



NVLAP LAB CODE 200707-0



FCC PART 90 TYPE APPROVAL

EMI MEASUREMENT AND TEST REPORT

For

Weierwei Electron Science& Technology Co., Ltd.

Room 18F07, New Asia Digital Electronics Plaza,

Xitier Road, Guangzhou, Guangdong, China

FCC ID: YC2VEV-V8

Report Type: Original Report	Product Type: Walkie Talkie
Test Engineer: <u>Alvin Huang</u> <i>Alvin Huang</i>	
Report Number: <u>RSZ10041202</u>	
Report Date: <u>2010-05-11</u>	
Merry Zhao <i>Merry, Zhao</i>	
Reviewed By: <u>EMC Engineer</u>	
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	

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. 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 “*” (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The Weierwei Electron Science& Technology Co., Ltd's product, model number: VEV-V8 (FCC ID: YC2VEV-V8) or the "EUT" as referred to in this report is a *Walkie Talkie* that operates in the frequency band 400~470 MHz and with two channel spacing of 12.5 kHz (narrow-band)/25 kHz (wide-band). The EUT is measured approximately 3.0 cm L x 5.5 cm W x 10.0 cm H, rated input voltage: DC 7.4V battery.

** All measurement and test data in this report was gathered from production sample serial number: 1004019 (Assigned by BACL, Shenzhen). The EUT was received on 2010-04-12.*

EUT Photo



Please see additional photos in Exhibit B & C

Objective

This Type approval report is prepared on behalf of Weierwei Electron Science& Technology Co., Ltd in accordance with Part 2, and Part 90 of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal Regulations Title 47 Part 2, Sub-part J as well as the following individual parts:

Part 90 – Private Land Mobile Radio Service

Applicable Standards: TIA 603-C and ANSI 63.4-2003.

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).



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 modifications were made to the unit tested.

Configuration of Test Setup



Stand

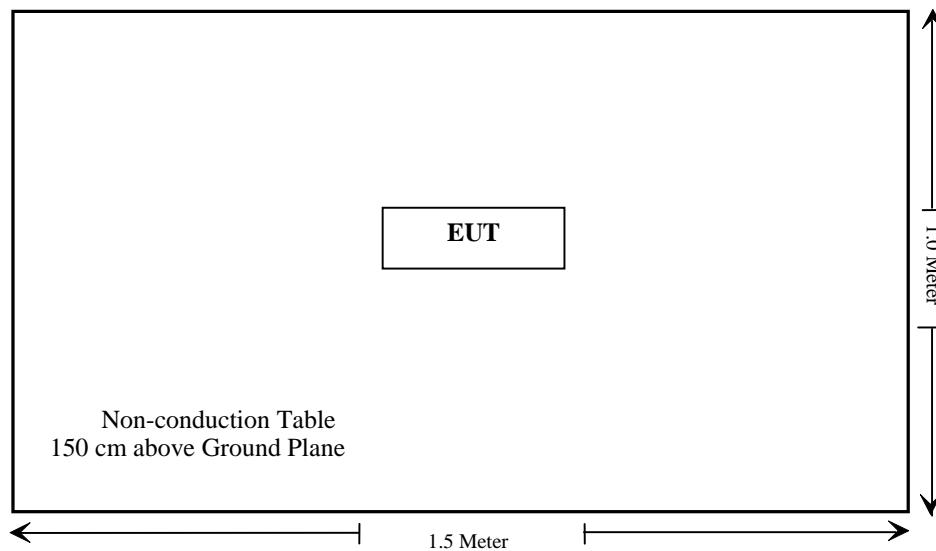


Side



Lie

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§1.1307(b); §2.1093	RF Exposure	Compliant*
§2.1046; §90.205	RF Output Power	Compliant
§2.1047; §90.207	Modulation Characteristic	Compliant
§2.1049, §90.209; §90.210	Occupied Bandwidth & Emission Mask	Compliant
§2.1051; §90.210	Spurious Emission at Antenna Terminal	Compliant
§2.1053; §90.210	Spurious Radiated Emissions	Compliant
§2.1055; §90.213	Frequency Stability	Compliant
§90.214	Transient Frequency Behavior	Compliant

Note: * Please refer to the SAR report released by BACL, Report Number: R1005135-SAR.

FCC §1.1307(b) & §2.1093 - RF EXPOSURE

Applicable Standard

According to FCC §1.1307(b) and §2.1093, protable device operates Part 90 should be subjected to routine environmental evaluation for RF exposure prior or equipment authorization or use.

Result: Compliance.

Please refer to SAR Report Number: R1005135-SAR.

FCC §2.1046 & §90.205- RF OUTPUT POWER

Applicable Standard

FCC §2.1046 and §90.205.

Test Procedure

1) Conducted RF Output Power

TIA-603-C section 2.2.1

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

Spectrum Analyzer setting:

RBW	Video B/W
100 kHz	300 kHz

2) Radiated Power Output (ERP)

TIA-603-C section 2.2.17

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT, during the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the ERP were measured by the substitution.

Absolute level=substituted level+Antenna gain-Cable Loss

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2009-05-05	2010-05-05
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-08
HP	Signal Generator	HP8657A	2849U00982	2009-10-28	2010-10-27

*** Statement of Tractability:** 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:	100.1 kPa

The testing was performed by Alvin Huang on 2010-05-01.

Test Mode: Transmitting

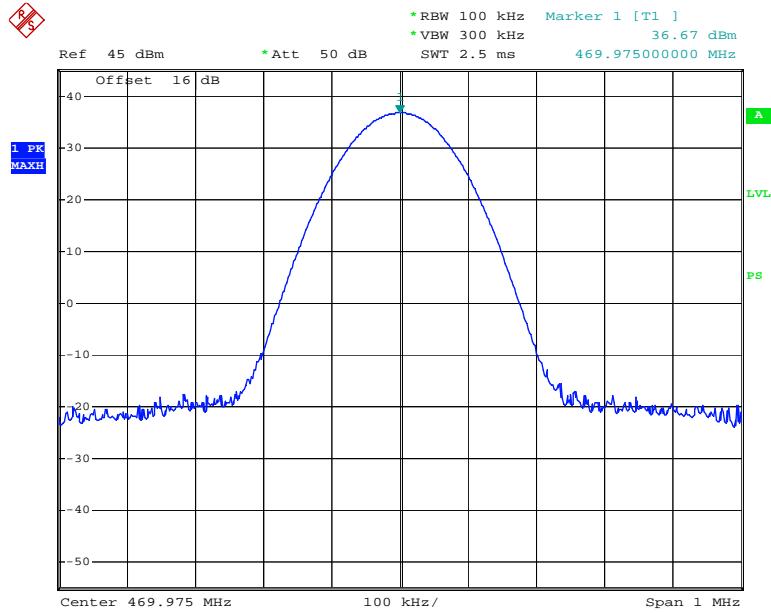
Test Result: Please refer to following table and plots.

1) Conducted Output Power:

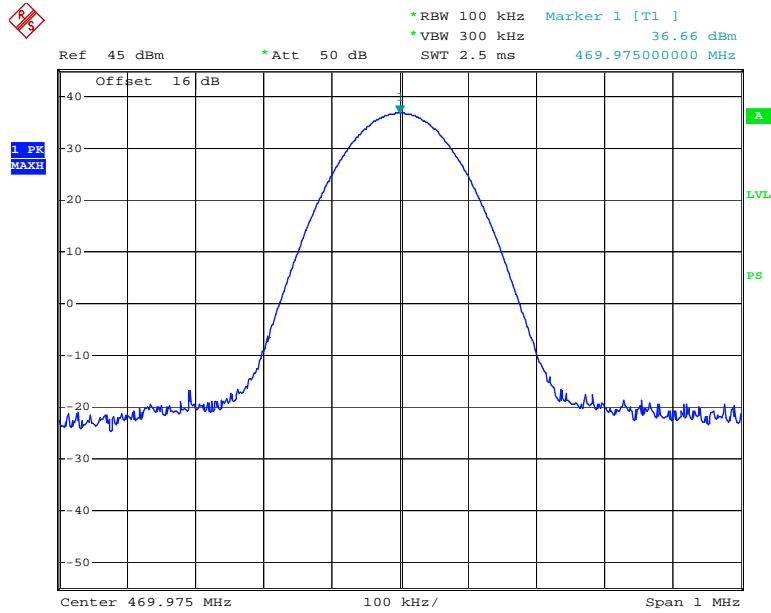
Frequency Spacing (kHz)	Frequency (MHz)	Output Power (dBm)	Output Power (Watt)	Rated Output Power (Watt)	Comment
High output power					
25.0	400.025	36.71	4.69	5	Low CH
	435.000	36.70	4.68	5	Middle CH
	469.975	36.66	4.63	5	High CH
12.5	400.025	36.71	4.69	5	Low CH
	435.000	36.69	4.67	5	Middle CH
	469.975	36.67	4.65	5	High CH
Middle output power					
25.0	400.025	32.61	1.82	2	Low CH
	435.000	33.43	2.20	2	Middle CH
	469.975	33.98	2.50	2	High CH
12.5	400.025	32.64	1.84	2	Low CH
	435.000	33.41	2.19	2	Middle CH
	469.975	33.98	2.50	2	High CH
Low output power					
25.0	400.025	29.06	0.81	1	Low CH
	435.000	30.13	1.03	1	Middle CH
	469.975	31.11	1.29	1	High CH
12.5	400.025	29.13	0.82	1	Low CH
	435.000	30.26	1.06	1	Middle CH
	469.975	31.10	1.29	1	High CH

