



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Product Name: VitaSound PAE

Brand Name: VitaSound

Model No.: PAE-100

FCC ID: S9X-HB-1121

Test Report Number:

C131015E01-RPW

Issued for

Honey Bee (Hong Kong) Limited

Flat L, 12/F, Phase 4, Kwun Tong Industrial Centre, 436-446 Kwun Tong Road, Kowloon,
HongKong

Issued by

Compliance Certification Services Inc.

Kun shan Laboratory

No.10 Weiye Rd., Innovation park, Eco&Tec,
Development Zone, Kunshan City, Jiangsu, China

TEL: 86-512-57355888

FAX: 86-512-57370818



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass
3.1	-	99% Bandwidth	-	Pass
3.2	15.247(b)(1)	Peak Output Power	$\leq 30\text{dBm}$	Pass
3.5	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}$	Pass
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	$\leq 20\text{dBc}$	Pass
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass
3.6	15.207	AC Conducted Emission	15.207(a)	Pass
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass



1. TEST RESULT CERTIFICATION

Product Name:	VitaSound PAE
Brand Name:	VitaSound
Model Name.:	PAE-100
Series Model:	PAE-500, PAE-380
Applicant Discrepancy:	Initial
Device Category:	PORTABLE DEVICES
Date of Test:	November 1, 2013- November 2, 2013
Applicant:	Honey Bee (Hong Kong) Limited Flat L, 12/F, Phase 4, Kwun Tong Industrial Centre, 436-446 Kwun Tong Road, Kowloon, HongKong
Manufacturer:	Shantou S.E.Z. Honey Bee Electronics Co., Ltd. 5/F, Blk 3, Zhu Hua Industrial Zone, Li Shui Zhuang, Zhong Qu, Long Hu Qu, Shantou City, Guangdong Province, China
Application Type:	Certification

APPLICABLE STANDARDS

STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Jeff.Fang
RF Manager
Compliance Certification Service Inc.

Tested by:

Blent.Wang
Test Engineer
Compliance Certification Service Inc.



2. EUT DESCRIPTION

Product Name:	VitaSound PAE
Brand Name:	VitaSound
Model Name:	PAE-100
Series Model:	PAE-500, PAE-380
Model Discrepancy:	Only for market segment
Power Adapter Power Rating :	Power supply and ADP (rating) : Model : SEB0902000P INPUT: 100-240V~50-60Hz,1A OUTPUT: 9V,2000mA Battery (rating) : Capacitance: 3.7V-1500mAh
Frequency Range:	2402 ~ 2480 MHz
Transmit Power:	Bluetooth v4.0:4.01dBm (2.52mW)
Modulation Technique:	Bluetooth v4.0:GFSK
Number of Channels:	40 Channels
Antenna Specification:	PCB Antenna

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for **FCC ID: S9X-HB-1121** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 2003 and FCC CFR 47 15.207, 15.209, 15.247.

3.1. EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2. EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3. GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 2003 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4 2003.



3.4. TEST MODES

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Antenna
Bandwidth Measurement	GFSK	1 Mbps	0/19/39	1
Output Power Measurement	GFSK	1 Mbps	0/19/39	1
Power Spectral Density	GFSK	1 Mbps	0/19/39	1
Band Edge Emissions	GFSK	1 Mbps	0/39	1
Spurious Emissions	GFSK	1 Mbps	0/19/39	1
Radiated Emissions Below 1GHz	CTX	1 Mbps	39	1
Radiated Emissions Above 1GHz	GFSK	1 Mbps	0/19/39	1
AC Power Conducted Emissions	CTX	-	-	-

Remark: For radiated test cases below 1GHz, the worst mode data rate channel 39 was reported only, because this data rate has the highest RF output power at preliminary tests.



3.5. FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(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
¹ 0.495 - 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 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



4. INSTRUMENT CALIBRATION

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

Equipment Used for Emissions Measurement

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	RS	FSU26	200789	2014-6-30
OSCILLOSCOPE	Agilent	DSO6104A	MY44002585	2014-3-14
Peak and Avg Power Sensor	Agilent	E9327A	US40441788	2014-3-14
EPM-P Series Power Meter	Agilent	E4416A	GB41292714	2014-3-14
Power SPLITTER	Mini-Circuits	ZN2PD-9G	SF078500430	N.C.R
DC POWER SUPPLY	AGILENT	E3632A	MY50340053	2014-3-14
Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	2014-1-24
Test Software	EZ-EMC			

977 Chamber

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	2014-4-16
Pre-Amplifier	MITEQ	JS41-00101800-32-10P	1675713	2013-10-8
Pre-Amplifier	MITEQ	NSP400-NF	870731	2014-4-26
Bilog Antenna	Sunol Sciences	JB1	A062604	2014-5-2
Horn-antenna	SCHWARZBECK	BBHA9120D	267	2014-4-28
Horn-antenna	SCHWARZBECK	BBHA9170	171	2014-4-28
Loop Antenna	Hengwei	HOPEV39501C	20051	2014-4-5
Turn Table	CT	CT123	4165	N.C.R
Antenna Tower	CT	CTERG23	3256	N.C.R
Controller	CT	CT100	95637	N.C.R
Test Software	EZ-EMC			



Compliance Certification Services Inc.

Report No: C131015E01-RPW

FCC ID: S9X-HB-1121

Date of Issue :November 4, 2013

Conducted Emission				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER	R&S	ESCI3	100781	2014-3-14
V (V-LISN)	Schwarzbeck	NNLK 8129	8129-143	2014-3-14
LISN (EUT)	FCC	FCC-LISN-50/250-50-2-02	SN:05012	2014-3-14
TRANSIENT LIMITER	SCHAFFNER	CFL9206	1710	2014-3-14
Test Software		EZ-EMC		

Remark: The measurement uncertainty is less than +/- 2.81dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.

Expanded Uncertainty (95% CONFIDENCE INTERVAL): K=2



5. FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at CCS China Kunshan Lab at 10#Weiye Rd, Innovation Park Eco. & Tec. Development Zone Kunshan city JiangSu, (215300), CHINA.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 2003 and CISPR Publication 22.

5.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3. LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 200581-0 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC5743 for 10m chamber 10m, IC5743 for 10m chamber 3m.



5.4. TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	47 CFR FCC Part 15/18 (using ANSI C63.4 :2003); VCCI V3; CNS 13438; CNS 13439; CNS 13803; CISPR 11; EN 55011; CISPR 13; EN 55013; CISPR 22:2005; CISPR 22:1997 +A1 :2000+A2 :2002; EN 55022:2006; EN55022 :1998 +A1 :2001+A2 :2003; EN 61000-6-3 (excluding discontinuous interference); EN 61000-6-4; AS/NZS CISPR 22; CAN/CSA-CEI/IEC CISPR 22; EN 61000-3-2; EN 61000-3-3; EN550024; EN 61000-4-2; EN 61000-4-3; EN61000-4-4; EN 61000-4-5; EN 61000-4-6; IEC 61000-4-8; EN 61000-4-11; IEC61000-3-2; IEC61000-3-3; IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4; IEC 61000-4-5; IEC 61000-4-6; IEC 61000-4-8; IEC 61000-4-11; EN 300 220-3; EN 300 328; EN 300 330-2; EN 300 440-1; EN 300-440-2; EN 300 893; EN 301 489-01; EN 301 489-3; EN 301 489-07; EN 301 489-17; 47 CFR FCC Part 15, 22, 24	 TESTING CERT #2541.01
USA	FCC	3/10 meter Sites to perform FCC Part 15/18 measurements	 93105, 90471
Japan	VCCI	3/10 meter Sites and conducted test sites to perform radiated/conducted measurements	VCCI R-1600 C-1707 G-216

* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



6. SETUP OF EQUIPMENT UNDER TEST

6.1. SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

6.2. SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID
1.	N/A	N/A	N/A	N/A	N/A

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



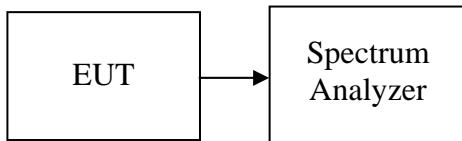
7. FCC PART 15.247 REQUIREMENTS

7.1. 6DB AND 99% BANDWIDTH MEASUREMENT

7.1.1. limit

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

7.1.2. Test Configuration



7.1.3. test procedure

KDB 558074 D01 DTS Measurement Guidance V03r01 dated 09-04-2013.

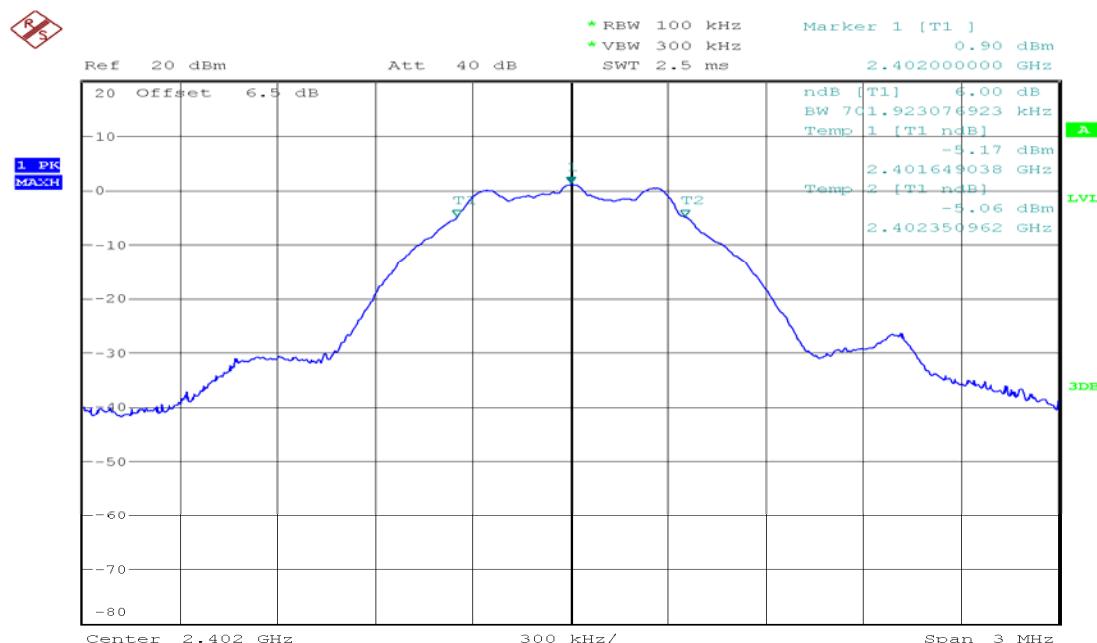
Test Data

7.1.4. Test Result of 6dB Bandwidth

Bluetooth 4.0 mode

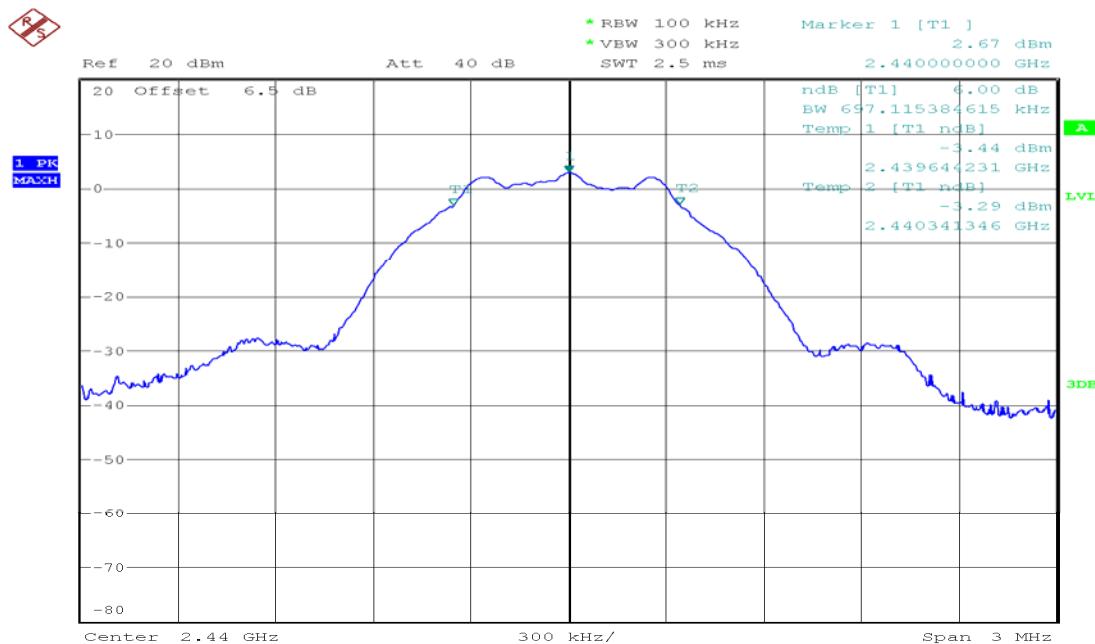
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2402	0.702	>500	PASS
Mid	2440	0.697		PASS
High	2480	0.697		PASS

