NVLAP LAB CODE 200707-0

FCC PART 15D

MEASUREMENT AND TEST REPORT

For

Shenzhen Guo Wei Electronics （H.K.） Co. Ltd.

Unit 20-21, 12/F, Goldfield Industrial Centre,

1 Sui Wo Road, Fo Tan, Shatin, Hong Kong

FCC ID: WSWDECT49B94TAMHS

Report Type:	**Product Type:**
Original Report	Digital Cordless Telephone with Answering Machine

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Report Number:	RSZ08101402
Report Date:	2008-11-20
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Shenzhen).This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*"

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Shenzhen Guo Wei Electronics (H.K.) Co. Ltd.'s* product, model number: *Studio o*r the "EUT" as referred to in this report is a handset of *Digital Cordless Telephone with Answering Machine,* which measures approximately: 15.2 cm L x 4.5 cm W x 2.7 cm H, input voltage: DC 2.4V battery.

** All measurement and test data in this report was gathered from production sample serial number: 0810035 (Assigned by BACL, Shenzhen). The EUT was received on 2008-10-14.*

Objective

This document is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.17 - 2006, and ANSI C64.3 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart D, and section 15.203, 15.315, 15.317, 15.319 and 15.323 rules.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All measurements contained in this report were conducted with ANSI C63.17 - 2006, 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 radiated and conducted emissions measurement was performed at 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).

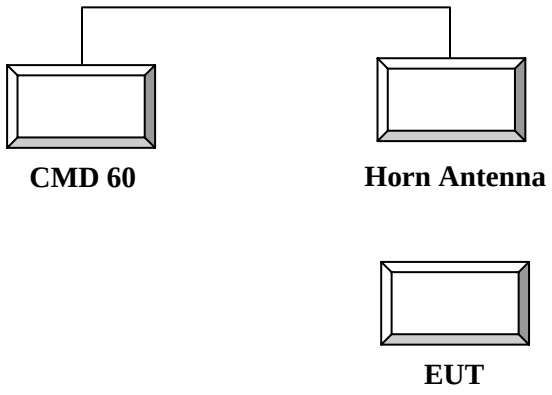
Equipment Modifications

No modification was made to the unit tested.

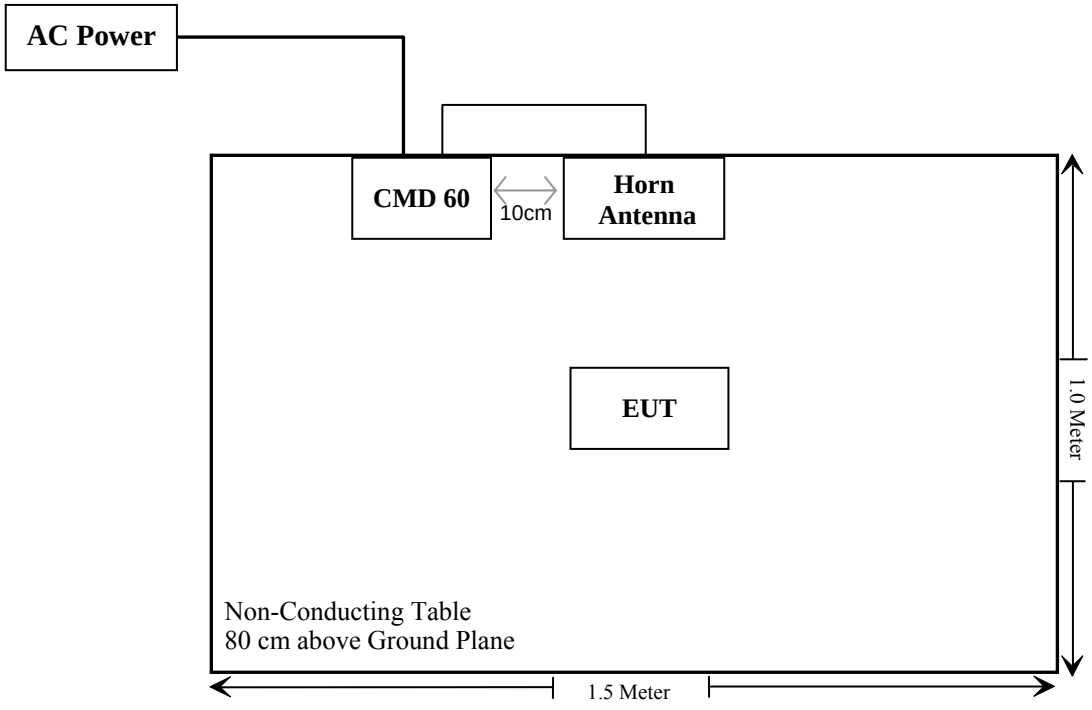
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
R & S	Digital Radio-Communication Tester	CMD60	8299061026	DoC

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 15.319 (i); §2.1093	RF Radiation Exposure (SAR)	Compliant*
§ 15.317 § 15.203	Antenna Requirement	Compliant
§ 15.319 (e)	Antenna Gain	Compliant
§ 15.315 § 15.207	Conducted Emission	N/A **
§ 15.323 (a)	Emission Bandwidth	Compliant
§ 15.319 (c)	Peak Transmit Power	Compliant
§ 15.319 (d)	Power Spectral Density	Compliant
§ 15.323 (d)	Emission Inside and Outside the sub-band	Compliant
§ 15.319 (g)	Radiated Emission	Compliant
§ 15.323 (f)	Frequency Stability Handset	Compliant
§ 15.323 (c)(e) § 15.319 (f)	Specific Requirements for UPCS	Compliant

Note: * Please refer to SAR report (R0810135-SAR)
** Battery operation.

§15. 319 (i) & §2.1093 - RF EXPOSURE

Standard Applicable

According to FCC Part15.319 (i), Unlicensed PCS devices are subject to the radiofrequency radiation exposure requirements specified in§1.1307(b) and 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Result: Please refer to SAR test report. (Report No.: R0810135-SAR)

§15.317&§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 an integral antenna on PCB. The maximum gain is 3 dBi. Please refer to the internal photos.

Result: Compliant.

Please refer to the EUT internal photos.

§15.319 (e) - ANTENNA GAIN

Standard Applicable

According to CFR 47 §15.319 (e):

The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

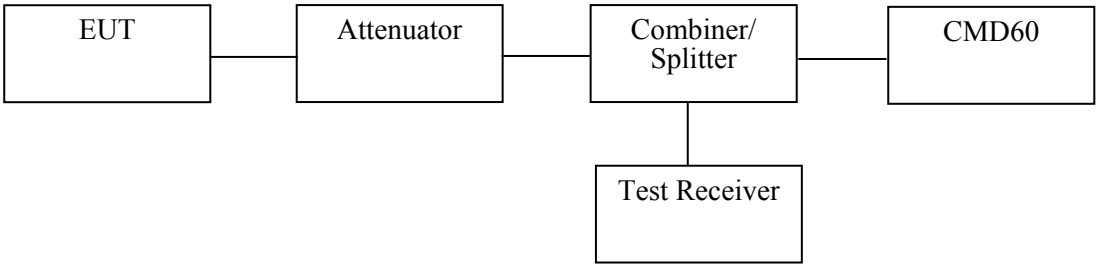
Result: The antenna gain is less than 3 dBi provided by manufacturer.

§15.323 (a) - EMISSION BANDWIDTH

Standard Applicable

The emission bandwidth is measured in accordance with ANSI C63.17 sub-clause 6.1.3 using the setup below

Test Setup 1:



The width, in Hz, of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that is 26 dB down relative to the maximum level of the modulated carrier. It is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1% of the emission band-width of the device under measurement. [Extraction from 47 CFR 15, subpart D, 15.303 (C)].

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2008-08-25	2009-08-25

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

Test Procedure

Using the manufacturer's information on occupied bandwidth set the spectrum analyzer as follows:

Resolution bandwidth	1.0% of the emission bandwidth (as close as possible)
Video bandwidth	>3 times the resolution bandwidth
Number of sweeps	sufficient to stability the trace
Detection mode	peak detection with maximum hold

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.8 kPa

The testing was performed by Bruce Zhang on 2008-11-05.

