



NVLAP LAB CODE 200707-0

FCC PART 15.247



MEASUREMENT AND TEST REPORT

For

Ever Win International Corp.

17579 Railroad Street City of Industry, CA91748, USA

FCC ID: MS3-SLX-810

Report Type: Original Report	Product Type: Bluetooth Headset
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Report Number: <u>RSZ08110604</u>	
Report Date: <u>2008-11-21</u>	
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* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Ever Win International Corp.*'s product, model number: *SLX-810* or the "EUT" as referred to in this report is a *Bluetooth headset*, which measures approximately: 5.6 cm L x 2.5 cm W x 3.5 cm H, input voltage: 3.7 V battery.

Adapter Information:

Model: 7501SD-5018A-UL;

Input: 100V-240V~50/60Hz, 50mA;

Output: 5.0V---180mA

** All measurement and test data in this report was gathered from production sample serial number: 0811009 (Assigned by BACL, Shenzhen). The EUT was received on 2008-11-06.*

Objective

This Type approval report is prepared on behalf of *Ever Win International Corp.* 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, 15.207, 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 Laboratories 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 Laboratories 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 Laboratories 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 Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at
<http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

Equipment Modifications

No modification was made to the unit tested.

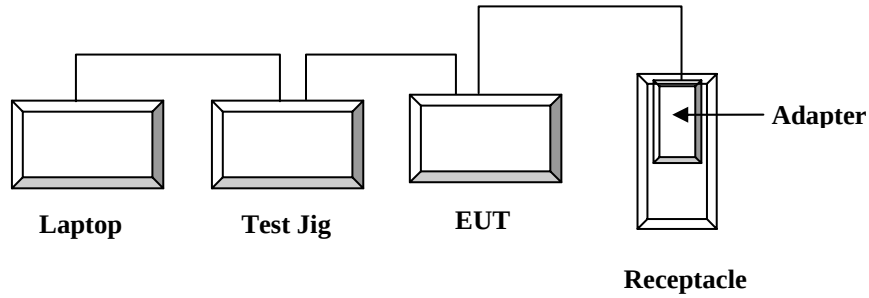
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Great Wall	Laptop	GREEN7331PRO	96F46W0004051900304	DoC

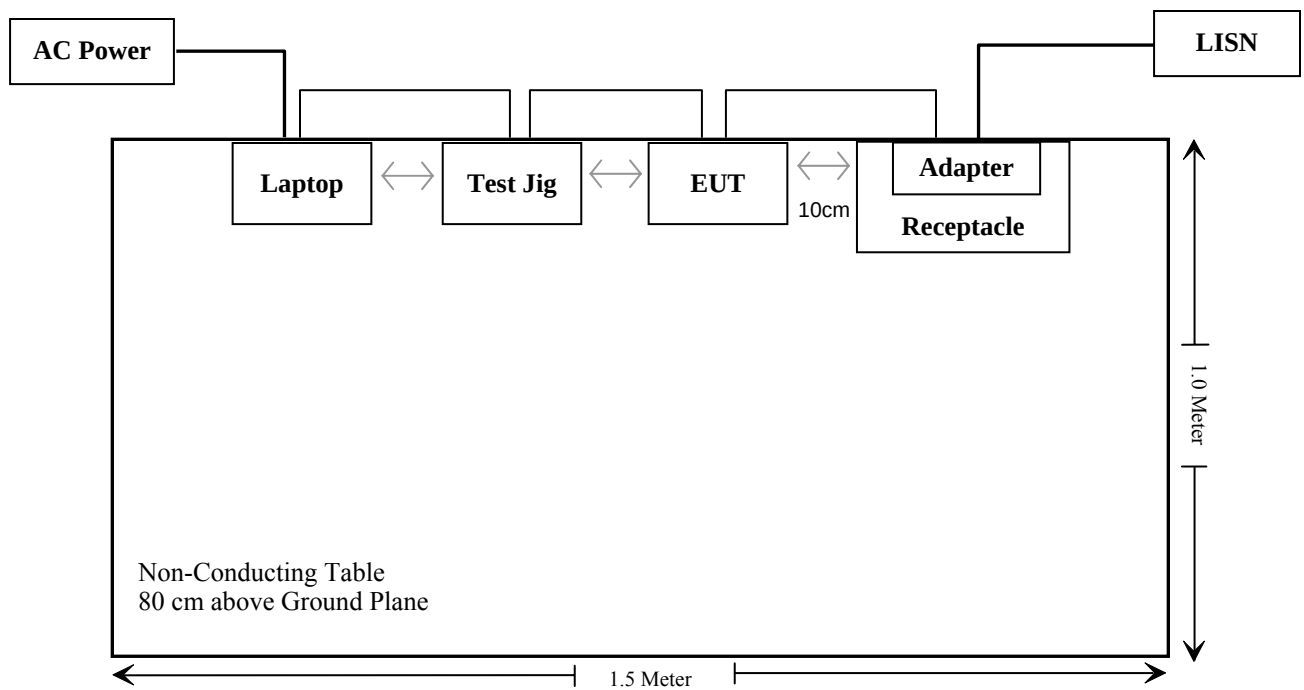
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable USB Cable	1.0	EUT	Adapter

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	Conducted Emissions	Compliant
§15.205, §15.209, §15.109, §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	Compliant

§15.247 (i) and §2.1093 - RF EXPOSURE

Standard Applicable

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

According to FCC Exclusion list, In the following table, f_{GHz} is mid-band frequency in GHz, and d is the distance to a person's body, excluding hands, wrists, feet, and ankles.

Exposure category	<u>low threshold</u>	<u>high threshold</u>
general population	$(60/f_{\text{GHz}})$ mW, $d < 2.5$ cm $(120/f_{\text{GHz}})$ mW, $d \geq 2.5$ cm	$(900/f_{\text{GHz}})$ mW, $d < 20$ cm
occupational	$(375/f_{\text{GHz}})$ mW, $d < 2.5$ cm $(900/f_{\text{GHz}})$ mW, $d \geq 2.5$ cm	$(2250/f_{\text{GHz}})$ mW, $d < 20$ cm

Routine SAR evaluation refers to that specifically required by § 2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

Measurement Result:

This is a portable device and the Max peak output power is $0.082\text{mW} < 24.58\text{ mW} = (60/2.441\text{GHz})\text{ mW}$. The SAR measurement is not necessary.

CFR47 §15.203 - ANTENNA REQUIREMENT

Standard Applicable

According to CFR47 § 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has a printed antenna on PCB. The maximum gain is 3.2 dBi; please refer to the internal photos.

Result: Compliant.

CFR47 §15.207 (a) - CONDUCTED EMISSIONS

Applicable Standard

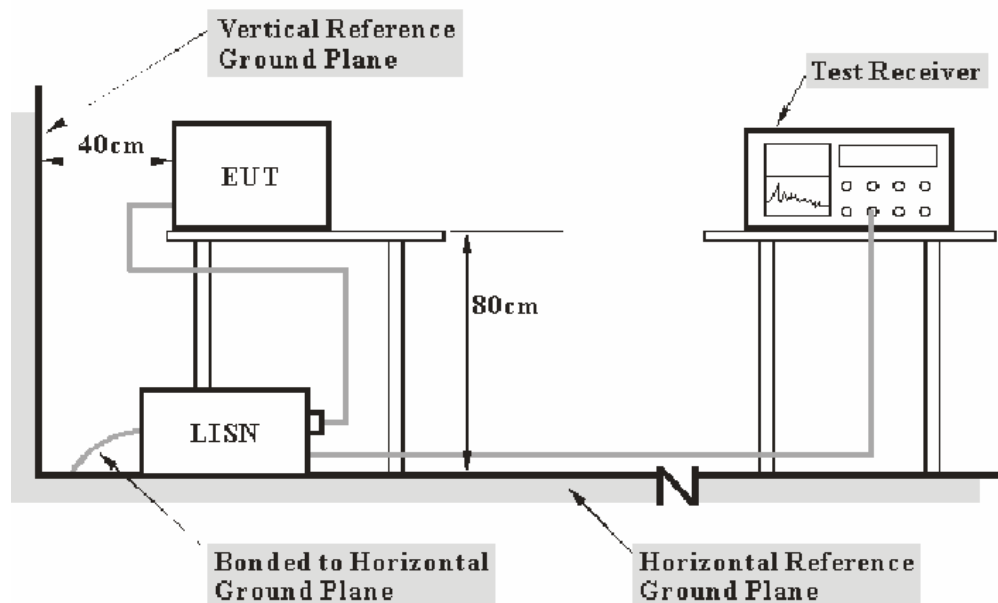
CFR47 §15.207

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 15.207 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 of EUT 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:

<u>Frequency Range</u>	<u>IF B/W</u>
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330	2008-03-25	2009-03-25
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2008-03-25	2009-03-25

* 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 outlet of 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 15.207, with the worst margin reading of:

2.30 dB at 26.5600 MHz in the **Line** conductor mode

Test Data**Environmental Conditions**

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

* The testing was performed by Vicent Kang on 2008-11-19.

Test Mode: Charging & Transmitting

Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/AV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
26.5600	57.70	QP	Line	60.00	2.30
29.2950	52.30	QP	Neutral	60.00	7.60
0.6050	37.20	QP	Neutral	56.00	18.80
0.5550	37.10	QP	Line	56.00	18.90
27.1200	30.50	AV	Line	50.00	19.50
0.3050	30.60	AV	Neutral	50.11	19.51
0.4450	37.10	QP	Line	56.97	19.87
0.6650	36.00	QP	Line	56.00	20.00
27.1200	29.80	AV	Neutral	50.00	20.20
0.3050	38.70	QP	Neutral	60.11	21.41
0.4650	34.80	QP	Neutral	56.60	21.80
0.2250	40.30	QP	Line	62.63	22.33
0.6700	23.50	AV	Line	46.00	22.50
0.4650	22.70	AV	Neutral	46.60	23.90
0.5550	21.70	AV	Line	46.00	24.30
0.6050	21.60	AV	Neutral	46.00	24.40
0.1500	30.80	AV	Neutral	56.00	25.20
0.1500	40.60	QP	Neutral	66.00	25.40
0.2250	27.00	AV	Line	52.63	25.63
22.0100	34.20	QP	Line	60.00	25.80
0.4450	20.40	AV	Line	46.97	26.57
21.7300	33.40	QP	Neutral	60.00	26.60
21.5050	17.10	AV	Line	50.00	32.90
21.5050	15.60	AV	Neutral	50.00	34.40

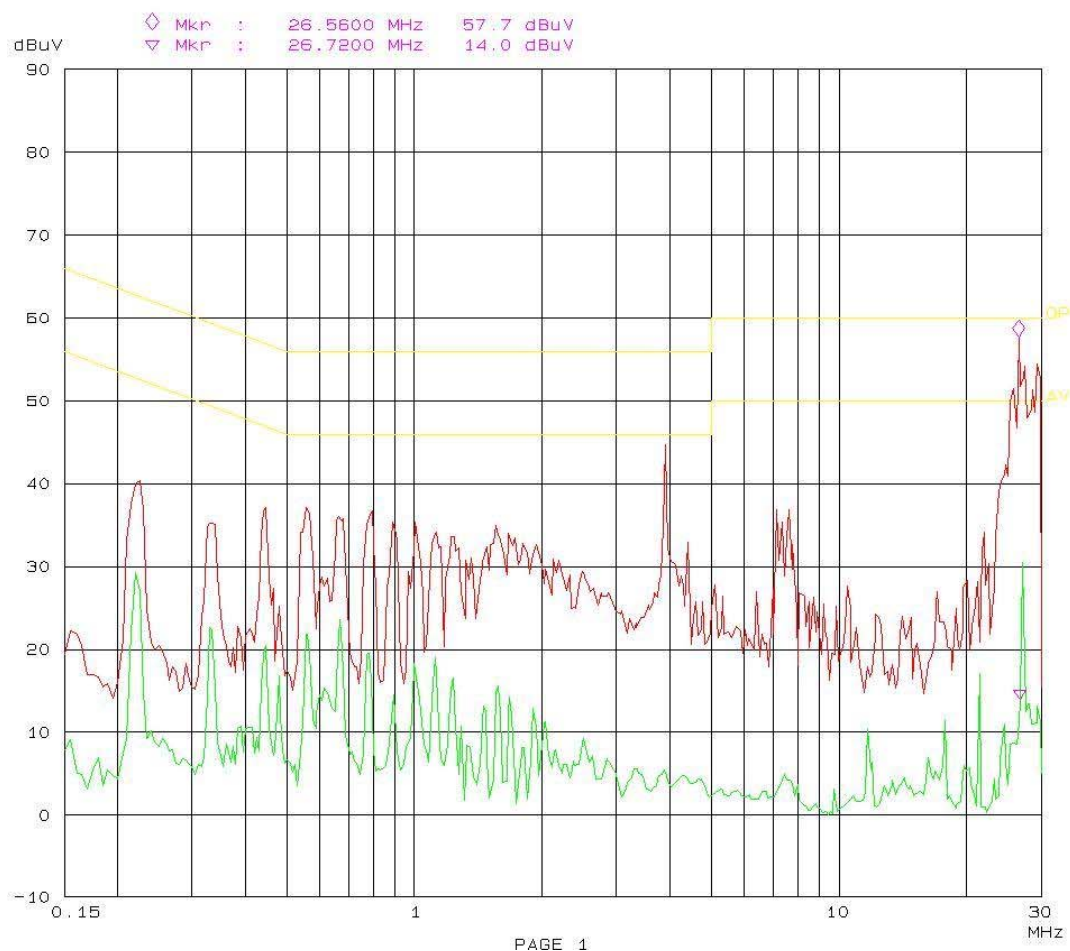
Plot(s) of Test Data

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

Conducted emission
FCC Part15

19, Nov 08 17:28

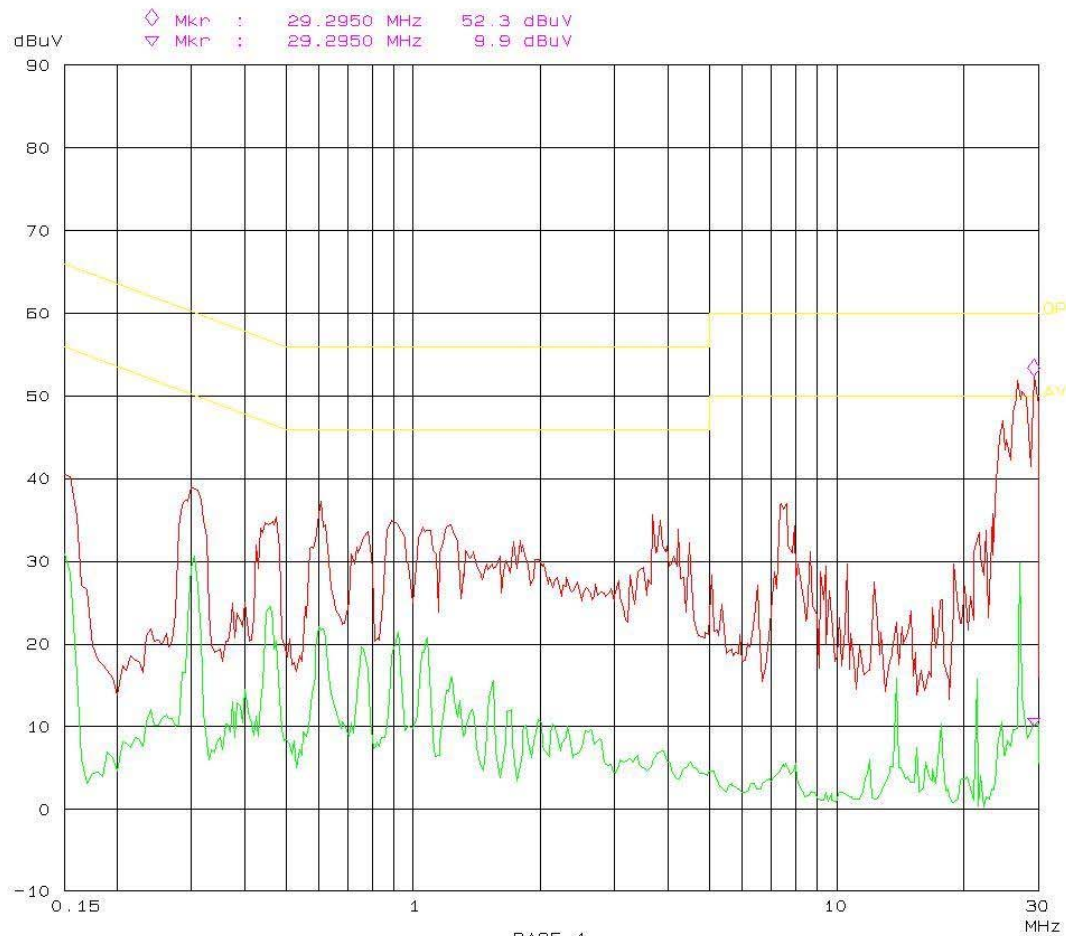
EUT: Bluetooth headset M/N: SLX-810
Manuf: EVER WIN
Op Cond: CHARGING&TRANSMITTING
Operator: Vicent
Test Spec: AC 120V/60Hz L
Comment: Temp: 25 Hum: 56%
BACL



Conducted emission
FCC Part15

19. Nov 08 17:43

EUT: Bluetooth headset M/N: SLX-810
Manuf: EVER WIN
Op Cond: CHARGING&TRANSMITTING
Operator: Vicent
Test Spec: AC 120V/60Hz N
Comment: Temp: 25 Hum: 56%
BACL



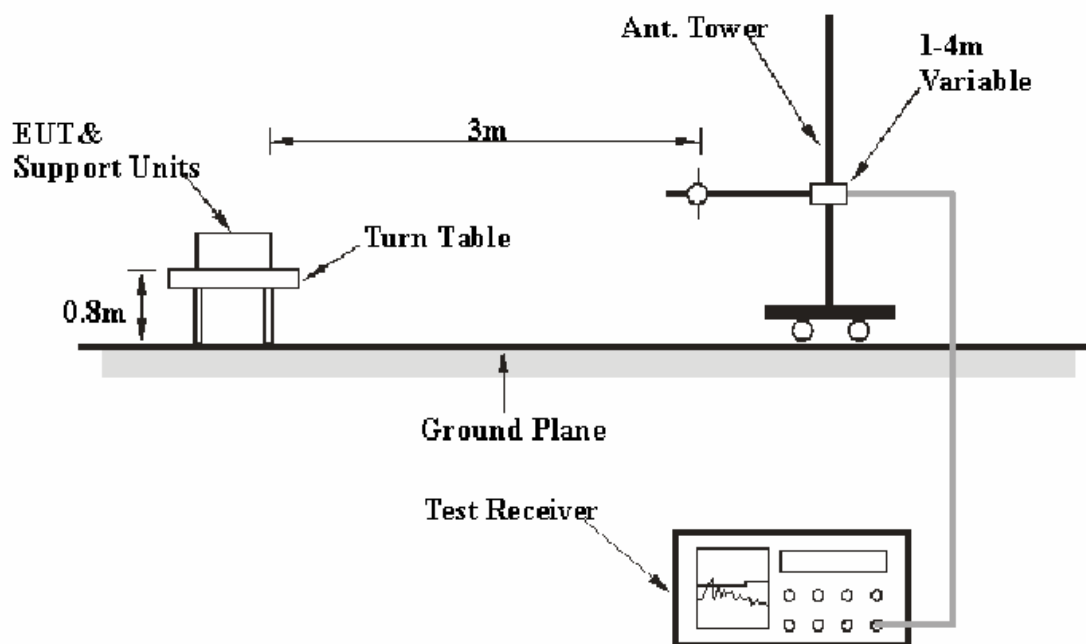
CFR47 §15.205, §15.209, §15.109, §15.247 - RADIATED EMISSIONS**Applicable Standard**

CFR47 §15.205; §15.209; §15.109; §15.247 (d).

