



FCC PART 90 TEST REPORT

For

QUANZHOU TRUEST COMMUNICATION CO.,LIMITED

RM13A Dragon Building, No.144 Wenling South Road, Fengze district Quanzhou City, Fujian Province,
China

FCC ID: OBLTC5566

Report Type: Original Report	Product Type: Dual Band Vehicle Two Way Radio
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Report Number: <u>R1XM120723051-00</u>	
Report Date: <u>2013-02-20</u>	
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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. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk “★” (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *QUANZHOU TRUEST COMMUNICATION CO.,LIMITED*'s product, model number: *TC-UV66,TC-UV55 (FCC ID: OBLTC5566)* (the "EUT") in this report is a *Dual Band Vehicle Two Way Radio*, which was measured approximately 15.5 cm(H) x 16.0 cm(W) x 4.0 cm(D), rated input voltage: DC 13.8V.

Note: the series product, model TC-UV66, TC-UV55 are electrically identical, we choose the model TC-UV55 for fully testing , just test the item Radiated Spurious Emissions for the model TC-UV66, and the difference between them please refers to the attached declaration letter.

**All measurement and test data in this report was gathered from production sample serial number: 120521TC5508 (Assigned by applicant). The EUT was received on 2012-08-01.*

Objective

This test report is prepared on behalf of *QUANZHOU TRUEST COMMUNICATION CO., LIMITED* 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-D and ANSI C63.4-2003.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan). 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. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) 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 February 02, 2012. 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.: 273710. 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. (Dongguan) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 500069-0).



The current scope of accreditations can be found at <http://ts.nist.gov/standards/scopes/5000690.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a test mode which has been done in the factory.

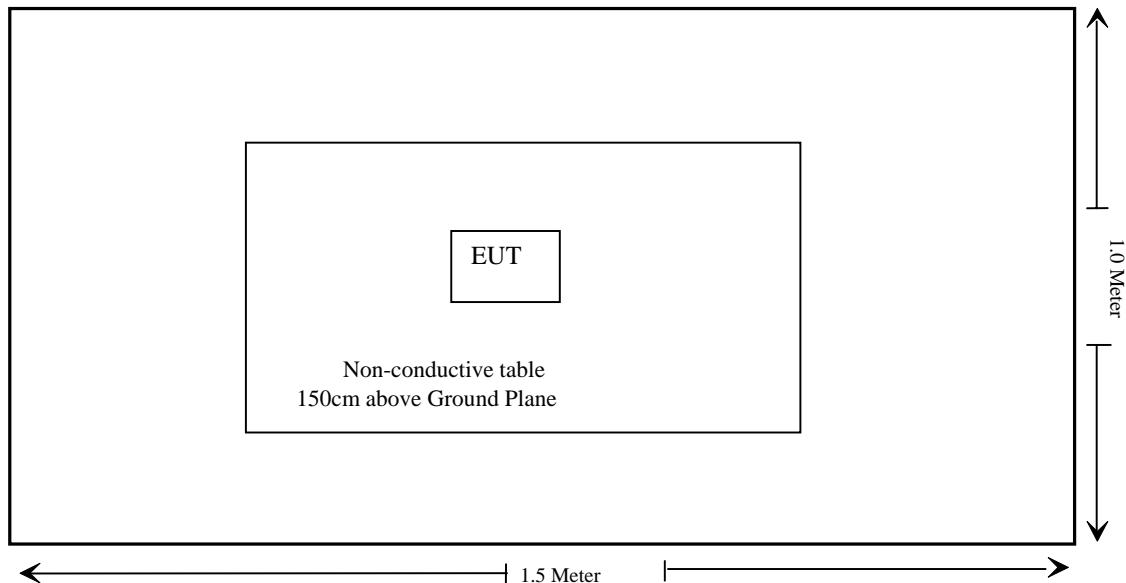
Specification:

Operating Frequency Band	VHF: 136-174 MHz UHF: 400-470 MHz
Modulation Mode	FM
Channnel Separation	12.5 kHz
Transmitter Power	UHF: High: 10W ~ 50 W/Low: 8W ~ 20W VHF: High: 10W ~ 40 W/Low: 8W ~ 20W

Equipment Modifications

No modifications were made to the unit tested.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§1.1307 (b) (1); §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§2.1046; §90.205	RF Output Power	Compliance
§2.1047; §90.207	Modulation Characteristic	Compliance
§2.1049; §90.209; §90.210	Occupied Bandwidth & Emission Mask	Compliance
§2.1051; §90.210	Spurious Emission at Antenna Terminal	Compliance
§2.1053; §90.210	Spurious Radiated Emissions	Compliance
§2.1055; §90.213	Frequency Stability	Compliance
§90.214	Transient Frequency Behavior	Compliance

Note: The uncertainty of any RF tests which use conducted method measurement is ± 0.96 dB.

The uncertainty of any radiation emissions measurement is ± 4.0 dB.

FCC §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**Applicable Standard**

According to 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for Occupational/Controlled Exposure

Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E , H or S (minutes)
0.3- 3.0	614	1.63	(100)*	6
3.0 - 30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E , H or S (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

MPE Calculation**Predication of MPE limit at a given distance**

$$S = PG/4\pi R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Frequency (MHz)	Antenna Gain		Conducted Power		Duty factor	Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)				
136.025	5	3.16	46.09	40644	50%	100	0.511	1
400.025	5	3.16	46.95	49545	50%	100	0.623	1.333

Note:

The EUT is occupation use only.

Because of the EUT is used for Push-To-Talk(PTT) between users and/or base stations a conservative 50% duty cycle is applied.

Result: Pass

FCC §2.1046 & §90.205- RF OUTPUT POWER

Applicable Standard

FCC §2.1046 and §90.205.

Test Procedure

Conducted RF Output Power:

TIA-603-D section 2.2.1

Radiated method:

TIA 603-D section 2.2.17

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

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	23.6 °C
Relative Humidity:	50%
ATM Pressure:	101.6 kPa

The testing was performed by Leon Chen on 2013-01-10.

Test Mode: Transmitting

Test Result: Compliance.

Please refer to following table.

UHF:

Frequency Spacing	Frequency	High Power Level	Low Power Level
kHz	MHz	dBm	dBm
12.5	400.025	46.95	42.66
12.5	435	41.23	41.37
12.5	469.975	40.95	39.43

VHF:

Frequency Spacing	Frequency	High Power Level	Low Power Level
kHz	MHz	dBm	dBm
12.5	136.025	46.09	42.75
12.5	155	44.66	42.55
12.5	173.975	40.98	40.94

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

Test Method: TIA/EIA-603 2.2.3

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
HP	RF Communications Test Set	HP8920A	3438A05201	2012-06-14	2013-06-13

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data**Environmental Conditions**

Temperature:	23.6 °C
Relative Humidity:	50%
ATM Pressure:	101.6 kPa

The testing was performed by Leon Chen on 2013-01-10.

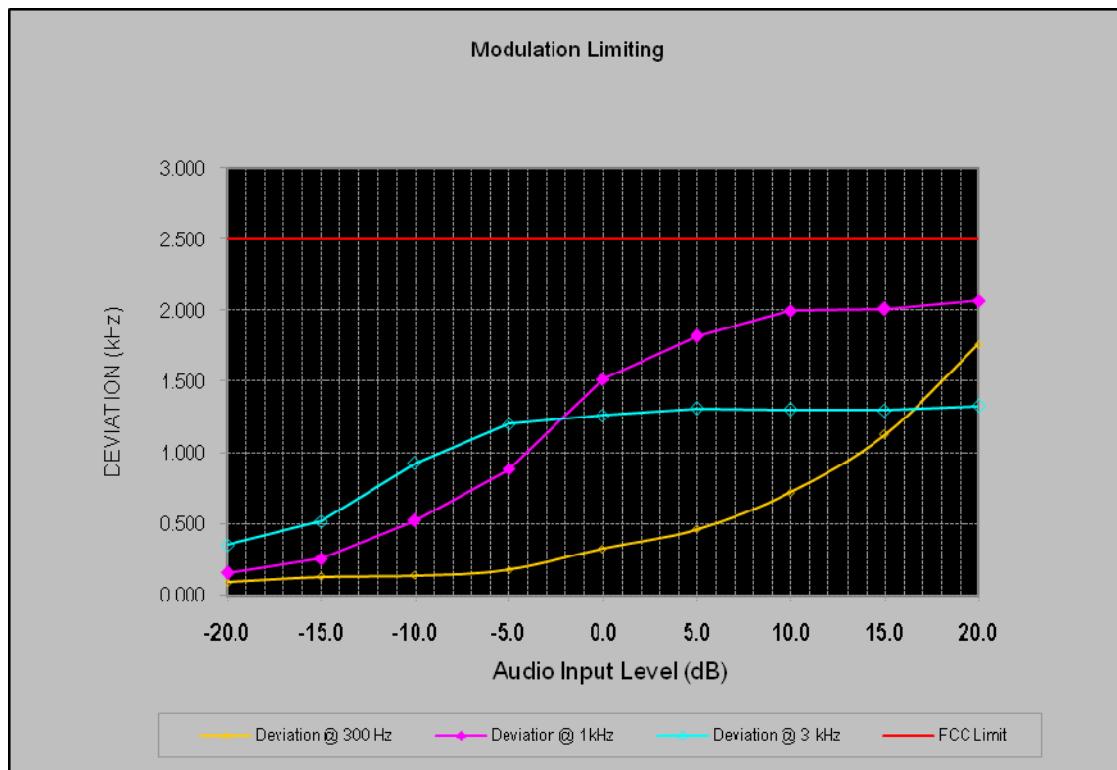
Test Mode: Transmitting

UHF:

MODULATION LIMITING (high power level)

Carrier Frequency: 435 MHz, Channel Separation = 12.5 kHz

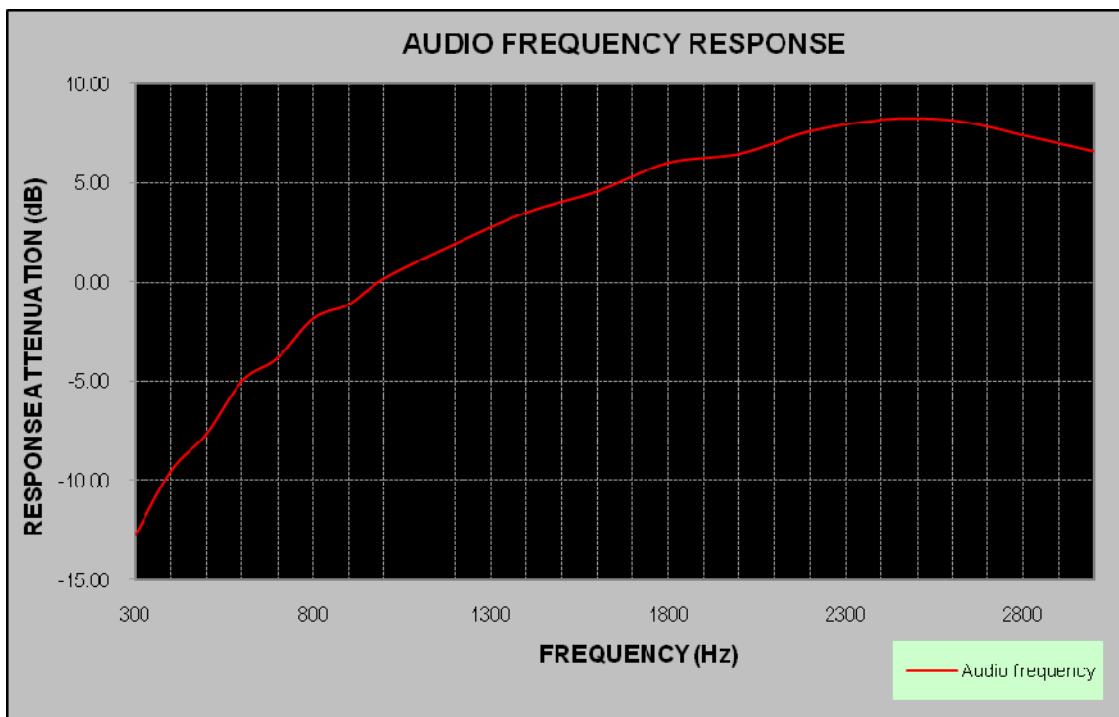
Audio Input Level [dBm]	Frequency Deviation (kHz)			FCC Limit [kHz]
	@ 300 Hz	@ 1kHz	@ 3 kHz	
20.0	1.764	2.071	1.330	2.5
15.0	1.126	2.011	1.298	2.5
10.0	0.723	1.998	1.304	2.5
5.0	0.465	1.818	1.313	2.5
0.0	0.329	1.518	1.265	2.5
-5.0	0.177	0.885	1.204	2.5
-10.0	0.140	0.523	0.927	2.5
-15.0	0.132	0.258	0.519	2.5
-20.0	0.091	0.158	0.354	2.5



