



# FCC PART 15 B TEST REPORT

For

## Huawei Technologies Co.,Ltd

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Shenzhen, 518129, P.R.C

**Test Model: eA280-135**  
**FCC ID: QISEA280-135**

<b>Report Type:</b> Original Report	<b>Product Name:</b> LTE CPE
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<b>Report Number:</b> RDG161201012A	
<b>Report Date:</b> 2017-05-26	
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**Note:** This test report was 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. (Chengdu). Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. This report was valid only with a valid digital signature.

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## **GENERAL INFORMATION**

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

The **Huawei Technologies Co.,Ltd**'s product, model number: **eA280-135 (FCC ID: QISEA280-135)** (the "EUT") in this report was a **LTE CPE**, which was measured approximately: 9.5 cm (D) x 21 cm (H), rated input voltage: DC12.0V from adapter. The highest operation frequency is 5825 MHz.

Switching power adapter information:

MODEL: HW-120200U6W

INPUT: 100-240V~50/60Hz, 0.8A

OUTPUT: DC12.0V 2.0A

*\*All measurement and test data in this report was gathered from final production sample, serial number: 161201012 (assigned by the BAACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2016-12-01, and EUT conformed to test requirement.*

### **Objective**

This test report is prepared on behalf of **Huawei Technologies Co.,Ltd** 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 Rules Part 15 B Class B.

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

FCC Part 15C DTS submissions with FCC ID: QISEA280-135.

FCC Part 15E NII submissions with FCC ID: QISEA280-135.

FCC Part 27 TNB submissions with FCC ID: QISEA280-135.

FCC Part 90 TNB submissions with FCC ID: QISEA280-135.

## 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 of the measurements detailed in this Test Report were performed by Bay Area Compliance Laboratories Corp. (Chengdu).

The Bay Area Compliance Laboratories Corp. Chengdu's measurement Uncertainties (calculated for a k=2 Coverage Factor corresponding to approximately 95% Coverage) were as follows:

-For all of the AC Line Conducted Emissions Tests reported herein:  $\pm 3.17$  dB.

-For of all of the direct Radiated Emissions Tests reported herein are:

30 MHz to 200 MHz:  $\pm 4.7$  dB;

200 MHz to 1 GHz:  $\pm 6.0$  dB;

1 GHz to 6 GHz:  $\pm 5.13$ dB; and,

6 GHz to 40 GHz:  $\pm 5.47$ dB.

And the uncertainty will not be taken into consideration for all test data recorded in the report.

## Test Facility

The test site used by BACL to collect test data is located in the No.5040, Huilongwan Plaza, No.1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on April 24, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## **SYSTEM TEST CONFIGURATION**

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### **Description of Test Configuration**

The system was configured for testing in a typical fashion (as normally used by a typical user).

### **EUT Exercise Software**

The software "Lan test.exe" was used in testing.

### **Equipment Modifications**

No modification was made to the EUT tested.

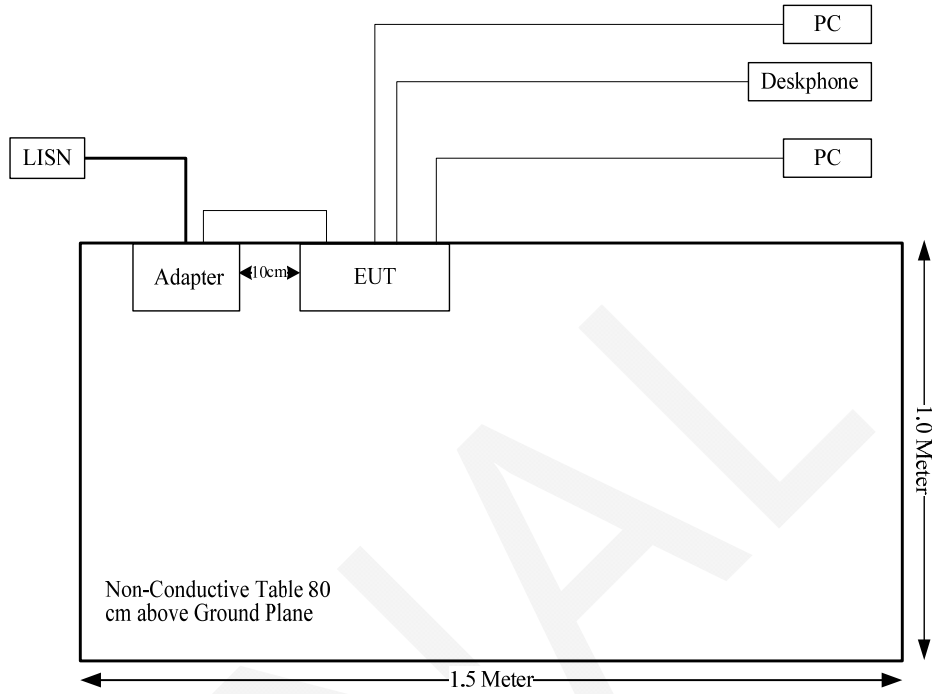
### **Local Support Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>
IBM	PC	8176	99Y7315
AVAYA	Deskphone	6408D+	041654712819
IBM	PC	8176	99Y7872

