NVLAP LAB CODE 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Shenzhen Coson Electronic Co., Ltd.

17 F, Ying Long Building, No. 6025, Shen Nan Middle Road,

Shenzhen, Guangdong, China

FCC ID: XPW-HMT5800RWG01

Report Type:	**Product Type:**
Original Report	RFID Hand-Held Mobile Terminal

Test Engineer:	Vicent Kang
Report Number:	RSZ09081052-RFID
Report Date:	2010-05-25
Reviewed By:	Merry Zhao EMC Engineer
Prepared By:	Bay Area Compliance Laboratories 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 *SHENZHEN COSON ELECTRONIC CO., LTD.'s* product, model number: *SD5800 (FCC ID: XPW-HMT5800RWG01) o*r the "EUT" as referred to in this report is a *RFID hand-held mobile terminal,* which measures approximately: 27.0 cm L 11.5 cm W x 17.0 xxx cm H, DC 15V adapter or DC 11.1 V battery.

Adapter information
Manufacture: Artesyn technologies (Z.S.);
Model: SSL40-7615;
Input: AC 100-240V 100-120VA 50/60Hz;
Output: 15VDC, 2.6A

For RFID mode, 50channels, 500 kHz/channel, Start from frequency: 902.75MHz, Stop frequency: 927.25MHz, Center frequency: 915.75MHz for US

Channel NO.	Frequency (MHz)	Channel NO.	Frequency (MHz)	Channel NO.	Frequency (MHz)
1	902.75	19	911.75	37	920.75
2	903.25	20	912.25	38	921.25
3	903.75	21	912.75	39	921.75
4	904.25	22	913.25	40	922.25
5	904.75	23	913.75	41	922.75
6	905.25	24	914.25	42	923.25
7	905.75	25	914.75	43	923.75
8	906.25	26	915.25	44	924.25
9	906.75	27	915.75	45	924.75
10	907.25	28	916.25	46	925.25
11	907.75	29	916.75	47	925.75
12	908.25	30	917.25	48	926.25
13	908.75	31	917.75	49	926.75
14	909.25	32	918.25	50	927.25
15	909.75	33	918.75		
16	910.25	34	919.25		
17	910.75	35	919.75		
18	911.25	36	920.25		

** All measurement and test data in this report was gathered from production sample serial number: 0908816 (Assigned by BACL). The EUT was received on 2009-08-10*

Objective

This Type approval report is prepared on behalf of *SHENZHEN COSON ELECTRONIC CO., LTD. in* accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part15.247 802.11b/g Wi-Fi and FCC Part 22H/24E submissions with FCC ID: XPW-HMT5800RWG01.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

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

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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

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

NVLAP LAB CODE 200707-0

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

EUT Exercise Software

"RFID.exe" is provided by manufacture.

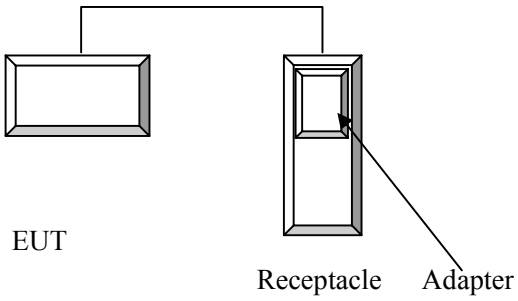
Equipment Modifications

No modification was made to the unit tested.

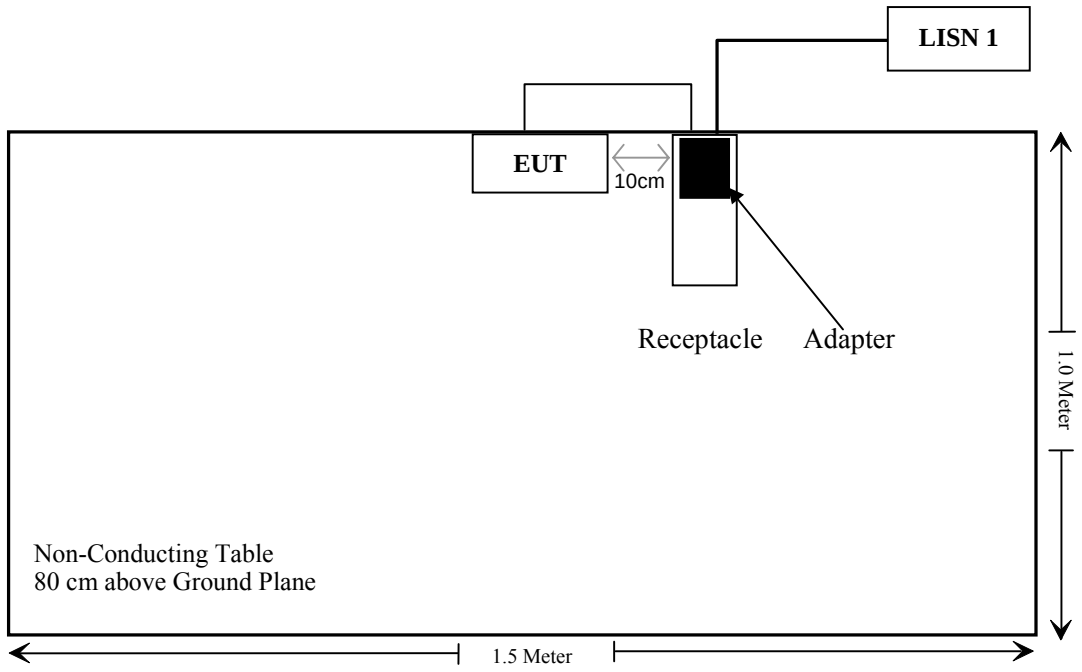
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable Power Cable with a Core	0.85	Adapter	EUT

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247(i), §2.1093	RF Exposure	Compliant*
§15.203	Antenna Requirement	Compliant
§15.207 (a)	Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Radiated Emissions	Compliant
§15.247(a)(1) (i)	20 dB Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(i)	Time of Occupancy (Dwell Time)	Compliant
§15.247(a)(1)(i)	Quantity of hopping channel Test	Compliant
§15.247(b)(2)	Peak Output Power Measurement	Compliant
§15.247(d)	Band Edges	Compliant

Note: * Please refer to the SAR report: R1002118-FCC-SAR.

FCC §15.247(i) & §1.1307(b)(1) & §2.1093– RF EXPOSURE

Applicable Standard

FCC§15.247(i) &1.1307 and §2.1093.

Test Result

Compliance

The EUT is a portable device which needs SAR evaluation; please refer to BACL SAR Report: R1002118-FCC-SAR.

FCC §15.203 – ANTENNA REQUIREMENT

Standard Applicable

According to FCC §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 3 antennas; one is for RF-ID, the gain is 3.5 dBi; one is for Wi-Fi, the gain is 2 dBi; other is for GSM850/PCS1900, the gain of PCS1900 is 2.15 dBi and the gain of GSM850 is 2.5 dBi The WiFi antenna and GPRS antenna are intergral antennas, whch are permanently attached. The RFID uses a unique antenna which designed by manufacturer.

Result: Compliant.

