NVLAP LAB CODE 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Telean Technology Ltd.

1603, 16/F, FO TAN INDUSTRIAL CENTRE, 26-28 AU PUI WAN STREET,

FO TAN, SHATIN, N.T., HONG KONG

FCC ID: MQ5BM-01TX

Report Type:	Product Type:
Original Report	2.4GHz Wireless Camera (Baby Monitor)

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Report Number:	RSZ09092803
Report Date:	2009-12-31
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Telean Technology Ltd.'s* product, model number: *BM-01TX(Camera) (FCC ID: MQ5BM-01TX)* or the "EUT" as referred to in this report is a *Baby Monitor*, which measures approximately: 9.8 cm L x 9.8 cm W x 13.20 cm H, input voltage: DC 6V adapter.

Adapter Information: CLASS 2 POWER SUPPLY
MODEL: PS06B-0600500U;
INPUT: AC 100-240V 50-60Hz 9W
OUTPUT: DC6V 500mA.

** All measurement and test data in this report was gathered from production sample serial number: 0909049 (Assigned by BACL, Shenzhen). The EUT was received on 2009-09-28.*

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2410.875	1	2414.250	2	2417.625
3	2421.000	4	2424.375	5	2427.750
6	2431.125	7	2434.500	8	2437.875
9	2441.250	10	2444.625	11	2448.000
12	2451.375	13	2454.750	14	2458.125
15	2461.500	16	2464.875	17	2468.250

Objective

This Type approval report is prepared on behalf of *Telean Technology Ltd. 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)

FCC Part 15.247 of Monitor portion, with FCC ID: MQ5BM-01RX.

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 21, 2007. 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).

EUT Exercise Software

N/A.

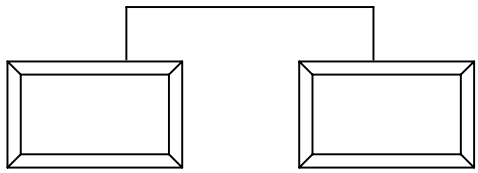
Equipment Modifications

No modification was made to the unit tested.

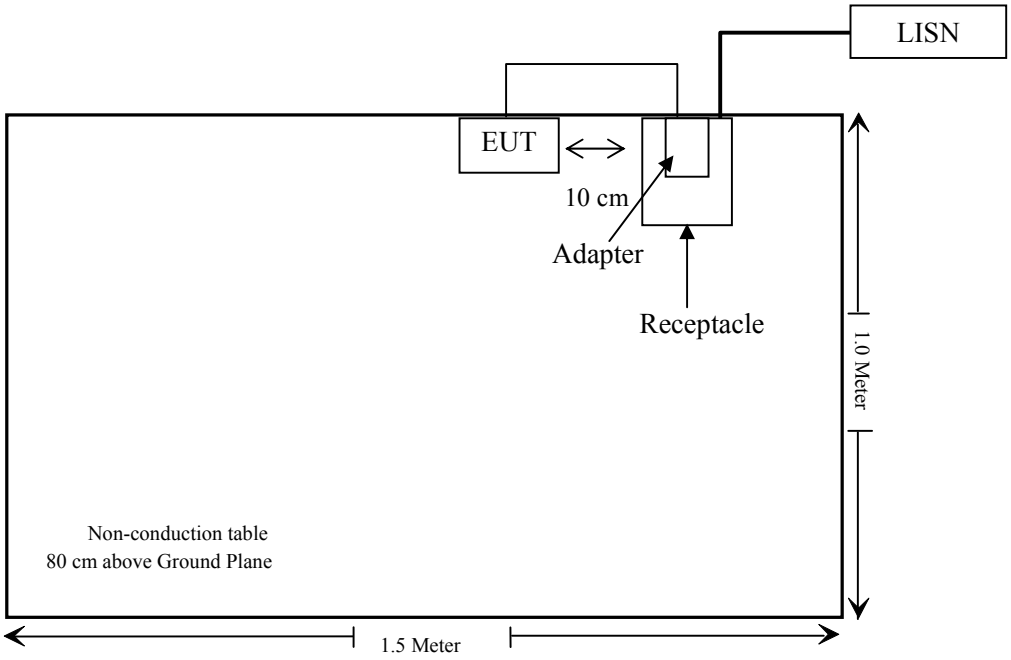
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable Power Line	1.85	Adapter	EUT

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b)(1), §2.1091	Maximum Permissible Exposure (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Radiated Emissions	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

FCC §15.247 (i) & §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Standard Applicable

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mw/cm^2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally ***numeric*** gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Maximum peak output power at antenna input terminal: 15.98 (dBm)
Maximum peak output power at antenna input terminal: 39.63 (mW)
Prediction distance: >20 (cm)
Predication frequency: 2410.875 (MHz)
Antenna Gain (typical): 1.6 (dBi)
Maximum Antenna Gain: 1.45 (numeric)
The worst case is power density at predication frequency at 20 cm: 0.0114 (mW/cm^2)
MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm^2)

Result:

The predicted power density level at 20 cm is 0.0114 mw/cm^2 which is below the uncontrolled exposure limit of 1.0 mw/cm^2, The EUT is used at least 20 cm away from user's body. It is determined as mobile equipment and complies with the MPE limit.

FCC §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. 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has an integral antenna soldered to the PCB, which in accordance to section 15.203, the maximum gain is 1.6 dBi; please refer to the internal photos.

Result: Compliant.

FCC §15.207 (a) - CONDUCTED EMISSIONS

Applicable Standard

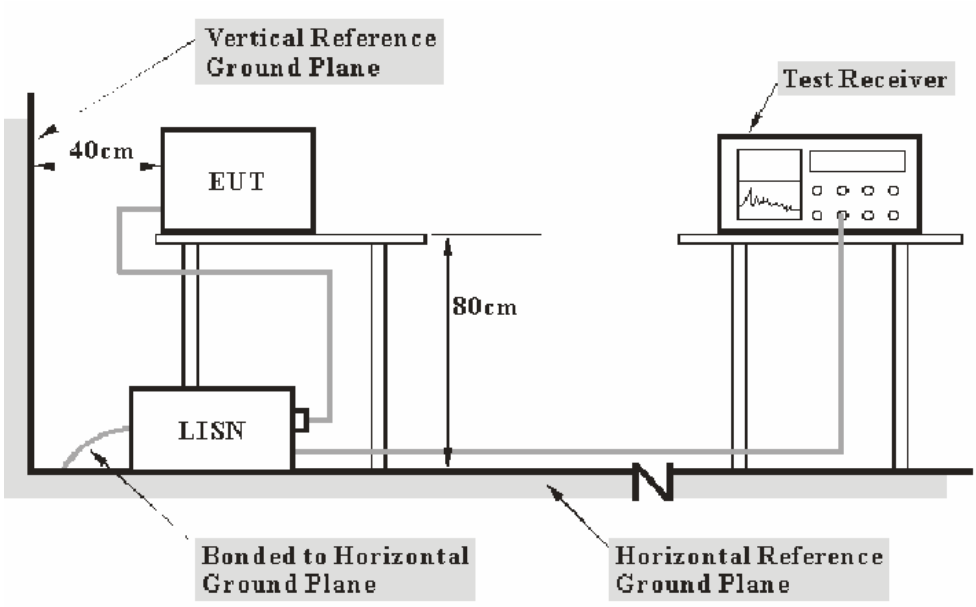
CFR47 §15.207

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 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	830245/006	2009-04-28	2010-04-27
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2009-04-28	2010-04-27

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

4.00 dB at **29.3750 MHz** in the **Neutral** conductor mode

Test Data

Environmental Conditions

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

The testing was performed by Bruce Zhang on 2009-10-15.

