



FCC PART 90

TEST REPORT

For

NANAN HONGDA ELECTRONIC EQUIPMENT CO., LTD.

Zian Road, Jiangnan High-Tech Industrial zone, Quanzhou, China

FCC ID: WENCHIERDA2011UAW

Report Type: Original Report	Product Type: TRANSCEIVER
Test Engineer: <u>Eric Lee</u> <i>Eric Lee</i>	
Report Number: <u>RXM11051051-00</u>	
Report Date: <u>2012-11-30</u>	
Reviewed By: <u>RF Leader</u> <i>Alvin Huang</i> <i>Alvin Huang</i>	
Test Laboratory: 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 www.baclcorp.com.cn	

Note: This test report is prepared for the customer shown above and for the equipment 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 shall be marked with an asterisk“★”

TABLE OF CONTENTS

GENERAL INFORMATION	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION	6
DESCRIPTION OF TEST CONFIGURATION	6
EQUIPMENT MODIFICATIONS	6
CONFIGURATION OF TEST SETUP	6
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
FCC §1.1307(b) & §2.1093 - RF EXPOSURE	8
APPLICABLE STANDARD	8
FCC §2.1046 & §90.205- RF OUTPUT POWER	9
APPLICABLE STANDARD	9
TEST PROCEDURE	9
TEST EQUIPMENT LIST AND DETAILS.....	9
TEST DATA	10
FCC §2.1047 & §90.207 - MODULATION CHARACTERISTIC	11
APPLICABLE STANDARD	11
TEST PROCEDURE	11
TEST EQUIPMENT LIST AND DETAILS.....	11
TEST DATA	11
FCC §2.1049, §90.209 & §90.210 – OCCUPIED BANDWIDTH & EMISSION MASK	17
APPLICABLE STANDARD	17
TEST PROCEDURE	17
TEST EQUIPMENT LIST AND DETAILS.....	17
TEST DATA	18
FCC §2.1051 & §90.210 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS	20
APPLICABLE STANDARD	20
TEST PROCEDURE	20
TEST EQUIPMENT LIST AND DETAILS.....	20
TEST DATA	21
FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS	23
APPLICABLE STANDARD	23
TEST PROCEDURE	23
TEST EQUIPMENT LIST AND DETAILS.....	23
TEST DATA	24
FCC §2.1055 & §90.213- FREQUENCY STABILITY	25
APPLICABLE STANDARD	25
TEST PROCEDURE	25
TEST EQUIPMENT LIST AND DETAILS.....	25

TEST DATA	25
FCC §90.214 - TRANSIENT FREQUENCY BEHAVIOR.....	27
APPLICABLE STANDARD	27
TEST PROCEDURE	27
TEST EQUIPMENT LIST AND DETAILS.....	27
TEST DATA	27
PRODUCT SIMILARITY DECLARATION LETTER.....	29

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *NANAN HONGDA ELECTRONIC EQUIPMENT CO., LTD.*'s product, model number: *UANB-501* (*FCC ID: WENCHIERDA2011UAW*) (the "EUT") in this report was a *TRANSCEIVER* that operates in the frequency band 136~174 MHz and with channel spacing of 12.5 kHz (narrow-band). The EUT was measured approximately 14.0 cm (L) x 6.1 cm (W) x 4.06 cm (H), rated input voltage: DC 7.2 V battery.

Note: The serial product, models UANB-401, UANB-501 and HD-2107G are electrically identical, UANB-501 was selected for fully testing, the differences among them is just the model number, which was explained in the attached declaration letter that was stated and guaranteed by the applicant

** All measurement and test data in this report was gathered from production sample serial number: 1105012 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2011-05-10.*

Objective

This test report is prepared on behalf of *NANAN HONGDA ELECTRONIC EQUIPMENT 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 on 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 December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

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 an ISO/IEC 17025 accredited laboratory, and is accredited by 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

