FCC PART 15.231

EMI MEASUREMENT AND TEST REPORT

For

Vson Technology Co., Ltd.

5 Floor, A building, Weixinda Xichen Industrial Park, Baoan District, Shenzhen, China

FCC ID: T2DV-809

March 23, 2006

This Report Concerns:	**Equipment Type:**
☒ Original Report	Wireless presenter

Test Engineer:	Kamn Hu
Report No.:	RSZ06021701
Test Date:	March 21, 2006
Reviewed By:	Chris Zeng
Prepared By:	Bay Area Compliance Lab Corp. (ShenZhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China Tel: +86-755-33320018 Fax: +86-755-33320008

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Vson Technology Co., Ltd.* 's product, model *V-809* or the "EUT" as referred to in this report is a Wireless presenter which measures approximately 12.0 cm L x 3.0 cm W x 1.9 cm H, rated input voltage: DC 5 V battery.

** The test data gathered are from production sample, serial number: 0602019, provided by the manufacturer, we receive the EUT on 2006-2-17.*

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 C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203,15.205,15.209 and 15.231 rules.

Related Submittal(s)/Grant(s)

No Related Submittals

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 radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Lab Corp. (ShenZhen) to collect radiated and conducted emission measurement data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China.

Test site at Bay Area Compliance Lab 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 Lab Corp. (ShenZhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Justification

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

EUT Exercise Software

N/A.

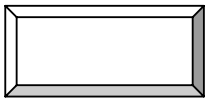
Special Accessories

N/A.

Equipment Modifications

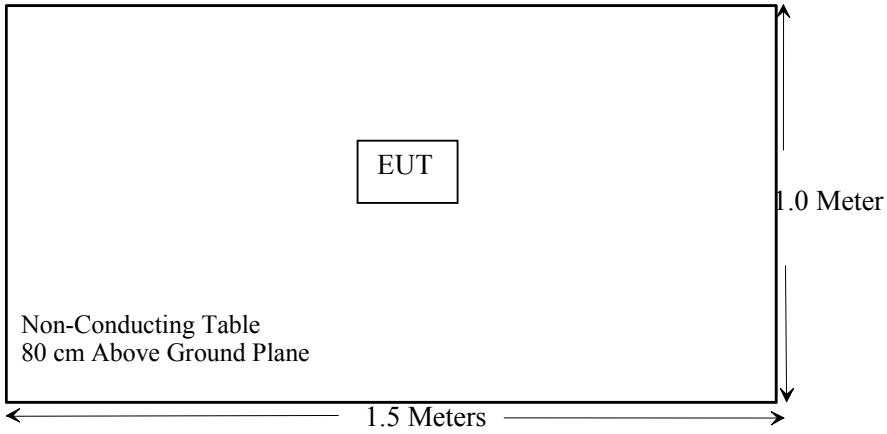
Bay Area Compliance Lab Corp. (ShenZhen) has not done any modification on the EUT.

Configuration of Test Setup



EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§15.209	General Requirement	Compliant
§15.231 (b)	Radiated Emission	Compliant*
§15.231 (c)	20dB Band Width Testing	Compliant
§15.231 (a)(1)	Deactivation Testing	Compliant

* Within measurement uncertainty.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

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.

This product has a build on board antenna, fulfill the requirement of this section.

