TESTREPORT

No.I19N02705-EMC

for

Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd

smartphone

Model Name: CP3706AS

FCC ID: R38YLCP3706AS

Hardware Version: P1

Software Version: 3706AS.SPRINT.191220.2D

Issued Date: 2020-01-19

Designation Number: CN1210

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 SAICT.

Test Laboratory:

Shenzhen Academy of Information and Communications Technology

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19N02705-EMC	Rev.0	1st edition	2020-01-19

CONTENTS

1. Summary of Test Report

1.1. Test Items

Description	smartphone
Model Name	CP3706AS
Applicant's name	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Manufacturer's Name	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd

1.2. Test Standards

Please refer to "4. Reference Documents"

1.3. Test Result

Please refer to "6.2 Test Results"

1.4. Testing Location

Address:	Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, China

1.5. Project data

Testing Start Date:	2019-12-05
Testing End Date:	2019-01-18

1.6. Signature

Liang Yong

(Prepared this test report)

Zhang Yunzhuan

(Reviewed this test report)

Cao Junfei

Director of the laboratory

(Approved this test report)

2. ClientInformation

2.1. Applicant Information

Company Name:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen
Contact:	Emily zhang
E-mail	zhangxuzhu@yulong.com
Tel:	15089742056

2.2. Manufacturer Information

Company Name:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen
Contact:	Emily zhang
E-mail	zhangxuzhu@yulong.com
Tel:	15089742056

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

3.1. About EUT

Description	smartphone
Model Name	CP3706AS
Brand Name	coolpad
FCC ID	R38YLCP3706AS
Bands	GSM 850/1900 bands, WCDMA BANDB 2/4/5, CDMA BC0/BC1/BC10, LTE BAND 2/4/5/7/12/13/25/26/41/66/71/CA_41C
Functions	2.4G Wi-Fi, 5G Wi-Fi, Bluetooth, FM, GPS/GLONASS
Condition of EUT as received	No obvious damage in appearance

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

EUT ID*	SN or IMEI	HW Version	SW Version	Receive Date
UT01aa	990015570009332	P1	3706AS.SPRINT.191220.2D	2019-12-05

*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	QC3.0 Charger	/
AE3	Type C cable	/
AE4	Headset	/

AE1

Model	3706AS_CA406787G
Manufacturer	CosMX
Capacity	3980mAh
Nominal Voltage	3.85 v

AE2

Model	Q3W18-1U-A
Manufacturer	Ruide

AE3

Model	LS-KP002
Manufacturer	Lishi

*AE ID: is used to identify the test sample in the lab internally.
AE4:Just for testing.

3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	UT01aa+AE1+AE2+AE3	/
Set.2	UT01aa+AE1+AE3	Data transfer Mode
Set.3	UT01aa+AE1+AE2+AE4	FM receiver 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	10-1-2018 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:
9.10m×6.10m×5.60m (L×W×H)

Temperature	Min. = 15 ℃, Max. = 35℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-18000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω
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 ℃, Max. = 30 ℃
Relative humidity	Min. =20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-10000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω

Fully-anechoic chamber did not exceed following limits along the EMC testing:
9.10m×6.10m×5.60m (L×W×H)

Temperature	Min. = 15 ℃, Max. = 35℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-18000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω
Voltage Standing Wave Ratio（VSWR）	≤ 6 dB, from 1 to 18GHz，3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

6. SUMMARY OF TEST RESULTS

6.1. Testing Environment

Normal Temperature: 15~35℃
Relative Humidity: 20~75%
Atmospheric pressure 86~106kPa

6.2. Summary of Measurement 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)	B.2	P

6.3. Statement

6.3.1 Statements of conformity

This report takes measured values as criterion of test conclusion. The test conclusion meets the limit requirements.

7. Measurement uncertainty

Test item	Frequency ranges	Measurement uncertaint
RE	30MHz-1GHz	4.90dB(k=2)
	1GHz-18GHz	4.60dB(k=2)
	18GHz-40GHz	4.10dB(k=2)
CE	150kHz-30MHz	3.10dB(k=2)

8. Test Facilities Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CALDUE DATE	CAL PERIOD
1.	Test Receiver	ESR7	101676	R&S	2020.11.27	1 year
2.	Test Receiver	ESCI	100702	R&S	2021.01.14	1 year
3.	Spectrum Analyzer	FSV40	101192	R&S	2021.01.14	1 year
4.	BiLog Antenna	3142E	00224831	ETS-Lindgren	2021.05.17	3 years
5.	LISN	ENV216	102067	R&S	2020.07.17	1 year
6.	Horn Antenna	3117	00066577	ETS-Lindgren	2022.04.02	3 years
7.	Horn Antenna	QSH-SL-18-26-S-20	17013	Q-par	2023.01.06	3 years
8.	Horn Antenna	QWH-SL-18-40-K-20	17014	Q-par	2023.01.06	3 years
9.	Universal Radio Communication Tester	CMU200	114545	R&S	2021.01.14	1 year
10.	Chamber	FACT3-2.0	1285	ETS-Lindgren	2021.07.19	2 years
11.	Software	EMC32	V10.01.00	R&S	/	/
12.	PC	ThinkPad T480	PF-13LW0C	Lenovo	/	/
13.	Printer	P1008	VNF6C12491	HP	/	/
14.	Mouse	MOEUUOA	44NY517	Lenovo	/	/

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 (Data transfer 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:

Charging Mode/ Camera Mode: The EUT is keeping on taking photos. The EUT is connected to a charger.

Charging Mode/ Video play Mode: The EUT is keeping on playing Video play. The EUT is connected to a charger.

Charging Mode/ FM receiver Mode: The EUT is synchronized to System Simulator (SS), and able to respond to paging messages and incoming call. An established call has been released. The FM receiver function is on. The EUT is connected to a charger.

Data transfer Mode: The model of the PC is Lenovo ThinkPad T480, and the serial number of the PC is PF-13LW0C. The software is used to let the PC keep on copying data to EUT or TF Card, 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 (μV/m)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

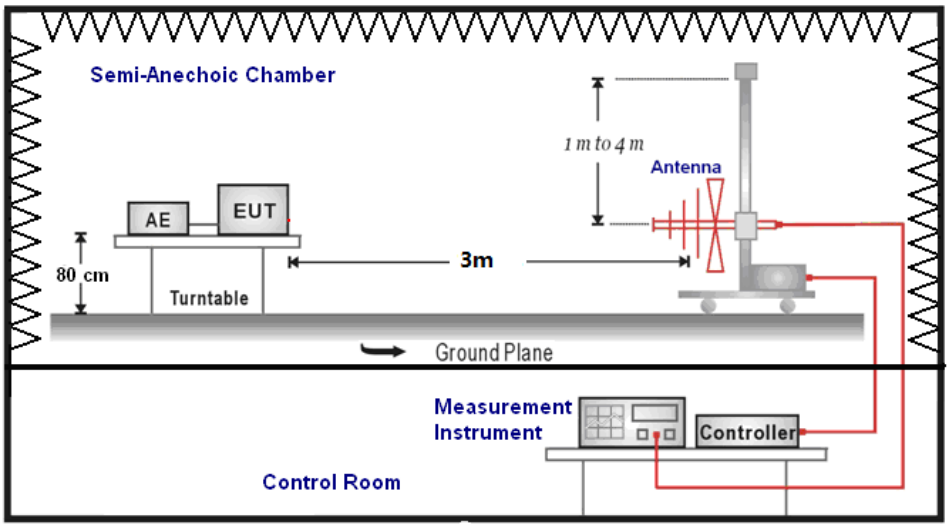
*Note: The original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

A.1.4 Test Condition

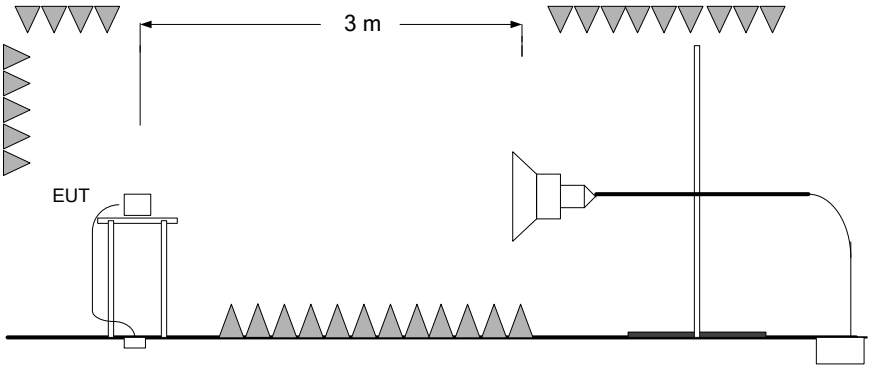
Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz (IF bandwidth)	5
Above 1000	1MHz/3MHz	15

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:

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

Where

G_A: Antenna factor of receive antenna

G_{PL}:PathLoss

P_{Mea}: Measurement result on receiver.

Note: the result contains vertical part and Horizontal part

Set.1 Charging Mode/ Camera Mode / Peak detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10235.5	46.79	74	27.21	H	5.2	41.59
11893	47.34	74	26.66	H	6.9	40.44
13062.5	47.46	74	26.54	H	8.3	39.16
14521.5	49.53	74	24.47	H	11.5	38.03
16364	50.94	74	23.06	V	14.2	36.74
17909.5	51.76	74	22.24	V	16.3	35.46

Set.1 Charging Mode/ Camera Mode / Average detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10235.5	36.96	54	17.04	H	5.2	31.76
11947	37.7	54	16.3	H	7	30.7
13198	38.13	54	15.87	V	8.5	29.63
14516	39.73	54	14.27	H	11.5	28.23
16708	41.79	54	12.21	H	14.9	26.89
17906.5	41.99	54	12.01	H	16.3	25.69

Set.1 Charging Mode/ Video play Mode / Peak detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10221	45.45	74	28.55	V	5.1	40.35
11951.5	47.5	74	26.5	V	7	40.5
13311	47.89	74	26.11	V	8.9	38.99
14375.5	48.98	74	25.02	V	10.9	38.08
16176	50.51	74	23.49	H	14.3	36.21
17649.5	51.49	74	22.51	V	15.5	35.99

Set.1 Charging Mode/ Video play Mode / Average detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10608.5	35.89	54	18.11	V	4.9	30.99
11613	37.36	54	16.64	V	6.8	30.56
12753.5	37.32	54	16.68	H	7.8	29.52
14437.5	39.31	54	14.69	V	11	28.31
16723.5	41.4	54	12.6	V	14.9	26.5
17925.5	42.29	54	11.71	V	16.1	26.19

Set.3 Charging Mode/ FM receiver Mode/ Peak detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10225	47.52	74	26.48	H	5.1	42.42
11715	47.54	74	26.46	V	6.9	40.64
12529	48.16	74	25.84	V	8	40.16
14496.5	49.47	74	24.53	H	11.4	38.07
16263	50.67	74	23.33	V	14.3	36.37
17973.5	51.43	74	22.57	H	16	35.43

Set.3 Charging Mode/ FM receiver Mode/ Average detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10157	36.44	54	17.56	V	5	31.44
11683.5	37.4	54	16.6	H	7.1	30.3
13297.5	37.95	54	16.05	H	9	28.95
14512.5	39.68	54	14.32	V	11.5	28.18
16359	40.98	54	13.02	V	14.3	26.68
17760.5	41.69	54	12.31	V	16.2	25.49

Set.2 Data transfer Mode/PC to EUT / Peak detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10473	45.31	74	28.69	V	5	40.31
12104.5	46.47	74	27.53	V	7.3	39.17
13332.5	46.99	74	27.01	V	8.8	38.19
14608.5	49.04	74	24.96	H	11.2	37.84
16212	50.12	74	23.88	V	14.4	35.72
17586.5	50.97	74	23.03	H	15.5	35.47

Set.2 Data transfer Mode/PC to EUT / Average detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10388	35.93	54	18.07	V	5	30.93
11549	36.75	54	17.25	H	6.4	30.35
12925	37.33	54	16.67	V	8.6	28.73
14824	38.64	54	15.36	H	10.7	27.94
16511	40.87	54	13.13	H	14.8	26.07
17882.5	41.7	54	12.3	H	16.2	25.5

Set.2 Data transfer Mode /EUT to PC / Peak detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
11819	46	74	28	V	6.6	39.4
10687.5	46.08	74	27.92	H	4.9	41.18
12931	47.63	74	26.37	H	8.6	39.03
14513.5	49.1	74	24.9	V	11.5	37.6
16632.5	50.71	74	23.29	H	14.9	35.81
17979	51.11	74	22.89	V	15.9	35.21

Set.2 Data transfer Mode /EUT to PC / Average detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10452.5	36.11	54	17.89	H	5	31.11
11895.5	36.99	54	17.01	H	7	29.99
12989.5	37.23	54	16.77	V	8.3	28.93
14502.5	39.17	54	14.83	V	11.5	27.67
16702.5	41.26	54	12.74	H	14.9	26.36
17909.5	41.73	54	12.27	H	16.3	25.43

Set.2 Data transfer Mode/PC to TF Card / Peak detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10841.5	45.65	74	28.35	V	5.3	40.35
12175.5	46.38	74	27.62	H	7.1	39.28
13263	46.78	74	27.22	H	8.7	38.08
14751.5	48.74	74	25.26	V	10.8	37.94
16245	50.86	74	23.14	H	14.3	36.56
17942.5	51.46	74	22.54	V	16	35.46

Set.2 Data transfer Mode/PC to TF Card / Average detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
10636.5	35.96	54	18.04	V	4.9	31.06
12537.5	37.26	54	16.74	H	8	29.26
13300.5	37.25	54	16.75	H	9	28.25
14581.5	39.2	54	14.8	V	11.3	27.9
16523	41.13	54	12.87	V	14.8	26.33
17955	41.98	54	12.02	H	16.1	25.88

Set.2 Data transfer Mode/TF Card to PC/Peak detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
12524	46.93	74	27.07	V	8	38.93
13288.5	47.6	74	26.4	H	8.9	38.7
15308	48.61	74	25.39	H	11.6	37.01
14568.5	49.12	74	24.88	V	11.4	37.72
16563.5	51.29	74	22.71	H	14.8	36.49
17850.5	51.72	74	22.28	H	16.1	35.62

Set.2 Data transfer Mode/TF Card to PC /Average detector

Frequency(MHz)	Result(dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBμV)
12122.5	37.17	54	16.83	H	7.3	29.87
13311	37.86	54	16.14	V	8.9	28.96
14175.5	38.19	54	15.81	H	10.8	27.39
14912.5	38.75	54	15.25	V	11.1	27.65
16711	41.21	54	12.79	H	14.9	26.31
17899.5	41.91	54	12.09	V	16.3	25.61

Charging Mode/ Camera Mode: Set.1

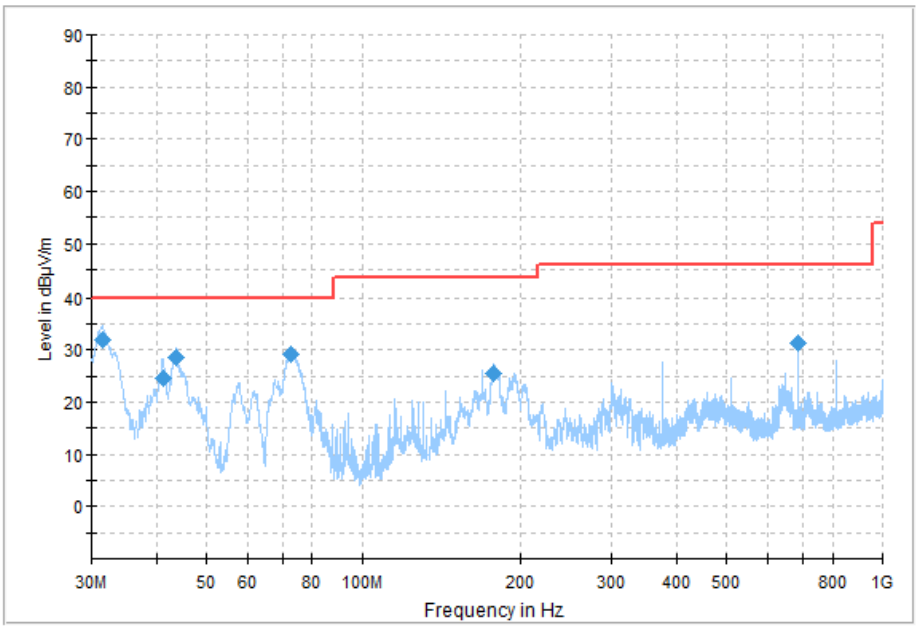


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
31.568889	31.98	40	8.02	V	-25.6	57.58
41.321111	24.59	40	15.41	V	-30	54.59
43.801667	28.42	40	11.58	V	-31.9	60.32
72.958889	29.01	40	10.99	V	-33.9	62.91
178.132778	25.5	43.5	18	V	-32.8	58.3
687.532222	31.33	46	14.67	V	-19.9	51.23

