



TESTING LABORATORY  
CERTIFICATE #4820.01



# FCC PART 15 B TEST REPORT

For

## HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED

Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon Hong Kong

**FCC ID: 2AC88-GLMU18A01**

<b>Report Type:</b> Original Report	<b>Product Type:</b> 4G Wireless Data Terminal
<b>Report Number:</b>	RDG180523006-00A
<b>Report Date:</b>	2018-07-26
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## GENERAL INFORMATION

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

<b>EUT Name:</b>	4G Wireless Data Terminal
<b>EUT Model:</b>	GLMU18A01
<b>FCC ID:</b>	2AC88-GLMU18A01
<b>Highest Operation Frequency:</b>	2480 MHz
<b>Rated Input Voltage:</b>	DC3.8V from Battery or DC 5V from USB port
<b>External Dimension:</b>	Length (132 mm)*Width (72 mm)*High (14 mm)
<b>Serial Number:</b>	180523006
<b>EUT Received Date:</b>	2018.05.23

### Objective

This test report is prepared on behalf of *HONGKONG U-CLOUDLINK NETWORK TECHNOLOGY 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 DTS submissions with FCC ID: 2AC88-GLMU18A01.

FCC Part 15C DSS submissions with FCC ID: 2AC88-GLMU18A01.

FCC Part 22H, 24E, Part 27 PCB submissions with FCC ID: 2AC88-GLMU18A01.

### 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: 4.55 dB, 200M~1GHz: 5.92 dB, 1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB, 18G~26.5G: 5.47 dB, 26.5G~40G: 5.63 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 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.

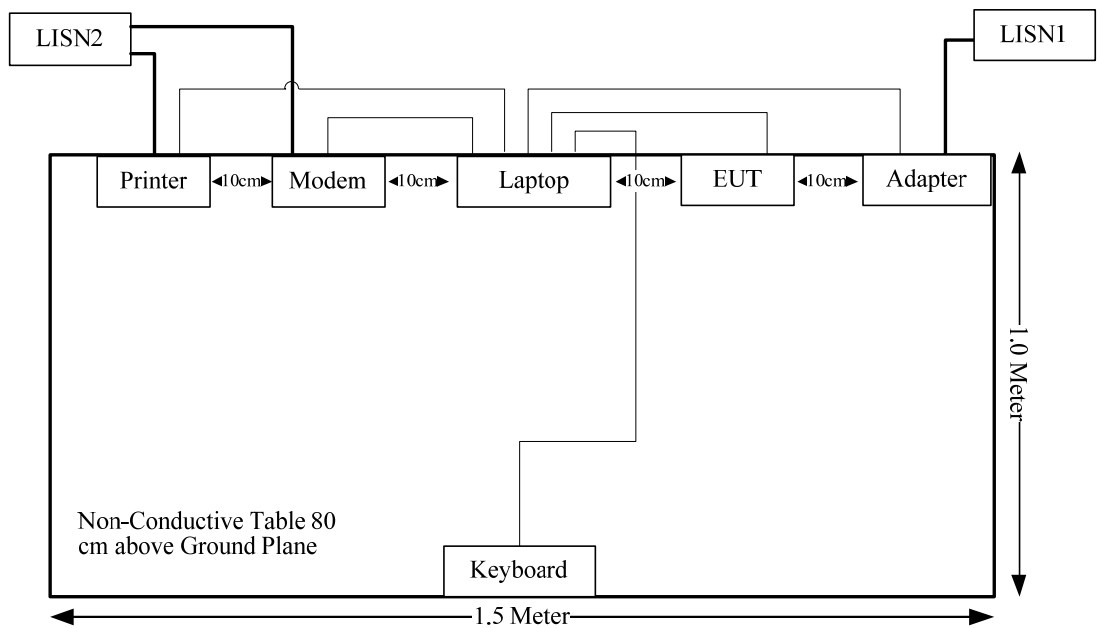
### Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017
HP	Printer	C3941A	JPTVOB2337
DELL	Keyboard	L100	CNORH656658907BL05DC
SAST	Modem	AEM-2100	293

