NVLAP LAB CODE 200167-0

FCC PART 90 TYPE APPROVAL

EMI MEASUREMENT AND TEST REPORT

For

Quantun Electronics, LLC

1379 Shotgun Road, Sunrise, Florida 33326, USA.

FCC ID: XMHQP-250U

Report Type:	**Product Type:**
Original Report	Walkie Talkie

Test Engineer:	Alvin Huang
Report Number:	RSZ09082604
Report Date:	2009-09-22
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

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 "*".

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Quantun Electronics, LLC's* product, model number: *QP-250(U)(FCC ID: XMHQP-250U)*or the "EUT" as referred to in this report is a *Walkie Talkie* that operates in the frequency band 450~470 MHz and with two channel spacing of 12.5 kHz (narrow-band)/25 kHz (wide-band). The EUT is measured approximately 4.7 cm L x 3.1 cm W x 15.5 cm H, powered by 3.7 VDC battery.

** All measurement and test data in this report was gathered from production sample serial number: 0908040 (Assigned by BACL, Shenzhen). The EUT was received on 2009-08-26.*

Objective

This Type approval report is prepared on behalf of *Quantun Electronics, LLC* 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).

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 modifications were made to the unit tested.

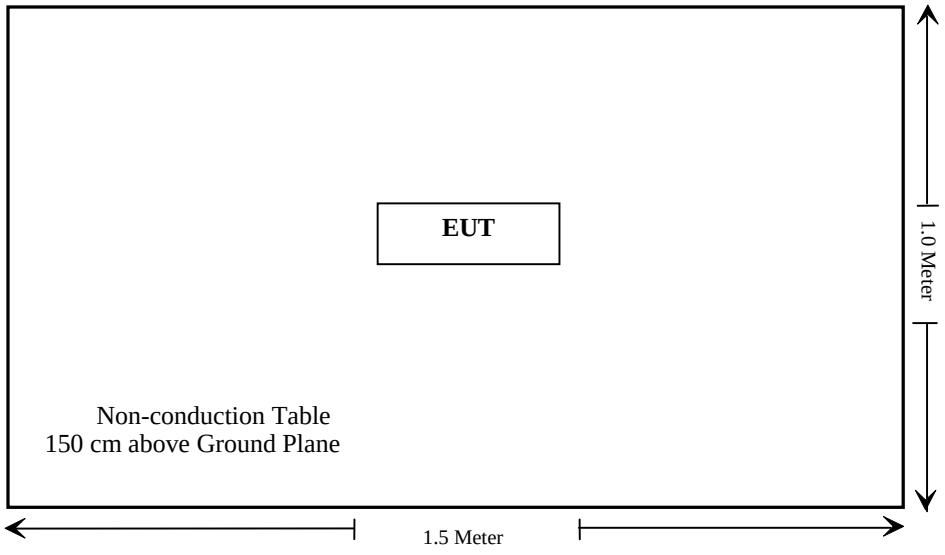
Configuration of Test Setup

Lie

Side

Stand

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: R0909097-SAR.
**Within measurement uncertainty

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 rountine environmental evaluation for RF exposure prior or equipment authorization or use.

Result: Compliance.

Please refer to SAR Report Number: R0909097-SAR.

FCC §2.1046 & §90.205- RF OUTPUT POWER

Applicable Standard

CFR47 §2.1046 and §90.205.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-08-14	2010-08-14
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2009-08-14	2010-08-14
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-05-09	2010-05-09
HP	Signal Generator	HP8657A	2849U00982	2008-10-16	2009-10-16

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

Test Procedure

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*

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 Data

Environmental Conditions

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

The testing was performed by Alvin Huang on 2009-09-05.

Test Mode: Transmitting

Test Result: Compliance.

Please refer to following table and plots

Antenna Port Conducted Output Power:

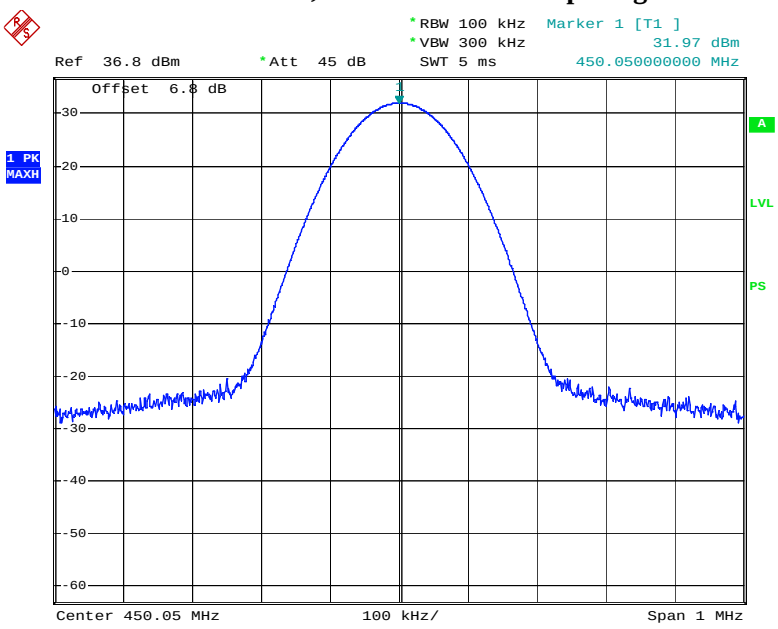
Channel Spacing (kHz)	Frequency Channel	Frequency (MHz)	Output Power (dBm)	Output Power (Watt)	Rated Power (Watt)
25	Low	450.125	32.10	1.622	2.0
25	Middle	460.125	31.99	1.581	2.0
25	High	469.125	31.76	1.500	2.0
12.5	Low	450.050	31.97	1.574	2.0
12.5	Middle	460.050	31.95	1.567	2.0
12.5	High	469.050	31.87	1.538	2.0

Effective Radiated Power (ERP)

Indicated		Table	Test Antenna		Substituted					Absolute Level (dBm)	Output Power (Watt)
Freq. (MHz)	S.A. Amp. (dBµV)	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											
450.050	107.46	360	1.3	V	450.050	31.0	V	0	0.7	30.3	1.07
450.050	98.56	27	1.2	H	450.050	19.1	H	0	0.7	18.4	0.07
460.050	107.51	10	1.3	V	460.050	31.1	V	0	0.7	30.4	1.10
460.050	98.02	360	1.5	H	460.050	18.6	H	0	0.7	17.9	0.06
469.050	107.86	90	1.6	V	469.050	31.1	V	0	0.7	30.4	1.10
469.050	98.67	79	1.8	H	469.050	19.0	H	0	0.7	18.3	0.07
25 kHz Channel Spacing											
450.125	107.23	263	1.2	V	450.125	30.8	V	0	0.7	30.1	1.02
450.125	98.35	102	1.3	H	450.125	18.8	H	0	0.7	18.1	0.06
460.125	107.39	50	1.5	V	460.125	31	V	0	0.7	30.3	1.07
460.125	98.67	87	1.6	H	460.125	19	H	0	0.7	18.3	0.07
469.125	108.12	156	1.2	V	469.125	31.2	V	0	0.7	30.5	1.12
469.125	99.02	32	1.3	H	469.125	19.4	H	0	0.7	18.7	0.07

Antenna Port Conducted Output Power:

Low Channe, 12.5 kHz Channel Spacing



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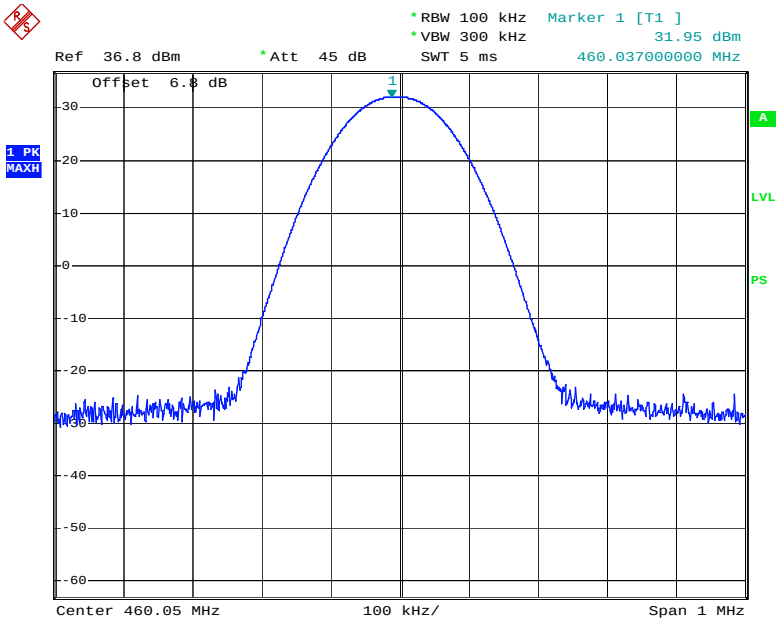
Middle Channel, 12.5 kHz Channel Spacing



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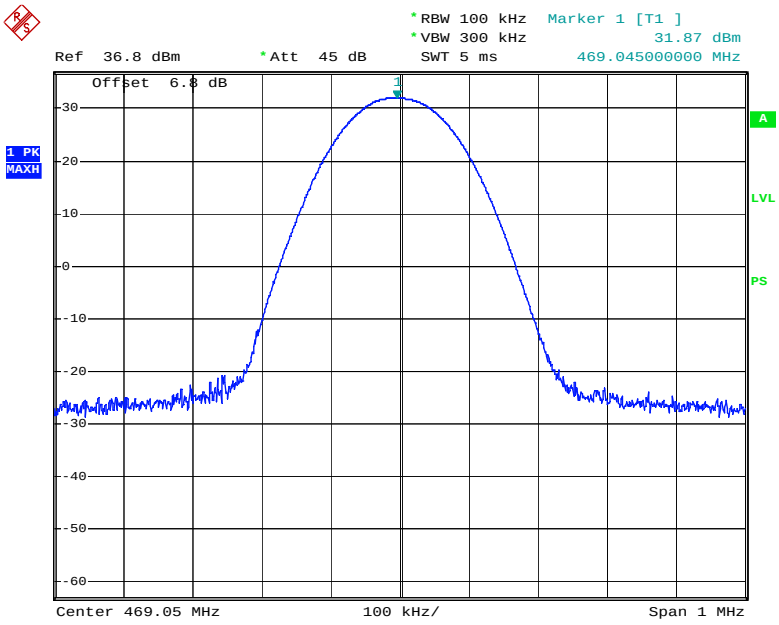
High Channel, 12.5 kHz Channel Spacing