FCC §15.207(a) - CONDUCTED EMISSIONS

Applicable Standard

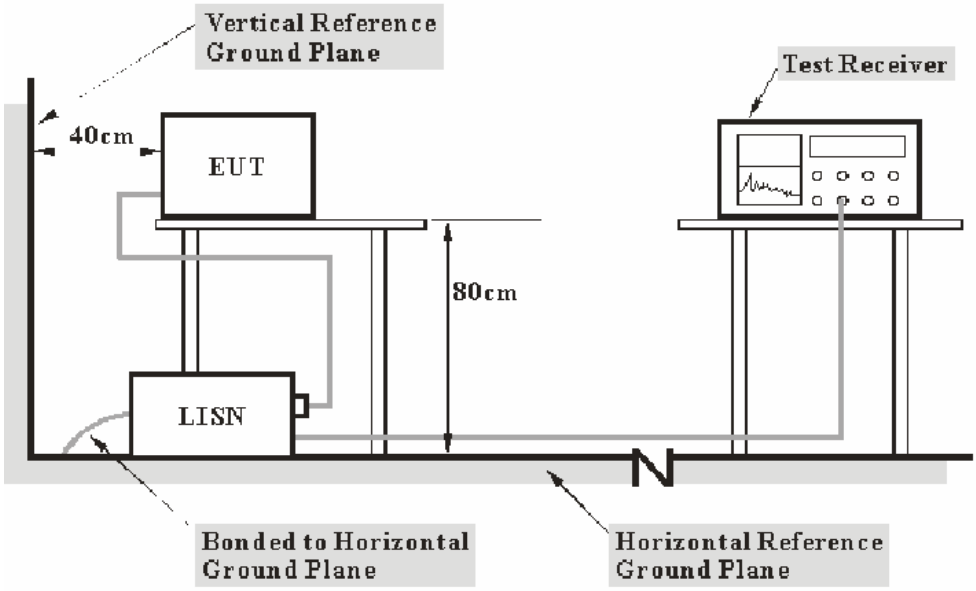
FCC §15.207

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ±2.4 dB.

Test Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	***IF B/W***
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2009-04-28	2010-04-27
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2009-04-28	2010-04-27

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

Test Procedure

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

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

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

Test Results Summary

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

10.41 dB at **4.6770 MHz** in the **Line** conductor mode
11.34 dB at **4.7310 MHz** in the **Neutral** conductor mode

Test Data

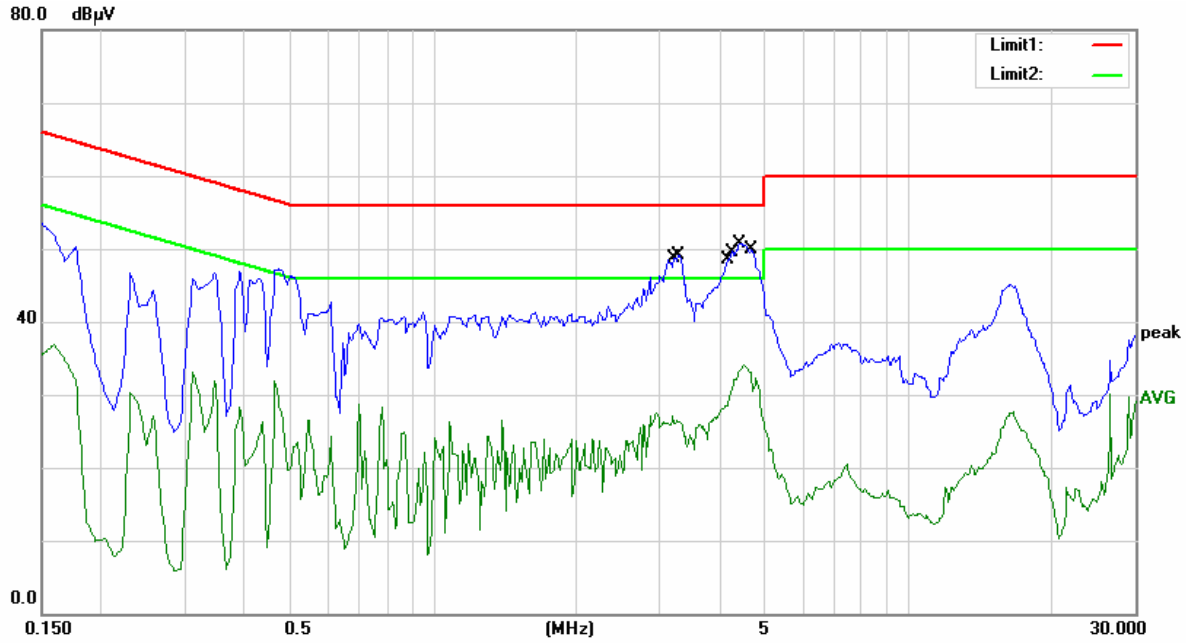
Environmental Conditions

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

The testing was performed by Vicent kang on 2009-09-19.

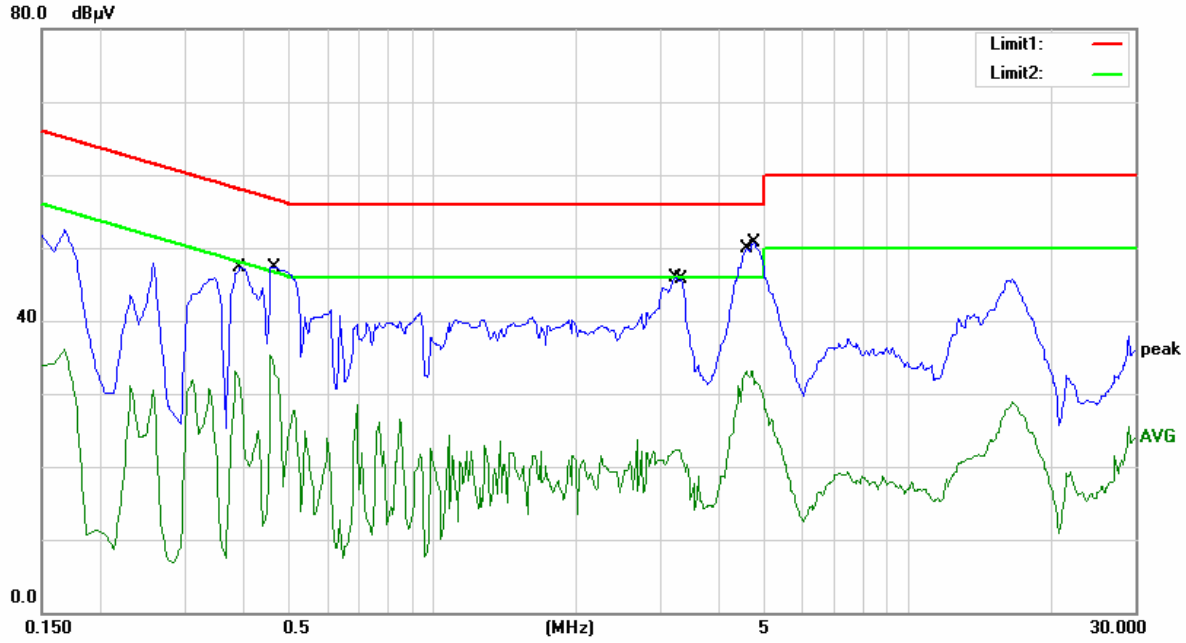
Test Mode: Transmitting

120 V/60Hz, Line



Frequency (MHz)	Receiver Reading (dBµV)	Correction Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Remark
4.6770	35.49	10.10	45.59	56.00	10.41	QP
4.2540	34.93	10.10	45.03	56.00	10.97	QP
4.4160	34.49	10.10	44.59	56.00	11.41	QP
4.1640	32.98	10.10	43.08	56.00	12.92	QP
3.2190	32.10	10.10	42.20	56.00	13.80	QP
3.2910	31.71	10.10	41.81	56.00	14.19	QP
4.6770	20.51	10.10	30.61	46.00	15.39	AV
4.2540	20.41	10.10	30.51	46.00	15.49	AV
4.4160	20.30	10.10	30.40	46.00	15.60	AV
4.1640	19.39	10.10	29.49	46.00	16.51	AV
3.2190	16.61	10.10	26.71	46.00	19.29	AV
3.2910	15.35	10.10	25.45	46.00	20.55	AV

