TEST REPORT

No.I21N03607-EMC

for

TCL Communication Ltd.

GSM Quad Band Mobile Phone

Model Name：2057D,2057X

With

Hardware Version: F109_MB_V1.0

Software Version: 2057D_ALW8_2SIM_V1_1_20211129_UNLOCK

FCC ID: 2ACCJB169

Issued Date: 2022-01-09

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:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I21N03607-EMC	Rev.0	1st edition	2022-01-09

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

CONTENTS

1. SUMMARY OF TEST REPORT

1.1. Test Items

Description	GSM Quad Band Mobile Phone
Model Name	2057D,2057X
Applicant's name	TCL Communication Ltd.
Manufacturer's Name	TCL Communication Ltd.

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 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: 2022-01-03 Testing End Date: 2022-01-06

1.6. Signature

Liang Yong
(Prepared this test report)

Zhang Yunzhuan
(Reviewed this test report)

Cao Junfei
(Approved this test report)

2. CLIENT INFORMATION

2.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
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Email	peter.yang@tcl.com
Tel.	+86 755 3664 5759
Fax	+86 755 3661 2000-81722

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact	Peter yang
Email	peter.yang@tcl.com
Tel.	+86 755 3664 5759
Fax	+86 755 3661 2000-81722

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)

3.1. About EUT

Description	GSM Quad Band Mobile Phone
Model Name	2057D,2057X
FCC ID	2ACCJB169
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
UT09aa	350306070003410	F109_MB_V1.0	2057D_ALW8_2SIM_V1_1_20211129_UNLOCK	2021-12-08

*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	USB Cable
AE4	Headset

AE1

Model	TLi009AA
Manufacturer	TIANMAO
Capacity	950mAh
Nominal Voltage	3.7v

AE2-1

Model	PA-5V550mA-005
S/N	CBA0066AGAC5
Manufacturer	PUAN

AE2-2

Model	UC11US
S/N	CBA0058AGAC5
Manufacturer	PUAN

AE3-1

Model	CDA3122005C2
Manufacturer	SHENGHUA

AE3-2

Model	CDA3122005C1

Manufacturer	JUWEI

AE4-1

Model	CCB0046A10C1
Manufacturer	JUWEI

AE4-2

Model	CCB0046A10C4
Manufacturer	MEIHAO

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

AE: ancillary equipment

3.4. EUT Set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT +AE1+AE2-1+AE3-1+AE4-1	
Set.2	EUT +AE1+AE2-2+AE3-2+AE4-2	
Set.3	EUT+AE1+AE3-1+PC+AE4-1	
Set.4	EUT+AE1+ AE3-2+PC+AE4-2	

3.5. General Description

The Equipment Under Test (EUT) is a model of GSM Quad Band Mobile Phone.
It supports GSM850/900/1800/1900MHz.
It has Camera,USB memory, Bluetooth functions.
It consists of normal options: Battery, Charger and USB 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 is based on the model 2057D for the primary complete test.
GSM Quad Band Mobile Phone 2057X manufactured by TCL Communication Ltd. is a variant model based on 2057D for conformance test. According to client's description, the table below shows the changes

changes	2057D	2057X
SIM	Dual SIM	Single SIM

According to the declaration of differences by manufacturer,
all tests results of the model 2057X are cited from the initial model 2057D, there is no need to add any additional tests.

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 ℃, Max. = 35℃
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 ℃, Max. = 35 ℃
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. = 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	Section in this report	Verdict
1	Radiated Emission	15.109(a)	A.1	P
2	Conducted Emission	15.107(a)	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	2022.01.13	1 year
3.	Spectrum Analyzer	FSV40	101192	R&S	2022.01.13	1 year
4.	BiLog Antenna	3142E	0224831	ETS-Lindgren	2024.05.27	3 years
5.	Horn Antenna	3117	00066577	ETS-Lindgren	2022.04.02	3 years
6.	LISN	ENV216	102067	R&S	2022.07.15	1 year
7.	Chamber	FACT3-2.0	1285	ETS-Lindgren	2023.05.29	2 years
8.	Software	EMC32	V10.50.40	R&S	/	/
9.	Universal Radio Communication Tester	CMU200	114545	R&S	2022.01.13	1 year
10.	Horn Antenna	QSH-SL-18-26-S-20	17013	Q-par	2023.01.06	3 years
11.	Horn Antenna	QSH-SL-8-26-40-K-20	17014	Q-par	2023.01.06	3 years

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.

GSM receiver: The EUT is connected to a charger for charging. The EUT is synchronized to System Simulator (SS), and able to respond to paging messages and incoming call. An established call has been released.

This device contains the receivers which tune and operate between 30MHz-960MHz in the following bands:GSM850MHz.

The EUT was tested while operating in licensed band receiver mode. All licensed band receivers that tune in the range of 30MHz-960MHz, as listed in Section 3.1, are investigated. Only the worst case emissions are reported.

All equipment is placed on the test table top and arranged in a typical configuration in accordance with ANSI C63.4-2014 and manipulated to obtain worst case emissions.

A.1.3 Measurement Limit

Limit from 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

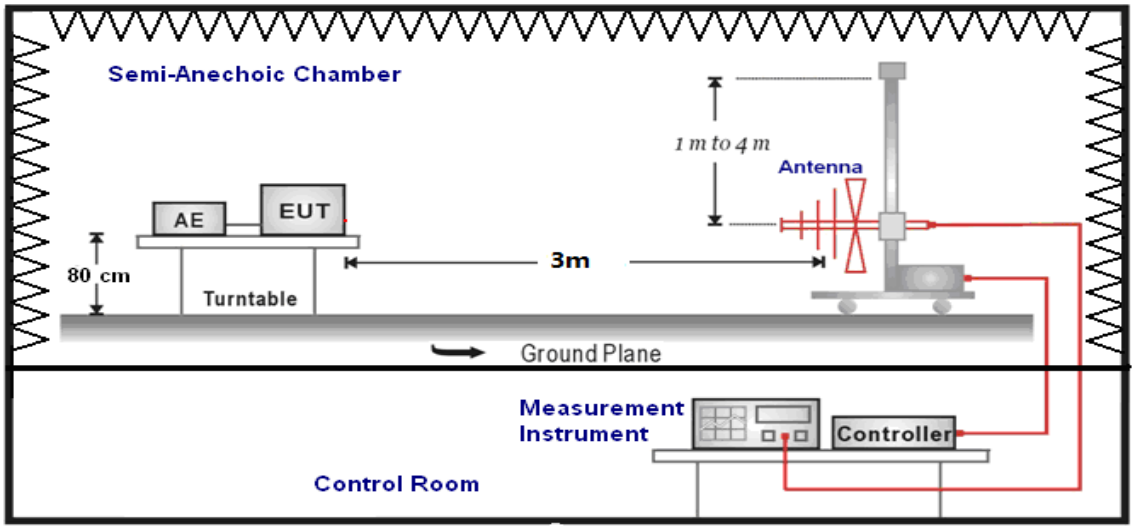
*Note: The original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

