NVLAP LAB CODE 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

NAKAJIMA USA, Inc.

6053 West Century Blvd., 8th Floor, Los Angeles, CA 90045

FCC ID: VLMS46KT89CO

This Report Concerns: ☒ Original Report	**Equipment Type:** BLUETOOTH KT/ CO
Test Engineer:	Henry Yang
Report No.:	RSZ07091805
Test Date:	2007-10-16 to 2007-11-15
Report Date:	2007-11-15
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 *NAKAJIMA USA, Inc.*'s product, model number: *360546, 360589 o*r the "EUT" as referred to in this report is a *BLUETOOTH KT/ CO*, which measures approximately 7.5 cm L x 5.5 cm W x 1.2 cm H, rated input voltage: DC 5V Battery.

The series products, model: *360546, 360589,* we select *360546* to test.

** The test data gathered are from production sample, serial number: 0709028 provided by the manufacturer, we receive the EUT on 2007-11-02.*

Objective

This Type approval report is prepared on behalf of *NAKAJIMA USA, Inc.* 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.

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.

Special Accessories

N/A.

Equipment Modifications

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

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
HP	Laser Jet5L	C3941A	JPTVOB2337	DoC
ECOM	Modem	EM-56DEV	6588D51200013	DoC

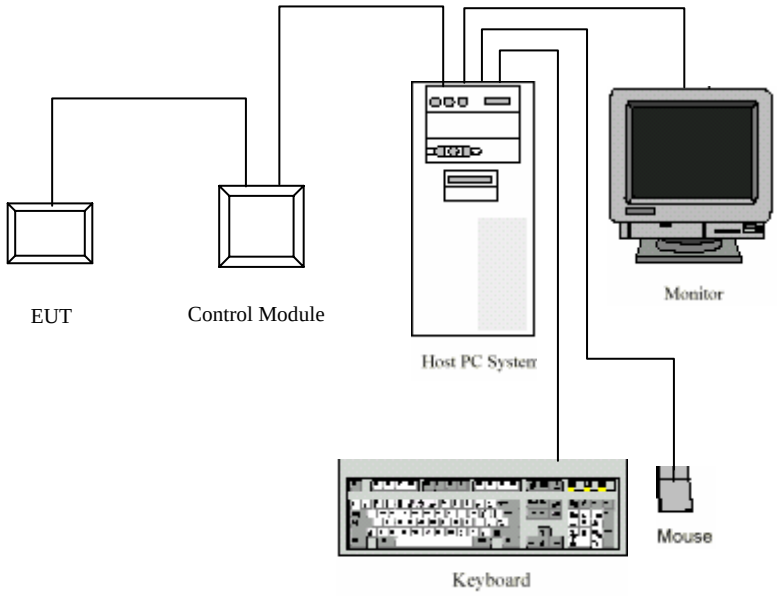
Local Support Equipment List and Details

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
CS	Smart Card	ACOS2	N/A	DoC

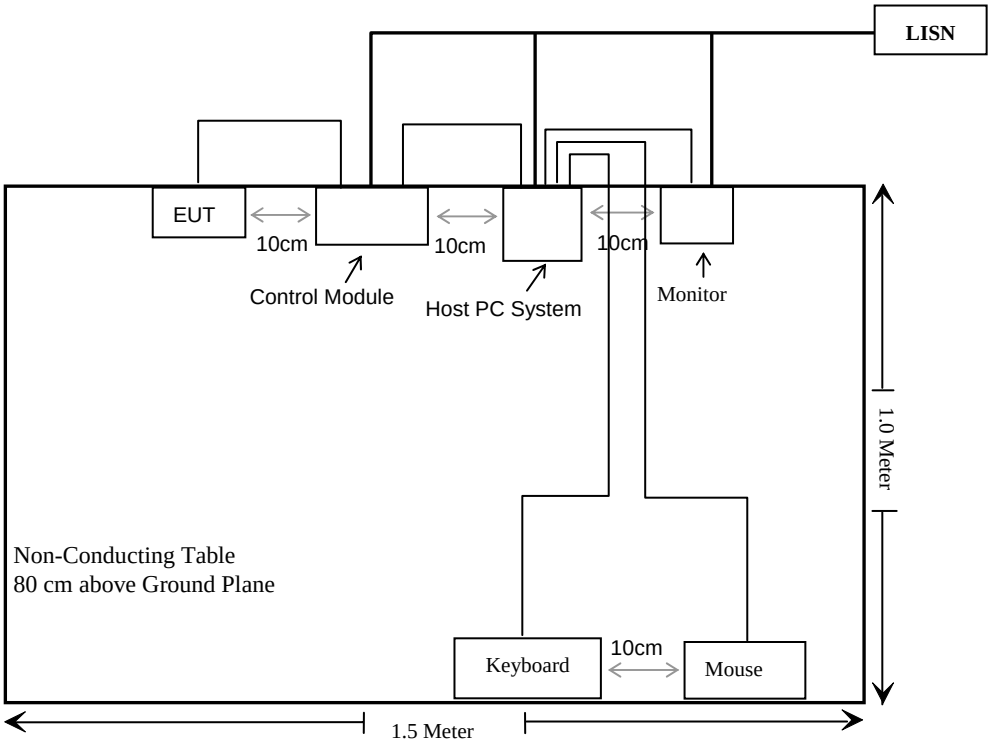
External I/O Cable

Cable Description	Length (m)	From Port	To
Shielded Detachable K/B Cable	1.5	K/B Port /Host	K/B
Shielded Detachable Mouse Cable	1.5	Mouse Port /Host	Mouse
Shielded Detachable VGA Cable	1.5	VGA Port /Host	Monitor

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
§15.109, §15.205, §15.209, §15.247(d)	Radiated Emission	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 (a)(1)	20 dB Bandwidth	Compliant

§15.247 (i) & §2.1093 - RF EXPOSURE

Standard Applicable

According to § 1.1310, 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, fGHz is mid-band frequency in GHz, and d is the distance to a person'sbody, excluding hands, wrists, feet, and ankles.

Exposure category	low threshold	high threshold
general population	$(60/f_{GHz})$ mW, $d < 2.5$ cm $(120/f_{GHz})$ mW, $d \geq 2.5$ cm	$(900/f_{GHz})$ mW, $d < 20$ cm
occupational	$(375/f_{GHz})$ mW, $d < 2.5$ cm $(900/f_{GHz})$ mW, $d \geq 2.5$ cm	$(2250/f_{GHz})$ 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 0.28 mW<24.98mW= (60/2.441GHz) mW

The SAR measurement is not required.

§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 a component 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.

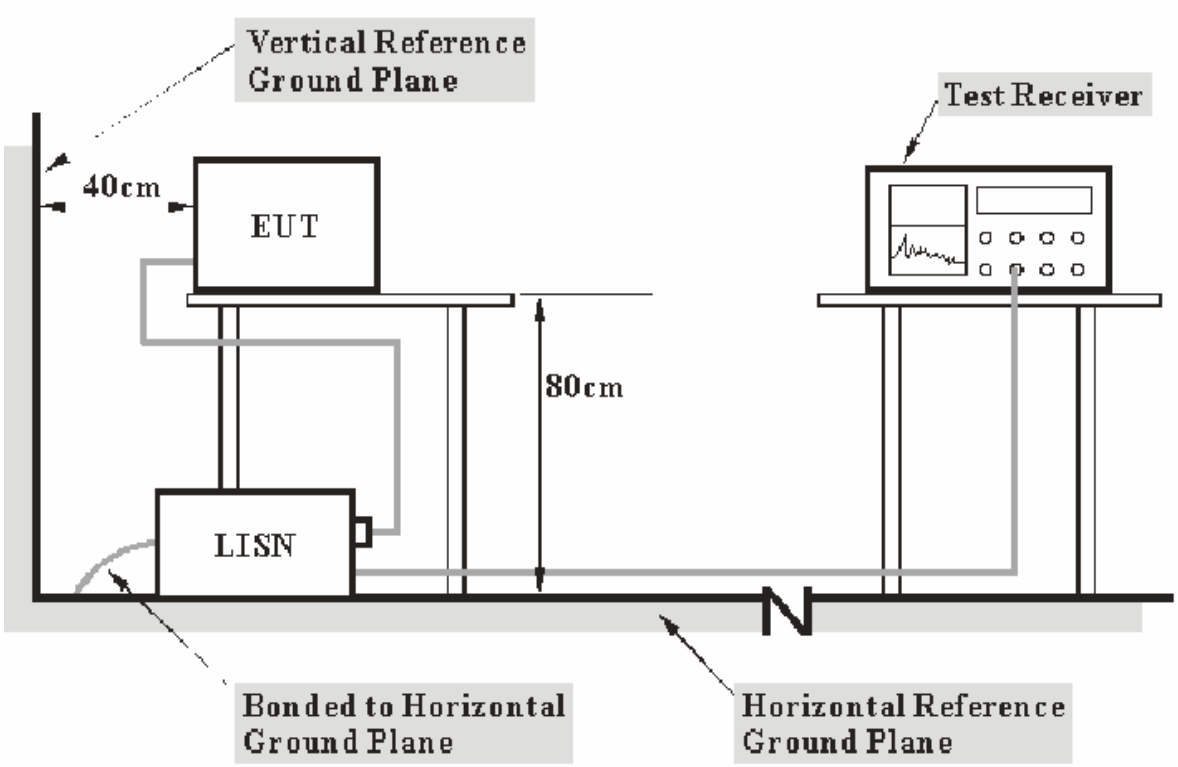
§15.107 (a) - CONDUCTED EMISSIONS

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 host 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
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	2007-03-26	2008-03-26
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2007-03-26	2008-03-26

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

5.4 dB at **5.830 MHz** in the **Live** conductor mode

Test Data

Environmental Conditions

Temperature:	22 ° C
Relative Humidity:	55%
ATM Pressure:	100.0 kPa

The testing was performed by Green Xu on 2007-11-15.

Test Mode: Charging

Line Conducted Emissions				FCC 15.207	
Frequency (MHz)	**Amplitude (dBμV)**	**Detector QP/AV**	**Phase Live/Neutral**	**Limit (dBμV)**	**Margin (dB)**
5.830	50.60	QP	Live	56.00	5.40
7.410	51.30	QP	Live	60.00	8.70
7.410	49.20	QP	Neutral	60.00	10.80
6.930	49.00	QP	Neutral	60.00	11.00
7.410	37.30	AV	Live	50.00	12.70
6.930	35.40	AV	Neutral	50.00	14.60
5.830	35.30	AV	Live	50.00	14.70
7.410	34.90	AV	Neutral	50.00	15.10
0.775	30.40	AV	Neutral	46.00	15.60
2.265	29.80	AV	Neutral	46.00	16.20
0.180	37.00	AV	Neutral	54.49	17.49
1.610	28.40	AV	Neutral	46.00	17.60
1.125	37.00	QP	Live	56.00	19.00
2.265	35.50	QP	Neutral	56.00	20.50
1.125	24.70	AV	Live	46.00	21.30
0.845	24.10	AV	Live	46.00	21.90
1.610	33.30	QP	Neutral	56.00	22.70
0.775	32.70	QP	Neutral	56.00	23.30
0.180	39.30	QP	Neutral	64.49	25.19
0.845	30.60	QP	Live	56.00	25.40
0.180	27.60	AV	Live	54.49	26.89
0.180	34.50	QP	Live	64.49	29.99
0.150	33.30	QP	Live	66.00	32.70
0.150	19.30	AV	Live	56.00	36.70