### **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>
RJ11 Cable	No	No	10	EUT	Deskphone
RJ45 Cable*2	No	No	10	EUT	PC
DC Cable	No	No	1.5	Adapter	EUT

### Configuration of Test Setup



## **SUMMARY OF TEST RESULTS**

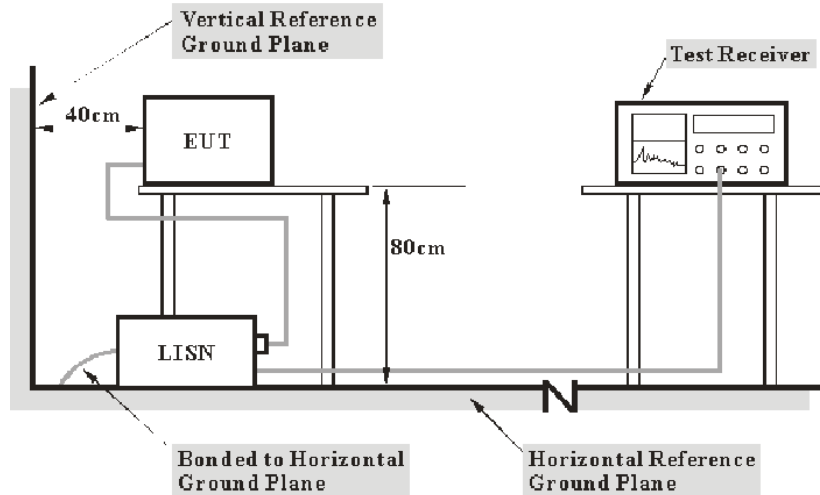
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<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§15.107	Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

FEMVAL

## 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 lisen with a 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
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2016-12-02	2017-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	100018	2016-12-02	2017-12-01
SOLAR ELECTRONICS	L.I.S.N.	9252-50-24 -BNC	984413	2016-12-02	2017-12-01
Rohde & Schwarz	PULSE LIMITER	ESH3Z2	DE14781	2016-10-31	2017-10-30
Unknown	Conducted Cable	Unknown	NO.5	2016-11-10	2017-11-09
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

\* **Statement of Traceability:** BAACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B "Implementation of traceability policy in accredited laboratories".

### Test Procedure

During the conducted emission test, the adapter 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

