



## FCC PART 15 B

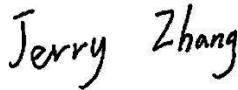
## TEST REPORT

For

## MAXWEST INTERNATIONAL LIMITED.

No.1,Longgang Road,Buji, Longgang, Shenzhen,China

**FCC ID: 2AEN3ASTRO5NLTE**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Mobile Phone
<b>Report Number:</b>	RDG171020005-00A
<b>Report Date:</b>	2017-11-16
<b>Reviewed By:</b> Jerry Zhang EMC Manager	
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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.(Dongguan).

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## GENERAL INFORMATION

### Product Description for Equipment Under Test (EUT)

The **MAXWEST INTERNATIONAL LIMITED.**'s product, model number: **Astro 5N LTE** (**FCC ID: 2AEN3ASTRO5NLTE**) (the "EUT") in this report was a **Mobile Phone**, which was measured approximately: 14.4 cm (L) x 7.4 cm (W) x 1.1 cm (H), rated input voltage:DC 3.8V from battery or DC 5.0V from adapter. The highest operation frequency is 2690MHz

#### *Adapter Information:*

*Model:AsTro 5N LTE*

*Input: AC100-240V 50/60Hz 0.2A*

*Output: 5.0V, 1A*

*\*All measurement and test data in this report was gathered from production sample serial number: 171020005 (Assigned by BACL,Dongguan). The EUT was received on 2017-10-10.*

### Objective

This test report is prepared on behalf of **MAXWEST INTERNATIONAL LIMITED.** in accordance with Part 2, Subpart J, and Part 15-Subparts A and B of the Federal Communications Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15 B Class B.

### Related Submittal(s)/Grant(s)

FCC Part 15C DSS submissions with FCC ID: 2AEN3ASTRO5NLTE.

FCC Part 15C DTS submissions with FCC ID: 2AEN3ASTRO5NLTE.

FCC Part 22H, 24E, 27 PCE submissions with FCC ID: 2AEN3ASTRO5NLTE.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Dongguan).

## Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~26.5GHz: 5.23 dB
Temperature	±1°C
Humidity	±5%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

## 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 Industry Area, Tangxia, Dongguan, Guangdong, China

Bay Area Compliance Laboratories Corp. (Dongguan) has been accredited to ISO/IEC 17025 by CNAS(Lab code: L5662). And accredited to ISO/IEC 17025 by NVLAP(Test Laboratory Accreditation Certificate Number 500069-0), the FCC Designation No. CN5002 under the KDB 974614 D01.

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.

Bay Area Compliance Laboratories Corp. (Dongguan) was registered with ISED Canada under ISED Canada Registration Number 3062D.

## **SYSTEM TEST CONFIGURATION**

### **Description of Test Configuration**

The system was configured for testing in operating and downloading mode.

### **EUT Exercise Software**

The software “winthrax.exe” was used during test.

### **Equipment Modifications**

No modification was made to the EUT tested.