### 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	1.0	USB Port of Laptop	EUT

Configuration of Test Setup



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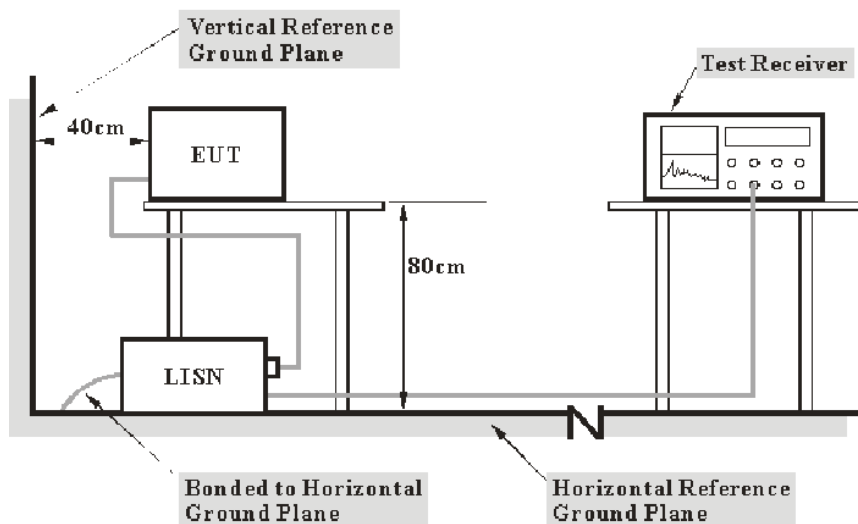
**SUMMARY OF TEST RESULTS**

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

## 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
Unknown	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
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