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 Laboratories 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 15.209 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 of EUT 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:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>
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	2008-11-15	2009-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2008-03-11	2009-03-11
HP	Amplifier	8449B	3008A00277	2008-09-29	2009-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-05-09	2009-05-09

*** Statement of Traceability:** Bay Area Compliance Laboratories 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.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz and peak and Average detection modes for frequencies above 1GHz.

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

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

Charging mode (Below 1GHz):

10.9 dB at 32.182500 MHz in the Horizontal polarization

Transmitting BDR mode (Below 1GHz):

1.8 dB at 912.058875 MHz in the Horizontal polarization

Transmitting BDR mode (Above 1 GHz):

10.30 dB at 7206 MHz in the Vertical polarization (Low Channel)
10.18 dB at 7323 MHz in the Horizontal polarization (Middle Channel)
10.35 dB at 7440 MHz in the Vertical polarization (High Channel)

Transmitting EDR mode (Below 1GHz):

2.1 dB at 912.037200 MHz in the Horizontal polarization

Transmitting EDR mode (Above 1 GHz):

9.84 dB at 7206 MHz in the Vertical polarization (Low Channel)
9.77 dB at 7323 MHz in the Horizontal polarization (Middle Channel)
9.95 dB at 7440 MHz in the Vertical polarization (High Channel)

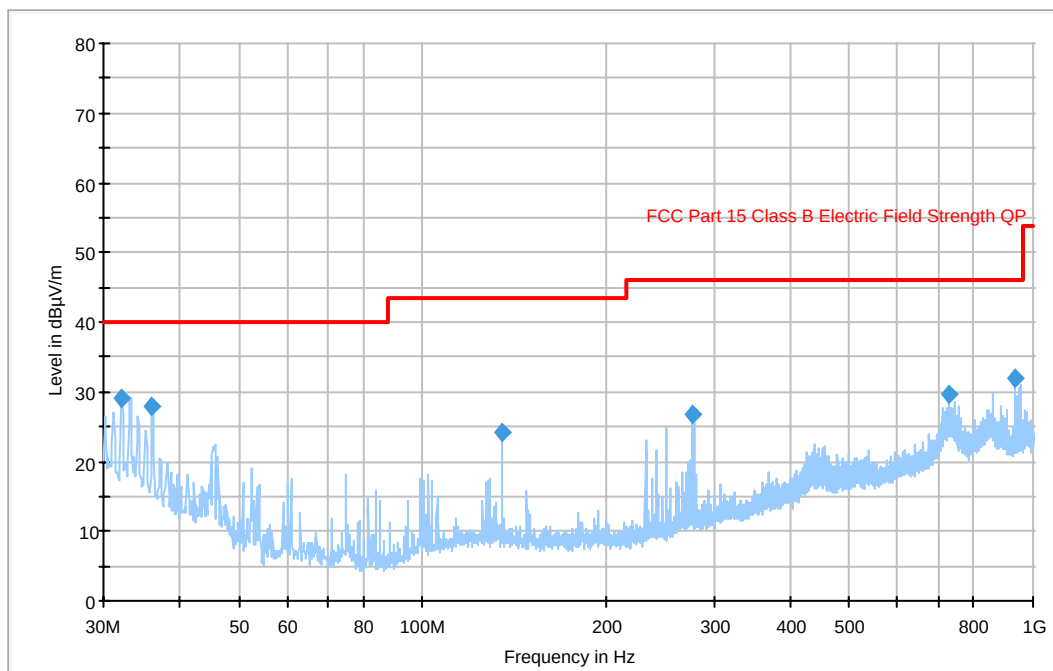
Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

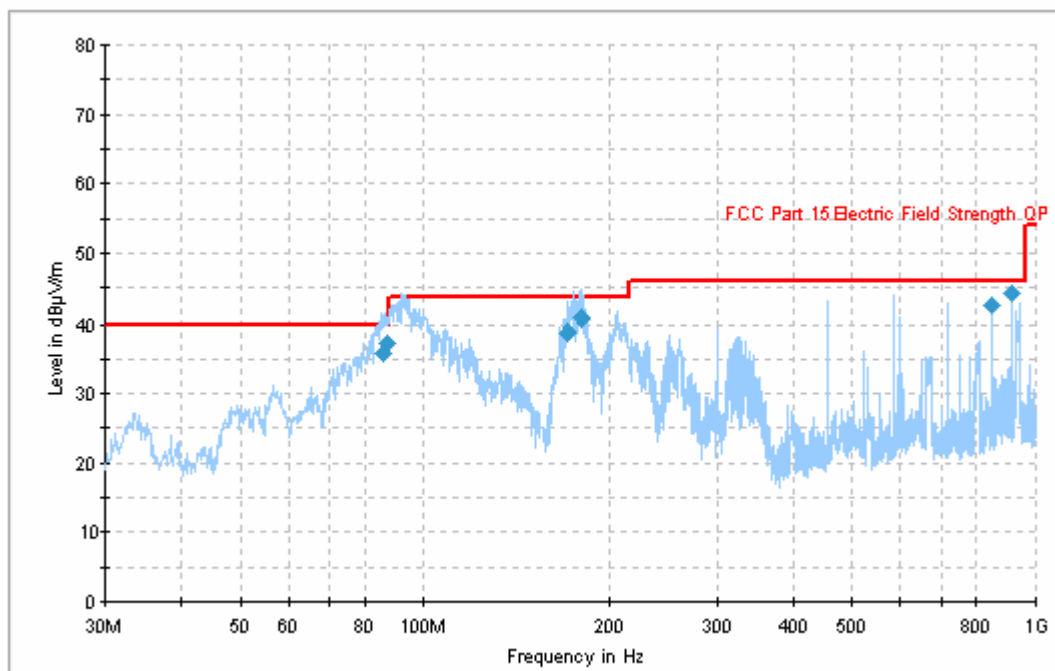
** The testing was performed by Vicent Kang on 2008-11-19*

Test Mode: Charging



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
32.182500	29.1	245.0	H	359.0	-18.5	40.0	10.9
36.062500	28.0	283.0	V	7.0	-21.2	40.0	12.0
935.252500	32.0	173.0	H	348.0	-9.5	46.0	14.0
726.702500	29.6	310.0	H	298.0	-9.4	46.0	16.4
275.895000	26.9	175.0	H	351.0	-9.3	46.0	19.1
134.881250	24.1	181.0	H	39.0	-9.3	43.5	19.4

Test Mode: Transmitting (BDR) (Below 1GHz)



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
912.058875	44.2	216.0	H	348.0	-3.4	46.0	1.8
87.274350	37.3	102.0	V	97.0	-22.1	40.0	2.7
180.318600	40.8	102.0	V	62.0	-17.2	43.5	2.7
846.897375	42.4	115.0	V	40.0	-4.7	46.0	3.6
85.616075	35.9	126.0	V	80.0	-22.2	40.0	4.1
171.047850	38.6	102.0	V	114.0	-17.8	43.5	4.9

Test Mode: Transmitting (BDR) (Above 1GHz)

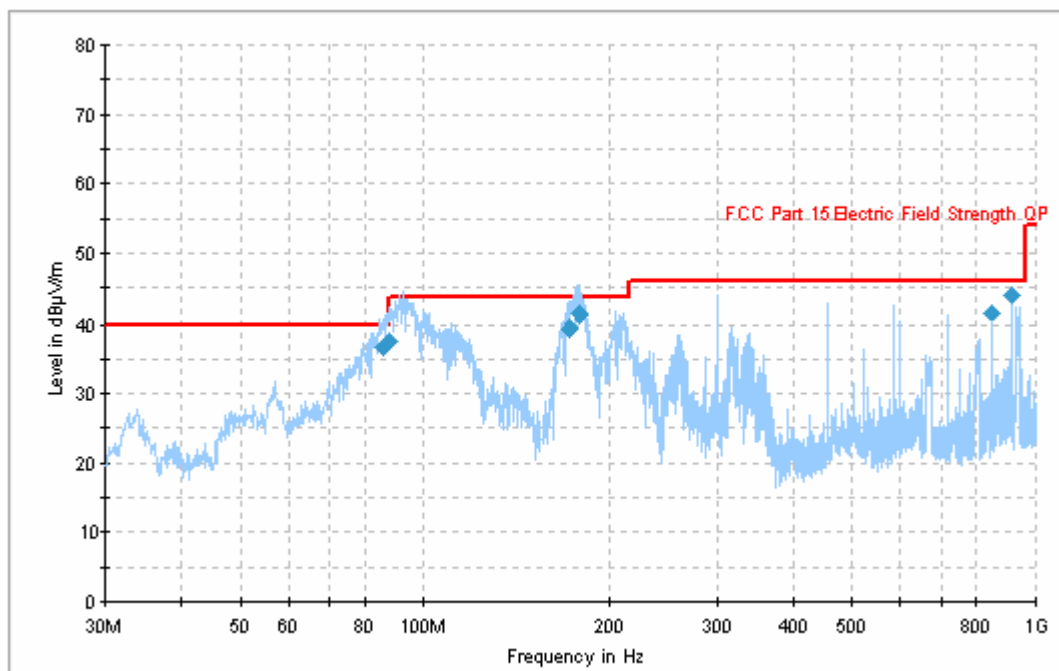
Freq. (MHz)	S.A. Reading (dBμV)	Detector PK/QP/AV	Direction Degree	Antenna			Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	Remarks
Low Channel (2402 MHz)												
2402	83.46	PK	25	1.80	H	30.6	3.60	34	83.66			Fund.
2402	74.92	AV	35	1.80	H	30.6	3.60	34	75.12			Fund.
2402	84.21	PK	355	1.75	V	30.6	3.60	34	84.41			Fund.
2402	73.53	AV	354	1.75	V	30.6	3.60	34	73.73			Fund.
7206	34.48	AV	175	1.37	V	38.00	4.82	33.60	43.7	54	10.30	Harmonic
7206	34.17	AV	154	1.55	H	38.00	4.82	33.60	43.39	54	10.61	Harmonic
4804	36.32	AV	240	1.02	H	35.00	3.98	33.70	41.6	54	12.40	Harmonic
4804	34.29	AV	180	1.05	V	35.00	3.98	33.70	39.57	54	14.43	Harmonic
7206	44.35	PK	175	1.37	V	38.00	4.82	33.60	53.57	74	20.43	Harmonic
7206	44.26	PK	155	1.55	H	38.00	4.82	33.60	53.48	74	20.52	Harmonic
4804	43.67	PK	240	1.00	H	35.00	3.98	33.70	48.95	74	25.05	Harmonic
4804	43.50	PK	180	1.05	V	35.00	3.98	33.70	48.78	74	25.22	Harmonic
Middle Channel (2441 MHz)												
2441	83.59	PK	178	140	H	30.6	3.61	34	83.8			Fund.
2441	73.96	AV	178	140	H	30.6	3.61	34	74.17			Fund.
2441	82.82	PK	230	1.67	V	30.6	3.61	34	83.03			Fund.
2441	71.97	AV	230	1.67	V	30.6	3.61	34	72.18			Fund.
7323	34.48	AV	250	1.00	H	38.10	4.84	33.60	43.82	54	10.18	Harmonic
7323	34.19	AV	178	1.03	V	38.10	4.84	33.60	43.53	54	10.47	Harmonic
4882	34.65	AV	250	1.00	H	35.20	4.28	33.70	40.43	54	13.57	Harmonic
4882	34.11	AV	178	1.03	V	35.20	4.28	33.70	39.89	54	14.11	Harmonic
7323	44.07	PK	178	1.03	V	38.10	4.84	33.60	53.41	74	20.59	Harmonic
7323	43.27	PK	250	1.00	H	38.10	4.84	33.60	52.61	74	21.39	Harmonic
4882	44.08	PK	178	1.03	V	35.20	4.28	33.70	49.86	74	24.14	Harmonic
4882	43.45	PK	250	1.00	H	35.20	4.28	33.70	49.23	74	24.77	Harmonic
High Channel (2480 MHz)												
2480	81.32	PK	35	1.67	H	30.6	3.62	34	81.54			Fund.
2480	71.66	AV	35	1.67	H	30.6	3.62	34	71.88			Fund.
2480	83.11	PK	355	1.67	V	30.6	3.62	34	83.33			Fund.
2480	72.58	AV	355	1.67	V	30.6	3.62	34	72.8			Fund.
7440	34.28	AV	280	1.20	V	38.10	4.87	33.60	43.65	54	10.35	Harmonic
7440	34.17	AV	355	1.67	H	38.10	4.87	33.60	43.54	54	10.46	Harmonic
4960	34.48	AV	355	1.10	V	35.40	4.48	33.70	40.66	54	13.34	Harmonic
4960	34.26	AV	35	1.10	H	35.40	4.48	33.70	40.44	54	13.56	Harmonic
7440	43.87	PK	280	1.20	V	38.10	4.87	33.60	53.24	74	20.76	Harmonic
7440	43.47	PK	355	1.67	H	38.10	4.87	33.60	52.84	74	21.16	Harmonic
4960	44.56	PK	355	1.10	V	35.40	4.48	33.70	50.74	74	23.26	Harmonic
4960	43.45	PK	35	1.10	H	35.40	4.48	33.70	49.63	74	24.37	Harmonic

Spurious emission in restricted band:

Freq. (MHz)	S.A. Reading (dBμV)	Detector PK/QP/AV	Direction Degree	Antenna			Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	Result
Out of left side band (2310-2390 MHz)												
2371.56	34.58	AV	183	1.10	H	30.6	3.61	34	34.79	54	19.21	Compliant
2371.56	34.56	AV	246	1.40	V	30.6	3.61	34	34.77	54	19.23	Compliant
2371.56	45.00	PK	352	1.50	V	30.6	3.61	34	45.21	74	28.79	Compliant
2371.56	44.78	PK	355	1.30	H	30.6	3.61	34	44.99	74	29.01	Compliant
Out of left side band (2483.5-2500 MHz)												
2484.50	34.26	AV	172	1.30	H	30.6	3.61	34	34.47	54	19.53	Compliant
2484.50	34.11	AV	172	1.30	V	30.6	3.61	34	34.32	54	19.68	Compliant
2484.50	44.73	PK	270	1.50	H	30.6	3.61	34	44.94	74	29.06	Compliant
2484.50	44.02	PK	270	1.50	V	30.6	3.61	34	44.23	74	29.77	Compliant

Note: The above are the highest points in restricted band.