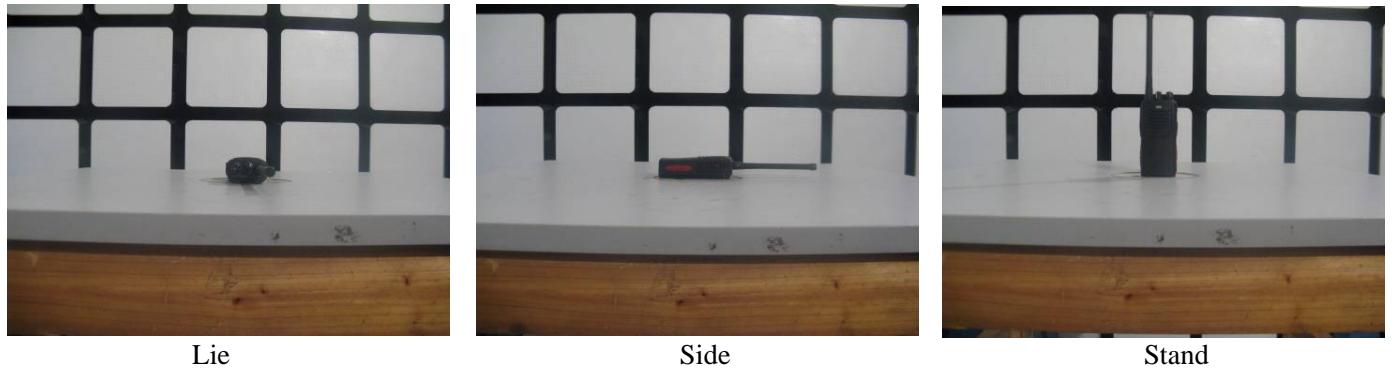
Description of Test Configuration

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

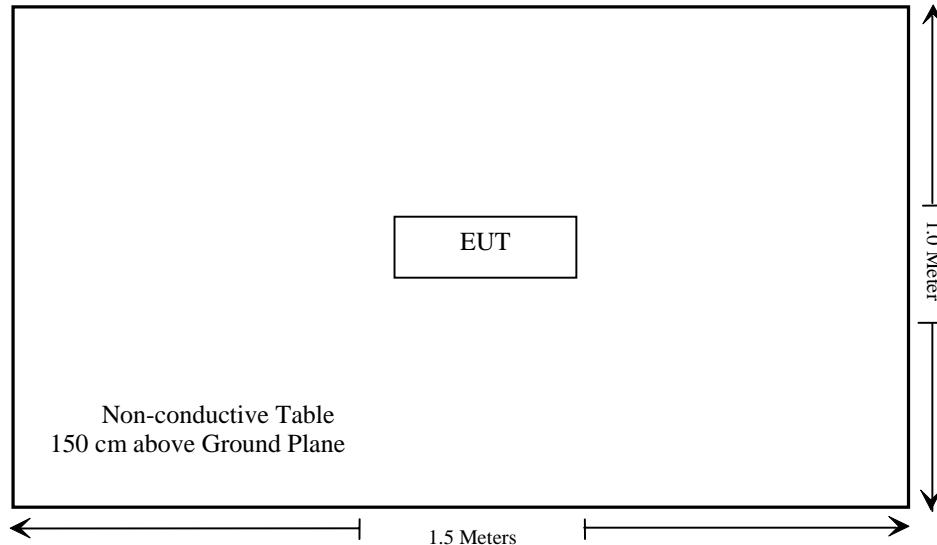
Equipment Modifications

No modification was made to the EUT tested.

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§1.1307 (b); §2.1093	RF Exposure	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) & §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: R1112225-SAR.

FCC §2.1046 & §90.205- RF OUTPUT POWER

Applicable Standard

FCC §2.1046 and §90.205.

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 Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ 26	8386001028	2011-11-24	2012-11-23
HP	Synthesized Sweeper	8341B	2624A00116	2012-05-17	2013-05-16
Com Power	Dipole Antenna	AD-100	041000	2012-06-06	2013-06-05
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM)

Test Data

Environmental Conditions

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

The testing was performed by Eric Lee on 2012-08-10.

Test Mode: Transmitting

Test Result: Compliance.

Please refer to following table and plots

Conducted Output Power at Antenna Port:

Frequency Spacing (kHz)	Frequency (MHz)	Output Power (dBm)	Output Power (Watt)	Emission power	Comment	
12.5	136.5	36.75	4.73	High Output Power	PK	
	155.0	36.98	4.99			
	173.5	36.50	4.47			
	136.5	30.56	1.14	Low Output Power		
	155.0	30.38	1.09			
	173.5	31.25	1.33			

Radiated output power (Measured with Max. conducted output power channel):

Frequency (MHz)	Receiver Reading (dB μ V)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Comments
			Height (m)	Polar (H / V)	SG Level (dBm)	Cable loss(dB)	Antenna Gain(dB)		
136.5	112.24	105	1.5	V	36.2	0.5	0.0	35.7	High Output Power
155.0	112.05	136	1.5	V	36.0	0.5	0.0	35.5	
173.5	111.65	145	1.5	V	35.6	0.5	0.0	35.1	

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 Communication Test Set	8920A	3438A05201	2012-06-14	2013-06-13
LEADER	MILLIVOLTMETER	LMV-181A	6041126	2012-05-09	2013-05-08

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM)

Test Data

Environmental Conditions

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

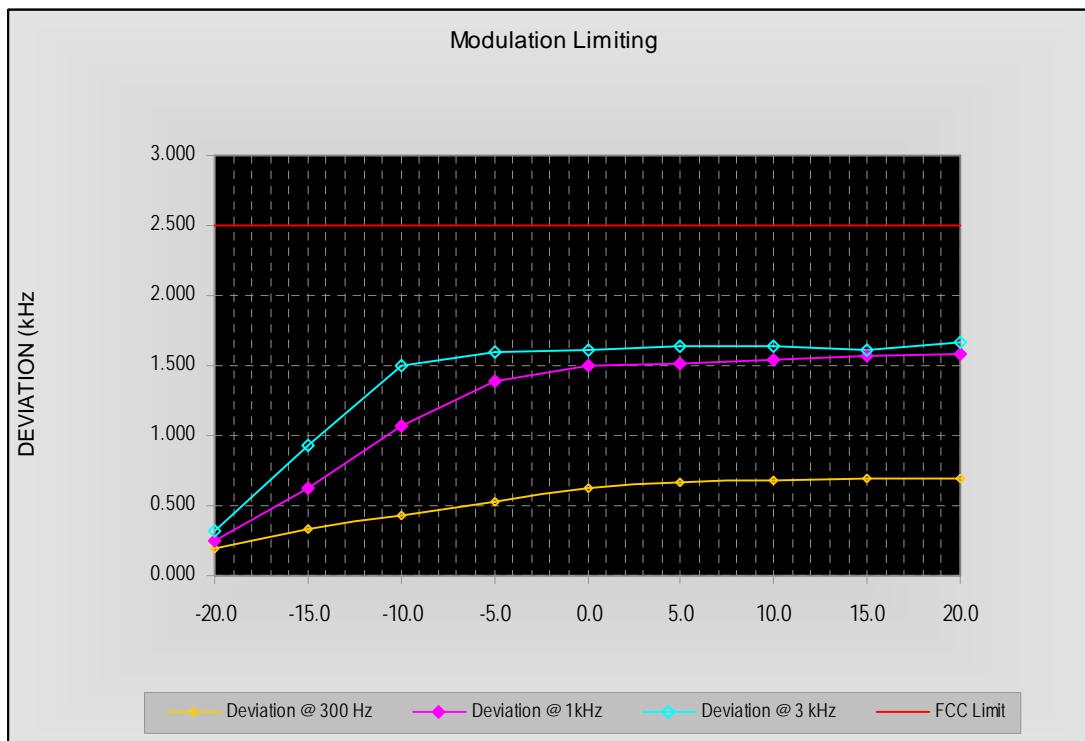
The testing was performed by Eric Lee on 2012-08-11.