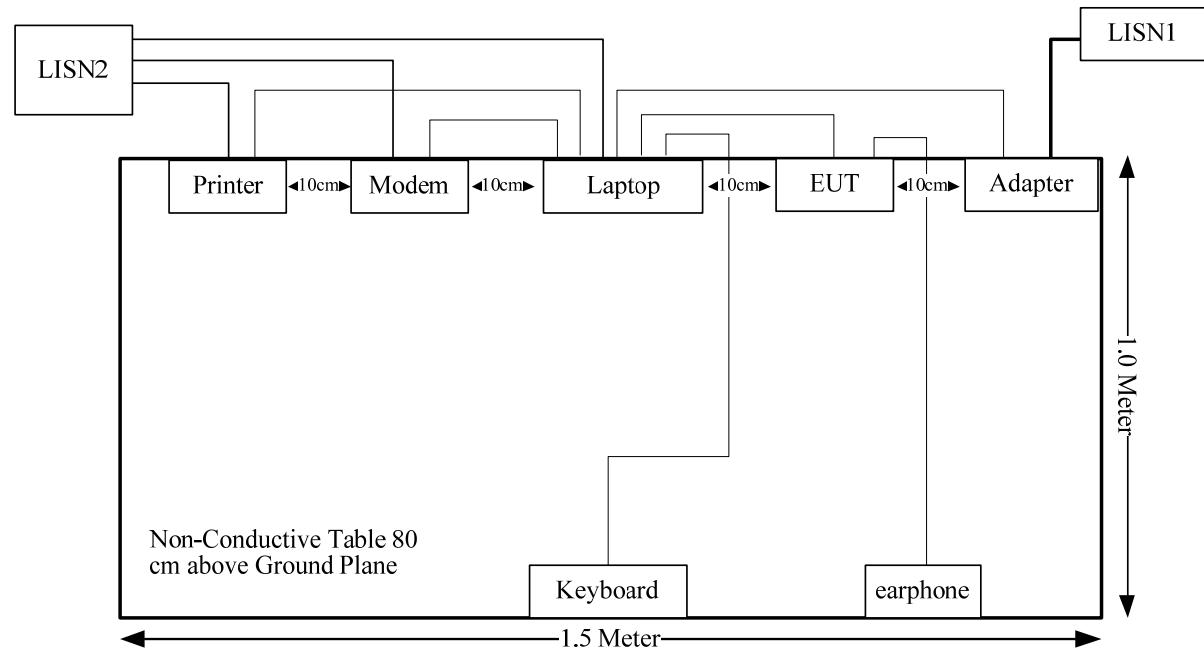
### **Local Support Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>
DELL	Laptop	PP11L	QDS-BRCM1017
HP	Printer	C3941A	JPTVOB2337
DELL	Keyboard	L100	CNORH656658907BL05DC
SAST	Modem	AEM-2100	0293

### **Support Cable List and Details**

<b>Cable Description</b>	<b>Shielding Type</b>	<b>Ferrite Core</b>	<b>Length (m)</b>	<b>From Port</b>	<b>To</b>
Parallel Cable	yes	No	1.2	Parallel Port of Laptop	Printer
Serial Cable	yes	No	1.2	Serial Port of Laptop	Modem
Keyboard Cable	yes	No	1.8	USB Port of Laptop	Keyboard
USB Cable	No	No	0.89	USB Port of Laptop	EUT
Earphone Cable	No	No	1.19	EUT	Earphone