Effective Radiated Power (ERP)

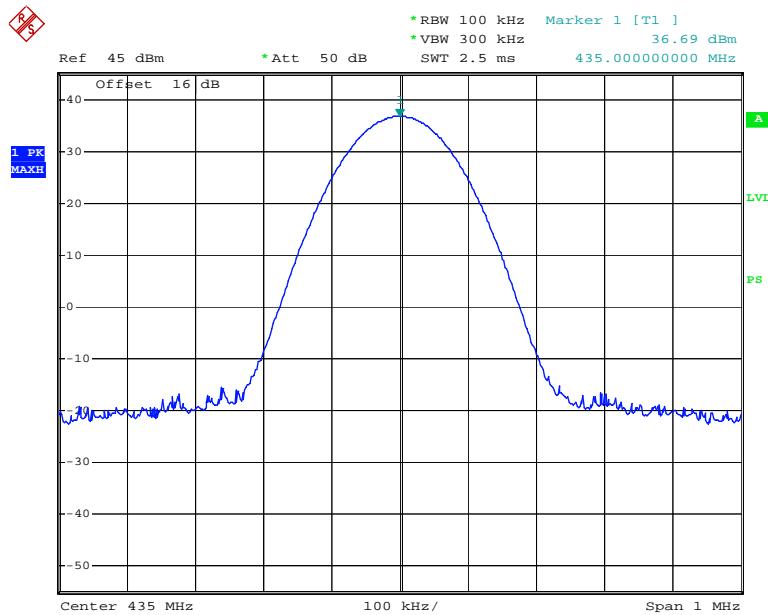
Indicated		Table	Test Antenna		Substituted					Absolute Level (dBm)	Output Power (Watt)
Freq. (MHz)	S.A. Amp. (dB μ V)	Angle Degree	Height (m)	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)	Antenna Gain Cord.	Cable Loss (dB)		
12.5 kHz Channel Spacing											
400.025	116.89	176	1.3	H	400.025	36.1	H	0	0.7	35.4	3.47
430.000	116.67	354	1.5	H	430.000	36.1	H	0	0.7	35.4	3.47
469.975	116.74	0	1.6	H	469.975	36.3	H	0	0.7	35.6	3.63
400.025	117.34	360	1.7	V	400.025	36.7	V	0	0.7	36.0	3.98
469.975	117.46	28	1.7	V	469.975	36.8	V	0	0.7	36.1	4.07
430.000	117.64	156	1.6	V	430.000	37.0	V	0	0.7	36.3	4.27
25.0 kHz Channel Spacing											
400.025	116.53	56	1.6	H	400.025	35.9	H	0	0.7	35.2	3.31
469.975	116.59	160	1.6	H	469.975	36.1	H	0	0.7	35.4	3.47
430.000	116.76	81	1.5	H	430.000	36.2	H	0	0.7	35.5	3.55
469.975	117.12	172	1.7	V	469.975	36.5	V	0	0.7	35.8	3.80
400.025	117.27	156	1.7	V	400.025	36.6	V	0	0.7	35.9	3.89
430.000	117.59	360	1.2	V	430.000	36.9	V	0	0.7	36.2	4.17

Antenna Port Conducted Output Power:**High Channel, 12.5 kHz Channel Spacing**

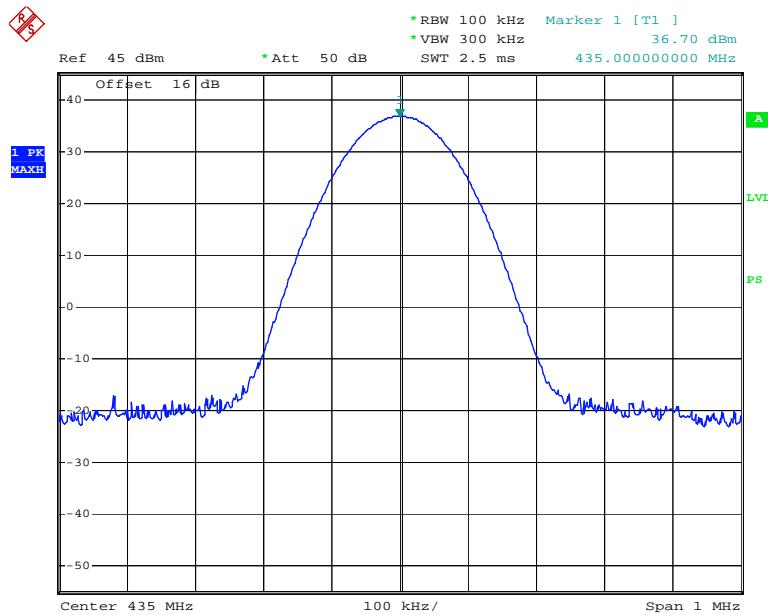
Date: 1.MAY.2010 08:57:35

High Channel, 25 kHz Channel Spacing

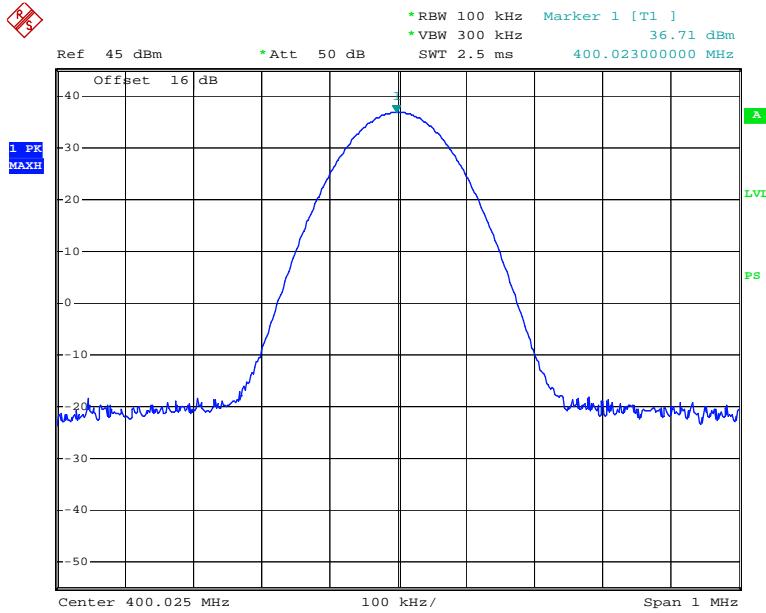
Date: 1.MAY.2010 08:57:13

Middle Channel, 12.5 kHz Channel Spacing

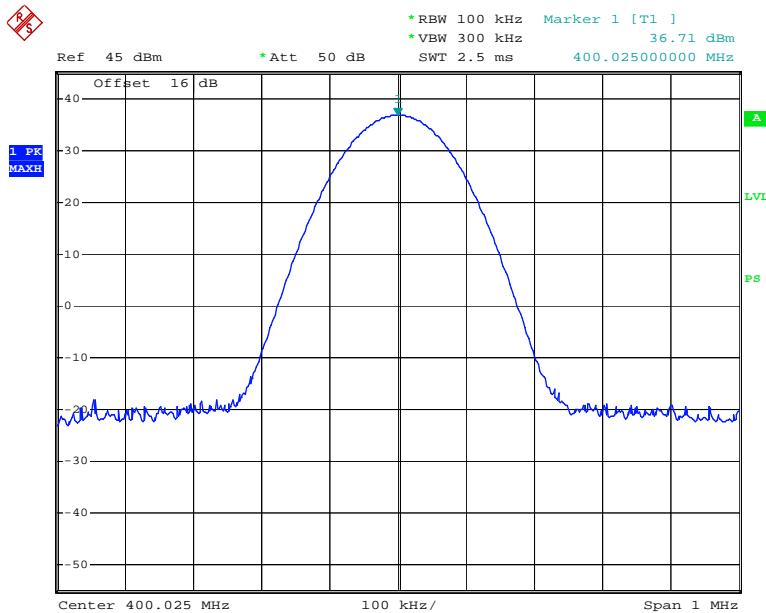
Date: 1.MAY.2010 08:58:07

Middle Channel, 25 kHz Channel Spacing

Date: 1.MAY.2010 08:56:49

Low Channel, 12.5 kHz Channel Spacing

Date: 1.MAY.2010 08:58:36

Low Channel, 25 kHz Channel Spacing

Date: 1.MAY.2010 08:52:42

FCC §2.1047 & §90.207 - MODULATION CHARACTERISTIC

Applicable Standard

FCC §2.1047 & §90.207:

- (a) Equipment which utilizes voice modulated communication shall show the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz. for equipment which is required to have a low pass filter, the frequency response of the filter, or all of the circuitry installed between the modulation limited and the modulated stage shall be supplied.
- (b) Equipment which employs modulation limiting, a curve showing the percentage of modulation versus the modulation input voltage shall be supplied.

