FCC 47 CFR PART 15 SUBPART C & INDUSTRY CANADA RSS-210

TEST REPORT

For

Zonar Connect

Model: 20081

Trade Name: ZONAR

Issued to

For FCC:
Zonar Systems Inc
18200 Cascade Ave South Suite 200
Seattle Washington United States

For IC
ZONAR SYSTEMS
18200 Cascade Ave South Suite 200
SEATTLE WA USA

Issued by

Compliance Certification Services Inc.
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
http://www.ccsrf.com
service@ccsrf.com
Issued Date: October 28, 2016

Testing Laboratory
1309

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		October 28, 2016		Initial Issue	ALL	Doris Chu

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1. TEST RESULT CERTIFICATION

Applicant: **For FCC**
Zonar Systems Inc
18200 Cascade Ave South Suite 200
Seattle Washington United States
For IC
ZONAR SYSTEMS
18200 Cascade Ave South Suite 200
SEATTLE WA USA

Manufacturer: First International Computer
8F, No.300, Yang Guang St., NeiHu, Taipei, Taiwan 114

Equipment Under Test: Zonar Connect

Trade Name: ZONAR

Model: 20081

Date of Test: July 27 ~ October 22, 2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C Industry Canada RSS-210 Issue 9	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.225 and Industry Canada RSS-210.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Sam Chuang
Manager
Compliance Certification Services Inc.

Tested by:

Dennis Li
Engineer
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	Zonar Connect
Trade Name	ZONAR
Model Number	20081
Model Discrepancy	N/A
Received Date	April 15, 2016
Power Ratting	VDC from Power Adapter DARFON / B112-51(SOY-0500250US) I/P: 100-240Vac, 0.4A, 50-60Hz O/P: 5Vdc, 2.5A
Frequency Range	13.56MHz
Modulation Technique	ASK
Number of Channels	1 Channel

Remark:

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *This submittal(s) (test report) is intended for FCC ID: **SEJ-CONNECT** & ISED No.：**5266A-CONNECT** filing to comply with FCC Part 15C, Section 15.207, 15.209 and IC RSS-210 & RSS-GEN.*

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC CFR 47 Part 15.207, 15.209, 15.225, RSS-210, RSS-Gen.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 - 13.41	322 - 335.4		

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.3 DESCRIPTION OF TEST MODES

The EUT (model: 20081) had been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.

3.3.1 The worst mode of measurement

AC Conducted Emission	
Test Condition	**AC Power line conducted emission for line and neutral**
Voltage/Hz	**120V/60Hz**
Test Mode	**Mode 1: Adapter Mode** **Mode 2: USB Charge Mode(Link NB)** **Mode 3: Adapter Mode and NFC Antenna Terminal Test**
Worst Mode	☒ **Mode 1** ☐ **Mode 2** ☒ **Mode 3**

Remark: The worst mode was record in this test report.

Radiated Emission Measurement	
Test Condition	**Band edge, Emission for Unwanted and Fundamental**
Voltage/Hz	**120V/60Hz**
Test Mode	**Mode 1: Adapter Mode** **Mode 2: USB Charge Mode(Link NB)** **Mode 3: Docking Mode**
Worst Mode	☒ **Mode 1** ☐ **Mode 2** ☐ **Mode 3**
Position	☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☒ Placed in fixed position at Z-Plane (H-Plane)

Remark:
1. The worst mode was record in this test report.

4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: *Each piece of equipment is scheduled for calibration once a year*

Conducted Emissions Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum Analyzer	R&S	FSV 40	101073	2015/10/04	2016/10/03

Wugu 966 Chamber A					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US42510252	2015/12/8	2016/12/7
Loop Ant	COM-POWER	AL-130	121051	2016/2/25	2017/2/24
Bilog Antenna	Sunol Sciences	JB3	A030105	2016/8/5	2017/8/4
Pre-Amplifier	EMEC	EM330	60609	2016/6/8	2017/6/7
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	EZ-EMC (CCS-3A1RE)				

Conducted Emission Room # B					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
LISN	SCHWARZBECK	NSLK 8127	8127-541	2015/11/23	2016/11/22
Receiver	R&S	ESCI	101073	2015/9/9	2016/9/8
Software	CCS-3A1-CE				

Remark:

1. Each piece of equipment is scheduled for calibration once a year and Precision Dipole is scheduled for calibration once three years.

2. N.C.R. = No Calibration Request.

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.2159
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

***Remark**: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.*

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10: 2013 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bucolical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12,2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method –47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	TAF Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	Canada IC 2324G-1 IC 2324G-2

** No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1	Zonar Connect Dock	ZONAR	20082	N/A	N/A	N/A	N/A
2	USB Dongle	Transcend	32 GB	N/A	N/A	N/A	N/A
3	Ear phone	Logitech	H150	N/A	N/A	N/A	N/A
4	SD Card	Kingston	4GB	N/A	N/A	N/A	N/A

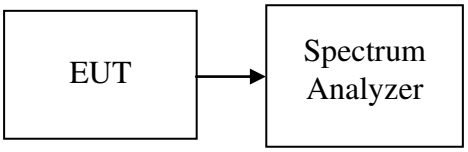
Remark:

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

7. FCC PART 15.225 REQUIREMENTS & RSS-210 REQUIREMENTS

7.1 OCCUPIED BANDWIDTH(99%) AND 20 DB BANDWIDTH

TEST CONFIGURATION



TEST PROCEDURE

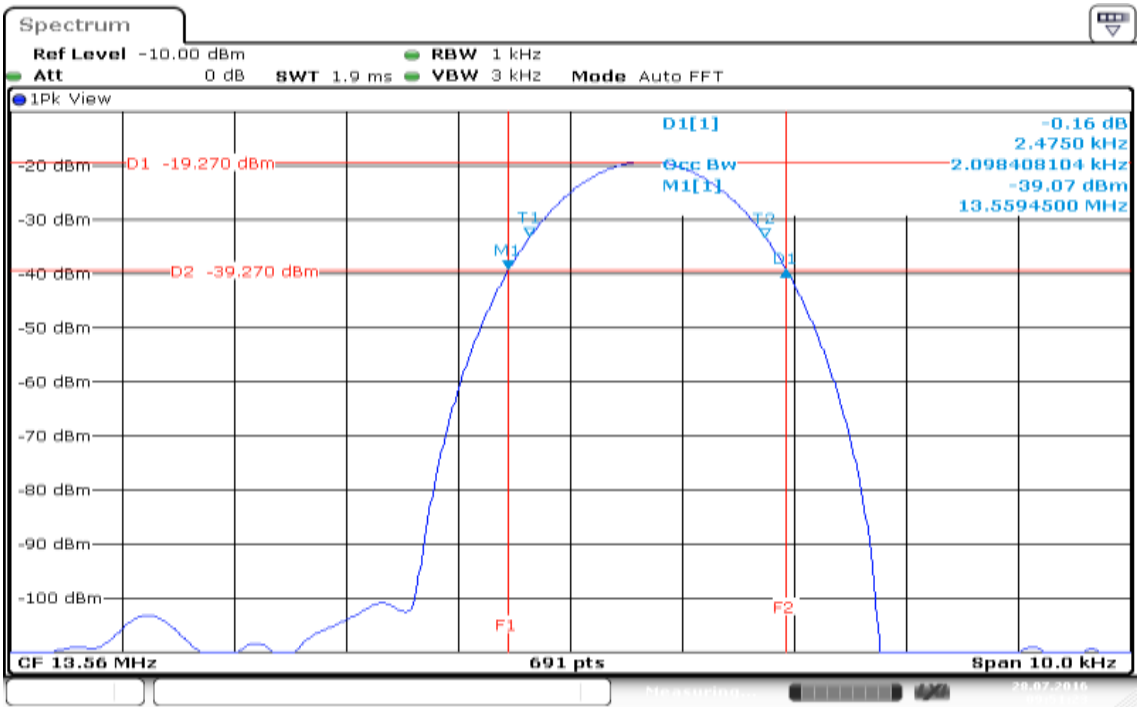
1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=1kHz, VBW = 3kHz, Span = 10kHz, Sweep = auto.
4. Record the max. reading.

TEST RESULTS

No non-compliance noted

Test Condition	Frequency(MHz)	Occupied Bandwidth 99% (kHz)	20 dB Bandwidth (kHz)
NFC	13.56	2.098	2.475

Test Plot



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7.2 RADIATED EMISSIONS

LIMIT

According to §15.225 & RSS-210) Annex B)B.6

(a) The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 15,848 microvolts / meter at 30 meters.
(b) Within the bands 13.410 – 13.553 MHz and 13.567 -13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts / meter at 30 meters.
(c) Within the bands 13.110 – 13.410 MHz and 13.710 – 14.010 MHz the field strength of any emissions shall not exceed 106 microvolts / meter at 30 meters.
(d) The field strength of any emissions appearing outside of the 13.110 – 14.010 MHz and shall not exceed the general radiated emission limits in §15.209.

All spurious emissions shall comply with the limits of §15.209(a) and RSS-Gen Table 2 & Table 4.

RSS-Gen Table 2 & Table 4: General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz (Note)

Frequency (MHz)	Field Strength microvolts/m at 3 meters (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Note: *Measurements for compliance with limits in the above table may be performed at distances other than 3 meters, in accordance with Section 6.5.
Transmitting devices are not permitted in Table 1 bands or, unless stated otherwise, in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz).

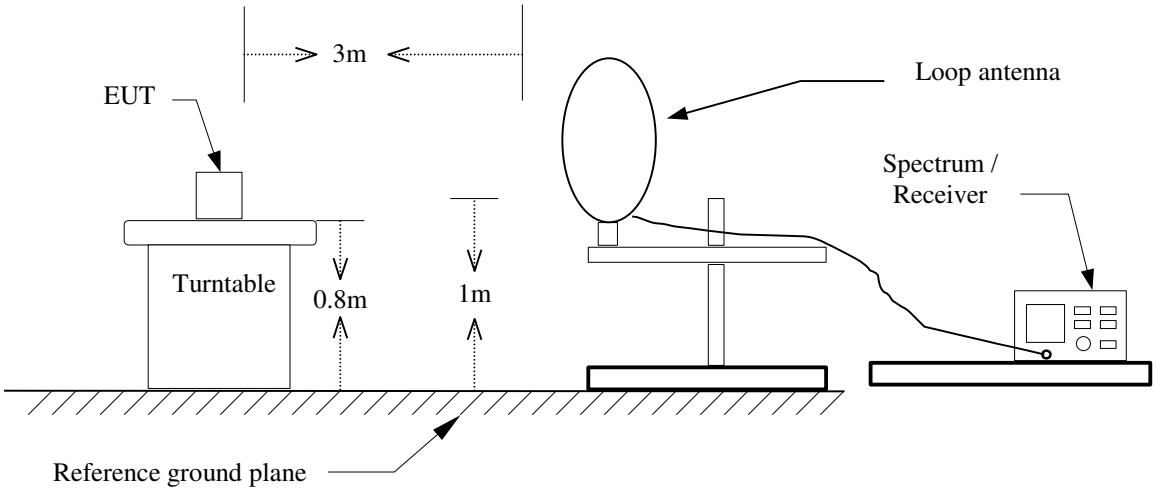
RSS-Gen Table 5: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz (Transmit)

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (meters)
9-490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1.705-30 MHz	30	N/A	30