Test Result: Pass

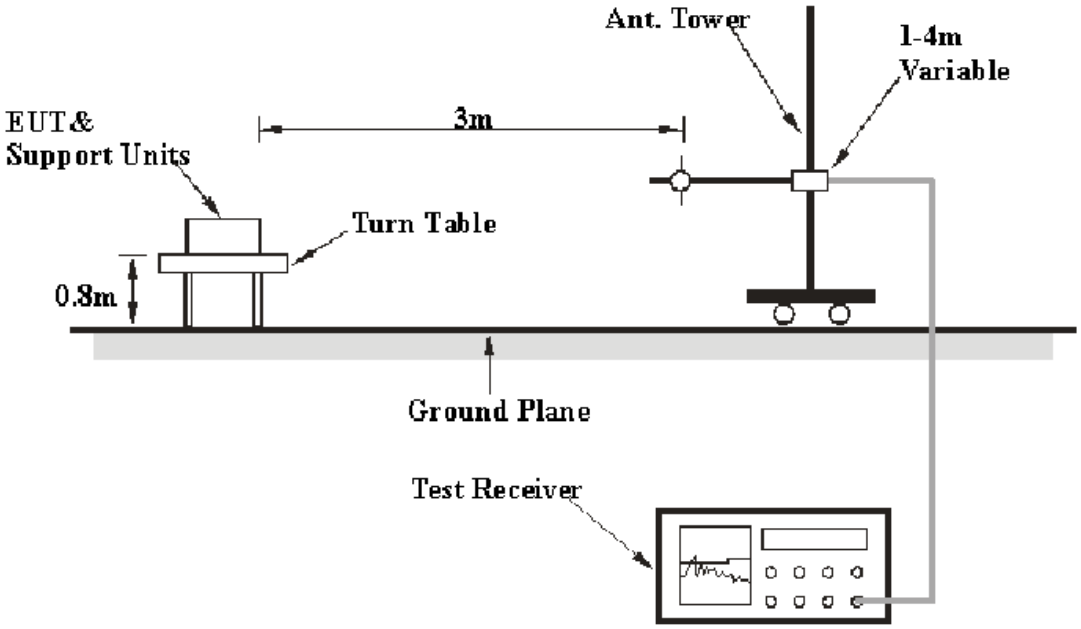
§15.205, §15.209, §15.231 (b)- RADIATED EMISSION

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 Lab Corp. (ShenZhen) is ±4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber A&B test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC 15 § 15.209 and 15.231.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 5 GHz.

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

Frequency Range	***RBW***	***VBW***
30 – 1000 MHz	100 kHz	300 kHz
1000 MHz –5 GHz	1 MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2005-12-21	2006-12-21
HP	Amplifier	8449B	3008A00277	2005-8-17	2006-8-17
Sunol Sciences	Horn Antenna	DRH-118	A052604	2005-7-20	2006-7-20
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2005-8-17	2006-8-17
HP	Amplifier	HP8447D	2944A09795	2005-8-17	2006-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2005-4-28	2006-4-28
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2005-8-17	2006-8-17
HP	Amplifier	HP8447E	1937A01046	2005-8-17	2006-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2005-4-28	2006-4-28

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

Test Procedure

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

All data was recorded in the Peak and Average detection mode.

Standard Applicable

According to §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental (Microvolts /meter)	Field Strength of spurious emissions ((Microvolts /meter)
40.66-40.70	2,250……..……..……	225
70-130…..……..……	1,250……..……...…	125
130-174……..……	1,250 to 3,370..……..……	125 to375
174-260……..……	3,750	375
260-470……..……..……	3,750 to12, 500..……..……	375 to 1,250
Above 470	12,500……..……..……	1,250

Linear interpolations for frequency ranges 130 - 174 MHz and 260 - 470 MHz.

The above field strength limits are specified at a distance of 3-meters the tighter limits apply at the band edges.

Corrected Amplitude & Margin Calculation

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

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

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -5.8dB means the emission is 5.8dB below the limit for Class C. The equation for margin calculation is as follows:

Margin = Limit – Corr. Ampl.

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 and 15.231, with the worst margin reading of:

30-1000MHz: 18.1 dB at **867.898 MHz** in the **Horizontal** polarization.
Above 1 GHz: 15.9 dB at **1301.87 MHz** in the **Horizontal** polarization.