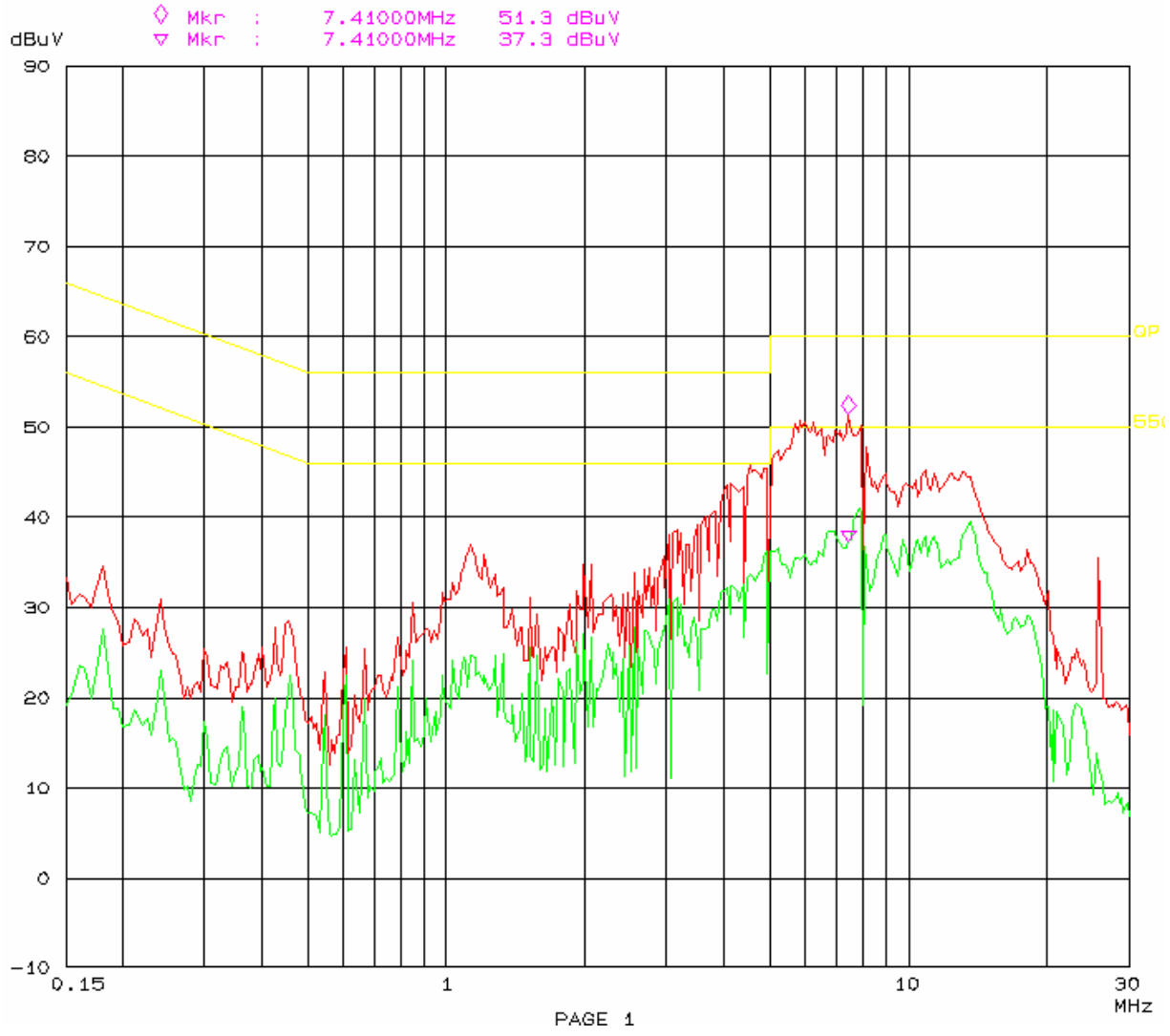
Plot(s) of Test Data

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

Conducted Emission Test
FCC Part15 B

15. Nov 07 18:14

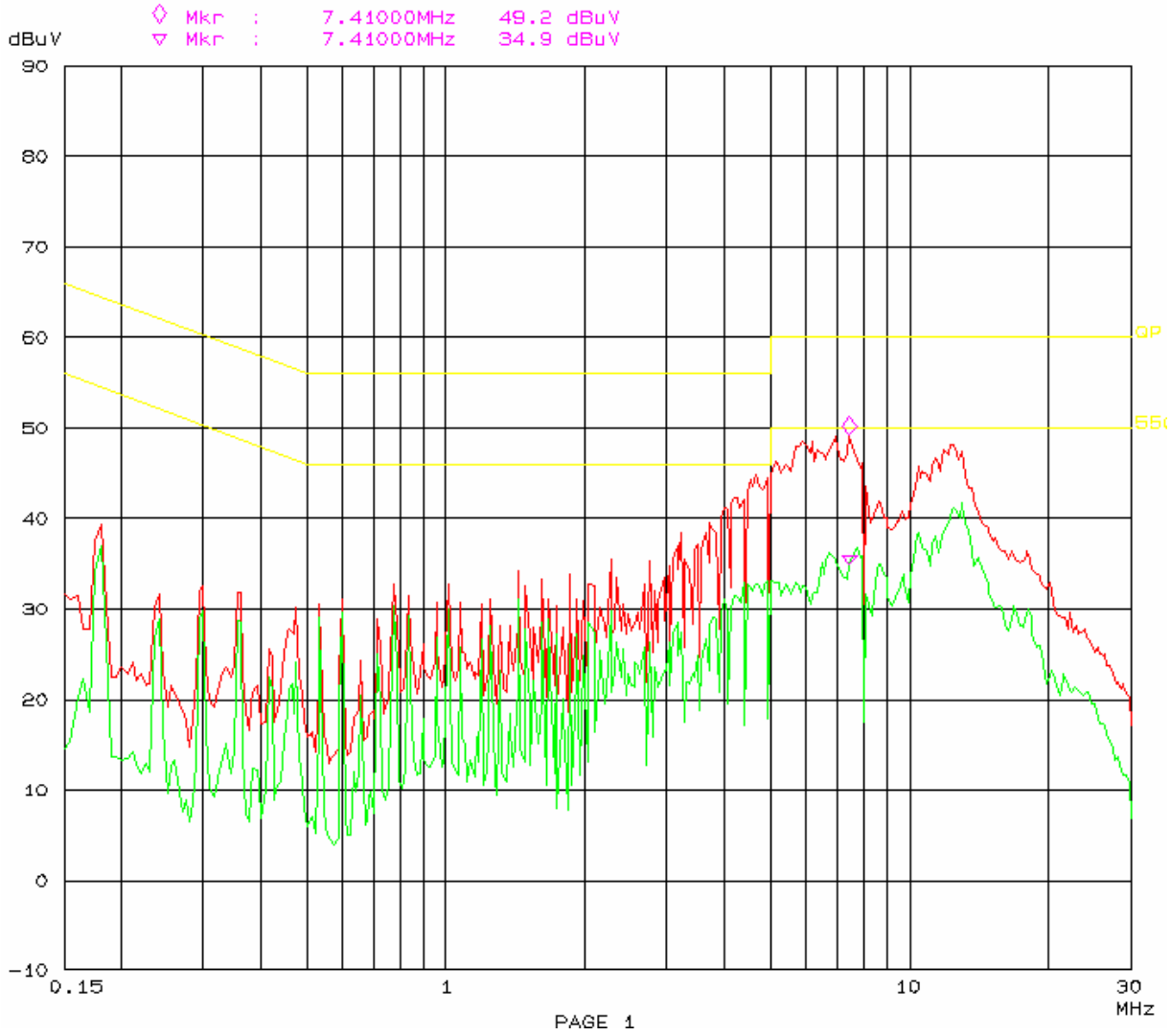
EUT: Bluetooth KT/CO M/N: 360546
Manuf: NAKAJIMA USA.Inc
Op Cond: CHARGING
Operator: GREEN
Test Spec: AC120V/60Hz L
Comment: Temp: 25 Humi 56%



Conducted Emission Test
FCC Part15 B

15. Nov 07 17:53

EUT: Bluetooth KT/CO M/N: 360546
Manuf: NAKAJIMA USA.Inc
Op Cond: CHARGING
Operator: GREEN
Test Spec: AC120V/60Hz N
Comment: Temp: 25 Humi 56%



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

Applicable Standard

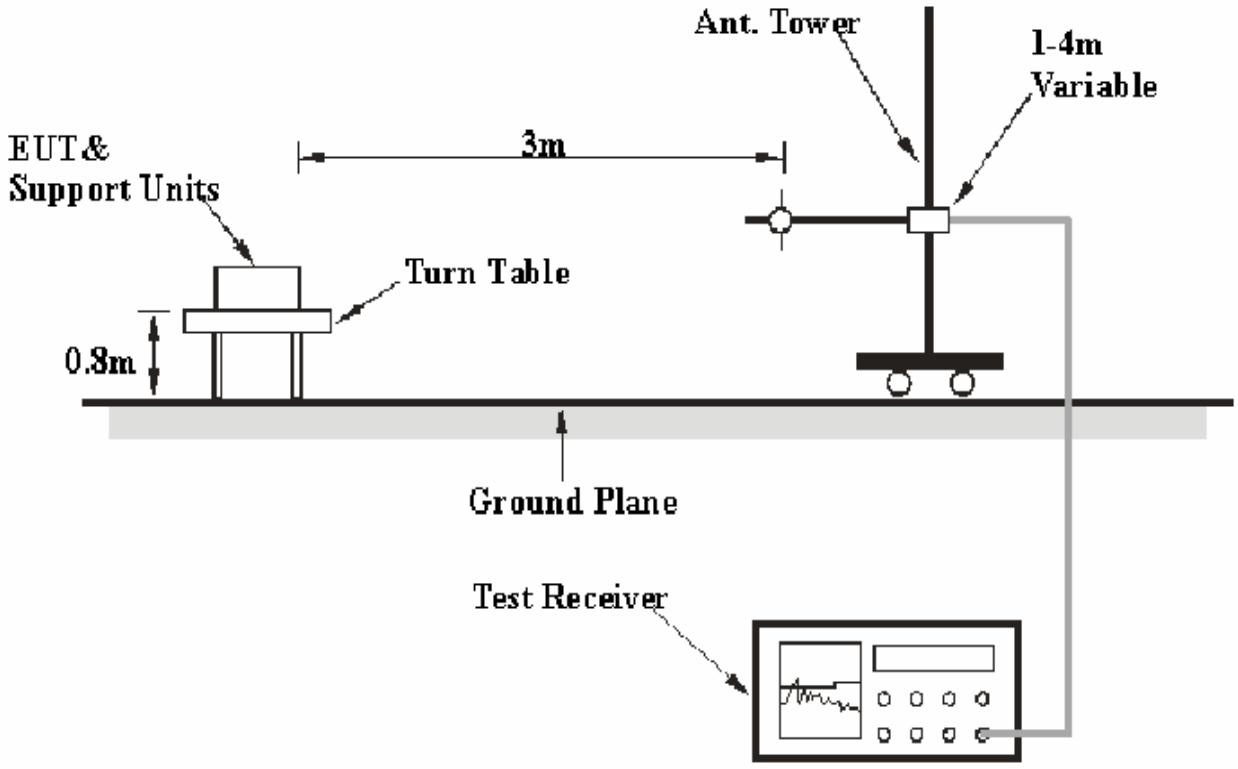
According to FCC §15.247 (d)

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 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 host PC 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	2007-09-29	2008-09-29
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2007-08-14	2008-08-14
HP	Amplifier	8449B	3008A00277	2007-09-29	2008-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2007-09-25	2008-09-25
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 host PC was connected to the outlet of the first LISN, and all other support equipment power cords were connected to the outlet of the second LISN.

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. Amp. = 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. Amp.

