

# FCC PART 15 B TEST REPORT

For

## CLC HONG KONG LIMITED

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**FCC ID: 2AG4WZ517**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Compass LTE
<b>Report Number:</b>	RDG171228009-00A
<b>Report Date:</b>	2018-02-10
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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).

## **TABLE OF CONTENTS**

<b>GENERAL INFORMATION.....</b>	<b>3</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	3
OBJECTIVE .....	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY .....	3
MEASUREMENT UNCERTAINTY.....	4
TEST FACILITY .....	4
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>5</b>
DESCRIPTION OF TEST CONFIGURATION .....	5
EUT EXERCISE SOFTWARE .....	5
EQUIPMENT MODIFICATIONS .....	5
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS .....	5
SUPPORT CABLE LIST AND DETAILS .....	5
CONFIGURATION OF TEST SETUP .....	6
<b>SUMMARY OF TEST RESULTS .....</b>	<b>7</b>
<b>FCC§15.107 - CONDUCTED EMISSIONS.....</b>	<b>8</b>
EUT SETUP.....	8
EMI TEST RECEIVER SETUP.....	8
TEST EQUIPMENT LIST AND DETAILS.....	9
TEST PROCEDURE .....	9
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	9
TEST RESULTS SUMMARY .....	9
TEST DATA .....	10
<b>FCC §15.109 - RADIATED SPURIOUS EMISSIONS .....</b>	<b>12</b>
EUT SETUP.....	12
EMI TEST RECEIVER SETUP.....	13
TEST PROCEDURE .....	13
TEST EQUIPMENT LIST AND DETAILS.....	13
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	14
TEST DATA .....	14

## GENERAL INFORMATION

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

<b>EUT Name:</b>		Compass LTE
<b>EUT Model:</b>		Z517
<b>FCC ID:</b>		2AG4WZ517
<b>Rated Input Voltage:</b>		DC3.8V from Battery or DC 5V from adapter
<b>Adapter Information</b>	<b>Model:</b>	PMC43
	<b>Input:</b>	AC100-240V~ 50/60Hz 0.2A
	<b>Output:</b>	5.0V , 1.0A
<b>External Dimension:</b>		Length (14.5 cm)*Width (7.1 cm)*High (0.9 cm)
<b>Serial Number:</b>		171228009
<b>EUT Received Date:</b>		2017.12.28
<b>The highest operation frequency:</b>		2690MHz

### Objective

This test report is prepared on behalf of **CLC HONG KONG 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: 2AG4WZ517.

FCC Part 15C DTS submissions with FCC ID: 2AG4WZ517.

FCC Part 22H, 24E, 27 PCE submissions with FCC ID: 2AG4WZ517.

### 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~18GHz: 5.23 dB
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$
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.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in downloading mode.

### EUT Exercise Software

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

### Equipment Modifications

No modification was made to the EUT tested.

