NVLAP LAB CODE 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Pacific Crest Corporation

990 Richard Ave. Suite 110,
Santa Clara, CA95050, USA

FCC ID: KEABTRX

Report Type:	**Product Type:**
☒ Original Report	Bluetooth Adapter

Test Engineer:	Merry Zhao
Report No.:	R0611284-247
Test Date:	2007-03-02 to 2007-03-05
Report Date:	2007-03-09
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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1 GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

The Pacific Crest Corporation's product, *FCCID: KEABTRX*, model number: BTRX01, Model *name: Bluetooth Serial Dongle* or the "EUT" as referred to in this report is a mobile Bluetooth Adapter for indoor use. The EUT is operating at 2402 MHz to 2480 MHz and uses a FHSS modulation.It can be applied to all kinds of home appliances, equipment (such as medical treatment equipment) and other electronic information products.

It can be used independently as well, excluding using by match. When user's equipment equipped with a this EUT of one subordinate equipment, other Bluetooth devices, such as Bluetooth PDA can search out adapter of this EUT, and find out the services provided, then establish links and communication with this adapter through these services as well. This module can still be used as the same as the serial wires for the communications of users' equipments.

1.2 Mechanical Description

The *Pacific Crest Corporation*'s product, *FCCID: KEABTRX*, model number: BTRX01, *Model name: Bluetooth Serial adapter* or the "EUT" as referred to in this report *measures* approximately: 7.2 cm L x 3.2 cm W x 1.8 cm H.

** The test data gathered are from production sample, serial number: 0701118, provided by the manufacturer.*

1.3 Objective

This Type approval report is prepared on behalf of *Pacific Crest Corporation* 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.

1.4 Related Submittal(s)/Grant(s)

No related submittal(s).

1.5 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.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the 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 values ranging from ±2.0 dB for Conducted Emissions tests and ±4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

Detailed instrumentation measurement uncertainties can be found in BACL Corp. report QAP-018.

1.7 Test Facility

The Test site used by Bay Area Compliance Laboratory Corp. (Shenzhen) to collect radiated and conducted emission measurement 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 and Industrial Canada registration test site No.: 5500A. 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

1.8 Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Motherboard	OWC297	CN-OWC297-70821-566-02BR	DoC
DELL	Power	NPS-250KB D	CN-0H2678-17972-56E8NBM	DoC
Seagate	Hard Disk	ST340014A	5JXK3NAD	DoC
DELL	3.5' Floppy	N/A	CN-0N8893-69802-54Q-02OZ	DoC
Lite-ON	CD-Rom	LTN-489S	N/A	DoC
Intel	Ethernet	PRO 10/100 VE	N/A	DoC
Intel	CPU	Celeron D-2533	N/A	DoC
ProMOS	Memory	V826632K24SATG-C0	0525-K1933700	DoC

1.9 Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	PC	DELL 170L	CN-0TC670-70821-560-F4WQ	DoC
DELL	Keyboard	SK-8110	CN07N244-71616-56I-1I0O	DoC
DELL	Mouse	M071KC	519046820	DoC
DELL	LCD Monitor	1505FP	Y4287-7168-574-GBSH	DoC
HP	Laser Jet5L	C3941A	JPTVOB2337	DoC
SAST	Modem	AEM-2100	293	DoC

1.10 External I/O Cable

Cable Description	Length (M)	From/Port	To
Shielded Detachable Keyboard Cable	1.50	Keyboard Port / Host	Keyboard
Shielded Detachable Mouse Cable	1.50	Mouse Port / Host	Mouse
Shielded Detachable Printer Cable	1.20	Parallel Port / Host	Printer
Shielded Detachable VGA Cable	1.50	VGA Port/Host	Monitor
RS232 Cable	1.20	EUT	Host PC
USB Cable	1.0	EUT	Host PC

2 SYSTEM TEST CONFIGURATION

2.1 Description of Test Configuration

The system was configured for testing with additional control unit as shown on the configuration of test setup on page 7.

2.2 EUT Exercise Software

The exercise software is available.

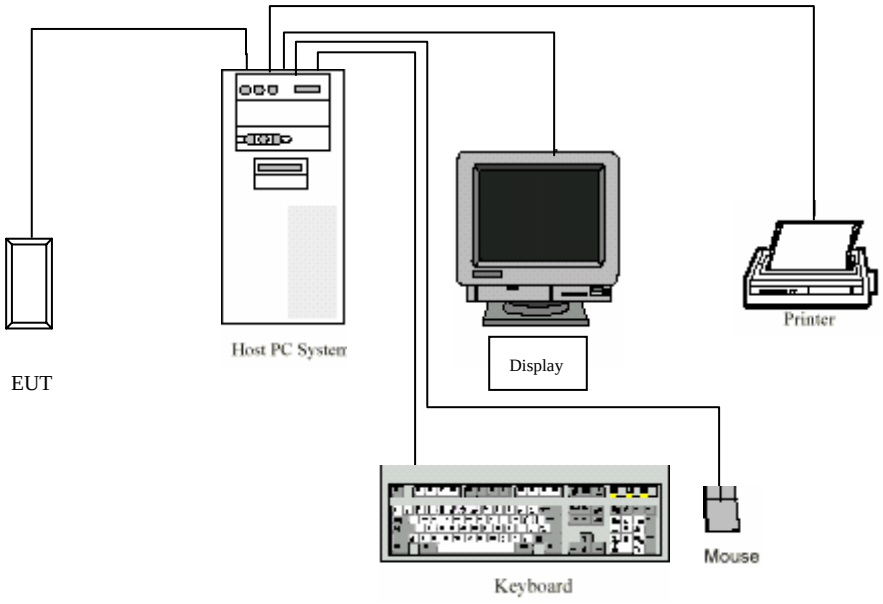
2.3 Special Accessories

The special Accessories were provided by Bay Area Compliance Laboratory Corp. (Shenzhen).
The control unit was provided by manufacturer.

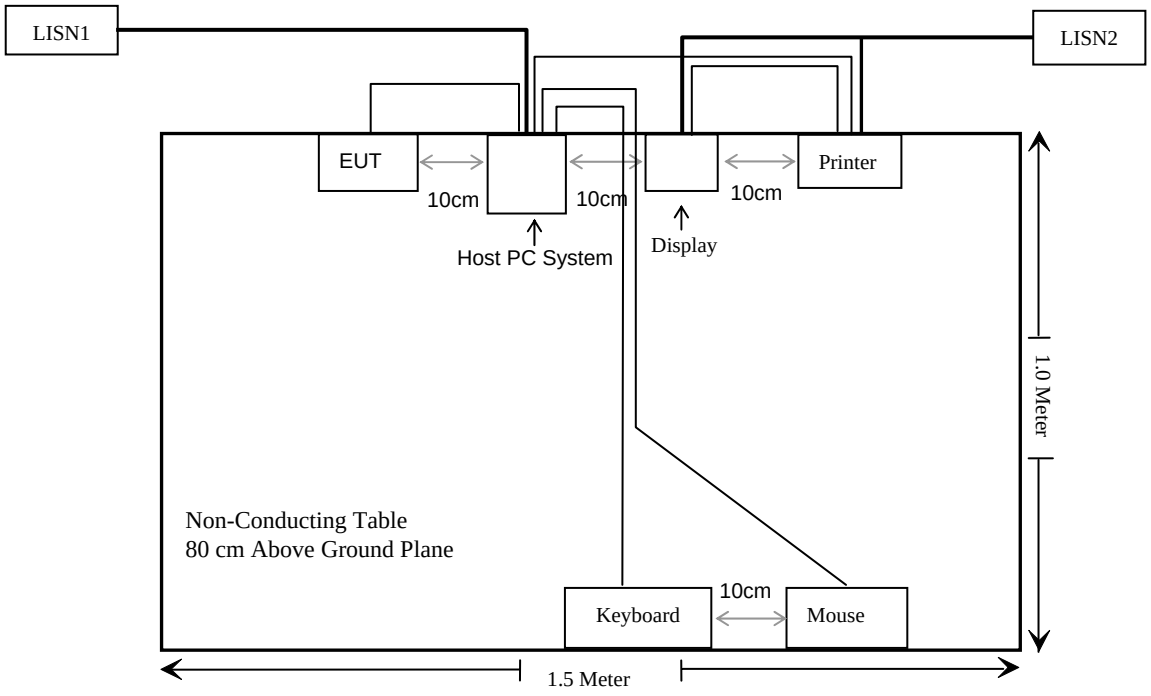
2.4 Equipment Modifications

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

2.5 Configuration of Test Setup



2.6 Block Diagram of Test Setup



3 SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§ 15.207 (a)	Conducted Emissions	Compliant
§15.205, §15.209(a) & §15.247(d)	Radiated Emissions	Compliant
§15.247(d)	Spurious Emissions at Antenna Terminals	Compliant
§15.247 (a) (1)	Hopping Channel Separation	Compliant
§15.247 (a) (1)	20 dB Channel Bandwidth	Compliant
§15.247 (a) (1) (iii)	Number of Hopping Frequencies Used	Compliant
§15.247 (a) (1) (iii)	Dwell Time of Each Frequency	Compliant
§15.247 (b)(1)	Maximum Peak Output Power	Compliant
§ 15.247 (d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247(i) §2.1091	RF Exposure	Compliant

4 § 15.247 (i) and § 2.1091 - RF EXPOSURE

4.1 Applicable Standard

According to §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is nt exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

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

4.2 Test Data

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$
S = power density (in appropriate units, e.g. mW/cm2)
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: -1.96 (dBm)
Maximum peak output power at antenna input terminal: 0.637 (mW)
Prediction distance: >20 (cm)
Predication frequency: 2480 (MHz)
Antenna Gain (typical): 1 (dBi)
Antenna Gain (typical): 1.26
The worst case is power density at predication frequency at 20 cm: 0.000159(mW/cm^2)
MPE limit for general population exposure at prediction frequency: 1 (mW/cm^2)

0.000159 (mW/cm^2) < 1 (mW/cm^2)

Result: Compliant.

5 §15.203 - ANTENNA REQUIREMENT

5.1 Applicable Standard

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 use of a standard antenna jack or electrical connector is prohibited.

And according to § 15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2 Antenna Connector Construction

The EUT has an internal 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.