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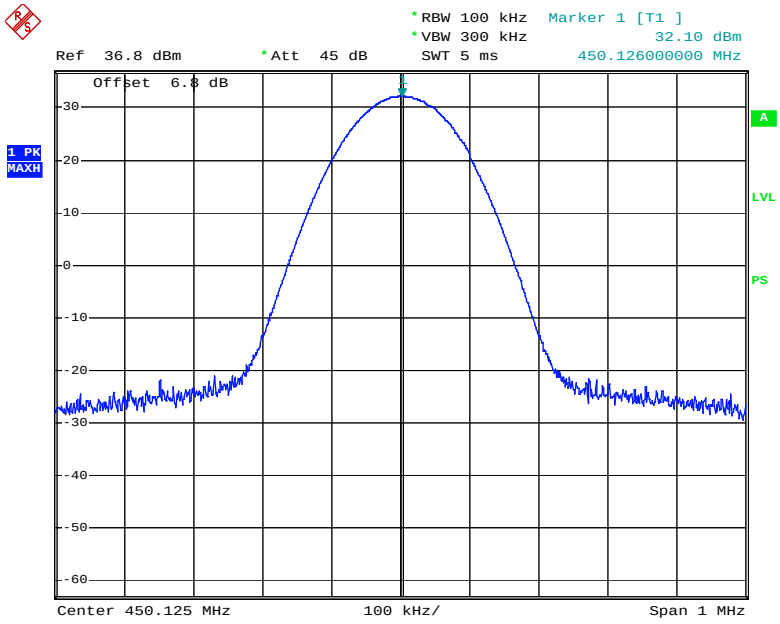
Low Channel, 25 kHz Channel Spacing



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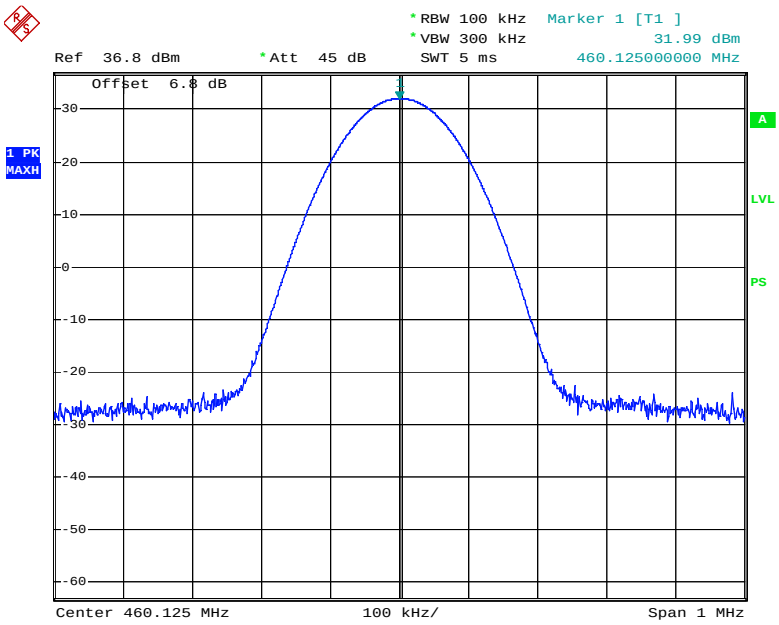
Middle Channel, 25 kHz Channel Spacing



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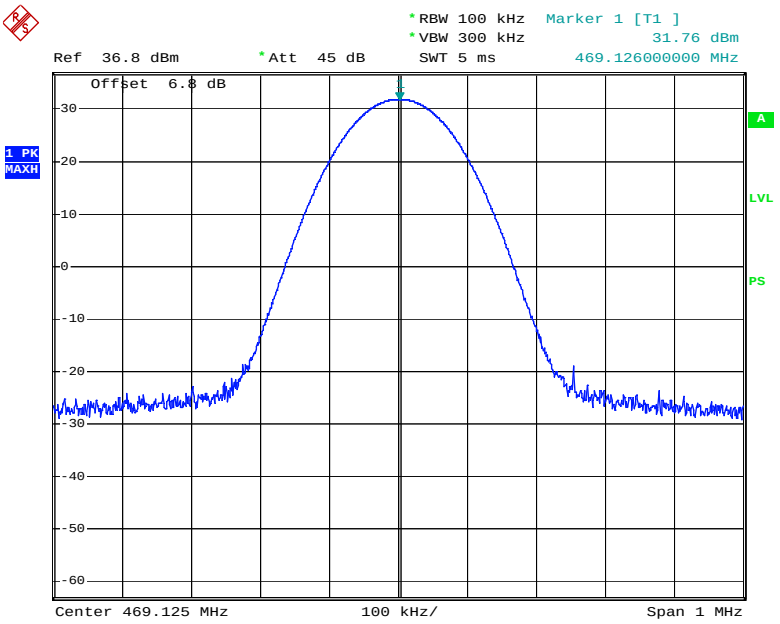
High Channel, 25 kHz Channel Spacing



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FCC §2.1047 & §90.207 - MODULATION CHARACTERISTIC

Applicable Standard

§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 Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
HP	Modulation Analyzer	8901B	3438A05208	2009-04-11	2010-04-11
NANYAN	Audio Generator	NY2201	019829	2008-12-23	2009-12-23

*** 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 Procedure

Test Method: TIA/EIA-603 2.2.3

Test Data

Environmental Conditions

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

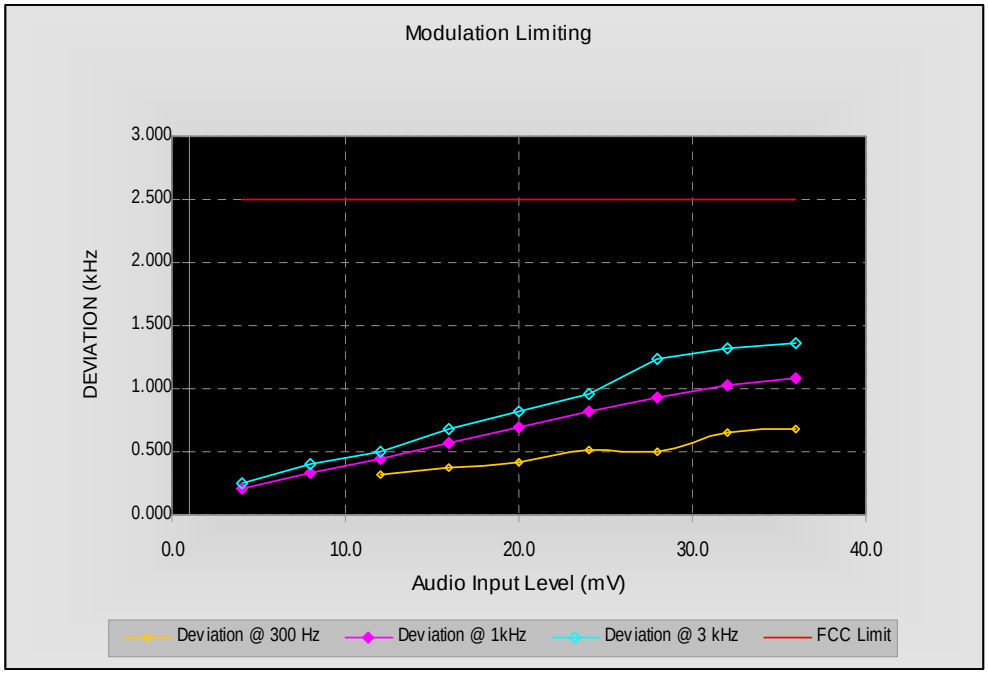
The testing was performed by Alvin Huang on 2009-09-17.

Test Mode: Transmitting

MODULATION LIMITING

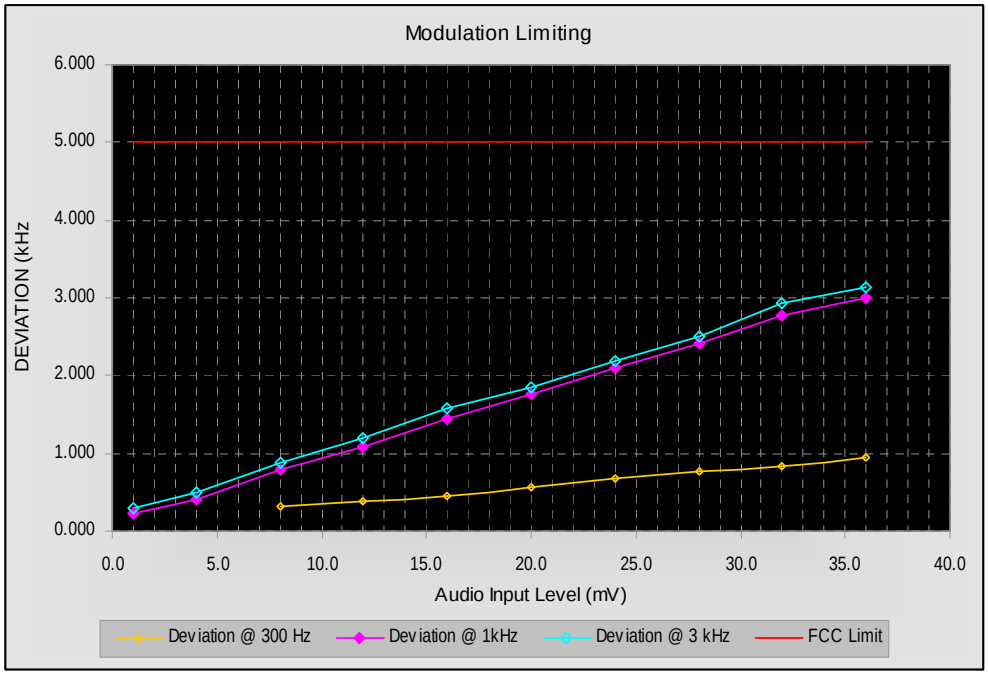
Carrier Frequency: 460.05 MHz, Channel Separation=12.5 kHz