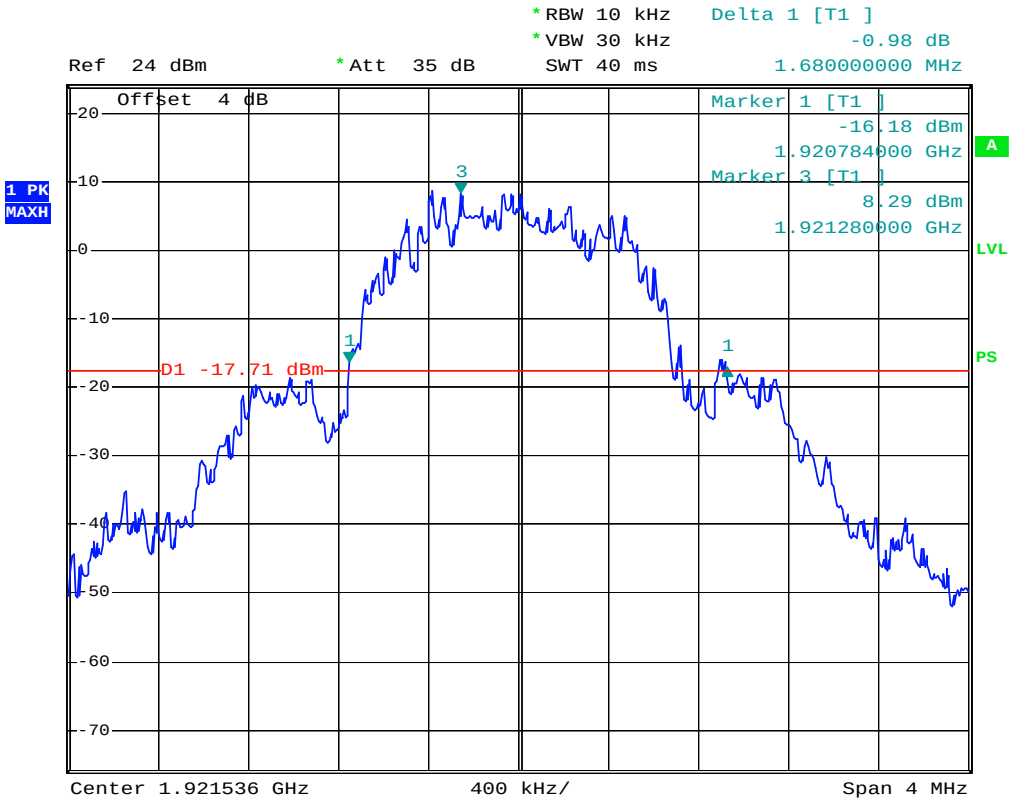
Test Mode: Transmitting

Channel	Center Frequency (MHz)	26 dB Bandwidth (MHz)	Limit
Low	1921.536	1.68	50kHz < OBW <2.5MHz
Middle	1924.992	1.68	50kHz < OBW <2.5MHz
High	1928.448	1.68	50kHz < OBW <2.5MHz

Test Result: Compliance.

Refer to the following plots.

Low Channel

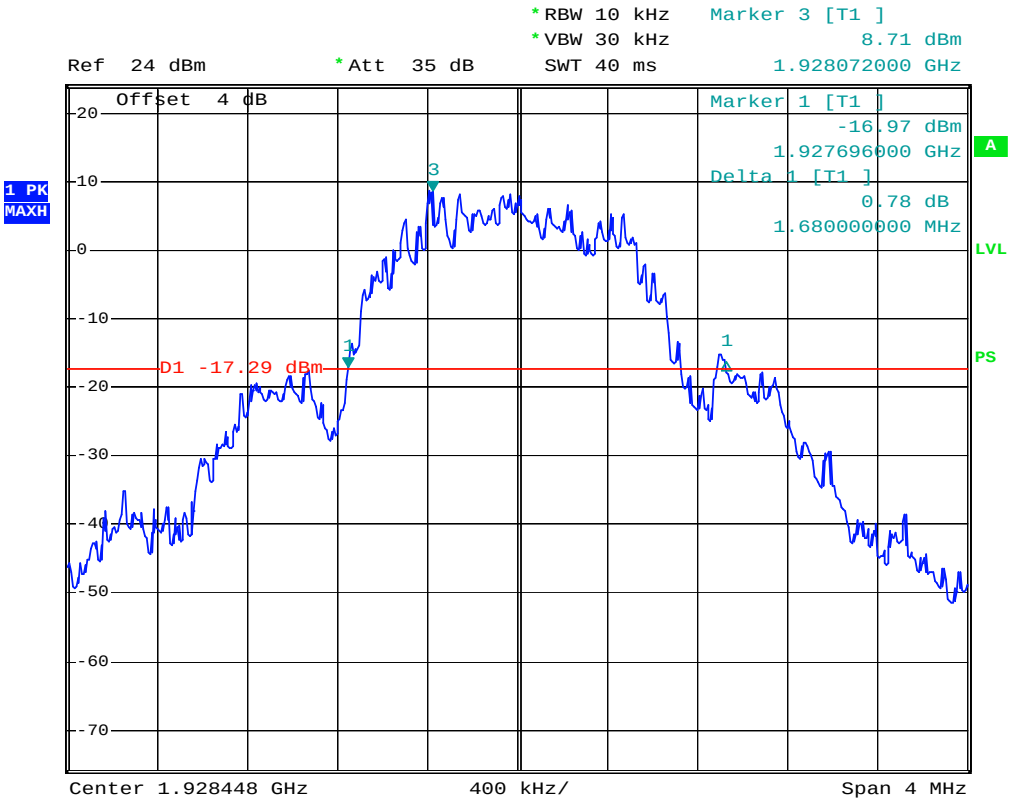


Date: 7.NOV.2008 18:00:35

Middle Channel

Date: 7.NOV.2008 17:43:32

High Channel



Date: 7.NOV.2008 17:48:08

§15.319 (c) - PEAK TRANSMIT POWER

Standard Applicable

The peak power output as measured over an interval of time equal to the transmission-burst duration of the device under all conditions of modulation. [47 CFR 15, subpart D, 15.303 (f)].

Part 15.323(a) & Part 15.319(c) Peak Transmit Power:
The limit for Peak Transmit Power (PTP) is calculated using the following formula:
PTP = 100 μ W x $(EBW)^{1/2}$
EBW is the transmit emission bandwidth in Hz determined in the other test item:
EBW = 1484000Hz
PTP = 100 μ W x $(1484000)^{1/2}$
PTP = 20.87dBm

The peak transmitter power is measured in accordance with ANSI C63.17-2006 Clause 6.1.2.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2008-08-25	2009-08-25

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

Test Procedure

Using the manufacturer's information on occupied bandwidth set the spectrum analyzer as follows:

RBW	≥ Emission bandwidth
Video bandwidth	≥ RBW
Span	Zero
Center frequency	Nominal center frequency of channels
Amplitude scale	Log (linear may be used if analyzer has sufficient linear dynamic range and accuracy)
Detection	Peak detection
Trigger	Video
Sweep rate	Sufficiently rapid to permit the transmit pulse to be resolved accurately

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.8 kPa

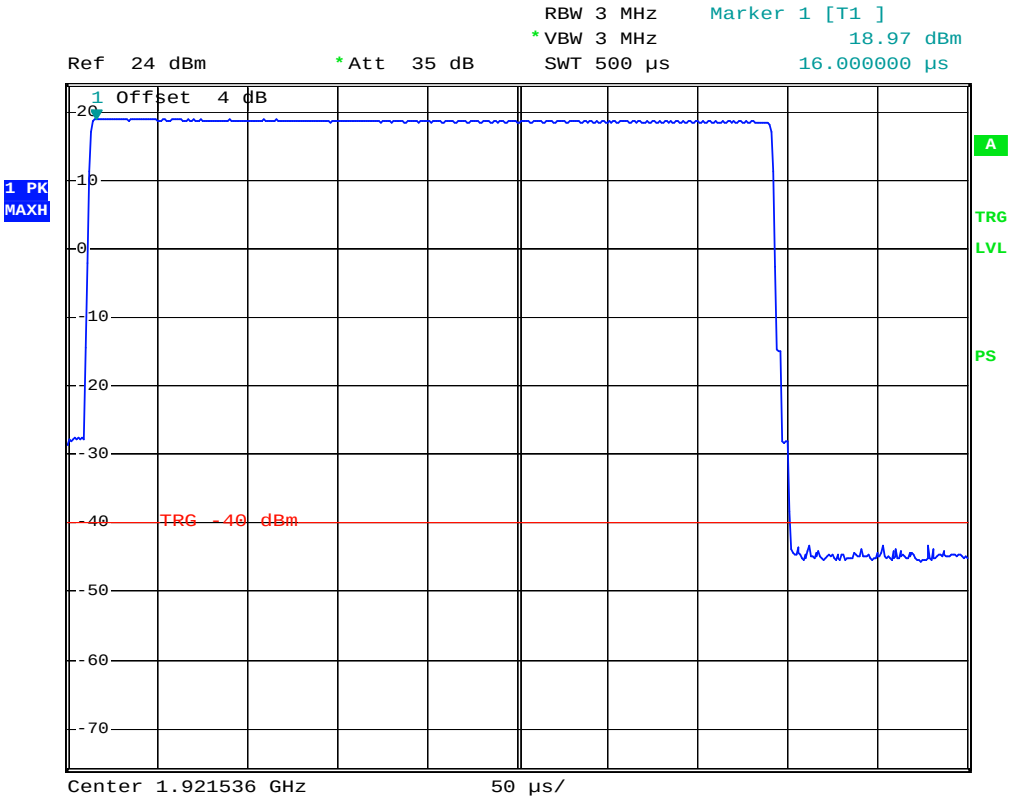
The testing was performed by Bruce Zhang on 2008-11-06.

Test Result: Compliance.

Refer to the following table and plots.