Test Mode: Transmitting (EDR) (Below 1GHz)



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
912.037200	44.0	206.0	H	349.0	-3.4	46.0	2.1
178.363225	41.3	106.0	V	65.0	-17.3	43.5	2.2
87.588525	37.5	145.0	V	66.0	-22.1	40.0	2.5
85.991125	36.7	108.0	V	76.0	-22.2	40.0	3.3
172.014675	39.2	109.0	V	78.0	-17.7	43.5	4.3
846.896400	40.9	119.0	V	36.0	-4.7	46.0	5.1

Test Mode: Transmitting (EDR) (Above 1GHz)

Freq. (MHz)	S.A. Reading (dBμV)	Detector PK/QP/AV	Direction Degree	Antenna			Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	Remarks
Low Channel (2402 MHz)												
2402	79.29	PK	25	1.80	H	30.6	3.60	34	79.49			Fund.
2402	68.58	AV	35	1.80	H	30.6	3.60	34	68.78			Fund.
2402	79.69	PK	355	1.75	V	30.6	3.60	34	79.89			Fund.
2402	67.40	AV	354	1.75	V	30.6	3.60	34	67.6			Fund.
7206	34.94	AV	175	1.37	V	38.00	4.82	33.60	44.16	54	9.84	Harmonic
7206	34.87	AV	154	1.55	H	38.00	4.82	33.60	44.09	54	9.91	Harmonic
4804	34.92	AV	180	1.05	V	35.00	3.98	33.70	40.2	54	13.80	Harmonic
4804	34.62	AV	240	1.02	H	35.00	3.98	33.70	39.9	54	14.10	Harmonic
7206	44.85	PK	175	1.37	V	38.00	4.82	33.60	54.07	74	19.93	Harmonic
7206	43.58	PK	155	1.55	H	38.00	4.82	33.60	52.8	74	21.20	Harmonic
4804	44.24	PK	240	1.00	H	35.00	3.98	33.70	49.52	74	24.48	Harmonic
4804	43.85	PK	180	1.05	V	35.00	3.98	33.70	49.13	74	24.87	Harmonic
Middle Channel (2441 MHz)												
2441	80.23	PK	178	140	H	30.6	3.61	34	80.44			Fund.
2441	70.52	AV	178	140	H	30.6	3.61	34	70.73			Fund.
2441	78.57	PK	230	1.67	V	30.6	3.61	34	78.78			Fund.
2441	64.36	AV	230	1.67	V	30.6	3.61	34	64.57			Fund.
7323	34.89	AV	250	1.00	H	38.10	4.84	33.60	44.23	54	9.77	Harmonic
7323	34.82	AV	178	1.03	V	38.10	4.84	33.60	44.16	54	9.84	Harmonic
4882	34.86	AV	178	1.03	V	35.20	4.28	33.70	40.64	54	13.36	Harmonic
4882	34.68	AV	250	1.00	H	35.20	4.28	33.70	40.46	54	13.54	Harmonic
7323	44.11	PK	250	1.00	H	38.10	4.84	33.60	53.45	74	20.55	Harmonic
7323	43.67	PK	178	1.03	V	38.10	4.84	33.60	53.01	74	20.99	Harmonic
4882	43.75	PK	250	1.00	H	35.20	4.28	33.70	49.53	74	24.47	Harmonic
4882	43.15	PK	178	1.03	V	35.20	4.28	33.70	48.93	74	25.07	Harmonic
High Channel (2480 MHz)												
2480	76.68	PK	35	1.67	H	30.6	3.62	34	76.9			Fund.
2480	64.46	AV	35	1.67	H	30.6	3.62	34	64.68			Fund.
2480	76.34	PK	355	1.67	V	30.6	3.62	34	76.56			Fund.
2480	65.55	AV	355	1.67	V	30.6	3.62	34	65.77			Fund.
7440	34.68	AV	280	1.20	V	38.10	4.87	33.60	44.05	54	9.95	Harmonic
7440	34.57	AV	355	1.67	H	38.10	4.87	33.60	43.94	54	10.06	Harmonic
4960	34.57	AV	355	1.10	V	35.40	4.48	33.70	40.75	54	13.25	Harmonic
4960	34.12	AV	35	1.10	H	35.40	4.48	33.70	40.30	54	13.70	Harmonic
7440	44.11	PK	355	1.67	H	38.10	4.87	33.60	53.48	74	20.52	Harmonic
7440	43.87	PK	280	1.20	V	38.10	4.87	33.60	53.24	74	20.76	Harmonic
4960	44.65	PK	355	1.10	V	35.40	4.48	33.70	50.83	74	23.17	Harmonic
4960	43.85	PK	35	1.10	H	35.40	4.48	33.70	50.03	74	23.97	Harmonic

Spurious emission in restricted band:

Freq. (MHz)	S.A. Reading (dBμV)	Detector PK/QP/AV	Direction Degree	Antenna			Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	Result
Out of left side band (2310-2390 MHz)												
2356.67	34.75	AV	246	1.40	V	30.6	3.61	34	34.96	54	19.04	Compliant
2356.67	34.41	AV	183	1.10	H	30.6	3.61	34	34.62	54	19.38	Compliant
2356.67	44.75	PK	352	1.50	V	30.6	3.61	34	44.96	74	29.04	Compliant
2356.67	43.65	PK	355	1.30	H	30.6	3.61	34	43.86	74	30.14	Compliant
Out of left side band (2483.5-2500 MHz)												
2483.67	34.56	AV	172	1.30	V	30.6	3.61	34	34.77	54	19.23	Compliant
2483.67	34.42	AV	172	1.30	H	30.6	3.61	34	34.63	54	19.37	Compliant
2483.67	45.34	PK	270	1.50	H	30.6	3.61	34	45.55	74	28.45	Compliant
2483.67	45.06	PK	270	1.50	V	30.6	3.61	34	45.27	74	28.73	Compliant

Note: The above are the highest points in restricted band.

CFR47 §15.247(a) (1)-CHANNEL SEPARATION TEST

Applicable Standard

Frequency hopping systems shall have hopping 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	2007-10-16	2008-10-16

*** Statement of Traceability:** Bay Area Compliance Laboratories 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 trace.
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Vicent Kang on 2008-11-19.*

Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting (BDR)

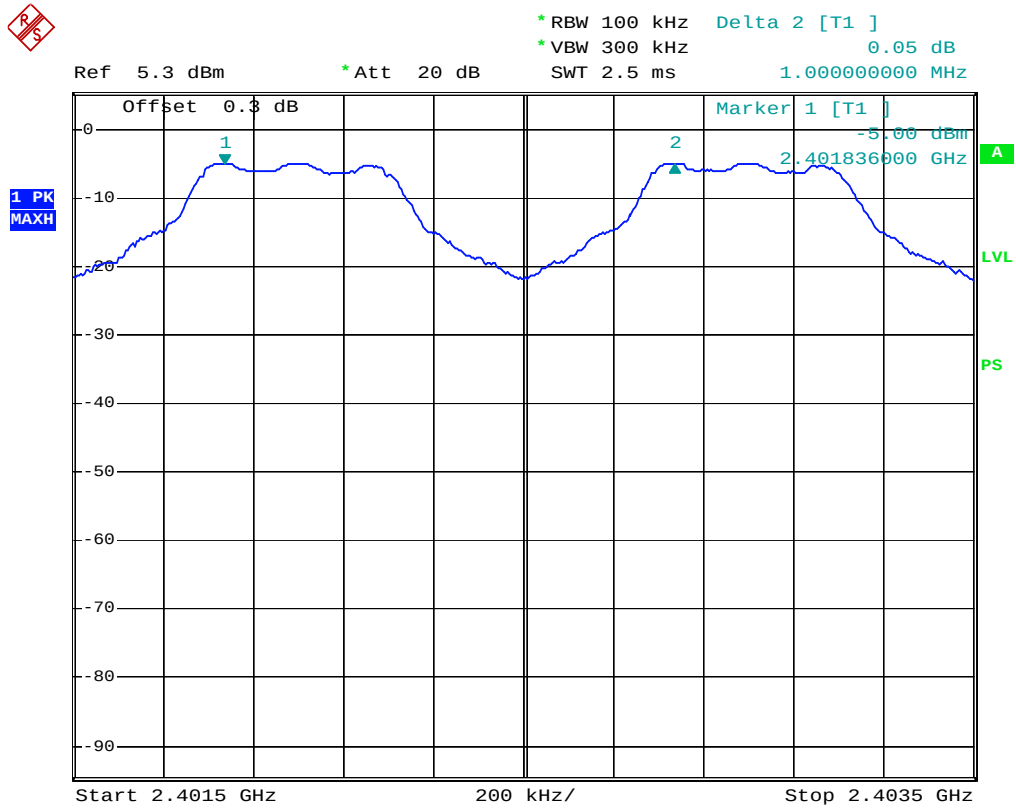
Channel	Channel Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low Channel	2402	1.000	0.555	Pass
Adjacent Channel	2403			
Mid Channel	2440	1.008	0.555	Pass
Adjacent Channel	2441			
High Channel	2480	1.000	0.571	Pass
Adjacent Channel	2479			

Test Mode: Transmitting (EDR)

Channel	Channel Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low Channel	2402	1.000	0.771	Pass
Adjacent Channel	2403			
Mid Channel	2440	1.000	0.776	Pass
Adjacent Channel	2441			
High Channel	2480	1.008	0.776	Pass
Adjacent Channel	2479			

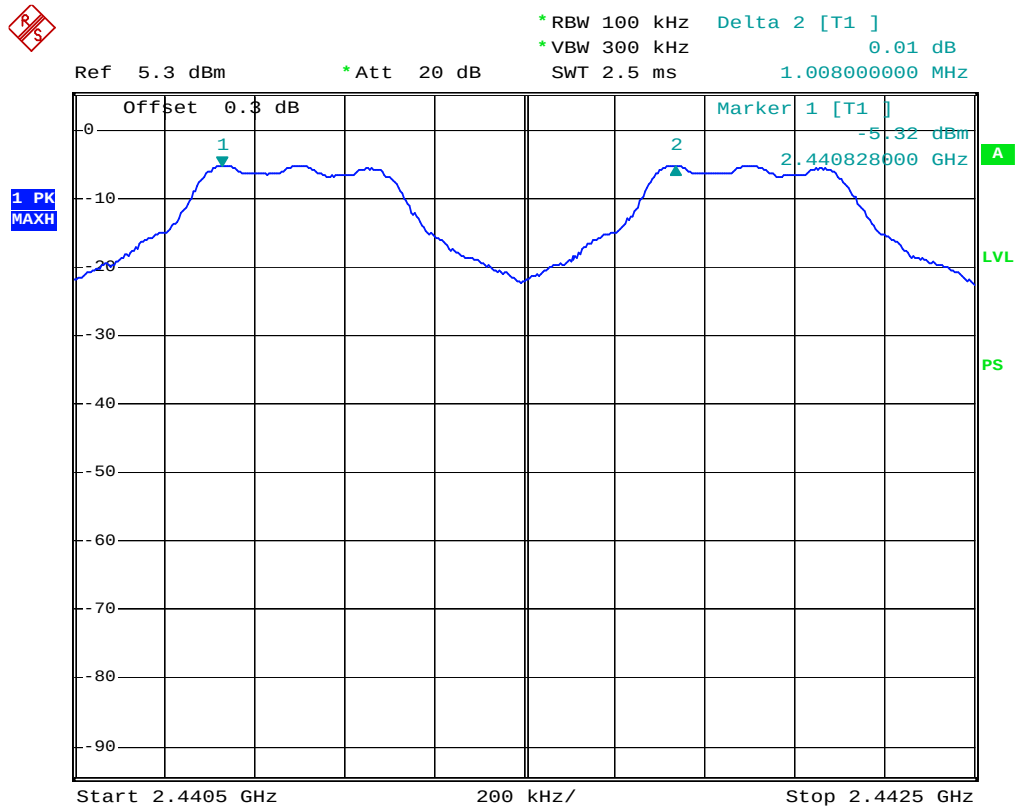
Test Mode: Transmitting (BDR)

Low Channel



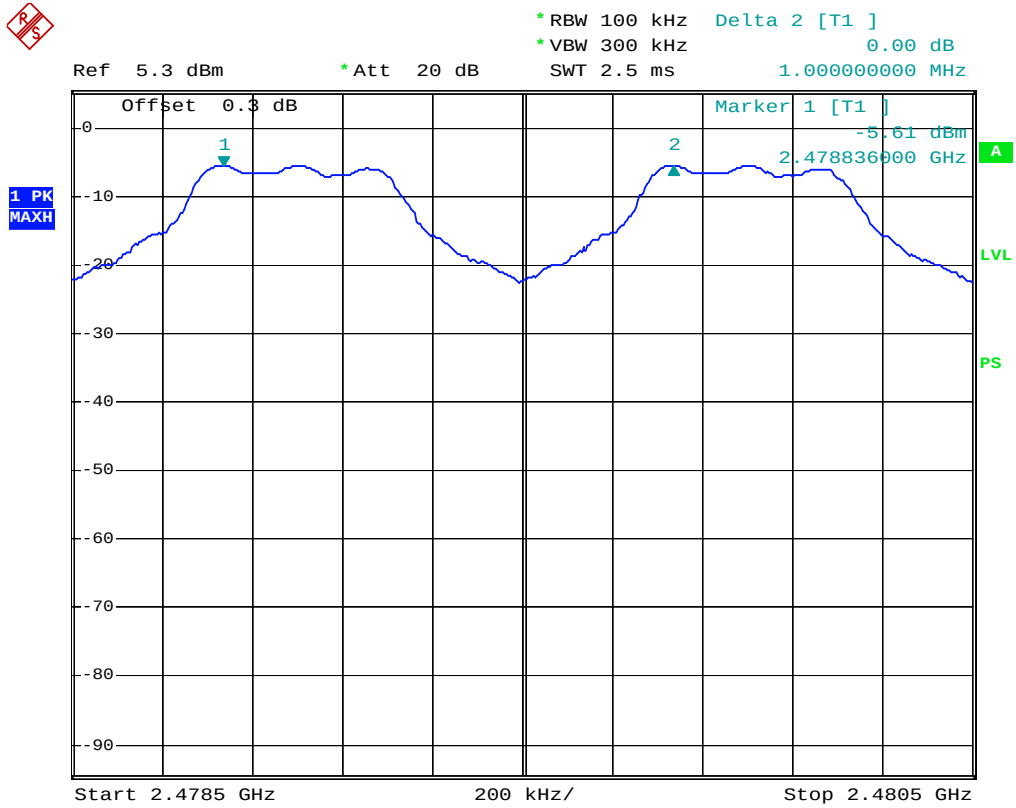
Date: 19.NOV.2008 10:33:33

Middle Channel



Date: 19.NOV.2008 11:11:18

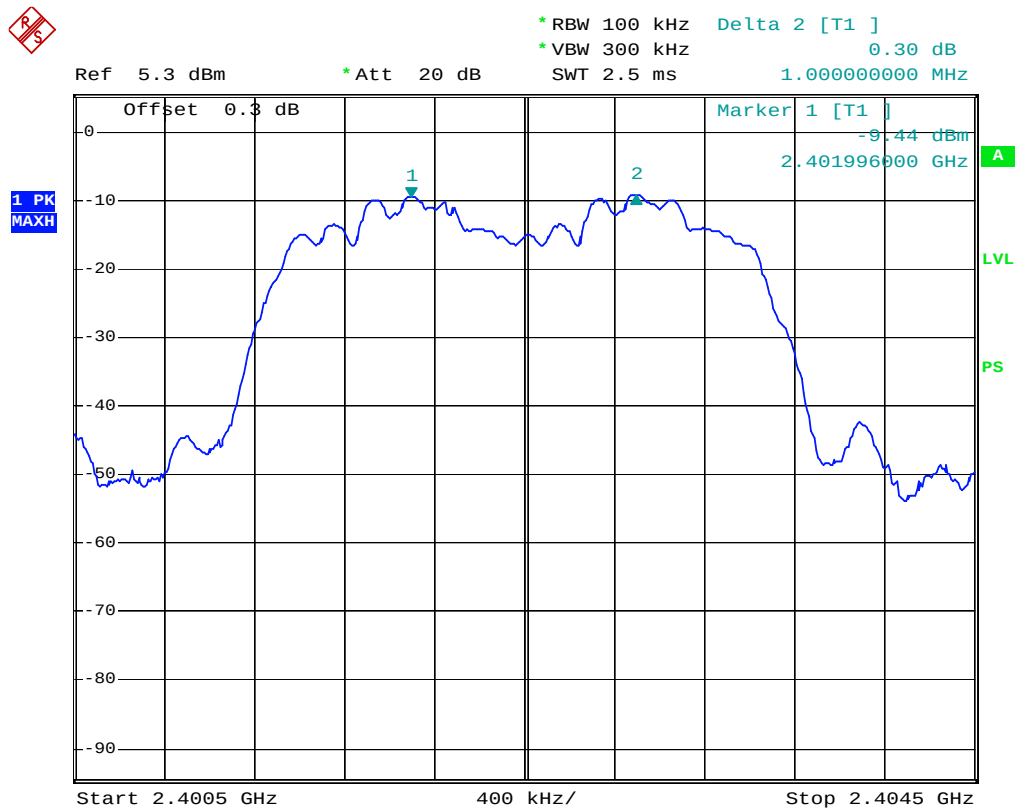
High Channel



Date: 19.NOV.2008 11:12:32

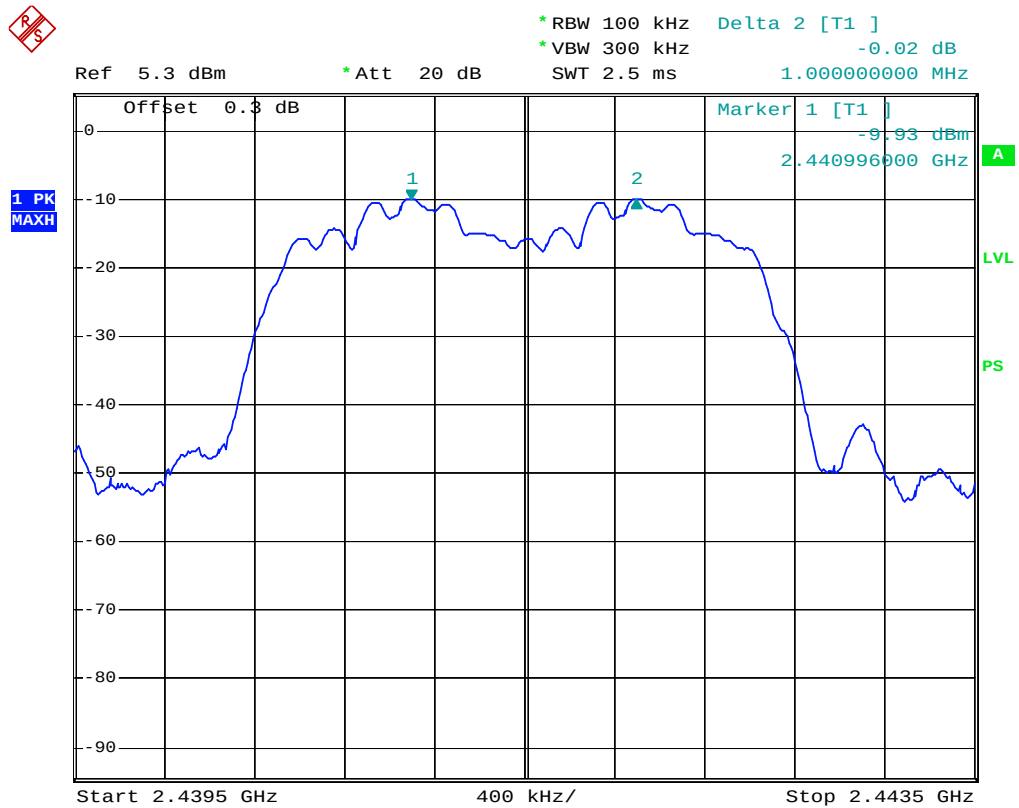
Test Mode: Transmitting (EDR)