## Configuration of Test Setup

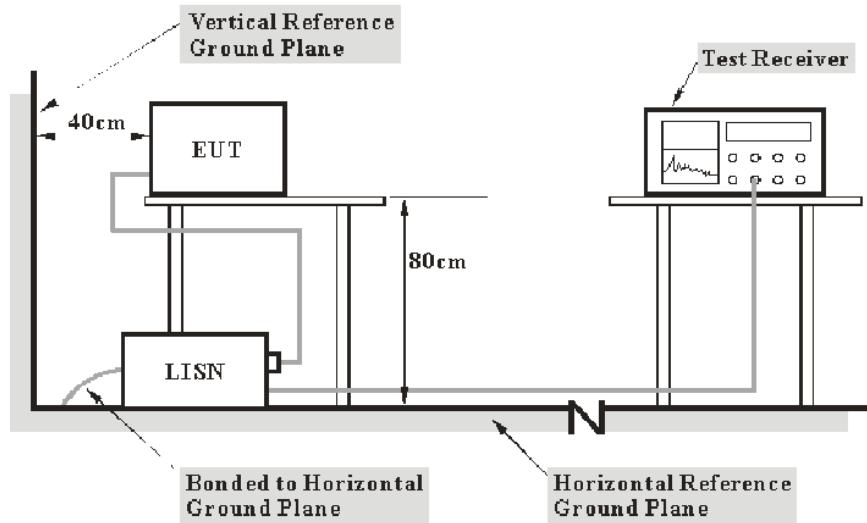


## SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Compliant
§15.109	Radiated Emissions	Compliant

## FCC§15.107 - CONDUCTED EMISSIONS

### EUT Setup



Note: 1. Support units were connected to second LISN.  
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter was connected to the Main LISN with 120V/60Hz AC power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	L.I.S.N	ESH2-Z5	892107/021	2017/9/25	2018/9/25
R&S	EMI Test Receiver	ESCS 30	830245/006	2016/12/8	2017/12/8
R&S	Two-line V-network	ENV 216	3560.6550.12	2016/12/8	2017/12/8
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
N/A	Coaxial Cable	C-NJNJ-50	C-0200-01	2017/9/5	2018/9/5

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

## Test Procedure

During the conducted emission test, the adapter of laptop was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

## Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_c + VDF$$

Herein,

$V_C$ : corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_c$ : attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The “Margin” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15 B Class B.

## Test Data

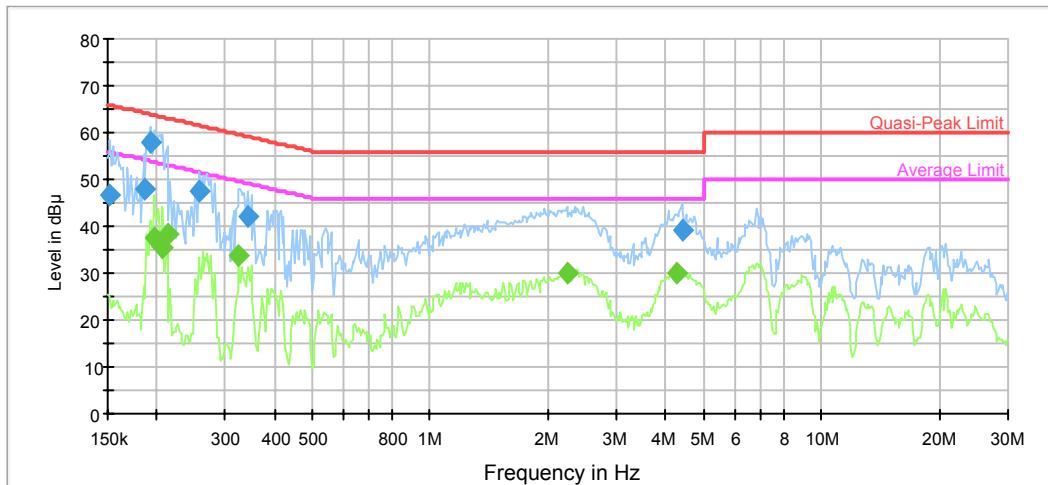
### Environmental Conditions

<b>Temperature:</b>	25.4 °C
<b>Relative Humidity:</b>	54 %
<b>ATM Pressure:</b>	101.3 kPa