Test Procedure

TIA/EIA-603 2.2.3

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
HP	Modulation Analyzer	8901B	3438A05208	2010-03-03	2011-03-02
NANYAN	Audio Generator	NY2201	019829	2009-12-23	2010-12-23

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.1 kPa

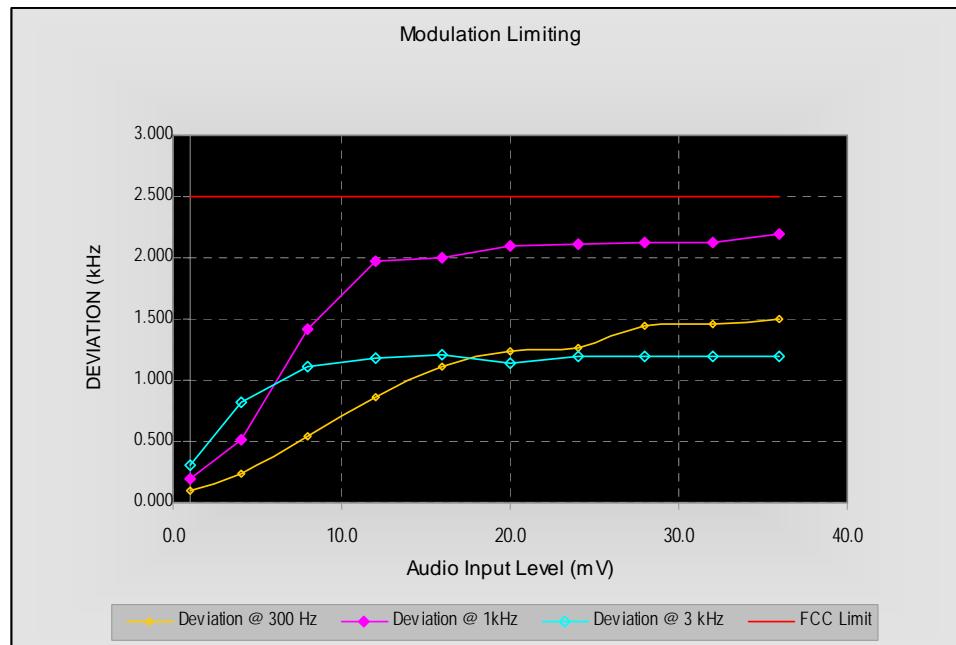
The testing was performed by Alvin Huang on 2010-05-08.

Test Mode: Transmitting

Modulation Limiting

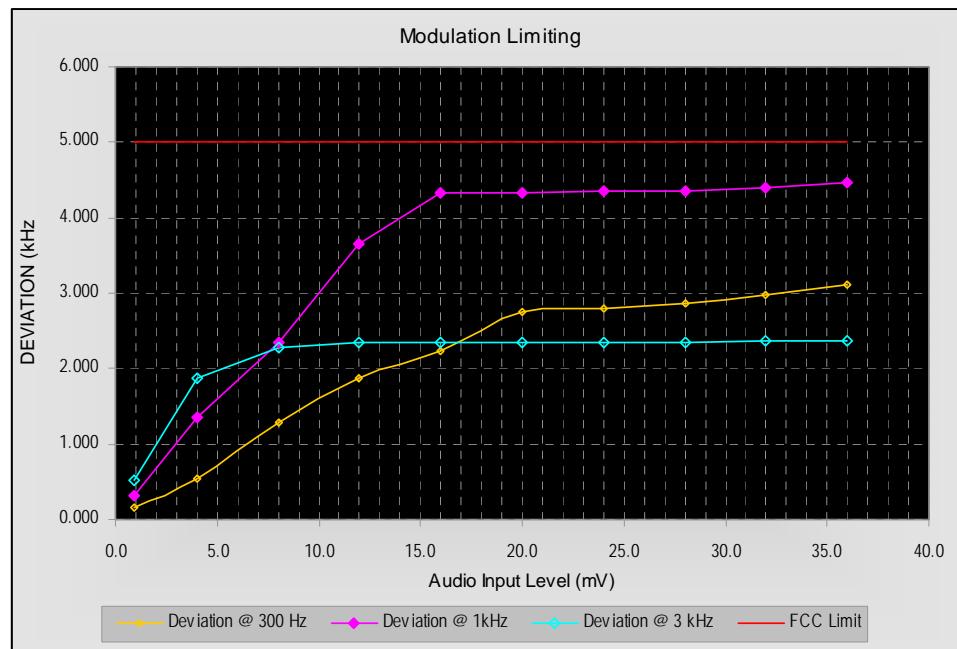
Carrier Frequency: 435.00 MHz, Channel Separation=12.5 kHz

Audio Input Level [mV]	Frequency Deviation (kHz)			FCC Limit [kHz]
	@ 300 Hz	@ 1kHz	@ 3 kHz	
1.0	0.100	0.200	0.301	2.5
4.0	0.235	0.512	0.815	2.5
8.0	0.536	1.412	1.106	2.5
12.0	0.867	1.975	1.186	2.5
16.0	1.111	2.006	1.205	2.5
20.0	1.243	2.101	1.134	2.5
24.0	1.267	2.109	1.197	2.5
28.0	1.450	2.125	1.197	2.5
32.0	1.458	2.129	1.198	2.5
36.0	1.501	2.200	1.197	2.5



Carrier Frequency: 435.00 MHz, Channel Separation=25.0 kHz

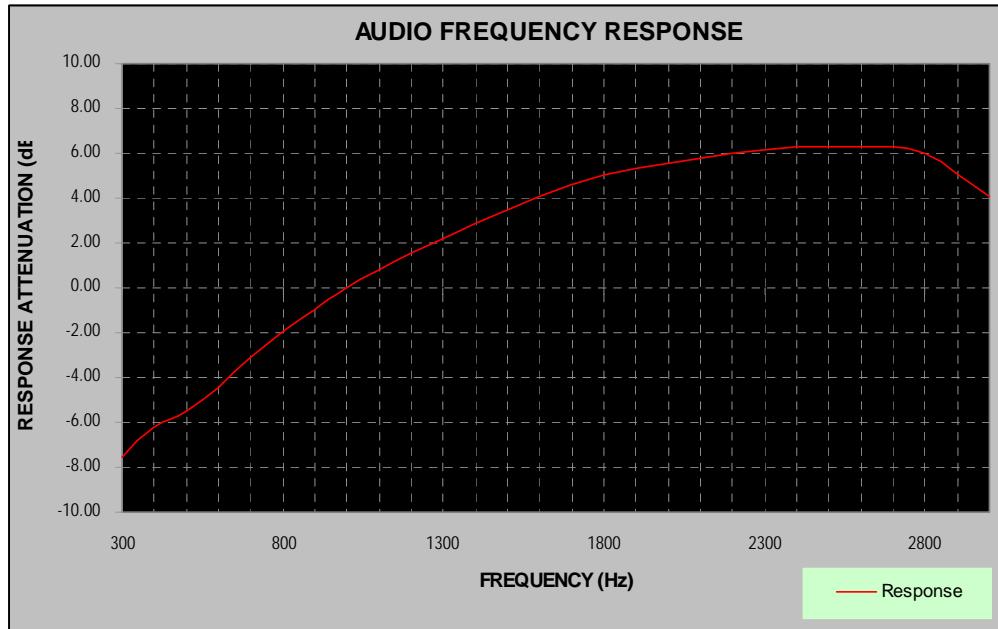
Audio Input Level [mV]	Frequency Deviation (kHz)			FCC Limit [kHz]
	@ 300 Hz	@ 1kHz	@ 3 kHz	
1.0	0.167	0.325	0.517	5.0
4.0	0.534	1.346	1.867	5.0
8.0	1.286	2.342	2.267	5.0
12.0	1.867	3.654	2.339	5.0
16.0	2.231	4.325	2.355	5.0
20.0	2.762	4.334	2.356	5.0
24.0	2.798	4.345	2.357	5.0
28.0	2.875	4.359	2.355	5.0
32.0	2.967	4.405	2.358	5.0
36.0	3.105	4.467	2.359	5.0



Audio Frequency Response

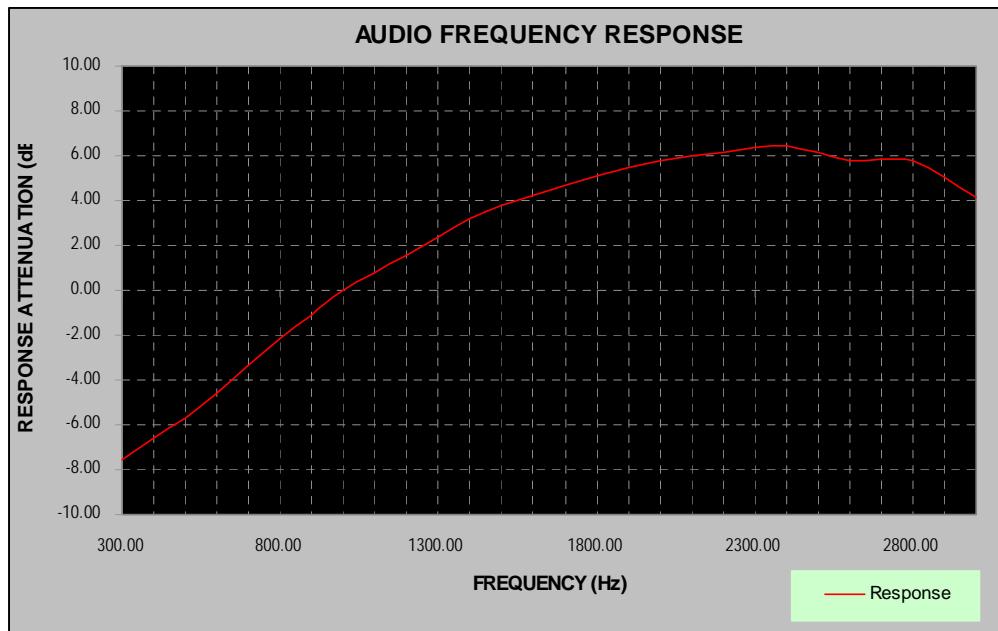
Carrier Frequency: 435.00 MHz, Channel Separation=12.5 kHz

