



TEST REPORT

No.I22N01644-EMC

for

IDEMIA Identity and Security France

ID Screen

Model Name: MPH-MB003A

With

Hardware Version: V01(M32N)

Software Version: V01

FCC ID: ZBW-MPHMB003

Issued Date: 2022-08-16

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.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I22N01644-EMC	Rev.0	1st edition	2022-08-16

Note: the latest revision of the test report supersedes all previous version.

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1. SUMMARY OF TEST REPORT

1.1. Test Items

Description	ID Screen
Model Name	MPH-MB003A
Applicant's name	IDEMIA Identity and Security France
Manufacturer's Name	IDEMIA Identity and Security France

1.2. Test Standards

FCC Part 15, Subpart B (10-1-2020 Edition); ANSI C63.4-2014.

1.3. Test Result

Total test 2 items, pass 2 items. Please refer to "6.2 Summary of Measurement 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: 2022-08-05

Testing End Date: 2022-08-15

1.6. Signature

Liang Yong

(Prepared this test report)

Zhang Yunzhuan

(Reviewed this test report)

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(Approved this test report)



2. CLIENT INFORMATION

2.1. Applicant Information

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2.2. Manufacturer Information

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Tel: +33 1 30 20 12 77
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3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT

(AE)

3.1. About EUT

Description	ID Screen
Model Name	MPH-MB003A
FCC ID	ZBW-MPHMB003
Condition of EUT as received	No obvious damage in appearance

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Receive Date
UT01aa	354520110403440	V01(M32N)	V01	2022-08-03

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

3.3. Internal Identification of AE

AE ID*	Description
AE1	Battery
AE2	Charger
AE3	Data Cable

AE1

Model	MPH-MB003A(178177093)
Manufacturer	Zhongshan Tianmao Battery Co., Ltd.
Capacity	5000mAh
Nominal Voltage	3.85V

AE2

Model	S008ACM0500200
Manufacturer	Ten Pao Electronics (Huizhou) Co., Ltd.

AE3-1

Model	JWUB1454-M01
Manufacturer	HUIZHOU JUWEI ELECTRONICS CO.,LTD

AE3-2

Model	JWUB1453-M01R
Manufacturer	HUIZHOU JUWEI ELECTRONICS CO.,LTD

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

AE: ancillary equipment

AE2: There is just one internal circuit of charger, and the plug of the charger can be replaced to meet worldwide country's requirement.



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3.4. EUT Set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT+AE1+AE2+AE3-1	
Set.2	EUT+AE1+AE2+AE3-2	
Set.3	EUT+AE1+AE3-2+PC	

3.5. General Description

The Equipment Under Test (EUT) is a model of ID Screen with internal antenna.

It supports GSM 900/850/1800/1900MHz, WCDMA Bands 1/2/5/8, and LTE Bands 1/2/3/4/5/7/8/20/28/38/40.

It has Camera, Video Player, USB Data Transfer, NFC, Bluetooth, GNSS and Wi-Fi functions.

It consists of normal options: Battery, Charger and Data Cable.

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

Samples (EUT+AE) undergoing test were selected by the Client. Relevant information is provided by the client.

This report serves as a record of MPH-MB003A (Non-IRIS Memory 32G) manufactured by IDEMIA Identity and Security France. According to client's description, the table below shows the difference:

Changes	Details
Audio PA	changed from AW8737L to BCT89317.
Components on PCB	3D G-sensor changed from STK8321 to SC7A2TR; P-sensor changed from 3in1 STK3311-X to 3in1 LTR-559ALS; DCDC changed from PCA9412A to ETA1132.
Camera	camera IC changed from GC2385 to GC02M2.
Memory	ROM changed from EMMC32G-TA29 to EMMC32G-TX29, RAM changed from 2NP-053RS WT:A to 2NP-053RS WT:B.
GPS LNA	changed from MXDLN16G to AW5005DNRZ.
Test Standards	FCC Part 15, Subpart B (10-1-2019 Edition) update to FCC Part 15, Subpart B (10-1-2020 Edition)

According to the declaration of differences by manufacturer, the following tests need to be performed from the report of the initial model:

No	Test Item	EUT set-up No	Test Mode
1	Radiated Emission	Set.1	Camera
		Set.2	Camera
		Set.3	Data Transfer
2	Conducted Emission	Set.1	Camera
		Set.2	Camera
		Set.3	Data Transfer

Other results are cited from the initial report.

The report number for initial model is I20N00956-EMC.

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	(10-1-2020 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 °C, Max. = 35°C
Relative humidity	Min. = 20 %, 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 °C, Max. = 35 °C
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 °C, Max. = 35°C
Relative humidity	Min. = 20 %, 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/IC rules	Section in this report	Verdict
1	Radiated Emission	15.109(a)/ Section 6.2	A.1	P
2	Conducted Emission	15.107(a)/ Section 6.1	A.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 uncertainty
Radiated Emission	30MHz-1GHz	4.86dB(k=2)
	1GHz-18GHz	4.82dB(k=2)
	18GHz-40GHz	2.90dB(k=2)
Conducted Emission	150kHz-30MHz	2.62dB(k=2)

8. MEASURING APPARATUS UTILIZED

No.	Name	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1.	Test Receiver	ESR7	101676	R&S	2022.11.24	1 year
2.	Test Receiver	ESCI	100702	R&S	2023.01.12	1 year
3.	Spectrum Analyzer	FSV40	101192	R&S	2023.01.12	1 year
4.	BiLog Antenna	3142E	0224831	ETS-Lindgren	2024.05.27	3 years
5.	Horn Antenna	3117	00066577	ETS-Lindgren	2025.04.17	3 years
6.	LISN	ENV216	102067	R&S	2023.07.14	1 year
7.	Chamber	FACT3-2.0	1285	ETS-Lindgren	2023.05.29	2 years
8.	Software	EMC32	V10.50.40	R&S	/	/
9.	Horn Antenna	QSH-SL-18-2 6-S-20	17013	Q-par	2023.01.06	3 years
10.	Horn Antenna	QSH-SL-8-26- 40-K-20	17014	Q-par	2023.01.06	3 years



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9. TEST ACCESSORY UTILIZED

No.	Name	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1.	PC	ThinkPad T480	PF-13LW0C	Lenovo	/	/
2.	Printer	P1008	VNF6C12491	HP	/	/
3.	Mouse	MOEUUOA	44NY517	Lenovo	/	/

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission (§15.109(a))

Reference

FCC: Part 15.109(a)

A.1.1 Method of measurement

The field strength of radiated emissions from the unintentional radiator at a distance of 3 meters or 1 meter 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. Below 18GHz the measurement antenna was placed at a distance of 3 meters from the EUT. Above 18GHz the measurement antenna was placed at a distance of 1 meters from the EUT. (According to Part 15.31(f)(1), 1m limit is calculated by extrapolation factor of 20 dB/decade) 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:

Camera: At the beginning of measurement, the battery is completely discharged. The battery and charger are installed so that the EUT works well and keeping on taking photos.

Data Transfer: The model of the PC is Lenovo ThinkPad T480, and the serial number of the PC is PF-13LW0C. The EUT is connected to a PC for transmitting data. 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 Part 15.109(a)

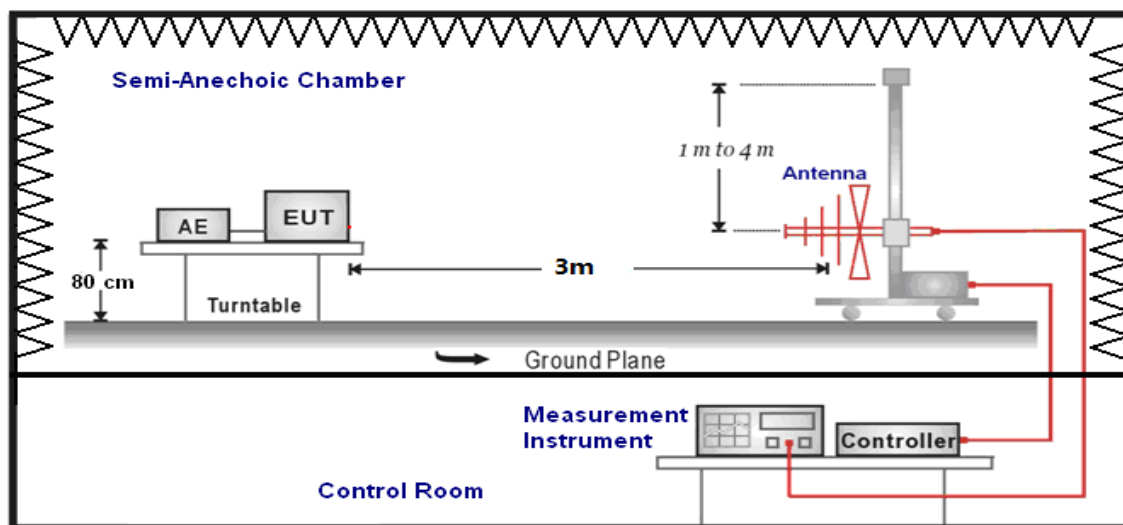
Frequency range (MHz)	Field strength limit ($\mu\text{V/m}$)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

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

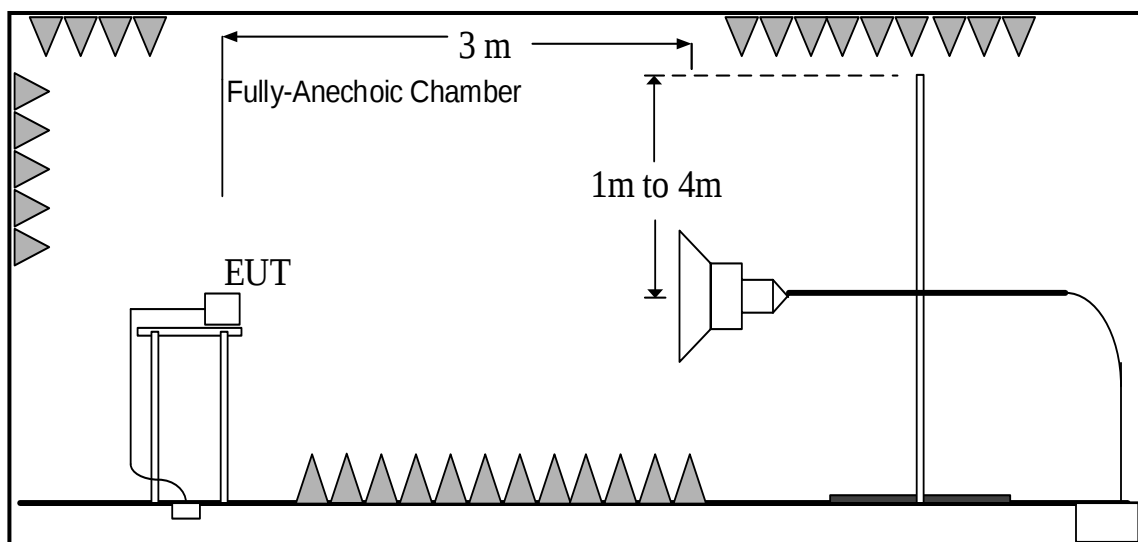
A.1.4 Test Condition

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

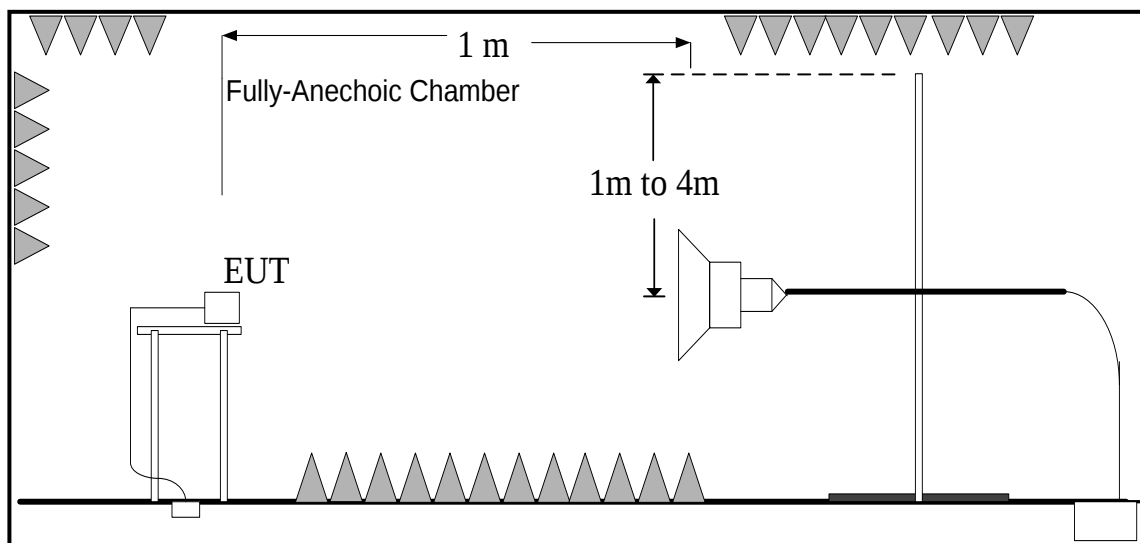
A.1.5 Test set-up: 30MHz-1GHz



1GHz-18GHz



18GHz-40GHz



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:

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

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

Result: Quasi-Peak(dB μ V/m) / Average(dB μ V/m)/Peak(dB μ V/m)

Note: the result contains vertical part and Horizontal part

Camera

Frequency range (MHz)	Quasi-Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
		UT01aa/Set.1	
30-88	40.00	See Figure A.1.1.	P
88-216	43.52		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dB μ V/m)	Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
			UT01aa/Set.1	
1000 to 18000	54.00	74.00	See Figure A.1.2.	P
18000 to 26500	63.54	83.54	See Figure A.1.3.	
26500 to 40000	63.54	83.54	See Figure A.1.4.	