Audio Input Level [mV]	Frequency Deviation (kHz)			FCC Limit [kHz]
	@ 300 Hz	@ 1kHz	@ 3 kHz	
1.0	/	/	/	/
4.0	/	0.211	0.253	2.5
8.0	/	0.334	0.402	2.5
12.0	0.315	0.445	0.506	2.5
16.0	0.379	0.564	0.678	2.5
20.0	0.415	0.697	0.825	2.5
24.0	0.519	0.825	0.953	2.5
28.0	0.505	0.937	1.234	2.5
32.0	0.657	1.021	1.323	2.5
36.0	0.685	1.085	1.357	2.5



Carrier Frequency: 460.125 MHz, Channel Separation=25.0 kHz

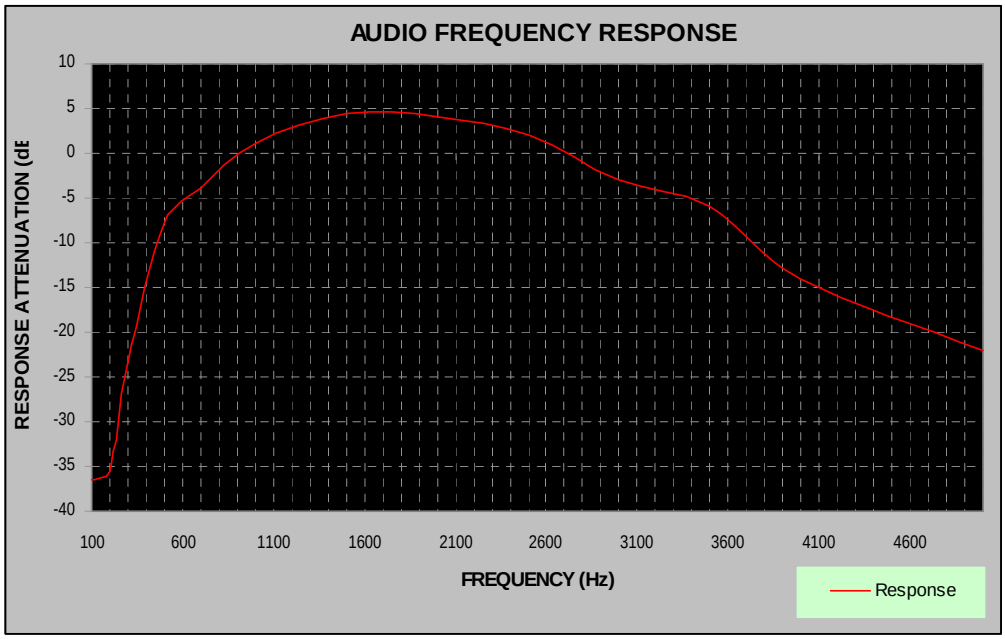
Audio Input Level [mV]	Frequency Deviation (kHz)			FCC Limit [kHz]
	@ 300 Hz	@ 1kHz	@ 3 kHz	
1.0	/	0.226	0.297	5.0
4.0	/	0.412	0.495	5.0
8.0	0.316	0.795	0.885	5.0
12.0	0.378	1.075	1.185	5.0
16.0	0.442	1.433	1.572	5.0
20.0	0.556	1.756	1.844	5.0
24.0	0.678	2.102	2.195	5.0
28.0	0.758	2.415	2.515	5.0
32.0	0.845	2.775	2.933	5.0
36.0	0.952	3.001	3.125	5.0



Audio Frequency Response

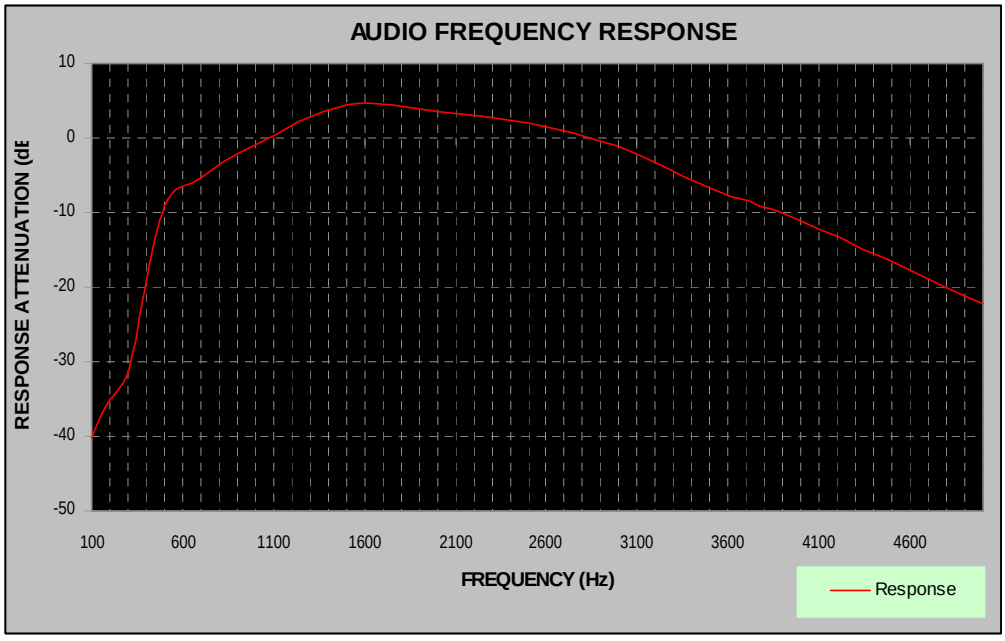
Carrier Frequency: 460.05 MHz, Channel Separation=12.5 kHz

Audio Frequency (Hz)	Response Attenuation (dB)
100	-36.5
200	-35.5
300	-23.4
500	-7.8
700	-3.9
1000	1.1
1500	4.5
2000	4
2500	2.1
3000	-3
3500	-6
4000	-14
5000	-22.1



Carrier Frequency: 460.1255 MHz, Channel Separation=25.0 kHz

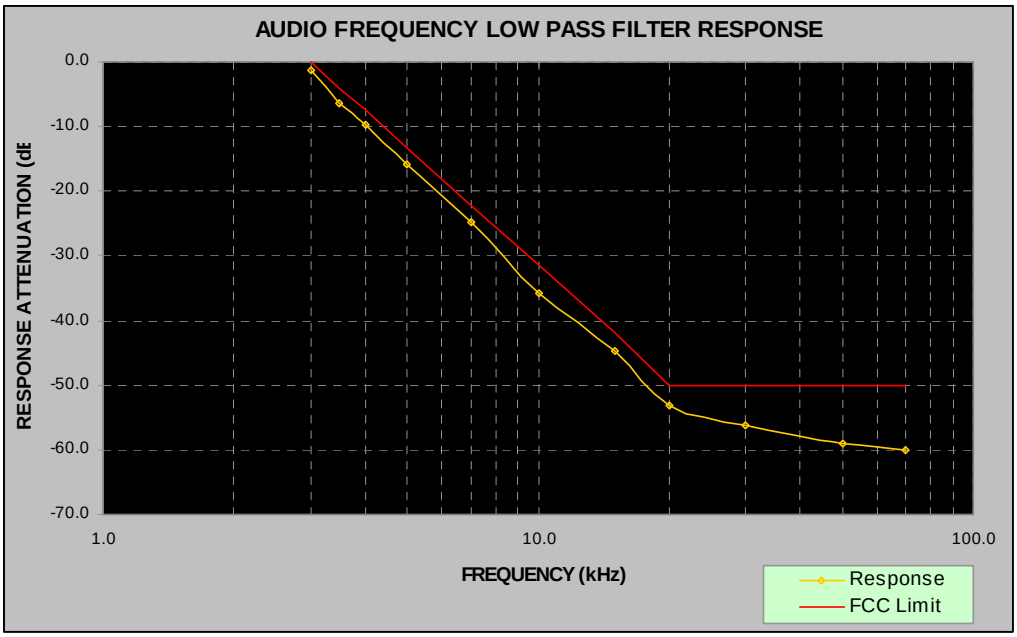
Audio Frequency (Hz)	Response Attenuation (dB)
100	-40.2
200	-35.2
300	-31.5
500	-9.1
700	-5.3
1000	-0.8
1500	4.5
2000	3.5
2500	2
3000	-1.2
3500	-6.6
4000	-11
5000	-22.2



Audio Frequency Low Pass Filter Response

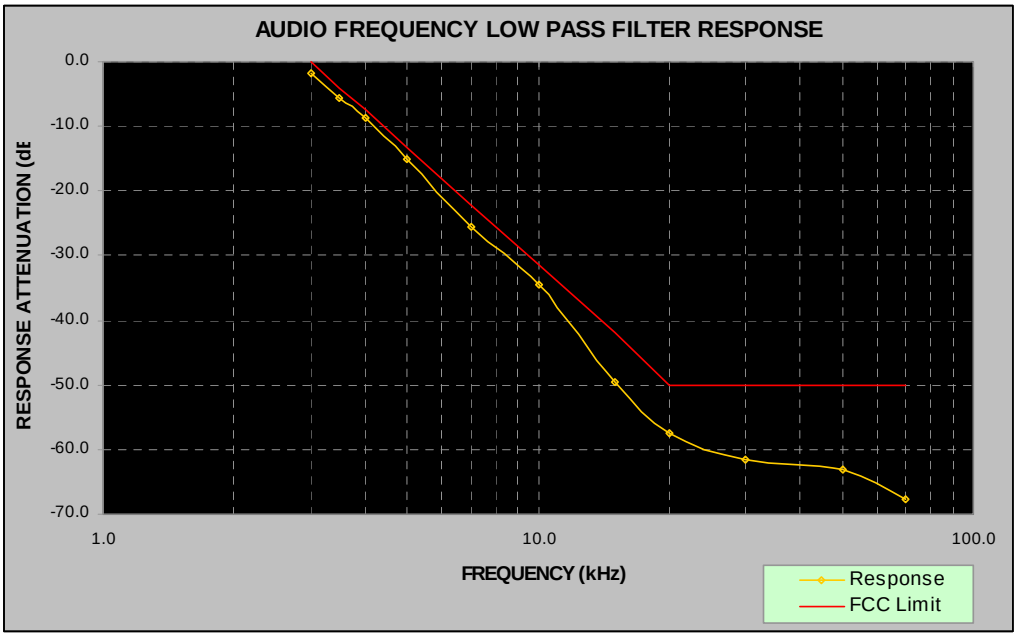
Carrier Frequency: 460.05 MHz, Channel Separation=12.5 kHz

Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
3.0	-1.3	0.0
3.5	-6.5	-4.0
4.0	-9.7	-7.5
5.0	-15.9	-13.3
7.0	-24.7	-22.1
10.0	-35.8	-31.4
15.0	-44.6	-42.0
20.0	-53.2	-50.0
30.0	-56.1	-50.0
50.0	-58.9	-50.0
70.0	-60.0	-50.0



Carrier Frequency: 460.125 MHz, Channel Separation=25.0 kHz

Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
3.0	-1.9	0.0
3.5	-5.5	-4.0
4.0	-8.8	-7.5
5.0	-15.1	-13.3
7.0	-25.6	-22.1
10.0	-34.4	-31.4
15.0	-49.5	-42.0
20.0	-57.6	-50.0
30.0	-61.5	-50.0
50.0	-63.1	-50.0
70.0	-67.7	-50.0



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

Applicable Standard

CFR47 §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 5.626kHz but no more than 12.5kHz, at least 7.27 (f_d –2.88kHz) 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+10logP=50+10log(1.574)=51.97dB

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+10logP=43+10log(1.622)=45.10dB

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 Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06
HP	Modulation Analyzer	8901B	3438A05208	2009-04-11	2010-04-11
NANYAN	Audio Generator	NY2201	019829	2008-12-23	2009-12-23

*** 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 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 Data

Environmental Conditions

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

The testing was performed by Alvin Huang on 2009-09-08 and 2009-09-12.

Emission Designator

According to CFR47 § 2.201 & § 2.202, Bn=2M + 2DK

1) 460.05 MHz, Channel spacing =12.5 kHz

Bn=2M + 2DK

Where M = 3000, *D* = 2.5 kHz, K = 1

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

Emission Designator: 11K0F3E

2) 460.125 MHz, Channel spacing =25 kHz

Bn=2M + 2DK

Where M = 3000, *D* = 5.0 kHz, K = 1

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

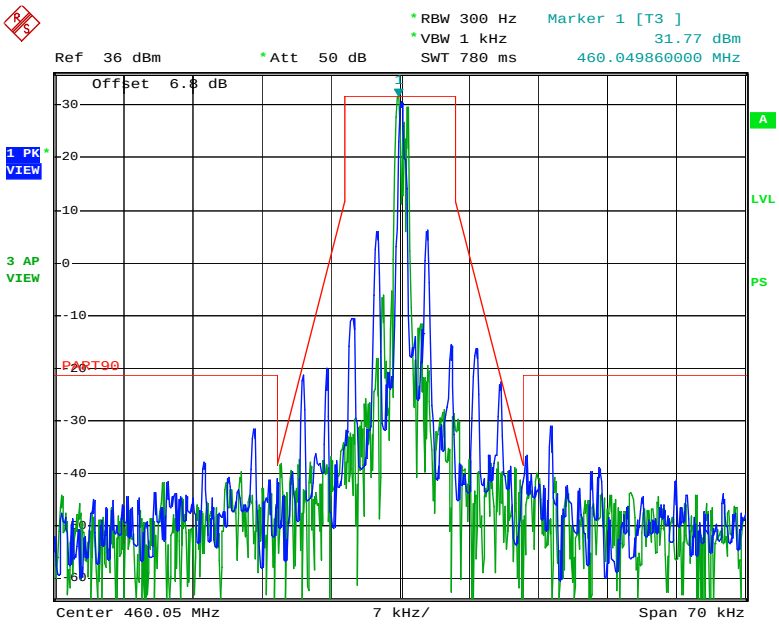
Emission Designator: 11K0F3E

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)



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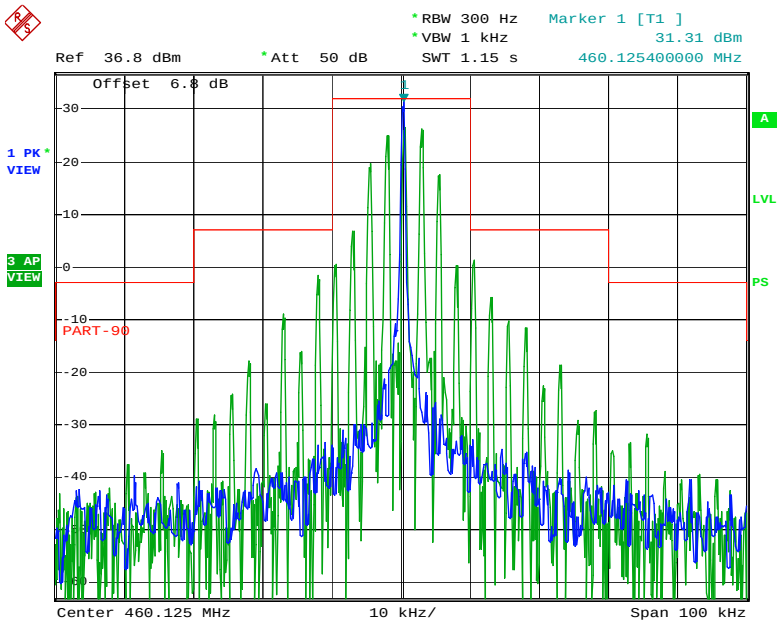
Emission Mask B, 25.0 kHz Channel Spacing (Middle Channel)



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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+10logP=50+10log (P) 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+10logP=43+10log (P) 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 Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-08-28	2010-08-27
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 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 Data

Environmental Conditions

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

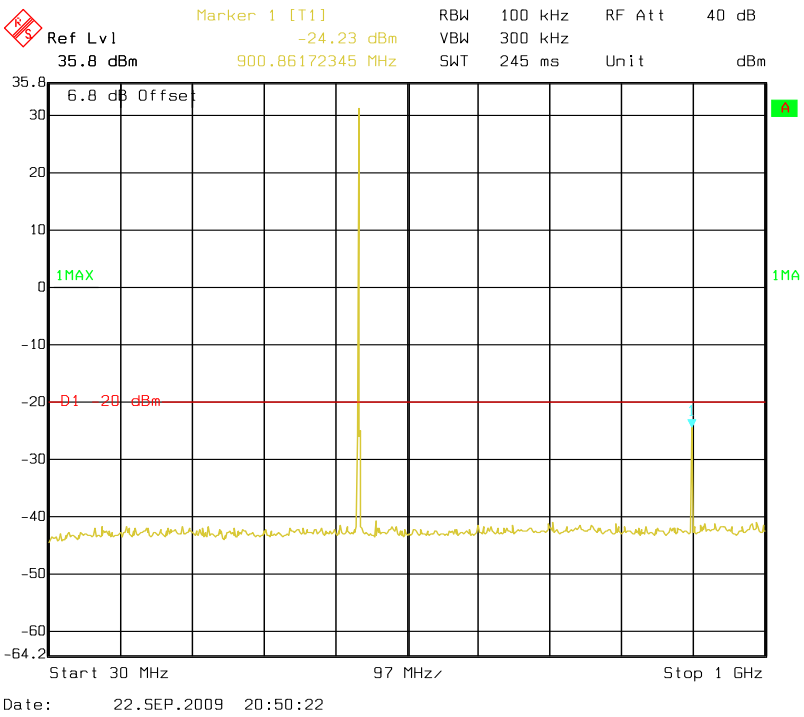
The testing was performed by Alvin Huang on 2009-09-22.

Please refer to the followingplots.

