

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Sunitec Enterprise Co., Ltd.

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FCC ID: RA8-BC003

This Report Concerns: <input checked="" type="checkbox"/> Original Report		Equipment Type: Bluetooth Speakerphone
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Report No.:	RSZ08021502	
Test Date:	2008-02-29	
Report Date:	2008-03-04	
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TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EUT EXERCISE SOFTWARE	6
SPECIAL ACCESSORIES.....	6
EQUIPMENT MODIFICATIONS	6
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	6
EXTERNAL I/O CABLE.....	6
CONFIGURATION OF TEST SETUP	7
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	8
§15.247 (i) and §1.1307(b) (1) - MAXIMUN PERMISSIBLE EXPOSURE.....	9
STANDARD APPLICABLE	9
TEST DATA	9
CFR47 §15.203 - ANTENNA REQUIREMENT.....	10
STANDARD APPLICABLE	10
ANTENNA CONNECTOR CONSTRUCTION	10
§15.207 (a) - CONDUCTED EMISSIONS.....	11
MEASUREMENT UNCERTAINTY	11
EUT SETUP.....	11
EMI TEST RECEIVER SETUP.....	12
TEST EQUIPMENT LIST AND DETAILS.....	12
TEST PROCEDURE	12
TEST RESULTS SUMMARY	12
TEST DATA	13
PLOT(S) OF TEST DATA	13
CFR47 §15.205, §15.209, §15.247 - RADIATED EMISSIONS.....	16
APPLICABLE STANDARD	16
MEASUREMENT UNCERTAINTY	16
EUT SETUP.....	16
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	17
TEST EQUIPMENT LIST AND DETAILS.....	17
TEST PROCEDURE	17
CORRECTED AMPLITUDE & MARGIN CALCULATION	18
TEST RESULTS SUMMARY.....	18
TEST DATA	18
CFR47 §15.247(a) (1)-CHANNEL SEPARATION TEST	21
APPLICABLE STANDARD	21

TEST EQUIPMENT LIST AND DETAILS.....21
TEST PROCEDURE21
TEST DATA21

CFR47 §15.247(a) (1) – 20dB BANDWIDTH TESTING.....26
APPLICABLE STANDARD26
TEST EQUIPMENT LIST AND DETAILS.....26
TEST PROCEDURE26
TEST DATA26

CFR47 §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST30
APPLICABLE STANDARD30
TEST EQUIPMENT LIST AND DETAILS.....30
TEST PROCEDURE30
TEST DATA30

CFR47 §15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME).....32
APPLICABLE STANDARD32
TEST EQUIPMENT LIST AND DETAILS.....32
TEST PROCEDURE32
TEST DATA32

CFR47 §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT36
APPLICABLE STANDARD36
TEST EQUIPMENT LIST AND DETAILS.....36
TEST PROCEDURE36
CORRECTED AMPLITUDE & MARGIN CALCULATION36
TEST DATA37

CFR47 §15.247(d) - BAND EDGES TESTING38
APPLICABLE STANDARD38
TEST EQUIPMENT LIST AND DETAILS.....38
TEST PROCEDURE38
TEST DATA39

DECLARATION LETTER.....42

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Sunitec's* product, model number: *BC390*, *BC380*, or the "EUT" as referred to in this report is a *Bluetooth Speakerphone*, which measures approximately: 6.0cm L x 3.7cm W x 2.1cm H, rated input voltage: DC 12V.

*Note: The series products, model *BC390*, *BC380*, we select *BC390* to test, there is no electrical change has been made to the equipment.

* *All measurement and test data in this report was gathered from production sample serial number: 0802008 (Assigned by BACL, Shenzhen). The EUT was received on 2008-02-15.*

Objective

This Type approval report is prepared on behalf of *Sunitec* 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 Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

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

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

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

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



NVLAP LAB CODE 200707-0

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

EUT Exercise Software

N/A.

Special Accessories

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

Equipment Modifications

No modification was made to the unit tested.

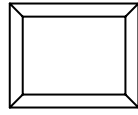
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Compaq	Notebook	PP2040	N/A	DoC

External I/O Cable

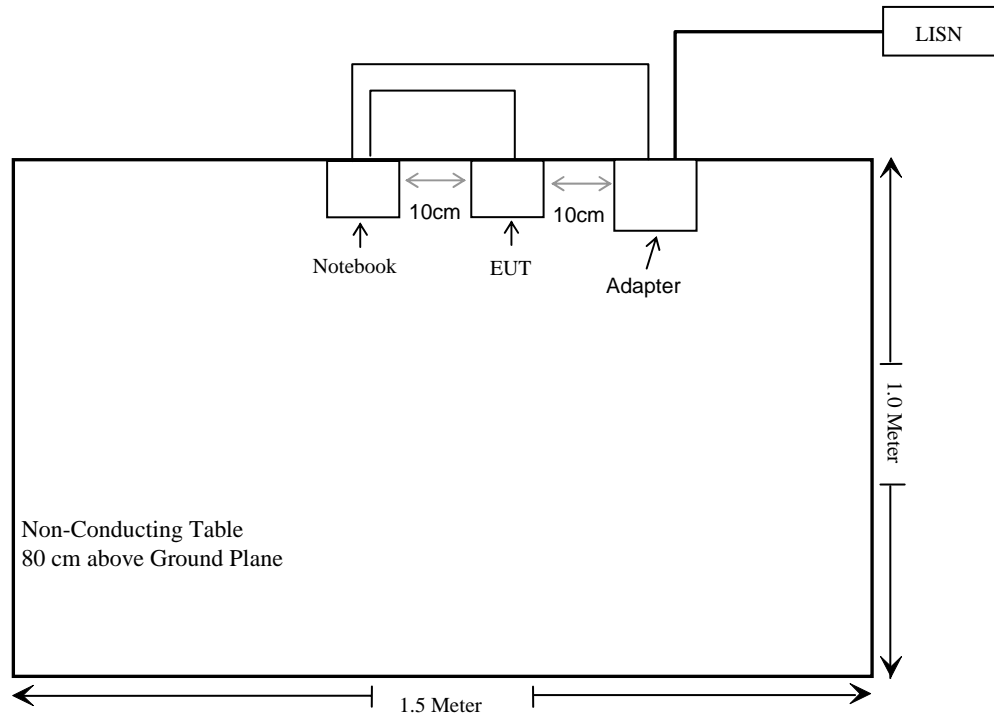
Cable Description	Length (M)	From Port	To
Unshielded Detachable USB Cable	1.0	EUT	Adapter (car charger)

Configuration of Test Setup



EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
CFR47 §15.247 (i), §1.1307 (b)(1)	Maximun Permissible Exposure	Compliant
CFR47 §15.203	Antenna Requirement	Compliant
CFR47 §15.207 (a)	Conducted Emissions	Compliant
CFR47 §15.205, §15.209, §15.247(d)	Radiated Emission	Compliant
CFR47 §15.247 (a)(1)	20 dB Bandwidth	Compliant
CFR47 §15.247(a)(1)	Channel Separation Test	Compliant
CFR47 §15.247(a)(1)(iii)	Time of occupancy (Dwell Time)	Compliant
CFR47 §15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
CFR47 §15.247(b)(1)	Peak Output Power Measurement	Compliant
CFR47 §15.247(d)	Band Edges	Compliant

§15.247 (i) and §1.1307(b) (1) - MAXIMUM PERMISSIBLE EXPOSURE

Standard Applicable

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 not exposed to radio frequency energy level in excess of the Commission's guidelines.

Radio frequency radiation exposure was calculated based on § 1.1310 limits.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
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

$$S = \frac{EIRP}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

EIRP = equivalent (or effective) isotropically radiated power

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

EIRP: -0.65 (dBm)

EIRP: 0.861 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2441 (MHz)

The worst case is power density at predication frequency at 20 cm: 0.0002 (mW/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mW/cm²)

$$0.0001 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$$

Result: Compliant

CFR47 §15.203 - ANTENNA REQUIREMENT

Standard Applicable

According to CFR47 § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has a integral (component) antenna on PCB. The maximum gain is 2 dBi, please refer to the internal photos.

Result: Compliance.

Please refer to the EUT internal photos.

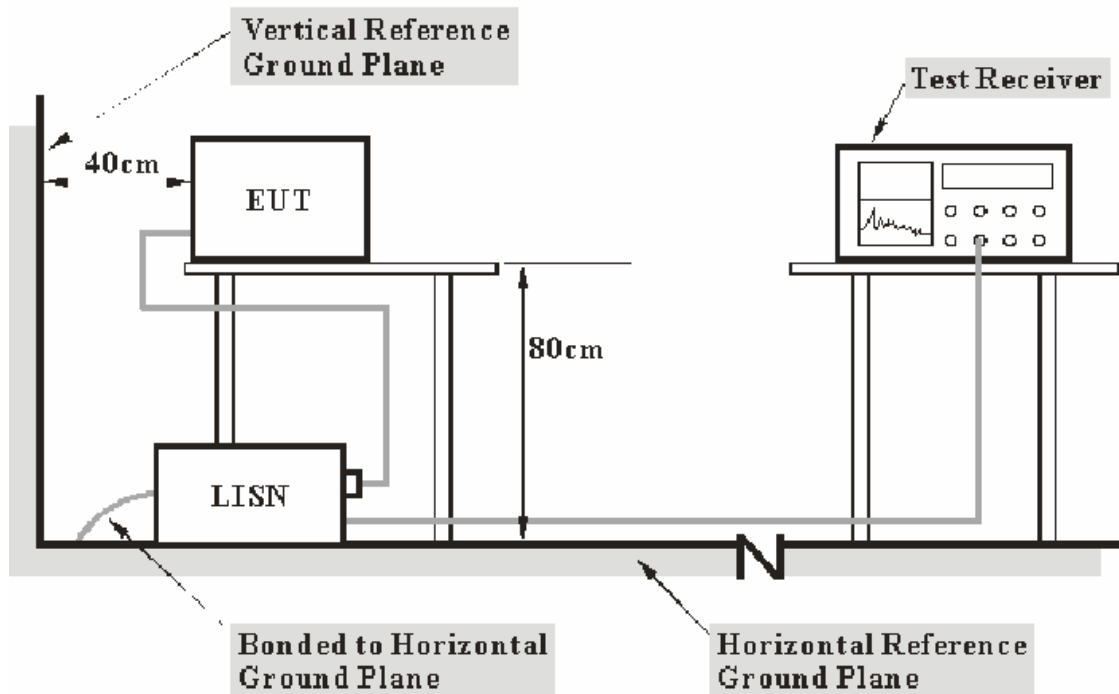
§15.207 (a) - CONDUCTED EMISSIONS

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 15.207 limits.