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:

Transmitting mode: 4.3 dB at **37.700875 MHz** in the **Vertical** polarization, **for below 1 GHz**
Tansmitting mode: 10.53 dB at **4804MHz** in the **Vertical** polarization, **for above 1 GHz (Low Channel)**
Transmitting mode: 11.31 dB at **4882 MHz** in the **Horizontal** polarization, **for above 1 GHz (Middle Channel)**
Transmitting mode: 1.93 dB at **4960 MHz** in the **Horizontal** polarization, **for above 1 GHz (High Channel)**

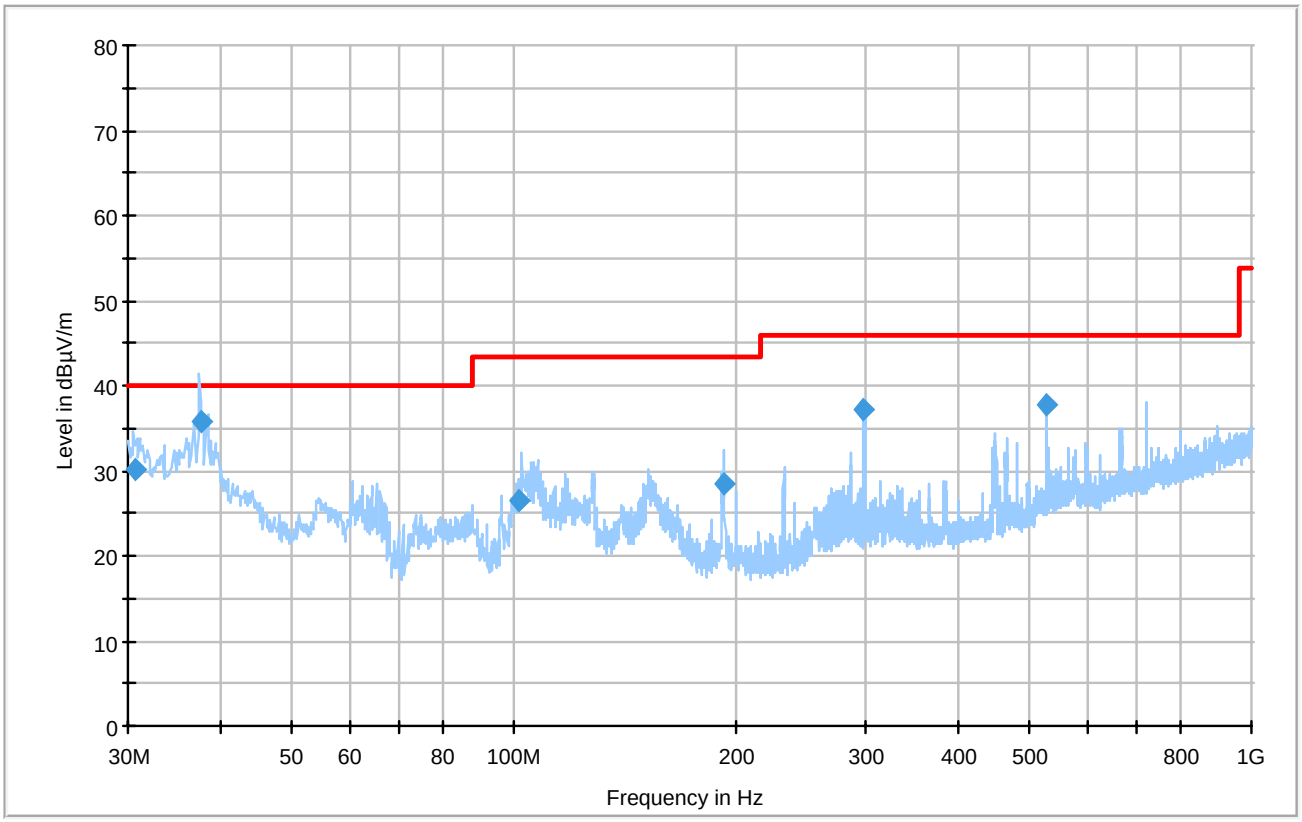
Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	52%
ATM Pressure:	100.9 kPa

The testing was performed by Henry Yang on 2007-11-01.

Test Mode: Transmiting (Below 1 GHz)



Frequency (MHz)	Quasi-Peak (dBµV/m)	Antenna Height (cm)	Polarity	Turntable Position (deg)	Corr. (dB)	Limit (dBµV/m)	Margin (dB)
37.700875	35.7	151.0	V	355.0	-9.9	40.0	4.3
528.061625	37.8	240.0	V	167.0	-5.2	46.0	8.2
298.678750	37.2	154.0	V	257.0	-10.0	46.0	8.8
30.776135	30.1	115.0	V	149.0	-4.9	40.0	9.9
192.364625	28.4	101.0	V	9.0	-12.9	43.5	15.1
101.328625	26.5	102.0	V	269.0	-15.7	43.5	17.0

Test Mode: Transmiting (Above 1 GHz)

Frequency (MHz)	Meter Reading (dBuV/m)	Detector PK/QP/AV	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Corr. Amp. (dBuV/m)	FCC Part 15.247/209		
				Height (m)	Polar H / V	Factor (dB)				Limit (dBuV/m)	Margin (dB)	Remarks
Low Channel												
2402	91.5	PK	90	1	H	30.6	3.61	35.0	90.73			Fund.
2402	88.63	AV	45	1.0	H	30.6	3.61	35.0	87.84			Fund.
2402	89.45	PK	90	1.0	V	30.6	3.61	35.0	88.66			Fund.
2402	80.97	AV	45	1.0	V	30.6	3.61	35.0	80.18			Fund.
4804	36.83	AV	90	1.0	V	35.4	4.64	33.4	43.47	54	10.53	Harmonic
4804	34.10	AV	90	1.0	H	36.6	4.64	33.4	41.94	54	12.06	Harmonic
4804	48.84	PK	180	1.2	H	36.6	4.64	33.4	56.68	74	17.32	Harmonic
1601	41.99	AV	180	1.2	V	26.0	2.77	35.0	35.76	54	18.24	Spurious
4804	48.97	PK	180	1.2	V	35.4	4.64	33.4	55.61	74	18.39	Harmonic
1601	40.65	AV	180	1.2	H	26.5	2.77	35.0	34.92	54	19.08	Spurious
1601	55.82	PK	45	1.2	V	26.0	2.77	35.0	49.59	74	24.41	Spurious
1601	52.67	PK	45	1.2	H	26.5	2.77	35.0	46.94	74	27.06	Spurious
Middle Channel												
2441	91.88	PK	60	1.4	V	30.6	3.61	35.0	91.09			Fund.
2441	86.45	AV	152	1.3	V	30.6	3.61	35.0	85.66			Fund.
2441	90.40	PK	128	1.5	H	30.6	3.61	35.0	89.61			Fund.
2441	84.93	AV	156	1.2	H	30.6	3.61	35.0	84.14			Fund.
4882	34.85	AV	243	1.4	H	36.6	4.64	33.4	42.69	54	11.31	Harmonic
4882	34.85	AV	142	1.6	V	35.4	4.64	33.4	41.49	54	12.51	Harmonic
1627.8	43.81	AV	135	1.3	V	26.0	2.77	35.0	37.58	54	16.42	Spurious
4882	48.50	PK	153	1.5	H	36.6	4.64	33.4	56.34	74	17.66	Harmonic
1627.8	42.30	AV	85	1.5	H	26.5	2.77	36.0	35.57	54	18.43	Spurious
4882	48.61	PK	234	1.8	V	35.4	4.64	33.4	55.25	74	18.75	Harmonic
1627.8	57.07	PK	265	1.4	H	26.5	2.77	36.0	50.34	74	23.66	Spurious
1627.8	56.32	PK	156	1.4	V	26.0	2.77	35.0	50.09	74	23.91	Spurious
High Channel												
2480	87.18	PK	89	1.5	H	30.6	3.61	35.0	86.39			Fund.
2480	82.70	AV	65	1.5	H	30.6	3.61	35.0	81.91			Fund.
2480	88.60	PK	65	1.4	V	30.6	3.61	35.0	87.81			Fund.
2480	80.05	AV	65	1.6	V	30.6	3.61	35.0	79.26			Fund.
4960	44.32	AV	256	1.8	H	36.6	4.55	33.4	52.07	54	1.93	Harmonic
1653	43.15	AV	210	1.2	V	26.0	2.77	35.0	36.92	54	17.08	Spurious
4960	49.05	PK	145	1.4	H	36.6	4.55	33.4	56.80	74	17.20	Harmonic
1653	41.91	AV	156	1.2	H	26.5	2.77	35.0	36.18	54	17.82	Spurious
4960	48.83	PK	142	1.4	V	35.4	4.55	33.4	55.38	74	18.62	Harmonic
1653	56.78	PK	240	1.4	V	26.0	2.77	35.0	50.55	74	23.45	Spurious
1.203	38.65	AV	324	1.2	V	23.8	2.50	36.0	28.95	54	25.05	Spurious
1653	54.13	PK	128	1.5	H	26.5	2.77	35.0	48.40	74	25.60	Spurious
1.203	51.96	PK	324	1.3	V	23.8	2.50	36.0	42.26	74	31.74	Spurious
4960	41.24	AV	142	1.5	V	35.4	4.55	33.4	47.79	54	6.21	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	2007-09-29	2008-09-29

*** 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. 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

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:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Yang on 2007-10-16.

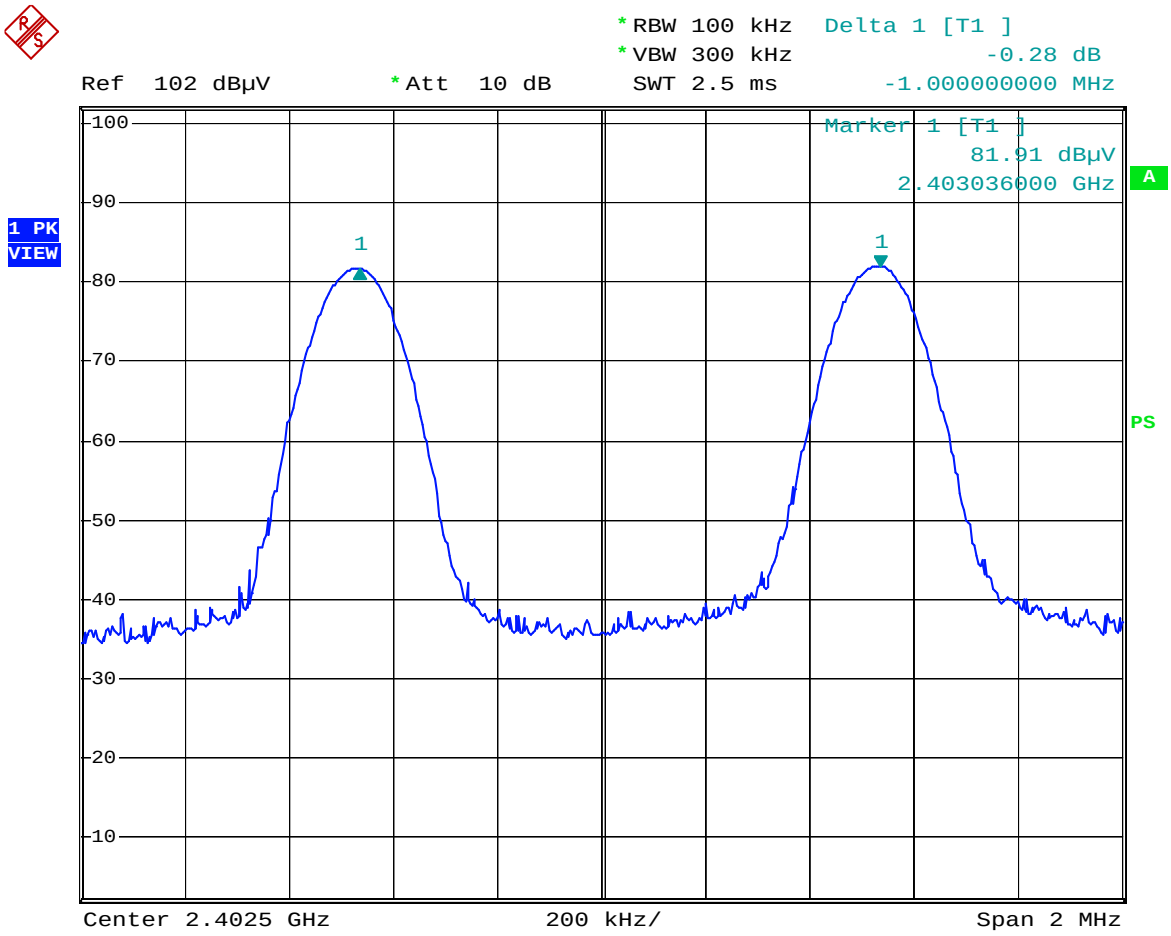
Test mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (MHz)	Limit (kHz)	Result
Low Channel	2402	1.000	⩾0.265	Pass
Adjacenct Channel	2403			
Mid Channel	2441	1.000	⩾0.265	Pass
Adjacenct Channel	2442			
High Channel	2480	1.000	⩾0.265	Pass
Adjacenct Channel	2479			