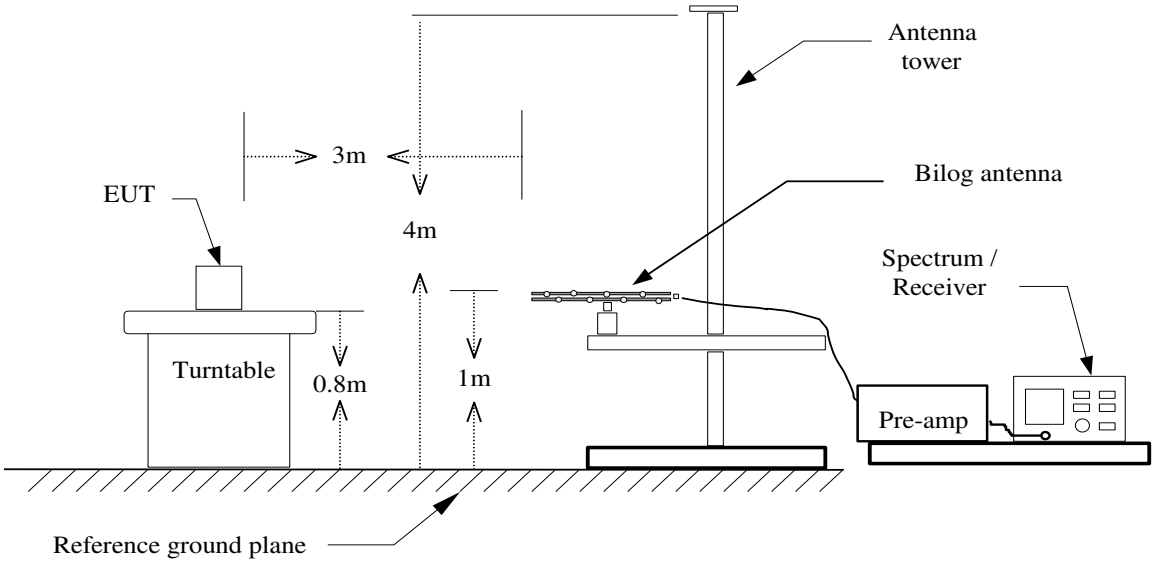
Note: The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average detector.

Test Configuration

9kHz ~ 30MHz



30MHz ~ 1GHz



TEST PROCEDURE

For 9kHz ~ 30MHz

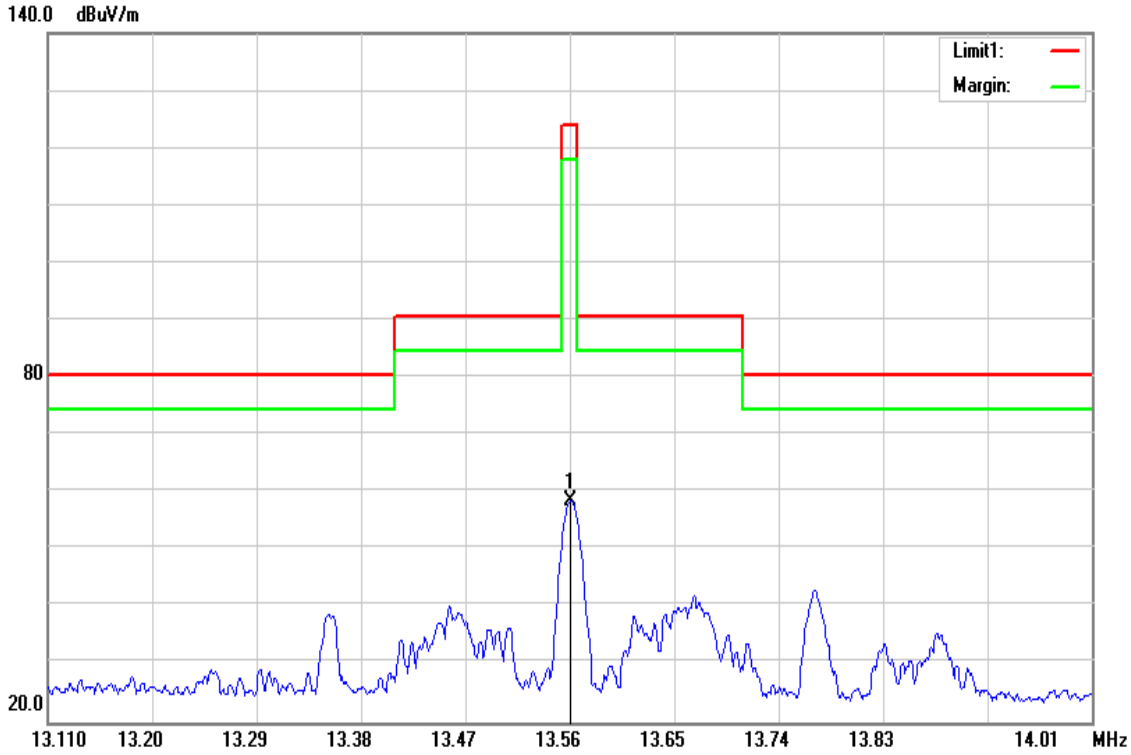
1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, The center of the loop shall be 1 m above the ground then to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both face on and face off.
6. Set the spectrum analyzer in the following setting as:
   9KHz-490KHz : RBW=200Hz / VBW=1kHz / Sweep=AUTO
   490KHz-30MHz : RBW=10kHz / VBW=30kHz / Sweep=AUTO

For 30MHz ~ 1GHz

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving
   antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:
   RBW=100kHz / VBW=300kHz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

Remark :
Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

Operation Mode:	TX mode	**Test Date:**	October 19, 2016
Temperature:	27°C	**Tested by:**	Dennis Li
Humidity:	53 % RH	**Polarity:**	Face on