Test Mode: Transmitting

MODULATION LIMITING

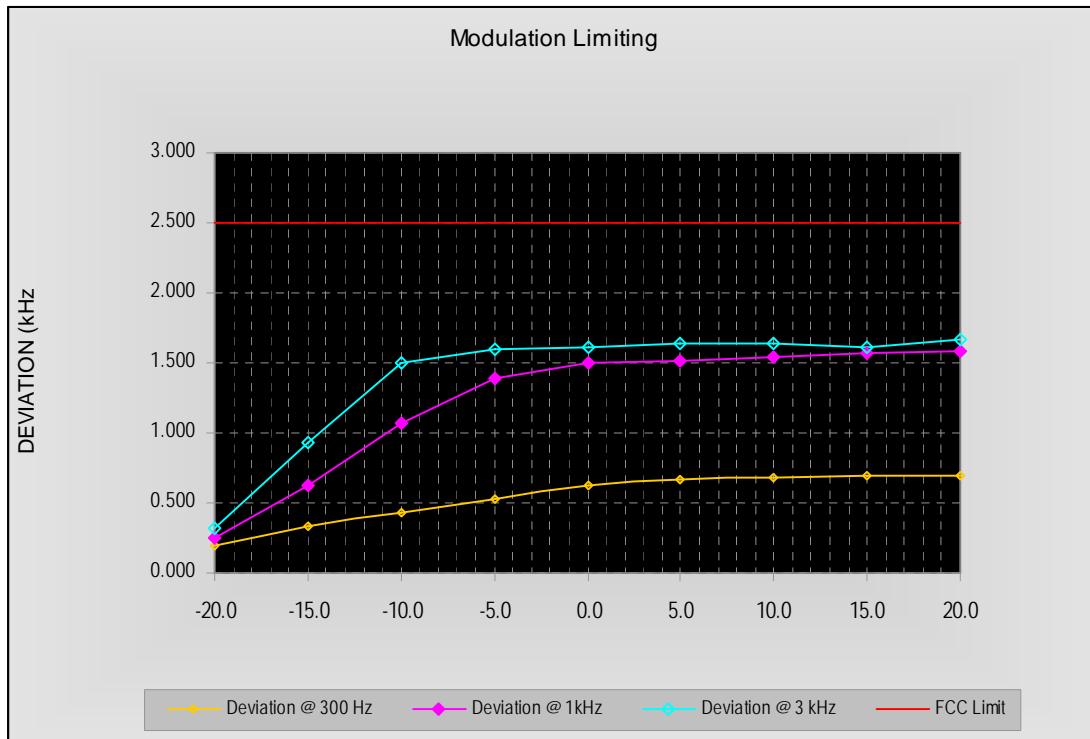
Carrier Frequency: 155.5 MHz, Channel Separation=12.5 kHz – High Power

Audio Input Level (dB)	Frequency Deviation (kHz)			FCC Limit (kHz)
	@ 300 Hz	@ 1kHz	@ 3 kHz	
-20.0	0.201	0.252	0.315	2.5
-15.0	0.331	0.623	0.934	2.5
-10.0	0.435	1.067	1.497	2.5
-5.0	0.524	1.384	1.602	2.5
0	0.621	1.500	1.616	2.5
5.0	0.668	1.516	1.636	2.5
10.0	0.674	1.546	1.635	2.5
15.0	0.701	1.573	1.617	2.5
20.0	0.695	1.587	1.661	2.5