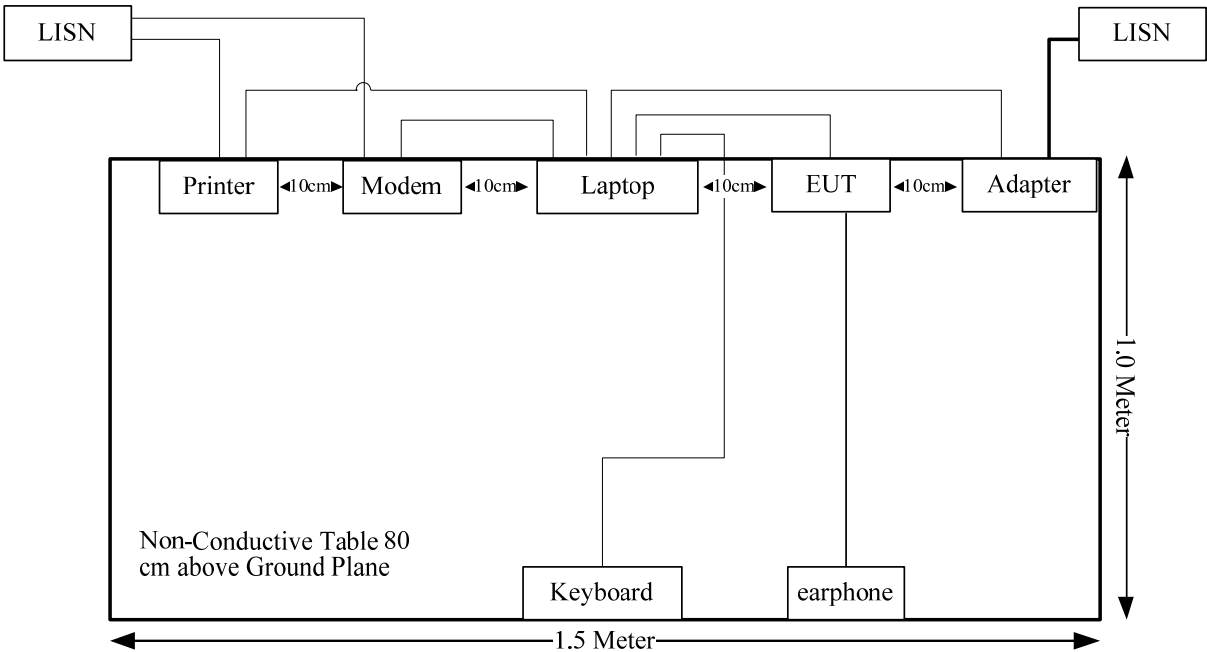
### Local Support Equipment List and Details

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

### Support Cable List and Details

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

Configuration of Test Setup



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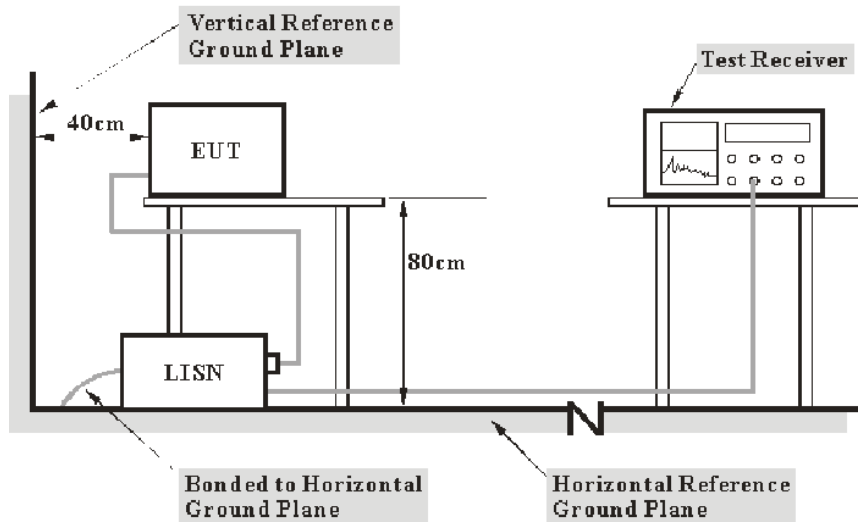
**SUMMARY OF TEST RESULTS**

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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	EMI Test Receiver	ESCS 30	830245/006	2017-12-11	2018-12-11
R&S	Two-line V-network	ENV 216	101614	2017-12-08	2018-12-08
R&S	L.I.S.N	ESH2-Z5	892107/021	2017-09-25	2018-09-25
N/A	Coaxial Cable	C-NJNJ-50	C-0200-01	2017-09-05	2018-09-05
R&S	Test Software	EMC32	Version8.53.0	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).