A.1.4 Test Condition

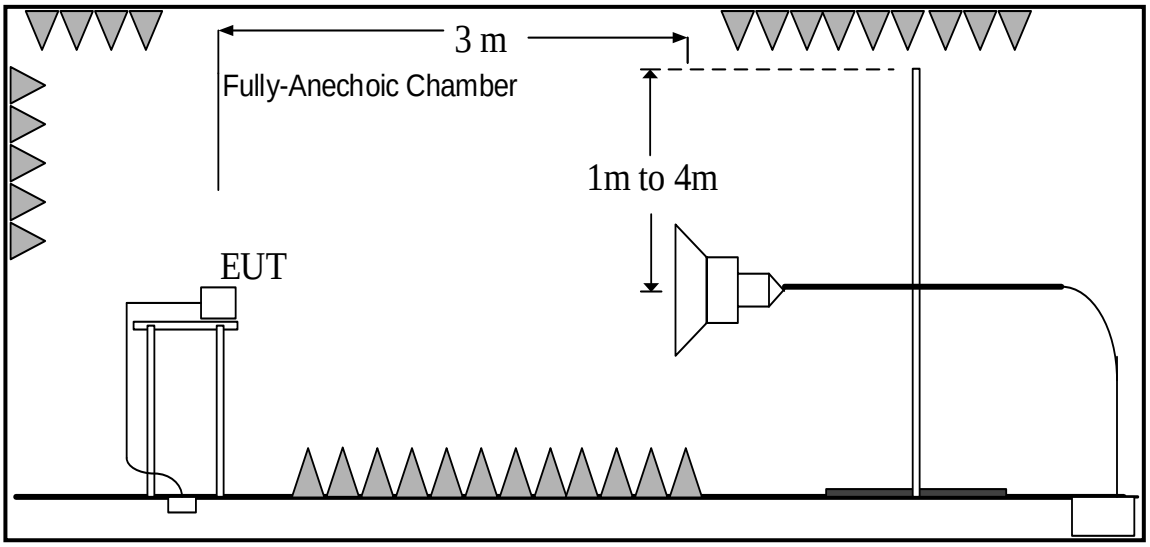
Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz (IF bandwidth)	5
Above 1000	1MHz/3MHz	15

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.

Result:Quasi-Peak(dBμV/m) /Average(dBμV/m)/Peak(dBμV/m)

Note: the result contains vertical part and Horizontal part

Camera

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT09aa/Set.1	Conclusion
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 (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m) UT09aa/Set.1	Conclusion
1000 to 18000	54.00	74.00	See Figure A.1.2.	P

Camera

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT09aa/Set.2	Conclusion
30-88	40.00	See Figure A.1.3.	P
88-216	43.52		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m) UT09aa/Set.1	Conclusion
1000 to 18000	54.00	74.00	See Figure A.1.4.	P

GSM receiver 850MHz

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT09aa/Set.1	Conclusion
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 (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m) UT09aa/Set.1	Conclusion
1000 to 18000	54.00	74.00	See Figure A.1.6.	P

Data Transfer: PC TO TF Card

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT09aa/Set.3	Conclusion
30-88	40.00	See Figure A.1.7.	P
88-216	43.52		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m) UT09aa/Set.3	Conclusion
1000 to 18000	54.00	74.00	See Figure A.1.8.	P

Data Transfer: TF Card TO PC

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m)	Conclusion
		UT09aa/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 (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m)	Conclusion
			UT09aa/Set.3	
1000 to 18000	54.00	74.00	See Figure A.1.10.	P

Data Transfer: PC TO TF Card

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m)	Conclusion
		UT09aa/Set.4	
30-88	40.00	See Figure A.1.11.	P
88-216	43.52		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m)	Conclusion
			UT09aa/Set.4	
1000 to 18000	54.00	74.00	See Figure A.1.12.	P

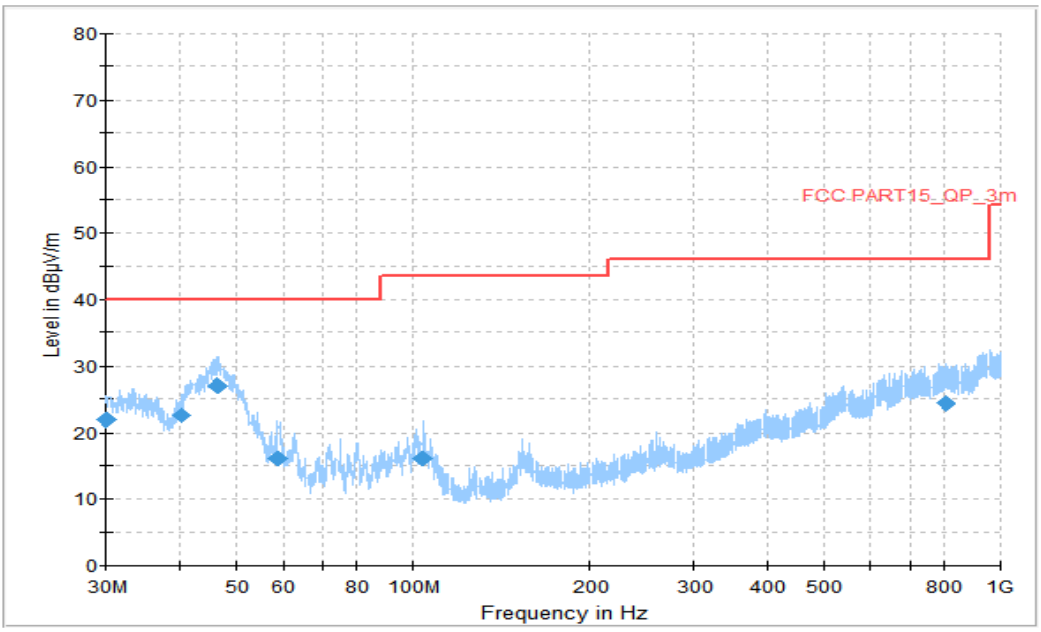


Figure A.1.1. Radiated Emission (Camera , 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	PMea (dBµV)
30.107778	21.99	40.00	18.01	V	-13	34.99
40.400556	22.55	40.00	17.45	V	-19	41.55
46.436111	26.93	40.00	13.07	V	-21	47.93
58.884444	16.12	40.00	23.88	V	-22	38.12
103.935556	16.05	43.52	27.47	V	-20	36.05
805.083889	24.26	46.02	21.76	H	-1	25.26