Frequency (MHz)	Peak Transmit Power (dBm)	Limit (dBm)
1921.536	18.97	21.13
1924.992	18.93	2113
1928.448	18.91	21.13

Low Channel



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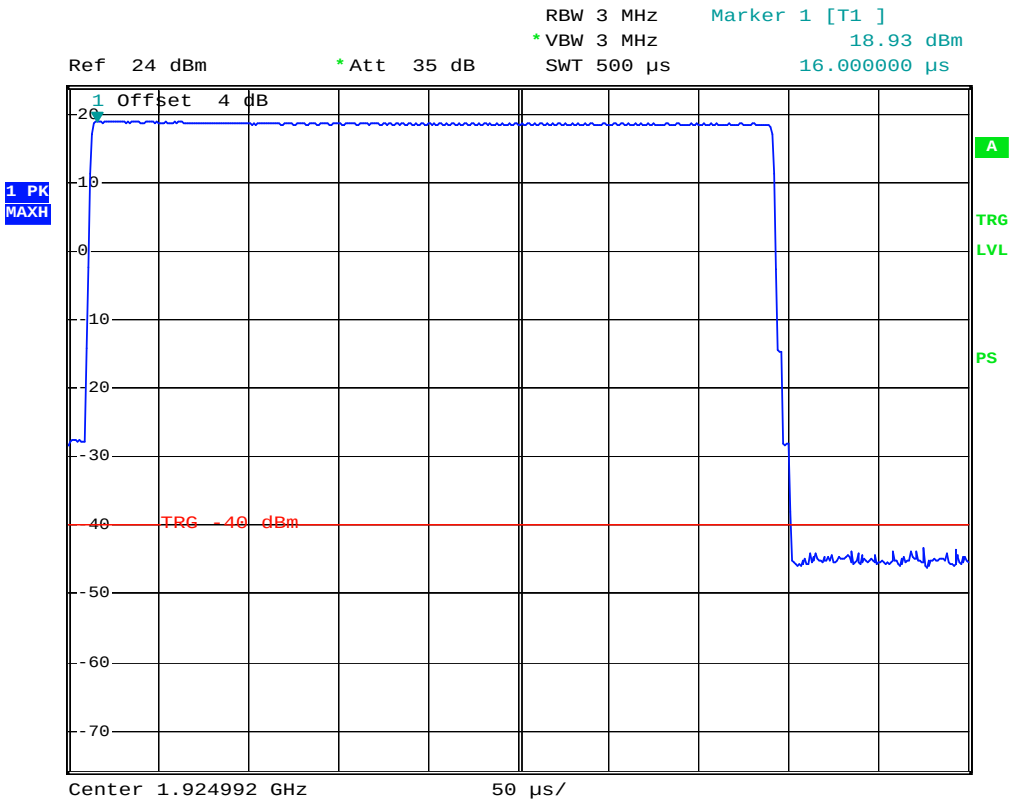
Middle Channel



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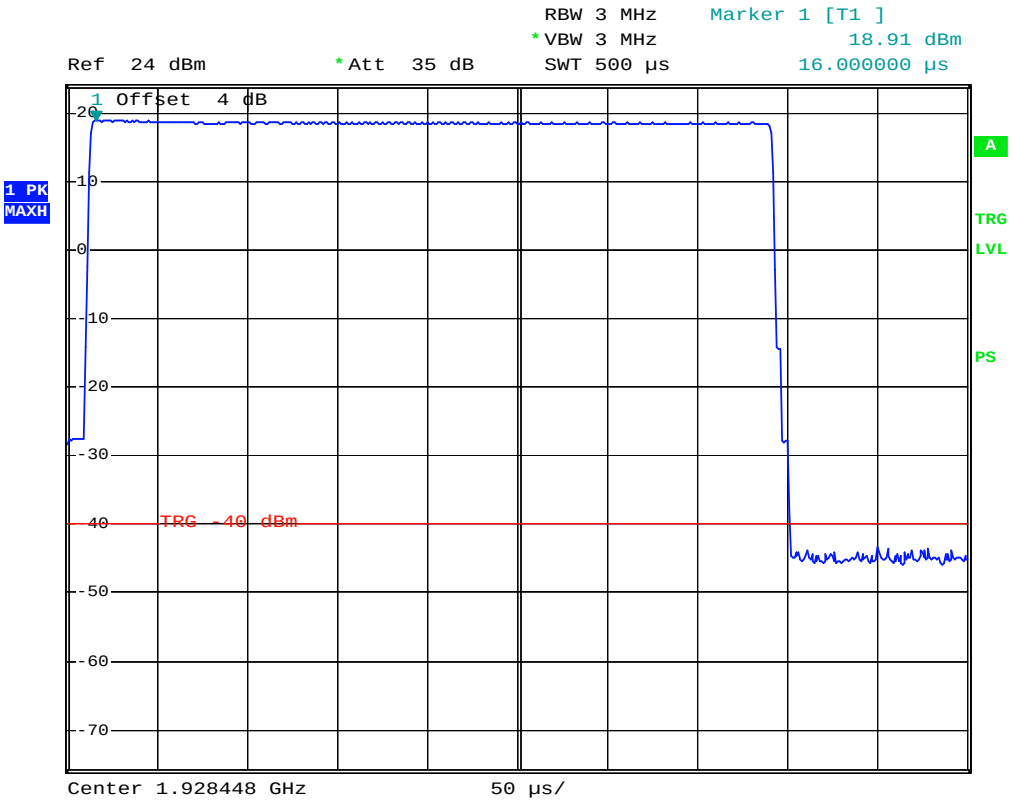
High Channel



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§15.319 (d) - POWER SPECTRAL DENSITY

Standard Applicable

The average pulse energy in a 3 kHz bandwidth is divided by the pulse duration.

The power spectral density shall not exceed 3mW in any 3 kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

The power spectral density is measured in accordance with ANSI C63.17.2006 Clause 6.1.5.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2008-08-25	2009-08-25

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

Test Procedure

Using the manufacturer's information on occupied bandwidth set the spectrum analyzer as follows:

RBW	3kHz
Video bandwidth	≥ 3 × RBW
Span	Zero span at frequency with the maximum level (frequency determined in 6.1.3 if the same type of signal (continuous versus burst) was used in 6.1.3)
Center frequency	Spectral peak as determined in 6.1.3
Sweep time	For burst signals, sufficient to include essentially all of the maximum length burst at the output of a 3 kHz filter (e.g., maximum input burst duration plus 600 µs). For continuous signals, 20 ms.
Amplitude scale	Log power
Detection	Sample detection and averaged for a minimum of 100 sweeps
Trigger	External or internal

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.8 kPa

The testing was performed by Bruce Zhang on 2008-11-26.

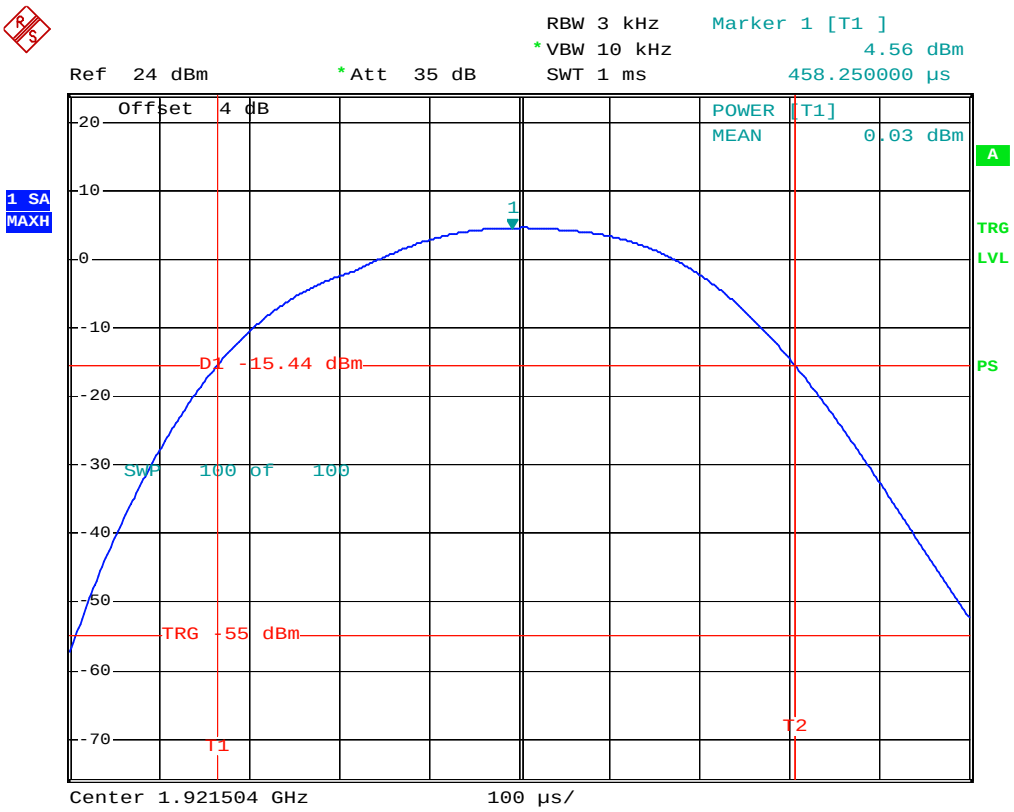
Test Mode: Transmitting

Test Result: Compliance.

