



# TESTREPORT

No.I15Z43162-EMC02

for

**Reliance Communications, LLC**

**GSM quad band and wcdma and LTE mobile phone**

**Model Name:RC501L**

**FCC ID:2ABGH-RC501L**

**with**

**Hardware Version: WMDGa**

**Software Version:Orbic-RC501L\_v1.0.9**

**Issued Date: 2016-01-25**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

**Test Laboratory:**

**FCC 2.948 Listed: No.525429**

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

No.52, HuayuanNorth Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: [ctl\\_terminals@catr.cn](mailto:ctl_terminals@catr.cn), website: [www.chinattl.com](http://www.chinattl.com)



## REPORT HISTORY

Report Number	Revision	Description	Issue Date
I15Z43162-EMC02	Rev.0	1st edition	2016-01-25

## **CONTENTS**

<b>1. TEST LABORATORY .....</b>	<b>4</b>
<b>1.1. TESTINGLOCATION .....</b>	<b>4</b>
<b>1.2. TESTINGENVIRONMENT .....</b>	<b>4</b>
<b>1.3. PROJECT DATA .....</b>	<b>4</b>
<b>1.4. SIGNATURE.....</b>	<b>4</b>
<b>2. CLIENTINFORMATION.....</b>	<b>5</b>
<b>2.1. APPLICANT INFORMATION.....</b>	<b>5</b>
<b>2.2. MANUFACTURER INFORMATION.....</b>	<b>5</b>
<b>3. EQUIPMENT UNDERTEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>6</b>
<b>3.1. ABOUT EUT .....</b>	<b>6</b>
<b>3.2. INTERNAL IDENTIFICATION OF EUT .....</b>	<b>6</b>
<b>3.3. INTERNAL IDENTIFICATION OF AE .....</b>	<b>6</b>
<b>3.4. EUT SET-UPS .....</b>	<b>7</b>
<b>4. REFERENCE DOCUMENTS .....</b>	<b>8</b>
<b>4.1. REFERENCE DOCUMENTS FOR TESTING.....</b>	<b>8</b>
<b>5. LABORATORY ENVIRONMENT.....</b>	<b>9</b>
<b>6. SUMMARY OF TEST RESULTS .....</b>	<b>10</b>
<b>7. TEST FACILITIES UTILIZED .....</b>	<b>11</b>
<b>ANNEX A: MEASUREMENT RESULTS.....</b>	<b>12</b>

## **1. Test Laboratory**

### **1.1. TestingLocation**

**Location 1: CTTL(huayuan North Road)**

Address: No. 52, Huayuan North Road, Haidian District, Beijing,  
P. R. China 100191

### **1.2. TestingEnvironment**

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

### **1.3. Project data**

Testing Start Date: 2015-12-11

Testing End Date: 2015-12-26

### **1.4. Signature**



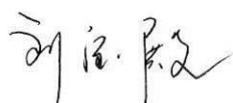
Wang Junqing

(Prepared this test report)



QuPengfei

(Reviewed this test report)



Liu Baodian

Deputy Director of the laboratory

(Approved this test report)



## **2. ClientInformation**

### **2.1. Applicant Information**

Company Name: Reliance Communications LLC  
Address: 555 Wireless Blvd, Hauppauge, NY 11788, United States.

### **2.2. Manufacturer Information**

Company Name: Reliance Communications LLC  
Address: 555 Wireless Blvd, Hauppauge, NY 11788, United States.

### **3. Equipment UnderTest (EUT) and Ancillary Equipment (AE)**

#### **3.1. About EUT**

Description	GSM quad band and wcdma and LTE mobile phone
Model Name	RC501L
FCC ID	2ABGH-RC501L
TX Band	GSM850/1900,WCDMA Band 2/4/5,FDD Band 2/4/5/17
RX Band	GSM850/1900,WCDMA Band 2/4/5,FDD Band 2/4/5/17

The Equipment Under Test(EUT)are a model of GSM quad band and wcdma and LTE mobile phonewith integrated antenna.

The EUT supports GPRS service and EGPRS service. It has MP3,camera,USB memory, FM radio, GPS receiver ,Bluetoothand WLAN functions.

Remark: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed information.

#### **3.2. Internal Identification of EUT**

<b>EUT ID*</b>	<b>SN or IMEI</b>
EUT1	357706079999661

\*EUT ID: is used to identify the test sample in the lab internally.

