FCC PART 15, CLASS B

TEST REPORT

For

AMGOO TELECOM (Shenzhen) CO., LTD

3/F, Block R2-A (North), Gaoxin S.Ave.4th, Hi-Tech Industrial Park,
Nanshan District, Shenzhen, China

FCC ID: UOSAM522

Report Type:	**Product Type:**
Original Report	Smart Phone

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Report Number:	RSZ141201006-00A
Report Date:	2014-12-12
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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.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *AMGOO TELECOM (Shenzhen) CO., LTD 's* product, model number: *AM522 (FCC ID: UOSAM522)* or the "EUT" in this report was a *Smart Phone,* which was measured approximately: 143 mm (L) x71.5 mm (W) x 8.6 mm (H), rated with input voltage: DC 3.7V rechargeable Li-ion battery or DC 5.0V from adapter. The highest operating frequency is 1.3GHz.

Adapter Information:
Model number: AM522
Input: AC100-240V, 50/60Hz, 0.2A
Output: DC 5.0V, 600mA

**All measurement and test data in this report was gathered from production sample serial number: 1412011 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2014-12-06*

Objective

This test report is prepared on behalf of *AMGOO TELECOM (Shenzhen) CO., LTD* in accordance with Part 2-Subpart J, Part 15-Subparts A and B of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

Part 15.247 DSS and DTS, Part 22H/24E PCE submissions with FCC ID: *UOSAM522.*

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) 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 December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. 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

Description of Test Configuration

The system was configured for testing in a manufacturer testing fashion.

EUT operation mode: Downloading (data transfer with computer)

EUT Exercise Software

"BurnIn test v5.3" exercise software was used.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

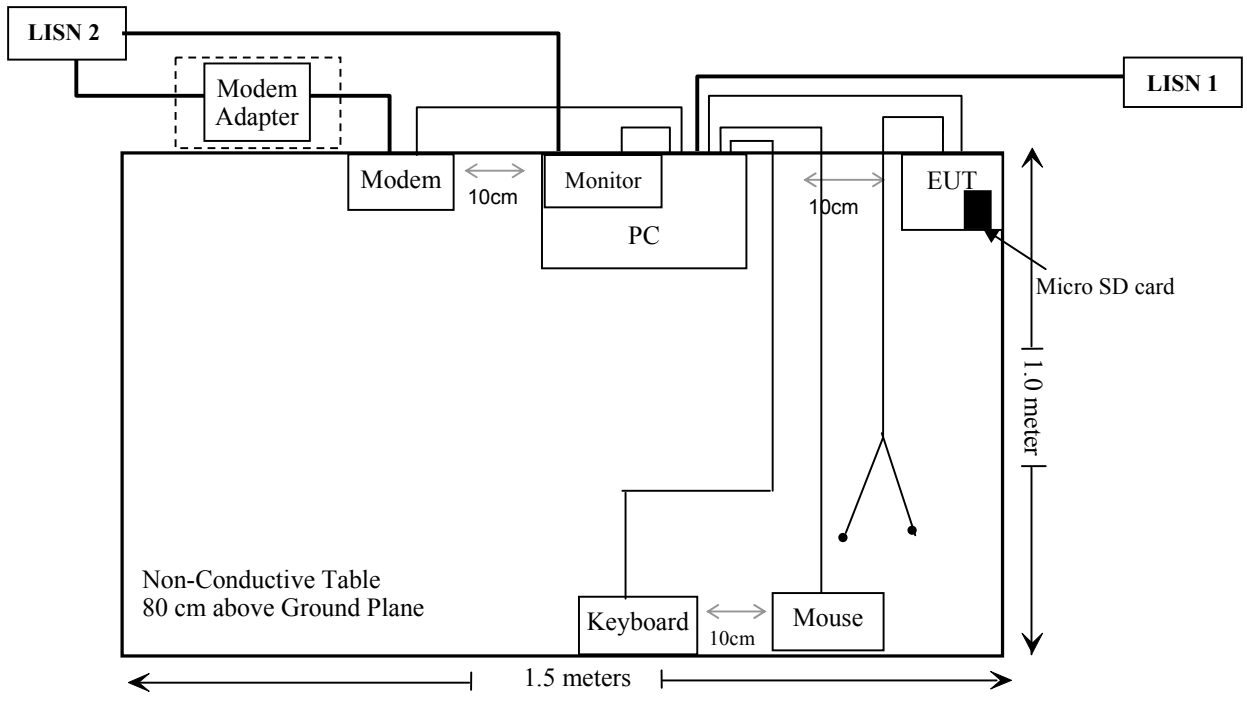
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	PC	VOSTRO 220S	127BP2X
DELL	LCD Monitor	E178WFPC	CN-OWY564-64180-7C4-2SQH
DELL	Keyboard	L100	CNORH656658907BL05DC
DELL	Mouse	MOC5UO	G1900NKD
SAST	Modem	AEM-2100	0293
Kingston	Micro SD card	4 GB	/
LISTED	Modem adapter	TYP30-1207000Z	E326703

