NVLAP LAB CODE 200707-0

FCC PART 15.247

EMI MEASUREMENT AND TEST REPORT

For

Xinwei Electronic Co., Ltd. Quanzhou

Wan An Tang Xi Industrial Area, Luo Jiang, Quanzhou, Fujian, China

FCC ID: UUPHST11S

This Report Concerns:	Equipment Type:
☒ Original Report	Bluetooth Headset (Stereo)

Test Engineer:	Henry Yang
Report No.:	RSZ07041601
Test Date:	2007-04-23 to 2007-04-28
Report Date:	2007-04-28
Reviewed By:	EMC Manager: Boni Baniqued
Prepared By:	Bay Area Compliance Laboratory Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Xinwei Electronic Co., Ltd., Quanzhou*'s product, model number: *T11S o*r the "EUT" as referred to in this report is a *Bluetooth Headset (Stereo)*, which measures approximately: 4.0 cm L x 2.0 cm W x 1.7 cm H, rated input voltage: 3.7V Battery.

Power Adapter:
Manufacturer: Mountronix Switching Power, Model: GFP051T-0510
Input: AC 100-240V 50/60Hz 0.2A, Output: DC 5V 1A

** The test data gathered are from production sample, serial number: 0704018 provided by the manufacturer, we receive the EUT on 2007-04-16.*

Objective

This Type approval report is prepared on behalf of *Xinwei Electronic Co., Ltd., Quanzhou* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratory Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratory Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratory Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm.

Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	PC	DELL 170L	CN-0TC670-70821-560-F4Q6	DoC
DELL	Keyboard	SK-8110	CN07N244-71616-56A-1B1E	DoC
DELL	Mouse	M071KC	520027907	DoC
DELL	LCD Monitor	1505FP	Y4287-7168-571-GBSH	DoC
ProMOS	Memory	V826632K24SATG-C0	0525-K1933700	DoC
Intel	CPU	Celeron D-2533	N/A	DoC

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Motherboard	OWC297	CN-OWC297-70821-564-00NI	DoC
DELL	Power	NPS-250KB D	CN-0H2678-17972-56E-80BM	DoC
Seagate	Hard Disk	ST340014A	5JXK3GXE	DoC
DELL	3.5' Floppy	N/A	CN-0N8893-69802-54Q-02P0	DoC
Lite-ON	CD-Rom	LTN-489S	N/A	DoC
Intel	Ethernet	PRO 10/100 VE	N/A	DoC
CASIRA	Bluetooth Development Kit	BCES301199/1	85060260105	DoC
EGSTON	Adapter	NIGFSW3	34640	DoC

External I/O Cable

Cable Description	Length (M)	From/Port	To
Shielded Detachable Keyboard Cable	1.5	Keyboard Port / Host	Keyboard
Shielded Detachable Mouse Cable	1.5	Mouse Port / Host	Mouse
Shielded Detachable VGA Cable	1.5	VGA Port / Host	Monitor
Unshielded Detachable Power Cable	1.5	EUT	Adapter

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in typical fashion (as normally used by a typical user).

EUT Exercise Software

N/A.

Special Accessories

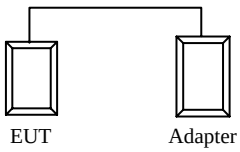
The special accessories were provided by Bay Area Compliance Laboratory Corp. (Shenzhen).

Equipment Modifications

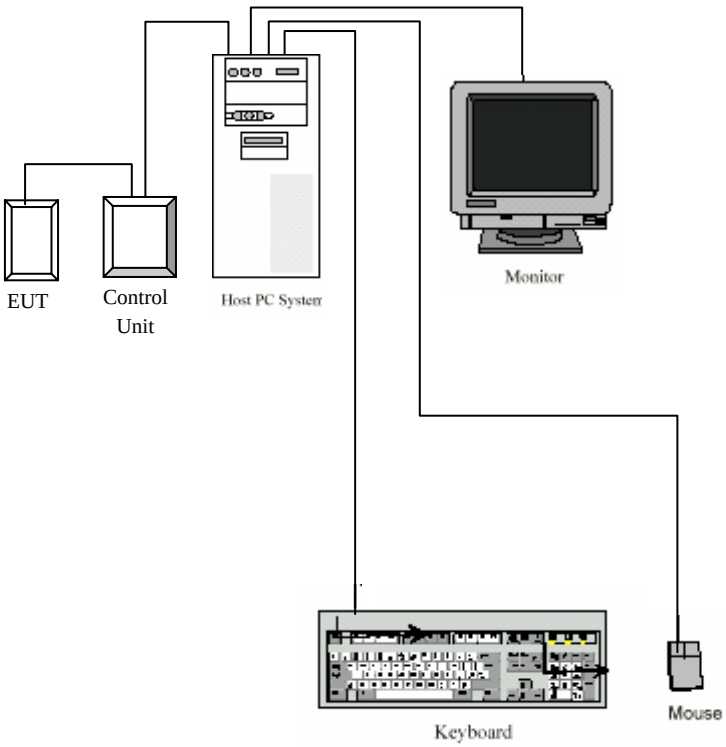
Bay Area Compliance Laboratory Corp. (Shenzhen) has not done any modification on the EUT.

Configuration of Test Setup

Charging Mode:

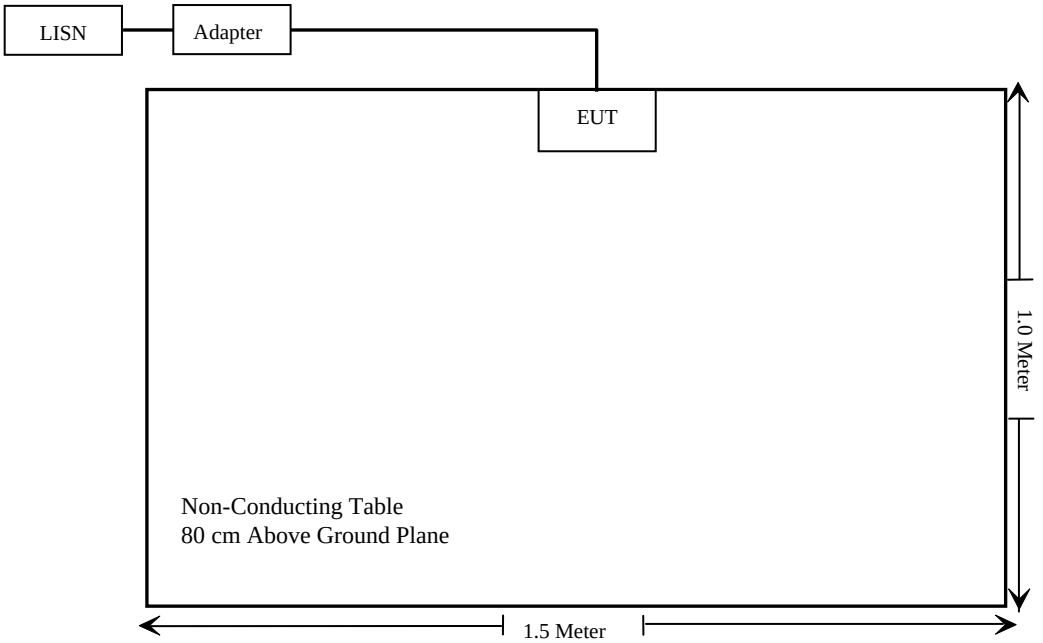


Transmitting Mode:



Block Diagram of Test Setup

Charging Mode:



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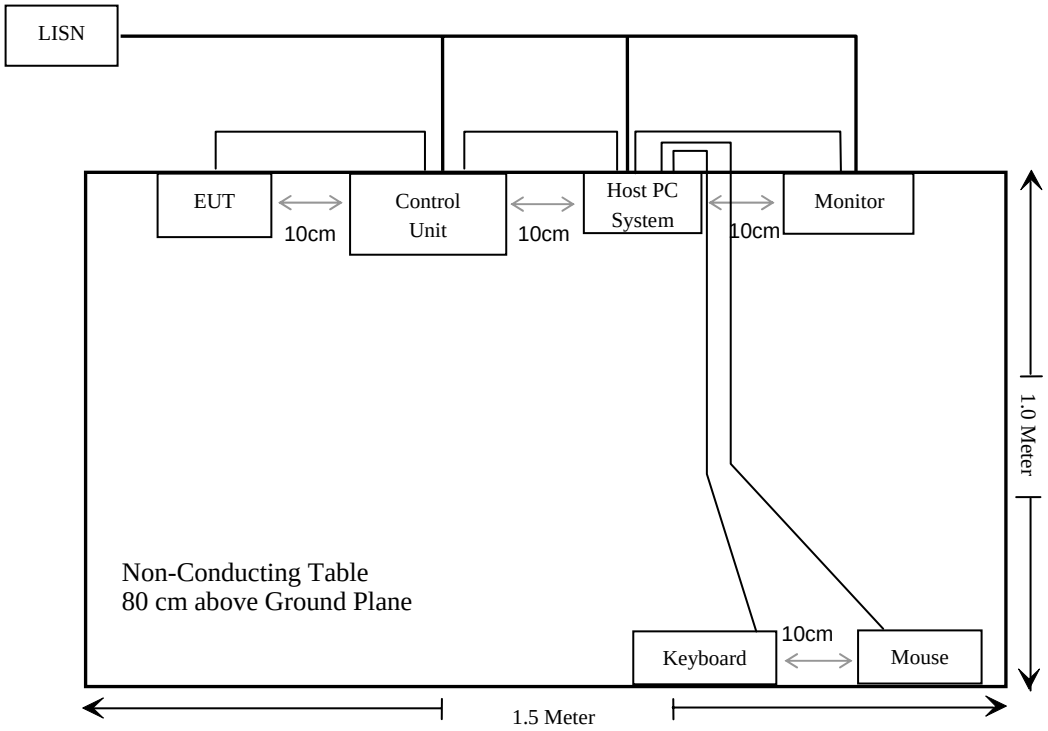


SUMMARY OF TEST RESULTS

Fcc Rules	Description Of Test	Result
§15.107 (a)	Conducted Emission	Compliant
§15.247 (b)	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§15.109, §15.205, §15.209, §15.247(d)	Radiated Emission	Compliant
§15.247 (a)(1)	20 dB Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges testing	Compliant

§15.247(b) - RF EXPOSURE

Limit

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Since the output power of this device was so low (0.0017 Watts), it is below the TCB exclusion list (2002 July 17) low threshold and met the RF Exposure Requirement.