Camera

Frequency range (MHz)	Quasi-Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
		UT01aa/Set.2	
30-88	40.00	See Figure A.1.5.	P
88-216	43.52		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dB μ V/m)	Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
			UT01aa/Set.2	
1000 to 18000	54.00	74.00	See Figure A.1.6.	P
18000 to 26500	63.54	83.54	See Figure A.1.7.	
26500 to 40000	63.54	83.54	See Figure A.1.8.	

Data Transfer: PC TO EUT

Frequency range (MHz)	Quasi-Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
		UT01aa/Set.3	
30-88	40.00	See Figure A.1.9.	P
88-216	43.52		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dB μ V/m)	Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
			UT01aa/Set.3	
1000 to 18000	54.00	74.00	See Figure A.1.10.	P
18000 to 26500	63.54	83.54	See Figure A.1.11.	
26500 to 40000	63.54	83.54	See Figure A.1.12.	

Data Transfer: EUT TO PC

Frequency range (MHz)	Quasi-Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
		UT01aa/Set.3	
30-88	40.00	See Figure A.1.13.	P
88-216	43.52		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dB μ V/m)	Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
			UT01aa/Set.3	
1000 to 18000	54.00	74.00	See Figure A.1.14.	P
18000 to 26500	63.54	83.54	See Figure A.1.15.	
26500 to 40000	63.54	83.54	See Figure A.1.16.	

Data Transfer: PC TO TF Card

Frequency range (MHz)	Quasi-Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
		UT01aa/Set.3	
30-88	40.00	See Figure A.1.17.	P
88-216	43.52		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dB μ V/m)	Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
			UT01aa/Set.3	
1000 to 18000	54.00	74.00	See Figure A.1.18.	P
18000 to 26500	63.54	83.54	See Figure A.1.19.	
26500 to 40000	63.54	83.54	See Figure A.1.20.	

Data Transfer: TF Card TO PC

Frequency range (MHz)	Quasi-Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
		UT01aa/Set.3	
30-88	40.00	See Figure A.1.21.	P
88-216	43.52		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dB μ V/m)	Peak Limit (dB μ V/m)	Result (dB μ V/m)	Conclusion
			UT01aa/Set.3	
1000 to 18000	54.00	74.00	See Figure A.1.22.	P
18000 to 26500	63.54	83.54	See Figure A.1.23.	
26500 to 40000	63.54	83.54	See Figure A.1.24.	

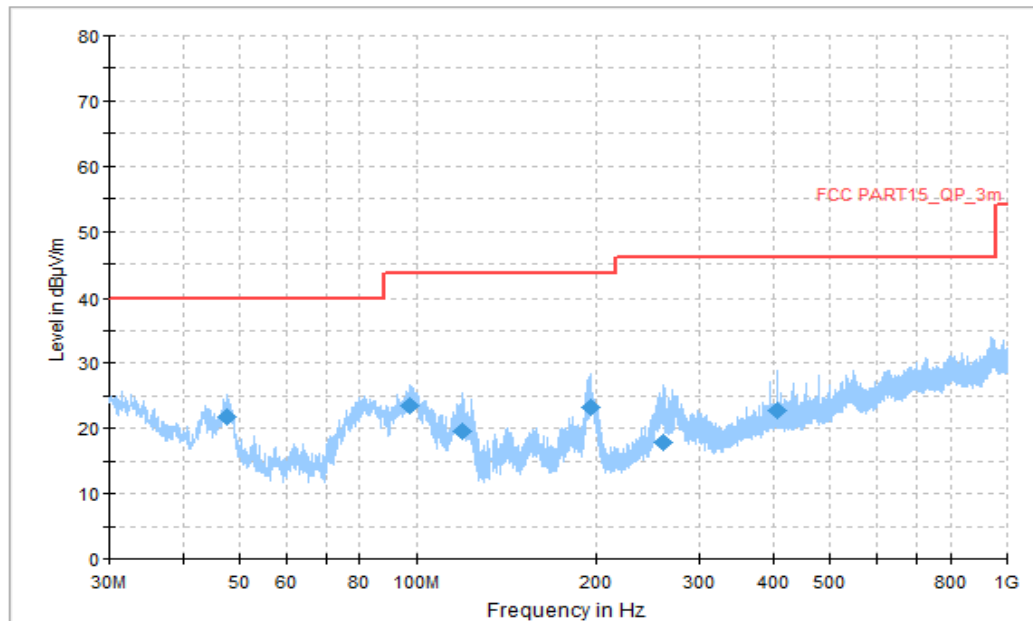


Figure A.1.1. Radiated Emission (Camera, 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	ARpl (dB/m)	P _{Mea} (dBμV)
47.675556	21.84	40.00	18.16	V	-21	42.84
97.522778	23.42	43.52	20.10	V	-20	43.42
119.186111	19.57	43.52	23.95	V	-21	40.57
195.923889	23.24	43.52	20.28	V	-18	41.24
261.075556	17.93	46.02	28.09	H	-14	31.93
408.030556	22.81	46.02	23.21	H	-9	31.81

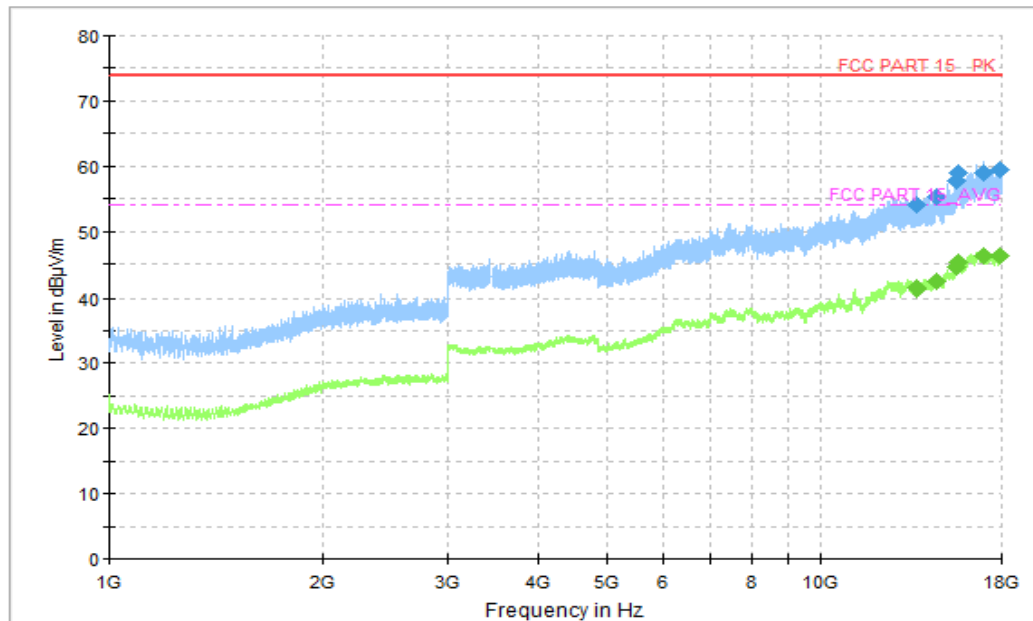


Figure A.1.2. Radiated Emission (Camera, 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
13649.000000	54.05	74.00	19.95	V	17	37.05
14597.000000	55.24	74.00	18.76	V	18	37.24
15577.000000	57.63	74.00	16.37	V	20	37.63
15647.500000	58.98	74.00	15.02	V	20	38.98
16965.250000	58.98	74.00	15.02	H	23	35.98
17880.250000	59.55	74.00	14.45	H	24	35.55

Final_Results_AVG

Frequency(MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
13649.000000	41.29	54.00	12.71	V	17	24.29
14597.000000	42.36	54.00	11.64	V	18	24.36
15577.000000	44.55	54.00	9.45	V	20	24.55
15647.500000	45.25	54.00	8.75	V	20	25.25
16965.250000	46.23	54.00	7.77	H	23	23.23
17880.250000	46.35	54.00	7.65	H	24	22.35

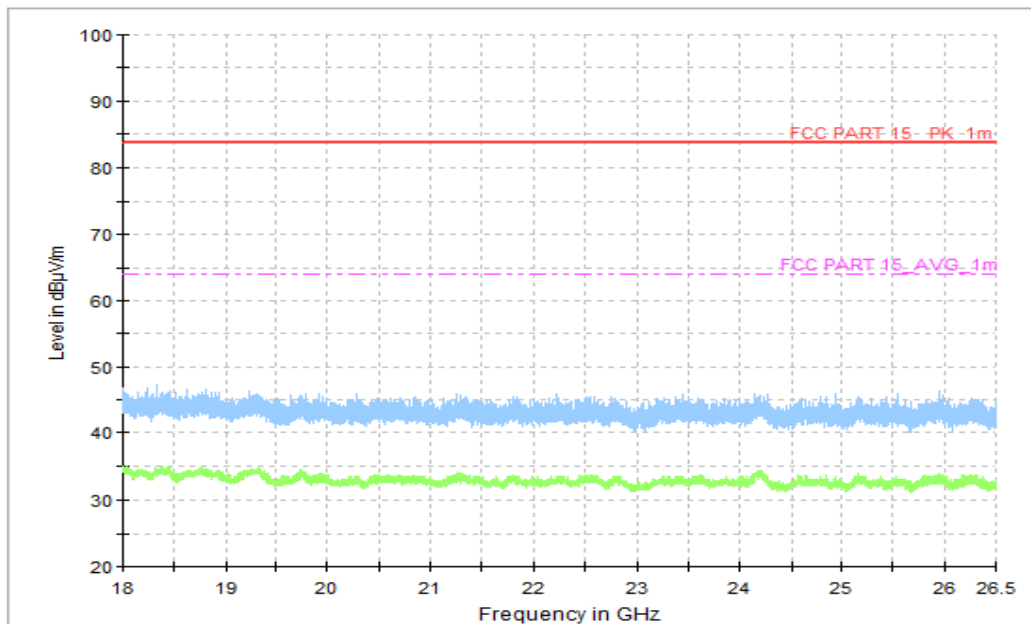


Figure A.1.3. Radiated Emission (Camera, 18GHz to 26.5GHz)