☒ **Compliant** ☐ **N/A**

6 §15.207 (a) - CONDUCTED EMISSIONS

6.1 Section 15.207 Conducted limits:

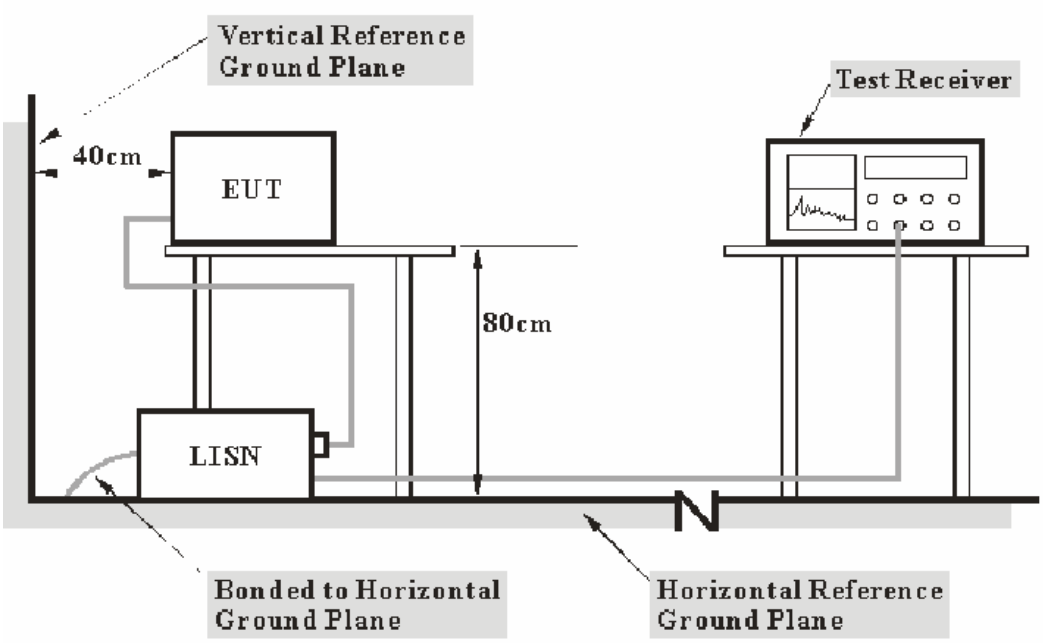
6.2 Applicable Standard

According to FCC §15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 * 56 60	56 to 46 * 46 50

** Decreases with the logarithm of the frequency.*

6.3 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.

6.4 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

6.5 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-8-17	2007-8-17
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2006-03-01	2007-03-01

*** 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.

6.6 Test Procedure

During the conducted emission test, the adapter 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.

6.7 Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC standard's conducted emissions limits for Class B devices, with the worst margin reading of:

-6.50 dB at **2.350 MHz** in the **Line** conductor.

6.8 Test Data

6.8.1 Environmental Conditions

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

The testing was performed by Merry Zhao on 2007-03-05.

Test Mode: Transmitting

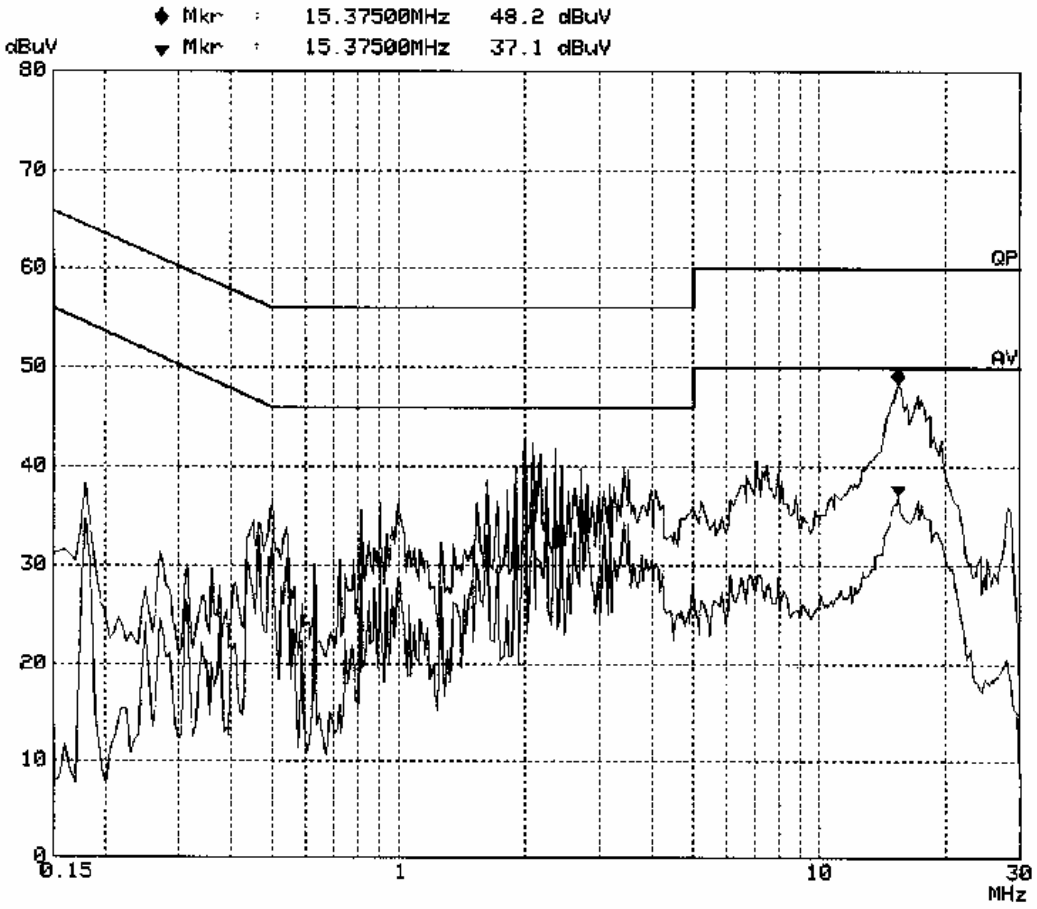
LINE CONDUCTED EMISSIONS				FCC PART 15 CLASS B	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/AV)	Phase Line/Neutral	Limit (dBμV)	Margin (dB)
2.350	39.50	AV	Line	46.00	6.50
2.085	38.00	AV	Neutral	46.00	8.00
2.080	37.50	AV	Line	46.00	8.50
2.810	36.00	AV	Neutral	46.00	10.00
15.375	48.20	QP	Line	60.00	11.80
15.315	47.70	QP	Neutral	60.00	12.30
1.625	33.10	AV	Line	46.00	12.90
15.375	37.10	AV	Line	50.00	12.90
0.500	32.60	AV	Line	46.00	13.40
2.080	42.30	QP	Line	56.00	13.70
2.350	42.10	QP	Line	56.00	13.90
15.315	35.90	AV	Neutral	50.00	14.10
2.085	41.60	QP	Neutral	56.00	14.40
0.180	39.90	AV	Neutral	54.49	14.59
2.810	41.30	QP	Neutral	56.00	14.70
1.000	31.30	AV	Neutral	46.00	14.70
1.625	38.70	QP	Line	56.00	17.30
1.000	37.50	QP	Neutral	56.00	18.50
0.500	36.40	QP	Line	56.00	19.60
7.475	40.10	QP	Line	60.00	19.90
7.475	28.00	AV	Line	50.00	22.00
0.180	41.80	QP	Neutral	64.49	22.69
0.275	27.80	AV	Neutral	50.97	23.17
0.275	36.20	QP	Neutral	60.97	24.77

6.9 Plot(s) of Test Data

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

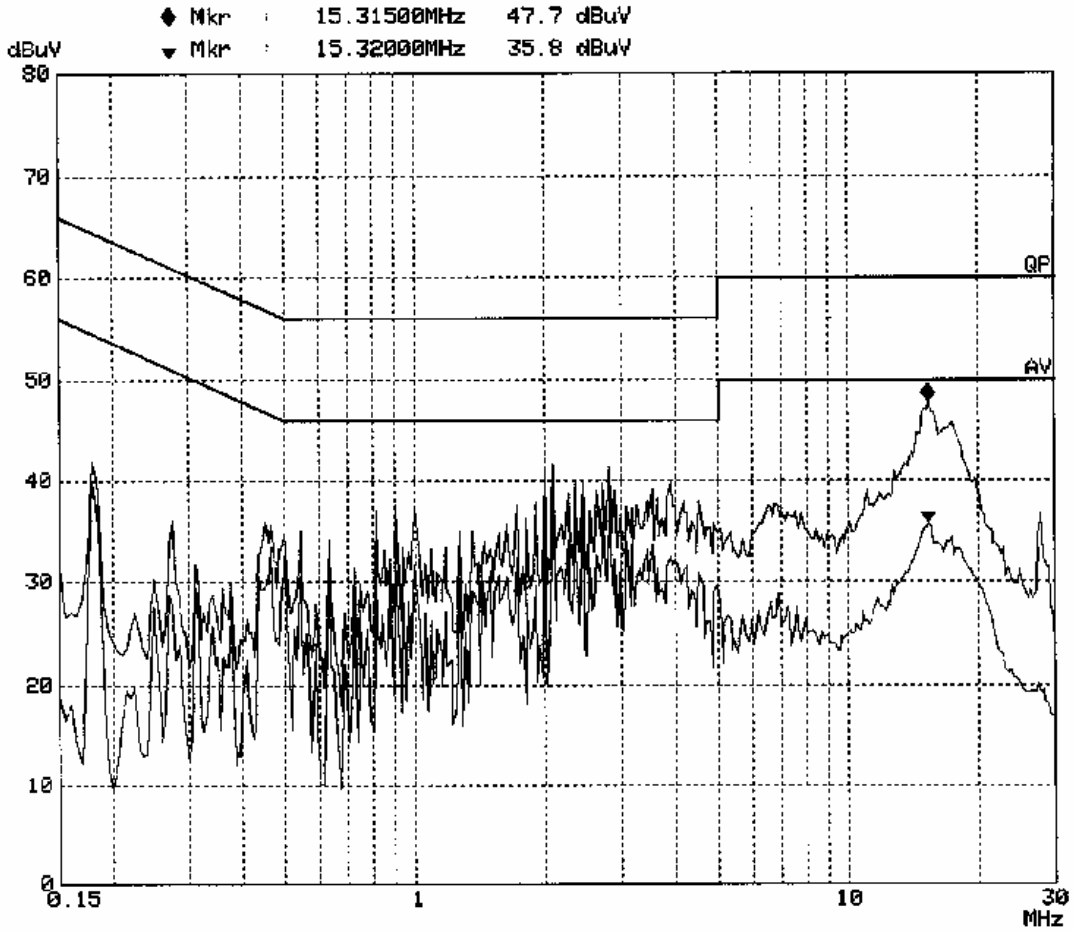
Conduction Emission Test
FCC Part15 Class B

EUT:	Bluetooth Serial Dongle
Manuf:	Pacific
Op Cond:	Transmitting
Operator:	Merry,zhao
Test Spec:	AC 120V/60Hz L
Comment:	Temp:25'C Humi:56%
Date:	05. Mar 07 13:44



Conduction Emission Test
FCC Part15 Class B

EUT:	Bluetooth Serial Dongle
Manuf:	Pacific
Op Cond:	Transmitting
Operator:	Merry,zhao
Test Spec:	AC 120V/60Hz N
Comment:	Temp:25'C Humi:56%
Date:	05. Mar 07 14:06



7 §15.205, §15.209(a) & §15.247(d) - RADIATED EMISSIONS

7.1 Applicable Standard: FCC §15.205 (a)

a) As Per 15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	960 – 1240	4. 5 – 5. 15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5. 35 – 5. 46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 –167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3 3458 – 3 358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

b) Except as provided in 15.205 paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

(c) Except as provided in paragraphs (d) and (e), regardless of the field strength limits specified elsewhere in this Subpart, the provisions of this Section apply to emissions from any intentional radiator.