Test Result: Pass

Please refer to following plots

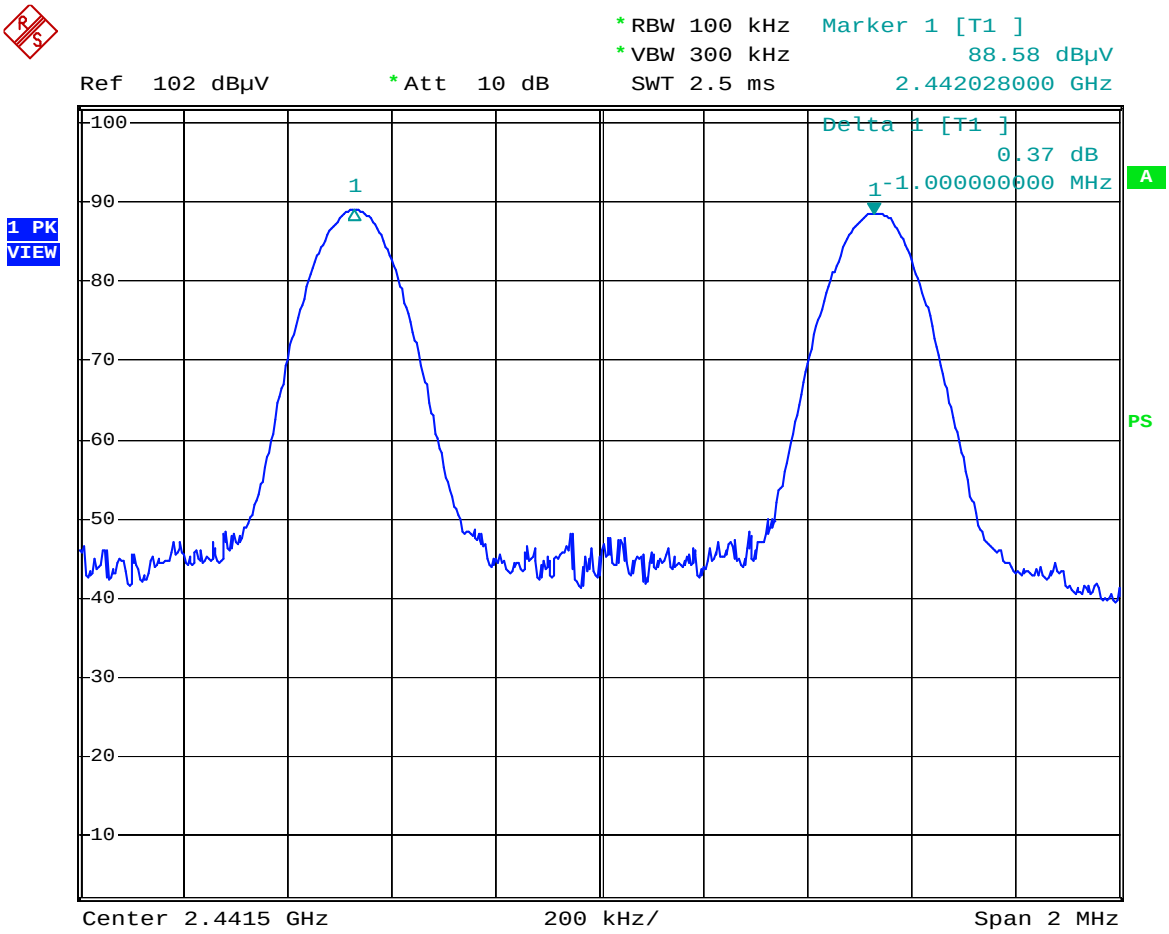
Low Channel



channel separation (low channel)

Date: 16.OCT.2007 16:11:35

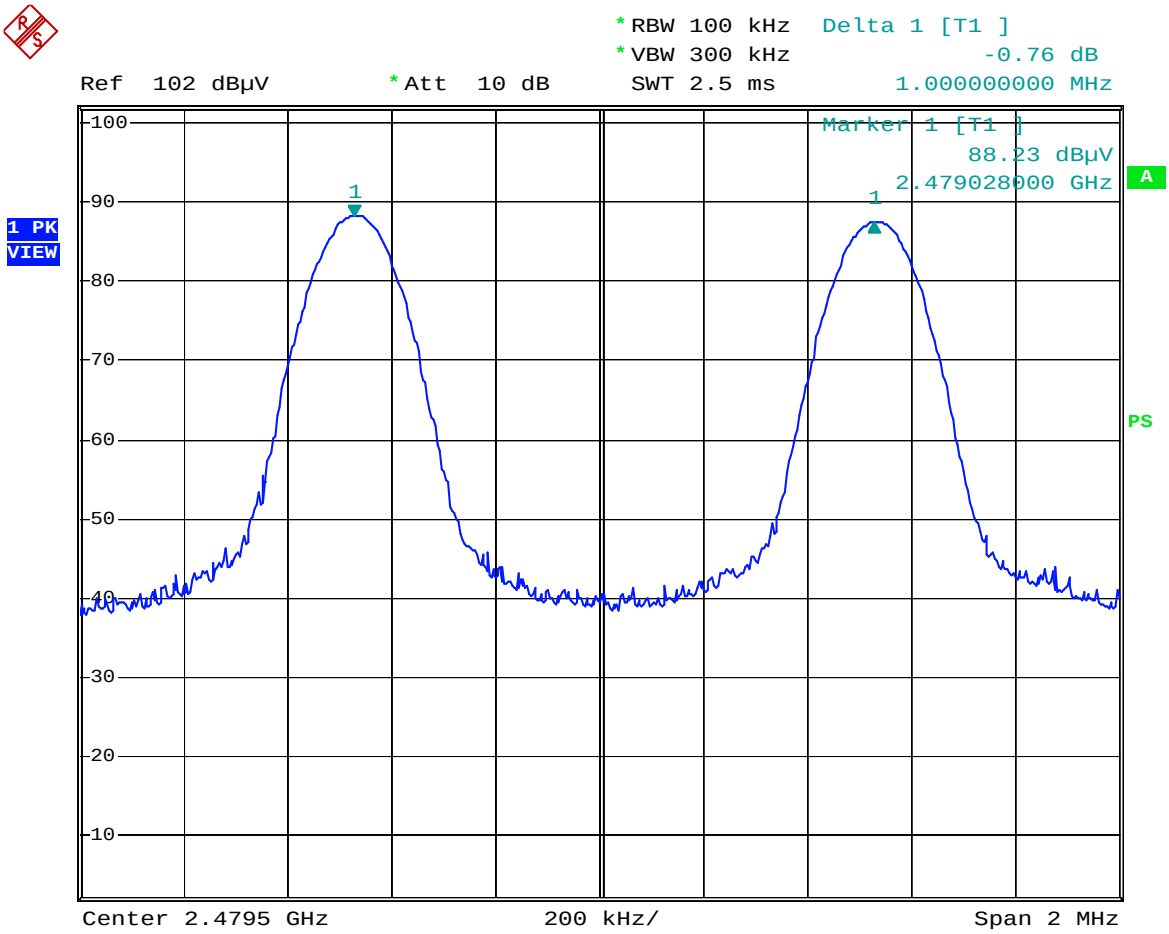
Middle Channel



channel separation (mid channel)

Date: 16.OCT.2007 16:14:51

High Channel



channel separation (high channel)

Date: 16.OCT.2007 16:17:39

§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	2007-09-29	2008-09-29

*** 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:	100.9kPa

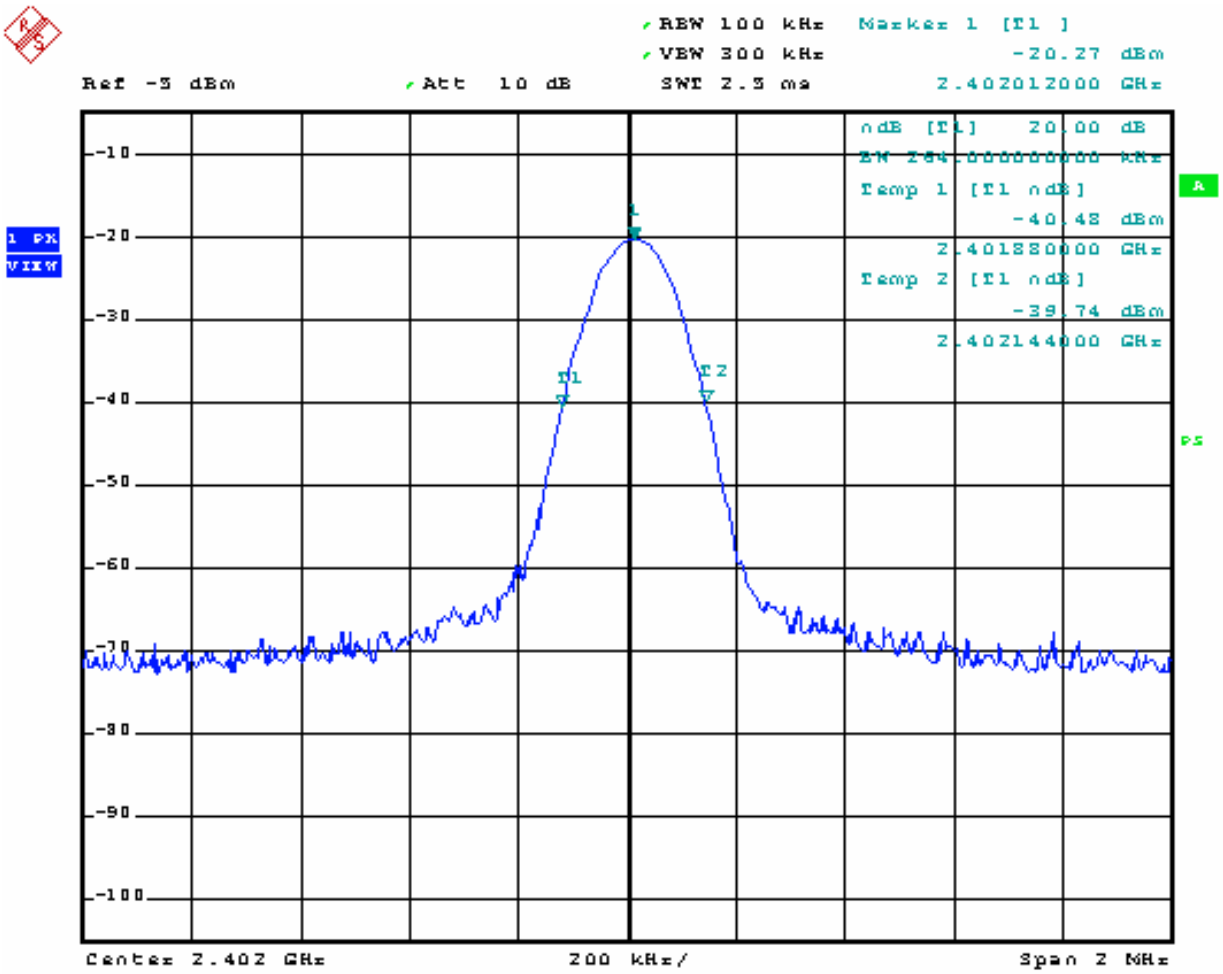
The testing was performed by Henry Yang on 2007-11-19.

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)
Low Channel	2402	0.264
Mid Channel	2441	0.264
High Channel	2480	0.265