Audio Frequency Response (high power level)

Carrier Frequency: 435 MHz, Channel Separation = 12.5 kHz

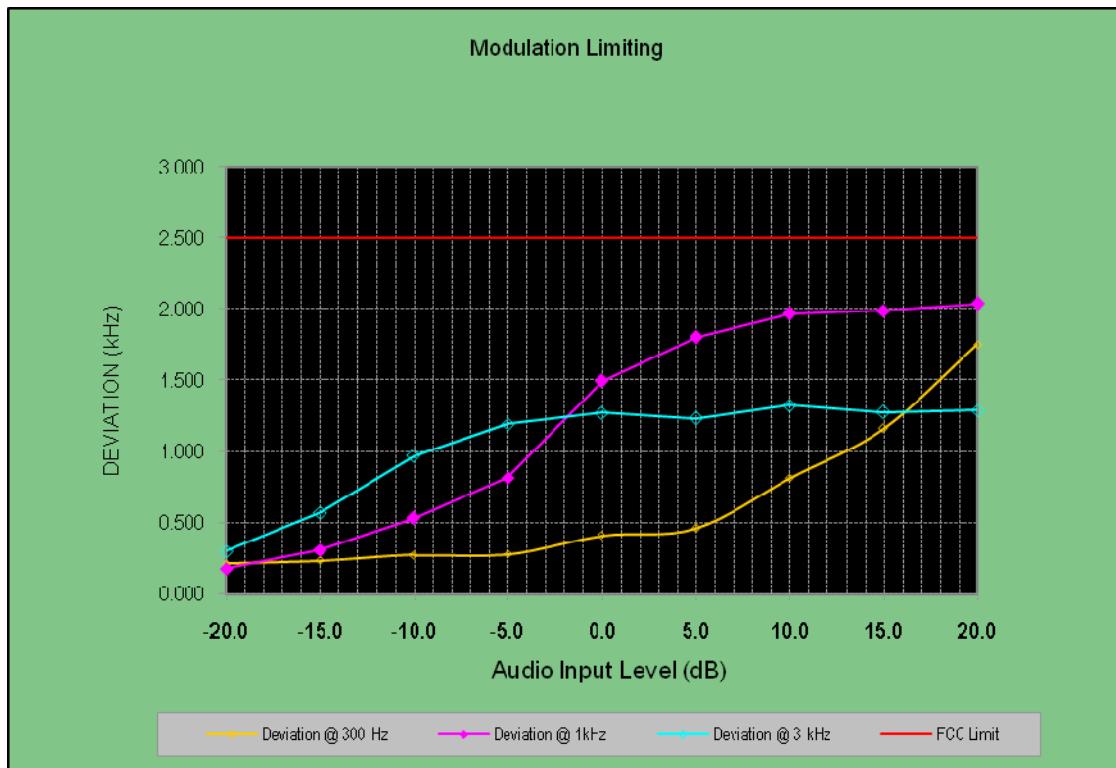
Audio Frequency (Hz)	Response Attenuation (dB)
300	-12.76
400	-9.52
500	-7.65
600	-4.96
700	-3.81
800	-1.80
900	-1.10
1000	0.20
1200	1.94
1400	3.55
1600	4.60
1800	6.01
2000	6.50
2200	7.59
2400	8.20
2600	8.16
2800	7.45
3000	6.60



MODULATION LIMITING (low power level)

Carrier Frequency: 435 MHz, Channel Separation = 12.5 kHz

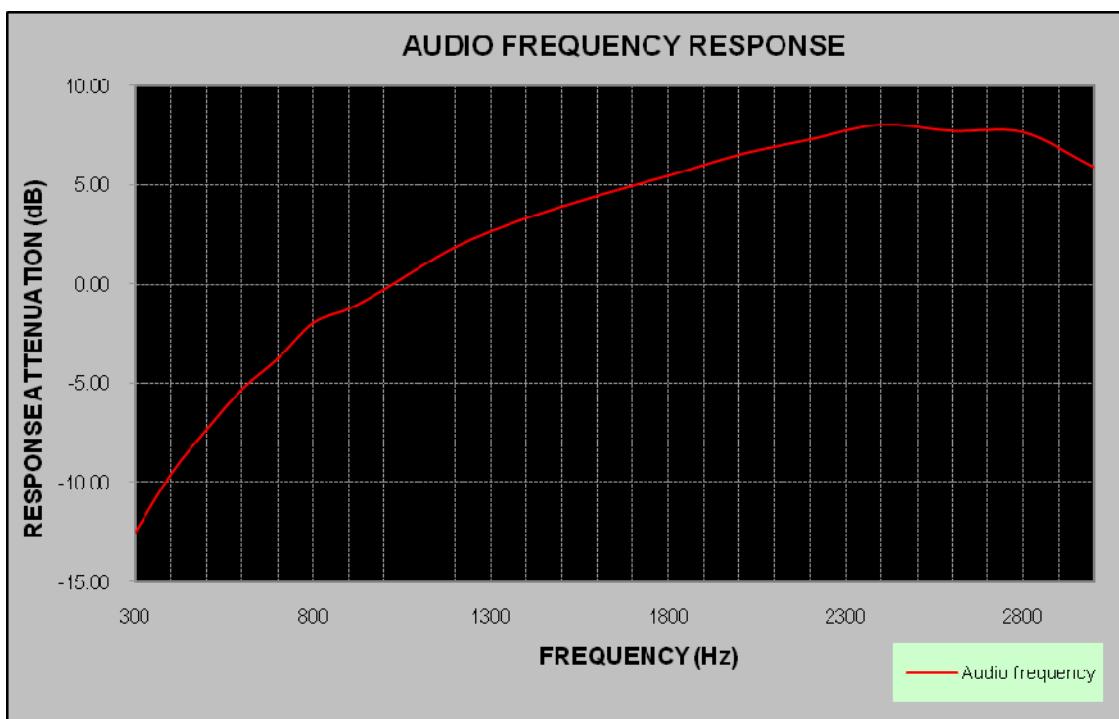
Audio Input Level [dBm]	Frequency Deviation (kHz)			FCC Limit [kHz]
	@ 300 Hz	@ 1kHz	@ 3 kHz	
20.0	1.754	2.037	1.289	2.5
15.0	1.163	1.992	1.276	2.5
10.0	0.814	1.967	1.324	2.5
5.0	0.462	1.801	1.233	2.5
0.0	0.412	1.497	1.272	2.5
-5.0	0.281	0.819	1.193	2.5
-10.0	0.274	0.533	0.969	2.5
-15.0	0.237	0.311	0.571	2.5
-20.0	0.212	0.177	0.299	2.5



Audio Frequency Response (low power level)

Carrier Frequency: 435 MHz, Channel Separation = 12.5 kHz

Audio Frequency (Hz)	Response Attenuation (dB)
300	-12.50
400	-9.56
500	-7.35
600	-5.30
700	-3.78
800	-1.95
900	-1.23
1000	-0.26
1200	1.86
1400	3.32
1600	4.47
1800	5.49
2000	6.54
2200	7.28
2400	8.02
2600	7.70
2800	7.66
3000	5.93

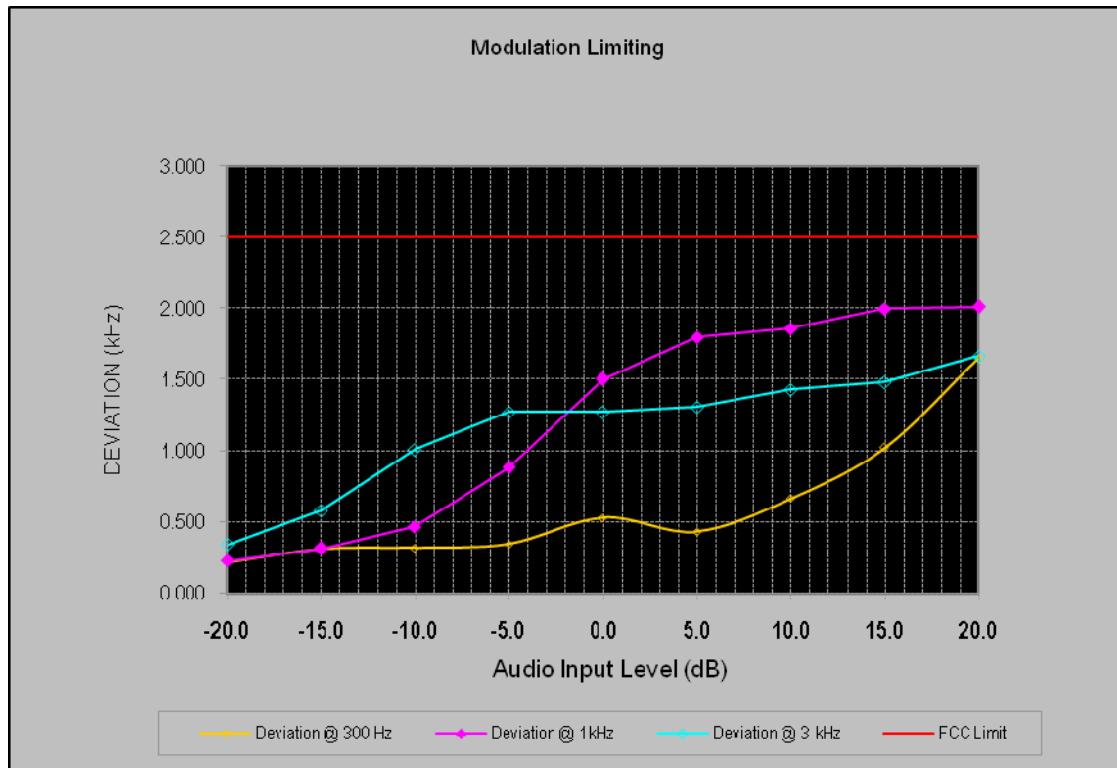


VHF:

MODULATION LIMITING (high power level)

Carrier Frequency: 155 MHz, Channel Separation = 12.5 kHz

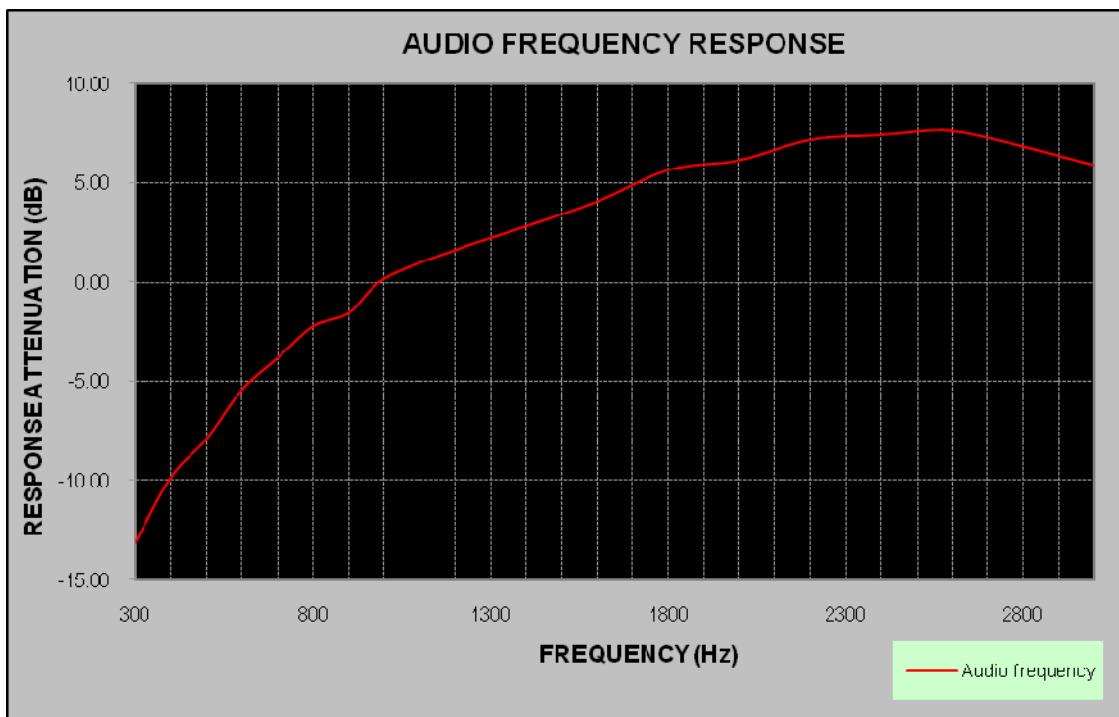
Audio Input Level [dBm]	Frequency Deviation (kHz)			FCC Limit [kHz]
	@ 300 Hz	@ 1kHz	@ 3 kHz	
20.0	1.651	2.012	1.668	2.5
15.0	1.022	2.000	1.485	2.5
10.0	0.666	1.858	1.429	2.5
5.0	0.434	1.799	1.308	2.5
0.0	0.531	1.506	1.274	2.5
-5.0	0.345	0.882	1.275	2.5
-10.0	0.318	0.467	1.009	2.5
-15.0	0.308	0.313	0.580	2.5
-20.0	0.216	0.228	0.342	2.5