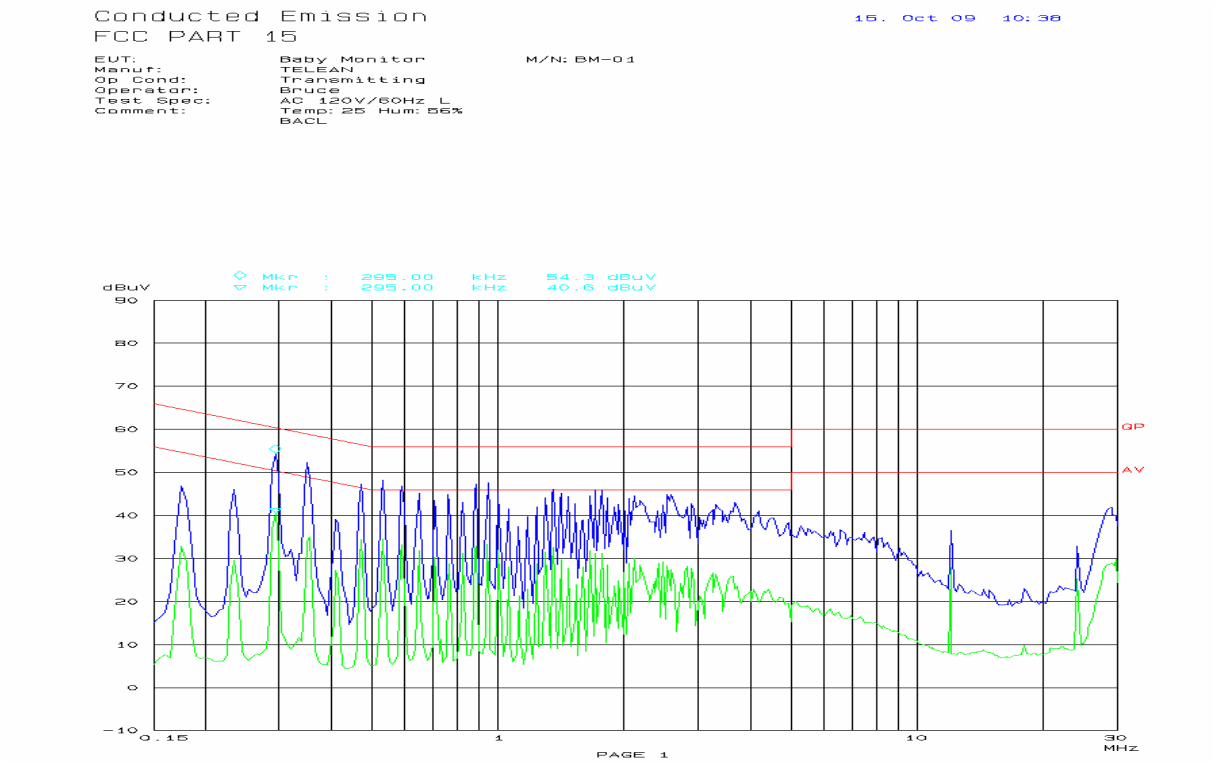
Test Mode: Transmitting

Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	**Amplitude (dBμV)**	**Detector (QP/AV)**	**Conductor (Line/Neutral)**	**Limit (dBμV)**	**Margin (dB)**
29.3750	56.00	QP	Neutral	60.00	4.00
0.2950	54.30	QP	Line	60.38	6.08
0.3500	52.30	QP	Line	58.96	6.66
0.5300	48.20	QP	Line	56.00	7.80
0.9450	47.60	QP	Line	56.00	8.40
0.4700	47.20	QP	Line	56.51	9.31
0.2950	40.60	AV	Line	50.38	9.78
29.8500	38.60	AV	Neutral	50.00	11.40
0.5300	34.50	AV	Line	46.00	11.50
0.2950	38.30	AV	Neutral	50.38	12.08
0.4700	34.30	AV	Line	46.51	12.21
0.5300	33.20	AV	Neutral	46.00	12.80
0.9450	33.20	AV	Line	46.00	12.80
0.2950	47.10	QP	Neutral	60.38	13.28
0.3550	35.00	AV	Line	48.84	13.84
0.6450	41.90	QP	Neutral	56.00	14.10
0.5300	41.30	QP	Neutral	56.00	14.70
0.6450	30.10	AV	Neutral	46.00	15.90
0.3500	43.00	QP	Neutral	58.96	15.96
0.3550	32.30	AV	Neutral	48.84	16.54
29.1700	41.80	QP	Line	60.00	18.20
29.1600	28.80	AV	Line	50.00	21.20
12.0000	28.60	AV	Neutral	50.00	21.40
12.0000	33.50	QP	Neutral	60.00	26.50