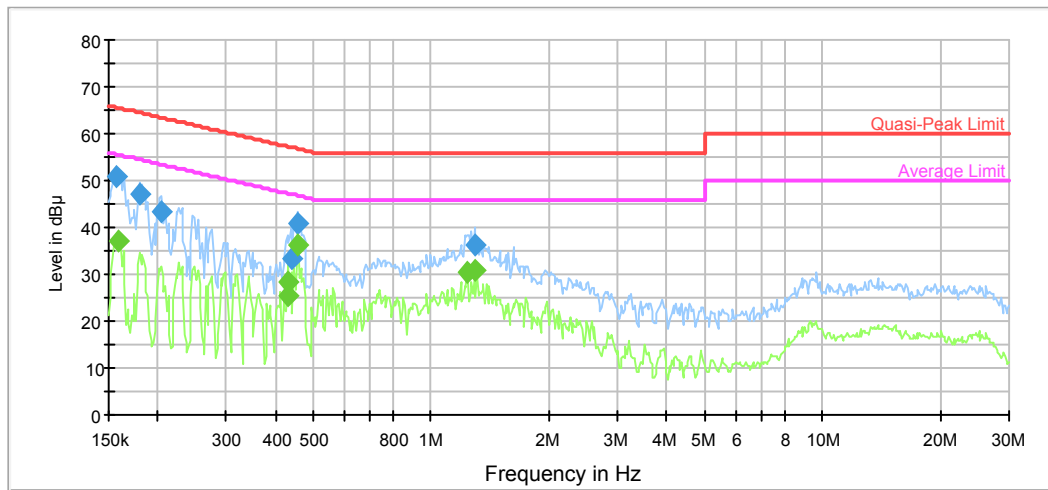
### Environmental Conditions

<b>Temperature:</b>	18 °C
<b>Relative Humidity:</b>	44%
<b>ATM Pressure:</b>	96.6 kPa

The testing was performed by Lorin Bian on 2017-02-08.

Test Mode: Operating

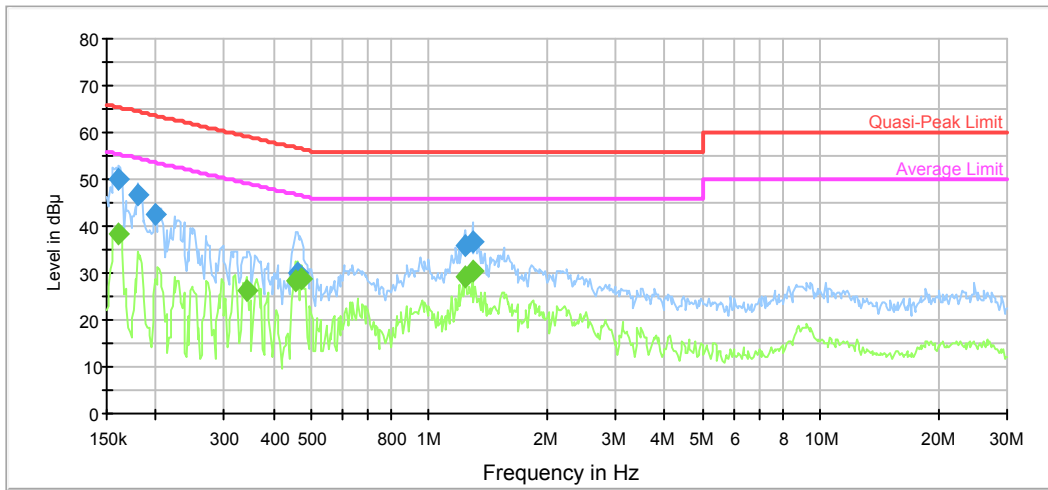
### AC120V, 60Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.157346	50.8	9.000	L1	19.7	14.8	65.6	Compliance
0.180171	47.2	9.000	L1	19.7	17.3	64.5	Compliance
0.204669	43.2	9.000	L1	19.7	20.2	63.4	Compliance
0.439808	33.5	9.000	L1	19.7	23.4	57.1	Compliance
0.457684	40.8	9.000	L1	19.7	16.0	56.8	Compliance
1.289541	36.3	9.000	L1	19.7	19.7	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.158604	37.0	9.000	L1	19.7	18.5	55.5	Compliance
0.429420	28.4	9.000	L1	19.7	18.9	47.3	Compliance
0.432855	25.4	9.000	L1	19.7	21.8	47.2	Compliance
0.457684	36.2	9.000	L1	19.7	10.5	46.7	Compliance
1.239175	30.2	9.000	L1	19.7	15.8	46.0	Compliance
1.289541	30.7	9.000	L1	19.7	15.3	46.0	Compliance