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

The spacing between the peripherals was 10 cm.

The EUT was connected to the host with USB cable.

The adapter of 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:

<i>Frequency Range</i>	<i>IF B/W</i>
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	12008	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2007-03-26	2008-03-26
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2007-05-09	2008-05-09

* Com-Power's LISN were used as the supporting equipment.

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

Test Procedure

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

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

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

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

9.70 dB at 1.125 MHz in the Hot conductor mode

Test Data**Environmental Conditions**

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

The testing was performed by Phoenix Liu on 2008-03-04

Test Mode: Charging

Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/AV)	Conductor (Hot/Neutral)	Limit (dBμV)	Margin (dB)
1.125	46.30	QP	Hot	56.00	9.70
1.120	45.20	QP	Neutral	56.00	10.80
1.125	34.60	AV	Hot	46.00	11.40
21.670	48.20	QP	Neutral	60.00	11.80
1.120	32.30	AV	Neutral	46.00	13.70
0.200	44.90	QP	Neutral	63.61	18.71
0.260	42.30	QP	Hot	61.43	19.13
0.265	41.40	QP	Neutral	61.27	19.87
0.410	27.60	AV	Hot	47.65	20.05
0.200	33.50	AV	Neutral	53.61	20.11
0.400	37.40	QP	Neutral	57.85	20.45
0.260	30.70	AV	Hot	51.43	20.73
0.265	30.40	AV	Neutral	51.27	20.87
0.150	44.80	QP	Hot	66.00	21.20
2.095	24.80	AV	Hot	46.00	21.20
0.410	39.60	QP	Hot	61.43	21.83
2.095	35.40	QP	Hot	57.65	22.25
0.400	25.60	AV	Neutral	47.85	22.25
25.390	31.40	QP	Hot	56.00	24.60
8.940	25.40	AV	Neutral	50.00	24.60
8.940	34.40	QP	Neutral	60.00	25.60
0.150	29.90	AV	Hot	56.00	26.10
21.865	17.10	AV	Neutral	50.00	32.90
25.230	9.00	AV	Hot	50.00	41.00

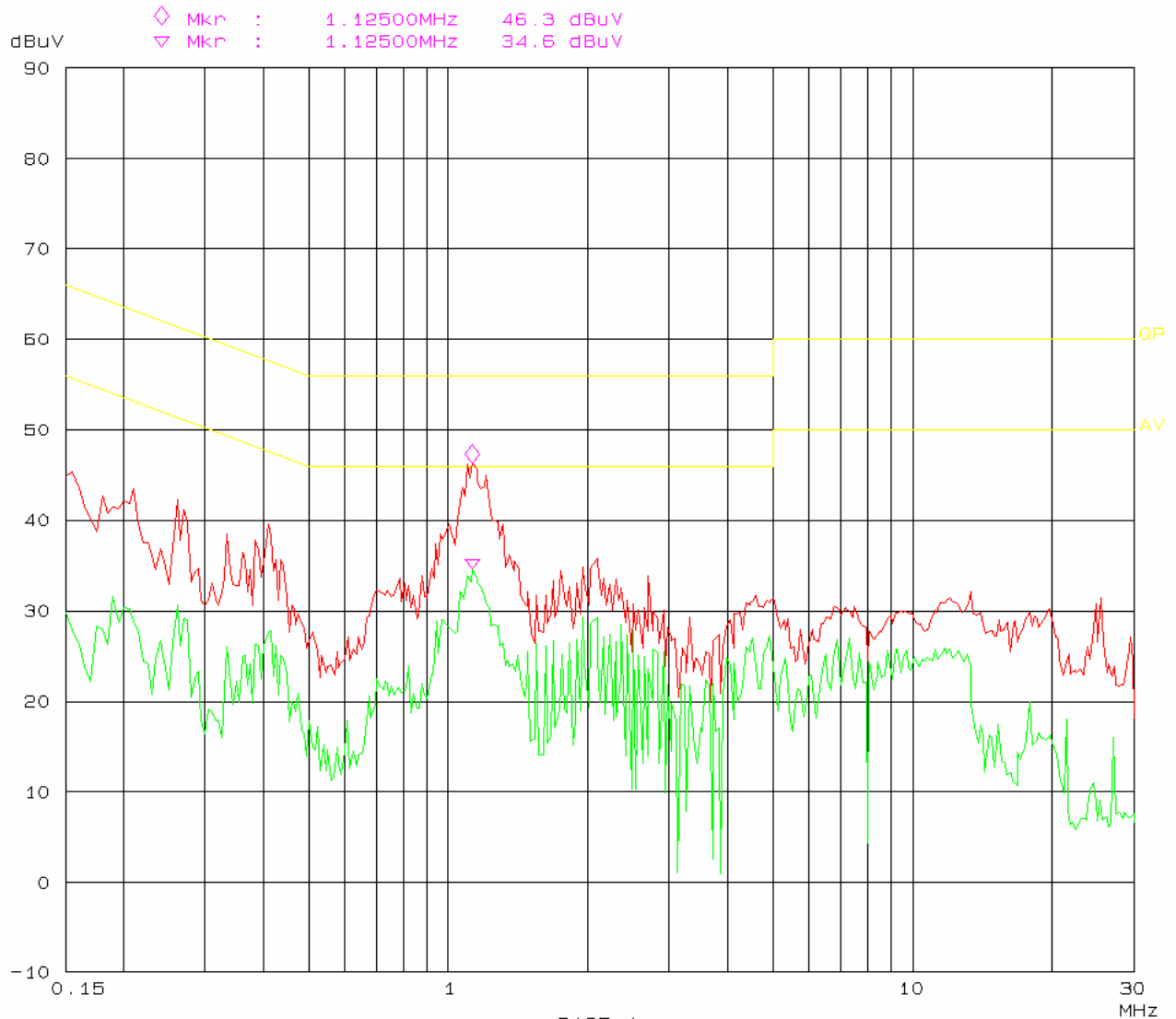
Plot(s) of Test Data

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

CONDUCTED EMISSION TEST
FCC PART15 B

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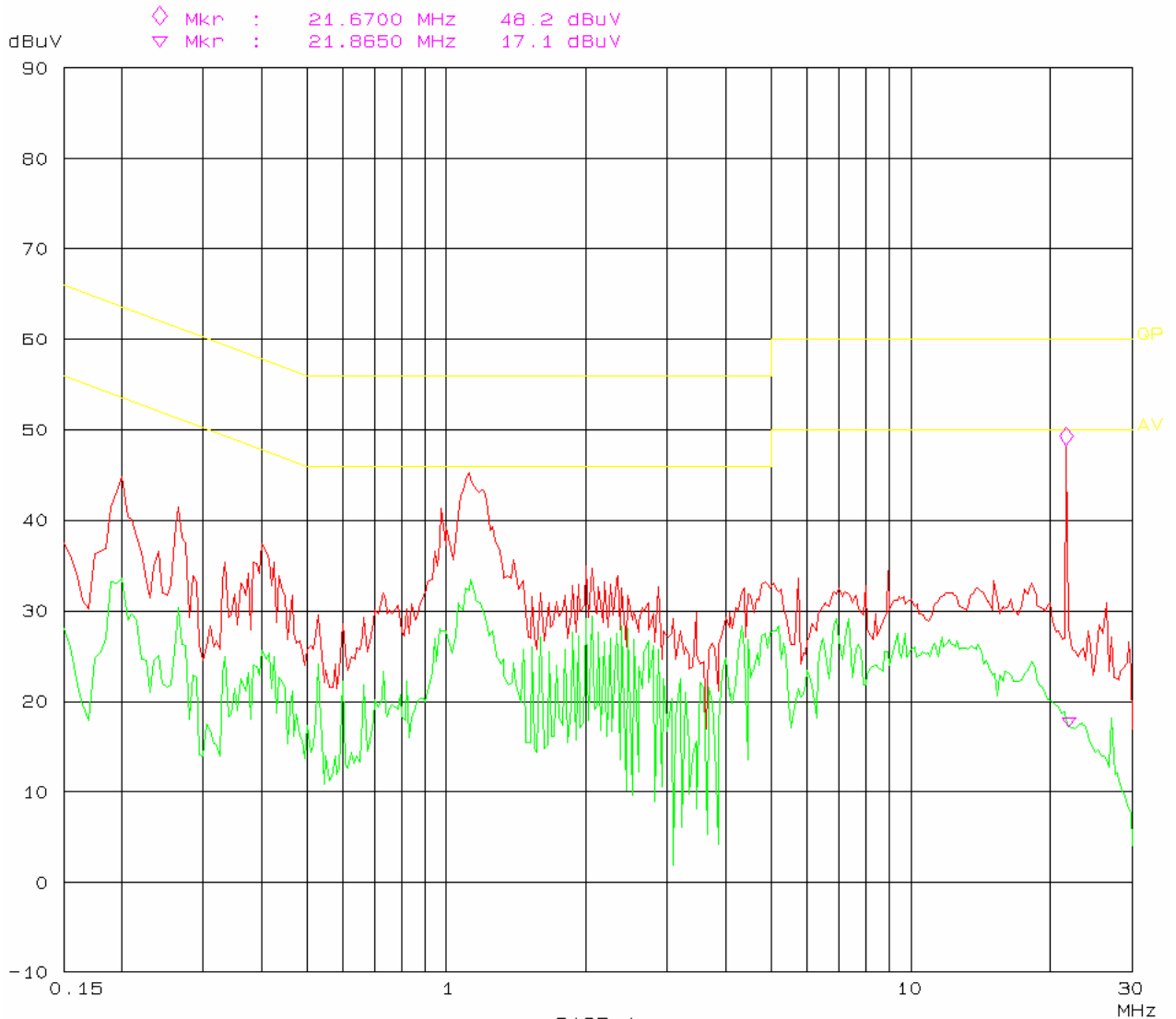
EUT: Bluetooth Speakerphone M/N: BC390
Manuf: SUNITEC
Op Cond: charging
Operator: Phoenix
Test Spec: AC 120V/60Hz H
Comment: Temp: 25 Humi: 56%