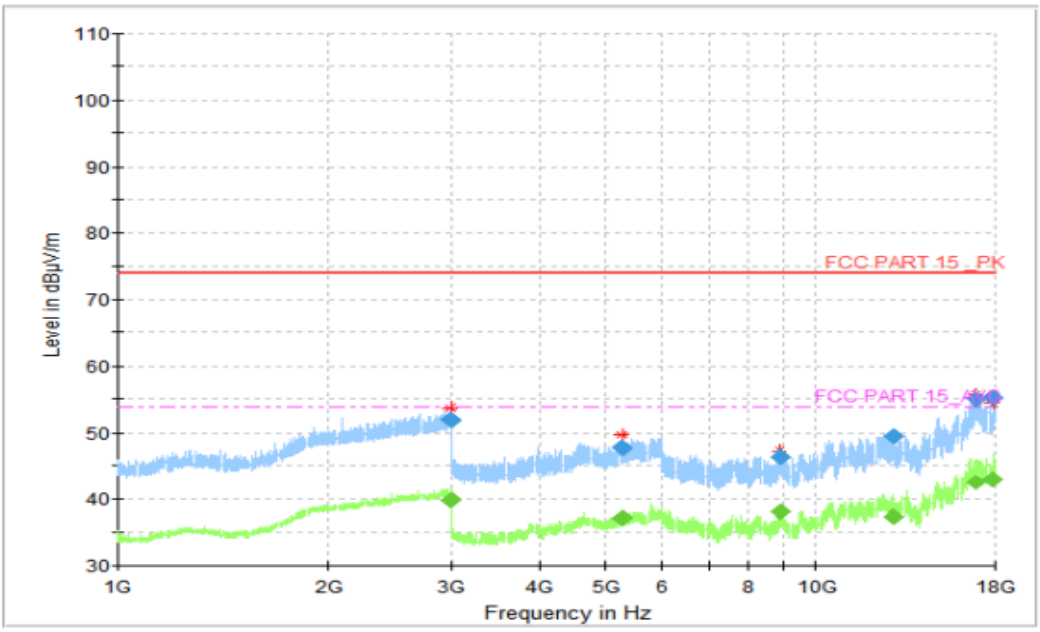


Figure A.1.2. Radiated Emission (Camera , 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
2996.071429	51.96	74.00	22.04	V	6.7	45.26
5272.500000	47.73	74.00	26.27	H	4.0	43.73
8879.142857	46.24	74.00	27.76	H	6.5	39.74
12872.571429	49.42	74.00	24.58	V	11.0	38.42
16956.428571	54.99	74.00	19.01	V	18.2	36.79
17919.857143	55.35	74.00	18.65	V	18.9	36.45

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
2996.071429	39.85	54.00	14.15	V	6.7	33.15
5272.500000	37.09	54.00	16.91	H	4.0	33.09
8879.142857	37.95	54.00	16.05	H	6.5	31.45
12872.571429	37.36	54.00	16.64	V	11.0	26.36
16956.428571	42.45	54.00	11.55	V	18.2	24.25
17919.857143	43.02	54.00	10.98	V	18.9	24.12

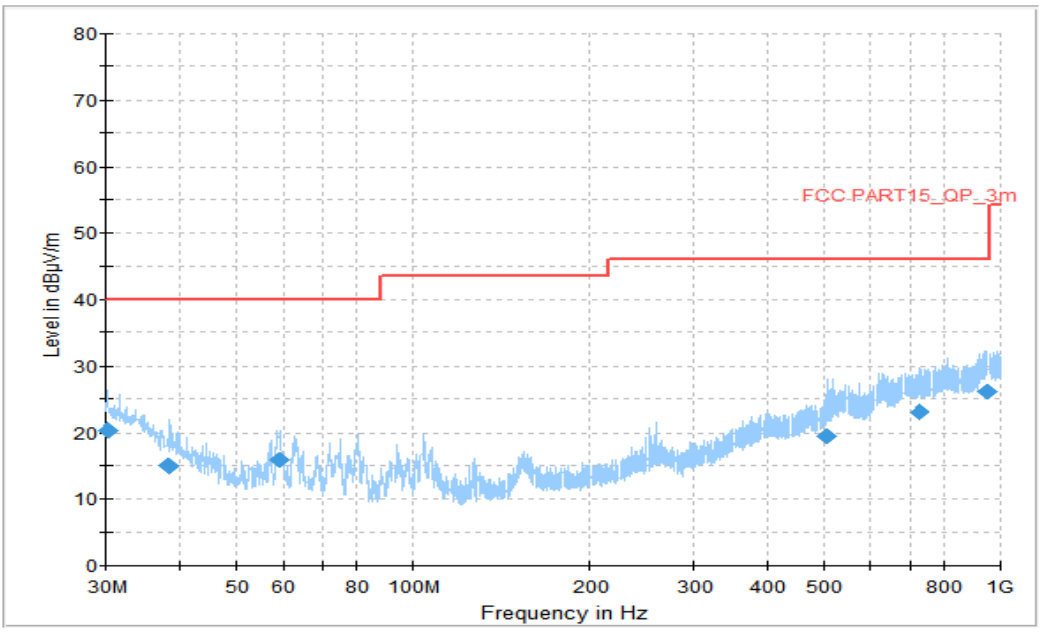


Figure A.1.3. Radiated Emission (Camera , 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	PMea (dBµV)
30.215556	20.39	40.00	19.61	H	-13	33.39
38.406667	15.02	40.00	24.98	V	-18	33.02
59.153889	15.89	40.00	24.11	V	-22	37.89
508.263889	19.47	46.02	26.55	V	-6	25.47
726.460000	23.01	46.02	23.01	V	-2	25.01
948.428333	26.06	46.02	19.96	V	1	25.06