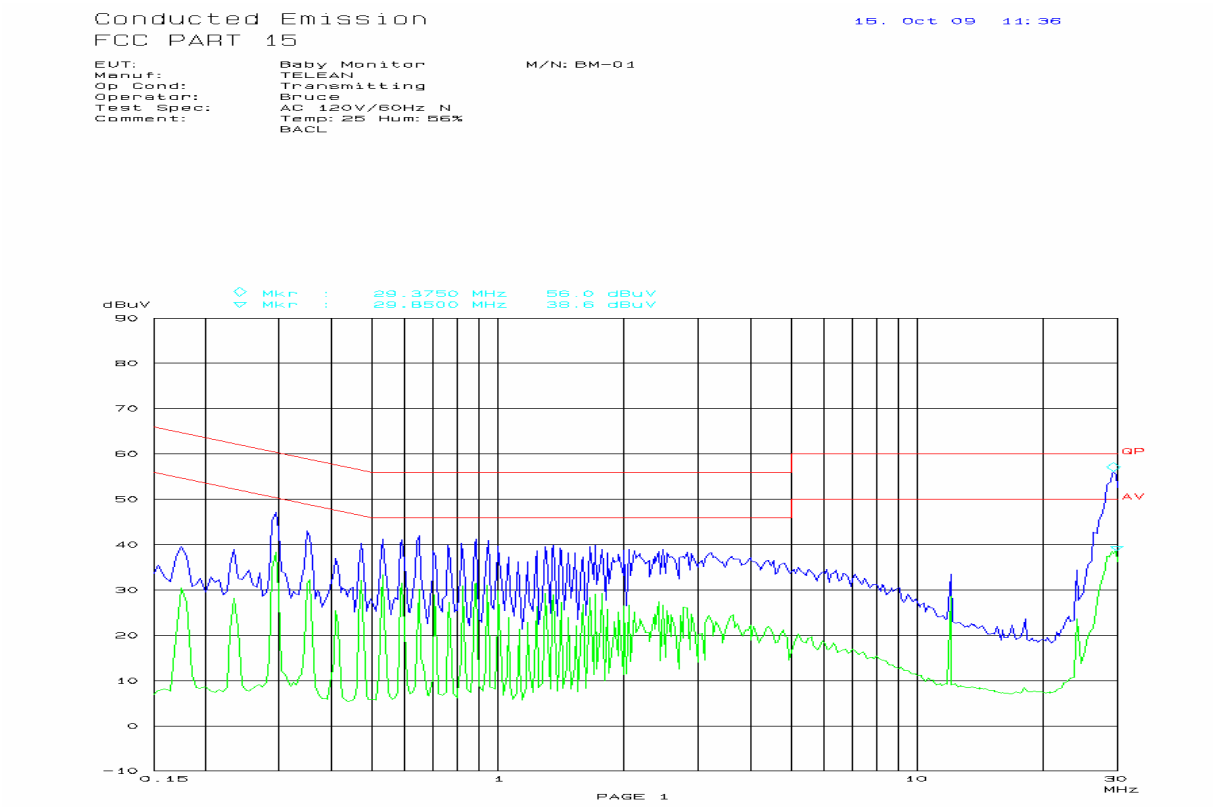
Plot(s) of Test Data

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

Line:



Neutral:



FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

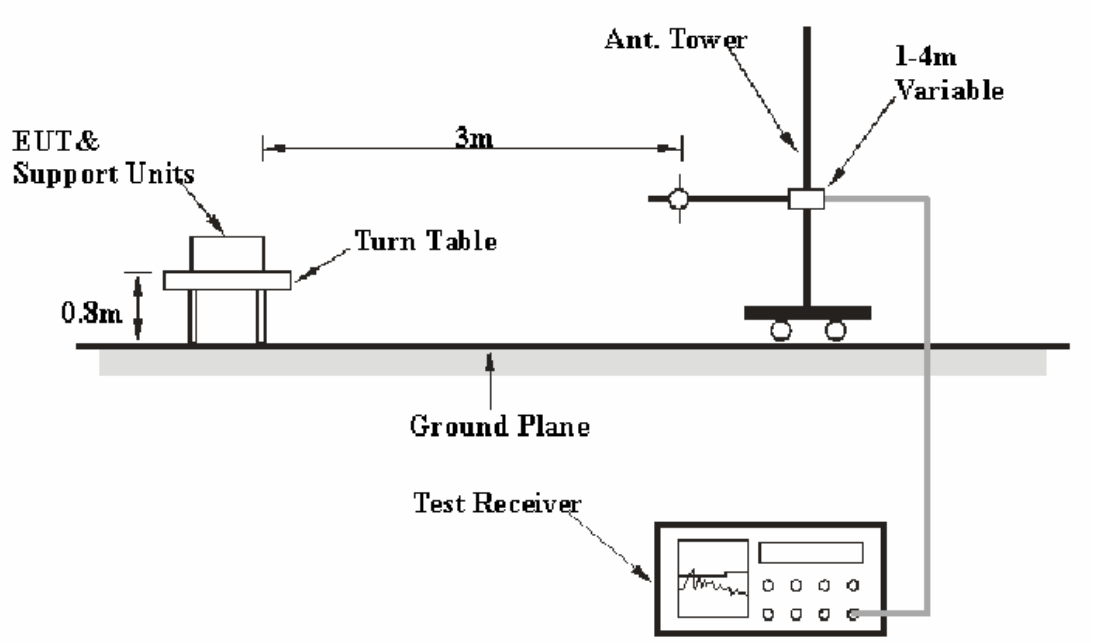
FCC §15.247 (d); §15.209; §15.205;

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 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***	***Dectector***
30MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10Hz	AV

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2009-08-02	2010-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-24	2010-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
HP	Amplifier	8449B	3008A00277	2009-09-12	2010-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2009-05-05	2010-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-08

*** 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, the host PC and monitor were 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:

Corrected Amplitude = Meter Reading + Antenna Factor + 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 limit. The equation for margin calculation is as follows:

Margin = Limit – 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 and 15.247, with the worst margin reading of:

30 -1000 MHz:

5.3 dB at **191.993000 MHz** in the **Vertical** polarization

Above 1 GHz:

Low Channel**: 5.19 dB** at **2314.9 MHz** in the **Vertical** polarization, for PK
Middle Channel**: 7.86 dB** at **2239.9 MHz** in the **Vertical** polarization, for PK
High Channel**: 8.06 dB** at **2262.8 MHz** in the **Vertical** polarization, for PK

Low Channel**: 10.19 dB** at **2314.9 MHz** in the **Vertical** polarization, for Ave
Middle Channel**: 12.86 dB** at **2239.9 MHz** in the **Vertical** polarization, for Ave
High Channel**: 13.06 dB** at **2262.8 MHz** in the **Vertical** polarization, for Ave

Test Data

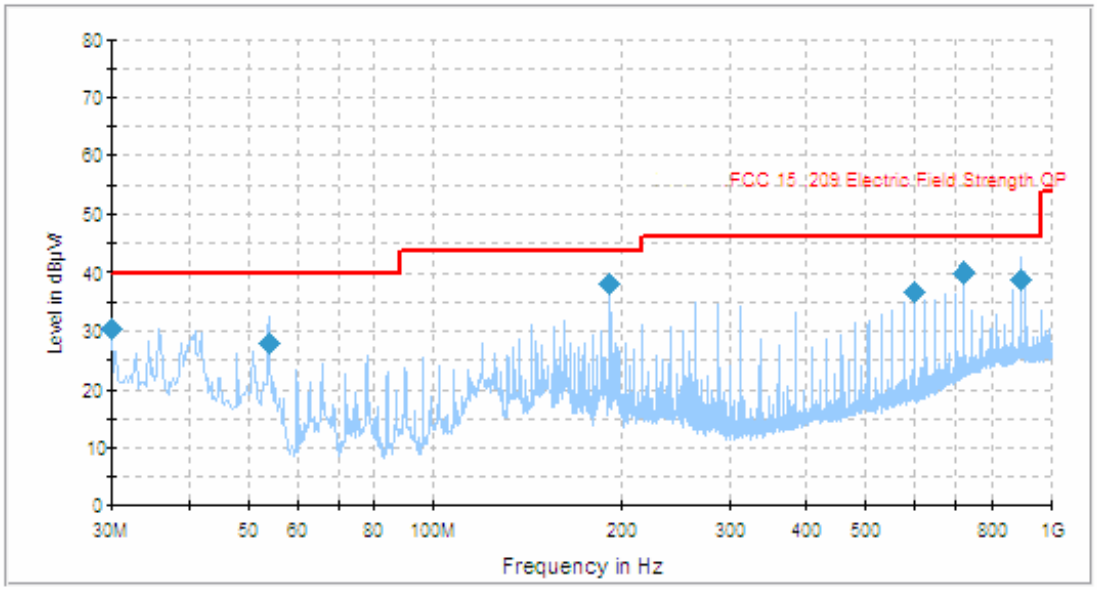
Environmental Conditions

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

The testing was performed by Bruce Zhang on 2009-10-22 to 2009-12-07.