\* **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

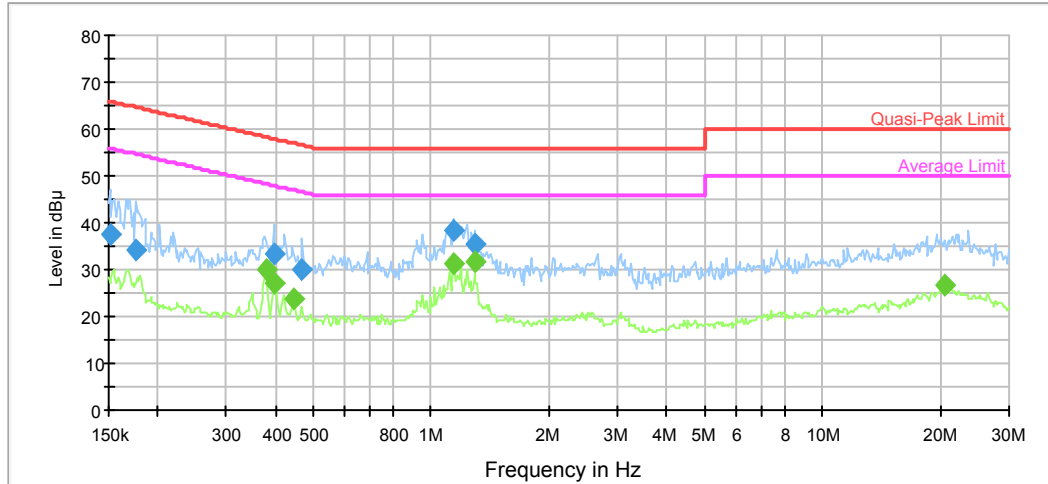
### Environmental Conditions

Temperature:	27.4 °C
Relative Humidity:	55 %
ATM Pressure:	101.2 kPa

*The testing was performed by Sider Huang on 2018-06-11.*

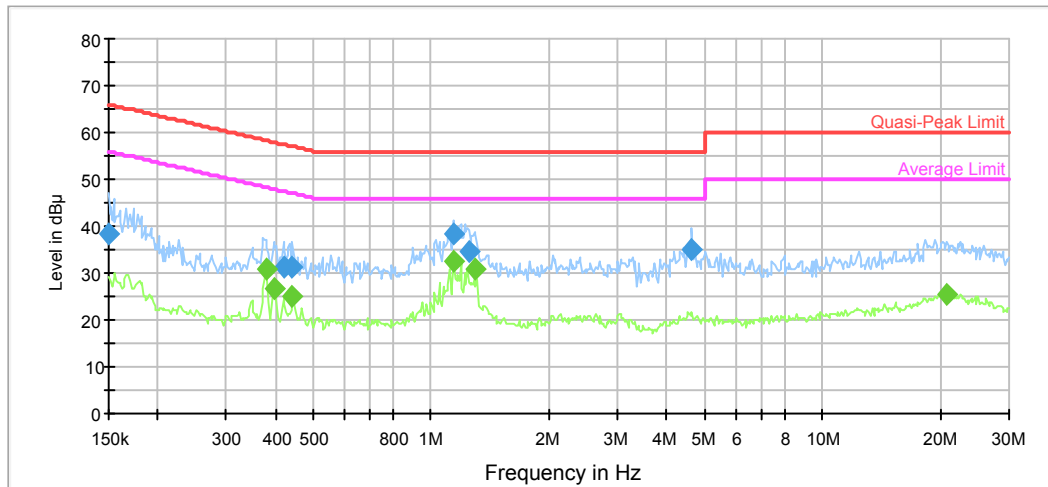
Test Mode: Downloading

AC120V, 60Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.151200	37.4	9.000	L1	11.2	28.5	65.9	Compliance
0.175915	34.1	9.000	L1	10.9	30.6	64.7	Compliance
0.396530	33.3	9.000	L1	10.0	24.6	57.9	Compliance
0.468757	29.9	9.000	L1	9.9	26.6	56.5	Compliance
1.144267	38.2	9.000	L1	9.8	17.8	56.0	Compliance
1.289541	35.4	9.000	L1	9.8	20.6	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.378019	30.0	9.000	L1	10.0	18.3	48.3	Compliance
0.399703	27.3	9.000	L1	10.0	20.6	47.9	Compliance
0.446873	23.9	9.000	L1	9.9	23.0	46.9	Compliance
1.144267	31.3	9.000	L1	9.8	14.7	46.0	Compliance
1.289541	31.5	9.000	L1	9.8	14.5	46.0	Compliance
20.475752	26.6	9.000	L1	10.1	23.4	50.0	Compliance

**AC120V, 60Hz, Neutral:**

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.150000	38.3	9.000	N	11.2	27.7	66.0	Compliance
0.419276	31.3	9.000	N	10.0	26.2	57.5	Compliance
0.443327	31.4	9.000	N	9.9	25.6	57.0	Compliance
1.144267	38.2	9.000	N	9.8	17.8	56.0	Compliance
1.249088	34.6	9.000	N	9.8	21.4	56.0	Compliance
4.651370	35.2	9.000	N	9.8	20.8	56.0	Compliance

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.378019	30.8	9.000	N	10.0	17.5	48.3	Compliance
0.399703	26.7	9.000	N	10.0	21.1	47.9	Compliance
0.443327	25.2	9.000	N	9.9	21.8	47.0	Compliance
1.144267	32.6	9.000	N	9.8	13.4	46.0	Compliance
1.289541	30.9	9.000	N	9.8	15.1	46.0	Compliance
20.804674	25.5	9.000	N	10.0	24.5	50.0	Compliance

## FCC §15.109 - RADIATED SPURIOUS EMISSIONS

### EUT Setup

#### Below 1GHz:



#### Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site A for the range 30MHz to 1GHz and the 3 meters chamber test site A for above 1GHz, 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 13.0 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
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2017-08-31	2018-08-31
TDK RF	Horn Antenna	HRN-0118	130 084	2016-01-05	2019-01-04
MICRO-COAX	Coaxial Cable	UFA147-1-2362-100 100	64639 231029-001	2018-02-24	2019-02-28
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-09-05	2018-09-05
E-Microwave	Band-stop Filters	OBSF-2400-2483.5-S	OE01601525	2017-06-16	2018-06-16
Micro-tronics	High Pass Filter	HPM50111	S/N-G217	2017-06-16	2018-06-16