### 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.

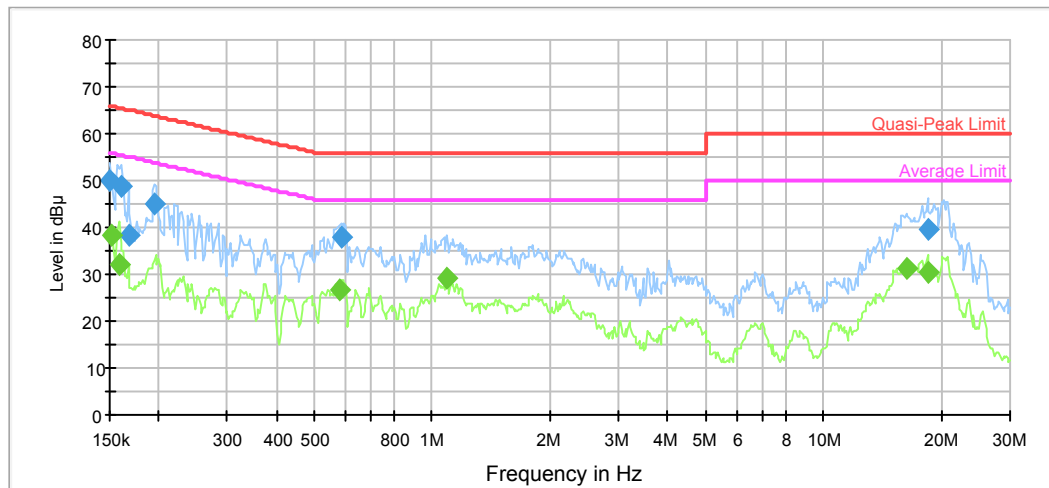
**Test Data****Environmental Conditions**

<b>Temperature:</b>	25.3 °C
<b>Relative Humidity:</b>	39 %
<b>ATM Pressure:</b>	101.1 kPa

The testing was performed by Jim Zhang on 2018-01-03.

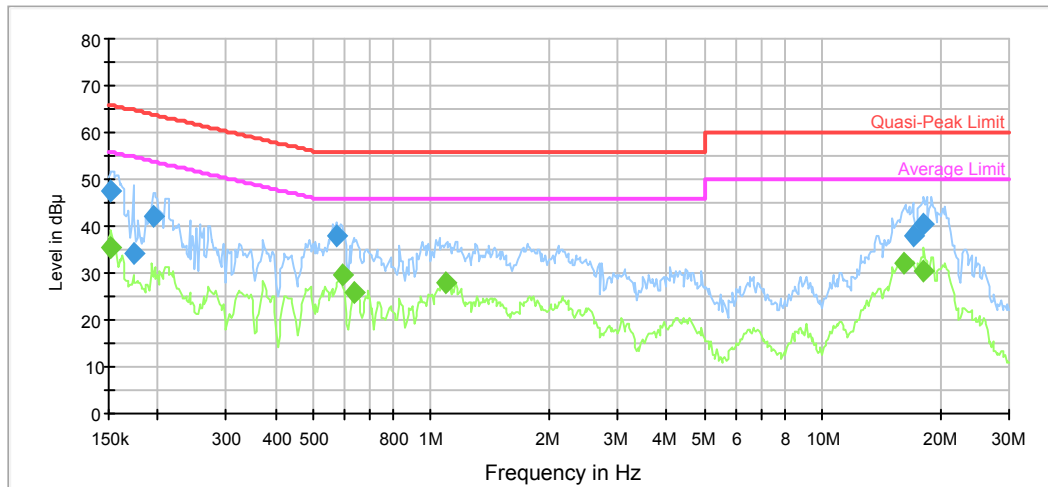
Test Mode: Downloading

AC120V, 60Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	49.9	9.000	L1	11.2	16.1	66.0	Compliance
0.161152	48.7	9.000	L1	11.0	16.7	65.4	Compliance
0.167702	38.3	9.000	L1	10.9	26.8	65.1	Compliance
0.195114	45.1	9.000	L1	10.7	18.7	63.8	Compliance
0.585926	37.8	9.000	L1	9.8	18.2	56.0	Compliance
18.460903	39.7	9.000	L1	10.1	20.3	60.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.152410	38.4	9.000	L1	11.2	17.5	55.9	Compliance
0.158604	32.2	9.000	L1	11.1	23.3	55.5	Compliance
0.581275	26.7	9.000	L1	9.8	19.3	46.0	Compliance
1.090848	29.3	9.000	L1	9.8	16.7	46.0	Compliance
16.381172	31.4	9.000	L1	10.0	18.6	50.0	Compliance
18.460903	30.5	9.000	L1	10.1	19.5	50.0	Compliance