External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-shielding Detachable USB Cable	1.5	Host PC	Mouse
Shielding Detachable Serial Cable	1.2	Host PC	Modem
Shielding Detachable K/B Cable	1.5	Host PC	Keyboard
Shielding Detachable VGA Cable	1.5	Host PC	LCD Monitor
Un-shielding Detachable Earphone Cable	1.0	EUT	Earphone
Un-shielding Detachable USB Cable	1.0	EUT	PC
Un-shielding un-detachable DC cable	1.2	Modem Adapter	Modem
Un-shielding detachable AC cable	1.7	Mains	Modem Adapter
Un-shielding detachable AC cable	1.5	Mains	PC
Un-shielding un-detachable AC Power cable	1.0	Mains	LCD Monitor

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

FCC §15.107 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

According to FCC §15.107

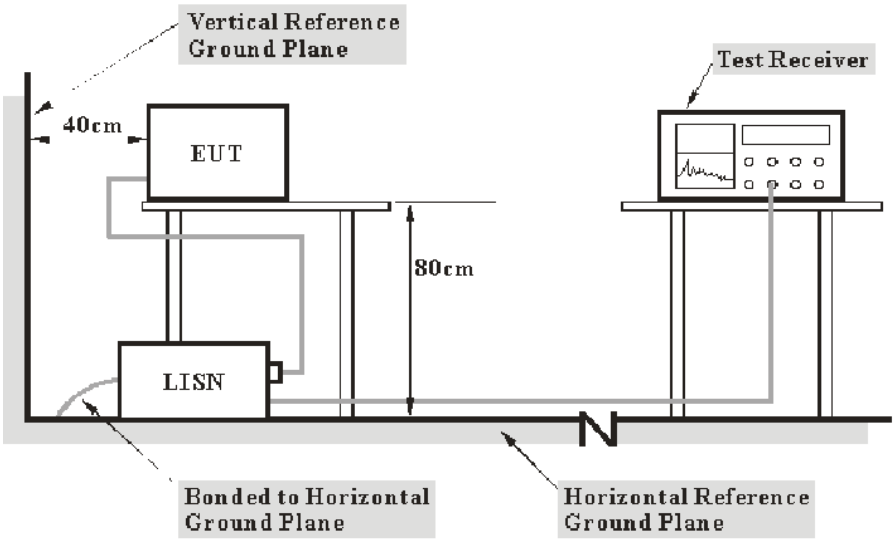
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN/ISN and receiver, LISN/ISN voltage division factor, LISN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Expanded Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

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 measurement procedure of EUT setup is according with per ANSI C63.4-2009. The related limit was specified in FCC Part 15.107 Class B.

The spacing between the peripherals was 10 cm.

The host PC was connected to a 120 VAC/60 Hz power source.

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

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 host PC was connected to the first LISN and the other relevant equipments were conncected to 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2014-06-17	2015-06-17
Rohde & Schwarz	LISN	ESH2-Z5	892107/021	2014-08-22	2015-08-22
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2014-10-15	2015-10-15
Rohde & Schwarz	CE Test software	EMC 32	V8.53	NCR	NCR

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

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

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:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107, with the worst margin reading of:

11.2 dB at **21.637430 MHz** in the **Neutral** conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL., $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