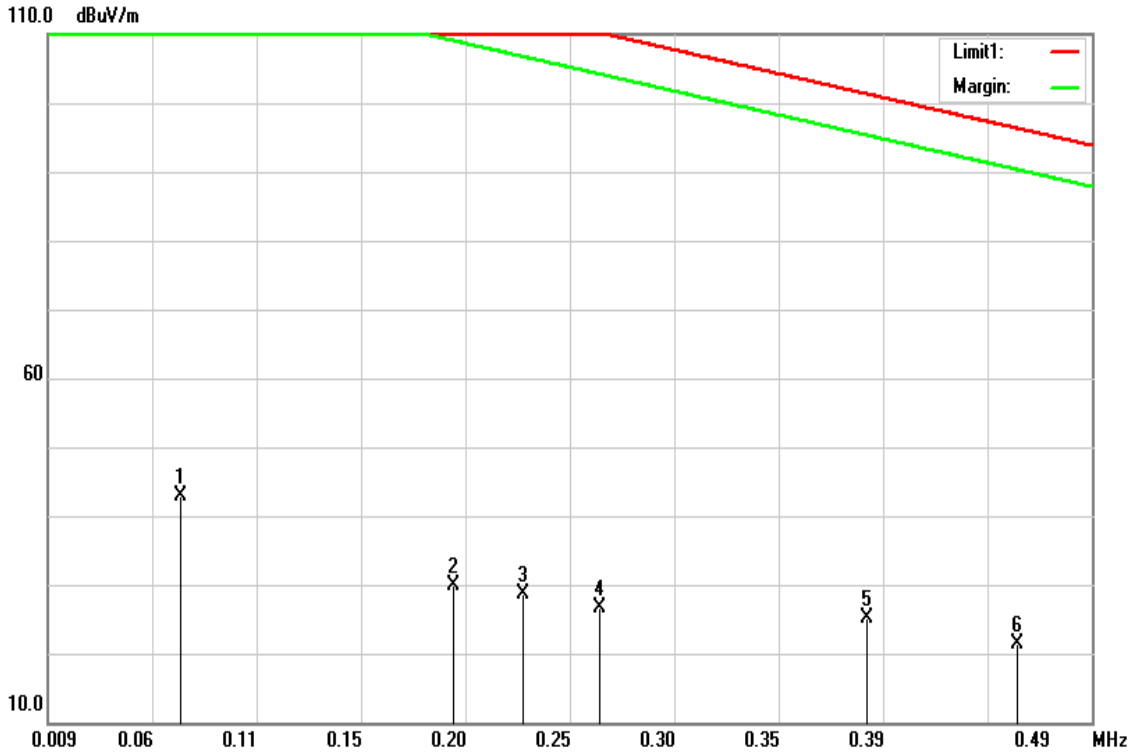
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	13.5609	43.82	14.66	58.48	124.00	-65.52	peak

Remark:

1. *Radiated emissions measured were made with an instrument using peak/quasi-peak/average detector mode.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Margin (dB) = Result (dBuV/m) – Limit (dBuV/m).*

9kHz ~ 490kHz

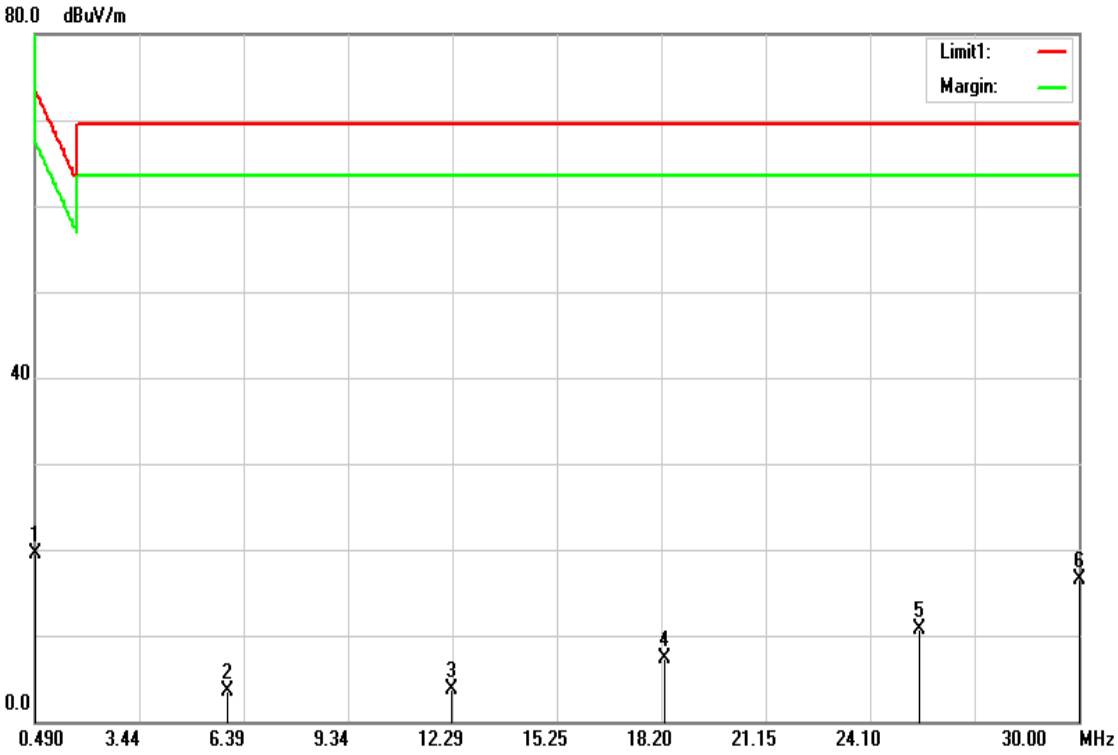
Operation Mode:	TX mode	**Test Date:**	October 19, 2016
Temperature:	27°C	**Tested by:**	Dennis Li
Humidity:	53 % RH	**Polarity:**	Face on



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
0.0701	59.79	-16.93	42.86	110.69	-67.83	peak
0.1961	47.03	-17.25	29.78	101.75	-71.97	peak
0.2279	46.01	-17.28	28.73	100.45	-71.72	peak
0.2634	43.94	-17.30	26.64	99.19	-72.55	peak
0.3866	42.56	-17.33	25.23	95.86	-70.63	peak
0.4558	38.82	-17.34	21.48	94.43	-72.95	peak