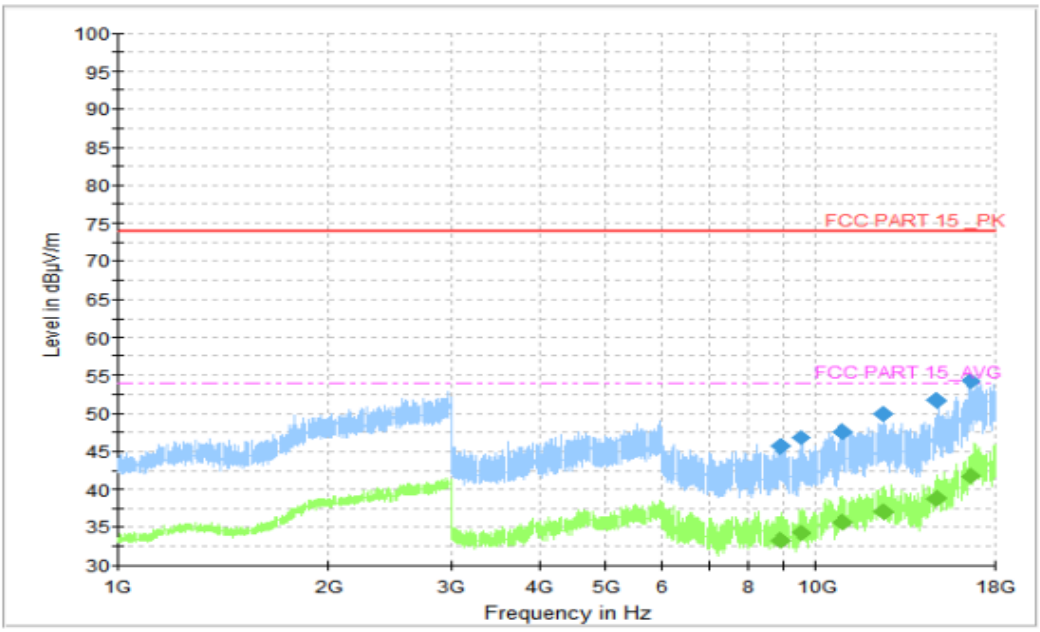


Figure A.1.4. Radiated Emission (Camera , 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
8852.142857	45.61	74.00	28.39	V	6.5	39.11
9512.571429	46.86	74.00	27.14	H	7.1	39.76
10913.142857	47.52	74.00	26.48	H	9.4	38.12
12455.142857	49.95	74.00	24.05	V	11.4	38.55
14835.000000	51.76	74.00	22.24	V	12.9	38.86
16605.000000	54.23	74.00	19.77	V	16.9	37.33

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
8852.142857	33.31	54.00	20.69	V	6.5	26.81
9512.571429	34.37	54.00	19.63	H	7.1	27.27
10913.142857	35.61	54.00	18.39	H	9.4	26.21
12455.142857	37.12	54.00	16.88	V	11.4	25.72
14835.000000	38.85	54.00	15.15	V	12.9	25.95
16605.000000	41.69	54.00	12.31	V	16.9	24.79

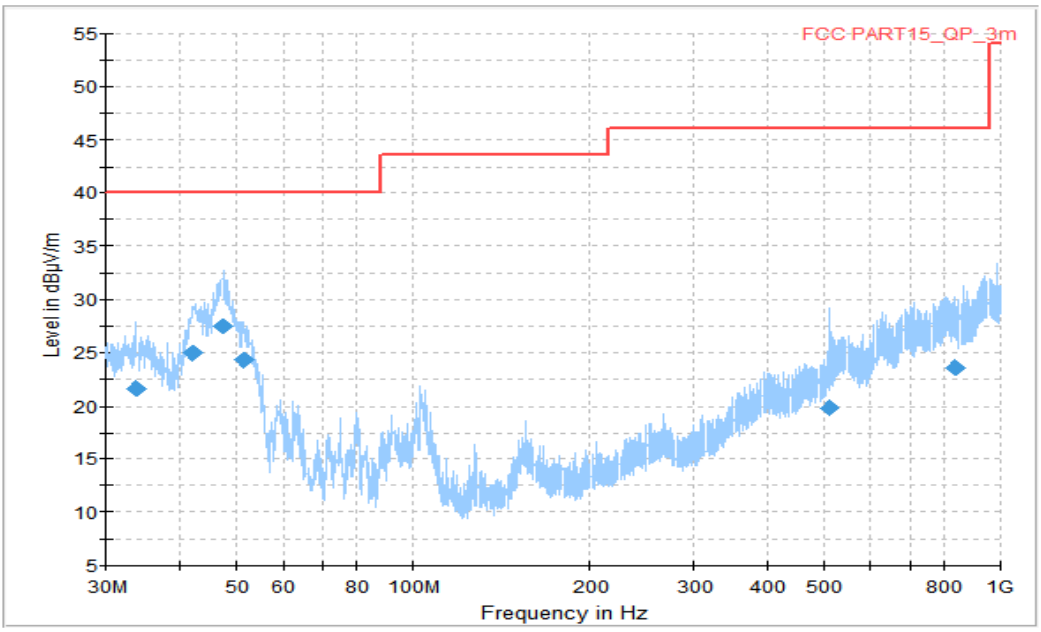


Figure A.1.5. Radiated Emission (GSM receiver 850MHz, 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
33.664444	21.56	40.00	18.44	V	-15	36.56
42.071111	24.91	40.00	15.09	V	-19	43.91
47.352222	27.46	40.00	12.54	V	-21	48.46
51.447778	24.32	40.00	15.68	V	-22	46.32
509.503333	19.84	46.02	26.18	H	-6	25.84
837.632778	23.64	46.02	22.38	V	-1	24.64