Audio Frequency Response (high power level)

Carrier Frequency: 155 MHz, Channel Separation = 12.5 kHz

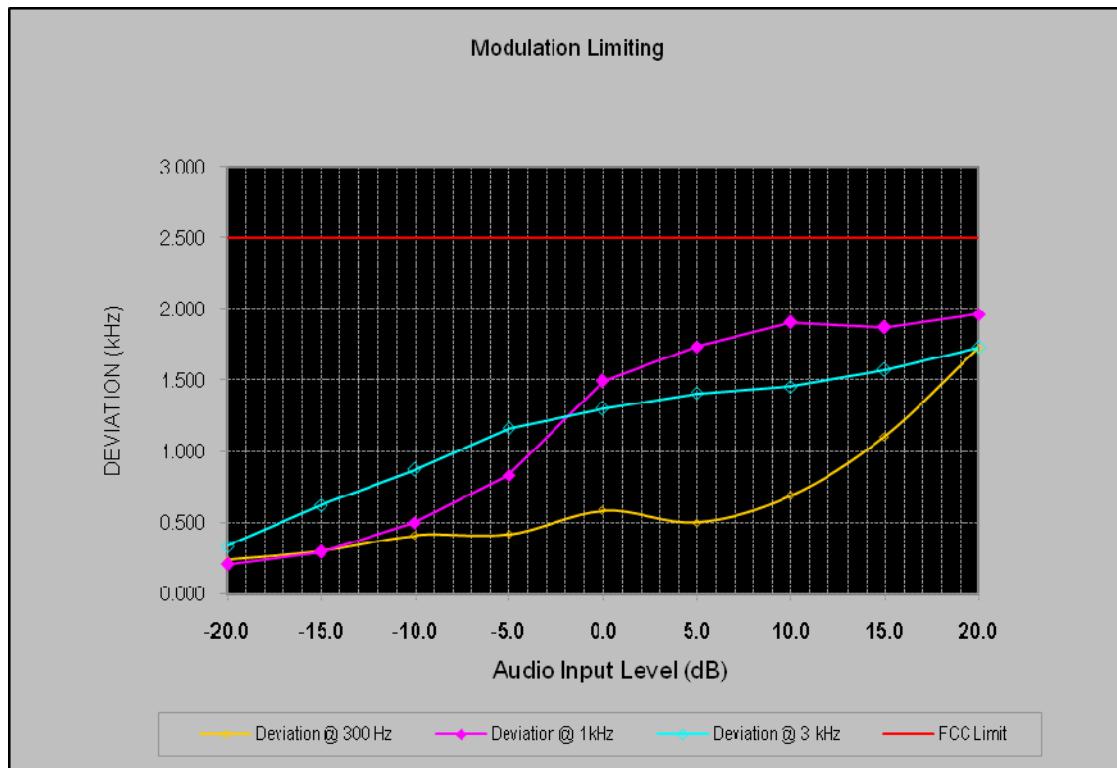
Audio Frequency (Hz)	Response Attenuation (dB)
300	-13.12
400	-9.79
500	-7.91
600	-5.39
700	-3.82
800	-2.22
900	-1.54
1000	0.16
1200	1.65
1400	2.83
1600	4.09
1800	5.67
2000	6.15
2200	7.19
2400	7.40
2600	7.63
2800	6.82
3000	5.91



MODULATION LIMITING (low power level)

Carrier Frequency: 155 MHz, Channel Separation = 12.5 kHz

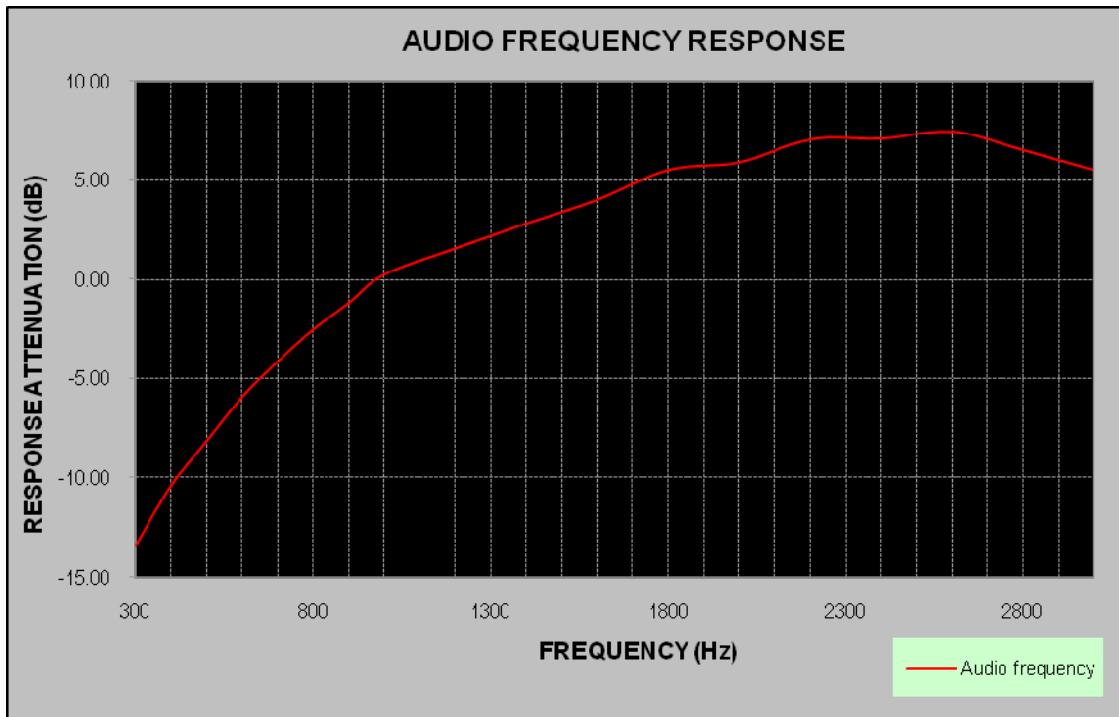
Audio Input Level [dBm]	Frequency Deviation (kHz)			FCC Limit [kHz]
	@ 300 Hz	@ 1kHz	@ 3 kHz	
20.0	1.727	1.965	1.732	2.5
15.0	1.108	1.871	1.573	2.5
10.0	0.689	1.907	1.455	2.5
5.0	0.503	1.738	1.410	2.5
0.0	0.587	1.495	1.303	2.5
-5.0	0.418	0.834	1.165	2.5
-10.0	0.411	0.502	0.875	2.5
-15.0	0.302	0.298	0.626	2.5
-20.0	0.240	0.210	0.335	2.5



Audio Frequency Response (low power level)

Carrier Frequency: 155 MHz, Channel Separation = 12.5 kHz

Audio Frequency (Hz)	Response Attenuation (dB)
300	-13.47
400	-10.37
500	-8.17
600	-5.93
700	-4.16
800	-2.52
900	-1.20
1000	0.27
1200	1.56
1400	2.82
1600	4.04
1800	5.54
2000	5.93
2200	7.07
2400	7.11
2600	7.46
2800	6.52
3000	5.53



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 5.625 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: $50 + 10\log P$

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

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 ± 35 kHz from the carrier frequency.

Test Data

Environmental Conditions

Temperature:	27.4 °C
Relative Humidity:	59%
ATM Pressure:	100.5 kPa

The testing was performed by Leon Chen on 2013-01-10.

UHF:

Frequency (MHz)	99% Occupied Bandwidth(kHz)	26 dB Bandwidth(kHz)	Emission power
400.025	5.51	10.69	High power level
469.975	5.51	10.70	High power level

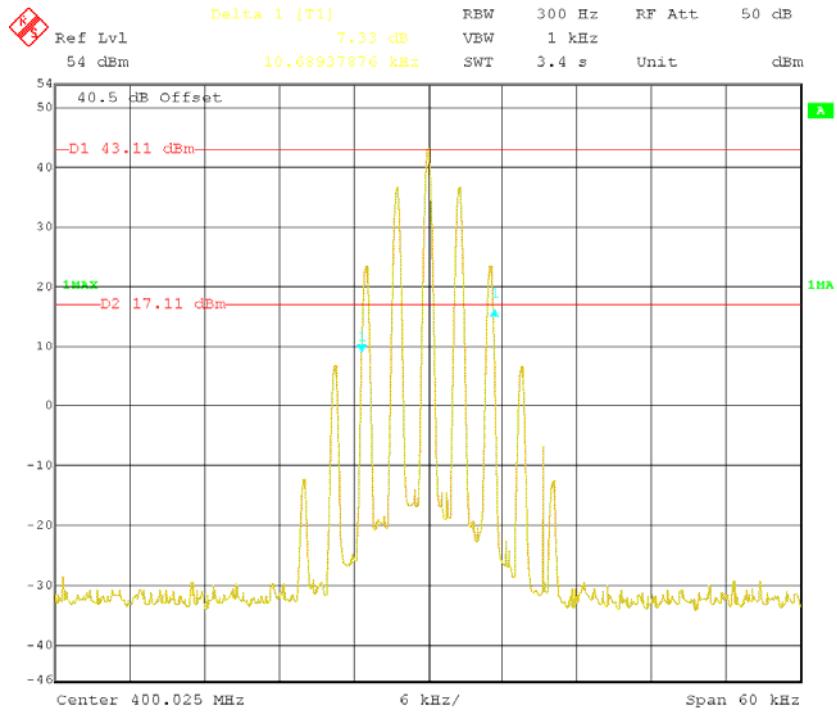
VHF:

Frequency (MHz)	99% Occupied Bandwidth(kHz)	26 dB Bandwidth(kHz)	Emission power
136.025	5.51	10.68	High power level
173.975	5.51	10.68	High power level

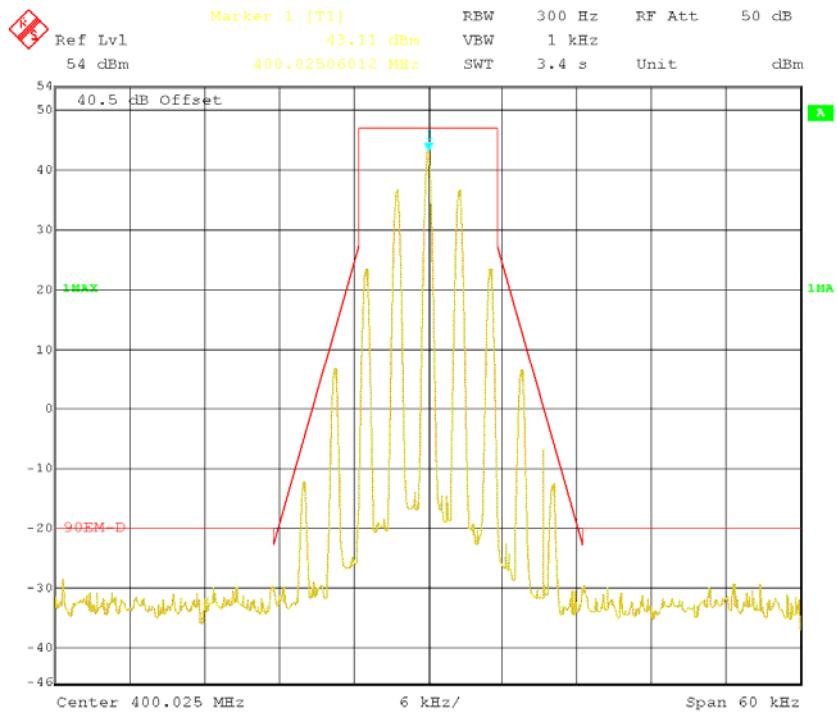
Please refer to the emission mask hereinafter plots.