\* **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

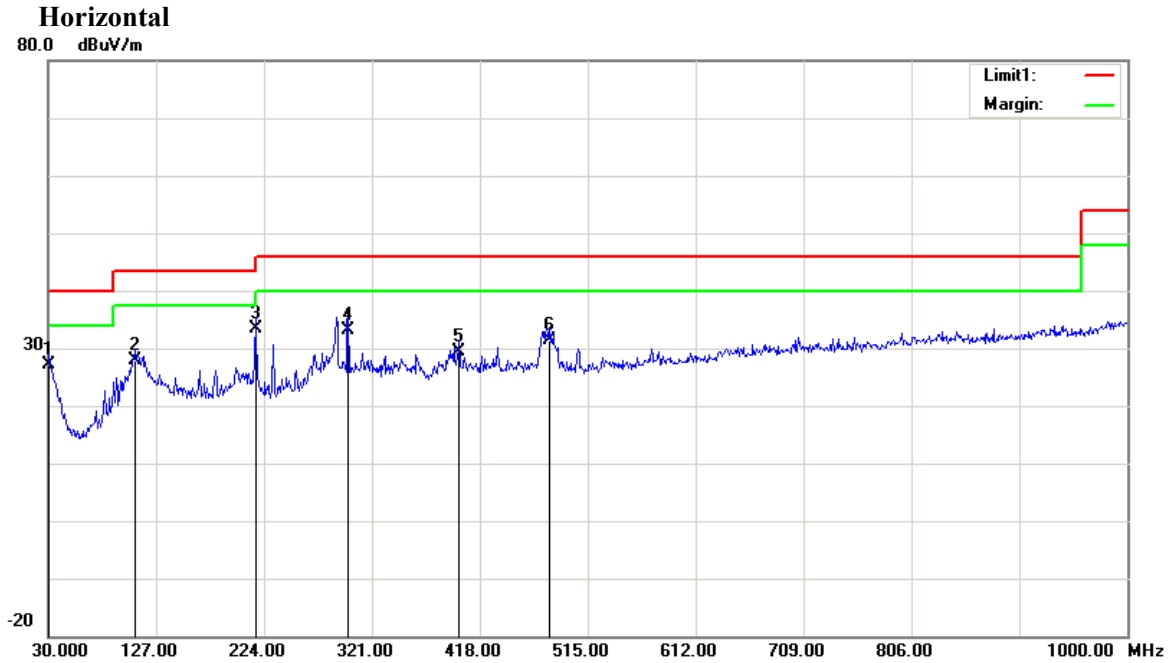
<b>Temperature:</b>	25.9~27.4 °C
<b>Relative Humidity:</b>	37~45 %
<b>ATM Pressure:</b>	101.3~101.5 kPa

