



TESTING LABORATORY  
CERTIFICATE #4820.01



## FCC PART 15B

### TEST REPORT

For

**electronics hub llc**

3560 NW, 72nd Avenue 33122 miami Florida United States

**FCC ID: 2AT5LL283G**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Mobile Phone
<b>Report Number:</b>	RDG191016001-00B
<b>Report Date:</b>	2019-10-08
<b>Reviewed By:</b> Reviewed By: Jerry Zhang EMC Manager	<i>Jerry Zhang</i>
<b>Test Laboratory:</b> Test Laboratory: Tel: +86-769-86858888 Fax: +86-769-86858891 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China

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## GENERAL INFORMATION

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

<b>EUT Name:</b>	Mobile Phone
<b>EUT Model:</b>	L28
<b>Highest Operation Frequency:</b>	2480 MHz
<b>Rated Input Voltage:</b>	3.8V DC from battery or 5V DC from adapter
<b>Adapter Information</b>	<b>Model:</b> JHC-A20UL50100
	<b>Input:</b> 100-240V 50/60Hz 0.3A Max
	<b>Output:</b> 5.0Vdc 1000mA
<b>External Dimension:</b>	132mm(L) * 63mm(W) * 21mm(H)
<b>Serial Number:</b>	191016001
<b>EUT Received Date:</b>	2019.10.16
<b>EUT Status:</b>	Good
<b>External Dimension:</b>	132mm(L) * 63mm(W) * 21mm(H)

### Objective

This report is prepared on behalf of electronics hub llc in accordance with FCC Part 15B Part 2, subpart J, and Part 15, Subpart 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 22H, 24E,27 PCE submissions with FCC ID: 2AT5LL283G  
FCC Part 15C DSS submissions with FCC ID: 2AT5LL283G

### 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	±1°C
Humidity	±5%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

## 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 lab has been recognized as the FCC accredited lab 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 lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

## Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '\*'. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in downloading mode.

### Equipment Modifications

No modification was made to the EUT.

### EUT Exercise Software

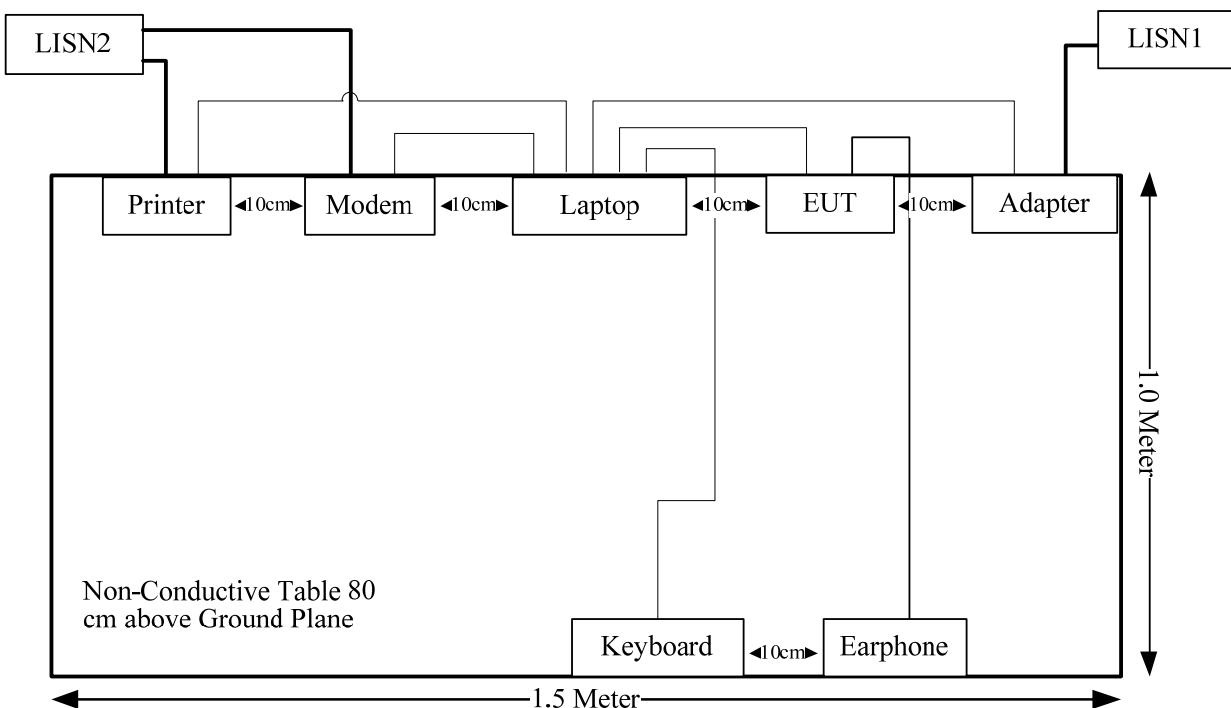
The software "Winthrax.exe" was used during test.