UHF – low channel:

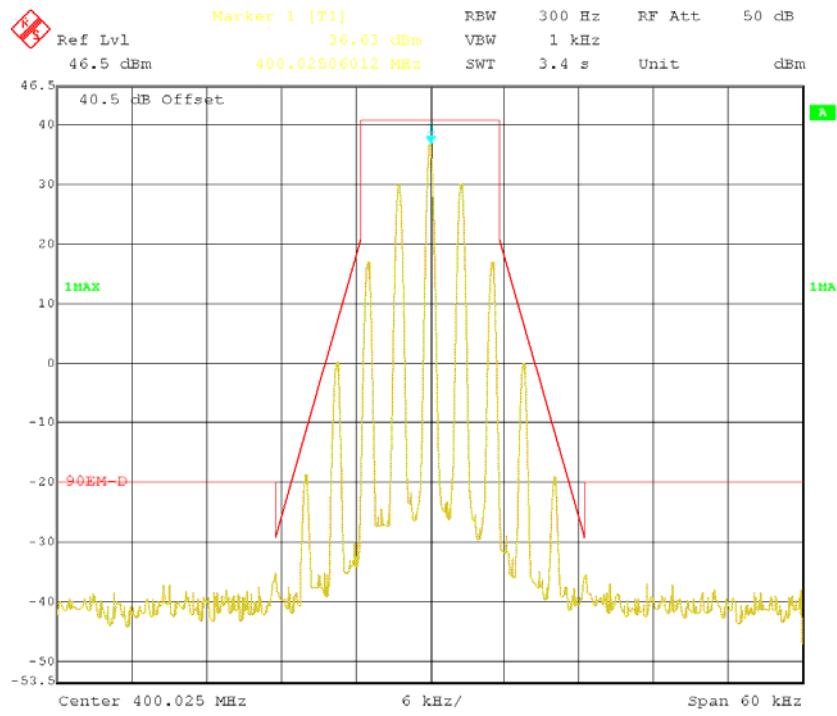
Occupied Bandwidth



Emission Mask – Type D (High power level)

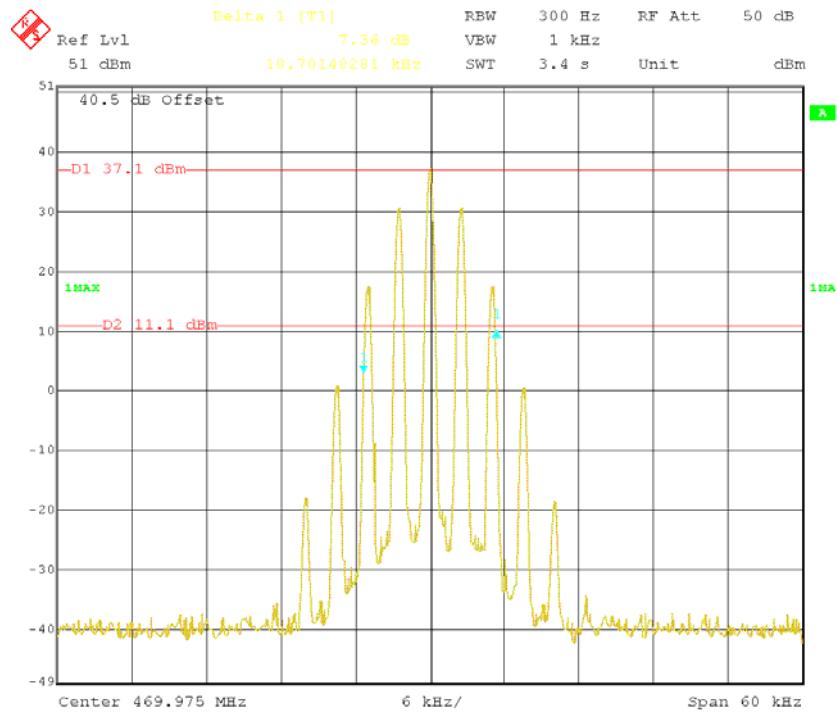


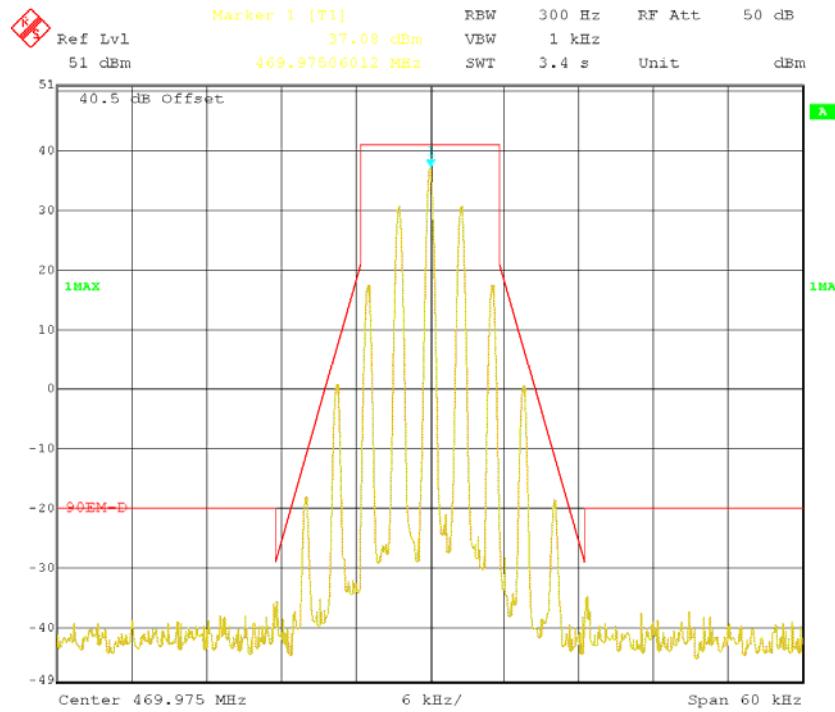
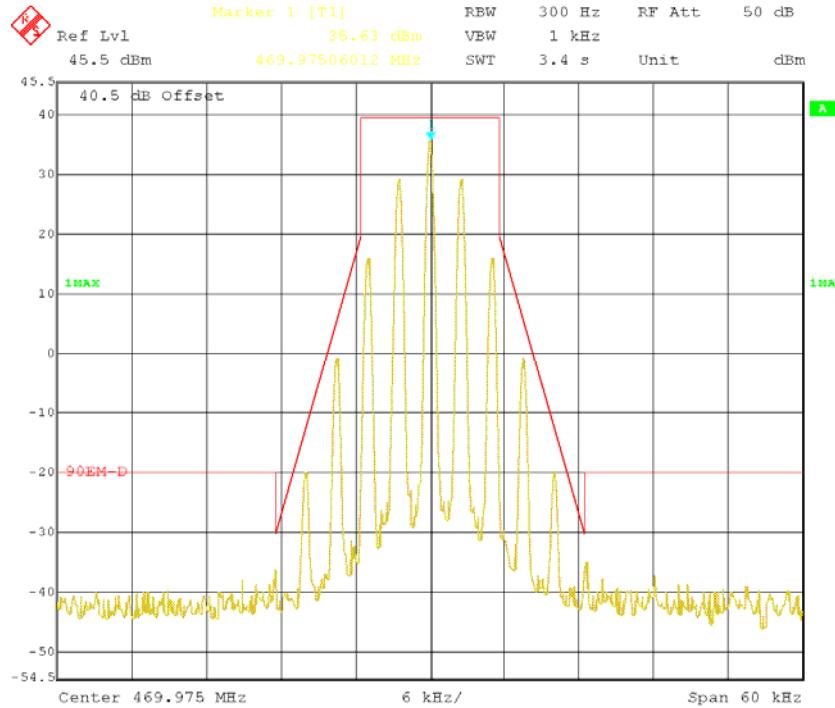
Emission Mask – Type D (Low power level)

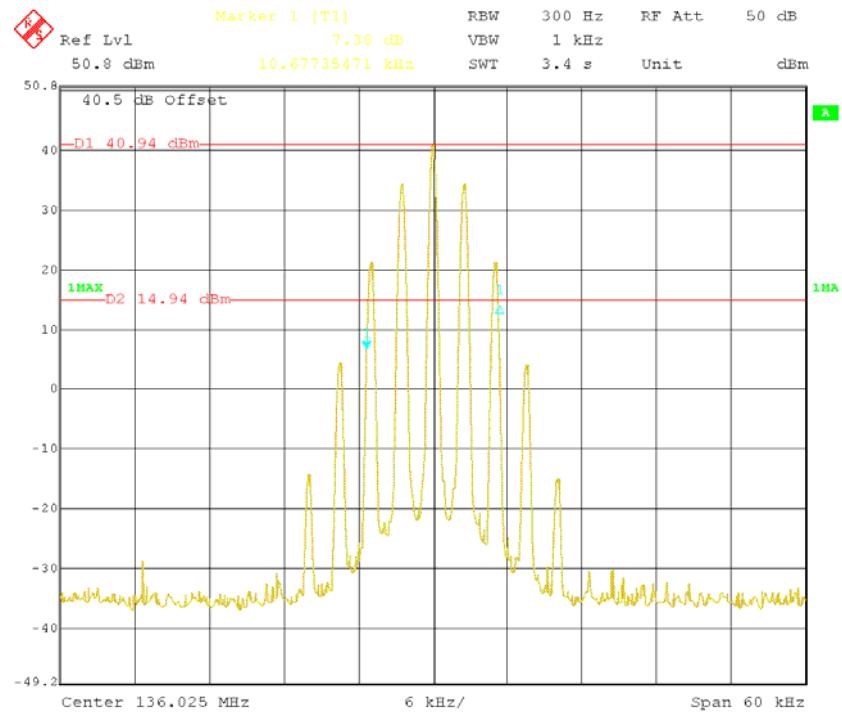
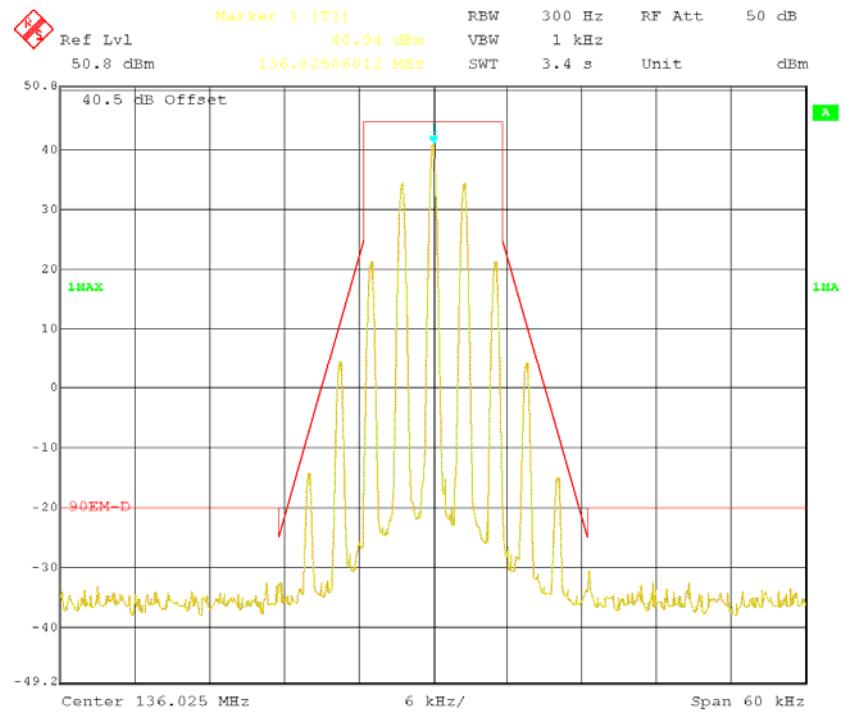


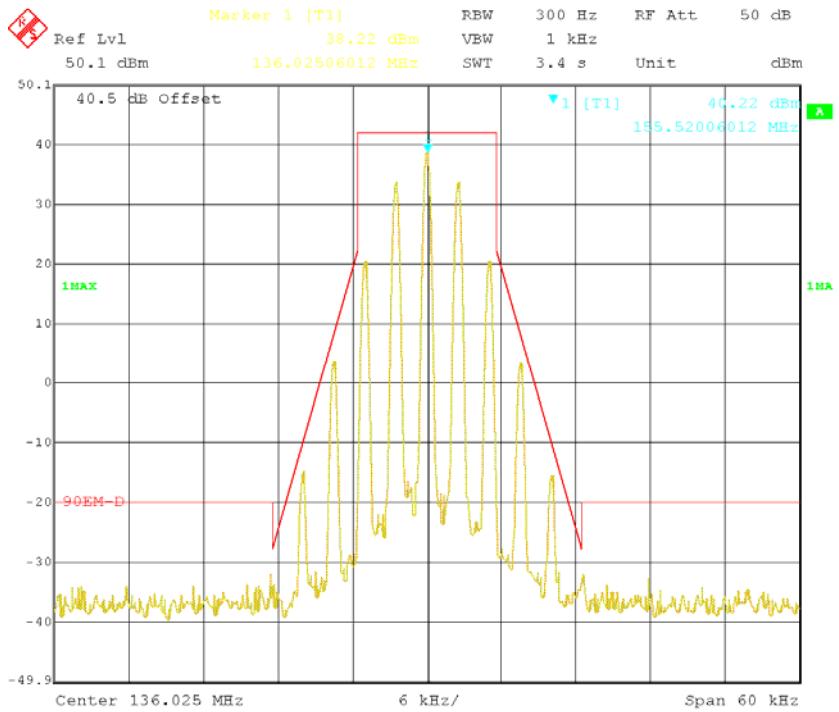
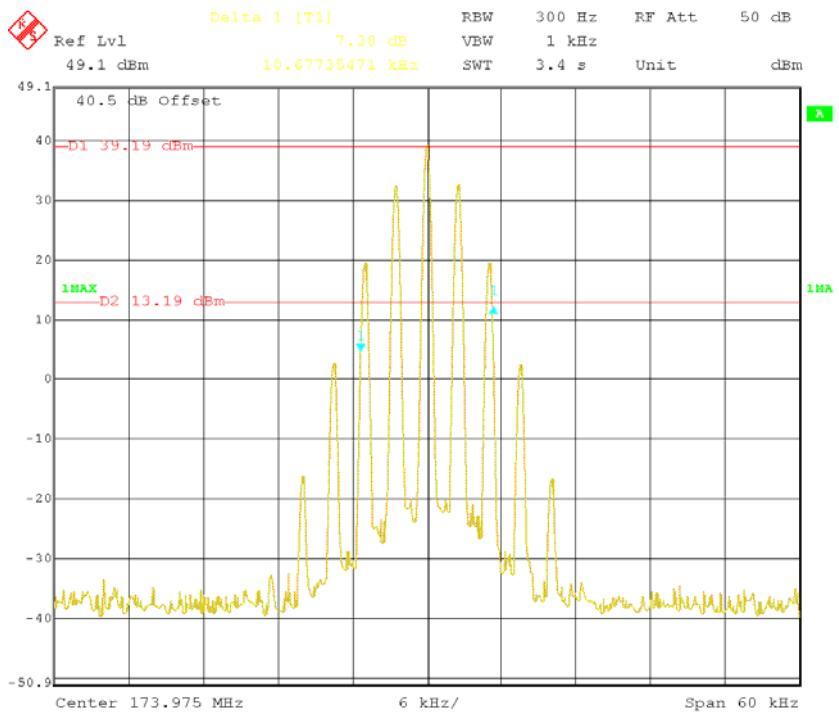
UHF – high channel:

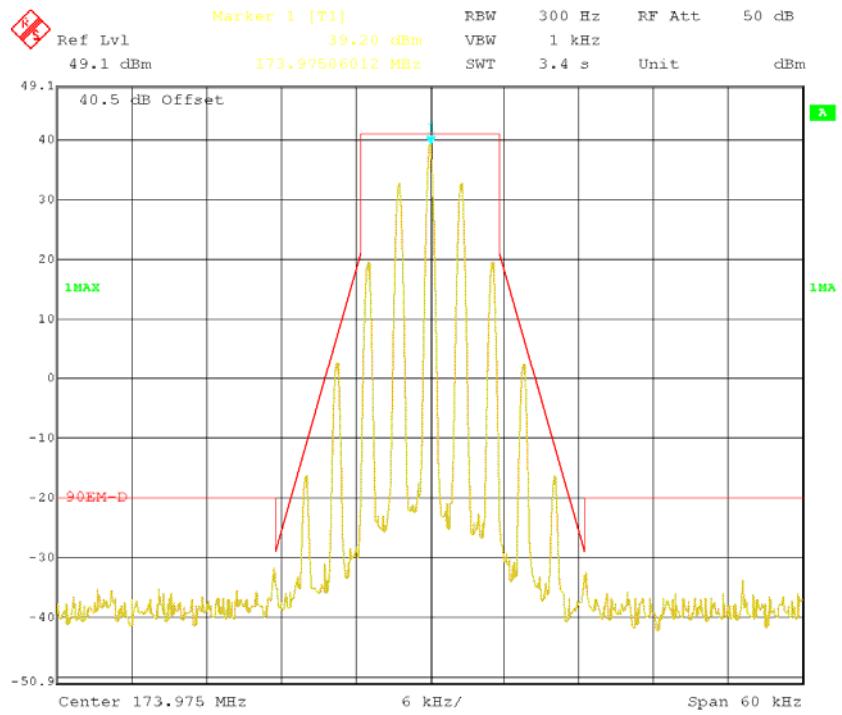
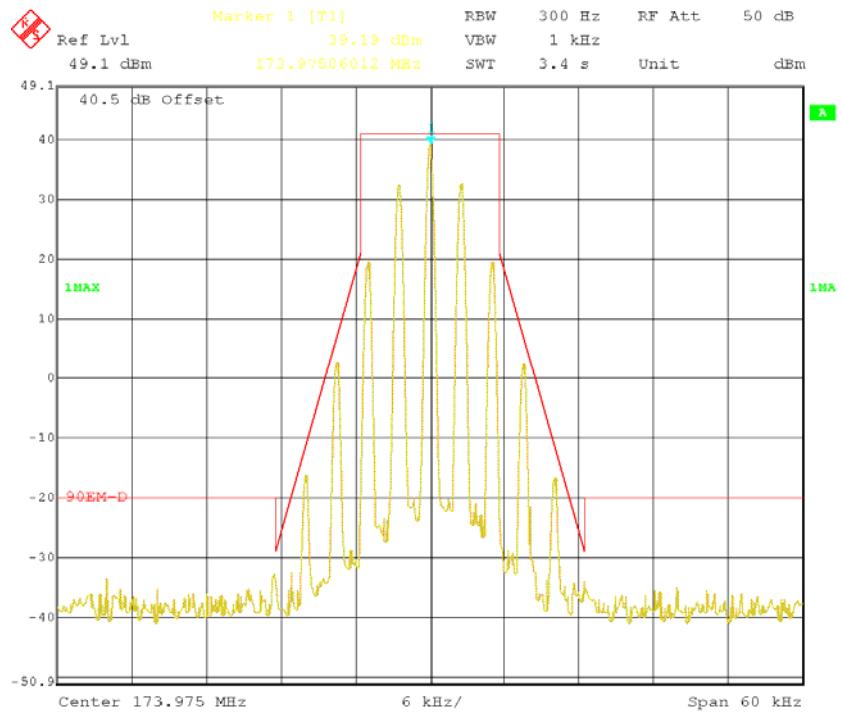
Occupied Bandwidth – high channel



Emission Mask – Type D (High power level)**Emission Mask – Type D (Low power level)**

VHF – low channel:**Occupied Bandwidth****Emission Mask- Channel – Type D (high power level)**

Emission Mask- Channel – Type D (low power level)**VHF – high channel:****Occupied Bandwidth – high channel**

Emission Mask- Channel – Type D (high power level)**Emission Mask- Channel – Type D (low power level)**

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:

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

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Data

Environmental Conditions

Temperature:	27.4 °C
Relative Humidity:	59%
ATM Pressure:	100.5 kPa

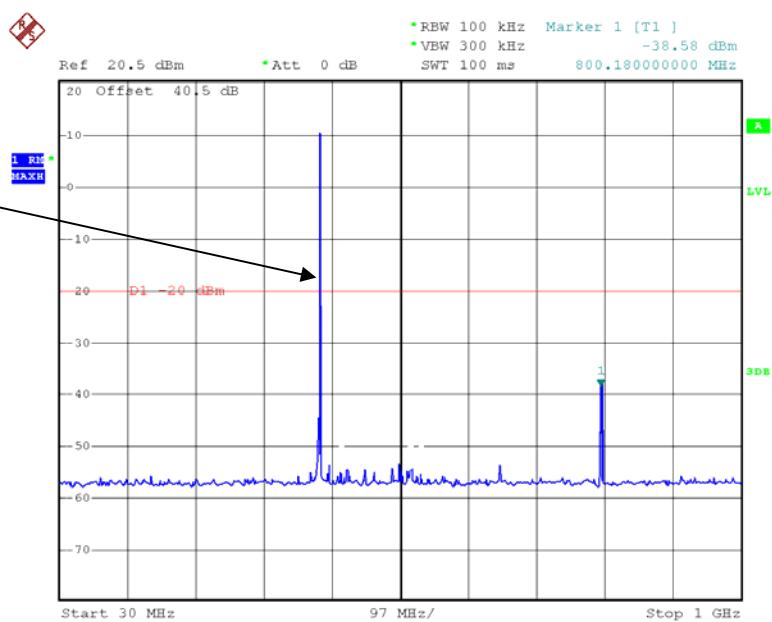
The testing was performed by Leon Chen on 2013-01-10.

Please refer to the following plots.

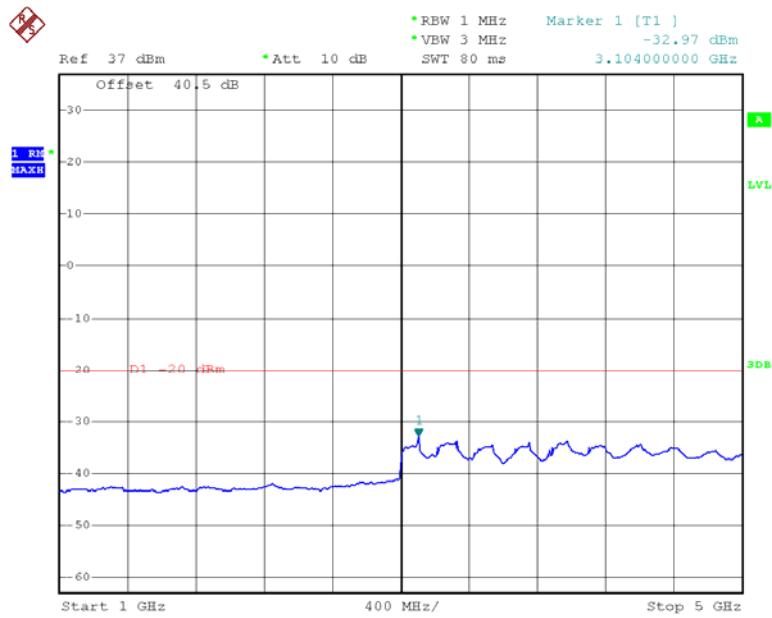
UHF - Low channel (high power):

30 MHz - 5 GHz

Fundamental

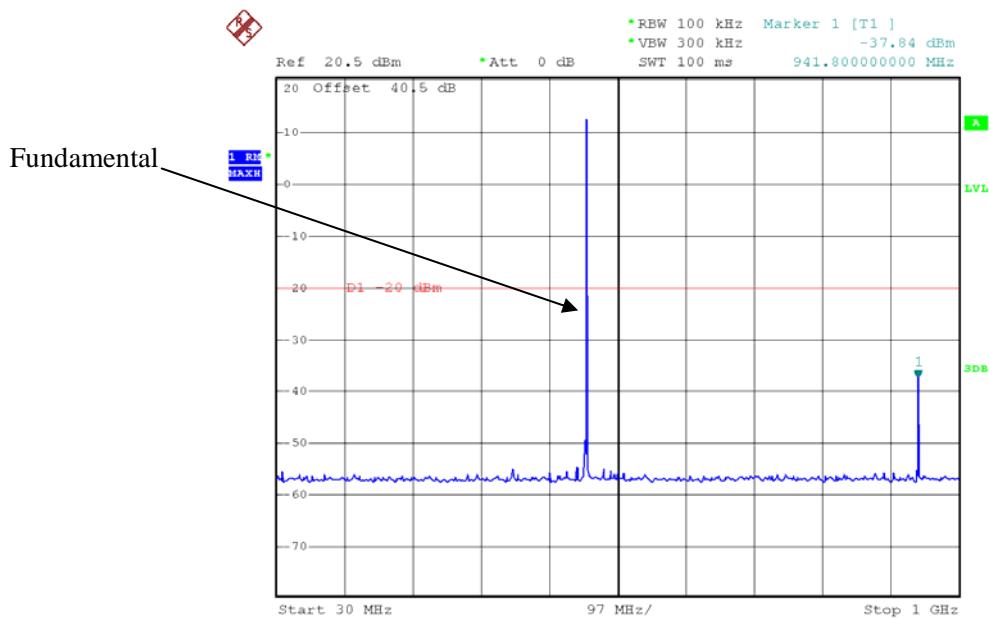


Date: 10.JAN.2013 09:19:10

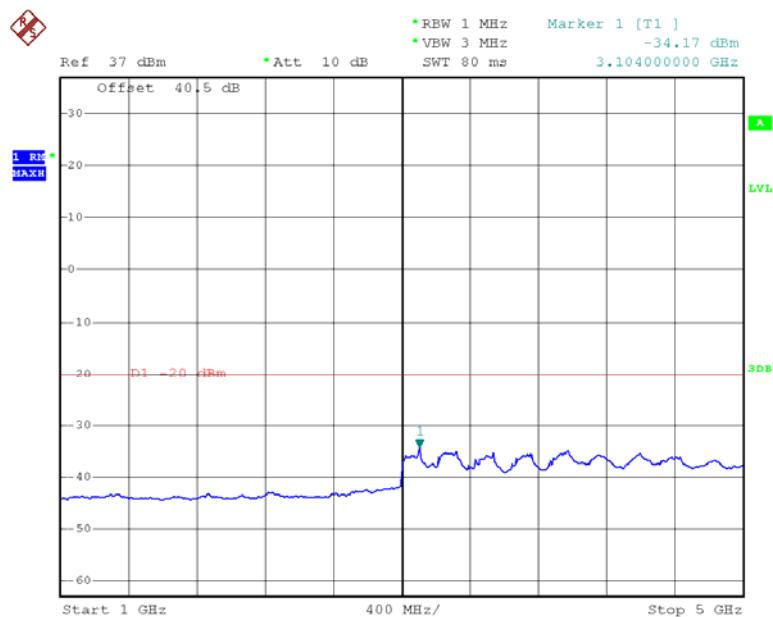


Date: 10.JAN.2013 14:58:24

UHF - High channel (high power):