☒ **Compliant** ☐ **N/A**

7.2 Applicable Standard: FCC §15.209 Radiated emission limits, general requirements.

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

Frequency (MHz)	Field Strength (micro volts/m)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

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

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

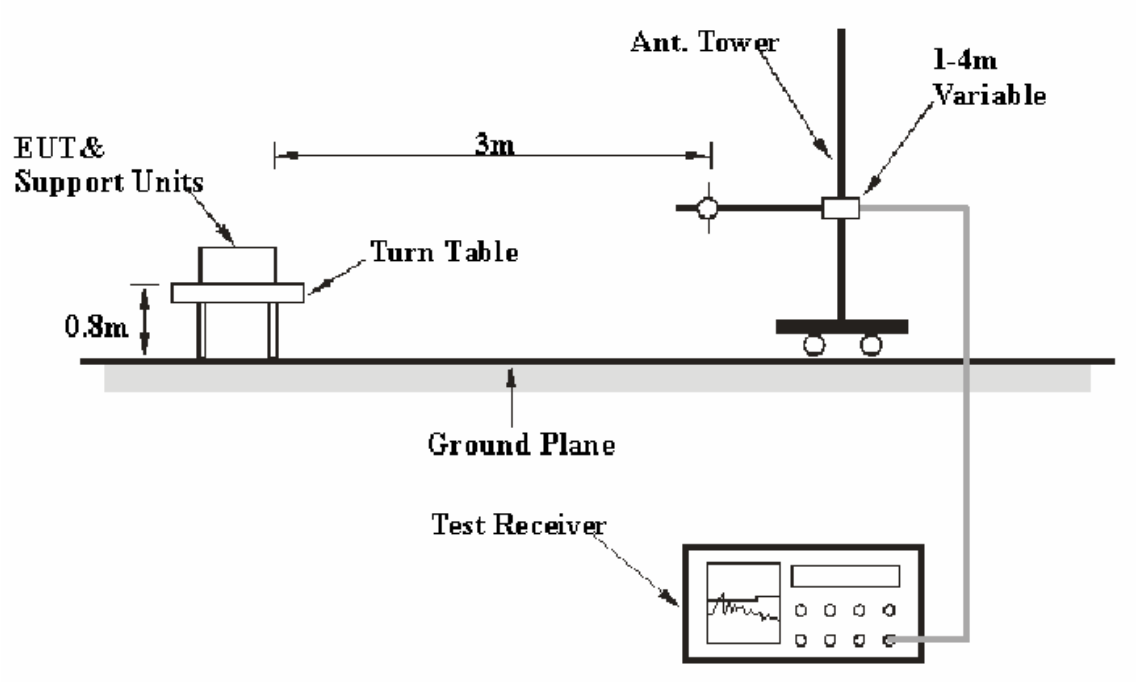
☒ **Compliant** ☐ **N/A**

7.3 Applicable Standard: FCC §15.247 (d) Radiated spurious emission requirements.

According to §15.247 (d) 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)).

☒ **Compliant** ☐ **N/A**

7.4 EUT Setup



The radiated emission tests were performed in the 3-meter Chamber, 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 host was connected to a 120 VAC/60 Hz power source.

7.5 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

7.6 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2006-11-15	2007-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2006-08-14	2007-08-14
HP	Amplifier	8449B	3008A00277	2006-09-29	2007-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2006-09-25	2007-09-25
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.

7.7 Test Procedure

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

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

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

7.8 Corrected Amplitude & Margin Calculation

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

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

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

Margin = Limit - Corr. Ampl.

7.9 Test Results Summary

According to the test data, the EUT complied with the FCC Title 47, Part 15 Subpart C sections 205, 209 and 247 standards' limits, with the closest margins from the limit listed below:

9.39 dB at **7206 MHz** in the **Veritical** polarization, Low Channel (Above 1 GHz)
7.35 dB at **7323 MHz** in the **Veritical** polarization, Middle Channel (Above 1 GHz)
9.85 dB at **7440 MHz** in the **Veritical** *polarization*, High Channel (Above 1 GHz)
3.70dB at **31.07 MHz** in the **Vertical** polarization for FCC 15.209

7.10 Test Data

7.10.1 Environmental Conditions

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

The testing was performed by Merry Zhao on 2007-03-02.

Test Mode: Transmitting (Above 1GHz)

Low Channel:

Frequency (MHz)	Meter Reading (dBuV)	Detector PK/QP /AV	Azimuth Degrees	Height (m)	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifer Gain (dB)	Corrected Reading (dBuV/m)	FCC Part 15.247		
										Limit (dBuV/m)	Margin (dB)	Remarks
2402	96.63	PK	90		H	28.3	3.61	35.0	93.54			Fund.
2402	88.13	AV	45	1.0	H	28.3	3.61	35.0	85.04			Fund.
2402	93.73	PK	90	1.0	V	30.6	3.61	35.0	92.94			Fund.
2402	83.57	AV	45	1.0	V	30.6	3.61	35.0	82.78			Fund.
7206	35.90	AV	90	1.0	V	37.9	4.51	33.7	44.61	54	9.39	harmonic
4804	37.47	AV	90	1.0	H	34.6	4.64	33.4	43.31	54	10.69	harmonic
7206	34.65	AV	180	1.2	H	36.6	4.51	33.7	42.06	54	11.94	harmonic
4804	35.23	AV	90	1.0	V	35.4	4.64	33.4	41.87	54	12.13	harmonic
7206	51.40	PK	180	1.2	V	37.9	4.51	33.7	60.11	74	13.89	harmonic
7206	50.30	PK	45	1.2	H	36.6	4.51	33.7	57.71	74	16.29	harmonic
4804	47.90	PK	180	1.2	V	35.4	4.64	33.4	54.54	74	19.46	harmonic
4804	47.80	PK	180	1.2	H	34.6	4.64	33.4	53.64	74	20.36	harmonic
1065	35.40	AV	180	1.2	V	23.8	2.00	36.0	25.20	54	28.80	spurious
1016	34.89	AV	180	1.2	H	23.6	2.00	36.0	23.69	54	30.31	spurious
1065	51.40	PK	45	1.2	V	23.8	2.00	36.0	41.2	74	32.80	spurious
1016	49.63	PK	45	1.2	H	23.6	1.20	36.0	38.43	74	35.57	spurious

Middle Channel:

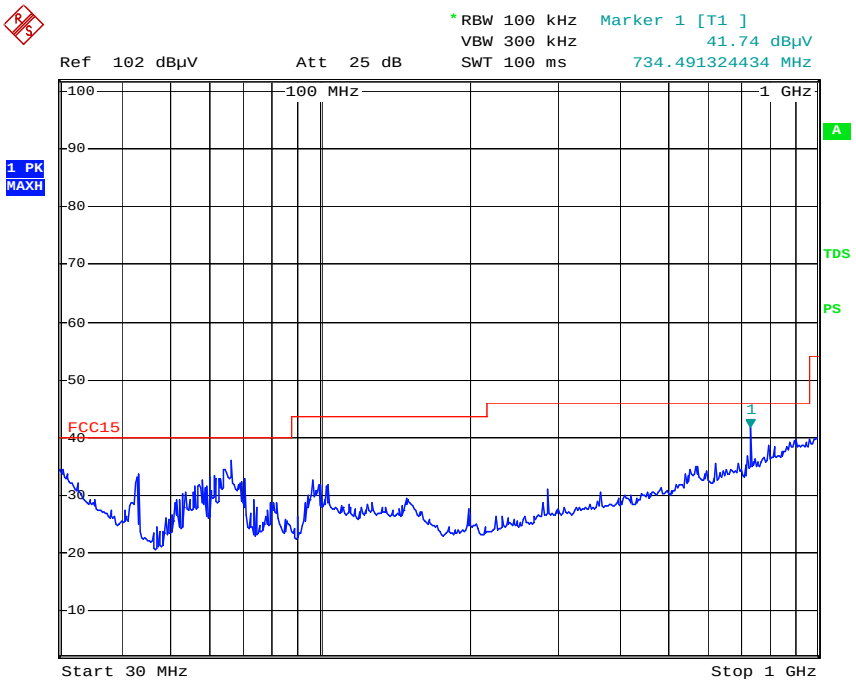
Frequency (MHz)	Meter Reading (dBuV)	Detector PK/QP /AV	Azimuth Degrees	Height (m)	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifer Gain (dB)	Corrected Reading (dBuV/m)	FCC Part 15.247		
										Limit (dBuV/m)	Margin (dB)	Remarks
2441.0	92.50	PK	60	1.4	V	30.6	3.61	35.00	91.71			Fund.
2441.0	87.80	AV	152	1.3	V	30.6	3.61	35.00	87.01			Fund.
2441.0	95.47	PK	128	1.5	H	28.9	3.61	35.00	92.98			Fund.
2441.0	91.13	AV	156	1.2	H	28.9	3.61	35.00	88.64			Fund.
7323.0	37.80	AV	270	1.2	V	37.8	4.75	33.70	46.65	54	7.35	harmonic
4882.0	38.43	AV	243	1.4	H	34.6	4.64	33.40	44.27	54	9.73	harmonic
7598.0	35.60	AV	140	1.3	V	37.7	4.79	34.30	43.79	54	10.21	spurious
7323.0	35.47	AV	120	1.0	H	36.3	4.75	33.70	42.82	54	11.18	harmonic
4882.0	36.37	AV	142	1.6	V	33.8	4.64	33.40	41.41	54	12.59	harmonic
7598.0	50.80	PK	120	1.5	V	37.7	4.79	34.30	58.99	74	15.01	spurious
7323.0	50.13	PK	210	1.2	V	37.8	4.75	33.70	58.98	74	15.02	harmonic
7323.0	50.97	PK	90	1.2	H	36.3	4.75	33.70	58.32	74	15.68	harmonic
4882.0	48.80	PK	153	1.5	H	34.6	4.64	33.40	54.64	74	19.36	harmonic
4882.0	47.87	PK	234	1.8	V	33.8	4.64	33.40	52.91	74	21.09	harmonic
1219.2	37.80	AV	150	1.3	V	24.6	2.50	35.80	29.10	54	24.90	spurious
1220.2	35.16	AV	180	1.2	H	24.6	2.50	35.80	26.46	54	27.54	spurious
1063.3	36.63	AV	135	1.3	V	23.8	1.20	36.00	25.63	54	28.37	spurious
1063.3	35.58	AV	85	1.5	H	23.6	1.20	36.00	24.38	54	29.62	spurious
1220.2	50.47	PK	150	1.5	H	24.6	2.50	35.80	41.77	74	32.23	spurious
1219.2	50.13	PK	120	1.2	V	24.6	2.50	35.80	41.43	74	32.57	spurious
1063.3	52.30	PK	156	1.4	V	23.8	1.20	36.00	41.30	74	32.70	spurious
1063.3	51.30	PK	265	1.4	H	23.6	1.20	36.00	40.10	74	33.90	spurious

