



FCC PART 90

TEST REPORT

For

NANAN HONGDA ELECTRONIC EQUIPMENT CO., LTD.

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

FCC ID:WEN-DUA1000

Report Type: Original Report	Product Type: Two-way radio
Test Engineer: <u>Candy Li</u> 	
Report Number: <u>RSZ150106017-00</u>	
Report Date: <u>2015-01-20</u>	
Reviewed By: Jimmy Xiao RF Engineer	
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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.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *NANAN HONGDA ELECTRONIC EQUIPMENT CO., LTD.*'s product, model number: *UA-1000*(FCC ID: *WEN-DUA1000*) or the "EUT" in this report was a *Two-way radio*, which was measured approximately: 13.2 cm (L) \times 6.2 cm (W) \times 3.8 cm (H), rated with input voltage: DC 7.4 V battery.

Note: The series product, model UA-1000 and D-2000, D-168, D-1688, UA-1000plus, they are identical schematics and the only difference between them is the model number. Model UA-1000 was selected for fully testing, which was explained in the attached product similarity declaration letter.

** All measurement and test data in this report was gathered from production sample serial number: 1501066 (Assigned by Applicant). The EUT supplied by the applicant was received on 2015-01-06.*

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-D and ANSI 63.4-2009.

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.

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

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.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

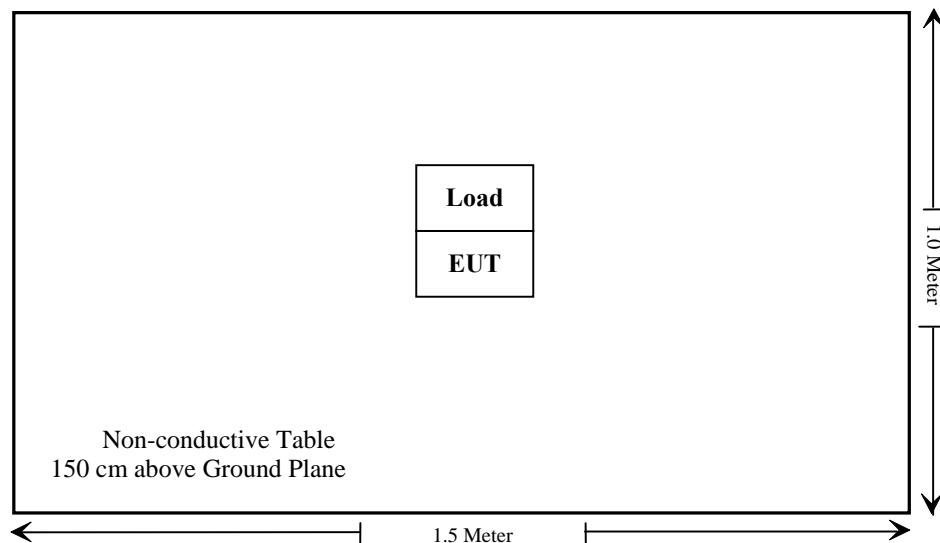
Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
N/A	50 ohm Load	N/A	N/A

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§1.1307 (b)(1), §2.1093	RF Exposure	Compliance
§2.1046; §90.205	RF Output Power	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

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: RSZ150106017-20.

FCC §2.1046 & §90.205 - RF Output Power

Applicable Standard

FCC §2.1046 and §90.205

Test Procedure

Conducted RF Output Power:

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

Spectrum Analyzer Setting:

R B/W Video B/W
100 kHz 300 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2014-08-22	2015-08-22
HP Agilent	RF Communication test set	8920A	3325U00859	2014-06-03	2015-06-03

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Candy Li from 2015-01-15

Test Mode: Transmitting

Test Result: Compliance. Please refer to following table.

Frequency	Modulation	Channel spacing (kHz)	Power Level	Output Power (dBm)	Output Power (W)	Result		
400.0125	Digital	12.5	High	36.76	4.74	Pass		
			Low	31.74	1.49	Pass		
420.0125			High	36.58	4.55	Pass		
			Low	32.01	1.59	Pass		
440.0125			High	36.68	4.66	Pass		
			Low	31.42	1.39	Pass		
460.0125			High	36.49	4.46	Pass		
			Low	31.46	1.40	Pass		
479.9875			High	36.89	4.89	Pass		
			Low	31.96	1.57	Pass		

Note: The rated high power is 5W, the limit is 4W-6W;
The rated low power is 1.5W, the limit is 1.3W-1.7W;

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 5.626 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 $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2014-08-22	2015-08-22
HP	RF Communication Test Set	8920A	3438A05201	2014-06-14	2015-06-13

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to 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 100 Hz and the spectrum was recorded in the frequency band ± 50 kHz from the carrier frequency.