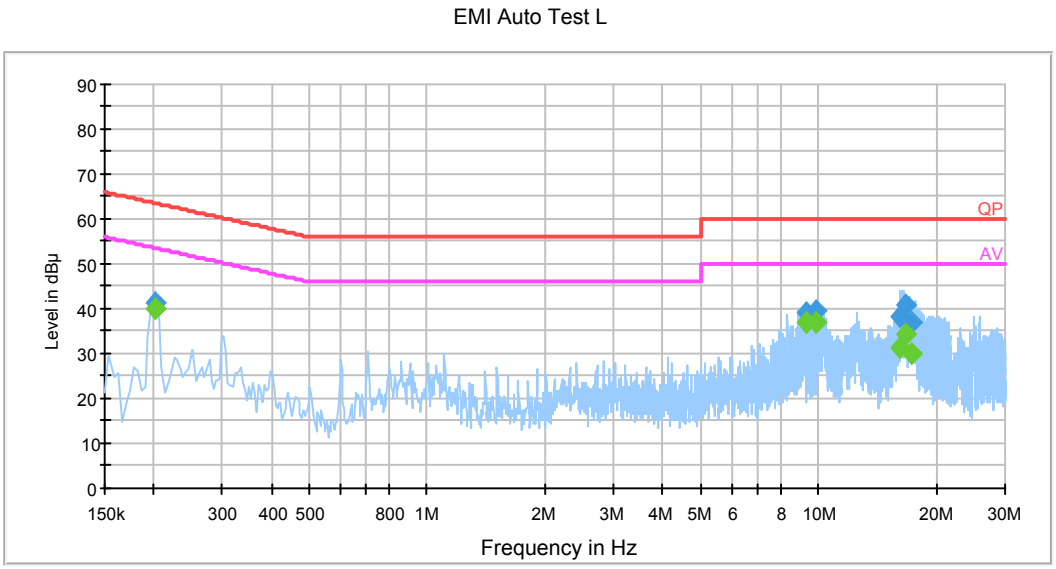
Environmental Conditions

Temperature:	20 ℃
Relative Humidity:	43 %
ATM Pressure:	101.0 kPa

The testing was performed by Xiangguang Kong on 2014-12-05

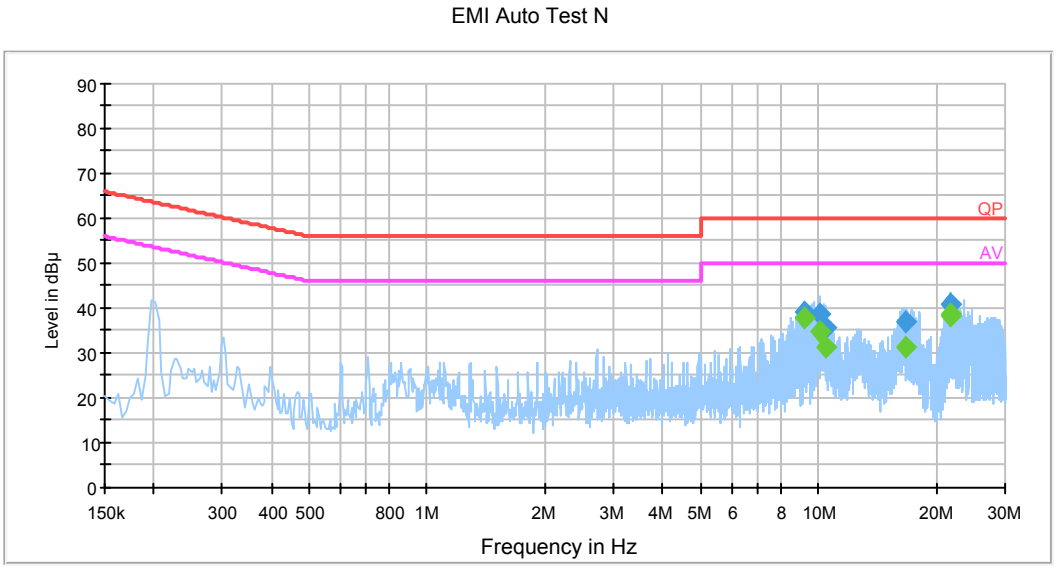
EUT Operation Mode: Downloading

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.201500	41.2	19.3	63.5	22.3	QP
0.201500	40.0	19.3	53.5	13.5	Ave.
9.356070	39.3	19.7	60.0	20.7	QP
9.356070	36.9	19.7	50.0	13.1	Ave.
9.860510	39.4	19.7	60.0	20.6	QP
9.860510	37.1	19.7	50.0	12.9	Ave.
16.195090	38.1	19.9	60.0	21.9	QP
16.195090	31.2	19.9	50.0	18.8	Ave.
16.701990	40.8	19.9	60.0	19.2	QP
16.701990	34.4	19.9	50.0	15.6	Ave.
17.217470	36.9	19.9	60.0	23.1	QP
17.217470	30.0	19.9	50.0	20.0	Ave.

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
9.256690	39.3	19.6	60.0	20.7	QP
9.256690	37.6	19.6	50.0	12.4	Ave.
10.067010	38.9	19.6	60.0	21.1	QP
10.067010	35.0	19.6	50.0	15.0	Ave.
10.461010	35.7	19.6	60.0	24.3	QP
10.461010	31.5	19.6	50.0	18.5	Ave.
16.705850	37.0	19.6	60.0	23.0	QP
16.705850	31.5	19.6	50.0	18.5	Ave.
21.637430	41.0	19.7	60.0	19.0	QP
21.637430	38.8	19.7	50.0	11.2	Ave.
21.638490	40.9	19.7	60.0	19.1	QP
21.638490	38.2	19.7	50.0	11.8	Ave.