490kHz ~ 30MHz

Operation Mode:	TX mode	**Test Date:**	October 19, 2016
Temperature:	27°C	**Tested by:**	Dennis Li
Humidity:	53 % RH	**Polarity:**	Face on



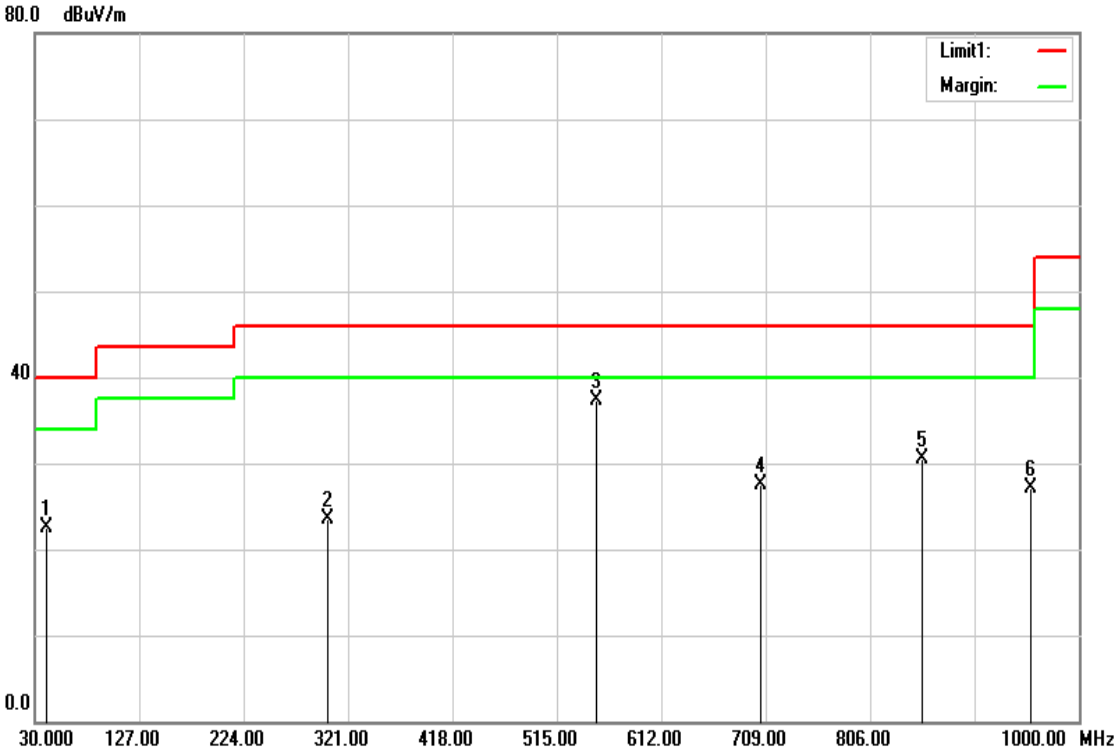
Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
0.4900	36.95	-17.35	19.60	73.80	-54.20	peak
5.9493	17.22	-13.78	3.44	69.50	-66.06	peak
12.2900	12.86	-9.24	3.62	69.50	-65.88	peak
18.2845	12.73	-5.44	7.29	69.50	-62.21	peak
25.4850	12.10	-1.31	10.79	69.50	-58.71	peak
30.0000	16.18	0.30	16.48	69.50	-53.02	peak

30MHz ~ 1GHz

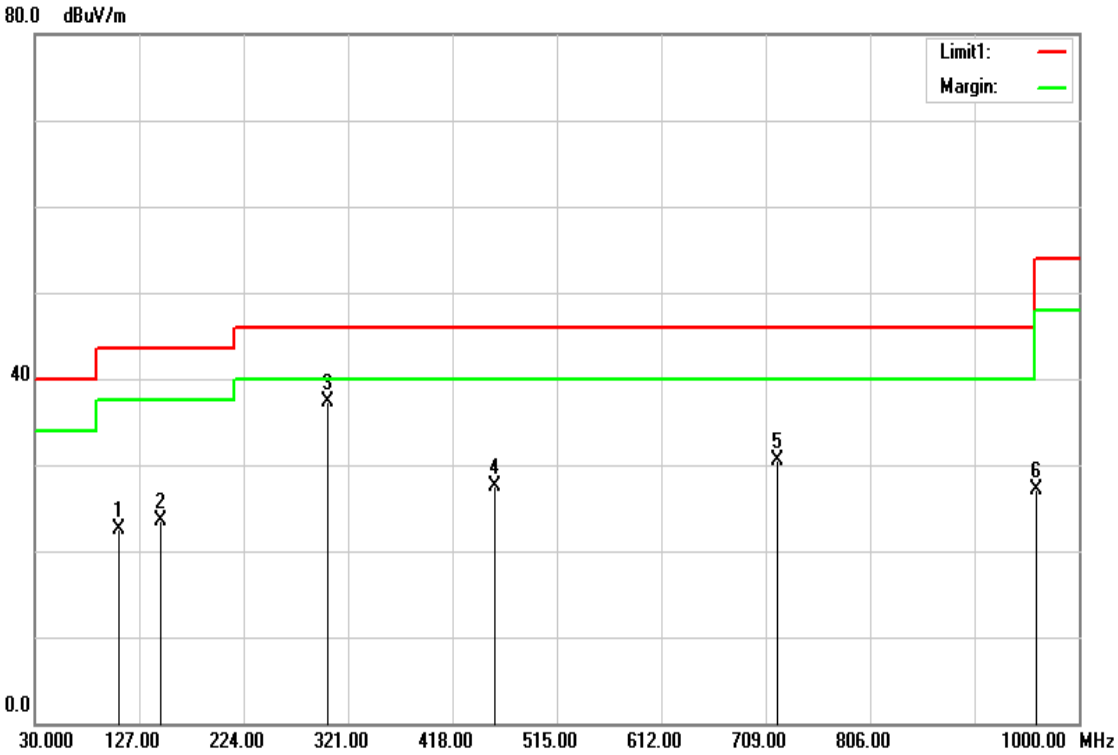
Operation Mode:	TX mode	**Test Date:**	October 22, 2016
Temperature:	27°C	**Tested by:**	Dennis Li
Humidity:	53 % RH	**Polarity:**	Ver./ Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
40.6700	38.22	-15.72	22.50	40.00	-17.50	QP
301.6000	37.61	-14.20	23.41	46.00	-22.59	peak
551.8600	45.77	-8.46	37.31	46.00	-8.69	peak
704.1500	33.44	-5.97	27.47	46.00	-18.53	peak
854.5000	34.15	-3.73	30.42	46.00	-15.58	peak
955.3800	29.38	-2.31	27.07	46.00	-18.93	peak
107.6000	40.19	-17.69	22.50	43.50	-21.00	peak
146.4000	39.38	-15.97	23.41	43.50	-20.09	peak
301.6000	51.51	-14.20	37.31	46.00	-8.69	peak
456.8000	37.53	-10.06	27.47	46.00	-18.53	peak
719.6700	36.04	-5.62	30.42	46.00	-15.58	peak
960.2300	29.30	-2.23	27.07	54.00	-26.93	peak