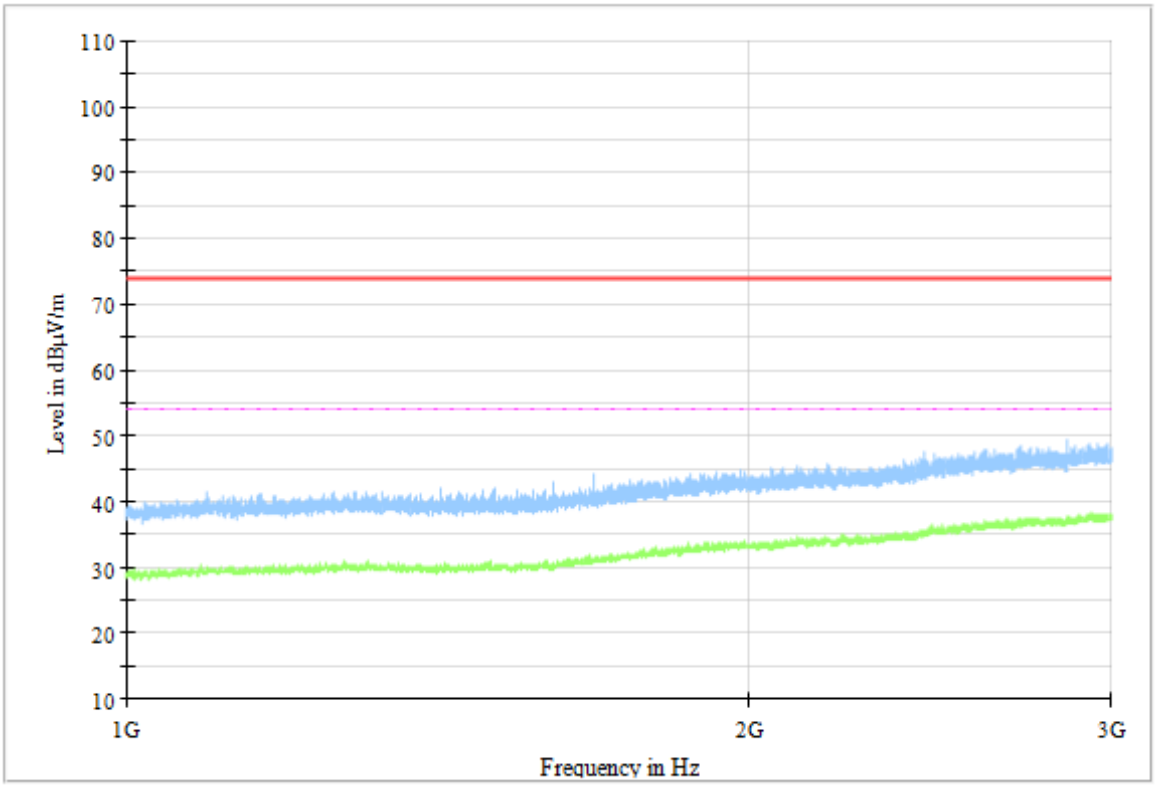


Figure A.2 Radiated Emission from 1GHz to 3GHz

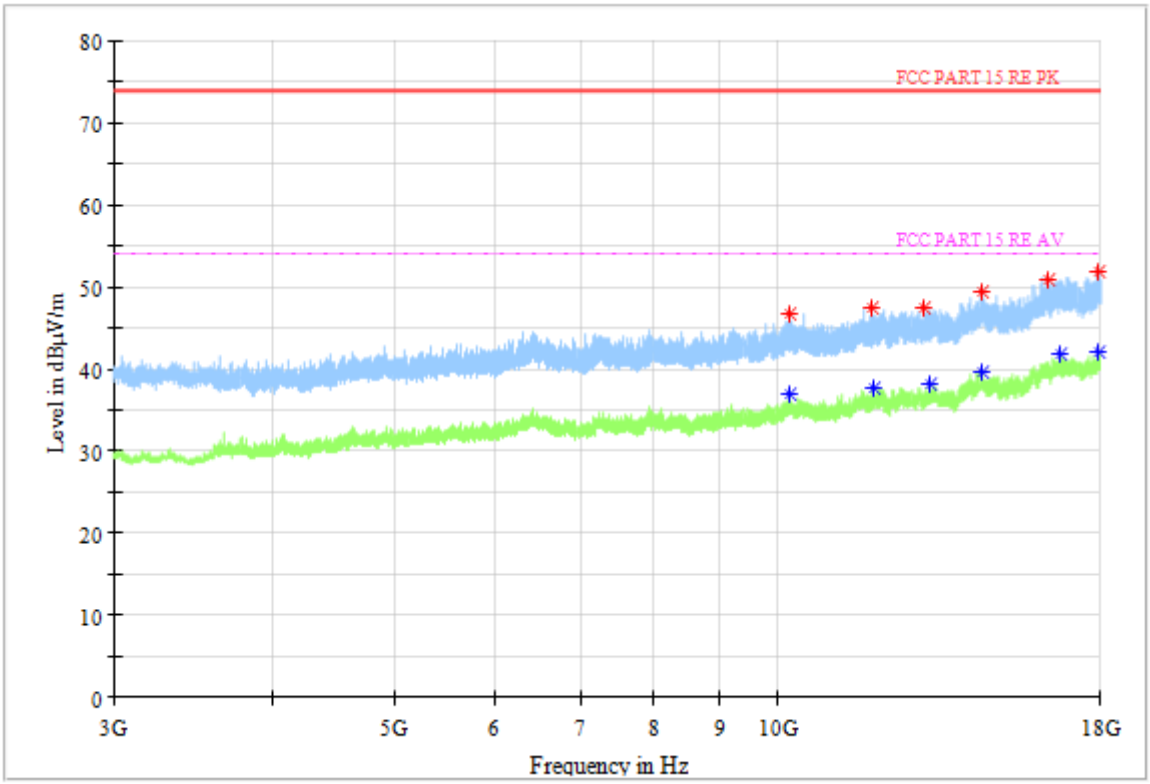


Figure A.3 Radiated Emission from 3GHz to 18GHz

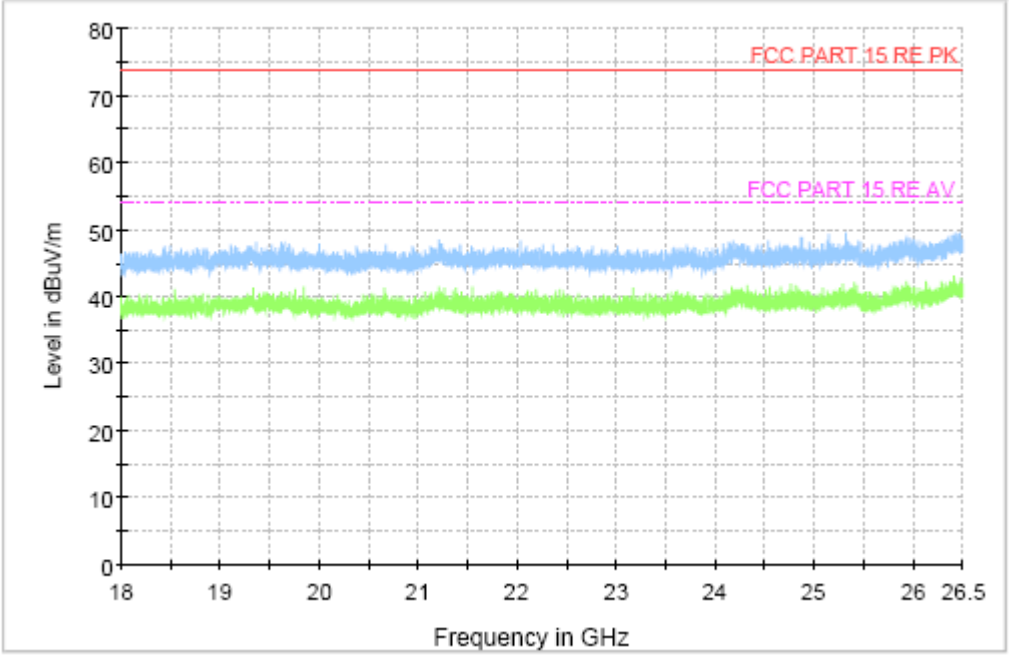


Figure A.4 Radiated Emission from 18GHz to 26GHz

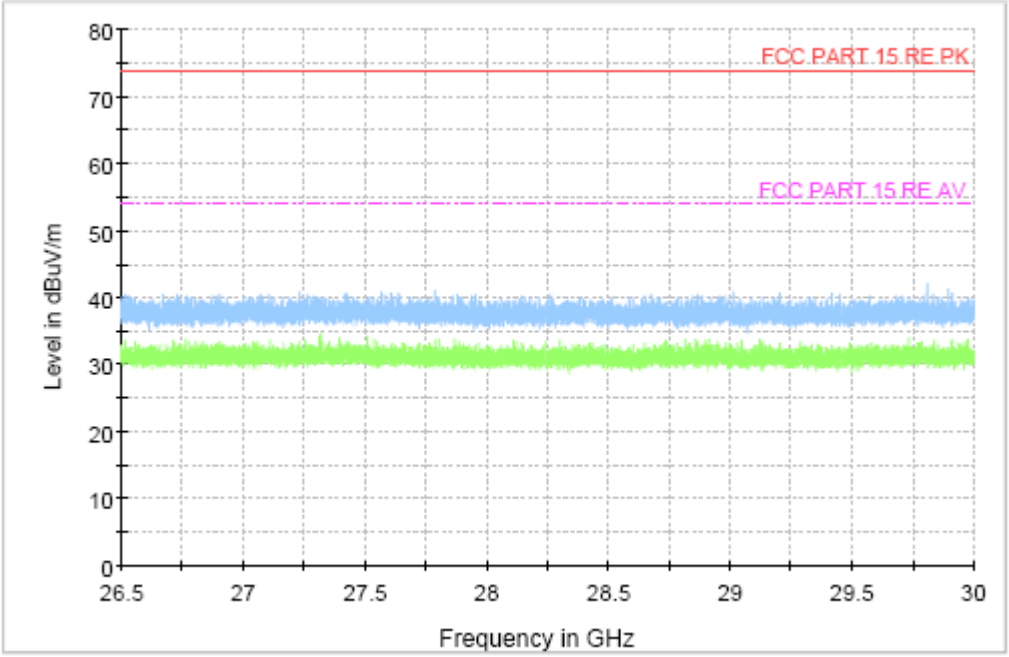


Figure A.5 Radiated Emission from 26GHz to 30GHz

Charging Mode/ Video play Mode: Set.1

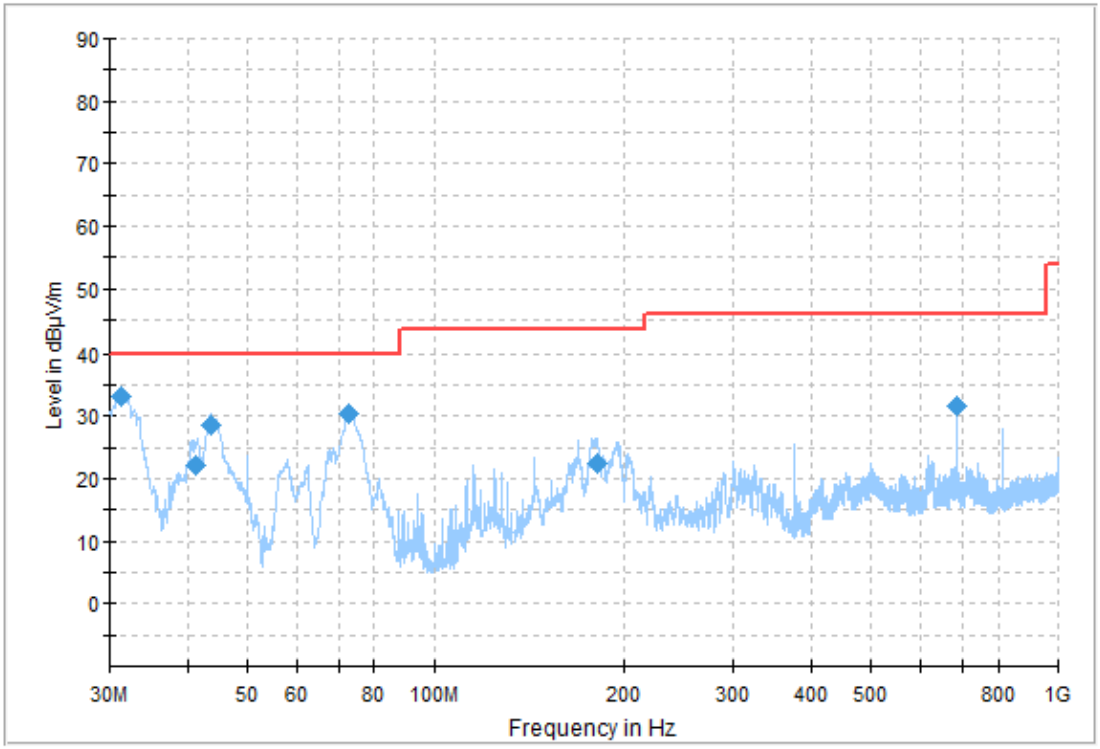


Figure A.6 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
31.391667	33.21	40	6.79	V	-25.5	58.71
41.326111	22.06	40	17.94	V	-30	52.06
43.711111	28.42	40	11.58	V	-31.9	60.32
72.473889	30.21	40	9.79	V	-34	64.21
181.272222	22.53	43.5	20.97	V	-33.7	56.23
687.518333	31.55	46	14.45	V	-19.9	51.45

