



TEST REPORT

No. I15Z41068-EMC01

for

Reliance Communications LLC

GSM/UMTS(B2/B4) Mobile phone

Model Name: RC4740

FCC ID: 2ABGH-RC4740

with

Hardware Version: M8047X_MB_P3

Software Version: M8047TMX_20150420_V1.0

Issued Date: 2015-06-18

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, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I15Z41068-EMC01	Rev.0	1st edition	2015-06-18
I15Z41068-EMC01	Rev.1	2nd edition	2015-08-11

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1. Test Laboratory

1.1. Testing Location

Location 1: CTTL(huayuan North Road)

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

1.2. Testing Environment

Normal Temperature: 15-35℃

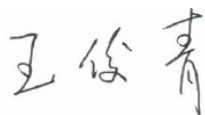
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2015-06-10

Testing End Date: 2015-06-17

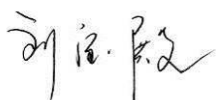
1.4. Signature



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 /Post: 555 Wireless Blvd. Haupauge, NY
Contact Person: Micky Chiang
Contact Email: micky.chiang@reliance.us
Telephone: 001.631.240.8396
Fax: /

2.2. Manufacturer Information

Company Name: Cellon Communication Technology co.,LTD
Address /Post: Room513, 5Floor, Research Activities Building , Tsinghua Information
Port, Hi-tech Park North Zone, Nanshan District, Shenzhen
City: Shenzhen
Country: China
Contact Person: Jack Gan
Contact Email: jack.gan@cellon.com
Telephone: 13480876001
Fax: /

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	GSM/UMTS(B2/B4) Mobile phone
Model Name	RC4740
FCC ID	2ABGH-RC4740
Extreme vol. Limits	3.4VDC to 4.2VDC (nominal: 3.7VDC)

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	350025855269554	M8047X_MB_P3	M8047TMX_20150420_V1.0

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Remarks
AE1	Battery	/	Inbuilt
AE4	Travel charger	/	1541068CH012
AE5	USB cable	/	1541068DC012

AE1

Model	Li-ion polymer
Manufacturer	WISEWOD
Capacitance	2000mAh
Nominal voltage	3.8V

AE4

Model	K05100-3
Manufacturer	KOSUN
Length of cable	/

AE5

Model	M8047X Data Cable
Manufacturer	Longyufei
Length of cable	98cm

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



3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE1+ AE4 + AE5	Charger
Set.2	EUT1+ AE1+ AE5	USB

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	10-1-13 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	2009

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber SAC-1 (23 meters×17meters×10meters) 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	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 10 m distance
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 6GHz
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	> 2 MΩ
Ground system resistance	< 4 Ω

6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:		
Verdict Column	P	Pass
	NA	Not applicable
	F	Fail
Location Column	1/2/3/4	The test is performed in test location 1, 2, 3 or 4 which are described in section 1.1 of this report

Clause	List	Clause in FCC rules	Verdict	Location
1	Radiated Emission	15.109(a)	P	1
2	Conducted Emission	15.107(a)	P	1

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100235	R&S	2016-03-02	1 year
2	Test Receiver	ESCI 7	100948	R&S	2016-07-07	1 year
3	Universal Radio Communication Tester	CMU200	109914	R&S	2016-03-26	1 year
4	Test Receiver	FSV	101047	R&S	2016-07-02	1 year
5	LISN	ENV216	101200	R&S	2016-07-07	1 year
6	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-16	3 years
7	EMI Antenna	3115	9906-5827	ETS-Lindgren	2016-12-15	3 years
8	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
9	Monitor	E178FPc	CN-OWR979-64180-7AJ-D2MS	DELL	N/A	N/A
10	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
11	Keyboard	L100	CN0RH659658907 ATOI40	DELL	N/A	N/A
12	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission (§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 distances of 10 meters(for 30MHz-1GHz) and 3 meters (for above 1GHz) is tested. Tested in accordance with the procedures of ANSI C63.4 - 2009, 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. 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.

A.1.3 Measurement Limit

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

Note: the above limit is for 3 meters test distance. 10 meters' limit is got by converting.