#### **3.3. Internal Identification of AE**

<b>AE ID*</b>	<b>Description</b>	<b>SN</b>
AE1	Battery	/
AE2	Travel charger	/
AE3	USB cable	/

##### **AE1**

Model	Orbic-RC501L
Manufacturer	Shenzhen City Rui electronic industry Co.,Ltd
Capacitance	2200mAh
Nominal voltage	3.8V

##### **AE2**

Model	TL6D-0501000
Manufacturer	Shenzhen Tailing Technology Co.,LTD.
Length of cable	/
SN	/

##### **AE3**

Model	AM/MICR05P CABLE
Manufacturer	SHENZHEN FKY-QY HARDWARE ELECTRONIC CO.,LTD
Length of cable	95cm

\*AE ID: is used to identify the test sample in the lab internally.

### 3.4. EUT set-ups

<b>EUT set-up No.</b>	<b>Combination of EUT and AE</b>	<b>Remarks</b>
Set.1	EUT1+ AE1 + AE2 + AE3	Charging mode
Set.2	EUT1+ AE1 + AE3	USB mode

## 4. Reference Documents

### 4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices	10-1-2015 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

## 5. LABORATORY ENVIRONMENT

**Semi-anechoic chamber** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω
Normalised site attenuation (NSA)	<± 4 dB, 3 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

**Shielded room** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω

**Fully-anechoic chamber** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 6GHz, 3 m distance

## **6. SUMMARY OF TEST RESULTS**

<b>Abbreviations used in this clause:</b>	
P	Pass
NA	Not applicable
F	Fail

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Radiated Emission	15.109(a)	A.1	P
2	Conducted Emission	15.107(a)	A.2	P

## 7. Test Facilities Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CALDUE DATE	CAL PERIOD
1.	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2017-12-09	3 Years
2.	Test Receiver	ESCI 7	100948	R&S	2016-07-07	1 Year
3.	EMI Antenna	3115	6914	ETS-Lindgren	2016-12-15	3 Years
4.	Test Receiver for Conducted Emission	ESU26	100235	R&S	2016-03-02	1 Year
5.	LISN	ENV216	101200	R&S	2016-07-07	1 Year
6.	Universal Radio Communication Tester	CMW500	143008	R&S	2016-12-09	1 Year
7.	Vector Signal Generator	SMBV100A	260613	R&S	2016-01-28	1 Year
8.	PC	OPTIPLEX 380	2X1YV2X	DELL	/	/
9.	Monitor	E1709Wc	CN-OJ672H-6 4180-9BF-1C RL	DELL	/	/
10.	Printer	P1606dn	VNC3L52122	HP	/	/
11.	Keyboard	L100	CN-ORH656-65890-03S-04 1Y	DELL	/	/
12.	Mouse	M-UAR	LZ013HC1YL V	DELL	/	/

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 Radiated Emission (§15.109(a))**

#### **Reference**

FCC: CFR Part 15.109(a)

#### **A.1.1 Method of measurement**

The field strength of radiated emissions from the unintentional radiator (USB mode of MS and charging mode of MS) at a distance of 3 meters is tested. Tested in accordance with the procedures of ANSI C63.4 -2014, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

#### **A.1.2 EUT Operating Mode:**

The MS is operating in the USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is Lenovo Thinkcentre M4099t, and the serial number of the PC is SA08850737. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

#### **A.1.3 Measurement Limit**

Limit from CFR Part 15.109(a)

Frequency range (MHz)	Field strength limit ( $\mu$ V/m)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

#### **A.1.4 Test Condition**

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz (IF bandwidth)	5
Above 1000	1MHz/3MHz	15

### A.1.5 Measurement Results

A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss". It includes the antenna factor of receive antenna and the path loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{Rpl} = P_{\text{Mea}} + G_A + G_{PL}$$

Where

$G_A$ : Antenna factor of receive antenna

$G_{PL}$ : Path Loss

$P_{\text{Mea}}$ : Measurement result on receiver.