### 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
USB Cable	No	No	1	Adapter	EUT
Earphone Cable	No	No	1.15	EUT	Earphone
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	Yes	1.8	USB Port of Laptop	Keyboard

**Block Diagram of Test Setup**

## Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Conducted emissions</b>					
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	Two-line V-network	ENV 216	101614	2018-12-10	2019-12-10
R&S	EMI Test Receiver	ESPI	100120	2019-05-09	2020-05-09
R&S	L.I.S.N	ESH2-Z5	892107/021	2019-09-19	2020-09-19
<b>Radiated emissions Below 1GHz</b>					
R&S	EMI Test Receiver	ESR3	102453	2019-06-26	2020-06-26
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	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2019-05-06	2020-05-06
HP	Amplifier	8447D	2727A05902	2019-09-05	2020-09-05
<b>Radiated emissions Above 1GHz</b>					
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2019-09-05	2020-09-05

\* 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).

**Environmental Conditions**

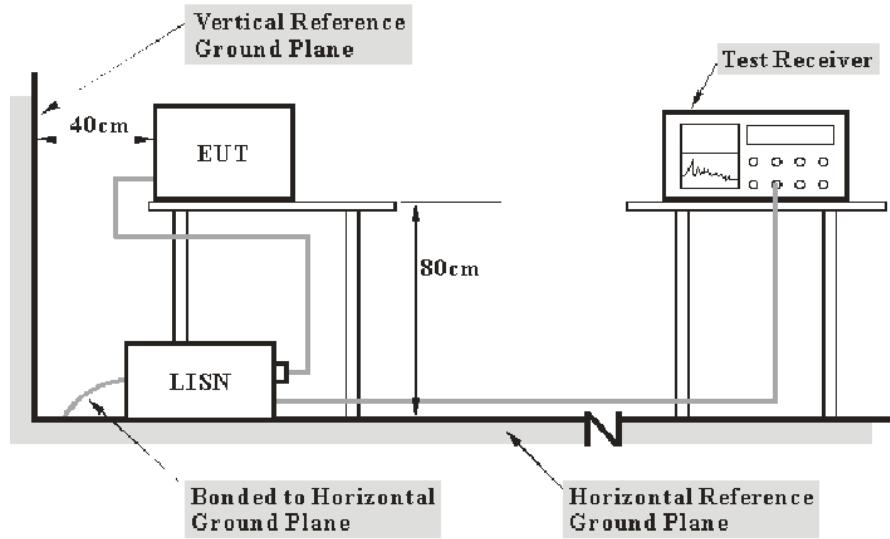
<b>Test Item:</b>	<b>Conducted emissions</b>	<b>Radiated emissions Below 1GHz</b>	<b>Radiated emissions Above 1GHz</b>
<b>Test Date:</b>	2019-10-21	2019-10-21	2019-10-23
<b>Tester:</b>	Sem Xing	Neil Liao	Lucy Lu
<b>Temperature:</b>	26.0°C	26.8°C	26.6°C
<b>Relative Humidity:</b>	60 %	48 %	48 %
<b>ATM Pressure:</b>	100.6 kPa	100.6 kPa	100.2 kPa

**SUMMARY OF TEST RESULTS**

Rule and Clause	Description of Test	Test Result
FCC §15.107	Conducted emissions	Compliance
FCC §15.109	Radiated emissions	Compliance