Audio Frequency (Hz)	Response Attenuation (dB)
300	-7.54
400	-6.20
500	-5.51
600	-4.44
700	-3.10
800	-1.94
900	-0.93
1000	0.00
1200	1.58
1400	2.92
1600	4.08
1800	5.01
2000	5.58
2200	6.02
2400	6.28
2600	6.28
2800	6.02
3000	4.08



Carrier Frequency: 435.00 MHz, Channel Separation=25.0 kHz

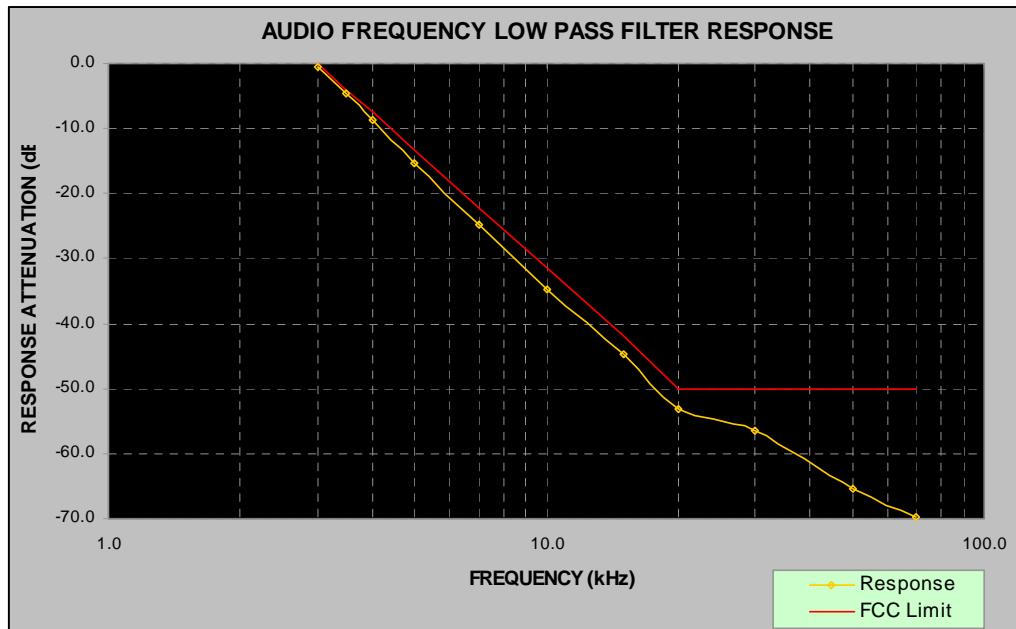
Audio Frequency (Hz)	Response Attenuation (dB)
300	-7.54
400	-6.56
500	-5.68
600	-4.58
700	-3.35
800	-2.16
900	-1.11
1000	0.00
1200	1.58
1400	3.17
1600	4.19
1800	5.11
2000	5.80
2200	6.15
2400	6.44
2600	5.81
2800	5.80
3000	4.14



Audio Frequency Low Pass Filter Response

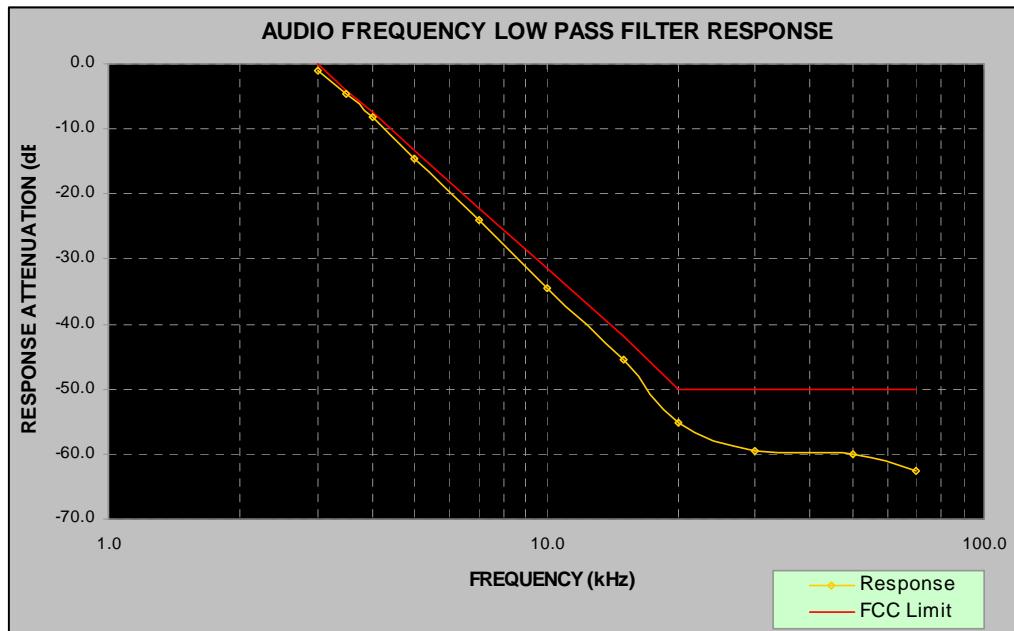
Carrier Frequency: 435.00 MHz, Channel Separation=12.5 kHz

Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
3.0	-0.5	0.0
3.5	-4.5	-4.0
4.0	-8.7	-7.5
5.0	-15.4	-13.3
7.0	-24.7	-22.1
10.0	-34.8	-31.4
15.0	-44.6	-42.0
20.0	-53.2	-50.0
30.0	-56.5	-50.0
50.0	-65.5	-50.0
70.0	-69.8	-50.0



Carrier Frequency: 435.00 MHz, Channel Separation=25.0 kHz

Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
3.0	-0.9	0.0
3.5	-4.6	-4.0
4.0	-8.1	-7.5
5.0	-14.5	-13.3
7.0	-24.1	-22.1
10.0	-34.4	-31.4
15.0	-45.5	-42.0
20.0	-55.1	-50.0
30.0	-59.5	-50.0
50.0	-60.1	-50.0
70.0	-62.7	-50.0



FCC §2.1049, §90.209 & §90.210 – OCCUPIED BANDWIDTH & EMISSION MASK

Applicable Standard

FCC §2.1049, §90.209 and §90.210

Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- 1) For any frequency removed from the center of the authorized bandwidth f_0 to 5.625 KHz removed from f_0 , 0dB.
- 2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625kHz but no more than 12.5kHz, at least 7.27 ($f_d - 2.88\text{kHz}$) dB.
- 3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5kHz at least:

$$50 + 10\log P = 50 + 10\log(1.574) = 51.97\text{dB}$$

Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

- 1) For any frequency removed from the center of the assigned channel by more than 50 percent up to and including 100 percent of the authorized bandwidth, at least 25 dB.
- 2) On any frequency removed from the center of the assigned channel by more than 100 percent up to and including 250 percent, at least 35 dB.
- 3) On any frequency removed from the center of the assigned channel by more than 250 percent at least:

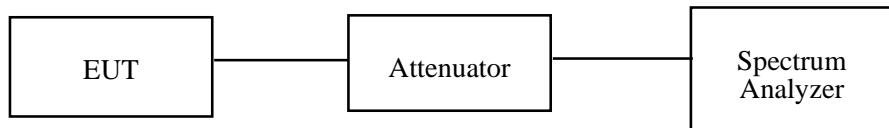
$$43 + 10\log P = 43 + 10\log(1.622) = 45.10\text{dB}$$

The resolution bandwidth was 300Hz or greater for measuring up to 250kHz from the edge of the authorized frequency segment, and 30kHz or greater for measuring more than 250kHz from the authorized frequency segment.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 300 Hz and the spectrum was recorded in the frequency band ± 50 kHz from the carrier frequency.



Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-24	2010-11-24
HP	Modulation Analyzer	8901B	3438A05208	2010-03-03	2011-03-02
NANYAN	Audio Generator	NY2201	019829	2009-12-23	2010-12-23

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.1 kPa

The testing was performed by Alvin Huang on 2010-05-02.