Result: SAR is not requied.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Connector Construction

The EUT has an integral antenna, which, in accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EUT photo for details.

Result: Compliant.

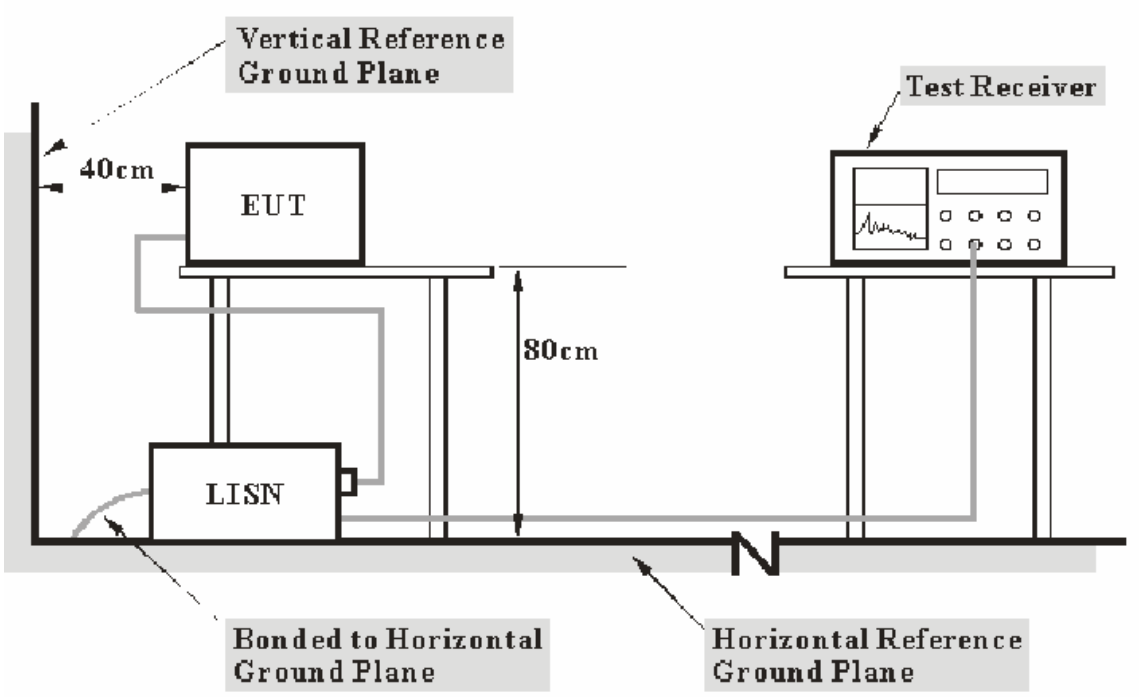
§15.107 (a) - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ±2.4 dB.

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	***IF B/W***
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330	2007-03-20	2008-03-19
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2007-03-01	2008-03-01

***** Com-Power's LISN were used as the supporting equipment.
*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the adapter was connected to the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15 Class B, with the worst margin reading of:

9.73 dB at **0.3600 MHz** in the **Live** conductor mode.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	1000mbar

The testing was performed by Henry Yang on 2007-04-27.

Test Mode: Charging

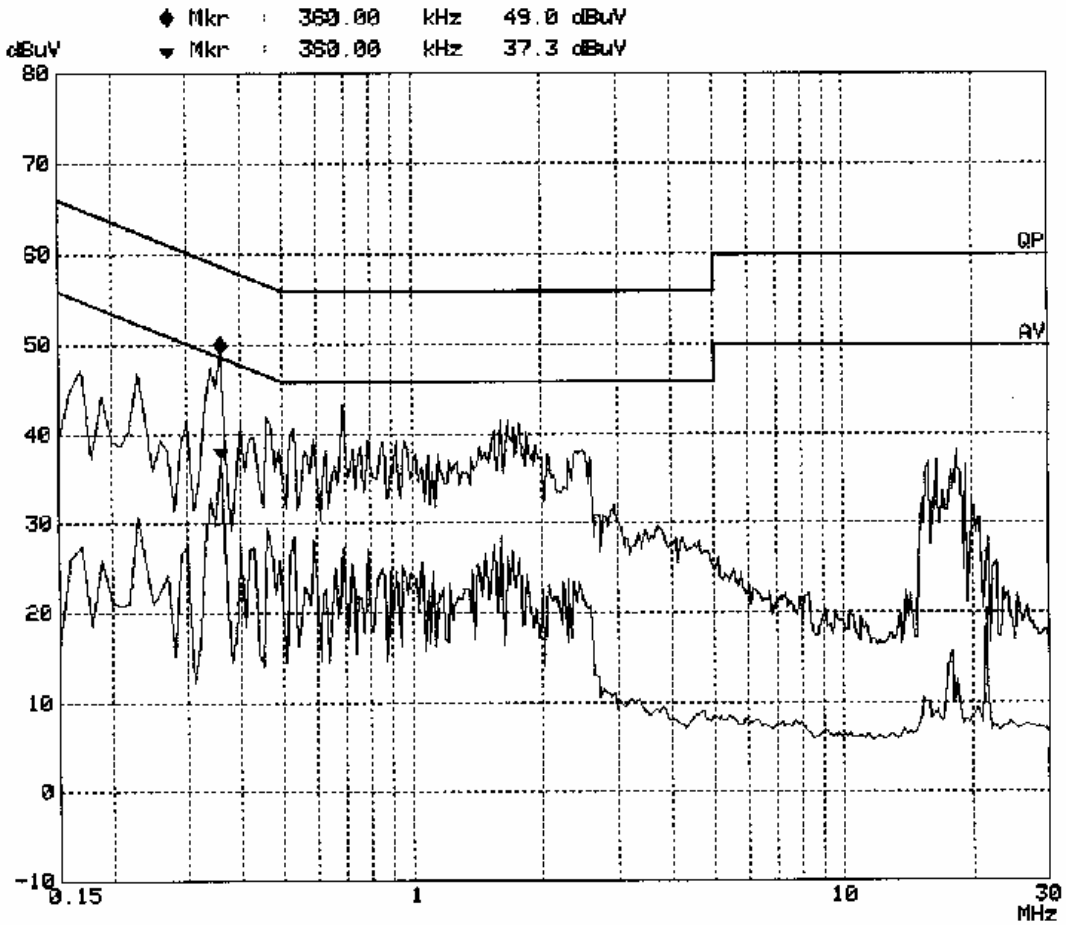
LINE CONDUCTED EMISSIONS				FCC PART 15 CLASS B	
Frequency (MHz)	**Amplitude (dBμV)**	**Detector (QP/AV)**	**Phase (Live/Neutral)**	**Limit (dBμV)**	**Margin (dB)**
0.3600	49.00	QP	Live	58.73	9.73
0.3600	37.30	AV	Live	48.73	11.43
0.3500	46.50	QP	Neutral	58.96	12.46
0.6900	43.30	QP	Live	56.00	12.70
0.5800	41.70	QP	Neutral	56.00	14.30
1.6700	41.60	QP	Live	56.00	14.40
0.6400	41.20	QP	Neutral	56.00	14.80
1.7430	41.10	QP	Live	56.00	14.90
0.3500	33.10	AV	Neutral	48.96	15.86
1.4400	39.90	QP	Neutral	56.00	16.10
0.6900	27.30	AV	Live	46.00	18.70
0.5800	26.60	AV	Neutral	46.00	19.40
1.6700	26.30	AV	Live	46.00	19.70
17.5500	39.50	QP	Neutral	60.00	20.50
0.6400	25.50	AV	Neutral	46.00	20.50
1.7430	25.20	AV	Live	46.00	20.80
1.4400	24.40	AV	Neutral	46.00	21.60
18.3200	38.10	QP	Live	60.00	21.90
16.2000	36.70	QP	Neutral	60.00	23.30
15.8300	36.70	QP	Live	60.00	23.30
18.3200	12.60	AV	Live	50.00	37.40
15.8300	10.10	AV	Live	50.00	39.90
17.5500	9.80	AV	Neutral	50.00	40.20
16.2000	8.50	AV	Neutral	50.00	41.50

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

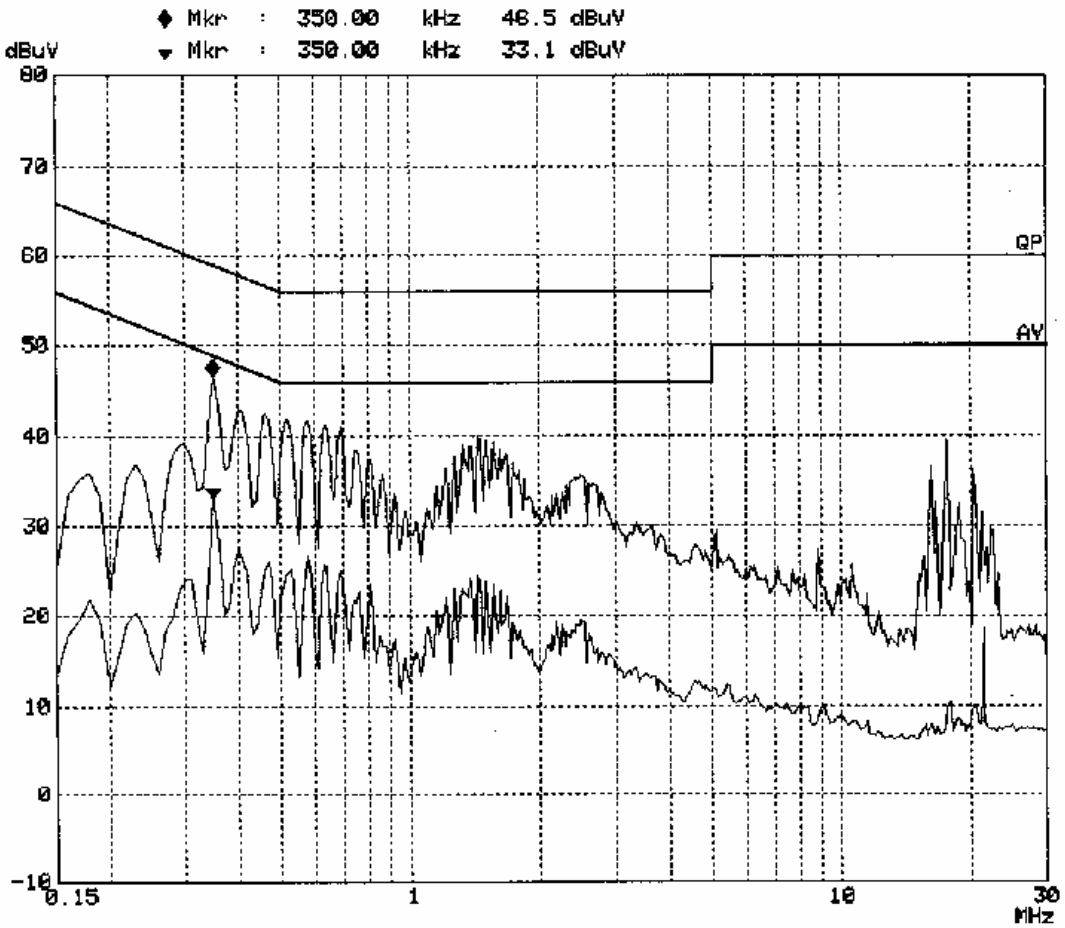
Conducted Emission Test
FCC Part15

EUT:	Bluetooth Headset
Manuf:	Xinwei
Op Cond:	Charging
Operator:	Henry
Test Spec:	AC 120V/60Hz L
Comment:	Temp:25'C Humi:56%
Date:	27. Apr 07 11:10