*The testing was performed by Alex You on 2017-11-15.*

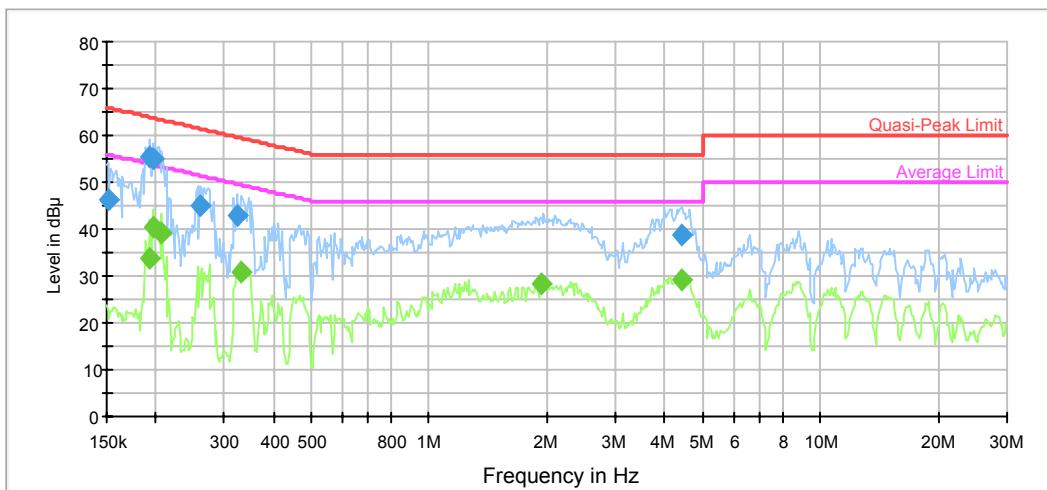
*Test Mode: Downloading*

**AC120V, 60Hz, Line:**



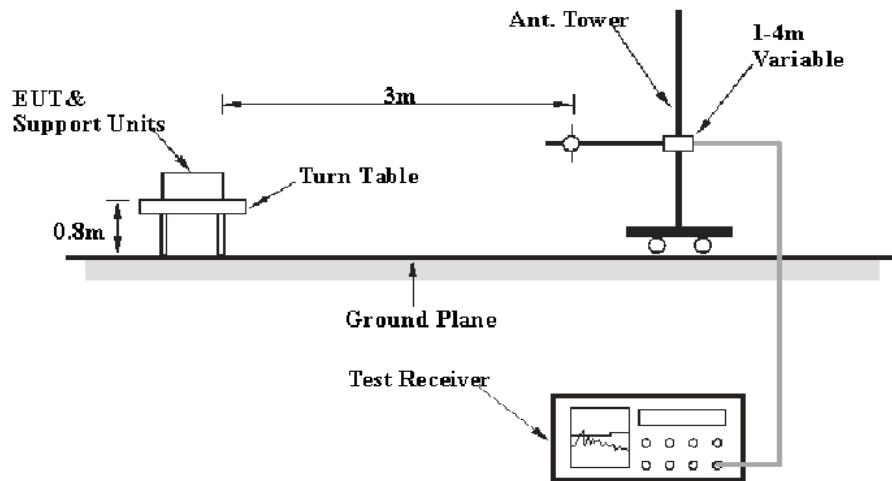
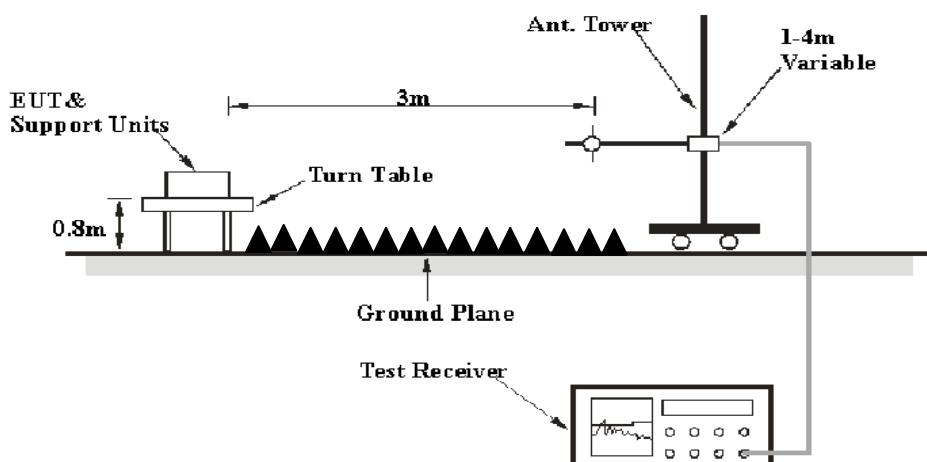
Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.152410	46.8	9.000	L1	11.2	19.1	65.9	Compliance
0.186006	48.0	9.000	L1	10.8	16.2	64.2	Compliance
0.193566	57.7	9.000	L1	10.7	6.2	63.9	Compliance
0.255827	47.3	9.000	L1	10.3	14.3	61.6	Compliance
0.343548	42.1	9.000	L1	10.1	17.0	59.1	Compliance
4.399032	39.1	9.000	L1	9.8	16.9	56.0	Compliance