Test Data

Environmental Conditions

Temperature:	25~26 °C
Relative Humidity:	50~51 %
ATM Pressure:	100.0~101.0 kPa

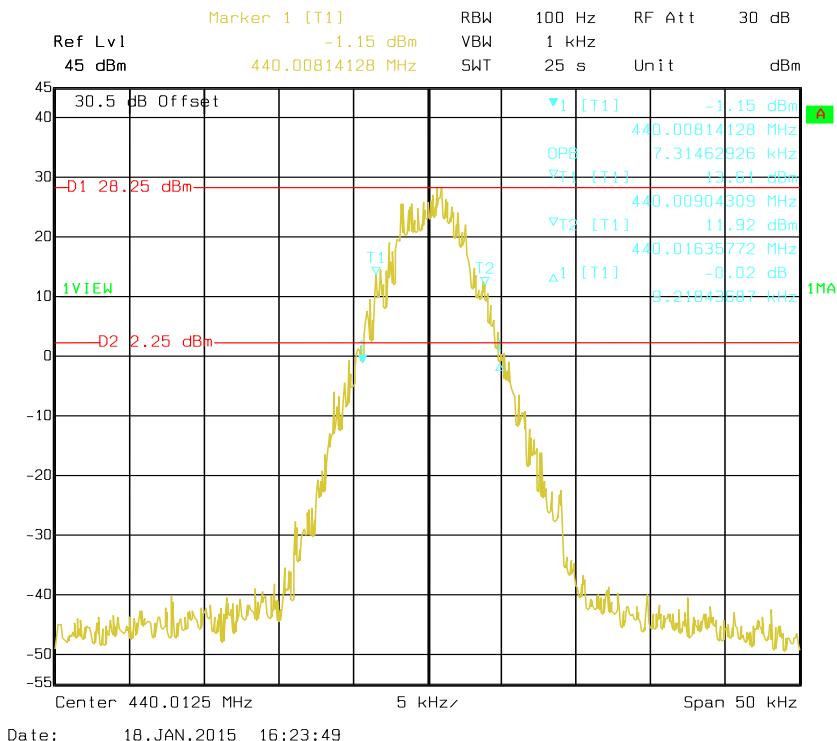
The testing was performed by Candy Li from 2015-01-18