*\* The testing was performed by Sunny Cen from 2018-06-12 to 2018-06-14.*

*Test Result: Compliance*

Test Mode: Downloading

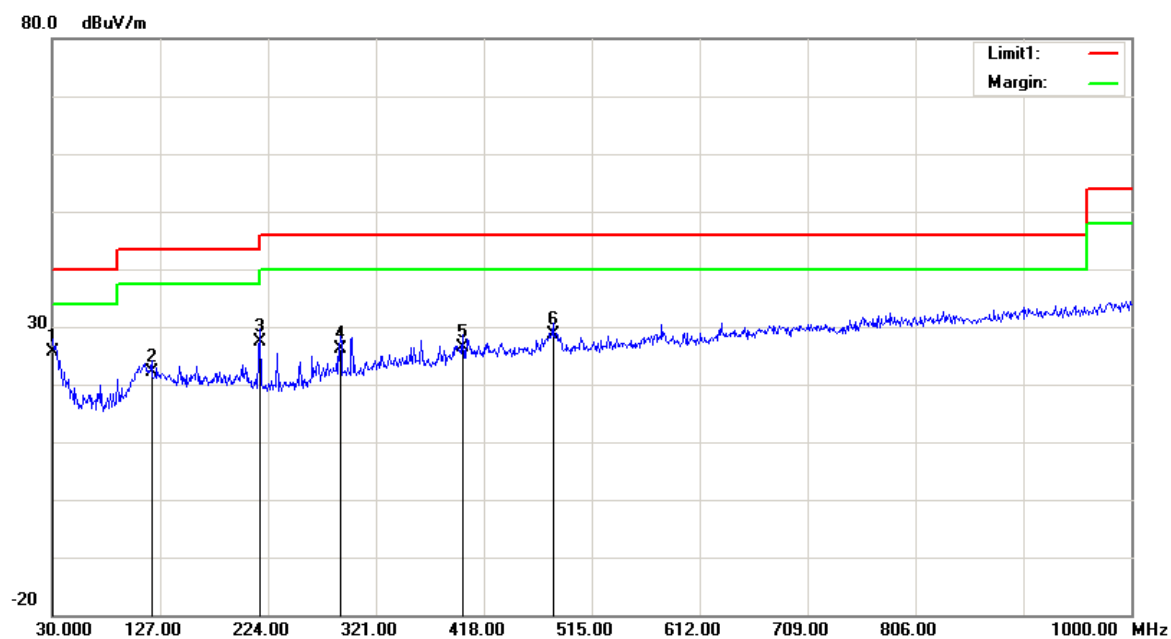
1) Below 1GHz:



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)
30.9700	26.28	QP	0.82	27.10	40.00	12.90
108.5700	34.57	QP	-6.77	27.80	43.50	15.70
216.2400	40.44	QP	-7.14	33.30	46.00	12.70
299.6600	37.26	QP	-4.06	33.20	46.00	12.80
399.5700	31.41	QP	-2.01	29.40	46.00	16.60
481.0500	31.76	QP	-0.36	31.40	46.00	14.60