Conducted Emission Test
FCC Part 15

EUT:	Bluetooth Headset
Manuf:	Xinwei
Op Cond:	Charging
Operator:	Henry
Test Spec:	AC 120V/60Hz N
Comment:	Temp:25'C Humi:56%
Date:	27. Apr 07 11:27



§15.109, §15.205, §15.209, §15.247 - RADIATED EMISSIONS

Applicable Standard

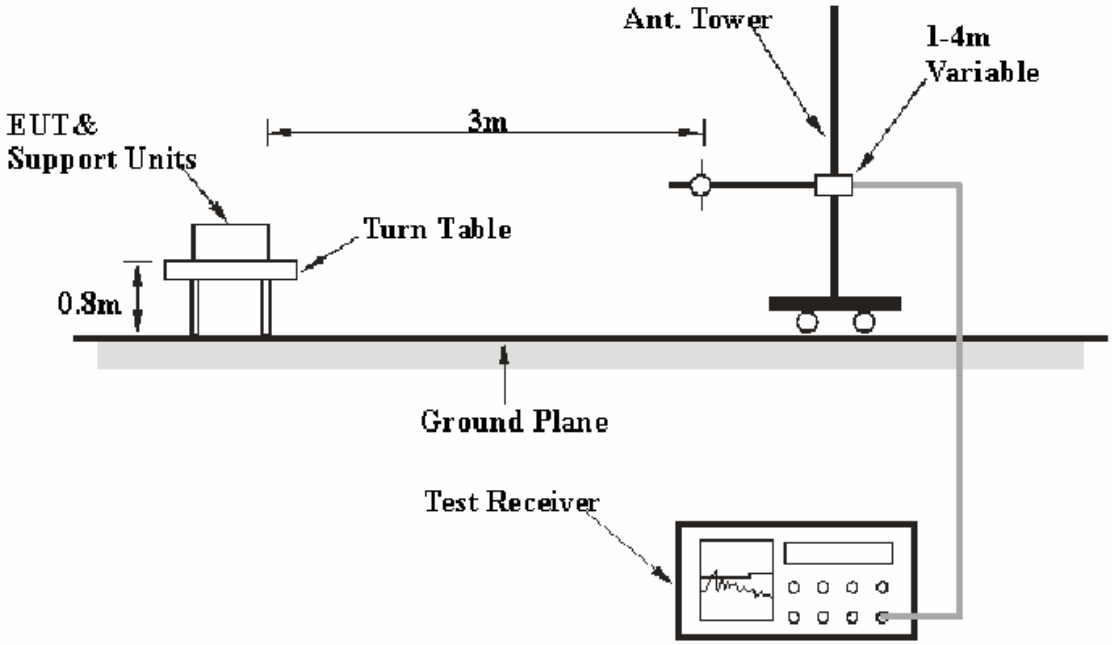
FCC §15.247 (d), 15.205, 15.209.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ±4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.109, FCC 15.209 and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	***RBW***	***Video B/W***
30MHz – 1000 MHz	100 kHz	300 kHz
1000 MHz – 25 GHz	1 MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2006-11-15	2007-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2006-08-14	2007-08-14
HP	Amplifier	8449B	3008A00277	2006-09-29	2007-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2006-07-20	2007-07-20
Agilent	Spectrum Analyzer	8564E	3943A01781	2006-11-22	2007-11-22

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the PK&AV detection mode.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corr. Ampl. = Meter Reading + Antenna Loss + Cable Loss- Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit - Corr. Ampl.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.109, 15.205, 15.209, and 15.247, with the worst margin reading of:

Charging Mode: **16.1 dB** at **30.141471 MHz** in the **Vertical** polarization.

Transmitting Mode:

30-1000MHz: 6.7 dB at **31.256564 MHz** in the **Vertical** polarization.
Above 1GHz: 19.52 dB at **4804 MHz** in the **Vertical** polarization, for Low Channel
Above 1GHz: 18.64 dB at **4882 MHz** in the **Vertical** polarization, for Middle Channel
Above 1GHz: 17.45 dB at **4960 MHz** in the **Vertical** polarization, for High Channel

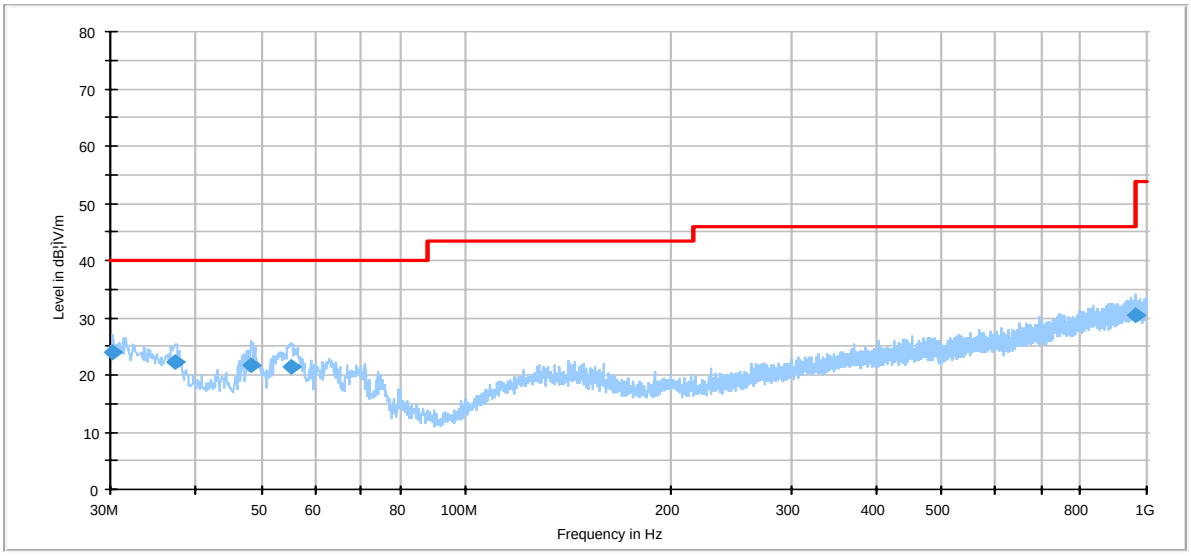
Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	52%
ATM Pressure:	1009mbar

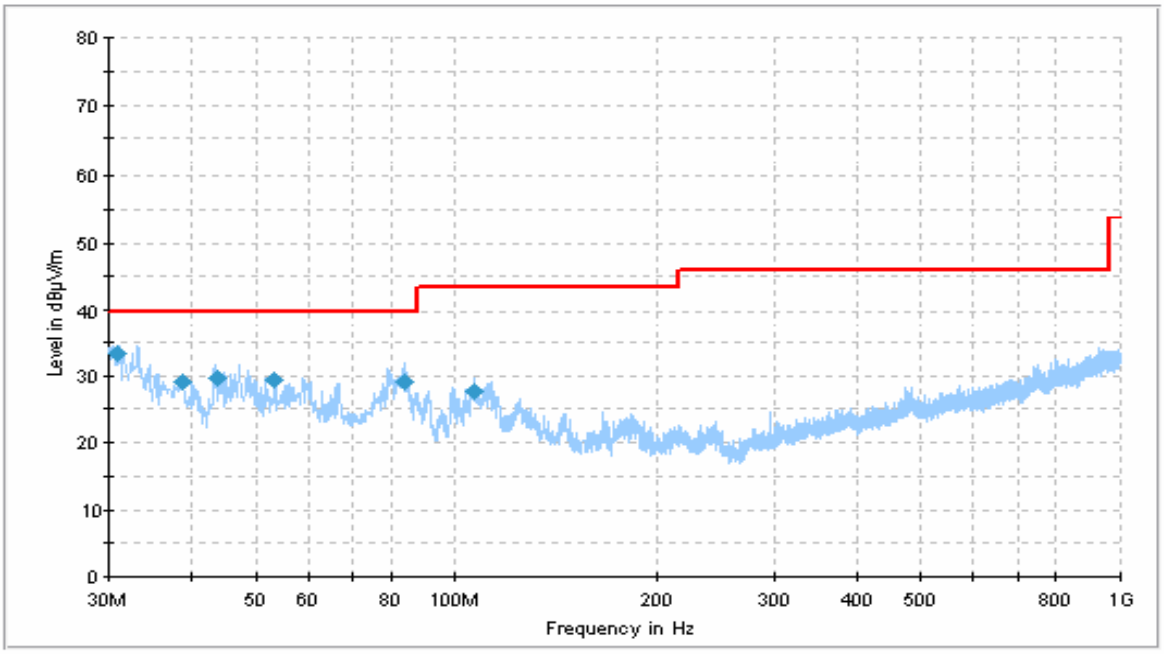
The testing was performed by Henry Yang on 2007-04-28.

