



TEST REPORT

No.B17N00006-EMC

for

Huawei Technologies Co.,Ltd.

Smart Watch

Model Name: LEO-DLXX

FCC ID: QISLEO-DLXX

with

Hardware Version: EA1LEOUM

Software Version: sawshark-userdebug7.1.1NFF47

Issued Date: 2017-02-09

Test Laboratory:

FCC 2.948 Listed: No.342690

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:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
B17N00006-EMC	Rev.0	1st edition	2017-02-09



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1. Test Laboratory

1.1. Testing Location

Address: TCL International E city No. 1001 Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong, China
Postal Code: 518048
Telephone: +86(755)33322000
Fax: +86(755)33322001

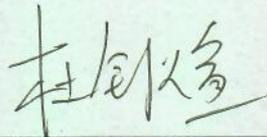
1.2. Testing Environment

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

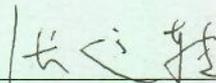
1.3. Project data

Testing Start Date: 2017-01-04
Testing End Date: 2017-02-06

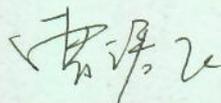
1.4. Signature



Du Zhaoxuan
(Prepared this test report)



Zhang Yunzhuan
(Reviewed this test report)



Cao Junfei
Director of the laboratory
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: Huawei Technologies Co.,Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co.,
Ltd., Bantian, Longgang District Shenzhen China

2.2. Manufacturer Information

Company Name: Huawei Technologies Co.,Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co.,
Ltd., Bantian, Longgang District Shenzhen China

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

3.1. About EUT

Description	Smart Watch
Model Name	LEO-DLXX
FCC ID	QISLEO-DLXX

The Equipment Under Test (EUT) are a model of Smart Watch with integrated antenna.

The EUT supports GPRS service and EGPRS service. It has MP3, 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.

Note: According to client's description, The EUT and the computer does not transfer data.

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI
EUT1	QEV0116B04000181

*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	charge dock	/
AE1		
Model	HB512627ECW	
Manufacturer	Huizhou Desay Battery Co., Ltd.	
Capacitance	410mAh	
Nominal Voltage	3.82V	
AE2-1		
Model	HW-050100U01	
Manufacturer	DONGGUAN PHITEK ELECTRONICS CO.,LTD.	
SN	P77901GB321957	
AE2-2		
Model	HW-050100U01	
Manufacturer	SHENZHEN HUNTKEY ELECTRONIC CO.,LTD.	
SN	H779K6G1M37948	
AE2-3		
Model	HW-050100U01	
Manufacturer	HUIZHOU BYD ELECTRONIC CO., LTD.	
SN	B77904G9M00168	



AE3

Model

Leo-Cradle

Manufacturer

Huawei Technologies Co.,Ltd.

*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 + AE2-1+ AE3	Charging mode
Set.2	EUT1+ AE1 + AE2-2+ AE3	Charging mode
Set.3	EUT1+ AE1 + AE2-3+ AE3	Charging 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-18000MHz,>90dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3 m distance, from 30 to 1000 MHz

Shield 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-10000MHz,>90dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω

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-18000MHz,>90dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18 GHz, 3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz



6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:	
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	CAL DUE DATE	CAL PERIOD
1.	Test Receiver	ESCI	100701	R&S	2017.08.09	1 year
2.	Test Receiver	ESR7	101675	R&S	2017.07.21	1 year
3.	Spectrum Analyzer	FSP 40	100378	R&S	2017.12.15	1 year
4.	BiLog Antenna	VULB9163	9163 330	Schwarzbeck	2017.04.22	3 years
5.	Horn Antenna	3117	00066585	ETS-Lindgren	2019.03.05	3 Years
6.	LISN	ESH2-Z5	100196	R&S	2018.01.05	1 year
7.	Universal Radio Communication Tester	E5515C	GB44051324	Agilent	2017.05.18	1 year
8.	Chamber	FACT5-2.0	4166	ETS-Lindgren	2018.05.13	3 years

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 charging mode. During the test MS is connected to a charger in the case of charging mode.

A.1.3 Measurement Limit

Limit from CFR Part 15.109(a)

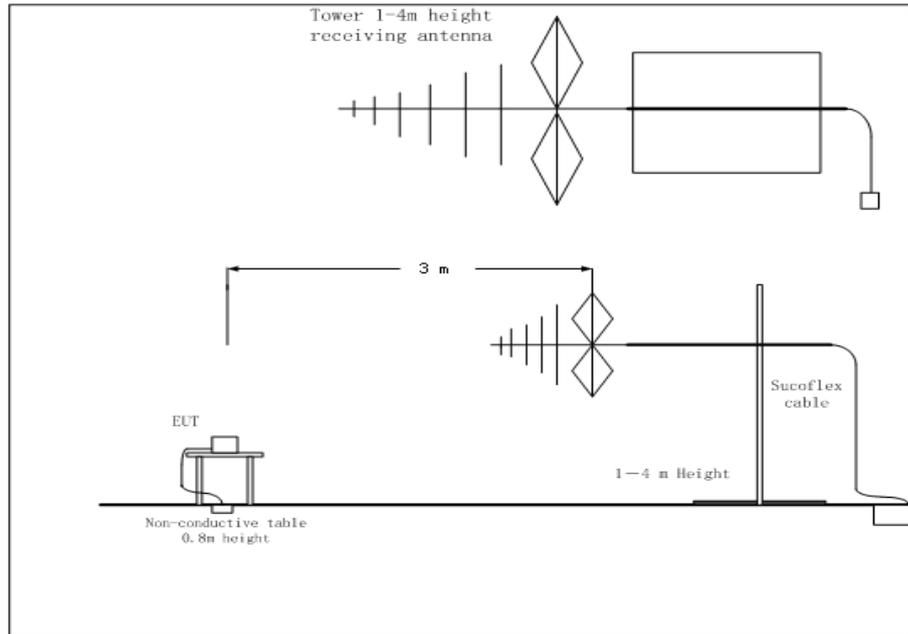
Frequency range (MHz)	Field strength limit ($\mu\text{V}/\text{m}$)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