A.1.4 Test Condition

Frequency range (MHz)	RBW/VBW	Sweep Time (s)	Detector
30-1000	120kHz (IF Bandwidth)	5	Peak/Quasi-peak
Above 1000	1MHz/1MHz	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:

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

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

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

Measurement results for Set.1:

Charging Mode/Average detector

Frequency(MHz)	Result(dB $\mu\text{V}/\text{m}$)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μV)	Polarity
17985.267	43.7	-17.7	45.6	15.800	V
17969.400	43.7	-17.7	45.6	15.800	H
17990.367	43.6	-17.7	45.6	15.700	V
17984.700	43.6	-17.7	45.6	15.700	H
17984.133	43.5	-17.7	45.6	15.600	V
17996.033	43.5	-17.7	45.6	15.600	V

Charging Mode/Peak detector

Frequency(MHz)	Result(dB $\mu\text{V}/\text{m}$)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μV)	Polarity
17991.500	55.1	-17.7	45.6	27.200	V
17735.367	54.8	-18.9	45.6	28.100	V
17841.333	54.8	-18.5	45.6	27.700	H
17942.767	54.7	-17.7	45.6	26.800	V
17988.100	54.7	-17.7	45.6	26.800	H
17849.267	54.6	-18.5	45.6	27.500	V

Measurement results for Set.2:**USB Mode/Average detector**

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
17990.367	43.8	-17.7	45.6	15.900	V
17984.133	43.8	-17.7	45.6	15.900	V
17988.667	43.7	-17.7	45.6	15.800	V
17988.100	43.7	-17.7	45.6	15.800	V
17985.833	43.7	-17.7	45.6	15.800	V
17990.933	43.6	-17.7	45.6	15.700	H

USB Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
17977.900	55.9	-17.7	45.6	28.000	V
17986.400	55.1	-17.7	45.6	27.200	H
17995.467	54.9	-17.7	45.6	27.000	V
17976.767	54.9	-17.7	45.6	27.000	H
17882.133	54.8	-18.5	45.6	27.700	V
17935.967	54.7	-17.7	45.6	26.800	V

Charging Mode, Set.1

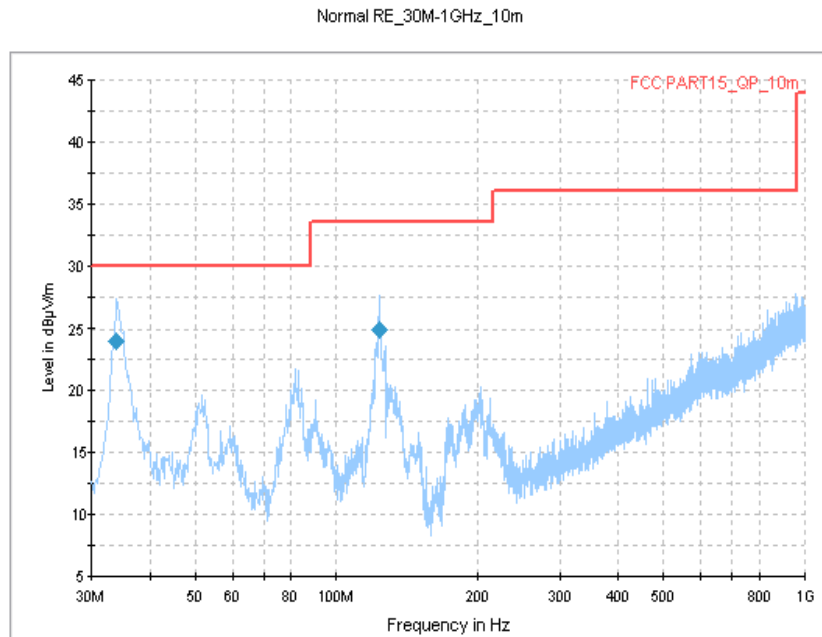


Fig.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
33.831500	24.1	100.0	V	30.0	-13.2	5.9	30.0
123.471000	25.0	125.0	V	75.0	-15.0	8.5	33.5