Please refer to following tables and plots

Frequency (MHz)	Power Spectral Density		Limit (mW/3kHz)	Result
	(dBm/3kHz)	(mW/3kHz)		
1921.536	0.03	1.0	3	Pass
1924.992	-0.06	0.99	3	Pass
1928.448	-0.14	0.97	3	Pass

Low Channel



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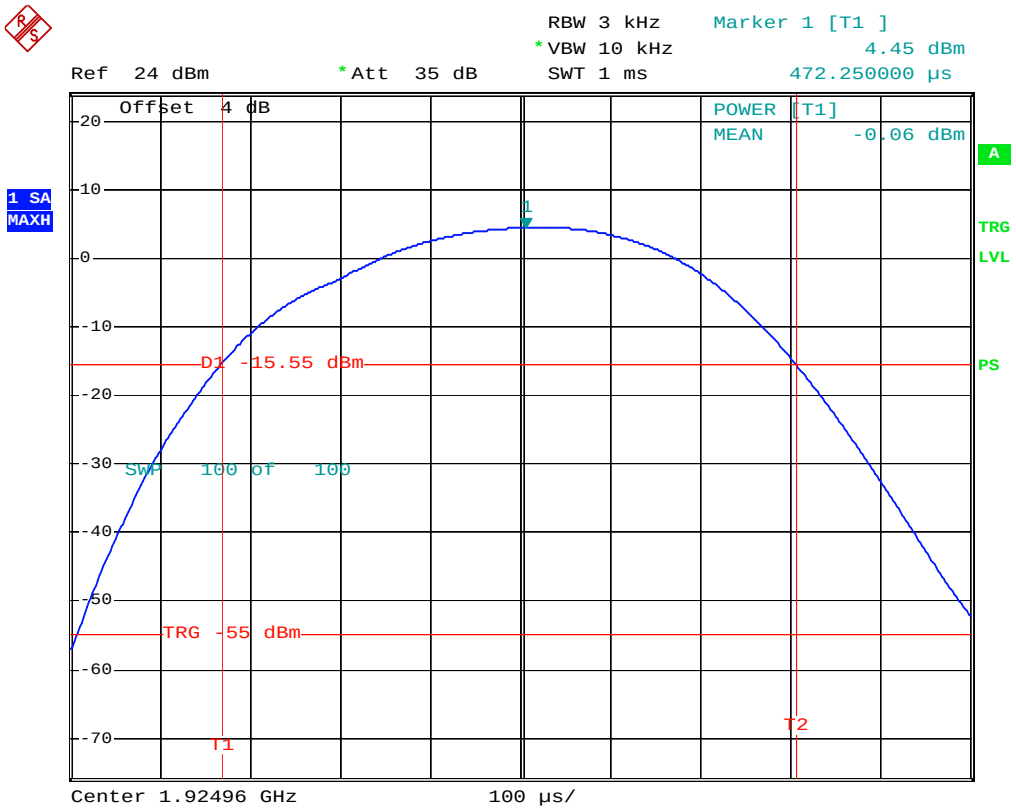
Middle Channel



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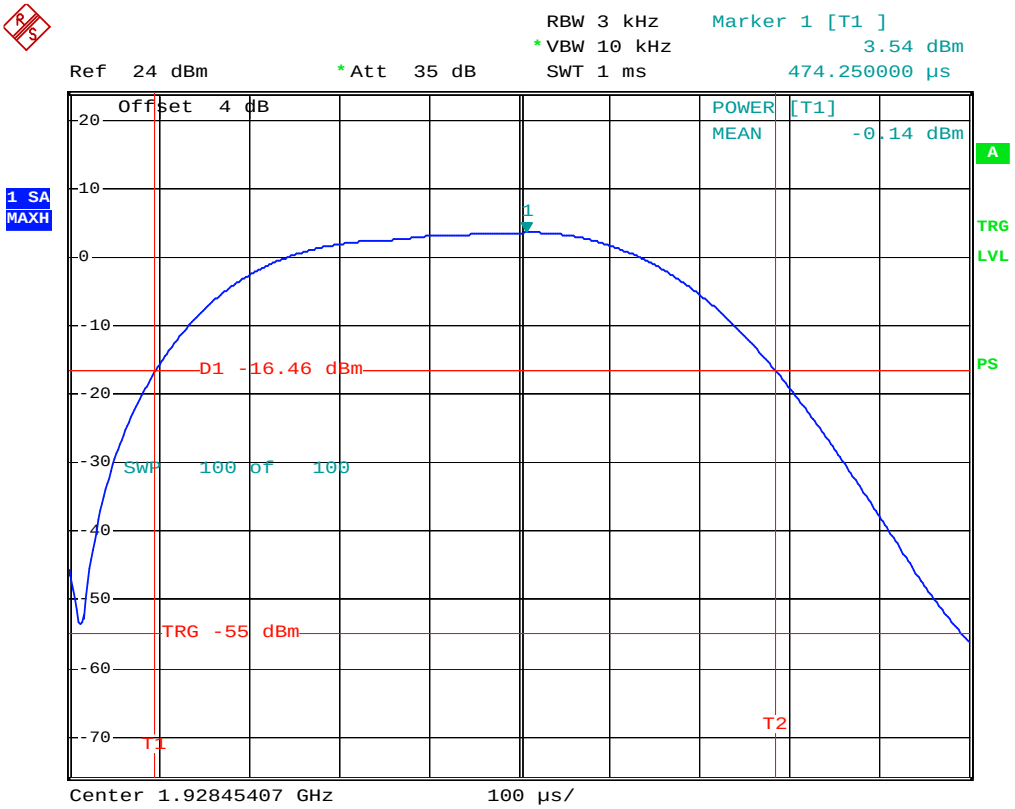
High Channel



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§15.323 (d) - EMISSION INSIDE AND OUTSIDE THE SUB-BAND

Standard Applicable

Emissions inside the sub-band must comply with the following emission mask:

1. In the bands between 1B and 2B measured from the center of the emission bandwidth the total power emitted by the device shall be at least 30 dB below the transmit power permitted for that device;
2. in the bands between 2B and 3B measured from the center of the emission bandwidth the total power emitted by an intentional radiator shall be at least 50 dB below the transmit power permitted for that radiator;
3. in the bands between 3B and the sub-band edge the total power emitted by an intentional radiator in the measurement bandwidth shall be at least 60 dB below the transmit power permitted for that radiator.

   Where B = emission bandwidth

Emission Outside the sub-band shall be attenuated below a reference power of 112 mw (20.5 dBm) as follows:

1. 30 dB between the sub-band and 1.25 MHz above or below the sub-band;
2. 50 dB between 1.25 and 2.5 MHz above or below the sub-band;
3. 60 dB at 2.5 MHz or greater above or below the sub-band.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2008-08-25	2009-08-25

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.8 kPa

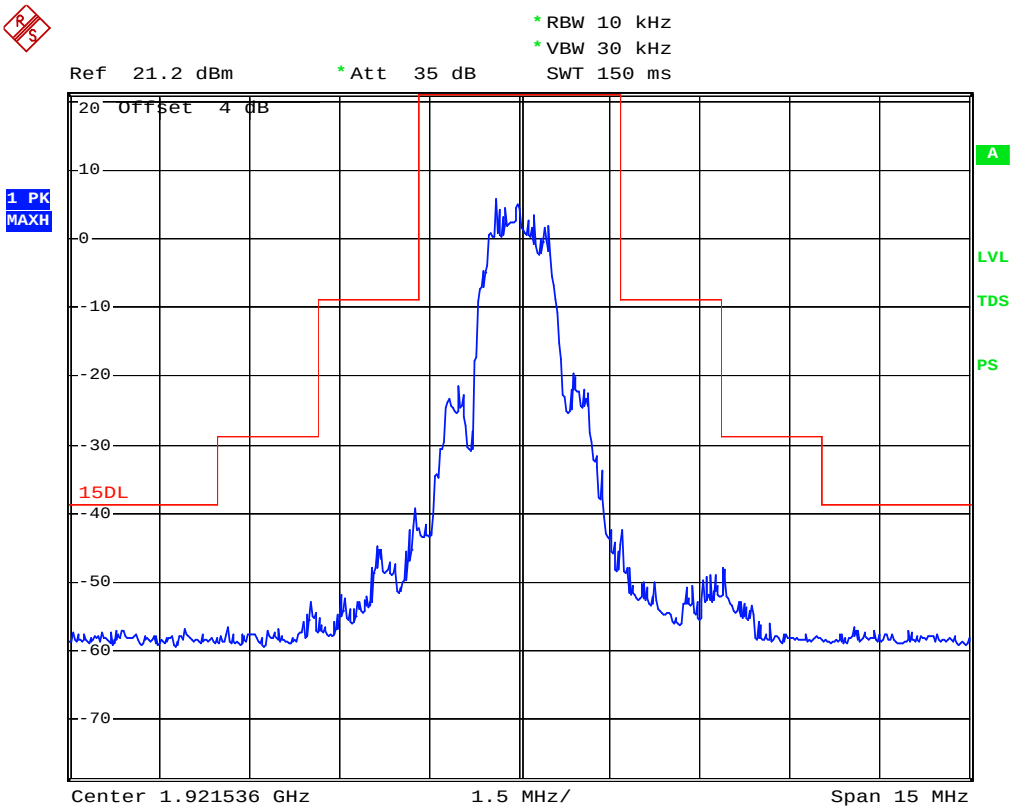
The testing was performed by Bruce Zhang on 2008-11-08.

Test Mode: Transmitting

Test Result: Compliance.