30-1000 MHz:

Test Mode: Transmitting (worse case)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
191.993000	38.2	179.0	H	310.0	-15.5	43.5	5.3
719.977000	40.1	118.0	H	155.0	-4.0	46.0	5.9
890.738250	38.9	303.0	H	19.0	-0.2	46.0	7.1
599.981000	36.8	97.0	V	121.0	-8.5	46.0	9.2
30.010750	30.6	97.0	V	92.0	-5.9	40.0	9.4
53.992750	27.8	117.0	V	252.0	-19.4	40.0	12.2

Above 1 GHz:

Indicated		Detector (PK/AV)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBμV/m)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2410.875 MHz)												
2314.9	65.82	PK	205	1.2	V	29.1	5.69	31.8	68.81	74	5.19	spurious
7232.625	48.34	PK	255	1.4	H	36.6	11.07	31.0	65.01	74	8.99	harmonic
7232.625	44.74	PK	360	1.6	V	37.0	11.07	31.0	61.81	74	12.19	harmonic
4821.75	49.25	PK	160	1.4	V	33.5	8.79	30.8	60.74	74	13.26	harmonic
4821.75	47.31	PK	200	1.7	H	33.8	8.79	30.8	59.10	74	14.90	harmonic
2506.9	53.72	PK	160	1.0	V	29.1	5.69	30.6	57.91	74	16.09	spurious
2314.9	53.41	PK	28	1.0	H	28.9	5.69	31.8	56.20	74	17.80	spurious
2506.9	48.25	PK	276	1.0	H	28.9	5.69	30.6	52.24	74	21.76	spurious
Middle Channel (2437.875 MHz)												
2239.9	63.15	PK	206	1.3	V	29.1	5.69	31.8	66.14	74	7.86	spurious
7313.625	46.80	PK	266	1.4	H	36.6	11.07	31.0	63.47	74	10.53	harmonic
7313.625	44.60	PK	226	1.3	V	37.0	11.07	31.0	61.67	74	12.33	harmonic
4875.75	48.81	PK	140	1.2	V	33.5	8.79	30.8	60.3	74	13.70	harmonic
4875.75	48.01	PK	163	1.6	H	33.8	8.79	30.8	59.8	74	14.20	harmonic
2533.9	52.03	PK	295	1.0	V	29.1	5.69	30.6	56.22	74	17.78	spurious
2239.9	53.10	PK	145	1.0	H	28.9	5.69	31.8	55.89	74	18.11	spurious
2533.9	49.91	PK	240	1.9	H	28.9	5.69	30.6	53.9	74	20.10	spurious
High Channel (2468.25 MHz)												
2262.8	63.15	PK	240	1.5	V	29.1	5.49	31.8	65.94	74	8.06	spurious
2484.5	61.84	PK	242	1.6	V	29.1	5.69	31.8	64.83	74	9.17	spurious
7404.75	47.67	PK	265	1.4	H	36.3	11.07	31.0	64.04	74	9.96	harmonic
4936.5	51.17	PK	190	1.7	H	33.8	8.79	30.8	62.96	74	11.04	harmonic
7404.75	44.76	PK	238	1.0	V	37.0	11.07	31.0	61.83	74	12.17	harmonic
4936.5	49.61	PK	270	1.0	V	33.5	8.79	30.8	61.1	74	12.90	harmonic
2262.8	54.44	PK	200	1.0	H	28.9	5.49	31.8	57.03	74	16.97	spurious
2484.5	50.06	PK	256	1.7	H	28.9	5.69	31.8	52.85	74	21.15	spurious

Indicated		Detector (PK/AV)	Table Angle Degree	Antenna		Correction Factor (dB)	Duty Cycle Factor (dB)	FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBμV/m)			Height (m)	Polar (H/V)			Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2410.875 MHz)											
2314.9	65.82	PK	205	1.2	V	2.99	-25	43.81	54	10.19	spurious
7232.625	48.34	PK	255	1.4	H	16.67	-25	40.01	54	13.99	harmonic
7232.625	44.74	PK	360	1.6	V	17.07	-25	36.81	54	17.19	spurious
4821.75	49.25	PK	160	1.4	V	11.49	-25	35.74	54	18.26	harmonic
4821.75	47.31	PK	200	1.7	H	11.79	-25	34.10	54	19.90	harmonic
2506.9	53.72	PK	160	1.0	V	4.19	-25	32.91	54	21.09	spurious
2314.9	53.41	PK	28	1.0	H	2.79	-25	31.20	54	22.80	harmonic
2506.9	48.25	PK	276	1.0	H	3.99	-25	27.24	54	26.76	spurious
Middle Channel (2437.875 MHz)											
2239.9	63.15	PK	206	1.3	V	2.99	-25	41.14	54	12.86	spurious
7313.625	46.80	PK	266	1.4	H	16.67	-25	38.47	54	15.53	harmonic
7313.625	44.60	PK	226	1.3	V	17.07	-25	36.67	54	17.33	harmonic
4875.75	48.81	PK	140	1.2	V	11.49	-25	35.30	54	18.70	harmonic
4875.75	48.01	PK	163	1.6	H	11.79	-25	34.80	54	19.20	spurious
2533.9	52.03	PK	295	1.0	V	4.19	-25	31.22	54	22.78	spurious
2239.9	53.10	PK	145	1.0	H	2.79	-25	30.89	54	23.11	harmonic
2533.9	49.91	PK	240	1.9	H	3.99	-25	28.90	54	25.10	spurious
High Channel (2468.25 MHz)											
2262.8	63.15	PK	240	1.5	V	2.79	-25	40.94	54	13.06	spurious
2484.5	61.84	PK	242	1.6	V	2.99	-25	39.83	54	14.17	spurious
7404.75	47.67	PK	265	1.4	H	16.37	-25	39.04	54	14.96	harmonic
4936.5	51.17	PK	190	1.7	H	11.79	-25	37.96	54	16.04	harmonic
7404.75	44.76	PK	238	1.0	V	17.07	-25	36.83	54	17.17	harmonic
4936.5	49.61	PK	270	1.0	V	11.49	-25	36.10	54	17.90	spurious
2262.8	54.44	PK	200	1.0	H	2.59	-25	32.03	54	21.97	harmonic
2484.5	50.06	PK	256	1.7	H	2.79	-25	27.85	54	26.15	spurious

Note: Correction factor = Antenna Gain + Cable Loss – Pre-Amplifier Gain
Corrected Level = Reading + Correction factor + Duty Cycle Correction Factor.
Duty Cycle Correction Factor = 20 log (Duty Cycle/Tp) = -25.0 dB

CFR47 §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	2008-11-07	2009-11-06

*** 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 truce
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Bruce Zhang on 2009-10-12.*

Test Result: Compliant.