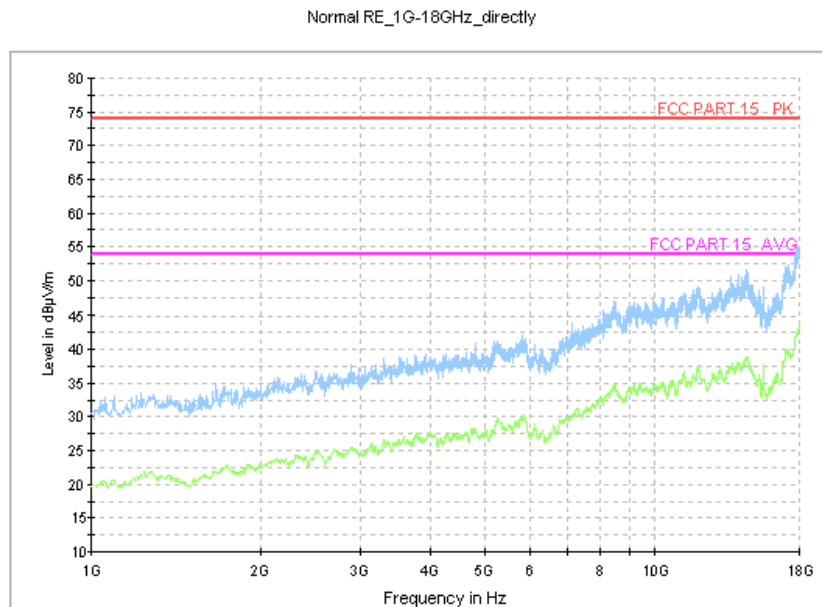


Fig.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.2

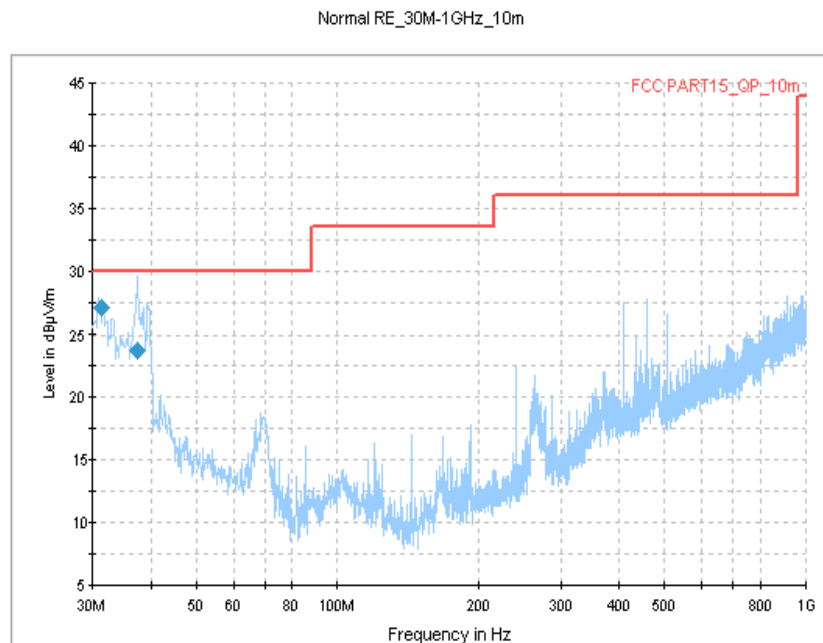


Fig.3 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
31.390000	27.0	114.0	V	210.0	-13.7	3.0	30.0
37.480500	23.7	108.0	V	270.0	-12.4	6.3	30.0

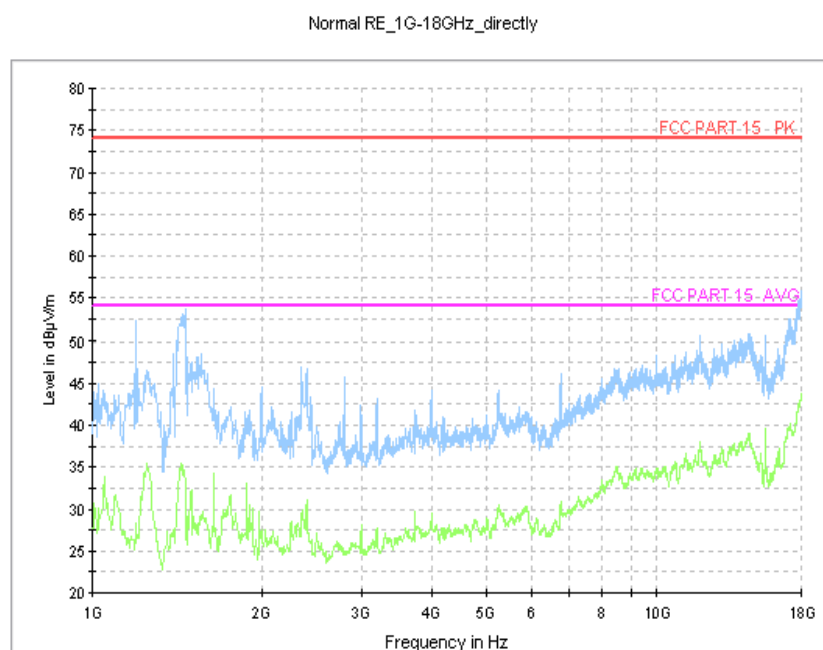


Fig.4 Radiated Emission from 1GHz to 18GHz

A.2 Conducted Emission (§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 150 kHz to 30 MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 - 2009, section 7.2.

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 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.