Please refer to following plots

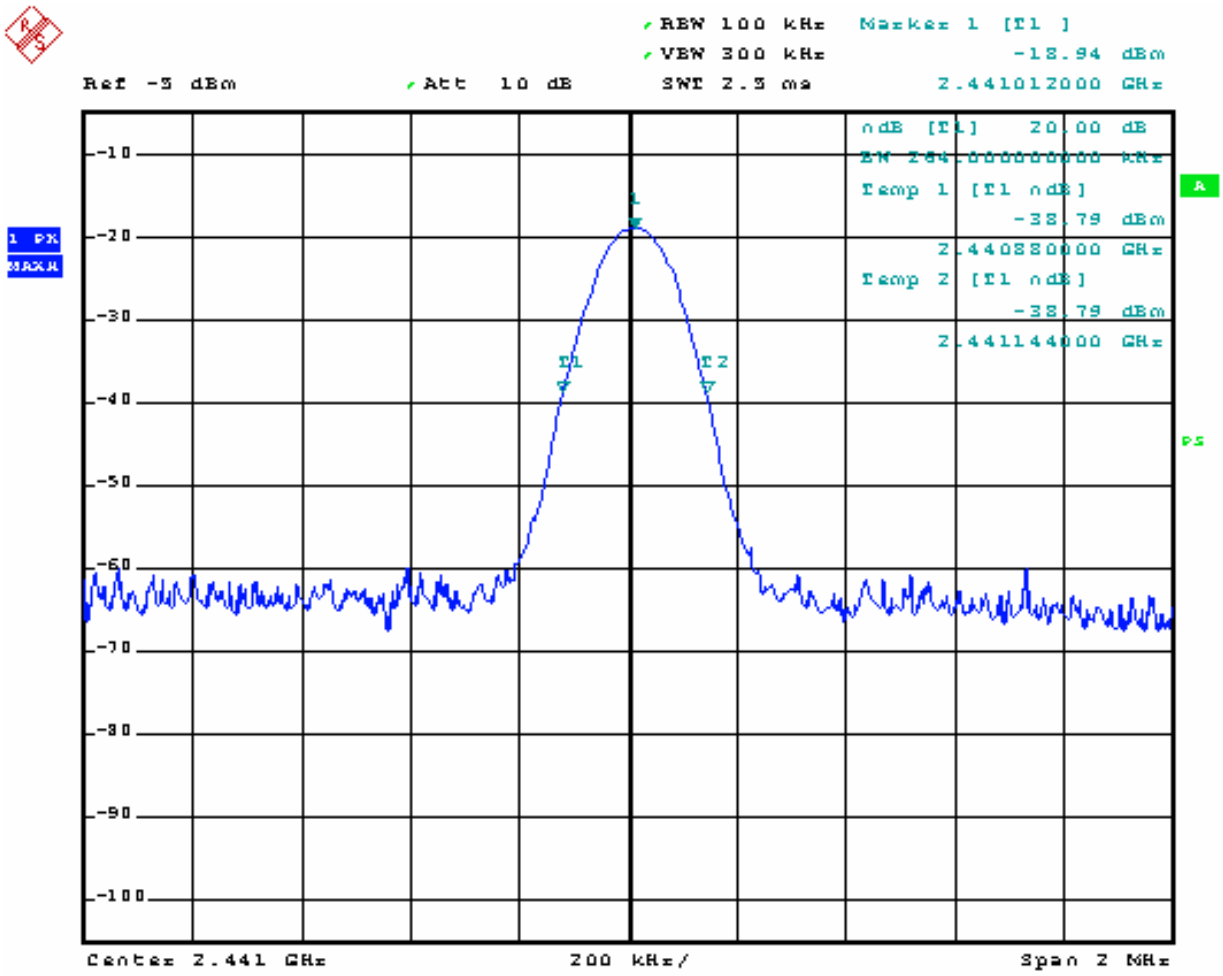
Low Channel



20dB Bandwidth (low channel)

Date:19.NOV.2007 14:45:06

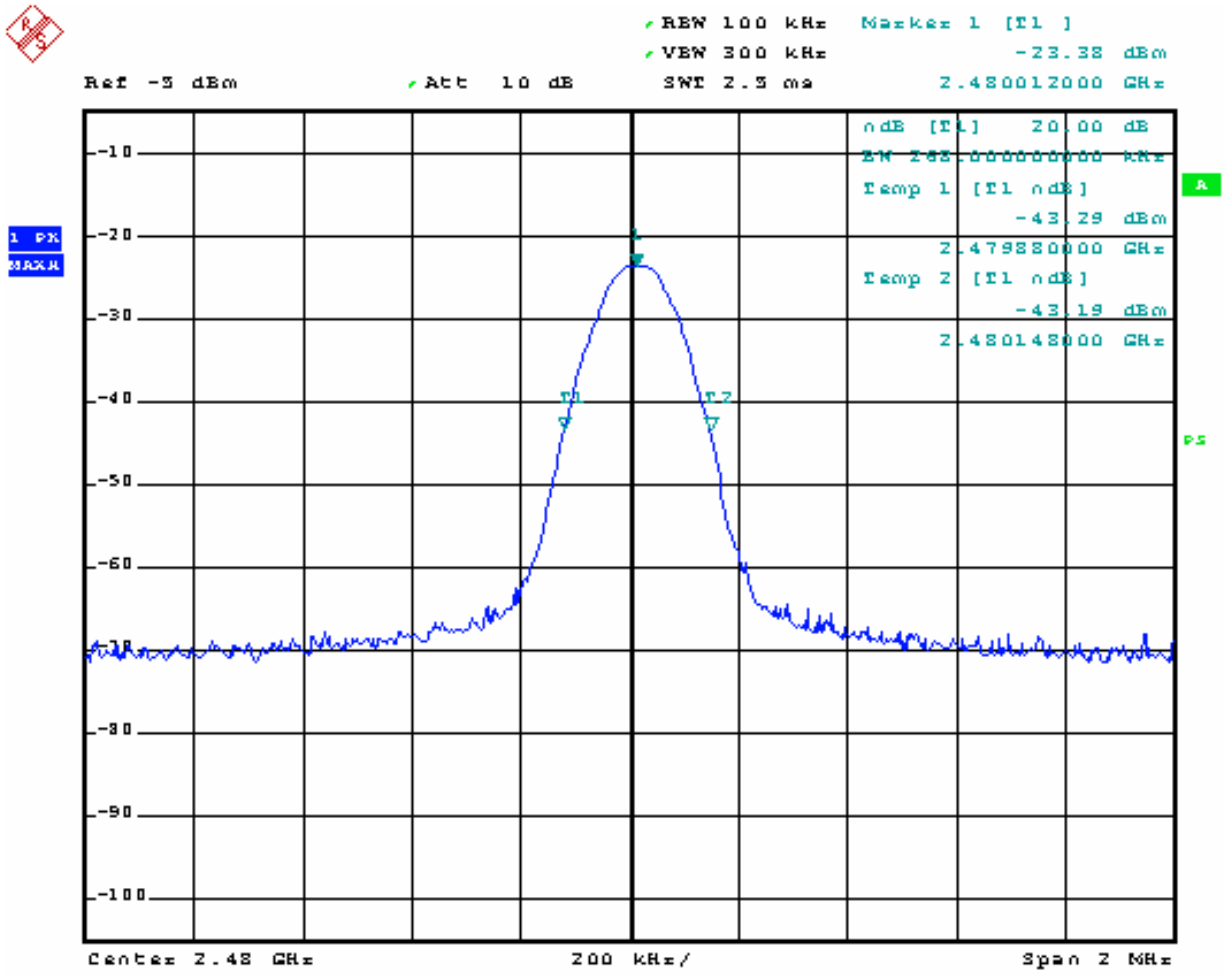
Middle Channel



20dB Bandwidth (mid channel)

Date:19.NOV.2007 14:46:22

High Channel



20dB Bandwidth (high channel)

Date:19.NOV.2007 14:48:03

§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	2007-09-29	2008-09-29

*** 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

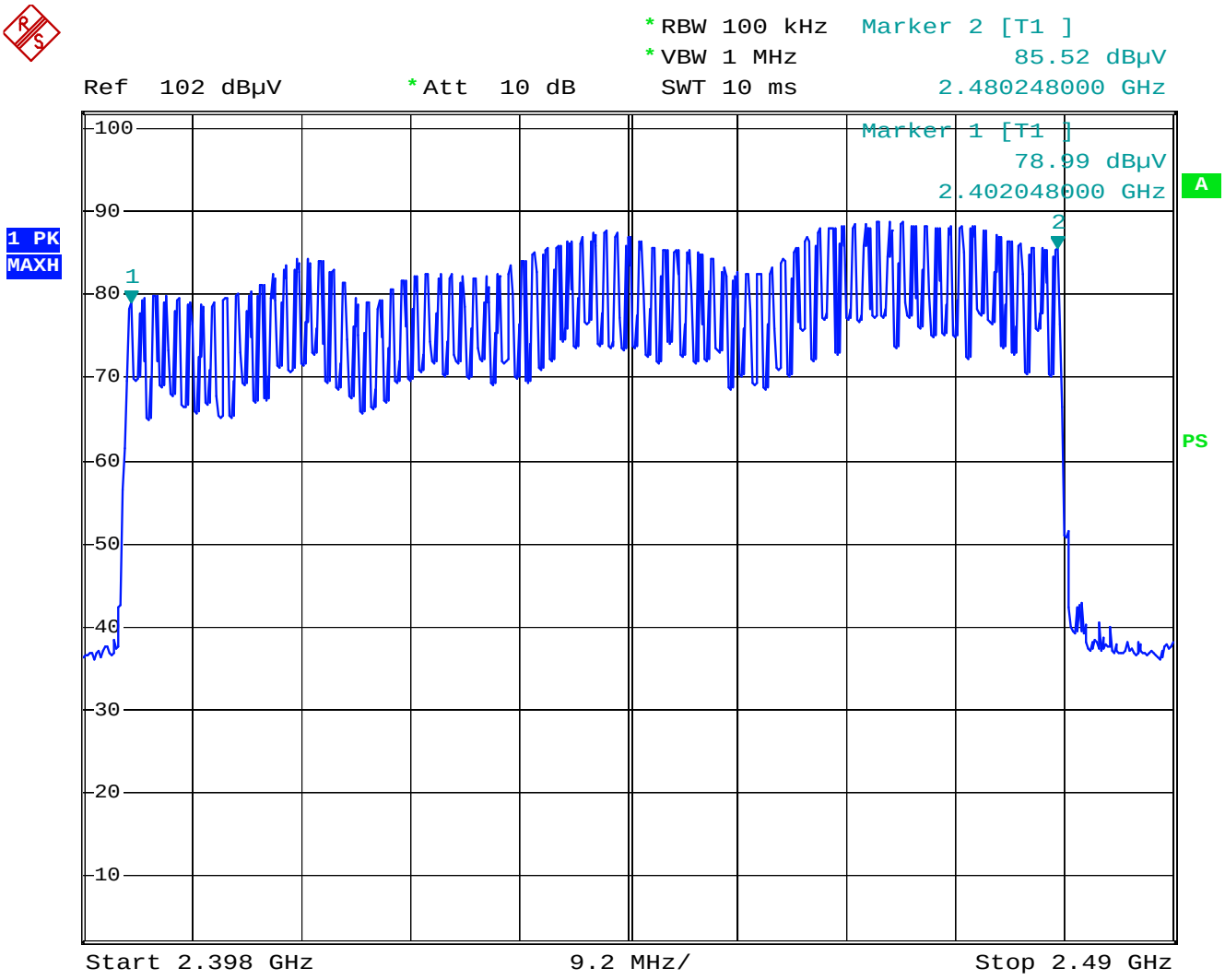
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Yang on 2007-10-16.

Test mode: Transmitting

Test Result: Pass

Please refer to following plot



number of hopping channel

Date: 16.OCT.2007 16:03:23

§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	2007-09-29	2008-09-29

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

The testing was performed by Henry Yang on 2007-10-16.

Test mode: Transmitting

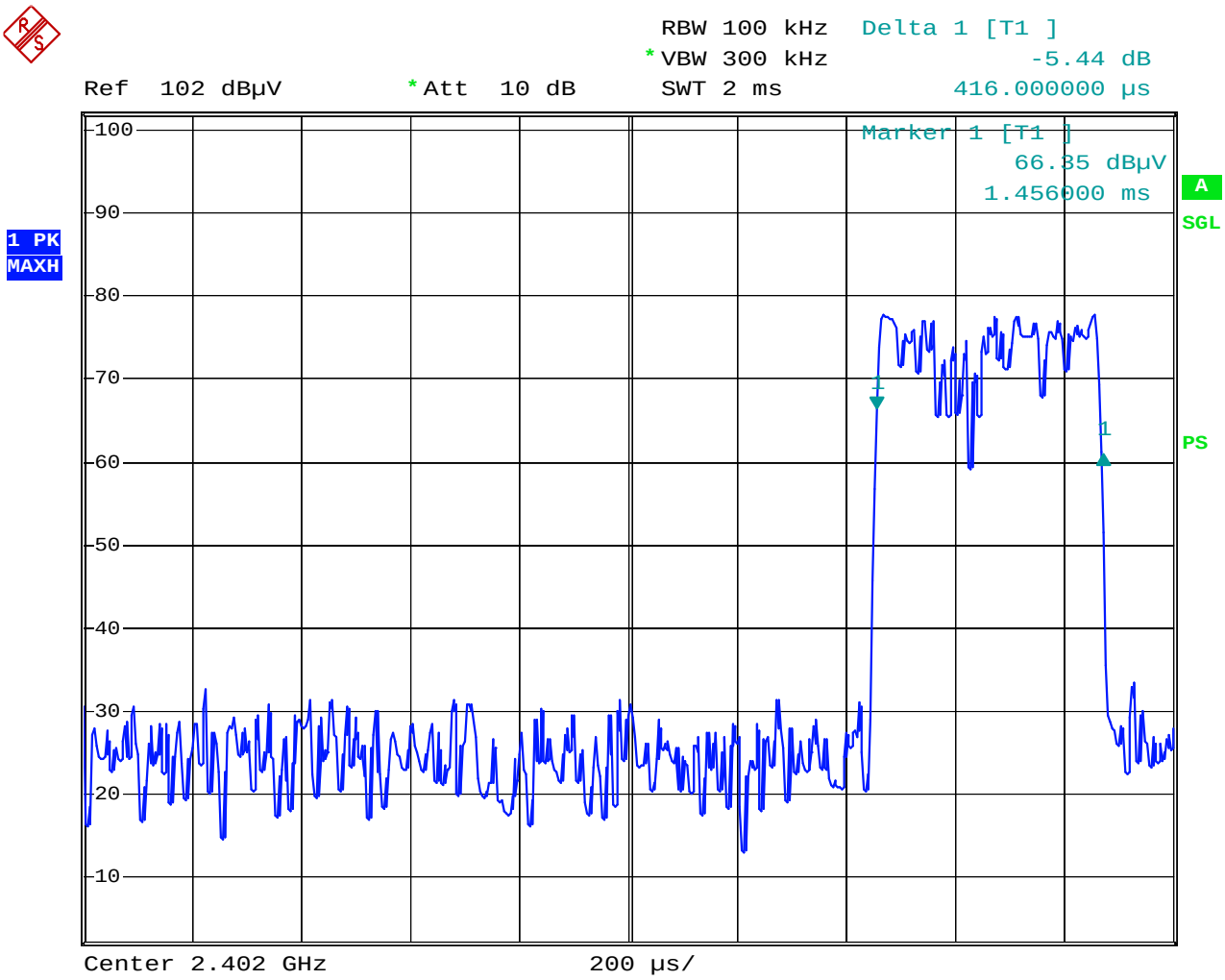
Channel	Pulse width (msec)	Dwell time (sec)	Limit (sec)	Result
Low Channel	0.416	0.133	0.4	Pass
Mid Channel	0.416	0.133	0.4	Pass
High Channel	0.416	0.133	0.4	Pass