120 V/60 Hz, Neutral:



Frequency (MHz)	Receiver Reading (dBµV)	Correction Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Remark
4.7310	34.56	10.10	44.66	56.00	11.34	QP
4.5600	33.92	10.10	44.02	56.00	11.98	QP
0.4650	33.48	10.10	43.58	56.60	13.02	QP
4.7310	20.53	10.10	30.63	46.00	15.37	AV
3.2280	30.31	10.10	40.41	56.00	15.59	QP
0.3930	32.13	10.10	42.23	58.00	15.77	QP
0.4650	20.73	10.10	30.83	46.60	15.77	AV
4.5600	19.71	10.10	29.81	46.00	16.19	AV
3.3360	27.47	10.10	37.57	56.00	18.43	QP
0.3930	17.92	10.10	28.02	48.00	19.98	AV
3.2280	11.26	10.10	21.36	46.00	24.64	AV
3.3360	9.60	10.10	19.70	46.00	26.30	AV

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

Applicable Standard

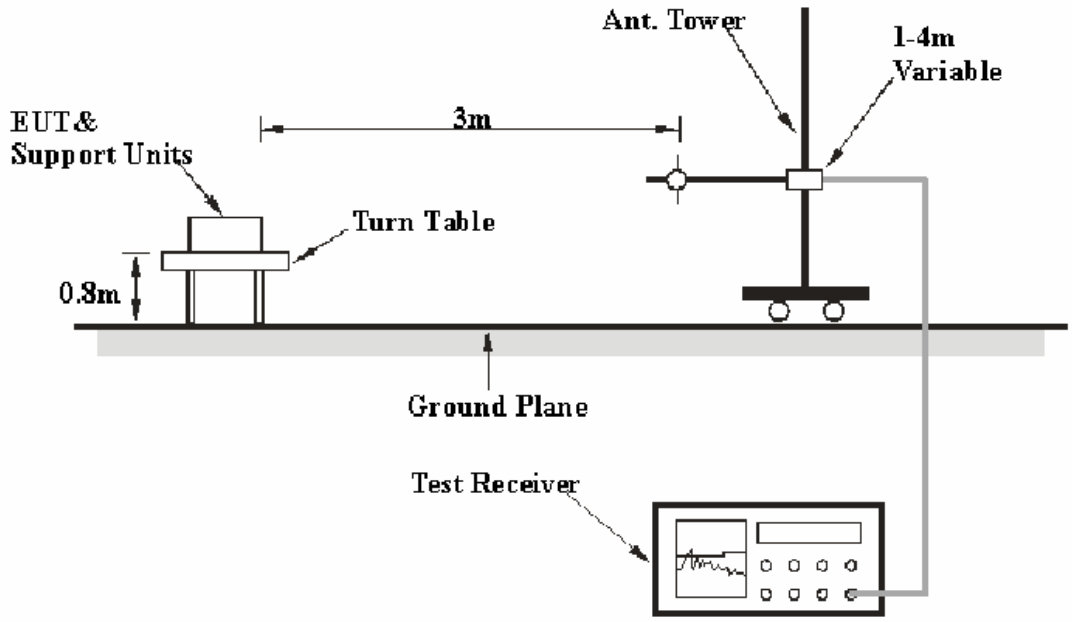
FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

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

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

Test Setup



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

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

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	***RBW***	***Video B/W***
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	2009-08-02	2010-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
HP	Amplifier	8449B	3008A00277	2009-09-12	2010-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2009-05-05	2010-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-08

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

Test Procedure

For the radiated emissions test, the adapter, the 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:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

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

Margin = Limit – Corrected Amplitude

Test Results Summary

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

30 -1000 MHz:

2.2 dB at **213.886500 MHz** in the **Vertical** polarization

Above 1 GHz:

Low Channel**: 1.35 dB** at **2708.25 MHz** in the **Vertical** polarization
Middle Channel**: 0.78 dB** at **2747.25 MHz** in the **Vertical** polarization
High Channel**: 1.07 dB** at **1854.50 MHz** in the **Vertical** polarization

Test Data

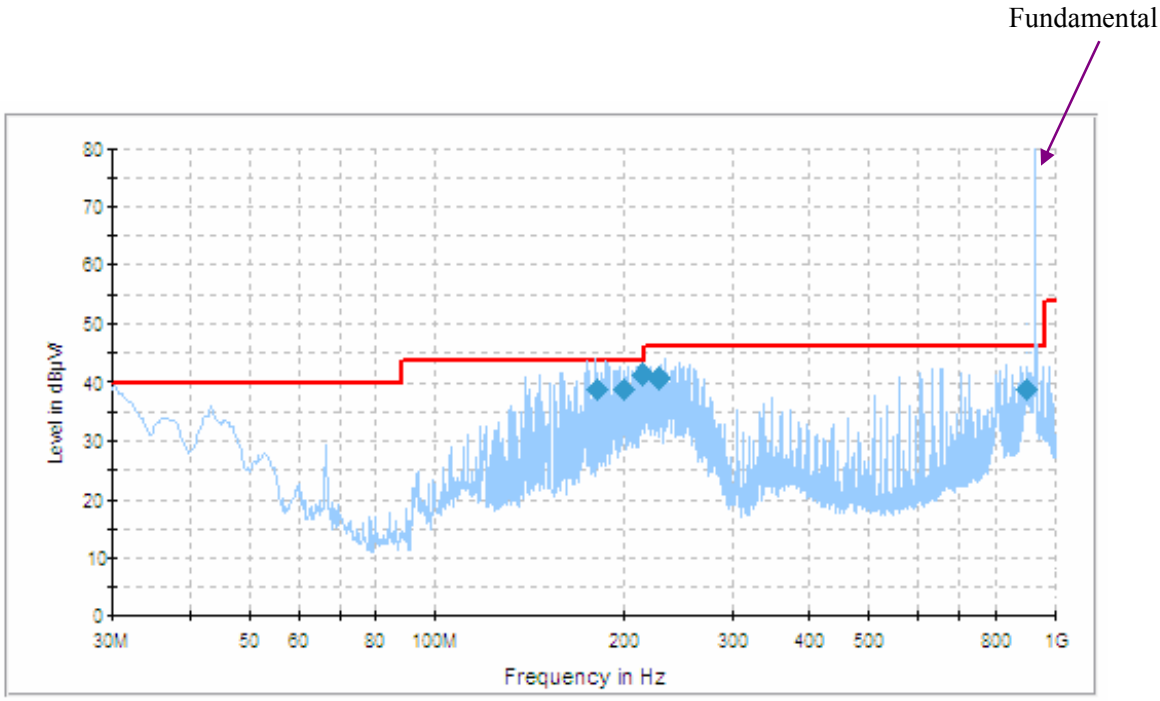
Environmental Conditions

Temperature:	24 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Vicent Kang on 2009-09-25.