Emission Designator

According to FCC §2.201 & §2.202, Bn=2M + 2DK

1) 435 MHz, Channel spacing =12.5 kHz

Bn=2M + 2DK

Where M = 3000, D = 2500 kHz, K = 1

Bn =2*(3000) + 2*(2500) = 11 kHz

Emission Designator: 11K0F3E

2) 435 MHz, Channel spacing =25 kHz

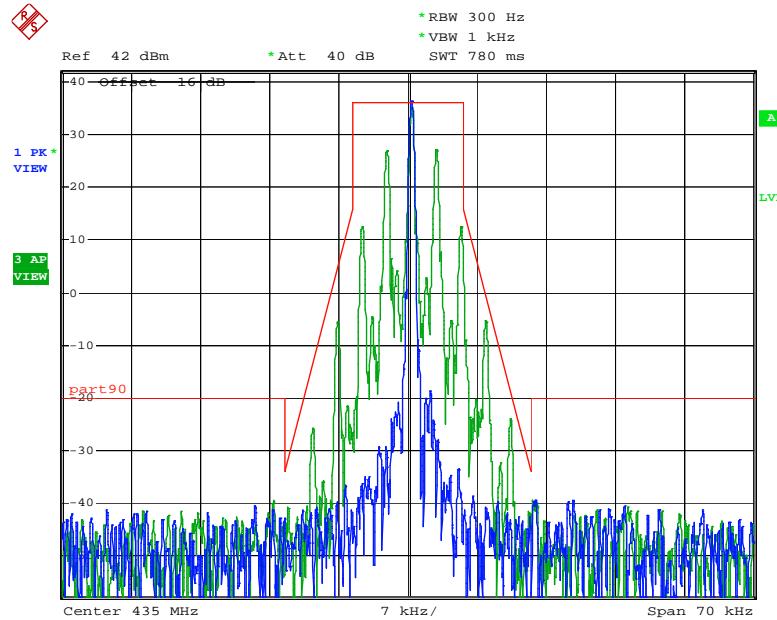
Bn=2M + 2DK

Where M = 3000, D = 5000 kHz, K = 1

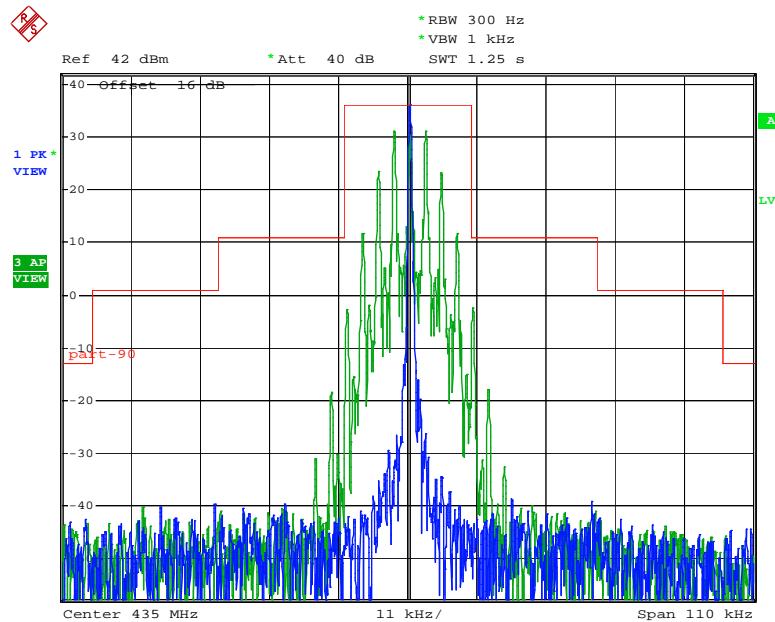
Bn =2*(3000) + 2*(5000) = 16 kHz

Emission Designator: 16K0F3E

Please refer to the emission mask hereinafter plots.

Emission Mask D, 12.5 kHz Channel Spacing (Middle Channel)

Date: 2.MAY.2010 01:47:20

Emission Mask B, 25.0 kHz Channel Spacing (Middle Channel)

Date: 2.MAY.2010 01:49:48

FCC §2.1051 & §90.210 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- 1) For any frequency removed from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 , 0 dB.
- 2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.626 kHz but no more than 12.5 kHz, at least 7.27 (f_d - 2.88 kHz) dB.
- 3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz at least:

$$50 + 10 \log P = 50 + 10 \log (P) \text{ dB}$$

Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

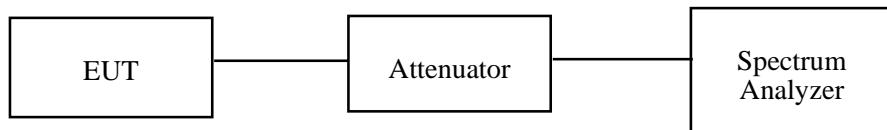
- 1) For any frequency removed from the center of the assigned channel by more than 50 percent up to and including 100 percent of the authorized bandwidth, at least 25 dB.
- 2) On any frequency removed from the center of the assigned channel by more than 100 percent up to and including 250 percent, at least 35 dB.
- 3) On any frequency removed from the center of the assigned channel by more than 250 percent at least:

$$43 + 10 \log P = 43 + 10 \log (P) \text{ dB}$$

The resolution bandwidth was 300 Hz or greater for measuring up to 250 kHz from the edge of the authorized frequency segment, and 30 kHz or greater for measuring more than 250 kHz from the authorized frequency segment.

Test Procedure

The RF output of the Walkie Talkie was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-08
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-24	2010-11-23

* **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 Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.1 kPa

The testing was performed by Alvin Huang on 2010-05-07.

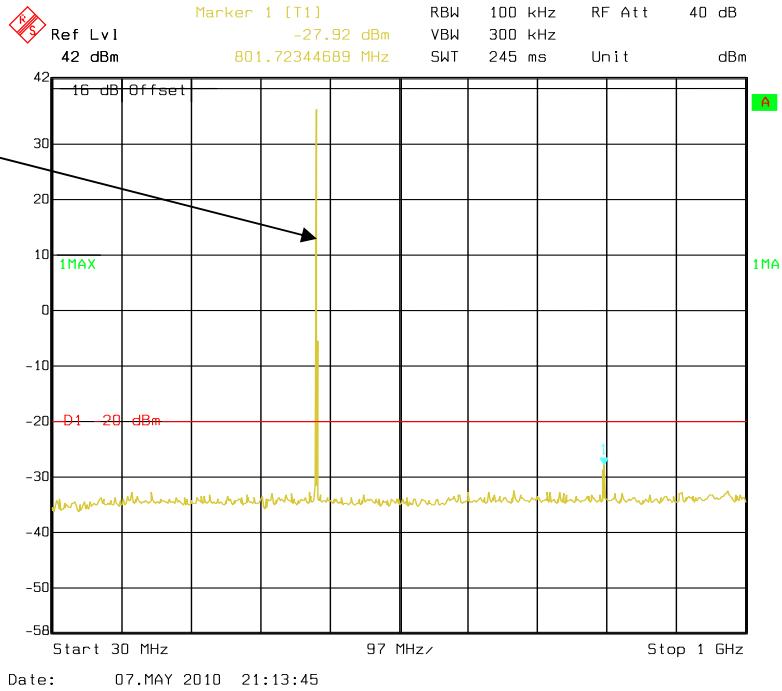
Please refer to the following plots.