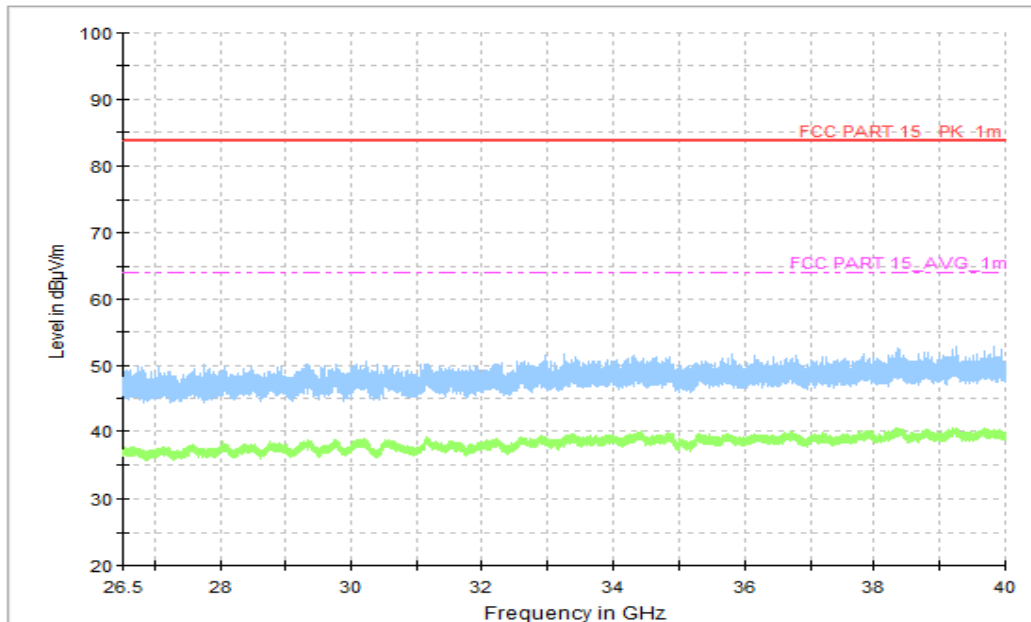


Figure A.1.4. Radiated Emission (Camera, 26.5GHz to 40GHz)

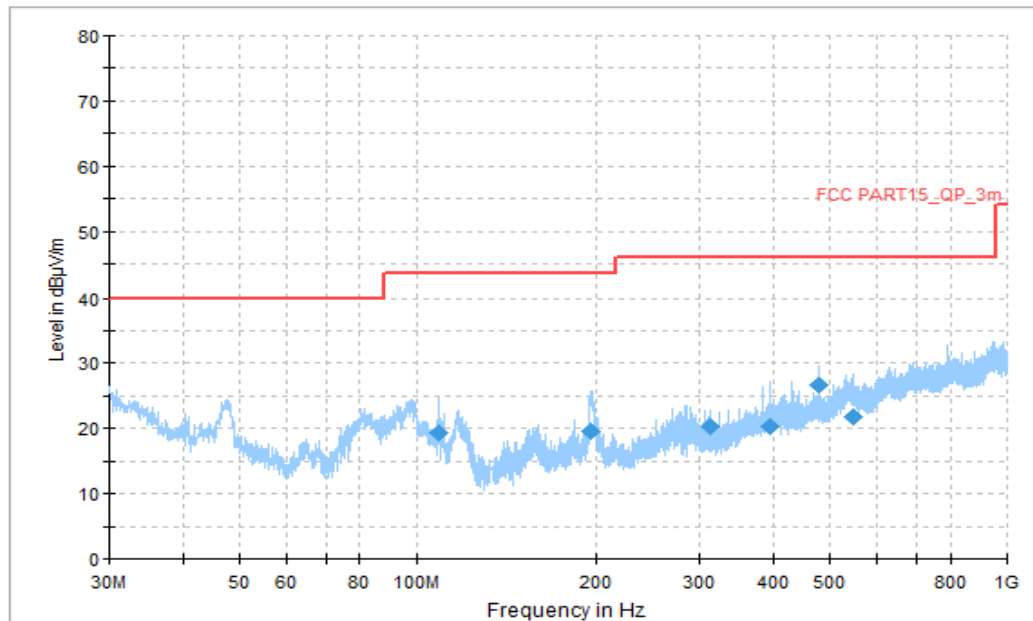


Figure A.1.5. Radiated Emission (Camera, 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	ARpl (dB/m)	P _{Mea} (dBμV)
109.055000	19.42	43.52	24.10	V	-20	39.42
195.600556	19.65	43.52	23.87	V	-18	37.65
312.000556	20.20	46.02	25.82	H	-13	33.20
396.013333	20.35	46.02	25.67	H	-9	29.35
479.972222	26.62	46.02	19.40	H	-7	33.62
548.087778	21.81	46.02	24.21	H	-4	25.81

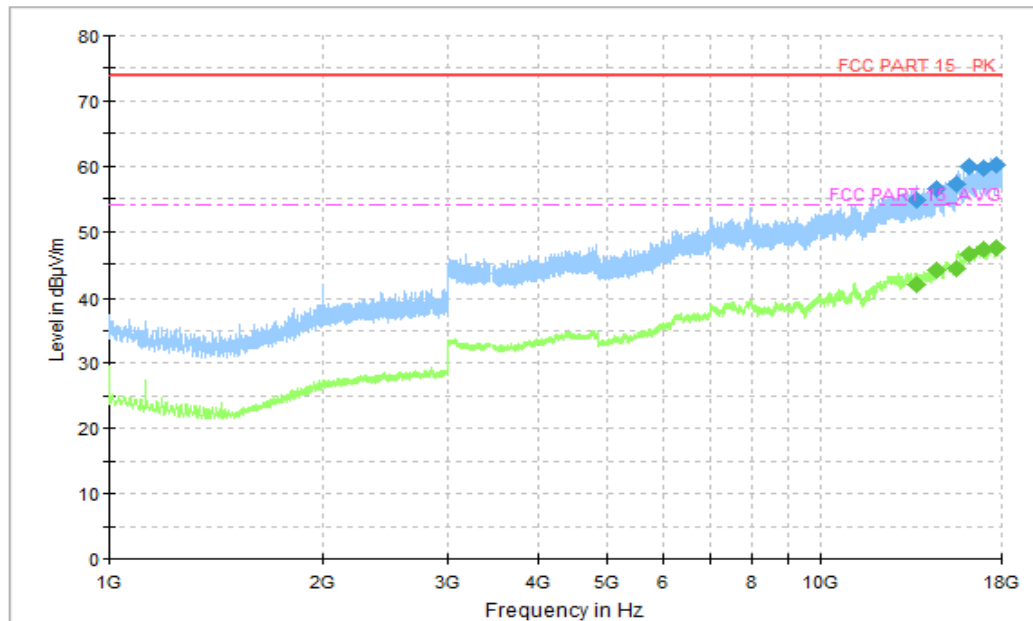


Figure A.1.6. Radiated Emission (Camera, 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
13650.500000	54.72	74.00	19.28	V	18	36.72
14545.750000	56.46	74.00	17.54	V	19	37.46
15545.500000	57.24	74.00	16.76	V	20	37.24
16150.000000	59.88	74.00	14.12	V	22	37.88
17020.250000	59.68	74.00	14.32	H	23	36.68
17667.250000	60.13	74.00	13.87	H	24	36.13

Final_Results_AVG

Frequency(MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
13650.500000	41.95	54.00	12.05	V	18	23.95
14545.750000	44.11	54.00	9.89	V	19	25.11
15545.500000	44.28	54.00	9.72	V	20	24.28
16150.000000	46.48	54.00	7.52	V	22	24.48
17020.250000	47.12	54.00	6.88	H	23	24.12
17667.250000	47.52	54.00	6.48	H	24	23.52

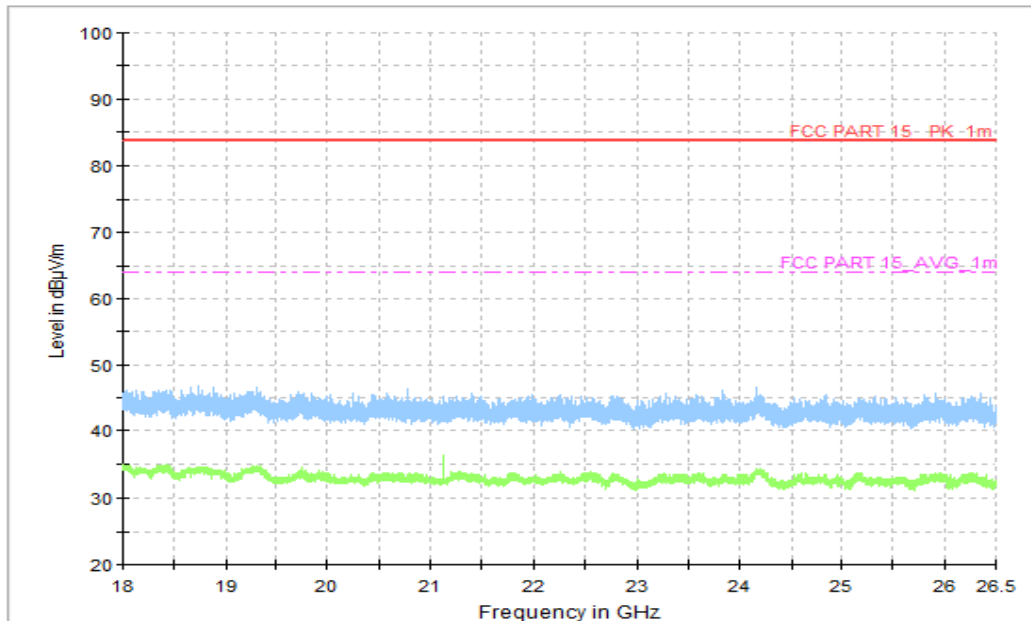


Figure A.1.7. Radiated Emission (Camera, 18GHz to 26.5GHz)

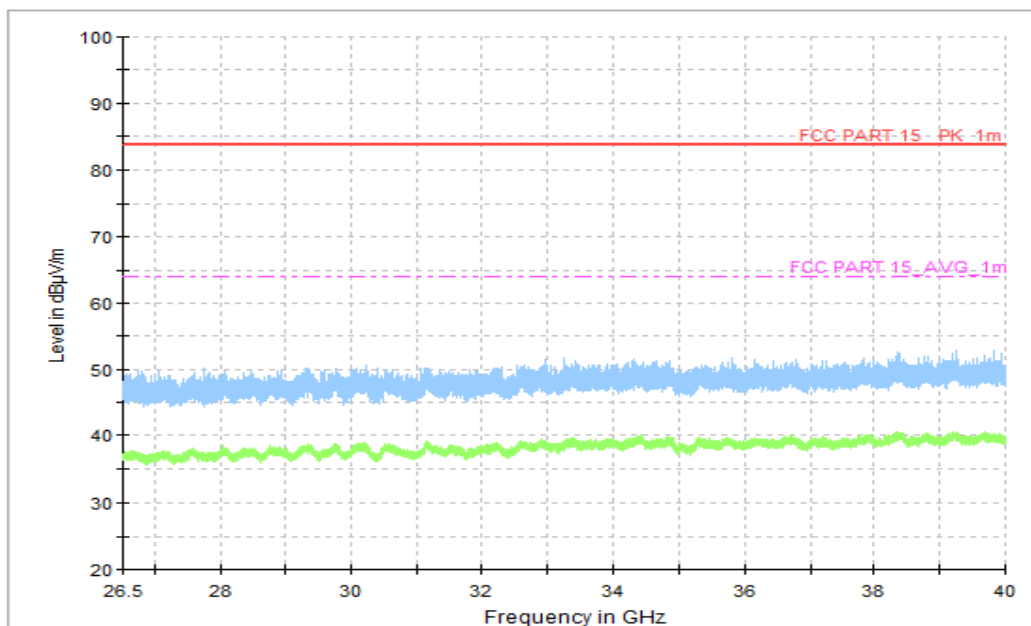


Figure A.1.8. Radiated Emission (Camera, 26.5GHz to 40GHz)