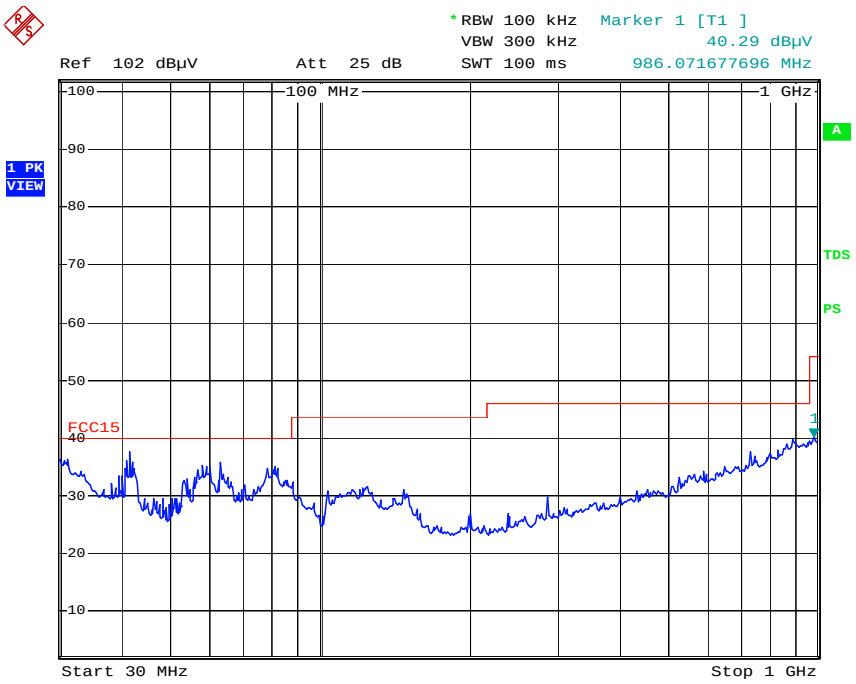
High Channel:

Frequency (MHz)	Meter Reading (dBuV)	Detector PK/QP /AV	Azimuth Degrees	Height (m)	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifer Gain (dB)	Corrected Reading (dBuV/m)	FCC Part 15.247		
										Limit (dBuV/m)	Margin (dB)	Remarks
2480.0	91.40	PK	89	1.5	H	28.9	3.61	35.0	88.91			Fund.
2480.0	89.23	AV	65	1.5	H	28.9	3.61	35.0	86.74			Fund.
2480.0	93.90	PK	65	1.4	V	30.6	3.61	35.0	93.11			Fund.
2480.0	81.07	AV	65	1.6	V	30.6	3.61	35.0	80.28			Fund.
7440.0	35.40	AV	210	1.2	V	37.7	4.75	33.7	44.15	54	9.85	harmonic
4960.0	37.57	AV	256	1.8	H	34.6	4.55	33.4	43.32	54	10.68	harmonic
4960.0	36.73	AV	142	1.5	V	35.4	4.55	33.4	43.28	54	10.72	harmonic
7440.0	35.40	AV	45	1.6	H	36.3	4.75	33.7	42.75	54	11.25	harmonic
7440.0	50.73	PK	240	1.4	V	37.7	4.75	33.7	59.48	74	14.52	harmonic
7440.0	50.90	PK	56	1.4	H	36.3	4.75	33.7	58.25	74	15.75	harmonic
4960.0	51.57	PK	145	1.4	H	34.6	4.55	33.4	57.32	74	16.68	harmonic
4960.0	48.51	PK	142	1.4	V	35.4	4.55	33.4	55.06	74	18.94	harmonic
1293.3	35.73	AV	155	1.2	H	25.0	2.60	35.8	27.53	54	26.47	spurious
1250.8	35.73	AV	156	1.2	H	24.6	2.50	35.8	27.03	54	26.97	spurious
1293.3	55.23	PK	180	1.2	H	25.0	2.60	35.8	47.03	74	26.97	spurious
1250.8	55.40	PK	128	1.5	H	24.6	2.50	35.8	46.70	74	27.30	spurious
1064.2	36.40	AV	324	1.2	V	23.8	1.20	36.0	25.40	54	28.60	spurious
1064.2	53.47	PK	324	1.3	V	23.8	1.20	36.0	42.47	74	31.53	spurious

30 MHz-1000MHz:

Frequency (MHz)	Meter Reading (dBuV)	Detector PK/QP /AV	Azimuth Degrees	Height (m)	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifier Gain (dB)	Corrected Reading (dBuV/m)	FCC Part 15.247/209	
										Limit (dBuV/m)	Margin (dB)
31.070	37.8	QP	45	1.0	V	24.1	1.2	26.8	36.3	40.0	3.7
66.266	52.8	QP	289	1.0	H	8.5	1.6	26.8	36.1	40.0	3.9
63.090	52.9	QP	45	1.0	V	8.1	1.6	26.8	35.8	40.0	4.2
42.599	46.9	QP	289	1.0	H	14.3	1.3	26.8	35.7	40.0	4.3
734.490	41.7	QP	180	1.2	H	21.2	5.8	26.9	41.7	46.0	4.3
81.210	51.5	QP	60	1.2	V	8.4	1.9	26.8	35.0	40.0	5.0
734.490	37.5	QP	35	3.8	V	21.2	5.8	26.9	37.6	46.0	8.4
96.775	49.2	QP	60	1.0	H	8.2	2.0	26.8	32.5	43.5	11.0
286.98	39.9	QP	45	1.2	H	13.8	3.2	26.0	30.9	46.0	15.1





Pacific bluetooth serial dongle radiated emission vertical

Date: 2.MAR.2007 18:07:08

8 §15.247 (a) (1) - HOPPING CHANNEL SEPARATION

8.1 Applicable Standard

Per 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, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

8.2 Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on a bench 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.
3. By using the Max-Hold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function, and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

8.3 Test Equipment List and Details

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

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

8.4 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.

8.5 Test Data

8.5.1 Environmental Conditions

Temperature:	27 °C
Relative Humidity:	50 %
ATM Pressure:	100..9 kPa

The testing was performed by Merry Zhao on 2007-03-05.

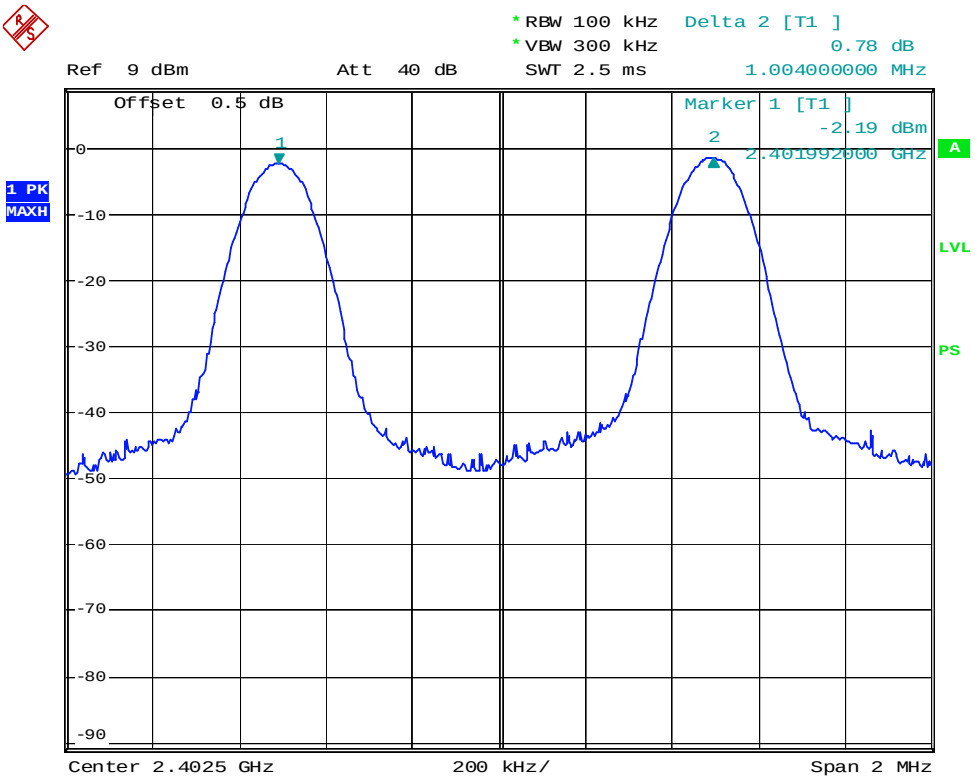
Test Result: Compliant

Test mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (kHz)	Limit (kHz)	Result
Low Channel	2402	1004	181.33	Compliant
Adjacency Channel	2403			
Mid Channel	2441	1000	181.33	Compliant
Adjacency Channel	2442			
High Channel	2480	1004	181.33	Compliant
Adjacency Channel	2479			

Please refer to the following plots.