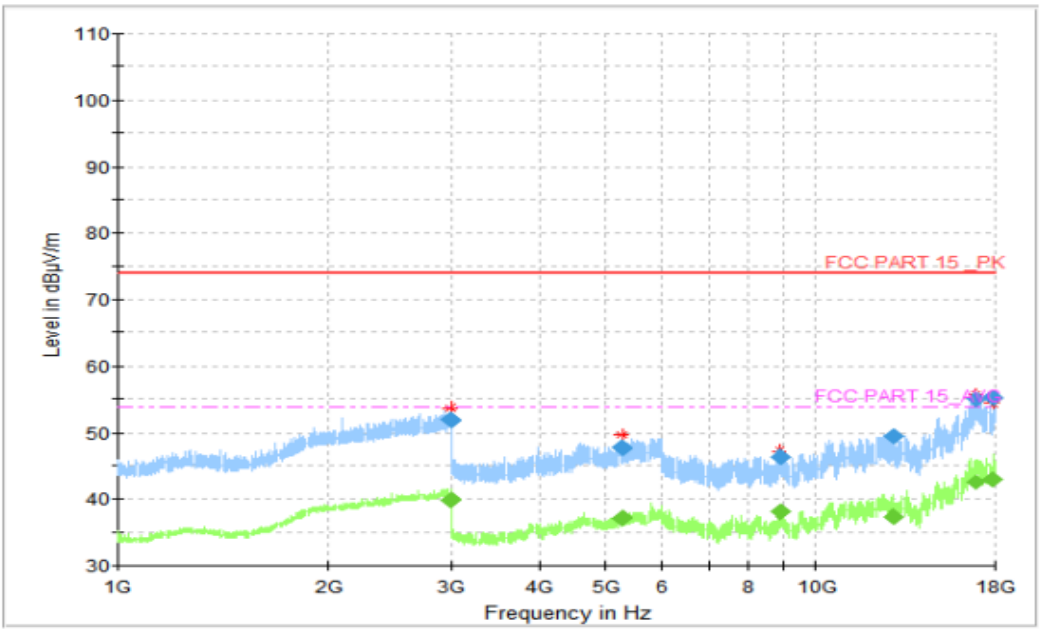


Figure A.1.6. Radiated Emission (GSM receiver 850MHz , 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
2996.071429	51.96	74.00	22.04	V	6.7	51.30
5272.500000	47.73	74.00	26.27	H	4.0	50.00
8879.142857	46.24	74.00	27.76	H	6.5	48.20
12872.571429	49.42	74.00	24.58	V	11.0	46.90
16956.428571	54.99	74.00	19.01	V	18.2	46.40
17919.857143	55.35	74.00	18.65	V	18.9	43.70

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
2996.071429	39.85	54.00	14.15	V	6.7	38.30
5272.500000	37.09	54.00	16.91	H	4.0	37.60
8879.142857	37.95	54.00	16.05	H	6.5	34.90
12872.571429	37.36	54.00	16.64	V	11.0	33.10
16956.428571	42.45	54.00	11.55	V	18.2	32.60
17919.857143	43.02	54.00	10.98	V	18.9	30.90

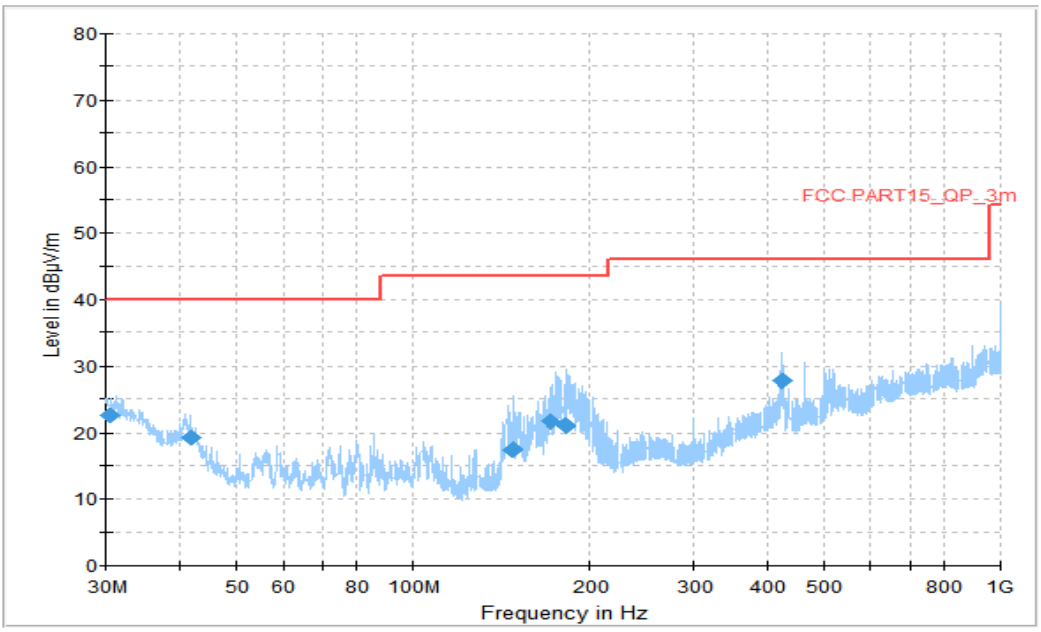


Figure A.1.7. Radiated Emission (Data Transfer: PC TO TF Card, 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
30.538889	22.62	40.00	17.38	V	-13	35.62
41.693889	19.15	40.00	20.85	V	-19	38.15
147.908889	17.34	43.52	26.18	V	-19	36.34
171.350556	21.67	43.52	21.85	V	-18	39.67
181.912778	21.01	43.52	22.51	V	-18	39.01
425.544444	27.69	46.02	18.33	V	-9	36.69