Note: the result contains vertical part and Horizontal part

**RE Measurement uncertainty:** 30M-1GHz: 5.08dB (K=2);  
 1GHz-18GHz: 4.56 dB (K=2)

#### Set.1 Charging mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Polarity	$A_{Rpl}$ (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
12721.000000	53.0	V	10.3	21.0	74.0
13273.000000	52.8	V	10.8	21.2	74.0
13647.000000	54.3	V	11.0	19.7	74.0
14139.000000	56.1	V	11.2	17.9	74.0
15140.000000	56.1	V	12.1	17.9	74.0
17368.000000	57.7	V	14.3	16.3	74.0

#### Set.1 Charging mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Polarity	$A_{Rpl}$ (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
12591.000000	40.2	V	10.2	13.8	54.0
13165.000000	40.7	V	10.8	13.3	54.0
13931.000000	42.7	V	10.9	11.3	54.0
14146.000000	43.3	V	11.2	10.7	54.0
15127.000000	44.2	H	12.1	9.8	54.0
16211.000000	45.8	V	13.3	8.2	54.0

**Set.2USB mode/ Peak detector**

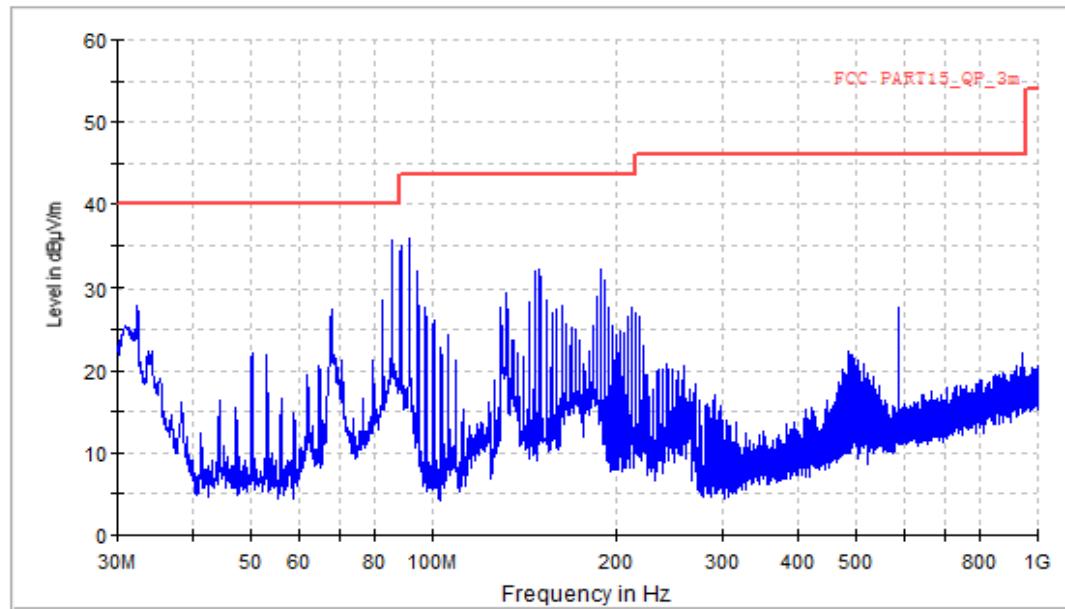
Frequency(MHz)	Result(dBuV/m)	Polarity	A <sub>Rpl</sub> (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
13097.000000	52.9	V	10.8	21.1	74.0
13910.000000	54.2	V	10.9	19.8	74.0
14522.000000	55.0	H	11.7	19.0	74.0
15065.000000	56.8	H	12.0	17.2	74.0
15823.000000	57.7	H	13.0	16.3	74.0
16219.000000	57.7	H	13.3	16.3	74.0