Carrier Frequency: 155.5 MHz, Channel Separation=12.5 kHz – Low Power

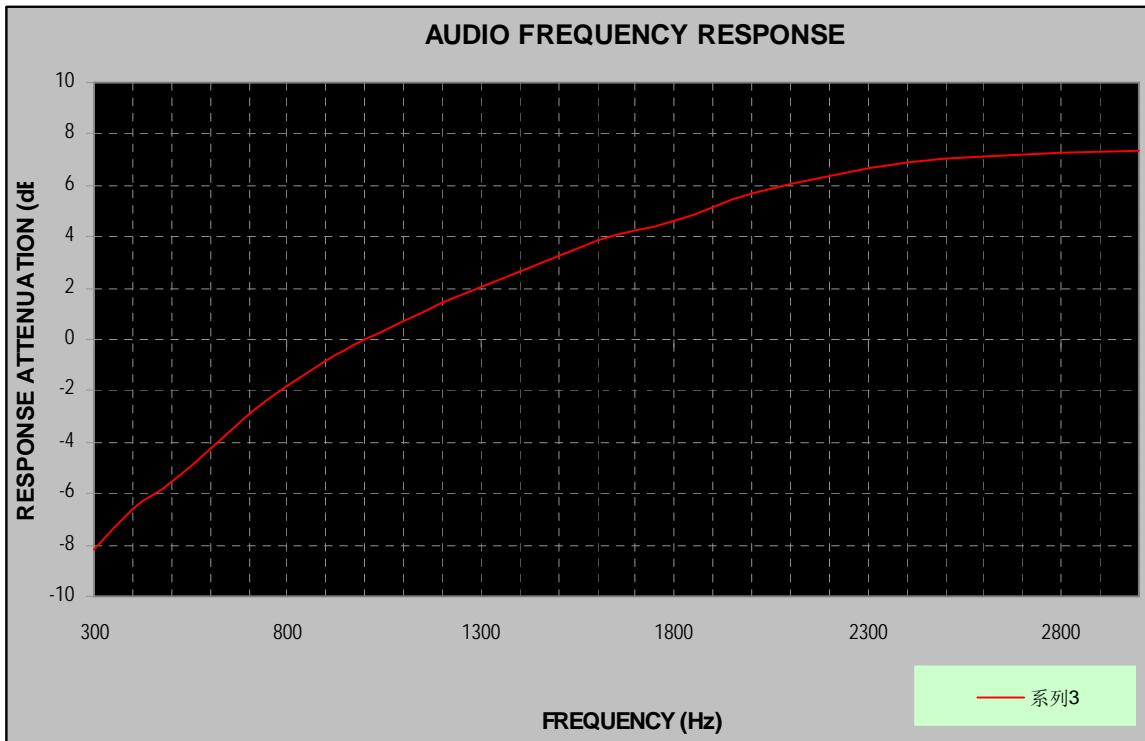
Audio Input Level (dB)	Frequency Deviation (kHz)			FCC Limit (kHz)
	@ 300 Hz	@ 1kHz	@ 3 kHz	
-20.0	0.210	0.248	0.312	2.5
-15.0	0.350	0.612	0.915	2.5
-10.0	0.415	1.025	1.457	2.5
-5.0	0.524	1.354	1.612	2.5
0	0.654	1.500	1.613	2.5
5.0	0.671	1.526	1.621	2.5
10.0	0.681	1.555	1.635	2.5
15.0	0.715	1.584	1.645	2.5
20.0	0.721	1.621	1.668	2.5



Audio Frequency Response

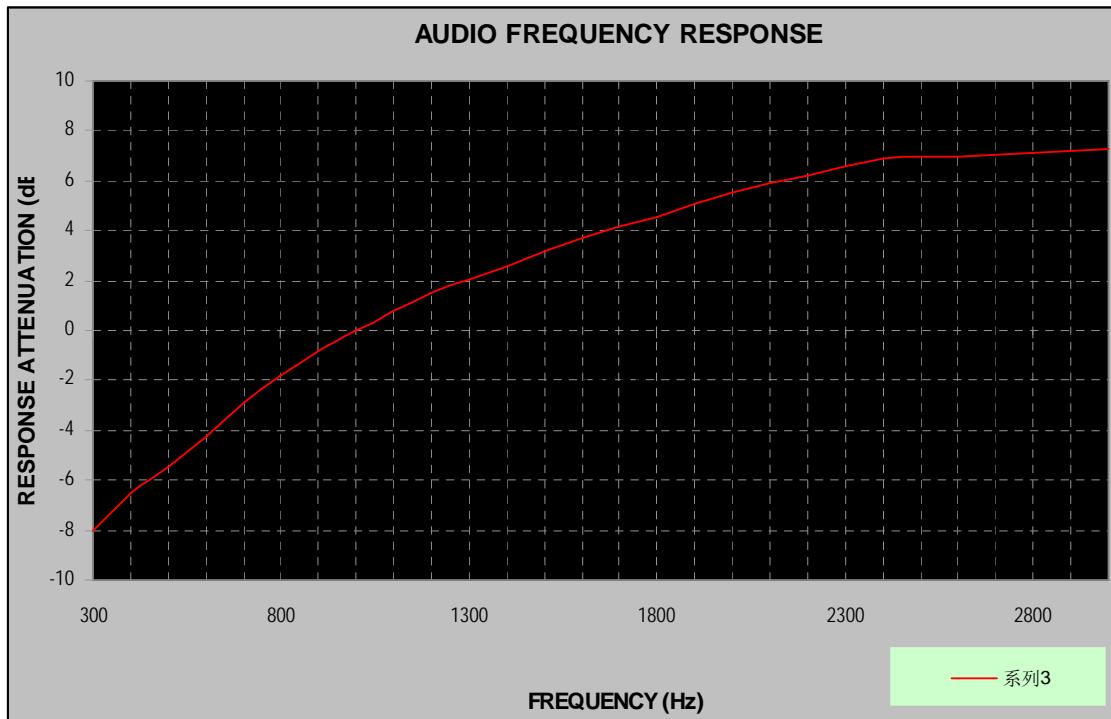
Carrier Frequency: 155.5 MHz, Channel Separation=12.5 kHz – High Power

Audio Frequency (Hz)	Response Attenuation (dB)
300	-8.15
400	-6.57
500	-5.55
600	-4.25
700	-2.91
800	-1.85
900	-0.81
1000	0
1200	1.45
1400	2.64
1600	3.87
1800	4.65
2000	5.67
2200	6.35
2400	6.91
2600	7.12
2800	7.25
3000	7.34