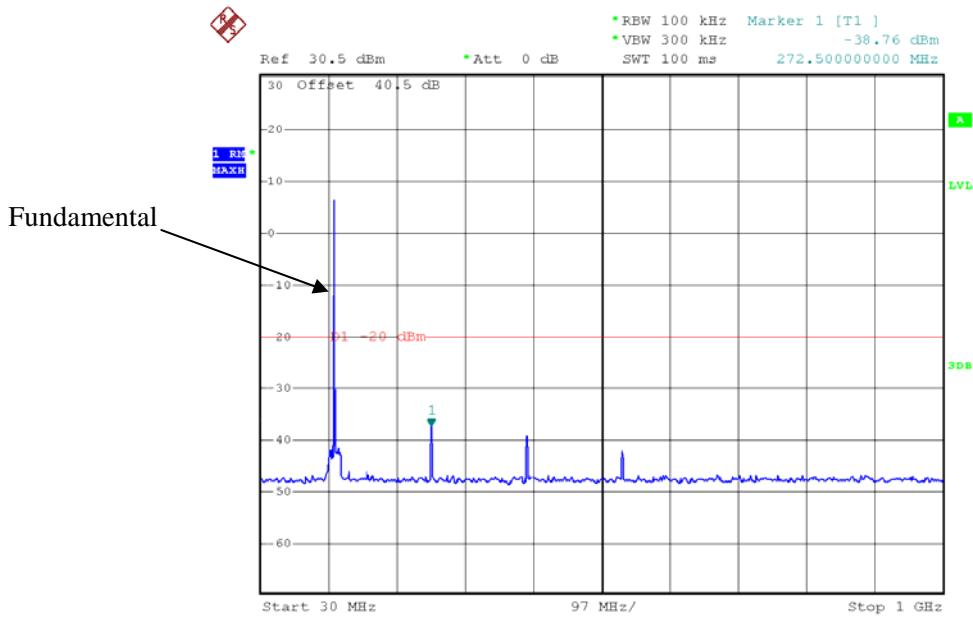


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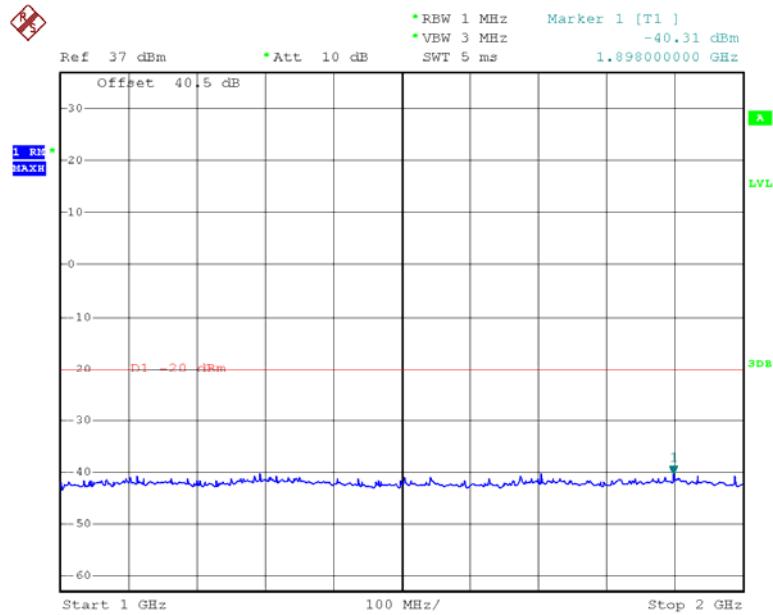
Date: 10.JAN.2013 19:41:11

VHF - low channel (high power):



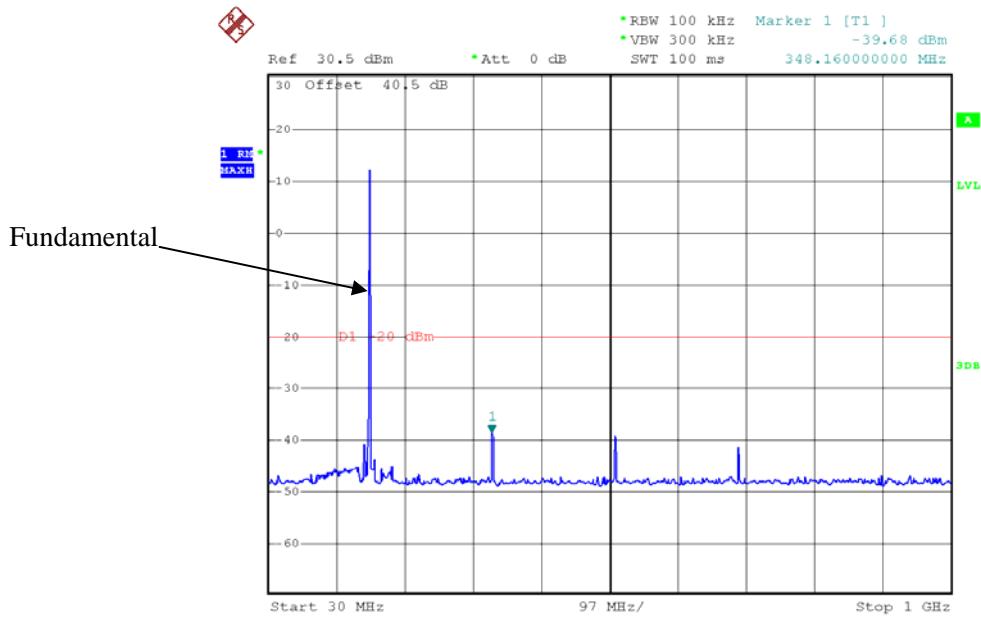
Fundamental

Date: 10.JAN.2013 08:47:17

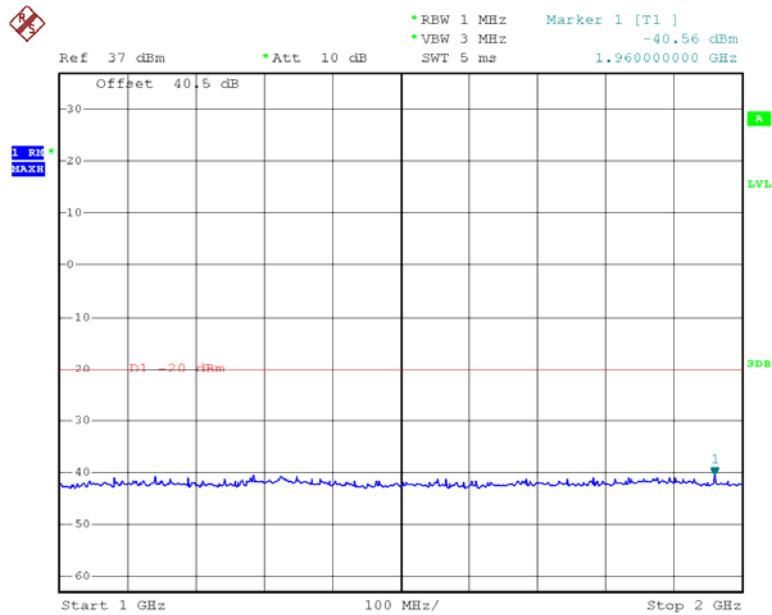


Date: 10.JAN.2013 19:26:30

VHF - high channel (high power):



Date: 10.JAN.2013 08:49:24



Date: 10.JAN.2013 19:28:13

FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §2.1053 and §90.210

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14
Sunol Sciences	Hybrid Antennas	JB3	A060611-3	2012-03-16	2013-03-15
TDK	Horn Antenna	HRN-0118	130 084	2012-9-6	2013-9-5
EMCO	Adjustable Dipole Antenna System	3121C	9109-753	2012-04-24	2013-04-23
Dayang	Horn Antenna	OMCDH101 80	10279001B	2010-07-30	2015-07-29
HP	Signal Generator	8648A	3426A00831	2012-3-15	2013-3-14
HP	Pre-amplifier	8447E	2434A02181	2012-03-08	2013-03-07
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	N/A	N/A
Giga	Signal Generator	1026	320408	2012-03-15	2013-03-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

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 Data

Environmental Conditions

Temperature:	20.3 °C
Relative Humidity:	43%
ATM Pressure:	101.4 kPa

The testing was performed by Leon Chen on 2013-01-10.

UHF band – high power level:

TX mode:

Model: TC-UV55

Frequency	Polar	S.G. Reading	S.G. Level	Antenna Gain	Cable Loss	Absolute Level	Limit	Margin
MHz	H/V	dB μ V	dBm	dBd/dBi	dB	dBm	dBm	dB
$f_c = 400.025\text{MHz}$								
800.180	H	50.87	-41.0	0.0	0.8	-41.8	-20.0	21.8
1200.000	H	52.45	-48.1	7.3	1.2	-42.0	-20.0	22.0
1600.100	H	51.90	-50.2	10.1	1.4	-41.5	-20.0	21.5
800.180	V	50.52	-38.8	0.0	0.8	-39.6	-20.0	19.6
1200.000	V	61.10	-39.7	7.3	1.2	-33.6	-20.0	13.6
1600.100	V	55.38	-46.7	10.1	1.4	-38.0	-20.0	18.0
$f_c = 469.975\text{MHz}$								
348.160	H	58.05	-43.6	0.0	0.4	-44.0	-20.0	24.0
941.800	H	49.95	-38.0	0.0	0.9	-38.9	-20.0	18.9
1408.800	H	55.14	-46.9	9.0	1.3	-39.2	-20.0	19.2
1877.760	H	56.32	-44.7	11.6	1.6	-34.7	-20.0	14.7
348.160	V	54.54	-44.5	0.0	0.4	-44.9	-20.0	24.9
941.800	V	46.10	-39.2	0.0	0.9	-40.1	-20.0	20.1
1408.800	V	60.21	-41.9	9.0	1.3	-34.2	-20.0	14.2
1877.760	V	56.66	-44.8	11.6	1.6	-34.8	-20.0	14.8

Model: TC-UV66

Frequency	Polar	S.G. Reading	S.G. Level	Antenna Gain	Cable Loss	Absolute Level	Limit	Margin
MHz	H/V	dB μ V	dBm	dBd/dBi	dB	dBm	dBm	dB
$f_c = 400.025\text{MHz}$								
800.180	H	49.34	-42.5	0.0	0.8	-43.3	-20.0	23.3
1200.000	H	54.02	-46.5	7.3	1.2	-40.4	-20.0	20.4
1600.100	H	52.95	-49.2	10.1	1.4	-40.5	-20.0	20.5
800.180	V	50.12	-39.2	0.0	0.8	-40.0	-20.0	20.0
1200.000	V	60.96	-39.8	7.3	1.2	-33.7	-20.0	13.7
1600.100	V	58.92	-43.2	10.1	1.4	-34.5	-20.0	14.5
$f_c = 469.975\text{MHz}$								
348.160	H	58.04	-43.6	0.0	0.4	-44.0	-20.0	24.0
941.800	H	49.69	-38.3	0.0	0.9	-39.2	-20.0	19.2
1408.800	H	58.86	-43.2	9.0	1.3	-35.5	-20.0	15.5
1877.760	H	52.71	-48.3	11.6	1.6	-38.3	-20.0	18.3
348.160	V	55.56	-43.5	0.0	0.4	-43.9	-20.0	23.9
941.800	V	50.07	-35.2	0.0	0.9	-36.1	-20.0	16.1
1408.800	V	56.88	-45.3	9.0	1.3	-37.6	-20.0	17.6
1877.760	V	56.10	-45.4	11.6	1.6	-35.4	-20.0	15.4

Note:

The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.