NOTE: Dwell time= Pulse time*(1600/2/79)*31.6S

Test Result: Pass

Please refer to following plots

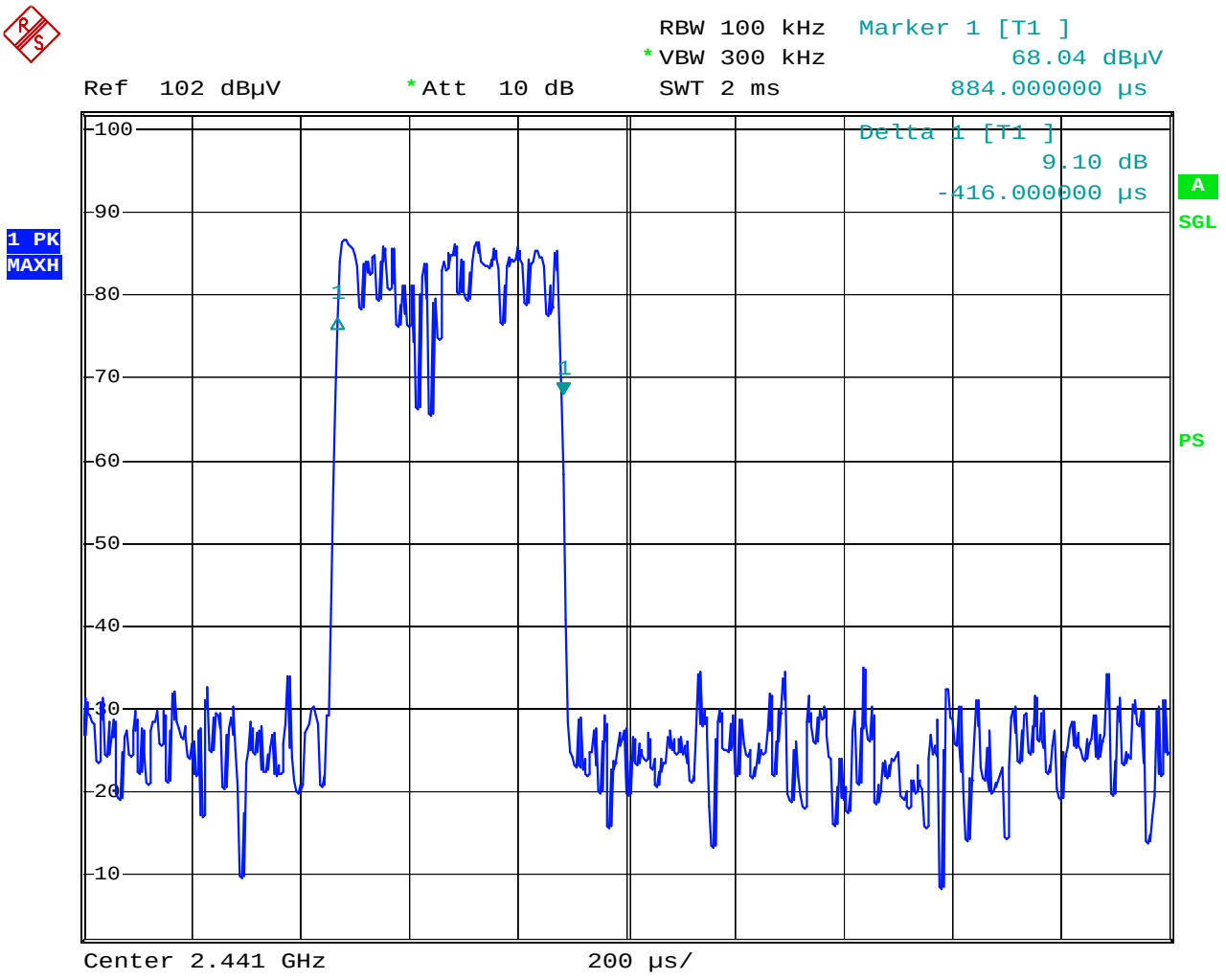
Low Channel



time on of pulse(low channel)

Date: 16.OCT.2007 16:55:12

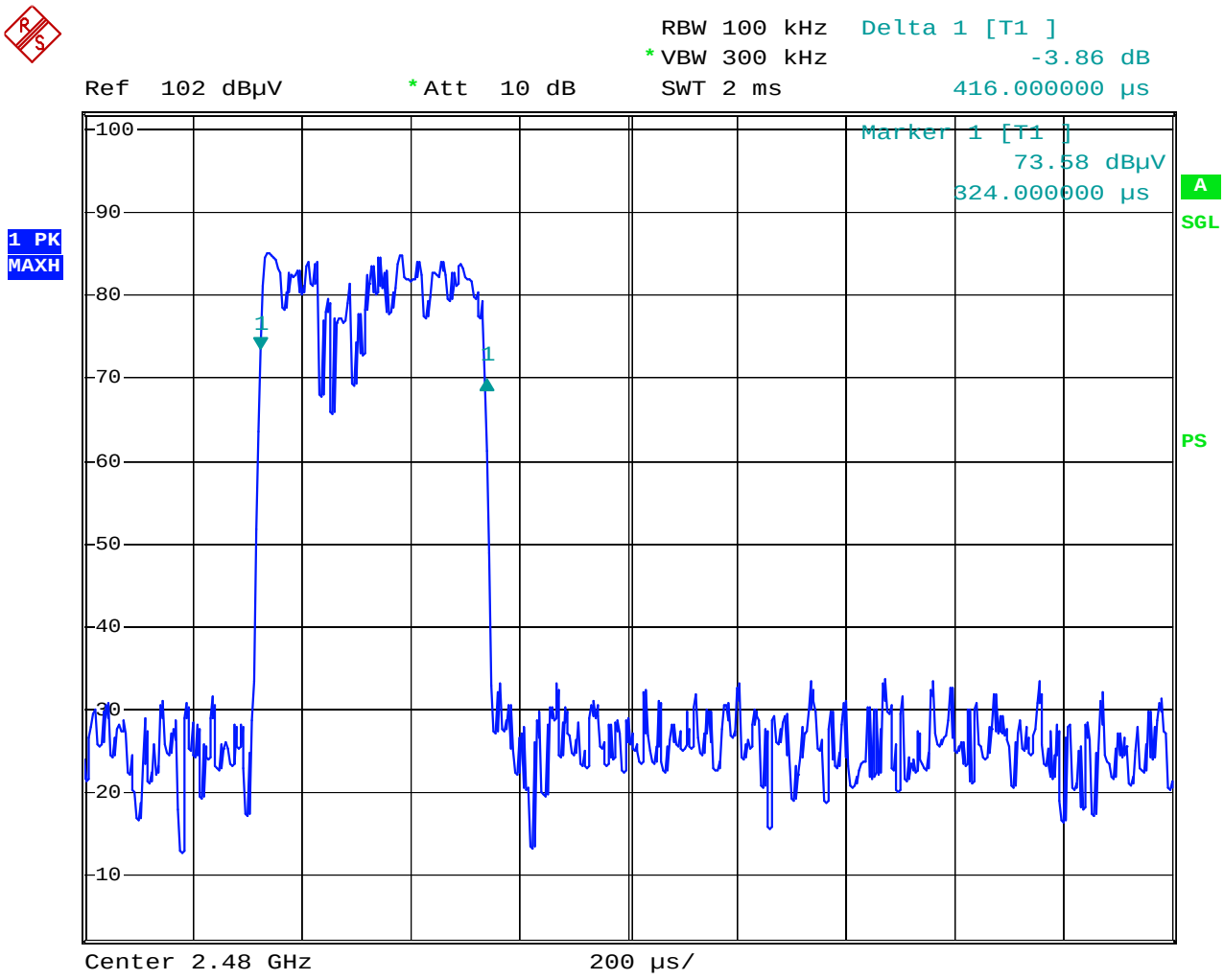
Middle Channel



time on of pulse(mid channel)

Date: 16.OCT.2007 16:56:28

High Channel



time on of pulse(high channel)

Date: 16.OCT.2007 16:58:38

§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.

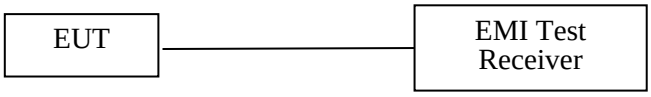
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-09-29	2008-09-29

*** 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:	56%
ATM Pressure:	100.0 kPa

The testing was performed by Henry Yang on 2007-11-09.

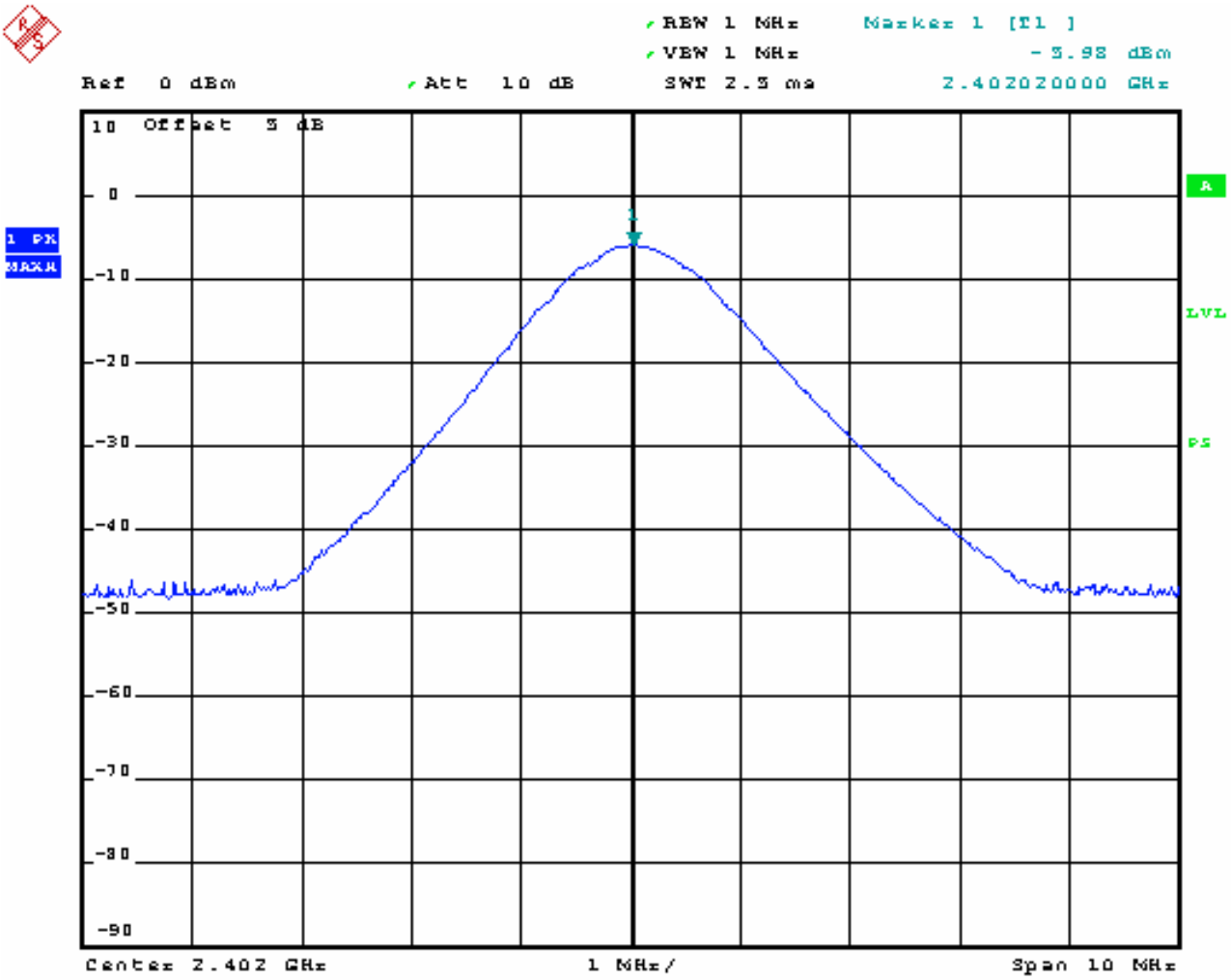
Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Power Output		Limit (w)
		(dBm)	(mw)	
Low Channel	2402	-5.98	0.25	1
Mid Channel	2441	-5.51	0.28	1
High Channel	2480	-7.85	0.16	1