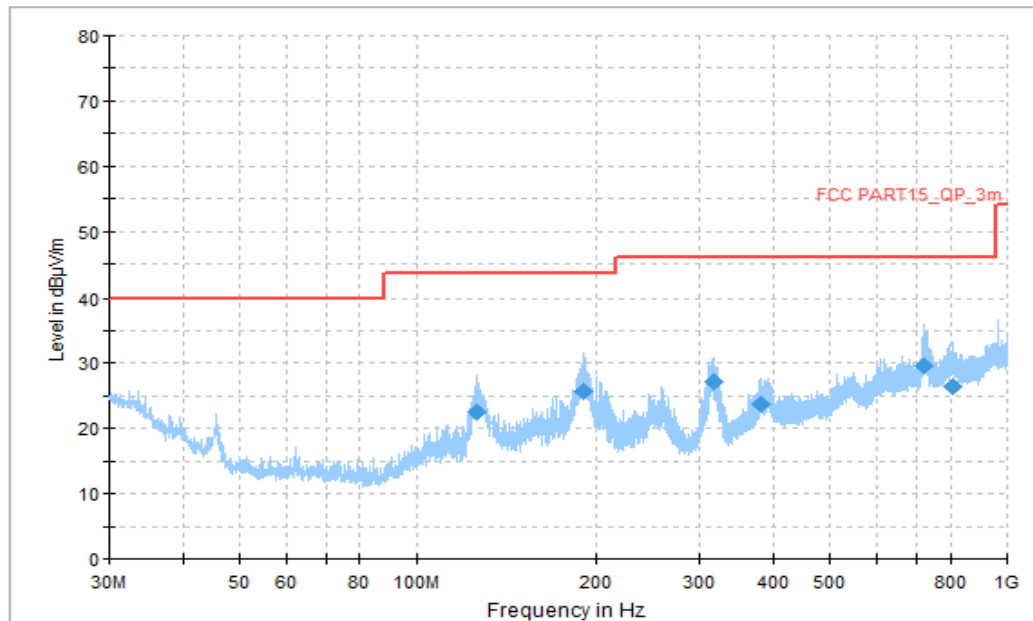


Figure A.1.9. Radiated Emission (Data Transfer: PC TO EUT, 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	ARpl (dB/m)	P _{Mea} (dBμV)
126.622778	22.47	43.52	21.05	V	-21	43.47
190.642778	25.67	43.52	17.85	V	-18	43.67
316.311667	27.07	46.02	18.95	V	-13	40.07
382.702778	23.78	46.02	22.24	V	-10	33.78
720.155000	29.61	46.02	16.41	V	-2	31.61
810.688333	26.33	46.02	19.69	V	-1	27.33

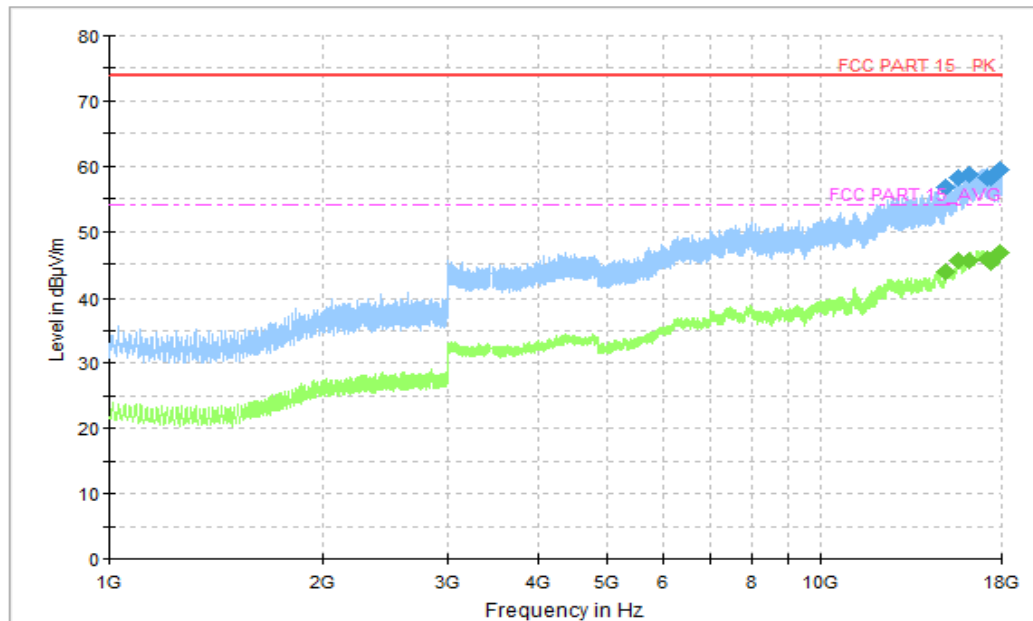


Figure A.1.10. Radiated Emission (Data Transfer: PC TO EUT, 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
15044.750000	56.75	74.00	17.25	V	18	38.75
15600.000000	58.11	74.00	15.89	V	20	38.11
16240.250000	58.82	74.00	15.18	V	21	37.82
17167.250000	58.14	74.00	15.86	V	21	37.14
17350.000000	58.11	74.00	15.89	H	22	36.11
17910.500000	59.49	74.00	14.51	H	24	35.49

Final_Results_AVG

Frequency(MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
15044.750000	43.77	54.00	10.23	V	18	25.77
15600.000000	45.43	54.00	8.58	V	20	25.43
16240.250000	45.50	54.00	8.50	V	21	24.50
17167.250000	45.75	54.00	8.25	V	21	24.75
17350.000000	45.22	54.00	8.78	H	22	23.22
17910.500000	46.64	54.00	7.36	H	24	22.64

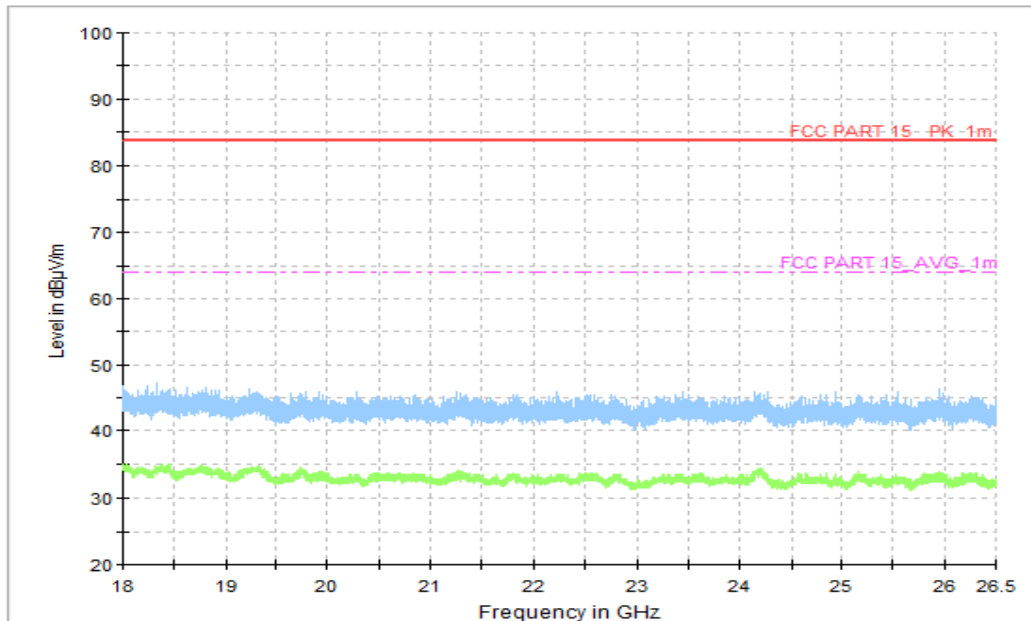


Figure A.1.11. Radiated Emission (Data Transfer: PC TO EUT, 18GHz to 26.5GHz)

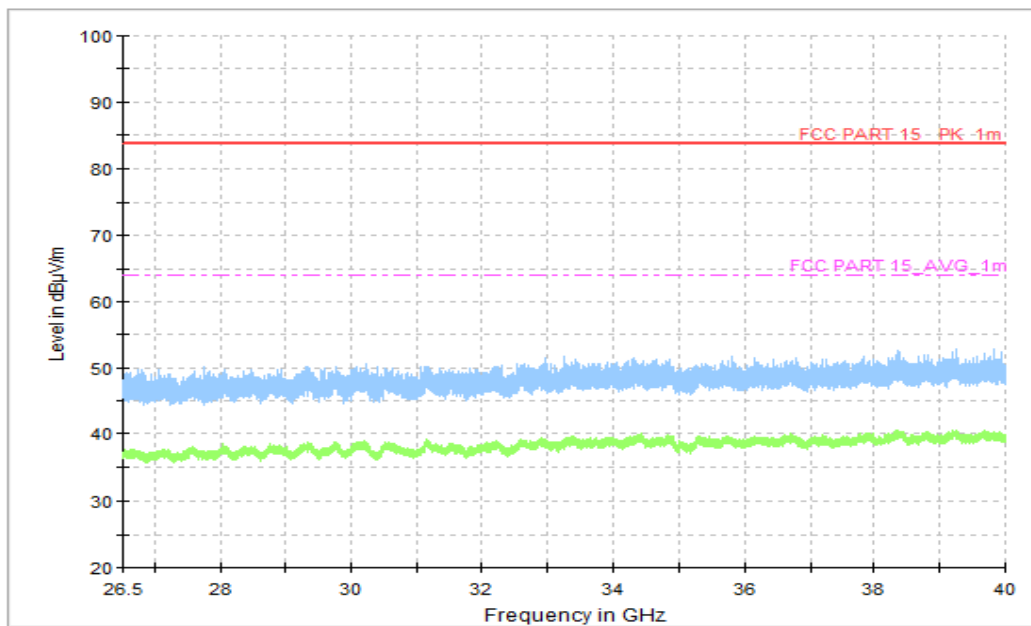


Figure A.1.12. Radiated Emission (Data Transfer: PC TO EUT, 26.5GHz to 40GHz)

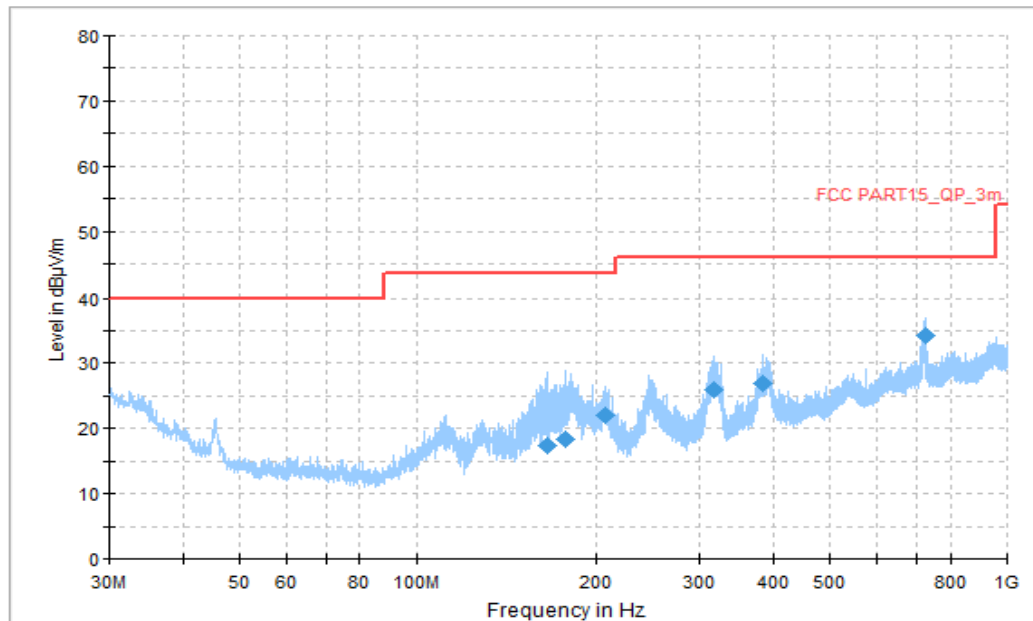


Figure A.1.13. Radiated Emission (Data Transfer: EUT TO PC, 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	ARpl (dB/m)	P _{Mea} (dBμV)
164.883889	17.45	43.52	26.07	V	-18	35.45
177.440000	18.42	43.52	25.10	V	-18	36.42
206.917222	22.07	43.52	21.45	H	-17	39.07
316.419444	25.99	46.02	20.03	H	-13	38.99
383.996111	26.89	46.02	19.13	H	-10	36.89
724.735556	34.23	46.02	11.79	H	-2	36.23