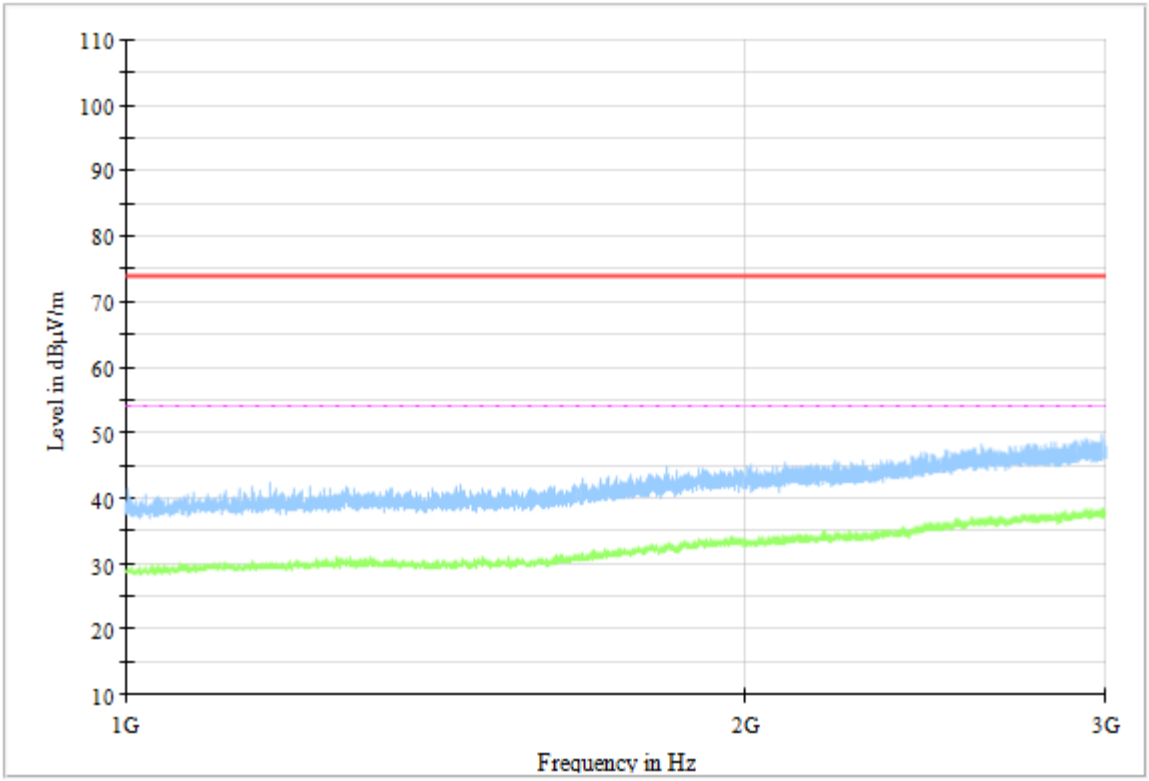


Figure A.7 Radiated Emission from 1GHz to 3GHz

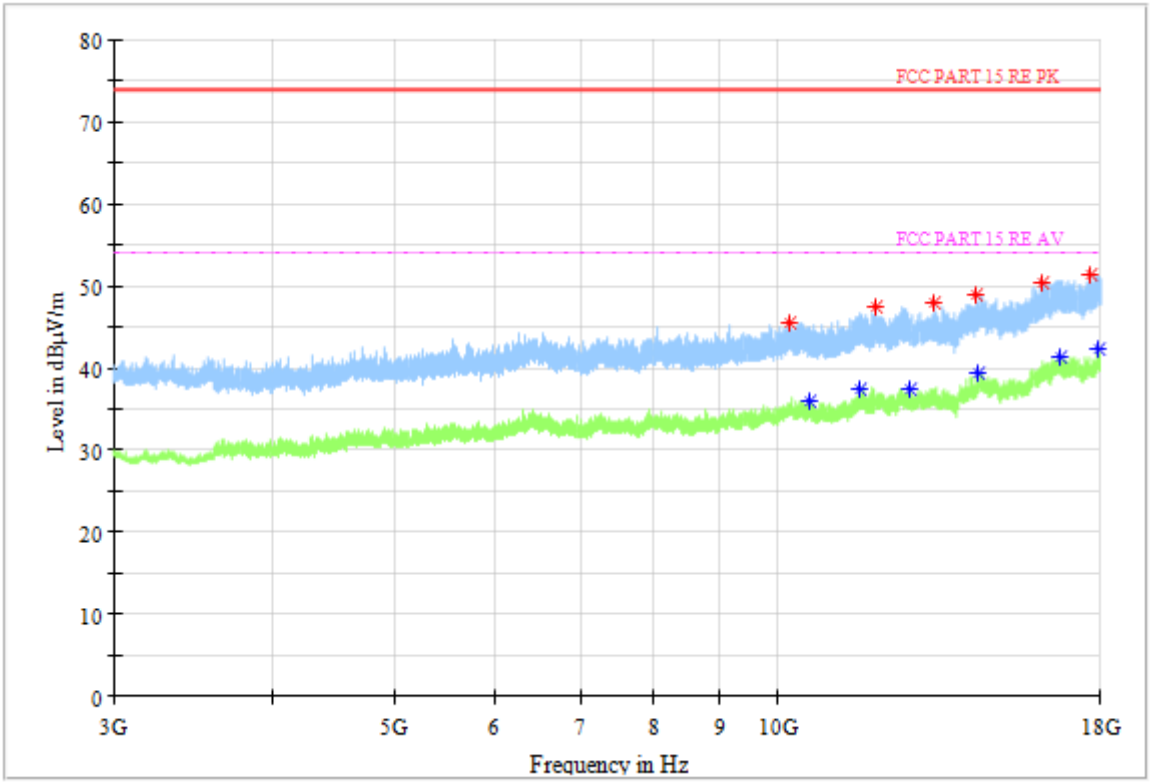


Figure A.8 Radiated Emission from 3GHz to 18GHz

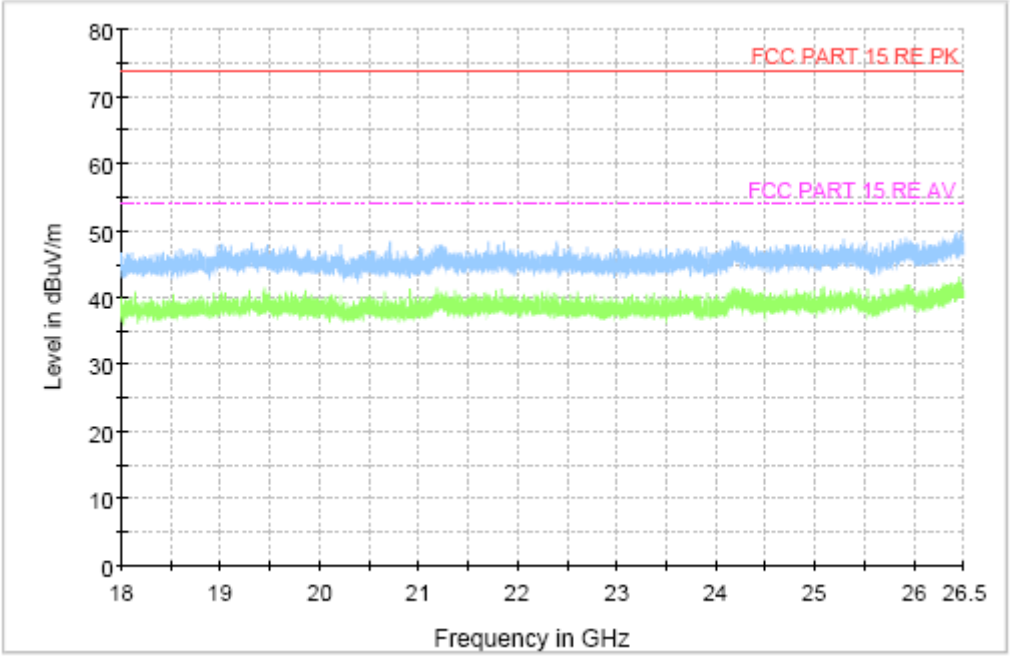


Figure A.9 Radiated Emission from 18GHz to 26.5GHz

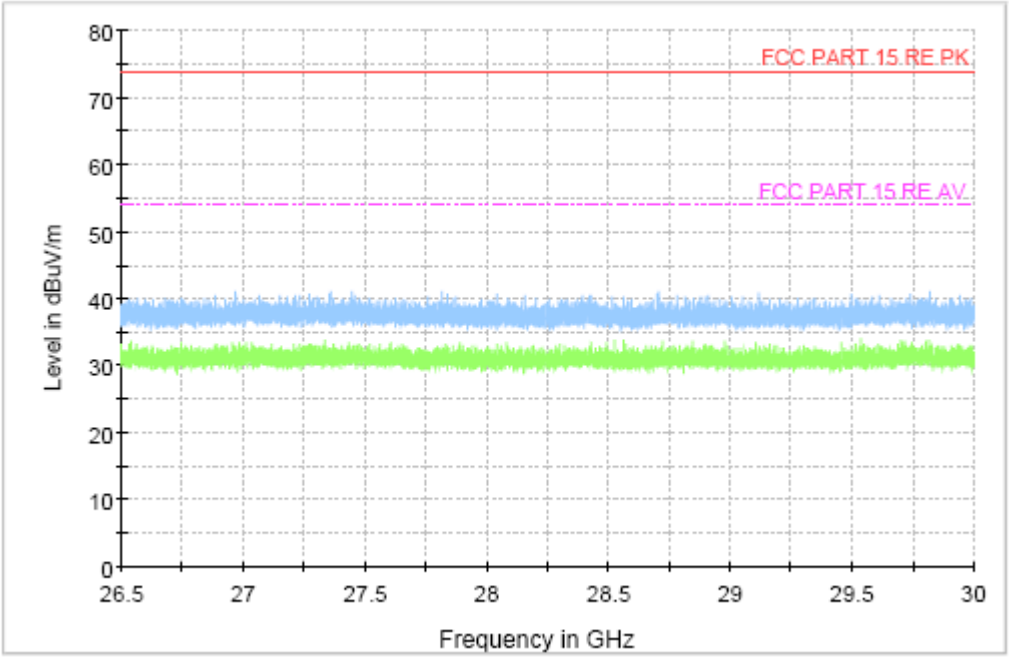


Figure A.10 Radiated Emission from 26.5GHz to 30GHz

Charging Mode/ FM receiver Mode: Set.3

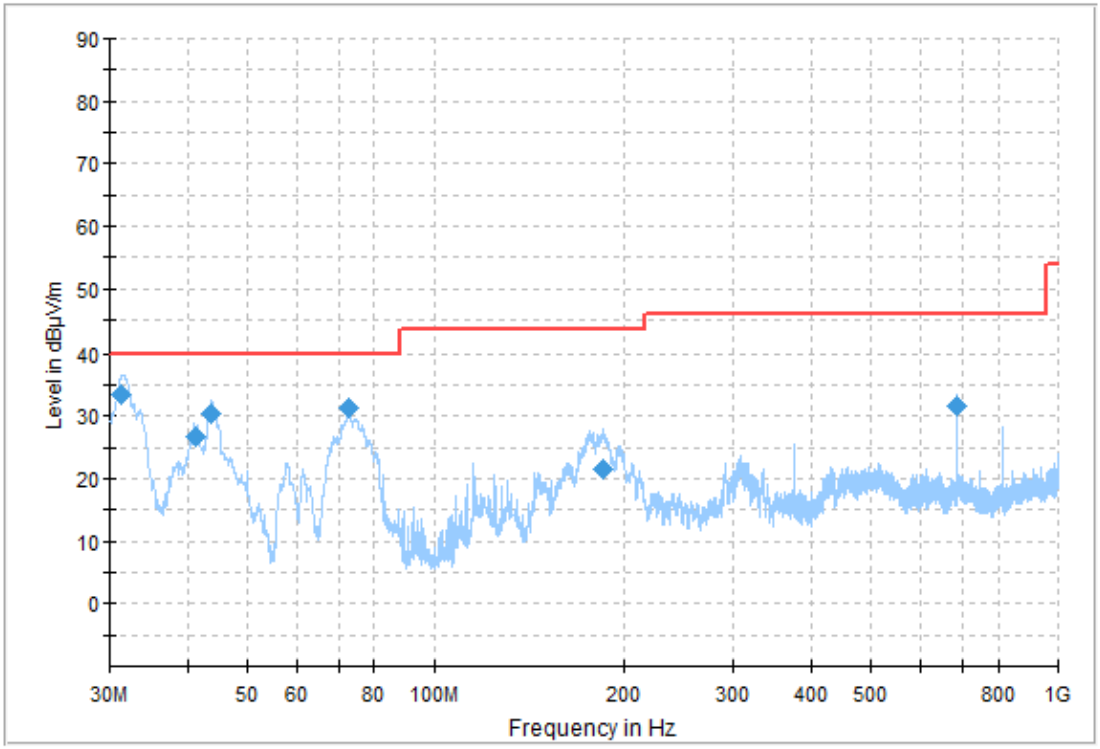


Figure A.11 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
31.396667	33.43	40	6.57	V	-25.5	58.93
41.213333	26.58	40	13.42	V	-29.9	56.48
43.735556	30.26	40	9.74	V	-31.9	62.16
72.833889	31.39	40	8.61	V	-33.9	65.29
185.06	21.56	43.5	21.94	V	-33.8	55.36
687.518333	31.64	46	14.36	V	-19.9	51.54

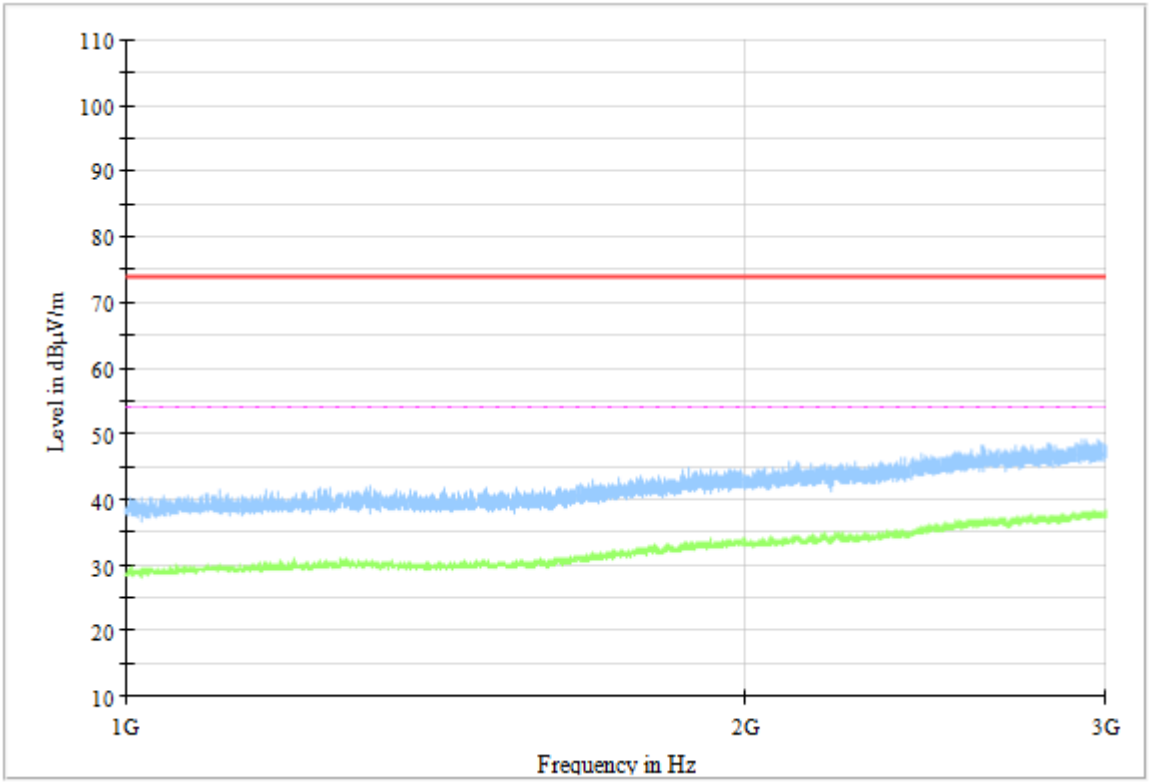


Figure A.12 Radiated Emission from 1GHz to 3GHz

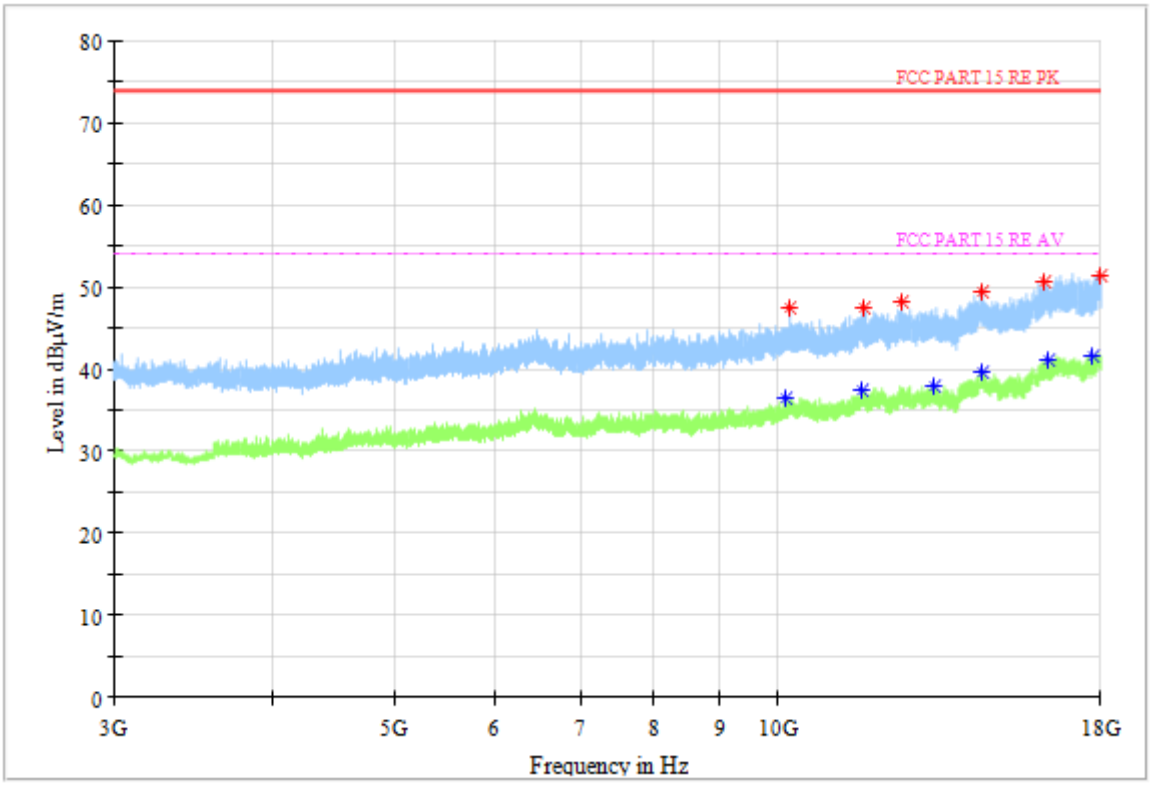


Figure A.13 Radiated Emission from 3GHz to 18GHz

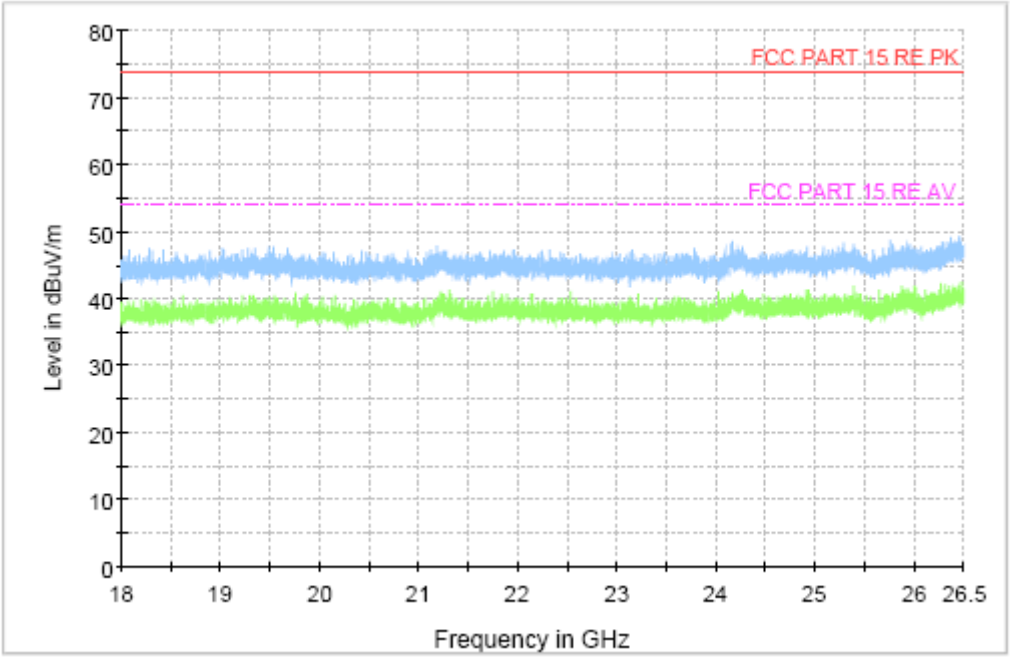


Figure A.14 Radiated Emission from 18GHz to 26.5GHz

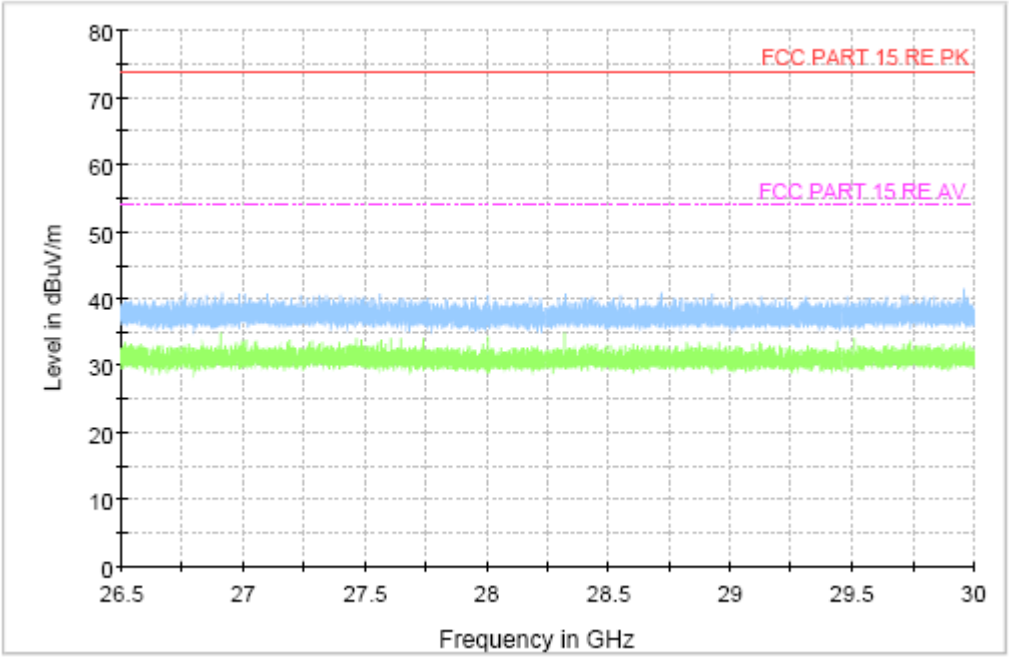


Figure A.15 Radiated Emission from 26.5GHz to 30GHz

Data transfer Mode/PC to EUT: Set.2

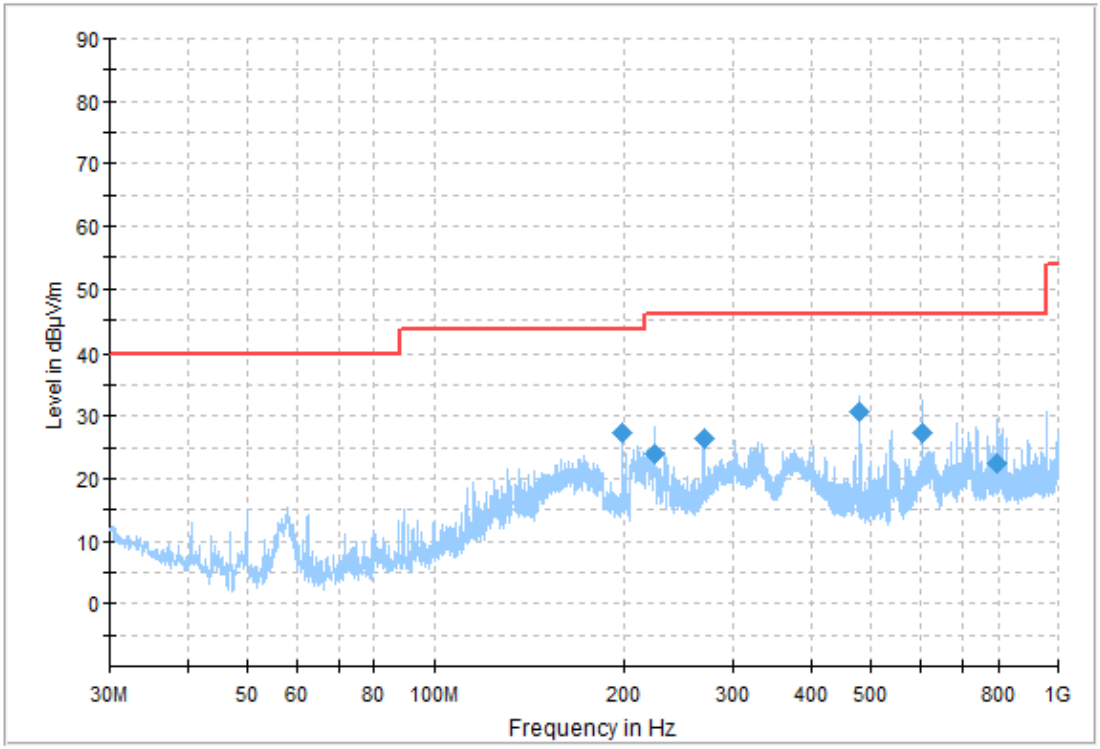


Figure A.16 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
199.218889	27.21	43.5	16.29	H	-33.1	60.31
224.157222	23.95	46	22.05	H	-32.4	56.35
269.556111	26.35	46	19.65	H	-30.6	56.95
479.992222	30.8	46	15.2	H	-23.9	54.7
604.22	27.26	46	18.74	V	-21.3	48.56
799.052778	22.4	46	23.6	V	-19	41.4