Test Data

Environmental Conditions

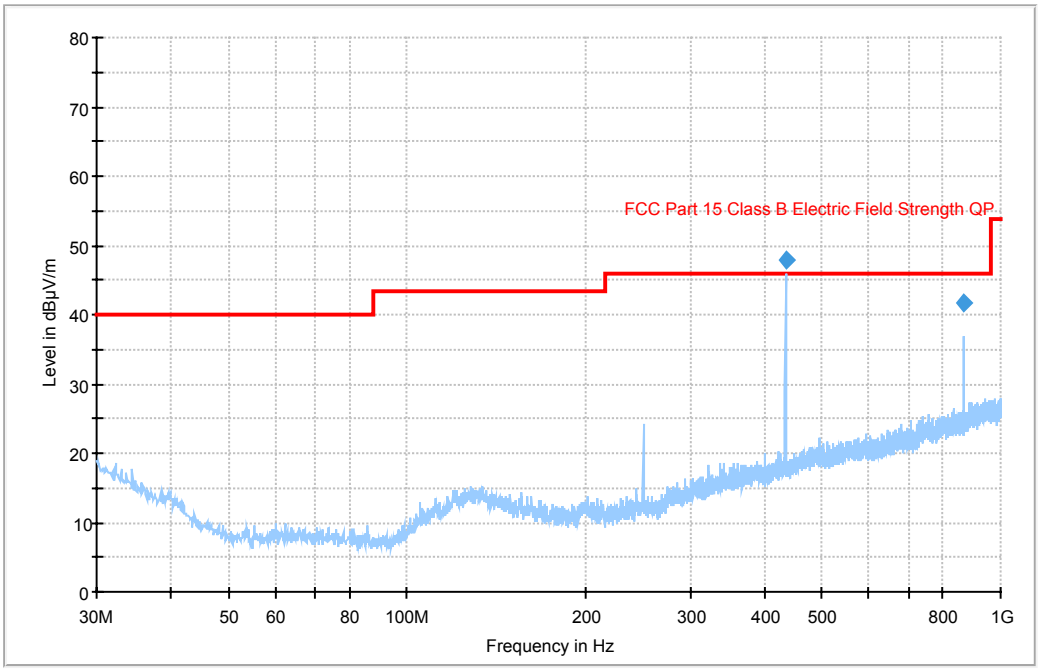
Temperature:	27 ° C
Relative Humidity:	56%
ATM Pressure:	1002mbar

The testing was performed by Kamn Hu on 2003-3-21.

Test Mode: Transmitting

30-1000MHz:

Auto Test (FCC 15 Class B) Horizontal



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity
433.949150	58,7	1000.000	120.000	100.0	H
867.898150	53.6	1000.000	120.000	112.0	H

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB µ V/m)	Comment
433.949150	103.0	-7.9	42.1	100.8	
867.898150	106.0	-1.3	27.2	80.8	

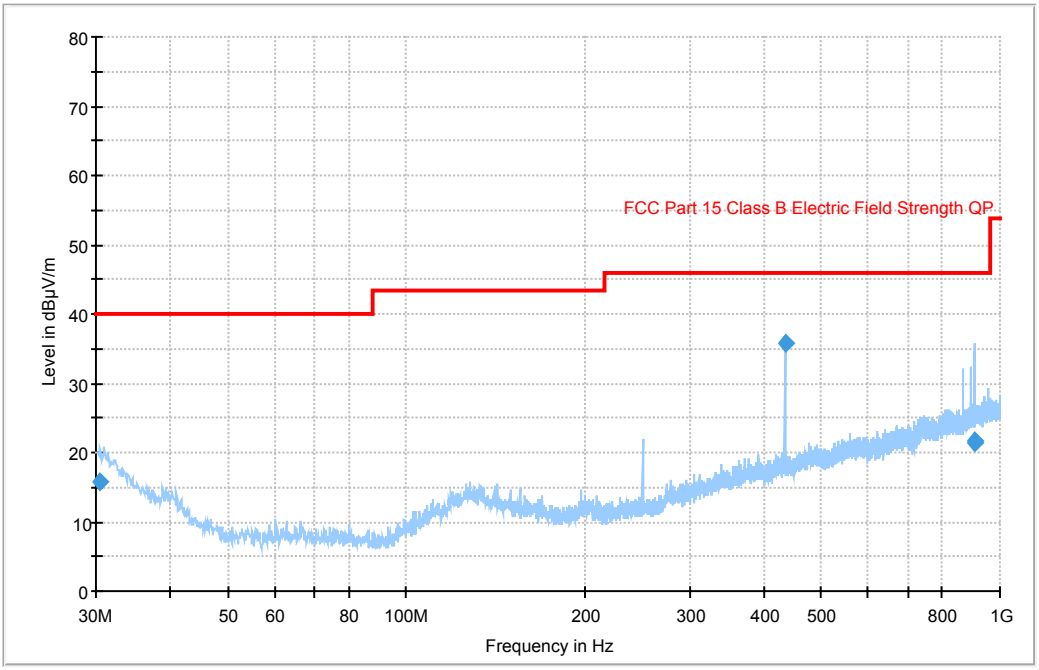
Final Measurement Detector 2

Frequency (MHz)	AV (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity
433.949150	43.8	1000.000	120.000	100.0	H
867.898150	42.7	1000.000	120.000	112.0	H