CONDUCTED EMISSION TEST
FCC PART15 B

04. Mar 08 13:14

EUT: Bluetooth Speakerphone M/N: BC390
Manuf: SUNITEC
Op Cond: charging
Operator: Phoenix
Test Spec: AC 120V/60Hz N
Comment: Temp: 25 Humi: 56%



CFR47 §15.205, §15.209, §15.247 - RADIATED EMISSIONS

Applicable Standard

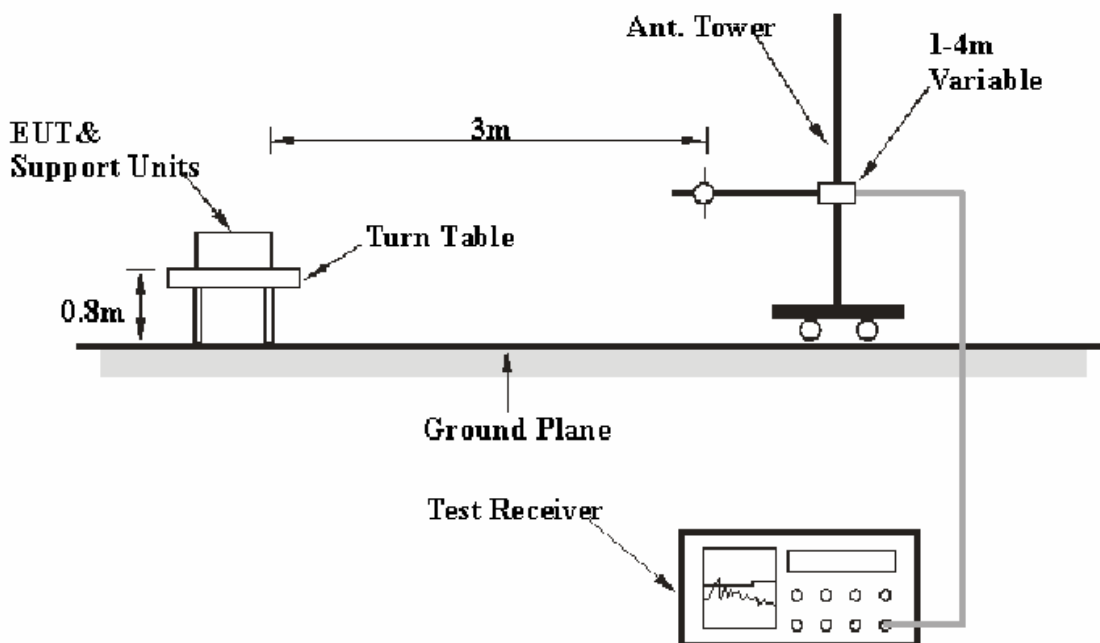
CFR47 §15.205; §15.209; §15.247 (d).

Measurement Uncertainty

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

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

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2007-11-15	2008-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16
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
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2007-05-09	2008-05-09

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

Test Procedure

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

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

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

Corrected Amplitude & Margin Calculation

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

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

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

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

Test Results Summary

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

Transmitting mode (Below 1GHz):

2.5 dB at 599.992650 MHz in the Vertical polarization

Transmitting mode (Above 1 GHz):

4.18 dB at 4804 MHz in the Vertical polarization (Low Channel)
6.83 dB at 4882 MHz in the Vertical polarization (Middle Channel)
9.10 dB at 4960 MHz in the Horizontal polarization (High Channel)

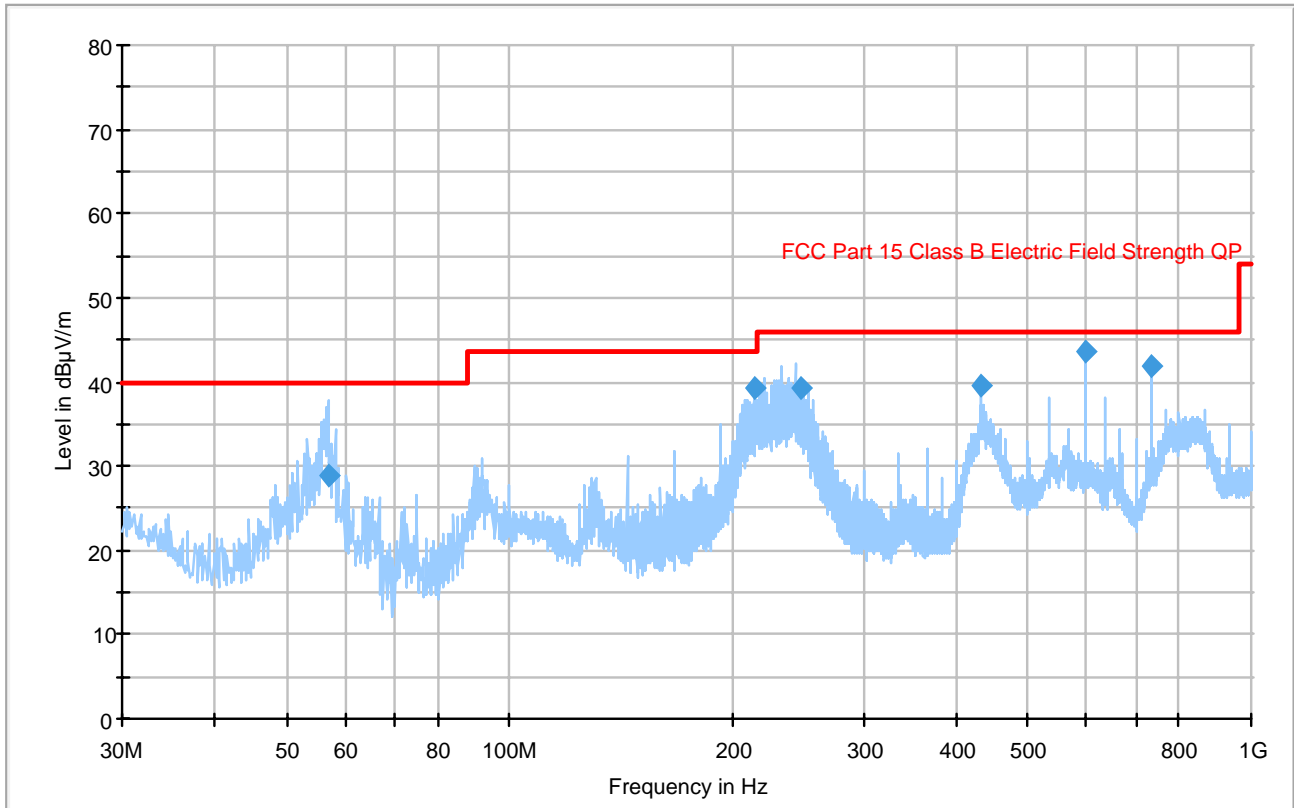
Test Data

Environmental Conditions

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

The testing was performed by Phoenix Liu on 2008-02-29.

Test Mode: Transmitting (Below 1GHz)



Frequency (MHz)	Corrected Amp. (dBµV/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
599.992650	43.5	151.0	V	231.0	-3.7	46.0	2.5
214.648975	39.4	175.0	H	229.0	-12.8	43.5	4.1
733.334425	41.8	132.0	H	136.0	-1.2	46.0	4.2
433.348075	39.6	294.0	H	191.0	-7.5	46.0	6.4
246.647875	39.2	160.0	H	215.0	-11.8	46.0	6.8
56.933775	28.9	290.0	V	272.0	-17.4	40.0	11.1

Test Mode: Transmitting (Above 1GHz)