Low Channel



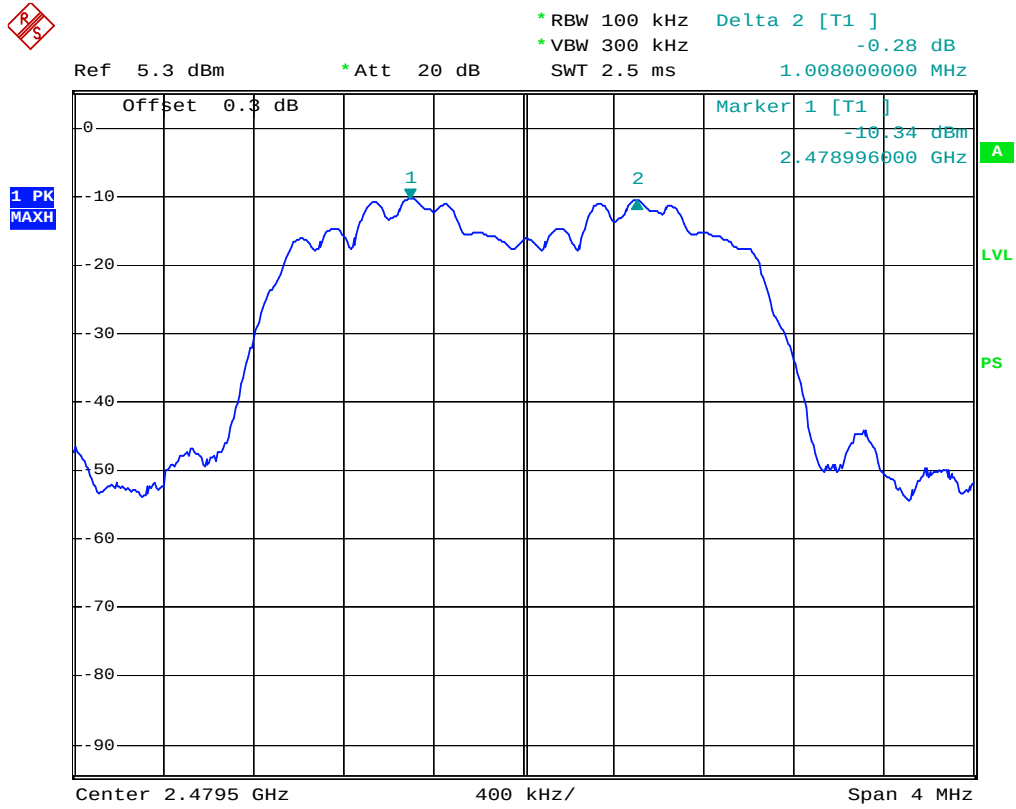
Date: 19.NOV.2008 15:53:31

Middle Channel



Date: 19.NOV.2008 15:54:45

High Channel



Date: 19.NOV.2008 15:55:52

CFR47 §15.247(a) (1) – 20dB BANDWIDTH TESTING

Applicable Standard

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 125mW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16

*** Statement of Traceability:** Bay Area Compliance Laboratories 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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Vicent Kang on 2008-11-19.*

Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting (BDR)

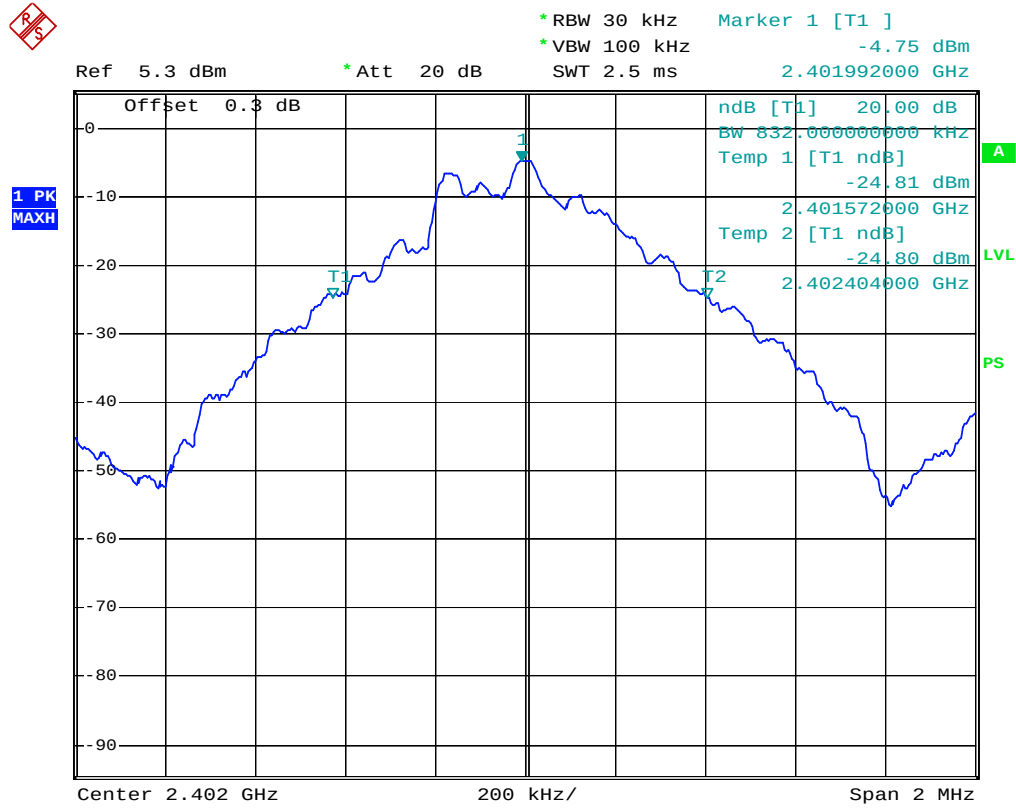
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
Low	2402	0.832
Middle	2441	0.832
High	2480	0.856

Test Mode: Transmitting (EDR)

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
Low	2402	1.156
Middle	2441	1.164
High	2480	1.164

Test Mode: Transmitting (BDR)

Low Channel



Date: 19.NOV.2008 10:30:19

Ref 5.3 dBm * Att 20 dB SWT 2.5 ms

Marker 1 [T1] -5.37 dBm

*RBW 30 kHz *VBW 100 kHz

Offset 0.3 dB

1 PK MAXH

ndB [T1] 20.00 dB

BW 832.00000000 kHz

Temp 1 [T1 ndB] -25.41 dBm

2.440572000 GHz

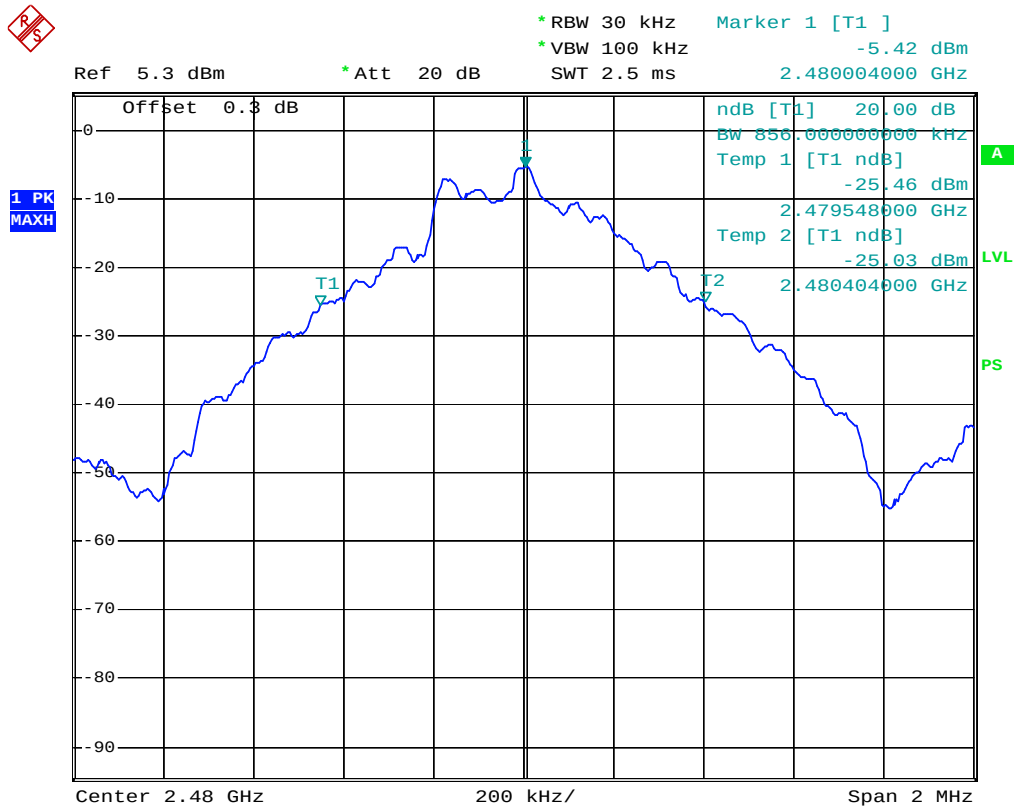
Temp 2 [T1 ndB] -25.48 dBm

2.441404000 GHz

Center 2.441 GHz 200 kHz/ Span 2 MHz

Date: 19.NOV.2008 10:50:28

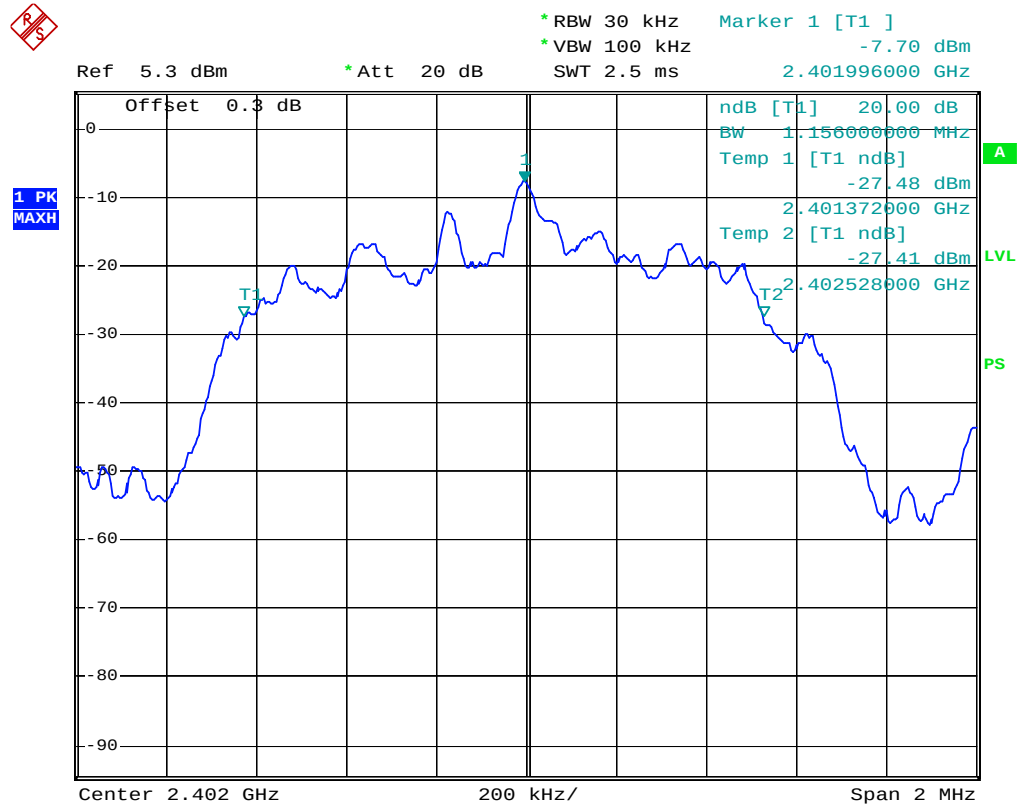
High Channel



Date: 19.NOV.2008 10:51:27

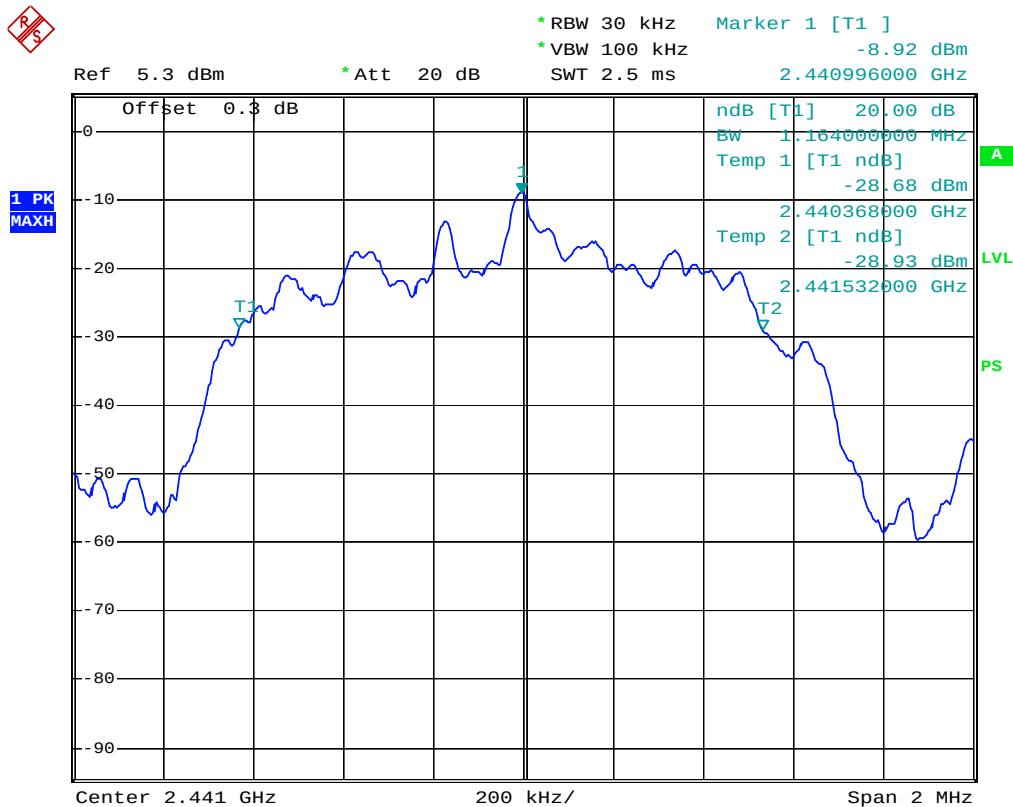
Test Mode: Transmitting (EDR)

Low Channel



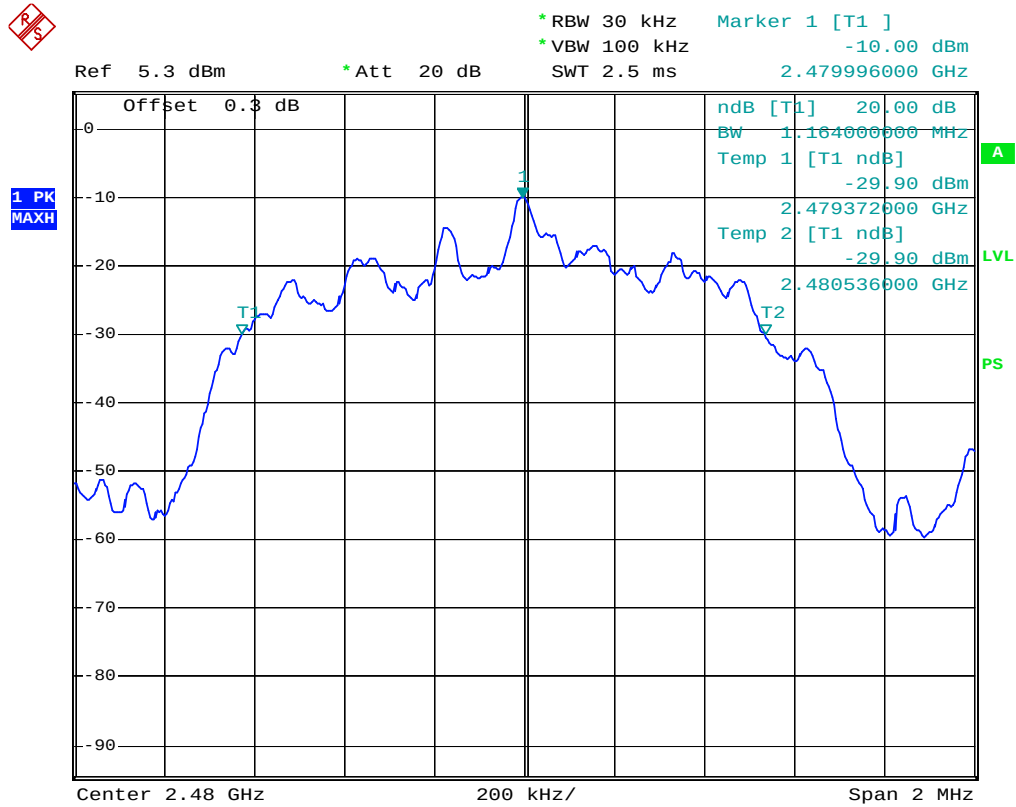
Date: 19.NOV.2008 15:47:11

Middle Channel



Date: 19.NOV.2008 15:47:59

High Channel



Date: 19.NOV.2008 15:49:58

CFR47 §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	2007-10-16	2008-10-16

*** Statement of Traceability:** Bay Area Compliance Laboratories 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:	56 %
ATM Pressure:	100.9 kPa

The testing was performed by Vicent Kang on 2008-11-19.

Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting (BDR)

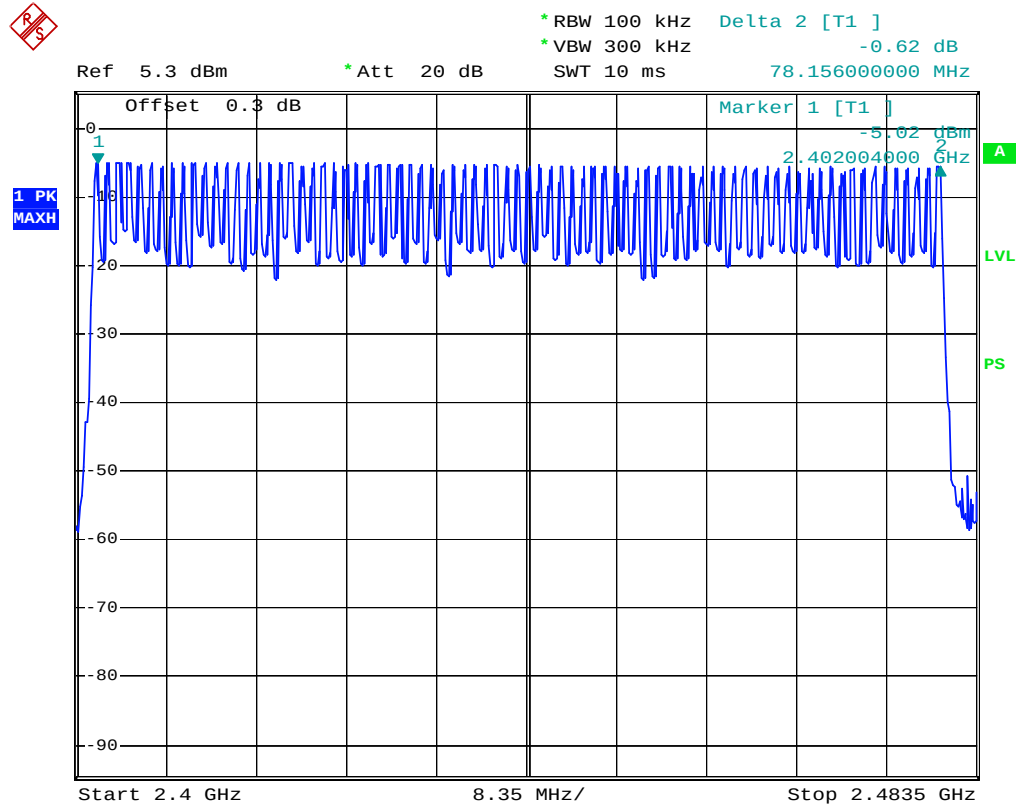
Frequency Range (MHz)	Number of Hopping Channel	Limit
2402-2480	79	≥ 15

Test Mode: Transmitting (EDR)

Frequency Range (MHz)	Number of Hopping Channel	Limit
2402-2480	79	≥ 15

Test Mode: Transmitting (BDR)

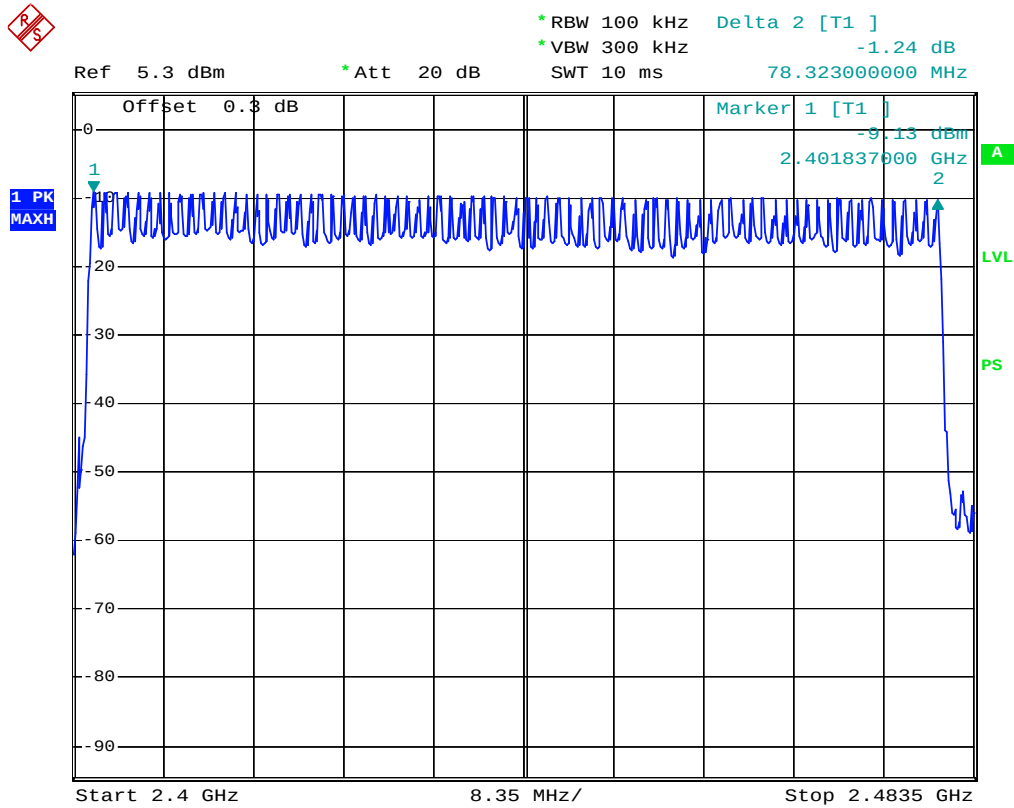
Number of Hopping Channels



Date: 19.NOV.2008 11:15:39

Test Mode: Transmitting (EDR)

Number of Hopping Channels



Date: 19.NOV.2008 16:05:20

CFR47 §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	2007-10-16	2008-10-16

*** Statement of Traceability:** Bay Area Compliance Laboratories 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 pulse was get from single sweep. In addition, the time of single pulses was tested.

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:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Vicent Kang on 2008-11-19.*

Test Result: Compliant.

Please refer to following tables and plots

*Test Mode: Transmitting (BDR)***DH 1:** Dwell time=Pulse width (ms) $\times$ (1600 $\div$ 2 $\div$ 79) $\times$ 31.6 Second

Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
Low	0.560	0.1792	0.4	Pass
Middle	0.576	0.1843	0.4	Pass
High	0.572	0.1830	0.4	Pass

DH 3: Dwell time=Pulse width (ms) $\times$ (1600 $\div$ 4 $\div$ 79) $\times$ 31.6 Second

Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
Low	1.848	0.2957	0.4	Pass
Middle	1.840	0.2944	0.4	Pass
High	1.840	0.2944	0.4	Pass

DH 5: Dwell time=Pulse width (ms) $\times$ (1600 $\div$ 6 $\div$ 79) $\times$ 31.6 Second

Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
Low	3.12	0.3328	0.4	Pass
Middle	3.12	0.3328	0.4	Pass
High	3.12	0.3328	0.4	Pass

*Test Mode: Transmitting (EDR)***DH 1:** Dwell time=Pulse width (ms) $\times$ (1600 $\div$ 2 $\div$ 79) $\times$ 31.6 Second

Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
Low	0.476	0.1523	0.4	Pass
Middle	0.468	0.1498	0.4	Pass
High	0.476	0.1523	0.4	Pass

DH 3: Dwell time=Pulse width (ms) $\times$ (1600 $\div$ 4 $\div$ 79) $\times$ 31.6 Second

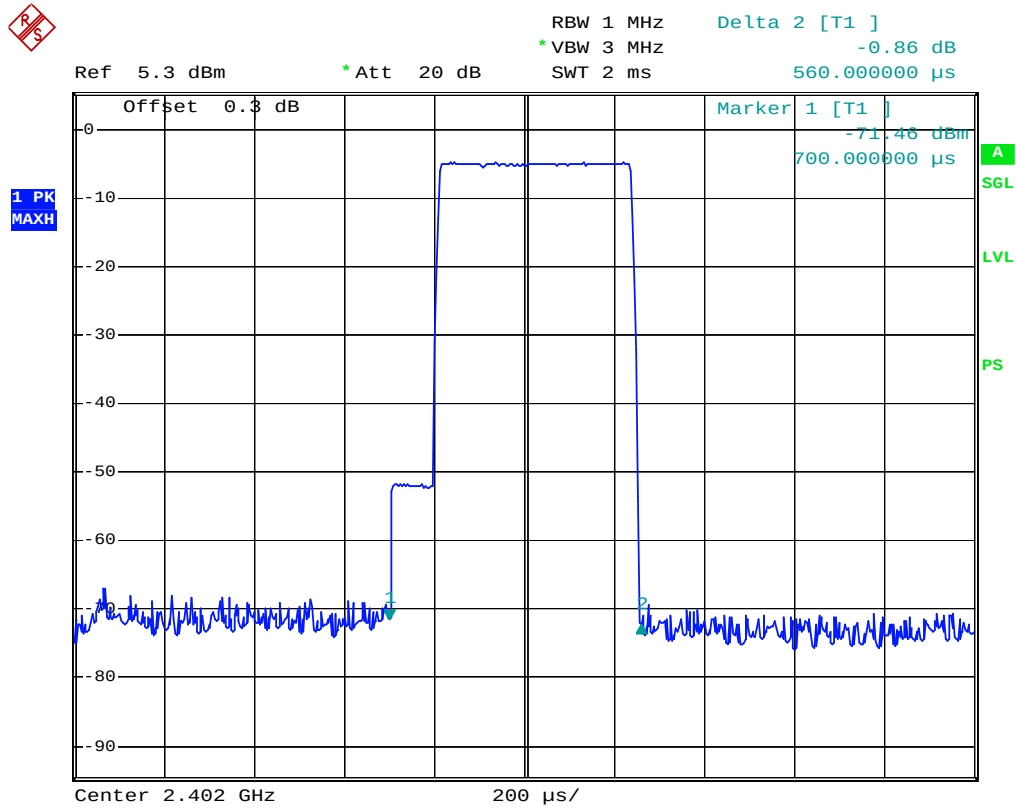
Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
Low	0.852	0.1363	0.4	Pass
Middle	0.860	0.1376	0.4	Pass
High	0.852	0.1363	0.4	Pass

DH 5: Dwell time=Pulse width (ms) $\times$ (1600 $\div$ 6 $\div$ 79) $\times$ 31.6 Second

Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
Low	1.264	0.1348	0.4	Pass
Middle	1.296	0.1382	0.4	Pass
High	1.280	0.1365	0.4	Pass

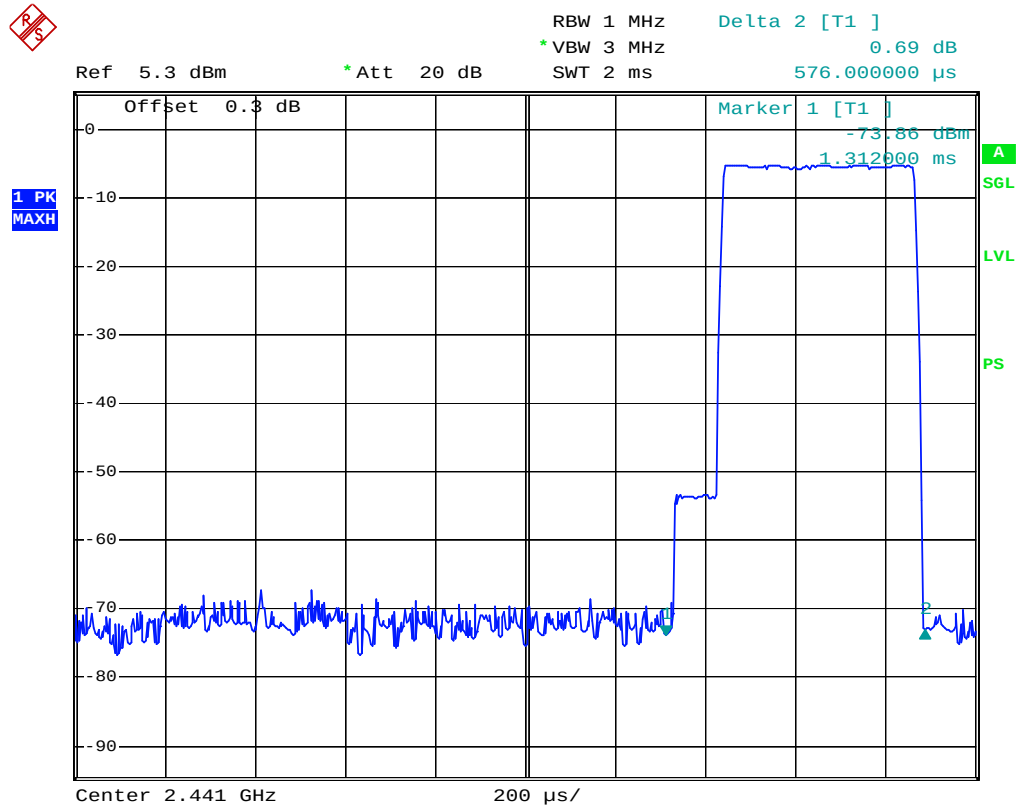
Test Mode: Transmitting (BDR)