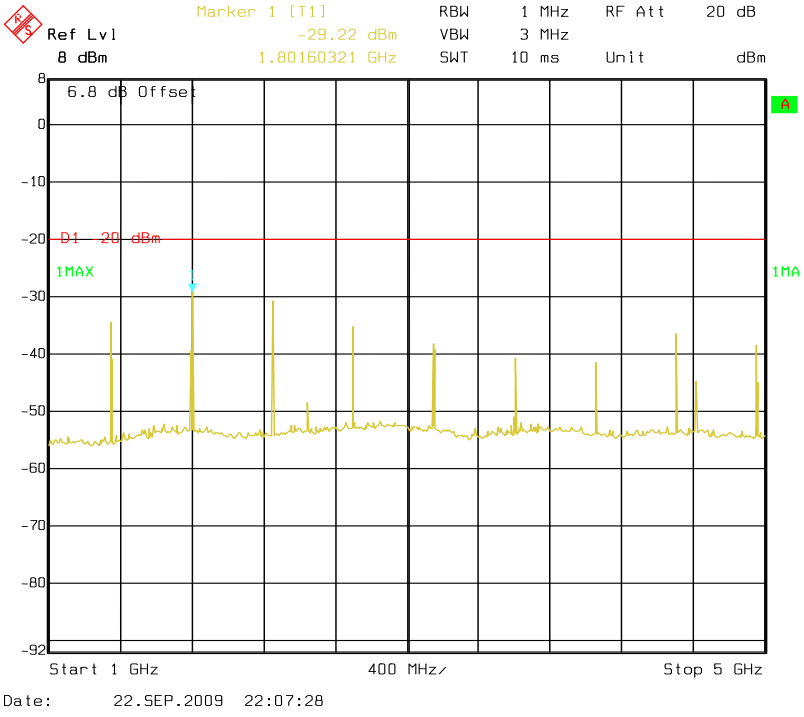
Test Mode: Transmitting

12.5 kHz Channel Spacing, Low Channel

30 MHz - 1 GHz

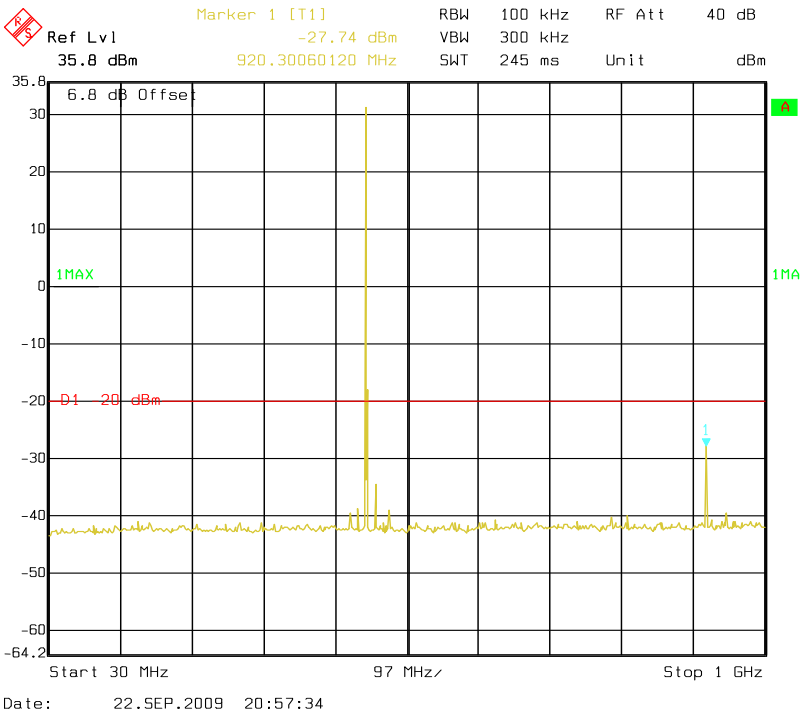


1 - 5 GHz

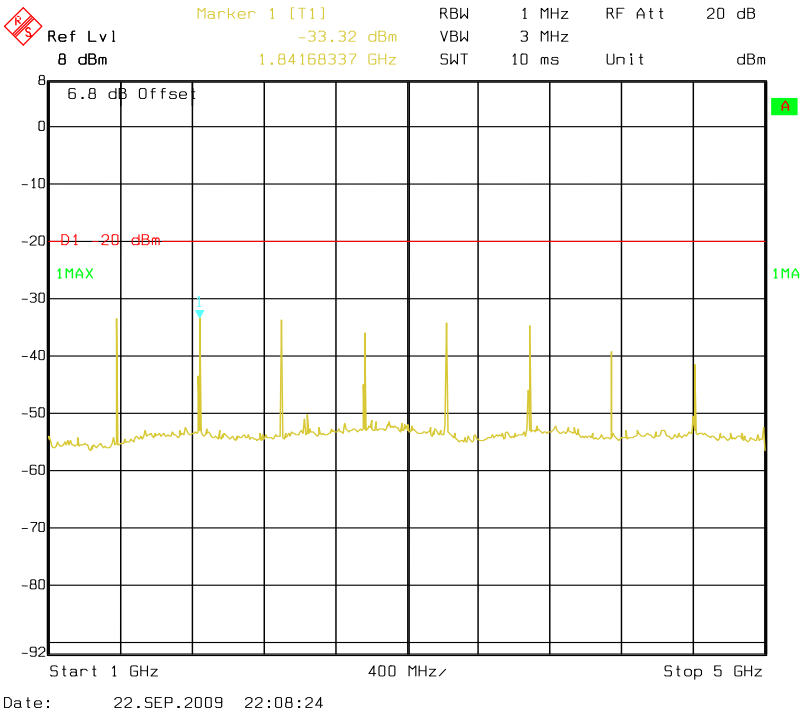


12.5 kHz Channel Spacing, Middle Channel

30 MHz - 1 GHz

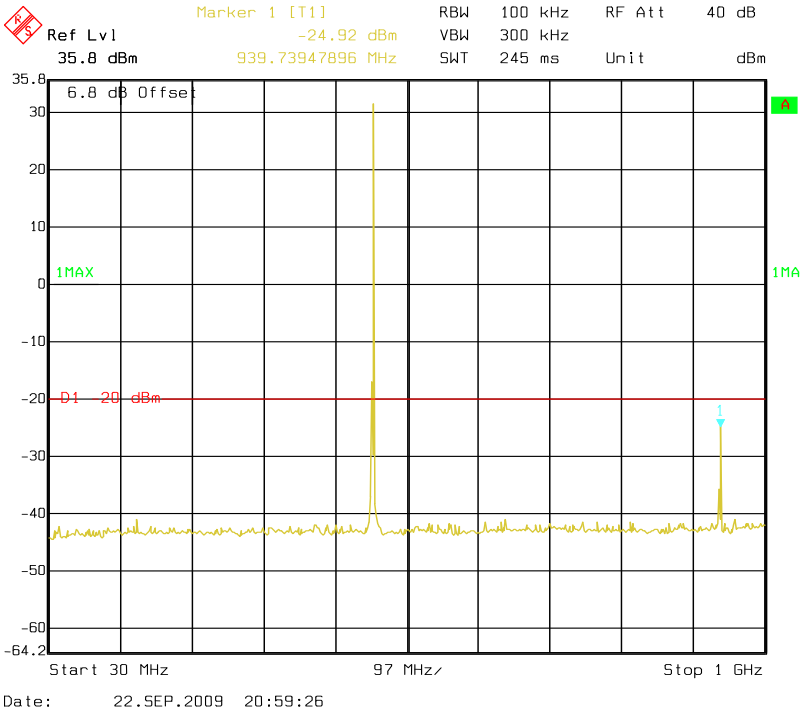


1 – 5 GHz

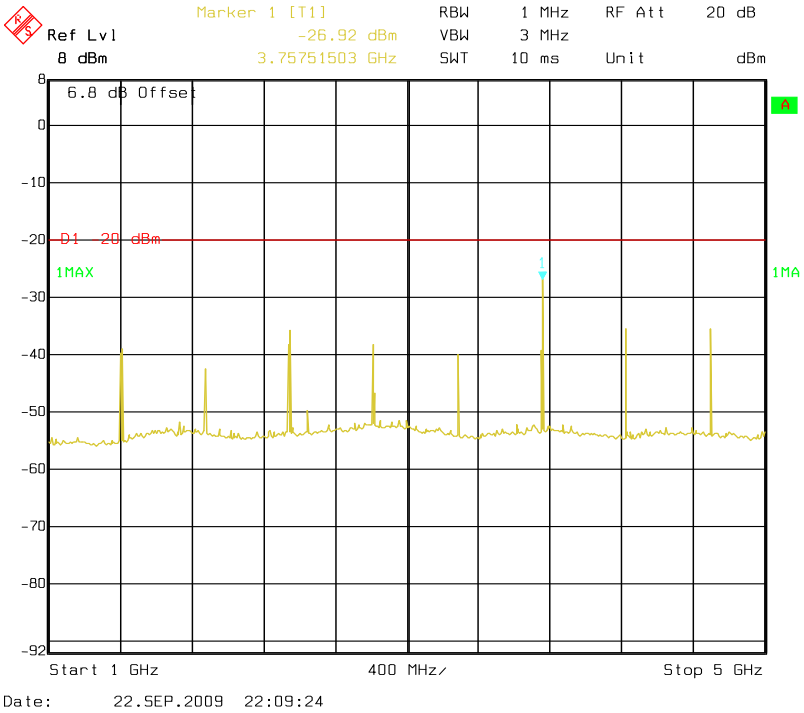


12.5 kHz Channel Spacing, High Channel

30 MHz - 1 GHz

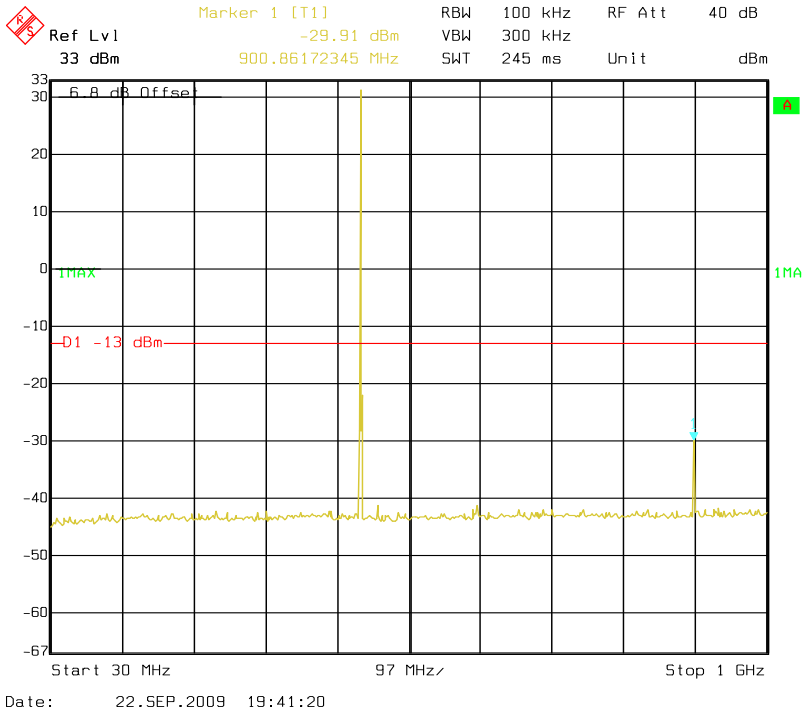


1 – 5 GHz

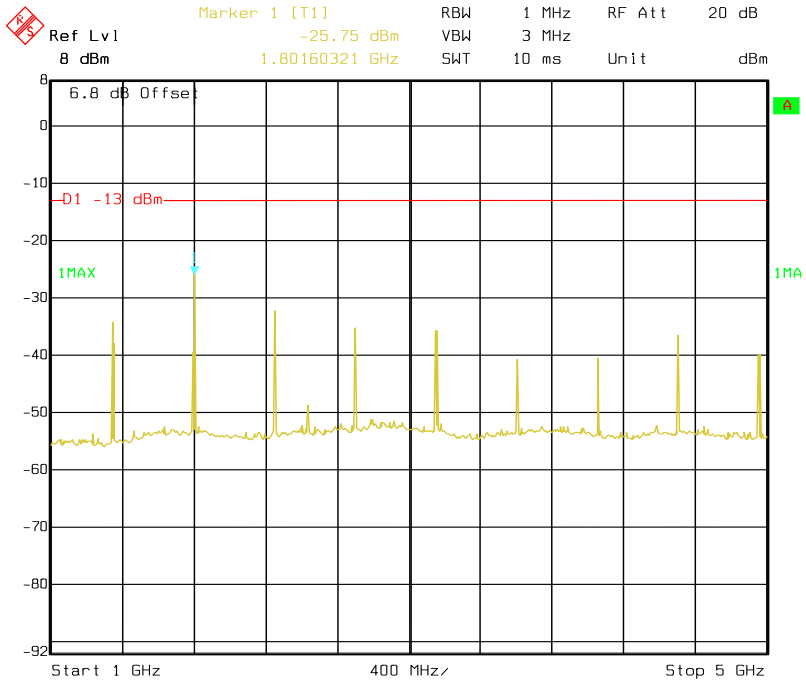


25.0 kHz Channel Spacing, Low Channel

30 MHz - 1 GHz

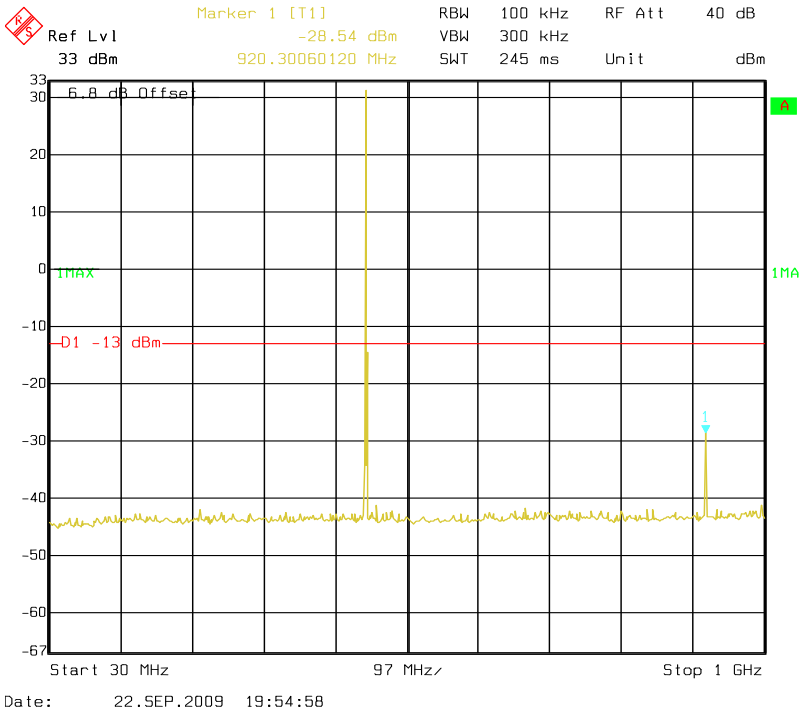


1 – 5 GHz

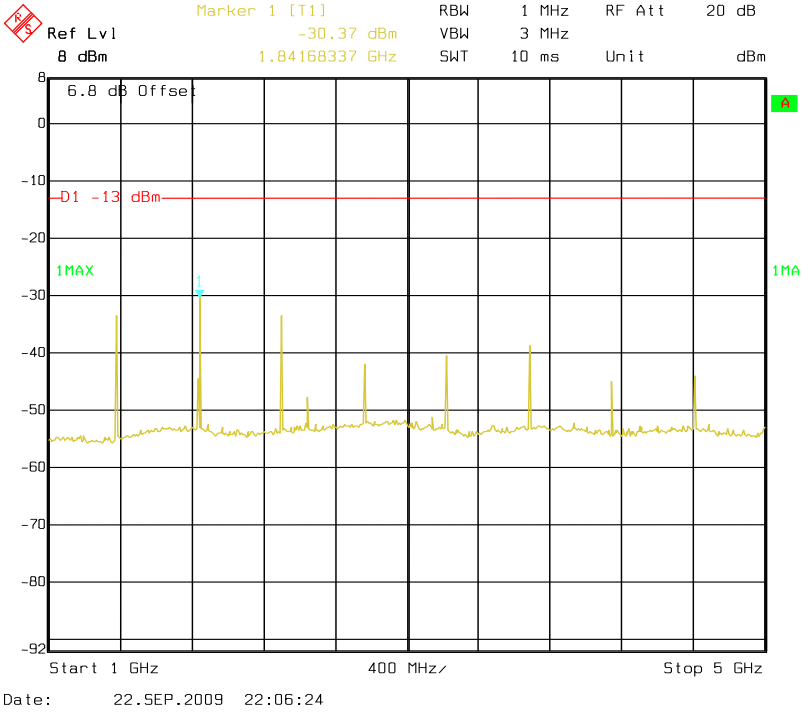


25.0 kHz, Channel Spacing, Middle Channel

30 MHz – 1 GHz

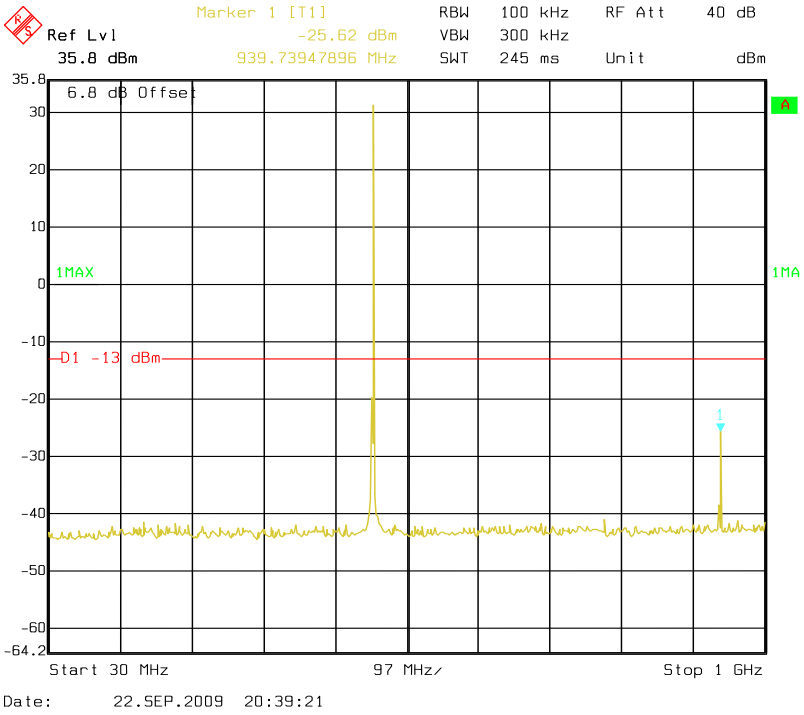


1 – 5 GHz

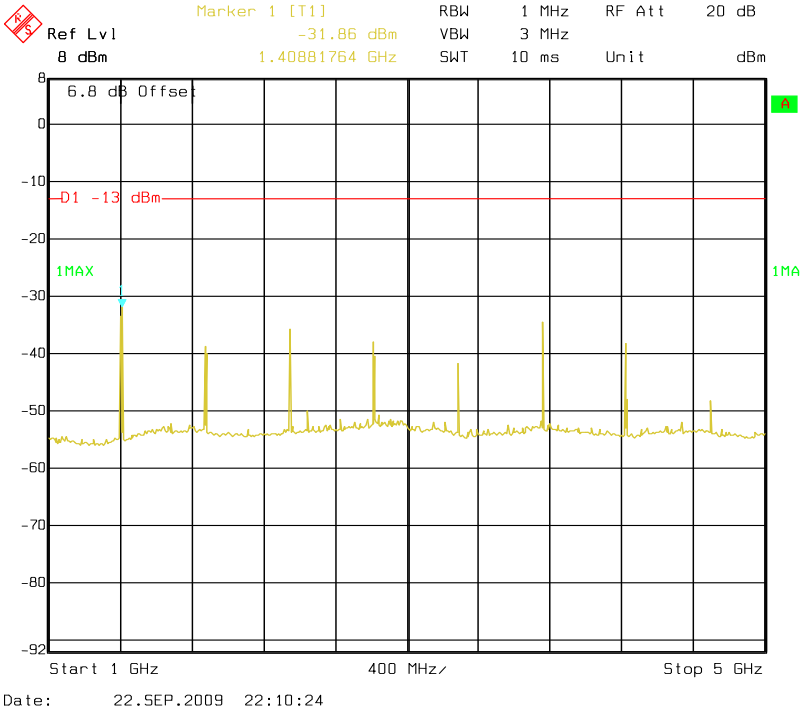


25.0 kHz Channel Spacing, High Channel

30 MHz – 1 GHz



1 – 5 GHz



FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

CFR47 §2.1053 and §90.210

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2009-04-12	2010-04-12
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-08-28	2010-08-27
HP	Signal Generator	HP8657A	2849U00982	2008-10-16	2009-10-16
A.H. System	Horn Antenna	SAS-200/571	135	2009-05-17	2010-05-17
HP	Synthesized Sweeper	8341B	2624A00116	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 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 1g (TXpwr in Watts/0.001)-the absolute level

Spurious attenuation limit in dB =43+10 Log_{10} (power out in Watts)
Spurious attenuation limit in dB =50+10 Log_{10} (power out in Watts) for EUT with a 12.5 kHz channel bandwidth.