30-1000 MHz:

Test Mode: Transmitting (worse case)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
213.886500	41.3	100.0	V	77.0	-14.5	43.5	2.2
181.426000	39.1	117.0	V	77.0	-16.0	43.5	4.4
200.665000	38.9	99.0	H	234.0	-14.8	43.5	4.6
227.313750	40.9	201.0	H	231.0	-14.2	46.0	5.1
896.759000	39.0	343.0	H	20.0	0.4	46.0	7.0

Above 1 GHz:

Indicated		Detector (PK/AV)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209		
Frequency (MHz)	Receiver Reading (dBμV/m)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (902.75 MHz)											
2708.25	47.66	AV	172	1.1	V	30.8	8.09	33.9	52.65	54	1.35*
1805.50	51.27	AV	162	1.2	H	28.3	5.99	34.2	51.36	54	2.64*
2708.25	45.32	AV	110	1.0	H	31.8	8.09	33.9	51.31	54	2.69*
2708.25	66.19	PK	172	1.1	V	30.8	8.09	33.9	71.18	74	2.82*
1805.50	70.04	PK	162	1.2	H	28.3	5.99	34.2	70.13	74	3.87*
1805.50	48.7	AV	180	1.0	V	28.8	5.99	34.2	49.29	54	4.71
3611.00	42.89	AV	150	1.3	H	33.5	5.77	33.7	48.46	54	5.54
2708.25	62.43	PK	110	1.0	H	31.8	8.09	33.9	68.42	74	5.58
1805.50	67.01	PK	180	1.0	V	28.8	5.99	34.2	67.60	74	6.40
3611.00	43.13	AV	158	1.0	V	32.2	5.77	33.7	47.40	54	6.60
3611.00	56.31	PK	150	1.3	H	33.5	5.77	33.7	61.88	74	12.12
3611.00	57.10	PK	158	1.0	V	32.2	5.77	33.7	61.37	74	12.63
1535.72	34.26	AV	215	1.0	V	27.8	5.6	34.4	33.26	54	20.74
1732.19	32.57	AV	215	1.0	H	28.1	5.91	34.2	32.38	54	21.62
1535.72	47.16	PK	215	1.0	V	27.8	5.6	34.4	46.16	74	27.84
1732.19	46.25	PK	215	1.0	H	28.1	5.91	34.2	46.06	74	27.94
Middle Channel (915.75 MHz)											
2747.25	48.23	AV	360	1.5	V	30.8	8.09	33.9	53.22	54	0.78*
2747.25	67.77	PK	360	1.5	V	30.8	8.09	33.9	72.76	74	1.24*
2747.25	45.28	AV	190	1.5	H	31.8	8.09	33.9	51.27	54	2.73*
1831.50	50.41	AV	100	1.6	V	28.8	5.99	34.2	51.00	54	3.00*
1831..50	69.86	PK	100	1.6	V	28.8	5.99	34.2	70.45	74	3.55*
1831.50	49.19	AV	220	1.0	H	28.3	5.99	34.2	49.28	54	4.72
1831.50	68.79	PK	220	1.0	H	28.3	5.99	34.2	68.88	74	5.12
2747.25	62.57	PK	190	1.5	H	31.8	8.09	33.9	68.56	74	5.44
3663.0	42.85	AV	40	1.3	V	32.2	5.77	33.7	47.12	54	6.88
3663.00	40.04	AV	170	1.2	H	33.5	5.77	33.7	45.61	54	8.39
3663.00	56.08	PK	40	1.3	V	32.2	5.77	33.7	60.35	74	13.65
3663.00	53.39	PK	170	1.2	H	33.5	5.77	33.7	58.96	74	15.04
1378.94	34.23	AV	35	1.1	H	28.1	5.91	34.2	34.04	54	19.96
1378.94	34.63	AV	85	1.3	V	25.8	5.37	34.6	31.20	54	22.8
1378.94	48.12	PK	35	1.1	H	28.1	5.91	34.2	47.93	74	26.07
1378.94	47.02	PK	85	1.3	V	25.8	5.37	34.6	43.59	74	30.41

Indicated		Detector (PK/AV)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209		
Frequency (MHz)	Receiver Reading (dBμV/m)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
High Channel (927.25 MHz)											
1854.50	72.34	PK	222	1.0	V	28.8	5.99	34.2	72.93	74	1.07*
2781.75	46.72	AV	210	1.0	H	31.8	8.09	33.9	52.71	54	1.29*
2781.75	67.28	PK	210	1.0	V	30.8	8.09	33.9	72.27	74	1.73*
2781.75	47.08	AV	210	1.0	V	30.8	8.09	33.9	52.07	54	1.93*
1854.50	51.19	AV	222	1.0	V	28.8	5.99	34.2	51.78	54	2.22*
1854.50	50.96	AV	215	1.1	H	28.3	5.99	34.2	51.05	54	2.95*
1854.50	70.66	PK	215	1.1	H	28.3	5.99	34.2	70.75	74	3.25*
2781.75	63.64	PK	210	1.0	H	31.8	8.09	33.9	69.63	74	4.37
3709.00	39.89	AV	170	1.5	H	33.5	5.77	33.7	45.46	54	8.54
3709.00	41.09	AV	150	1.5	V	32.2	5.77	33.7	45.36	54	8.64
3709.00	54.18	PK	150	1.5	V	32.2	5.77	33.7	58.45	74	15.55
3709.00	52.50	PK	170	1.5	H	33.5	5.77	33.7	58.07	74	15.93
1144.69	34.75	AV	360	1.6	V	25.1	4.85	35.0	29.70	54	24.30
1144.69	34.74	AV	60	1.3	H	25.1	4.78	35.0	29.62	54	24.38
1144.69	48.98	PK	60	1.3	H	25.1	4.78	35.0	43.86	74	30.14
1144.69	48.36	PK	360	1.6	V	25.1	4.85	35.0	43.31	74	30.69

** Within measurement uncertainty.*

FCC§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 20 dB bandwidth of the hopping channel, whichever is greater.

Test Equipment List and Details

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

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

Test Procedure

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

Test Data

Environmental Conditions

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

** The testing was performed by Vicent Kang on 2009-10-20.*

Test Result: Compliant.

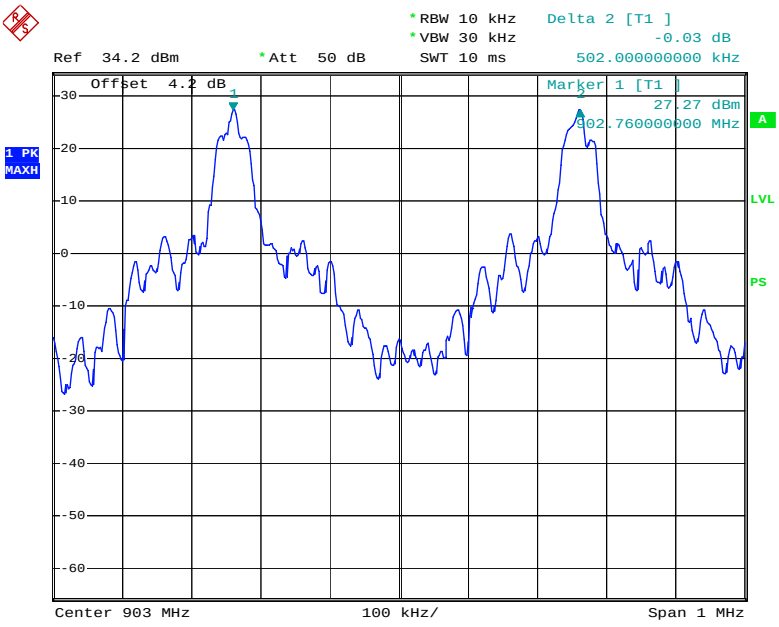
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Channel Separation (kHz)	Limit (> 20 dB Bandwidth) (kHz)	Result
Low Channel	502	81.9	Pass
Adjacent Channel			
Mid Channel	500	85.5	Pass
Adjacent Channel			
High Channel	500	84.6	Pass
Adjacent Channel			