Test Mode: Charging



Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	Polarity	Turntable Position (deg)	Corr. (dB)	Limit (dBµV/m)	Margin (dB)
30.141471	23.9	380.0	V	342.0	-4.9	40.0	16.1
961.230188	30.5	217.0	V	84.0	1.1	47.0	16.5
37.319812	22.3	151.0	V	298.0	-9.9	40.0	17.7
48.361688	21.6	110.0	V	0.0	-17.0	40.0	18.4
55.387312	21.3	99.0	V	0.0	-18.4	40.0	18.7

Test Mode: Transmitting (30-1000MHz)



Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	Polarity	Turntable Position (deg)	Corr. (dB)	Limit (dBµV/m)	Margin (dB)
31.256564	33.3	114.0	V	218.0	-6.8	40.0	6.7
44.198313	29.6	202.0	V	53.0	-15.7	40.0	10.4
52.987375	29.2	131.0	V	10.0	-19.1	40.0	10.8
39.152355	29.0	103.0	V	161.0	-12.6	40.0	11.0
84.172686	28.9	114.0	V	81.0	-18.7	40.0	11.1
107.022562	27.6	126.0	V	221.0	-15.4	40.0	12.4

Test Mode: Transmitting (Above 1GHz)

Freq. (MHz)	Meter Reading (dBuV)	Detector PK/QP/AV	Direction Degree	Ant. Height (m)	Ant. Polar H / V	Antenna Factor (dB/m)	Cable Loss (dB)	Amplifer Gain (dB)	Corr. Ampl. (dBuV/m)	FCC Part 15.247		
										Limit (dBuV/m)	Margin (dB)	Remarks
Low Channel												
2402	97.80	PK	20	1.2	H	27.4	3.61	35	93.81			Fund.
2402	95.69	AV	263	1.4	H	27.4	3.61	35	91.70			Fund.
2402	102.13	PK	18	1.6	V	27.4	3.61	35	98.14			Fund.
2402	99.22	AV	45	1.0	V	27.4	3.61	35	95.23			Fund.
4804	31.94	AV	180	1.6	V	31.3	4.64	33.4	34.48	54	19.52	Harmonic
4804	30.67	AV	270	1.6	H	31.3	4.64	33.4	33.21	54	20.79	Harmonic
4804	43.61	PK	250	1.0	V	31.3	4.64	33.4	46.15	74	27.85	Harmonic
4804	41.50	PK	49	1.2	H	31.3	4.64	33.4	44.04	74	29.96	Harmonic
Middle Channel												
2441	98.80	PK	197	1.6	H	27.4	3.61	35	94.81			Fund.
2441	96.9	AV	197	1.6	H	27.4	3.61	35	92.91			Fund.
2441	102.63	PK	182	1.2	V	27.4	3.61	35	98.64			Fund.
2441	100.12	AV	182	1.2	V	27.4	3.61	35	96.13			Fund.
4882	32.82	AV	180	1.6	V	31.3	4.64	33.4	35.36	54	18.64	Harmonic
4882	31.64	AV	109	1.2	H	31.3	4.64	33.4	34.18	54	19.82	Harmonic
4882	43.17	PK	45	1.0	V	31.3	4.64	33.4	45.71	74	28.29	Harmonic
4882	42.01	PK	109	1.2	H	31.3	4.64	33.4	44.55	74	29.45	Harmonic
High Channel												
2480	95.97	PK	197	1.6	H	27.4	3.61	35	91.98			Fund.
2480	94.11	AV	197	1.6	H	27.4	3.61	35	90.12			Fund.
2480	98.97	PK	182	1.2	V	27.4	3.61	35	94.98			Fund.
2480	96.95	AV	182	1.2	V	27.4	3.61	35	92.96			Fund.
4960	33.31	AV	180	1.6	V	32.0	4.64	33.4	36.55	54	17.45	Harmonic
4960	30.13	AV	109	1.2	H	32.0	4.64	33.4	33.37	54	20.63	Harmonic
4960	43.54	PK	109	1.2	H	32.0	4.64	33.4	46.78	74	27.22	Harmonic
4960	42.82	PK	45	1.0	V	32.0	4.64	33.4	46.06	74	27.94	Harmonic

§15.247(a) (1)-CHANNEL SEPARATION TEST

Applicable Standard

Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB 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 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Set the EUT in transmitting mode, spectrum Bandwidth was set at 100 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another truce
3. Measure the channel separation.

Limit

FCC Part 15, Subpart C Section 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.

FREQUENCY RANGE (MHz)	Limit (kHz)
902-928	>25kHz or the 20dB bandwidth
2400-2483.5	>25kHz or two-thirds of the 20dB bandwidth
5725-5850	>25kHz or the 20dB bandwidth

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	1009 mbar

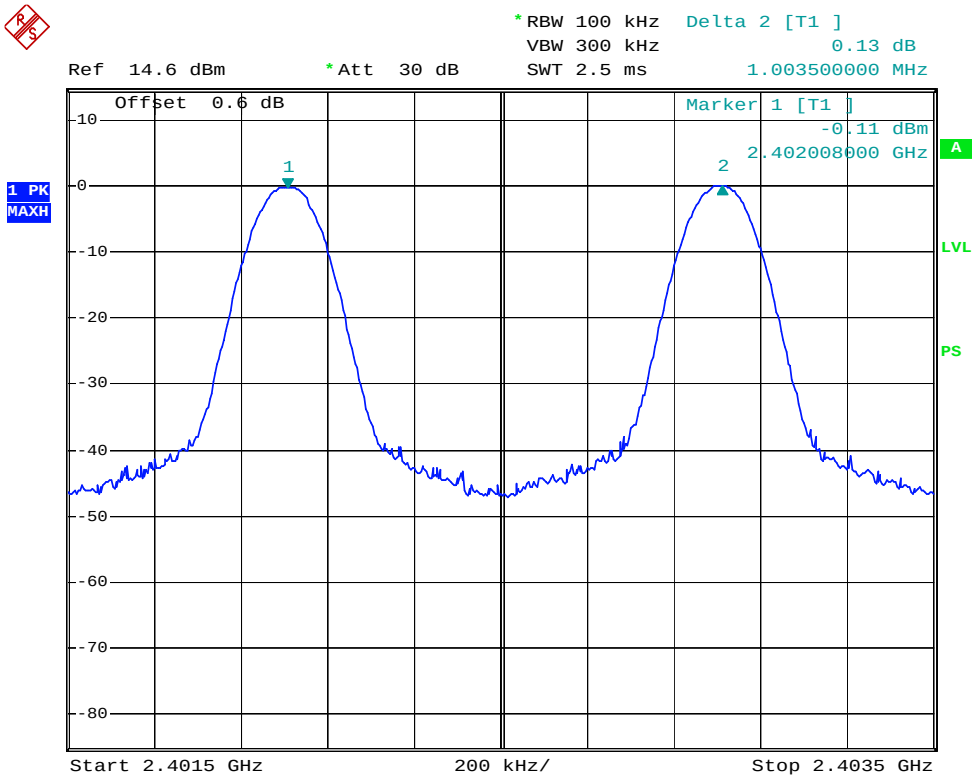
The testing was performed by Henry Yang on 2007-04-25.

Test Result: Pass

Test mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (kHz)	Limit (kHz)	Result
Low Channel	2402	1003.5	182.7	Pass
Adjacency Channel	2403			
Mid Channel	2441	1000	182.7	Pass
Adjacency Channel	2442			
High Channel	2480	1000	181.3	Pass
Adjacency Channel	2479			

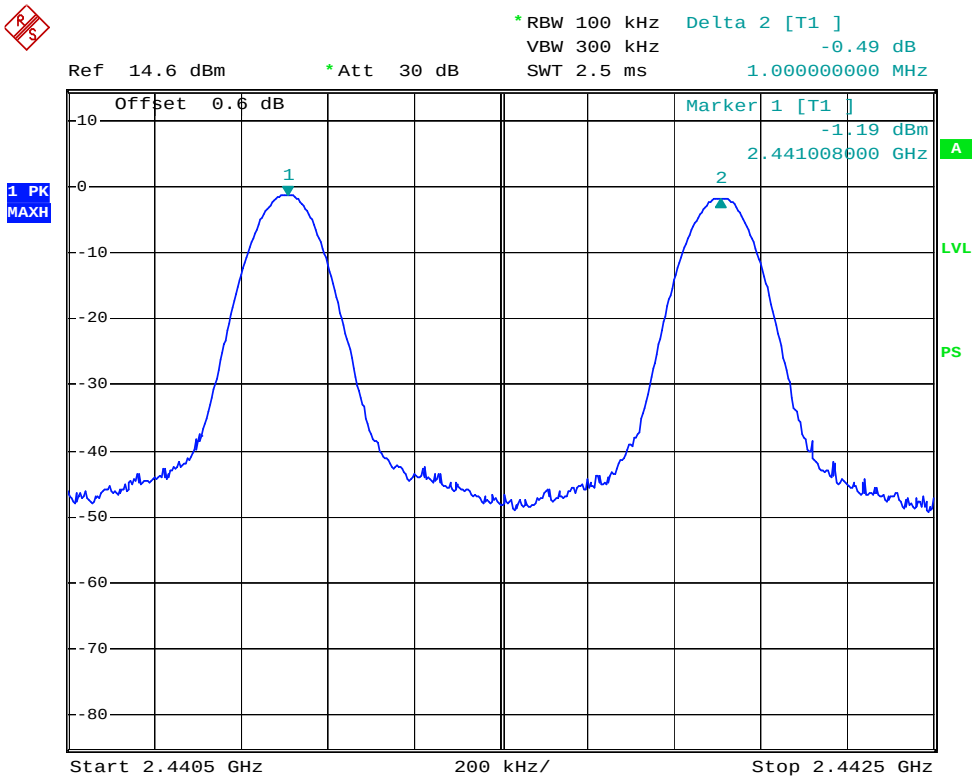
Low channel



channel separation low channel

Date: 25.APR.2007 11:26:45

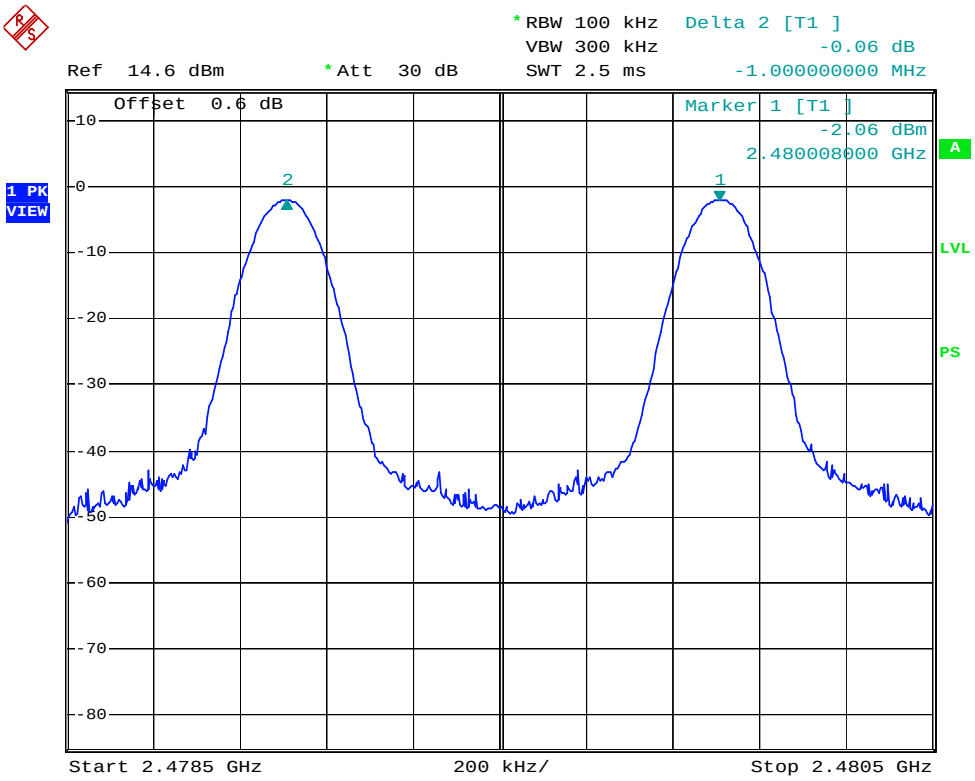
Middle channel



channel separation mid channel

Date: 25.APR.2007 11:30:47

High channel



channel separation high channel

Date: 25.APR.2007 11:34:26

§15.247(a) (1) –20dB BANDWIDTH TESTING

Applicable Standard

Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB Bandwidth of the hopping channel, whichever is greater.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1009mbar