**Set.2USB mode/ Average detector**

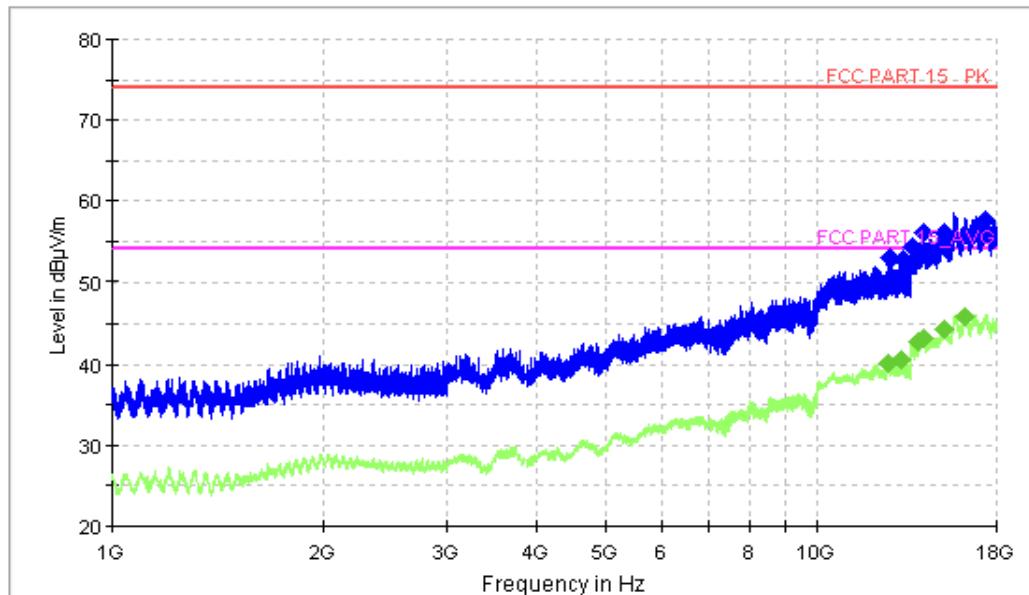
Frequency(MHz)	Result(dBuV/m)	Polarity	A <sub>Rpl</sub> (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
13162.000000	40.3	H	10.8	13.7	54.0
13936.000000	42.4	V	10.9	11.6	54.0
14170.000000	43.3	H	11.3	10.7	54.0
15059.000000	44.1	V	12.0	9.9	54.0
15757.000000	45.8	V	12.9	8.2	54.0
17382.000000	45.7	V	14.3	8.3	54.0

**Charging mode: Set 1**

FCC-RE1-30MHz-1GHz

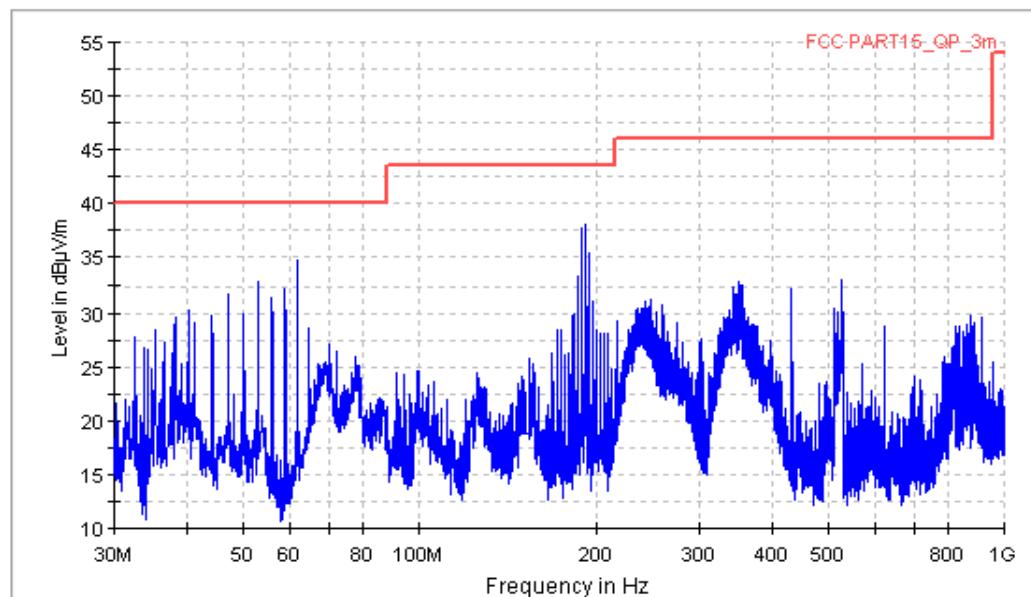
**Figure A.1 Radiated Emission from 30MHz to 1GHz**