Test Result: Pass

Please refer to the following plots

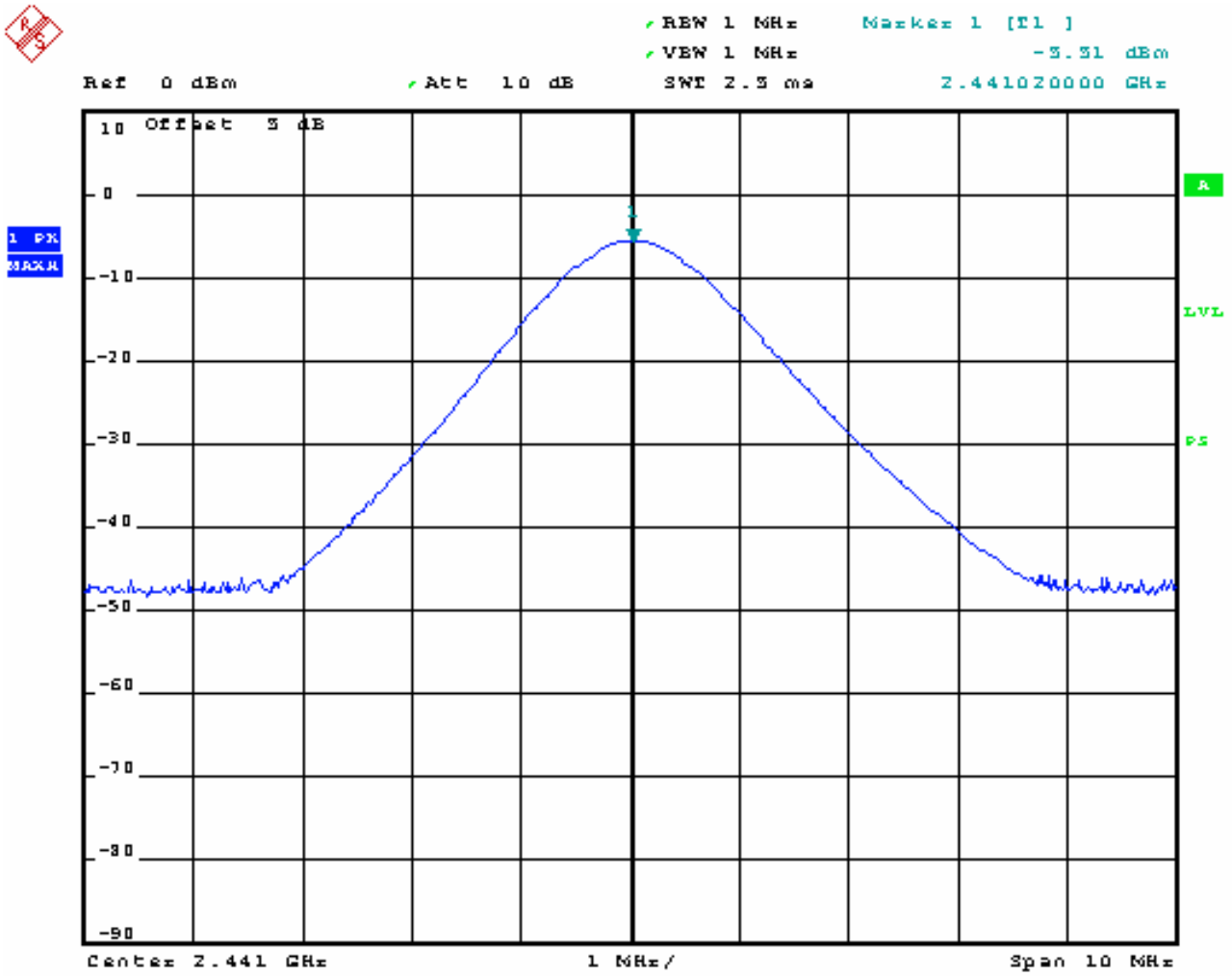
Low Channel



output power (low channel)

Date: 9.NOV.2007 14:13:43

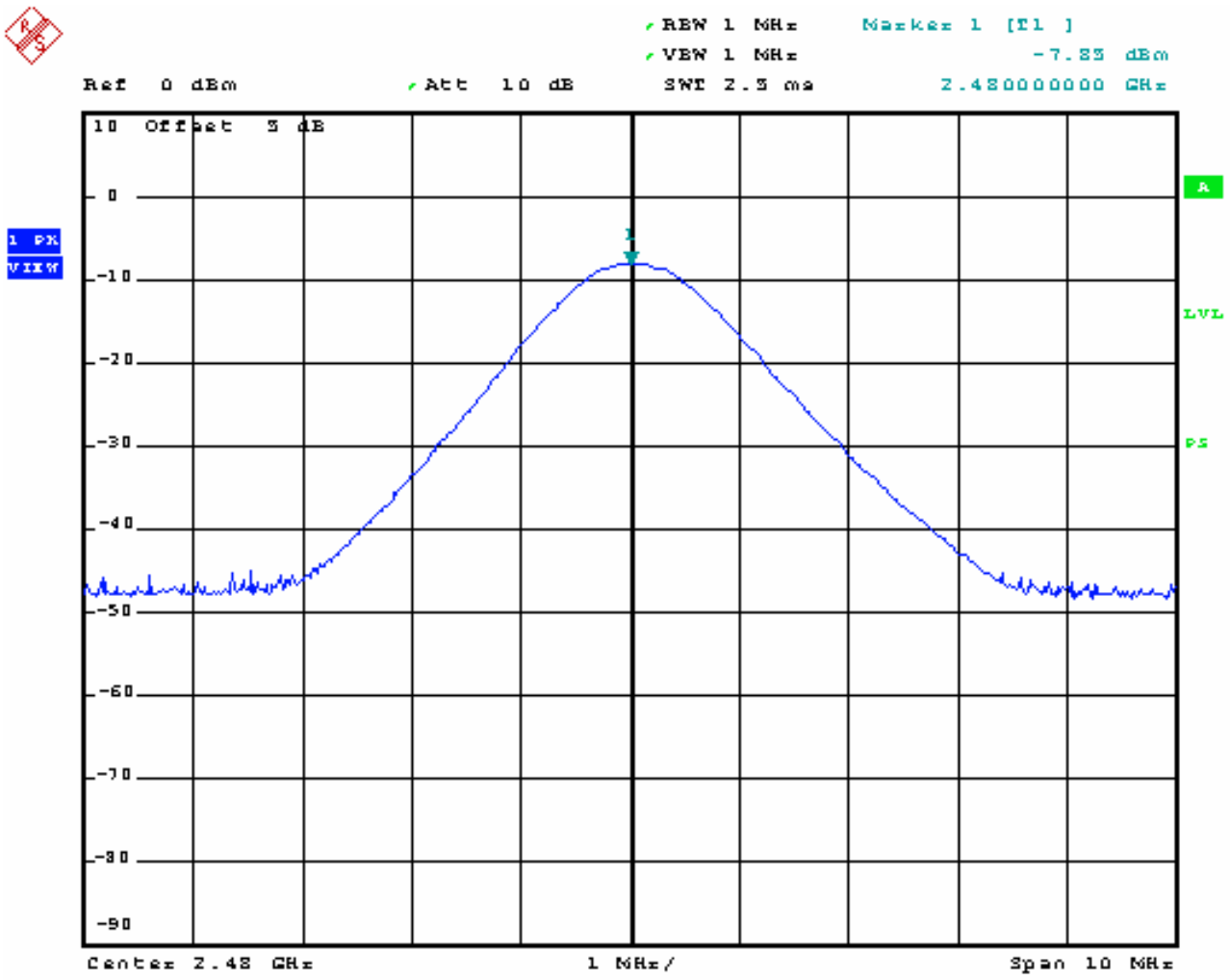
Middle Channel



output power (mid channel)

Date: 9.NOV.2007 14:11:48

High Channel



output power (high channel)

Date: 9.NOV.2007 14:18:44

§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	2007-09-29	2008-09-29

*** 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. Put it on the Rotated table and 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:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

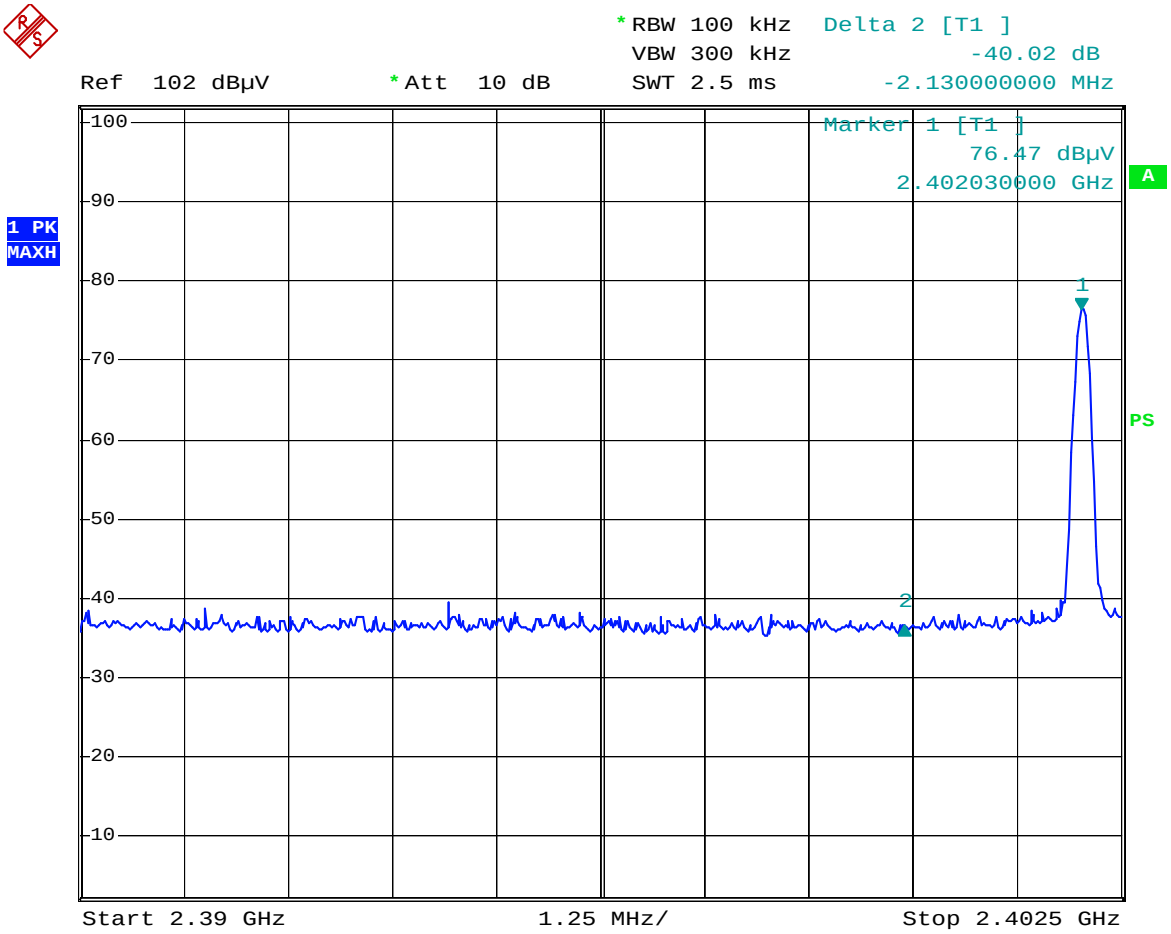
The testing was performed by Henry Yang on 2007-10-16.