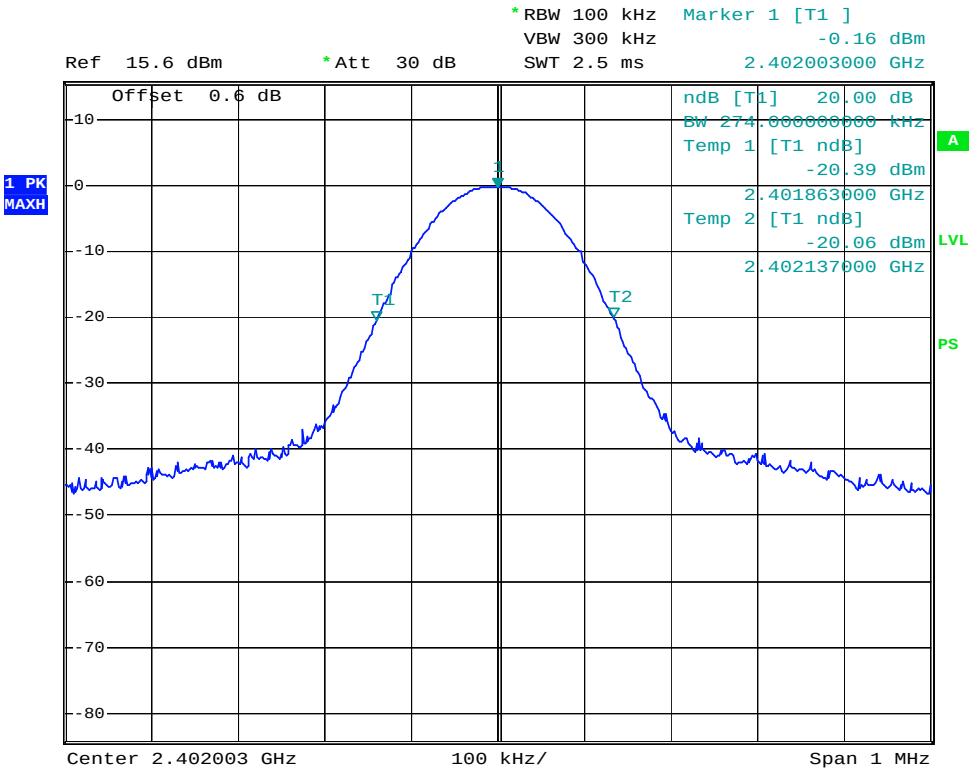
The testing was performed by Henry Yang on 2007-04-23.

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)	Result
Low Channel	2402	274	Pass
Middle Channel	2441	274	Pass
High Channel	2480	272	Pass

Please refer to the plots hereinafter:

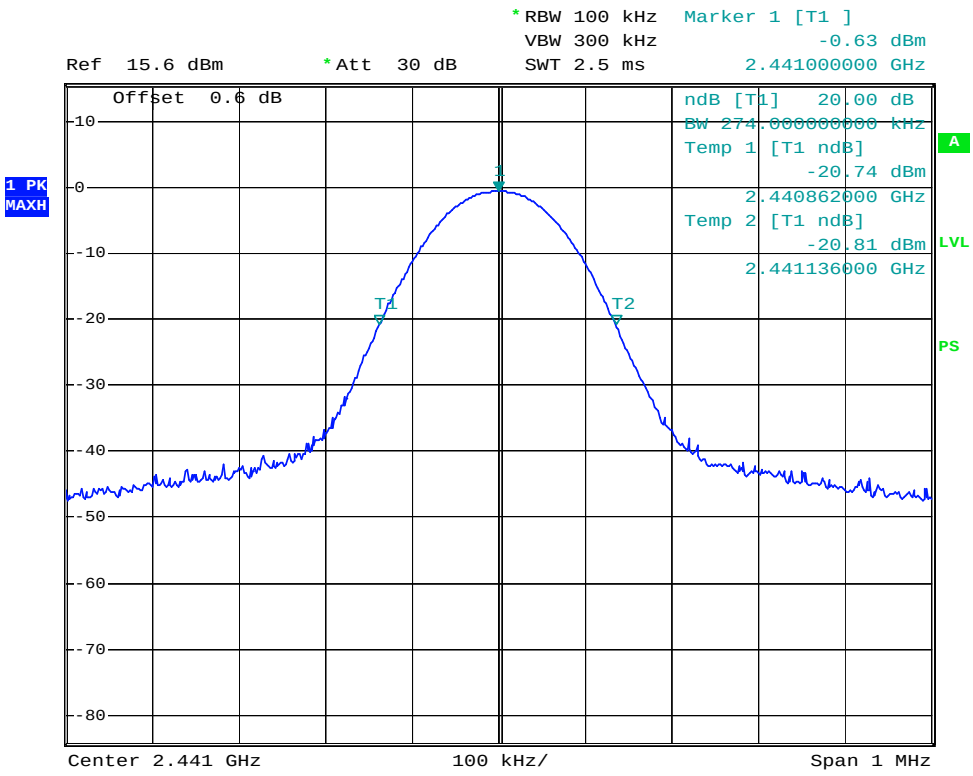
Low channel



20dB BANDWIDTH -LOW CHANNEL

Date: 23.APR.2007 18:05:29

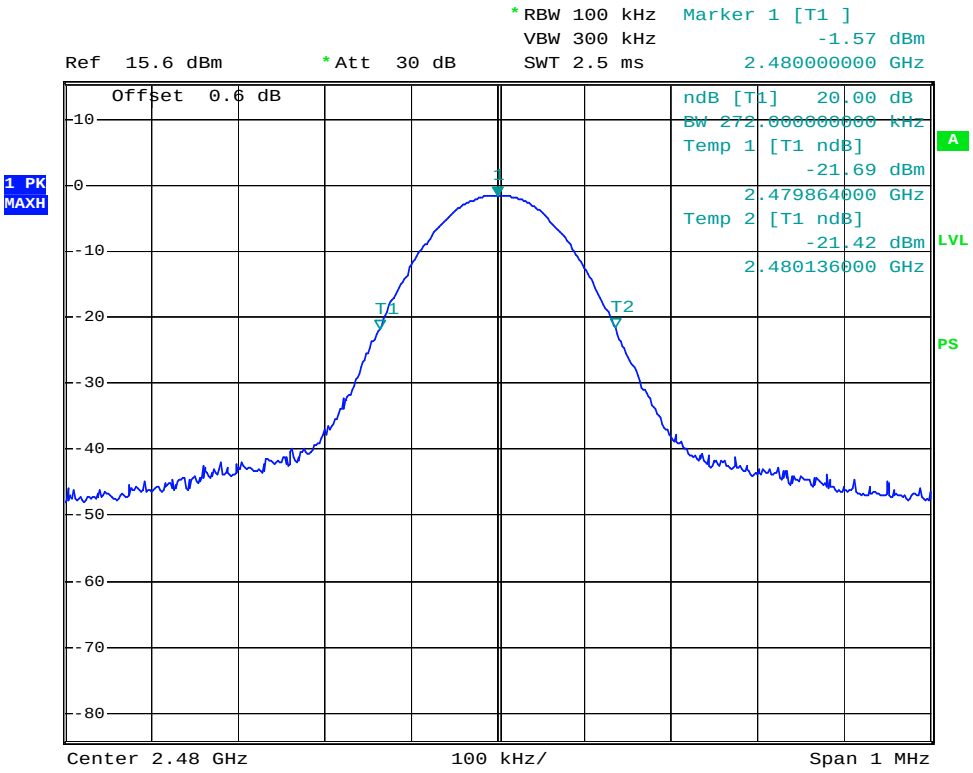
Middle channel



20dB BANDWIDTH -MID CHANNEL

Date: 23.APR.2007 18:07:10

High channel



20dB BANDWIDTH -HIGH CHANNEL

Date: 23.APR.2007 18:08:45

§15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in transmitting mode from first channel to last.
3. By using the Max-Hold function record the Quantity of the channel.