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB µ V/m)	Comment
433.949150	103.0	-7.9	37.0	80.8	
867.898150	106.0	-1.3	18.1	60.8	

Auto Test (FCC 15 Class B) Vertical



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity
30.410719	15.8	1000.000	120.000	270.0	V
433.954550	48.6	1000.000	120.000	259.0	V
903.721650	21.6	1000.000	120.000	168.0	V
907.740700	21.5	1000.000	120.000	305.0	V

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB µ V/m)	Comment
30.410719	183.0	-6.0	65.0	80.8	
433.954550	81.0	-7.9	52.2	100.8	
903.721650	260.0	-0.2	59.2	80.8	
907.740700	203.0	-0.2	59.3	80.8	

Final Measurement Detector 2

Frequency (MHz)	AV (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity
30.410719	10.9	1000.000	120.000	270.0	V
433.954550	28.9	1000.000	120.000	259.0	V
903.721650	13.9	1000.000	120.000	168.0	V
907.740700	13.8	1000.000	120.000	305.0	V

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB µ V/m)	Comment
30.410719	183.0	-6.0	49.9	60.8	
433.954550	81.0	-7.9	51.9	80.8	
903.721650	260.0	-0.2	46.9	60.8	
907.740700	203.0	-0.2	47.0	60.8	

Above 1GHz:

Frequency	Meter Reading	Detector	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifer Gain	Corr. Ampl.	FCC Part 15.231 & 15.209		
MHz	dBuV/m	PK/QP/AV	Degree	Meter	H / V	dB	dB	dB	dBuV/m	Limit dBuV/m	Margin dB	
Above 1GHz												
1301.87	46.8	AV	180	1.2	H	25.0	2.6	36.33	38.1	54.0	15.9	Spurious
1301.87	62.9	PK	45	1.0	H	25.0	2.6	36.33	54.2	74.0	19.8	Spurious
1301.87	41.5	AV	60	1.0	V	25.0	2.6	36.33	32.8	54.0	21.2	Spurious
1301.87	57.3	PK	45	1.0	V	25.0	2.6	36.33	48.6	74.0	25.4	Spurious
2169.78	41.7	PK	45	1.2	V	28.4	3.4	35.16	52.0	80.8	28.8	Spurious
1735.82	35.1	AV	180	1.2	V	28.4	3.4	35.16	31.7	60.8	29.1	Spurious
1735.82	32.4	AV	60	1.0	H	28.4	3.4	35.16	29.0	60.8	31.8	Spurious
1735.82	50.4	PK	45	1.2	V	28.4	3.4	35.16	47.0	80.8	33.8	Spurious
2169.78	28.2	AV	60	1.0	V	28.4	3.4	35.16	24.8	60.8	36.0	Spurious
1735.82	47.1	PK	45	1.0	H	28.4	3.4	35.16	43.7	80.8	37.1	Spurious
2169.78	24.9	AV	180	1.2	H	28.4	3.4	35.16	21.5	60.8	39.3	Spurious
2169.78	37.0	PK	45	1.2	H	28.4	3.4	35.16	33.6	80.8	47.2	Spurious

Note: The EUT was tested in all three orthogonal planes.
* Within measurement uncertainty.

§15.231(c) 20dB BANDWIDTH TESTING

Requirement

Per 15.231(c) ,The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2005-8-17	2006-8-17
HP	Amplifier	HP8447E	1937A01046	2005-8-17	2006-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2005-4-28	2006-4-28

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

Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1009mbar

The testing was performed by Kamn Hu on 2006-3-21.