*Note: The original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

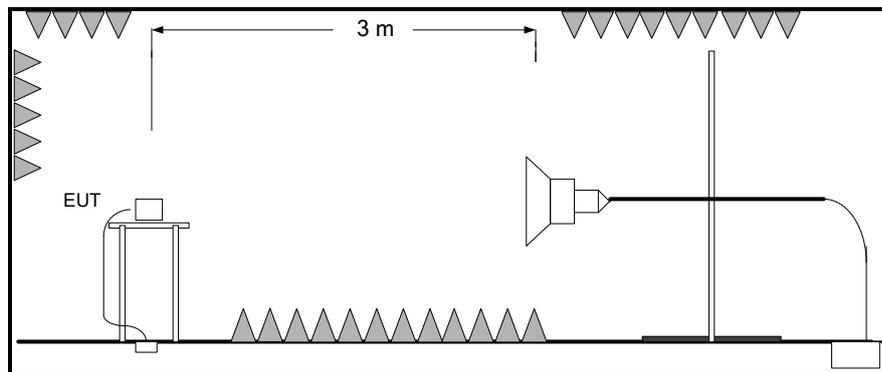
A.1.4 Test Condition

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

**A.1.5 Test set-up:
30MHz-1GHz**



1GHz-18GHz



A.1.6 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.

Note: the result contains vertical part and Horizontal part

RE Measurement uncertainty: 30M-1GHz: 5.12dB (k=2);
1GHz-18GHz: 4.48 dB (k=2)

Set.1 Charging mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Limit (dB μ V/m)	Margin(dB)	Polarity	A_{Rpl} (dB)	P_{Mea} (dB μ V)
14038.500000	54.32	74.00	19.68	V	10.9	43.42
15086.000000	54.77	74.00	19.23	V	12.1	42.67
15758.000000	56.83	74.00	17.17	V	12.8	44.03
16226.500000	57.76	74.00	16.24	V	13.1	44.66
16876.500000	57.14	74.00	16.86	V	14.0	43.14
17846.000000	57.37	74.00	16.63	V	13.8	43.57

Set.1 Charging mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Limit (dB μ V/m)	Margin(dB)	Polarity	A_{Rpl} (dB)	P_{Mea} (dB μ V)
14529.500000	43.05	54.00	10.95	V	11.8	31.25
15150.500000	43.92	54.00	10.08	V	12.1	31.82
15676.500000	45.23	54.00	8.77	V	12.6	32.63
16200.000000	45.49	54.00	8.51	V	13.1	32.39
16804.000000	46.09	54.00	7.91	V	13.9	32.19
17291.000000	45.60	54.00	8.40	V	13.9	31.7

Set.2 Charging mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Limit (dB μ V/m)	Margin(dB)	Polarity	A _{Rpl} (dB)	P _{Mea} (dB μ V)
14172.000000	54.73	74.00	19.27	V	11.2	43.53
15128.500000	54.90	74.00	19.10	V	12.1	42.8
15755.000000	56.84	74.00	17.16	V	12.8	44.04
16307.500000	56.88	74.00	17.12	V	13.3	43.58
16721.000000	57.52	74.00	16.48	V	13.8	43.72
17787.500000	58.12	74.00	15.88	V	13.9	44.22

Set.2 Charging mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Limit (dB μ V/m)	Margin(dB)	Polarity	A _{Rpl} (dB)	P _{Mea} (dB μ V)
14553.000000	42.98	54.00	11.02	V	11.9	31.08
15168.000000	44.19	54.00	9.81	V	12.1	32.09
15752.000000	45.48	54.00	8.52	V	12.8	32.68
16223.000000	45.96	54.00	8.04	V	13.1	32.86
16786.000000	46.49	54.00	7.51	V	13.9	32.59
17298.500000	45.95	54.00	8.05	V	13.9	32.05

Set.3 Charging mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Limit (dB μ V/m)	Margin(dB)	Polarity	A _{Rpl} (dB)	P _{Mea} (dB μ V)
14532.000000	54.79	74.00	19.21	V	11.8	42.99
15153.500000	56.03	74.00	17.97	V	12.1	43.93
15684.500000	56.91	74.00	17.09	V	12.6	44.31
16377.500000	56.82	74.00	17.18	V	13.5	43.32
16773.000000	57.47	74.00	16.53	V	13.9	43.57
17466.500000	57.96	74.00	16.04	V	14.0	43.96

Set.3 Charging mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Limit (dB μ V/m)	Margin(dB)	Polarity	A _{Rpl} (dB)	P _{Mea} (dB μ V)
14550.000000	43.36	54.00	10.64	V	11.9	31.46
15142.000000	44.24	54.00	9.76	V	12.1	32.14
15767.500000	45.57	54.00	8.43	V	12.8	32.77
16178.500000	45.95	54.00	8.05	V	13.1	32.85
16749.000000	46.59	54.00	7.41	V	13.9	32.69
17353.500000	46.29	54.00	7.71	V	14.0	32.29

Note: The measurement result of Set.1, Set.2 and Set.3 showed here are worst cases of combinations of different batteries and USB cables.