FCC-RE2-1-18GHz

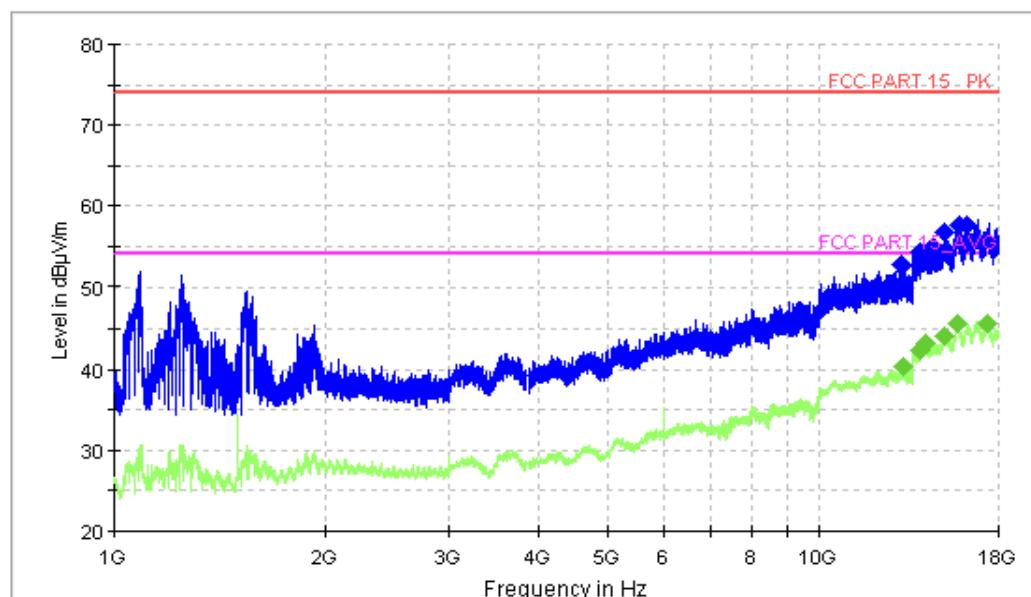
**Figure A.2 Radiated Emission from 1GHz to 18GHz**

**USB mode: Set 2**

FCC-RE1-30MHz-1GHz

**Figure A.3 Radiated Emission from 30MHz to 1GHz**

FCC-RE2-1-18GHz

**Figure A.4 Radiated Emission from 1GHz to 18GHz**

**A.2 Conducted Emission (§15.107(a))****Reference**

FCC: CFR Part 15.107(a)

**A.2.1 Method of measurement**

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 -2014, section 7.3.

**A.2.2 EUT Operating Mode:**

The MS is operating in the USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is Lenovo Thinkcentre M4099t, and the serial number of the PC is SA08850737. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

**A.2.3 Measurement Limit**

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

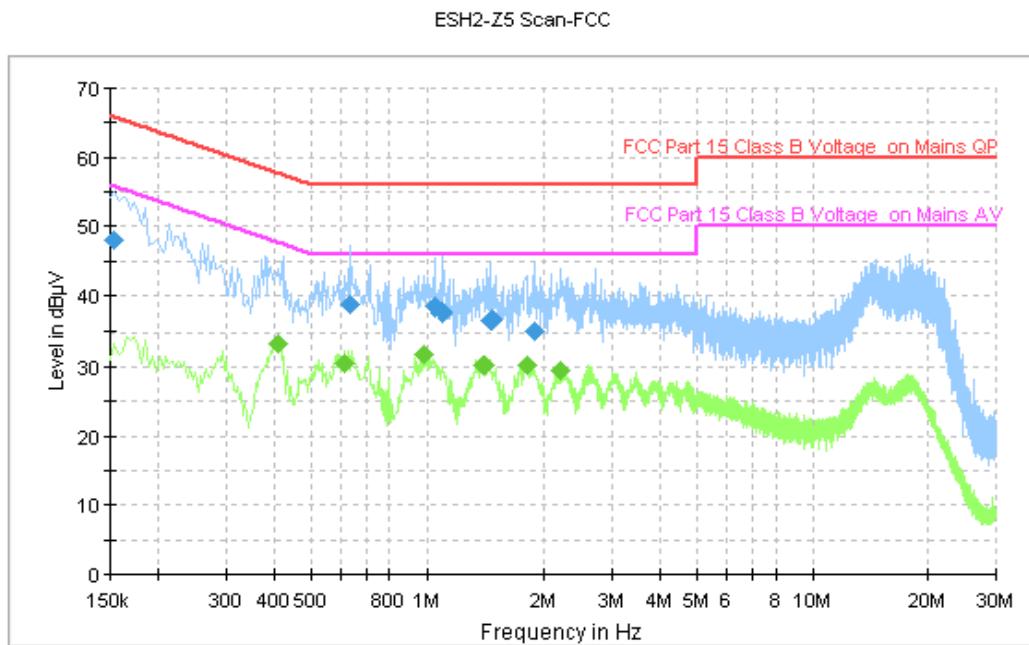
\*Decreases with the logarithm of the frequency