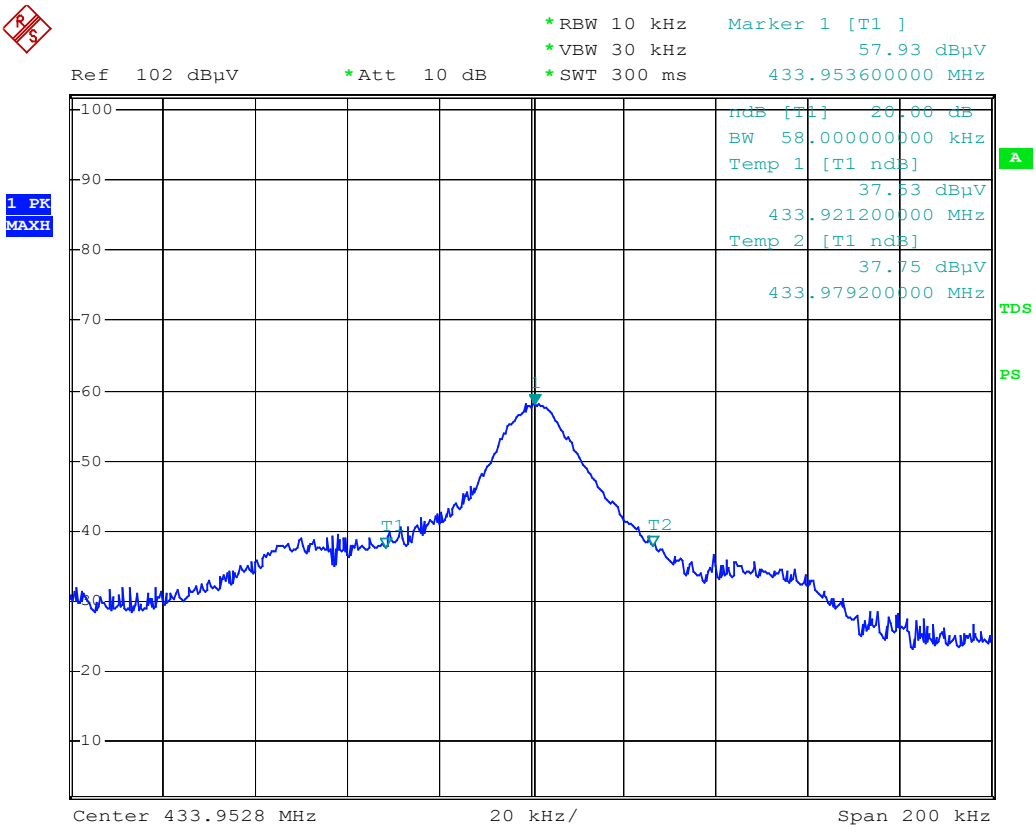
Test Mode: Transmitting

Frequency MHz	Bandwidth Emission kHz	Limit kHz	Result
433.9536	58.00	1084.8840	Pass

Limit=Frequency×0.25%=433.9536×0.25%=1084.8840 kHz

Test Result Pass

Refer to the attached plots.



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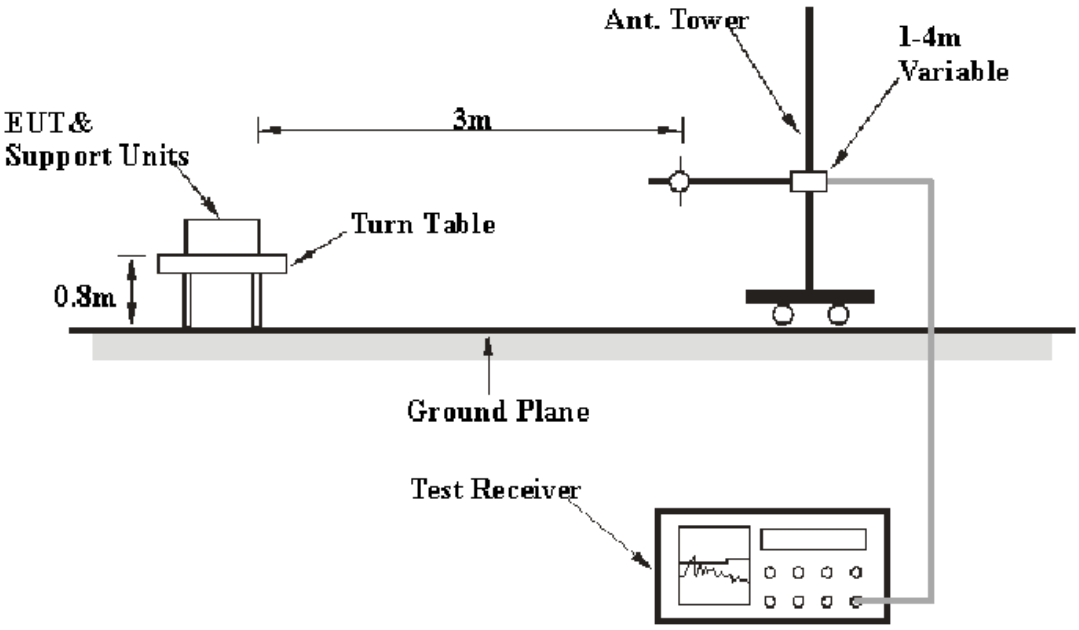
§15.231(a)-DEACTIVATION TESTING