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.196675	37.4	9.000	L1	10.7	16.3	53.7	Compliance
0.207957	35.5	9.000	L1	10.6	17.8	53.3	Compliance
0.212988	38.3	9.000	L1	10.5	14.8	53.1	Compliance
0.324910	33.6	9.000	L1	10.1	16.0	49.6	Compliance
2.234662	30.1	9.000	L1	9.7	15.9	46.0	Compliance
4.261034	30.1	9.000	L1	9.8	15.9	46.0	Compliance

**AC120V, 60Hz, Neutral:**

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.151200	46.3	9.000	N	11.2	19.6	65.9	Compliance
0.193566	55.5	9.000	N	10.7	8.4	63.9	Compliance
0.196675	55.1	9.000	N	10.6	8.6	63.7	Compliance
0.259937	45.1	9.000	N	10.3	16.3	61.4	Compliance
0.322331	42.8	9.000	N	10.1	16.8	59.6	Compliance
4.434225	38.7	9.000	N	9.8	17.3	56.0	Compliance

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.193566	33.9	9.000	N	10.7	20.0	53.9	Compliance
0.196675	40.4	9.000	N	10.6	13.3	53.7	Compliance
0.207957	39.3	9.000	N	10.6	14.0	53.3	Compliance
0.330129	30.6	9.000	N	10.1	18.8	49.4	Compliance
1.936076	28.3	9.000	N	9.7	17.7	46.0	Compliance
4.399032	29.3	9.000	N	9.8	16.7	46.0	Compliance

**FCC §15.109 - RADIATED SPURIOUS EMISSIONS****EUT Setup****Below 1GHz:****Above 1GHz:**

The radiated emission Below 1GHz tests were performed in the 3 meters chamber test site, above 1GHz tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

## EMI Test Receiver Setup

The system was investigated from 30 MHz to 13.5 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10 Hz	/	AVG

## Test Procedure

During the radiated emissions, the adapter of laptop was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2017/9/1	2018/9/1
Sunol Sciences	Antenna	JB3	A060611-2	2017/8/25	2020/8/25
HP	Amplifier	8447D	2727A05902	2017/9/5	2018/9/5
Agilent	Spectrum Analyzer	E4440A	SG43360054	2016/12/8	2017/12/8
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016/1/5	2019/1/5
MITEQ	Amplifier	AFS42-00101800-2 5-S-42	2001271	2017/9/5	2018/9/5
N/A	Coaxial Cable	C-NJNJ-50	C-0400-01	2017/9/5	2018/9/5
N/A	Coaxial Cable	C-NJNJ-50	C-0075-01	2017/9/5	2018/9/5
N/A	Coaxial Cable	C-NJNJ-50	C-1000-01	2017/9/5	2018/9/5
N/A	Coaxial Cable	C-SJSJ-50	C-0800-01	2017/9/5	2018/9/5
Farad	Test Software	EZ-EMC	V1.1.42	N/A	N/A

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

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Data

### Environmental Conditions

<b>Temperature:</b>	25.7 °C
<b>Relative Humidity:</b>	30.7 %
<b>ATM Pressure:</b>	101.6 kPa