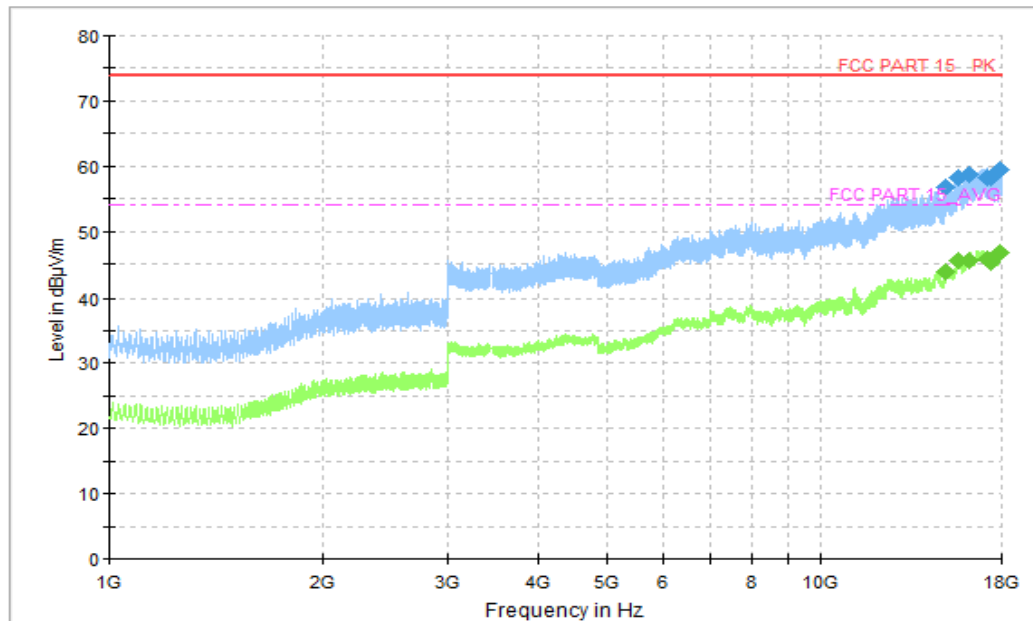


Figure A.1.14. Radiated Emission (Data Transfer: EUT TO PC, 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
15263.500000	56.17	74.00	17.83	V	19	37.17
15661.750000	58.51	74.00	15.49	V	20	38.51
16575.500000	59.56	74.00	14.44	V	22	37.56
17017.500000	59.72	74.00	14.28	V	23	36.72
17331.500000	58.48	74.00	15.52	H	22	36.48
17717.500000	59.38	74.00	14.62	H	23	36.38

Final_Results_AVG

Frequency(MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
15263.500000	43.67	54.00	10.33	V	19	24.67
15661.750000	45.83	54.00	8.17	V	20	25.83
16575.500000	46.22	54.00	7.78	V	22	24.22
17017.500000	47.34	54.00	6.66	V	23	24.34
17331.500000	45.22	54.00	8.78	H	22	23.22
17717.500000	46.49	54.00	7.51	H	23	23.49

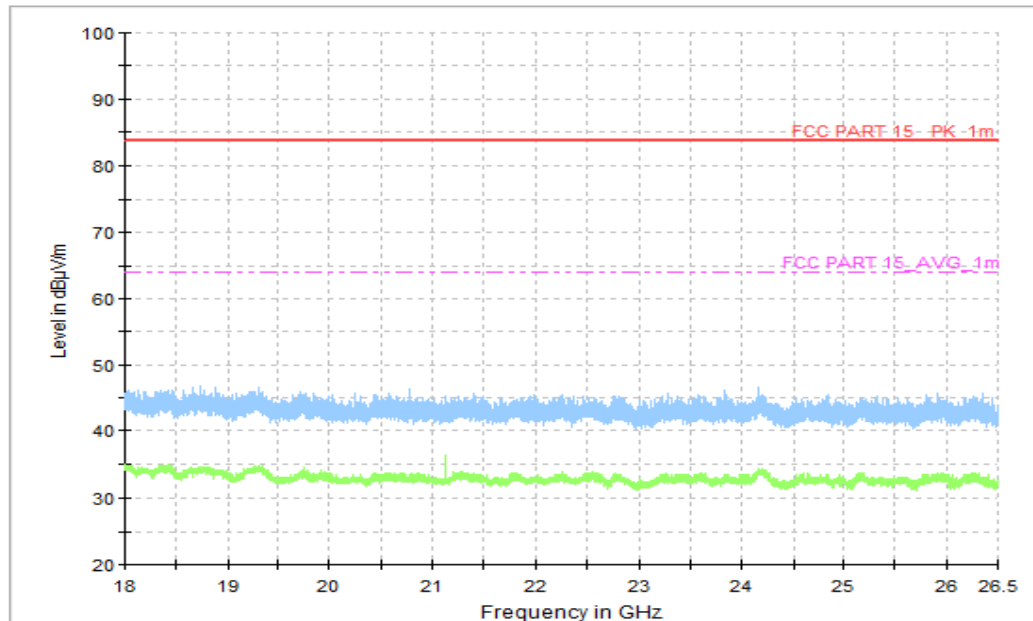


Figure A.1.15. Radiated Emission (Data Transfer: EUT TO PC, 18GHz to 26.5GHz)

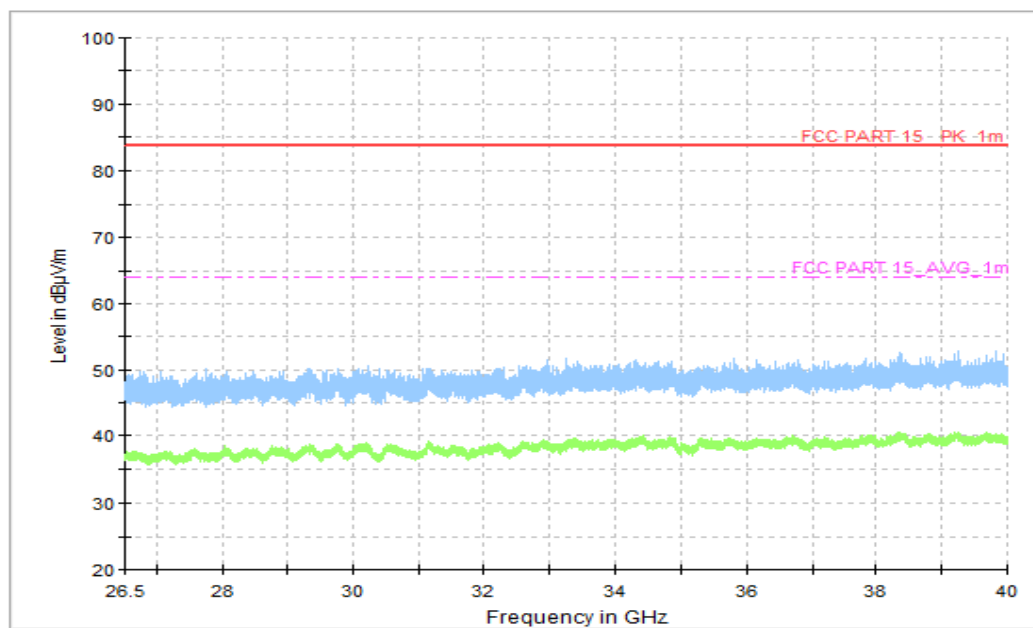


Figure A.1.16. Radiated Emission (Data Transfer: EUT TO PC, 26.5GHz to 40GHz)

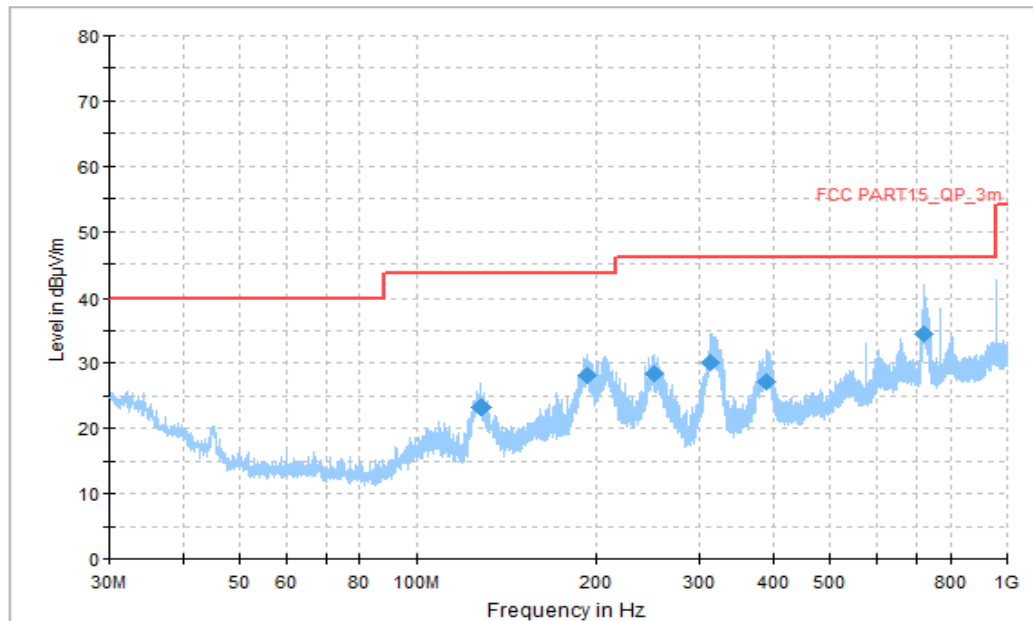


Figure A.1.17. Radiated Emission (Data Transfer: PC TO TF Card, 30MHz to 1GHz)
Final_Results

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	ARpl (dB/m)	P _{Mea} (dBμV)
127.970000	23.14	43.52	20.38	H	-21	44.14
192.636667	28.24	43.52	15.28	H	-18	46.24
251.213889	28.47	46.02	17.55	H	-15	43.47
312.323889	30.01	46.02	16.01	H	-13	43.01
388.738333	27.26	46.02	18.76	H	-9	36.26
719.454444	34.54	46.02	11.48	H	-2	36.54

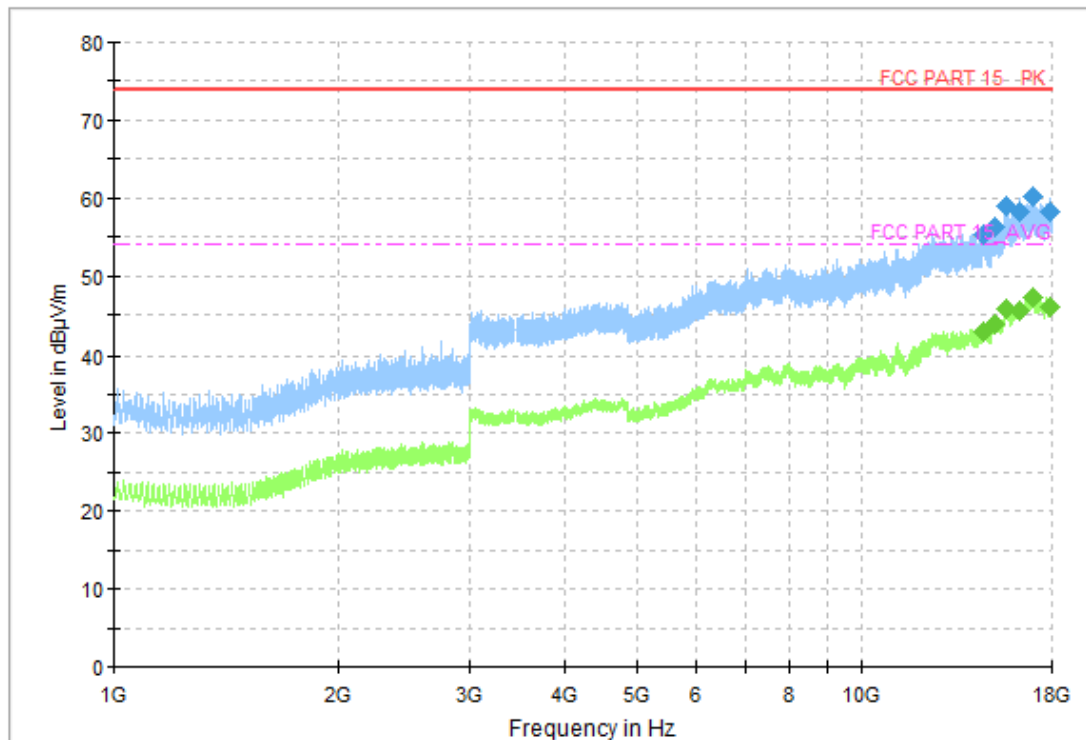


Figure A.1.18. Radiated Emission (Data Transfer: PC TO TF Card, 1GHz to 18GHz)
Final_Results_PK

Frequency(MHz)	Peak (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
14536.250000	55.27	74.00	18.73	V	18	37.27
15100.250000	56.27	74.00	17.73	V	18	38.27
15659.500000	58.93	74.00	15.07	V	20	38.93
16263.750000	58.20	74.00	15.80	V	21	37.20
17016.250000	60.22	74.00	13.78	H	23	37.22
17946.250000	58.32	74.00	15.68	H	24	34.32