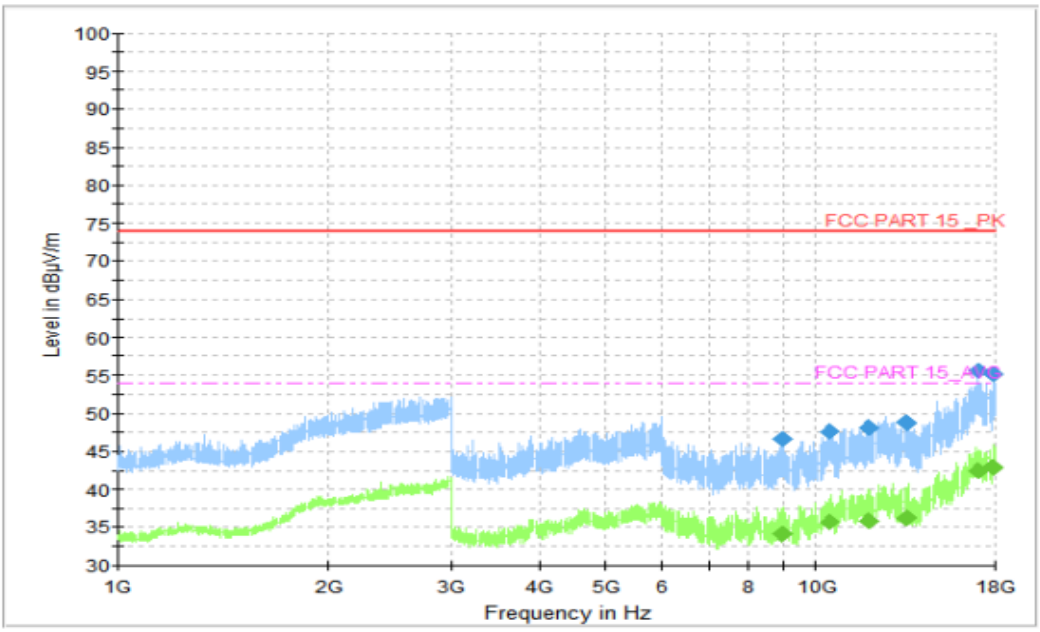


Figure A.1.8. Radiated Emission (Data Transfer: PC TO TF Card, 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
8920.285714	46.67	74.00	27.33	H	6.5	40.17
10417.714286	47.54	74.00	26.46	V	9.0	38.54
11844.857143	48.10	74.00	25.90	V	10.0	38.10
13448.142857	48.77	74.00	25.23	H	11.5	37.27
17059.714286	55.68	74.00	18.32	H	18.5	37.18
17901.428571	55.29	74.00	18.71	H	18.8	36.49

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
8920.285714	34.01	54.00	19.99	H	6.5	27.51
10417.714286	35.60	54.00	18.40	V	9.0	26.6
11844.857143	35.83	54.00	18.17	V	10.0	25.83
13448.142857	36.34	54.00	17.66	H	11.5	24.84
17059.714286	42.42	54.00	11.58	H	18.5	23.92
17901.428571	42.88	54.00	11.12	H	18.8	24.08

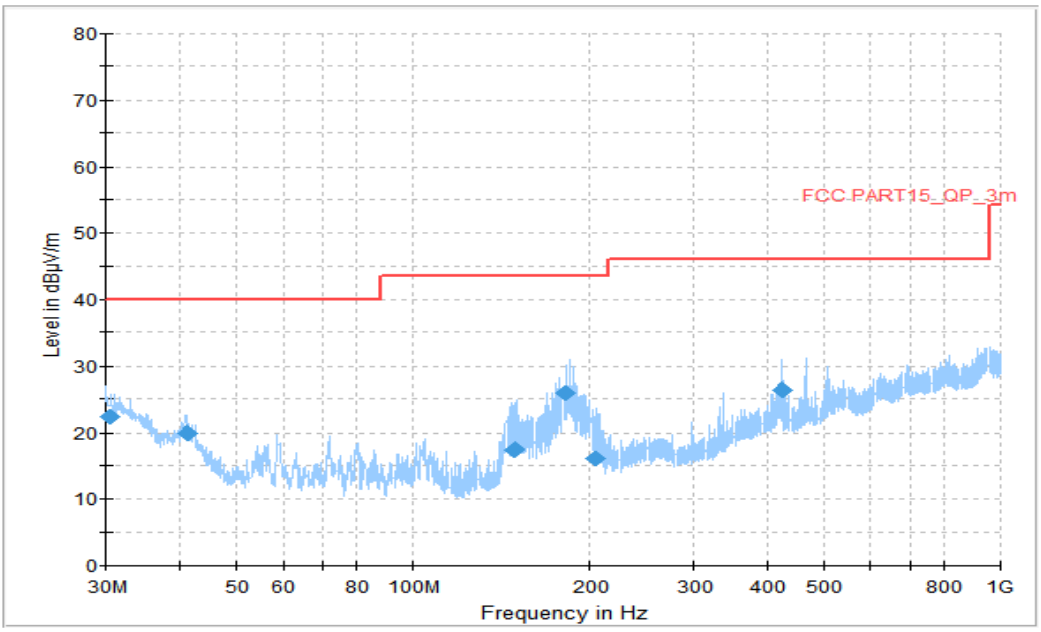


Figure A.1.9. Radiated Emission (Data Transfer: TF Card TO PC, 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
30.431111	22.45	40.00	17.55	V	-13	35.45
41.316667	19.86	40.00	20.14	V	-19	38.86
149.040556	17.44	43.52	26.08	V	-19	36.44
181.320000	25.98	43.52	17.54	V	-18	43.98
204.977222	15.99	43.52	27.53	V	-17	32.99
425.652222	26.38	46.02	19.64	H	-9	35.38

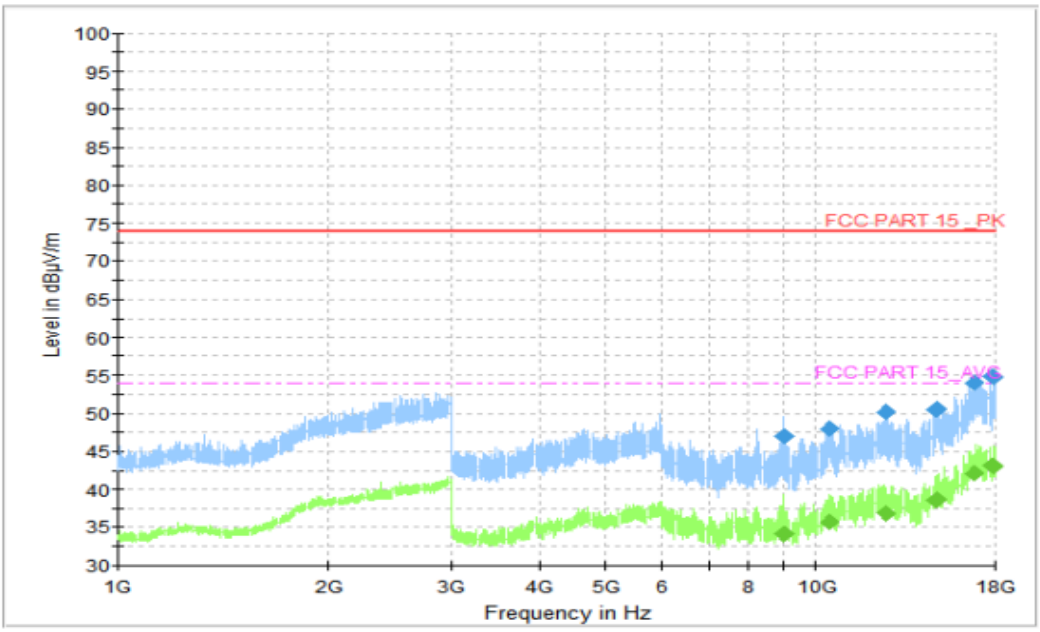


Figure A.1.10. Radiated Emission (Data Transfer: TF Card TO PC, 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
8985.857143	47.00	74.00	27.00	V	6.5	40.50
10442.571429	48.06	74.00	25.94	V	9.0	39.06
12545.142857	50.09	74.00	23.91	V	11.3	38.79
14815.714286	50.56	74.00	23.44	V	12.9	37.66
16794.000000	53.96	74.00	20.04	V	17.8	36.16
17914.714286	54.90	74.00	19.10	H	18.9	36.00