Please refer to following tables and plots

Low Channel (Unwanted Emission inside the Sub-band)



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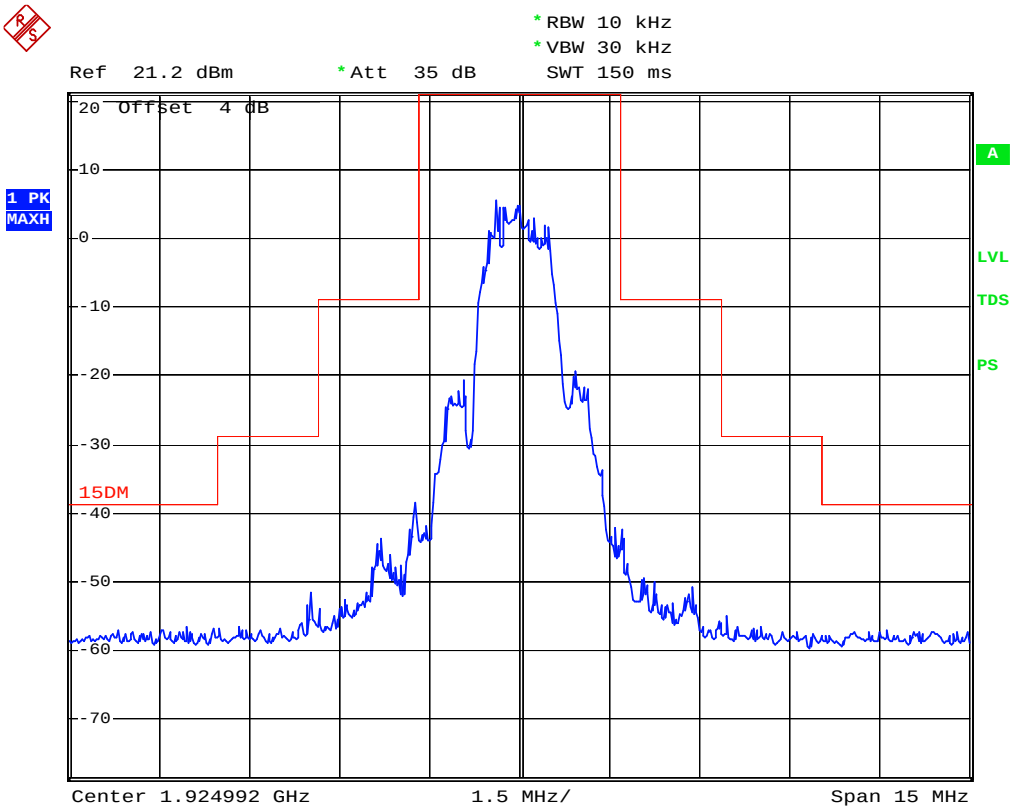
Middle Channel (Unwanted Emission inside the Sub-band)



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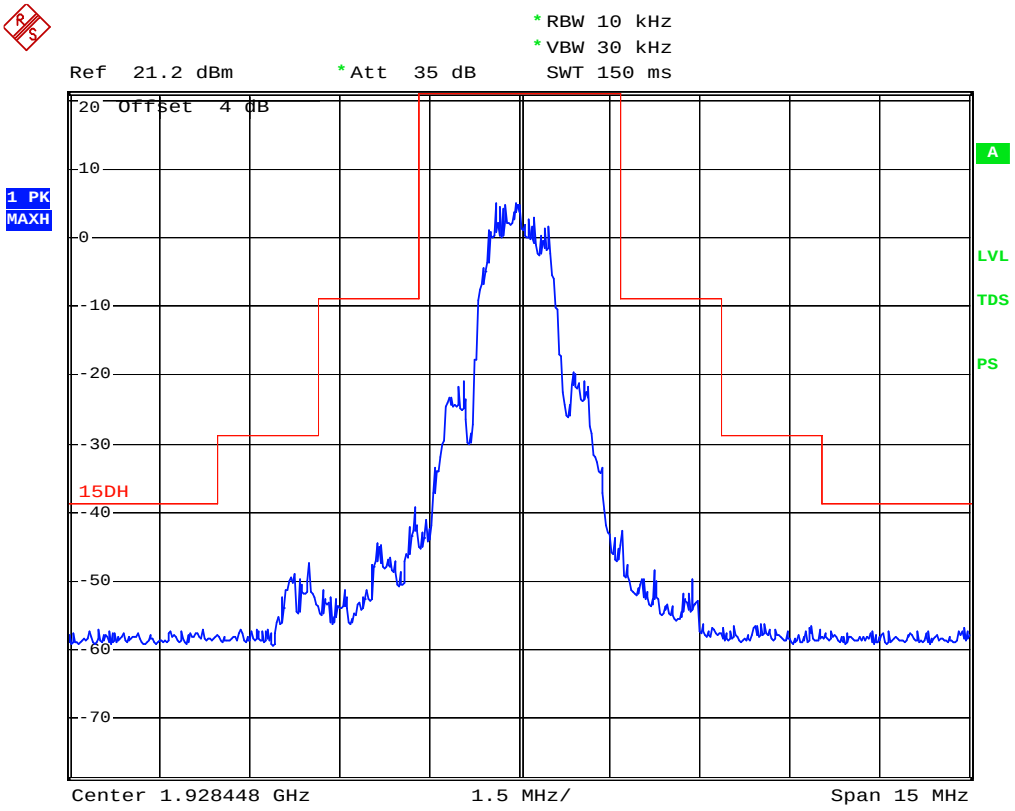
High Channel (Unwanted Emission inside the Sub-band)



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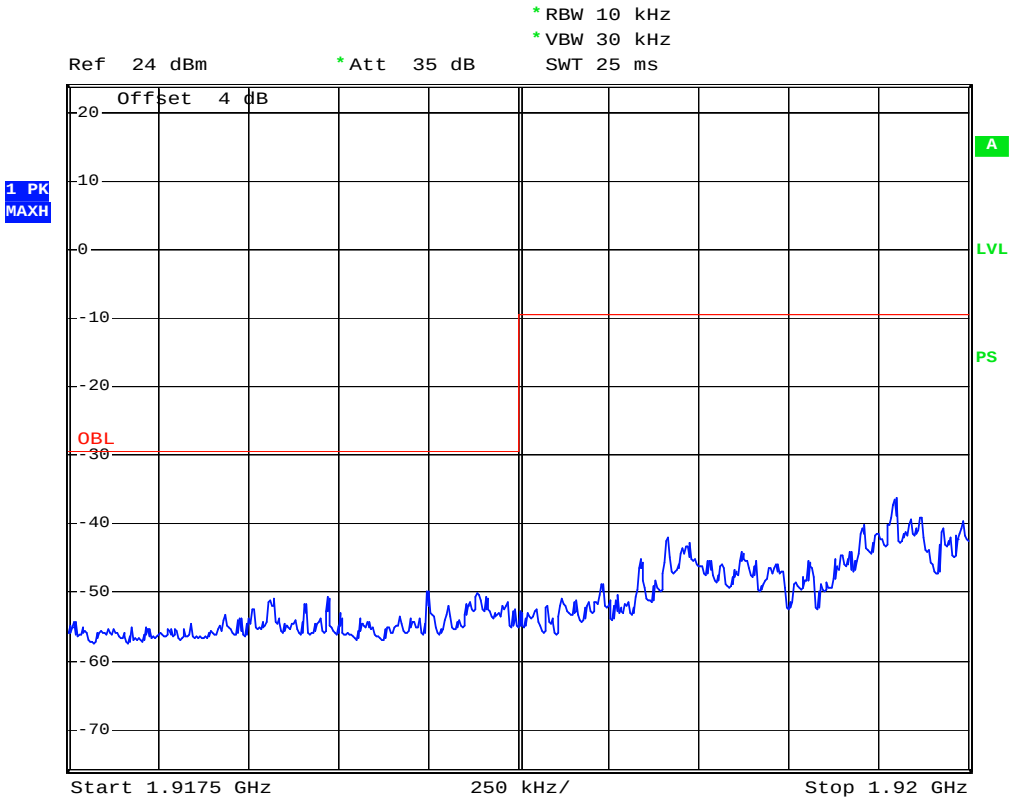
Low Channels (Unwanted Emission outside the Sub-band)