Test Results Summary

1.6 dB at **900.10 MHz** in the **Vertical** polarization (Low Channel, 12.5 kHz)
1.3 dB at **920.10 MHz** in the **Vertical** polarization (Middle Channel, 12.5 kHz)
1.2 dB at **938.10 MHz** in the **Vertical** polarization (High Channel, 12.5 kHz)
8.3 dB at **900.250 MHz** in the **Vertical** polarization (Low Channel, 25 kHz)
8.1 dB at **920.250 MHz** in the **Vertical** polarization (Middle Channel, 25 kHz)
8.4 dB at **938.250 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 2009-09-10.

Test Mode: Transmitting

Indicated		Table Angle (Degree)	Test Antenna		Substituted					Absolute Level (dBm)	FCC Part 90	
Freq. (MHz)	S.A. Amp. (dBµV/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=450.05 MHz（12.5 kHz Channel Spacing）												
900.10	51.51	90	1.0	V	900.10	-20.8	V	0	0.8	-21.6	-20	1.6*
1800.20	68.34	142	1.1	V	1800.20	-34.2	V	6.1	1.2	-29.3	-20	9.3
900.10	42.56	50	1.6	H	900.10	-28.6	H	0	0.8	-29.4	-20	9.4
1350.15	70.24	183	1.1	V	1350.15	-36.3	V	6.2	1.0	-31.1	-20	11.1
2250.25	60.03	164	1.2	V	2250.25	-37.9	V	7.2	1.4	-32.1	-20	12.1
2250.25	60.04	106	1.6	H	2250.25	-42.1	H	7.1	1.4	-36.4	-20	16.4
1350.15	60.12	360	1.5	H	1350.15	-42.3	H	6.2	1.0	-37.1	-20	17.1
1800.20	51.24	258	1.5	H	1800.20	-49.0	H	6.1	1.2	-44.1	-20	24.1
Middle Channel, f=460.05 MHz（12.5 kHz Channel Spacing）												
920.10	51.17	360	1.2	V	920.10	-20.5	V	0	0.8	-21.3	-20	1.3*
920.10	45.36	10	1.5	H	920.10	-28.5	H	0	0.8	-29.3	-20	9.3
1840.20	68.24	254	1.1	V	1840.20	-34.3	V	6.1	1.2	-29.4	-20	9.4
2300.25	62.18	21	1.0	V	2300.25	-35.2	V	7.2	1.4	-29.4	-20	9.4
1380.15	70.67	156	1.3	V	1380.15	-36.6	V	6.2	1.0	-31.4	-20	11.4
2300.25	61.01	156	1.2	H	2300.25	-41	H	7.2	1.4	-35.2	-20	15.2
1840.20	55.13	90	1.3	H	1840.20	-45	H	6.1	1.2	-40.1	-20	20.1
1380.15	56.42	8	1.5	H	1380.15	-46.1	H	6.2	1.0	-40.9	-20	20.9
High Channel, f= 469.05 MHz（12.5 kHz Channel Spacing）												
938.10	52.10	286	1.3	V	938.10	-20.4	V	0	0.8	-21.2	-20	1.2*
1407.15	70.58	16	1.2	V	1407.15	-35.0	V	6.4	1.1	-29.7	-20	9.7
1876.20	68.00	360	1.1	V	1876.20	-35.2	V	6.1	1.2	-30.3	-20	10.3
938.10	43.15	10	1.5	H	938.10	-31.1	H	0	0.8	-31.9	-20	11.9
2345.25	60.05	67	1.2	V	2345.25	-41.1	V	7.2	1.4	-35.3	-20	15.3
1407.15	61.35	248	1.6	H	1407.15	-41.0	H	6.4	1.1	-35.7	-20	15.7
2345.25	60.11	105	1.6	H	2345.25	-42.2	H	7.2	1.4	-36.4	-20	16.4
1876.20	56.16	354	1.5	H	1876.20	-43.5	H	6.1	1.2	-38.6	-20	18.6

Indicated		Table Angle (Degree)	Test Antenna		Substituted					Absolute Level (dBm)	FCC Part 90	
Freq. (MHz)	S.A. Amp. (dBµV/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=450.125 MHz（25 kHz Channel Spacing）												
900.250	51.86	270	1.0	V	900.250	-20.5	V	0	0.8	-21.3	-13	8.3
1350.375	72.56	160	1.2	V	1350.375	-35.0	V	6.2	1	-29.8	-13	16.8
900.250	44.03	360	2.0	H	900.250	-30.2	H	0	0.8	-31.0	-13	18.0
1800.500	67.59	360	1.0	V	1800.500	-36.0	V	6.1	1.2	-31.1	-13	18.1
2250.625	61.23	156	1.0	V	2250.625	-36.8	V	7.1	1.4	-31.1	-13	18.1
2250.625	55.79	98	2.0	H	2250.625	-38.5	H	7.1	1.4	-32.8	-13	19.8
1350.375	63.88	139	1.9	H	1350.375	-38.7	H	6.2	1	-33.5	-13	20.5
1800.500	60.77	360	1.6	H	1800.500	-39.4	H	6.1	1.2	-34.5	-13	21.5
Middle Channel, f=460.25 MHz（25 kHz Channel Spacing）												
920.250	52.10	0	1.3	V	920.250	-20.3	V	0	0.8	-21.1	-13	8.1
2300.625	64.16	178	1.0	V	2300.625	-33.2	V	7.2	1.4	-27.4	-13	14.4
1840.500	69.36	78	1.0	V	1840.500	-33.2	V	6.1	1.2	-28.3	-13	15.3
920.250	43.81	167	1.9	H	920.250	-30.1	H	0	0.8	-30.9	-13	17.9
1380.375	70.35	360	1.2	V	1380.375	-36.3	V	6.2	1.0	-31.1	-13	18.1
1840.500	58.67	360	1.8	H	1840.500	-41.4	H	6.1	1.2	-36.5	-13	23.5
2300.625	59.67	356	2.0	H	2300.625	-42.4	H	7.2	1.4	-36.6	-13	23.6
1380.375	54.66	97	2.0	H	1380.375	-48.2	H	6.2	1.0	-43.0	-13	30.0
High Channel, f= 469.25 MHz（25 kHz Channel Spacing）												
938.250	51.97	157	1.3	V	938.250	-20.6	V	0	0.8	-21.4	-13	8.4
1876.500	68.11	83	1.0	V	1876.500	-35.2	V	6.1	1.2	-30.3	-13	17.3
2345.625	61.22	10	1.5	V	2345.625	-36.2	V	7.2	1.4	-30.4	-13	17.4
938.250	44.09	97	1.3	H	938.250	-30.0	H	0	0.8	-30.8	-13	17.8
1407.375	68.10	49	1.2	V	1407.375	-37.6	V	6.4	1.1	-32.3	-13	19.3
1407.375	62.50	360	1.5	H	1407.375	-39.8	H	6.4	1.1	-34.5	-13	21.5
2345.625	58.99	15	1.4	H	2345.625	-43.5	H	7.2	1.4	-37.7	-13	24.7
1876.500	54.50	0	1.6	H	1876.500	-45.2	H	6.1	1.2	-40.3	-13	27.3

Note: *Within measurement uncertainty

FCC §2.1055 & §90.213- FREQUENCY STABILITY

Applicable Standard

CFR47 §2.1055& §90.213

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	2009-04-22	2010-04-22

*** 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 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 Data

Environmental Conditions

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

The testing was performed by Alvin Huang on 2009-09-13.

Test Mode: Transmitting

For 12.5 kHz Channel Spacing

1) Frequency Stability versus Input Temperature

Reference Frequency: 460.05 MHz, Limit: 2.5 ppm			
Test Environment		**Frequency Measure with Time Elapsed**	
Temperature (°C)	**Power Supplied (Vdc)**	**Measured Frequency (MHz)**	**Frequency Error (ppm)**
50	3.7	460.05089	1.934572
40	3.7	460.05082	1.782415
30	3.7	460.05079	1.717205
20	3.7	460.05076	1.651994
10	3.7	460.05065	1.412890
0	3.7	460.05056	1.217259
-10	3.7	460.05045	0.978155
-20	3.7	460.05055	1.195522
-30	3.7	460.05049	1.065102

2) Frequency Stability versus Input Voltage

Reference Frequency: 460.05 MHz, Limit: 2.5 ppm			
Test Environment		**Frequency Measure with Time Elapsed**	
Temperature (°C)	**Power Supplied (Vdc)**	**Measured Frequency (MHz)**	**Frequency Error (ppm)**
20	3.2	460.05073	1.586784

For 25 kHz Channel Spacing

1) Frequency Stability versus Input Temperature

Reference Frequency: 460.125 MHz, Limit: 5.0 ppm			
Test Environment		**Frequency Measure with Time Elapsed**	
Temperature (°C)	**Power Supplied (Vdc)**	**Measured Frequency (MHz)**	**Frequency Error (ppm)**
50	3.7	460.12585	1.847324
40	3.7	460.12577	1.673458
30	3.7	460.12575	1.629992
20	3.7	460.12556	1.217061
10	3.7	460.12555	1.195327
0	3.7	460.12552	1.130128
-10	3.7	460.12555	1.195327
-20	3.7	460.12540	0.869329
-30	3.7	460.12544	0.956262

2) Frequency Stability versus Input Voltage

Reference Frequency: 460.125 MHz, Limit: 5.0 ppm			
Test Environment		**Frequency Measure with Time Elapsed**	
Temperature (°C)	**Power Supplied (Vdc)**	**Measured Frequency (MHz)**	**Frequency Error (ppm)**
20	3.2	460.12550	1.086661

FCC §90.214 - TRANSIENT FREQUENCY BEHAVIOR

Applicable Standard

CFR47 §90.214

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
TEKTRONIX	Digital Phosphor Oscilloscope	TDS 7104	B020518	2009-04-11	2010-04-11
HP	Modulation Analyzer	8901B	3438A05208	2009-04-11	2010-04-11
HP	Signal Generator	HP8657A	2849U00982	2008-10-16	2009-10-16

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

Test Procedure

TIA/EIA-603 2.2.19

Test Data

Environmental Conditions

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

The testing was performed by Alvin Huang on 2009-09-13.