Test Mode: Transmitting

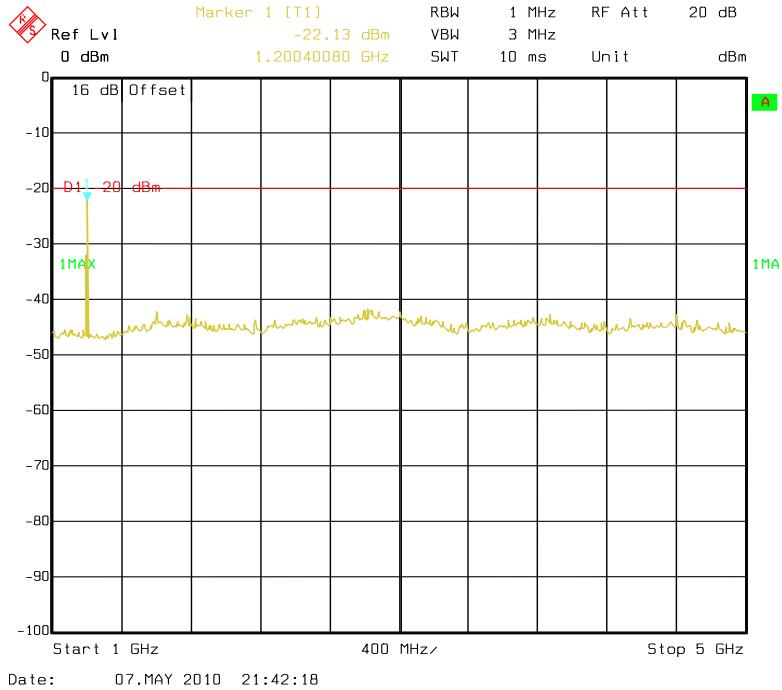
12.5 kHz Channel Spacing, Low Channel

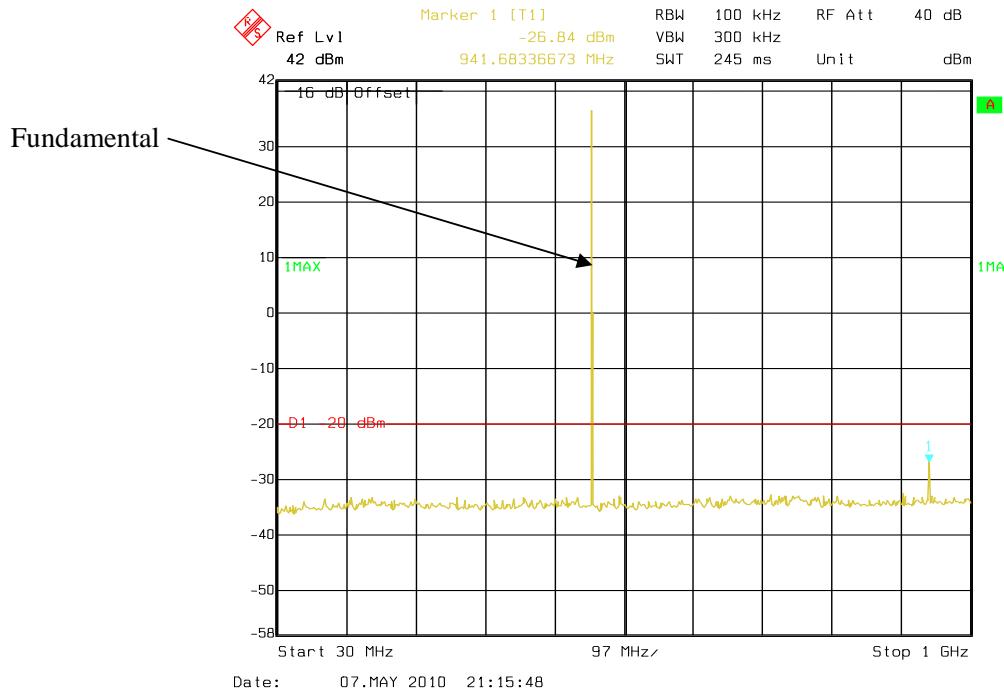
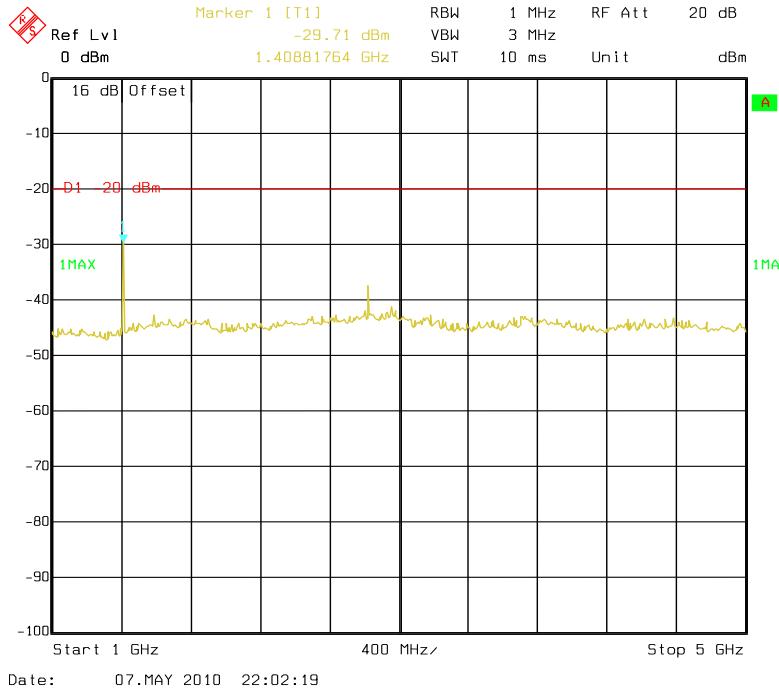
30 MHz - 1 GHz

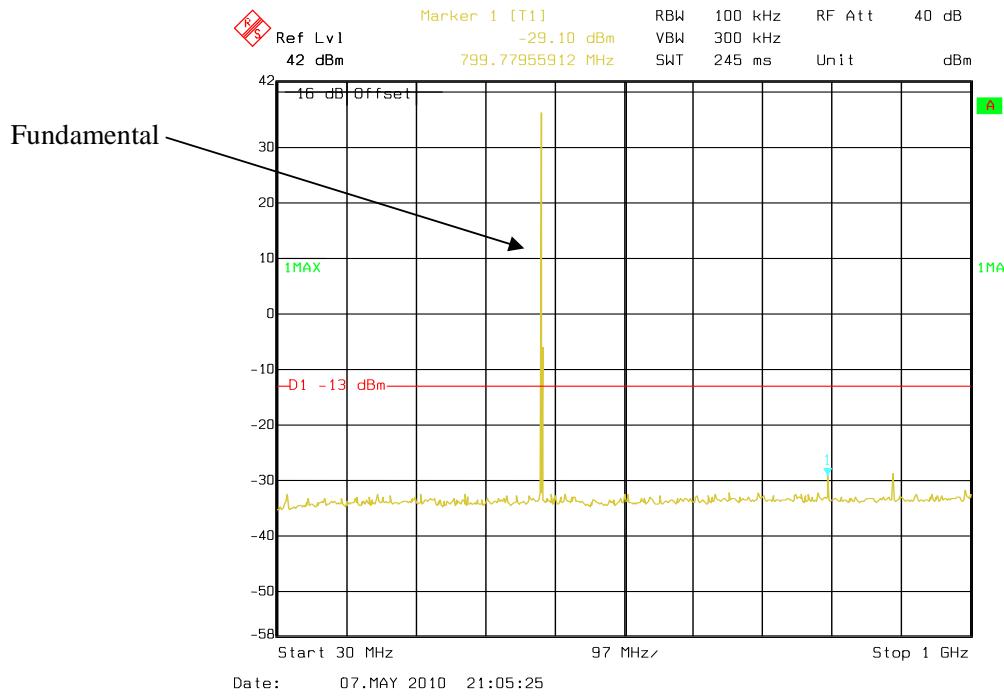
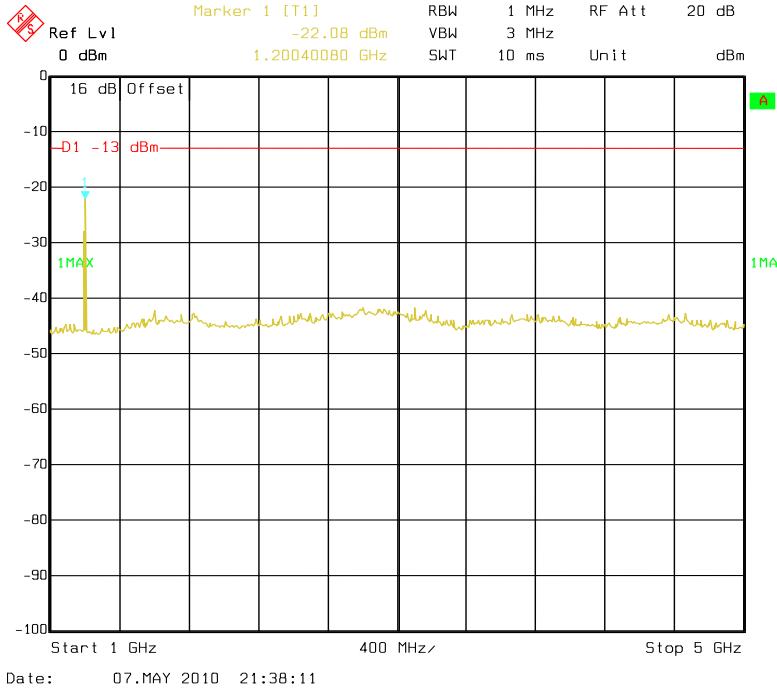
Fundamental



1 - 5 GHz

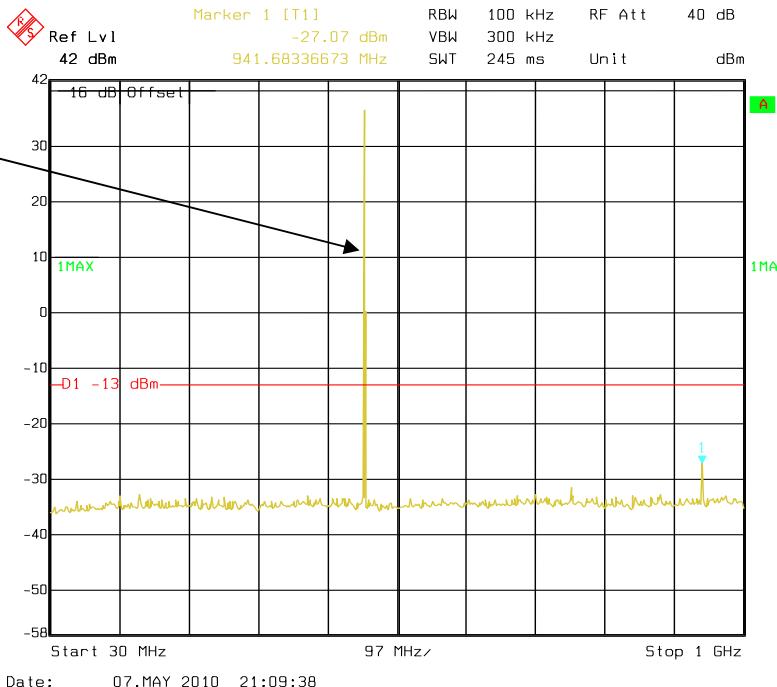
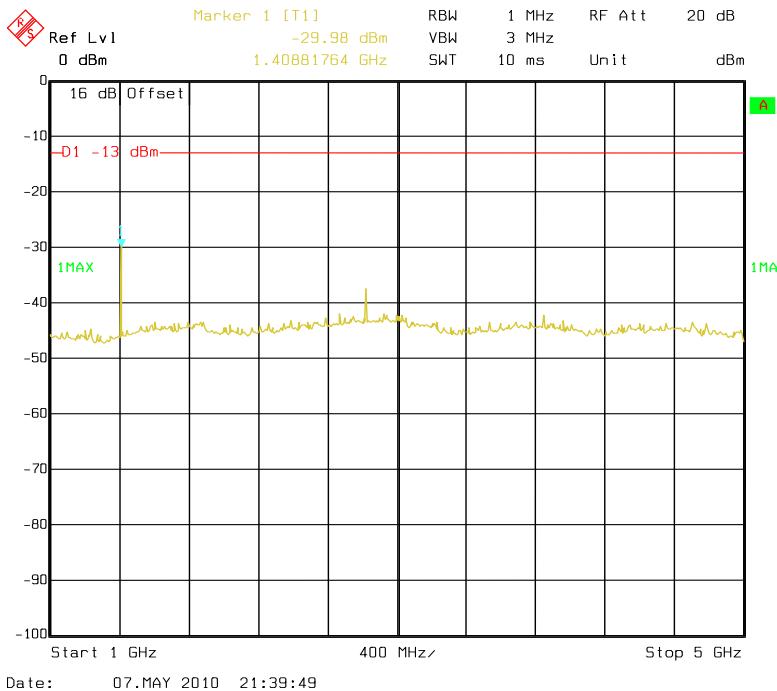