**AC120V, 60Hz, Neutral:**

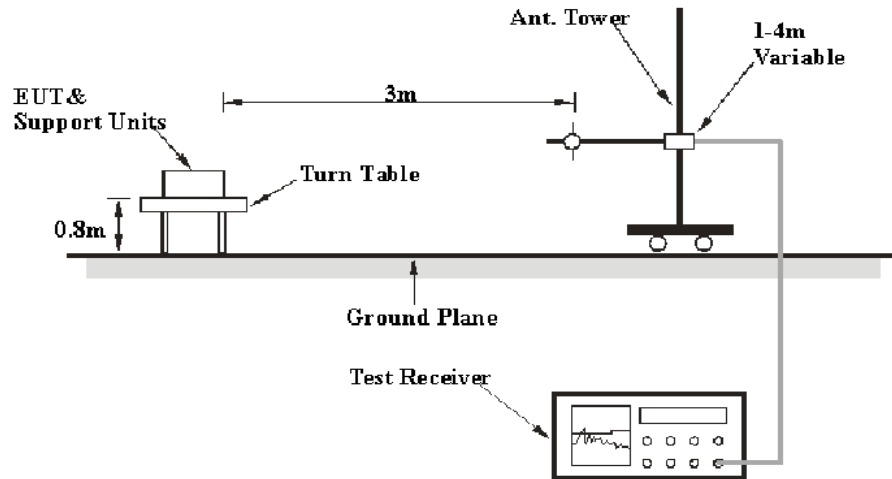
Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.152410	47.7	9.000	N	11.1	18.2	65.9	Compliance
0.173134	34.0	9.000	N	10.9	30.8	64.8	Compliance
0.195114	41.9	9.000	N	10.7	21.9	63.8	Compliance
0.576662	37.8	9.000	N	9.8	18.2	56.0	Compliance
17.046987	37.9	9.000	N	10.0	22.1	60.0	Compliance
18.169036	40.6	9.000	N	10.0	19.4	60.0	Compliance

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.152410	35.4	9.000	N	11.1	20.5	55.9	Compliance
0.590613	29.7	9.000	N	9.8	16.3	46.0	Compliance
0.639600	25.8	9.000	N	9.8	20.2	46.0	Compliance
1.090848	28.1	9.000	N	9.8	17.9	46.0	Compliance
16.122185	32.2	9.000	N	10.0	17.8	50.0	Compliance
18.169036	30.6	9.000	N	10.0	19.4	50.0	Compliance

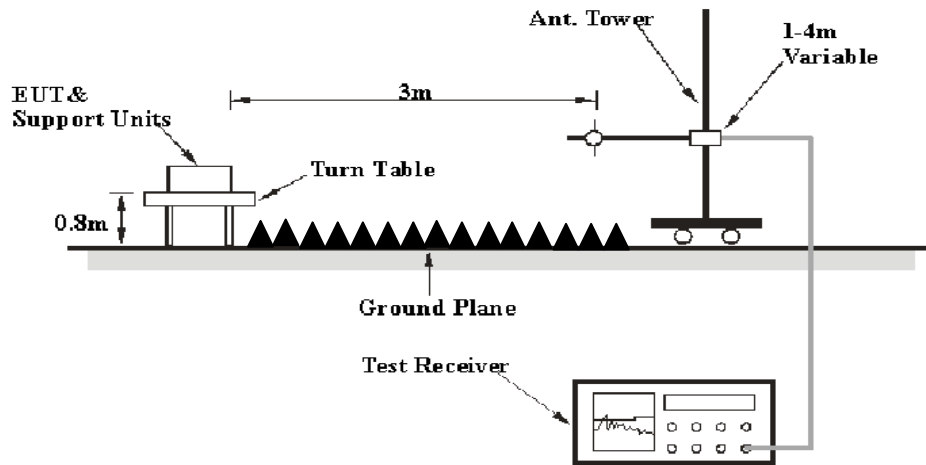
## FCC §15.109 - RADIATED SPURIOUS EMISSIONS