## 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 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

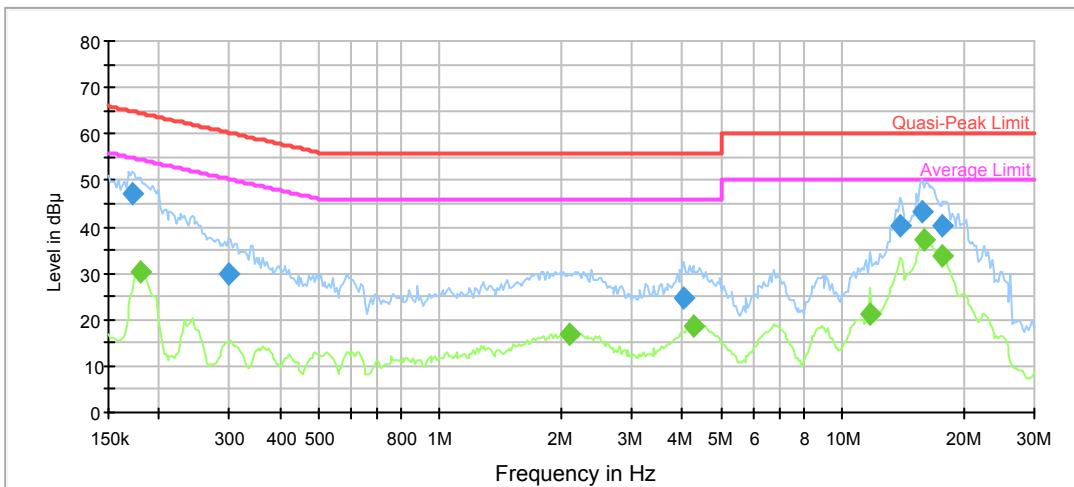
The “Margin” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

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

## Test Data

Please refer to following table and plots:

Port: L  
 Test Mode: Downloading  
 Power Source: AC120V/60Hz



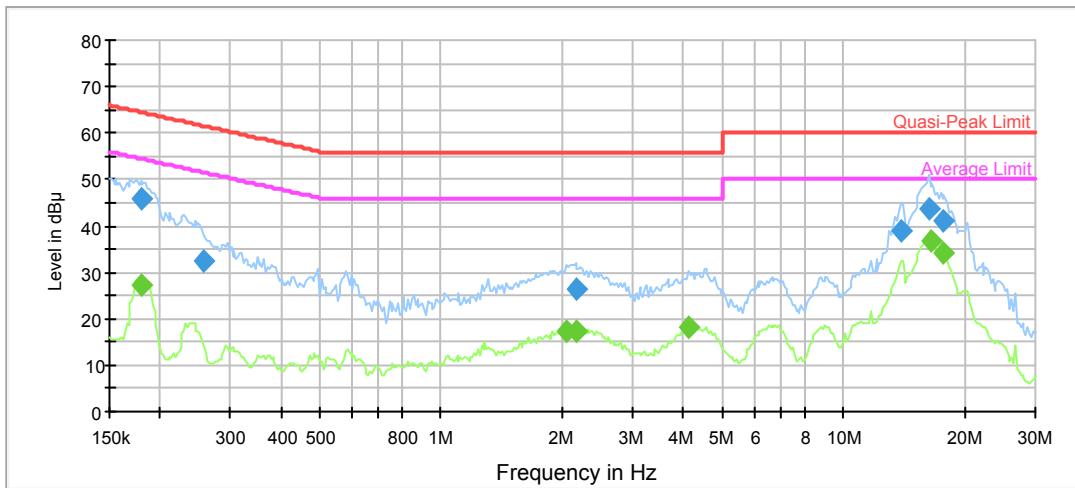
## Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.172421	47.3	9.000	L1	10.9	17.5	64.8
0.298034	30.0	9.000	L1	10.1	30.3	60.3
4.040790	24.8	9.000	L1	9.8	31.2	56.0
13.877672	40.0	9.000	L1	9.9	20.0	60.0
15.794085	43.3	9.000	L1	9.9	16.7	60.0
17.797171	40.1	9.000	L1	10.0	19.9	60.0