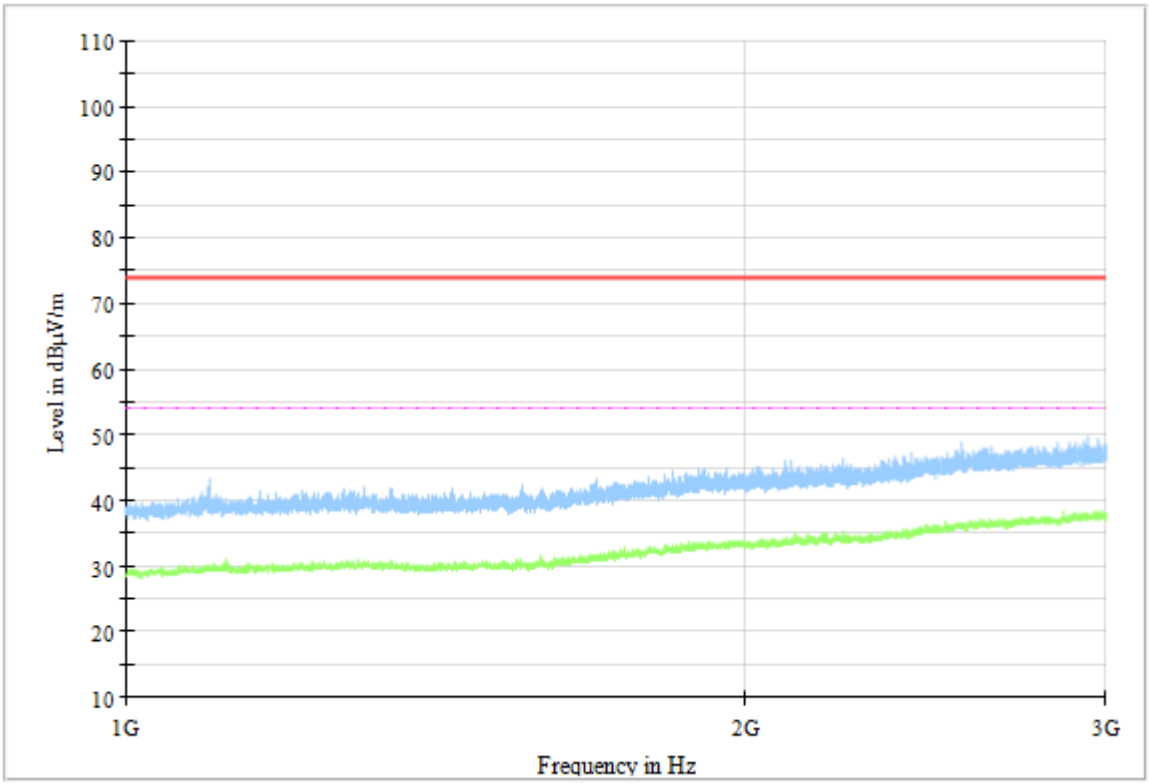


Figure A.17 Radiated Emission from 1GHz to 3GHz

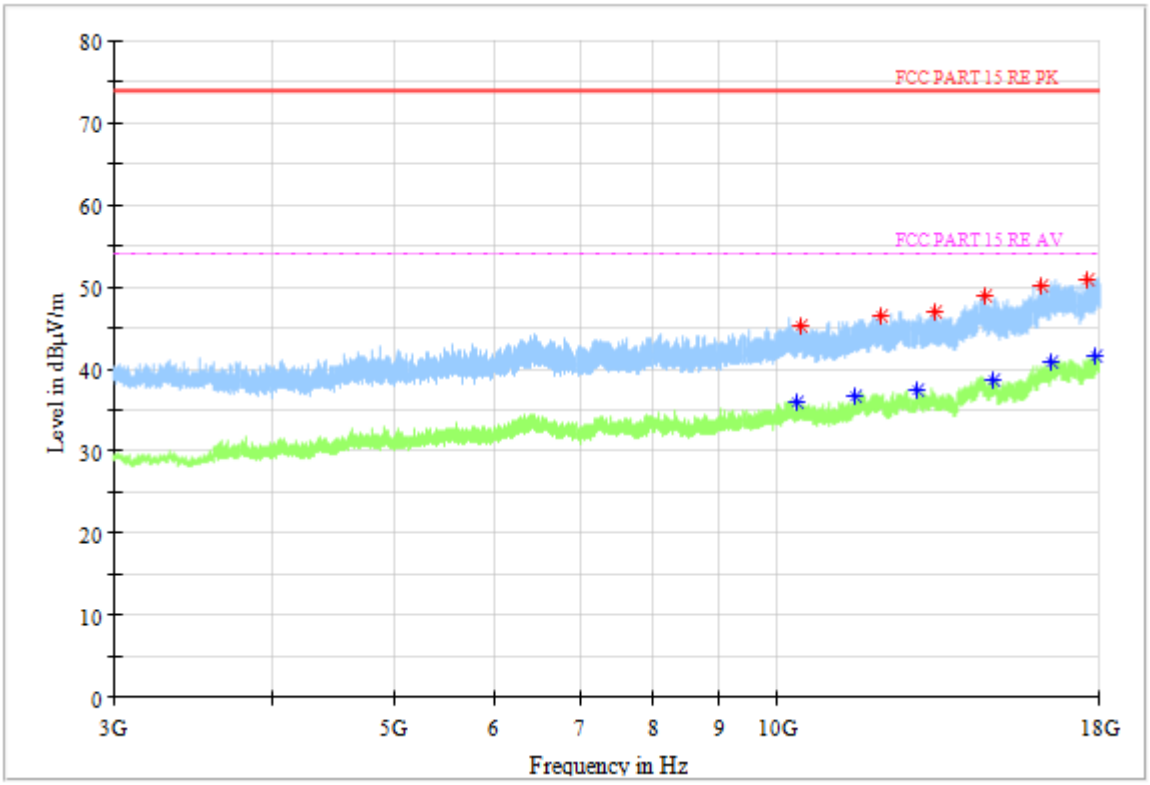


Figure A.18 Radiated Emission from 3GHz to 18GHz

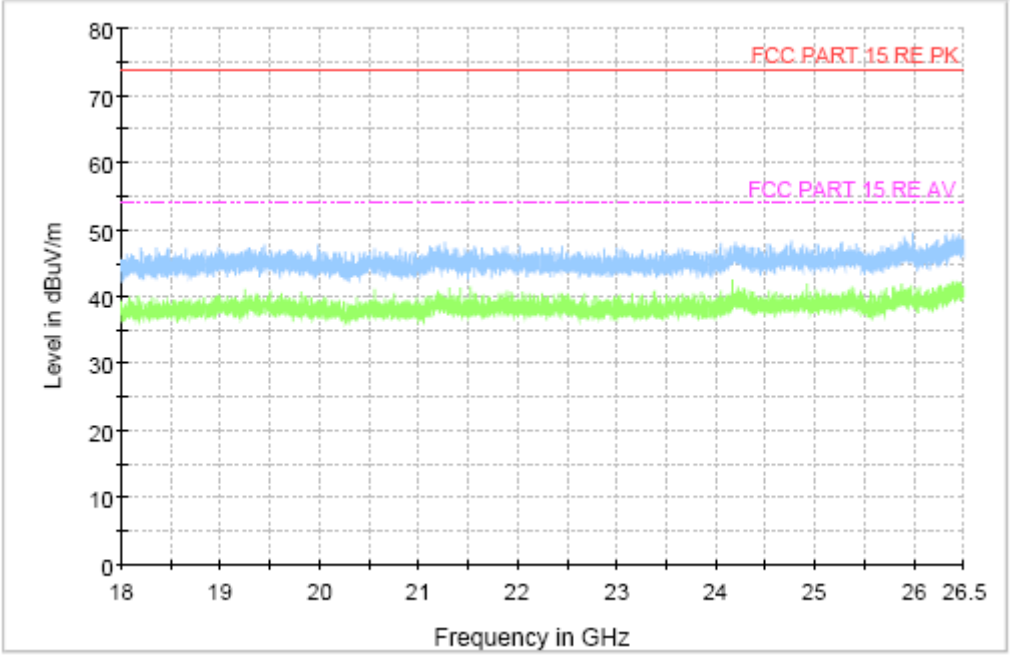


Figure A.19 Radiated Emission from 18GHz to 26.5GHz

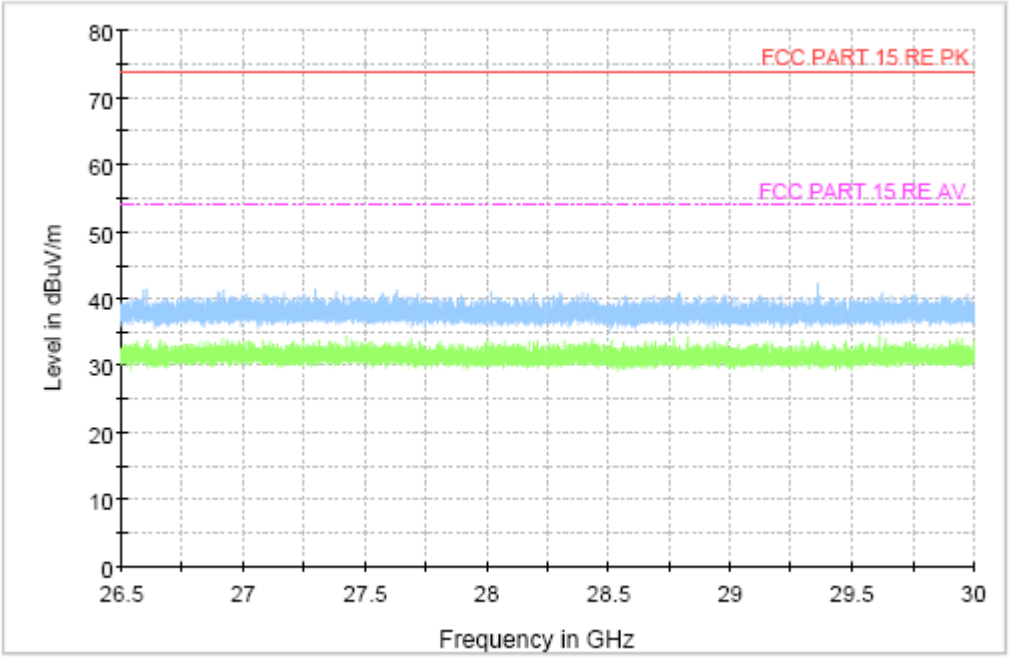


Figure A.20 Radiated Emission from 26.5GHz to 30GHz

Data transfer Mode /EUT to PC: Set.2

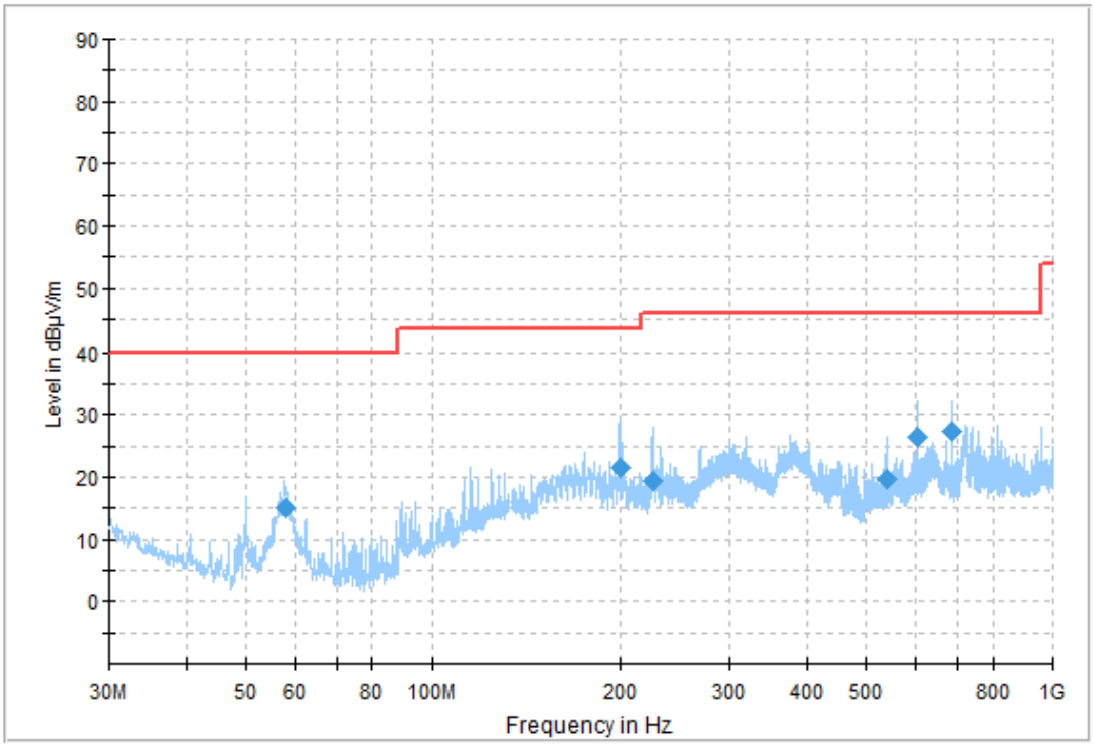


Figure A.21 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
57.837222	15.21	40	24.79	H	-37.6	52.81
200.562778	21.56	43.5	21.94	H	-33.1	54.66
225.113333	19.37	46	26.63	H	-32.4	51.77
539.216111	19.66	46	26.34	V	-23	42.66
606.645	26.26	46	19.74	V	-21.3	47.56
687.532222	27.28	46	18.72	V	-19.9	47.18