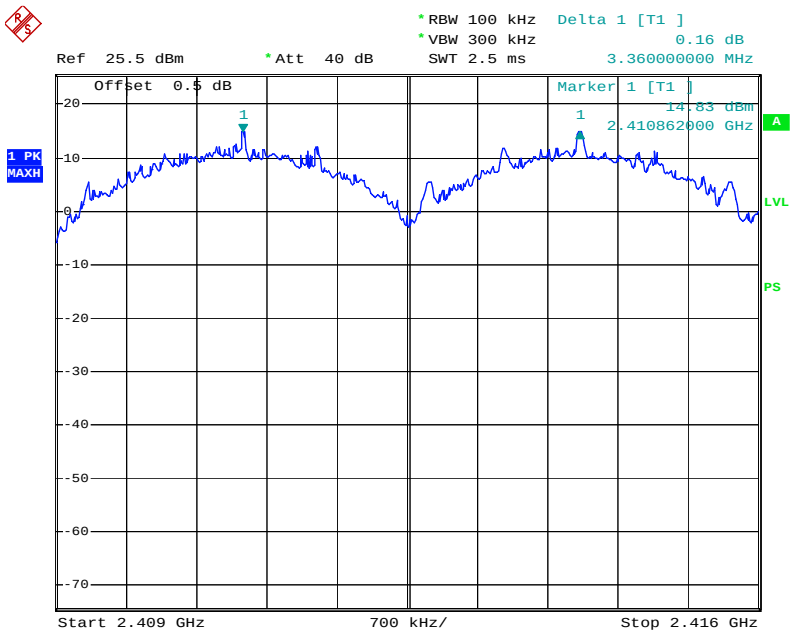
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low Channel	2410.875	3.360	2.427	Pass
Adjacent Channel	2414.250			
Mid Channel	2437.875	3.360	2.427	Pass
Adjacent Channel	2441.250			
High Channel	2464.875	3.360	2.427	Pass
Adjacent Channel	2468.250			

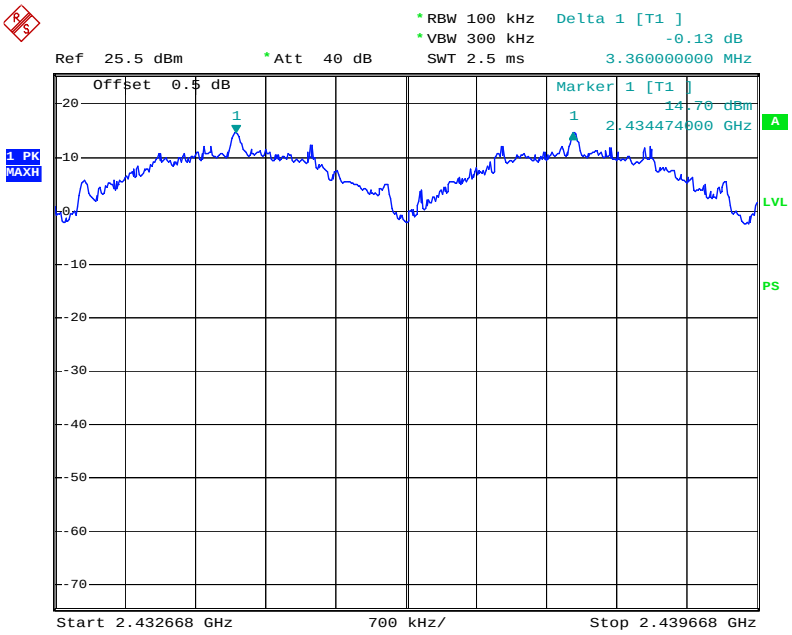
Please refer to the following plots.

Low Channel



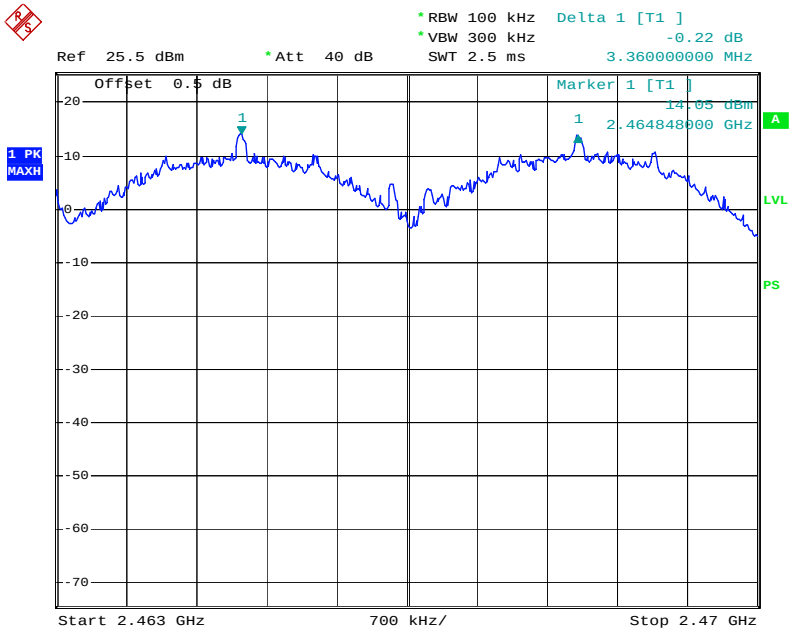
Date: 12.OCT.2009 11:31:21

Middle Channel



Date: 12.OCT.2009 11:47:55

High Channel



Date: 12.OCT.2009 11:43:39

CFR47 §15.247(a)(1) – 20 dB 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	2008-11-07	2009-11-06

*** 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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Bruce Zhang on 2009-10-12.*

Test Result: Compliant.

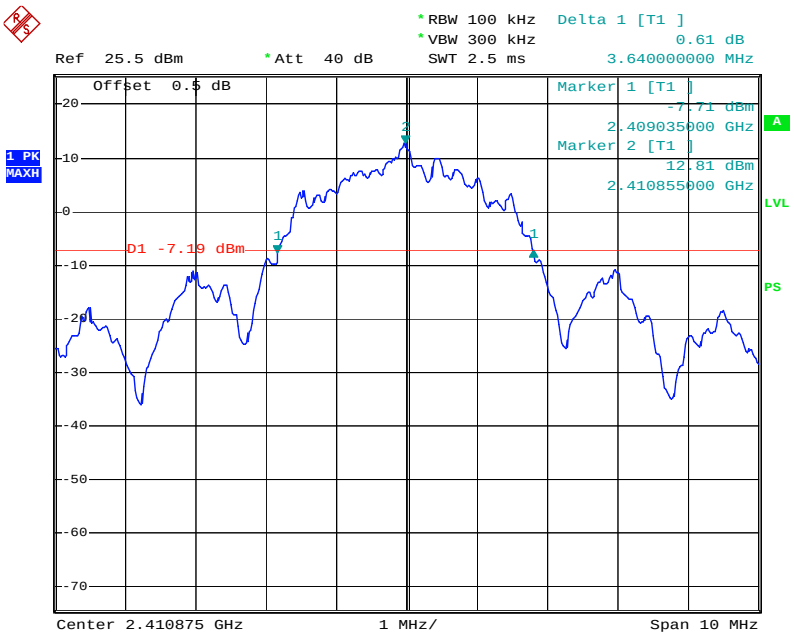
Please refer to following tables and plots