**AC120V, 60Hz, Neutral:**



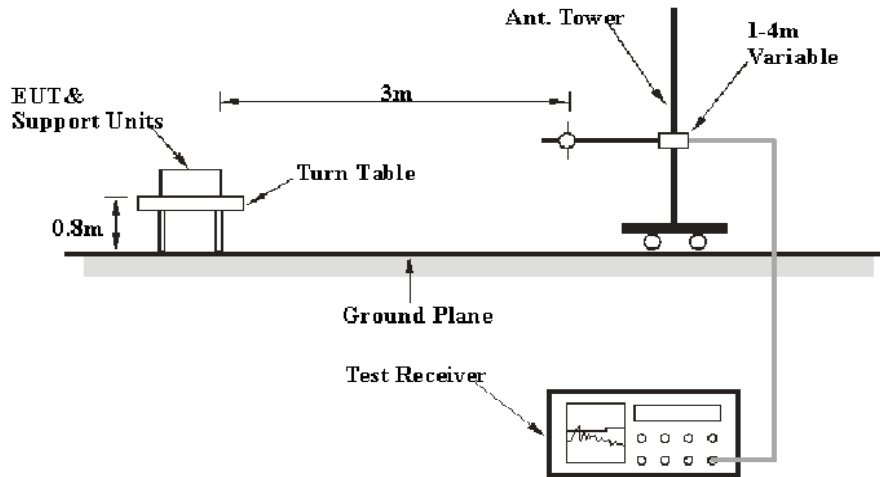
Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.161152	50.1	9.000	N	19.7	15.3	65.4	Compliance
0.180171	46.7	9.000	N	19.7	17.8	64.5	Compliance
0.199835	42.7	9.000	N	19.6	20.9	63.6	Compliance
0.461346	30.0	9.000	N	19.6	26.7	56.7	Compliance
1.239175	35.8	9.000	N	19.6	20.2	56.0	Compliance
1.289541	36.7	9.000	N	19.6	19.3	56.0	Compliance

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.159873	38.1	9.000	N	19.7	17.4	55.5	Compliance
0.343548	26.3	9.000	N	19.6	22.8	49.1	Compliance
0.454052	28.3	9.000	N	19.6	18.5	46.8	Compliance
0.472507	28.9	9.000	N	19.6	17.6	46.5	Compliance
1.239175	29.3	9.000	N	19.6	16.7	46.0	Compliance
1.289541	30.5	9.000	N	19.6	15.5	46.0	Compliance

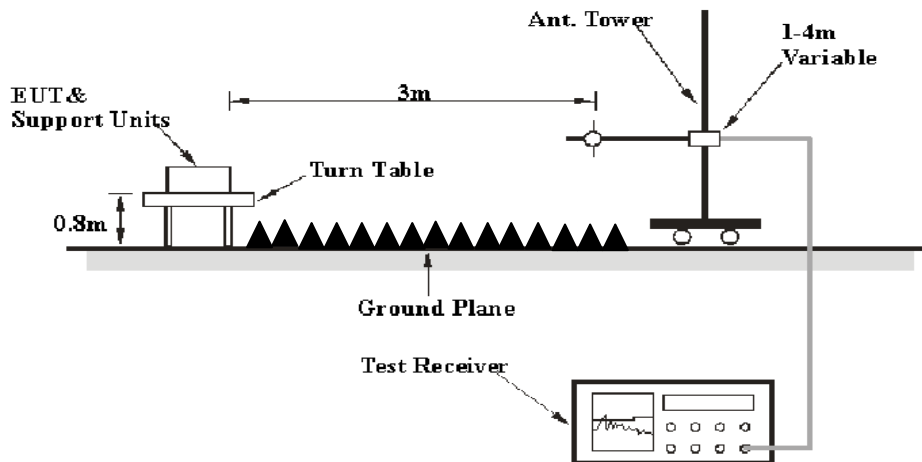
## FCC §15.109 - RADIATED SPURIOUS EMISSIONS

### EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, 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 30 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	Detector
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

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
Agilent	Amplifier	8447D	2944A10442	2016-12-02	2017-12-01
Rohde &Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Sunol Sciences	Broadband Antenna	JB3	A121808	2016-04-10	2019-04-09
Rohde &Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
ETS	Horn Antenna	3115	003-6076	2016-12-02	2017-12-01
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2017-05-20	2018-05-19
EMCT	Semi-Anechoic Chamber	966	966-1	2015-04-24	2018-04-23
Unknown	RF Cable (below 1GHz)	Unknown	NO.1	2016-11-10	2017-11-09
Unknown	RF Cable (below 1GHz)	Unknown	NO.4	2016-11-10	2017-11-09
Unknown	RF Cable(above 1GHz)	Unknown	NO.2	2016-11-10	2017-11-09
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1312	2016-08-18	2017-08-18
Quinstar	Amplifier	QLW-1840553 6-JO	15964001032	2016-08-18	2017-08-18
Agilent	Spectrum Analyzer	8564E	5943A01752	2016-08-18	2017-08-18
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113 024	2014-06-16	2017-06-15