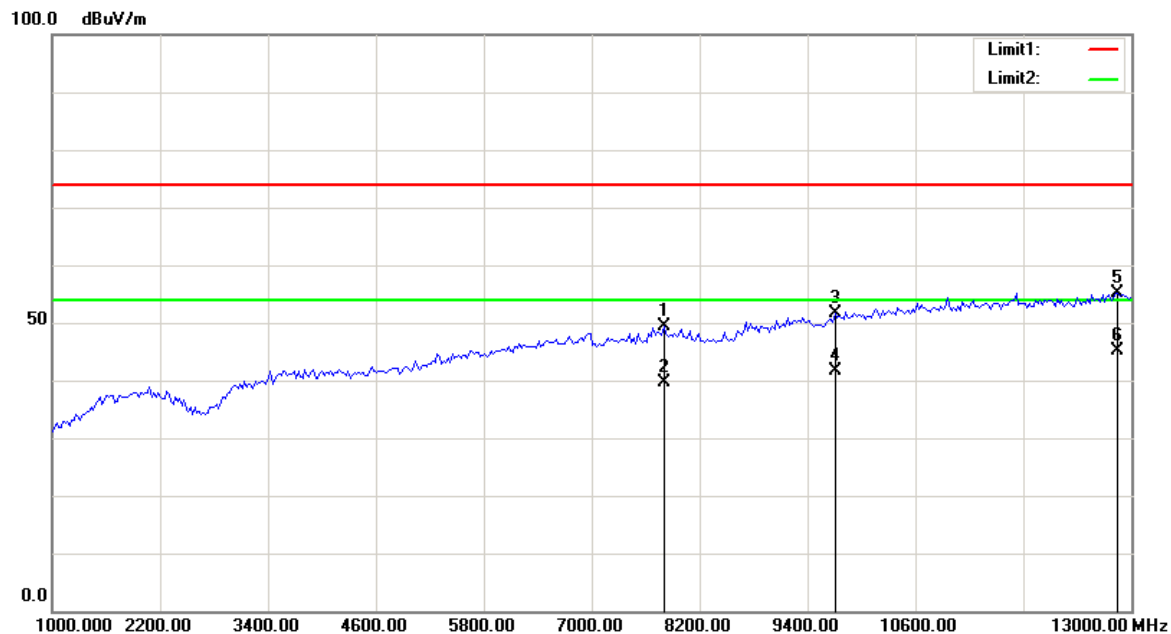
## Vertical



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	24.05	QP	1.55	25.60	40.00	14.40
119.2400	27.13	QP	-5.03	22.10	43.50	21.40
216.2400	34.54	QP	-7.14	27.40	46.00	18.60
288.9900	30.16	QP	-4.06	26.10	46.00	19.90
398.6000	28.43	QP	-2.03	26.40	46.00	19.60
480.0800	28.97	QP	-0.37	28.60	46.00	17.40

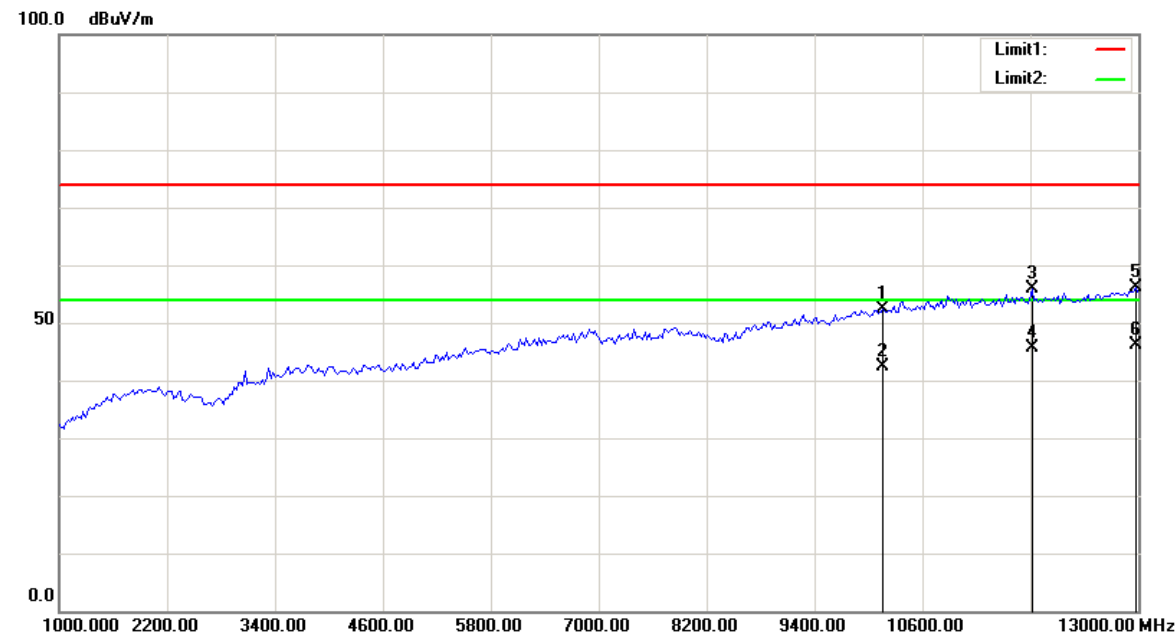
## 2) Above 1GHz:

## Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
7805.611	35.71	peak	13.56	49.27	74.00	24.73
7805.611	26.19	AVG	13.56	39.75	54.00	14.25
9705.411	35.40	peak	16.18	51.58	74.00	22.42
9705.411	25.34	AVG	16.18	41.52	54.00	12.48
12855.711	34.76	peak	20.41	55.17	74.00	18.83
12855.711	24.80	AVG	20.41	45.21	54.00	8.79

Vertical



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10162.325	35.60	peak	16.71	52.31	74.00	21.69
10162.325	25.66	AVG	16.71	42.37	54.00	11.63
11821.643	37.15	peak	18.66	55.81	74.00	18.19
11821.643	27.06	AVG	18.66	45.72	54.00	8.28
12975.952	35.43	peak	20.60	56.03	74.00	17.97
12975.952	25.65	AVG	20.60	46.25	54.00	7.75

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