Test Mode: Transmitting

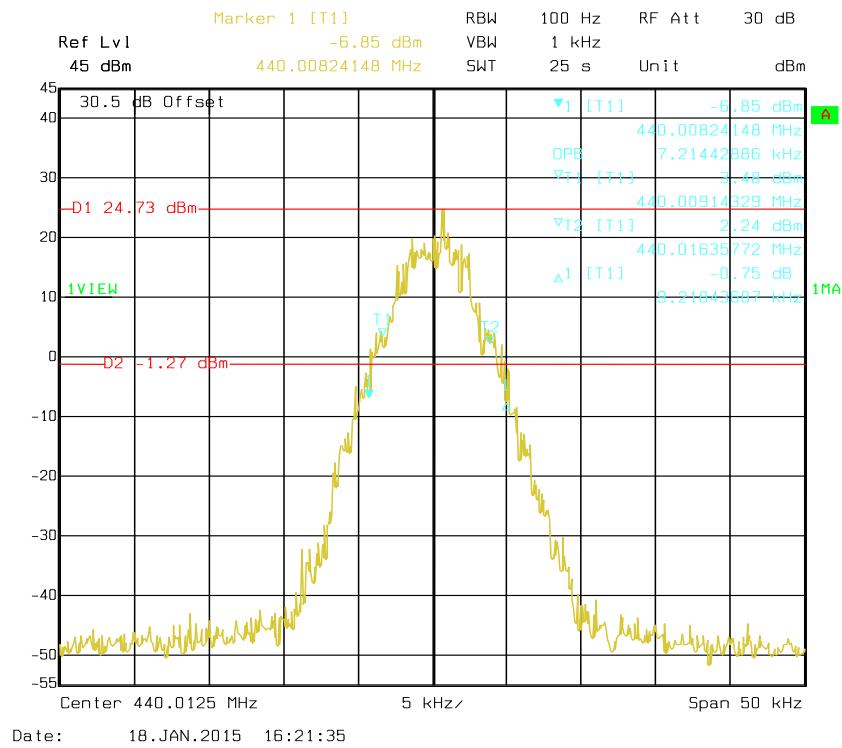
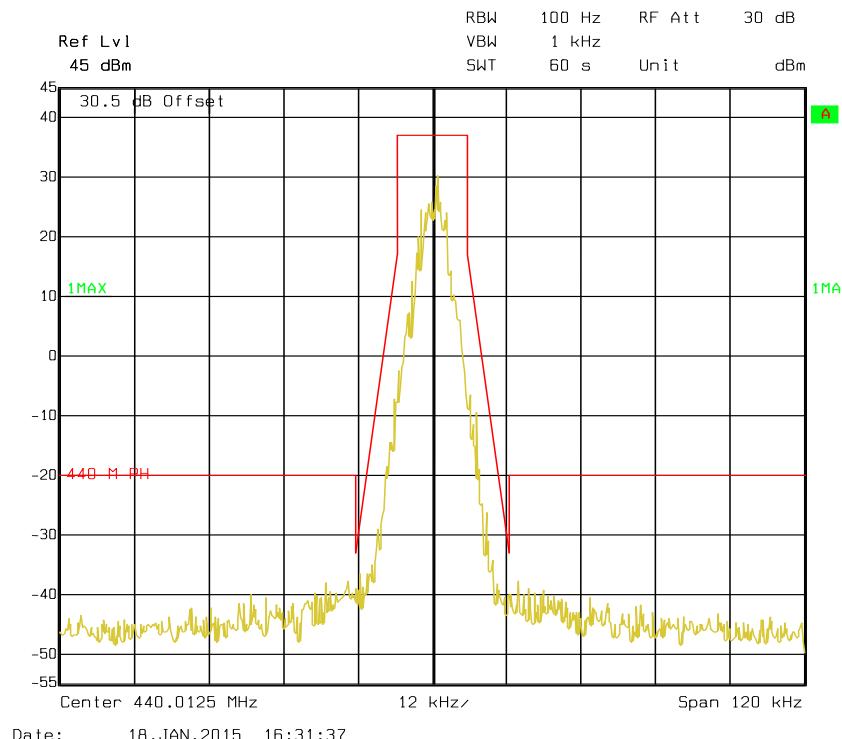
Modulation	Frequency (MHz)	Channel space (kHz)	Power Level	99% Occupied Bandwidth (kHz)	26 dB Emissions Bandwidth (kHz)
Digital	440.0125	12.5	High	7.31	9.22
			Low	7.21	9.22

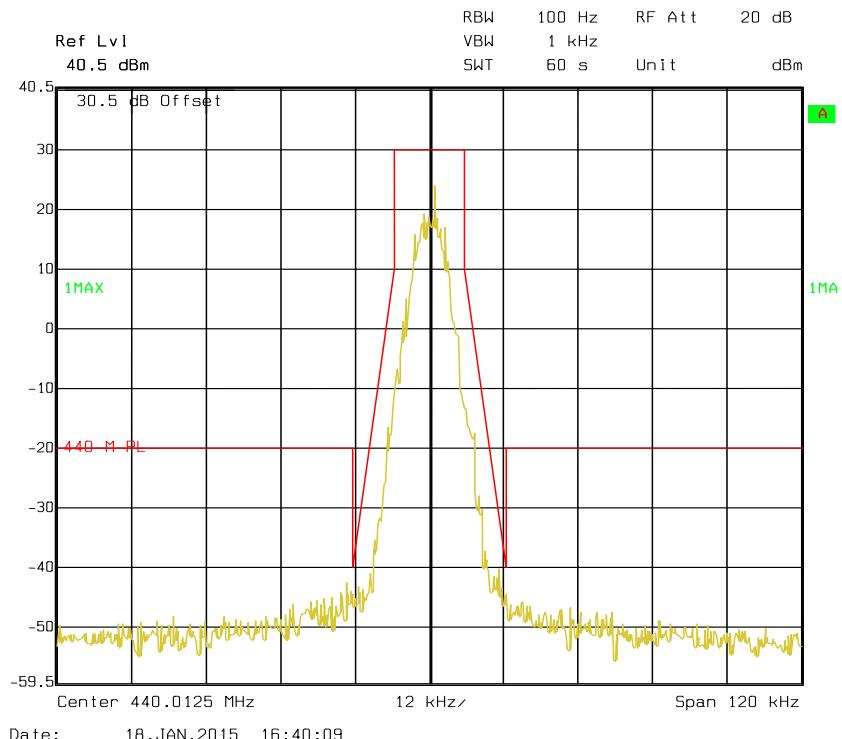
Digital Modulation:

99% Occupied Bandwidth & 26 dB Emissions Bandwidth 12.5 kHz, 440.0125 MHz (High Power)



Date: 18.JAN.2015 16:23:49

99% Occupied Bandwidth & 26 dB Emissions Bandwidth 12.5 kHz, 440.0125 MHz (Low Power)**Emission Mask D with High Power 12.5 kHz, 440.0125 MHz**

Emission Mask D with Low Power 12.5 kHz, 440.0125 MHz

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 $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2014-08-22	2015-08-22

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to 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 100 kHz for below 1GHz, and 1MHz for above 1GHz. sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Data

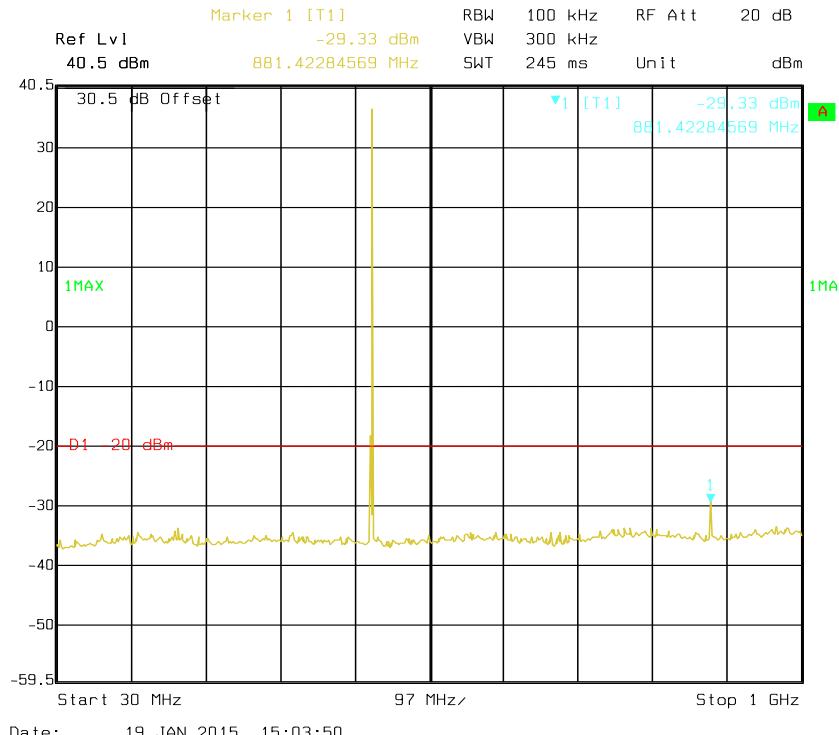
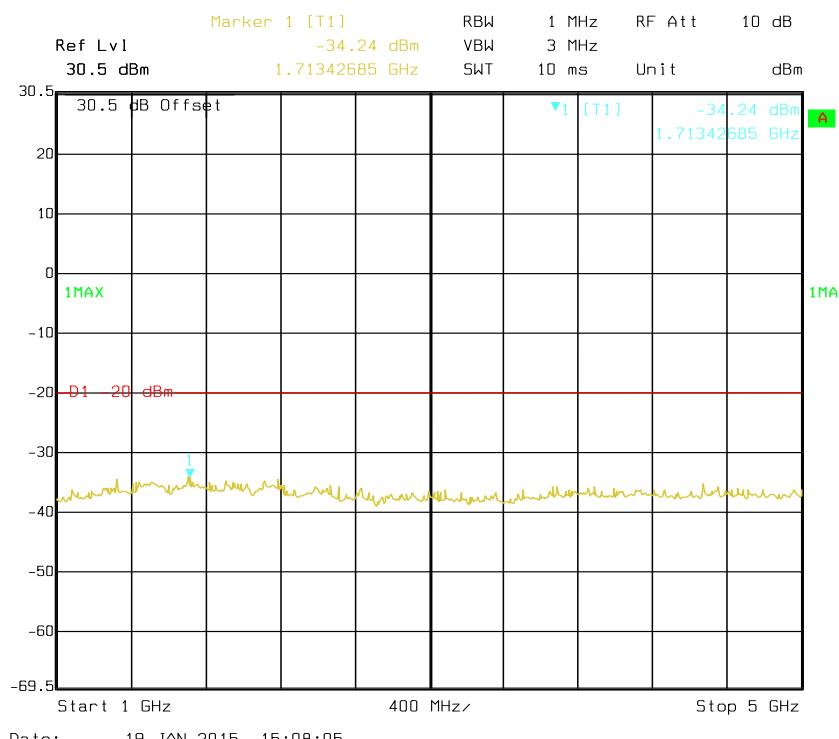
Environmental Conditions

Temperature:	26 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Candy Li on 2015-01-19.