Final_Results_AVG

Frequency(MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
14536.250000	42.81	54.00	11.19	V	18	24.81
15100.250000	43.81	54.00	10.19	V	18	25.81
15659.500000	45.64	54.00	8.36	V	20	25.64
16263.750000	45.42	54.00	8.58	V	21	24.42
17016.250000	47.23	54.00	6.77	H	23	24.23
17946.250000	45.95	54.00	8.05	H	24	21.95

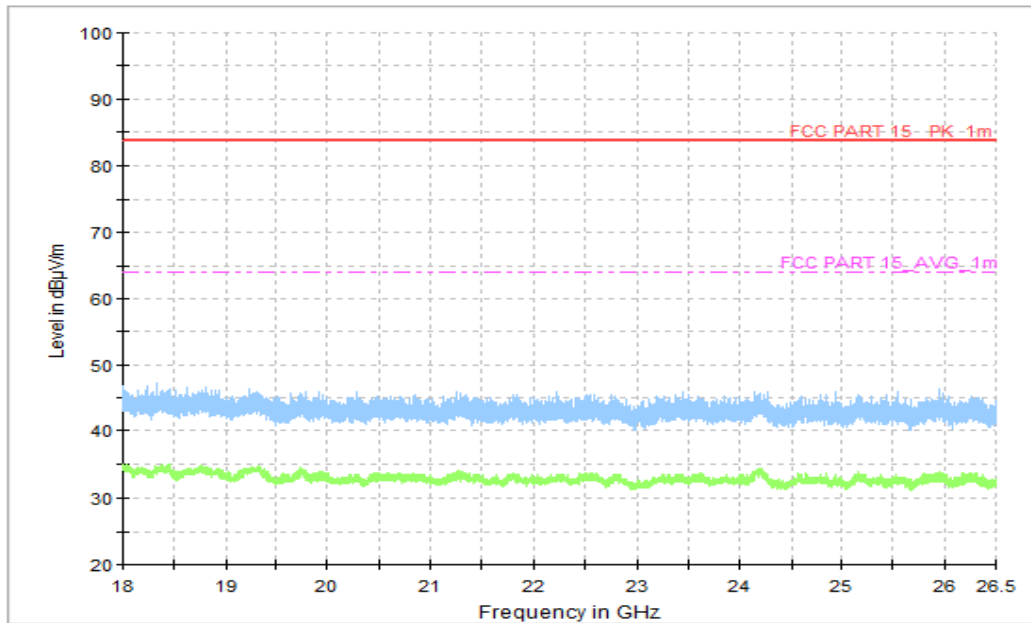


Figure A.1.19. Radiated Emission (Data Transfer: PC TO TF Card, 18GHz to 26.5GHz)

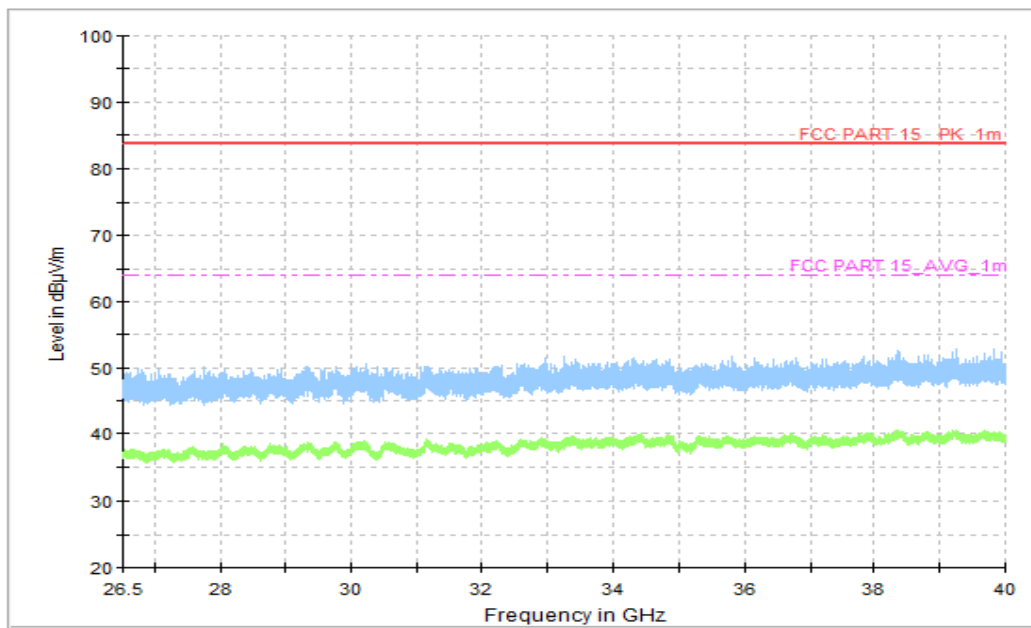


Figure A.1.20. Radiated Emission (Data Transfer: PC TO TF Card, 26.5GHz to 40GHz)

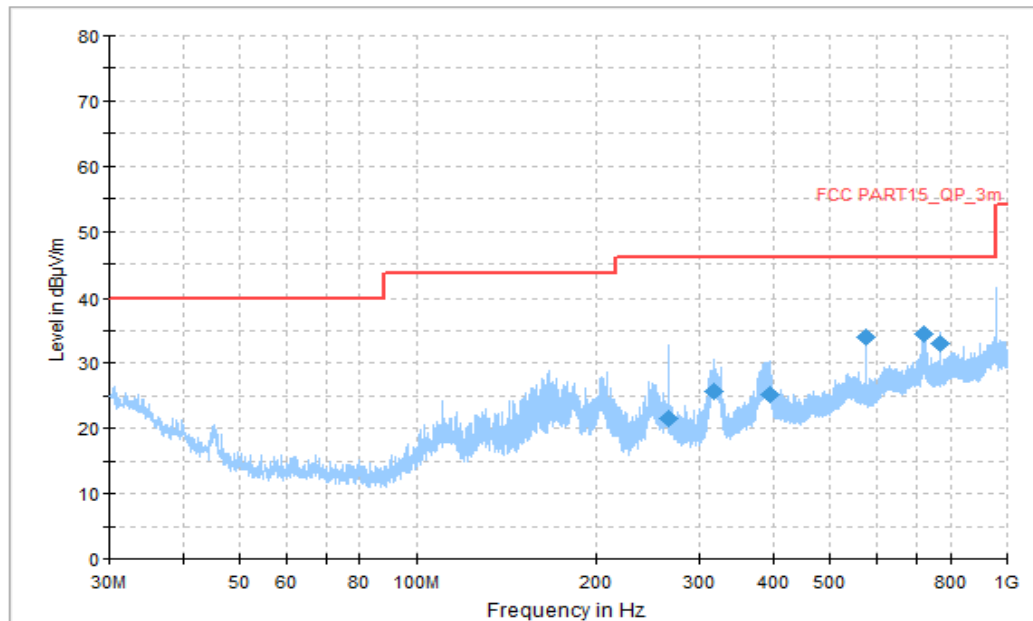


Figure A.1.21. Radiated Emission (Data Transfer: TF Card TO PC, 30MHz to 1GHz)
Final_Results

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	ARpl (dB/m)	P _{Mea} (dBμV)
265.763889	21.43	46.02	24.59	V	-14	35.43
318.305556	25.62	46.02	20.40	H	-13	38.62
394.666111	25.18	46.02	20.84	H	-9	34.18
576.002222	33.98	46.02	12.04	V	-5	38.98
721.987222	34.41	46.02	11.61	H	-2	36.41
768.008333	33.10	46.02	12.92	H	-2	35.10

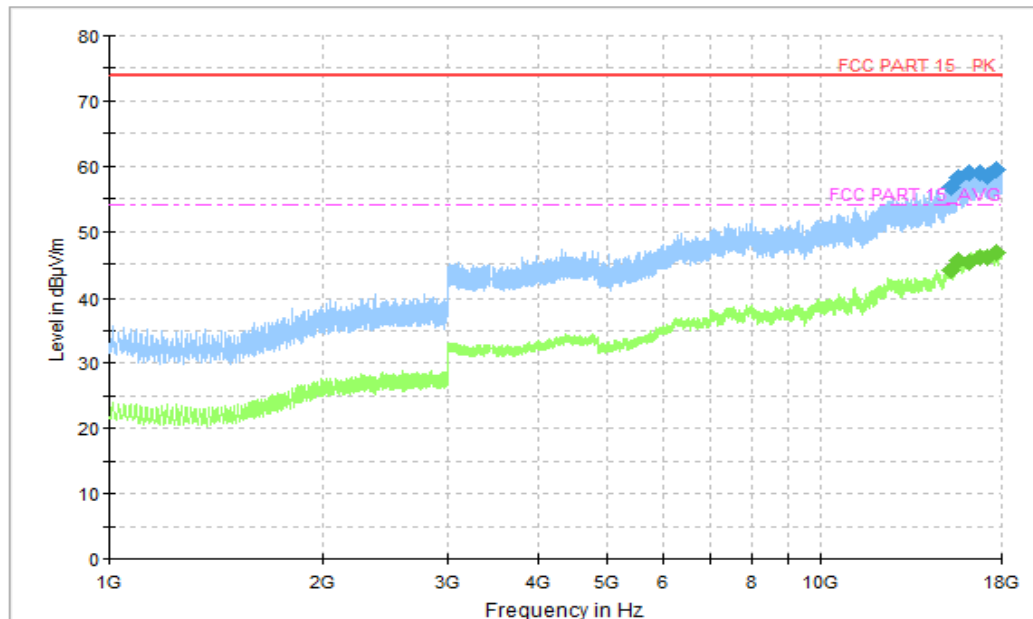


Figure A.1.22. Radiated Emission (Data Transfer: TF Card TO PC, 1GHz to 18GHz)
Final_Results_PK

Frequency(MHz)	Peak (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
15307.500000	56.77	74.00	17.23	V	19	37.77
15637.750000	58.32	74.00	15.68	V	20	38.32
16173.250000	58.98	74.00	15.02	V	21	37.98
16744.000000	58.84	74.00	15.16	V	21	37.84
17223.250000	58.49	74.00	15.51	H	22	36.49
17681.000000	59.53	74.00	14.47	H	23	36.53

Final_Results_AVG

Frequency(MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
15307.500000	43.99	54.00	10.01	V	19	24.99
15637.750000	45.56	54.00	8.44	V	20	25.56
16173.250000	45.33	54.00	8.67	V	21	24.33
16744.000000	46.09	54.00	7.91	V	21	25.09
17223.250000	45.90	54.00	8.10	H	22	23.9
17681.000000	46.63	54.00	7.37	H	23	23.63

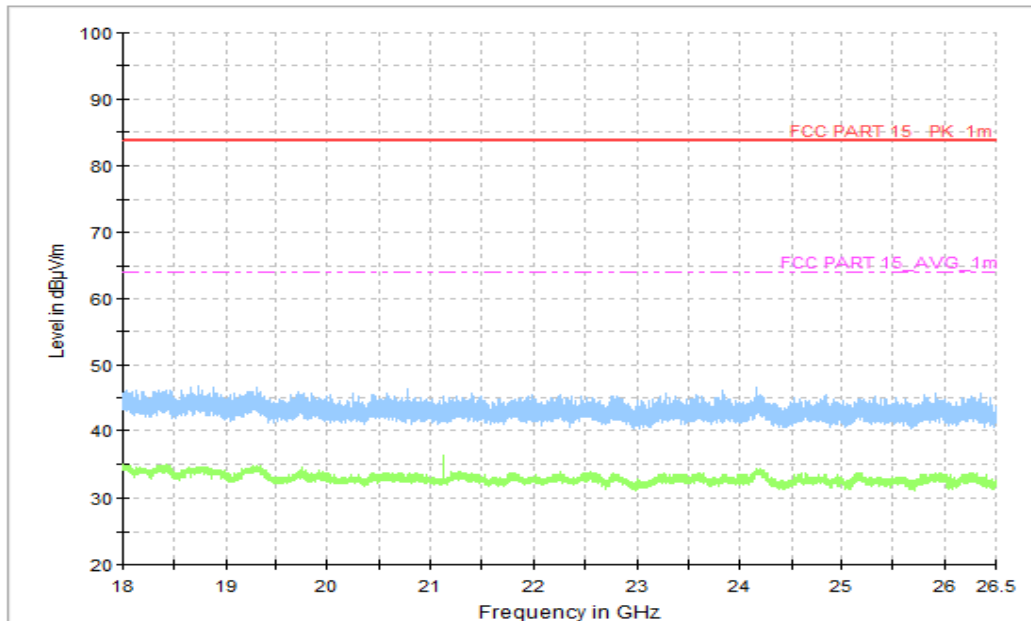


Figure A.1.23. Radiated Emission (Data Transfer: TF Card TO PC, 18GHz to 26.5GHz)