\* **Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

### 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

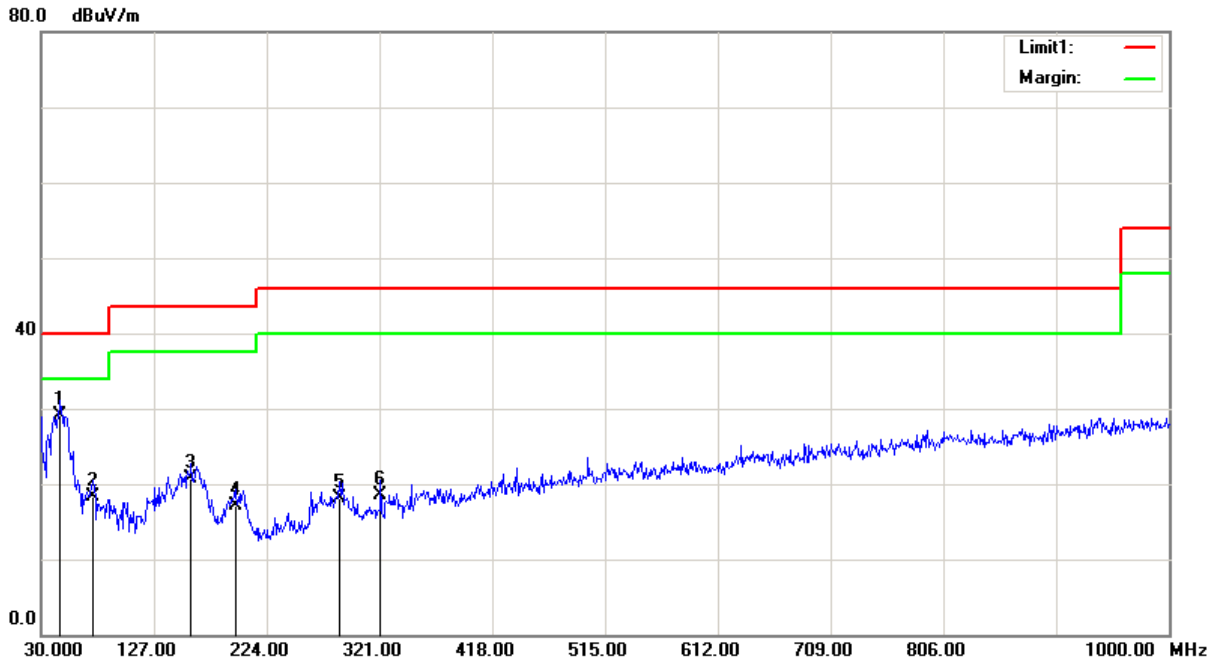
<b>Temperature:</b>	27 °C
<b>Relative Humidity:</b>	58 %
<b>ATM Pressure:</b>	100.1 kPa

\* The testing was performed by Lorin Bian on 2017-05-23.

Test Result: Compliance

Test Mode: Operating

1) 30MHz-1GHz:



Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
46.4900	29.10	100	H	263	-10.75	-10.90	40.00
74.6200	18.40	100	H	263	-12.04	-21.60	40.00
159.0100	20.70	100	H	240	-7.24	-22.80	43.50
196.8400	17.20	150	H	240	-7.90	-26.30	43.50
286.0800	18.20	150	H	250	-6.20	-27.80	46.00
321.9700	18.50	150	H	260	-5.55	-27.50	46.00

2) 1-30GHz:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB)					
1906	35.57	PK	H	24.75	2.98	26.73	36.57	74.00	37.43
1906	27.73	AV	H	24.75	2.98	26.73	28.73	54.00	25.27
3244	33.03	PK	H	25.57	3.80	26.50	35.90	74.00	38.10
3244	24.67	AV	H	25.57	3.80	26.50	27.54	54.00	26.46
4912	28.71	PK	H	31.12	5.07	26.87	38.03	74.00	35.97
4912	20.23	AV	H	31.12	5.07	26.87	29.55	54.00	24.45
1720	36.33	PK	V	24.45	2.84	26.55	37.07	74.00	36.93
1720	27.66	AV	V	24.45	2.84	26.55	28.40	54.00	25.60
3208	32.15	PK	V	25.36	3.74	26.48	34.77	74.00	39.23
3208	22.98	AV	V	25.36	3.74	26.48	25.60	54.00	28.40
4612	29.32	PK	V	30.16	5.22	26.86	37.84	74.00	36.16
4612	21.08	AV	V	30.16	5.22	26.86	29.60	54.00	24.40

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