## Final Result 2

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.179422	30.2	9.000	L1	10.8	24.3	54.5
2.095345	17.1	9.000	L1	9.7	28.9	46.0
4.246911	18.7	9.000	L1	9.8	27.3	46.0
11.717994	21.0	9.000	L1	9.9	29.0	50.0
15.952026	37.0	9.000	L1	9.9	13.0	50.0
17.797171	33.9	9.000	L1	10.0	16.1	50.0

Port: N  
 Test Mode: Downloading  
 Power Source: AC120V/60Hz



## Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.179422	45.9	9.000	N	10.8	18.6	64.5
0.256712	32.4	9.000	N	10.3	29.1	61.5
2.158836	26.2	9.000	N	9.8	29.8	56.0
13.877672	39.0	9.000	N	9.9	21.0	60.0
16.272662	43.8	9.000	N	9.9	16.2	60.0
17.797171	41.1	9.000	N	10.0	18.9	60.0

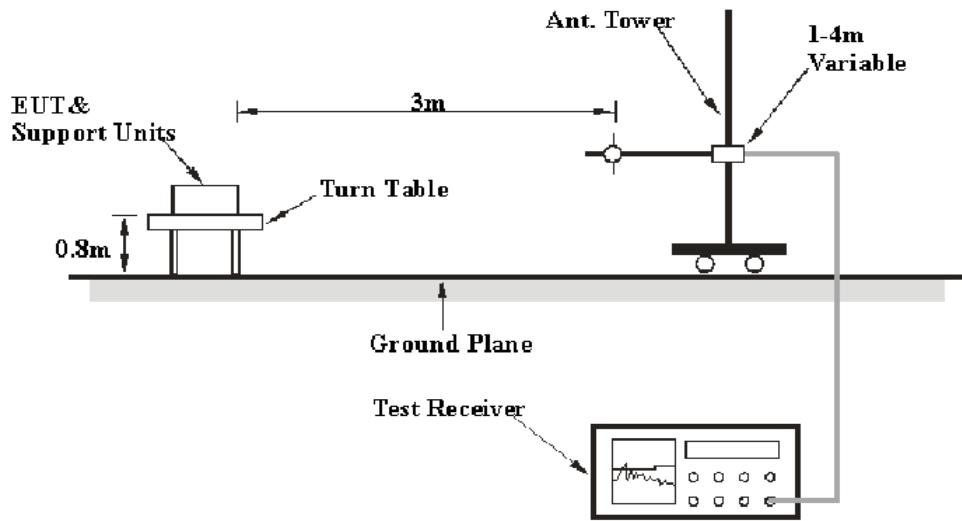
## Final Result 2

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.181216	27.2	9.000	N	10.8	27.2	54.4
2.054059	17.3	9.000	N	9.8	28.7	46.0
2.180425	17.3	9.000	N	9.8	28.7	46.0
4.122010	18.2	9.000	N	9.8	27.8	46.0
16.435388	36.7	9.000	N	9.9	13.3	50.0
17.797171	34.2	9.000	N	10.0	15.8	50.0