Test Mode: Transmitting

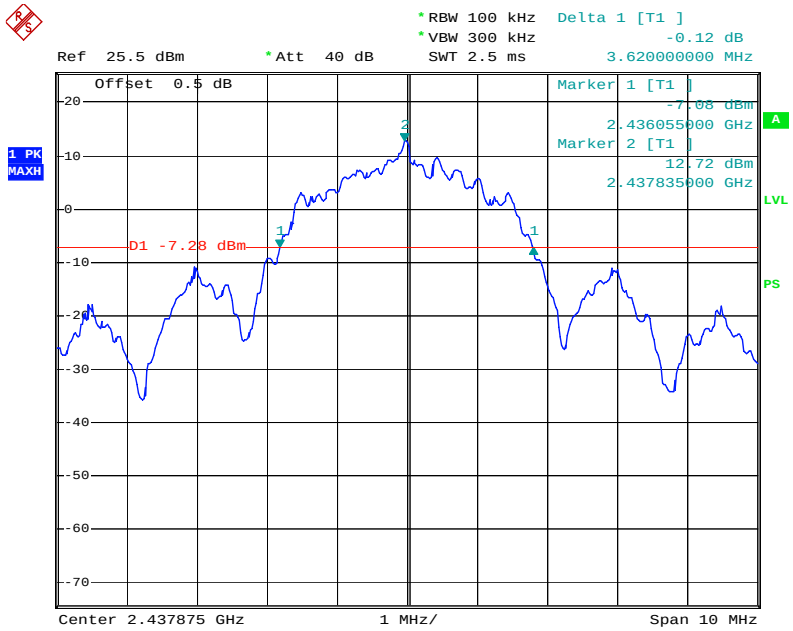
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2410.875	3.640
Middle	2437.875	3.620
High	2468.25	3.620

Please refer to the following plots.

Low Channel

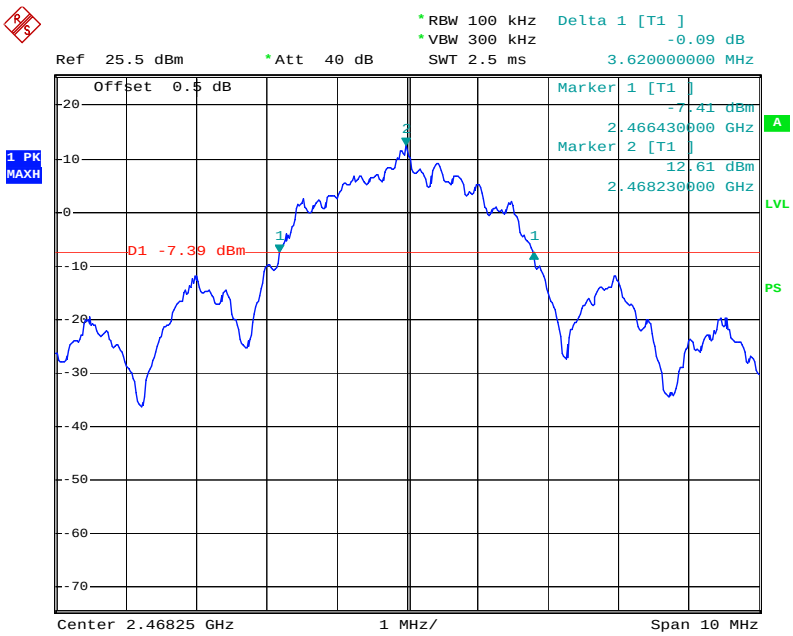


Middle Channel



Date: 12.OCT.2009 10:54:22

High Channel



Date: 12.OCT.2009 11:04:52

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	2008-11-07	2009-11-06

*** 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 hopping mode from first channel to last.
3. By using the Max-Hold function record the Quantity of the channel.

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

The testing was performed by Bruce Zhang on 2009-10-12.

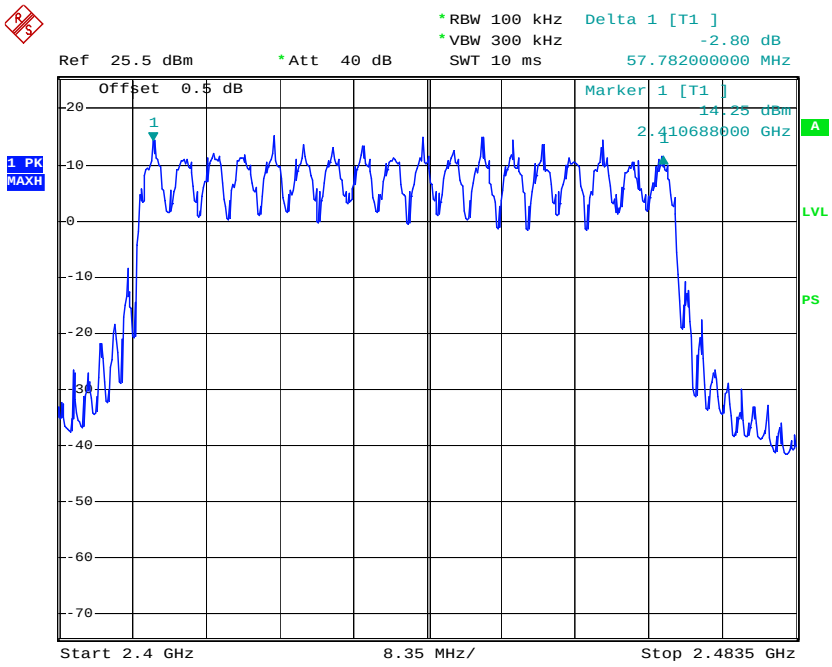
Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	18	≥ 15

Number of Hopping Channels



Date: 12.OCT.2009 11:27:19

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	2008-11-07	2009-11-06

*** 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/2/ number of hopping channels * (0.4×18s)
Hop rate=314.47/s (Base on 3180μs/each channel in the hopping information)

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Bruce Zhang on 2009-10-12 to 2009-10-21.*

Test Result: Compliant.

Please refer to following tables and plots

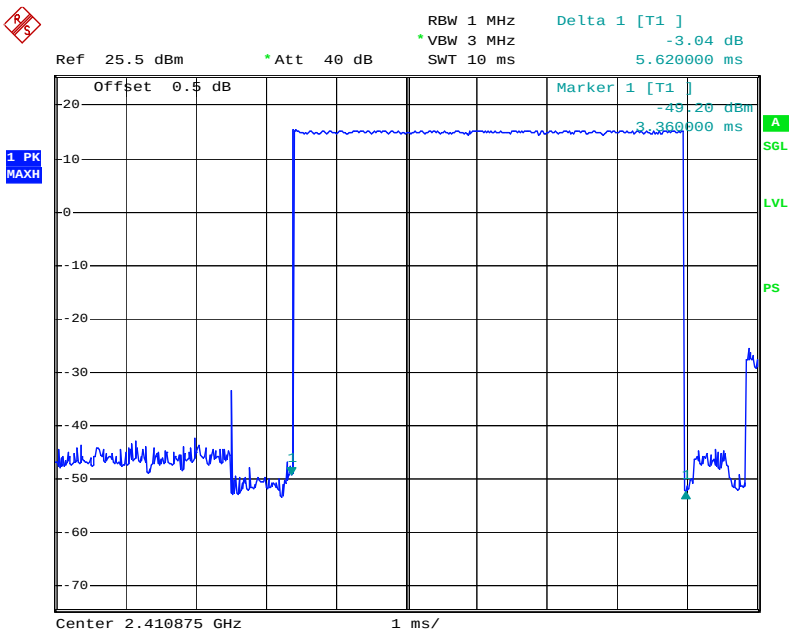
Test Mode: Transmitting

Channel	Pulse Width (ms)	Dwell Time (Sec)	Limit (Sec)	Result
Low	5.62	0.352	0.4	Pass
Middle	5.62	0.352	0.4	Pass
High	5.64	0.353	0.4	Pass