Test Mode: Transmitting

For 12.5 kHz Channel Spacing:

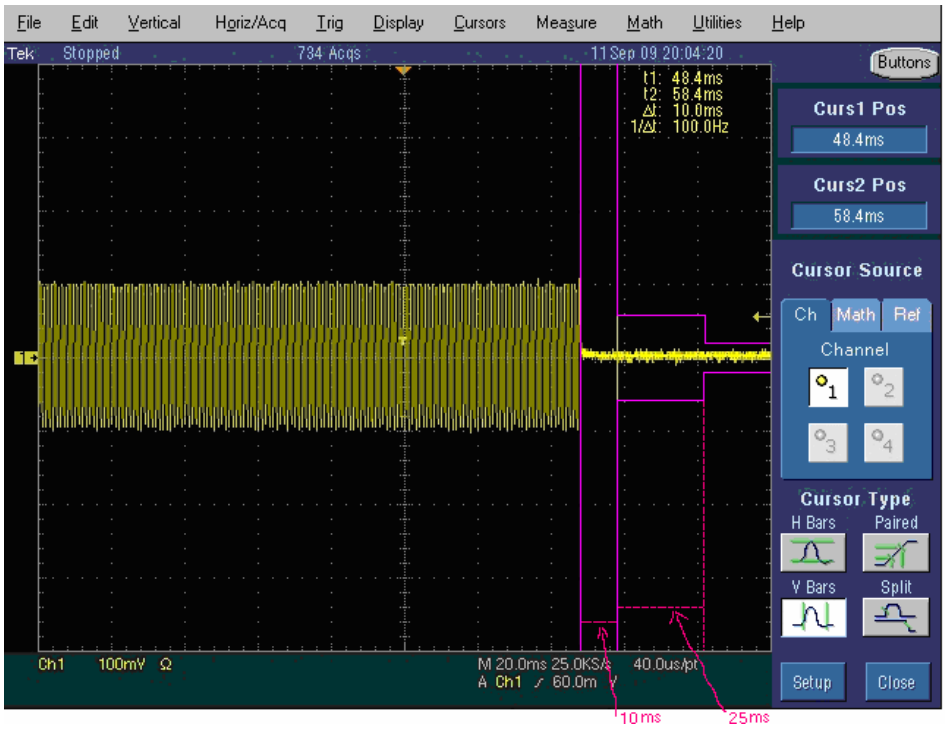
Operation Frequency (MHz)	Channel Separation (kHz)	Transient Period (ms)	Transient Frequency	Result
460.05	12.5	<10	+/-12.5 kHz	Pass
		<25	+/-6.25 kHz	
		<10	+/-12.5 kHz	

For 25 kHz Channel Spacing:

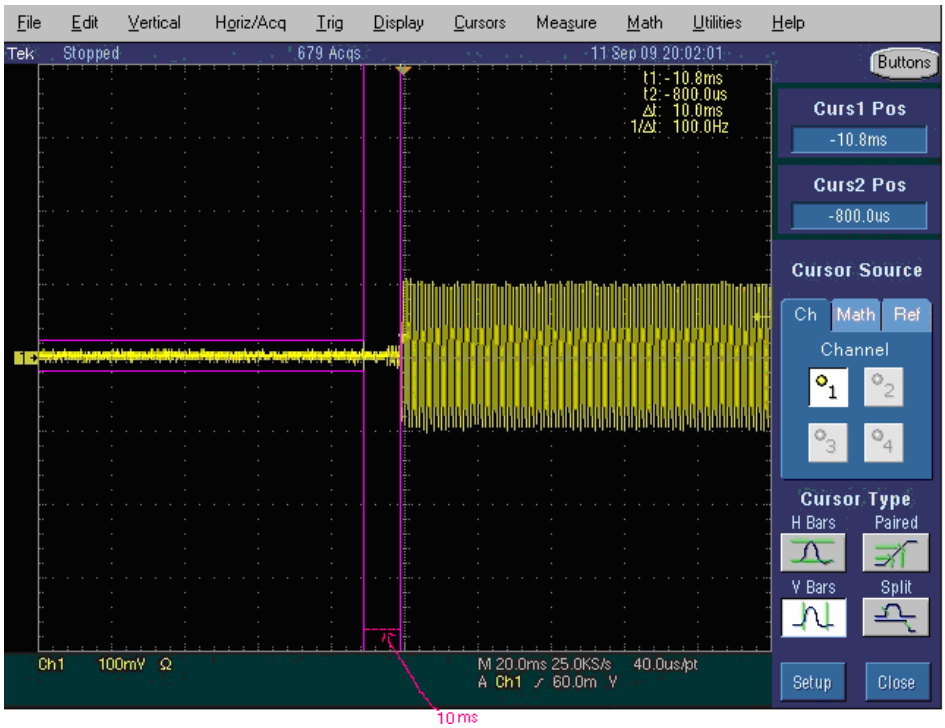
Operation Frequency (MHz)	Channel Separation (kHz)	Transient Period (ms)	Transient Frequency	Result
460.125	25	<10	+/-25.0 kHz	Pass
		<25	+/-12.5 kHz	
		<10	+/-25.0kHz	

Please refer to the followingplots.

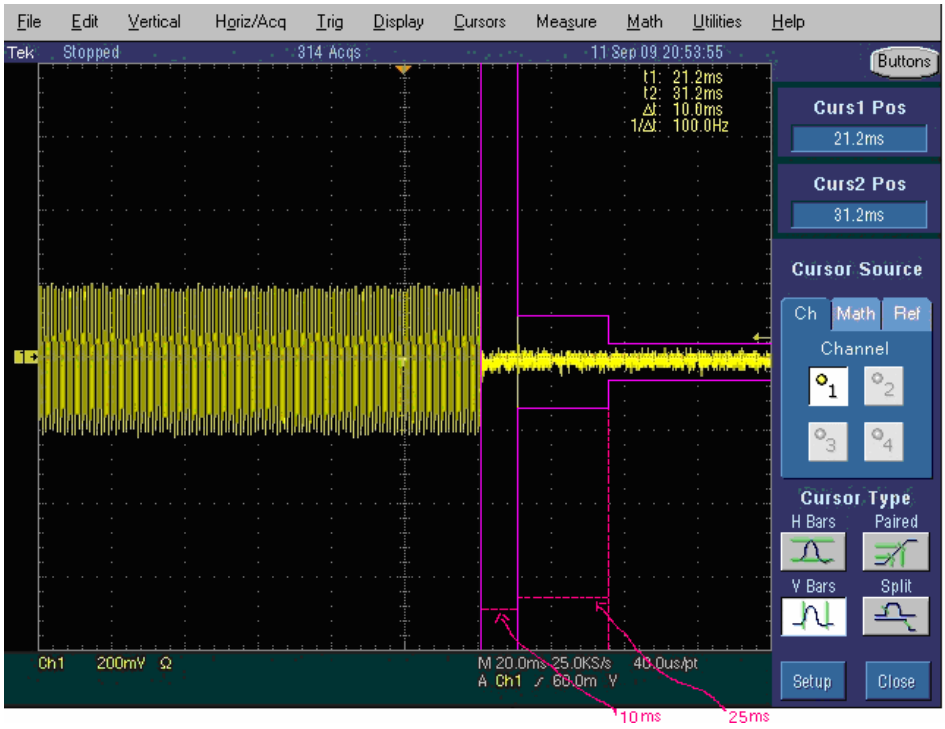
Turn on (12.5 kHz Channel Spacing)



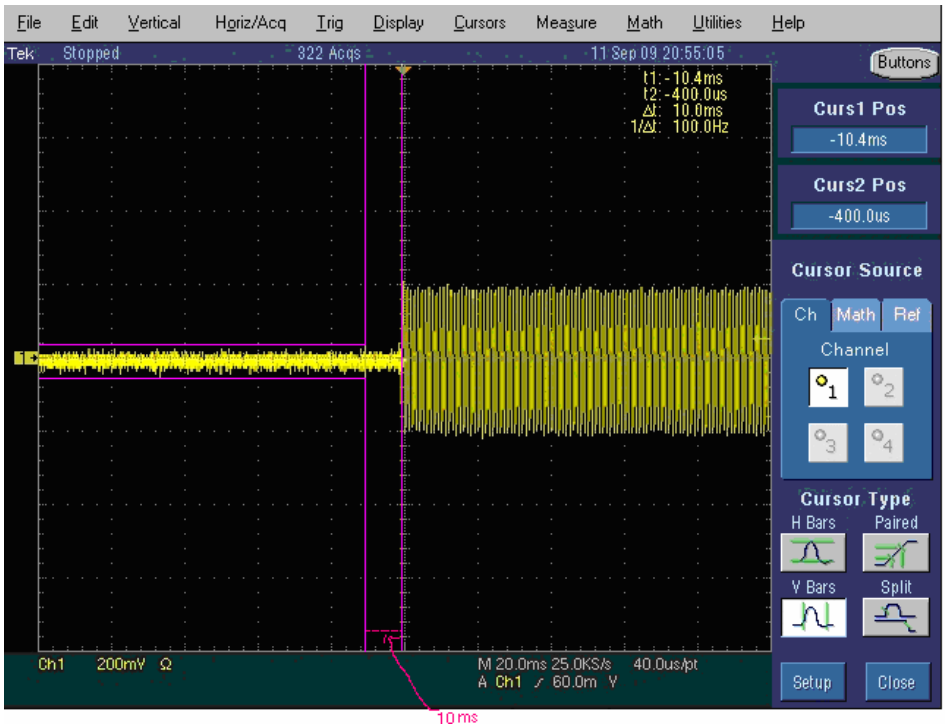
Turn off (12.5 kHz Cahnnel Spacing)



Turn on (25 kHz Channel Spacing)



Turn off (25 kHz Channel Spacing)



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