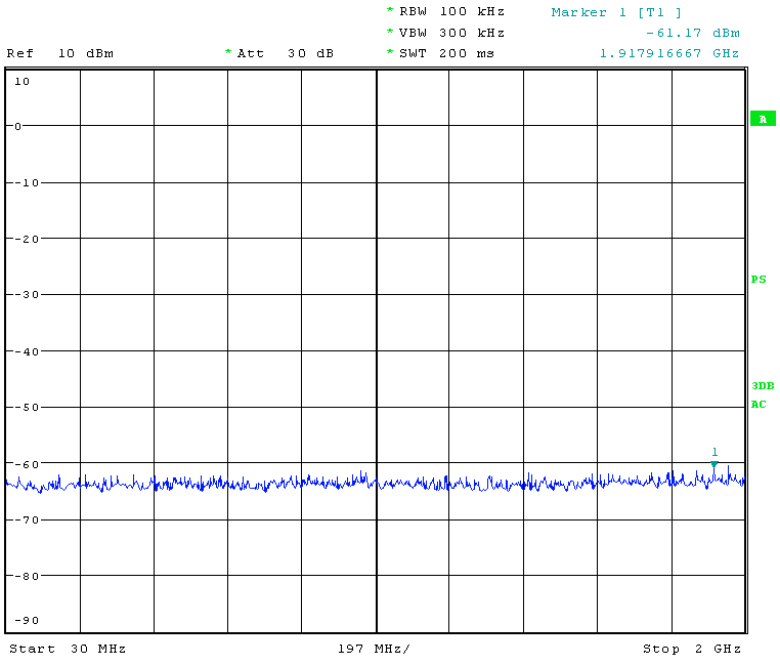


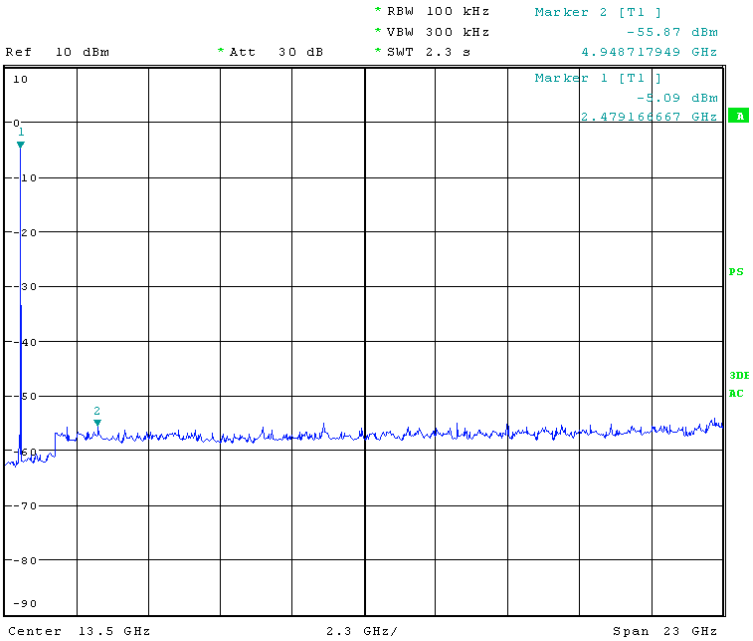
Middle Channel:





High Channel:

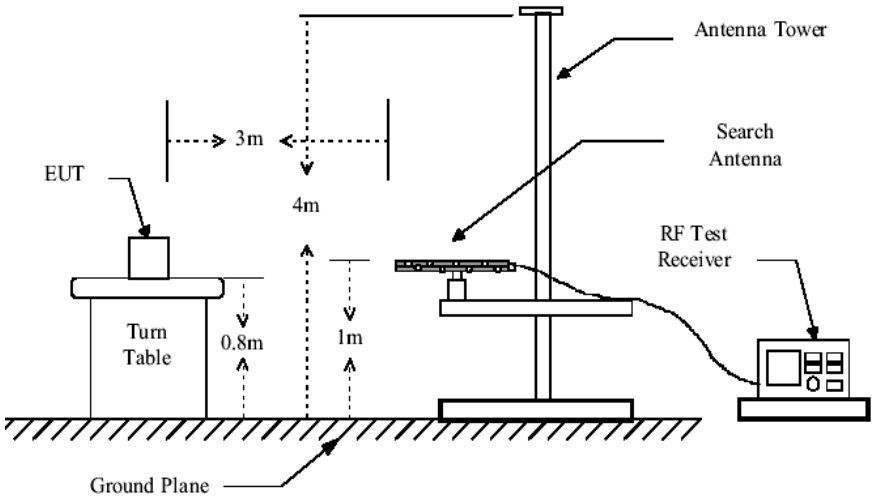




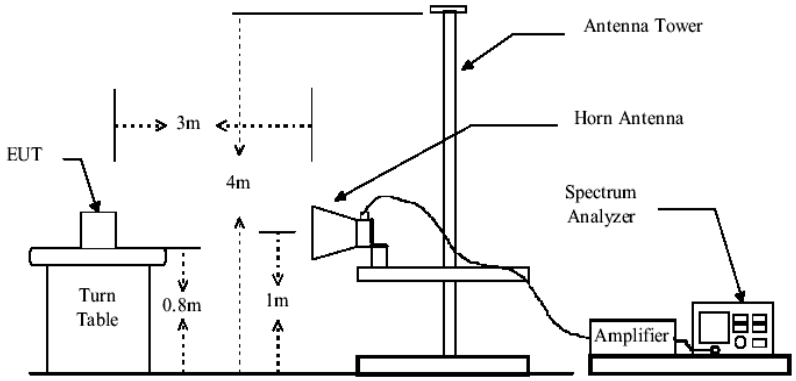
6.10 Radiated Spurious Emissions

Test Requirement:	FCC 15.247(d) & 15.209 / RSS 210 issue 7 Annex 8.5
Test Method:	ANSI C63.4 section 8 & 13
Test Date:	Mar 22, 2010
Test Status:	Test low channel, Middle, high channel transmitting mode; Receiver mode
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber) Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). For PK value: RBW = 1 MHz for f ≥ 1 GHz VBW ≥ RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for f ≥ 1 GHz VBW =10Hz; Sweep = auto Detector function = peak Trace = max hold Receive antenna scan height 1 m - 4 m. polarization Vertical / Horizontal
15.209 Limit:	40.0 dBμV/m between 30MHz & 88MHz 43.5 dBμV/m between 88MHz & 216MHz 46.0 dBμV/m between 216MHz & 960MHz 54.0 dBμV/m above 960MHz
15.247(d) limit:	(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that Contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Configuration:



Below 1GHz radiated emissions test configuration



Above 1GHz radiated emissions test configuration

Test Procedure: The procedure used was ANSI Standard C63.4-2001. The receiver was scanned from 30MHz to 25GHz.When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Pre-test were performed for there spatial orthogonal(X, Y, Z), the worst test data (X orthogonal)was submitted.

Transmitter mode:

Test in Channel Low in transmitting status- Vertical polarization

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
30.0	14.2	0.18	24.6	25.70	15.48	40.0
200.0	10.9	0.25	24.5	27.71	14.36	43.5
830.0	22.8	0.42	24.0	28.48	27.70	46.0

1~25 GHz Harmonics & Spurious Emissions, Peak & Average Measurement

Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4804.00	30.8	1.2	0.5	43.4	46.8	35.9	74.0
7206.00	36.0	1.7	0.8	43.1	45.9	41.3	74.0
9608.00	37.8	2.2	0.9	43.9	47.2	44.2	74.0

Average Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4804.00	30.8	1.2	0.5	43.4	36.6	25.7	54.0
7206.00	36.0	1.7	0.8	43.1	36	31.4	54.0
9608.00	37.8	2.2	0.9	43.9	36.9	33.9	54.0

Remark: No other radiation has been found.

Test in Channel Low in transmitting status- Horizontal polarization

30MHz~1GHz Spurious Emissions,Quasi-Peak Measurement:

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
30.00	14.2	0.18	24.6	25.96	15.74	40.0
200.00	10.9	0.25	24.5	27.97	14.62	43.5
830.00	22.8	0.42	24.0	28.69	27.91	46.0

1~25 GHz Harmonics & Spurious Emissions, Peak & Average Measurement

Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4804.00	30.8	1.2	0.5	43.4	46.2	35.3	74.0
7206.00	36.0	1.7	0.8	43.1	45.1	40.5	74.0
9608.00	37.8	2.2	0.9	43.9	46.3	43.3	74.0

Average Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4804.00	30.8	1.2	0.5	43.4	36.1	25.2	54.0
7206.00	36.0	1.7	0.8	43.1	35.8	31.2	54.0
9608.00	37.8	2.2	0.9	43.9	37.1	34.1	54.0

Remark: No other radiation has been found.