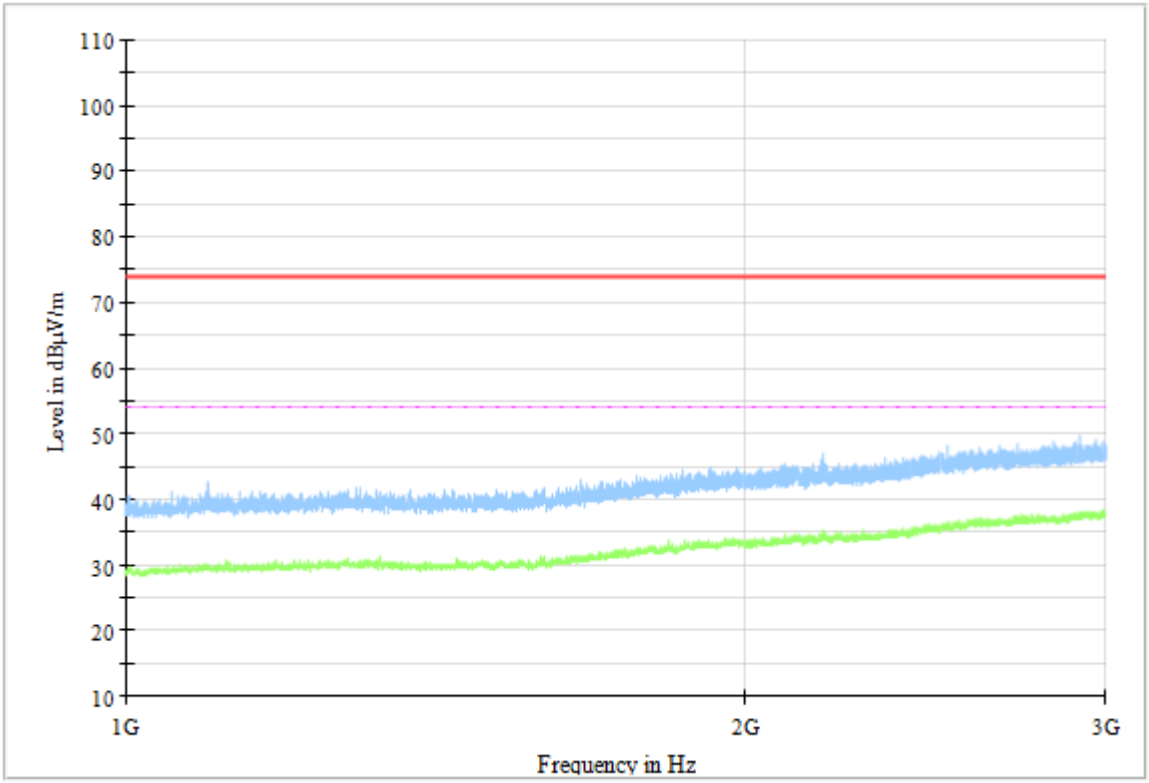


Figure A.22 Radiated Emission from 1GHz to 3GHz

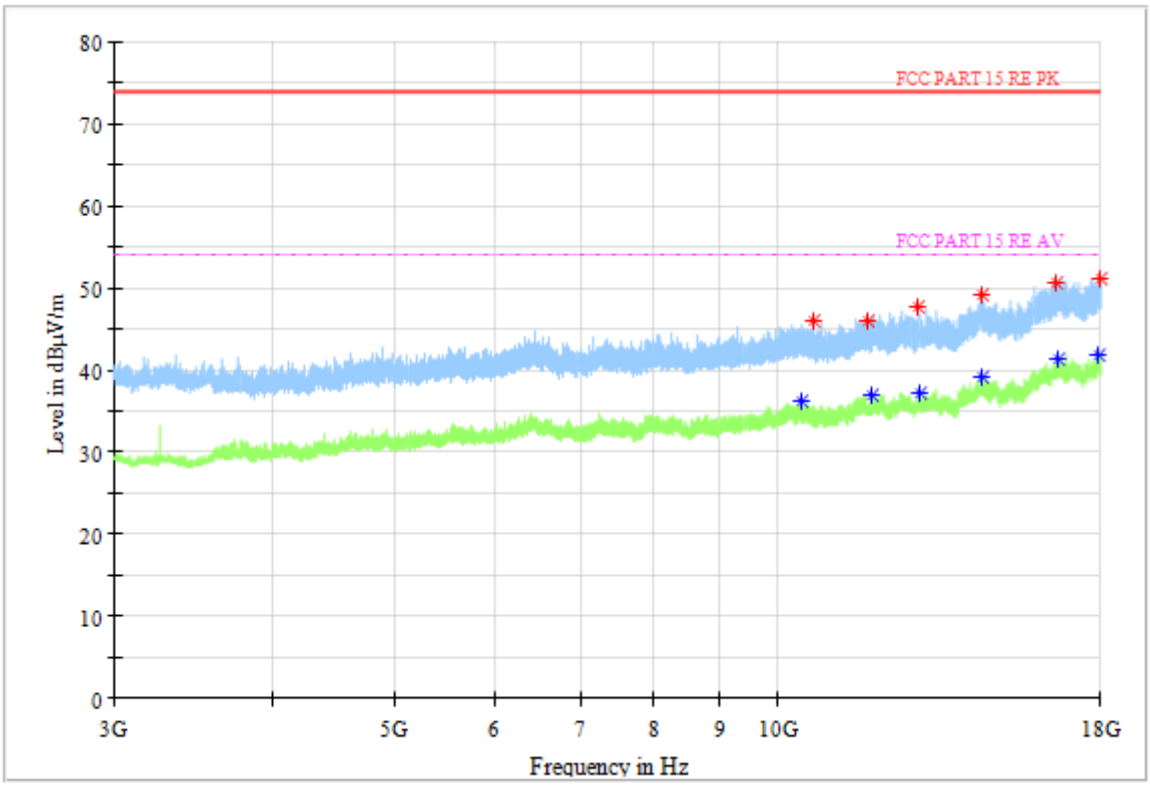


Figure A.23 Radiated Emission from 3GHz to 18GHz

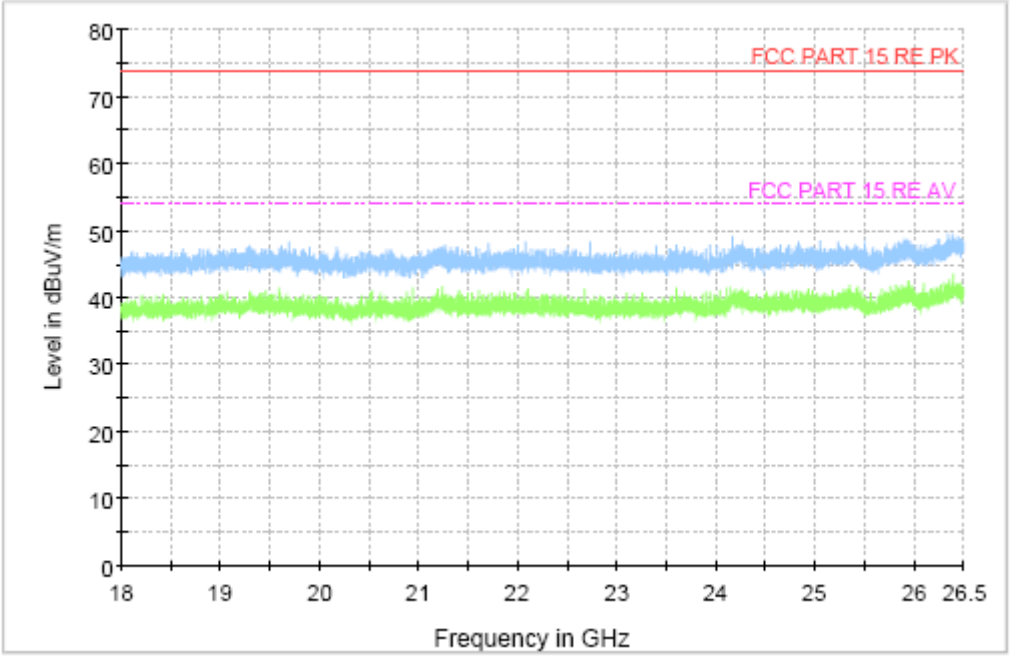


Figure A.24 Radiated Emission from 18GHz to 26.5GHz

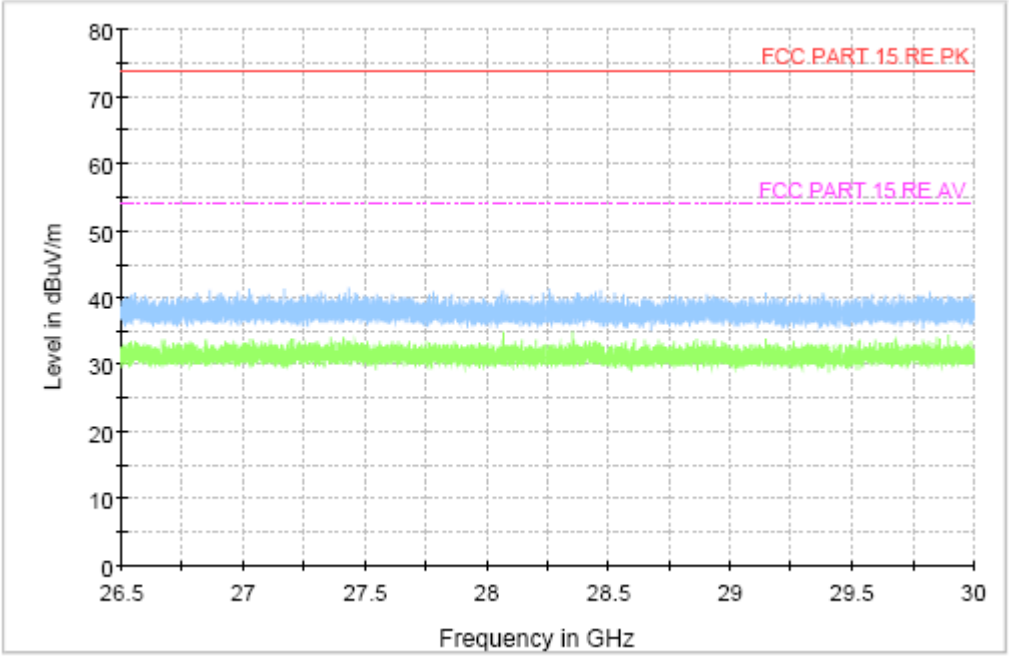


Figure A.25 Radiated Emission from 26.5GHz to 30GHz

Data transfer Mode/PC to TF Card: Set.2

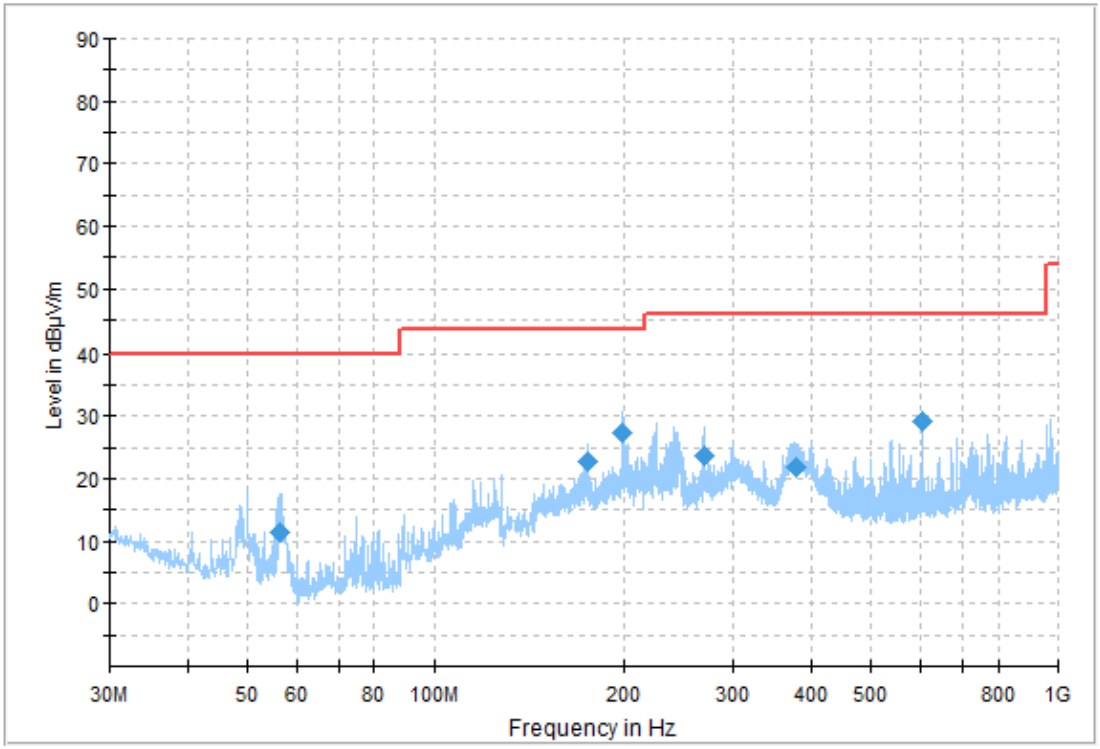


Figure A.26 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
56.253333	11.4	40	28.6	V	-38.4	49.8
175.035	22.6	43.5	20.9	H	-31.3	53.9
198.664444	27.39	43.5	16.11	H	-33.2	60.59
269.580556	23.53	46	22.47	H	-30.6	54.13
379.748333	21.93	46	24.07	H	-26.8	48.73
606.631111	29.03	46	16.97	V	-21.3	50.33

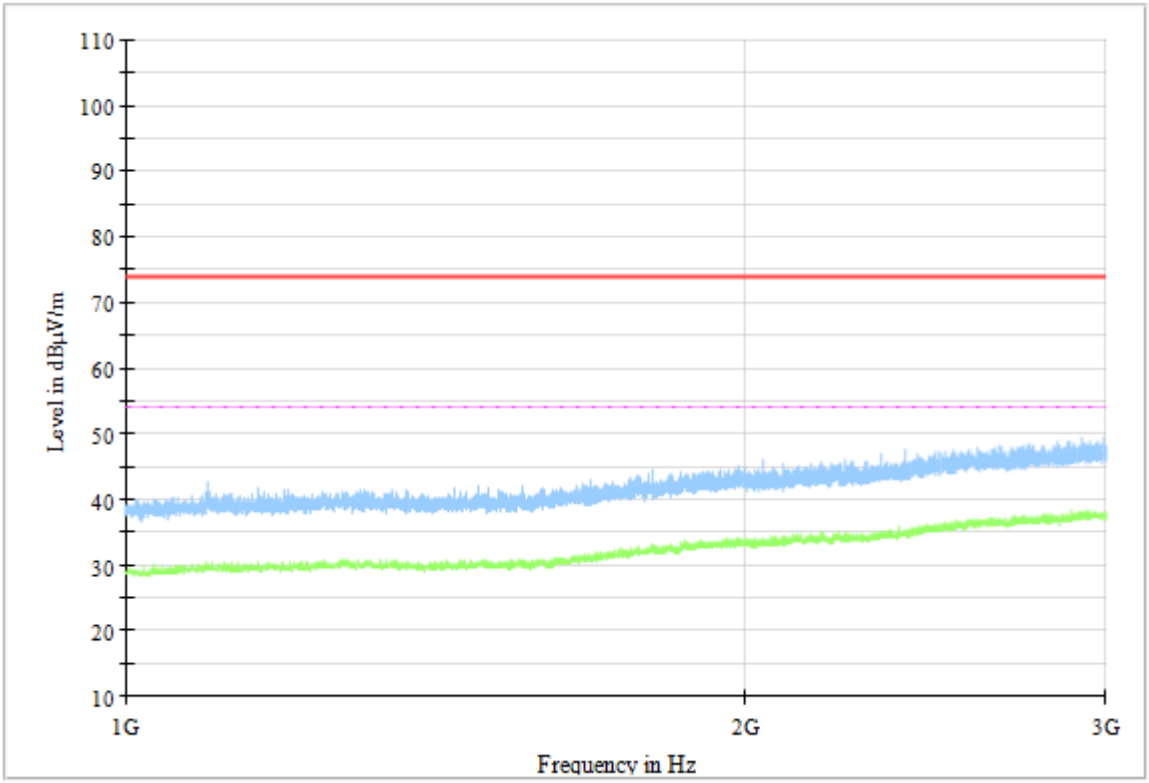


Figure A.27 Radiated Emission from 1GHz to 3GHz

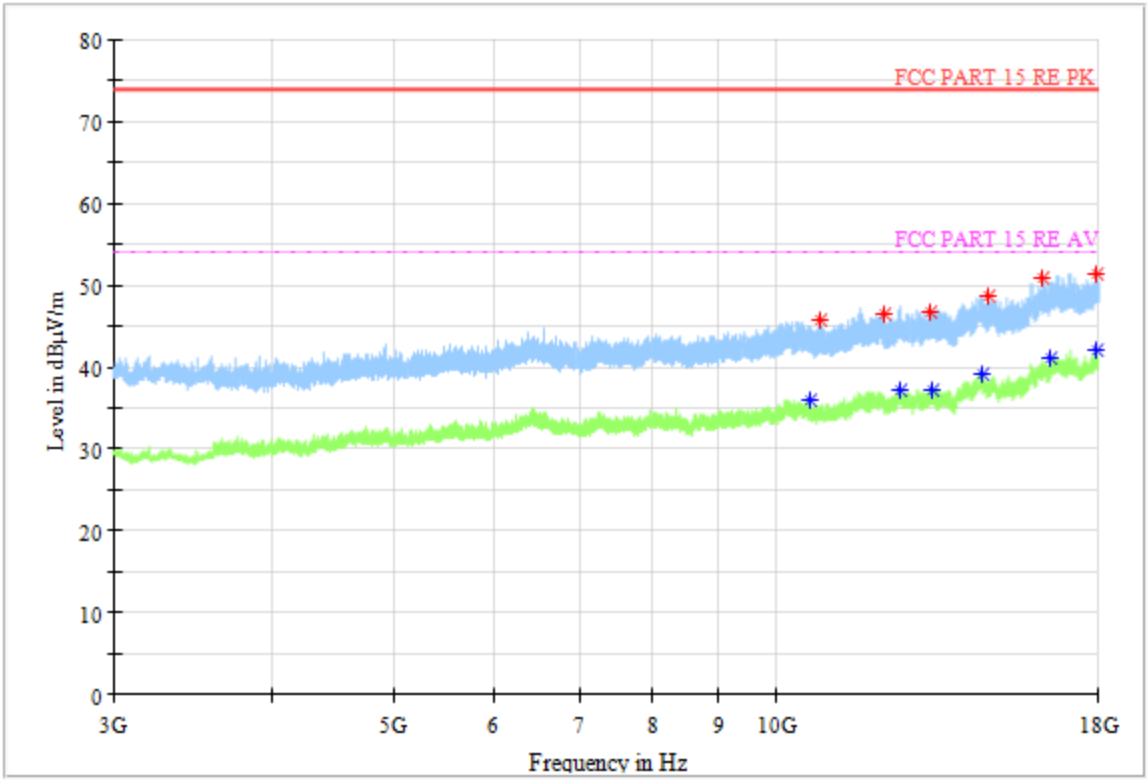


Figure A.28 Radiated Emission from 3GHz to 18GHz

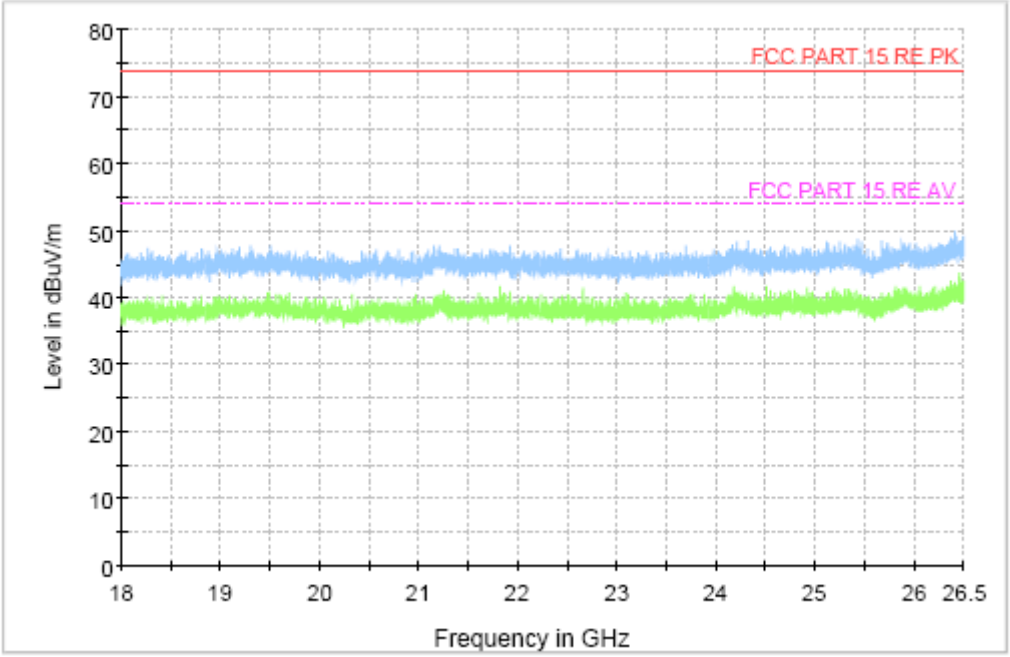


Figure A.29 Radiated Emission from 18GHz to 26.5GHz

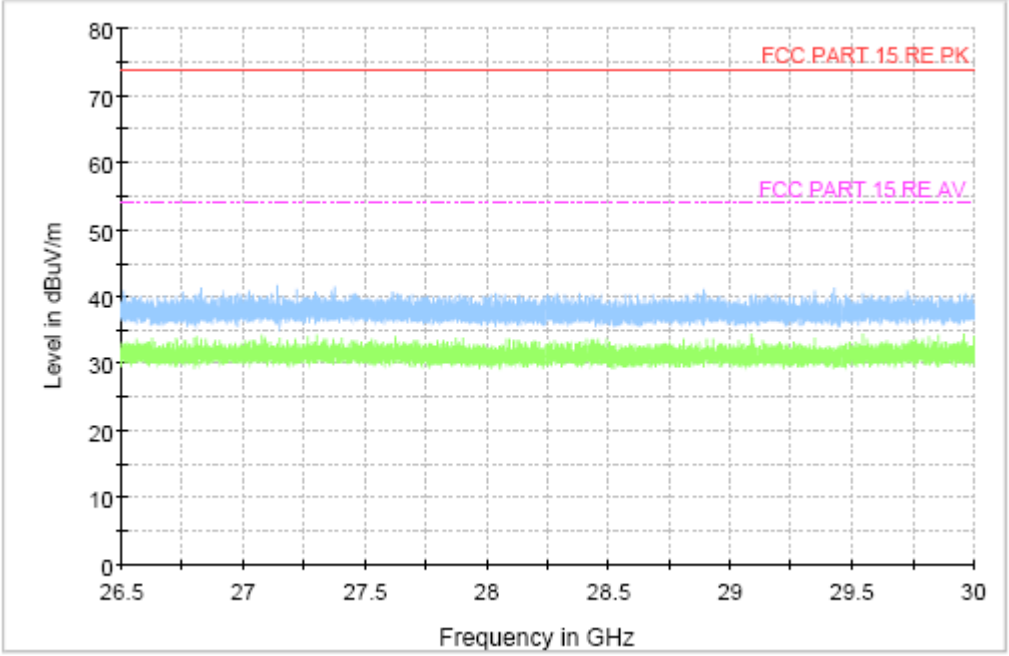


Figure A.30 Radiated Emission from 26.5GHz to 30GHz

Data transfer Mode/TF Card to PC: Set.2

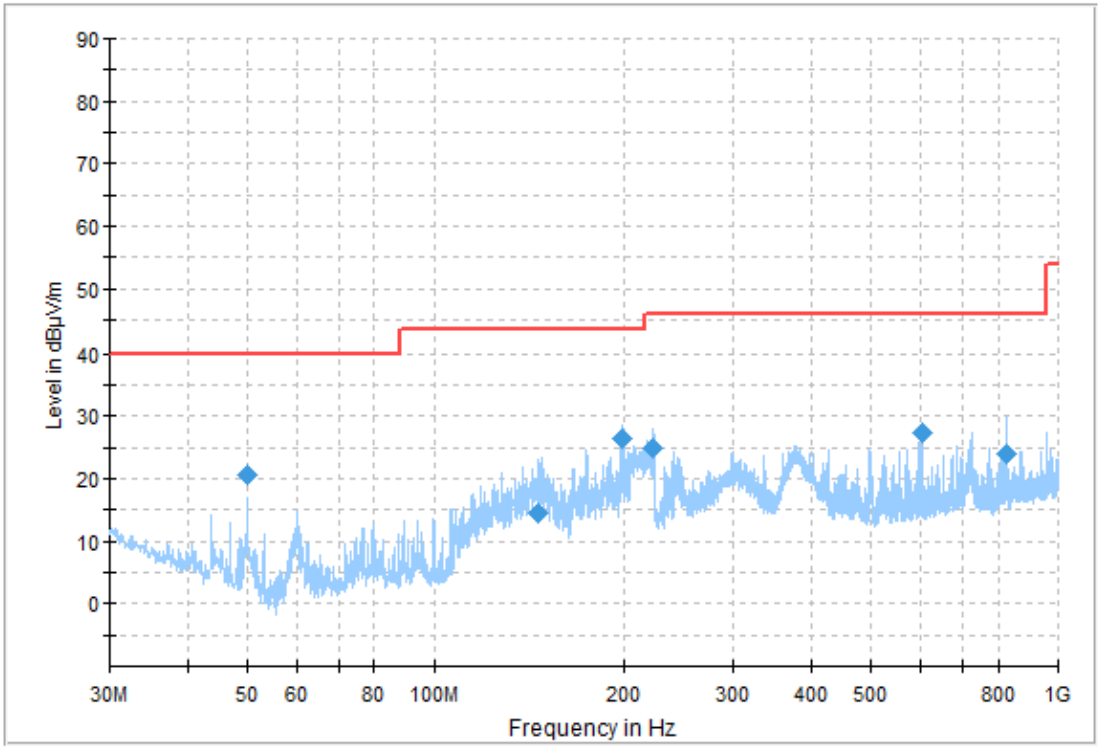


Figure A.31 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
49.998889	20.69	40	19.31	V	-36.6	57.29
146.122778	14.32	43.5	29.18	V	-33.7	48.02
199.377222	26.32	43.5	17.18	H	-33.1	59.42
222.928333	25.01	46	20.99	H	-32.4	57.41
606.631111	27.25	46	18.75	V	-21.3	48.55
828.071111	24	46	22	V	-18.9	42.9