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
2) Corrected Amplitude = Reading + Correction Factor
3) Margin = Limit – Corrected Amplitude

FCC §15.109 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §15.109

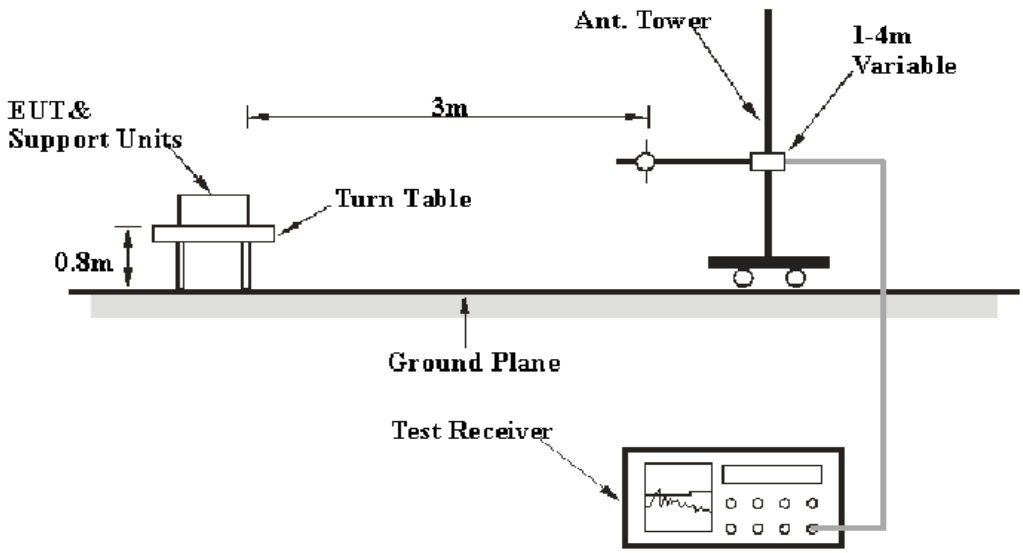
Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

Frequency	Polarity	Measurement uncertainty
30 MHz~200 MHz	Horizontal	4.62 dB (k=2, 95% level of confidence)
	Vertical	4.54 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	Horizontal	4.84 dB (k=2, 95% level of confidence)
	Vertical	5.91 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	Horizontal/Vertical	4.68 dB (k=2, 95% level of confidence)
Above 6 GHz	Horizontal/Vertical	4.92 dB (k=2, 95% level of confidence)

EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15.109 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 spacing between the peripherals was 10 cm.

The host PC was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 6.5 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	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

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

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2014-09-30	2015-09-30
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2014-11-12	2015-11-12
Sunol Sciences	Broadband Antenna	JB3	A111513	2014-06-18	2017-06-17
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2015-02-10
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2014-11-12	2015-11-12
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2014-04-03	2015-04-03
TDK	Chamber	Chamber A	2#	2012-10-15	2015-10-15
TDK	Chamber	Chamber B	1#	2012-07-23	2015-07-22
R&S	Auto test Software	EMC32	V9.10	NCR	NCR

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that 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:

Corrected Amplitude = Meter Reading + 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:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

10.63 dB at **314.52 MHz** in the **Horizontal** polarization mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	19 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Xiangguang Kong on 2014-12-03

EUT Operation Mode: Downloading

30 MHz – 6.5 GHz

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor （dB）	Corrected Amplitude (dBμV/m)	FCC Part15B	
	Reading (dBμV)	Detector (PK/QP/Ave.)	Degree	Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
30.18	25.83	QP	126	1.33	V	-6.0	19.83	40	20.17
31.71	25.07	QP	137	1.10	V	-7.4	17.67	40	22.33
239.95	33.91	QP	75	1.31	H	-14.8	19.11	46	26.89
283.69	38.12	QP	109	1.02	H	-12.7	25.42	46	20.58
314.52	47.47	QP	299	1.14	H	-12.1	35.37	46	10.63
480.02	22.98	QP	183	3.48	V	-8.6	14.38	46	31.62
1148.29	54.56	PK	90	2.10	V	0.16	54.72	74	19.28
1148.29	28.46	Ave.	90	2.10	V	0.16	28.62	54	25.38
1060.00	54.21	PK	266	1.90	V	-0.66	53.55	74	20.45
1060.00	28.94	Ave.	266	1.90	V	-0.66	28.28	54	25.72
2222.44	51.13	PK	170	1.10	V	6.13	57.26	74	16.74
2222.44	23.26	Ave.	170	1.10	V	6.13	29.39	54	24.61

Note:
1) Correction Factor=Antenna factor (RX) + cable loss – amplifier factor
2) Corrected Amplitude = Correction Factor + Reading
3) Margin = Limit - Corrected Amplitude

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