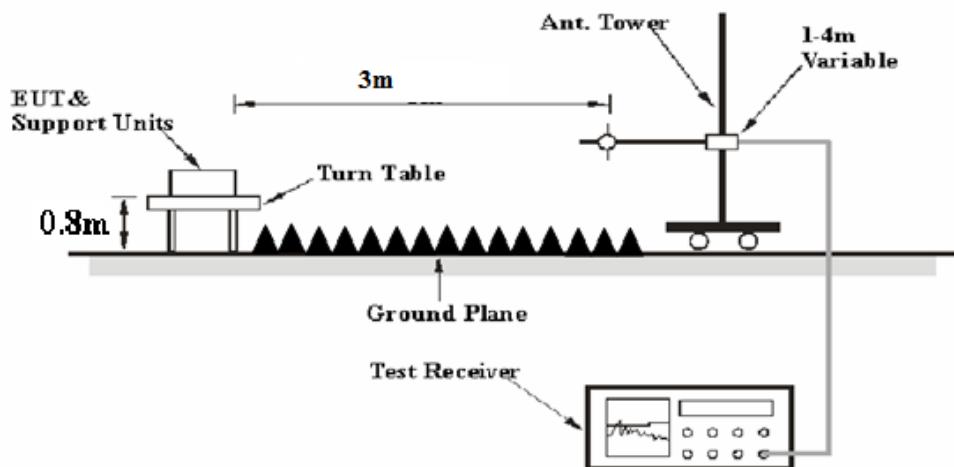
## RADIATED EMISSIONS

### EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission below 1GHz tests were performed in the 3 meters chamber test site A, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.4-2014. The specification used was with the FCC Part 15 B Class B limits.

## EMI Test Receiver Setup

The system was investigated from 30 MHz to 13 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	Reduced video bandwidth	/	AVG

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

## 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.

## Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading + Corrected

Note:

Corrected = Antenna Factor + Cable Loss - 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:

$$\text{Margin} = \text{Limit} - \text{Result}$$

## Test Data

Please refer to following table and plots:

**Condition:** FCC Part 15B Class B  
**EUT:** Mobile Phone  
**Test Mode:** Downloading

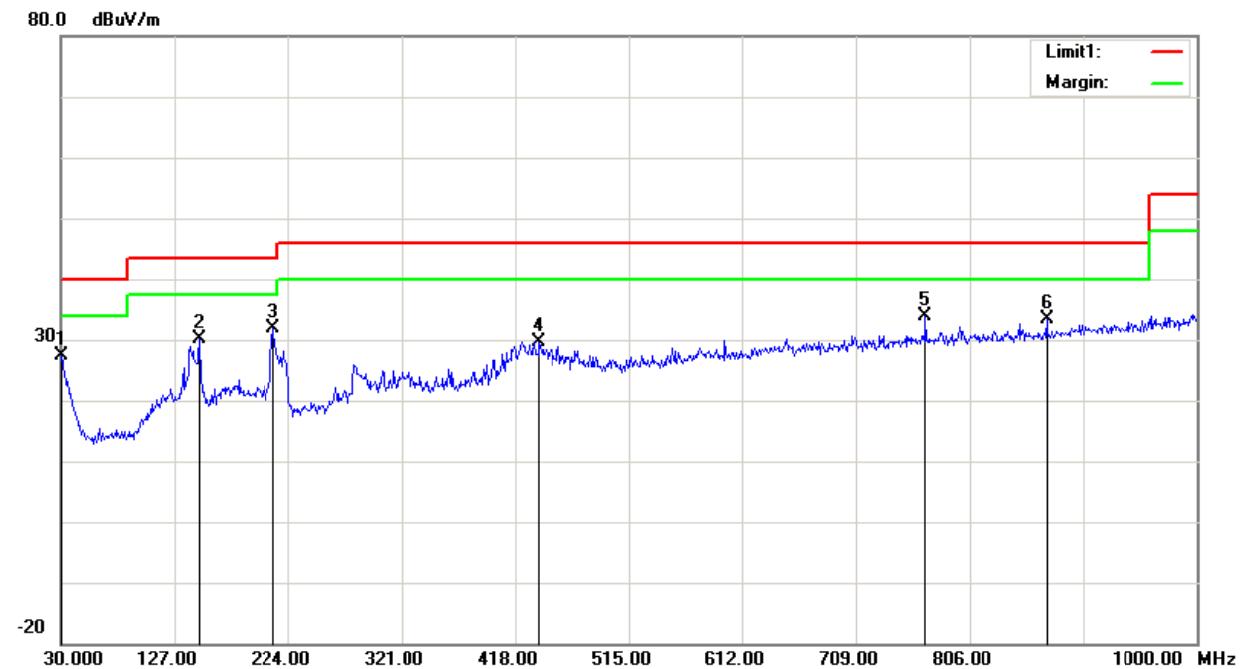
**Polarization:** Horizontal  
**Power:** AC 120V/60Hz  
**Distance:** 3m



Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.000	26.25	peak	1.72	27.97	40.00	12.03
147.3700	38.14	peak	-6.04	32.10	43.50	11.40
210.4200	40.40	QP	-7.37	33.03	43.50	10.47
307.4200	35.33	peak	-3.65	31.68	46.00	14.32
768.1700	33.70	peak	4.26	37.96	46.00	8.04
798.2400	30.78	peak	4.37	35.15	46.00	10.85

**Condition:** FCC Part 15B Class B  
**EUT:** Mobile Phone  
**Test Mode:** Downloading

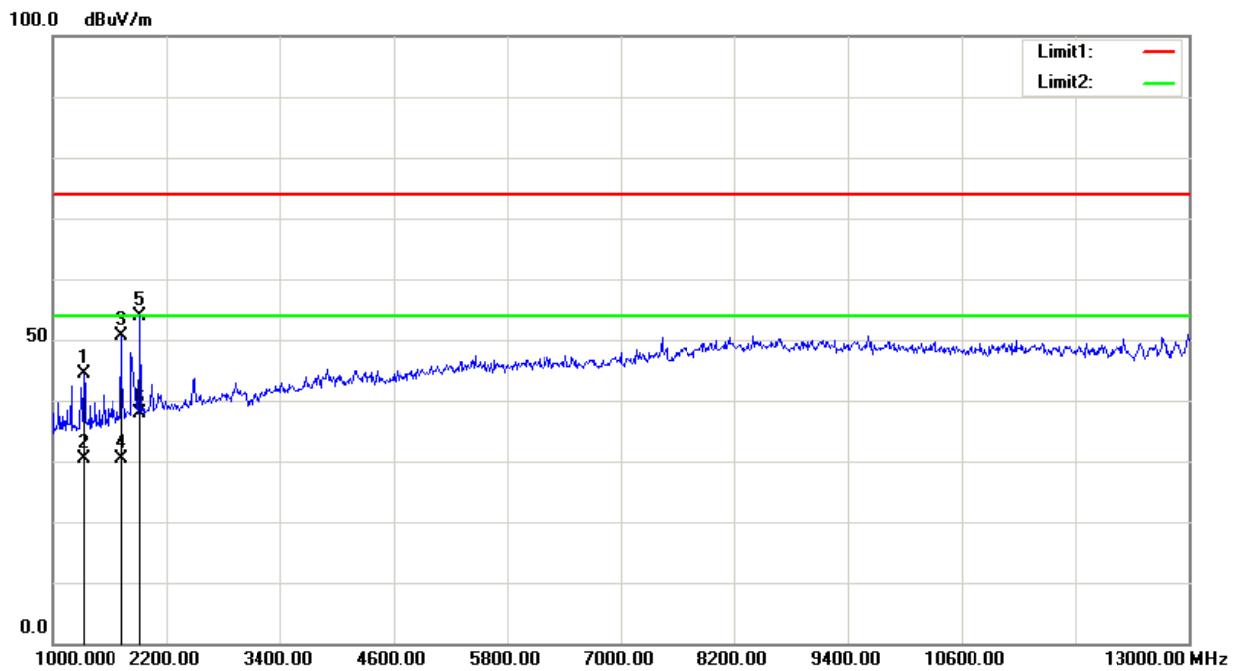
**Polarization:** Vertical  
**Power:** AC 120V/60Hz  
**Distance:** 3m



Frequency (MHz)	Reading (dB <sub>uV</sub> )	Detector	Corrected (dB/m)	Result (dB <sub>uV/m</sub> )	Limit (dB <sub>uV/m</sub> )	Margin (dB)
30.9700	26.47	peak	0.91	27.38	40.00	12.62
148.3400	36.07	peak	-6.05	30.02	43.50	13.48
211.3900	39.25	peak	-7.38	31.87	43.50	11.63
438.3700	30.84	peak	-1.22	29.62	46.00	16.38
768.1700	29.73	peak	4.26	33.99	46.00	12.01
871.9600	27.80	peak	5.46	33.26	46.00	12.74