VHF band – high power level:

TX mode:

Model: TC-UV55

Frequency	Polar	S.G. Reading	S.G. Level	Antenna Gain	Cable Loss	Absolute Level	Limit	Margin
MHz	H/V	dB μ V	dBm	dBd/dBi	dB	dBm	dBm	dB
$f_c=136.025\text{MHz}$								
408.300	H	52.50	-42.3	0.0	0.5	-42.8	-20.0	22.8
544.100	H	49.90	-40.6	0.0	0.5	-41.1	-20.0	21.1
680.870	H	52.62	-37.0	0.0	0.6	-37.6	-20.0	17.6
817.640	H	51.94	-39.9	0.0	0.8	-40.7	-20.0	20.7
1632.340	H	50.62	-51.3	10.4	1.4	-42.3	-20.0	22.3
408.300	V	50.19	-42.0	0.0	0.5	-42.5	-20.0	22.5
545.070	V	47.80	-39.9	0.0	0.5	-40.4	-20.0	20.4
680.870	V	45.09	-42.4	0.0	0.6	-43.0	-20.0	23.0
817.640	V	50.28	-38.9	0.0	0.8	-39.7	-20.0	19.7
1632.340	V	48.95	-53.0	10.4	1.4	-44.0	-20.0	24.0
$f_c=173.975\text{MHz}$								
348.160	H	63.85	-37.8	0.0	0.4	-38.2	-20.0	18.2
521.790	H	49.35	-40.0	0.0	0.5	-40.5	-20.0	20.5
696.390	H	49.41	-39.5	0.0	0.6	-40.1	-20.0	20.1
870.020	H	54.50	-37.5	0.0	0.7	-38.2	-20.0	18.2
1565.740	H	46.86	-55.3	9.9	1.4	-46.8	-20.0	26.8
348.160	V	54.50	-44.6	0.0	0.4	-45.0	-20.0	25.0
521.790	V	48.52	-38.8	0.0	0.5	-39.3	-20.0	19.3
696.690	V	47.82	-39.4	0.0	0.6	-40.0	-20.0	20.0
870.020	V	44.35	-44.3	0.0	0.7	-45.0	-20.0	25.0
1565.740	V	53.18	-48.9	9.9	1.4	-40.4	-20.0	20.4

Model: TC-UV66

Frequency	Polar	S.G. Reading	S.G. Level	Antenna Gain	Cable Loss	Absolute Level	Limit	Margin
MHz	H/V	dB μ V	dBm	dBd/dBi	dB	dBm	dBm	dB
f_c=136.025MHz								
408.300	H	53.90	-40.9	0.0	0.5	-41.4	-20.0	21.4
544.100	H	52.64	-37.8	0.0	0.5	-38.3	-20.0	18.3
680.870	H	51.83	-37.8	0.0	0.6	-38.4	-20.0	18.4
817.640	H	53.45	-38.4	0.0	0.8	-39.2	-20.0	19.2
1632.340	H	49.97	-51.9	10.4	1.4	-42.9	-20.0	22.9
408.300	V	48.27	-44.0	0.0	0.5	-44.5	-20.0	24.5
545.070	V	43.85	-43.9	0.0	0.5	-44.4	-20.0	24.4
680.870	V	46.08	-41.4	0.0	0.6	-42.0	-20.0	22.0
817.640	V	52.47	-36.7	0.0	0.8	-37.5	-20.0	17.5
1632.340	V	46.45	-55.5	10.4	1.4	-46.5	-20.0	26.5
f_c=173.975MHz								
348.160	H	62.37	-39.3	0.0	0.4	-39.7	-20.0	19.7
521.790	H	47.27	-42.1	0.0	0.5	-42.6	-20.0	22.6
696.390	H	47.74	-41.2	0.0	0.6	-41.8	-20.0	21.8
870.020	H	54.05	-38.0	0.0	0.7	-38.7	-20.0	18.7
1565.740	H	48.98	-53.2	9.9	1.4	-44.7	-20.0	24.7
348.160	V	56.19	-42.9	0.0	0.4	-43.3	-20.0	23.3
521.790	V	45.31	-42.0	0.0	0.5	-42.5	-20.0	22.5
696.690	V	48.72	-38.5	0.0	0.6	-39.1	-20.0	19.1
870.020	V	44.16	-44.5	0.0	0.7	-45.2	-20.0	25.2
1565.740	V	54.91	-47.2	9.9	1.4	-38.7	-20.0	18.7

Note:

The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.

FCC §2.1055 & §90.213- FREQUENCY STABILITY

Applicable Standard

FCC §2.1055 & §90.213

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14
ESPEC	Humidity tester	ESX-4CA	018 463	2012-3-2	2013-3-1

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The AC 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.

Test Data

Environmental Conditions

Temperature:	26.8 °C
Relative Humidity:	58%
ATM Pressure:	100.5 kPa

The testing was performed by Leon Chen on 2013-01-10.

Test Mode: Transmitting

UHF:

Reference Frequency: 435MHz, Limit: 2.5 ppm			
Temperature	Voltage	Reading	Frequency Error
°C	V _{DC}	MHz	ppm
-30	13.8	434.999829	-0.393
-20	13.8	434.999837	-0.375
-10	13.8	434.999833	-0.384
0	13.8	434.999851	-0.343
10	13.8	434.999826	-0.400
20	13.8	434.999819	-0.416
30	13.8	434.999835	-0.379
40	13.8	434.999826	-0.400
50	13.8	434.999884	-0.267
25	15.9	434.999873	-0.292
25	11.7	434.999869	-0.301

VHF:

Reference Frequency: 155MHz, Limit: 5 ppm			
Temperature	Voltage	Reading	Frequency Error
°C	V _{DC}	MHz	ppm
-30	13.8	154.999919	-0.523
-20	13.8	154.999943	-0.368
-10	13.8	154.999928	-0.465
0	13.8	154.999936	-0.413
10	13.8	154.999956	-0.284
20	13.8	154.999946	-0.348
30	13.8	154.999932	-0.439
40	13.8	154.999968	-0.206
50	13.8	154.999974	-0.168
25	15.9	154.999931	-0.445
25	11.7	154.999926	-0.477

FCC §90.214 - TRANSIENT FREQUENCY BEHAVIOR

Applicable Standard

Regulations: FCC §90.214

Test method: ANSI/TIA-603-D 2010, section 2.2.19.3

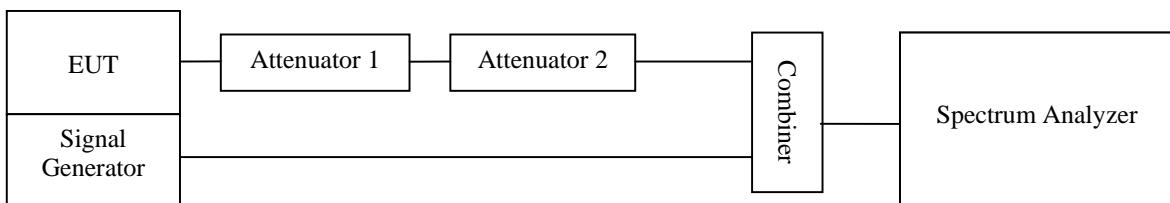
Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14
HP	Signal Generator	8648A	3426A00831	2012-10-9	2013-10-8

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

- a) Connect the EUT and test equipment as shown on the following block diagram.
- b) Set the Spectrum Analyzer to measure FM deviation, and tune the RF frequency to the transmitter assigned frequency.
- c) Set the signal generator to the assigned transmitter frequency and modulate it with a 1 kHz tone at ± 12.5 kHz deviation and set its output level to -100dBm.
- d) Turn on the transmitter.
- e) Supply sufficient attenuation via the RF attenuator to provide an input level to the Spectrum Analyzer that is 40 dB below the maximum allowed input power when the transmitter is operating at its rated power level. Note this power level on the Spectrum Analyzer as P_0 .
- f) Turn off the transmitter.
- g) Adjust the RF level of the signal generator to provide RF power equal to P_0 . This signal generator RF level shall be maintained throughout the rest of the measurement.
- h) Remove the attenuation 1, so the input power to the Spectrum Analyzer is increased by 30 dB when the transmitter is turned on.
- i) Adjust the vertical amplitude control of the spectrum analyzer to display the 1000 Hz at ± 4 divisions vertically centered on the display. Set trigger mode of the Spectrum Analyzer to “Video”, and tune the “trigger level” on suitable level. Then set the “tiger offset” to -10ms for turn on and -15ms for turn off.
- j) Turn on the transmitter and the transient wave will be captured on the screen of Spectrum Analyzer. Observe the stored display. The instant when the 1 kHz test signal is completely suppressed is considered to be t_{on} . The trace should be maintained within the allowed divisions during the period t_1 and t_2 .
- k) Then turn off the transmitter, and another transient wave will be captured on the screen of Spectrum Analyzer. The trace should be maintained within the allowed divisions during the period t_3 .



Test Data

Environmental Conditions

Temperature:	27.4 °C
Relative Humidity:	59%
ATM Pressure:	100.5 kPa

The testing was performed by Leon Chen on 2012-01-10.

UHF band:

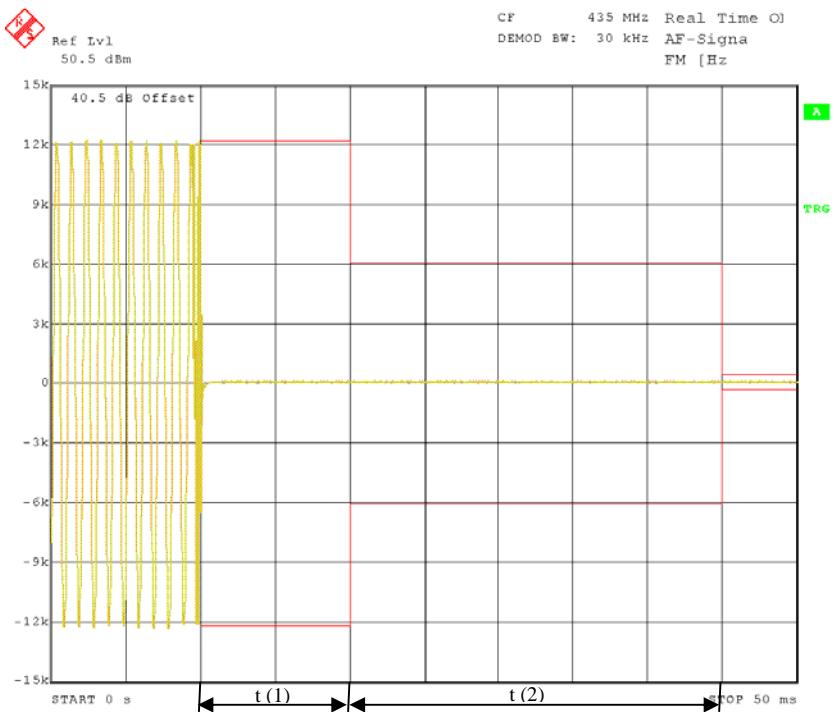
Channel Separation (kHz)	Transient Period (ms)	Transient Frequency	Result
12.5	<10 (t1)	± 12.5 kHz	Pass
	<25(t2)	± 6.25 kHz	
	<10 (t3)	± 12.5 kHz	

VHF band:

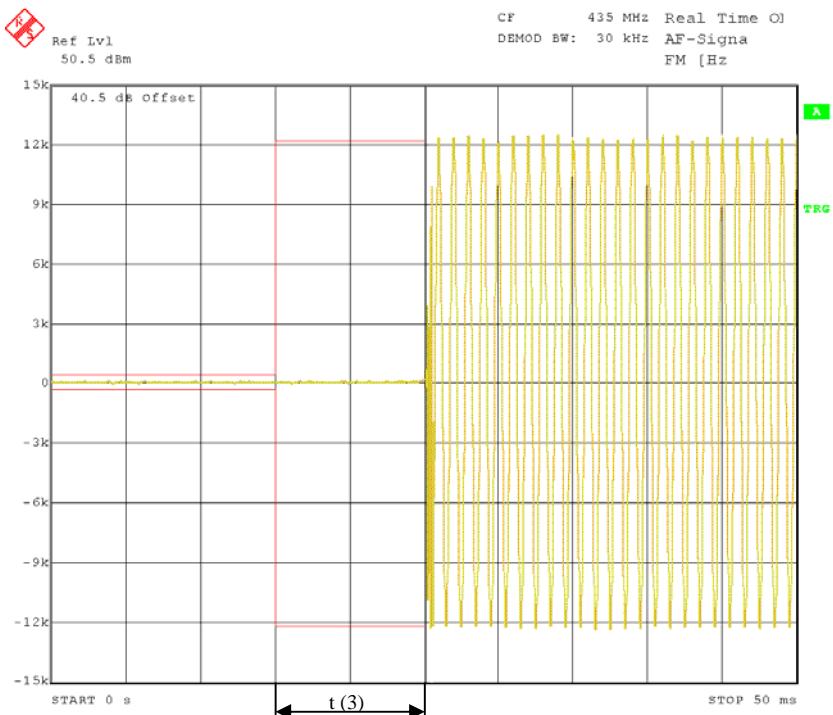
Channel Separation (kHz)	Transient Period (ms)	Transient Frequency	Result
12.5	<5 (t1)	± 12.5 kHz	Pass
	<20 (t2)	± 6.25 kHz	
	<5 (t3)	± 12.5 kHz	