Vertical



Horizontal



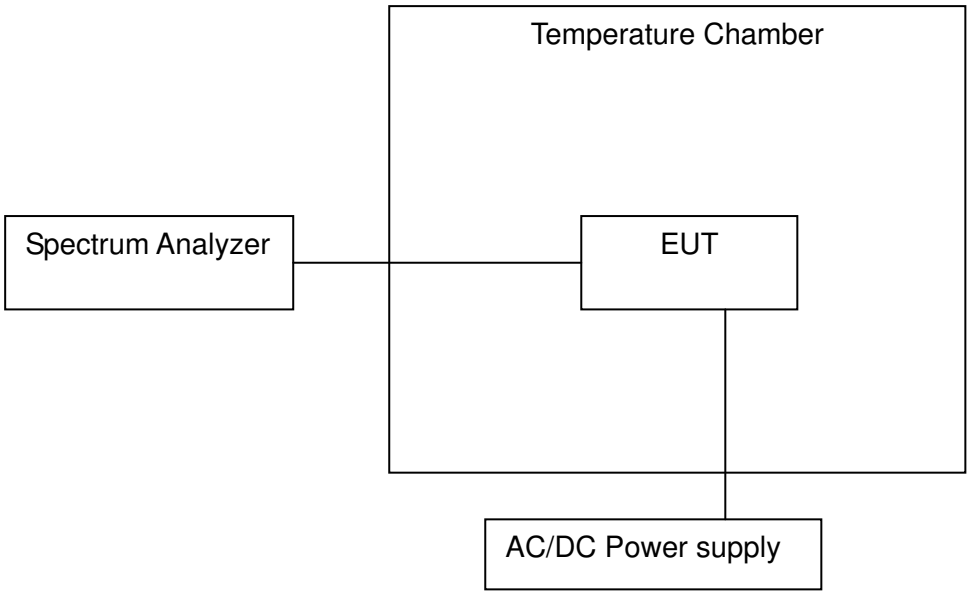
7.3 FREQUENCY STABILITY

LIMIT

According to §15.225(e), the frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Configuration

Temperature and Voltage Measurement (under normal and extreme test conditions)



TEST PROCEDURE

1. Turn the EUT off, and place it inside the environmental temperature chamber.
2. Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.
3. Set the spectrum analyzer as RBW=1kHz, VBW = RBW, Span = 200kHz, Sweep = auto.
4. Turn the EUT on and record the operating frequency at startup and two, five, and ten minutes after the EUT is energized.
5. Switch off the EUT and Lower the chamber temperature by not more than 10 °C and allow the temperature inside the chamber to stabilize.
6. Mark the peak frequency and measure the frequency tolerance using frequency counter function.
7. Repeat step 4 through step 6 down to the lowest specified temperature.

TEST RESULTS

No non-compliance noted.

TEST DATA

Condition			Frequency Error (ppm)									
Temperature	**Modulation Mode**	**Test Freq.**	**0 min**	**2 min**	**5 min**	**10 min**	**0 min**	**2 min**	**5 min**	**10 min**	**Limit (ppm)**	**Result**
			Normal									
T20°CVmax	CW	13.56	13.560800	13.560750	13.560670	13.560670	59.00	55.31	49.41	49.41	100	**Pass**
T20°CVmin	CW	13.56	13.560800	13.560750	13.560670	13.560670	59.00	55.31	49.41	49.41		**Pass**
			Extreme									
T50°CVnom	CW	13.56	13.560770	13.560650	13.560750	13.560680	56.78	47.94	55.31	50.15	100	**Pass**
T40°CVnom	CW	13.56	13.560650	13.560650	13.560670	13.560650	47.94	47.94	49.41	47.94		**Pass**
T30°CVnom	CW	13.56	13.560720	13.560650	13.560550	13.560650	53.10	47.94	40.56	47.94		**Pass**
T20°CVnom	CW	13.56	13.560800	13.560750	13.560670	13.560670	59.00	55.31	49.41	49.41		**Pass**
T10°CVnom	CW	13.56	13.560850	13.560950	13.560950	13.560850	62.68	70.06	70.06	62.68		**Pass**
T0°CVnom	CW	13.56	13.560950	13.560950	13.560850	13.560850	70.06	70.06	62.68	62.68		**Pass**
T-10°CVnom	CW	13.56	13.560660	13.560680	13.560680	13.560690	48.67	50.15	50.15	50.88		**Pass**
T-20°CVnom	CW	13.56	13.560709	13.560709	13.560695	13.560680	52.29	52.29	51.25	50.15		**Pass**