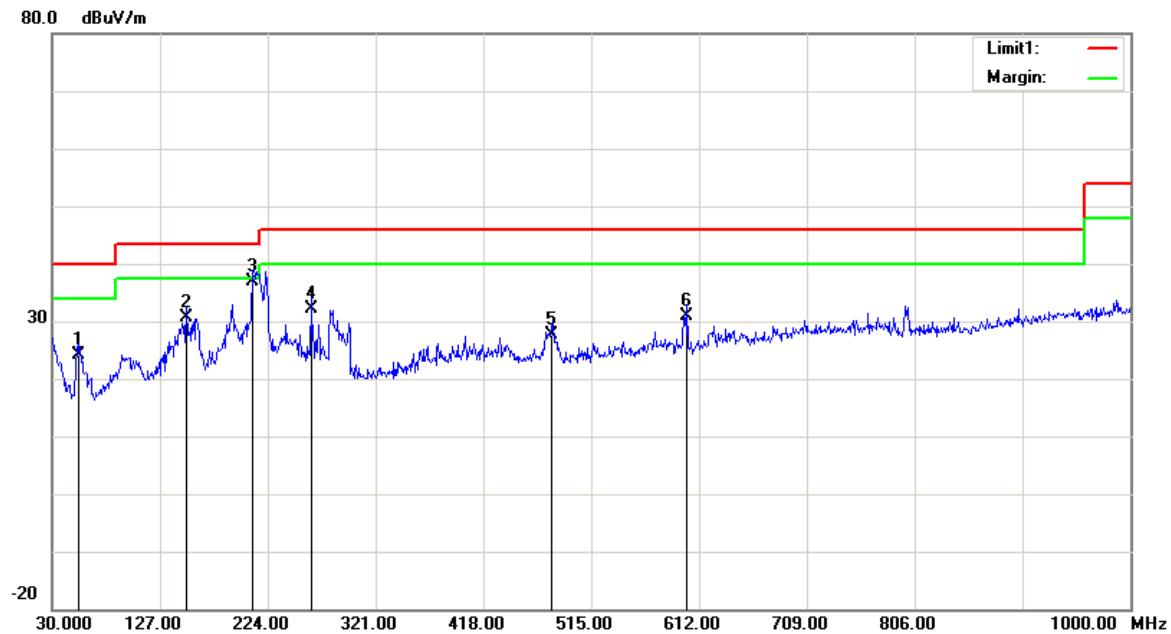
\* The testing was performed by Blake Yang & Steven Zuo on 2017-10-16.