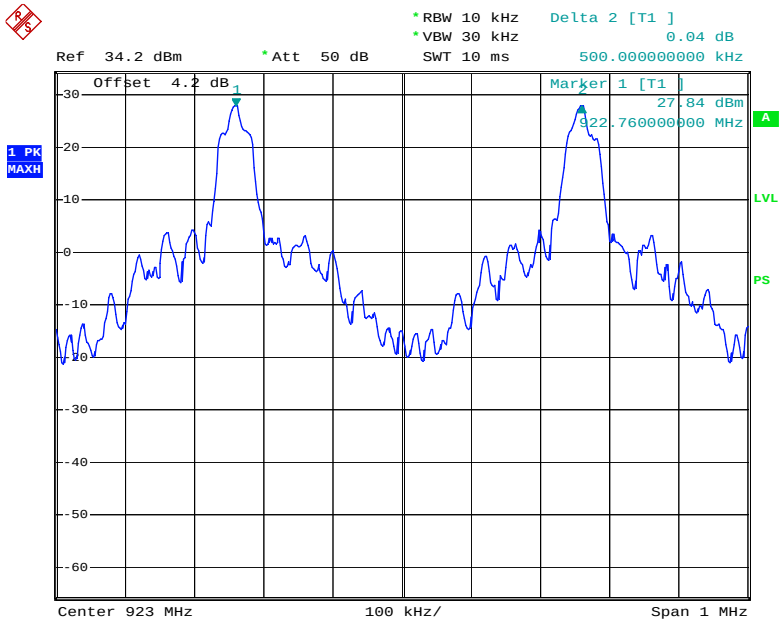
Please refer to the following plots.

Low Channel



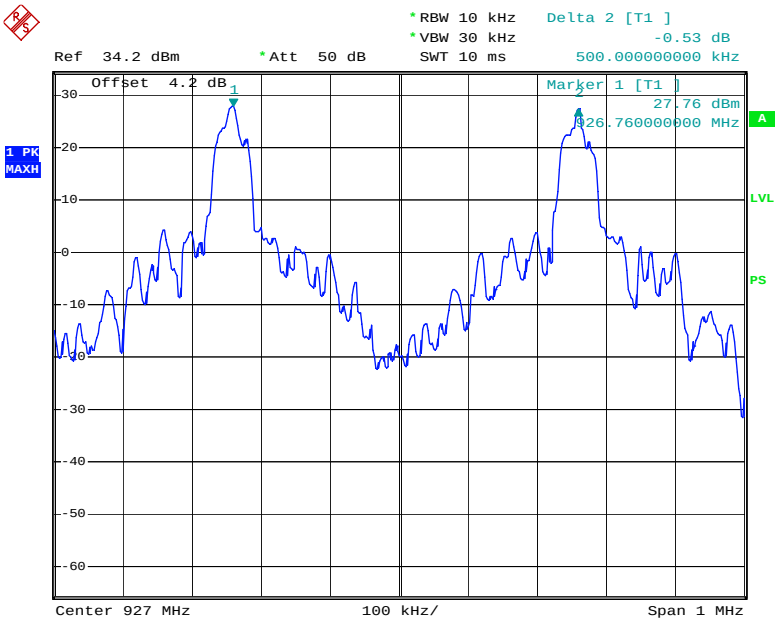
Date: 20.OCT.2009 09:29:52

Middle Channel



Date: 20.OCT.2009 09:27:51

High Channel



Date: 20.OCT.2009 09:25:19

FCC §15.247(a)(1)(i) – 20 dB BANDWIDTH TESTING

Applicable Standard

For frequency hopping systems operating in the 902 – 928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second Period.

Test Equipment List and Details

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

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

Test Procedure

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

Test Data

Environmental Conditions

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

** The testing was performed by Vicent Kang on 2009-10-20.*

Test Result: Compliant.

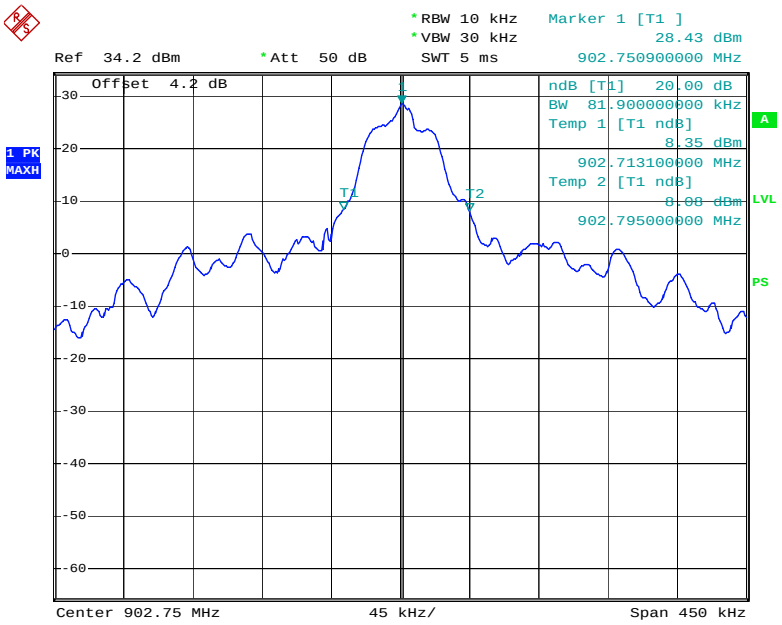
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	902.75	81.9
Middle	915.75	85.5
High	927.25	84.6

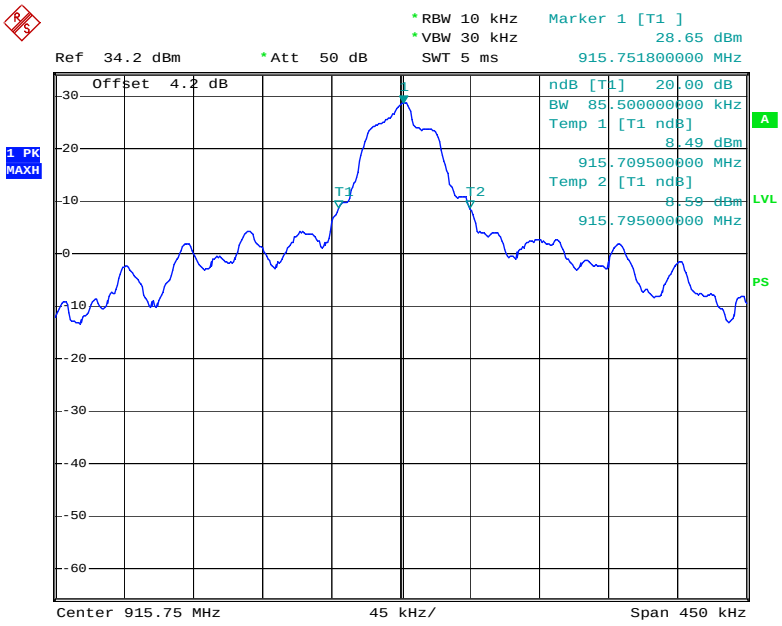
Please refer to the following plots.