Low Channel for DH1



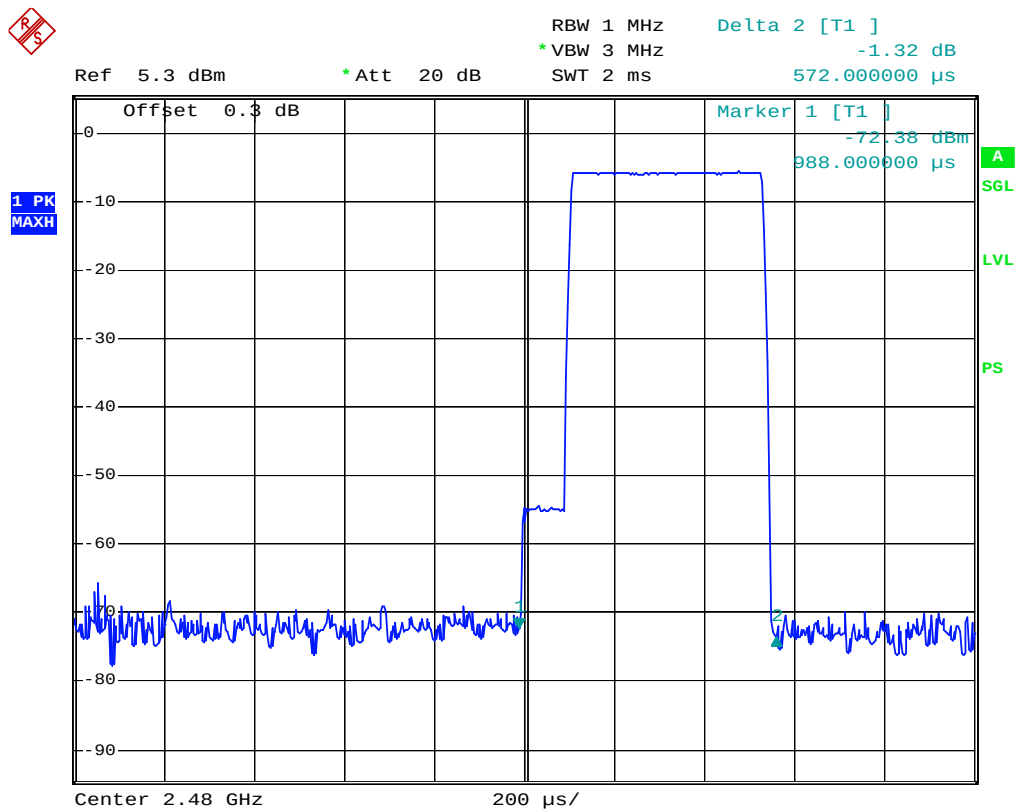
Date: 19.NOV.2008 11:17:12

Middle Channel for DH1



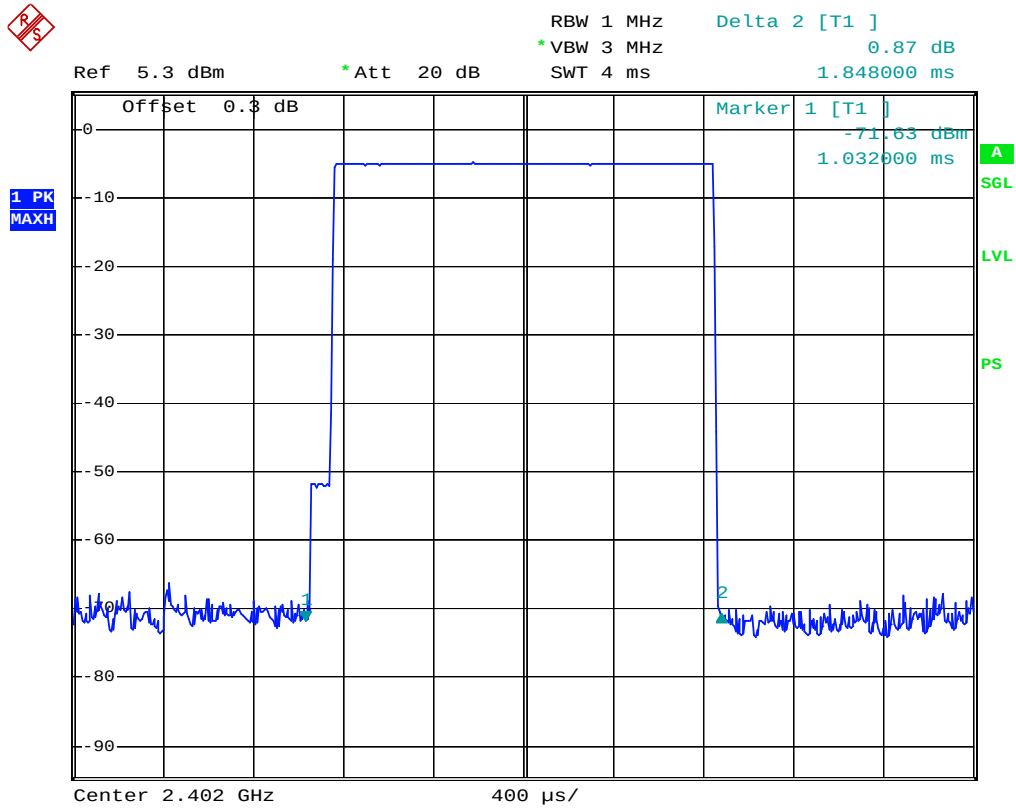
Date: 19.NOV.2008 11:19:06

High Channel for DH1



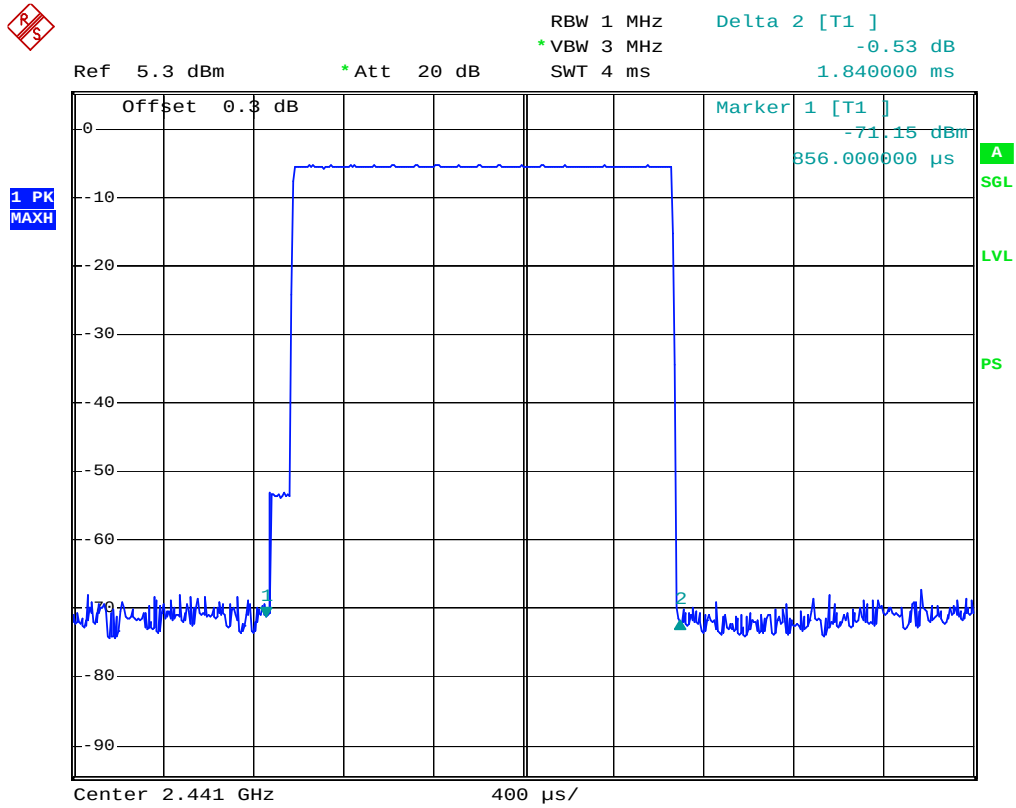
Date: 19.NOV.2008 11:19:53

Low Channel for DH3



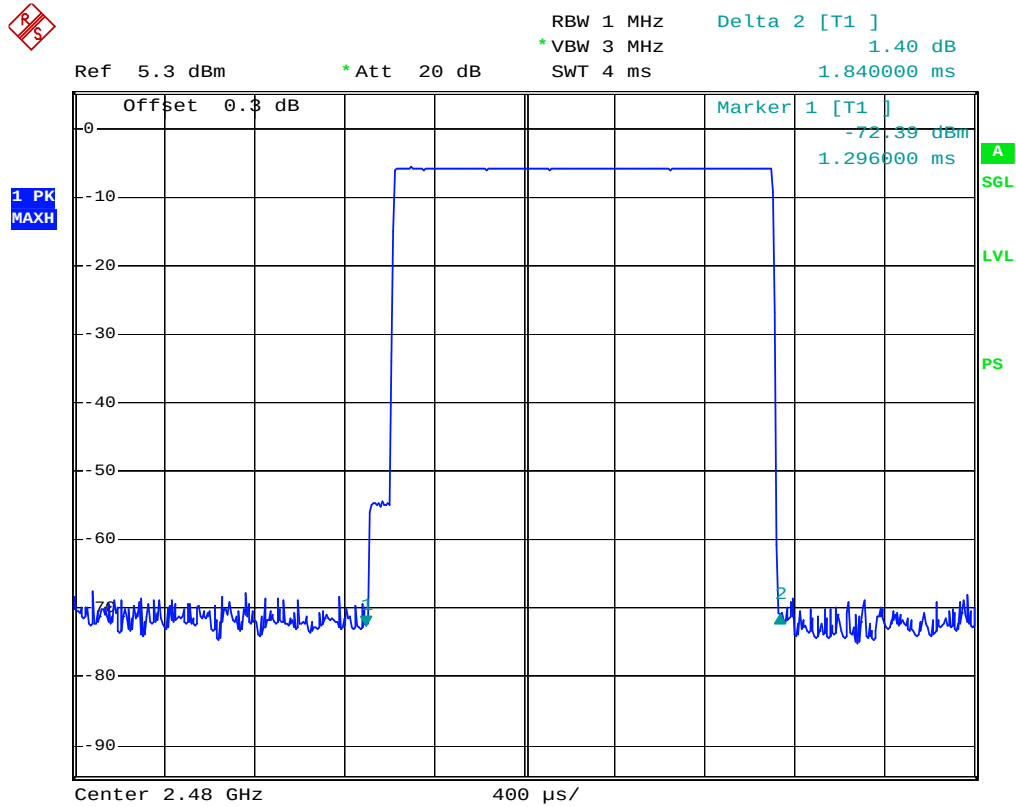
Date: 19.NOV.2008 11:25:59

Middle Channel for DH3



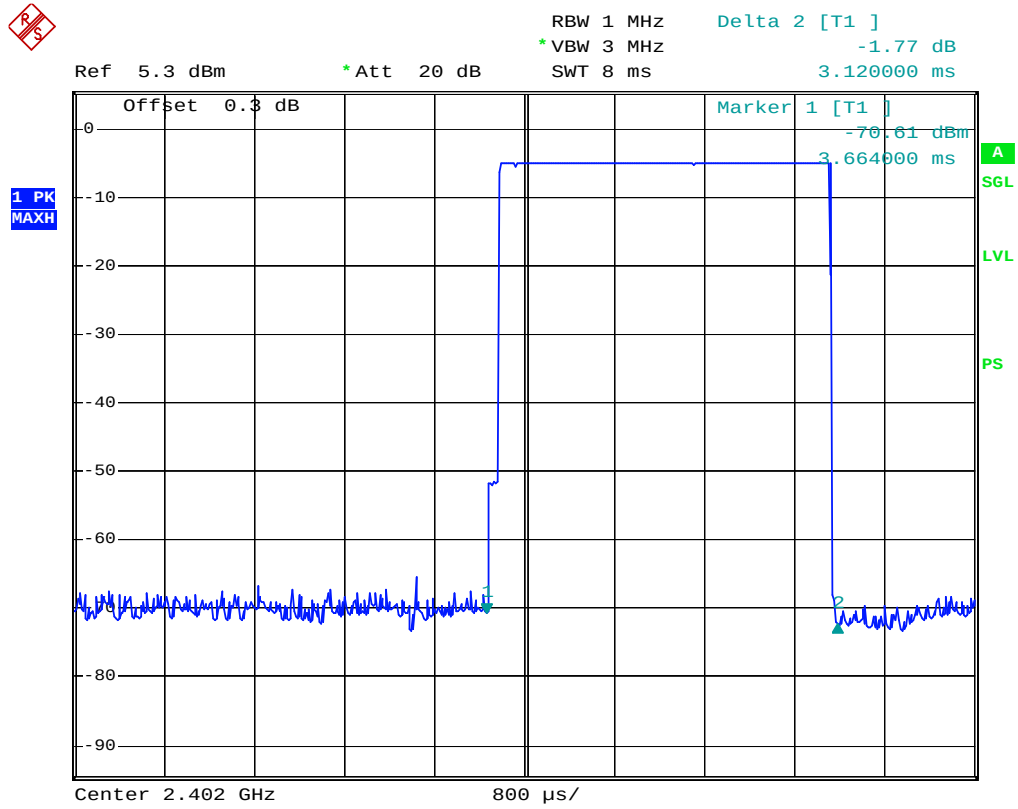
Date: 19.NOV.2008 11:25:16

High Channel for DH3



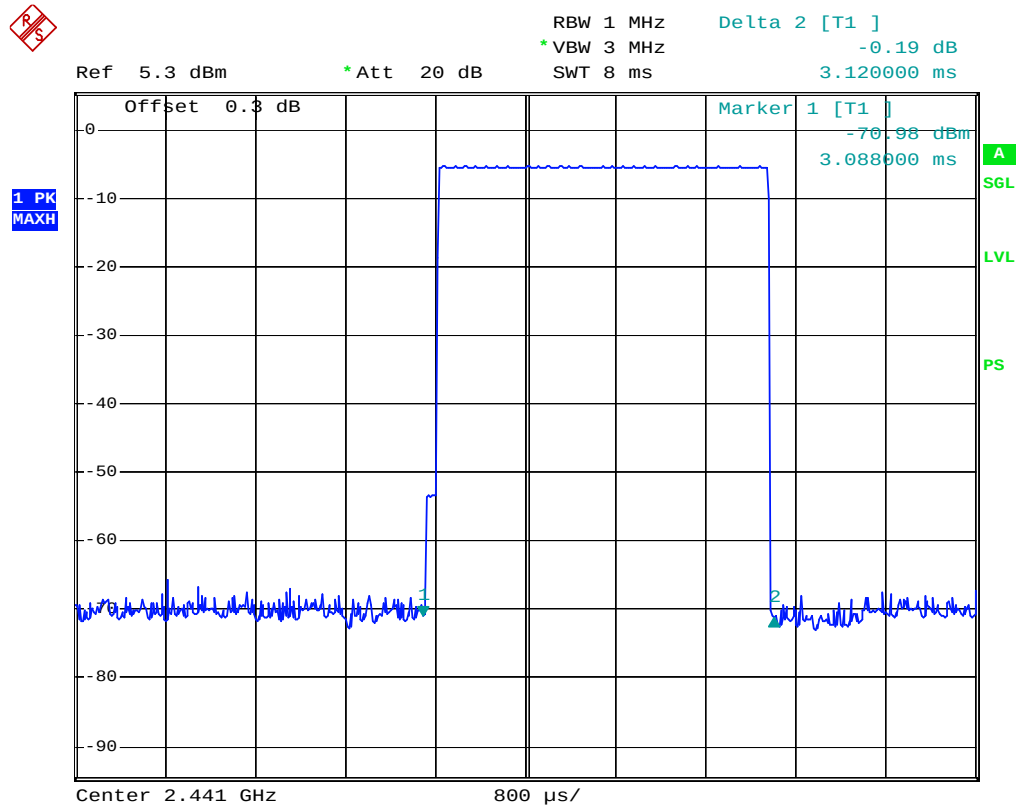
Date: 19.NOV.2008 11:23:20

Low Channel for DH5



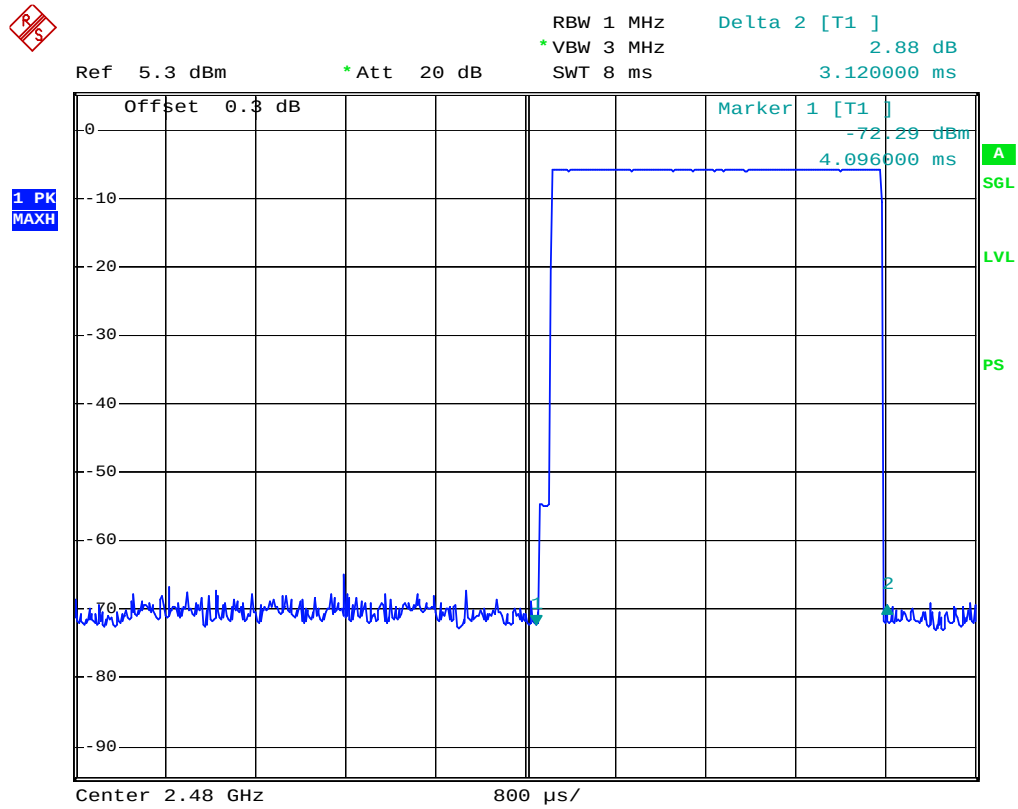
Date: 19.NOV.2008 11:27:08

Middle Channel for DH5



Date: 19.NOV.2008 11:30:05

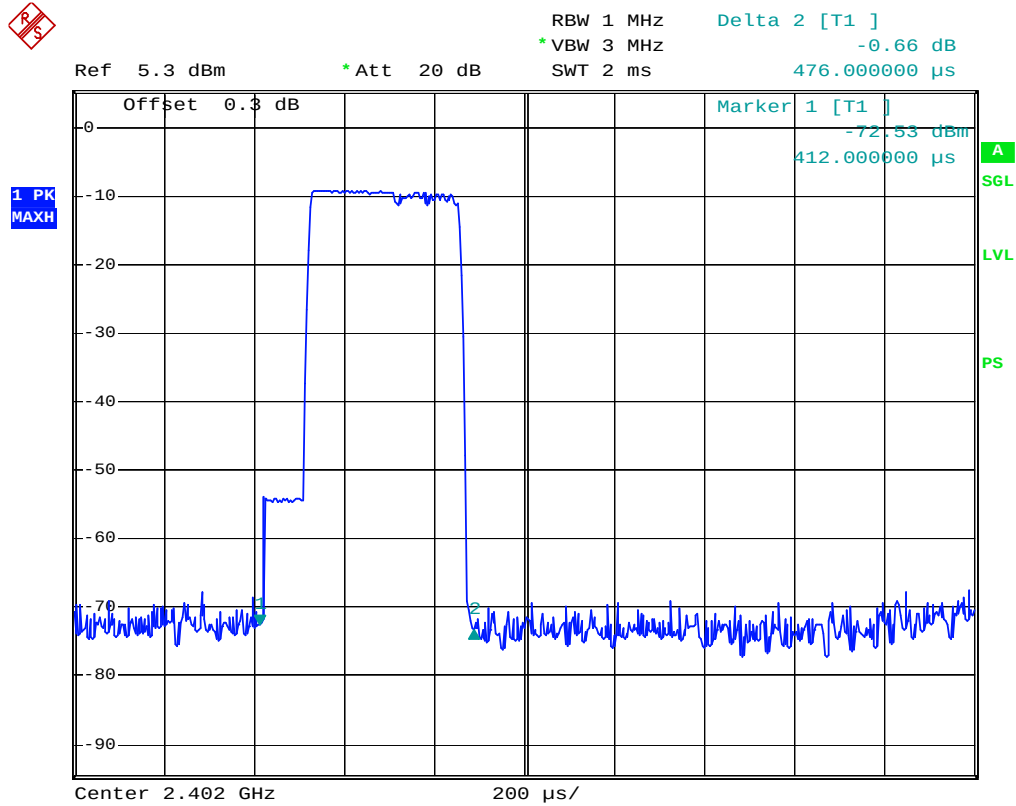
High Channel for DH5



Date: 19.NOV.2008 11:31:34

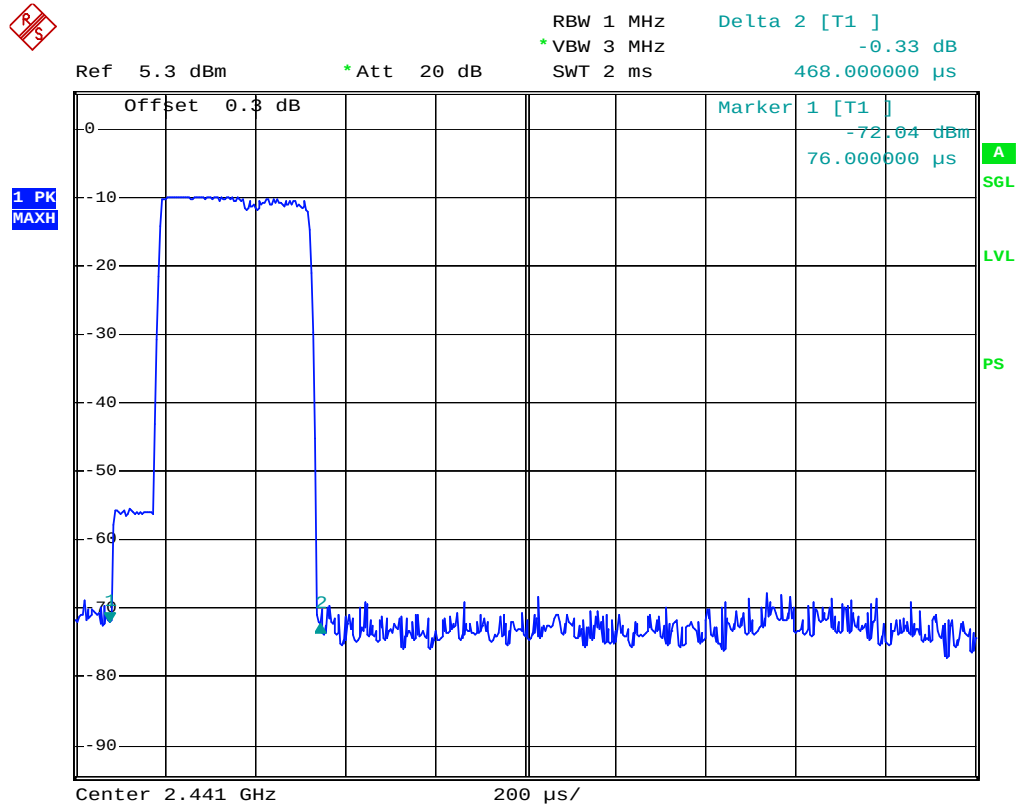
Test Mode: Transmitting (EDR)