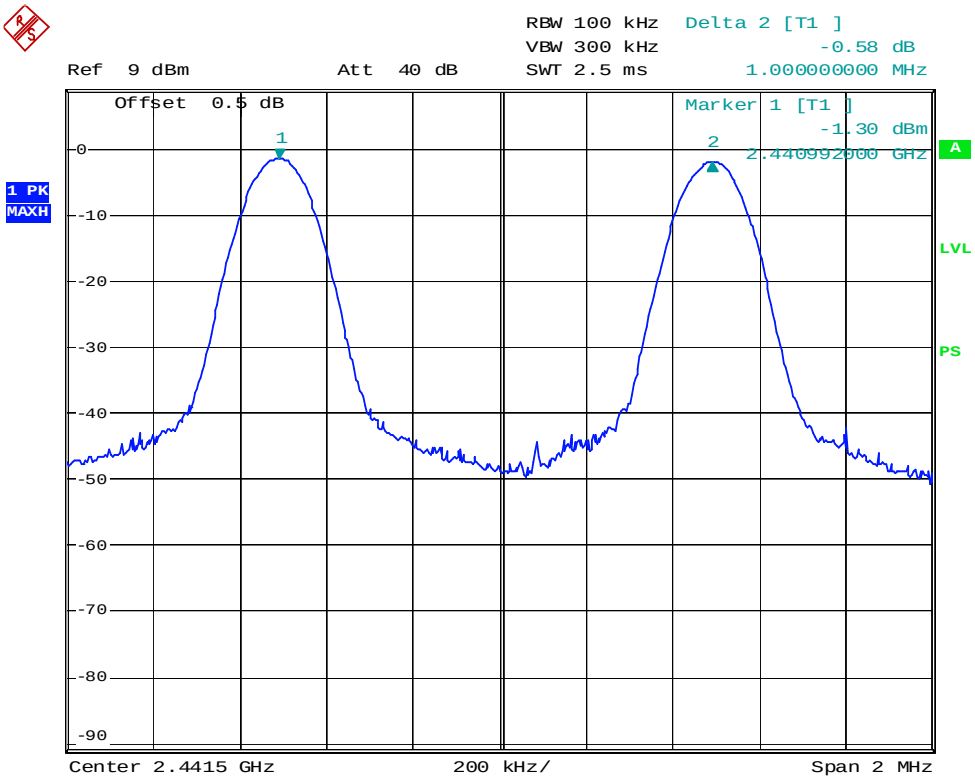
Low channel



Pacific bluetooth serial dongle L-CH channel separation

Date: 5.MAR.2007 10:35:39

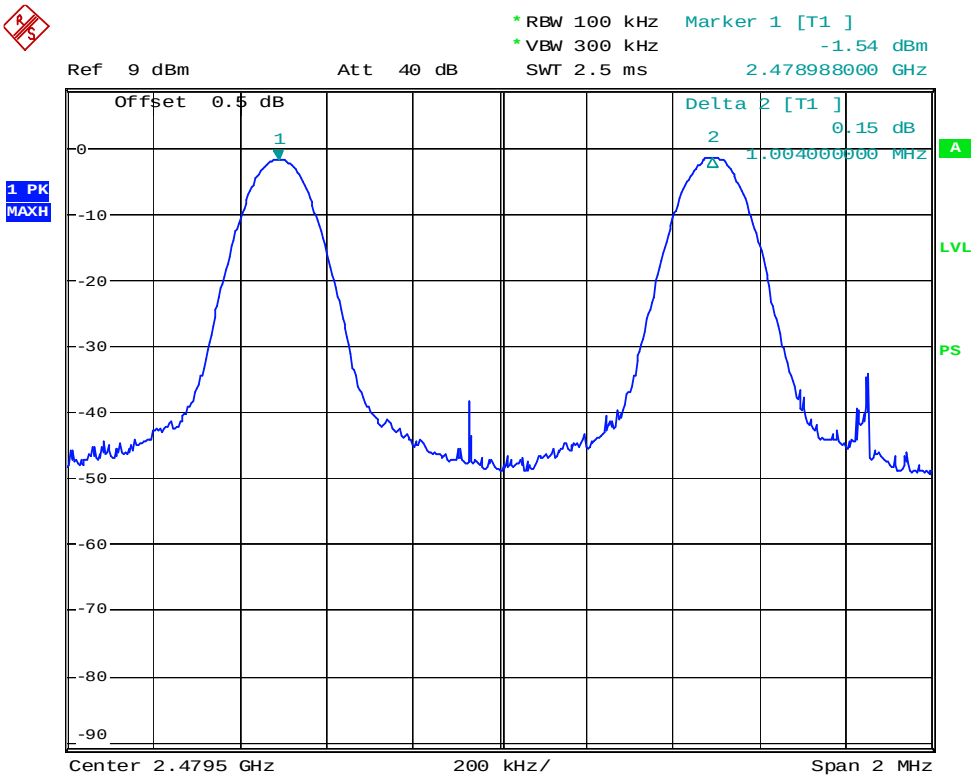
Middle channel



Pacific bluetooth serial dongle M-CH channel separaton

Date: 5.MAR.2007 10:18:48

High channel



Pacific bluetooth serial dongle H-CH channel separation

Date: 5.MAR.2007 10:38:43

9 §15.247(a) (1) –20dB CHANNEL BANDWIDTH

9.1 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.

9.2 Test Equipment List and Details

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

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

9.3 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.

9.4 Test Data

9.4.1 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	100.9 kPa

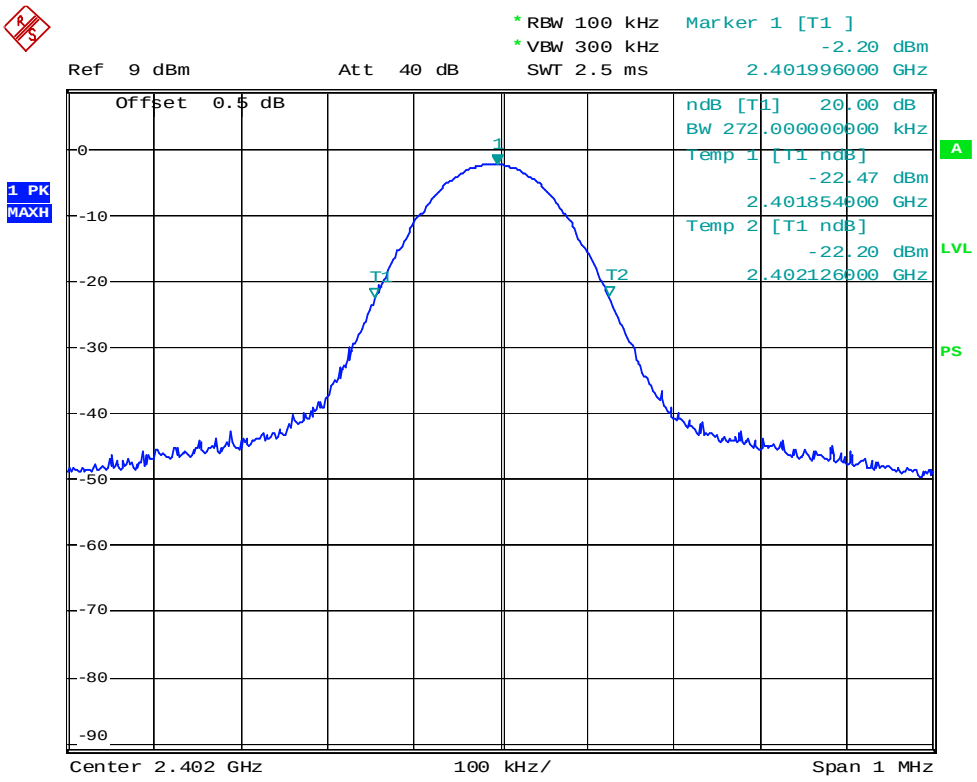
The testing was performed by Merry Zhao on 2007-03-05.

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)
Low	2402	272
Mid	2441	272
High	2480	272

Please refer to the following plots.