Low Channel



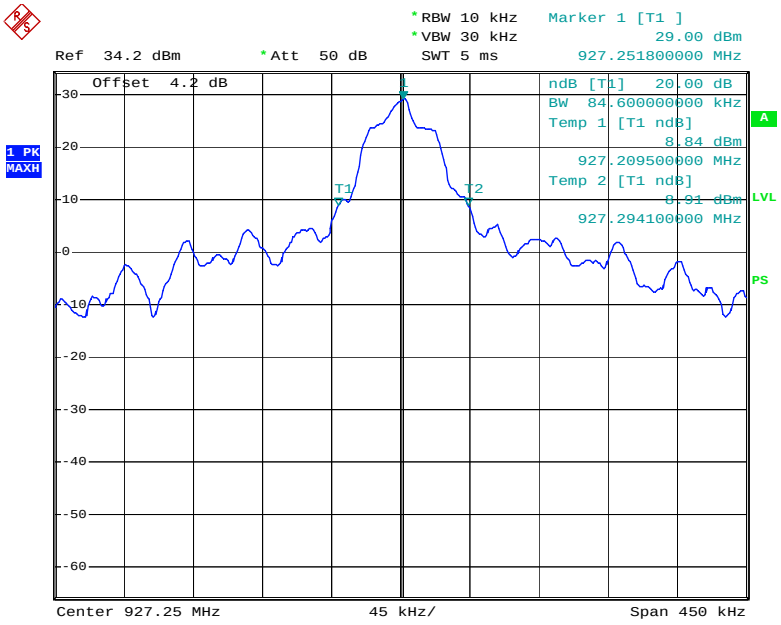
Date: 20.OCT.2009 14:40:33

Middle Channel



Date: 20.OCT.2009 14:41:33

High Channel



Date: 20.OCT.2009 14:42:10

FCC§15.247(a)(1)(i)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

For frequency hopping systems operating in the 902 – 928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second Period.

Test Equipment List and Details

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

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

Test Procedure

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

Test Data

Environmental Conditions

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

The testing was performed by Vicent Kang on 2009-10-19.

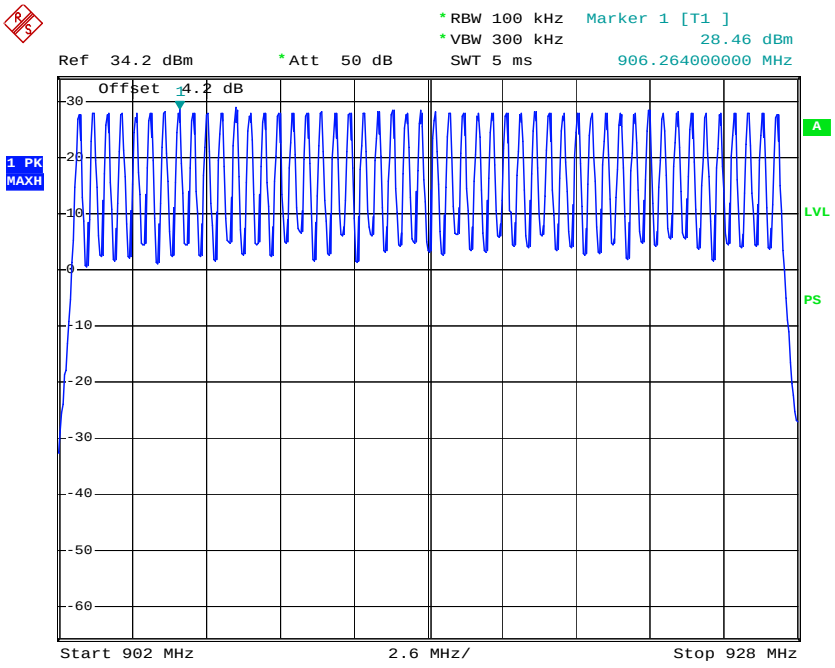
Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting

Frequency Range (MHz)	Number of Hopping Channel	Limit
902-928	50	≥ 50

Number of Hopping Channels



Date: 19.OCT.2009 10:01:04

FCC §15.247(a)(1)(i) -TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

For frequency hopping systems operating in the 902 – 928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second Period.

Test Equipment List and Details

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

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

Test Procedure

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

Test Data

Environmental Conditions

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

** The testing was performed by Vicent Kang on 2009-10-20.*

Test Result: Compliant.

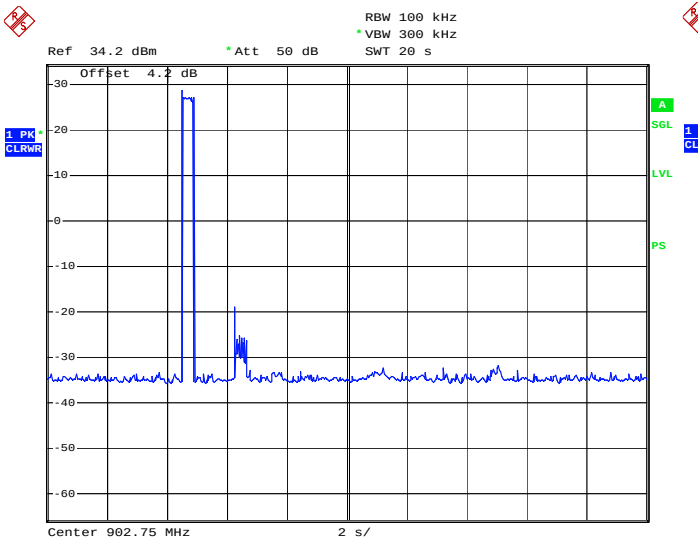
Please refer to following tables and plots

Test Mode: Transmitting

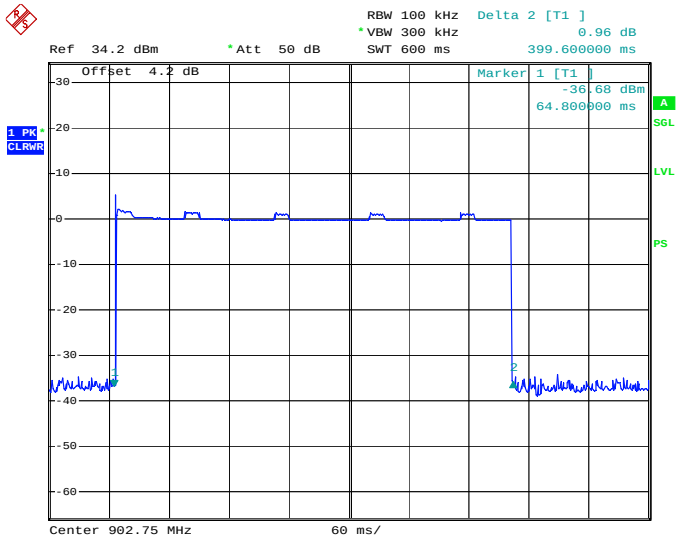
Channel	Pulse Width (ms)	Pulse Quantity Per 20 Sec.	Dwell Time (Sec)	Limit (Sec.)
Low	399.6	1	0.3996	0.4
Middle	399.6	1	0.3996	0.4
High	399.6	1	0.3996	0.4

Please refer to the following plots.

