



TESTREPORT

No. I16Z40908-EMC01

for

Reliance Communications LLC

GSM/WCDMA/LTE Android mobile phone

Model Name: RC503L

FCC ID: 2ABGH-RC503L

IC Number: 20994-RC503L

with

Hardware Version: RC503L V.01

Software Version: Orbic-RC503L_V2.0.0

Issued Date: 2016-06-23

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:

IC O.A.T.S listed: No.12389A-1

FCC 2.948 Listed: No. 525429

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I16Z40908-EMC01	Rev.0	1st edition	2016-06-23



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1. Test Laboratory

1.1. Testing Location

Location 4: CTTL(BDA)

Address No.18A, Kangding Street, Beijing Economic-Technology
Development Area, Beijing, P. R. China 100176

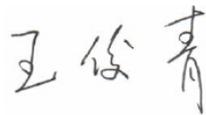
1.2. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2016-04-06
Testing End Date: 2016-04-28

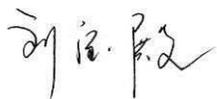
1.4. Signature



Wang Junqing
(Prepared this test report)



Qu Pengfei
(Reviewed this test report)



Liu Baodian
Deputy Director of the laboratory
(Approved this test report)



2. Client Information

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 Under Test(EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	GSM/WCDMA/LTE Android mobile phone
Model Name	RC503L
FCC ID	2ABGH-RC503L
IC Number	20994-RC503L

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT	868817019997483	RC503L V.01	Orbic-RC503L_V2.0.0

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

3.3. Internal Identification of AE

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

AE1-1

Model	Orbic-RC503L
Manufacturer	ShenZhen RuiDe Electronic Industrial Co.,LTD
Capacitance	2200mAh
Nominal voltage	4.35V

AE2

Model	TL6D-0501000
Manufacturer	SHENZHEN TAILING TECHNOLOGY CO.,LTD

AE3-1

Model	/
Manufacturer	/
Length of cable	93cm

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



3.4. General Description

The Equipment Under Test (EUT) are a model of GSM/WCDMA/LTE Android mobile phone with integrated antenna.

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

It includes normal options: Travel Charger and USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

3.5. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
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-Unintentional Radiators	10-1-2015 Edition
ICES-003	Information Technology Equipment(ITE)-Limits and methods of measurement	Issue 6
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 SAC-2(10 meters×6.7meters×6.1meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	>2 MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	<± 4 dB, 3m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio(S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
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. = 35°C
Relative humidity	Min. =20 %, Max. =75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω

6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:	
P	Pass
NA	Not applicable
F	Fail

Items	Test Name	Clause in IC rules	Section in this report	Verdict
1	Radiated Emission	Section 5	A.1	P
2	Conducted Emission	Section 5	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	2017-03-02	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.	PC	OPTIPLEX 380	2X1YV2X	DELL	/	/
8.	Monitor	E1709Wc	CN-OJ672H-6 4180-9BF-1C RL	DELL	/	/
9.	Printer	P1606dn	VNC3L52122	HP	/	/
10.	Keyboard	L100	CN-ORH656- 65890-03S-04 1Y	DELL	/	/
11.	Mouse	M-UAR	LZ013HC1YL V	DELL	/	/

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission (§15.109(a))

Reference

IC:ICES-003 section 6.2

A.1.1 Method of measurement

The field strength of radiated emissions from the unintentional radiator (USB mode of MS, charging mode of MS and GPS mode of MS) at distances of 3 meters(for 30MHz-1GHz) and 3 meters (for above 1GHz) 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 3/10 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.

For the charging mode, the EUT is keeping on playing MP3 file.

For the USB 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 DELL OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

A.1.3 Measurement Limit

Limit from CFR Part 15.109(a)

Frequency range (MHz)	Field strength limit ($\mu\text{V}/\text{m}$)		
	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)	Detector
30-1000	120kHz (IF bandwidth)	5	Peak/Quasi-peak
Above 1000	1MHz/3MHz	15	Peak,Average

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_{Mea} : Measurement result on receiver.

Note: the result contains vertical part and Horizontal part

Measurement uncertainty (worst case): $U = 4.3 \text{ dB}$, $k=2$.