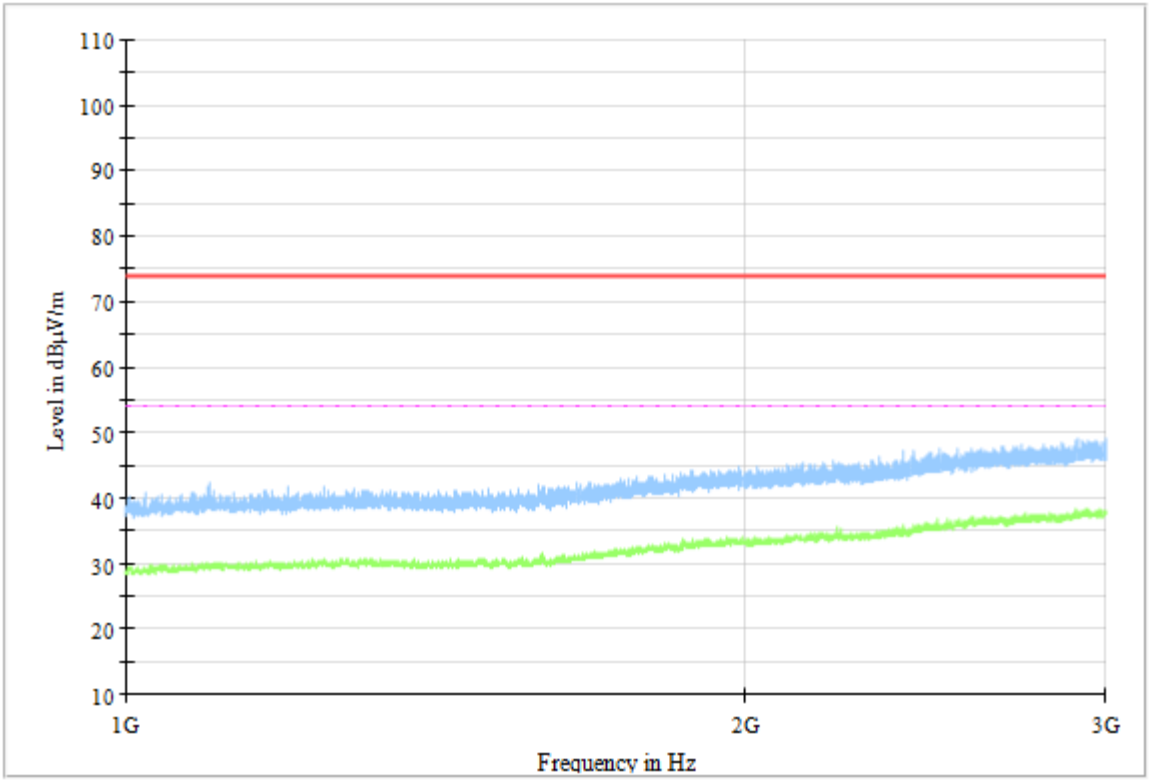


Figure A.32 Radiated Emission from 1GHz to 3GHz

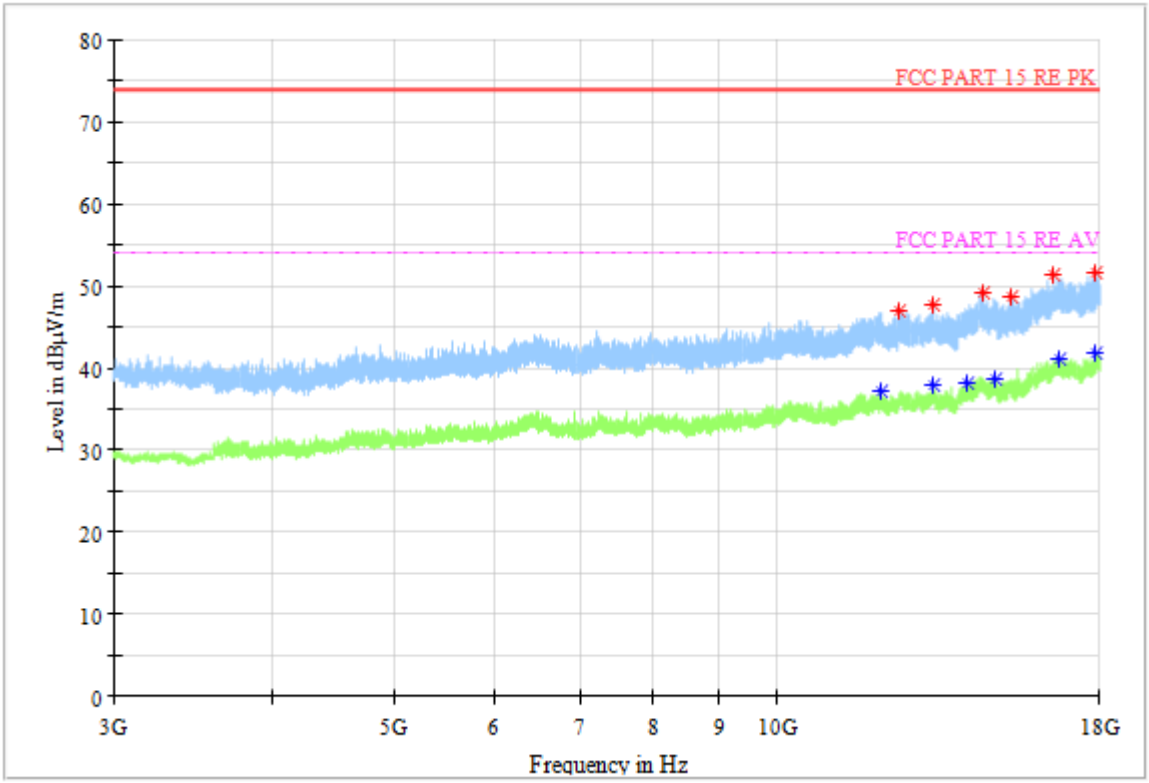


Figure A.33 Radiated Emission from 3GHz to 18GHz

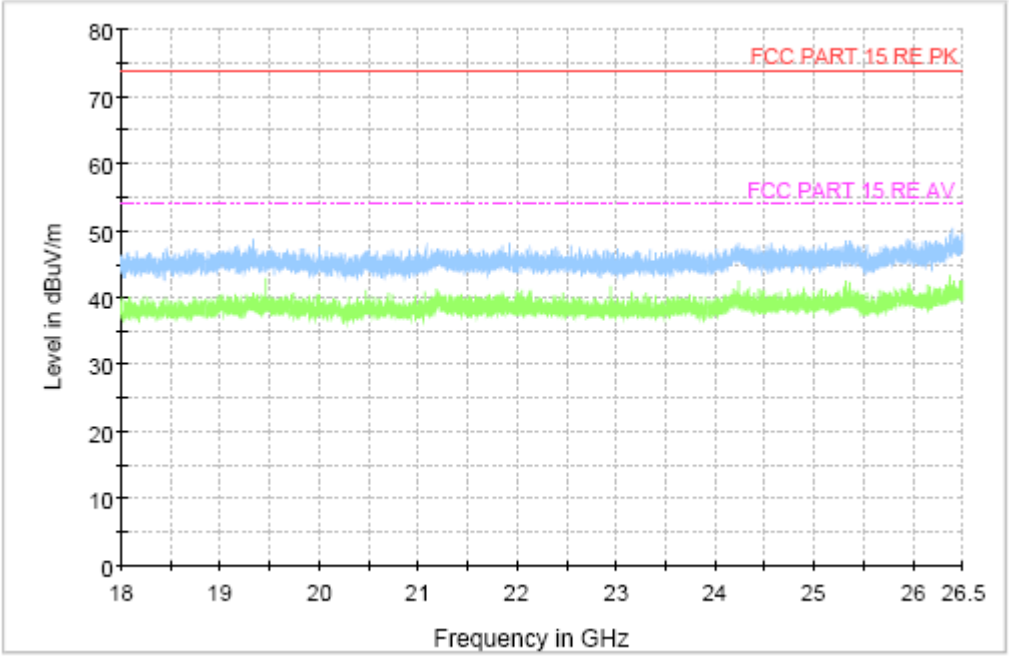


Figure A.34 Radiated Emission from 18GHz to 26.5GHz

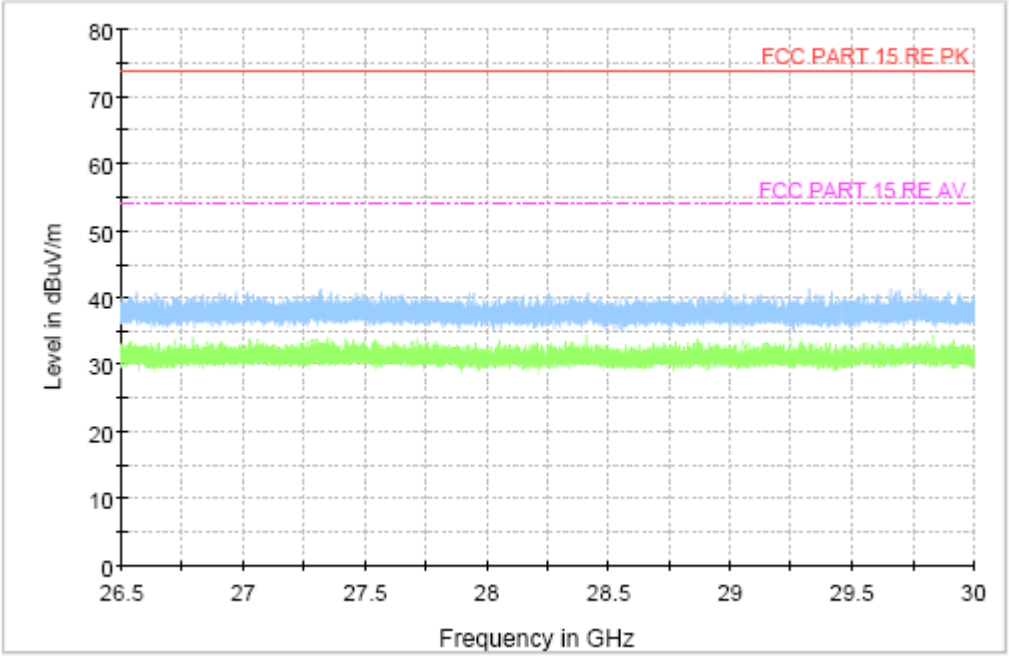


Figure A.35 Radiated Emission from 26.5GHz to 30GHz

B.2 Conducted Emission (§15.107(a))

Reference

FCC: CFR Part 15.107(a)

B.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.

B.2.2 EUT Operating Mode:

Charging Mode/ Camera Mode: The EUT is keeping on taking photos. The EUT is connected to a charger.

Charging Mode/ Video play Mode: The EUT is keeping on playing Video play. The EUT is connected to a charger.

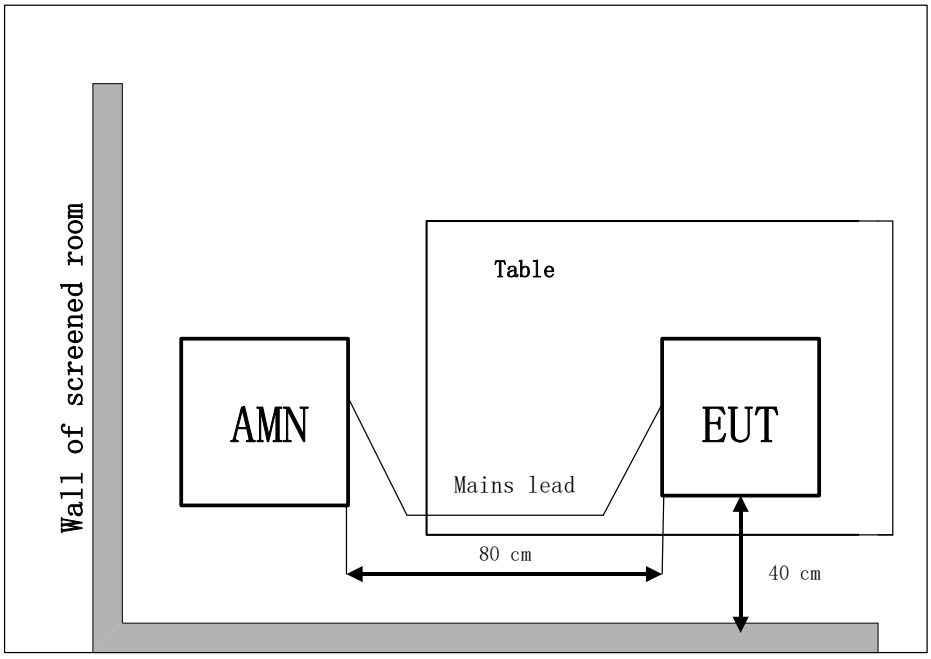
Charging Mode/ FM receiver Mode: The EUT is synchronized to System Simulator (SS), and able to respond to paging messages and incoming call. An established call has been released. The FM receiver function is on. The EUT is connected to a charger.

Data transfer Mode: The model of the PC is Lenovo ThinkPad T480, and the serial number of the PC is PF-13LW0C. The software is used to let the PC keep on copying data to EUT or TF Card, reading and erasing the data after copy action was finished.

B.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		

B.2.4Test set-up:



B.2.5 Test Condition in charging mode

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

RBW	Sweep Time(s)
9kHz	1

B.2.6 Measurement Results

QuasiPeak(dBµV) /Average(dBµV) =PMea+Corr

Where

Corr: PathLoss + Voltage Division Factor

PMea: Measurement result on receiver.

Charging Mode/ Camera Mode: Set.1
Voltage: 120V

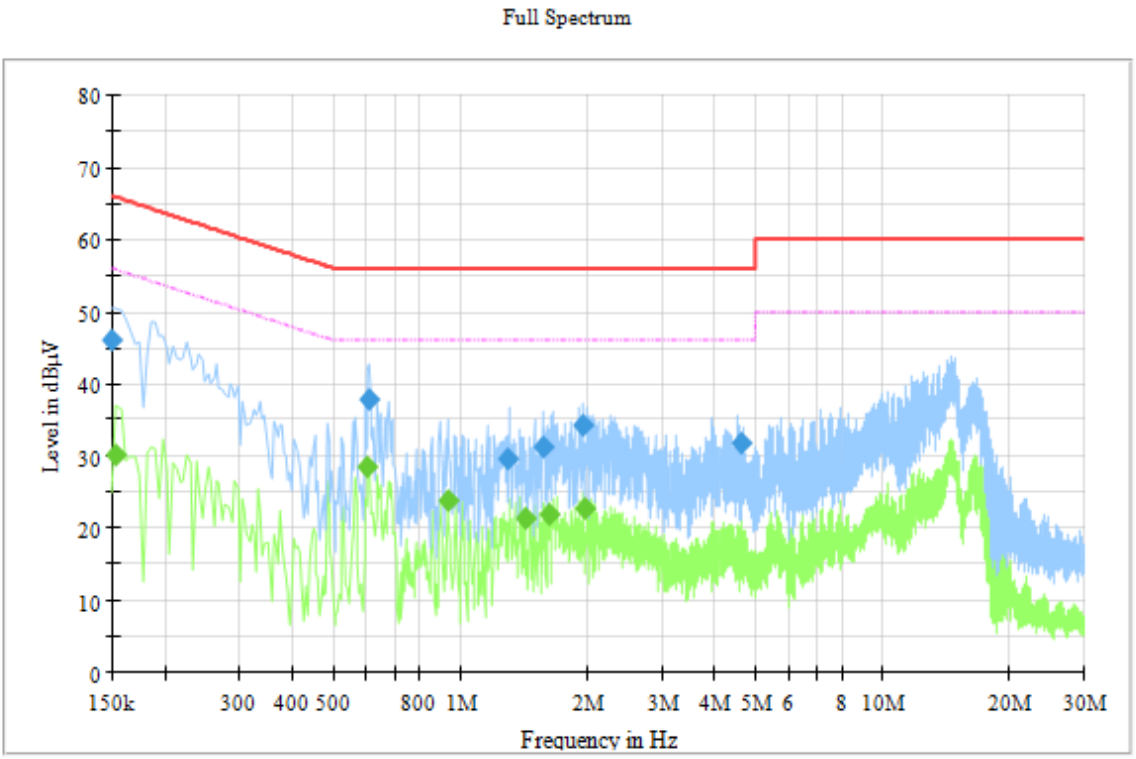


Figure B.1 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.15	46.12	66	19.88	L1	9.6	36.52
0.608	37.86	56	18.14	N	9.6	28.26
1.3	29.46	56	26.54	N	9.7	19.76
1.58	31.23	56	24.77	N	9.7	21.53
1.948	34.14	56	21.86	N	9.7	24.44
4.64	31.73	56	24.27	N	9.7	22.03

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.154	30.11	55.78	25.67	N	9.6	20.51
0.604	28.36	46	17.64	N	9.6	18.76
0.94	23.96	46	22.04	N	9.7	14.26
1.424	21.47	46	24.53	N	9.7	11.77
1.624	22	46	24	N	9.7	12.3
1.988	22.82	46	23.18	N	9.7	13.12

Charging Mode/ Video play Mode: Set.1
Voltage: 120V

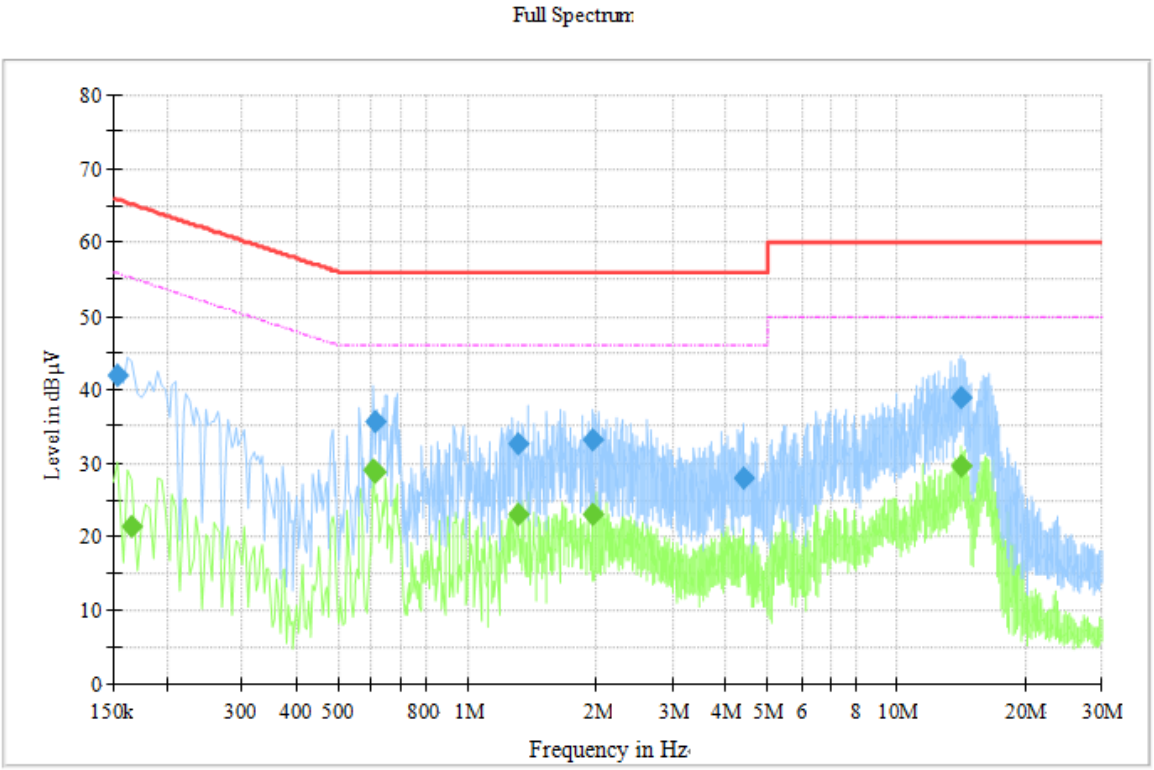


Figure B.2 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.154	41.9	65.78	23.89	N	9.6	32.3
0.612	35.5	56	20.5	N	9.6	25.9
1.308	32.51	56	23.49	N	9.7	22.81
1.952	33.22	56	22.78	N	9.7	23.52
4.412	27.98	56	28.02	N	9.7	18.28
14.156	38.89	60	21.11	N	9.8	29.09

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.166	21.4	55.16	33.76	L1	9.6	11.8
0.604	29.02	46	16.98	N	9.6	19.42
0.608	28.77	46	17.23	N	9.6	19.17
1.308	23.06	46	22.94	N	9.7	13.36
1.948	23.07	46	22.93	N	9.7	13.37
14.072	29.57	50	20.43	N	9.8	19.77

Charging Mode/ FM receiver Mode: Set.3
Voltage: 120V

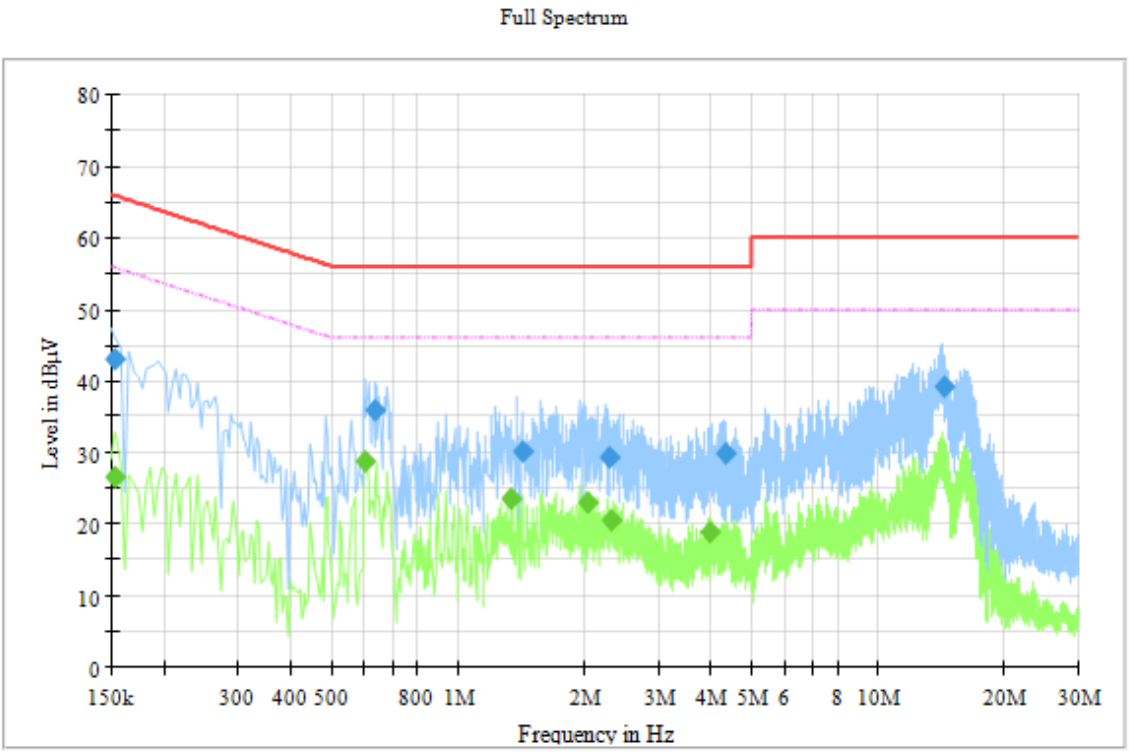


Figure B.3 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.154	43.13	65.78	22.65	L1	9.6	33.53
0.64	35.94	56	20.06	N	9.6	26.34
1.428	30.09	56	25.91	N	9.7	20.39
2.3	29.25	56	26.75	N	9.7	19.55
4.34	29.78	56	26.22	N	9.7	20.08
14.372	39.18	60	20.82	N	9.8	29.38

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.154	26.66	55.78	29.13	N	9.6	17.06
0.604	28.69	46	17.31	N	9.6	19.09
1.348	23.66	46	22.34	N	9.7	13.96
2.036	23.01	46	22.99	N	9.7	13.31
2.328	20.49	46	25.51	N	9.7	10.79
3.996	18.93	46	27.07	N	9.7	9.23