*NOTE: Dwell time = Pulse time*314.47/2/18*(18*0.4s)*

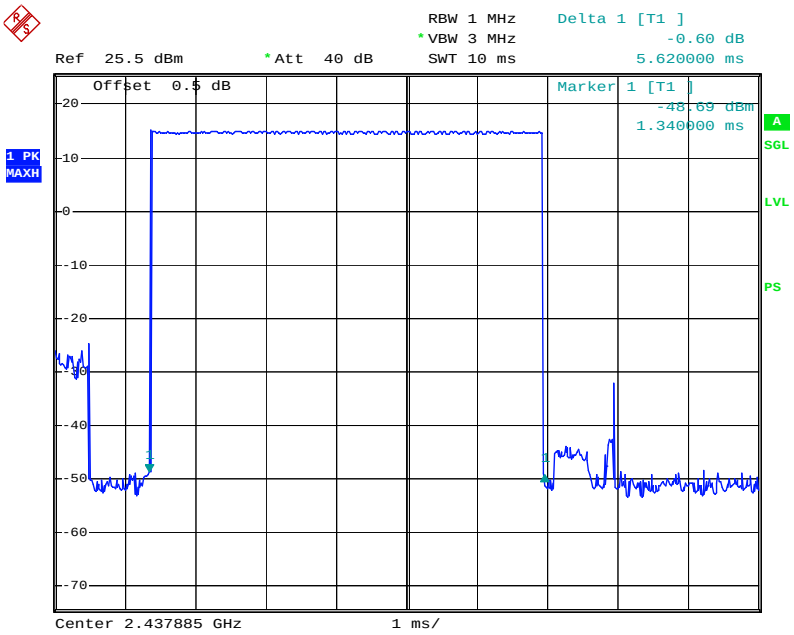
Please refer to the following plots.

Low Channel



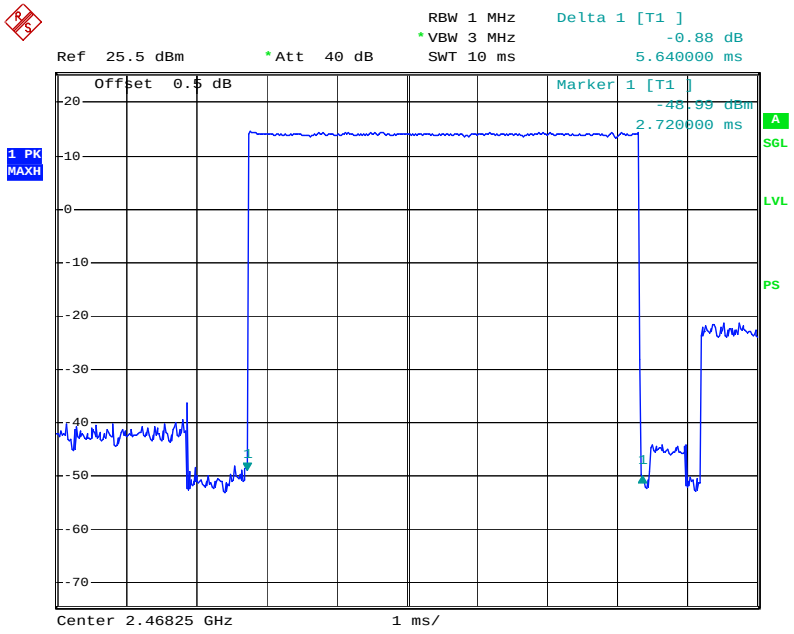
Date: 12.OCT.2009 11:49:44

Middle Channel



Date: 12.OCT.2009 11:51:12

High Channel



Date: 12.OCT.2009 11:52:14

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.

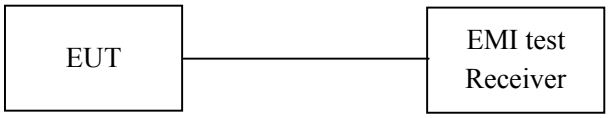
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06

*** 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 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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

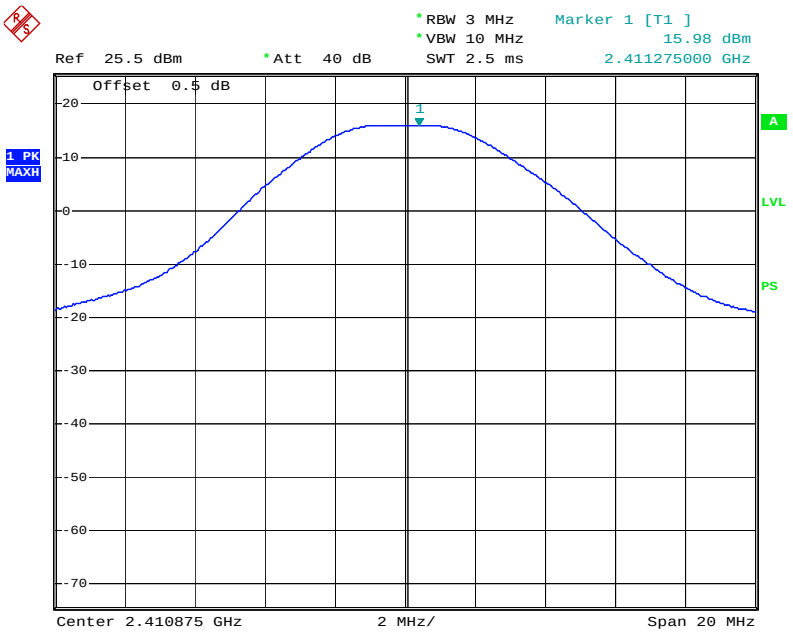
** The testing was performed by Bruce Zhang on 2009-10-12.*

Test Result: Compliant.