Freq. (MHz)	Meter Reading (dBuV)	Detector PK/QP/AV	Direction Degree	Antenna		Antenna Loss (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Corr. Amp. (dBuV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)					Limit (dBuV/m)	Margin (dB)	Remarks
Low Channel (2402 MHz)												
4804	48.88	AV	90	1.0	V	29.70	4.64	33.4	49.82	54	4.18	harmonic
4804	48.79	AV	60	1.0	H	29.60	4.64	33.4	49.63	54	4.37	harmonic
1715	50.24	AV	180	1.2	H	22.30	2.98	34.6	40.92	54	13.08	spurious
1192	49.56	AV	90	1.2	H	21.50	2.77	35.0	38.83	54	15.17	spurious
1192	49.21	AV	180	1.2	V	21.00	2.77	35.0	37.98	54	16.02	spurious
4804	56.28	PK	180	1.2	V	29.70	4.64	33.4	57.22	74	16.78	harmonic
4804	55.67	PK	210	1.2	H	29.60	4.64	33.4	56.51	74	17.49	harmonic
1715	59.36	PK	45	1.3	H	22.30	2.98	34.6	50.04	74	23.96	spurious
1192	58.78	PK	45	1.2	V	21.00	2.77	35.0	47.55	74	26.45	spurious
1192	56.34	PK	180	1.2	H	21.50	2.77	35.0	45.61	74	28.39	spurious
Middle Channel (2441 MHz)												
4882	46.33	AV	243	1.4	V	29.60	4.64	33.4	47.17	54	6.83	harmonic
4882	45.98	AV	142	1.6	H	29.70	4.64	33.4	46.92	54	7.08	harmonic
1705	49.10	AV	90	1.5	H	22.10	2.98	34.6	39.58	54	14.42	spurious
4882	58.51	PK	234	1.8	H	29.70	4.64	33.4	59.45	74	14.55	harmonic
4882	58.56	PK	153	1.5	V	29.60	4.64	33.4	59.40	74	14.60	harmonic
1390	49.01	AV	135	1.3	H	21.00	2.77	35.0	37.78	54	16.22	spurious
1705	46.15	AV	60	1.5	V	22.10	2.98	34.6	36.63	54	17.37	spurious
1390	46.21	AV	85	1.5	V	21.50	2.77	35.0	35.48	54	18.52	spurious
1705	59.35	PK	110	1.5	H	22.10	2.98	34.6	49.83	74	24.17	spurious
1705	58.10	PK	140	1.5	V	22.10	2.98	34.6	48.58	74	25.42	spurious
1390	58.46	PK	156	1.4	H	21.00	2.77	35.0	47.23	74	26.77	spurious
1390	57.35	PK	265	1.4	V	21.50	2.77	35.0	46.62	74	27.38	spurious
High Channel (2480 MHz)												
4960	44.15	AV	256	1.8	H	29.60	4.55	33.4	44.90	54	9.10	harmonic
4960	43.52	AV	142	1.5	V	29.70	4.55	33.4	44.37	54	9.63	harmonic
4960	59.45	PK	145	1.4	H	29.60	4.55	33.4	60.20	74	13.80	harmonic
4960	59.09	PK	142	1.4	V	29.70	4.55	33.4	59.94	74	14.06	harmonic
1458	48.60	AV	100	1.5	H	21.90	2.84	34.1	39.24	54	14.76	spurious
1196	47.85	AV	156	1.2	H	21.50	2.77	35.0	37.12	54	16.88	spurious
1458	43.81	AV	160	1.5	V	21.90	2.84	34.1	34.45	54	19.55	spurious
1196	44.42	AV	210	1.2	V	21.00	2.77	35.0	33.19	54	20.81	spurious
1458	60.32	PK	120	1.5	H	21.90	2.84	34.1	50.96	74	23.04	spurious
1458	59.80	PK	180	1.5	V	21.90	2.84	34.1	50.44	74	23.56	spurious
1196	60.47	PK	128	1.5	H	21.50	2.77	35.0	49.74	74	24.26	spurious
1196	59.99	PK	240	1.4	V	21.00	2.77	35.0	48.76	74	25.24	spurious

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

Applicable Standard

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16

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

Test Procedure

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

Test Data

Environmental Conditions

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

The testing was performed by Phoenix Liu on 2008-02-29.

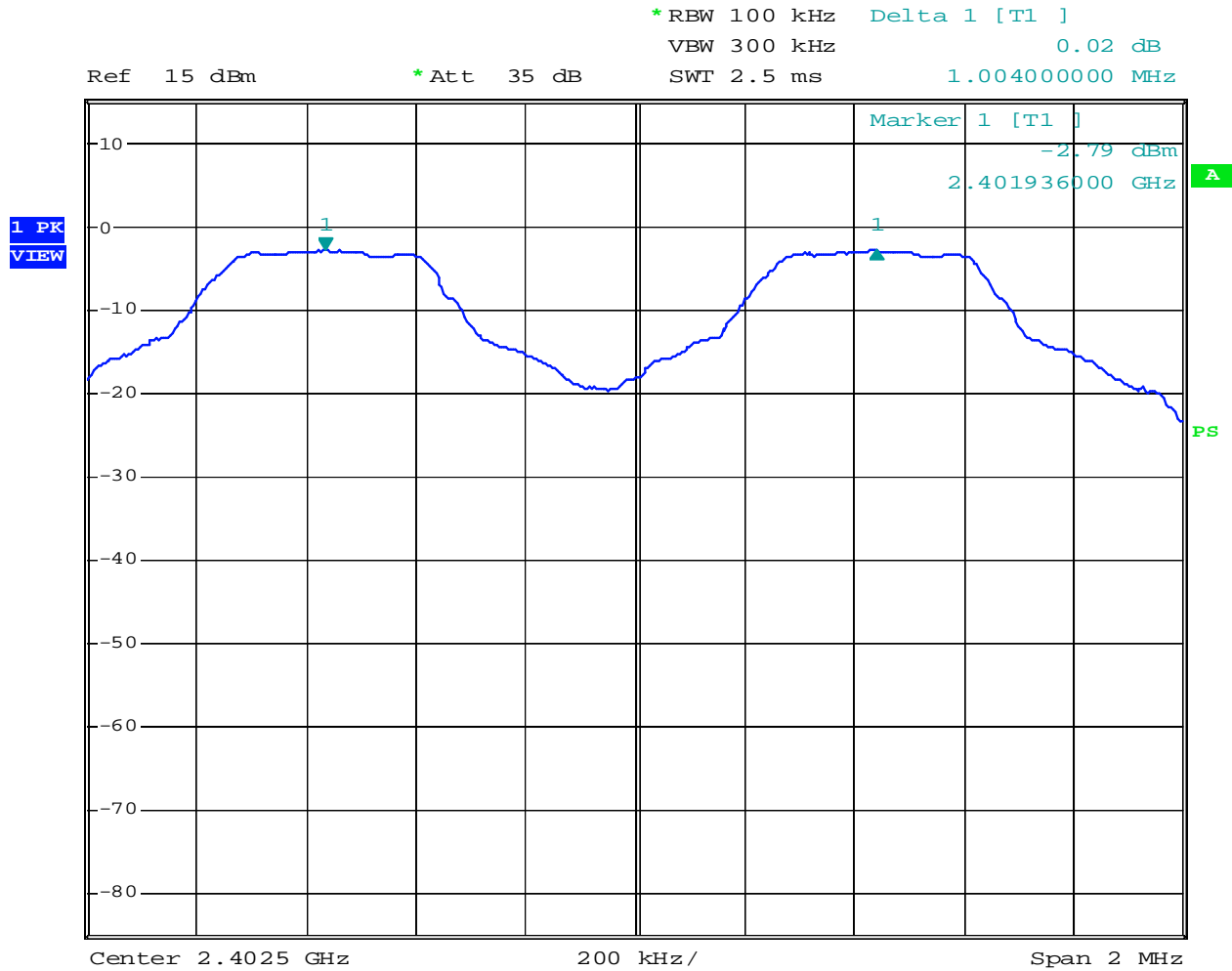
Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (kHz)	Limit (kHz)	Result
Low Channel	2402	1004	592.0	Pass
Adjacent Channel	2403			
Mid Channel	2441	1004	594.5	Pass
Adjacent Channel	2442			
High Channel	2480	1004	594.5	Pass
Adjacent Channel	2479			

Test Result: Compliance.