Low Channel for DH1



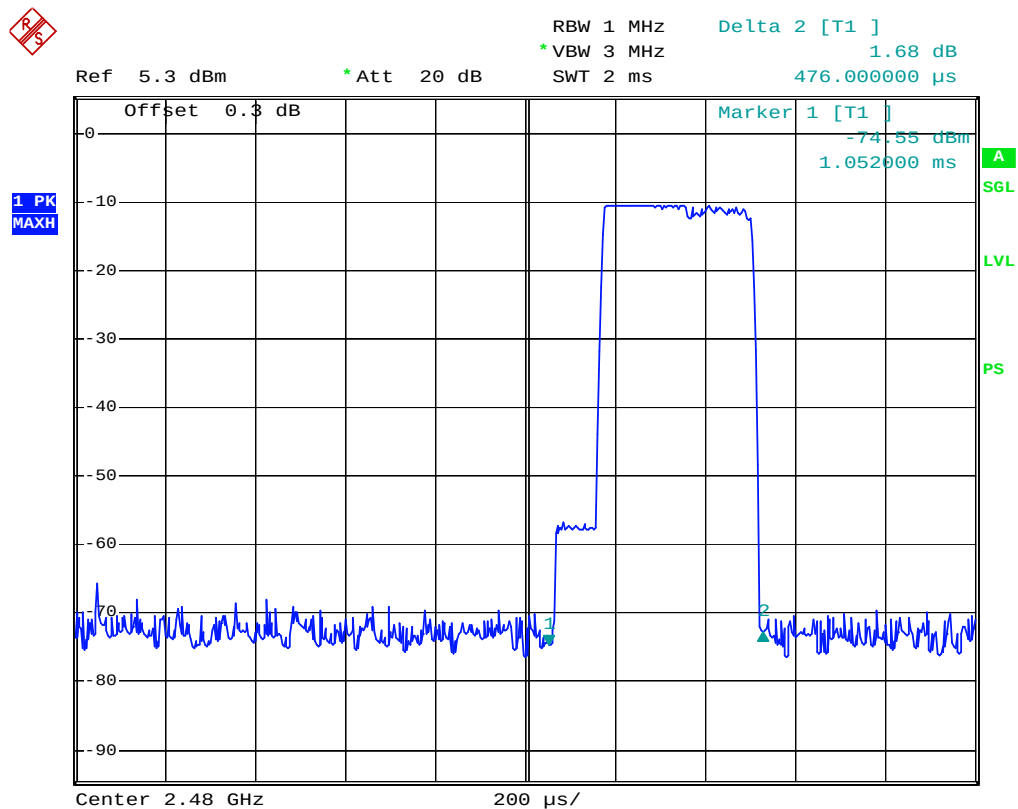
Date: 19.NOV.2008 16:07:09

Middle Channel for DH1



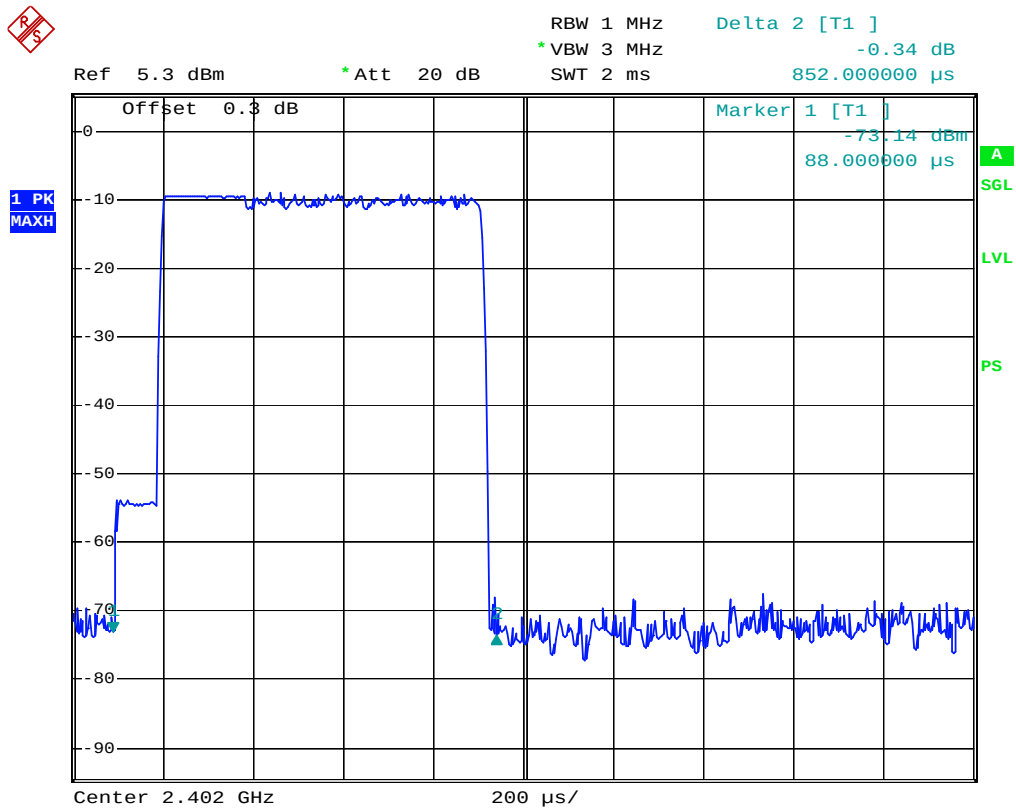
Date: 19.NOV.2008 16:08:10

High Channel for DH1



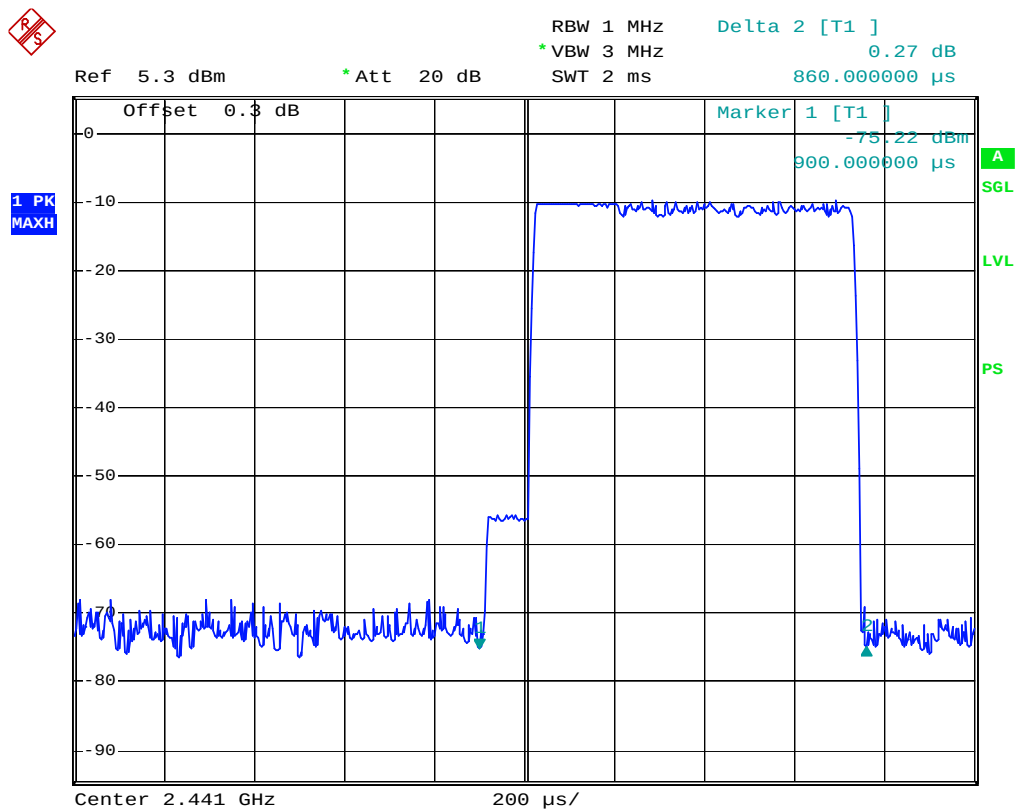
Date: 19.NOV.2008 16:09:45

Low Channel for DH3



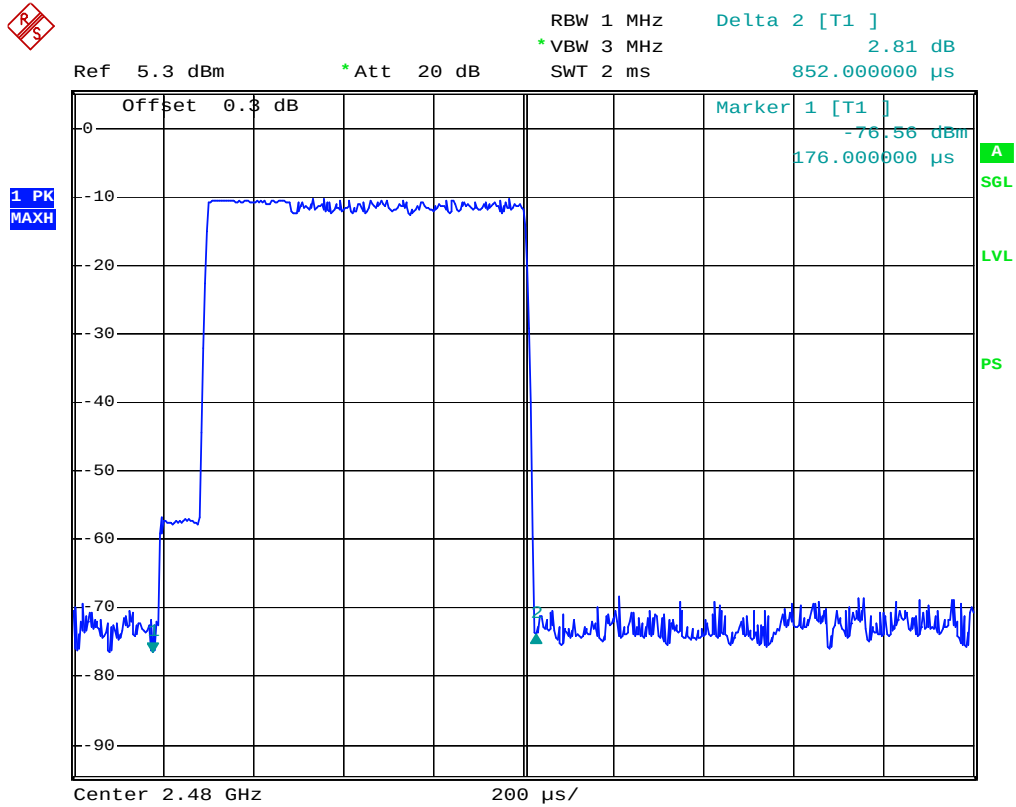
Date: 19.NOV.2008 16:16:54

Middle Channel for DH3



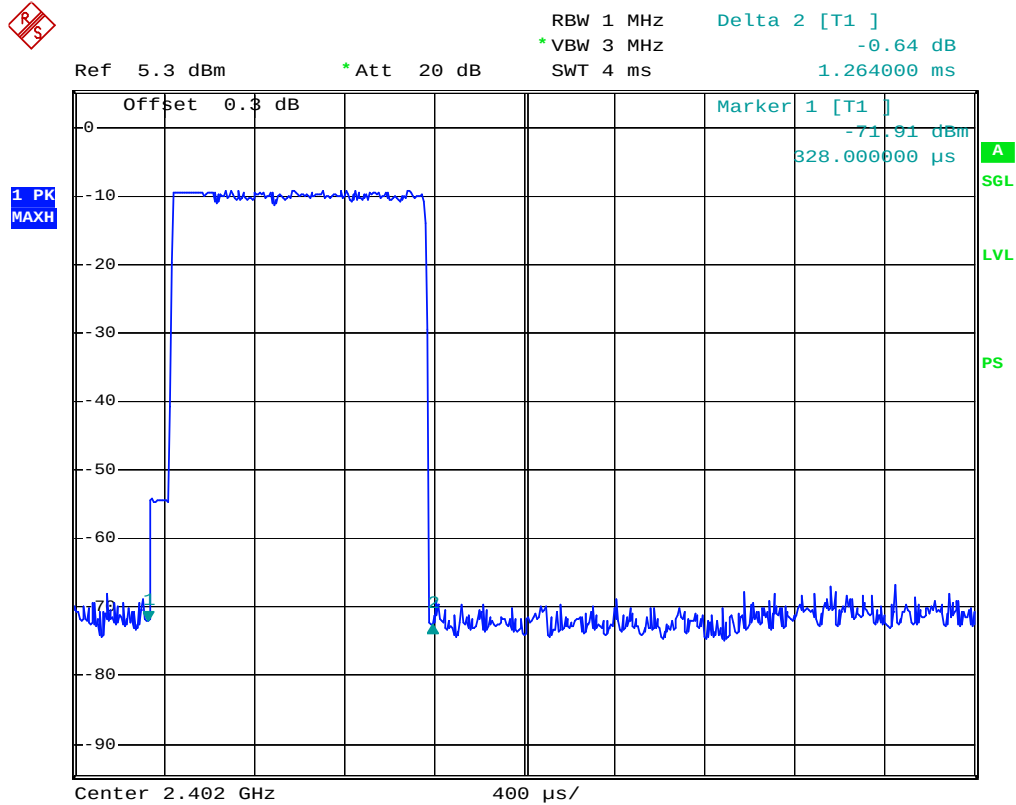
Date: 19.NOV.2008 16:15:42

High Channel for DH3



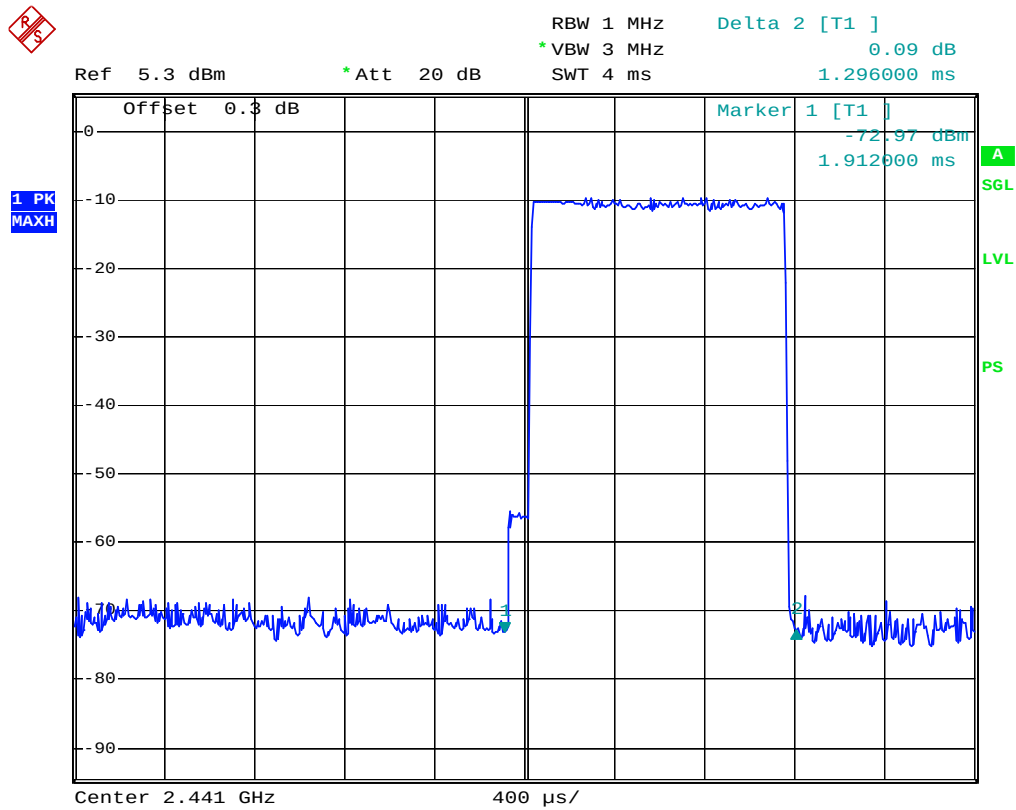
Date: 19.NOV.2008 16:17:37

Low Channel for DH5



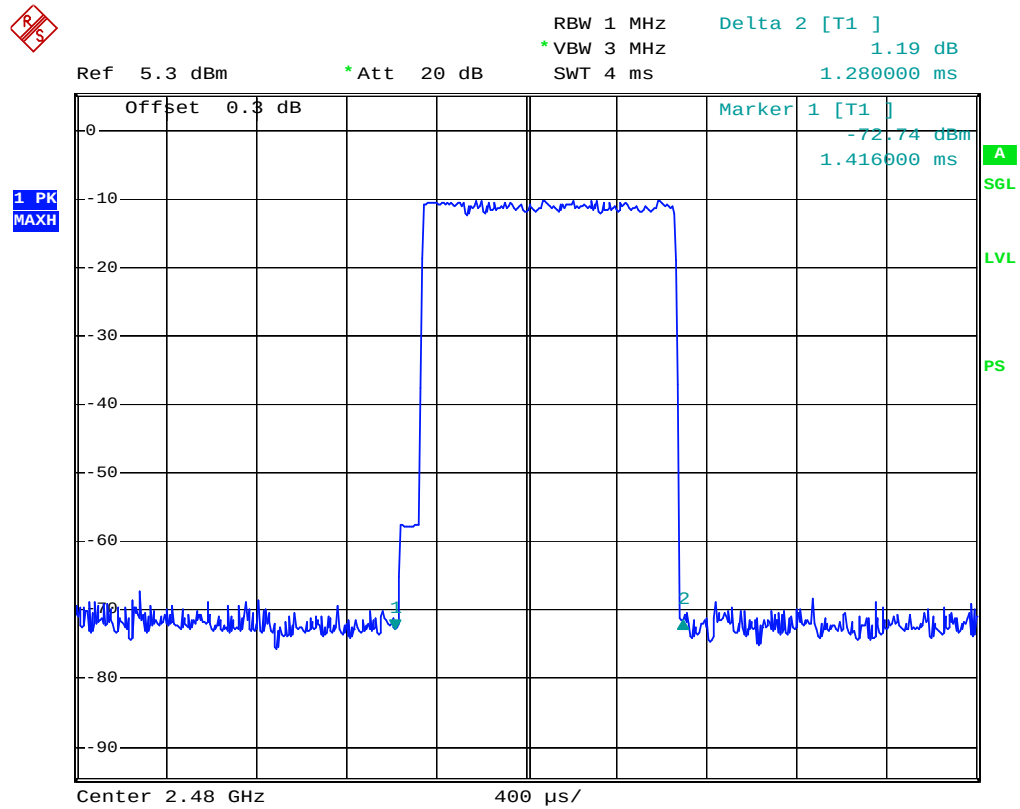
Date: 19.NOV.2008 16:21:05

Middle Channel for DH5



Date: 19.NOV.2008 16:19:47

High Channel for DH5



Date: 19.NOV.2008 16:19:06

CFR47 §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.

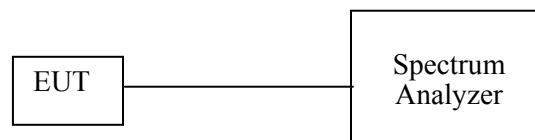
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16

*** Statement of Traceability:** Bay Area Compliance Laboratories 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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Vicent Kang on 2008-11-19*

Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting (BDR)

Freq. (MHz)	Receiver Reading (dBμV/m)	Detector PK	Table Direction Degree	Antenna		Cable Loss (dB)	Pre- Amp. (dB)	Cord. Amp. (dBμV/m)	EIRP		Limit (mW)
				Height (m)	Factor (dB/m)				(dBm)	(mW)	
2402	84.21	PK	254	1.7	30.6	3.60	34	84.41	-10.86	0.082	1000
2441	82.82	PK	0	1.7	30.6	3.61	34	83.03	-12.24	0.060	1000
2480	83.11	PK	355	1.6	30.6	3.62	34	83.33	-11.94	0.064	1000

Note: $P \text{ (dBm)} = E \text{ (dBμV/m)} - 95.27$

Test Mode: Transmitting (EDR)

Freq. (MHz)	Receiver Reading (dBμV/m)	Detector PK	Table Direction Degree	Antenna		Cable Loss (dB)	Pre- Amp. (dB)	Cord. Amp. (dBμV/m)	EIRP		Limit (mW)