Data transfer Mode/PC to EUT: Set.2
Voltage: 120V

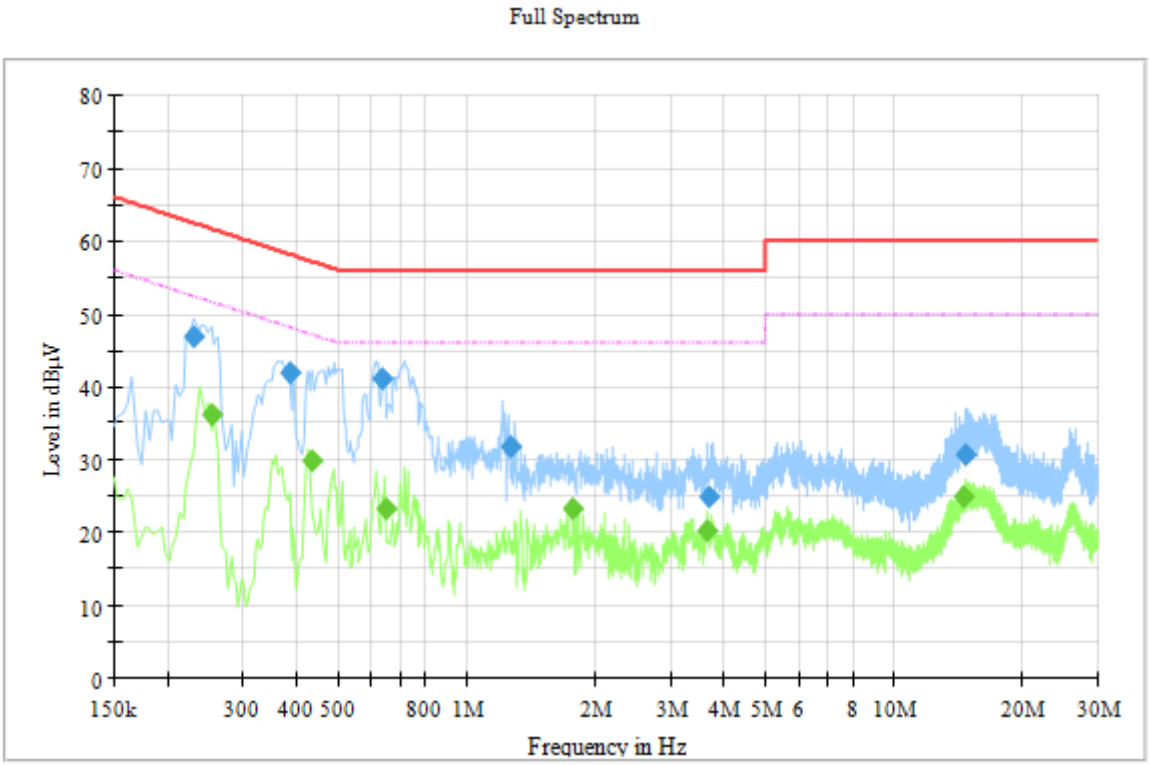


Figure B.4 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.23	46.99	62.45	15.46	N	9.6	37.39
0.388	41.87	58.11	16.24	N	9.6	32.27
0.64	41.14	56	14.86	N	9.6	31.54
1.276	31.77	56	24.23	N	9.7	22.07
3.692	24.96	56	31.04	N	9.7	15.26
14.66	30.61	60	29.39	L1	9.8	20.81

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.254	36.19	51.63	15.44	N	9.6	26.59
0.436	29.99	47.14	17.15	N	9.6	20.39
0.648	23.38	46	22.62	N	9.6	13.78
1.78	23.16	46	22.84	L1	9.7	13.46
3.656	20.24	46	25.76	N	9.7	10.54
14.636	24.83	50	25.17	L1	9.8	15.03

Data transfer Mode /EUT to PC: Set.2
Voltage: 120V

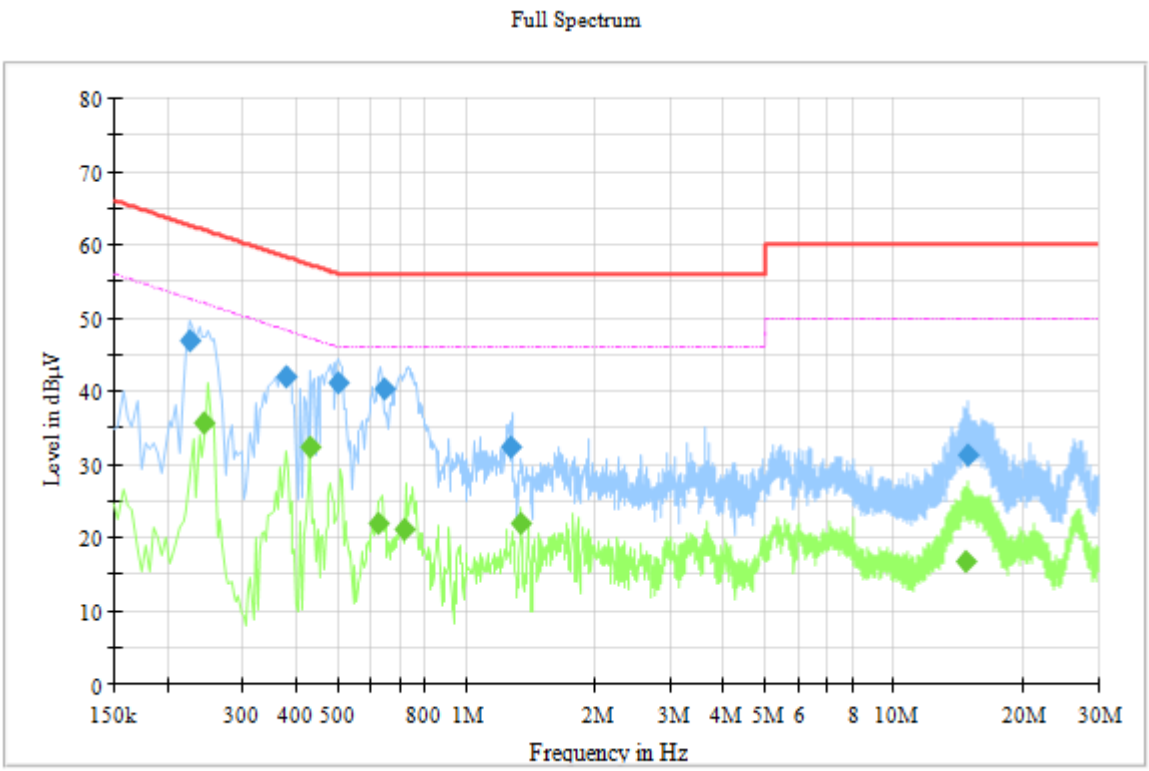


Figure B.5 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.226	46.9	62.6	15.7	N	9.6	37.3
0.38	42.02	58.28	16.26	N	9.6	32.42
0.5	41.09	56	14.91	N	9.6	31.49
0.644	40.28	56	15.72	N	9.6	30.68
1.276	32.33	56	23.67	N	9.7	22.63
14.928	31.25	60	28.75	L1	9.8	21.45

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.244	35.5	51.96	16.46	N	9.6	25.9
0.432	32.32	47.21	14.9	N	9.6	22.72
0.624	21.8	46	24.2	L1	9.6	12.2
0.72	21.2	46	24.8	L1	9.6	11.6
1.348	21.83	46	24.17	L1	9.7	12.13
14.74	16.64	50	33.36	L1	9.8	6.84

Data transfer Mode/PC to TF Card: Set.2
Voltage: 120V

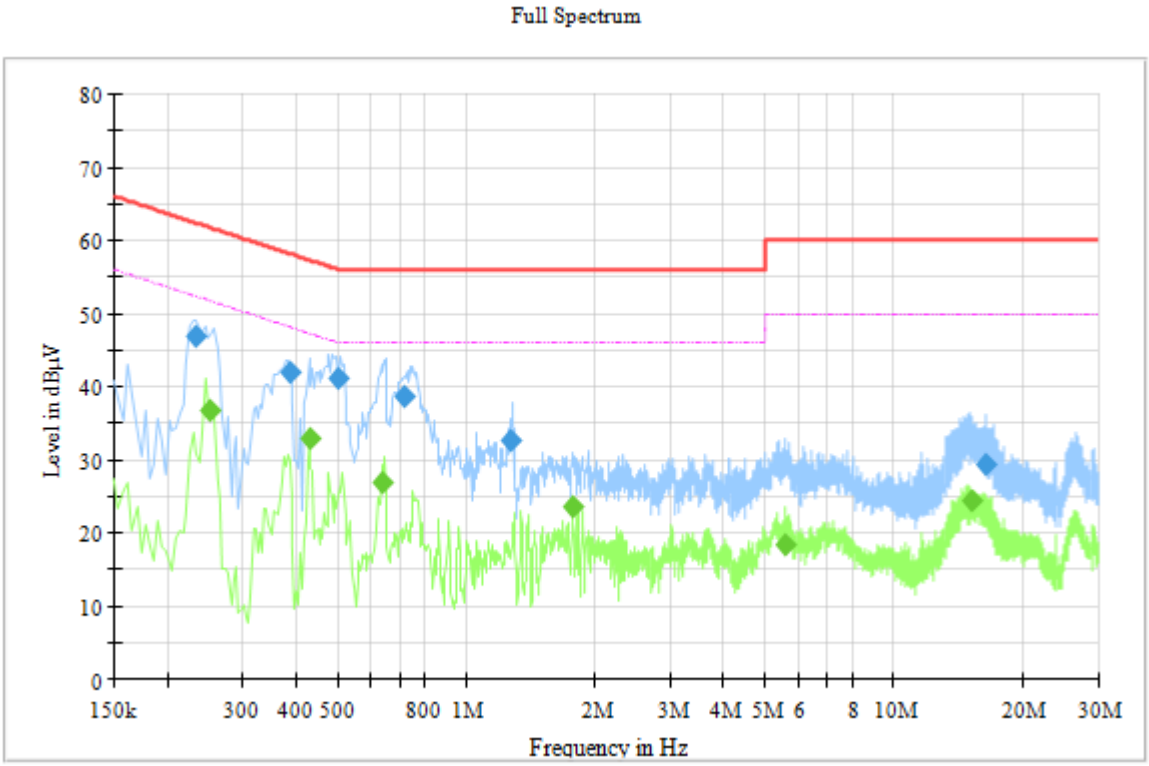


Figure B.6 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.234	46.78	62.31	15.53	N	9.6	37.18
0.388	41.88	58.11	16.23	N	9.6	32.28
0.5	41.13	56	14.87	N	9.6	31.53
0.72	38.56	56	17.44	N	9.6	28.96
1.276	32.48	56	23.52	N	9.7	22.78
16.332	29.35	60	30.65	N	9.8	19.55

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.252	36.79	51.69	14.9	N	9.6	27.19
0.432	32.95	47.21	14.27	N	9.6	23.35
0.64	26.84	46	19.16	N	9.6	17.24
1.776	23.5	46	22.5	L1	9.7	13.8
5.572	18.37	50	31.63	L1	9.7	8.67
15.128	24.41	50	25.59	L1	9.8	14.61

Data transfer Mode/TF Card to PC: Set.2
Voltage: 120V

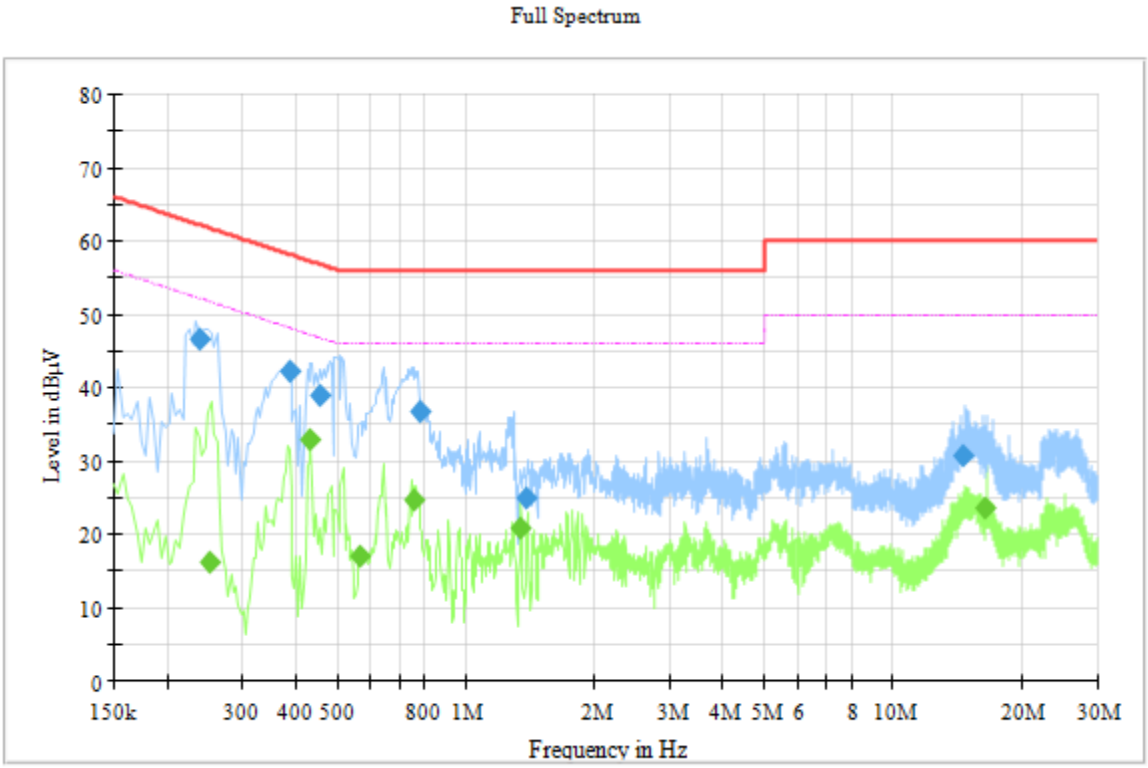


Figure B.7 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.238	46.63	62.17	15.54	N	9.6	37.03
0.388	42.12	58.11	15.99	N	9.6	32.52
0.456	38.86	56.77	17.9	N	9.6	29.26
0.78	36.75	56	19.25	N	9.6	27.15
14.572	30.61	60	29.39	L1	9.8	20.81
1.384	24.98	56	31.02	N	9.7	15.28

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.252	16.21	51.69	35.48	N	9.6	6.61
0.432	33.01	47.21	14.2	N	9.6	23.41
0.564	16.89	46	29.11	N	9.6	7.29
0.76	24.76	46	21.24	N	9.6	15.16
1.34	20.76	46	25.24	L1	9.7	11.06
16.416	23.47	50	26.53	N	9.8	13.67

Charging Mode/ Camera Mode: Set.1
Voltage: 240V

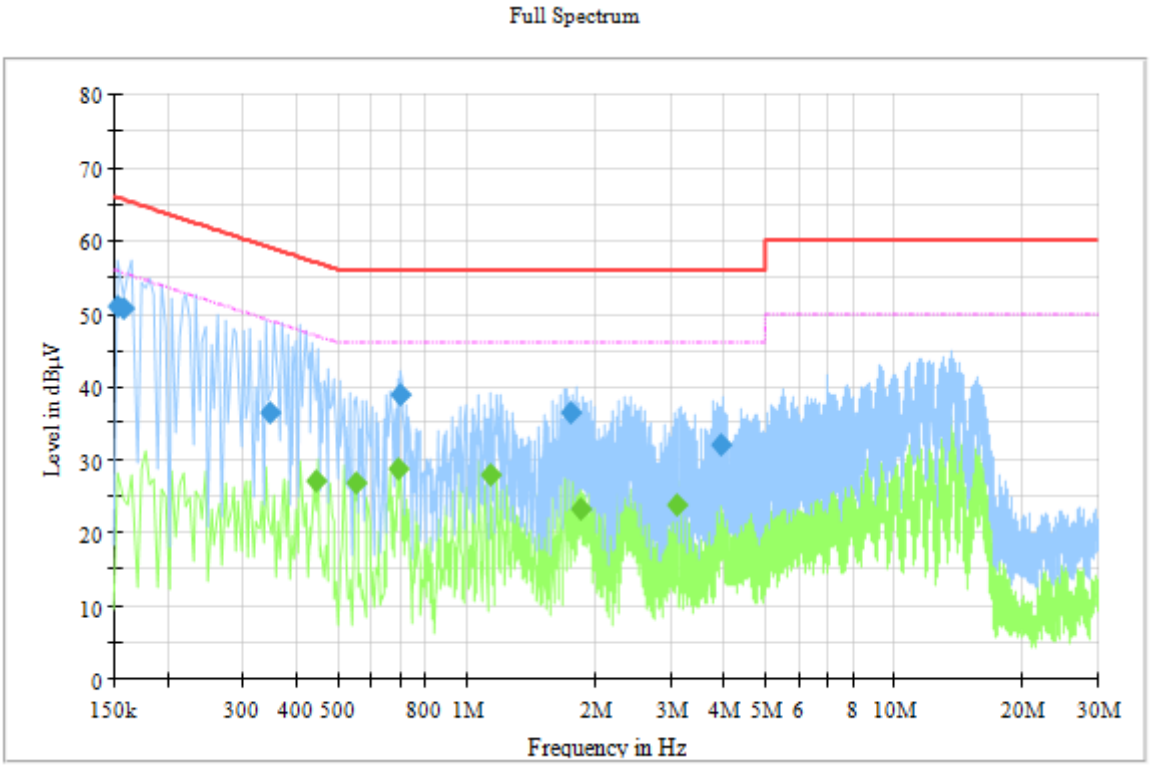


Figure B.8 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.154	51.02	65.78	14.76	L1	9.6	41.42
0.158	50.8	65.57	14.77	L1	9.6	41.2
0.348	36.32	59.01	22.69	N	9.6	26.72
0.7	38.93	56	17.07	N	9.6	29.33
1.764	36.35	56	19.65	N	9.7	26.65
3.96	31.96	56	24.04	N	9.7	22.26

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.448	27.22	46.91	19.69	N	9.6	17.62
0.552	26.8	46	19.2	N	9.6	17.2
0.696	28.68	46	17.32	N	9.6	19.08
1.144	28.06	46	17.94	N	9.7	18.36
1.848	23.27	46	22.73	N	9.7	13.57
3.108	23.71	46	22.29	N	9.7	14.01

Charging Mode/ Video play Mode: Set.1
Voltage: 240V

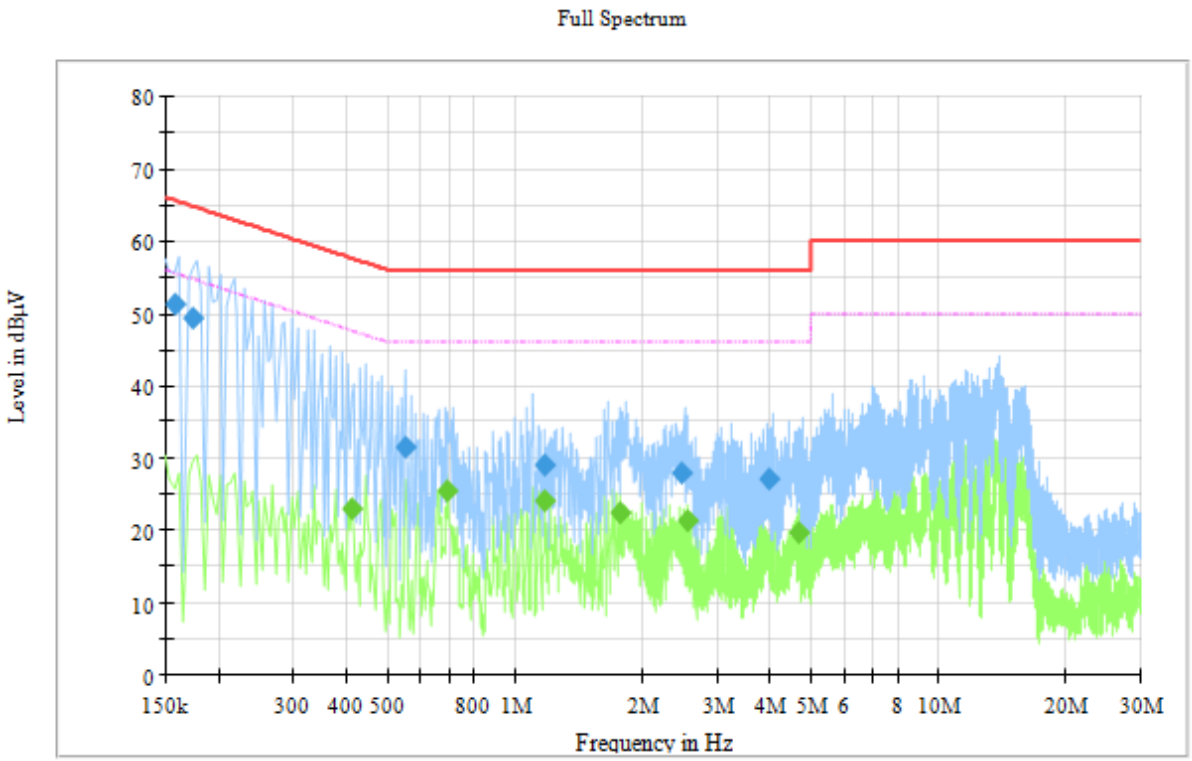


Figure B.9 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.158	51.22	65.57	14.35	L1	9.6	41.62
0.174	49.22	64.77	15.55	L1	9.6	39.62
0.552	31.54	56	24.46	N	9.6	21.94
1.176	29.17	56	26.83	N	9.7	19.47
2.484	27.93	56	28.07	N	9.7	18.23
3.996	27.16	56	28.84	N	9.7	17.46