Please refer to following plots

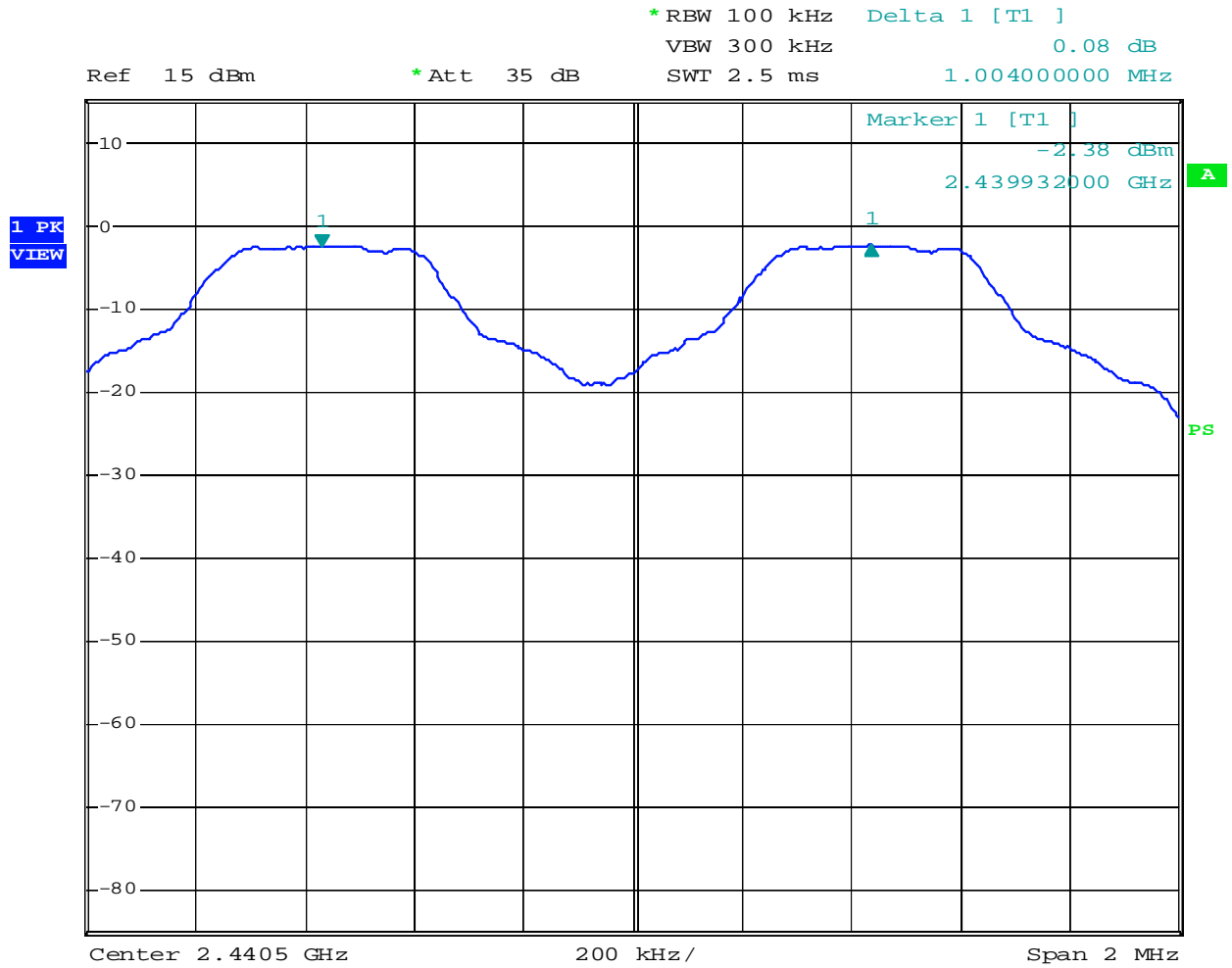
Low Channel



channel separation low channel

Date: 26.FEB.2008 20:53:22

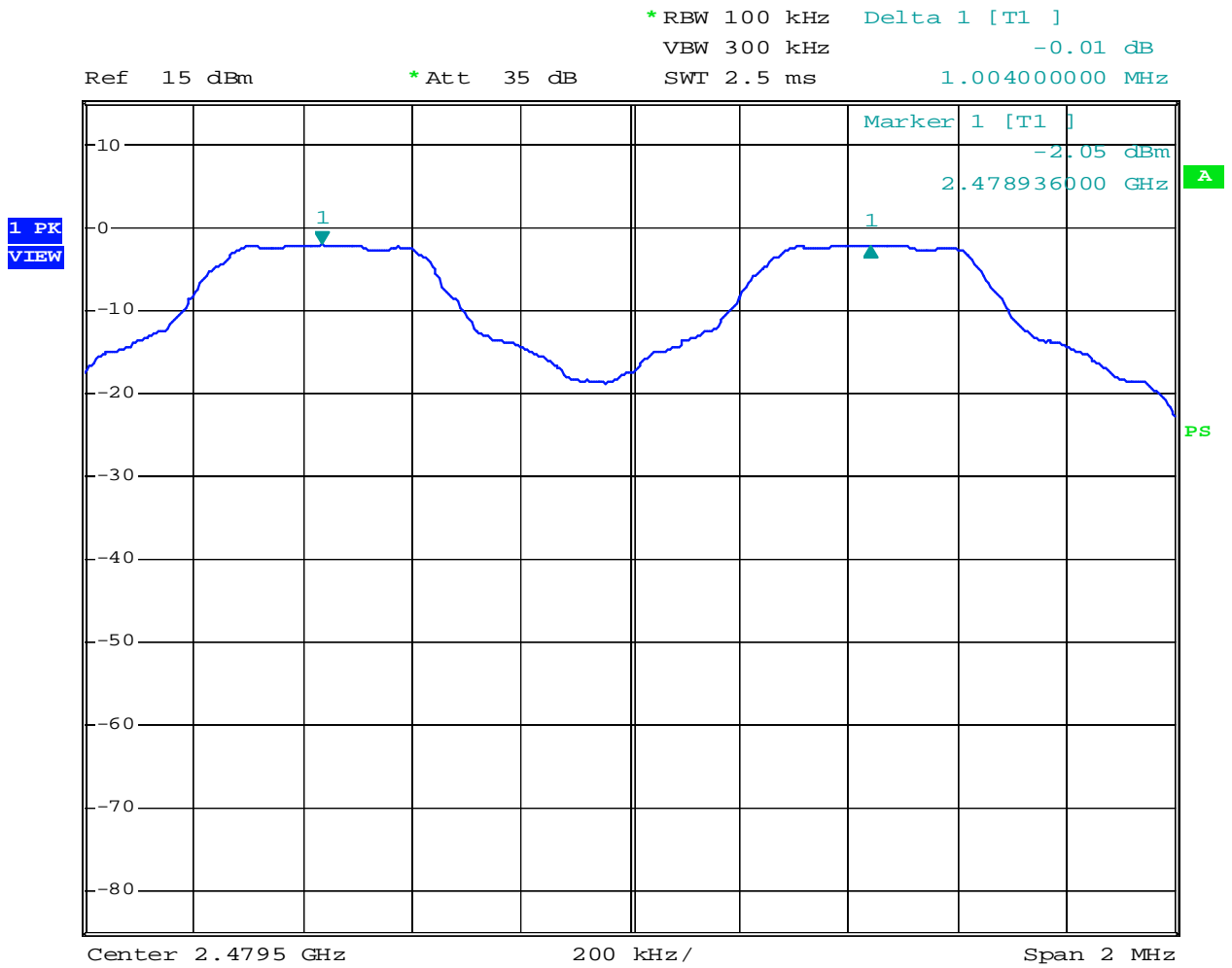
Middle Channel



channel separation middle channel

Date: 26.FEB.2008 20:54:47

High Channel



channel separation high channel

Date: 26.FEB.2008 20:56:05

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

Applicable Standard

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16

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

Test Procedure

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

Test Data

Environmental Conditions

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

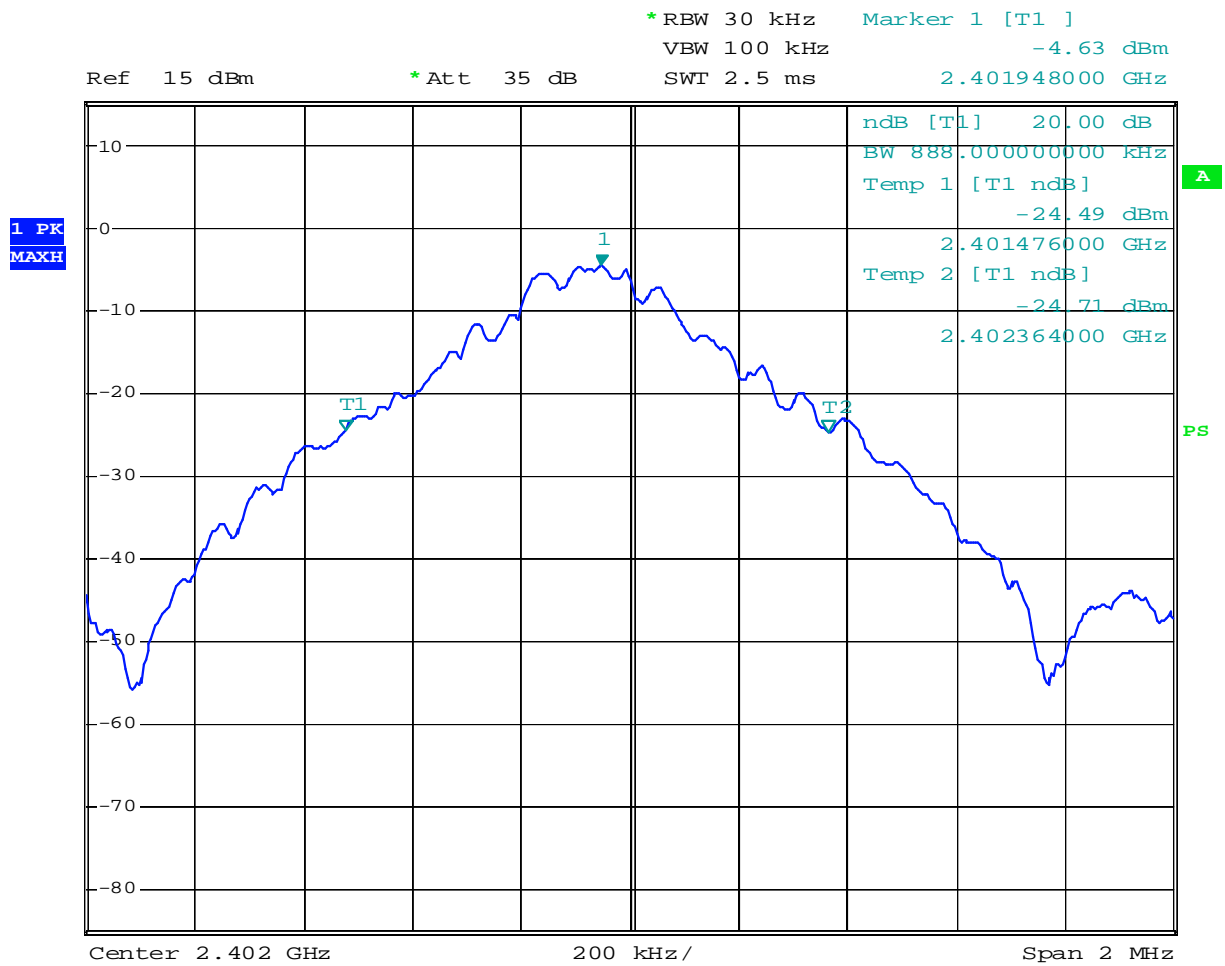
The testing was performed by Phoenix Liu on 2008-02-29.

Test Result: Please refer to the following table and plots.