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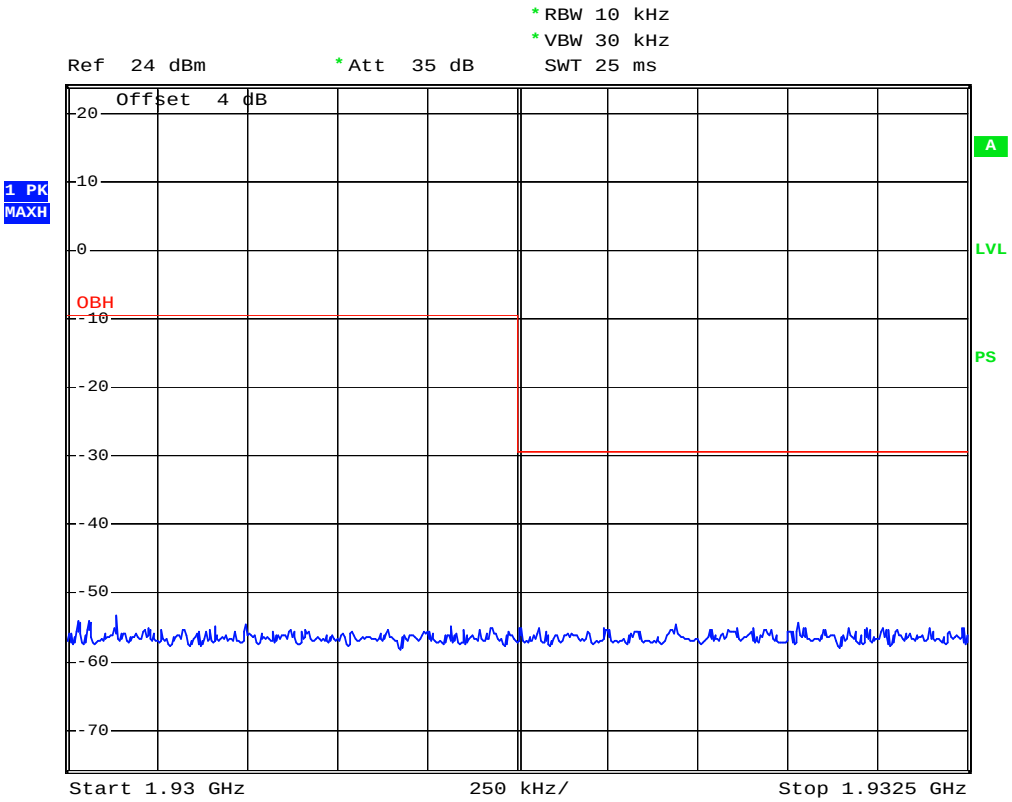
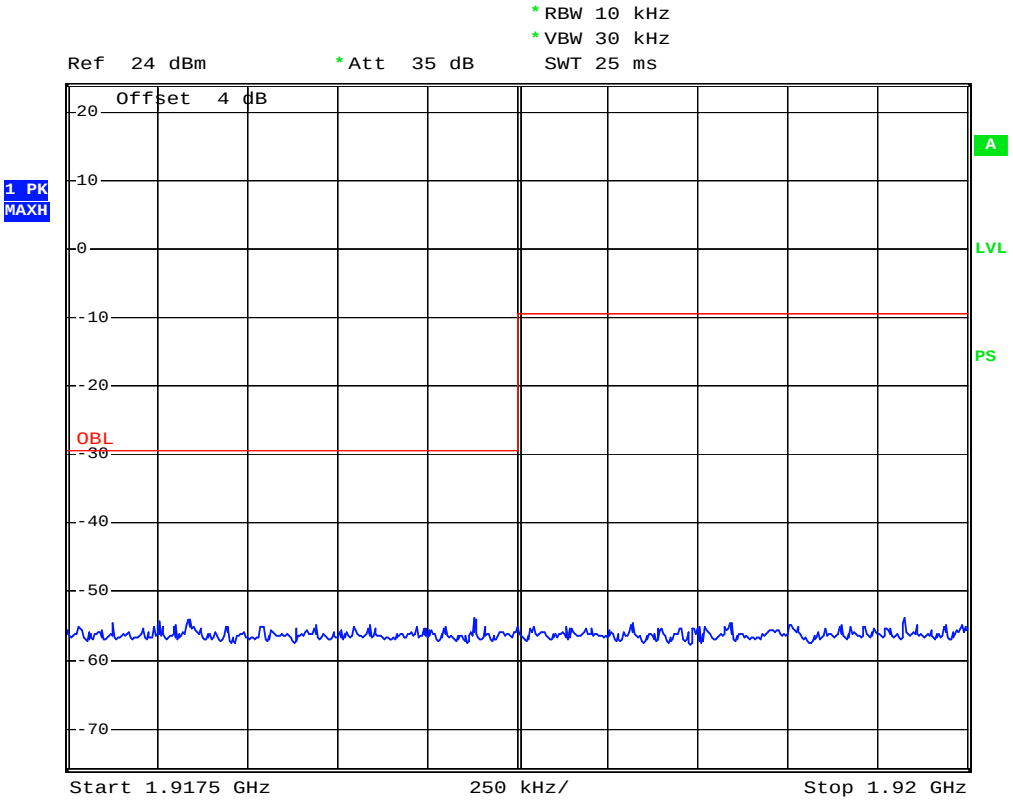


Date: 10.NOV.2008 11:21:12

High Channels (Unwanted Emission outside the Sub-band)



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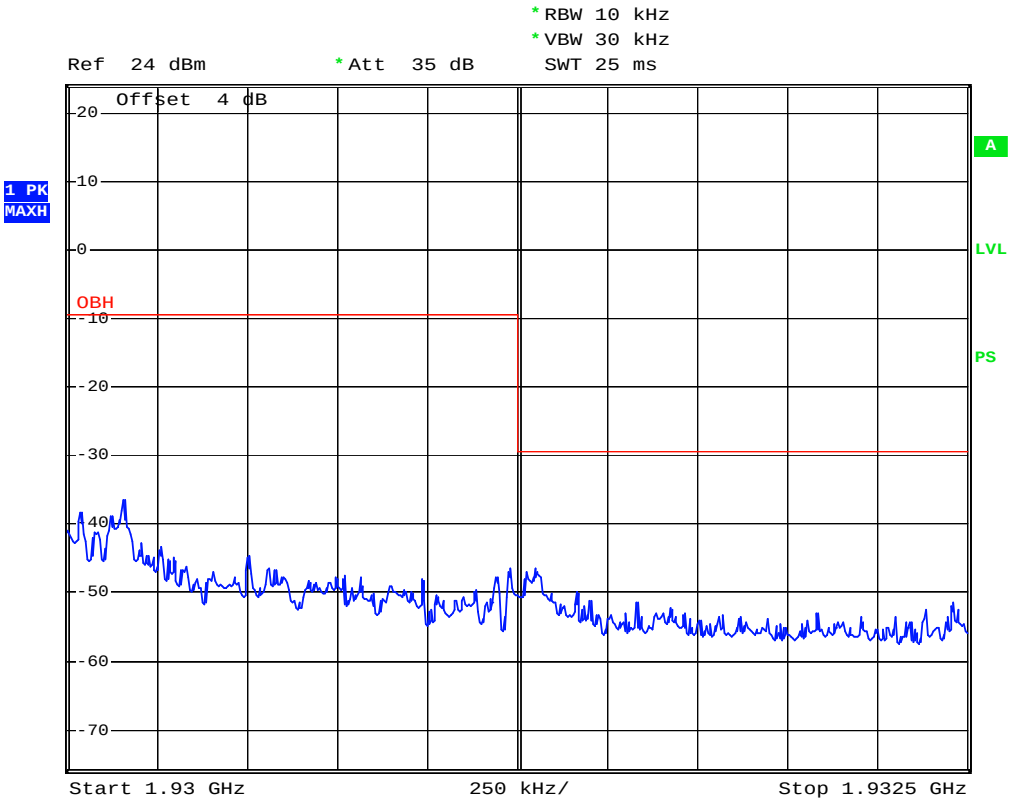


Date: 10.NOV.2008 11:20:10

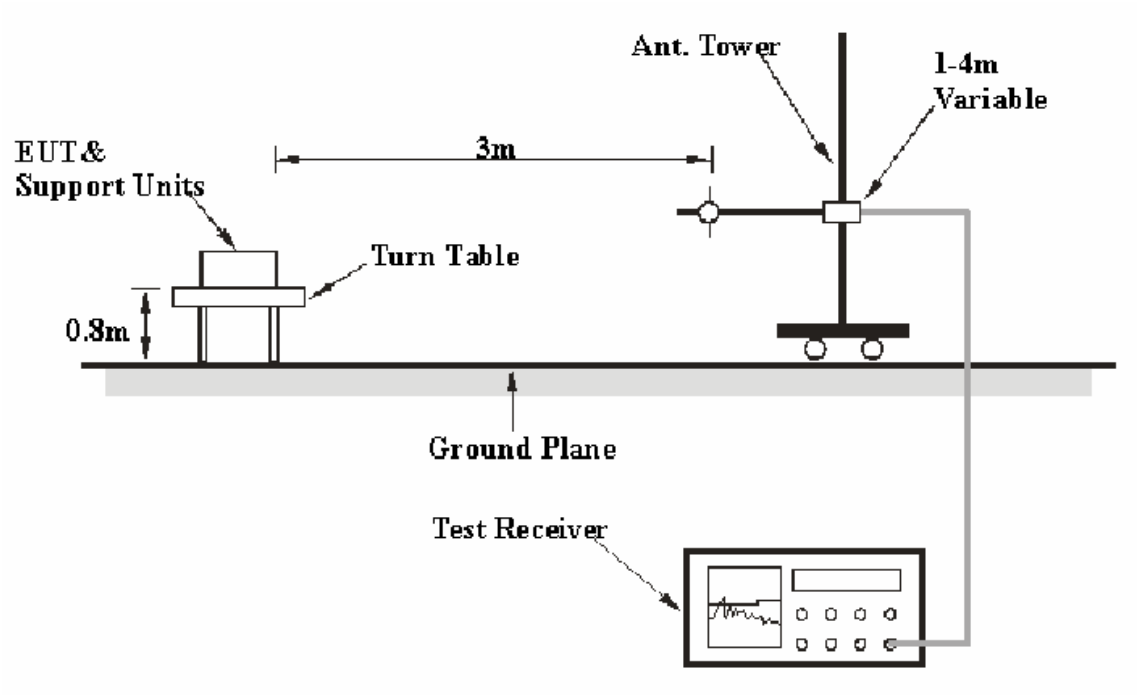
§15.319 (g) - RADIATED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, 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 C63.17 - 2006. The specification used was the FCC 15.209 and FCC 15.319(g) 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.

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
Above 1 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	2008-10-16	2009-10-16
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2008-03-11	2009-03-11
HP	Amplifier	8449B	3008A00277	2008-09-29	2009-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-05-09	2009-05-09

*** 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 30MHz-1GHz and peak and Average detection modes for frequencies above 1GHz.