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.412	22.95	47.61	24.66	L1	9.7	13.25
0.696	25.57	46	20.43	L1	9.6	15.97
1.18	24.13	46	21.87	L1	9.7	14.43
1.772	22.36	46	23.64	L1	9.7	12.66
2.556	21.34	46	24.66	L1	9.7	11.64
4.696	19.7	46	26.3	N	9.7	10

Charging Mode/ FM receiver Mode: Set.3
Voltage: 240V

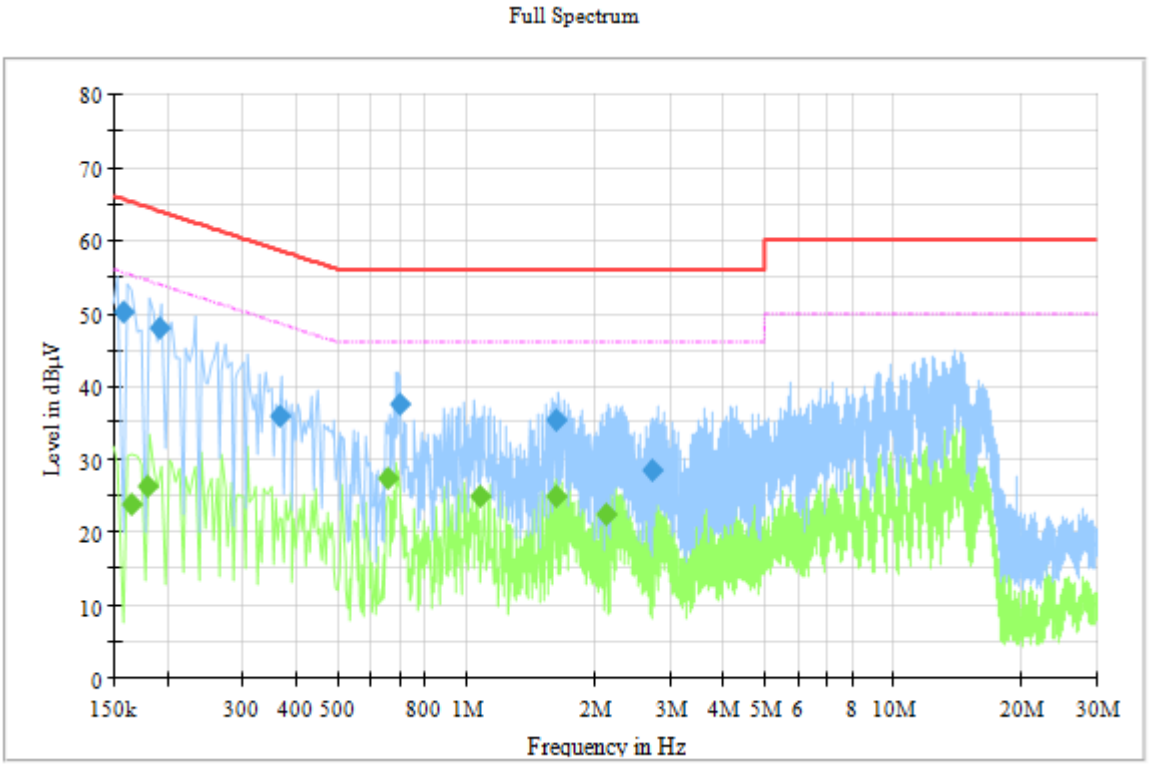


Figure B.10 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.158	50.1	65.57	15.47	L1	9.6	40.5
0.192	48.08	63.95	15.87	L1	9.6	38.48
0.368	36	58.55	22.55	L1	9.6	26.4
0.704	37.5	56	18.5	N	9.6	27.9
1.624	35.33	56	20.67	N	9.7	25.63
2.74	28.62	56	27.38	N	9.7	18.92

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.166	23.75	55.16	31.41	L1	9.6	14.15
0.18	26.23	54.49	28.25	N	9.6	16.63
0.66	27.28	46	18.72	N	9.6	17.68
1.076	24.9	46	21.1	N	9.7	15.2
1.628	24.83	46	21.17	N	9.7	15.13
2.144	22.53	46	23.47	N	9.7	12.83

Data transfer Mode/PC to EUT: Set.2
Voltage: 240V

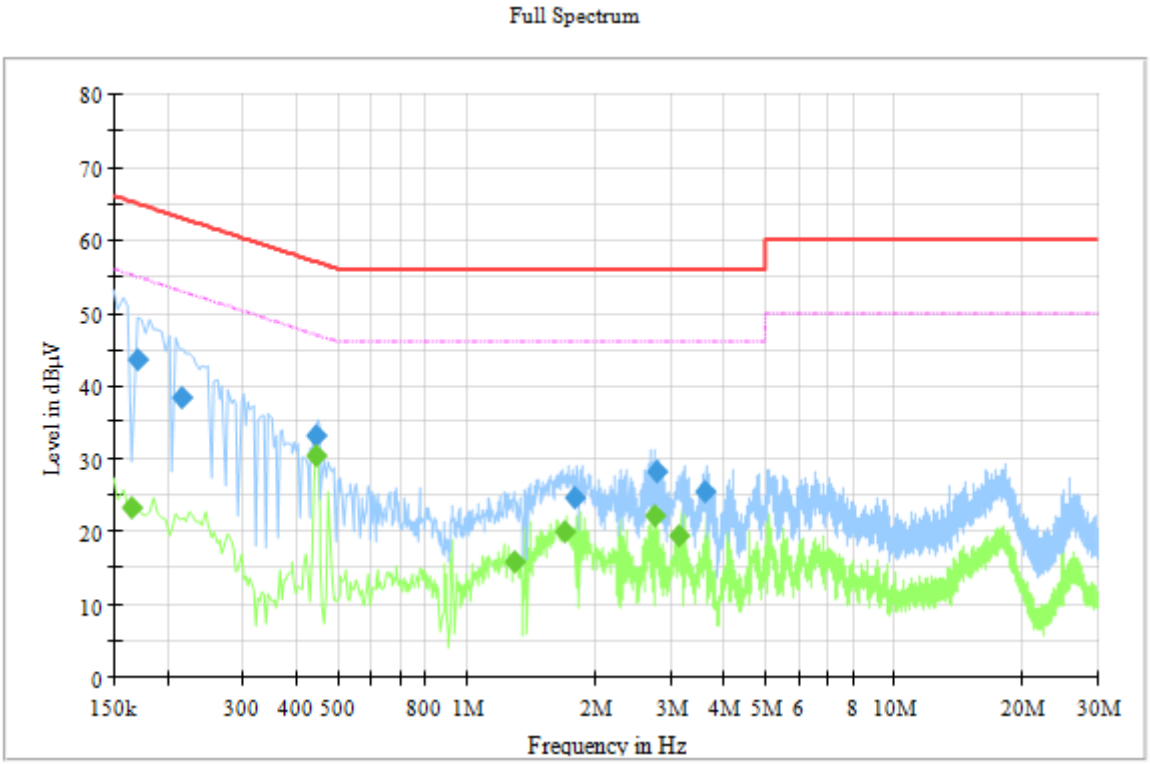


Figure B.11 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.17	43.48	64.96	21.48	N	9.6	33.88
0.216	38.31	62.97	24.66	L1	9.6	28.71
0.444	33.09	56.99	23.9	N	9.6	23.49
1.788	24.78	56	31.22	L1	9.7	15.08
2.788	28.18	56	27.82	N	9.7	18.48
3.636	25.38	56	30.62	N	9.7	15.68

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.166	23.39	55.16	31.77	N	9.6	13.79
0.444	30.41	46.99	16.58	N	9.6	20.81
1.304	16.03	46	29.97	L1	9.7	6.33
1.704	19.97	46	26.03	L1	9.7	10.27
2.752	22.24	46	23.76	N	9.7	12.54
3.16	19.44	46	26.56	N	9.7	9.74

Data transfer Mode /EUT to PC: Set.2
Voltage: 240V

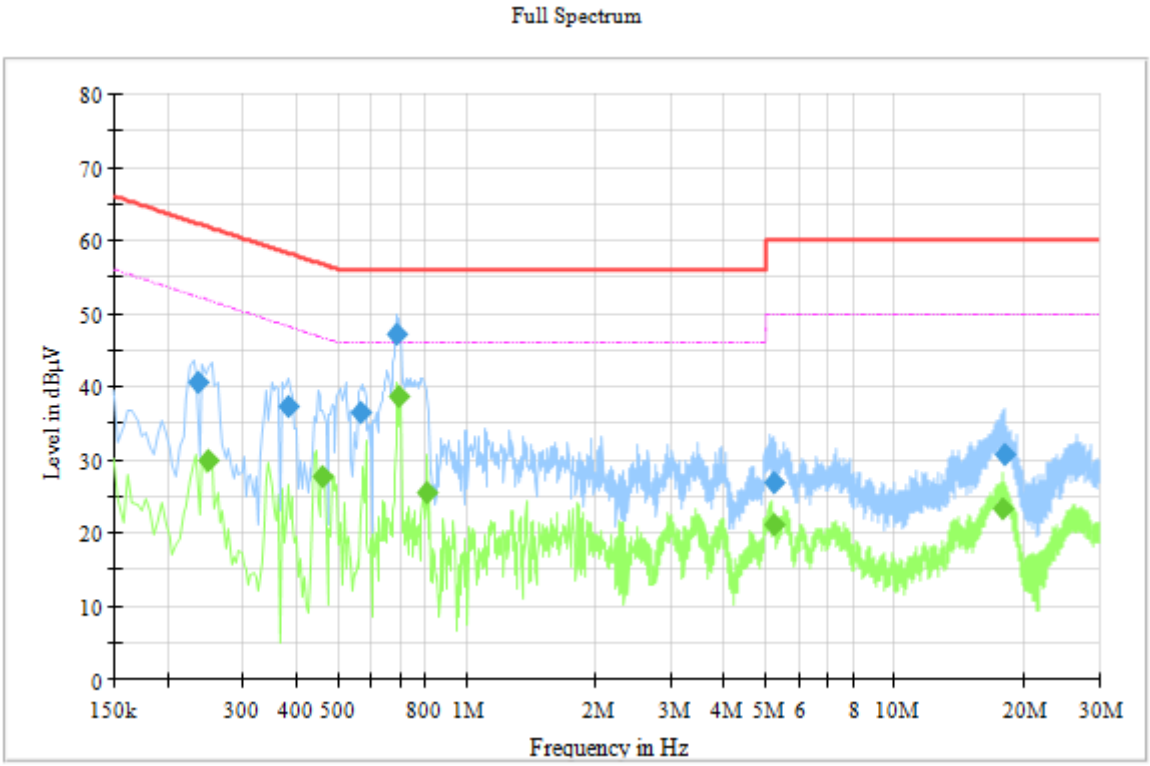


Figure B.12 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.684	47.06	56	8.94	N	9.6	37.46
0.236	40.58	62.24	21.65	N	9.6	30.98
0.384	37.37	58.19	20.82	N	9.6	27.77
0.568	36.5	56	19.5	N	9.6	26.9
18.008	30.58	60	29.42	L1	9.7	20.88
5.196	26.92	60	33.08	L1	9.7	17.22

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.248	29.82	51.82	22	N	9.6	20.22
0.46	27.6	46.69	19.1	N	9.6	18
0.696	38.61	46	7.39	N	9.6	29.01
0.804	25.41	46	20.59	N	9.6	15.81
5.2	20.96	50	29.04	L1	9.7	11.26
17.852	23.18	50	26.82	L1	9.8	13.38

Data transfer Mode/PC to TF Card: Set.2
Voltage: 240V

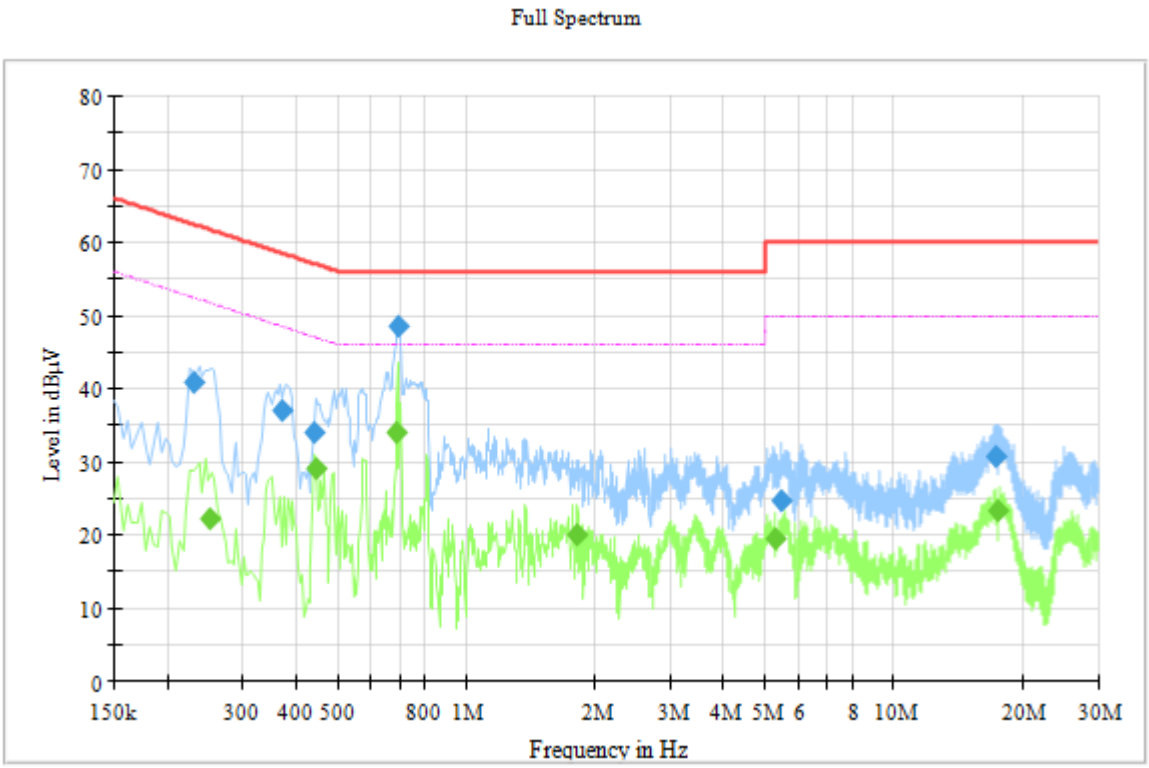


Figure B.13 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.232	40.81	62.38	21.57	N	9.6	31.21
0.372	37.11	58.46	21.34	N	9.6	27.51
0.44	33.85	57.06	23.21	N	9.6	24.25
0.692	48.62	56	7.38	N	9.6	39.02
5.44	24.54	60	35.46	N	9.7	14.84
17.26	30.66	60	29.34	L1	9.8	20.86

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.252	22.07	51.69	29.62	N	9.6	12.47
0.444	29.05	46.99	17.94	N	9.6	19.45
0.688	33.94	46	12.06	N	9.6	24.34
1.812	20.06	46	25.94	L1	9.7	10.36
5.296	19.52	50	30.48	L1	9.7	9.82
17.424	23.4	50	26.6	L1	9.8	13.6

Data transfer Mode/TF Card to PC: Set.2
Voltage: 240V

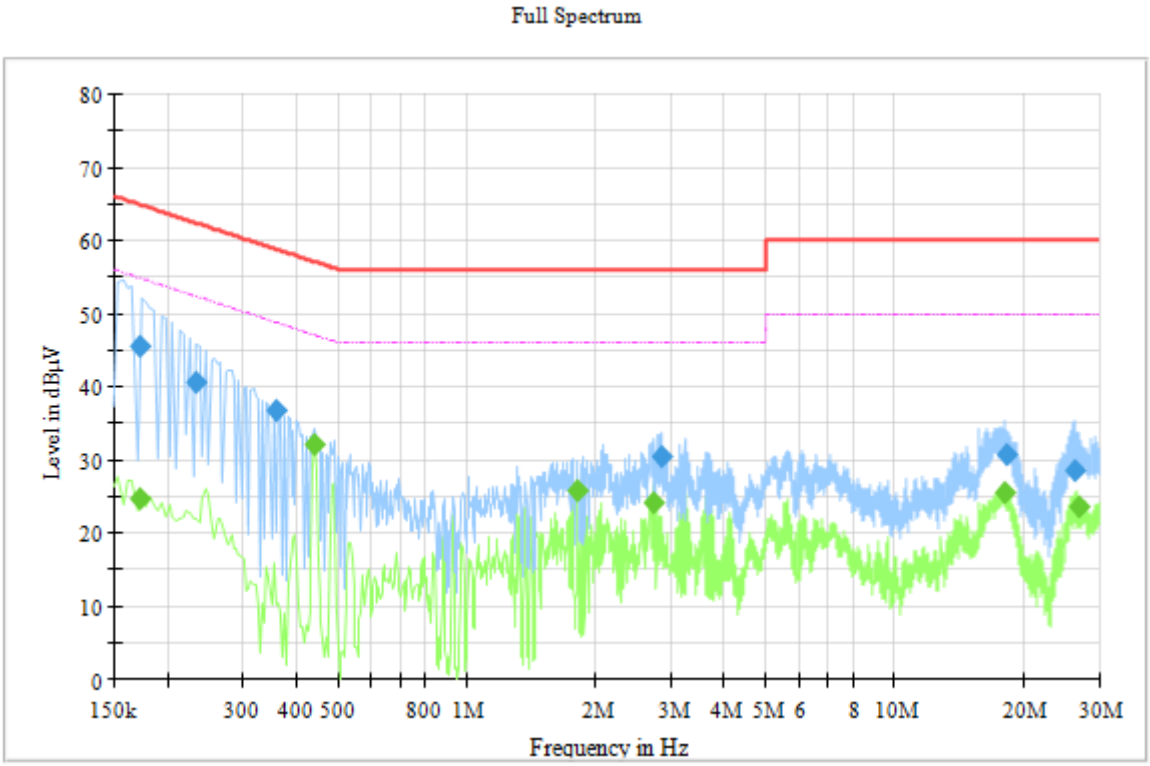


Figure B.14 Conducted Emission

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.172	45.39	64.86	19.48	L1	9.6	35.79
0.234	40.5	62.31	21.81	N	9.6	30.9
0.36	36.69	58.73	22.04	N	9.6	27.09
2.844	30.42	56	25.58	N	9.7	20.72
18.168	30.78	60	29.22	L1	9.7	21.08
26.392	28.36	60	31.64	N	9.7	18.66

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.172	24.71	54.86	30.15	N	9.6	15.11
0.44	32.07	47.06	14.99	N	9.6	22.47
1.816	25.73	46	20.27	L1	9.7	16.03
2.748	24.23	46	21.77	N	9.7	14.53
18.024	25.51	50	24.49	L1	9.7	15.81
26.824	23.42	50	26.58	N	9.7	13.72

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