Carrier Frequency: 155.5 MHz, Channel Separation=12.5 kHz – Low Power

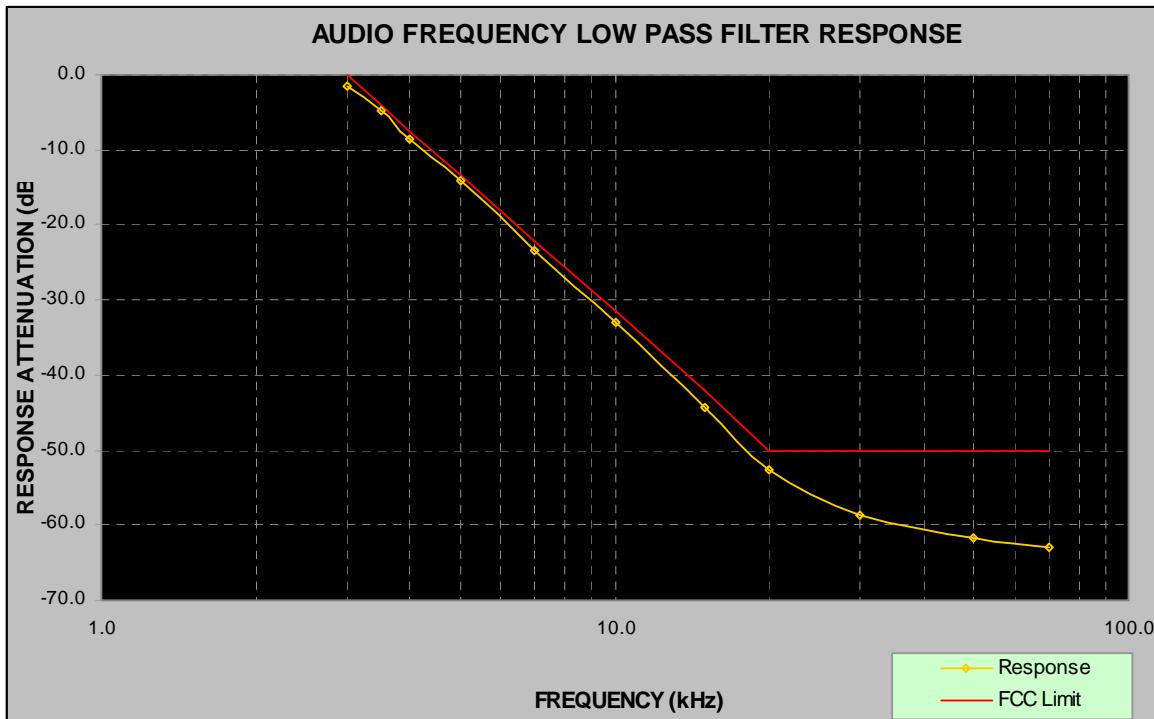
Audio Frequency (Hz)	Response Attenuation (dB)
300	-8.02
400	-6.54
500	-5.46
600	-4.23
700	-2.86
800	-1.85
900	-0.84
1000	0
1200	1.52
1400	2.61
1600	3.75
1800	4.54
2000	5.56
2200	6.25
2400	6.87
2600	6.99
2800	7.12
3000	7.24



Audio Frequency Low Pass Filter Response

Carrier Frequency: 155.5 MHz, Channel Separation=12.5 kHz

Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
3.0	-1.6	0.0
3.5	-4.8	-4.0
4.0	-8.6	-7.5
5.0	-14.2	-13.3
7.0	-23.5	-22.1
10.0	-32.9	-31.4
15.0	-44.2	-42.0
20.0	-52.6	-50.0
30.0	-58.6	-50.0
50.0	-61.7	-50.0
70.0	-62.9	-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 5.625 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:

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

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

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
HP	RF Communication Test Set	8920	3438A05201	2012-06-14	2013-06-13

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM)