6dB Bandwidth Plot on Channel 00



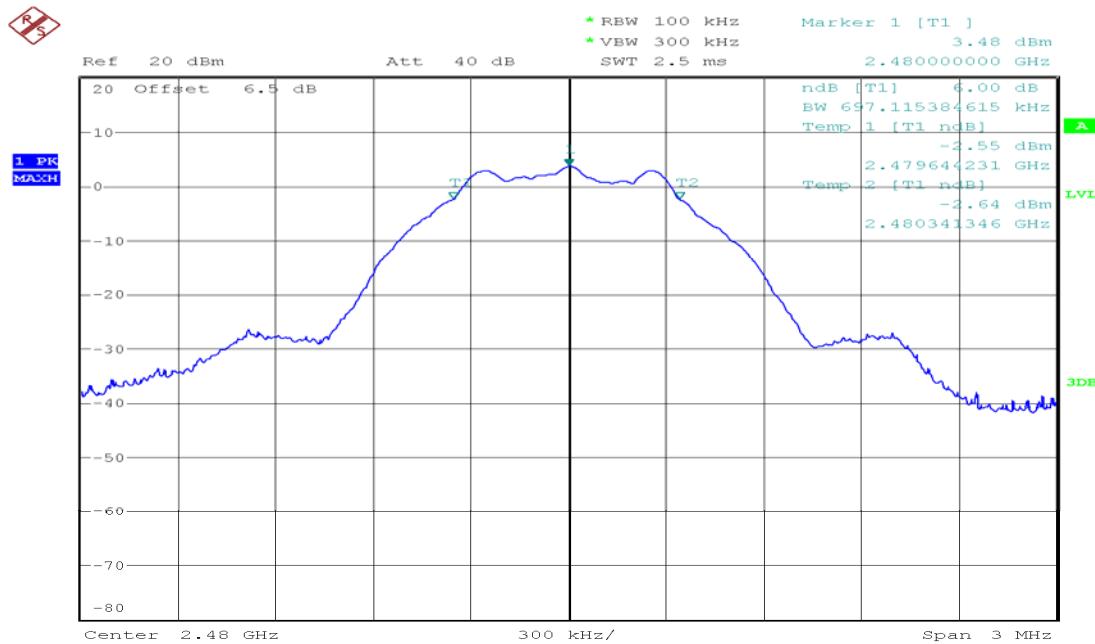


6dB Bandwidth Plot on Channel 19



Date: 2.NOV.2013 14:39:51

6dB Bandwidth Plot on Channel 39



Date: 2.NOV.2013 14:40:50

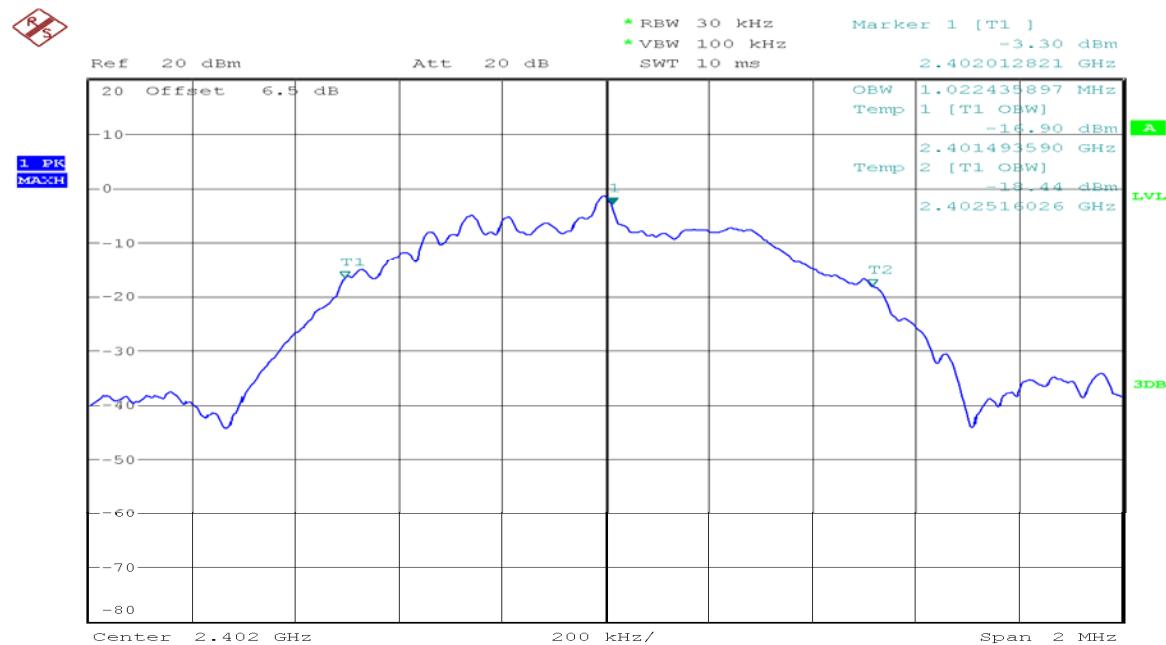


7.1.5. Test Result of 99% Occupied Bandwidth

Bluetooth 4.0 mode

Channel	Frequency (MHz)	Bluetooth 4.0 - LE 99% Occupied Bandwidth(MHz)
Low	2402	1.022
Mid	2440	
High	2480	

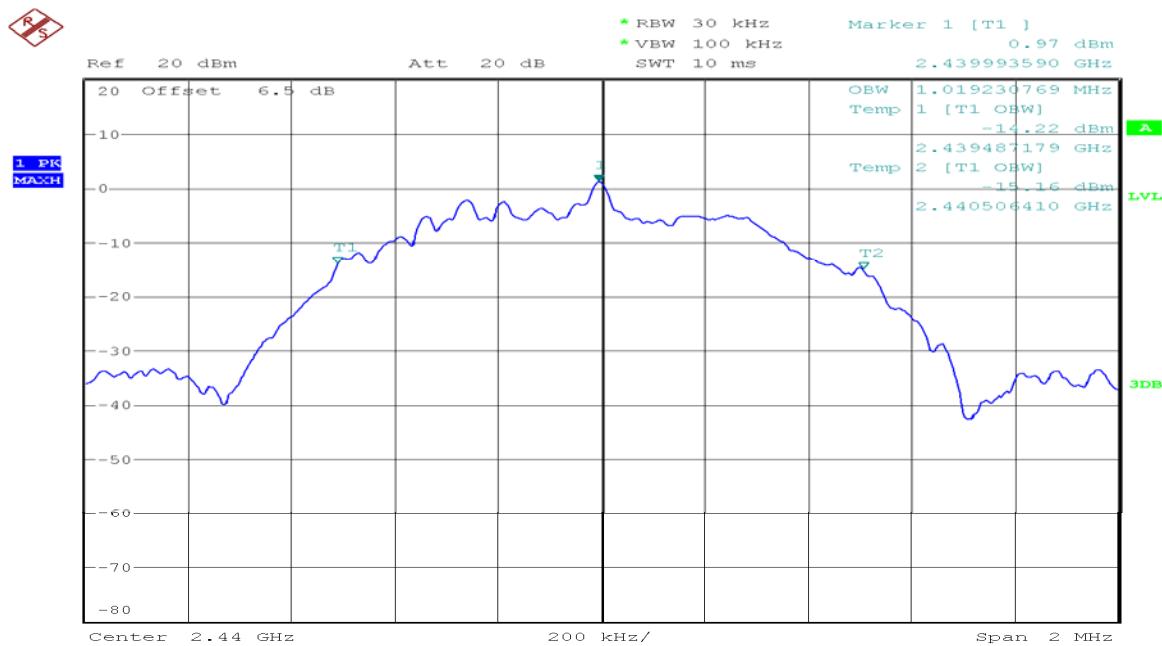
99% Occupied Bandwidth Plot on Channel 00



Date: 2.NOV.2013 11:44:42

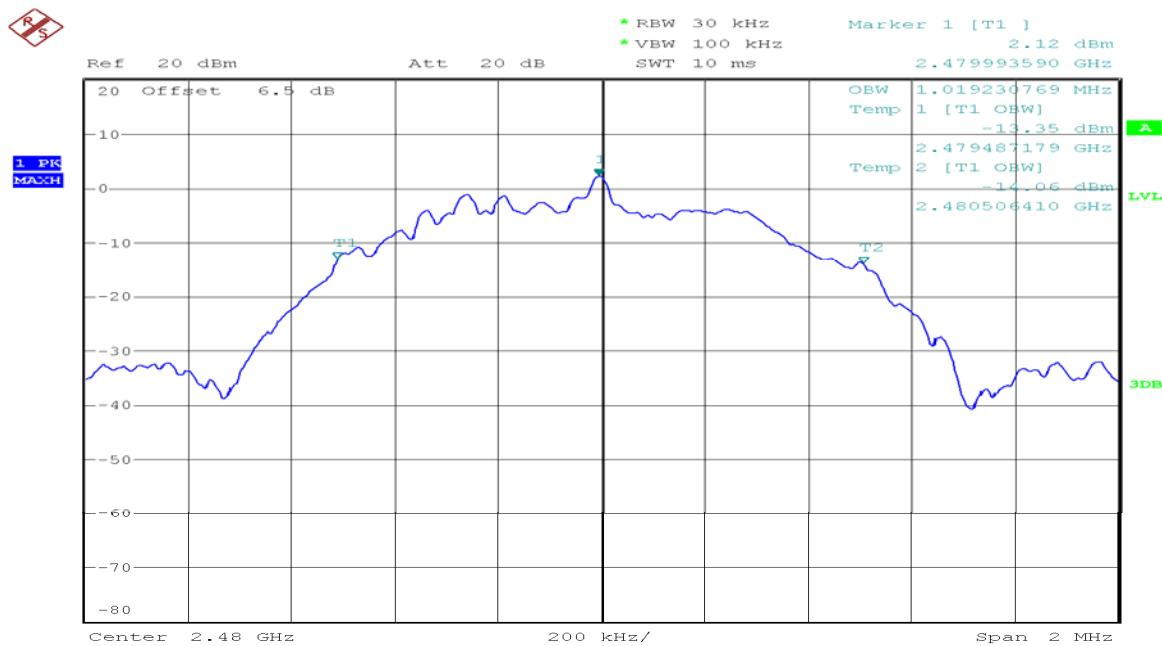


99% Occupied Bandwidth Plot on Channel 19



Date: 2.NOV.2013 11:45:23

99% Occupied Bandwidth Plot on Channel 39



Date: 2.NOV.2013 11:45:46



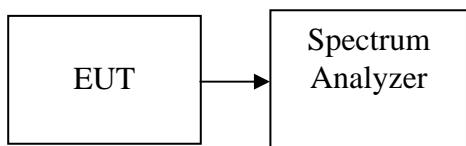
7.2. OUTPUT POWER MEASUREMENT

7.2.1. limit

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
2. According to §15.247(b)(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.

7.2.2. Test Configuration



7.2.3. test procedure

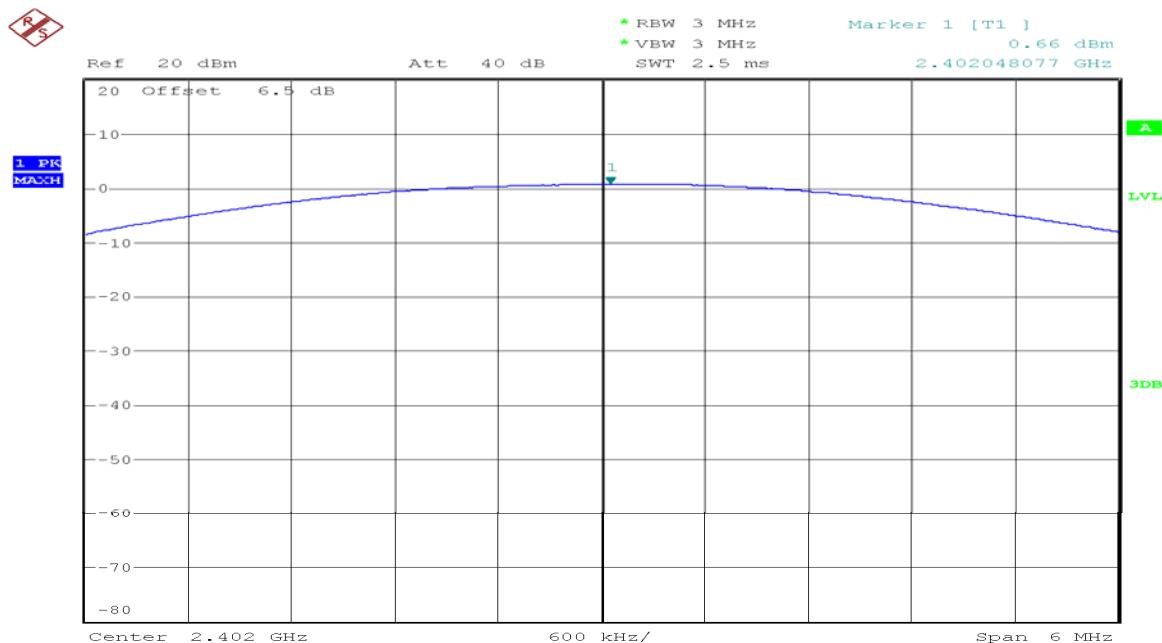
KDB 558074 D01 DTS Measurement Guidance V03r01 dated 09-04-2013.