A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dBμV)	
	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/IF bandwidth	Sweep Time(s)
9kHz	1

A.2.5 Measurement Results

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

Charging Mode, Set.1

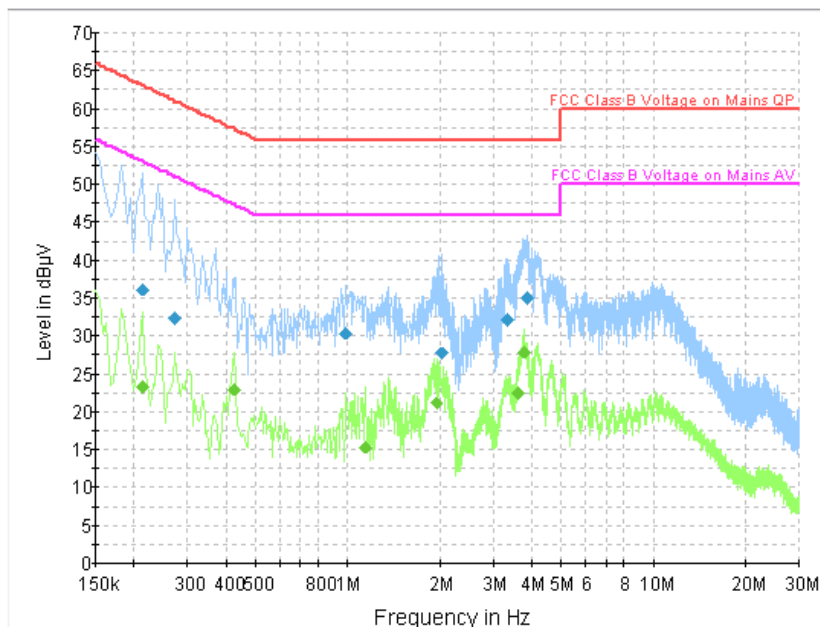


Fig.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	36.2	GND	L1	19.8	26.9	63.1
0.271500	32.4	GND	L1	19.8	28.7	61.1
0.987000	30.5	GND	N	19.7	25.5	56.0
2.017500	27.7	GND	L1	19.6	28.3	56.0
3.340500	32.3	GND	L1	19.7	23.7	56.0
3.844500	35.0	GND	L1	19.7	21.0	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	23.4	GND	L1	19.8	29.7	53.1
0.424500	23.0	GND	N	19.8	24.3	47.4
1.144500	15.4	GND	L1	19.6	30.6	46.0
1.950000	21.1	GND	L1	19.6	24.9	46.0
3.601500	22.5	GND	L1	19.7	23.5	46.0
3.781500	27.9	GND	L1	19.7	18.1	46.0

USB Mode, Set.2

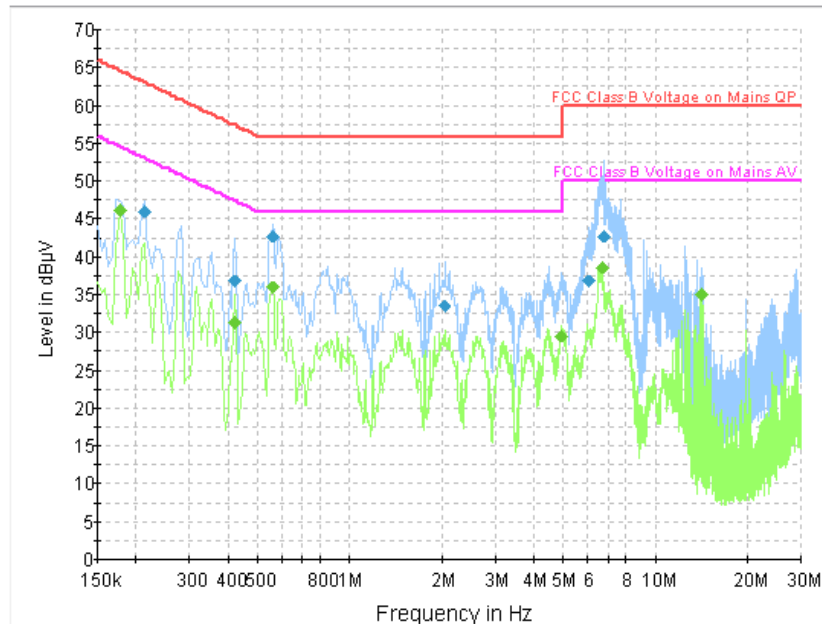


Fig.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	46.1	GND	N	19.8	17.0	63.1
0.420000	36.8	GND	L1	19.8	20.7	57.4
0.559500	42.7	GND	L1	19.8	13.3	56.0
2.040000	33.6	GND	N	19.6	22.4	56.0
6.063000	36.7	GND	N	19.7	23.3	60.0
6.747000	42.7	GND	L1	19.7	17.3	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	46.2	GND	N	19.7	8.4	54.6
0.420000	31.4	GND	L1	19.8	16.0	47.4
0.559500	35.9	GND	L1	19.8	10.1	46.0
4.965000	29.6	GND	N	19.6	16.4	46.0
6.702000	38.6	GND	L1	19.7	11.4	50.0
14.154000	35.0	GND	N	20.1	15.0	50.0

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