Test in Channel Middle in transmitting status- Vertical polarization

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
30.00	14.2	0.18	24.6	25.87	15.65	40.0
200.00	10.9	0.25	24.5	27.83	14.48	43.5
830.00	22.8	0.42	24.0	28.59	27.81	46.0

1~25 GHz Harmonics & Spurious Emissions, Peak & Average Measurement

Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4882.00	30.9	1.3	0.5	43.3	47	36.1	74.0
7323.00	36.2	1.8	0.6	43.1	46	41.4	74.0
9764.00	38.1	2.3	0.9	43.9	46.5	43.5	74.0

Average Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4882.00	30.9	1.3	0.5	43.3	36.7	25.8	54.0
7323.00	36.2	1.8	0.6	43.1	36.2	31.6	54.0
9764.00	38.1	2.3	0.9	43.9	36.7	33.7	54.0

Remark: No other radiation has been found.

Test in Channel Middle in transmitting status- Horizontal polarization

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
30.00	14.2	0.1	24.6	26.03	15.81	40.0
200.00	10.9	0.2	24.5	27.71	14.36	43.5
830.00	22.8	0.4	24.0	28.49	27.71	46.0

1~25 GHz Harmonics & Spurious Emissions, Peak & Average Measurement

Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4882.00	30.9	1.3	0.5	43.3	46.1	35.2	74.0
7323.00	36.2	1.8	0.6	43.1	45.7	41.1	74.0
9764.00	38.1	2.3	0.9	43.9	45.2	42.2	74.0

Average Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4882.00	30.9	1.3	0.5	43.3	36.4	25.5	54.0
7323.00	36.2	1.8	0.6	43.1	35.8	31.2	54.0
9764.00	38.1	2.3	0.9	43.9	35.7	32.7	54.0

Remark: No other radiation has been found.

Test in Channel High in transmitting status- Vertical polarization

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
30.00	14.2	0.2	24.6	25.55	15.33	40.0
200.00	10.9	0.3	24.5	27.95	14.60	43.5
830.00	22.8	0.4	24.0	28.42	27.64	46.0

1~25 GHz Harmonics & Spurious Emissions, Peak & Average Measurement

Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4960.00	31.1	1.4	0.7	43.4	47.1	36.2	74.0
7440.00	36.4	2.0	0.7	43.2	46.2	41.6	74.0
9920.00	38.3	2.6	1.0	44.1	45	42	74.0

Average Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4960.00	31.1	1.4	0.7	43.4	37.8	26.9	54.0
7440.00	36.4	2.0	0.7	43.2	35.2	30.6	54.0
9920.00	38.3	2.6	1.0	44.1	34.7	31.7	54.0

Remark: No other radiation has been found.

Test in Channel High in transmitting status- Horizontal polarization

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
30.00	14.2	0.2	24.6	26.01	15.79	40.0
200.00	10.9	0.3	24.5	28.03	14.68	43.5
830.00	22.8	0.4	24.0	28.79	28.01	46.0

1~25 GHz Harmonics & Spurious Emissions, Peak & Average Measurement

Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4960.00	31.1	1.4	0.7	43.4	45.8	34.9	74.0
7440.00	36.4	2.0	0.7	43.2	44.9	40.3	74.0
9920.00	38.3	2.6	1.0	44.1	44.1	41.1	74.0

Average Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4960.00	31.1	1.4	0.7	43.4	35.6	24.7	54.0
7440.00	36.4	2.0	0.7	43.2	35.5	30.9	54.0
9920.00	38.3	2.6	1.0	44.1	34.5	31.5	54.0

Remark: No other radiation has been found.

Receiver mode:

Horizontal polarization(Quasi-Peak Measurement)

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
30.00	14.2	0.2	24.6	25.08	14.88	40.0
100.00	11.1	0.3	24.5	27.42	14.32	43.5
500.00	18.5	0.4	24.1	28.84	23.64	46.0

Vertical polarization(Quasi-Peak Measurement)

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
30.00	14.2	0.2	24.6	24.92	14.72	40.0
100.00	11.1	0.3	24.5	27.63	14.53	43.5
500.00	18.5	0.4	24.1	29.07	23.87	46.0

Remark: No other radiation has been found.

Test Level =Receiver Reading + Antenna Factor + Cable Factor+ Filter –Preamplifier Factor.

Remark: No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part. Hence there no other emissions have been reported.