Test Data

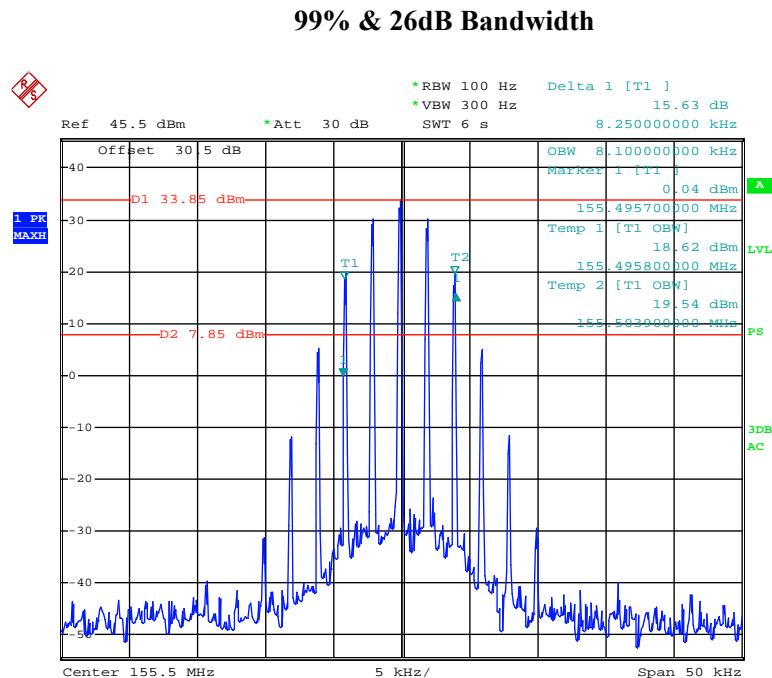
Environmental Conditions

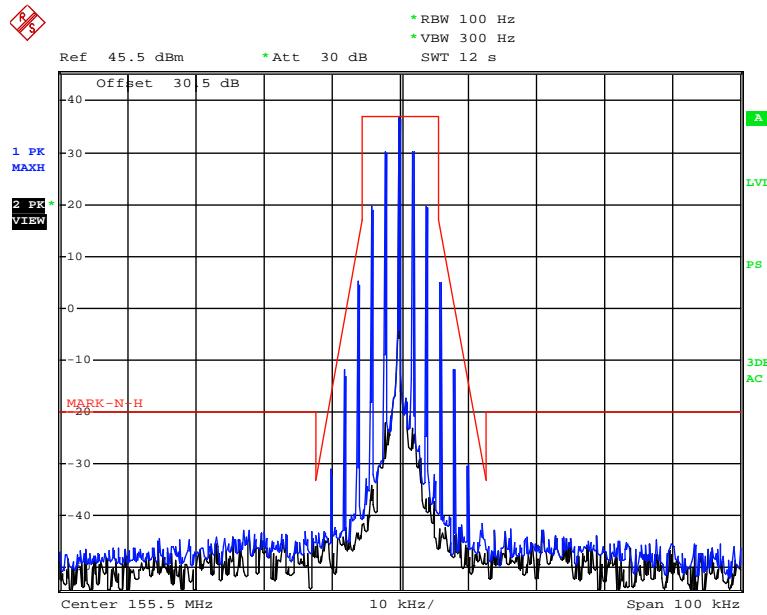
Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.1 kPa

The testing was performed by Eric Lee on 2012-10-30.

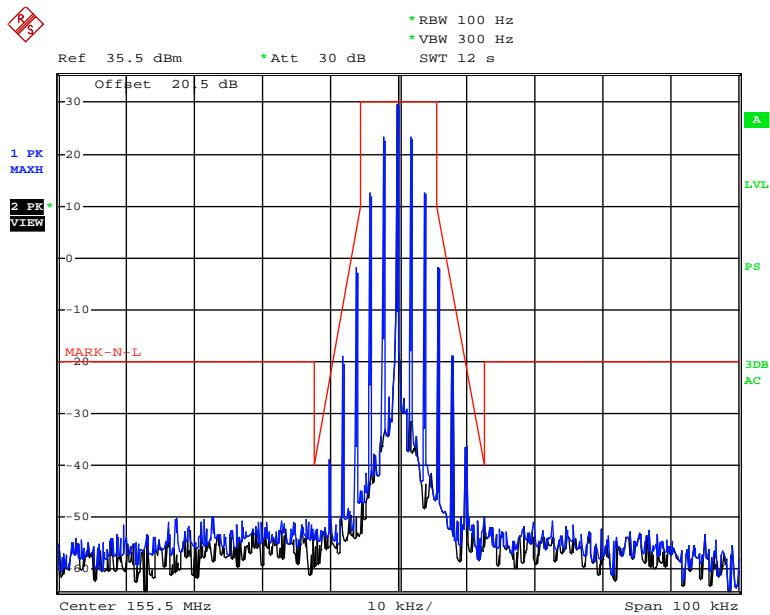
Result: Compliance. Please refer to the following table and plot.

99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
8.10	8.25



Emission Mask D, 12.5 kHz Channel Spacing- High power

Date: 30.OCT.2012 14:53:49

Emission Mask D, 12.5 kHz Channel Spacing- Low power

Date: 30.OCT.2012 15:17:26

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 EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100kHz for below 1GHz, and 1MHz for above 1GHz. 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	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM)

Test Data

Environmental Conditions

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

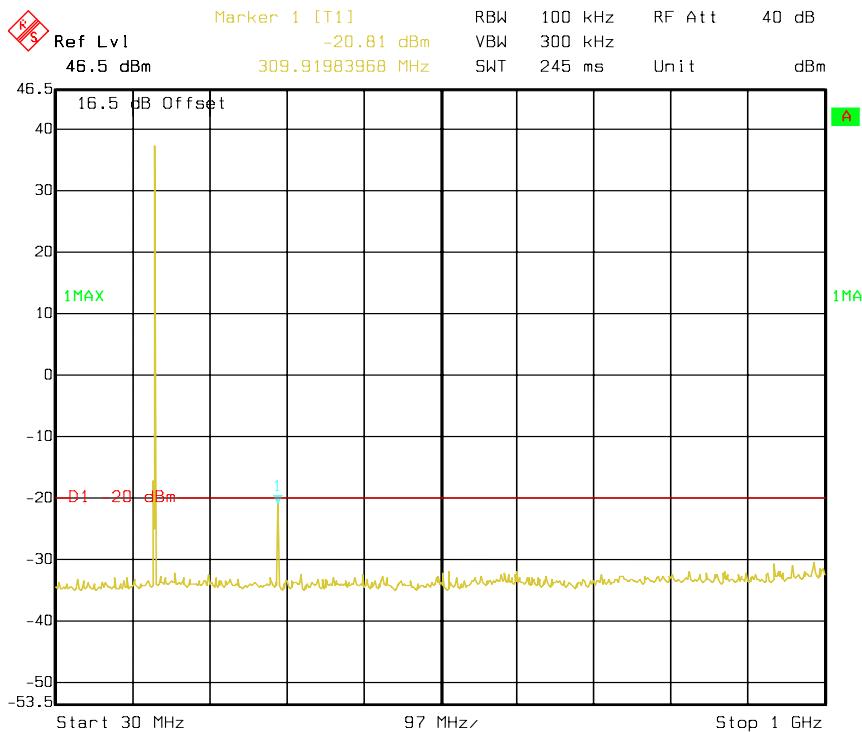
The testing was performed by Eric Lee on 2012-10-30.