Test Mode: Transmitting

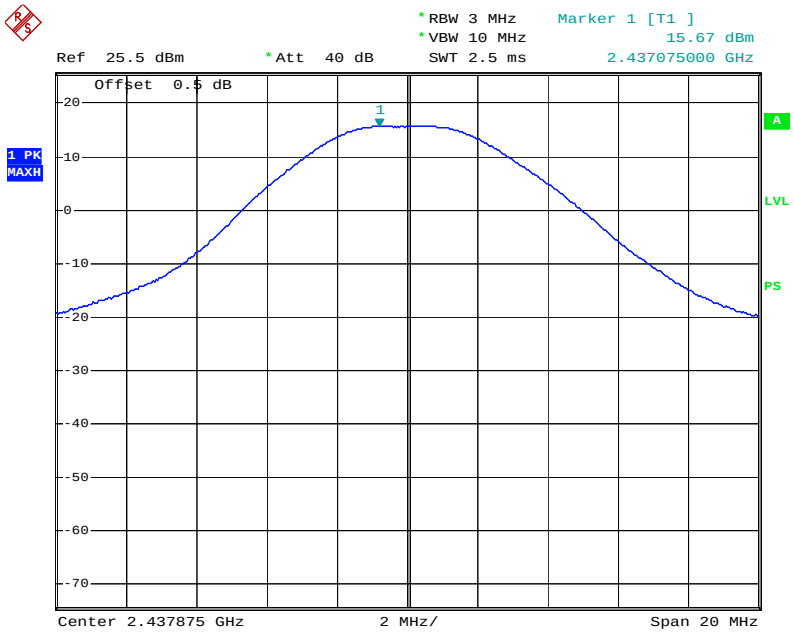
Channel	Frequency	Output Power		FCC Limit （mW）	Result
	(MHz)	(dBm)	（mW）		
Low	2410.875	15.98	39.628	1000	Pass
Mid	2437.875	15.67	36.898	1000	Pass
High	2468.250	15.18	32.961	1000	Pass

Low Channel



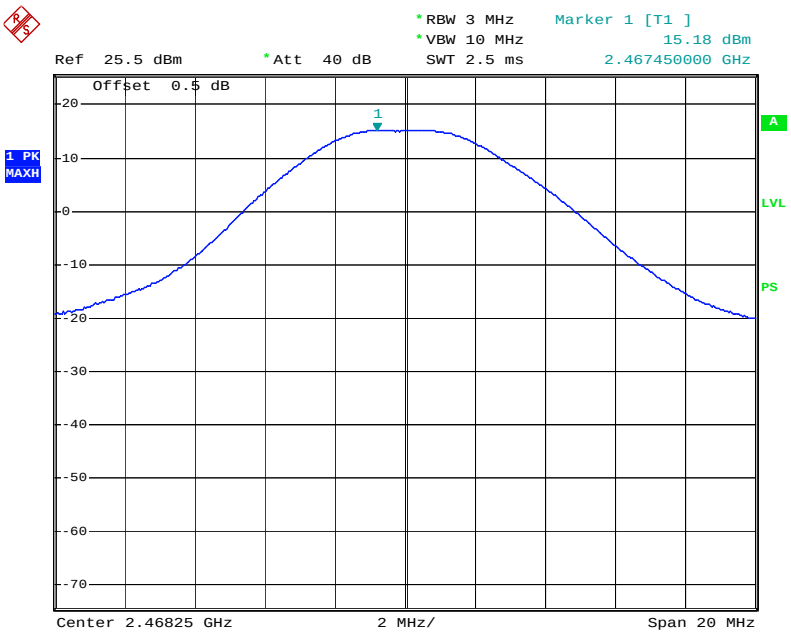
Date: 12.OCT.2009 11:14:20

Middle Channel



Date: 12.OCT.2009 11:14:47

High Chanel



Date: 12.OCT.2009 11:11:11

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	2008-11-07	2009-11-06

*** 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. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz.
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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

**The testing was performed by Bruce Zhang on 2009-10-12.*

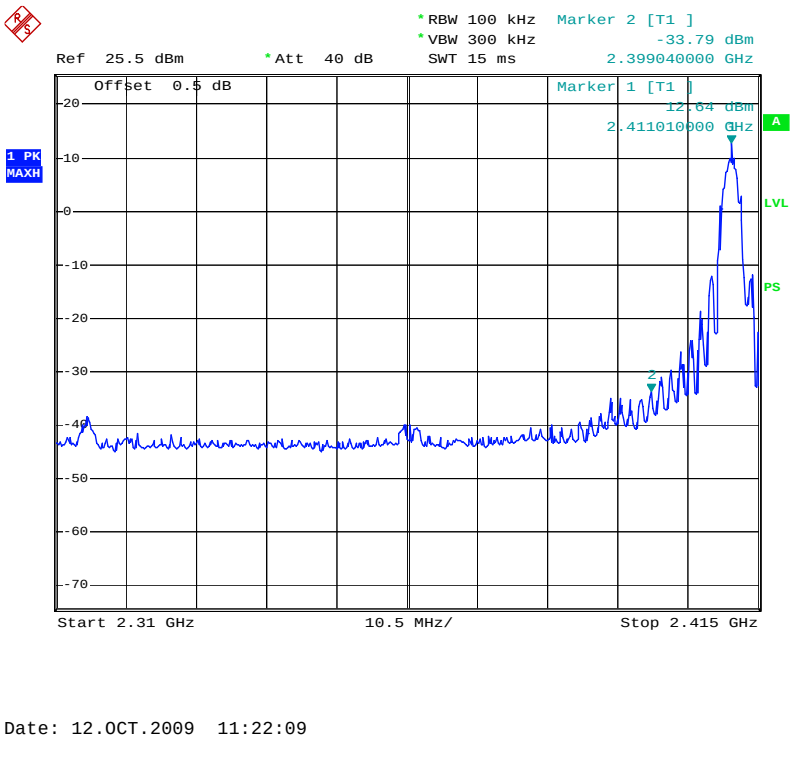
Test Result: Compliant

Test Mode: Transmitting

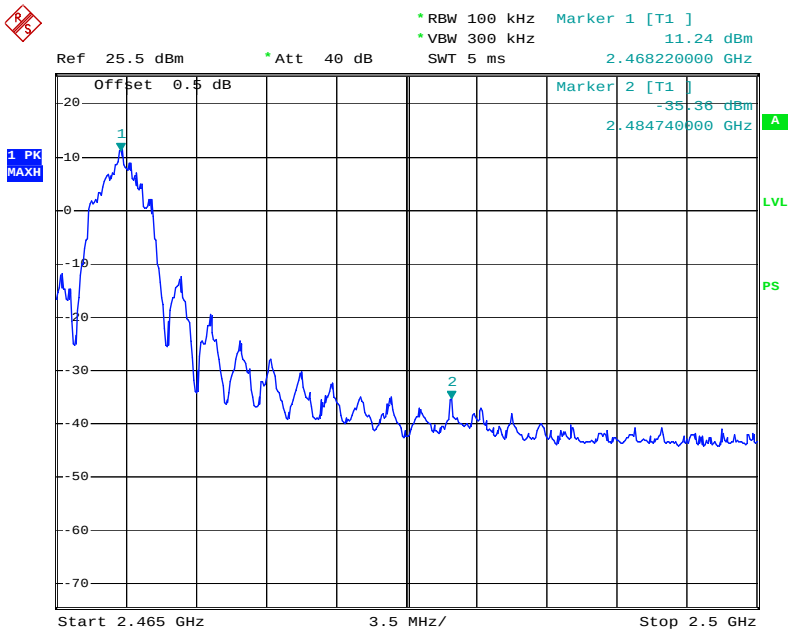
Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.04	46.63	20
2484.74	46.60	20

Please refer to follow plots:

Band Edge: Left Side



Band Edge: Right Side



Date: 12.OCT.2009 11:19:21

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