### 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	2017-12-11	2018-12-11
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
R&S	Spectrum Analyzer	FSEM	831259/019	2017-07-18	2018-07-18
TDK RF	Horn Antenna	HRN-0118	130 084	2016-01-05	2019-01-04
N/A	Coaxial Cable	C-2.4J2.4J-50	C-0700-01	2017-06-27	2018-06-27
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-2.4J2.4J-50	C-0700-01	2017-06-27	2018-06-27
Farad	Test Software	EZ-EMC	V1.1.4.2	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>	17.2~23.3 °C
<b>Relative Humidity:</b>	31~36 %
<b>ATM Pressure:</b>	100.8~101.3 kPa

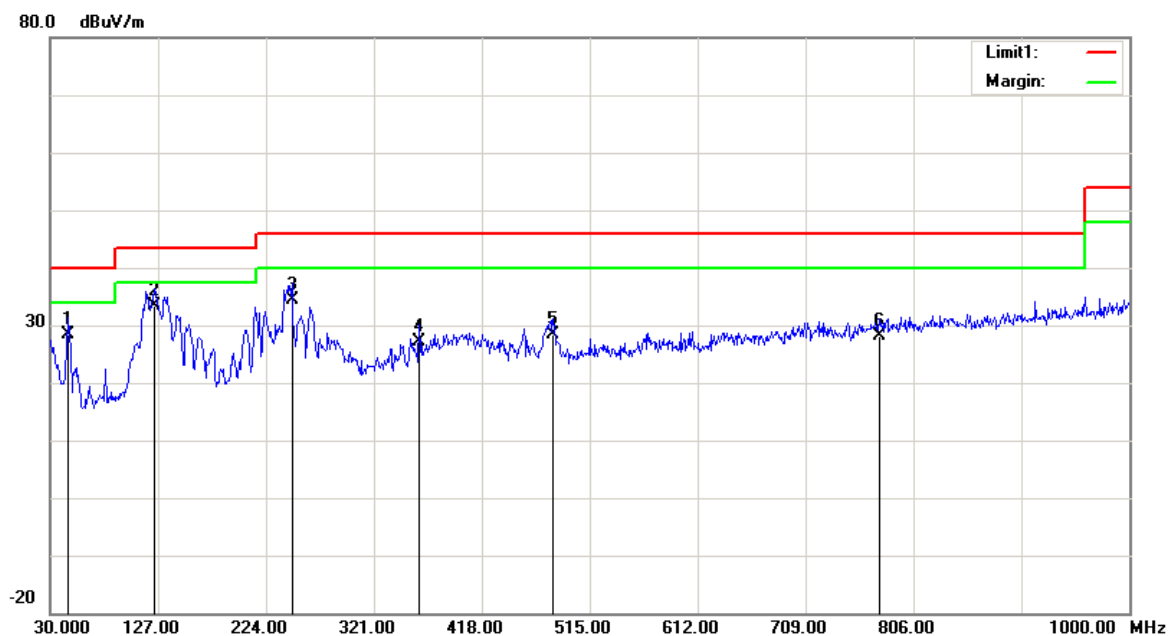
*\* The testing was performed by Blake Yang&Eric Xiao on 2018-01-05 and 2018-02-05.*