Corrected Amplitude & Margin Calculation

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

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

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum 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 15.209 and 15.319 (g), with the worst margin reading of:

Transmitting mode (30 – 1000 MHz):

8.3 dB at **449.999800 MHz** in the **Vertical** polarization **(Low Channel)**
6.5 dB at **511.473550 MHz** in the **Vertical** polarization **(High Channel)**

Transmitting mode (Above 1 GHz):

13.76 dB at **3843.072 MHz** in the **Vertical** polarization **(Low Channel)**
12.95 dB at **3856.896 MHz** in the **Vertical** polarization **(High Channel)**

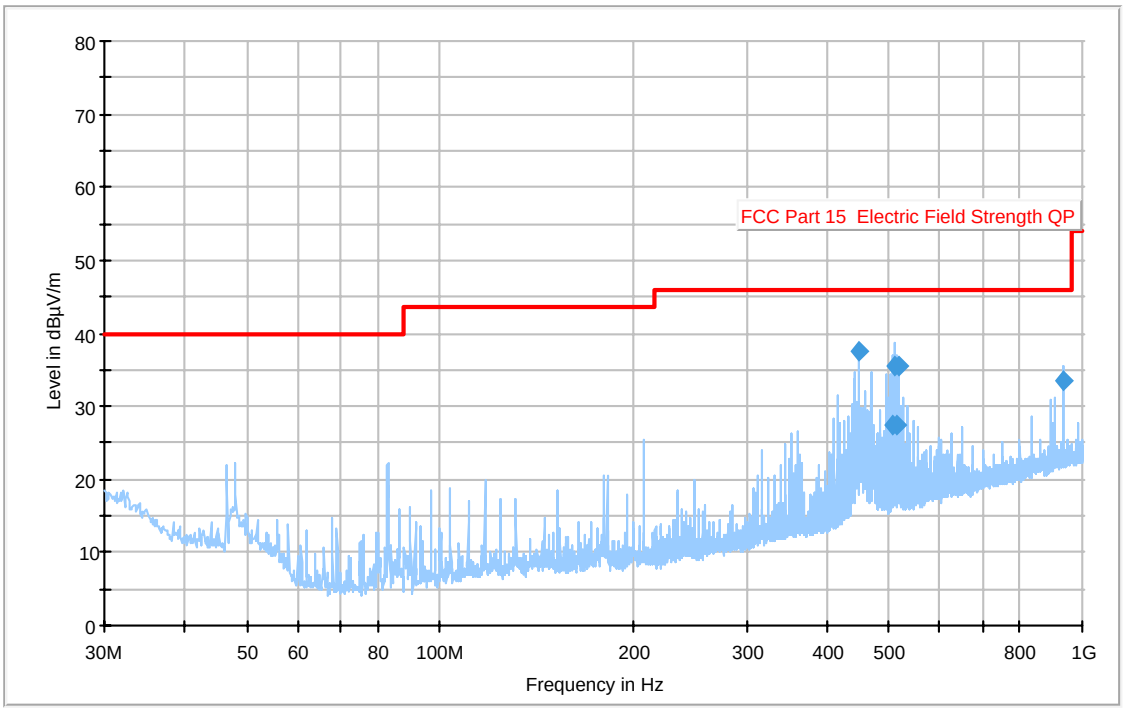
Test Data

Environmental Conditions

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

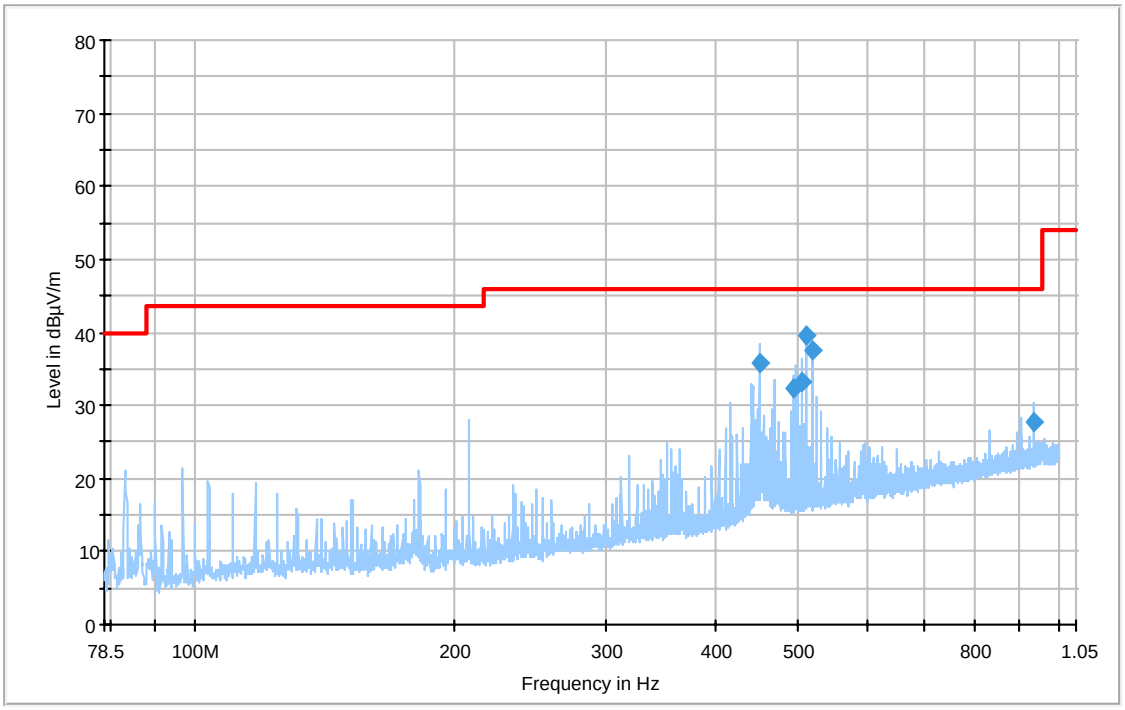
The testing was performed by Bruce Zhang on 2008-11-05.

Test Mode: Transmitting Low Channel



Frequency (MHz)	Corrected Amp. (dBµV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
449.999800	37.7	104.0	V	105.0	-11.3	46.0	8.3
511.476100	35.6	101.0	V	85.0	-10.6	46.0	10.4
518.399725	35.6	102.0	V	85.0	-10.3	46.0	10.4
936.008875	33.6	101.0	V	66.0	-3.4	46.0	12.4
508.042025	27.5	102.0	V	93.0	-10.7	46.0	18.5
514.957850	27.3	103.0	V	88.0	-10.4	46.0	18.7

Test Mode: Transmitting High Channel



Frequency (MHz)	Corrected Amp. (dBµV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
511.473550	39.5	101.0	V	84.0	-10.6	46.0	6.5
518.391475	37.6	102.0	V	87.0	-10.3	46.0	8.4
449.975800	36.0	105.0	V	104.0	-11.3	46.0	10.1
936.101250	27.6	267.0	V	211.0	-3.6	46.0	27.4
494.364050	32.3	362.0	V	344.0	-3.9	46.0	27.7
504.290250	33.1	103.0	V	29.0	-3.9	46.0	27.9

Test Mode: Transmitting (Above 1GHz)

Freq. (MHz)	Meter Reading (dBµV)	Detector PK/QP/AV	Direction Degree	Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC Part 15.319/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBuV/m)	Margin (dB)	Remarks
Low Channel												
3843.072	57.52	PK	35	1.7	V	32.1	4.32	33.7	60.24	74	13.76	Harmonic
3843.072	56.83	PK	306	1.3	H	32.1	4.32	33.7	59.55	74	14.45	Harmonic
5764.608	46.74	PK	120	1.6	H	34.5	6.50	33.6	54.14	74	19.86	Harmonic
5764.608	46.08	PK	0	1.0	V	34.5	6.50	33.6	53.48	74	20.52	Harmonic
High Channel												
3856.896	58.33	PK	33	1.7	V	32.1	4.32	33.7	61.05	74	12.95	Harmonic
3856.896	56.59	PK	306	1.3	H	32.1	4.32	33.7	59.31	74	14.69	Harmonic
5785.344	46.51	PK	10	1.0	H	34.5	6.50	33.6	53.91	74	20.09	Harmonic
5785.344	46.29	PK	0	1.0	V	34.5	6.50	33.6	53.69	74	20.31	Harmonic

Field Strength of Spurious Emission (Average)							
Freq. (MHz)	Peak Corrected Amplitude @3m (dBµV/m)	Ant. Polar (H/V)	Duty Cycle Factor (dB)	Corrected Amp. (dBµV/m)	Part 15.319(g)		Comment
					Limit (dBµV/m)	Margin	
Low Channel							
3843.072	60.24	V	-27.83	32.41	54	21.59	Harmonic
3843.072	59.55	H	-27.83	31.72	54	22.28	Harmonic
5764.608	54.14	H	-27.83	26.31	54	27.69	Harmonic
5764.608	53.48	V	-27.83	25.65	54	28.35	Harmonic
High Channel							
3843.072	61.05	V	-27.83	33.22	54	20.78	Harmonic
3843.072	59.31	H	-27.83	31.48	54	22.52	Harmonic
5764.608	53.91	H	-27.83	26.08	54	27.92	Harmonic
5764.608	53.69	V	-27.83	25.86	54	28.14	Harmonic

Note: Duty Cycle=Ton/Tp*100%
Ton=406µs=0.406ms
Tp=10ms
Duty Cycle=4.06%
Duty Cycle factor = 20lg (Duty Cycle) = -27.83 dB
AV=PK+(Duty Cycle)

§15.323 (f) - FREQUENCY STABILITY

Standard Applicable

Per §15.323(f), the frequency stability of the carrier frequency of the intentional radiator shall be maintained within ±10 ppm over 1 hour or the interval between channel access monitoring, whichever is shorter. The frequency stability shall be maintained over a temperature variation of −20° to +50 °C at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20 °C. For equipment that is capable only of operating from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary supply voltage

Test Procedure

This procedure should be carried out for each of the following test cases:

Temperature	Supply Voltage
20℃	85-115% or new batteries
-20℃ [a]	Normal
+50℃	Normal

[a] Use the lowest temperature at which the EUT is specified to operate if it is above -20 ℃.