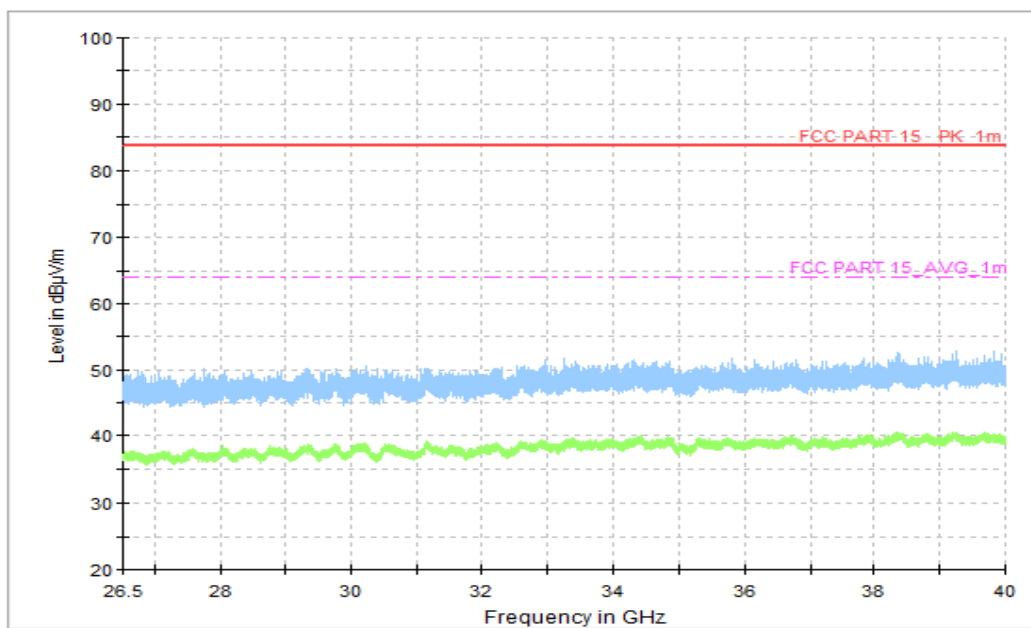


Figure A.1.24. Radiated Emission (Data Transfer: TF Card TO PC, 26.5GHz to 40GHz)

A.2 Conducted Emission (§15.107(a))

Reference

FCC: 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:

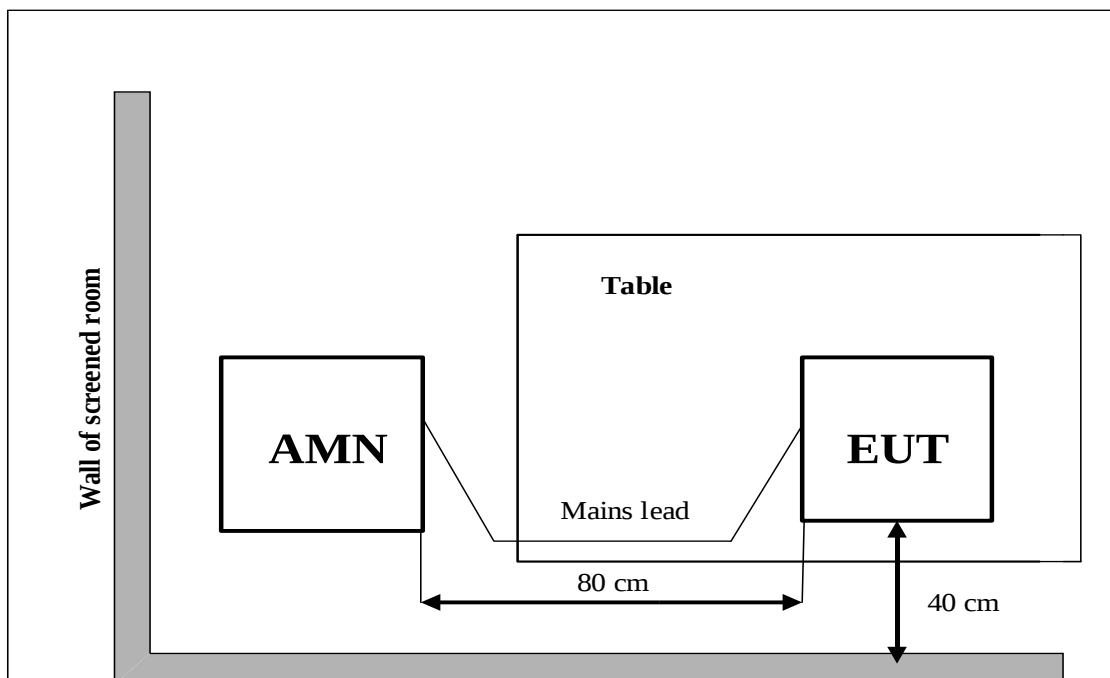
Camera: At the beginning of measurement, the battery is completely discharged. The battery and charger are installed so that the EUT works well and keeping on taking photos.

Data Transfer: The model of the PC is Lenovo ThinkPad T480, and the serial number of the PC is PF-13LW0C. The EUT is connected to a PC for transmitting data. 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.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 set-up:



A.2.5 Test Condition in charging mode

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

RBW	Sweep Time(s)
9kHz	1

A.2.6 Measurement Results

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

Where

Corr: PathLoss + Voltage Division Factor

PMea: Measurement result on receiver.

Camera

AC Input Port/ Voltage: 120V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV)	Conclusion
			UT01aa/Set.1	
0.15 to 0.5	66 to 56	56 to 46	See Figure A.2.1.	P
0.5 to 5	56	46		
5 to 30	60	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Camera

AC Input Port/ Voltage: 120V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV)	Conclusion
			UT01aa/Set.2	
0.15 to 0.5	66 to 56	56 to 46	See Figure A.2.2.	P
0.5 to 5	56	46		
5 to 30	60	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Data Transfer

AC Input Port/ Voltage: 120V/60Hz

To Input and Voltage: 20V/0.01V				
Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV)	Conclusion
			UT01aa/Set.3	
0.15 to 0.5	66 to 56	56 to 46	See Figure A.2.3.	P
0.5 to 5	56	46		
5 to 30	60	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Camera

AC Input Port/ Voltage: 240V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV)	Conclusion
			UT01aa/Set.1	
0.15 to 0.5	66 to 56	56 to 46	See Figure A.2.4.	P
0.5 to 5	56	46		
5 to 30	60	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Camera

AC Input Port/ Voltage: 240V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV)	Conclusion
			UT01aa/Set.2	
0.15 to 0.5	66 to 56	56 to 46	See Figure A.2.5.	P
0.5 to 5	56	46		
5 to 30	60	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				



Data Transfer

AC Input Port/ Voltage: 240V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV)	Conclusion
			UT01aa/Set.3	
0.15 to 0.5	66 to 56	56 to 46	See Figure A.2.6.	P
0.5 to 5	56	46		
5 to 30	60	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

AC Input Port/ Voltage: 120V/60Hz

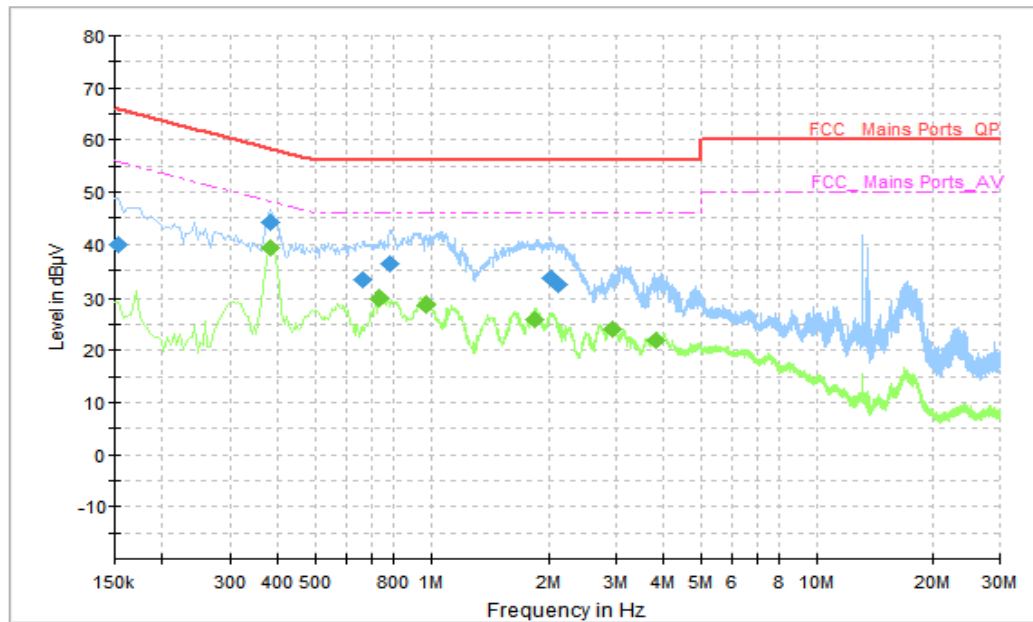


Figure A.2.1. Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.154000	39.86	65.78	25.92	N	10	29.86
0.382000	44.09	58.24	14.14	L1	10	34.09
0.666000	33.32	56.00	22.68	N	10	23.32
0.778000	36.40	56.00	19.60	N	10	26.40
2.034000	33.37	56.00	22.63	N	10	23.37
2.126000	32.16	56.00	23.84	N	10	22.16

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.382000	39.47	48.24	8.77	L1	10	29.47
0.734000	29.73	46.00	16.27	L1	10	19.73
0.966000	28.77	46.00	17.23	L1	10	18.77
1.846000	25.97	46.00	20.03	L1	10	15.97
2.934000	23.98	46.00	22.02	L1	10	13.98
3.810000	21.87	46.00	24.13	L1	10	11.87

AC Input Port/ Voltage: 120V/60Hz

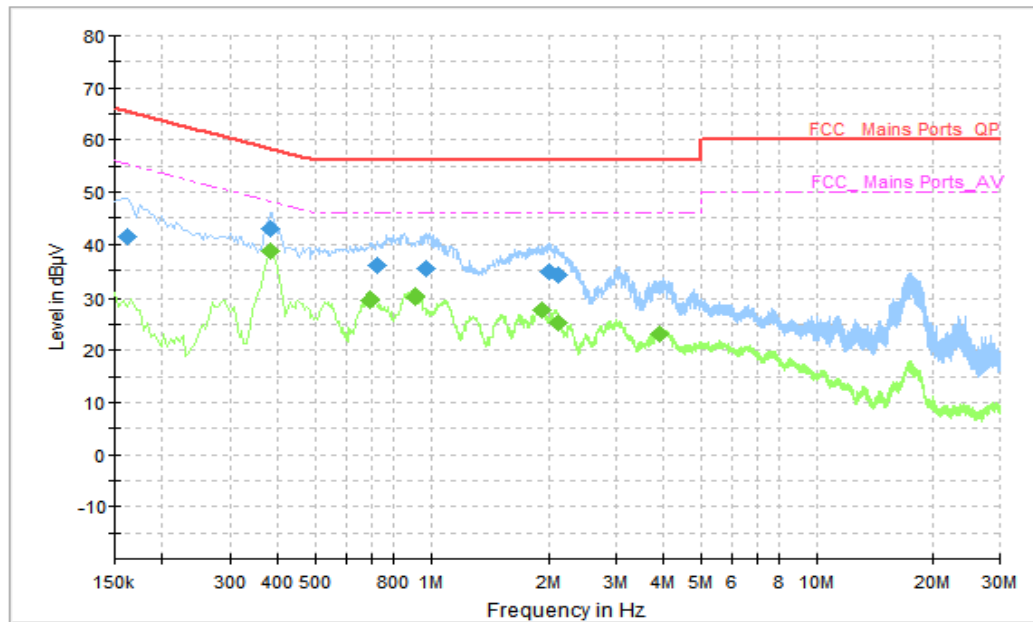


Figure A.2.2. Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.162000	41.51	65.36	23.85	N	10	31.51
0.382000	42.96	58.24	15.28	L1	10	32.96
0.726000	36.06	56.00	19.94	L1	10	26.06
0.966000	35.39	56.00	20.61	N	10	25.39
2.018000	34.71	56.00	21.29	N	10	24.71
2.130000	34.20	56.00	21.80	N	10	24.20