**Condition:** FCC Part 15B Class B  
**EUT:** Mobile Phone  
**Test Mode:** Downloading

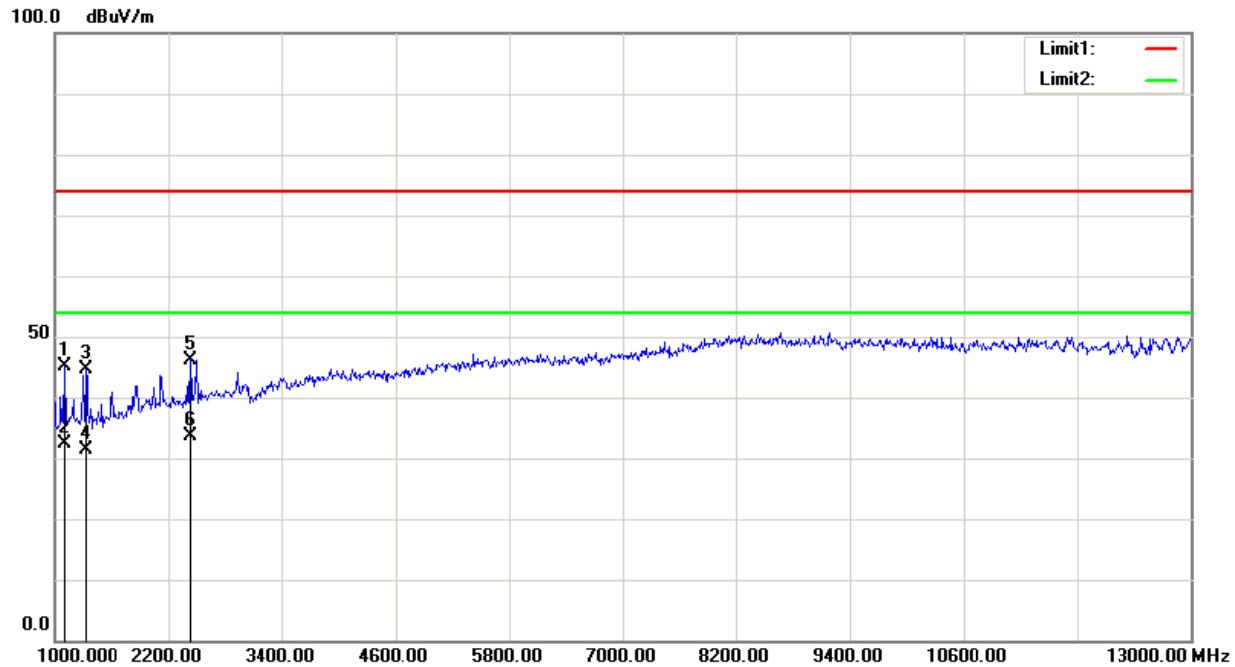
**Polarization:** Horizontal  
**Power:** AC 120V/60Hz  
**Distance:** 3m



Frequency (MHz)	Reading (dB $\mu$ V)	Detector	Corrected (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1330.000	54.15	peak	-9.76	44.39	74.00	29.61
1330.000	40.12	AVG	-9.76	30.36	54.00	23.64
1726.000	58.86	peak	-8.28	50.58	74.00	23.42
1726.000	38.65	AVG	-8.28	30.37	54.00	23.63
1924.000	61.42	peak	-7.45	53.97	74.00	20.03
1924.000	45.25	AVG	-7.45	37.80	54.00	16.20

**Condition:** FCC Part 15B Class B  
**EUT:** Mobile Phone  
**Test Mode:** Downloading

**Polarization:** Vertical  
**Power:** AC 120V/60Hz  
**Distance:** 3m



Frequency (MHz)	Reading (dB $\mu$ V)	Detector	Corrected (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1096.000	55.51	peak	-10.31	45.20	74.00	28.80
1096.000	42.57	AVG	-10.31	32.26	54.00	21.74
1330.000	54.39	peak	-9.76	44.63	74.00	29.37
1330.000	41.25	AVG	-9.76	31.49	54.00	22.51
2434.000	52.66	peak	-6.41	46.25	74.00	27.75
2434.000	40.12	AVG	-6.41	33.71	54.00	20.29

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