6.10.1 Radiated Emissions which fall in the restricted bands

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	Base on ANSI 63.4
Test Date:	Mar 23, 2010
Measurement Distance:	3m (Semi-Anechoic Chamber)
Limit:	40.0 dBμV/m between 30MHz & 88MHz; 43.5 dBμV/m between 88MHz & 216MHz; 46.0 dBμV/m between 216MHz & 960MHz; 54.0 dBμV/m above 960MHz.
Detector:	For PK value: RBW = 1 MHz for f ≥ 1 GHz VBW ≥ RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for f ≥ 1 GHz VBW =10Hz; Sweep = auto Detector function = peak Trace = max hold

Test Result:

Low Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)
2390.000	27.88	1.1	0.5	42.4
2483.500	28.74	1.2	0.6	42.6

Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
44.15	35.49	31.23	22.57
44.75	35.1	32.69	23.04

Middle Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)
2390.000	27.88	1.1	0.5	42.4
2483.500	28.74	1.2	0.6	42.6

Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
45.34	35.68	32.42	22.76
45.19	35.63	33.13	23.57

High Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)
2390.000	27.88	1.1	0.5	42.4
2483.500	28.74	1.2	0.6	42.6

Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)

44.81	35.23	31.89	22.31
44.27	34.00	32.21	21.94

Remark: No any other emission which fall in restricted bands can be detected and be reported.

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section. only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

6.11 Band Edges Requirement

Test Requirement:	FCC Part 15 C/ RSS 210 issue 7 Annex 8.5
Test Method:	Based on ANSI 63.4
	Operation within the band 2400 – 2483.5 MHz
Test Date:	Mar 19, 2010
Requirements:	Section 15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Method of Measurement:	Set RBW of spectrum analyzer to 100 kHz and VBW of spectrum analyzer to 300 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

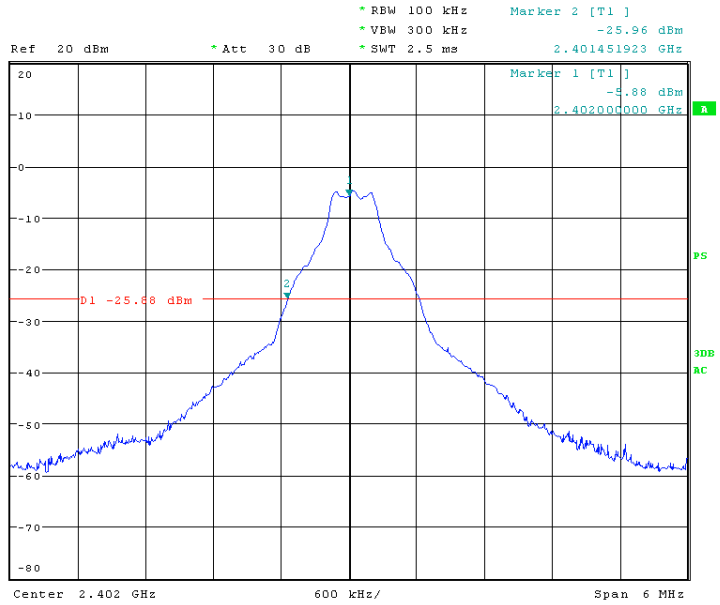
The band edges was measured and recorded Result:

The Lower Edges attenuated more than 20dB.

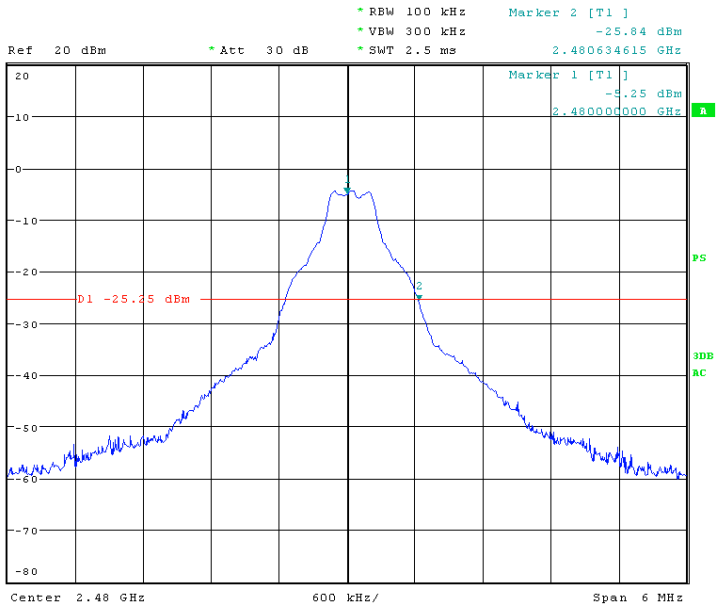
The Upper Edges attenuated more than 20dB.

The graph as below. represents the emissions take for this device.

Low Channel:



High Channel:



End of Report~