Low Channel

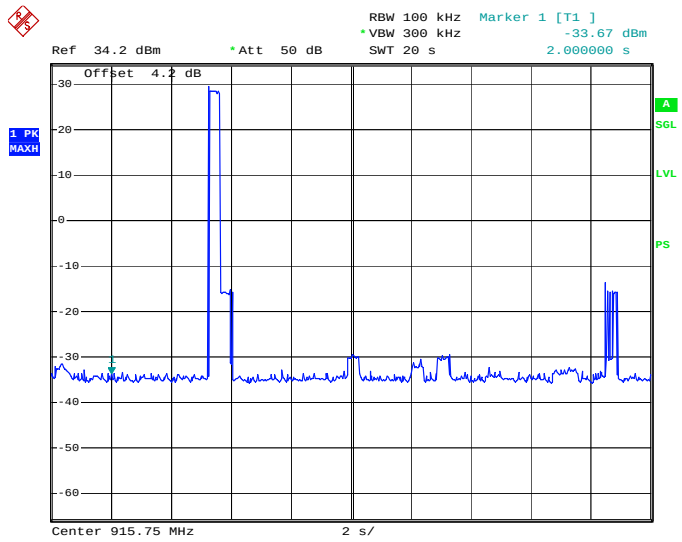


Date: 20.OCT.2009 09:48:47

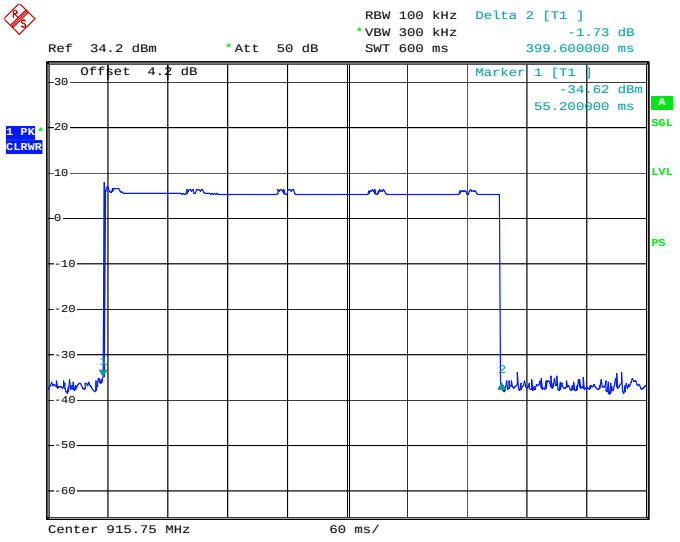


Date: 20.OCT.2009 09:17:28

Middle Channel

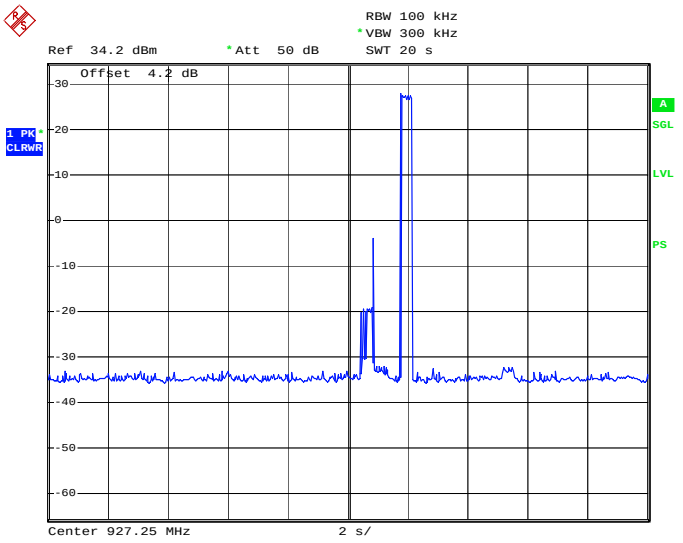


Date: 20.OCT.2009 10:19:14

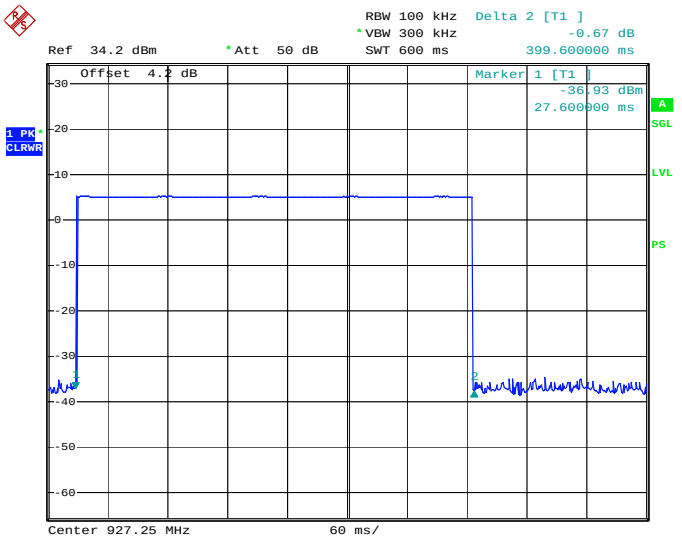


Date: 20.OCT.2009 09:26:43

High Channel



Date: 20.OCT.2009 09:51:03



Date: 20.OCT.2009 09:30:31

FCC §15.247(b)(2) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

For frequency hopping systems operating in the 902 – 928 MHz band: 1 watt for systems employing at least 50 hopping channels.

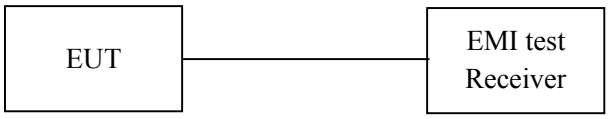
Test Equipment List and Details

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

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

Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI test receiver.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

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

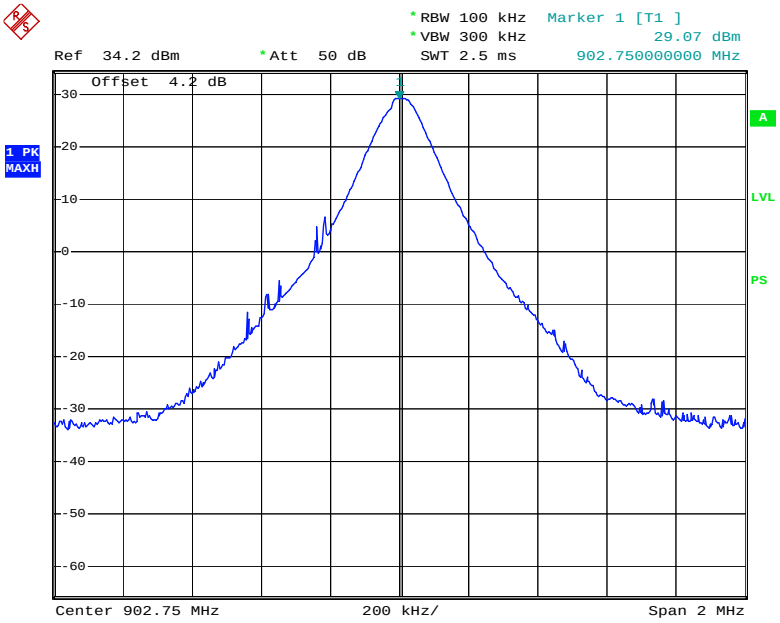
** The testing was performed by Vicent Kang on 2009-10-19.*

Test Result: Compliant.