Using the mean carrier frequency at 20℃ and at nominal supply voltage as the reference, the mean carrier frequency shall be maintained within ±10 ppm at the two extreme temperatures (or as declared by the manufacturer) and at normal temperature (typically 20℃) at the two extreme supply voltages.
This test does not apply to an EUT that is capable only of operating from a battery.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
WUHUAN	Temperature & Humidity Chamber	HTP205	20021115	N/A	N/A
R&S	Digital Radio-Communication Tester	CMD60	8281461029	2008-9-26	2009-9-25

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.8 kPa

The testing was performed by Bruce Zhang on 2008-11-08

Test Result: Compliance.

Test Mode: Transmitting

Temperature (^{O}C)	Voltage (Vdc)	Channel Frequency (MHz)	Measured Frequency Offset (kHz)	Measured Frequency Offset (ppm)	Limit (ppm)
20	2.4	1924.992	3	1.56	±10
-20	2.4	1924.992	-4	-2.08	±10
50	2.4	1924.992	6	3.12	±10

§15.323 (c) (e) & §15.319(f) – SPECIFIC REQUIREMENTS FOR UPCS DEVICE

Automatic Discontinuation of Transmission, FCC Part 15.319(f)
The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. The provisions in this section are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

Test Procedure:
Please according to the declaration provided by manufacturer.

Test Result:

Meet the requirement

Monitoring Time FCC 15.323 (c) (1)

Immediately prior to initiating transmission, devices must monitor the combined time and spectrum window in which they intend to transmit. For a period of at least 10 milliseconds for systems designed to use a 10 milliseconds or shorter frame period or at least 20 milliseconds for systems designed to use a 20 milliseconds frame period

Test Procedure:

ANSI C63.17 2006 clause 7.3.4

Test Result:

EUT monitors the combined time and spectrum window prior to initiation of transmission. Test result please according to FCC15.323(c) (4).

Lower Monitoring Threshold Part15.323 (c)(2)

The monitoring threshold must not be more than 30 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth used by the device.

Test Procedure:

ANSI C63.17 2006 clause 7.3.1

Test Result: Not Apply

Maximum Transmit Period FCC Part15.323 (c) (3)

If no signal above the threshold level is detected, transmission may commence and continue with the same emission bandwidth in the monitored time and spectrum windows without further monitoring. However, occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.

Test Procedure:

ANSI C63.17 2006 clause 8.2.2

Test Result:

Repetition of Access Criteria	Measured Maximum Transmission Time (Second)	Limit (Second)	Results
First	19800	28,800	Pass
Second	18000	28,800	Pass

System Acknowledgement, FCC Part15.323 (c) (4)

Once access to specific combined time and spectrum windows is obtained an acknowledgment from a system participant must be received by the initiating transmitter within one second or transmission must cease. Periodic acknowledgments must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signaling information may transmit continuously for 30 seconds without receiving an acknowledgment, at which time the access criteria must be repeated.

Test Procedure:

ANSI C63.17 2006 clause 8.1.1, 8.2.1

Test Result:

Test	Time taken (second)	Limit (second)	Result
Connection acknowledgement	0.0052	1	Pass
Change of access criteria for control information	N/A	30	Pass
Transmission cease time	5.80	30	Pass
Pulse length	0.01	0.01	Pass

Note: N/A=Not Applicable

Least Interfered Channel (LIC) Selection, FCC Part15.323 (c) (5)

If access to spectrum is not available as determined by the above, and a minimum of 40 duplex system access channels are defined for the system, the time and spectrum windows with the lowest power level below a monitoring threshold of 50 dB above the thermal noise power determined for the emission bandwidth may be accessed.
Calculation of monitoring threshold limits for isochroous devices:
Lower threshold: $T_L = -174+10Log_{10}B + M_u + P_{MAX}-P_{EUT}$ (dBm)
Upper threshold: $T_U = -174+10Log_{10}B + M_u + P_{MAX}-P_{EUT}$ (dBm)
Where: B=Emission bandwidth (Hz)

M_u =dB the threshold may exceed thermal noise (30 for T_L & 50 for T_U)
P_{MAX} =5Log$_{10}$B-10(dBm)
P_{EUT} =Transmitted power (dBm)

Limit:

Monitor Threshold	B (MHz)	M_U (dB)	P_{MAX} (dBm)	P_{EUT} (dBm)	Threshold (dBm)
T_L	1.76	30	21.23	18.93	-79.24
T_U	1.76	50	21.23	18.93	-59.24

The EUT must not transmit until the interference level is less than or equal to:
Measured Threshold Level ≤ T_U
Where: T_U =Upper threshold level

Test Procedure:

ANSI C63.17 clause 7.3.2, 7.3.3, 7.3.4

Test Result:

Monitor threshold	Measured Threshold Level	Limit (dBm)
Lower Threshold(dBm)	N/A	-79.24
Upper Threshold(dBm)	-62.5	-59.24

Note: The upper threshold is applicable as the EUT utilizes more than 40 duplex system channels

Random waiting FCC 15.323(c) (6)

If the selected combined time and spectrum windows are unavailable, the device may either monitor and select different windows or seek to use the same window after waiting an amount of time, randomly chosen from a uniform random distribution between 10 and 150 milliseconds, commencing when the channel becomes available.

Test Procedure:

ANSI C63.17 2006 clause 8.1.3

Test Result:

The manufacturer declares that this provision is not utilized by the EUT.

Monitoring Bandwidth, FCC Part 15.323 (c) (7)

The monitoring system bandwidth must be equal to or greater than the emission bandwidth of the intended transmission and have a maximum reaction time less than 50xSQRT (1.25/emission bandwidth in MHz) microseconds for signals at the applicable threshold level but shall not be required to be less than 50 microseconds

Test Procedure:

ANSI C63.17 2006 clause 7.5

Test Result:

Test Equation (µs)	Bandwidth (MHz)	Pulse width (µs)	Limit (µs)	Result
$50\ (1.25/B)^{1/2}$	1.76	42.14	50	Pass
$35\ (1.25/B)^{1/2}$	1.76	29.50	35	Pass

Monitoring Antenna, FCC Part15.323 (c) (8)

The monitoring system shall use the same antenna used for transmission, or an antenna that yields equivalent reception at that location.

Test Procedure:

ANSI C63.17 2006 paragraph 4

Test Result:

The antenna of the EUT used for transmission is the same interior antenna that used for monitoring.

Monitoring threshold relation FCC 15.323(c) (9)

Devices that have a power output lower than the maximum permitted under the rules can increase their monitoring detection threshold by one decibel for each one decibel that the transmitter power is below the maximum permitted.

Test Procedure:

ANSI C63.17 2006 paragraph 4

Test Result:

Comply. Test data please according to FCC 15.323(c) (5)

Duplex Connections, FCC Part15.323 (c) (10)

An initiating device may attempt to establish a duplex connection by monitors both its intended transmit and receive time and spectrum windows. If both the intended transmit and receive time and spectrum windows meet the access criteria, then the initiating device can initiate a transmission in the intended transmit time and spectrum window. If the power detected by the responding device can be decoded as a duplex connection signal from the initiating device, then the responding device may immediately begin transmitting on the receive time and spectrum window monitored by the initiating device.

Test Procedure:

ANSI C63.17 clause 8.3

Test Result:

The manufacturer declares that this provision is not utilized by the EUT.

Alternative monitoring interval for co-located devices, FCC Part 15.323 (c) (11)

An initiating device that is prevented from monitoring during its intended transmit window due to monitoring system blocking from the transmissions of a co-located (within one meter) transmitter of the same system, may monitor the portions of the time and spectrum windows in which they intend to receive over a period of at least 10 milliseconds. The monitored time and spectrum window must total at least 50 percent of the 10 millisecond frame interval and the monitored spectrum must be within 1.25 MHz of the center frequency of channel(s) already occupied by that device or co-located co-operating devices. If the access criteria is met for the intended receive time and spectrum window under the above conditions, then transmission in the intended transmit window by the initiating device may commence.

Test Procedure:

ANSI C63.17 2006 clause 8.4

Test Result:

The manufacturer declares that this provision is not utilized by the EUT.

Fair Access, FCC Part 15.323 (c) (12)

The provisions of FCC Part15.323(c)(10) or (c)(11) shall not be used to extend the range of spectrum occupied over space or time for the purpose of denying fair access to spectrum to other devices.

Test Result:

The manufacturer declares that this device does not use any mechanisms as provided by Part15.323 (c) (10) or (c) (11) to extend the range of spectrum occupied over space or time for the purpose of denying fail access to spectrum to other device.

Frame Repetition Stability, Part15 .323 (e)

The frame period (a set of consecutive time slots in which the position of each time slot can be identified by reference to a synchronizing source) of an intentional radiator operating in these sub-bands shall be 20 milliseconds or 10 milliseconds/X where X is a positive whole number.

Test Procedure:

Measurement method according to ANSI C63.17 2006 clause 6.2.2, 6.2.3

Test Result:

Frame Repetition Stability:

Frame Repetition Stability (ppm)	Limit (ppm)	Result (Pass/Fail)
0.57	10	Pass

Frame Period and Jitter:

Max. Pos. Jitter (us)	Max. Neg. Jitter (us)	Frame Period (ms)	Limit	
			Frame Period (ms)	Jitter (µs)
0.17	-0.14	10.00000	20 or10/X	25us

Note: X is a positive whole number.

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