Set.1 Charging mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Polarity	A_{Rpl} (dB)	Margin(dB)	Limit (dB μ V/m)
14209.500000	56.0	H	11.3	18.0	74.0
14988.000000	56.4	V	12.0	17.6	74.0
15788.000000	57.6	H	12.8	16.4	74.0
16223.500000	57.0	H	13.1	17.0	74.0
16799.500000	57.9	H	13.9	16.1	74.0
17465.000000	56.7	H	14.0	17.3	74.0

Set.1 Charging mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Polarity	A_{Rpl} (dB)	Margin(dB)	Limit (dB μ V/m)
14534.000000	44.3	V	11.9	9.7	54.0
15076.000000	44.9	H	12.1	9.1	54.0
15785.500000	45.7	H	12.8	8.3	54.0
16235.500000	45.6	H	13.1	8.4	54.0
16819.500000	45.9	H	13.9	8.1	54.0
17380.500000	45.5	H	14.0	8.5	54.0



Set.2USB mode/ Peak detector

Frequency(MHz)	Result(dBuV/m)	Polarity	A _{Rpl} (dB)	Margin(dB)	Limit (dB μ V/m)
14056.000000	56.0	V	11.0	18.0	74.0
15133.000000	56.6	H	12.1	17.4	74.0
15688.500000	58.5	H	12.7	15.5	74.0
16197.500000	58.2	H	13.1	15.8	74.0
16713.000000	59.2	H	13.8	14.8	74.0
17801.000000	58.5	H	13.9	15.5	74.0

Set.2USB mode/ Average detector

Frequency(MHz)	Result(dBuV/m)	Polarity	A _{Rpl} (dB)	Margin(dB)	Limit (dB μ V/m)
14538.500000	44.4	H	11.9	9.6	54.0
15116.000000	45.2	V	12.1	8.8	54.0
15745.000000	46.5	V	12.8	7.5	54.0
16200.000000	46.7	H	13.1	7.3	54.0
16778.500000	47.2	H	13.9	6.8	54.0
17267.000000	46.9	H	13.9	7.1	54.0