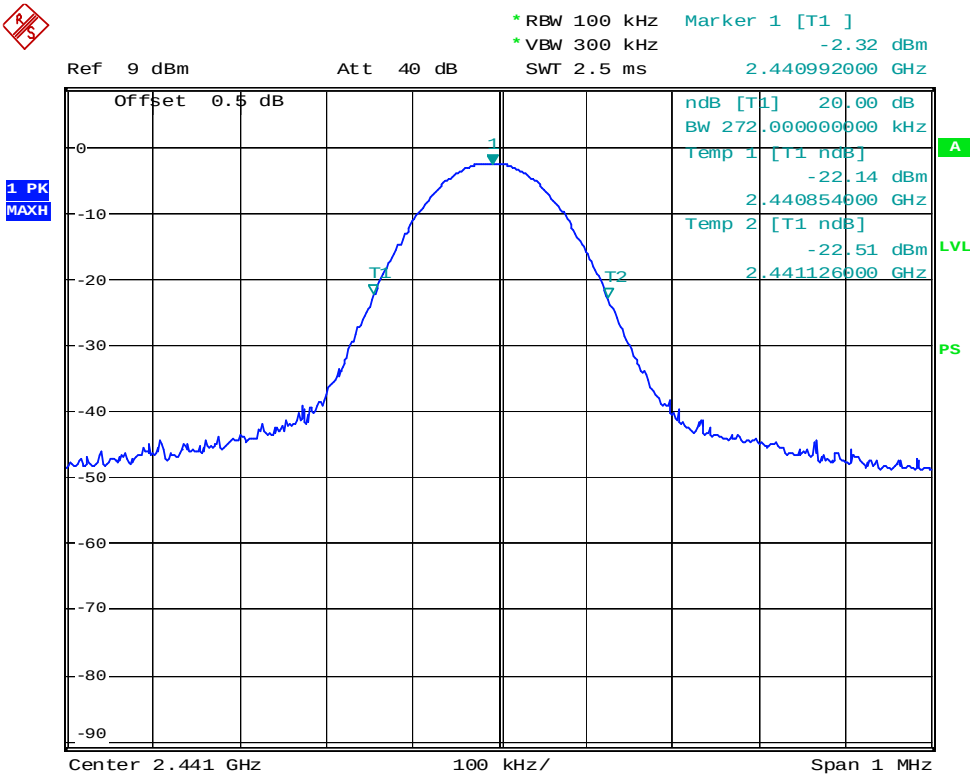
Low channel



Pacific bluetooth serial dongle L-CH 20dB bandwidth

Date: 5.MAR.2007 10:31:25

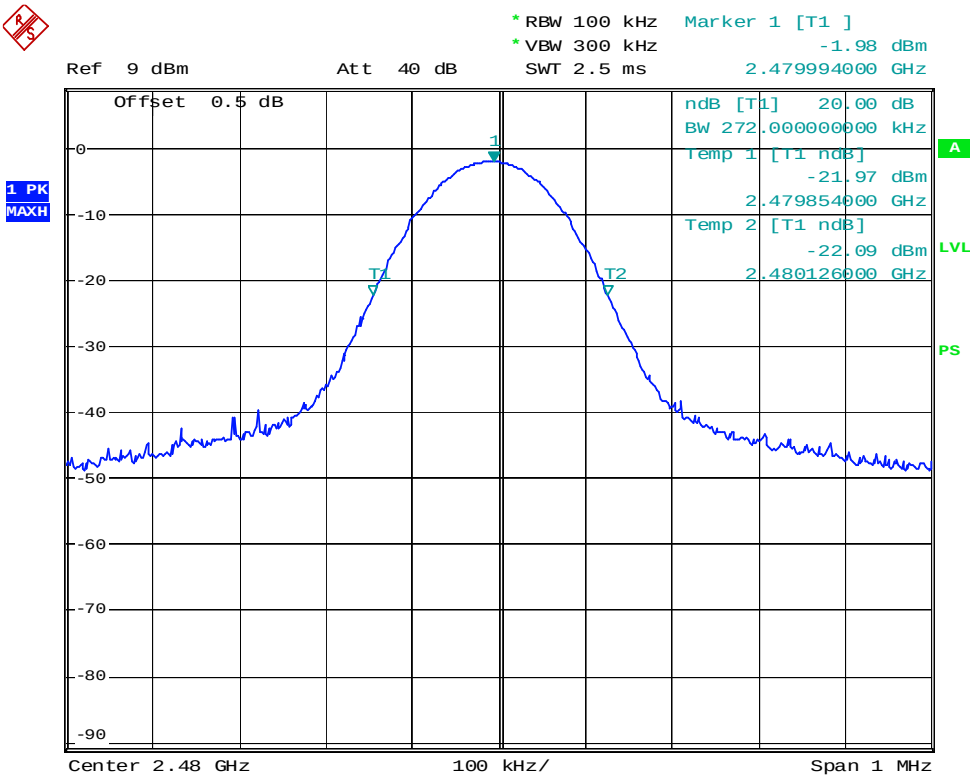
Middle channel



Pacific bluetooth serial dongle M-CH 20dB bandwidth

Date: 5.MAR.2007 09:57:35

High channel



Pacific bluetooth serial dongle H-CH 20dB bandwidth

Date: 5.MAR.2007 10:42:12

10 §15.247(a) (1) (iii) - NUMBER OF HOPPING FREQUENCIES USED

10.1 Applicable Standard

According to §15.247(a) (1) (iii) 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.

10.2 Test Equipment List and Details

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

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

10.3 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 number of the channel.

Frequency Range	Numberof Hopping Channel (CH)	Limit (CH)
2402-2480	79	>15

10.4 Test Data

10.4.1 Environmental Conditions

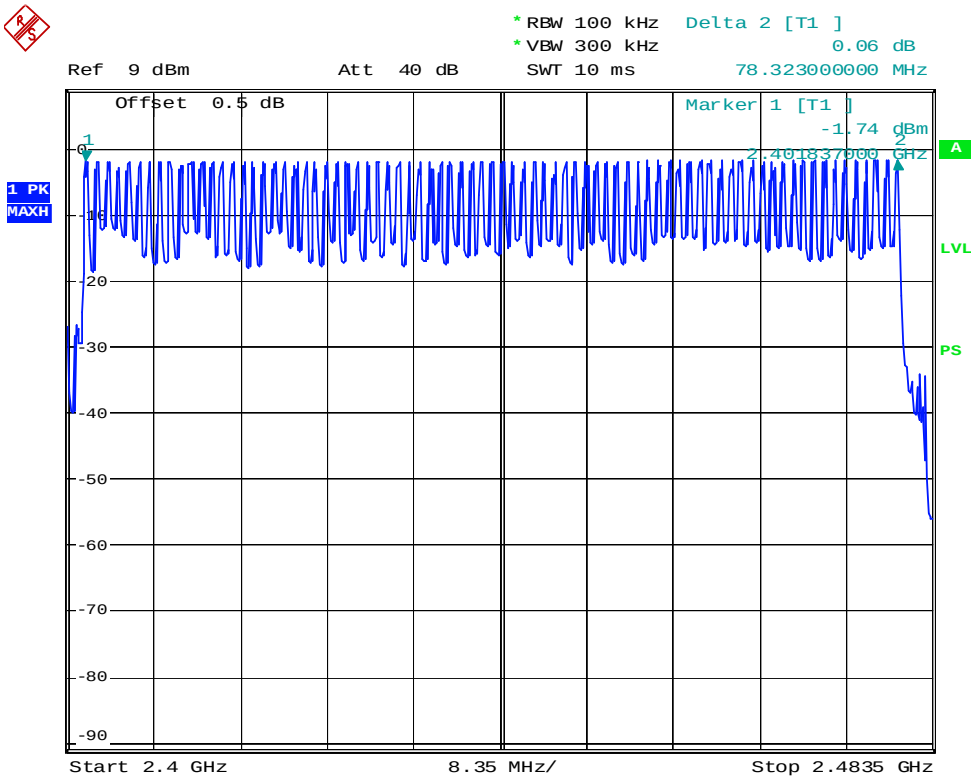
Temperature:	27 °C
Relative Humidity:	50 %
ATM Pressure:	100.9 kPa

The testing was performed by Merry Zhao on 2007-03-05.

Test mode: Transmitting

Test Result: Compliant. Please refer to the following plot.

Number of Hopping Channels



Pacific bluetooth serial dongle hopping channels

Date: 5.MAR.2007 10:25:39

11 §15.247(a) (1) (iii) - DWELL TIME

11.1 Applicable Standard

According to §15.247 (a) (1) (iii), 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.

11.2 Test Equipment List and Details

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

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

11.3 Test Procedure

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

Dwell Time= Pulse width (ms) x number of hopping pulses in 31.6 seconds.

11.4 Test Data

11.4.1 Environmental Conditions

Temperature:	27 °C
Relative Humidity:	50 %
ATM Pressure:	100.9 kPa

The testing was performed by Merry Zhao on 2007-03-05.

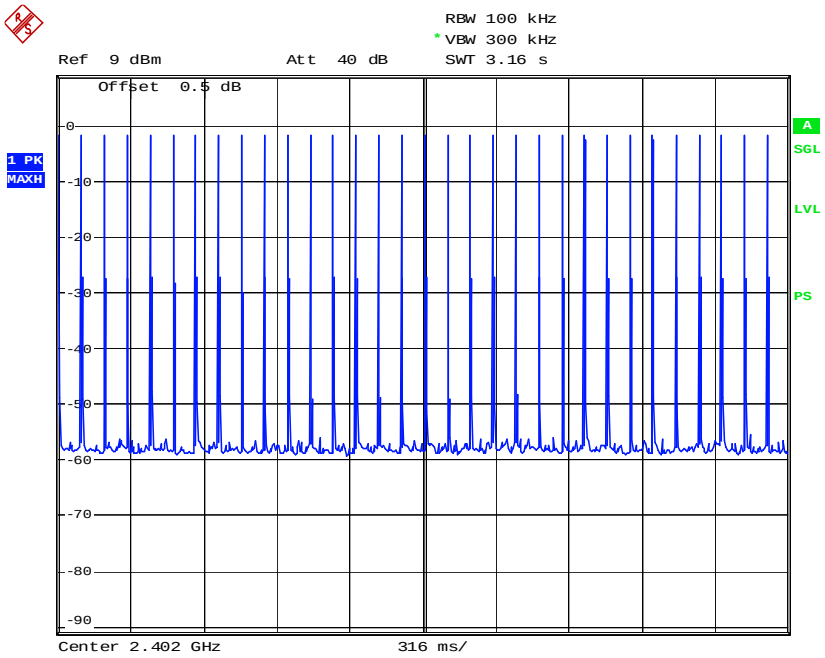
Test mode: Transmitting

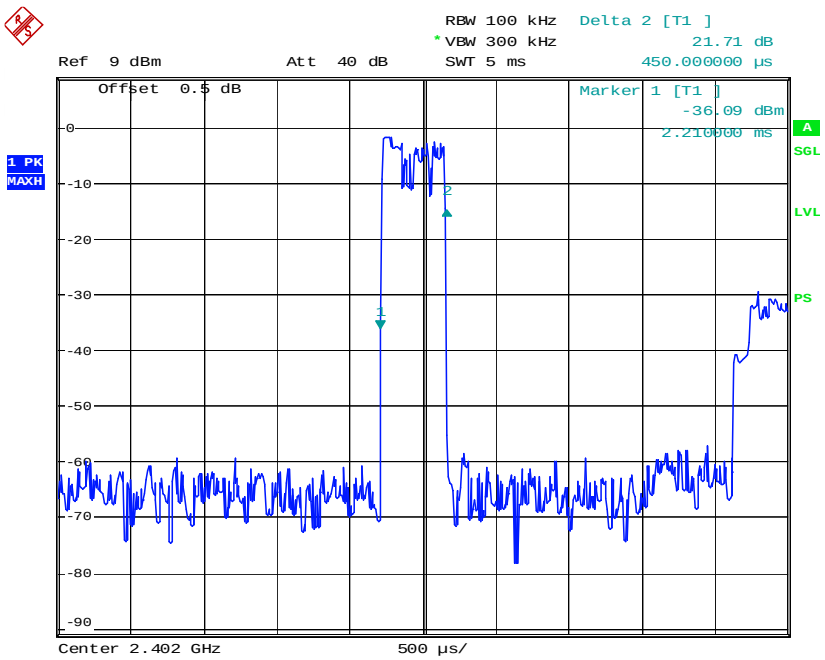
Result: Compliant.

Channel	Pulse wide (msec)	Number of Hopping Pulses in 31.6sec	Dwell time (sec)	Limit (sec)	Result
Low	0.450	320	0.144	0.4	Compliant
Mid	0.450	320	0.144	0.4	Compliant
High	0.450	320	0.144	0.4	Compliant

Please refer to the following plots.