*Test Result: Compliance*

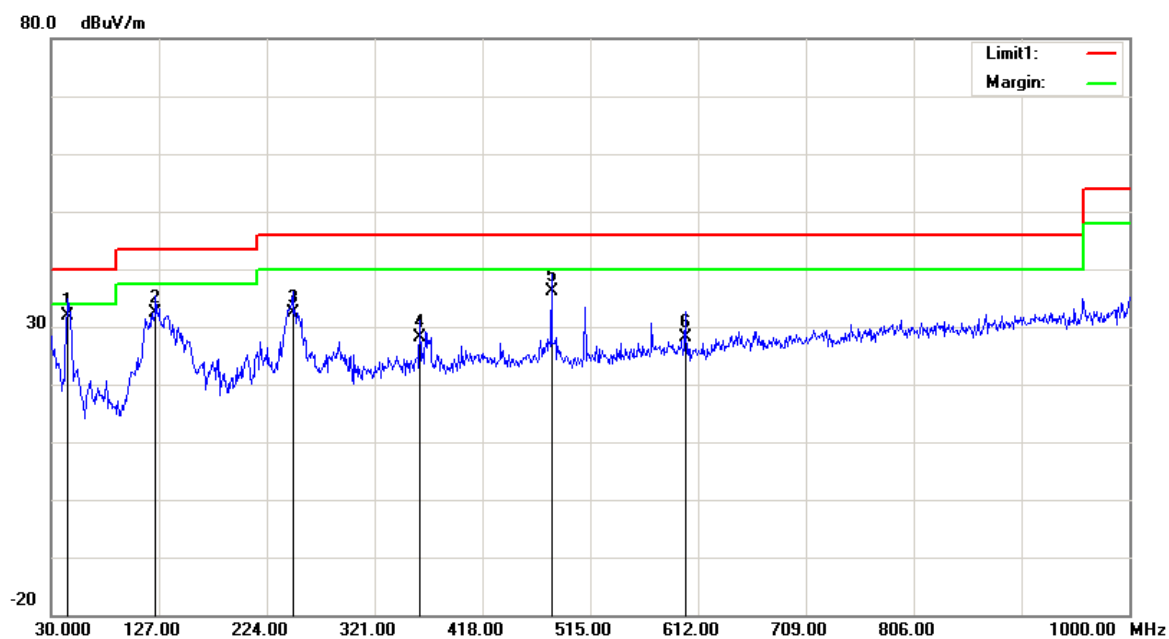
Test Mode: Downloading

### 1) Below 1GHz:

#### Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
46.4900	38.51	QP	-10.21	28.30	40.00	11.70
124.0900	38.19	QP	-4.79	33.40	43.50	10.10
247.2800	40.63	QP	-6.33	34.30	46.00	11.70
361.7400	30.10	QP	-2.90	27.20	46.00	18.80
482.0200	29.33	QP	-1.03	28.30	46.00	17.70
775.9300	24.20	QP	3.90	28.10	46.00	17.90