Charging mode: Set 1

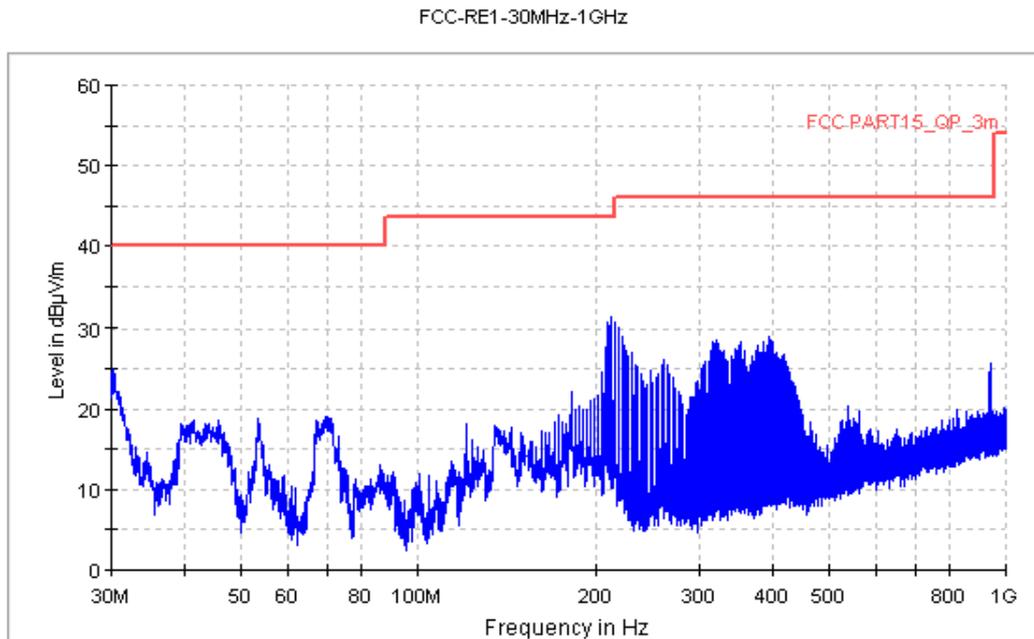


Figure A.1 Radiated Emission from 30MHz to 1GHz

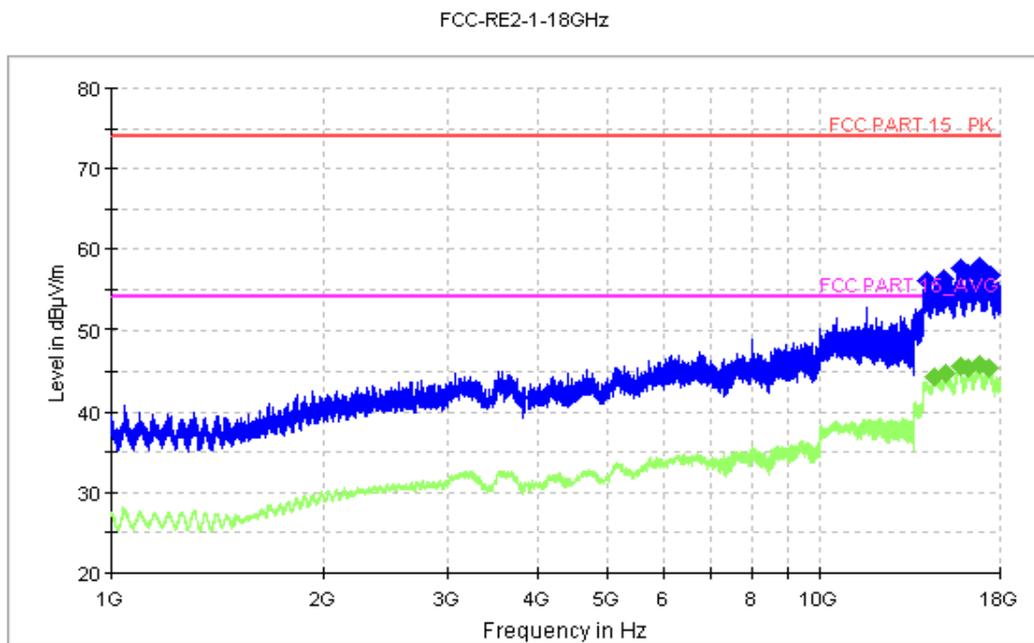


Figure A.2 Radiated Emission from 1GHz to 18GHz

USB mode: Set 2

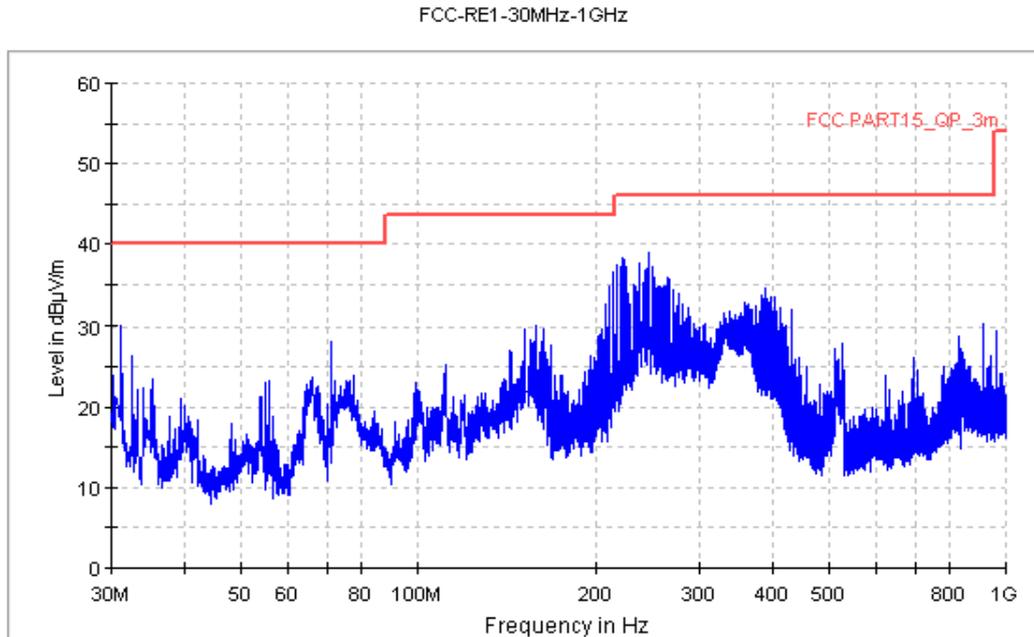


Figure A.3 Radiated Emission from 30MHz to 1GHz

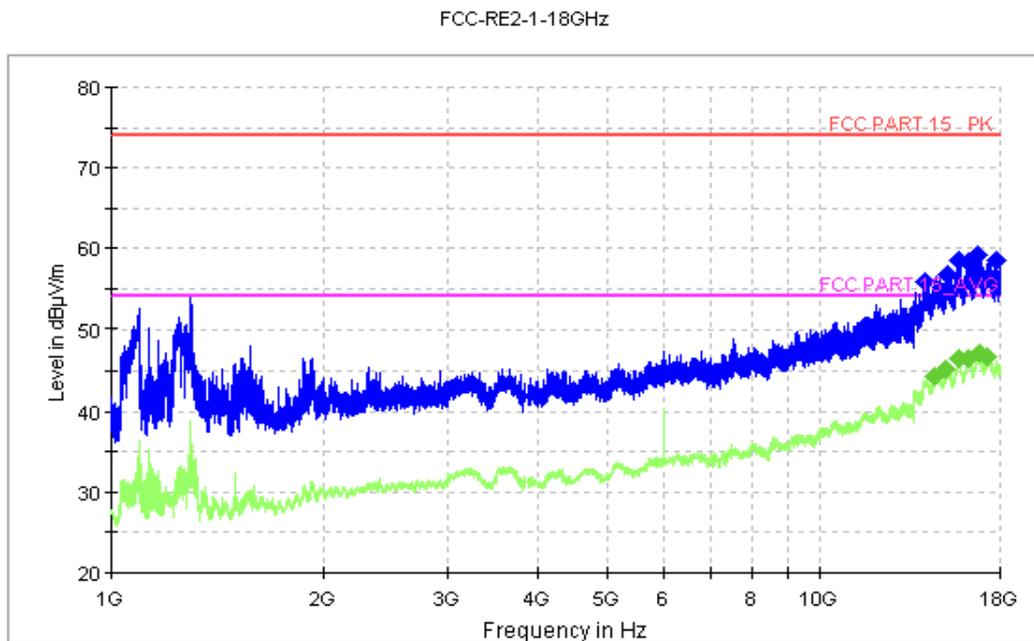


Figure A.4 Radiated Emission from 1GHz to 18GHz

A.2 Conducted Emission (§15.107(a))

Reference

IC: ICES-003 section 6.1.

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 150 kHz to 30 MHz 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.

For the charging mode, the EUT is keeping on playing MP3 file.

For the USB 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 DELL OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dB μ 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

A.2.5 Measurement Results

Measurement uncertainty: $U = 2.9 \text{ dB}$, $k=2$.