7.2.4. Test Result of Peak Output Power

Channel	Frequenc	Output	Output	Limit	Result
	y (MHz)	(dBm)	(mw)		
Low	2402	0.66	1.16	30dBm	PASS
Mid	2440	2.95	1.97		PASS
High	2480	4.01	2.52		PASS

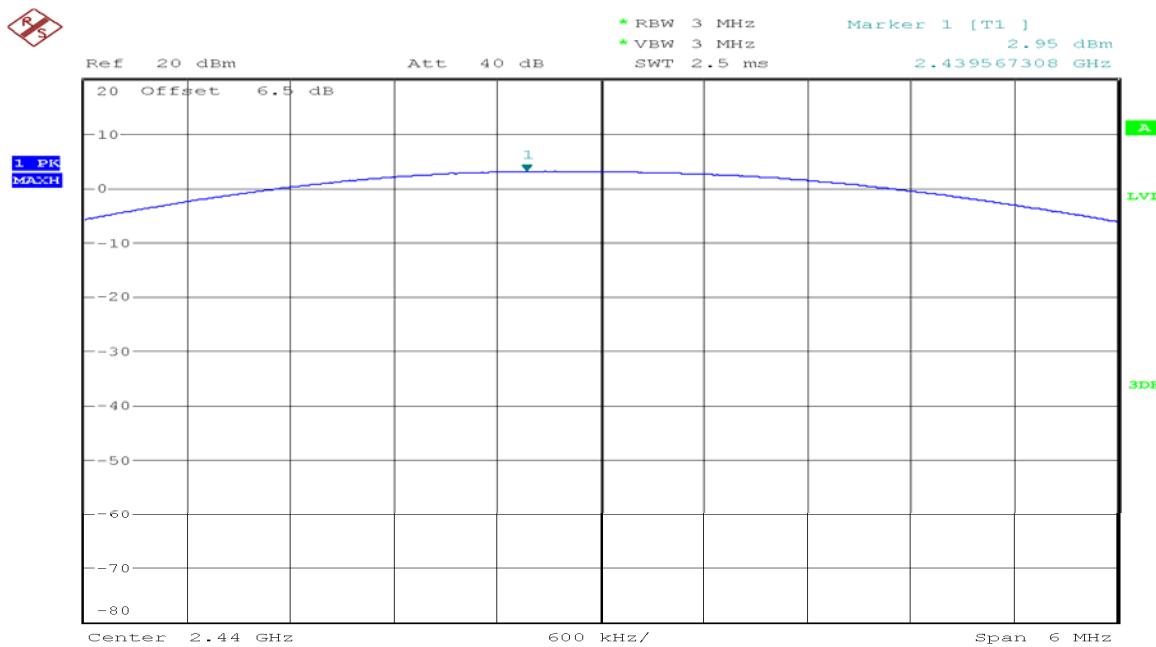
Peak Output Power Plot on Channel 00



Date: 2.NOV.2013 11:29:25

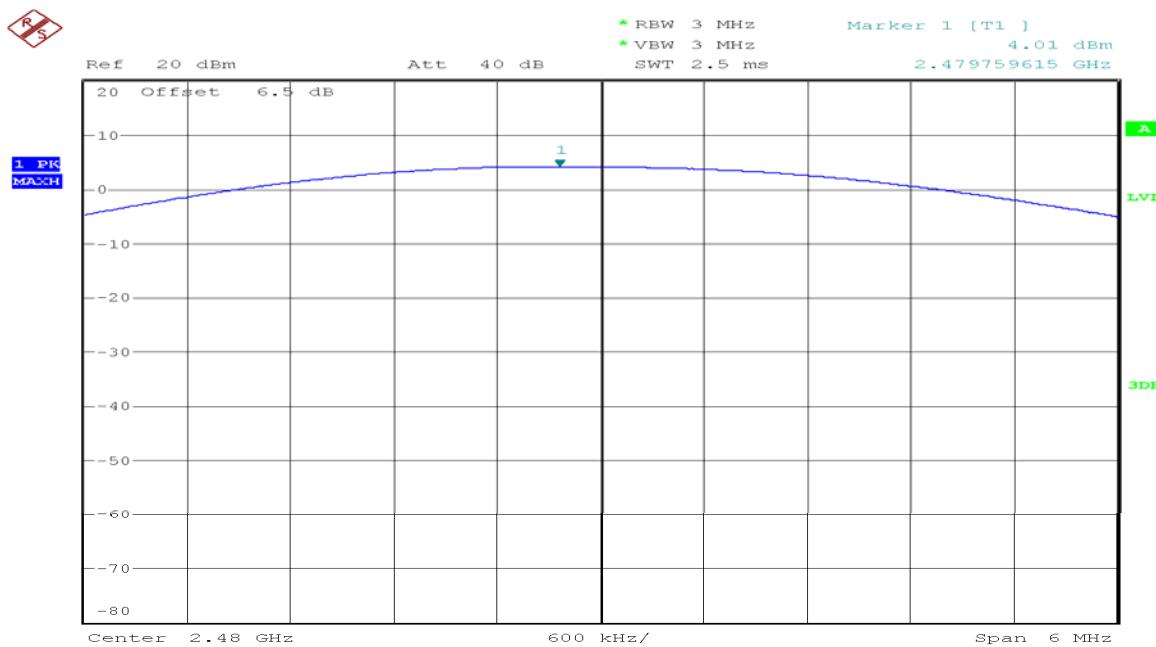


Peak Output Power Plot on Channel 19



Date: 2.NOV.2013 11:30:45

Peak Output Power Plot on Channel 39



Date: 2.NOV.2013 11:31:14

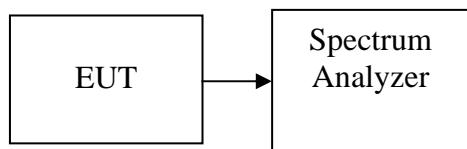


7.3. PEAK POWER SPECTRAL DENSITY

7.3.1. limit

1. According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
2. According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

7.3.2. Test Configuration



7.3.3. test procedure

KDB 558074 D01 DTS Measurement Guidance V03r01 dated 09-04-2013.

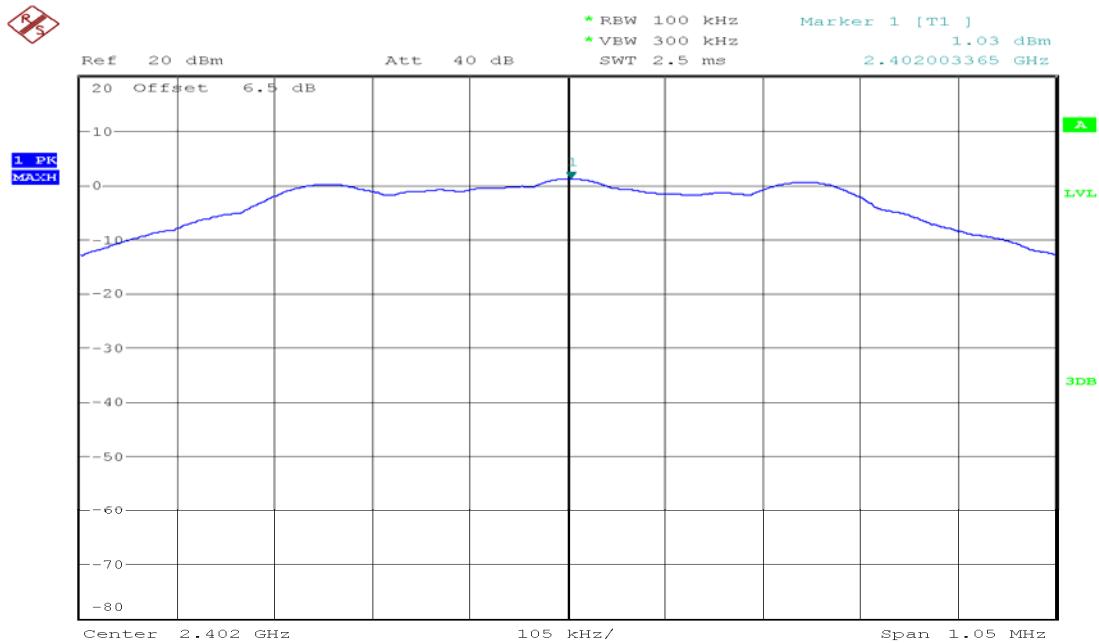
7.3.4. Test Result of Power Spectral Density

Channel	Frequenc y	PPSD(100 kHz)	PPSD(3kHz z)	Limit
	(MHz)	(dBm)	(dBm)	(dBm)
Low	2402	1.03	-14.49	8
Mid	2440	2.51	-12.86	8
High	2480	3.4	-11.92	8



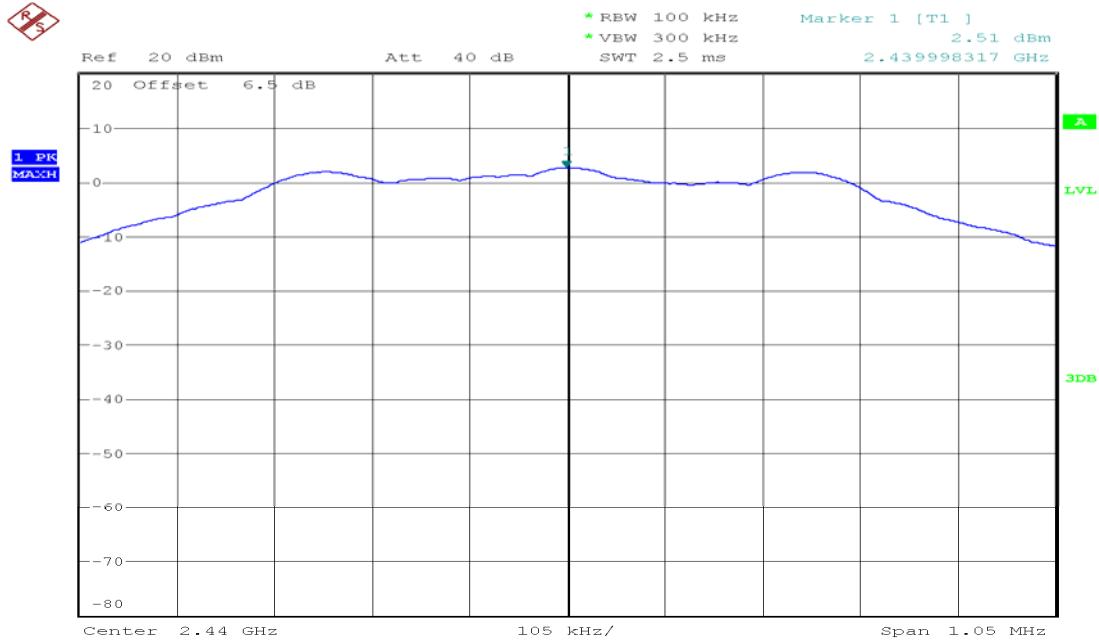
7.3.5. Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on Channel 00