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.382000	38.59	48.24	9.64	L1	10	28.59
0.694000	29.45	46.00	16.55	L1	10	19.45
0.906000	30.15	46.00	15.85	L1	10	20.15
1.930000	27.73	46.00	18.27	L1	10	17.73
2.126000	25.19	46.00	20.81	L1	10	15.19
3.894000	23.16	46.00	22.84	L1	10	13.16

AC Input Port/ Voltage: 120V/60Hz

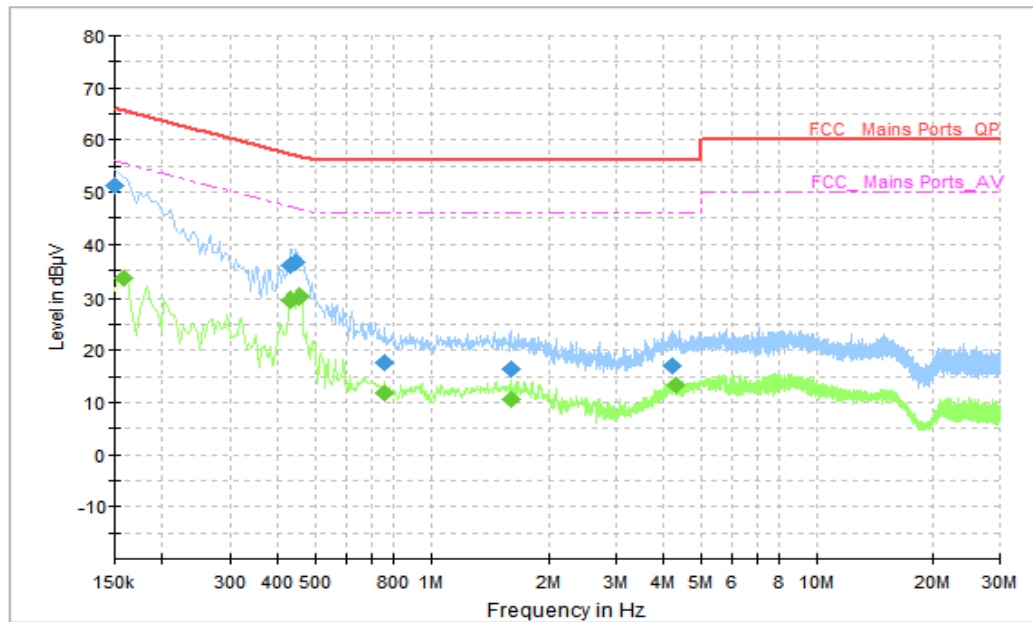


Figure A.2.3. Conducted Emission (Data Transfer)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.150000	51.28	66.00	14.72	N	10	41.28
0.430000	35.83	57.25	21.42	L1	10	25.83
0.446000	36.58	56.95	20.37	L1	10	26.58
0.758000	17.74	56.00	38.26	L1	10	7.74
1.598000	16.49	56.00	39.51	L1	10	6.49
4.222000	17.00	56.00	39.00	L1	10	7.00

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.158000	33.43	55.57	22.14	L1	10	23.43
0.430000	29.61	47.25	17.64	L1	10	19.61
0.454000	30.13	46.80	16.68	N	10	20.13
0.758000	11.80	46.00	34.20	L1	10	1.80
1.598000	10.51	46.00	35.49	L1	10	0.51
4.294000	13.46	46.00	32.54	L1	10	3.46

AC Input Port/ Voltage: 240V/60Hz

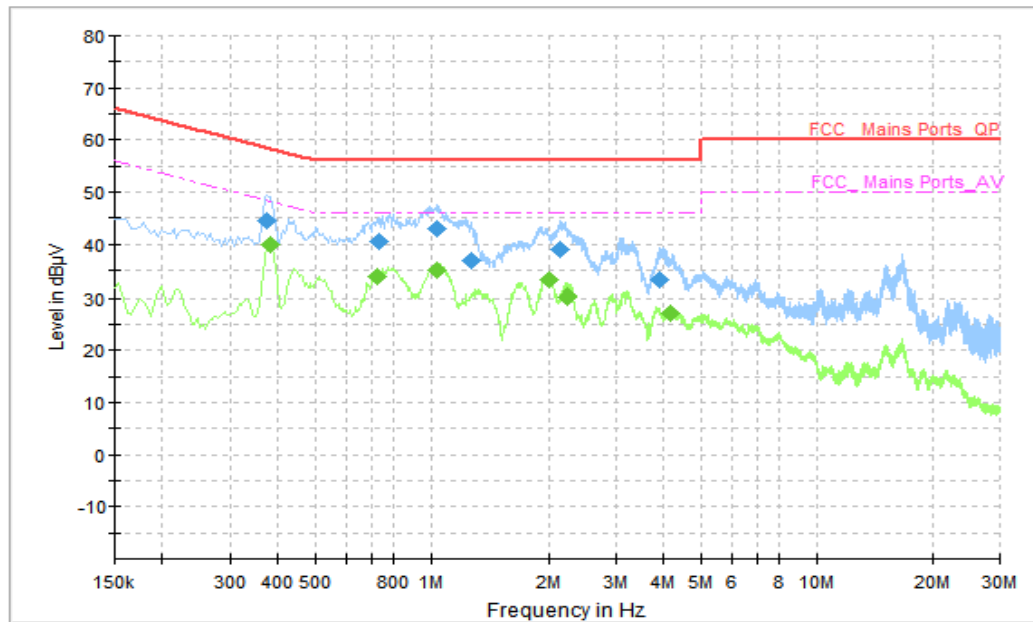


Figure A.2.4. Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.374000	44.58	58.41	13.83	N	10	34.58
0.730000	40.66	56.00	15.34	N	10	30.66
1.034000	42.88	56.00	13.12	N	10	32.88
1.270000	36.84	56.00	19.16	N	10	26.84
2.150000	38.90	56.00	17.10	N	10	28.9
3.910000	33.12	56.00	22.88	N	10	23.12

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.382000	40.04	48.24	8.20	L1	10	30.04
0.726000	33.82	46.00	12.18	L1	10	23.82
1.038000	35.01	46.00	10.99	L1	10	25.01
2.006000	33.11	46.00	12.89	L1	10	23.11
2.250000	30.05	46.00	15.95	L1	10	20.05
4.146000	26.96	46.00	19.04	L1	10	16.96

AC Input Port/ Voltage: 240V/60Hz

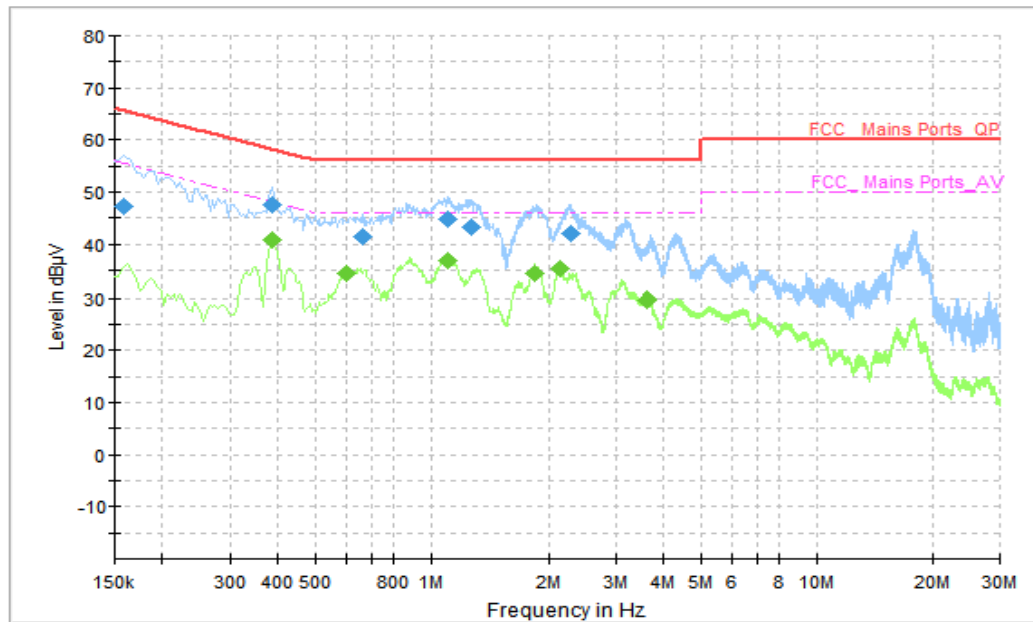


Figure A.2.5. Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.158000	47.13	65.57	18.43	N	10	37.13
0.386000	47.55	58.15	10.60	N	10	37.55
0.666000	41.51	56.00	14.49	N	10	31.51
1.106000	44.89	56.00	11.11	N	10	34.89
1.278000	43.42	56.00	12.58	N	10	33.42
2.286000	42.05	56.00	13.95	N	10	32.05

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.386000	40.88	48.15	7.27	L1	10	30.88
0.602000	34.56	46.00	11.44	L1	10	24.56
1.102000	36.96	46.00	9.04	L1	10	26.96
1.846000	34.55	46.00	11.45	L1	10	24.55
2.154000	35.42	46.00	10.58	L1	10	25.42
3.630000	29.63	46.00	16.37	L1	10	19.63

AC Input Port/ Voltage: 240V/60Hz

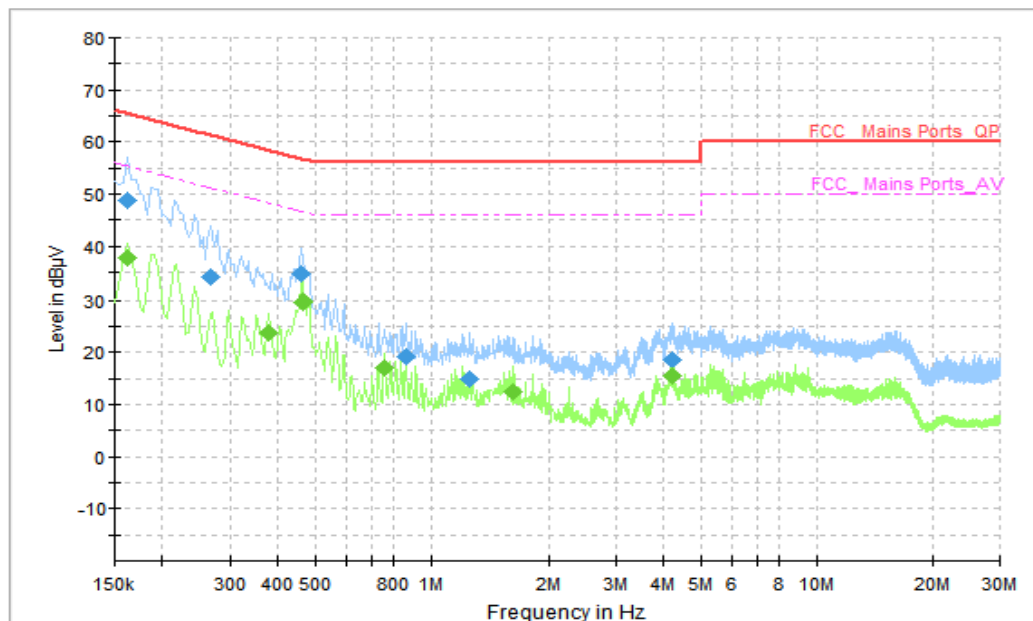


Figure A.2.6. Conducted Emission (Data Transfer)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.162000	48.87	65.36	16.49	N	10	38.87
0.266000	34.27	61.24	26.97	L1	10	24.27
0.458000	34.75	56.73	21.98	L1	10	24.75
0.862000	19.19	56.00	36.81	L1	10	9.19
1.266000	14.86	56.00	41.14	L1	10	4.86
4.210000	18.44	56.00	37.56	L1	10	8.44

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.162000	37.66	55.36	17.70	L1	10	27.66
0.378000	23.87	48.32	24.46	L1	10	13.87
0.462000	29.52	46.66	17.14	L1	10	19.52
0.754000	16.89	46.00	29.11	L1	10	6.89
1.610000	12.52	46.00	33.48	L1	10	2.52
4.182000	15.36	46.00	30.64	L1	10	5.36

END OF REPORT