Charging mode: Set 1

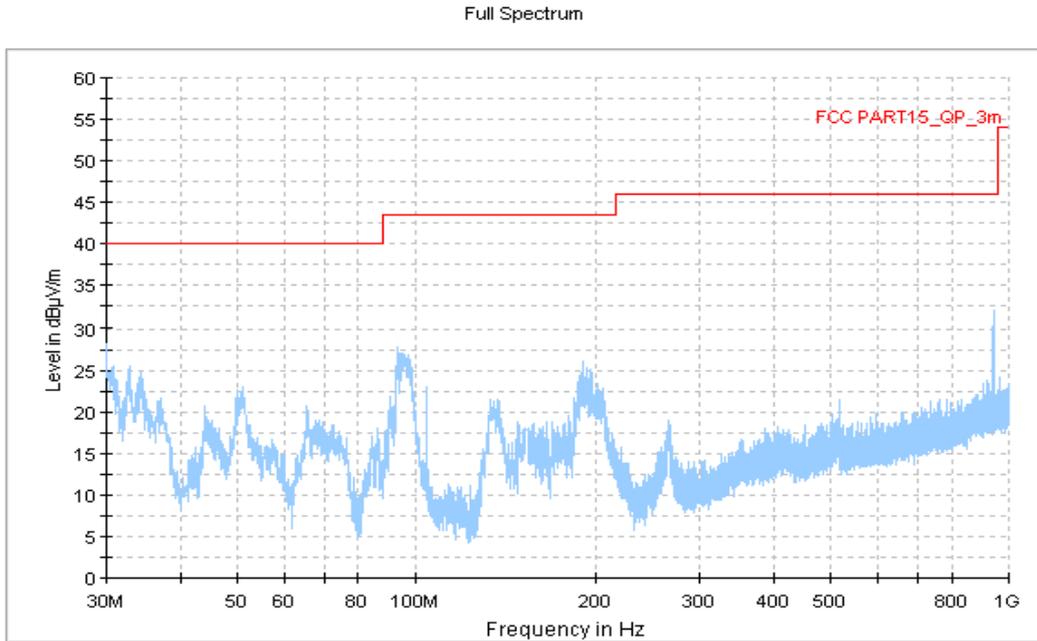


Figure A.1 Radiated Emission from 30MHz to 1GHz

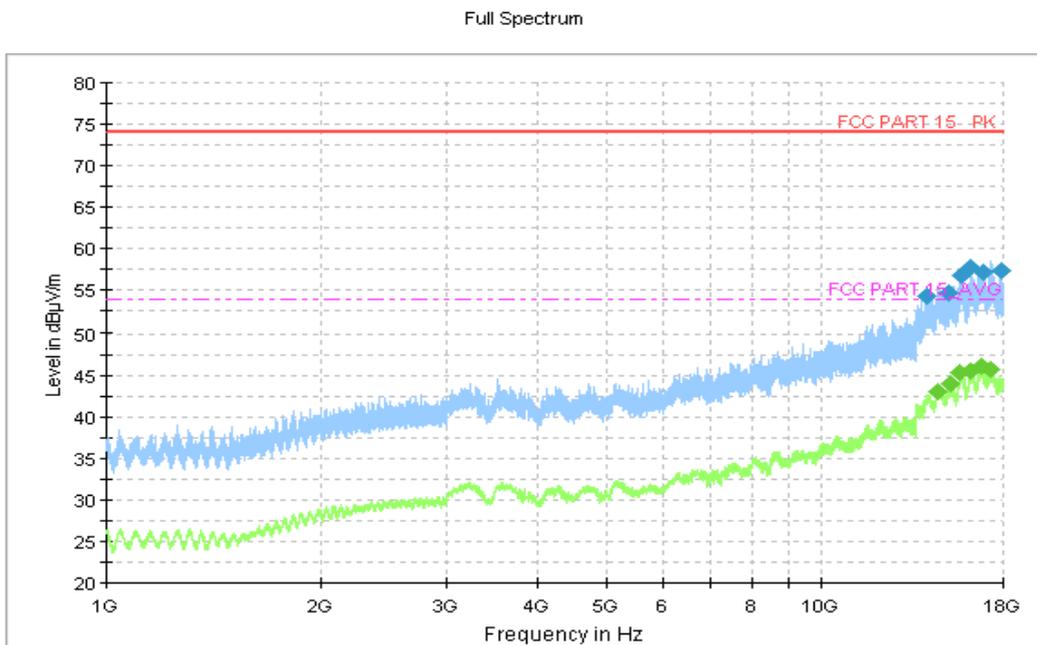


Figure A.2 Radiated Emission from 1GHz to 18GHz

Charging mode: Set 2

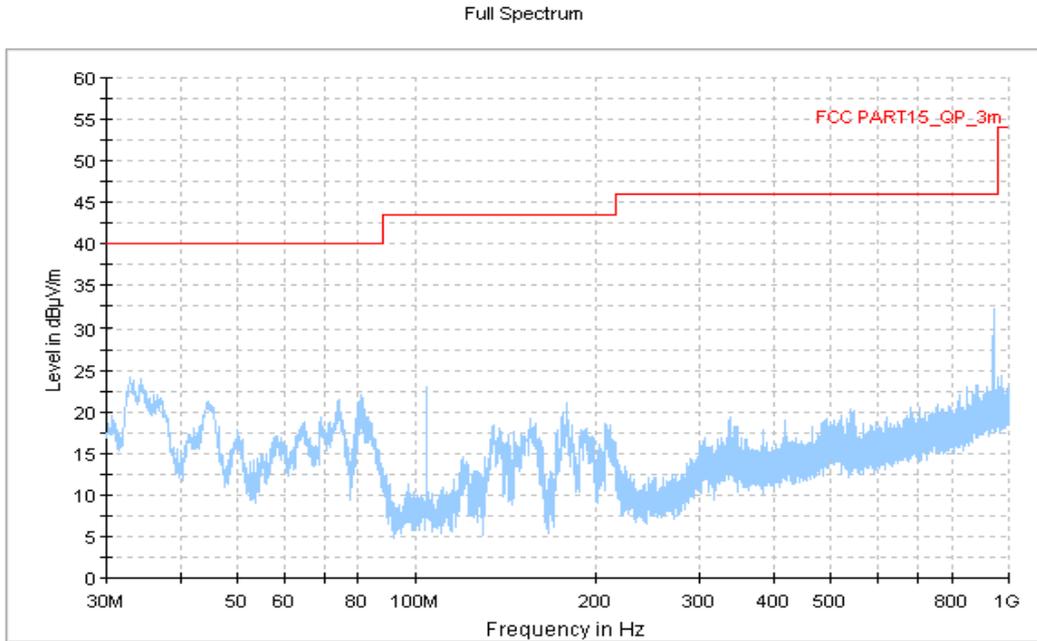


Figure A.3 Radiated Emission from 30MHz to 1GHz

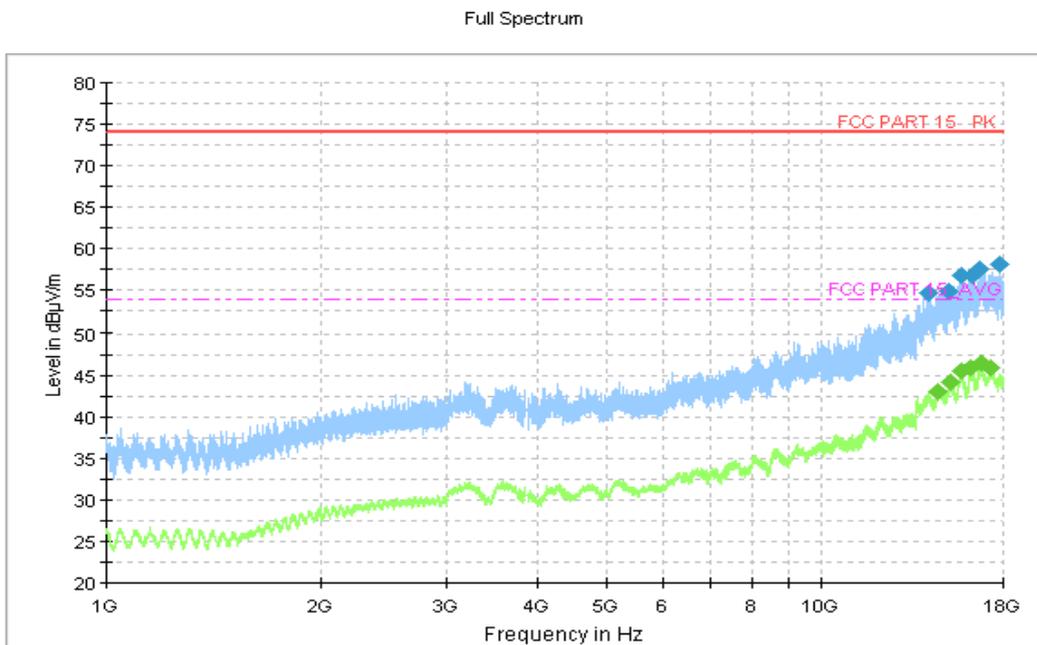