Test Mode: Transmitting

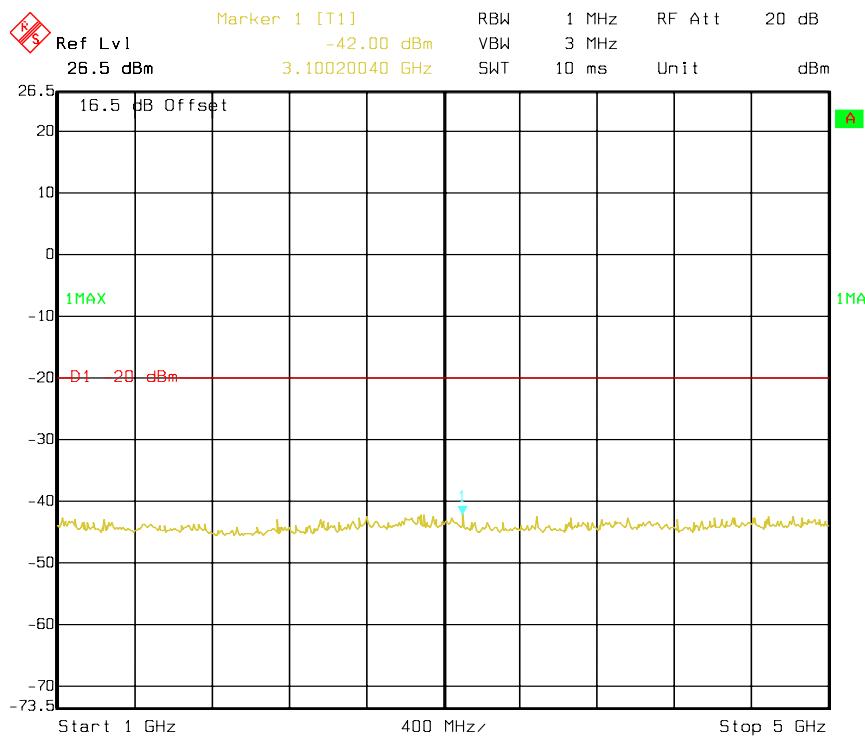
Please refer to the following plots.

12.5 kHz Channel Spacing, 155.5 MHz

30 MHz - 1000 MHz



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} (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 Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
HP	Signal Generator	HP8657A	2849U00982	2012-10-21	2013-10-20
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-10	2015-02-09
HP	Synthesized Sweeper	8341B	2624A00116	2012-04-11	2013-04-10
Mini-Circuits	Amplifier	ZVA-213+	N/A	2011-11-24	2012-11-23
HP	Amplifier	8447E	1937A01057	2011-11-24	2012-11-23
COM POWER	Dipole Antenna	AD-100	041000	2012-06-06	2013-06-05

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM)

Test Data

Environmental Conditions

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

The testing was performed by Eric Lee on 2012-10-29.

Test Mode: Transmitting

Indicated		Table Angle (Degree)	Test Antenna		Substituted					Absolute Level (dBm)	FCC Part 90	
Freq. (MHz)	Receiver Reading (dB μ V)		Height (m)	Polar (H/V)	Freq. (MHz)	Level (dBm)	Ant. Polar (H/V)	Ant. Gain Cord. (dB)	Cable Loss (dB)		Limit (dBm)	Margin (dB)
Middle channel 155.5MHz (12.5 kHz spacing)												
622	61.93	135	1.5	V	620	-33.7	V	0	0.65	-34.35	-20	14.35
311	65.69	140	2.1	V	310	-34.3	V	0	0.36	-34.66	-20	14.66
466.5	54.72	352	1.8	H	465	-39.9	H	0	0.46	-40.36	-20	20.36
466.5	58.27	133	1.2	V	465	-40.0	V	0	0.46	-40.46	-20	20.46
1088.5	53.86	236	1.6	V	1085	-46.6	V	5.9	0.76	-41.46	-20	21.46
622	56.38	178	1.4	H	620	-41.1	H	0	0.65	-41.75	-20	21.75
1088.5	48.87	110	1.4	H	1085	-47.5	H	5.9	0.76	-42.36	-20	22.36
311	54.59	251	1.3	H	310	-45.3	H	0	0.36	-45.66	-20	25.66

FCC §2.1055 & §90.213- FREQUENCY STABILITY

Applicable Standard

FCC §2.1055& §90.213
Test method: ANSI/TIA-603-D 2010

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.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Hewlett-Packard	Frequency Counter	5342A	2317A08289	2011-04-15	2014-04-14
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2011-11-24	2012-11-23

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM)

Test Data

Environmental Conditions

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

The testing was performed by Eric Lee on 2012-10-29.

Test Mode: Transmitting

For 12.5 kHz Channel Spacing

1) Frequency Stability versus Input Temperature

Reference Frequency: 155.5MHz, Limit: 2.5 ppm			
Test Environment		Frequency Measure with Time Elapsed	
Temperature (°C)	Power Supplied (V _{DC})	Measured Frequency (MHz)	Frequency Error (ppm)
50	7.2	155.500175	1.125
40	7.2	155.500158	1.016
30	7.2	155.500175	1.125
20	7.2	155.500154	0.990
10	7.2	155.500181	1.164
0	7.2	155.500167	1.074
-10	7.2	155.500179	1.151
-20	7.2	155.500182	1.170
-30	7.2	155.500158	1.016

2) Frequency Stability versus Input Voltage

Reference Frequency: 155.5 MHz, Limit: 2.5 ppm			
Test Environment		Frequency Measure with Time Elapsed	
Temperature (°C)	Power Supplied (V _{DC})	Measured Frequency (MHz)	Frequency Error (ppm)
20	6.2	155.500191	1.228

Note: The operating end point voltage is 6.2V

FCC §90.214 - TRANSIENT FREQUENCY BEHAVIOR

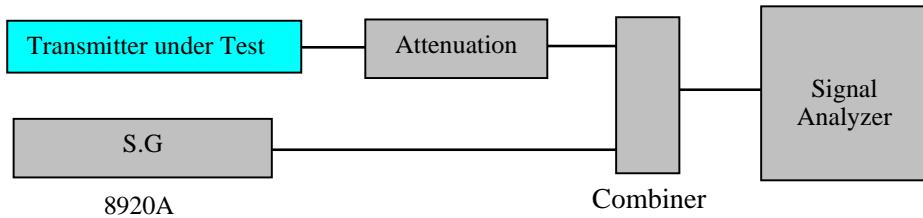
Applicable Standard

FCC §90.214

Test method: ANSI/TIA-603-D 2010

Test Procedure

TIA-603-D 2.2.19.2



Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
HP	RF Communications Test Set	HP8920A	3438A05201	2012-06-14	2013-06-13