Test Mode: Transmitting

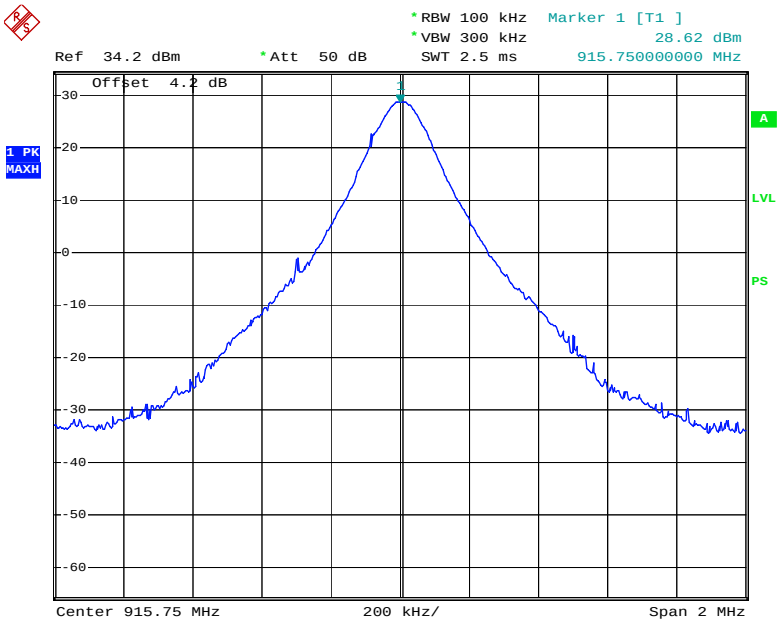
Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)
Low	902.75	29.07	30
Middle	915.75	28.62	30
High	927.25	28.38	30

Low Channel



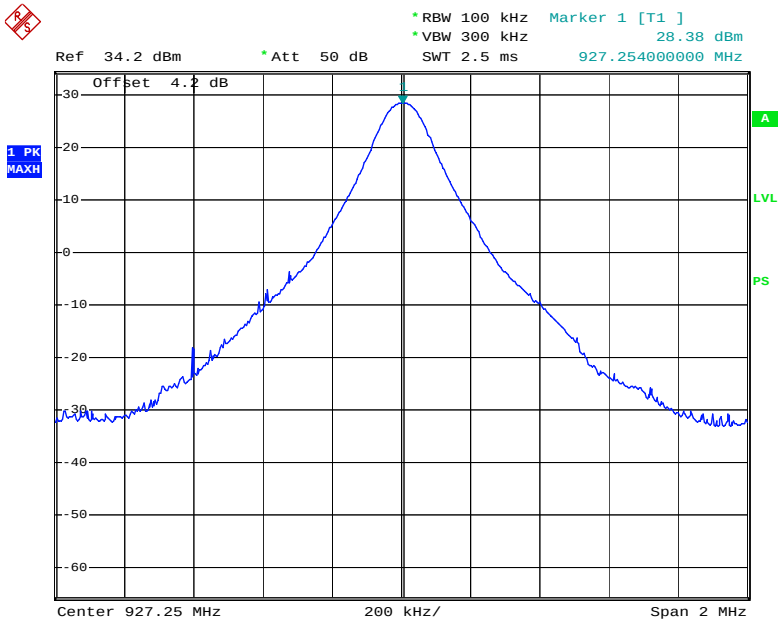
Date: 19.OCT.2009 10:05:55

Middle Channel



Date: 19.OCT.2009 10:06:43

High Chanel



Date: 19.OCT.2009 10:11:27

FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

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

Test Equipment List and Details

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

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

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

**The testing was performed by Vicent Kang on 2009-10-19.*

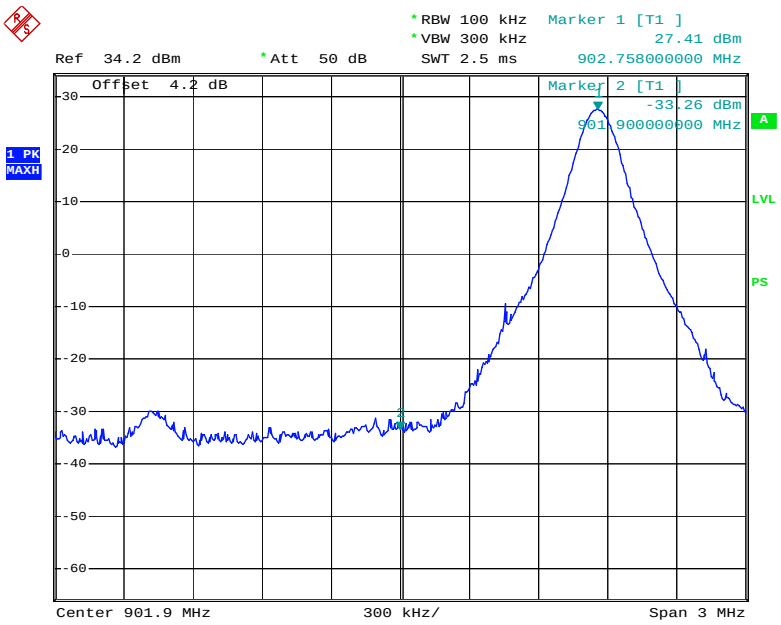
Test Result: Compliant

Test Mode: Transmitting

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
901.900	60.67	20
928.100	59.88	20

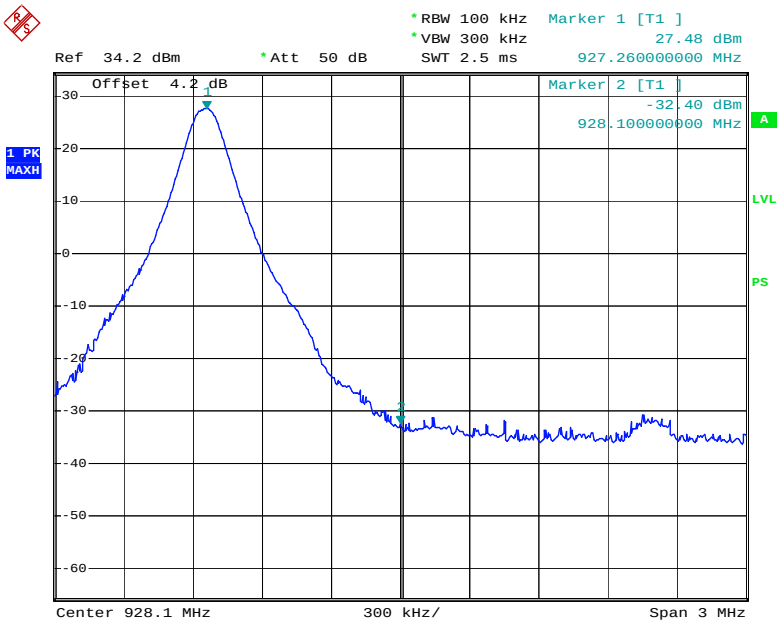
Please refer to follow plots:

Band Edge: Left Side



Date: 19.OCT.2009 10:22:26

Band Edge: Right Side



Date: 19.OCT.2009 10:24:53

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