12.5 kHz Channel Spacing, High Channel**30 MHz - 1 GHz****1 – 5 GHz**

25 kHz Channel Spacing, Low Channel**30 MHz - 1 GHz****1 - 5 GHz**

25 kHz Channel Spacing, High Channel**30 MHz – 1 GHz**

Fundamental

**1 – 5 GHz**

FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §2.1053 and §90.210

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \log_{10}(\text{TXpwr in Watts}/0.001)$ -the absolute level

Spurious attenuation limit in dB = $43 + 10 \log_{10}(\text{power out in Watts})$

Spurious attenuation limit in dB = $50 + 10 \log_{10}(\text{power out in Watts})$ for EUT with a 12.5 kHz channel bandwidth.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2009-05-05	2010-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-08
HP	Signal Generator	HP8657A	2849U00982	2009-10-28	2010-10-27
A.H. System	Horn Antenna	SAS-200/571	135	2009-05-17	2010-05-17
HP	Synthesized Sweeper	8341B	2624A00116	2010-03-03	2011-03-02

* **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 Results Summary

7.6 dB at 2400.15 MHz in the **Vertical** polarization (Low Channel, 12.5 kHz)
12.2 dB at 2819.85 MHz in the **Vertical** polarization (High Channel, 12.5 kHz)
15.6 dB at 2400.15 MHz in the **Vertical** polarization (Low Channel, 25 kHz)
18.3 dB at 2819.85 MHz in the **Vertical** polarization (High Channel, 25 kHz)

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.1 kPa

The testing was performed by Alvin Huang on 2010-05-01.

Indicated		Table Angle (Degree)	Test Antenna		Substituted					Absolute Level (dBm)	FCC Part 90	
Freq. (MHz)	S.A. Amp. (dB μ V/m)		Height (m)	Polar (H/V)	Freq. (MHz)	Level (dBm)	Ant. Polar (H/V)	Ant. Gain Cord. (dB)	Cable Loss (dB)		Limit (dBm)	Margin (dB)
Low Channel, f=400.025 MHz (12.5 kHz Channel Spacing)												
2400.15	62.18	284	1.12	V	2400.15	-33.8	V	7.4	1.2	-27.6	-20	7.6
2400.15	57.28	360	1.97	H	2400.15	-42.7	H	7.4	1.2	-36.5	-20	16.5
1200.075	53.25	167	1.25	V	1200.075	-47.8	V	6.3	0.8	-42.3	-20	22.3
1200.075	47.52	76	1.36	H	1200.075	-49.7	H	6.3	0.8	-44.2	-20	24.2
800.05	41.00	256	1.16	V	800.05	-54.3	V	0	0.7	-55.0	-20	35.0
800.05	36.79	164	1.98	H	800.05	-58.3	H	0	0.7	-59.0	-20	39.0
High Channel, f= 469.975 MHz (12.5 kHz Channel Spacing)												
2819.85	57.94	146	1.35	V	2819.85	-38.2	V	7.3	1.3	-32.2	-20	12.2
1409.925	56.35	169	1.32	V	1409.925	-44.6	V	6.4	0.9	-39.1	-20	19.1
939.95	54.66	95	1.32	V	939.95	-40.2	V	0	0.7	-40.9	-20	20.9
2819.85	52.03	176	1.76	H	2819.85	-48.0	H	7.3	1.3	-42.0	-20	22.0
939.95	52.48	247	1.13	H	939.95	-42.1	H	0	0.7	-42.8	-20	22.8
1879.9	46.15	175	1.12	V	1879.9	-49.8	V	6.1	1.0	-44.7	-20	24.7
1409.925	46.10	165	1.97	H	1409.925	-52.8	H	6.4	0.9	-47.3	-20	27.3
2349.875	43.56	125	1.86	H	2349.875	-57.3	H	7.4	1.2	-51.1	-20	31.1
Low Channel, f=400.025 MHz (25 kHz Channel Spacing)												
2400.15	61.29	102	1.26	V	2400.15	-34.8	V	7.4	1.2	-28.6	-13	15.6
2800.175	54.79	175	1.75	H	2800.175	-45.2	H	7.3	1.3	-39.2	-13	26.2
1200.075	53.26	105	1.65	V	1200.075	-47.8	V	6.3	0.8	-42.3	-13	29.3
1200.075	47.13	91	1.97	H	1200.075	-50.1	H	6.3	0.8	-44.6	-13	31.6
1600.1	49.56	186	1.46	V	1600.1	-50.5	V	6.2	1.0	-45.3	-13	32.3
2400.15	46.98	198	1.86	H	2400.15	-53.2	H	7.4	1.2	-47.0	-13	34.0
800.05	41.84	346	1.30	V	800.05	-53.5	V	0	0.7	-54.2	-13	41.2
800.05	37.79	125	1.65	H	800.05	-57.3	H	0	0.7	-58.0	-13	45.0
High Channel, f= 469.975 MHz (25 kHz Channel Spacing)												
2819.85	58.76	355	1.44	V	2819.85	-37.3	V	7.3	1.3	-31.3	-13	18.3
1409.925	56.97	206	1.45	V	1409.925	-44.1	V	6.4	0.9	-38.6	-13	25.6
939.95	55.04	312	1.35	V	939.95	-39.8	V	0	0.7	-40.5	-13	27.5
939.95	53.47	50	1.96	H	939.95	-41.0	H	0	0.7	-41.7	-13	28.7
2819.85	51.33	178	1.85	H	2819.85	-48.7	H	7.3	1.3	-42.7	-13	29.7
1879.9	47.16	360	1.35	V	1879.9	-48.8	V	6.1	1.0	-43.7	-13	30.7
1409.925	47.15	16	1.67	H	1409.925	-51.8	H	6.4	0.9	-46.3	-13	33.3
2349.875	43.75	196	1.86	H	2349.875	-57.1	H	7.4	1.2	-50.9	-13	37.9

FCC §2.1055 & §90.213- FREQUENCY STABILITY

Applicable Standard

FCC §2.1055& §90.213

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to an f Spectrum Analyzer via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

The frequency stability shall be measured with variation of primary supply voltage as follows:

- (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
WUHUAN	Temperature & Humidity Chamber	HTP205	20021115	2009-05-09	2010-05-09
Hewlett-Packard	Frequency Counter	5342A	2317A08289	2010-04-22	2011-04-22

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.1 kPa

The testing was performed by Alvin Huang on 2010-05-07.

Test Mode: Transmitting

1) 12.5 kHz Channel Spacing

Reference Frequency: 435.00 MHz, Limit: 2.5 ppm			
Test Environment		Frequency Measure with Time Elapsed	
Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (MHz)	Frequency Error (ppm)
Frequency Stability versus Input Temperature			
50	7.4	435.000381	0.875862
40	7.4	435.000378	0.868966
30	7.4	435.000382	0.878161
20	7.4	435.000388	0.891954
10	7.4	435.000380	0.873563
0	7.4	435.000381	0.875862
-10	7.4	435.000379	0.871264
-20	7.4	435.000386	0.887356
-30	7.4	435.000384	0.882759
Frequency Stability versus Input Voltage			
25	6.5	435.000384	0.882759

2) 25 kHz Channel Spacing

Reference Frequency: 435.00 MHz, Limit: 5 ppm			
Test Environment		Frequency Measure with Time Elapsed	
Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (MHz)	Frequency Error (ppm)
Frequency Stability versus Input Temperature			
50	7.4	435.000385	0.885057
40	7.4	435.000381	0.875862
30	7.4	435.000386	0.887356
20	7.4	435.000387	0.889655
10	7.4	435.000379	0.871264
0	7.4	435.000386	0.887356
-10	7.4	435.000379	0.871264
-20	7.4	435.000386	0.887356
-30	7.4	435.000381	0.875862
Frequency Stability versus Input Voltage			
25	6.5	435.000384	0.882759

FCC §90.214 - TRANSIENT FREQUENCY BEHAVIOR

Applicable Standard

FCC §90.214

Test Procedure

TIA/EIA-603 2.2.19

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
TEKTRONIX	Digital Phosphor Oscilloscope	TDS 7104	B020518	2010-03-03	2011-03-02
HP	Modulation Analyzer	8901B	3438A05208	2010-03-03	2011-03-02
HP	Signal Generator	HP8657A	2849U00982	2009-10-28	2010-10-27