				Height (m)	Factor (dB/m)				(dBm)	(mW)	
2402	79.69	PK	254	1.7	30.6	3.60	34	79.89	-15.38	0.029	1000
2441	80.23	PK	0	1.7	30.6	3.61	34	80.44	-14.83	0.033	1000
2480	76.68	PK	355	1.6	30.6	3.62	34	76.90	-18.37	0.015	1000

Note: $P \text{ (dBm)} = E \text{ (dBμV/m)} - 95.27$

CFR47 §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	2008-10-16	2009-10-16

*** Statement of Traceability:** Bay Area Compliance Laboratories 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. For conducted measurements the transmitter shall be connected to the measuring equipment.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz 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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

**The testing was performed by Vicent Kang on 2008-11-19*

Test Result: Compliant

Please refer to the following table and plots.

Test Mode: Transmitting (BDR)

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.510	47.47	20
2484.460	44.74	20

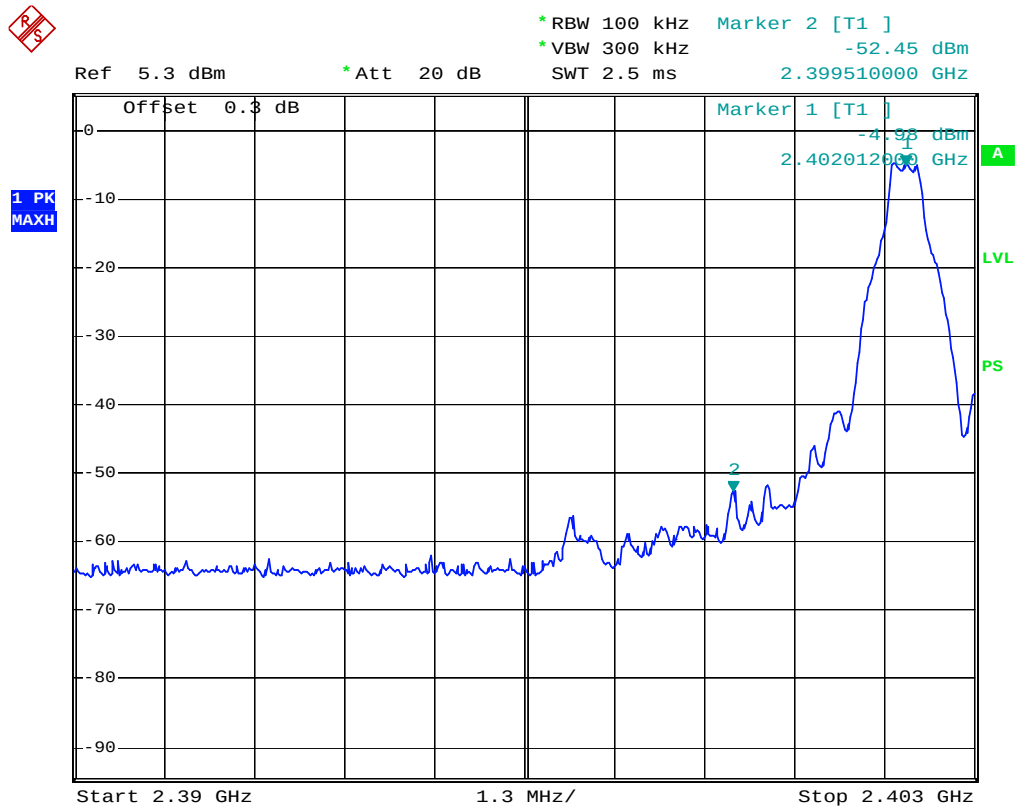
Test Mode: Transmitting (EDR)

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.854	50.14	20
2483.662	47.22	20

Note: The point fall into the stricted band was tested in FCC 15.209, please refer to the restrict band testing.

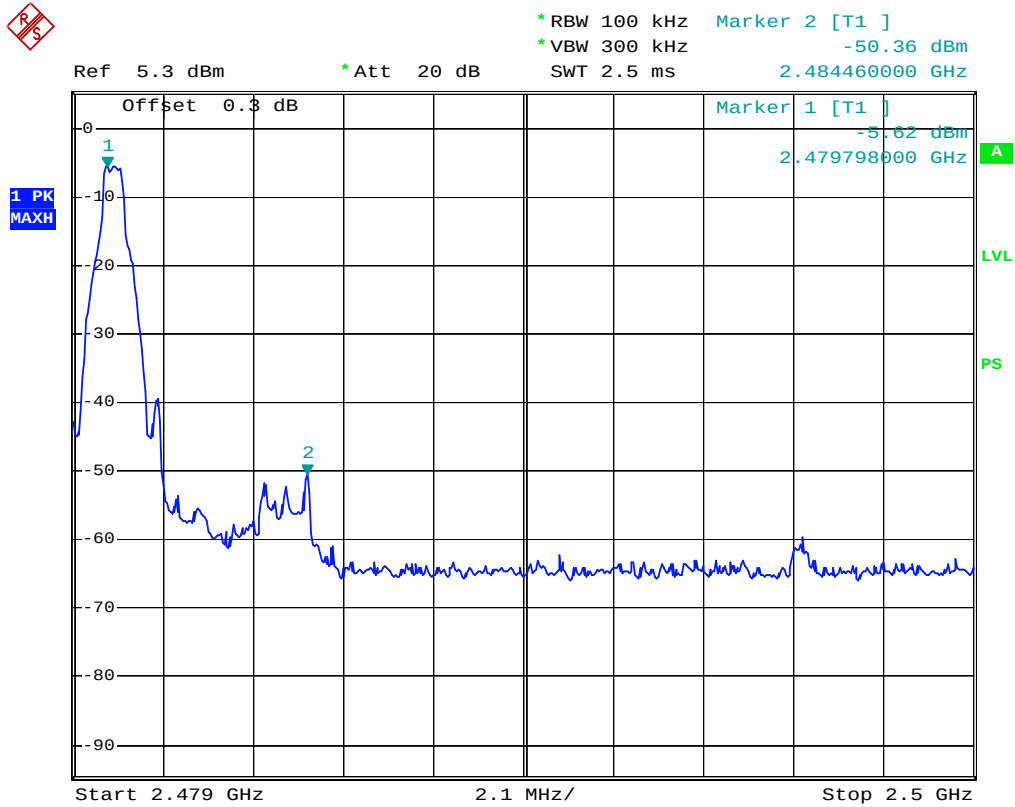
Test Mode: Transmitting (BDR)

Band Edge Left Side



Date: 19.NOV.2008 11:07:24

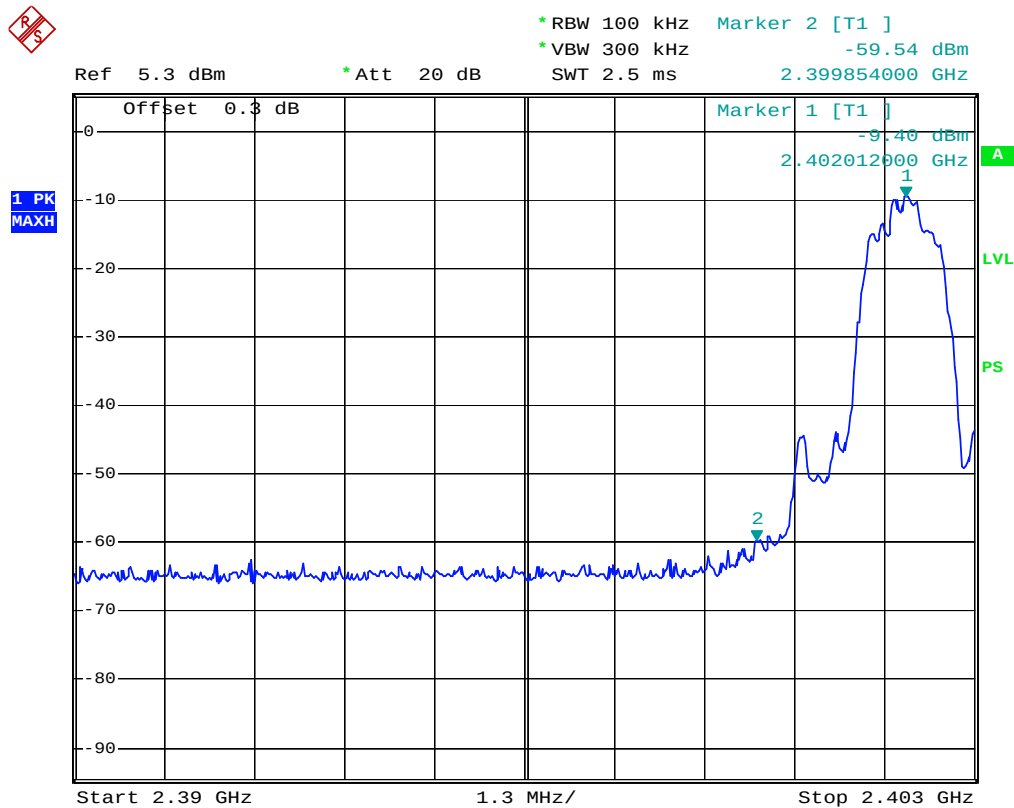
Band Edge Right Side



Date: 19.NOV.2008 11:09:36

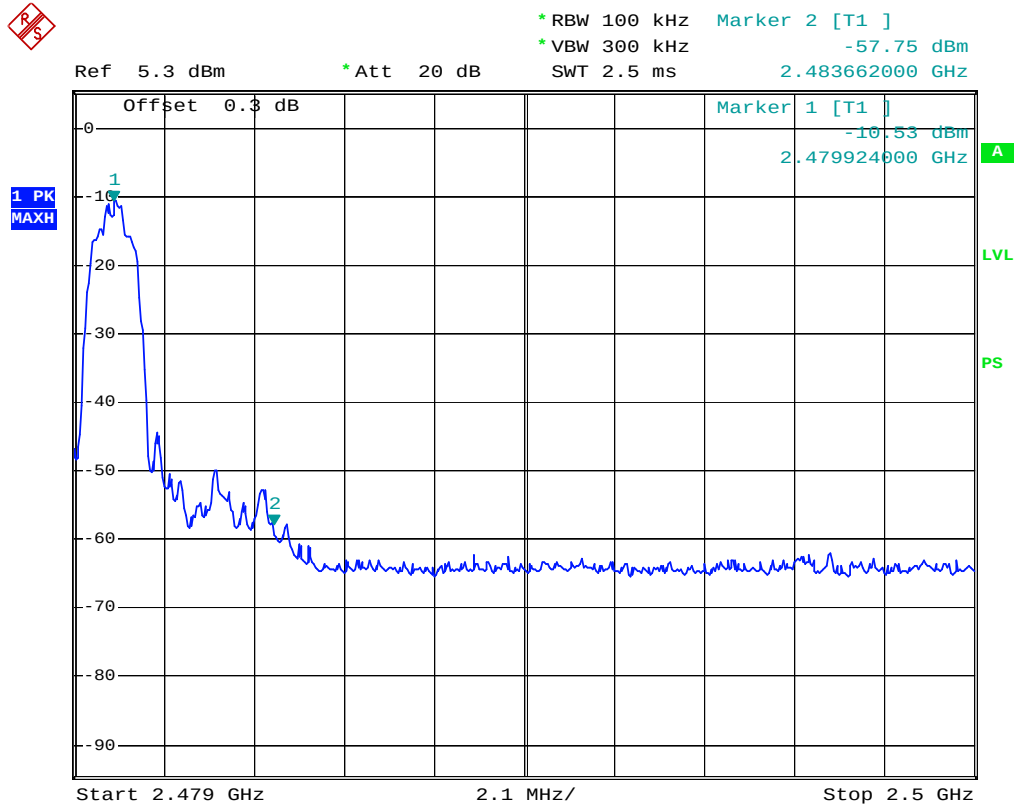
Test Mode: Transmitting (EDR)

Band Edge Left Side



Date: 19.NOV.2008 16:00:03

Band Edge Right Side



Date: 19.NOV.2008 15:58:34

***** END OF REPORT *****