Charging mode: Set.1

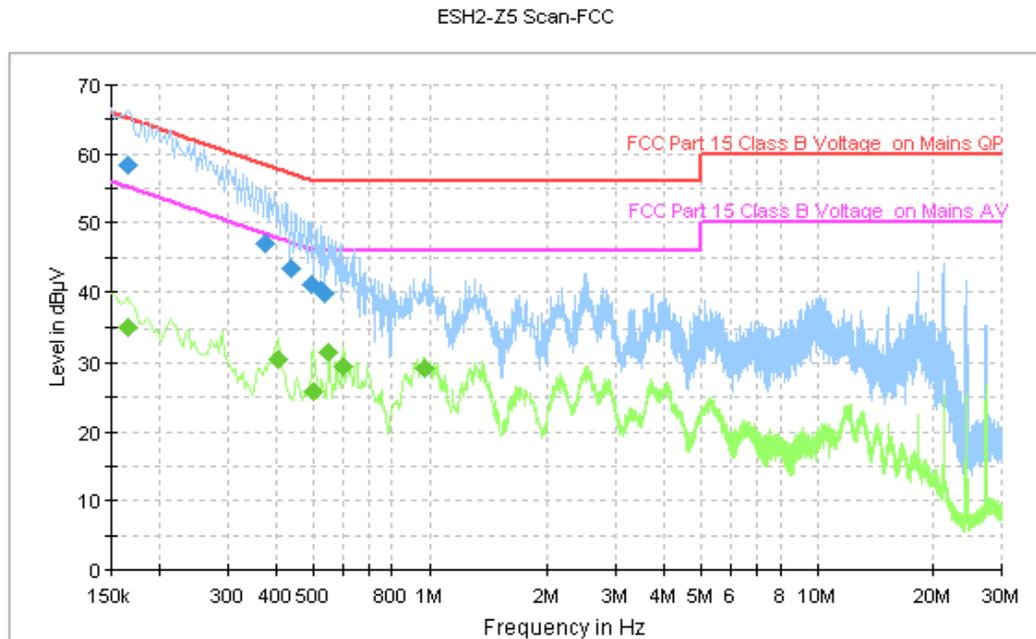


Figure A.5 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.166000	58.4	GND	L1	10.0	6.8	65.2
0.374000	46.9	GND	L1	10.0	11.5	58.4
0.438000	43.4	GND	L1	10.0	13.7	57.1
0.498000	41.1	GND	L1	10.0	14.9	56.0
0.522000	40.3	GND	L1	10.0	15.7	56.0
0.538000	39.7	GND	L1	10.1	16.3	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.166000	35.2	GND	L1	10.0	20.0	55.2
0.406000	30.5	GND	L1	10.0	17.2	47.7
0.502000	25.7	GND	L1	10.0	20.3	46.0
0.550000	31.6	GND	L1	10.1	14.4	46.0
0.598000	29.5	GND	L1	10.1	16.5	46.0
0.970000	29.2	GND	L1	10.1	16.8	46.0

USB mode:Set.2

ESH2-Z5 Scan-FCC

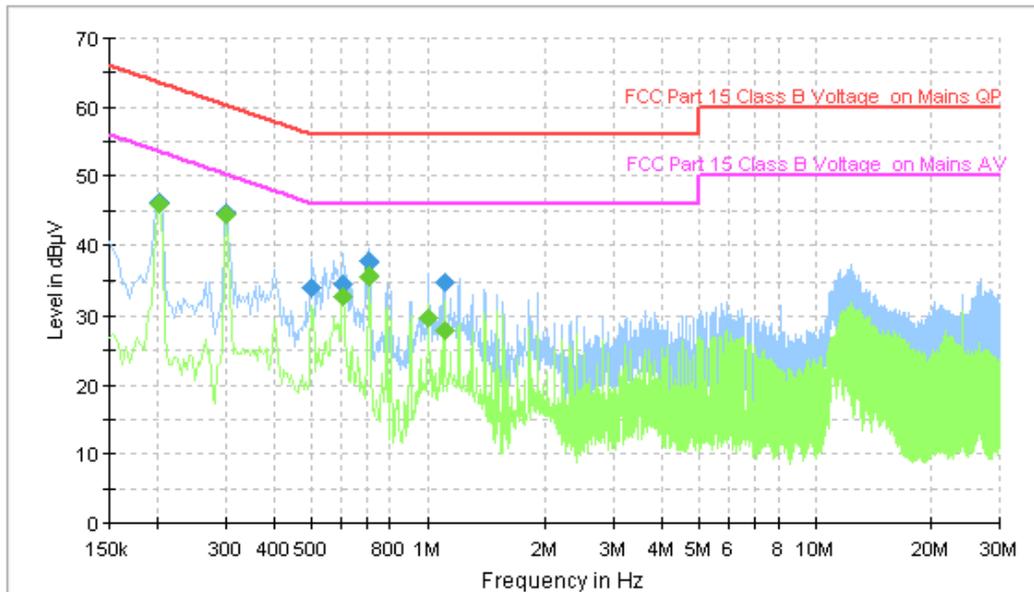


Figure A.6 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.202000	46.2	GND	N	10.1	17.3	63.5
0.302000	44.7	GND	N	10.1	15.5	60.2
0.502000	34.0	GND	N	10.1	22.0	56.0
0.602000	34.7	GND	N	10.1	21.3	56.0
0.706000	37.7	GND	N	10.0	18.3	56.0
1.110000	34.9	GND	N	10.1	21.1	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.202000	45.9	GND	N	10.1	7.6	53.5
0.302000	44.3	GND	N	10.1	5.8	50.2
0.602000	32.7	GND	N	10.1	13.3	46.0
0.706000	35.8	GND	N	10.0	10.2	46.0
1.006000	29.6	GND	N	10.1	16.4	46.0
1.106000	28.0	GND	N	10.1	18.0	46.0

END OF REPORT