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM)

Test Data

Environmental Conditions

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

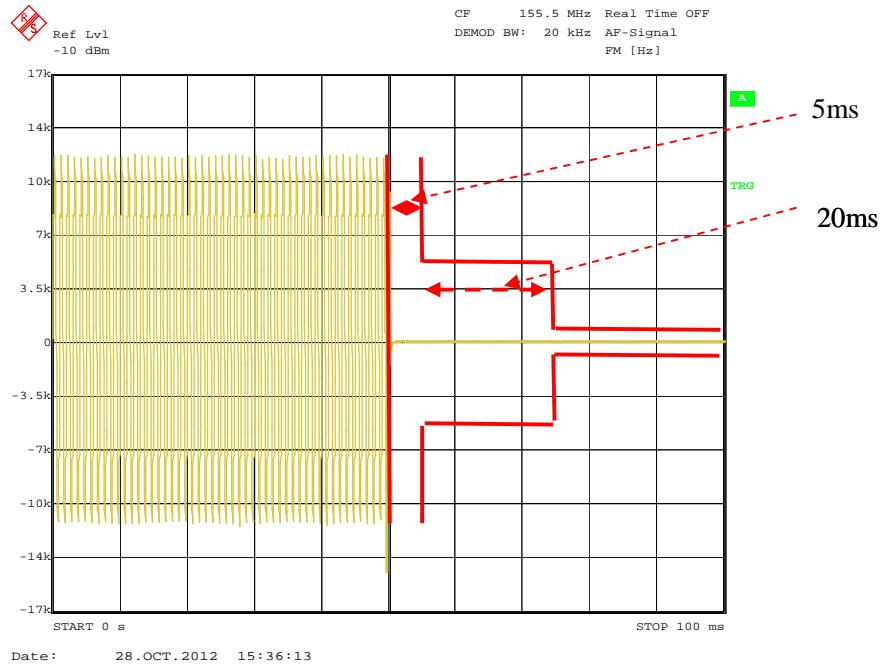
The testing was performed by Eric Lee on 2012-10-28.

Test Mode: Transmitting

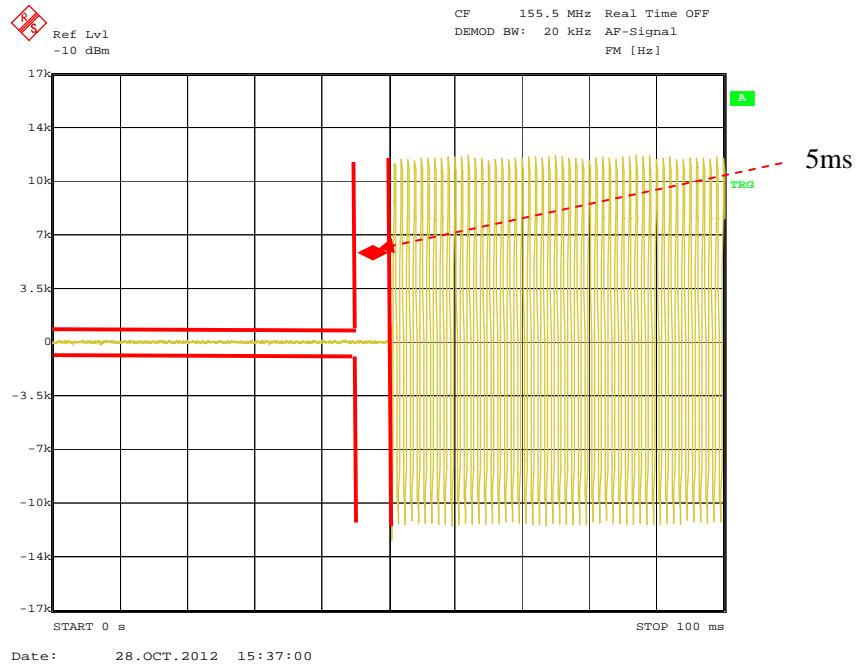
Operation Frequency (MHz)	Channel Separation (kHz)	Transient Period (ms)	Transient Frequency	Result
155.5	12.5	<5	+/-12.5 kHz	Pass
		<20	+/-6.25 kHz	
		<5	+/-12.5 kHz	

Please refer to the following plots.

Turn on (12.5 kHz Channel Spacing)



Turn off (12.5 kHz Cahnnel Spacing)



PRODUCT SIMILARITY DECLARATION LETTER



NANAN HONGDA ELECTRONIC EQUIPMENT CO., LTD.
Add: Zian Road, Jiangnan High-Tech Industrial zone, Quanzhou, China
Tel: 0595-28828859 Fax: 0595-28828820

Product Similarity Declaration

To Whom It May Concern,

We, NANAN HONGDA ELECTRONIC EQUIPMENT CO., LTD. hereby declare that our (TRANSCEIVER) , Model Number: UANB-401, HD-2107G is electrically identical with the Model Number: UANB-501 that was certified by BACL. They are the same circuit and PCB layout except model.

Please contact me if you have any question.

Signature:

A handwritten signature in black ink that appears to read "Dalen Bao".

Print Name: Dalen Bao

Title: Export Manager

Date: 2012-6-20

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