Date: 2.NOV.2013 14:46:33

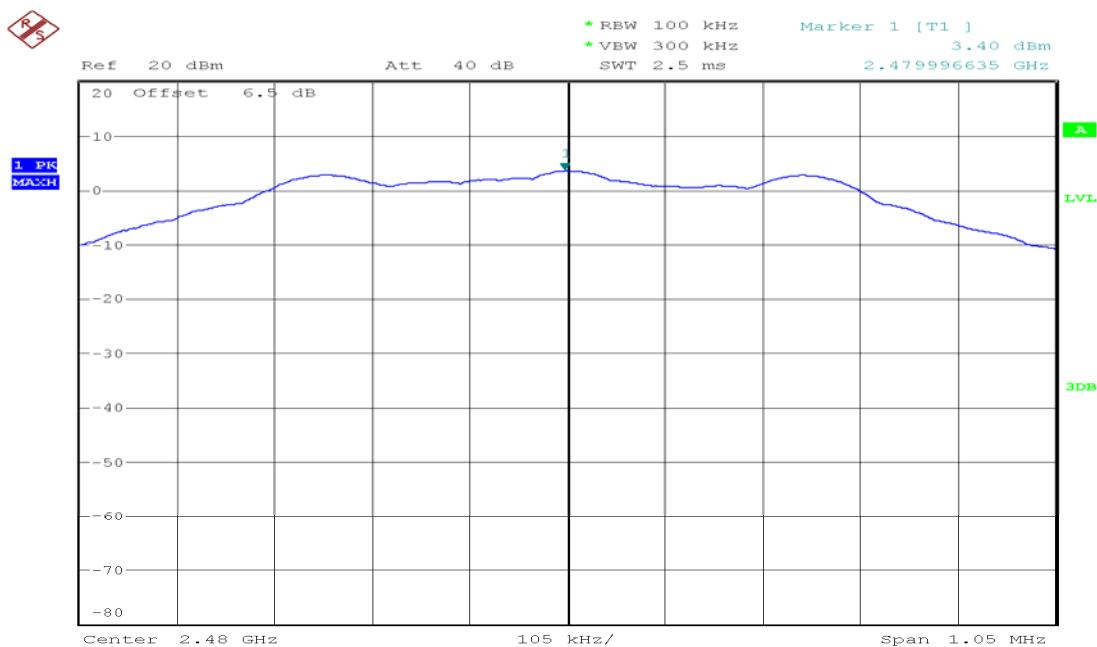
PSD 100kHz Plot on Channel 19



Date: 2.NOV.2013 14:47:21



PSD 100kHz Plot on Channel 39

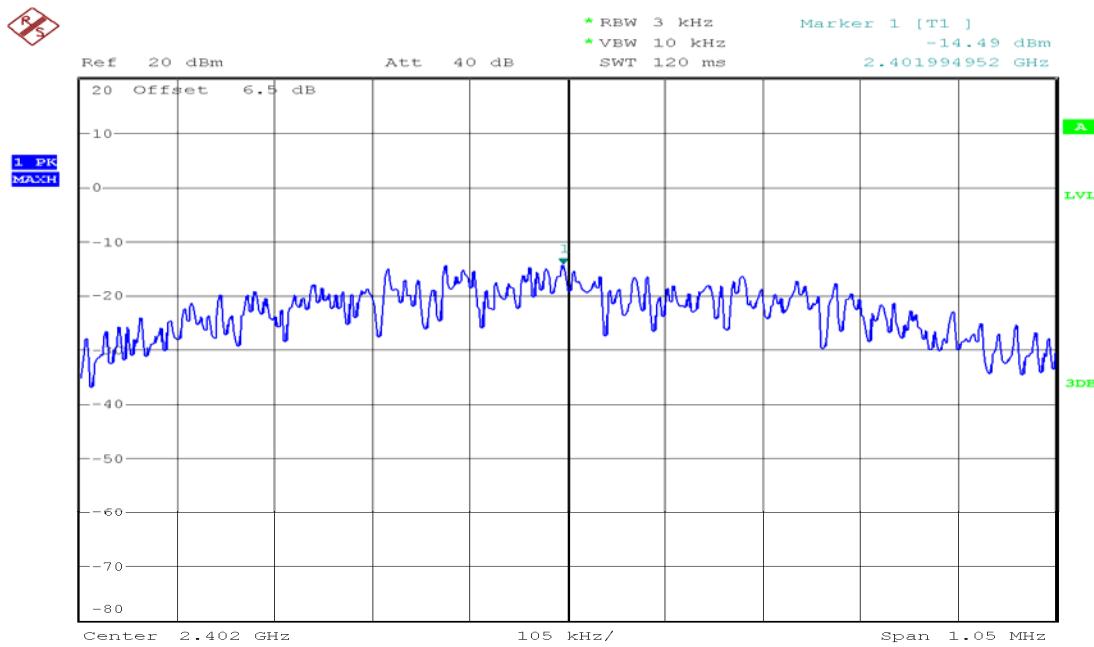


Date: 2.NOV.2013 14:47:59



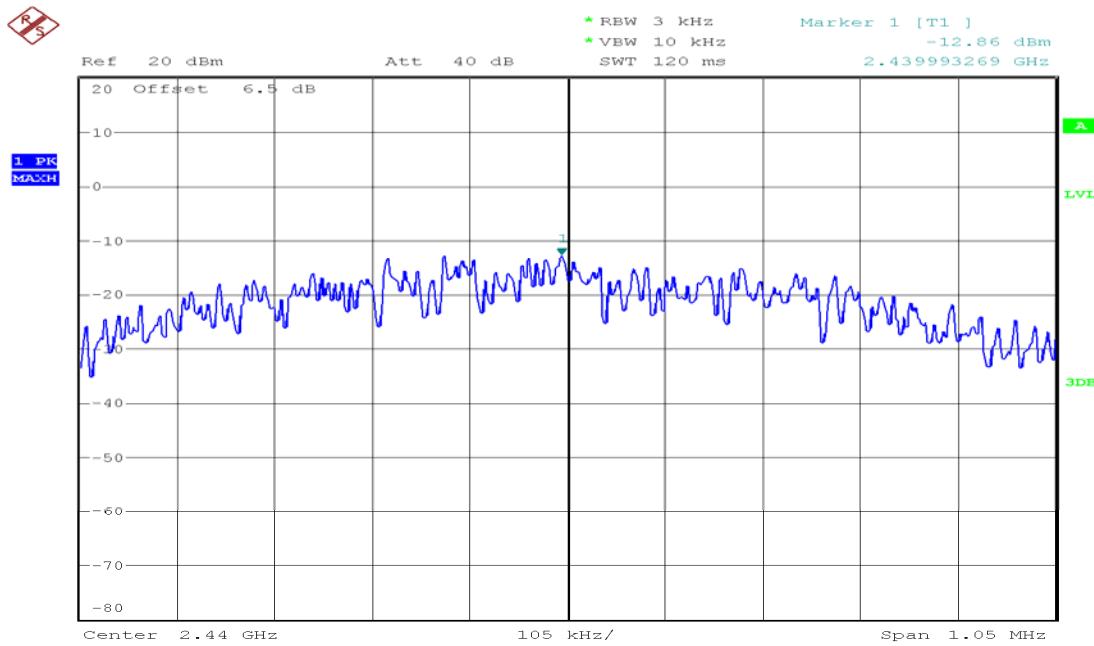
7.3.6. Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on Channel 00



Date: 2.NOV.2013 14:45:25

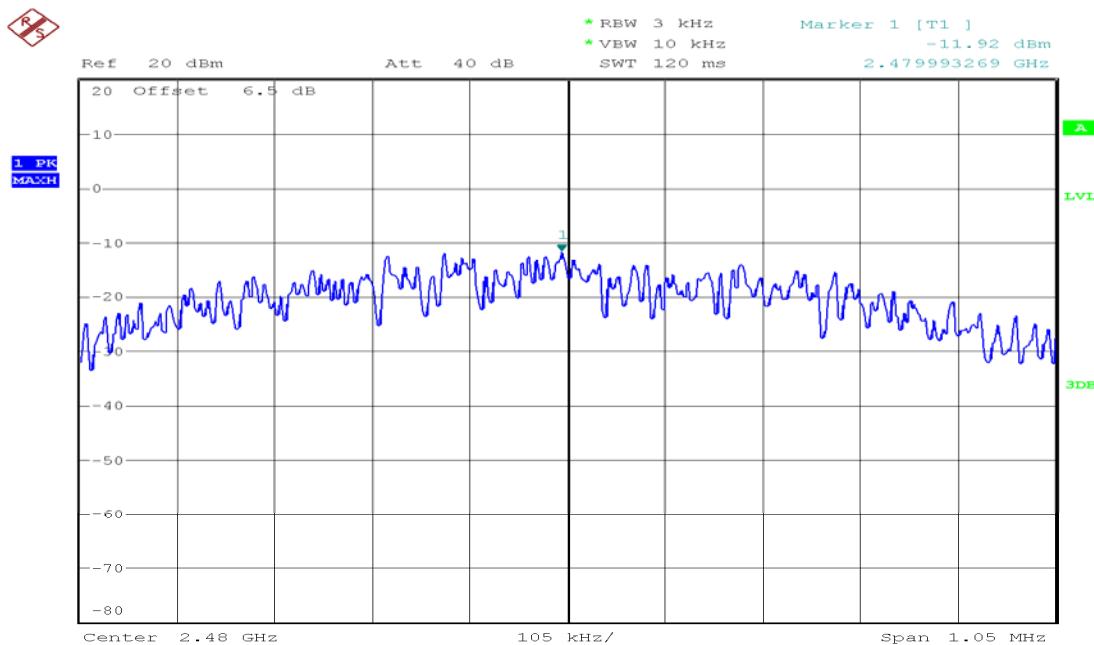
PSD 3kHz Plot on Channel 19



Date: 2.NOV.2013 14:44:35



PSD 3kHz Plot on Channel 39



Date: 2.NOV.2013 14:43:51



7.4. RADIATED BAND EDGE AND SPURIOUS EMISSION MEASUREMENT

LIMIT

1. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

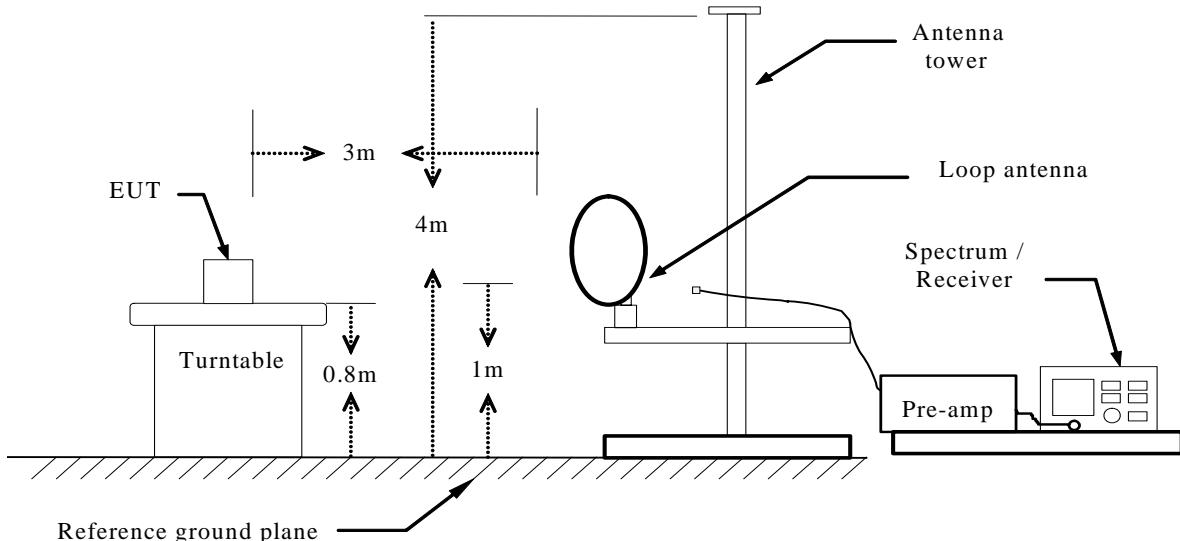
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

2. In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

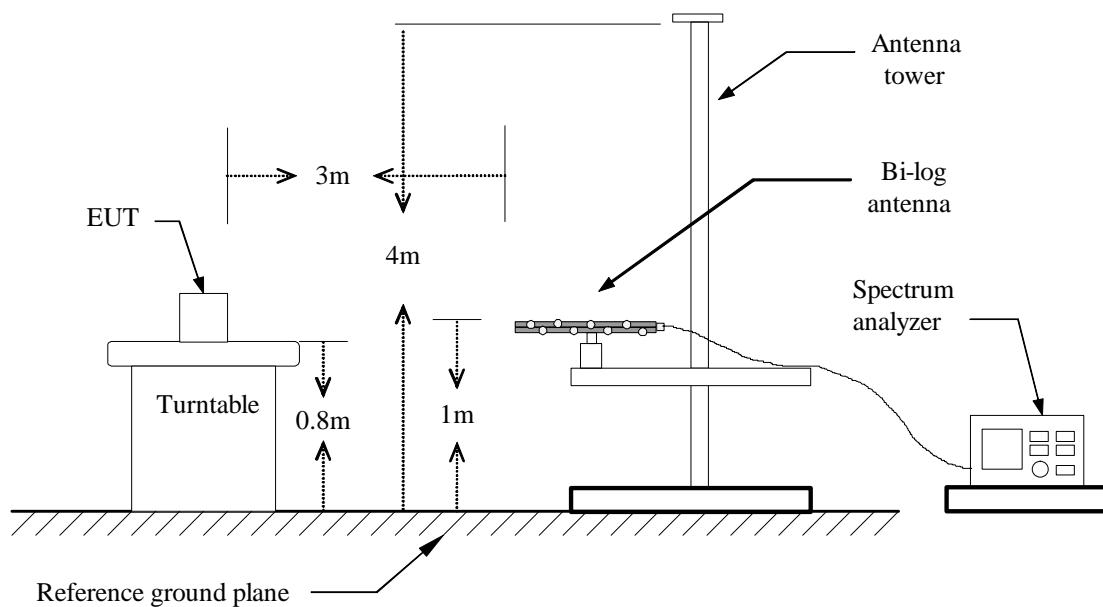
Test Configuration

Below 30MHz

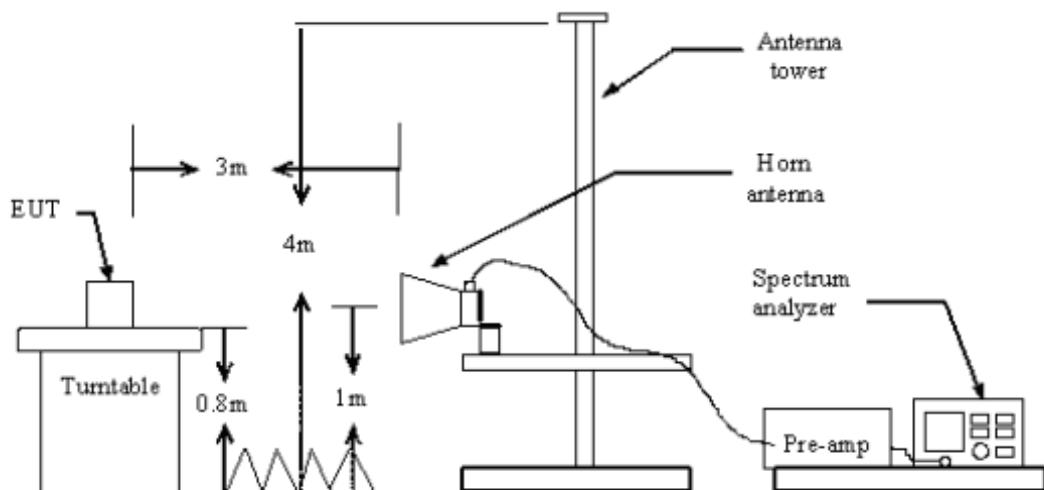




Below 1 GHz



Above 1 GHz





TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

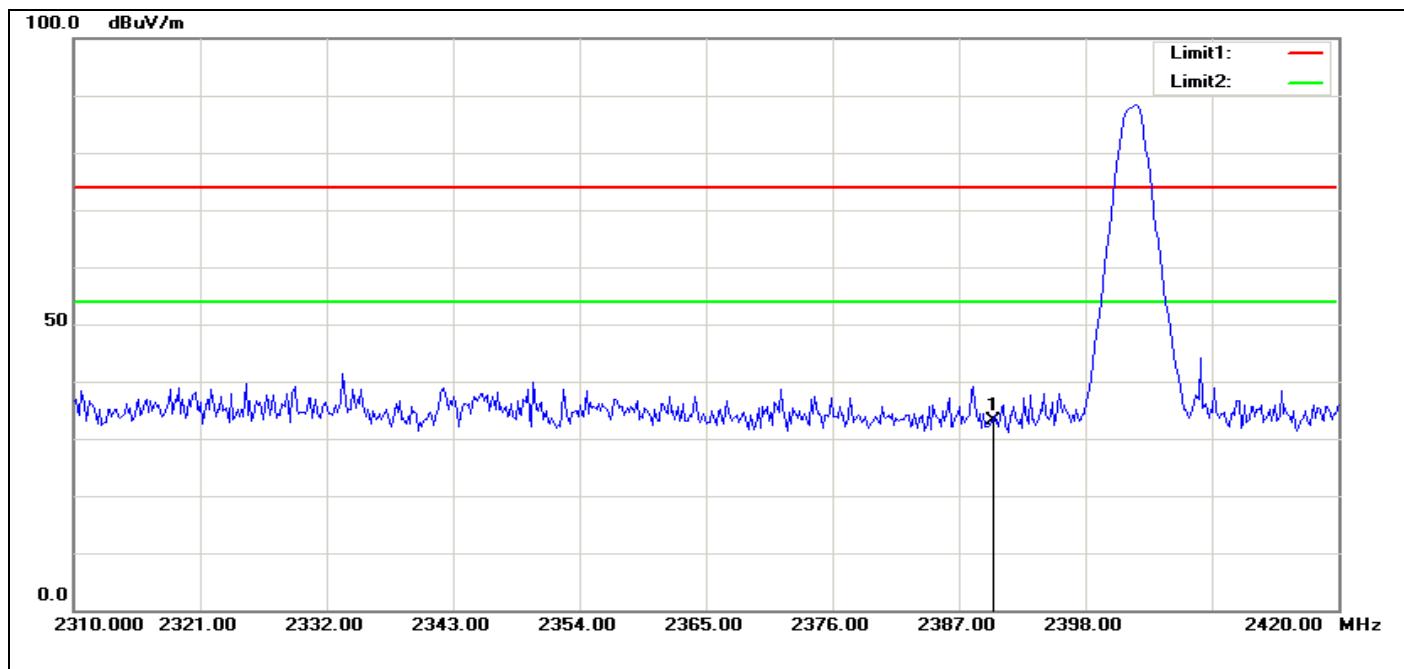
RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