*Test Result: Compliance*

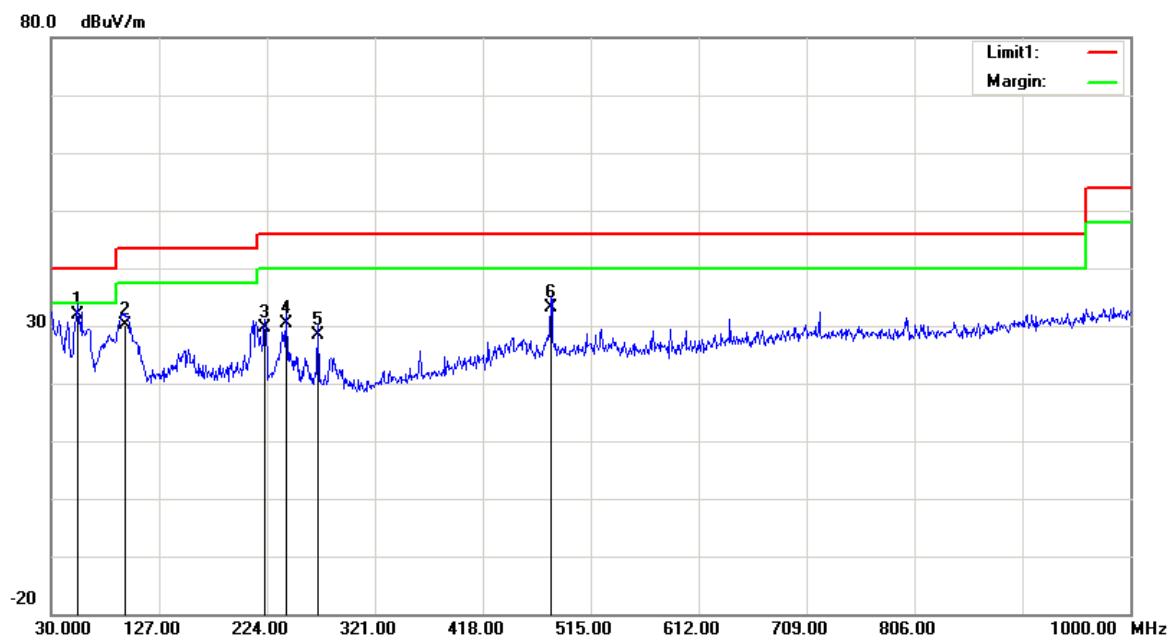
*Test Mode: Downloading*

**1) Below 1GHz:**

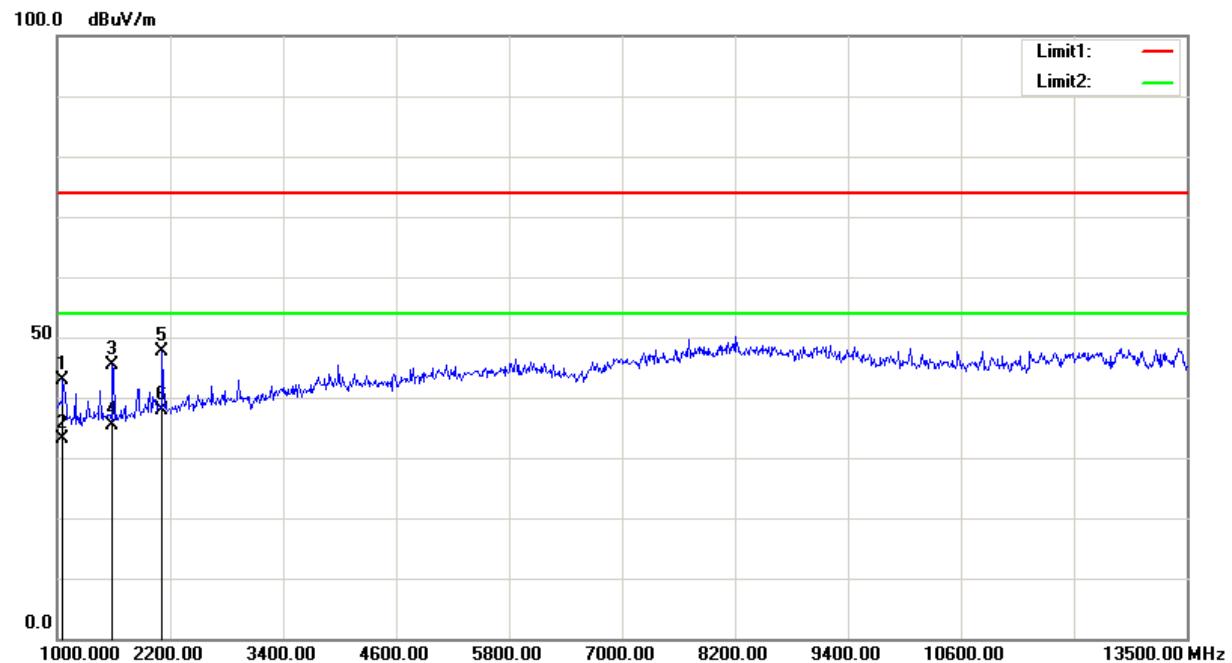
**Horizontal**



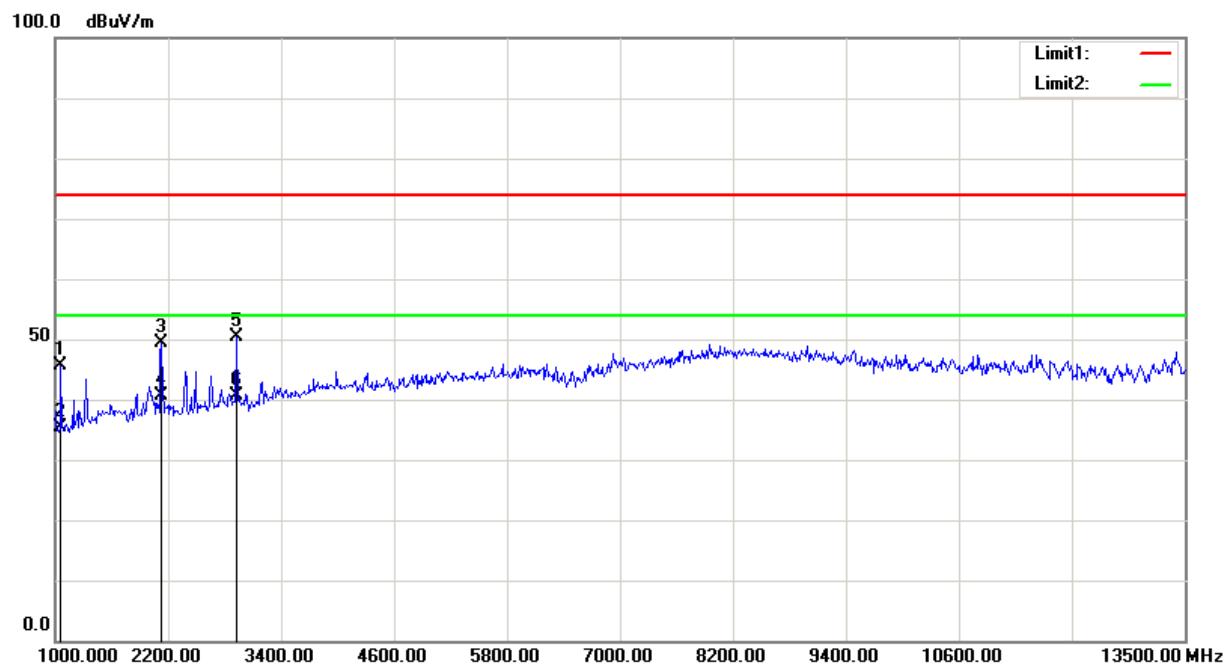
Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
54.2500	36.47	QP	-12.37	24.10	40.00	15.90
150.2800	37.15	QP	-6.45	30.70	43.50	12.80
210.4200	44.33	QP	-7.43	36.90	43.50	6.60
262.8000	36.79	QP	-4.69	32.10	46.00	13.90
479.1100	28.60	QP	-1.00	27.60	46.00	18.40
601.3300	30.60	QP	0.20	30.80	46.00	15.20

**Vertical**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
53.2800	44.17	QP	-12.27	31.90	40.00	8.10
96.9300	39.37	QP	-9.27	30.10	43.50	13.40
222.0600	36.34	QP	-6.74	29.60	46.00	16.40
241.4600	36.55	QP	-6.25	30.30	46.00	15.70
269.5900	32.48	QP	-4.08	28.40	46.00	17.60
479.1100	34.20	QP	-1.00	33.20	46.00	12.80

**2) Above 1GHz:****Horizontal**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1060.000	53.25	peak	-10.49	42.76	74.00	31.24
1060.000	43.64	AVG	-10.49	33.15	54.00	20.85
1594.000	54.14	peak	-8.74	45.40	74.00	28.60
1594.000	44.23	AVG	-8.74	35.49	54.00	18.51
2116.000	54.70	peak	-6.97	47.73	74.00	26.27
2116.000	44.82	AVG	-6.97	37.85	54.00	16.15

**Vertical**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1066.000	55.97	peak	-10.45	45.52	74.00	28.48
1066.000	45.83	AVG	-10.45	35.38	54.00	18.62
2128.000	56.36	peak	-6.93	49.43	74.00	24.57
2128.000	47.62	AVG	-6.93	40.69	54.00	13.31
2926.000	55.58	peak	-5.13	50.45	74.00	23.55
2926.000	45.72	AVG	-5.13	40.59	54.00	13.41

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