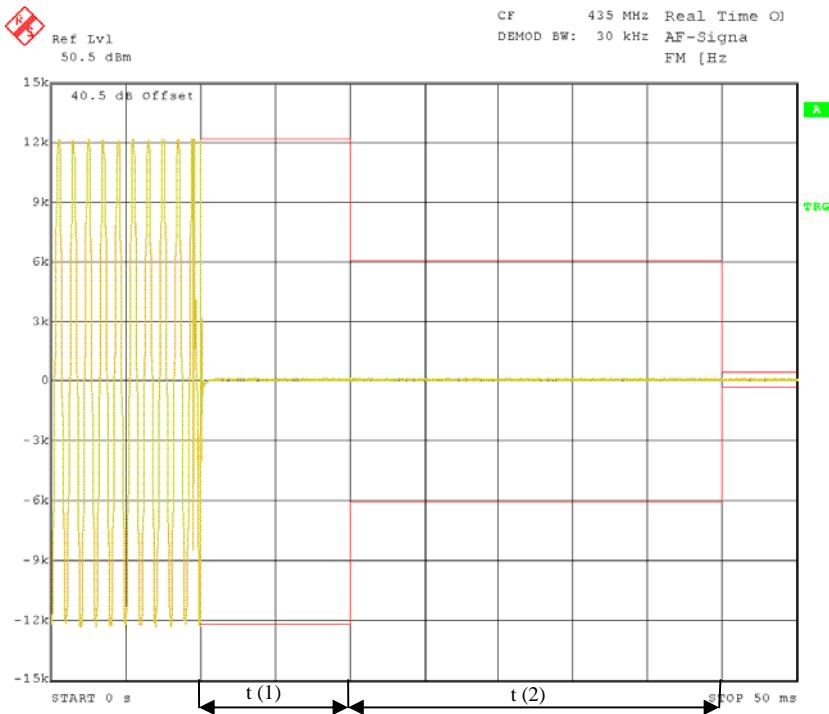
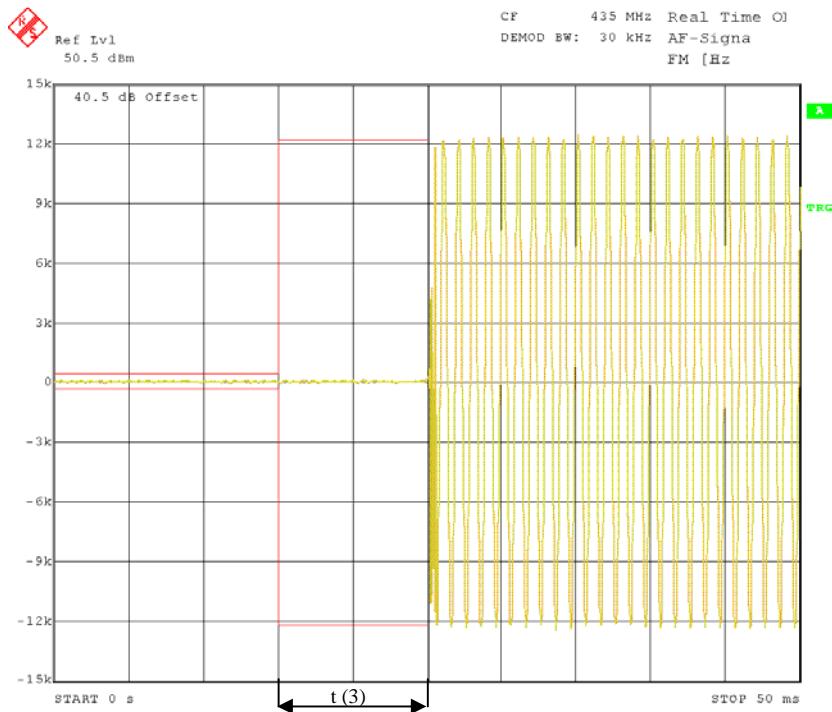
UHF:

Turn on –Middle Channel (high power level)

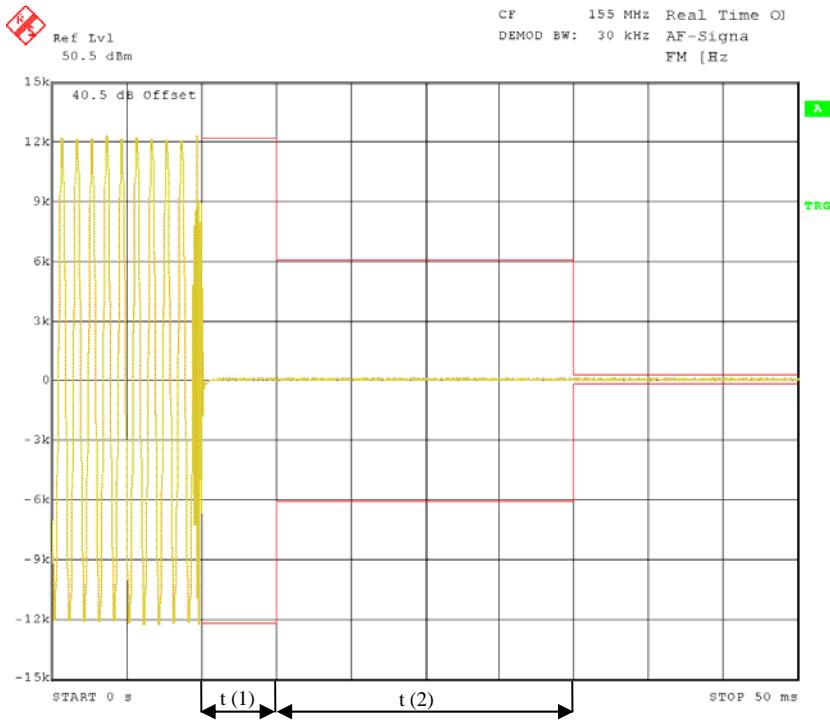
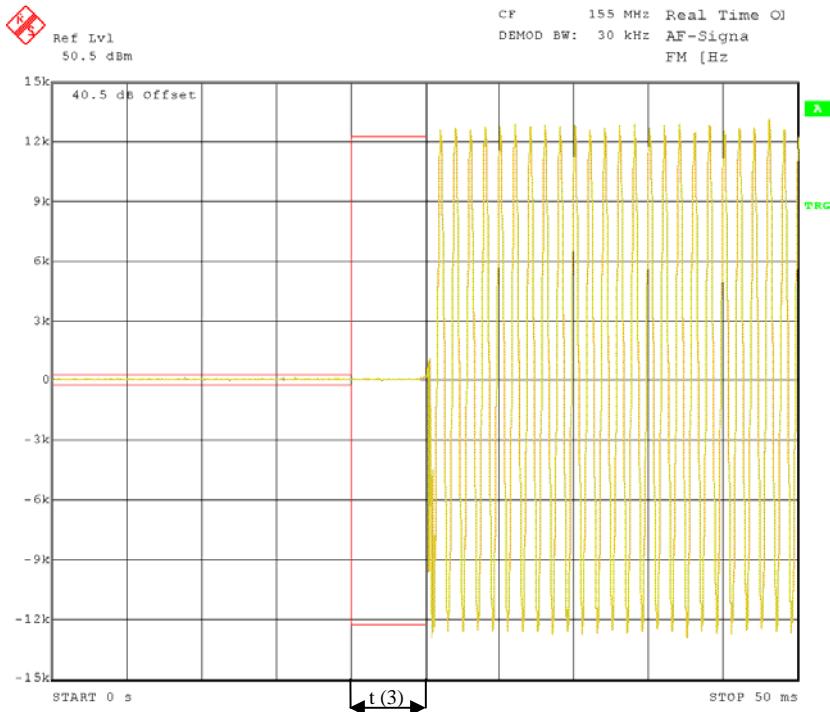


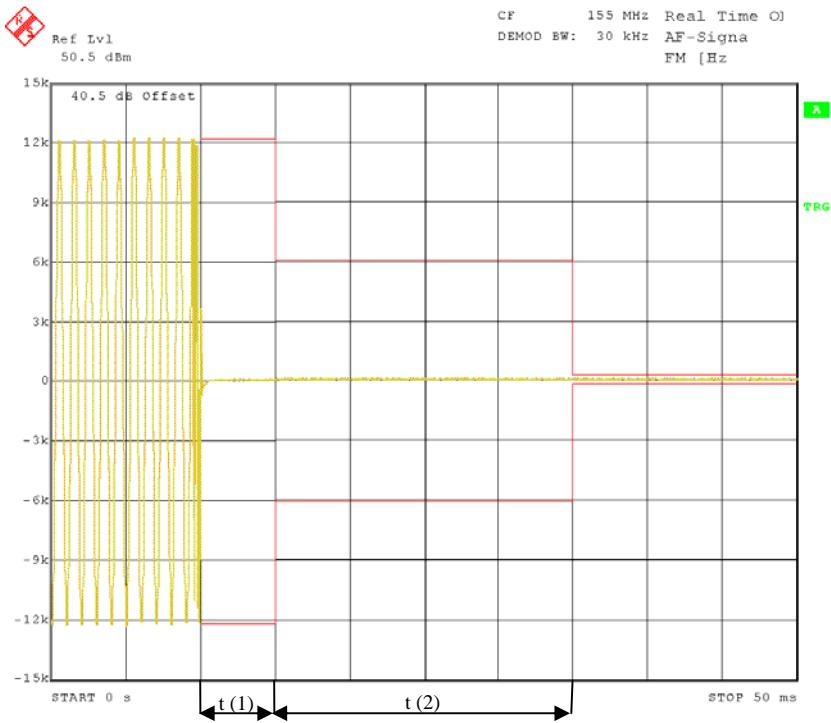
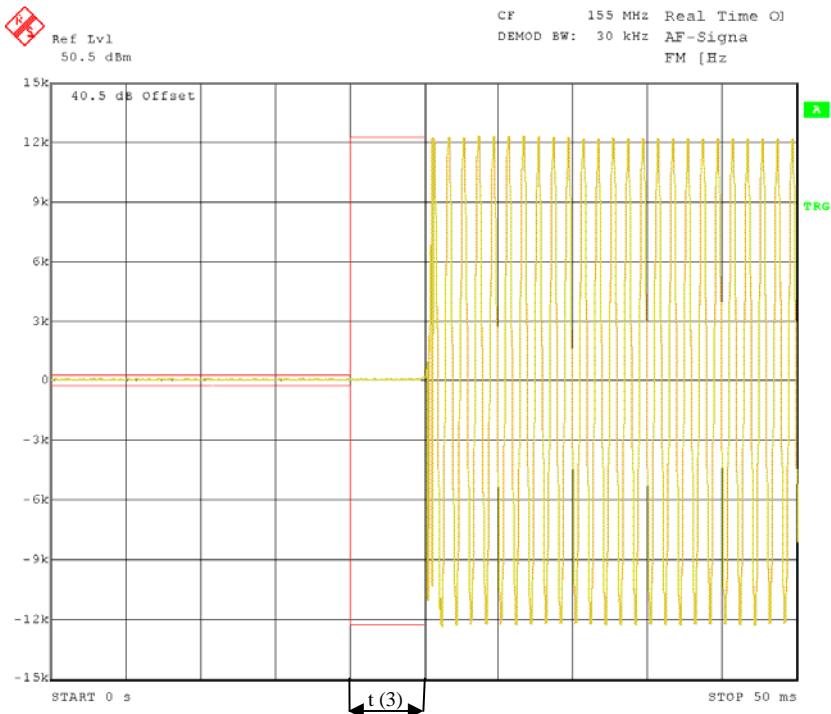
Turn off –Middle Channel (high power level)



Turn on –Middle Channel (low power level)**Turn off –Middle Channel (low power level)**

VHF:

Turn on –Middle Channel (high power level)**Turn off –Middle Channel (high power level)**

Turn on –Middle Channel (low power level)**Turn off –Middle Channel (low power level)**

DECLARATION LETTER



QUANZHOU TRUEST COMMUNICATION CO.,LIMITED

Add: RM13A Dragon Building, No.144 Wenling South Road, Fengze district Quanzhou City, Fujian Province, China

Tel: 13905978726 Fax: 0595-22611378/22517069

DECLARATION

2013-1-15

To:

Bay Area Compliance Laboratories Corp.
1274 Anvilwood Avenue
Sunnyvale, CA 94089

Dear Sir or Madam:

We, QUANZHOU TRUEST COMMUNICATION CO.,LIMITED, hereby declare that our product: Dual Band Vehicle Two Way Radio, model number: TC-UV66, TC-UV55, their software, operation and main board is the same. Their difference is only for housing and keypad physical form, they are same type radio.

Please contact me should there be need for any additional classification or information.

Best Regards,

Signature:

Yunsheng Huang
The general manager

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