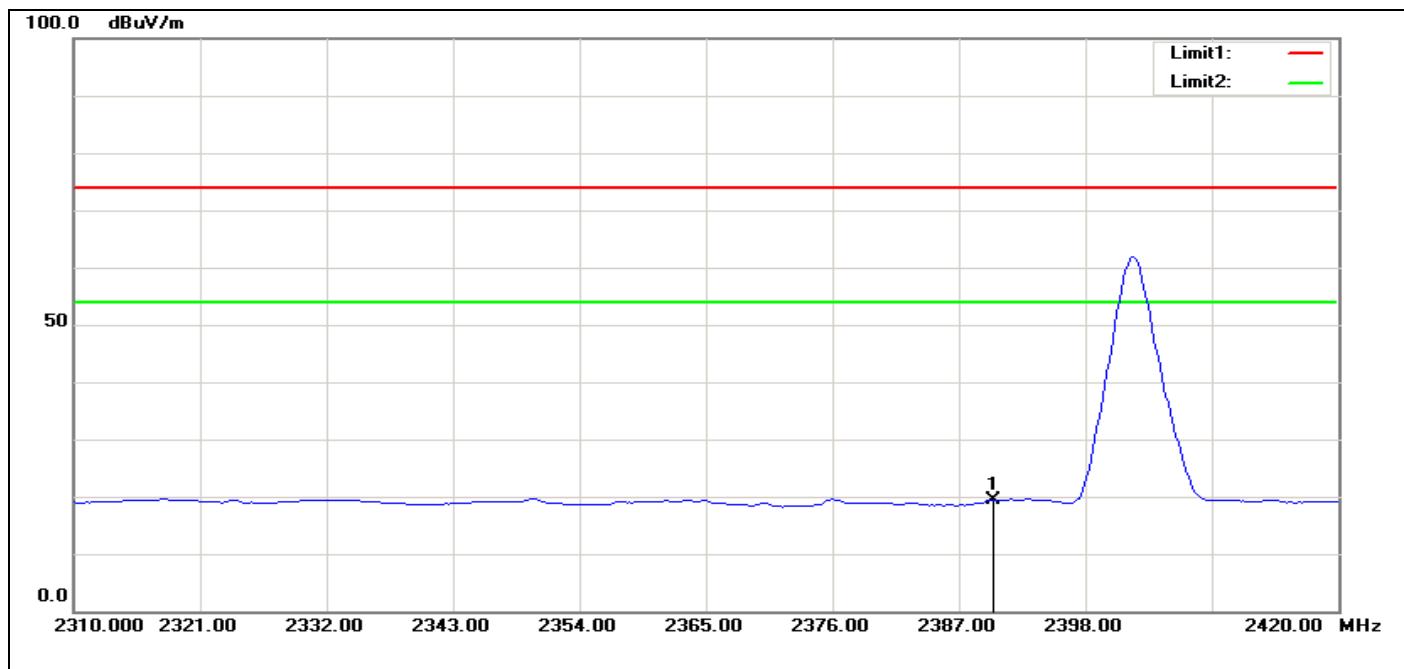
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

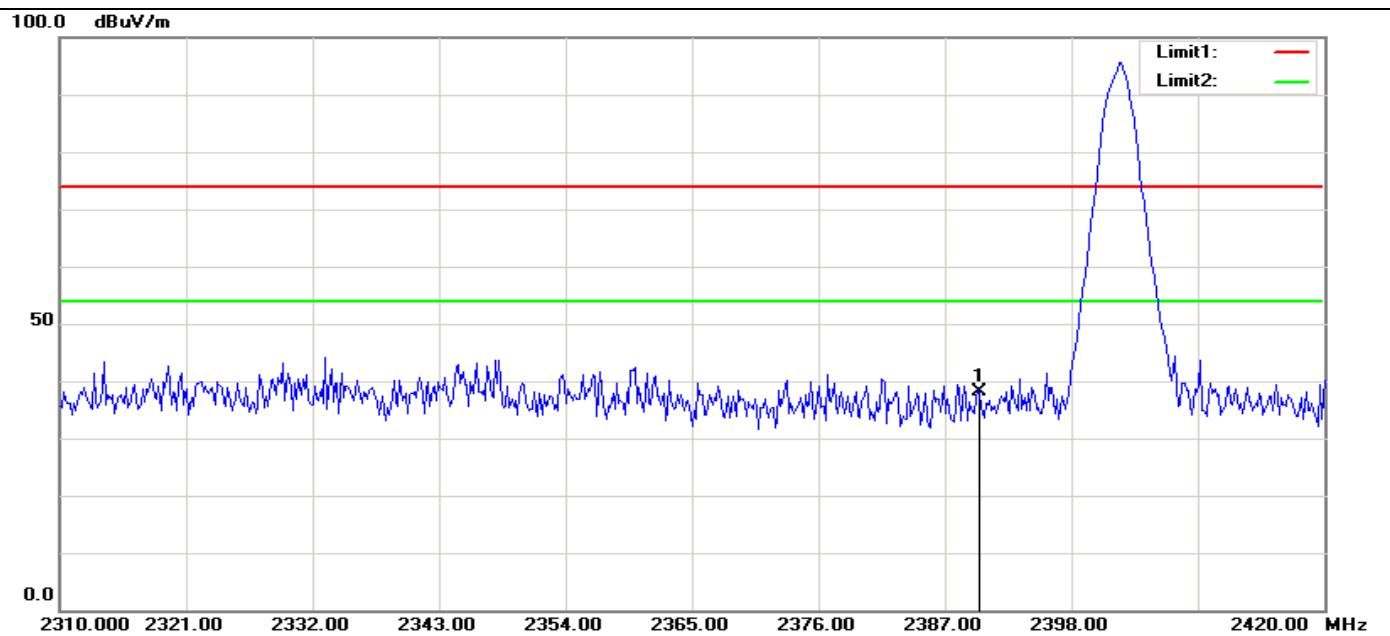
7. Repeat above procedures until the measurements for all frequencies are complete.

**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)****PEAK**

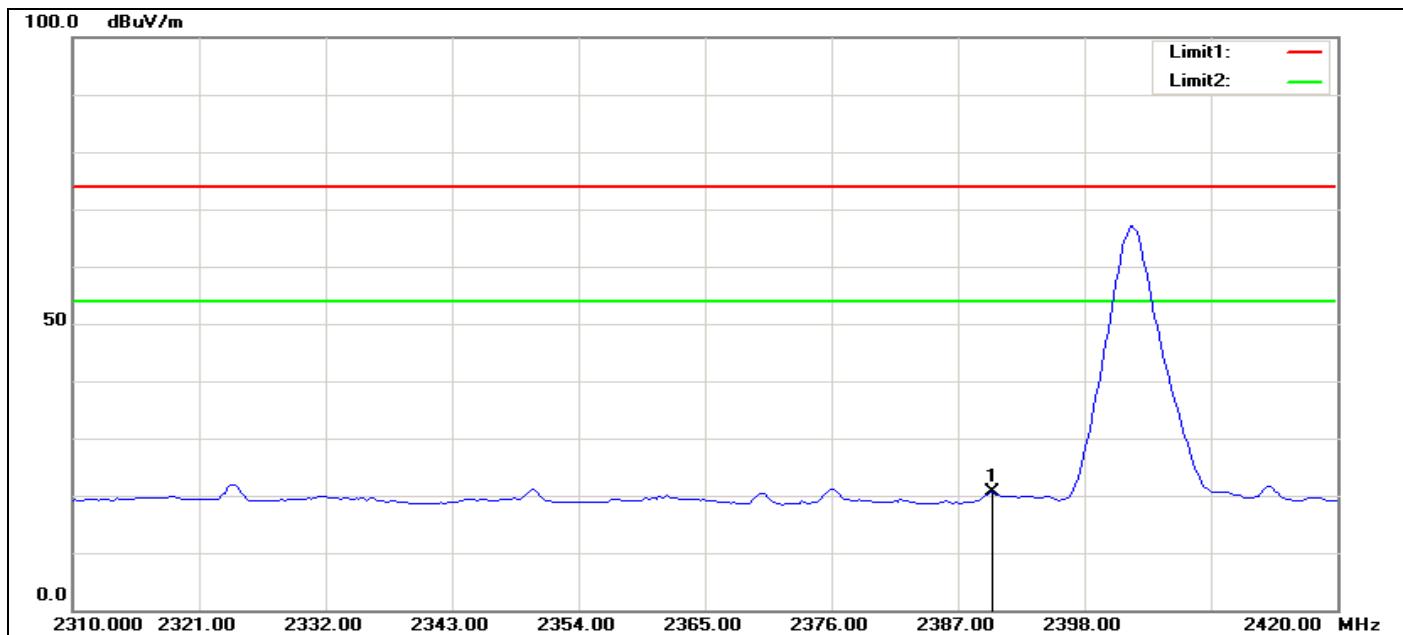
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2390.000	47.38	-14.28	33.10	74.00	-40.90	100	207	peak

AVG

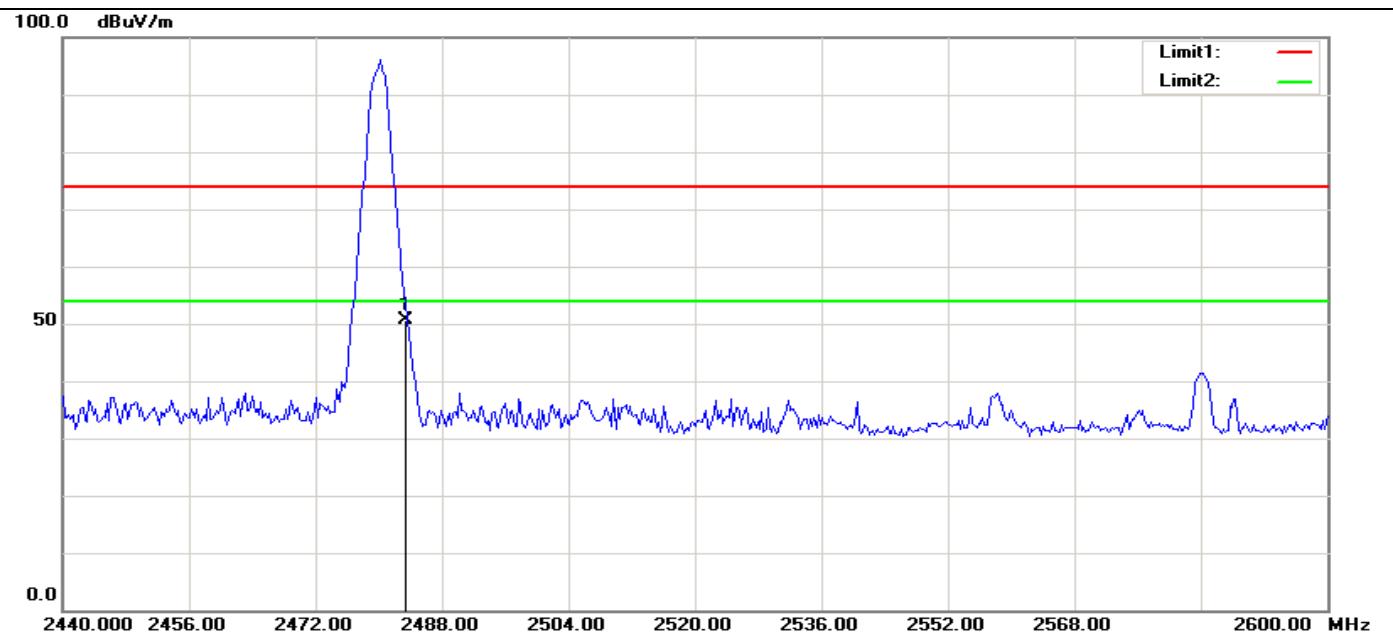
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2390.000	33.76	-14.28	19.48	54.00	-34.52	100	207	AVG