Remark: Vnom: 24
Vmax: 27.6
Vmin: 20.4

7.4 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a) & RSS-Gen §8.8, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

** Decreases with the logarithm of the frequency.*

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Operation Mode: NFC mode **Test Date:** October 20, 2016

Temperature: 26°C **Tested by:** Dennis Li

Humidity: 60% RH

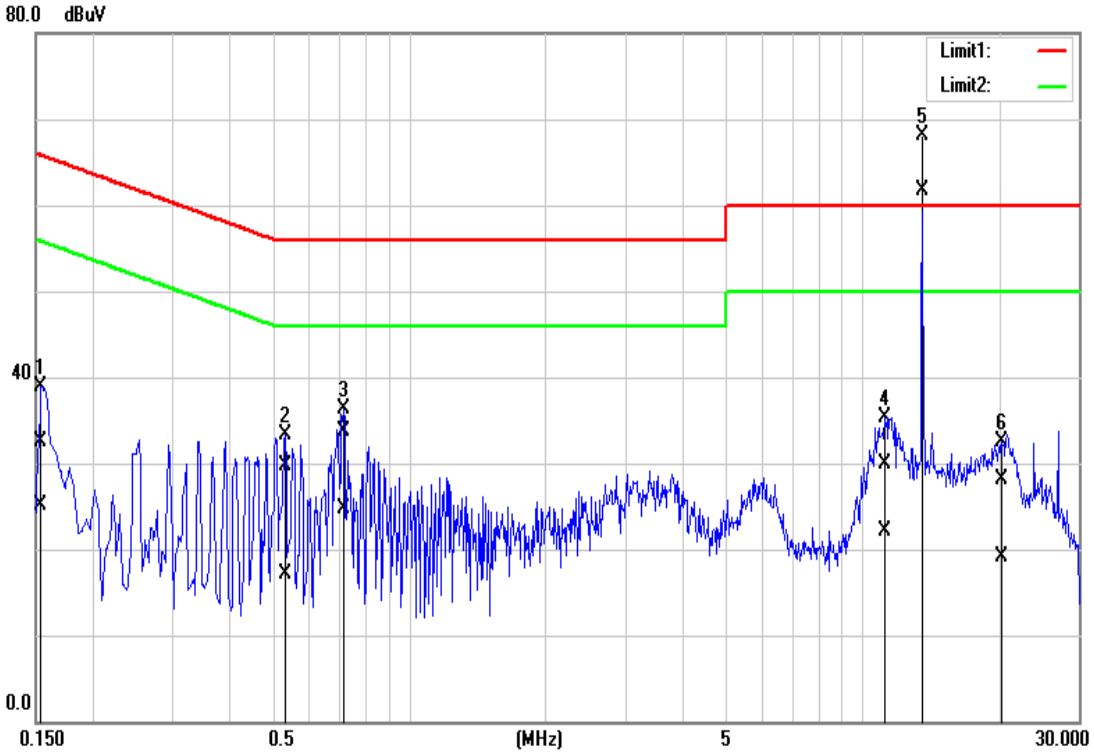
Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1539	22.71	15.37	9.71	32.42	25.08	65.78	55.79	-33.36	-30.71	L1
0.5340	19.99	7.40	9.70	29.69	17.10	56.00	46.00	-26.31	-28.90	L1
0.7180	24.01	15.04	9.71	33.72	24.75	56.00	46.00	-22.28	-21.25	L1
11.2180	20.19	12.27	9.80	29.99	22.07	60.00	50.00	-30.01	-27.93	L1
13.5600	58.34	51.94	9.82	68.16	61.76	60.00	50.00	8.16	11.76	L1
20.3580	18.25	9.29	9.88	28.13	19.17	60.00	50.00	-31.87	-30.83	L1
0.1700	24.69	16.63	9.78	34.47	26.41	64.96	54.96	-30.49	-28.55	L2
0.7019	28.77	16.30	9.76	38.53	26.06	56.00	46.00	-17.47	-19.94	L2
1.3380	18.83	9.44	9.77	28.60	19.21	56.00	46.00	-27.40	-26.79	L2
2.3699	19.95	10.04	9.79	29.74	19.83	56.00	46.00	-26.26	-26.17	L2
5.3420	18.11	7.84	9.87	27.98	17.71	60.00	50.00	-32.02	-32.29	L2
13.5600	58.75	54.84	10.11	68.86	64.95	60.00	50.00	8.86	14.95	L2

Remark:

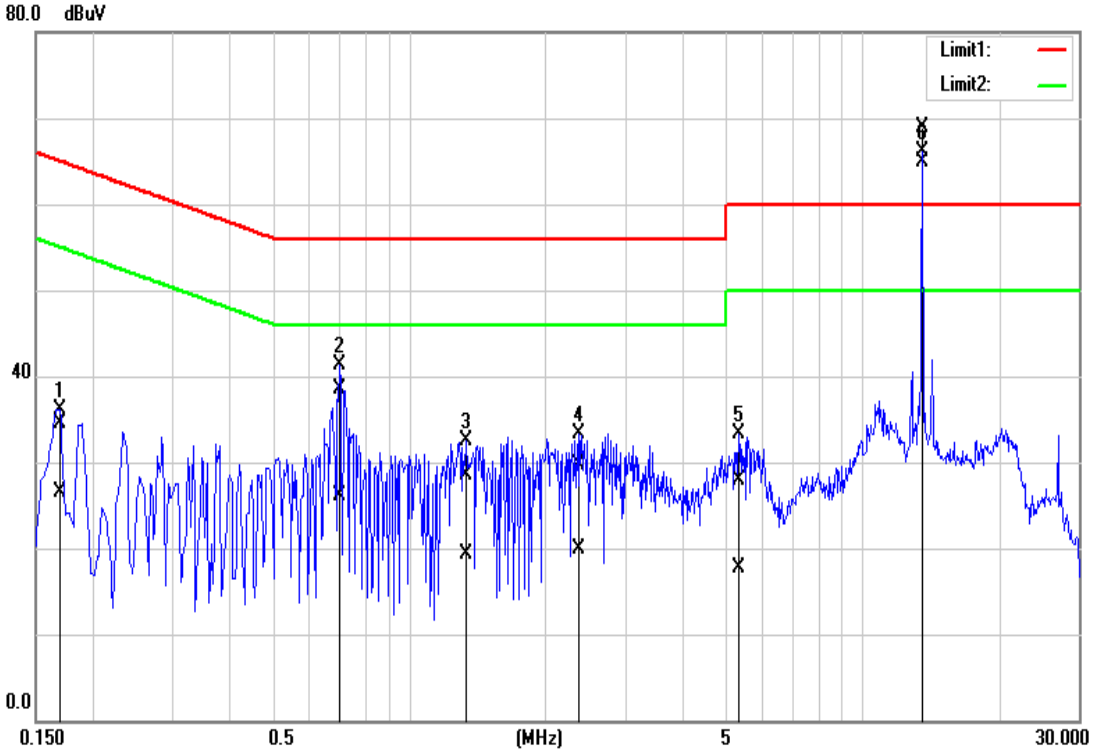
1. *The measuring frequencies range between 0.15 MHz and 30 MHz.*
2. *The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.*
3. *The IF bandwidth of SPA between 0.15MHz and 30MHz was 10kHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.*
4. *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*
5. *"-" means Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.*

Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)



Operation Mode:	NFC mode- Terminal Ant	**Test Date:**	October 20, 2016
Temperature:	26°C	**Tested by:**	Dennis Li
Humidity:	60% RH		

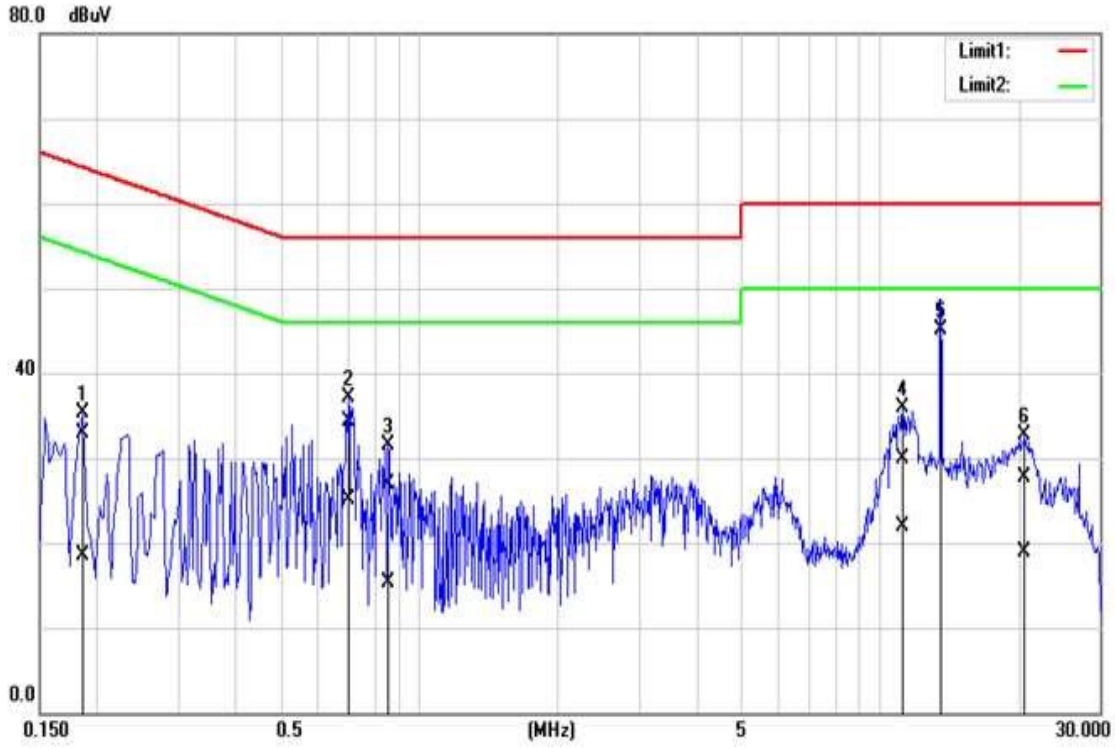
Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1860	23.12	8.86	9.70	32.82	18.56	64.21	54.21	-31.39	-35.65	L1
0.7020	24.66	15.39	9.71	34.37	25.10	56.00	46.00	-21.63	-20.90	L1
0.8580	17.11	5.67	9.71	26.82	15.38	56.00	46.00	-29.18	-30.62	L1
11.2460	20.10	12.11	9.80	29.90	21.91	60.00	50.00	-30.10	-28.09	L1
13.5600	35.23	35.28	9.82	45.10	45.05	60.00	50.00	-14.90	-4.95	L1
20.6900	17.79	9.00	9.87	27.66	18.87	60.00	50.00	-32.34	-31.13	L1
0.1620	22.27	14.27	9.78	32.05	24.05	65.36	55.36	-33.31	-31.31	L2
0.6980	28.63	16.69	9.76	38.39	26.45	56.00	46.00	-17.61	-19.55	L2
1.4299	19.00	8.99	9.77	28.77	18.76	56.00	46.00	-27.23	-27.24	L2
2.4580	19.43	9.78	9.79	29.22	19.57	56.00	46.00	-26.78	-26.43	L2
11.1820	20.24	10.36	10.05	30.29	20.41	60.00	50.00	-29.71	-29.59	L2
13.5600	35.23	35.61	10.11	45.72	45.34	60.00	50.00	-14.28	-4.6	L2

Remark:

1. *The measuring frequencies range between 0.15 MHz and 30 MHz.*
2. *The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.*
3. *The IF bandwidth of SPA between 0.15MHz and 30MHz was 10kHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.*
4. *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*
5. *"-" means Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.*

Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)