**A.2.4 Test Condition in charging mode**

Voltage (V)	Frequency (Hz)
120	60

RBW	Sweep Time(s)
9kHz	1

**CE Measurement uncertainty:** 2.7 dB (K=2)

**A.2.5 Measurement Results**
**Charging mode: Set.1**

**Figure A.5 Conducted Emission**
**Final Measurement Detector 1**

Frequency (MHz)	QuasiPeak (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.154000	48.1	GND	L1	10.0	17.7	65.8
0.634000	38.8	GND	N	10.0	17.2	56.0
1.046000	38.6	GND	N	10.1	17.4	56.0
1.102000	37.8	GND	N	10.1	18.2	56.0
1.458000	36.8	GND	N	10.1	19.2	56.0
1.894000	35.1	GND	N	10.1	20.9	56.0

**Final Measurement Detector 2**

Frequency (MHz)	Average (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.410000	33.3	GND	L1	10.0	14.3	47.6
0.610000	30.4	GND	L1	10.0	15.6	46.0
0.986000	31.7	GND	L1	10.1	14.3	46.0
1.406000	30.3	GND	L1	10.1	15.7	46.0
1.802000	30.2	GND	L1	10.1	15.8	46.0
2.210000	29.5	GND	L1	10.1	16.5	46.0

USB mode: Set.2

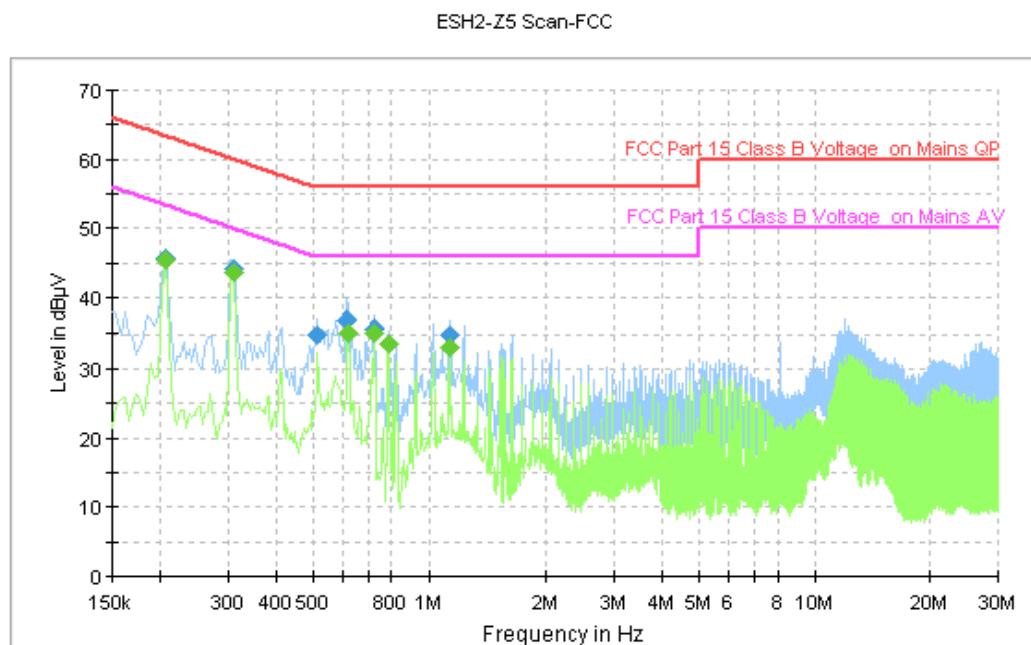


Figure A.6 Conducted Emission

## Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.206000	45.6	GND	N	10.1	17.7	63.4
0.310000	44.0	GND	N	10.1	15.9	60.0
0.514000	34.8	GND	N	10.1	21.2	56.0
0.614000	36.9	GND	N	10.0	19.1	56.0
0.718000	35.7	GND	N	10.0	20.3	56.0
1.130000	34.8	GND	N	10.1	21.2	56.0

## Final Measurement Detector 2

Frequency (MHz)	Average (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.206000	45.4	GND	N	10.1	8.0	53.4
0.310000	43.5	GND	N	10.1	6.4	50.0
0.618000	35.1	GND	N	10.0	10.9	46.0
0.718000	35.1	GND	N	10.0	10.9	46.0
0.786000	33.5	GND	L1	10.1	12.5	46.0
1.130000	33.0	GND	N	10.1	13.0	46.0

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