Test Data

Environmental Conditions

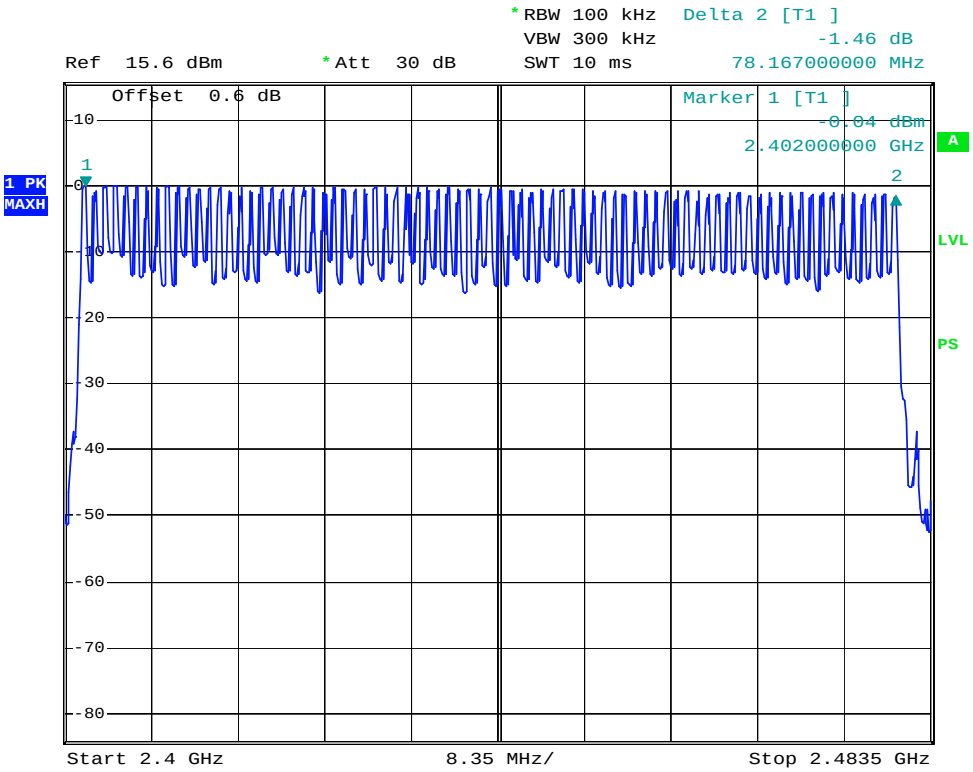
Temperature:	27 °C
Relative Humidity:	50 %
ATM Pressure:	1009 mbar

The testing was performed by Henry Yang on 2007-04-23.

Test mode: Transmitting

Frequency Range in 2400 to 2483.5 MHz	Number of Hopping Channels	Limit
2402-2480	79	>15

Test Result: Pass, please refer to the plot.



quantity of channel

Date: 23.APR.2007 18:02:24

§15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 X channel no.(s), The quantity of False was get from single sweep. In addition, the time of single Pluses was tested.

Limit

FCC Part 15, Subpart C Section 15.247.

FREQUENCY RANGE (MHz)	LIMIT (ms)		
	20dB bandwidth <250kHz (50 Channel)	20dB bandwidth >250kHz (50 Channel)	20dB bandwidth <1 MHz (79 Channel)
902-928	N/A	N/A	N/A
2400-2483.5	N/A	N/A	31.6s
5725-5850	N/A	N/A	N/A

Dwell Time= time slot length * hope rate/ number of hopping channels * 31.6s
Hop rate=1600/s

Test Data

Environmental Conditions

Temperature:	27 °C
Relative Humidity:	50 %
ATM Pressure:	1009 mbar

The testing was performed by Henry Yang on 2007-04-25.

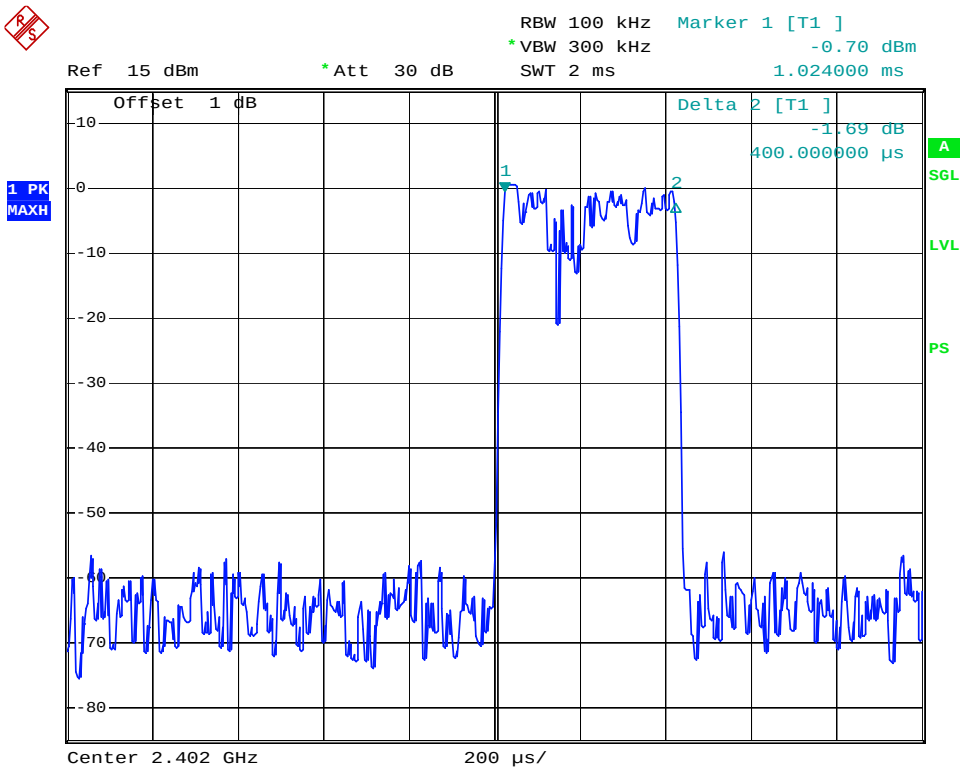
Test mode: Transmitting

Test Result: Pass

Channel	Pulse wide (msec)	Number of hopping Pulses in 0.4 sec.	Dwell time (sec)	Limit (sec)	Result
Low Channel	0.400	320	0.128	0.4	Pass
Mid Channel	0.400	320	0.128	0.4	Pass
High Channel	0.400	320	0.128	0.4	Pass

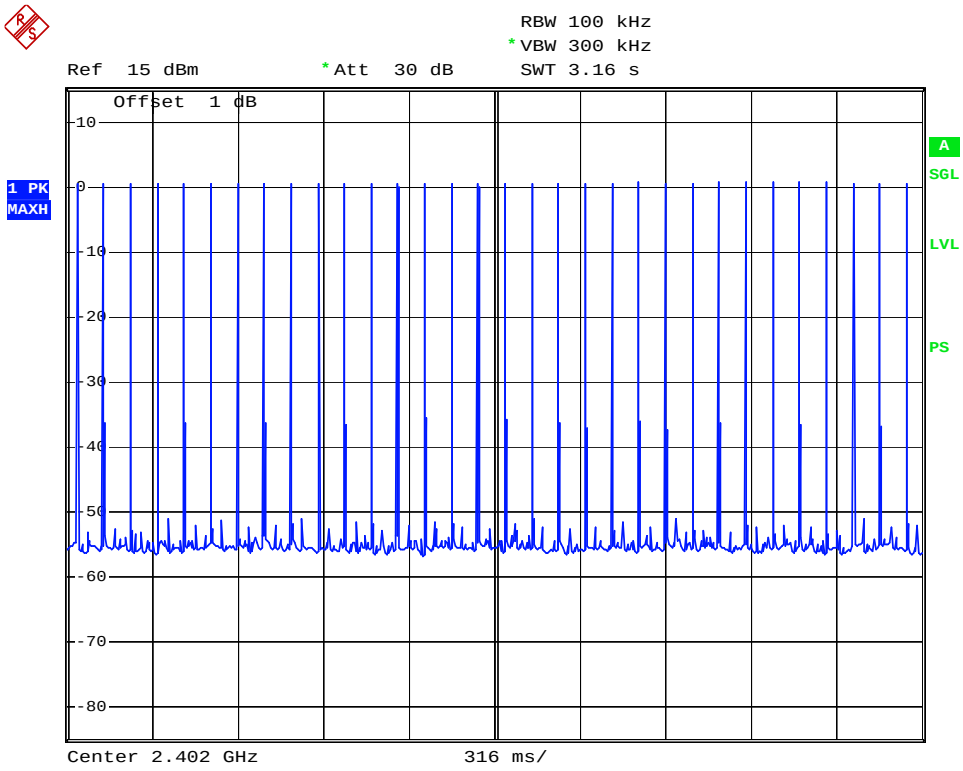
Please refer to the plots:

Low channel



occupied time pulse width - low channel

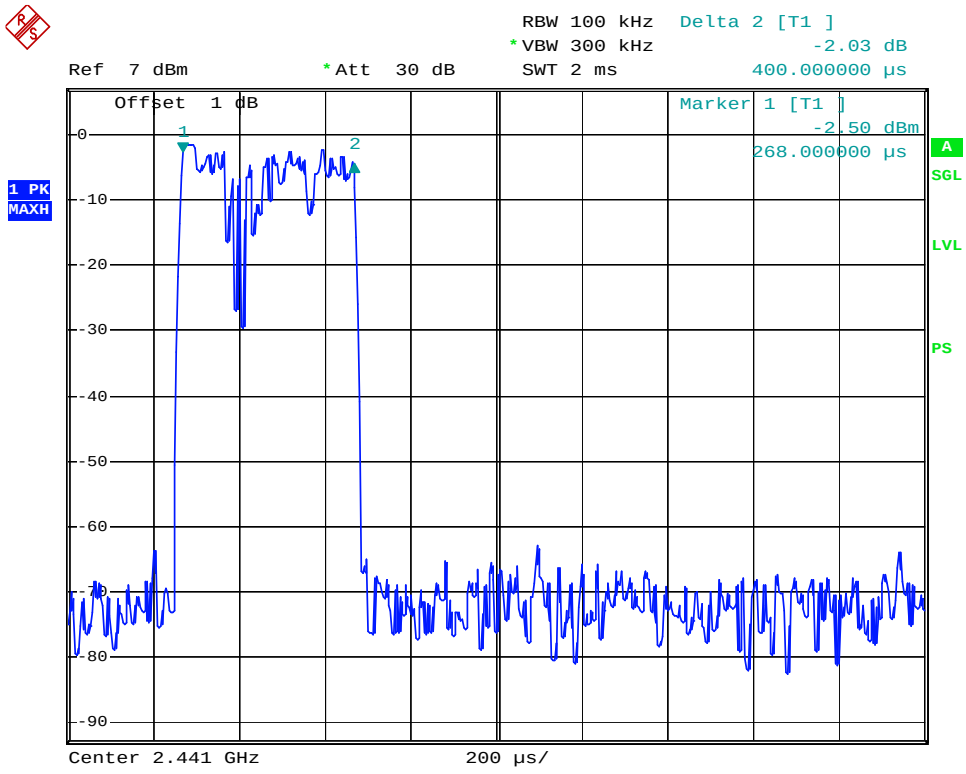
Date: 25.APR.2007 11:11:27



occupied time No.of pulse - low channel

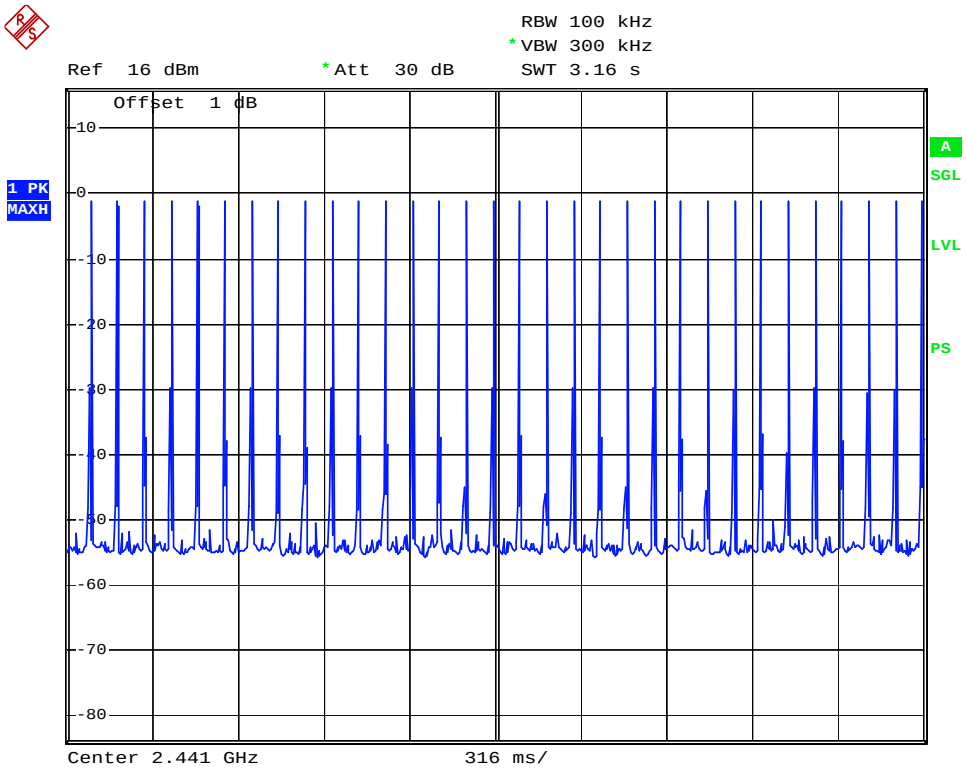
Date: 25.APR.2007 11:08:42

Middle channel



occupied time pulse width - mid channel

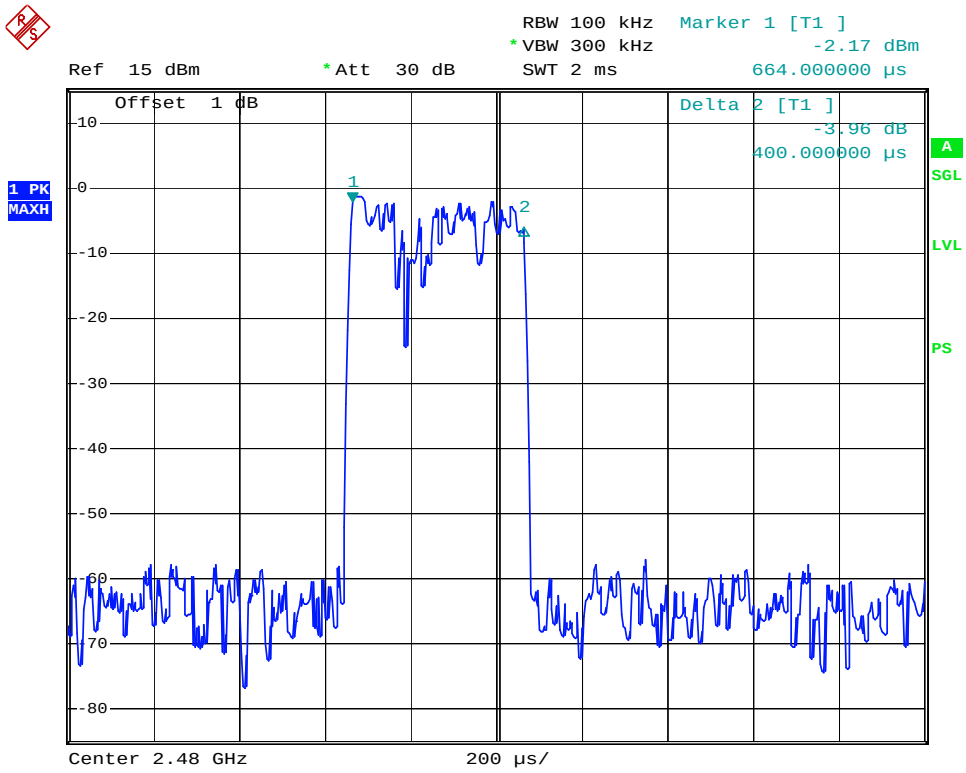
Date: 25.APR.2007 11:05:48



occupied time No.of pulse mid channel

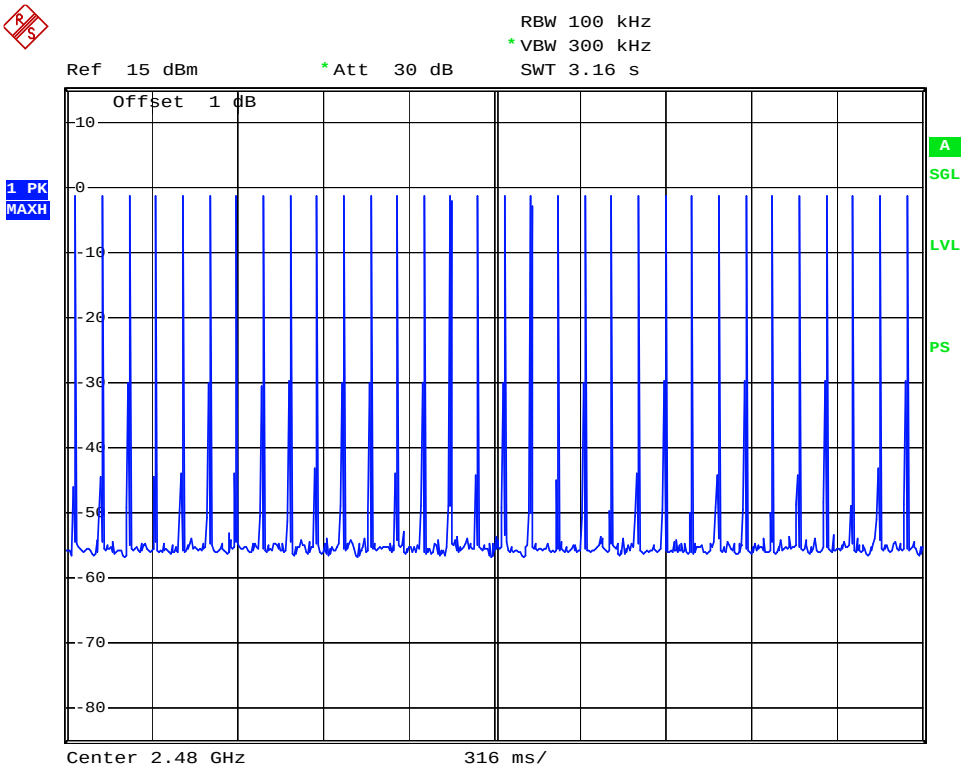
Date: 25.APR.2007 10:55:51

High channel



occupied time pulse width - high channel

Date: 25.APR.2007 11:14:46



occupied time No.of pulse - high channel

Date: 25.APR.2007 11:13:15

§15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §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.

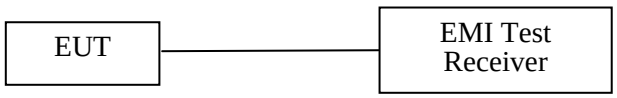
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI Test Receiver.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1009mbar

The testing was performed by Henry Yang on 2007-04-25.

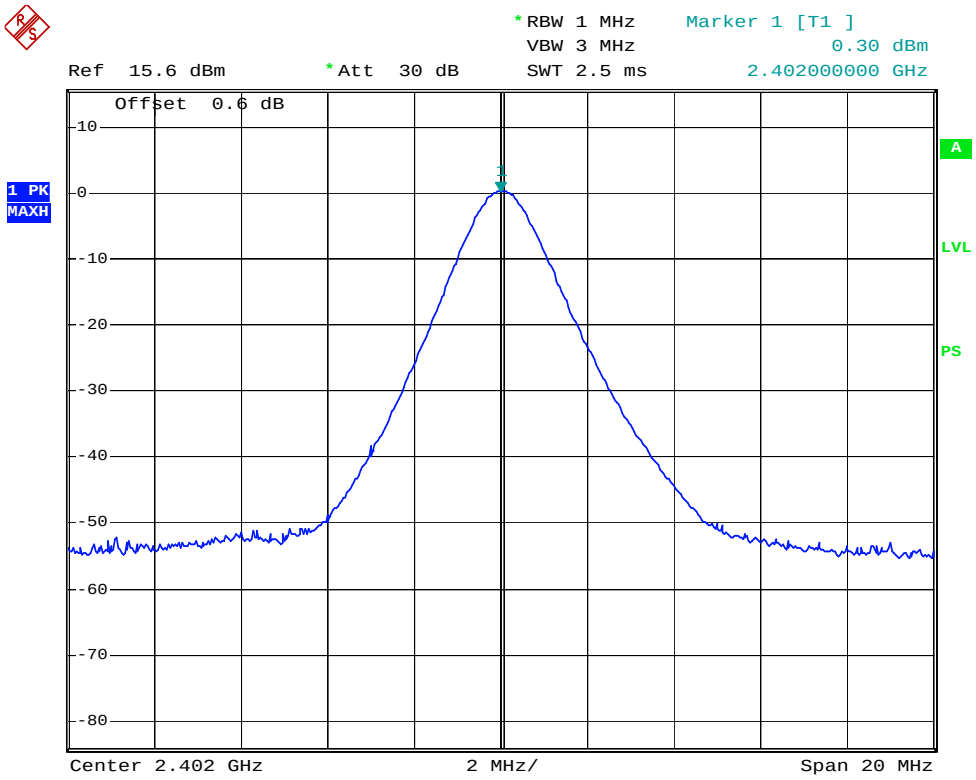
Test Mode: Transmitting

Channel	Channel Frequency (MHz)	RF Power (dBm)	Power Output (w)	Limit (w)
Low	2402	0.3	0.0017	1
Mid	2441	-1.86	0.00065	1
High	2480	-2.23	0.0006	1

Test Result: Pass

Please refer to the following plots.