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	20dB Bandwidth (MHz)
Low	2402	888
Middle	2441	892
High	2480	892

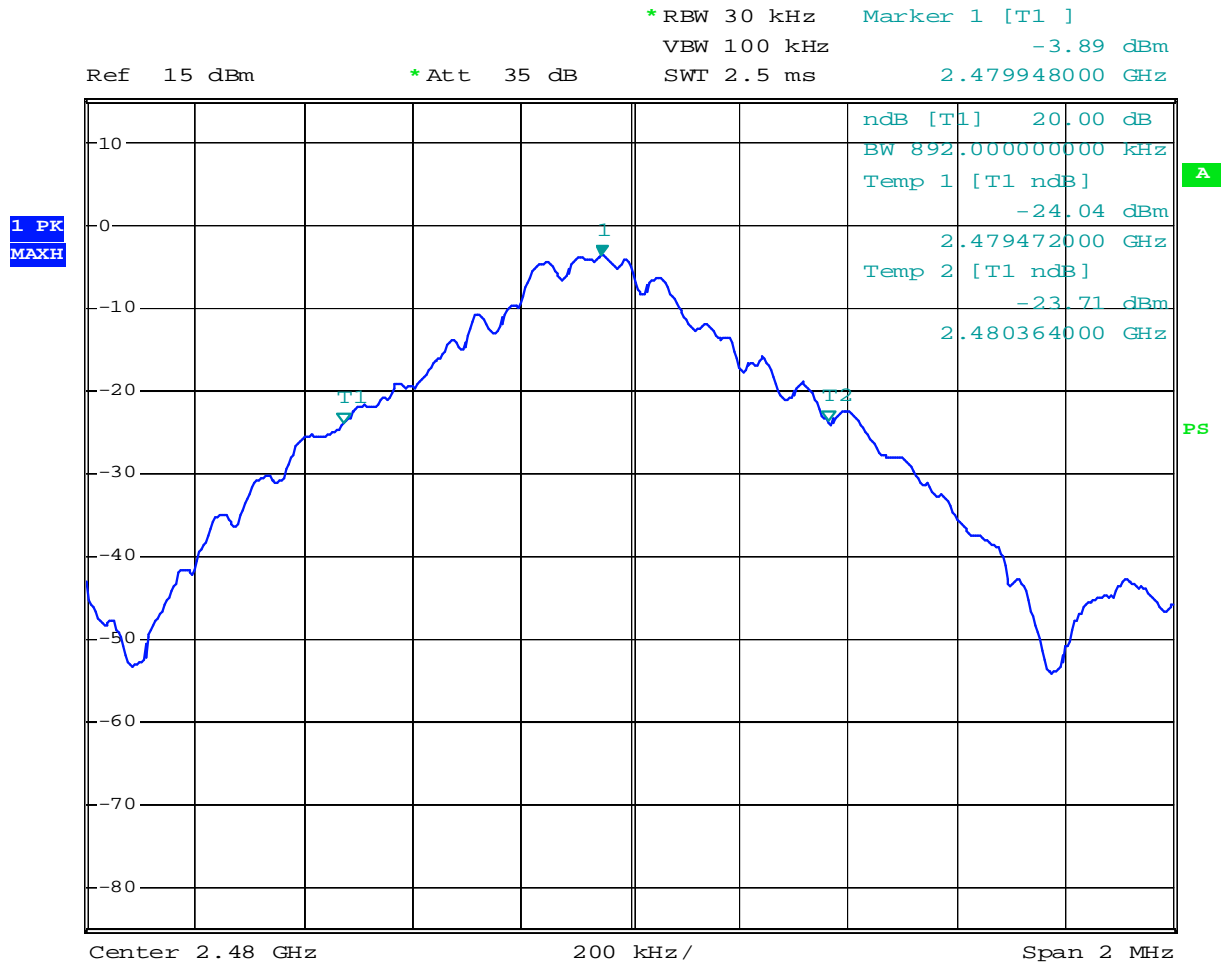
Low Channel



20dB bandwidth low channel

Date: 26.FEB.2008 20:59:30

High Channel



20dB bandwidth high channel

Date: 26.FEB.2008 20:57:53

CFR47 §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16

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

Test Procedure

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

Test Data

Environmental Conditions

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

The testing was performed by Phoenix Liu on 2008-02-29.

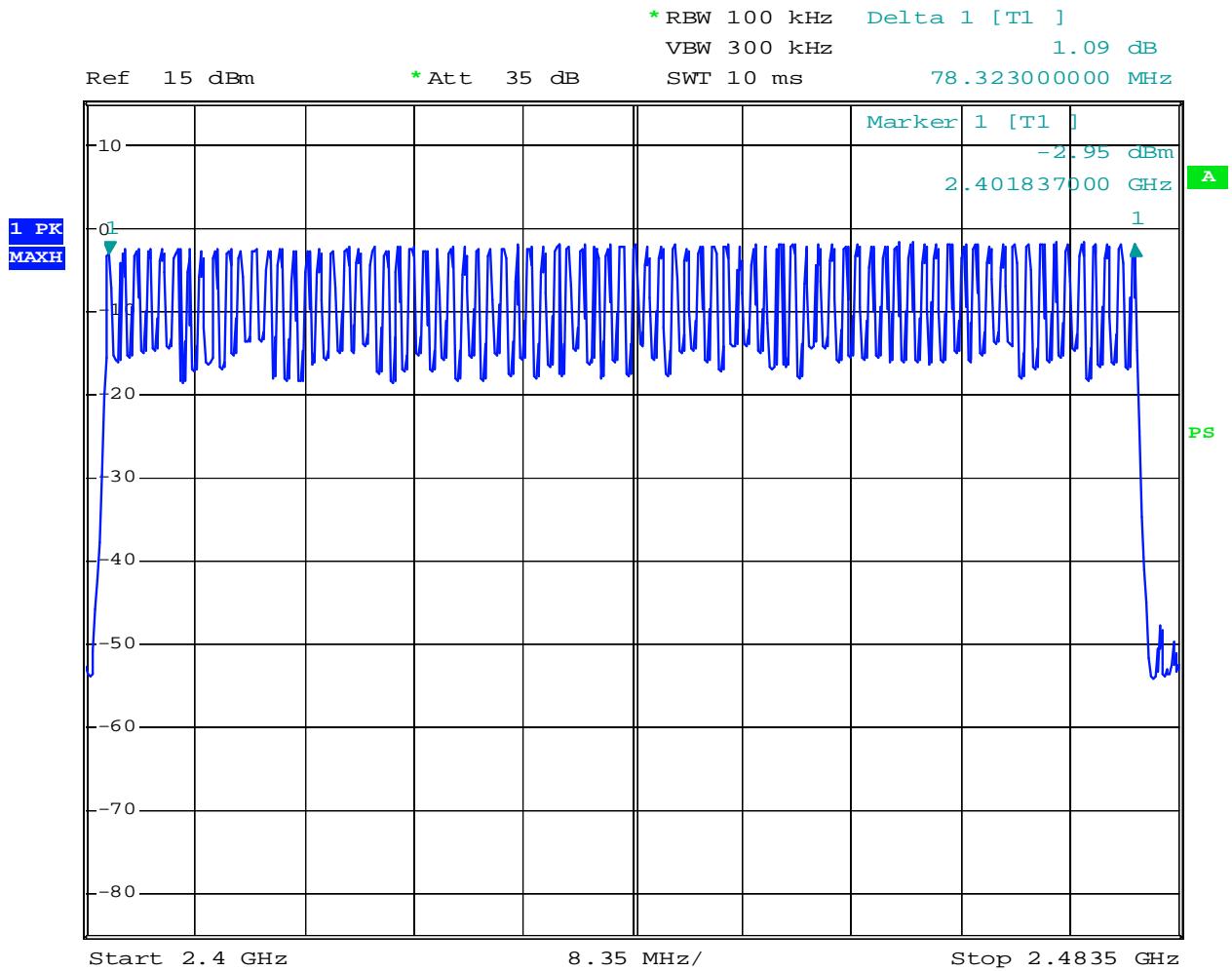
Test Mode: Transmitting

Test Result: Compliance.

Please refer to following plot.

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

Number of Hopping Channels



hopping channels

Date: 26.FEB.2008 20:46:27

CFR47 §15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16

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

Test Procedure

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

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

Test Data

Environmental Conditions

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

The testing was performed by Phoenix Liu on 2008-02-29.

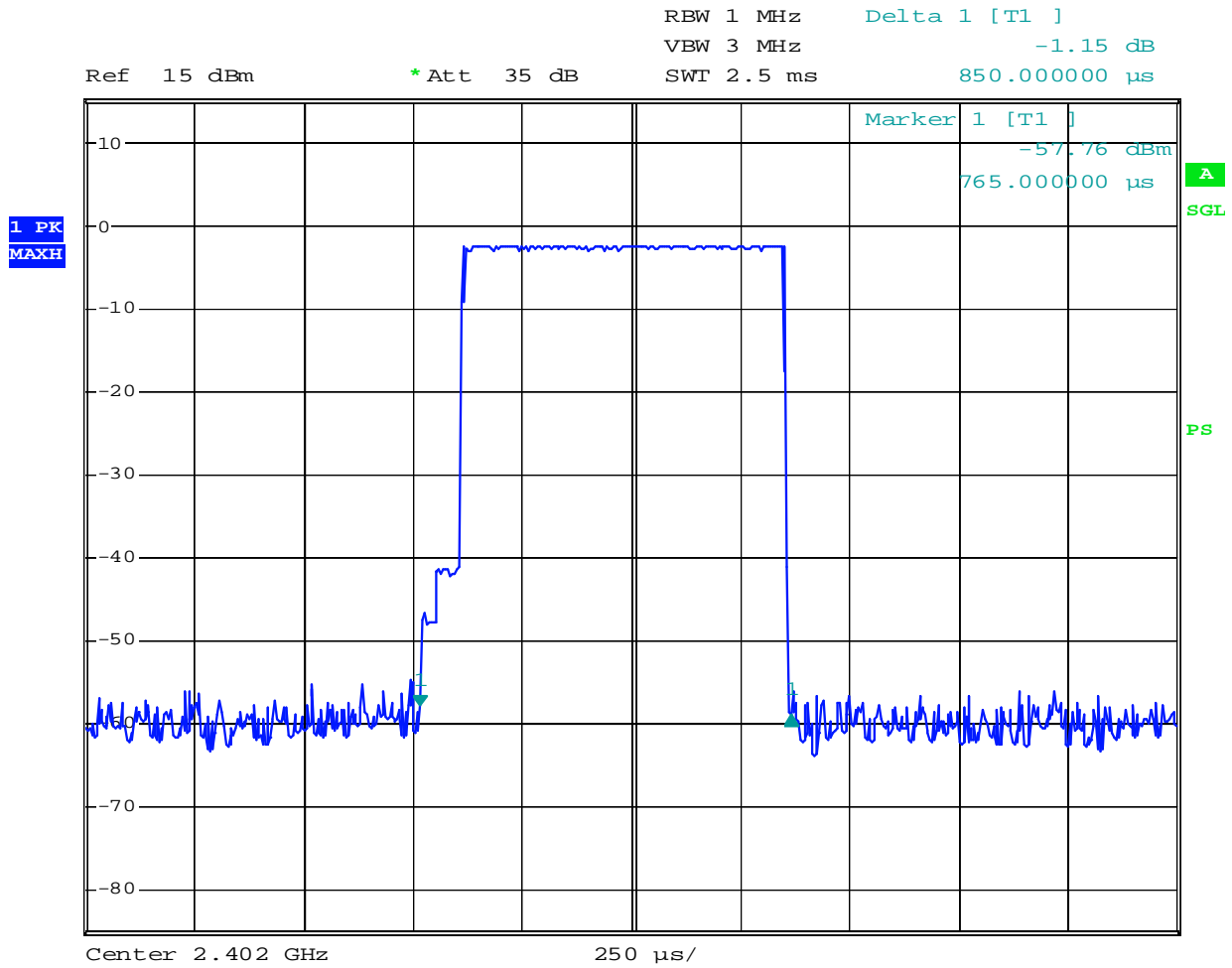
Test Mode: Transmitting

Test Result: Compliance. Please refer to following tables and plots

Channel	Pulse width (msec)	Dwell time (sec)	Limit (sec)	Result
Low	0.850	0.272	0.4	Pass
Middle	0.850	0.272	0.4	Pass
High	0.850	0.272	0.4	Pass