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
8985.857143	34.05	54.00	19.95	V	6.5	27.55
10442.571429	35.75	54.00	18.25	V	9.0	26.75
12545.142857	36.80	54.00	17.20	V	11.3	25.50
14815.714286	38.69	54.00	15.31	V	12.9	25.79
16794.000000	42.05	54.00	11.95	V	17.8	24.25
17914.714286	43.13	54.00	10.87	H	18.9	24.23

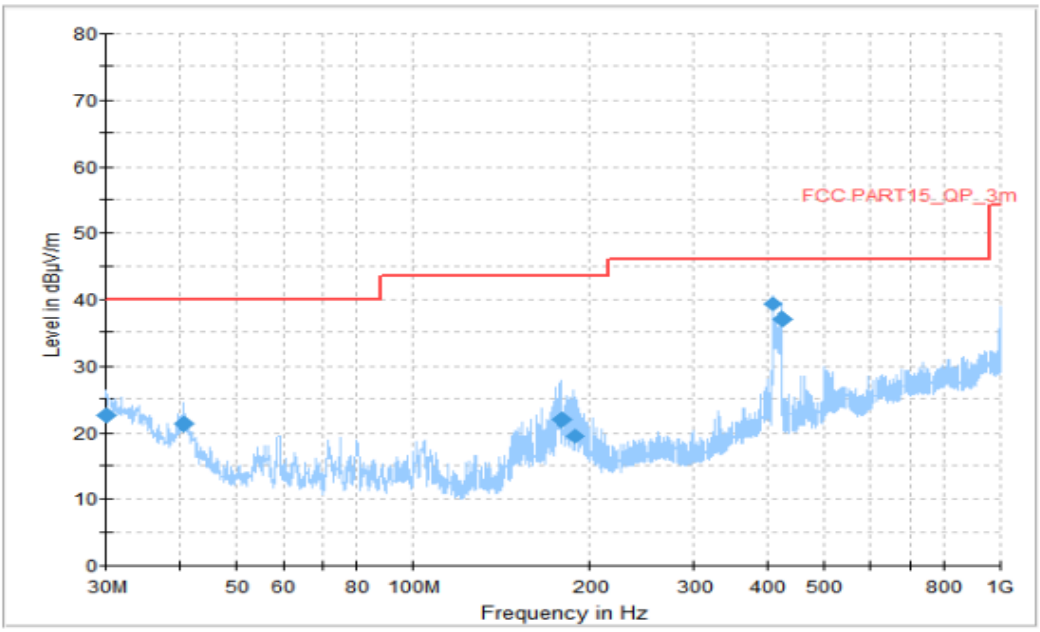


Figure A.1.11. Radiated Emission (Data Transfer: TF Card TO PC, 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
30.107778	22.61	40.00	17.39	V	-13	35.61
40.670000	21.28	40.00	18.72	V	-19	40.28
178.410000	21.88	43.52	21.64	V	-18	39.88
189.080000	19.43	43.52	24.09	V	-18	37.43
409.431667	39.23	46.02	6.79	H	-9	48.23
424.358889	37.19	46.02	8.83	H	-9	46.19

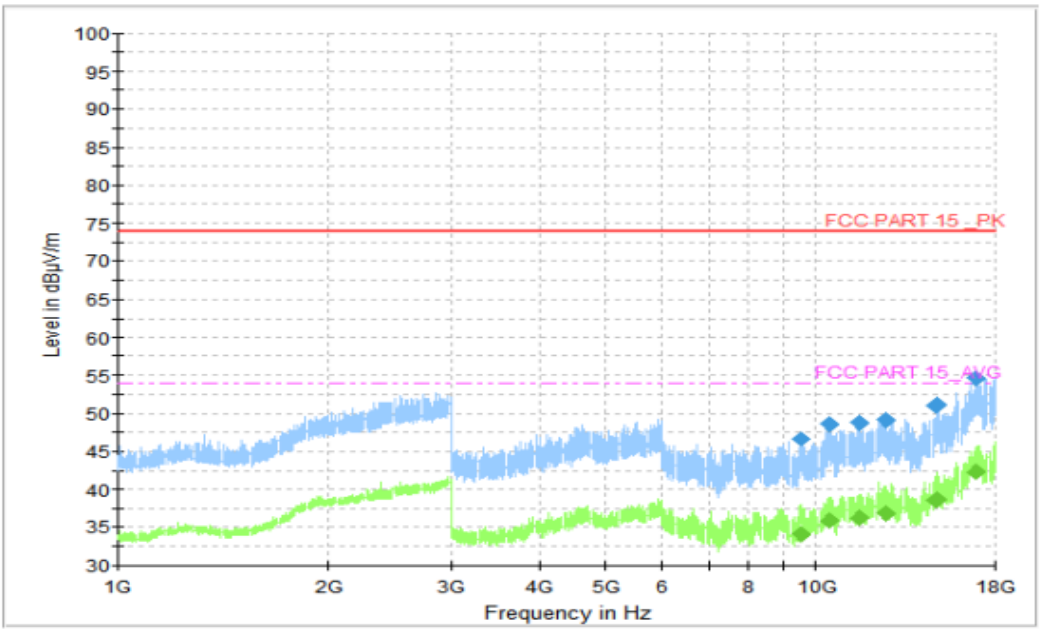


Figure A.1.12. Radiated Emission (Data Transfer: TF Card TO PC, 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9475.714286	46.56	74.00	27.44	V	7.0	39.56
10451.571429	48.66	74.00	25.34	V	9.0	39.66
11483.142857	48.72	74.00	25.28	H	10.1	38.62
12532.714286	49.07	74.00	24.93	V	11.3	37.77
14813.571429	51.03	74.00	22.97	H	12.9	38.13
16965.857143	54.60	74.00	19.40	V	18.3	36.30

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9475.714286	34.18	54.00	19.82	V	7.0	27.18
10451.571429	35.92	54.00	18.08	V	9.0	26.92
11483.142857	36.25	54.00	17.75	H	10.1	26.15
12532.714286	36.75	54.00	17.25	V	11.3	25.45
14813.571429	38.59	54.00	15.41	H	12.9	25.69
16965.857143	42.26	54.00	11.74	V	18.3	23.96

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.