Figure A.4 Radiated Emission from 1GHz to 18GHz

Charging mode: Set 3

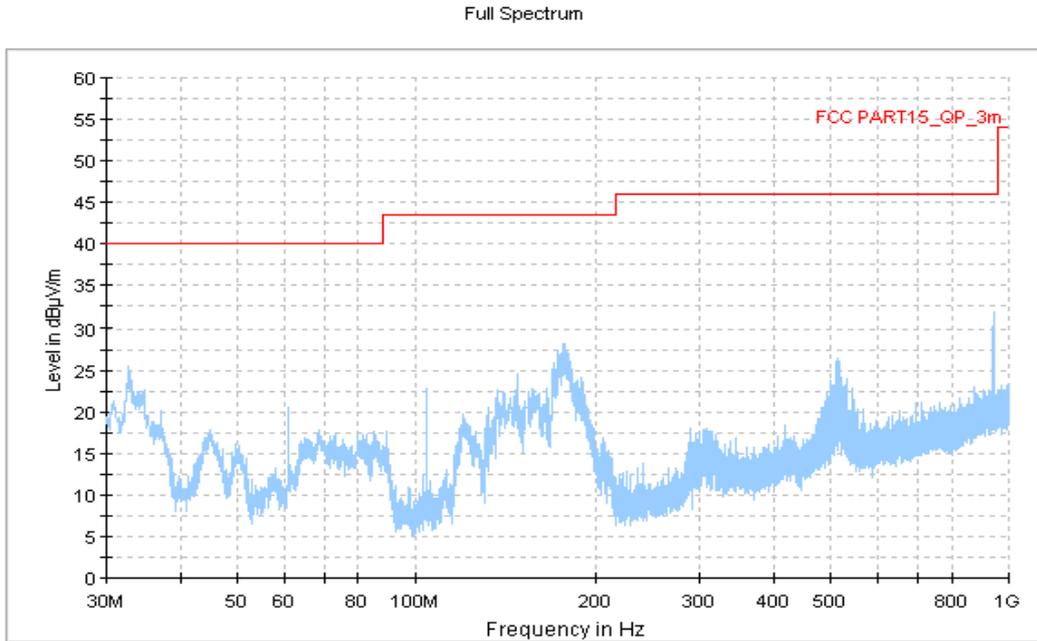


Figure A.5 Radiated Emission from 30MHz to 1GHz

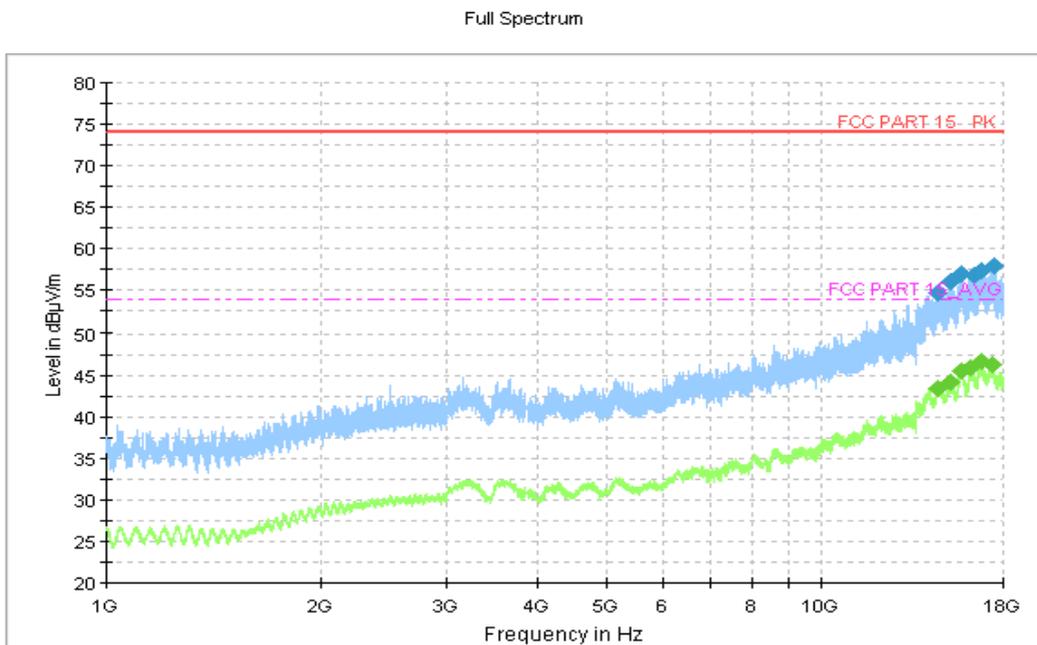


Figure A.6 Radiated Emission from 1GHz to 18GHz

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 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:

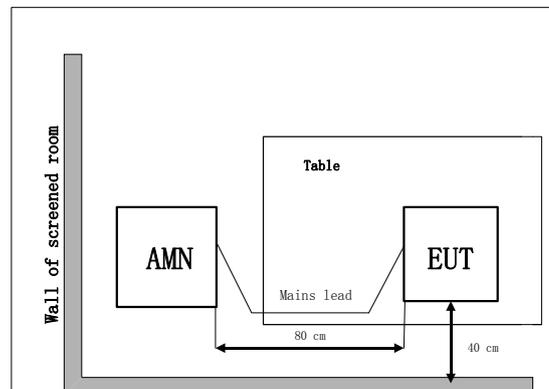
The MS is operating in the charging mode. During the test MS is connected to a charger in the case of charging mode.

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 set-up:



A.2.5 Test Condition in charging mode

Voltage (V)	Frequency (Hz)
120	60
240	60

RBW	Sweep Time(s)
9kHz	1

CE Measurement uncertainty: 3.06 dB (k=2)