Low channel

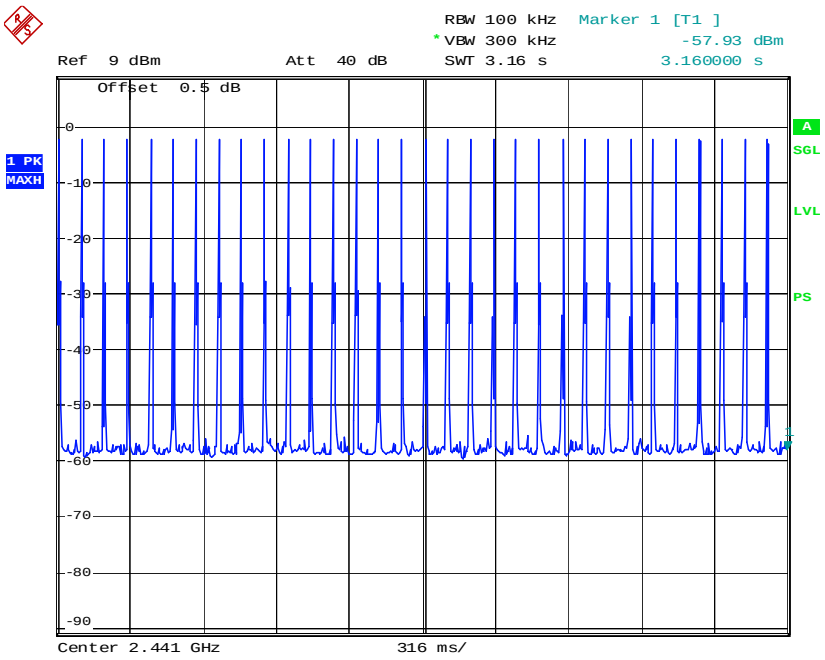


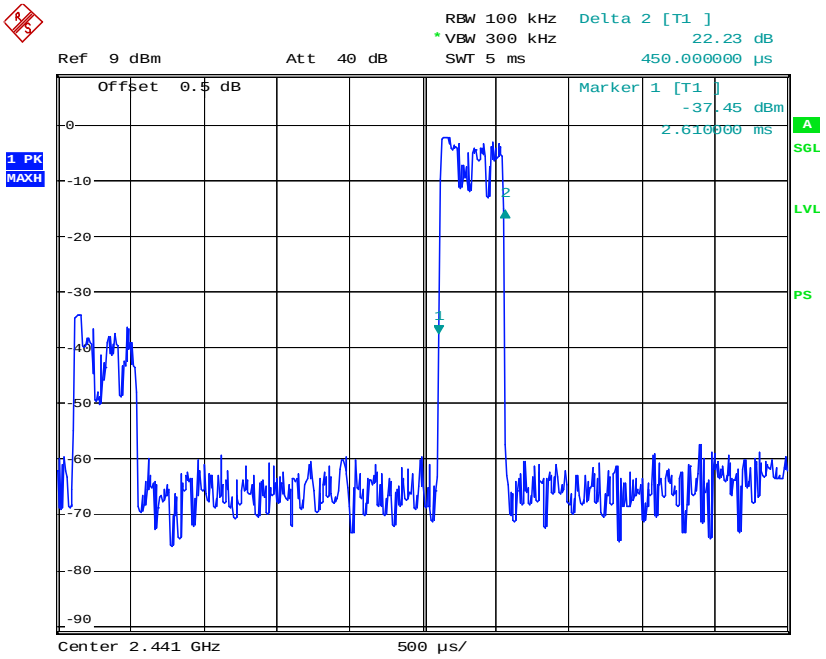


Pacific bluetooth serial dongle L-CH dwell time2

Date: 5.MAR.2007 10:58:31

Middle channel

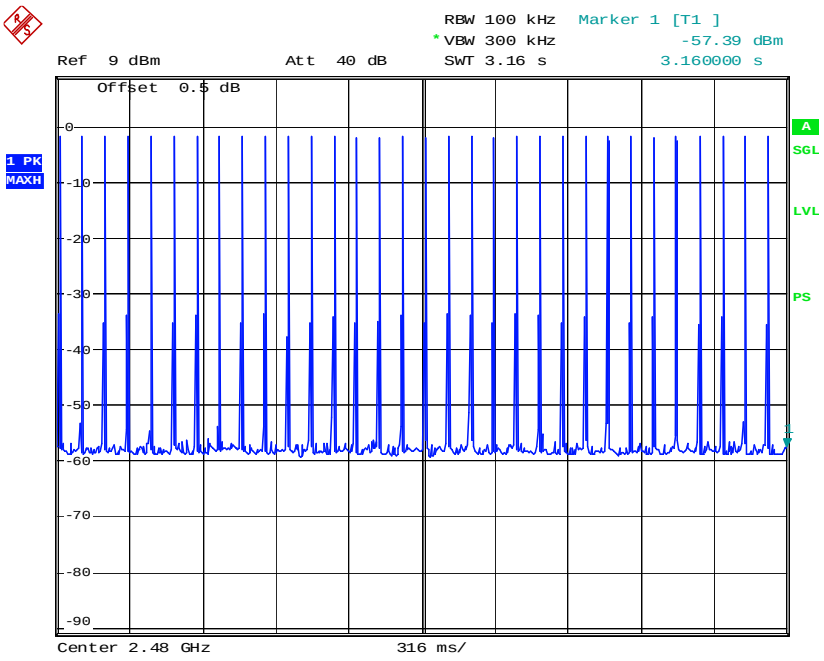




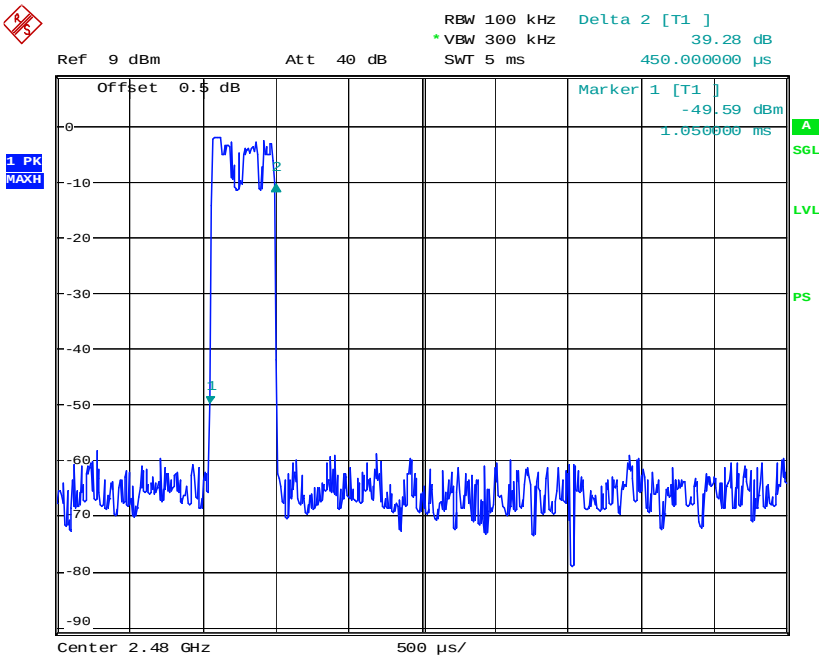
Pacific bluetooth serial dongle M-CH dwell time2

Date: 5.MAR.2007 11:00:24

High channel



Pacific bluetooth serial dongle H-CH dwell time1



Pacific bluetooth serial dongle H-CH dwell time2

Date: 5.MAR.2007 11:02:20

12 §15.247(b) (1) – MAXIMUM PEAK OUTPUT POWER

12.1 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.

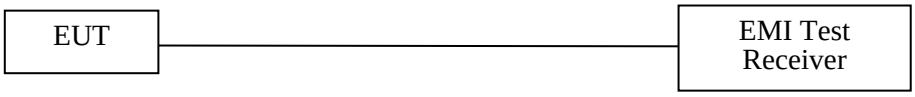
12.2 Test Equipment List and Details

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

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

12.3 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.



12.4 Test Data

12.4.1 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	100.9 kPa

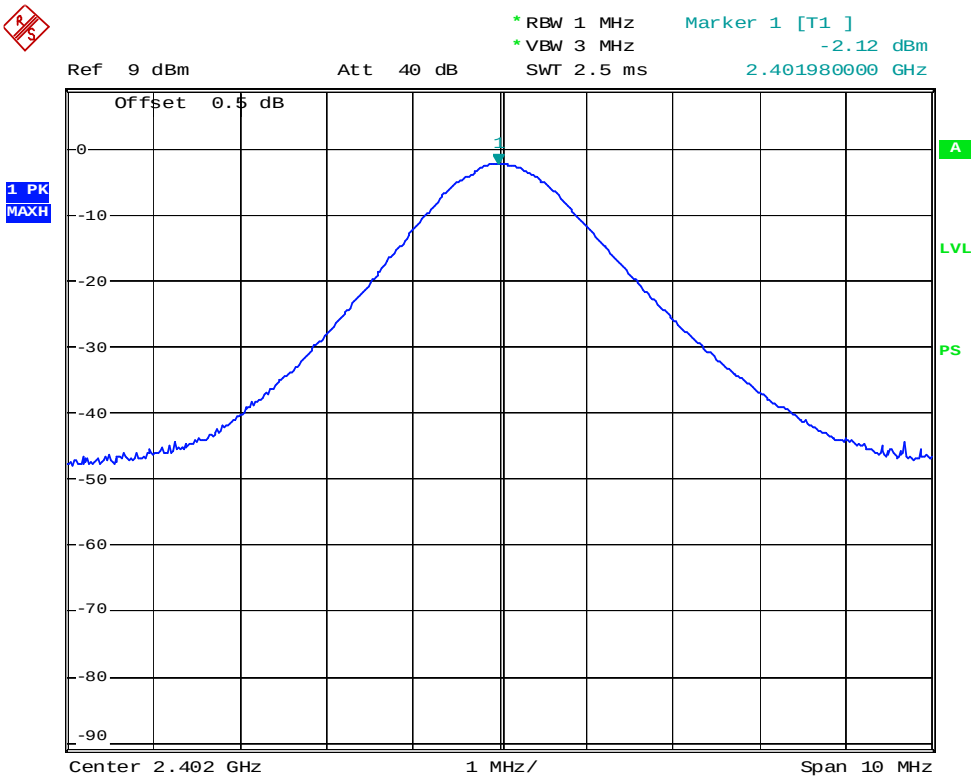
The testing was performed by Merry Zhao on 2006-12-12.

Test mode: Transmitting

Channel	Frequency (MHz)	Power Output		Limit (w)
		(dBm)	(w)	
Low Channel	2402	-2.12	0.00062	1
Mid Channel	2441	-2.15	0.00061	1
High Channel	2480	-1.96	0.00064	1

Test Result: Compliant. Please refer to the following plots.