Test Mode: Transmitting

Please refer to the following plots.

Digital Modulation:**30 MHz – 1 GHz, Spacing Channel 12.5 kHz 440.0125 MHz****1 GHz – 5 GHz, Spacing Channel 12.5 kHz 440.0125 MHz**

FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §2.1053 and §90.210

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2014-11-03	2015-11-03
HP	Amplifier	8447E	1937A01046	2014-05-06	2015-05-06
Sunol Sciences	Broadband Antenna	JB3	A111513	2014-06-18	2017-06-17
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2014-08-22	2015-08-22
Sunol Sciences	Horn Antenna	DRH-118	A052304	2013-12-01	2016-11-30
HP	Synthesized Sweeper	8341B	2624A00116	2014-06-03	2015-06-03
Mini-Circuits	Amplifier	ZVA-183-S+	5969001149	2014-04-23	2015-04-23
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2015-02-10
COM POWER	Dipole Antenna	AD-100	041000	NCR	NCR

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to 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 1g (TXpwr in Watts/0.001)-the absolute level

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Candy Li on 2015-01-15.

Test Mode: Transmitting

30 MHz – 5 GHz:

Frequency (MHz)	Receiver Reading (dB μ V)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 90	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Digital Modulation 440.0125 MHz										
880.03	52.67	335	1.8	H	-44.3	0.70	0	-45.00	-20	25.00
880.03	54.56	128	1.4	V	-42.4	0.70	0	-43.10	-20	23.10
1320.04	47.22	0	1.6	H	-53.1	1.30	6.30	-48.10	-20	28.10
1320.04	54.26	355	1.7	V	-46.3	1.30	6.30	-41.30	-20	21.30
2640.08	57.10	299	1.9	H	-37.6	1.70	9.20	-30.10	-20	10.10
2640.08	53.55	170	1.6	V	-41.7	1.70	9.20	-34.20	-20	14.20
3520.10	54.57	172	1.8	H	-37.6	1.90	10.00	-29.50	-20	9.50
3520.10	51.64	182	1.4	V	-41.1	1.90	10.00	-33.00	-20	13.00
3960.11	61.11	357	1.3	H	-30.8	2.20	9.90	-23.10	-20	3.10
3960.11	60.30	360	1.8	V	-31.4	2.20	9.90	-23.70	-20	3.70

Note:

Absolute Level = SG Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

FCC §2.1055 & §90.213- FREQUENCY STABILITY

Applicable Standard

FCC §2.1055 and §90.213

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Hewlett-Packard	Frequency Counter	5343A	2232A00827	2013-05-09	2016-05-08
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2014-11-01	2015-11-01
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to 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 DC 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 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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Candy Li on 2015-01-15..

Test Mode: Transmitting

For Digital Modulation

Reference Frequency: 440.0125 MHz, Limit: ± 2.5 ppm, 12.5 kHz			
Test Environment		Frequency Measure with Time Elapsed	
Temperature (°C)	Power Supplied (V_{DC})	Measured Frequency (MHz)	Frequency Error (ppm)
Frequency Stability versus Input Temperature			
50	7.4	440.012415	-0.193
40	7.4	440.012423	-0.175
30	7.4	440.012420	-0.182
20	7.4	440.012418	-0.186
10	7.4	440.012427	-0.166
0	7.4	440.012431	-0.157
-10	7.4	440.012422	-0.177
-20	7.4	440.012416	-0.191
-30	7.4	440.012419	-0.184
Frequency Stability versus Input Voltage			
20	6.2	440.012425	-0.170

PRODUCT SIMILARITY DECLARATION LETTER

2015-5-12

Product Similarity Declaration

To Whom It May Concern,

We, NANAN HONGDA ELECTRONIC EQUIPMENT CO., LTD, hereby declare that we have a product named as Electronic Scale (Model number:UA-1000) was tested by BACL, meanwhile, for our marketing purpose, we would like to list a series models (D-2000,D-168,D-1688,UA-1000plus) on reports and certificate, all the models are identical schematics, only named differently.

No other changes are made to them.

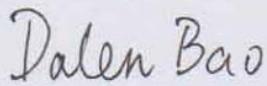
We confirm that all information above is true, and we'll be responsible for all the consequences. Please contact me if you have any question.

Sincerely,

Signature

Dalen Bao

Manager



***** END OF REPORT *****