**RESTRICTED BANDEDGE (Low Channel, Vertical)****PEAK**

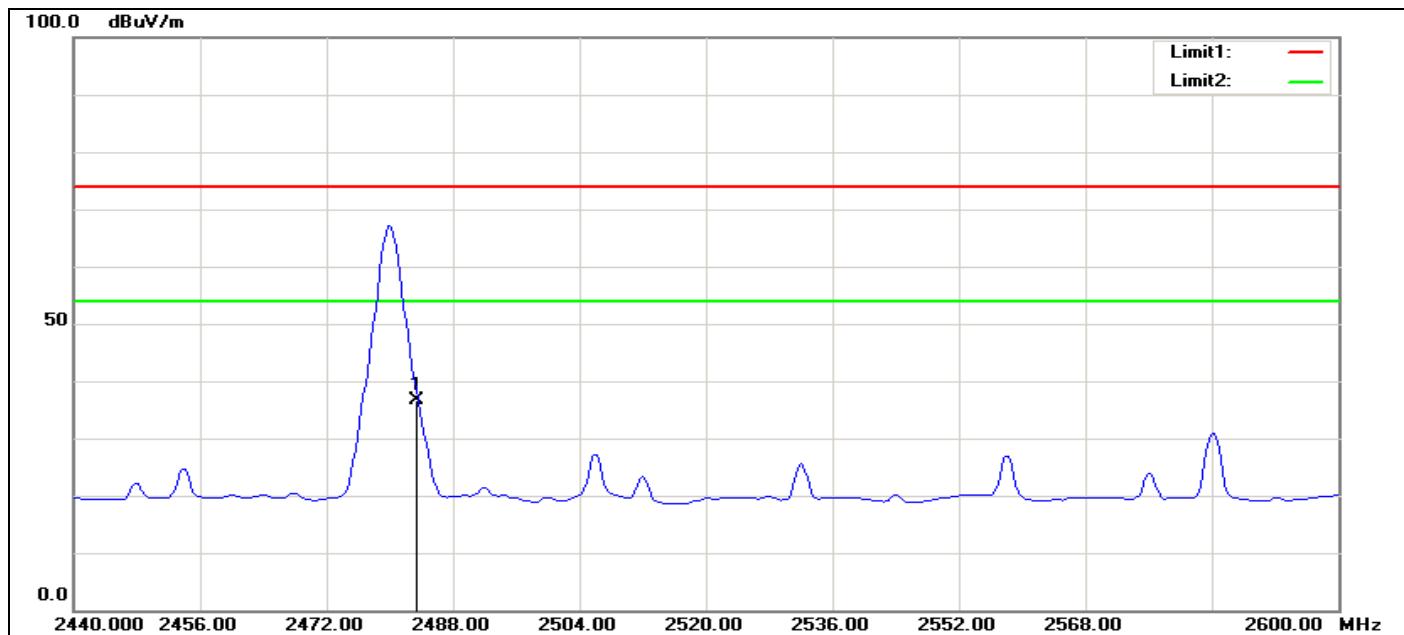
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2390.000	52.41	-14.28	38.13	74.00	-35.87	100	158	peak

AVG

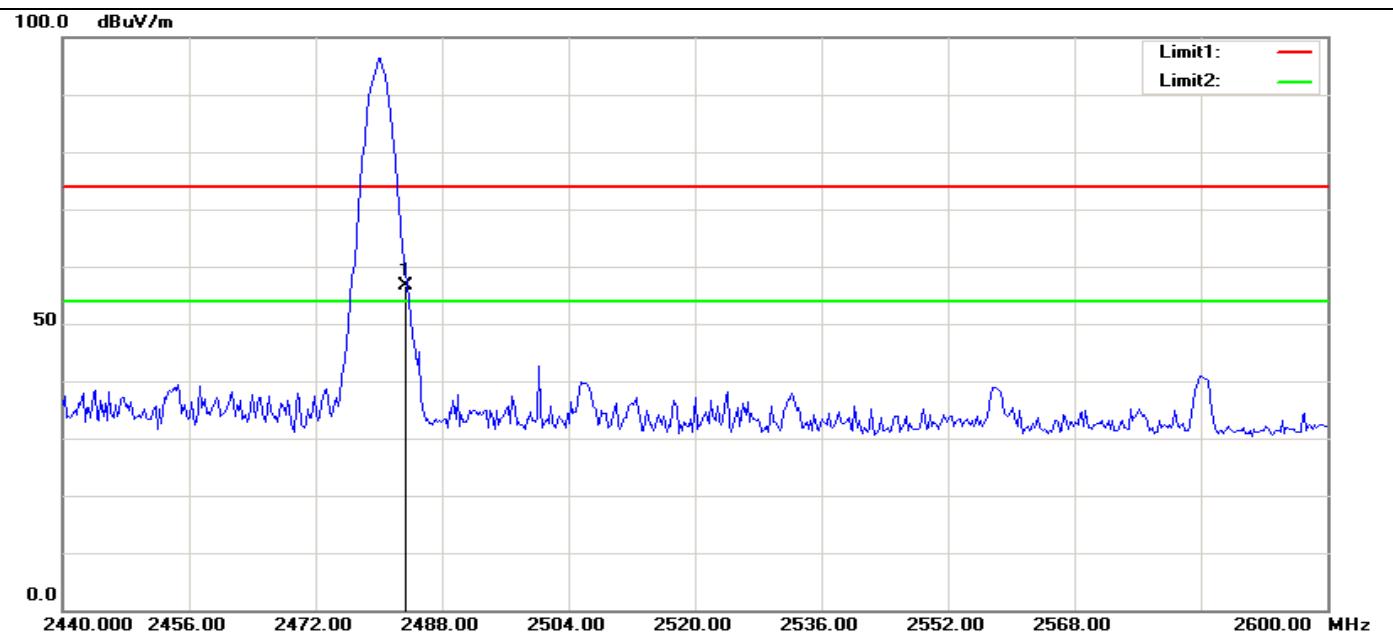
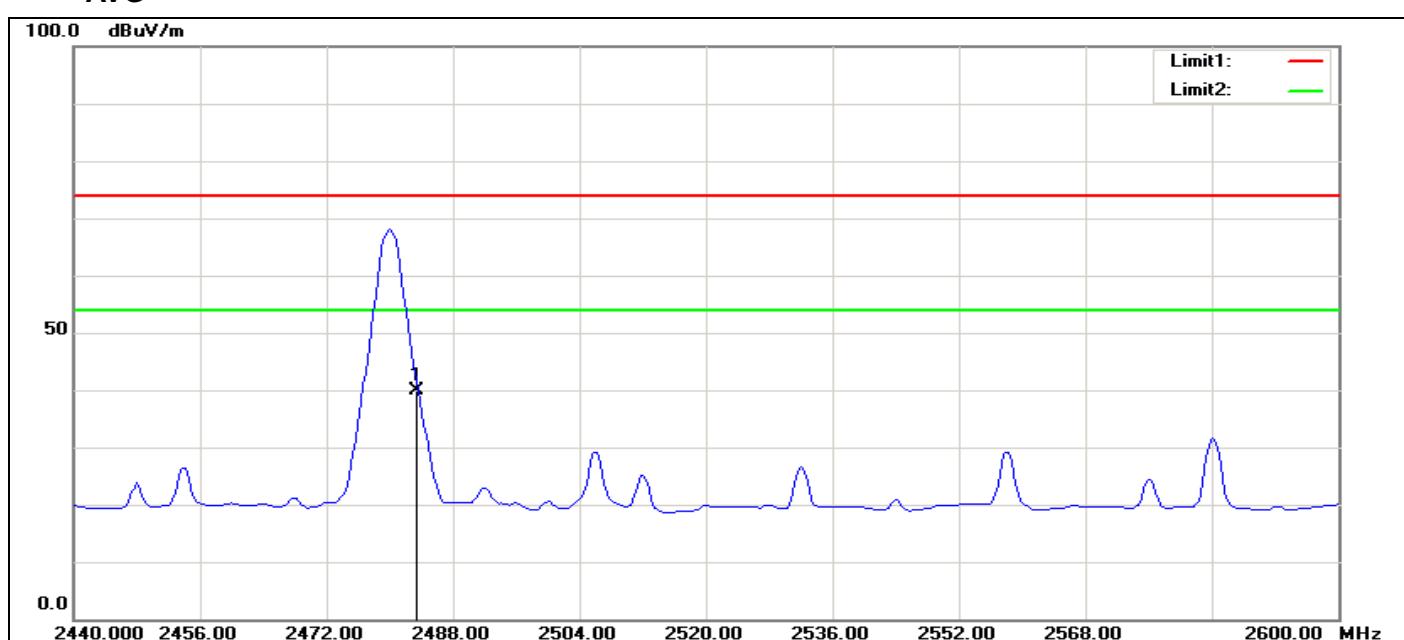
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2390.000	34.80	-14.28	20.52	54.00	-33.48	100	158	AVG

**RESTRICTED BANDEDGE (High Channel, Horizontal)****PEAK**

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	65.27	-13.65	51.62	74.00	-22.38	100	23	peak

AVG

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	50.29	-13.65	36.64	54.00	-17.36	100	24	AVG

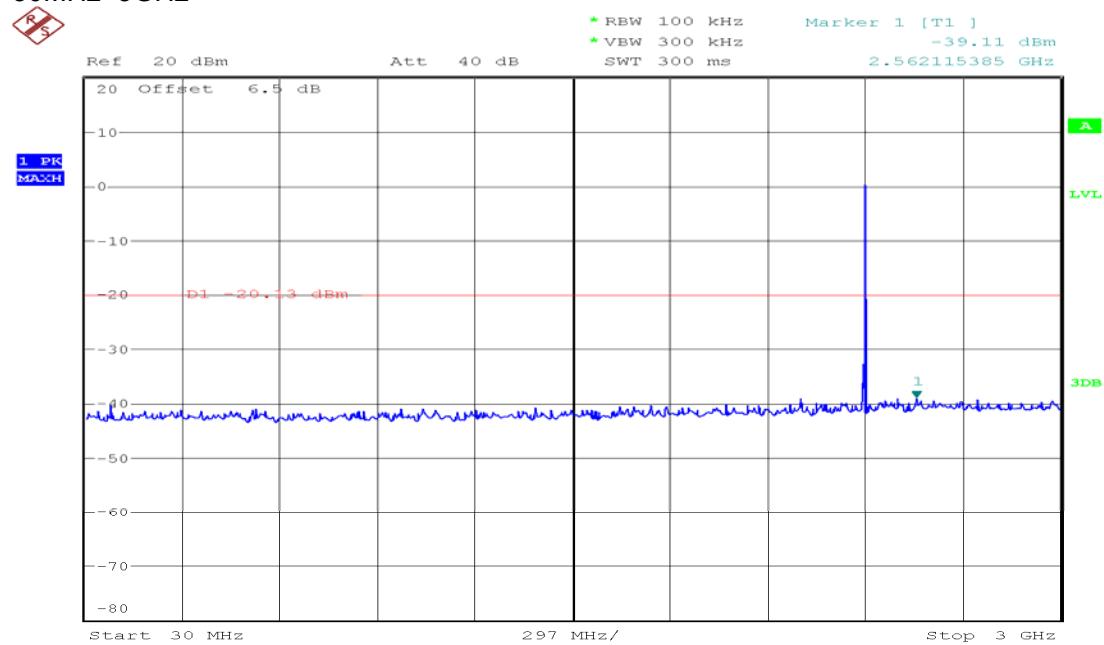
**RESTRICTED BANDEDGE (High Channel, Vertical)****PEAK****AVG**



7.4.1. Test Plots of Spurious Emission

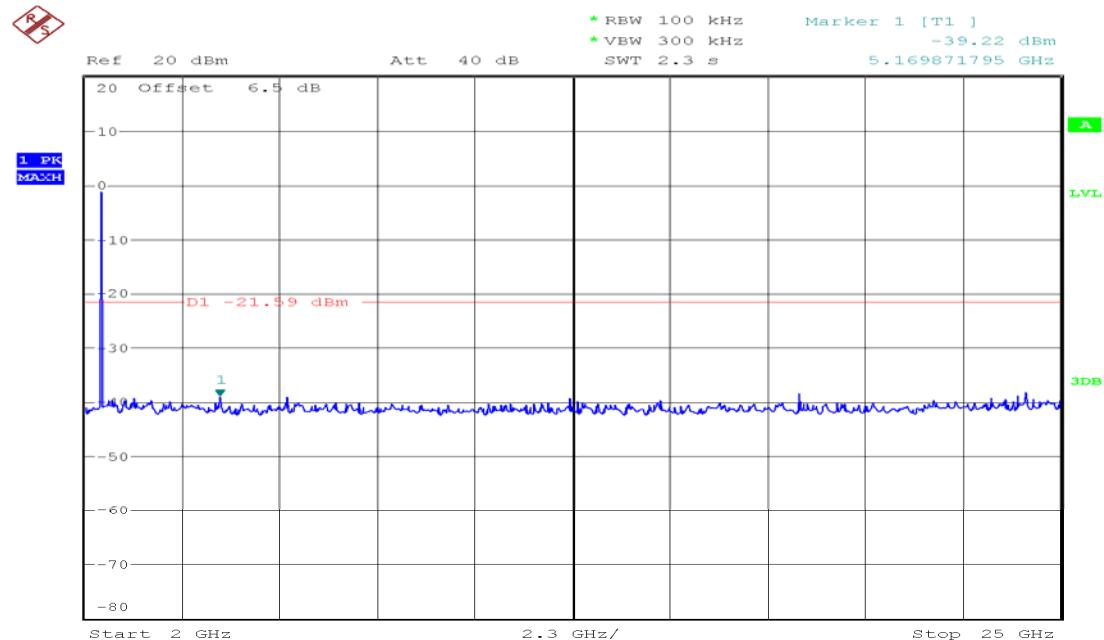
Conducted Spurious Emission Plot on Channel 00