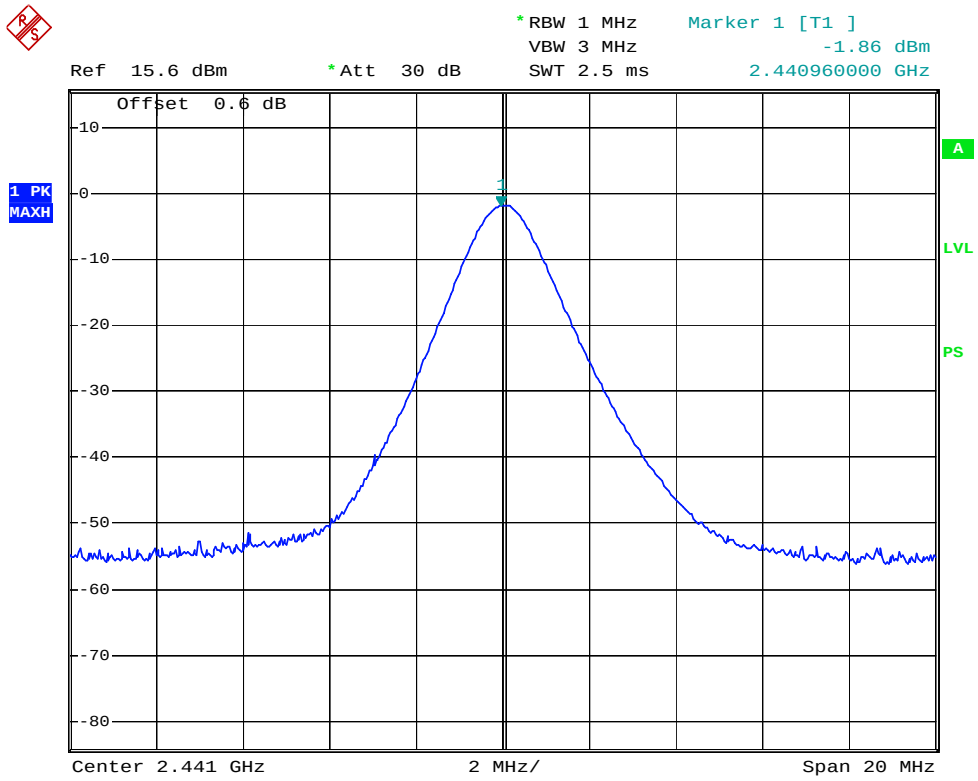
Low channel



output power low channel

Date: 25.APR.2007 10:43:15

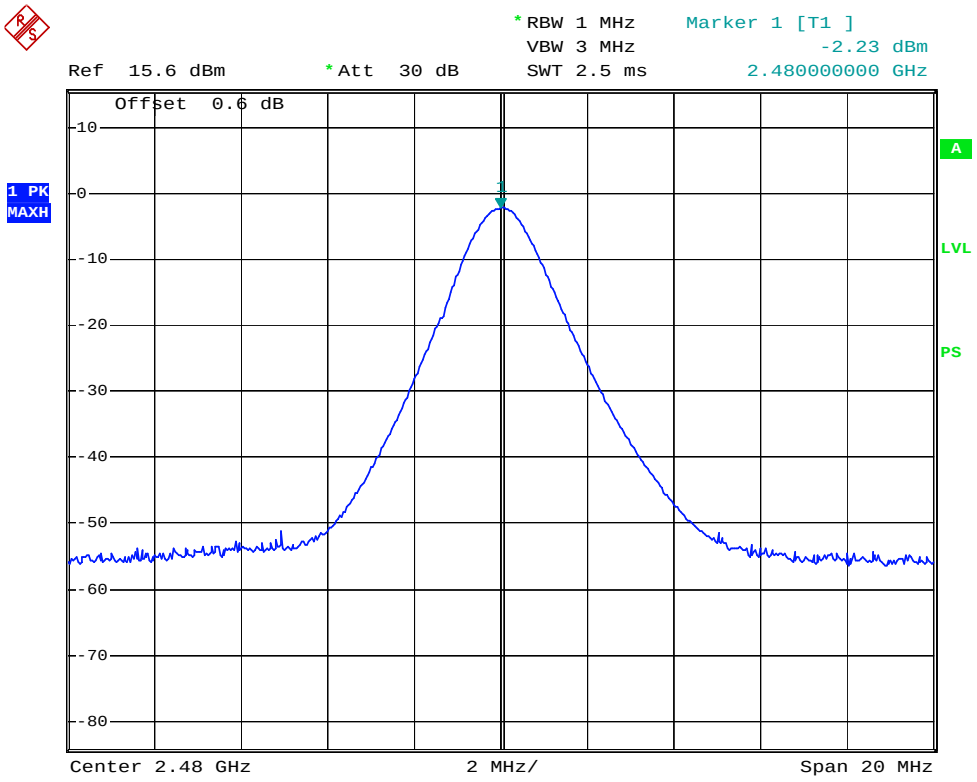
Middle channel



output power mid channel

Date: 25.APR.2007 10:45:49

High channel



output power high channel

Date: 25.APR.2007 10:46:37

§15.247(d) - BAND EDGES TESTING

Applicable Standard

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 §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100kHz and VBW to 300kHz of spectrum analyzer with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

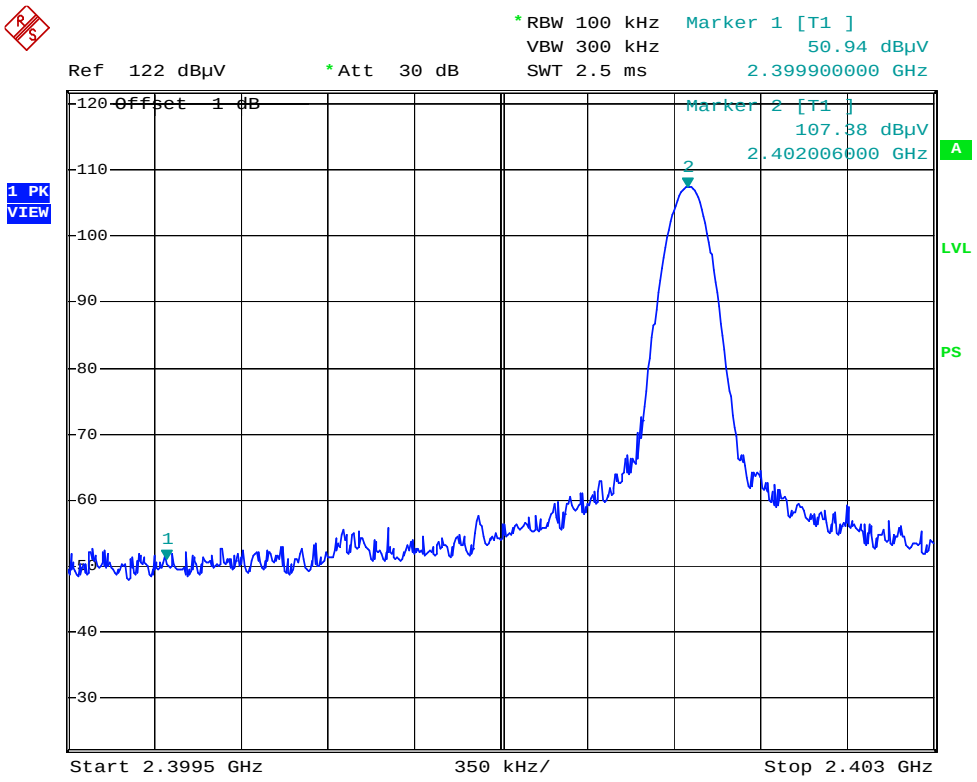
Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009mbar

The testing was performed by Henry Yang on 2007-04-25.

Test Mode: Transmitting

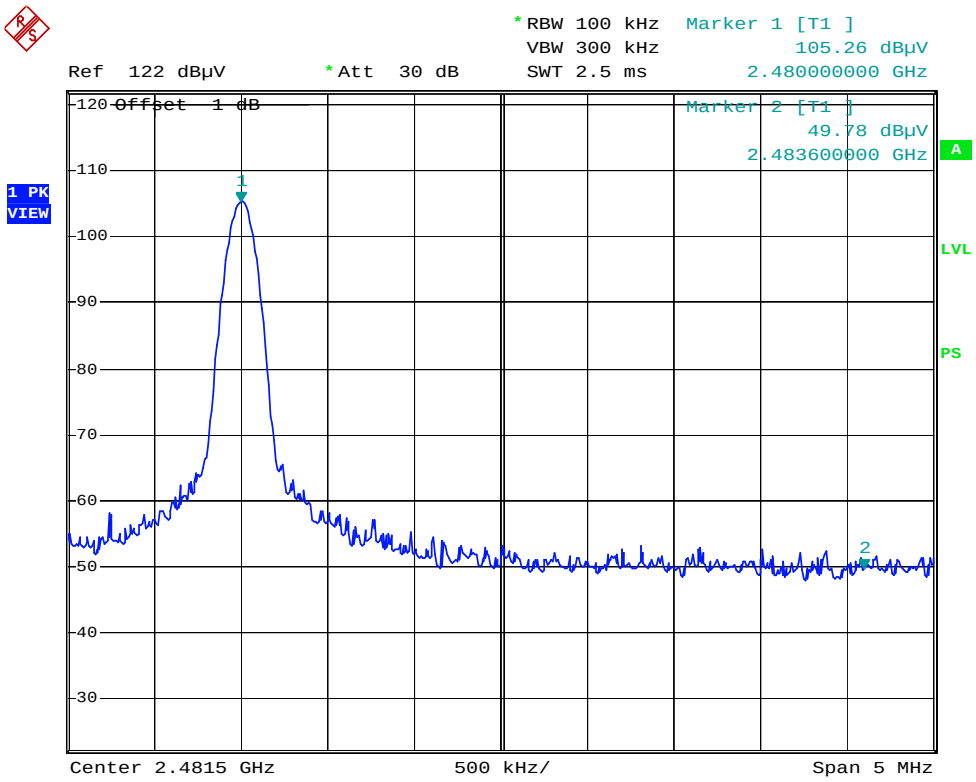
Test Result: Pass

Frequency (MHz)	Emission (dBμV/m)	Limit (dBμV/m)
2399.9	50.94	54
2483.6	49.78	54



bandedge lower

Date: 25.APR.2007 11:54:20



bandedge upper

Date: 25.APR.2007 11:56:55