Requirement

Per 15.231(a) (1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

EUT Setup



The deactivation test was 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 15.231(a) limits.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2005-8-17	2006-8-17
HP	Amplifier	HP8447E	1937A01046	2005-8-17	2006-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2005-4-28	2006-4-28

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

Test Procedure

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

Test Data

Environmental Conditions

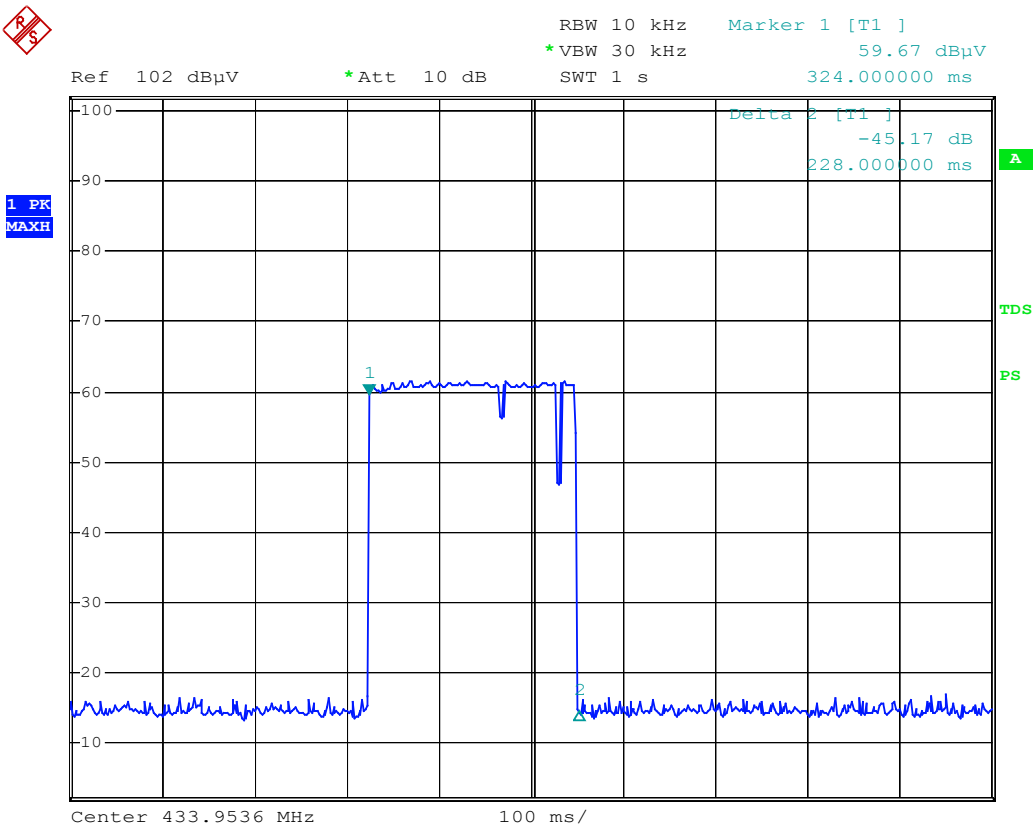
Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1032mbar

The testing was performed by Kamn Hu on 2006-3-21.

Test Mode: Transmitting

Transmitting time (Second)	Limit (Second)	Result
0.324	5	Pass

Refer to the attached plots.



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