A.2.6 Measurement Results
Charging mode:Set.1
Voltage:120V

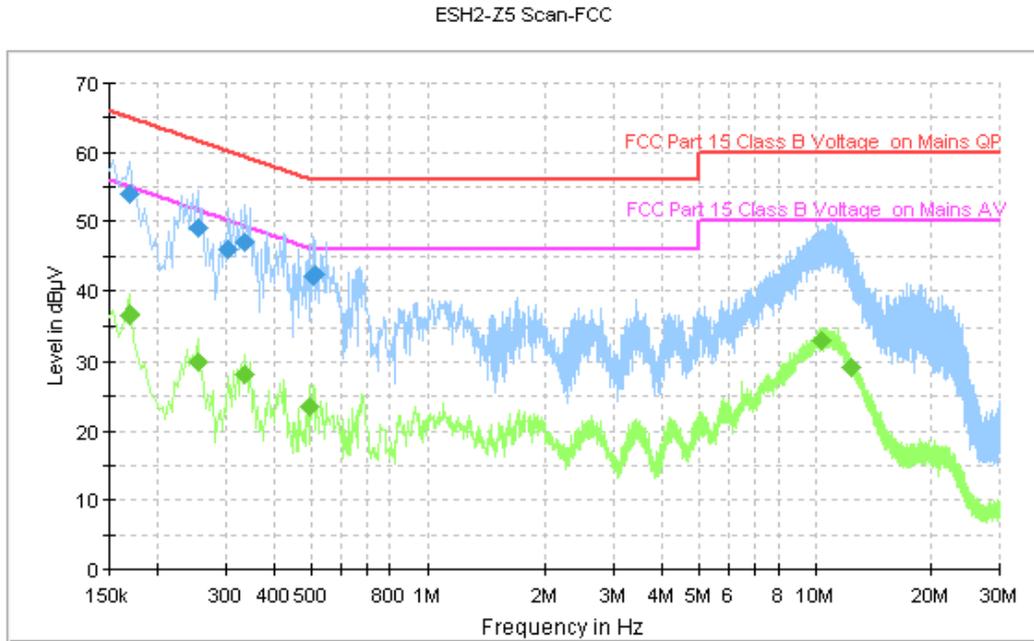


Figure A.7 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.170000	54.1	GND	N	9.6	10.9	65.0
0.254000	49.1	GND	N	9.6	12.6	61.6
0.306000	46.1	GND	N	9.6	14.0	60.1
0.338000	47.1	GND	N	9.6	12.1	59.3
0.506000	42.2	GND	N	9.7	13.8	56.0
0.514000	42.4	GND	N	9.7	13.6	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.170000	36.6	GND	N	9.6	18.4	55.0
0.254000	29.9	GND	N	9.6	21.7	51.6
0.338000	28.2	GND	N	9.6	21.0	49.3
0.498000	23.5	GND	N	9.7	22.6	46.0
10.354000	33.1	GND	N	9.9	16.9	50.0
12.426000	29.1	GND	N	9.9	20.9	50.0

Charging mode: Set.2
Voltage: 120V

ESH2-Z5 Scan-FCC

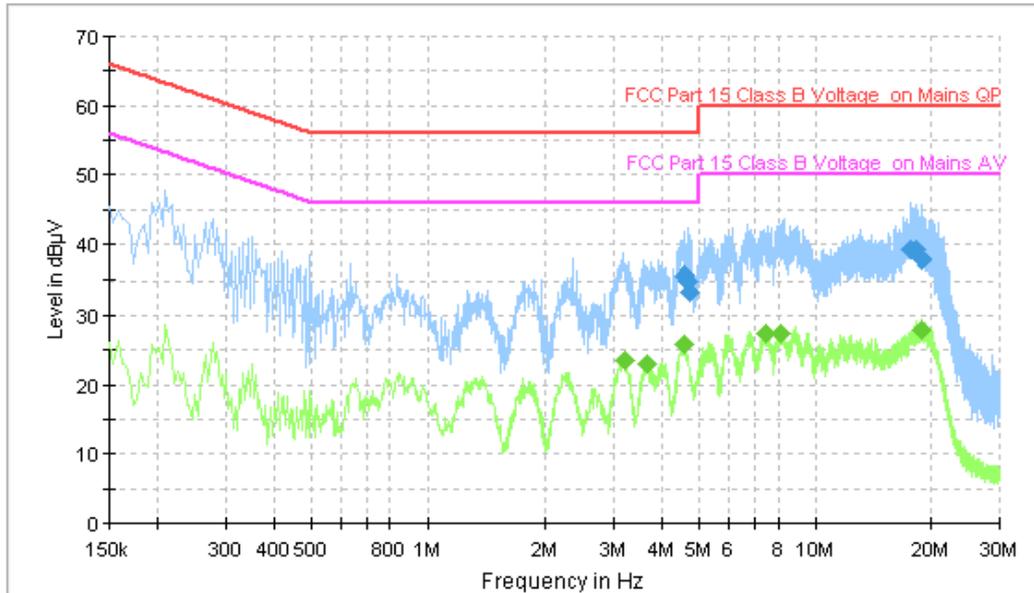


Figure A.8 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
4.566000	35.7	GND	N	9.6	20.3	56.0
4.670000	34.9	GND	N	9.6	21.1	56.0
4.738000	33.3	GND	N	9.6	22.7	56.0
17.590000	39.2	GND	N	9.9	20.8	60.0
18.318000	39.2	GND	N	9.9	20.8	60.0
18.834000	38.1	GND	N	10.0	21.9	60.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
3.210000	23.5	GND	N	9.6	22.5	46.0
3.678000	22.9	GND	N	9.6	23.1	46.0
4.570000	25.8	GND	N	9.6	20.2	46.0
7.414000	27.3	GND	N	9.8	22.7	50.0
8.150000	27.3	GND	N	9.8	22.7	50.0
18.766000	28.0	GND	N	10.0	22.0	50.0