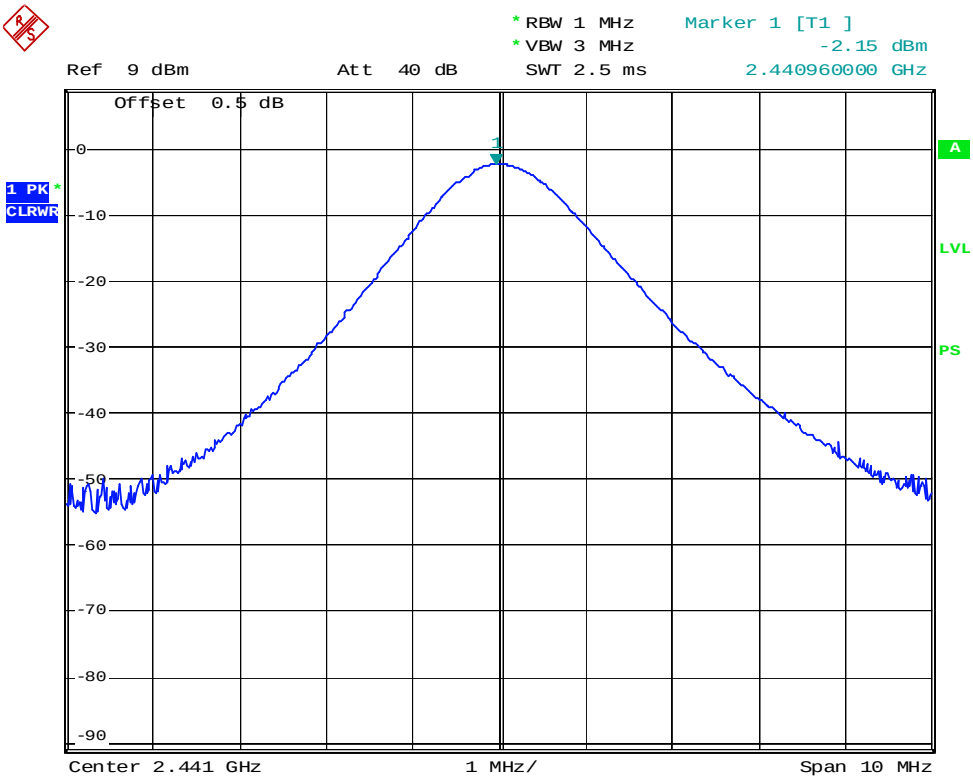
Low channel



Pacific bluetooth serial dongle L-CH output power

Date: 5.MAR.2007 10:28:55

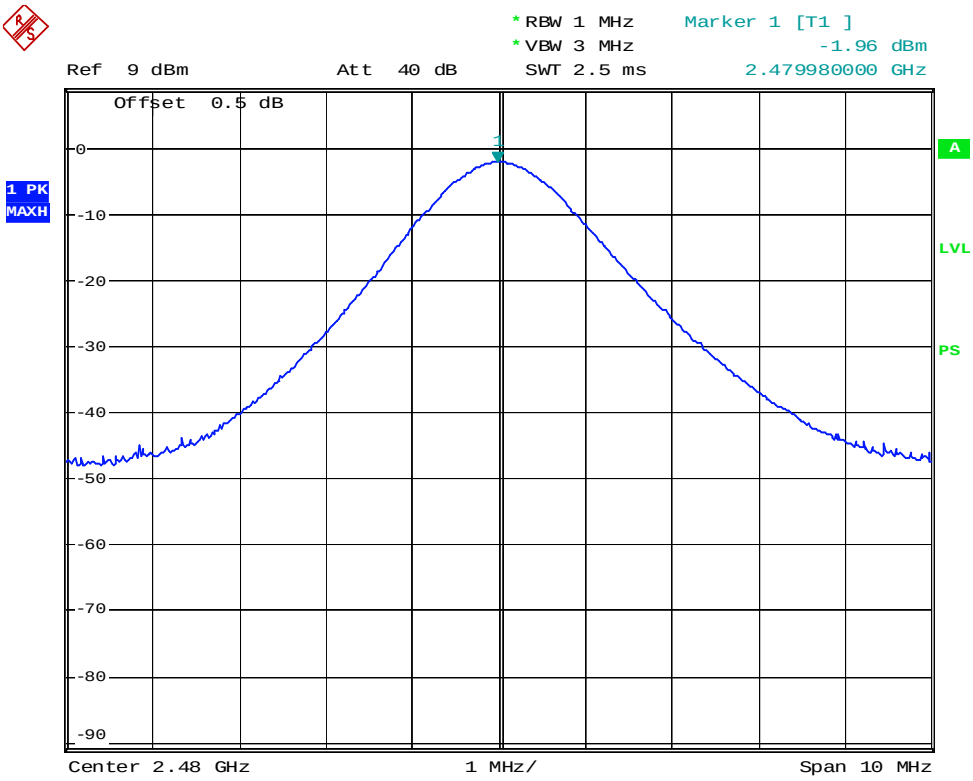
Middle channel



Pacific bluetooth serial dongle M-CH output power

Date: 5.MAR.2007 09:54:17

High channel



Pacific bluetooth serial dongle H-CH output power

Date: 5.MAR.2007 10:43:44

13 §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGES

13.1 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)).

13.2 Test Equipment List and Details

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

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

13.3 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 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.

13.4 Test Data

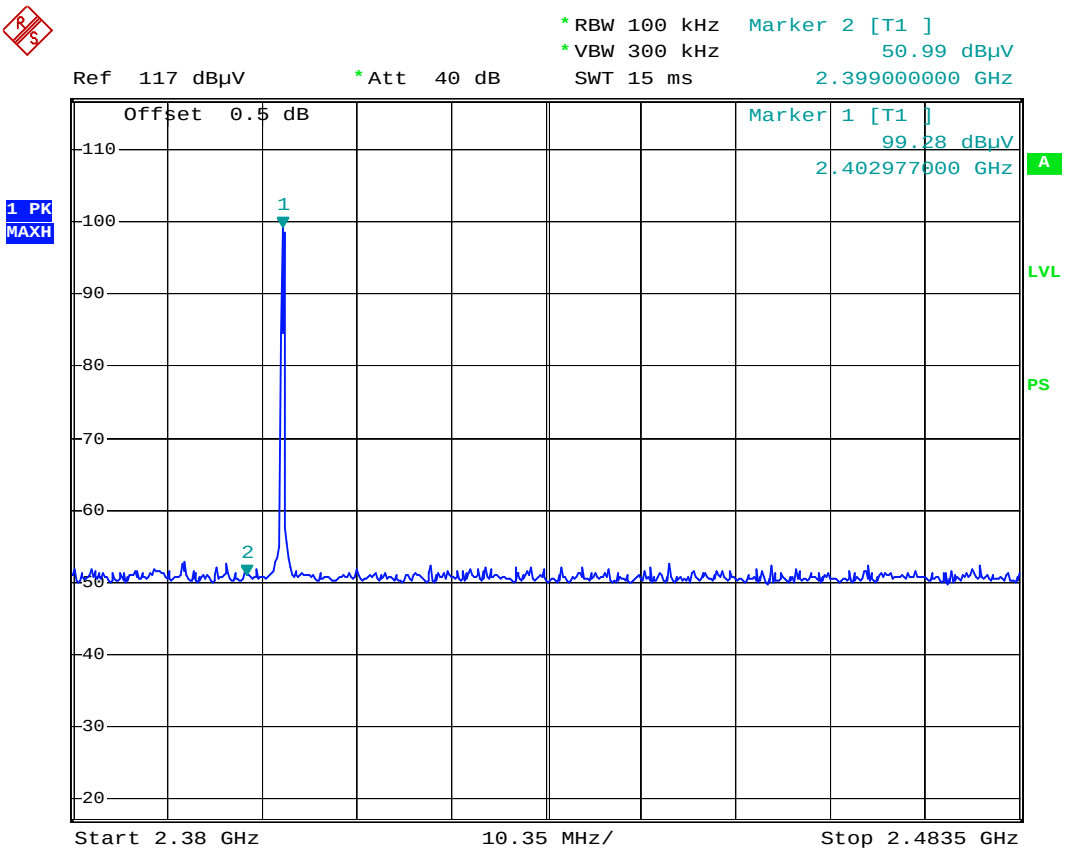
13.4.1 Environmental Conditions

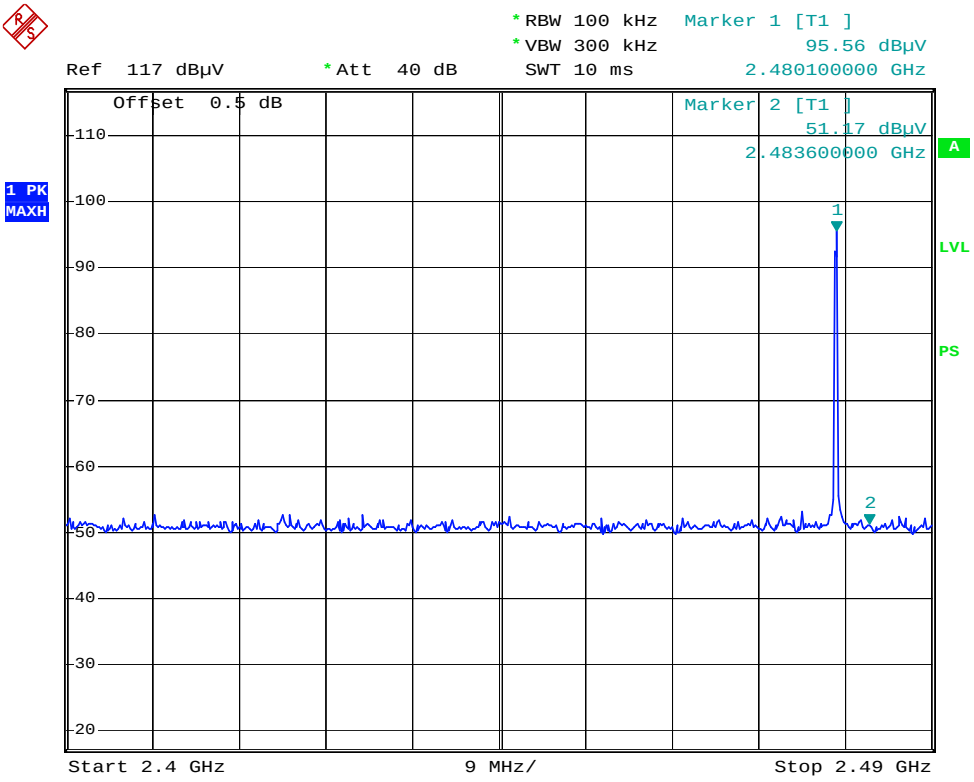
Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	100.9 kPa

The testing was performed by Merry Zhao on 2007-03-05.

Test Mode: Transmitting

Test Result: Compliant.





Radiated emission in Restricted band (2310MHz ~ 2390MHz) and (2483.5 MHz -2500MHz)

Frequency (MHz)	Reading (dBµV)	Detector PK//AV	Direction Degree	Height (m)	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Pre-Amplifier (dB)	Correction Reading (dBµV/m)	FCC 15.209	
										Limit (dBµV/m)	Margin (dB)
2483.6	51.17	PK	230	1.8	V	30.6	4	35	50.77	74	23.23
2483.6	48.57	PK	268	1.6	H	28.69	4	35	46.26	74	27.74
2385.3	42.15	PK	20	1.2	H	28.9	3.61	35	39.66	74	34.34
2343.3	39.89	PK	270	1.6	V	30.6	3.61	35	39.1	74	34.9
2387.5	40.20	PK	120	1.2	V	28.9	3.61	35	37.71	74	36.29
2345.4	39.3	PK	263	1.4	H	28.9	3.61	35	36.81	74	37.19