NOTE: Dwell time=Pulse width (ms) × (1600 ÷ 2 ÷ 79) × 31.6 Second

Low Channel

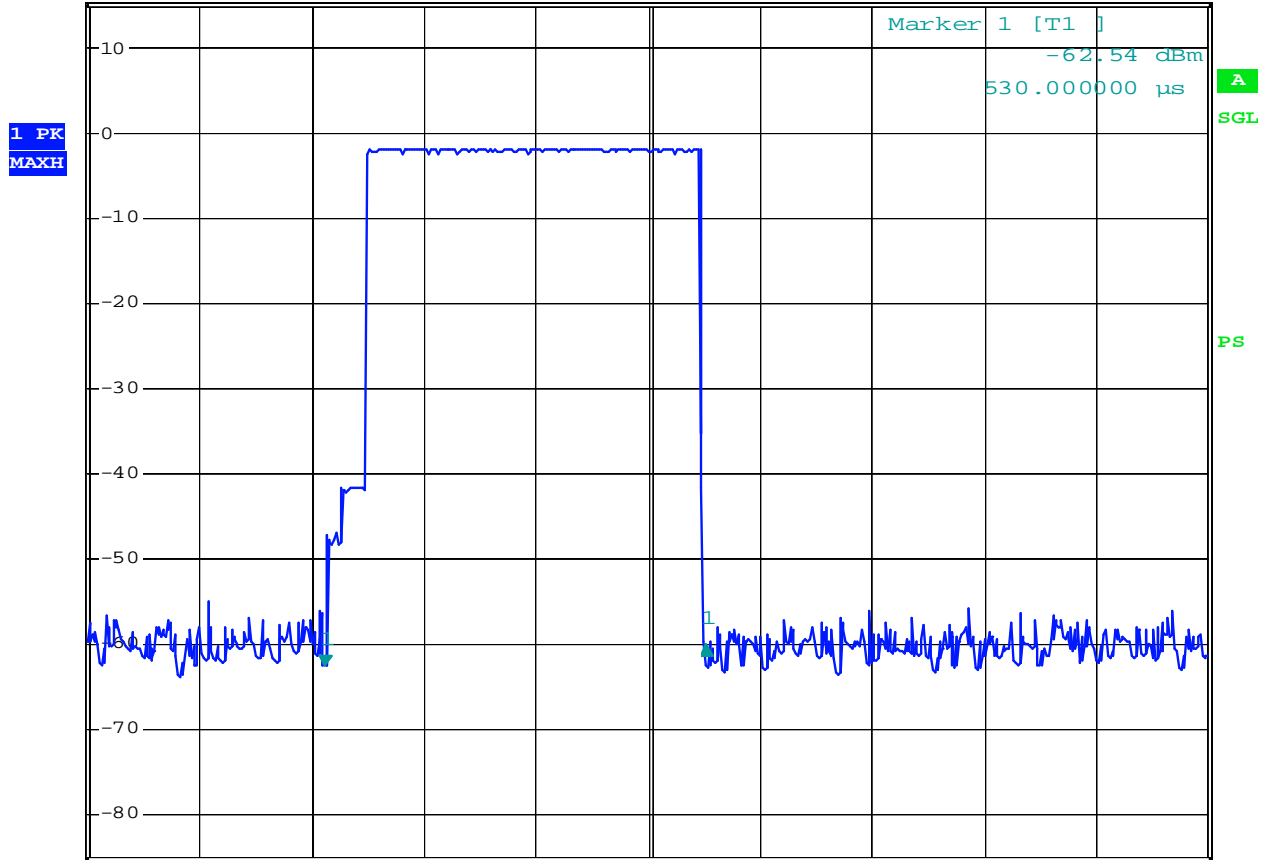


dwll time low channel

Date: 26.FEB.2008 21:46:21

Middle Channel

RBW 1 MHz Delta 1 [T1]
VBW 3 MHz 2.60 dB
Ref 15 dBm *Att 35 dB SWT 2.5 ms 850.000000 μ s

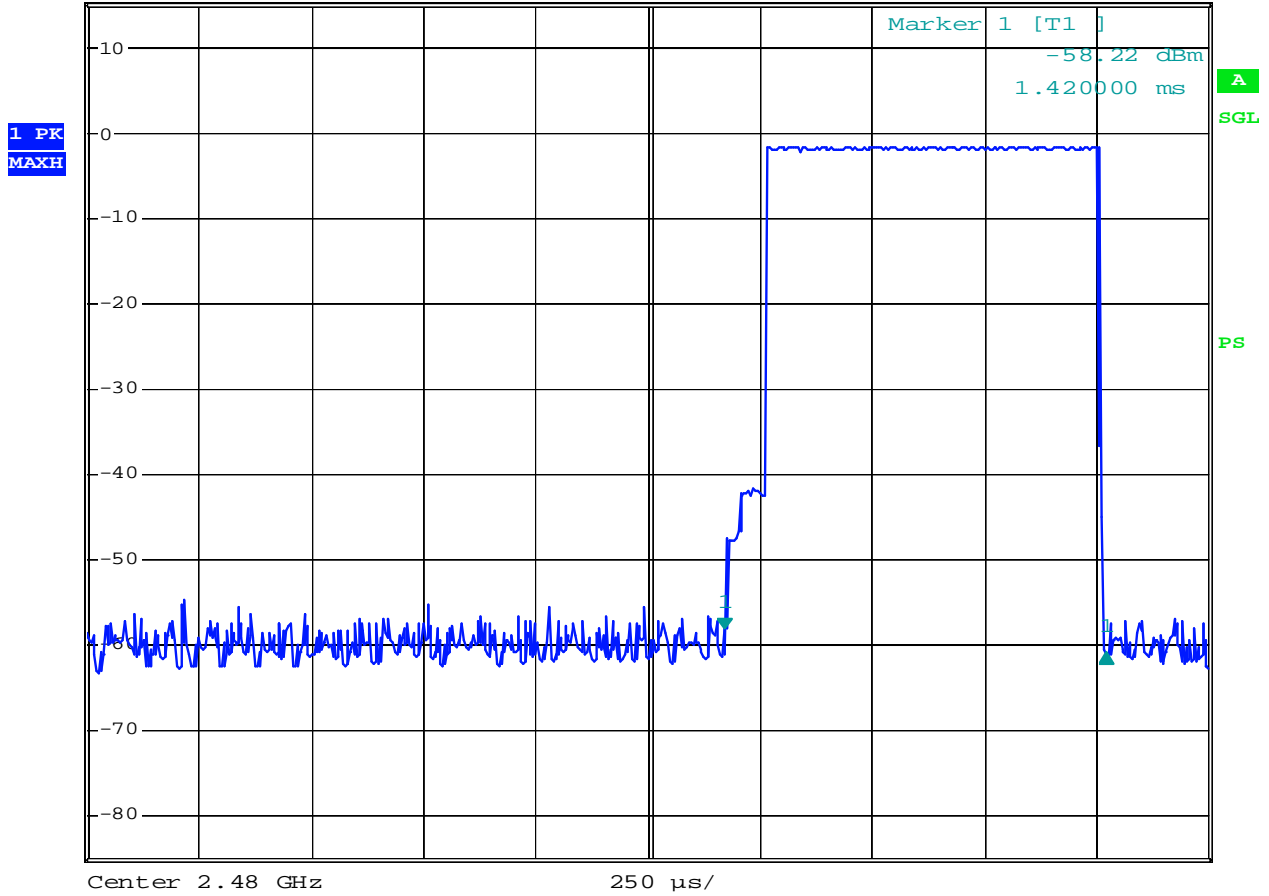


dwll time middle channel

Date: 26.FEB.2008 21:43:32

High Channel

RBW 1 MHz Delta 1 [T1]
VBW 3 MHz -2.43 dB
Ref 15 dBm *Att 35 dB SWT 2.5 ms 850.00000 μ s



dwll time high channel

Date: 26.FEB.2008 21:45:08

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
HP	Amplifier	HP8447D	2944A09795	2007-11-15	2008-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16
HP	Amplifier	8449B	3008A00277	2007-09-29	2008-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2007-09-25	2008-09-25
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2007-05-09	2008-05-09

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

Test Procedure

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

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

Data was recorded in peak detection modes.

Corrected Amplitude & Margin Calculation

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

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

Test Data**Environmental Conditions**

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

The testing was performed by Phoenix Liu on 2008-02-29.

Test Mode: Transmitting

Test Result: Compliance.