30MHz~3GHz



Date: 2.NOV.2013 11:12:42

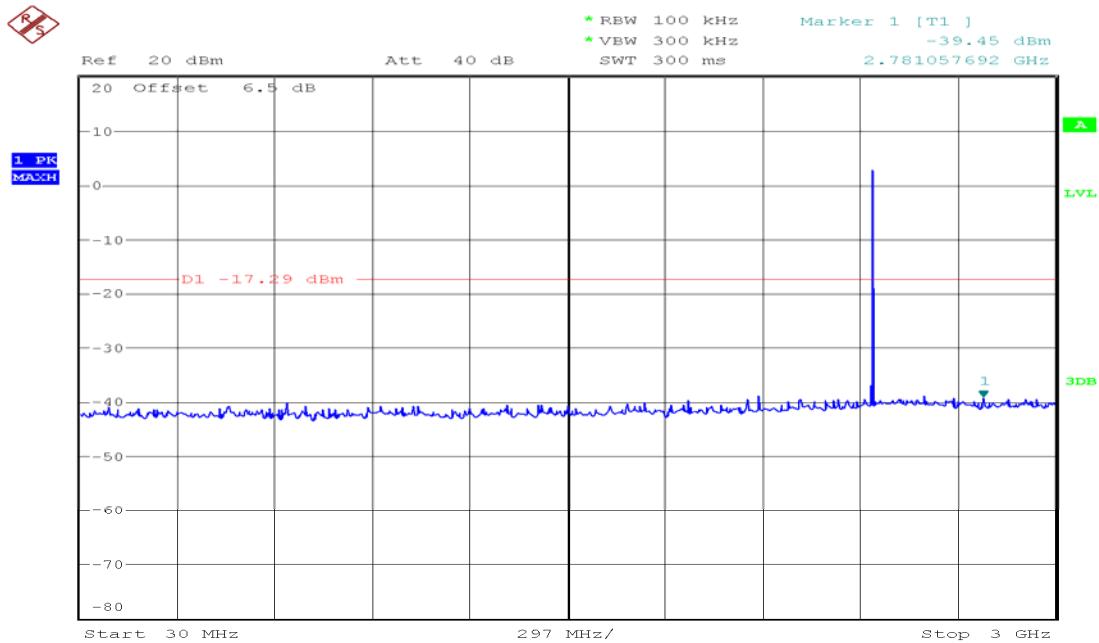
2GHz~25GHz



Date: 2.NOV.2013 11:08:28

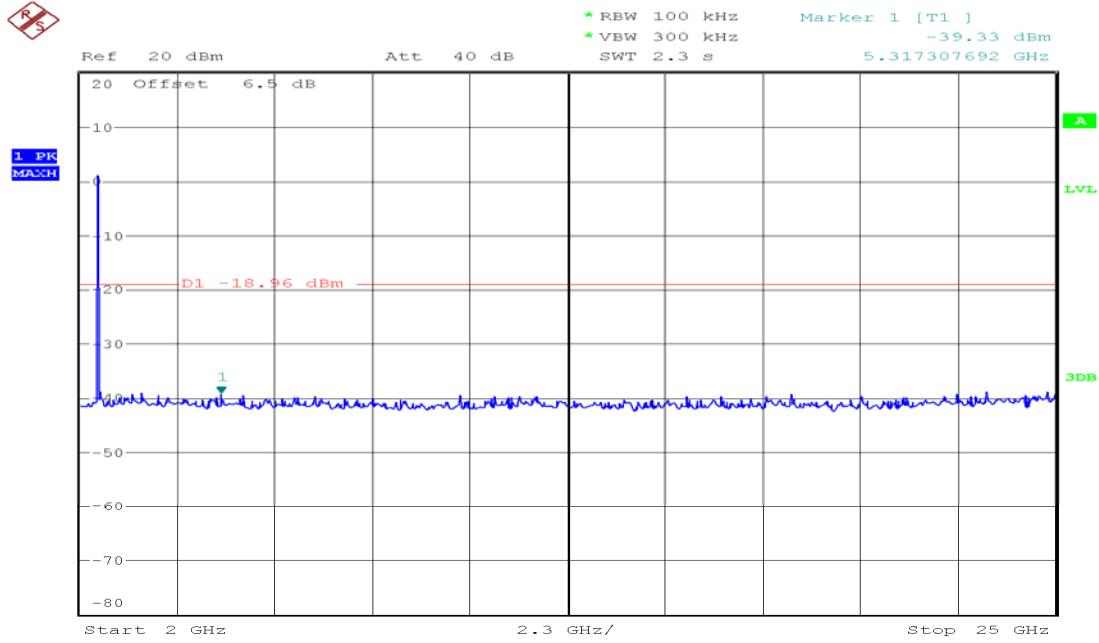


Conducted Spurious Emission Plot on Channel 19 30MHz~3GHz



Date: 2.NOV.2013 11:12:02

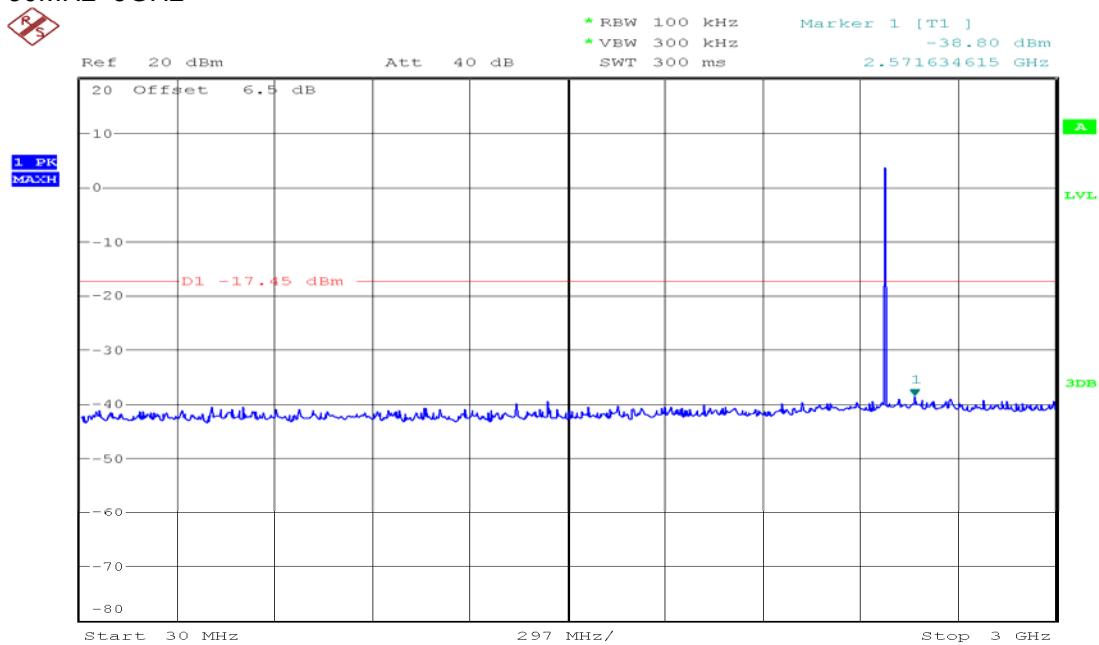
2GHz~25GHz



Date: 2.NOV.2013 11:09:15

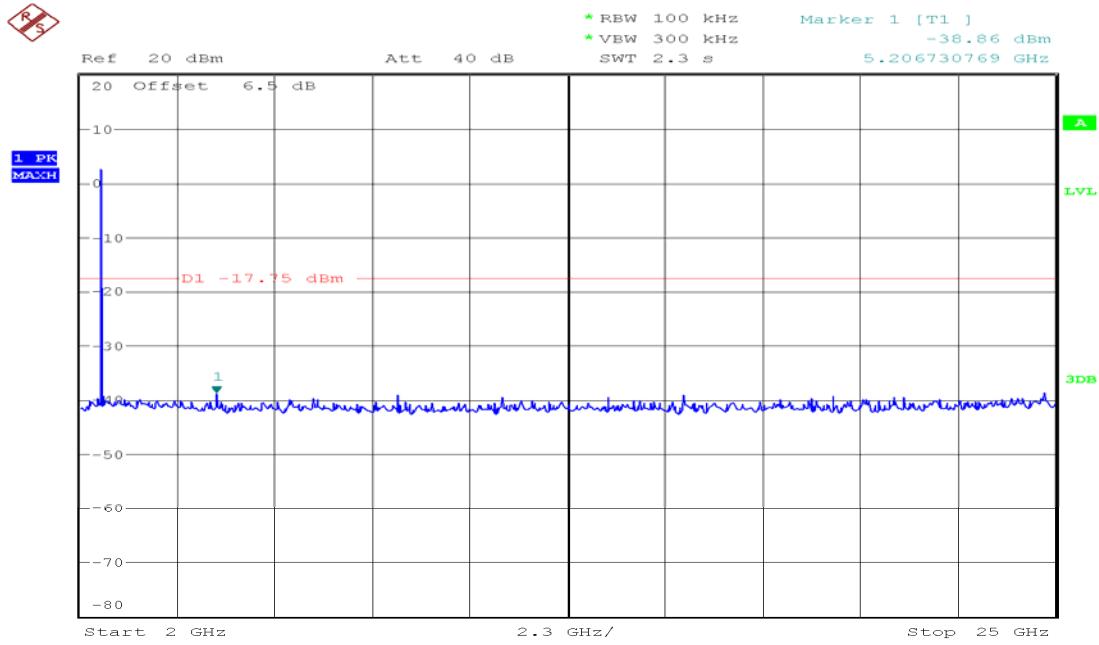


Conducted Spurious Emission Plot on Channel 39 30MHz~3GHz



Date: 2.NOV.2013 11:11:03

3GHz~25GHz



Date: 2.NOV.2013 11:09:55



7.5. RADIATED EMISSIONS

7.5.1. limit

- According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

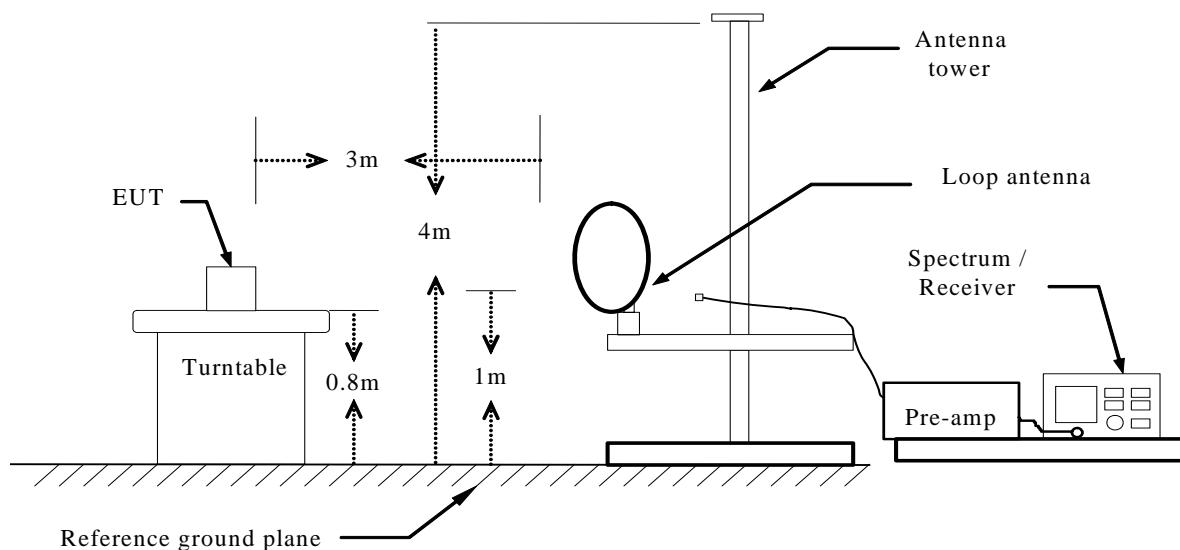
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

- In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength ($\text{dB}\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