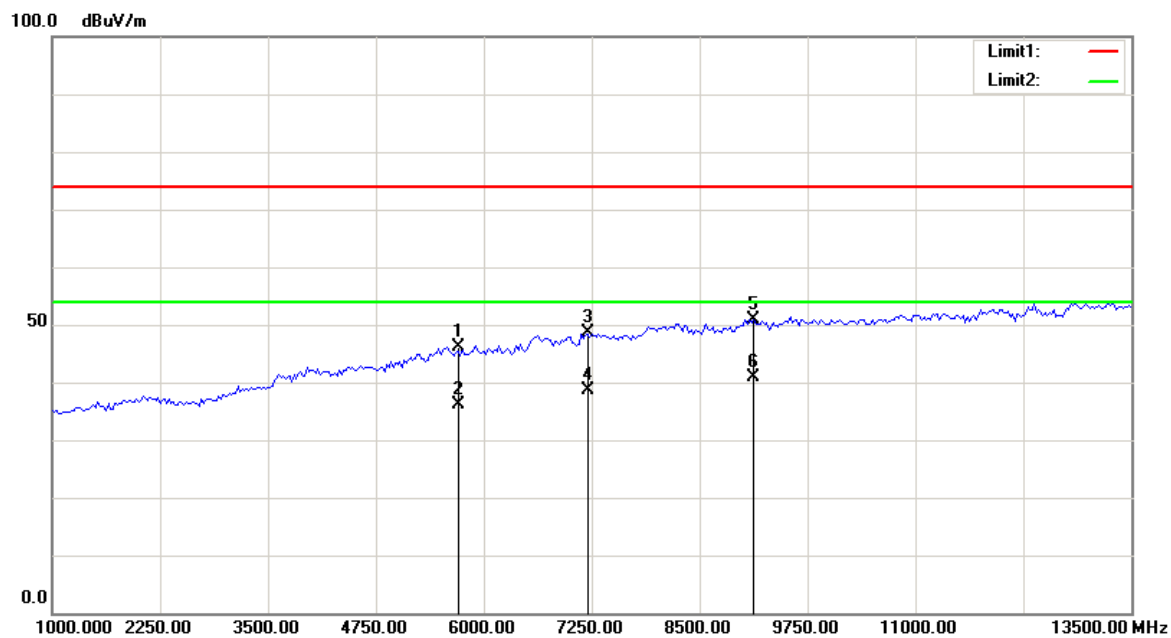
**Vertical**

Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
44.5500	41.17	QP	-9.27	31.90	40.00	8.10
124.0900	37.19	QP	-4.79	32.40	43.50	11.10
247.2800	38.63	QP	-6.33	32.30	46.00	13.70
361.7400	31.00	QP	-2.90	28.10	46.00	17.90
480.0800	37.21	QP	-1.01	36.20	46.00	9.80
600.3600	27.90	QP	0.20	28.10	46.00	17.90



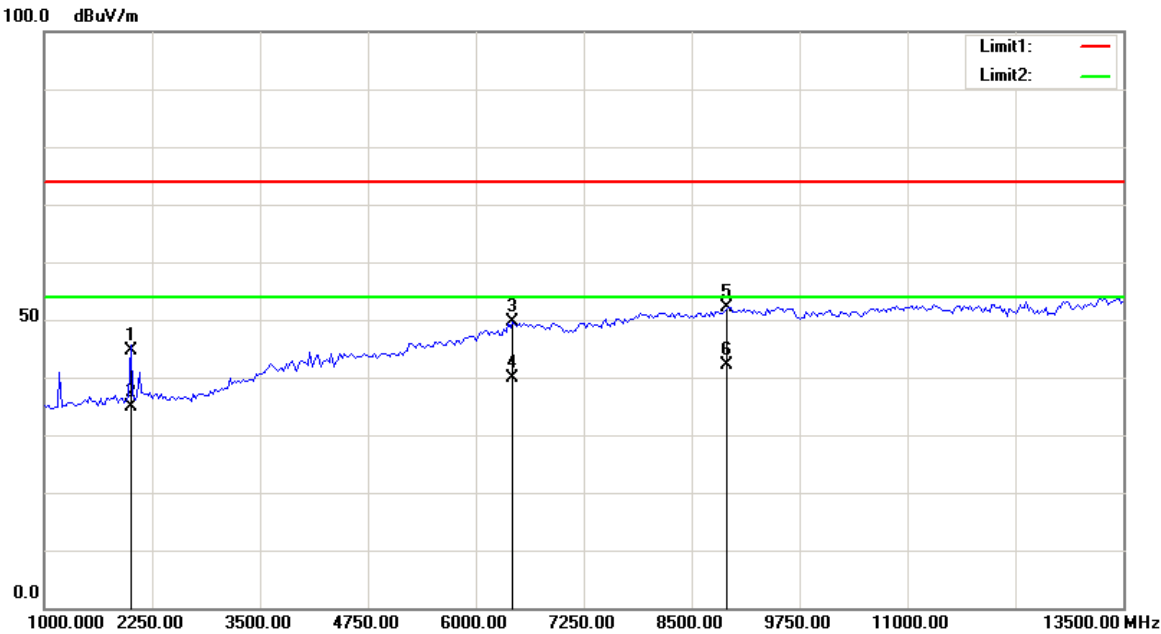
## 2) Above 1GHz:

## Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5713.427	32.43	peak	13.67	46.10	74.00	27.90
5713.427	22.53	AVG	13.67	36.20	54.00	17.80
7180.361	32.14	peak	16.46	48.60	74.00	25.40
7180.361	22.24	AVG	16.46	38.70	54.00	15.30
9104.208	31.14	peak	19.85	50.99	74.00	23.01
9104.208	21.05	AVG	19.85	40.90	54.00	13.10

Vertical



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1985.972	32.43	peak	1.74	44.72	74.00	29.28
1985.972	22.53	AVG	1.74	34.80	54.00	19.20
6410.822	32.14	peak	15.46	49.75	74.00	24.25
6410.822	22.24	AVG	15.46	39.80	54.00	14.20
8887.776	31.14	peak	19.33	52.14	74.00	21.86
8887.776	21.05	AVG	19.33	42.20	54.00	11.80

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