Freq. (MHz)	Receiver Reading (dB μ V)	Detector PK/AV	Table Direction Degree	Test Antenna		Cable Loss (dB)	Pre- Amp. (dB)	Cord. Amp. (dB μ V/m)	Tran. Factor (dB)	EIRP		FCC 15.247 Limit (mW)
				Height (m)	Factor (dB/m)					(dBm)	(mW)	
Low Channel												
2402	96.87	PK	180	1.5	29.6	2.5	35	93.97	95.27	-1.30	0.741	125
Middle Channel												
2441	97.38	PK	210	1.5	29.6	2.5	35	94.48	95.27	-0.79	0.834	125
High Channel												
2480	97.52	PK	190	1.4	29.6	2.5	35	94.62	95.27	-0.65	0.861	125

Note: P (dBm) = E (dB μ V/m) – 95.27

CFR47 §15.247(d) - BAND EDGES TESTING

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16

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

Test Procedure

1. Check the calibration of the measuring instrument 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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

The testing was performed by Phoenix Liu on 2008-02-29.

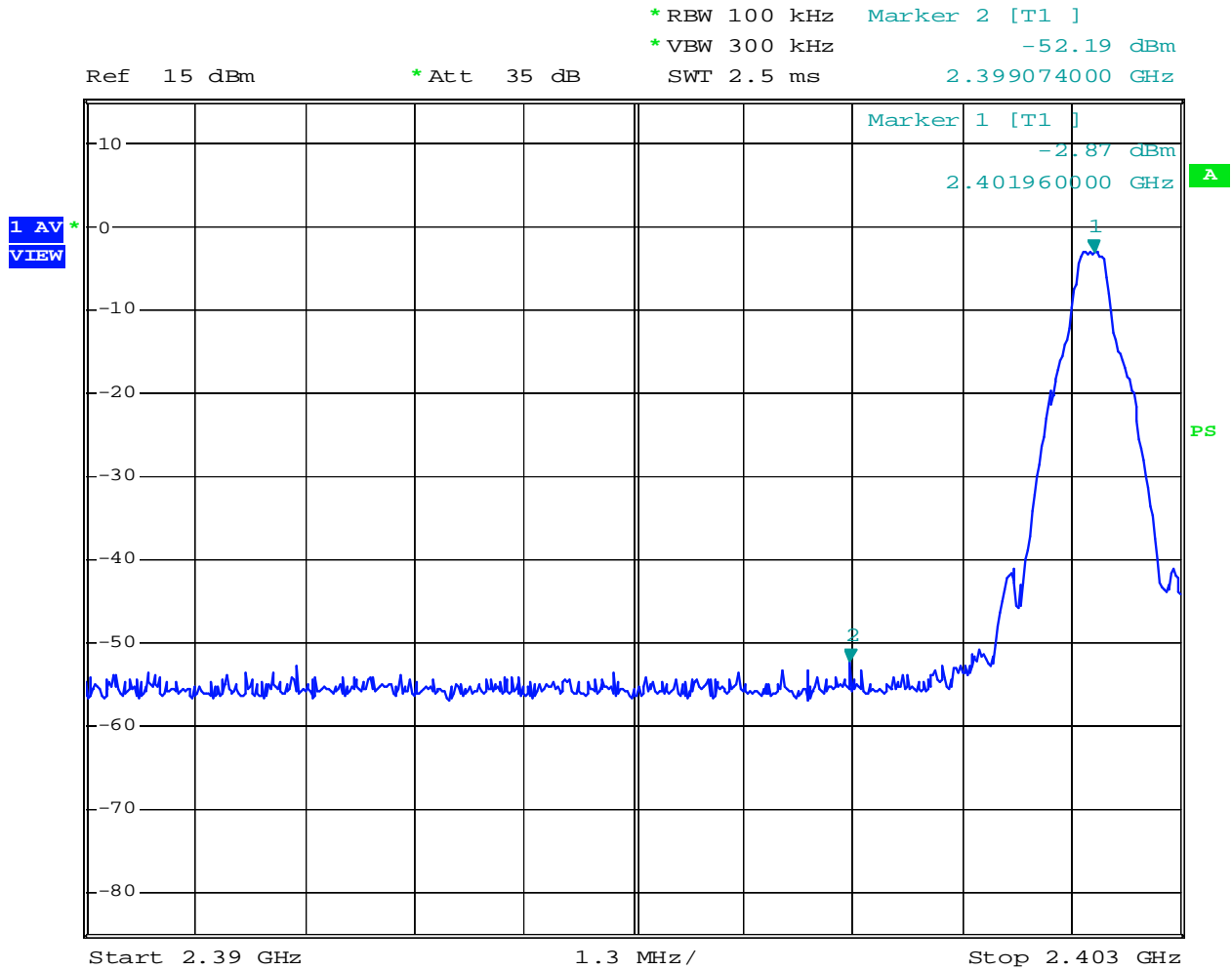
Test Mode: Transmitting

Test Result: Pass

Please refer to the following table and plots.

Frequency (MHz)	Delta Peak to band emission (dBc)	Limit (dBc)
2399.074	49.32	20
2495.422	51.54	20

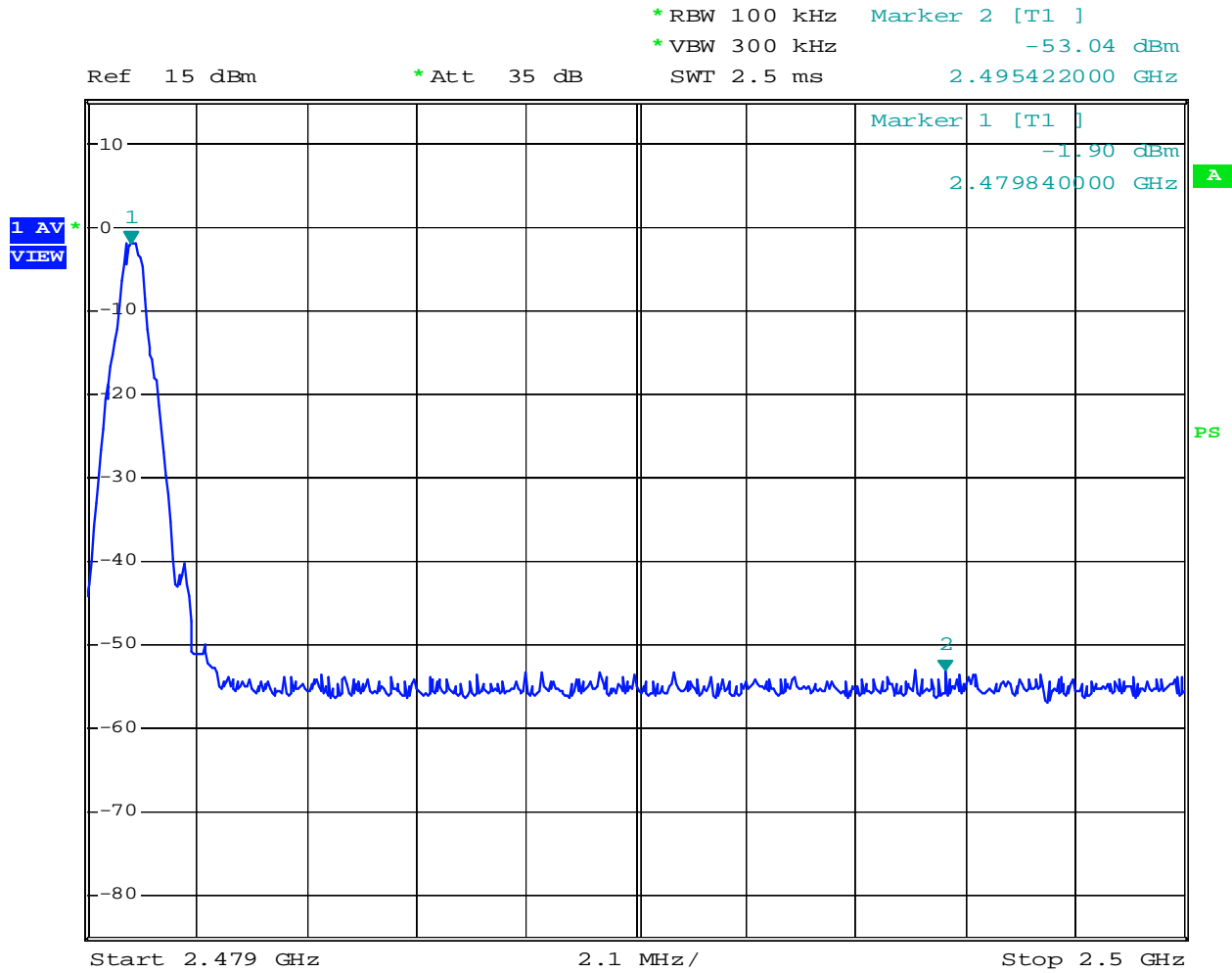
Band Edge Left Side



band edge left

Date: 26.FEB.2008 21:24:46

Band Edge Right Side



band edge right

Date: 26.FEB.2008 21:22:53

DECLARATION LETTER

SUNITEC ENTERPRISE CO., LTD

To: Bay Area Compliance Laboratories Corp

Declaration letter

Dear Sir,

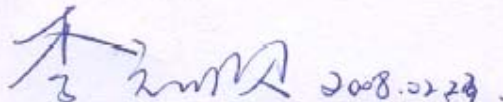
For our business issue and marketing requirement, we would like to list some model numbers on the FCC, CE certificates and reports, as following:

Model No.: BC390, BC380

We declare that there is no electrical change has been made to the equipment that alters the compliance characteristics. The difference of these models is the covers. Please kindly handle on the project.

Thank you!

Signature:



2008.02.28

Printed name/ title: Yuanshun Li / Manager

Tel: (86)755 28016180

Fax: (86)755 29802984

Address: No.2,Qilin Road 2,Run Tang Ind,Dan-keng Vilage Fu Min Community.Guan-lan Town, BaoAn District, Shenzhen GuangDong China

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