Charging mode:Set.3
Voltage:120V

ESH2-Z5 Scan-FCC

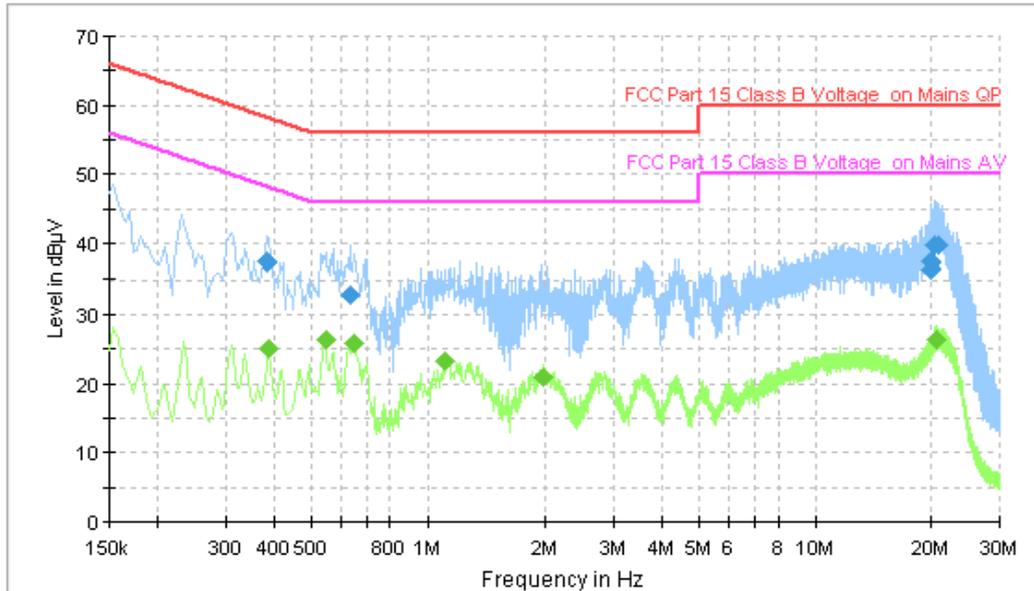


Figure A.9 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.386000	37.4	GND	N	9.6	20.8	58.1
0.630000	32.9	GND	N	9.6	23.1	56.0
19.854000	36.4	GND	N	10.0	23.6	60.0
19.986000	37.5	GND	N	10.0	22.5	60.0
20.462000	39.7	GND	N	10.0	20.3	60.0
20.850000	39.8	GND	N	10.0	20.2	60.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.390000	25.0	GND	N	9.6	23.1	48.1
0.546000	26.4	GND	N	9.7	19.6	46.0
0.646000	25.8	GND	N	9.6	20.2	46.0
1.110000	23.2	GND	N	9.6	22.8	46.0
1.982000	21.0	GND	N	9.6	25.0	46.0
20.602000	26.4	GND	N	10.0	23.6	50.0

Charging mode:Set.1
Voltage:240V

ESH2-Z5 Scan-FCC

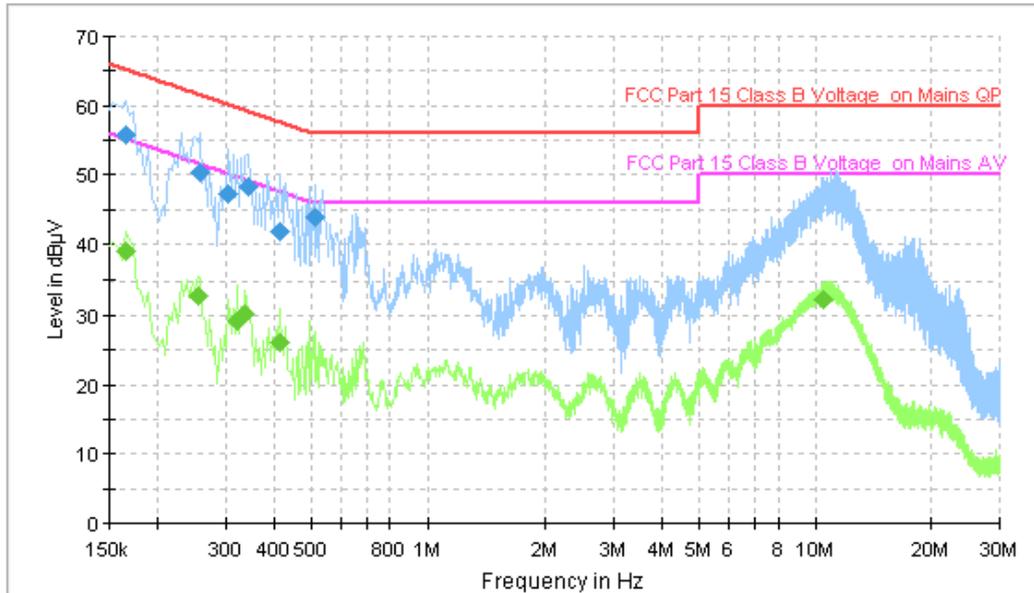


Figure A.10 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.166000	55.7	GND	N	9.6	9.4	65.2
0.258000	50.3	GND	N	9.6	11.2	61.5
0.306000	47.2	GND	N	9.6	12.9	60.1
0.342000	48.3	GND	N	9.6	10.8	59.2
0.414000	41.8	GND	N	9.7	15.7	57.6
0.514000	44.0	GND	N	9.7	12.0	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.166000	38.9	GND	N	9.6	16.3	55.2
0.254000	32.8	GND	N	9.6	18.9	51.6
0.322000	29.1	GND	N	9.6	20.6	49.7
0.338000	30.1	GND	N	9.6	19.1	49.3
0.414000	26.0	GND	N	9.7	21.6	47.6
10.542000	32.4	GND	N	9.9	17.6	50.0