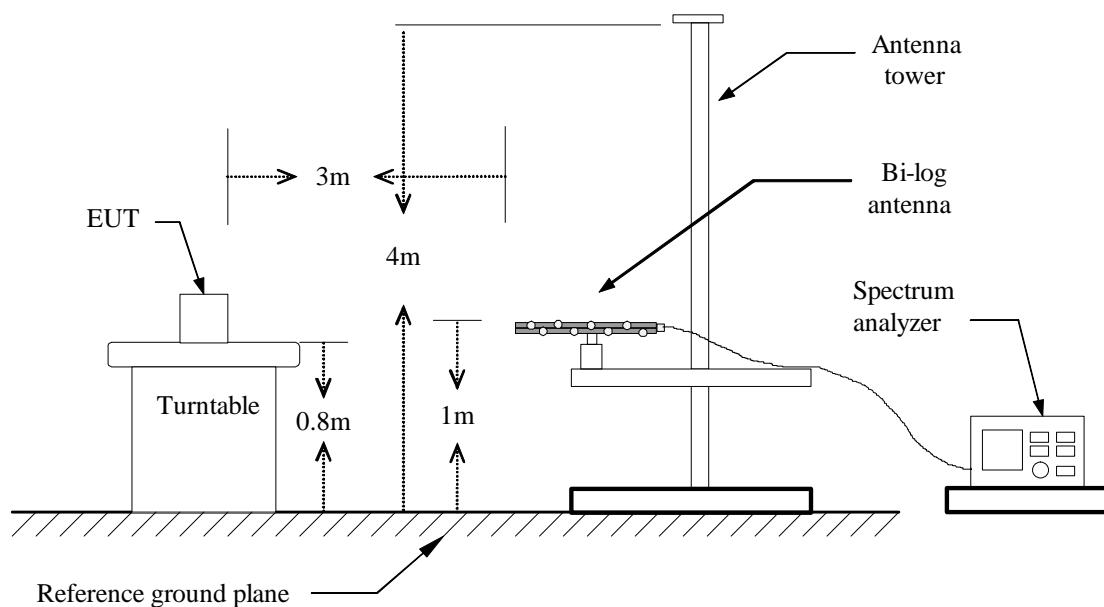
7.5.2. Test Configuration

Below 30MHz

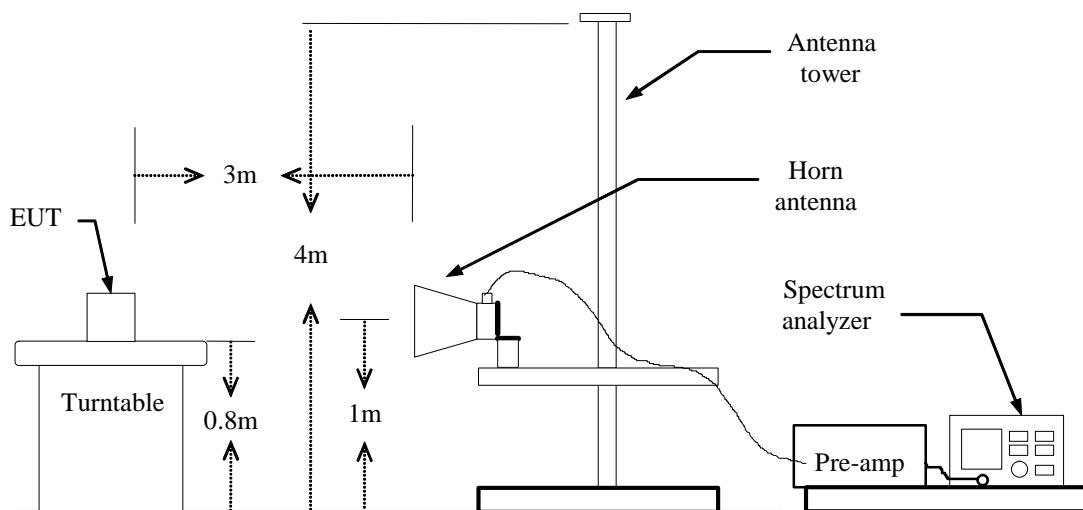




Below 1 GHz



Above 1 GHz





7.5.3. test procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

7. Repeat above procedures until the measurements for all frequencies are complete.



7.5.4. Test Result of Radiated Emission

30MHz-1GHz

Operation Mode: Bluetooth v4.0

Test Date: November 2, 2013

Test Channel: CH39

Tested by: Blent.Wang

Temperature: 25°C

Polarity: Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
2	487.8400	16.15	19.29	35.44	46.00	-10.56	201	0	peak
3	642.0700	15.08	21.98	37.06	46.00	-8.94	100	97	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
3	596.4800	16.35	20.52	36.87	46.00	-9.13	204	216	peak
4	678.9300	15.62	21.98	37.60	46.00	-8.40	204	231	peak

Notes:

1. Measurements above show only up to maximum emissions noted, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
2. Radiated emissions measured in frequency range from 9 KHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Compliance Certification Services Inc.

Report No: C131015E01-RPW

FCC ID: S9X-HB-1121

Date of Issue :November 4, 2013

Above1GHz

Operation Mode: Bluetooth v4.0

Test Date: November 2, 2013

Test Channel: CH00

Tested by: Blent.Wang

Temperature: 25°C

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4788.910	V	60.04	-8.06	51.98	74.00	-22.02	PEAK
7236.550	V	46.22	-0.67	45.55	74.00	-28.45	PEAK
4788.110	H	61.68	-8.06	53.62	74.00	-20.38	PEAK
7295.350	H	47.66	-0.87	46.79	74.00	-27.21	PEAK

Operation Mode: Bluetooth v4.0

Test Date: November 2, 2013

Test Channel: CH19

Tested by: Blent.Wang

Temperature: 25°C

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4868.590	V	53.96	-7.72	46.24	74.00	-27.76	PEAK
7320.513	V	49.24	-0.83	48.41	74.00	-25.59	PEAK
4868.590	H	54.88	-7.72	47.16	74.00	-26.84	PEAK
7320.513	H	50.34	-0.83	49.51	74.00	-24.49	PEAK

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.
 - b. AV Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.



Compliance Certification Services Inc.

Report No: C131015E01-RPW

FCC ID: S9X-HB-1121

Date of Issue :November 4, 2013

Operation Mode: Bluetooth v4.0

Test Date: November 2, 2013

Test Channel: CH39

Tested by: Blent.Wang

Temperature: 25°C

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4952.160	V	52.62	-7.59	45.03	74.00	-28.97	PEAK
7431.660	V	45.52	-0.54	44.98	74.00	-29.02	PEAK
4952.610	H	59.24	-7.58	51.66	74.00	-22.34	PEAK
7428.350	H	48.56	-0.55	48.01	74.00	-25.99	PEAK

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.
 - b. AV Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.



7.6. POWERLINE CONDUCTED EMISSIONS

7.6.1. limit

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator 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, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreases with the logarithm of the frequency.

7.6.2. Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

7.6.3. TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

7.6.4. test result of AC Conducted Emission

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.



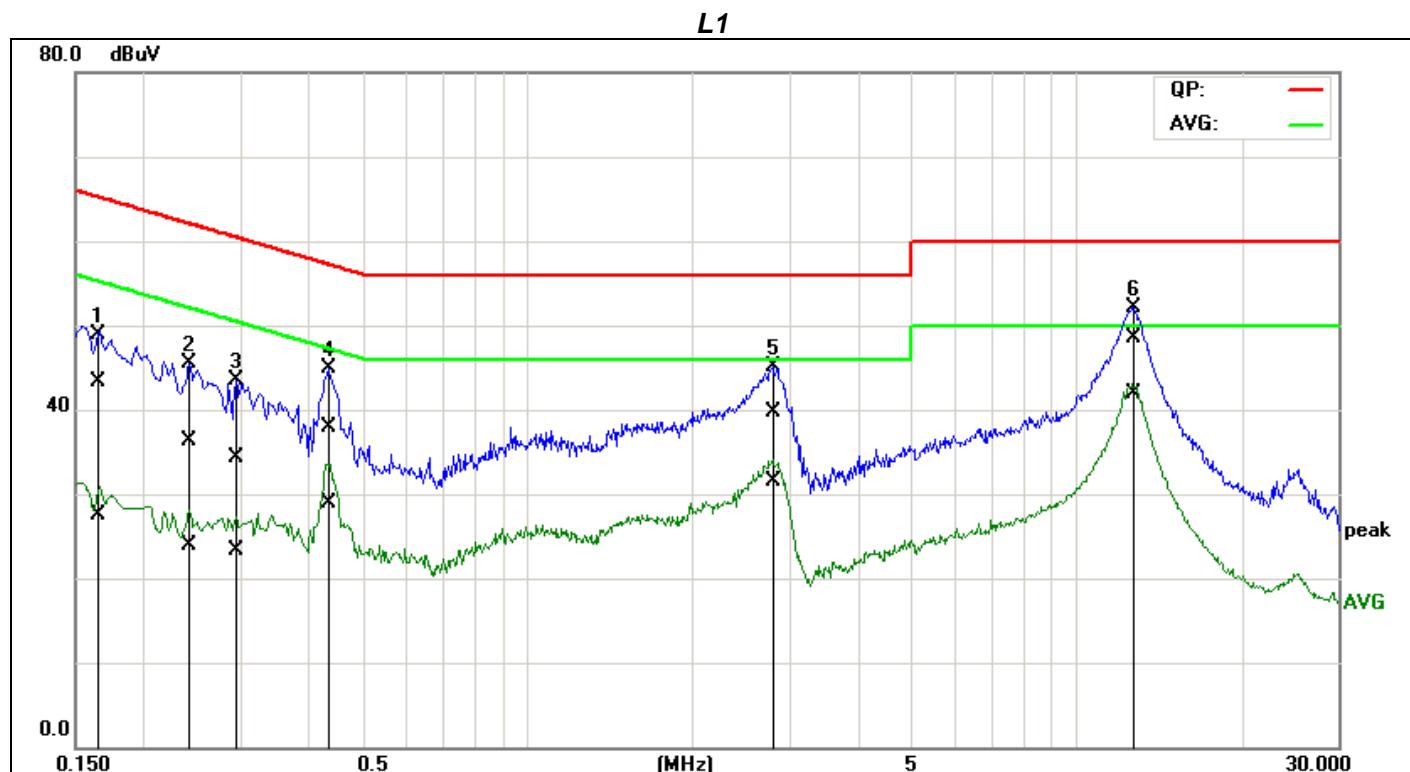
Compliance Certification Services Inc.

Report No: C131015E01-RPW

FCC ID: S9X-HB-1121

Date of Issue :November 4, 2013

Job No.:	C131015E01	Date:	2013-11-2
Company:	Honey Bee (Hong Kong) Limited	Time:	15:32:29
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	Blent.Wang
Line:	L1	Test Voltage:	AC 120V/60Hz
Model:	PAE-100	Description:	



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1623	23.51	7.66	19.76	43.27	27.42	65.35	55.35	-22.08	-27.93	Pass
2	0.2425	16.75	4.22	19.63	36.38	23.85	62.01	52.01	-25.63	-28.16	Pass
3	0.2925	14.57	3.72	19.67	34.24	23.39	60.45	50.45	-26.21	-27.06	Pass
4	0.4370	18.12	9.12	19.78	37.90	28.90	57.12	47.12	-19.22	-18.22	Pass
5	2.8222	19.68	11.38	20.03	39.71	31.41	56.00	46.00	-16.29	-14.59	Pass
6	12.6867	27.69	21.05	20.81	48.50	41.86	60.00	50.00	-11.50	-8.14	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).



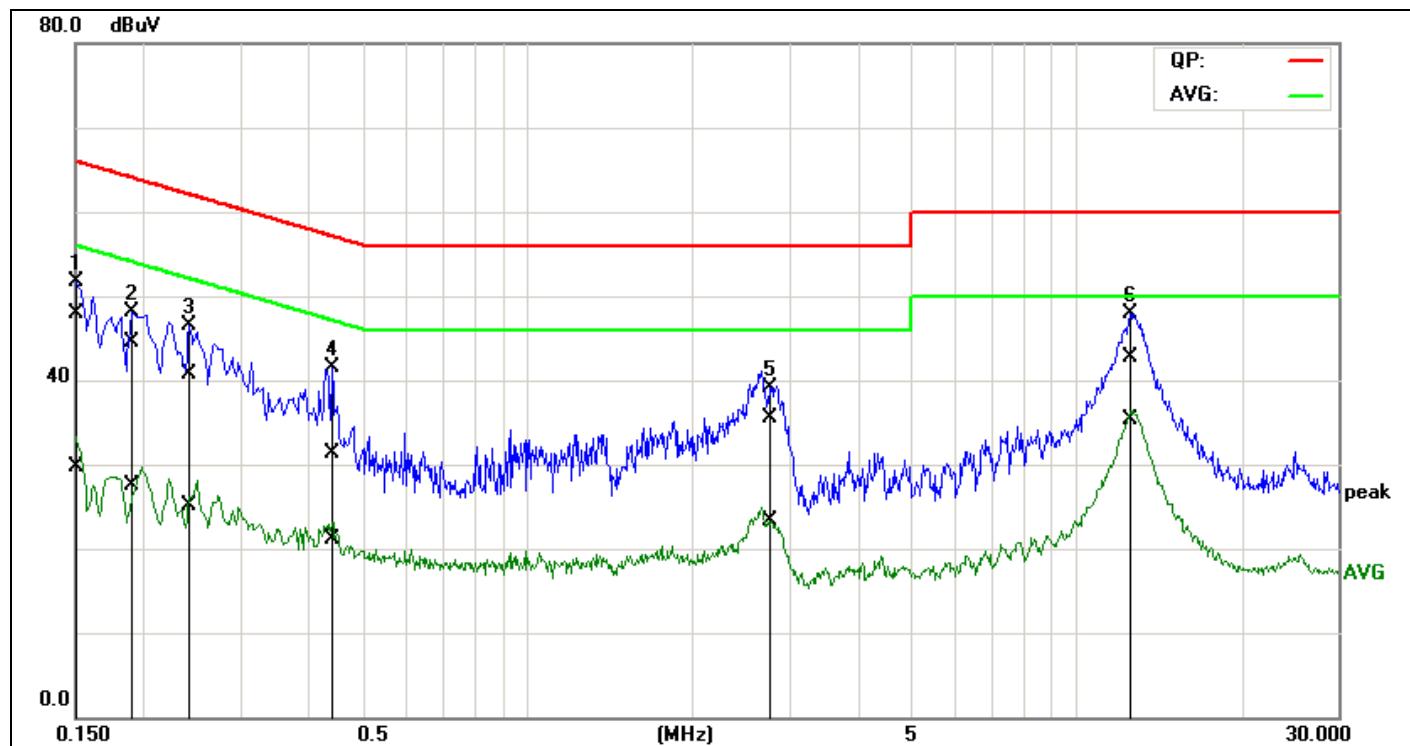
Compliance Certification Services Inc.

Report No: C131015E01-RPW

FCC ID: S9X-HB-1121

Date of Issue :November 4, 2013

Job No.:	C131015E01	Date:	2013-11-2
Company:	Honey Bee (Hong Kong) Limited	Time:	15:36:59
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	Blent.Wang
Line:	L2	Test Voltage:	AC 120V/60Hz
Model:	PAE-100	Description:	



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1500	28.17	9.88	19.73	47.90	29.61	66.00	56.00	-18.10	-26.39	Pass
2	0.1886	24.92	7.81	19.66	44.58	27.47	64.10	54.10	-19.52	-26.63	Pass
3	0.2404	21.06	5.35	19.67	40.73	25.02	62.08	52.08	-21.35	-27.06	Pass
4	0.4418	11.49	1.37	19.81	31.30	21.18	57.03	47.03	-25.73	-25.85	Pass
5	2.7604	15.50	3.33	20.05	35.55	23.38	56.00	46.00	-20.45	-22.62	Pass
6	12.6419	21.96	14.54	20.74	42.70	35.28	60.00	50.00	-17.30	-14.72	Pass

Remark:

1. The measuring frequencies range between 0.15 MHz and 30 MHz.
2. The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.
3. “--” denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.
4. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10KHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.

END OF REPORT