Emission Frequency (MHz)	Emission Level (dBuV/m)	Bandedge (dBc)	Limit (dBc)	Magin (dB)
2399.9	36.45	40.2	20	20.2
2483.6	36.50	46.9	20	26.9

NOTE:
BANDEDGE=HIGHEST PK – EMISSION LEVEL

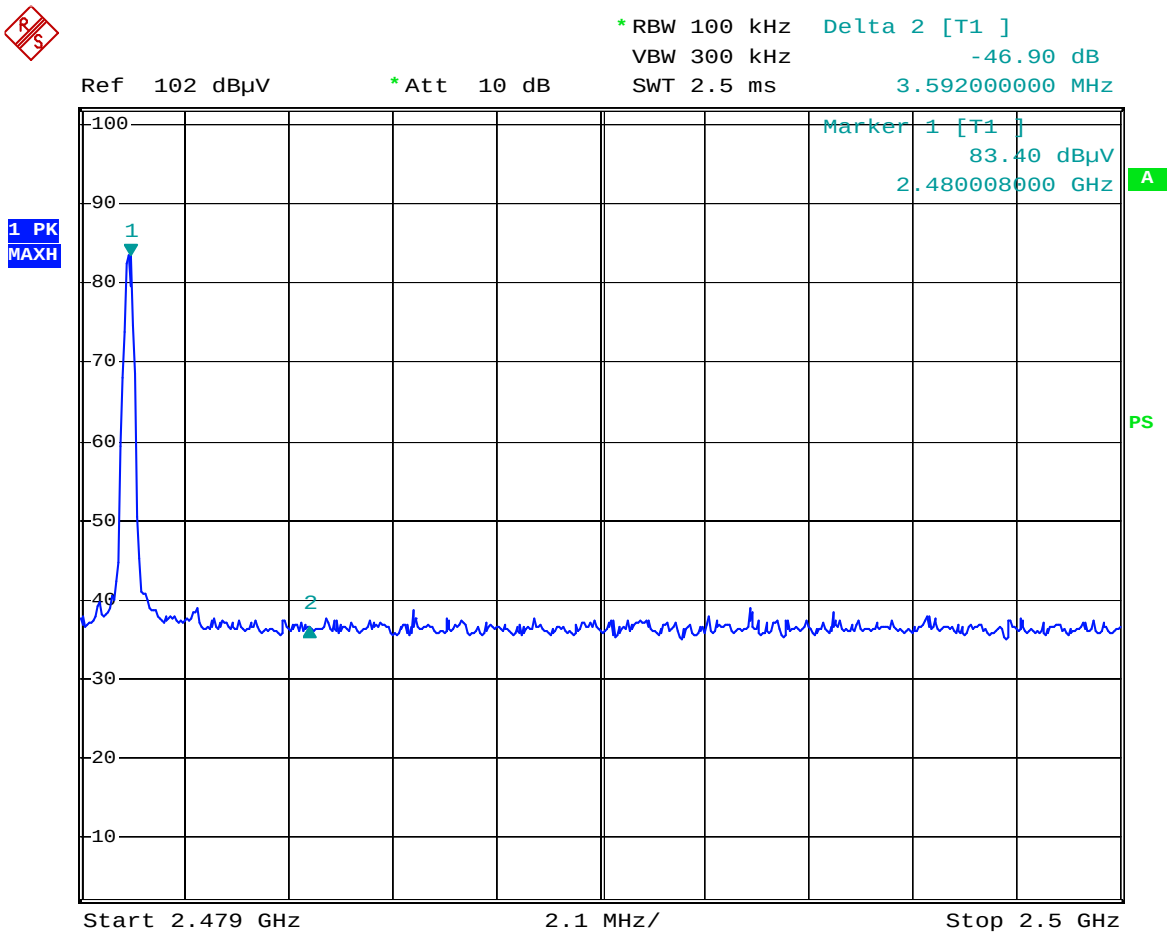
Test Result: Pass

Please refer to the following plots



bandedge(lower)

Date: 16.OCT.2007 17:05:06

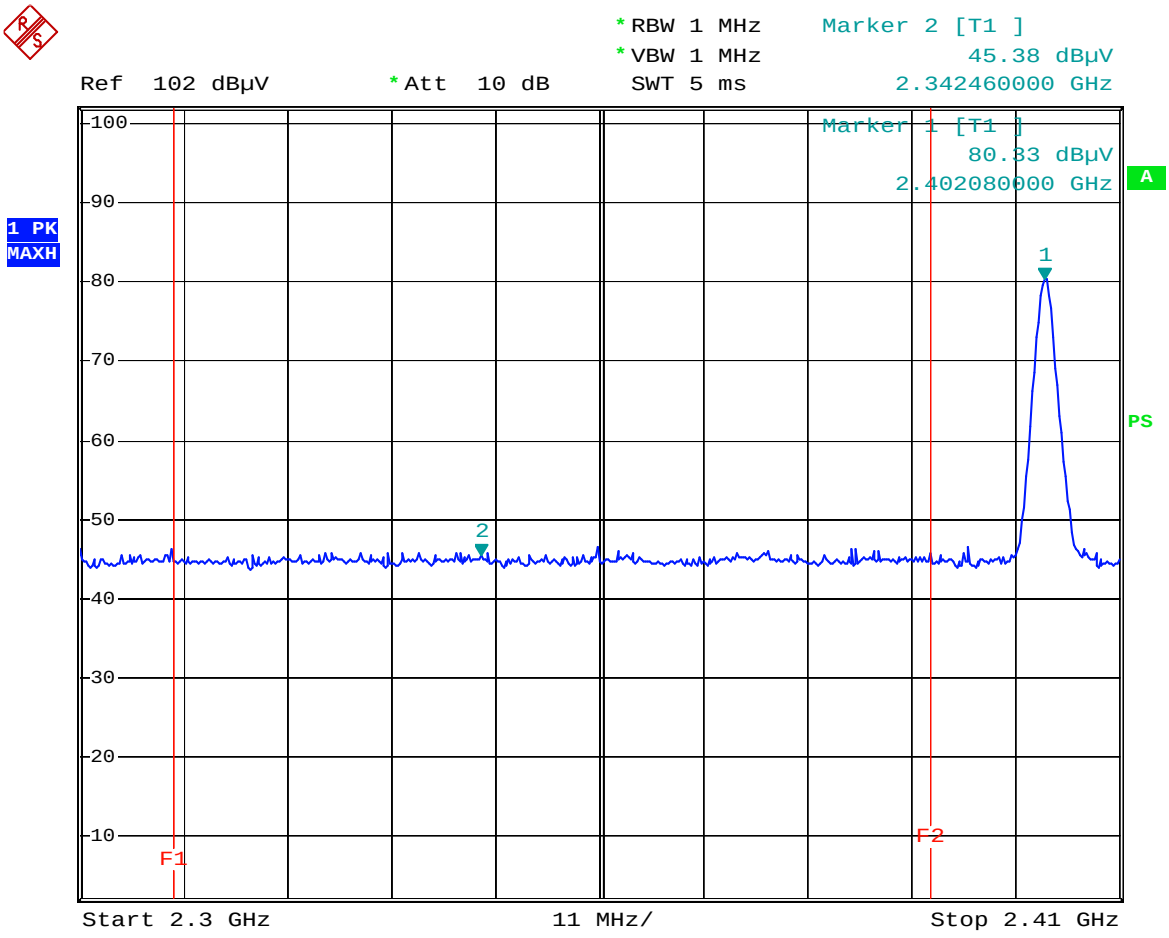


bandedge(upper)

Date: 16.OCT.2007 17:07:20

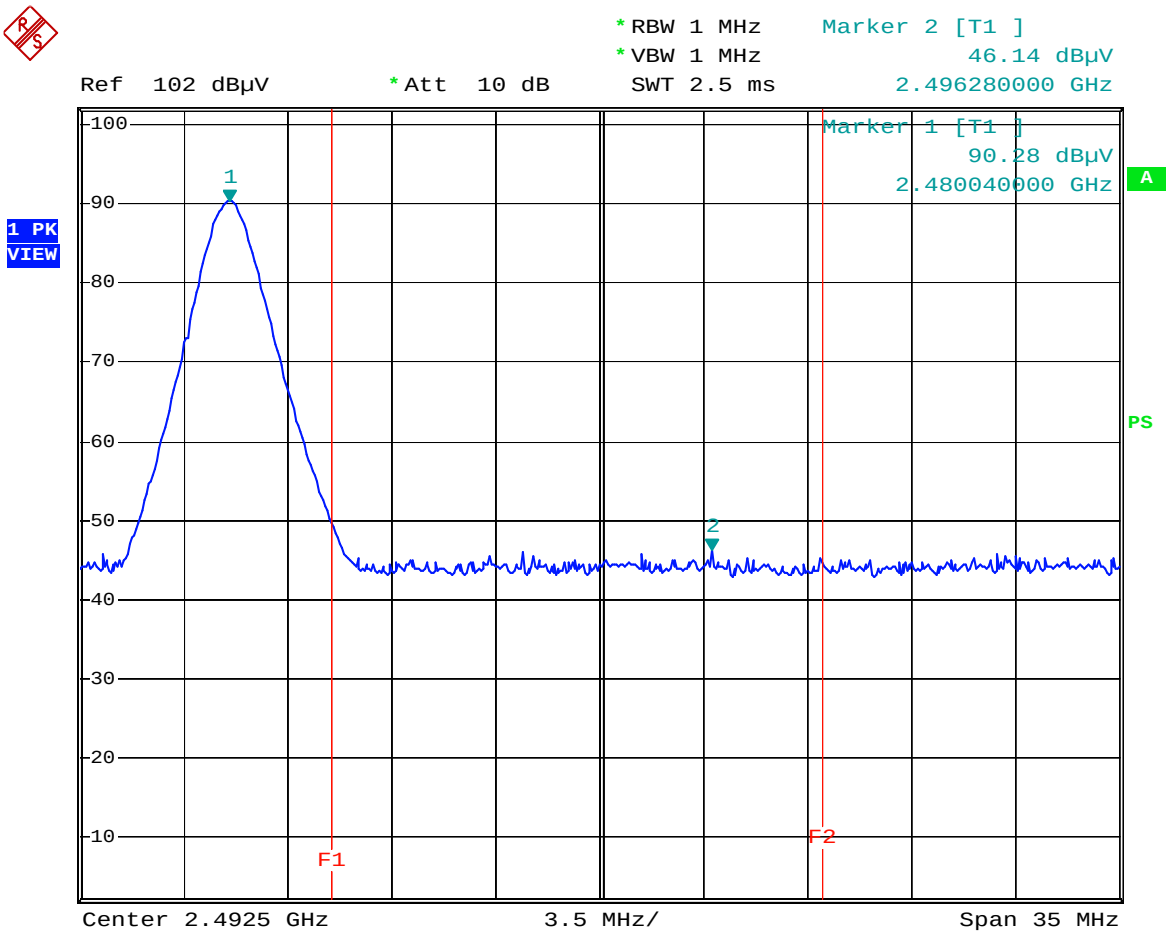
Radiated Emissions in restricted band

Emission Frequency (MHz)	Detector Type	Emission Level (dBuV/m)	Limit (dBuV/m)	Magin (dB)
2342.5	PK	45.4	74	28.60
	AV	44.9	54	9.10
2496.3	PK	46.14	74	27.86
	AV	45.79	54	8.21



restrict band 2.31-2.39GHz

Date: 16.OCT.2007 21:14:58



restrict band 2.4835-2.500GHz

Date: 16.OCT.2007 21:28:56

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