Charging mode: Set.2
Voltage: 240V

ESH2-Z5 Scan-FCC

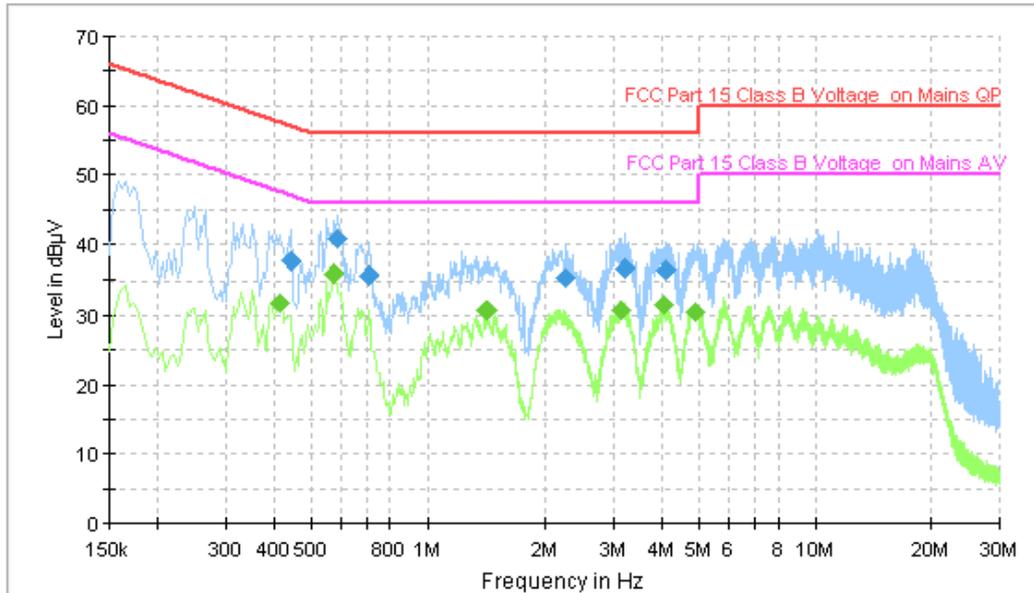


Figure A.11 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.442000	37.8	GND	N	9.7	19.2	57.0
0.582000	40.7	GND	N	9.6	15.3	56.0
0.706000	35.6	GND	N	9.5	20.4	56.0
2.262000	35.3	GND	N	9.6	20.7	56.0
3.214000	36.7	GND	N	9.6	19.3	56.0
4.114000	36.3	GND	N	9.6	19.7	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.414000	31.7	GND	N	9.7	15.9	47.6
0.570000	35.9	GND	N	9.7	10.1	46.0
1.410000	30.8	GND	N	9.5	15.2	46.0
3.138000	30.8	GND	N	9.6	15.2	46.0
4.034000	31.5	GND	N	9.6	14.5	46.0
4.874000	30.4	GND	N	9.6	15.6	46.0

Charging mode:Set.3
Voltage:240V

ESH2-Z5 Scan-FCC

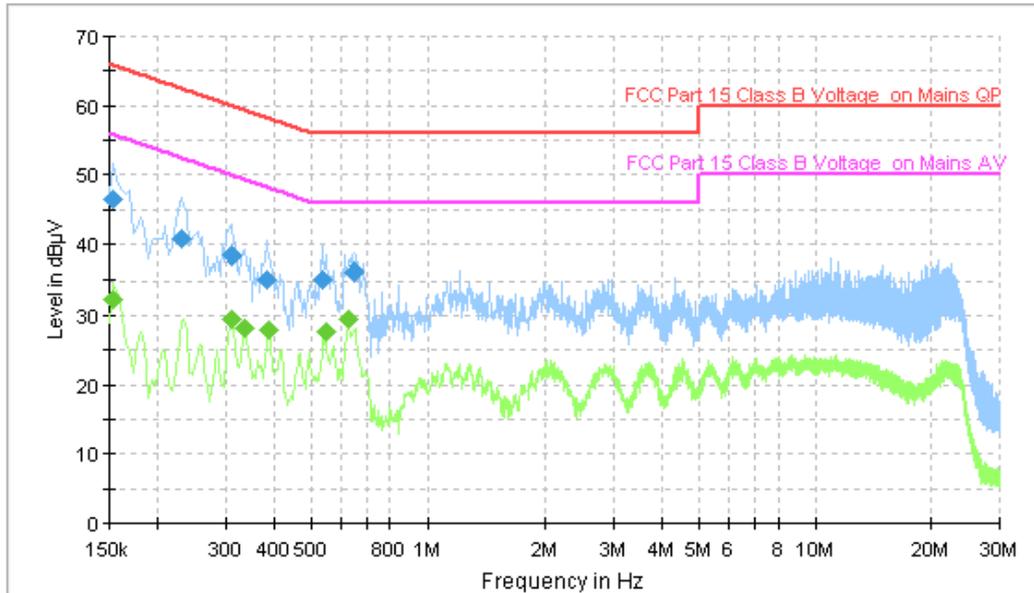


Figure A.12 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.154000	46.4	GND	N	9.6	19.3	65.8
0.230000	40.8	GND	N	9.6	21.7	62.4
0.310000	38.5	GND	N	9.6	21.5	60.0
0.382000	35.2	GND	N	9.6	23.1	58.2
0.534000	35.1	GND	N	9.7	20.9	56.0
0.646000	36.3	GND	N	9.6	19.7	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.154000	32.3	GND	N	9.6	23.5	55.8
0.310000	29.4	GND	N	9.6	20.5	50.0
0.338000	28.2	GND	N	9.6	21.1	49.3
0.390000	27.8	GND	N	9.6	20.3	48.1
0.546000	27.6	GND	N	9.7	18.4	46.0
0.622000	29.4	GND	N	9.6	16.6	46.0

END OF REPORT