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.1 kPa

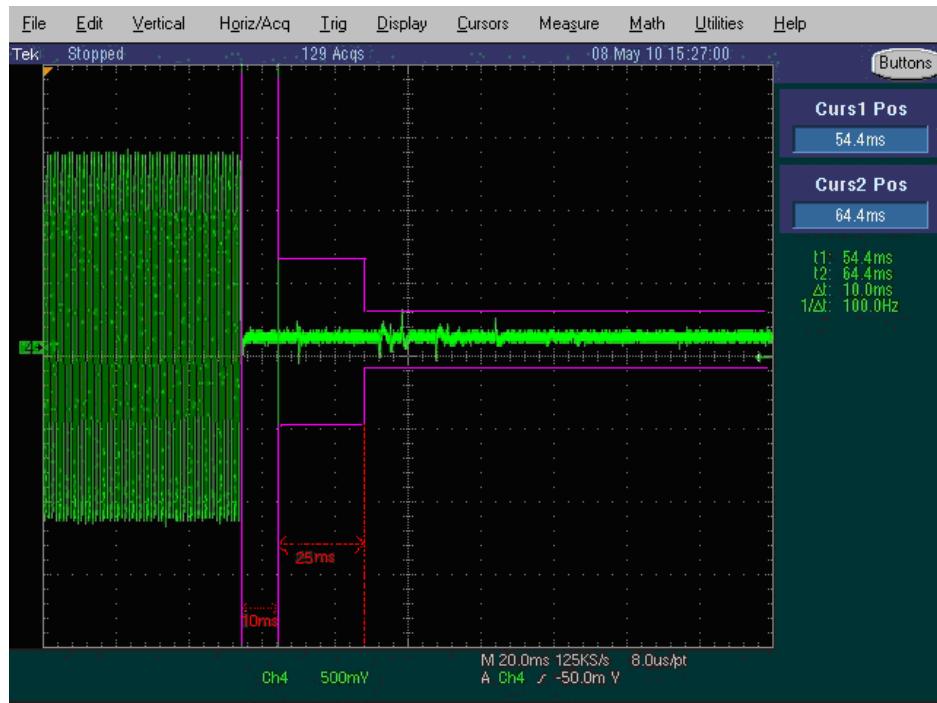
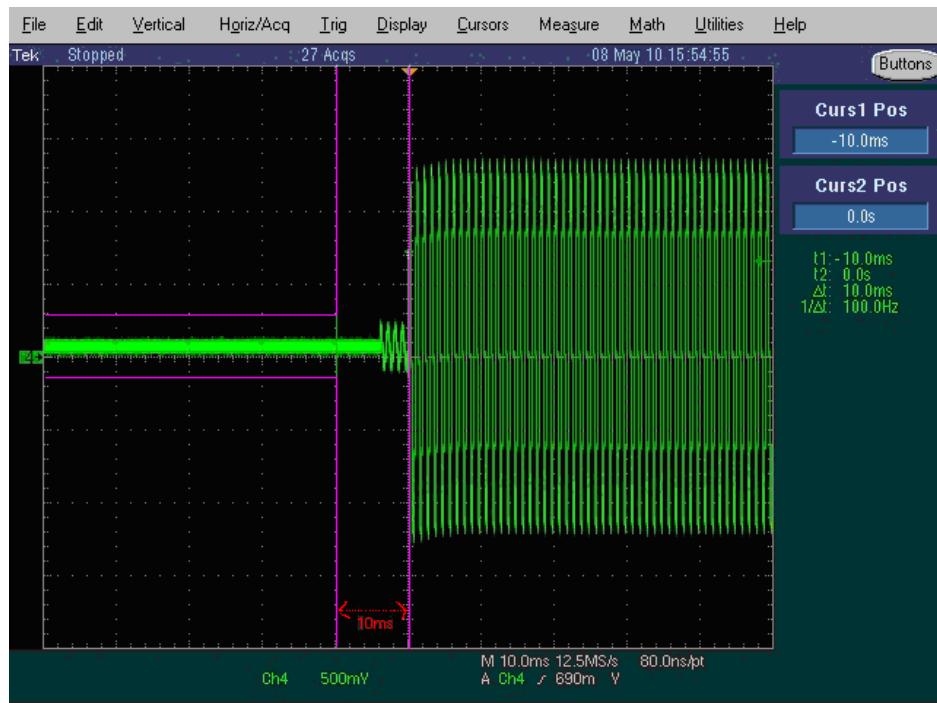
The testing was performed by Alvin Huang on 2010-05-08.

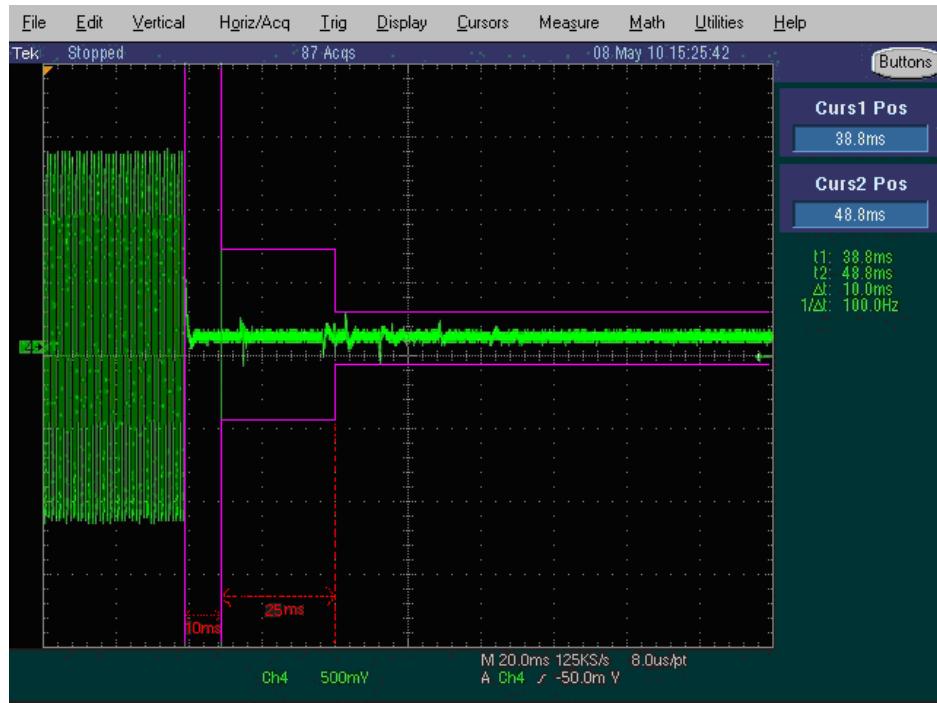
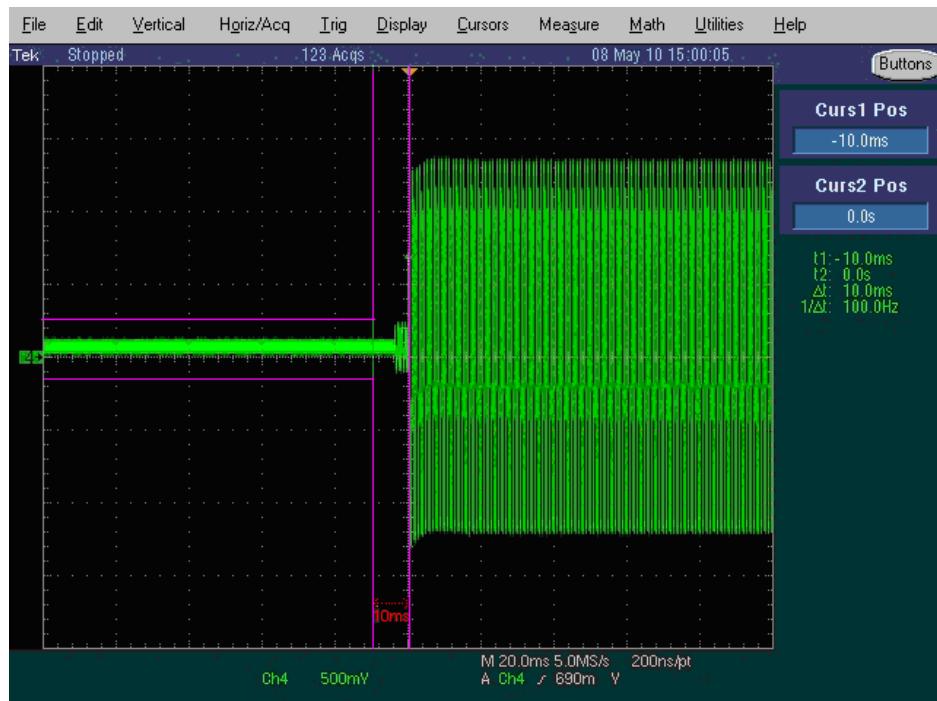
Test Mode: Transmitting

For 12.5 kHz Channel Spacing:

Channel Separation (kHz)	Operation Frequency (MHz)	Transient Period (ms)	Transient Frequency	Result
12.5	435.00	< 10	+/-12.5 kHz	Pass
		< 25	+/-6.25 kHz	
		< 10	+/-12.5 kHz	
25.0	435.00	< 10	+/-25.0 kHz	Pass
		< 25	+/-12.5 kHz	
		< 10	+/-25.0 kHz	

Please refer to the following plots.

Turn on (12.5 kHz Channel Spacing)**Turn off (12.5 kHz Cahnnel Spacing)**

Turn on (25 kHz Channel Spacing)**Turn off (25 kHz Channel Spacing)**

***** End of Report *****