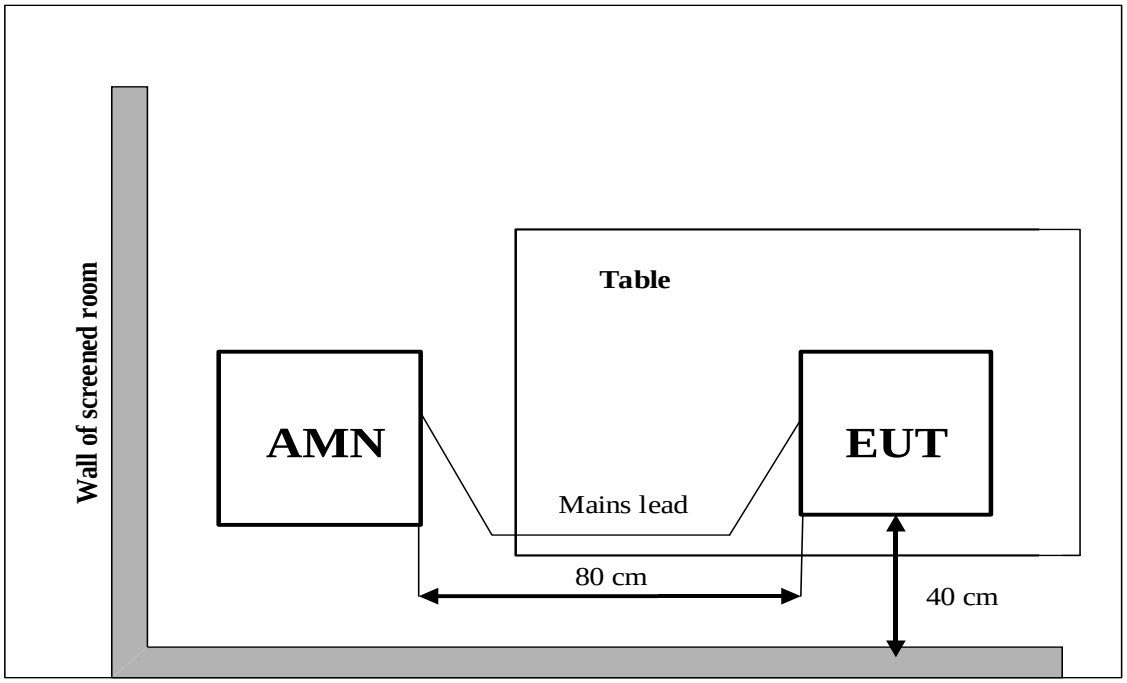
Video Player: The EUT is connected to a charger for charging and keeping on playing mp3.

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.2.4Test 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
			UT09aa/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) UT09aa/Set.2	Conclusion
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

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT09aa/Set.3	Conclusion
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.				

Data Transfer

AC Input Port/ Voltage: 120V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT09aa/Set.4	Conclusion
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) UT09aa/Set.1	Conclusion
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.				

Camera

AC Input Port/ Voltage: 240V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT09aa/Set.2	Conclusion
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.				

Data Transfer

AC Input Port/ Voltage: 240V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT09aa/Set.3	Conclusion
0.15 to 0.5	66 to 56	56 to 46	See Figure A.2.7.	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) UT09aa/Set.4	Conclusion
0.15 to 0.5	66 to 56	56 to 46	See Figure A.2.8.	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

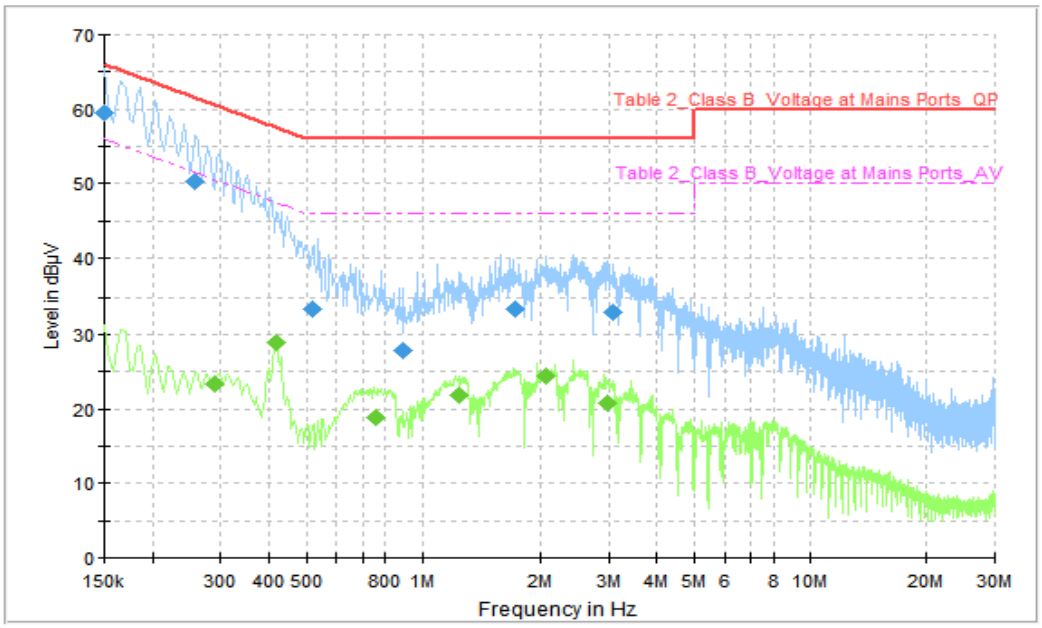


Figure A.2.1. Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.150000	59.56	66.00	6.44	L1	10	49.56
0.258000	50.30	61.50	11.20	L1	10	40.3
0.518000	33.50	56.00	22.50	L1	10	23.50
0.890000	27.87	56.00	28.13	N	10	17.87
1.718000	33.44	56.00	22.56	L1	10	23.44
3.094000	32.92	56.00	23.08	L1	10	22.92

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.290000	23.24	50.52	27.28	L1	10	13.24
0.418000	28.88	47.49	18.61	L1	10	18.88
0.758000	18.76	46.00	27.24	L1	10	8.76
1.242000	21.83	46.00	24.17	L1	10	11.83
2.054000	24.40	46.00	21.60	L1	10	14.4
2.974000	20.79	46.00	25.21	N	10	10.79

AC Input Port/ Voltage: 120V/60Hz

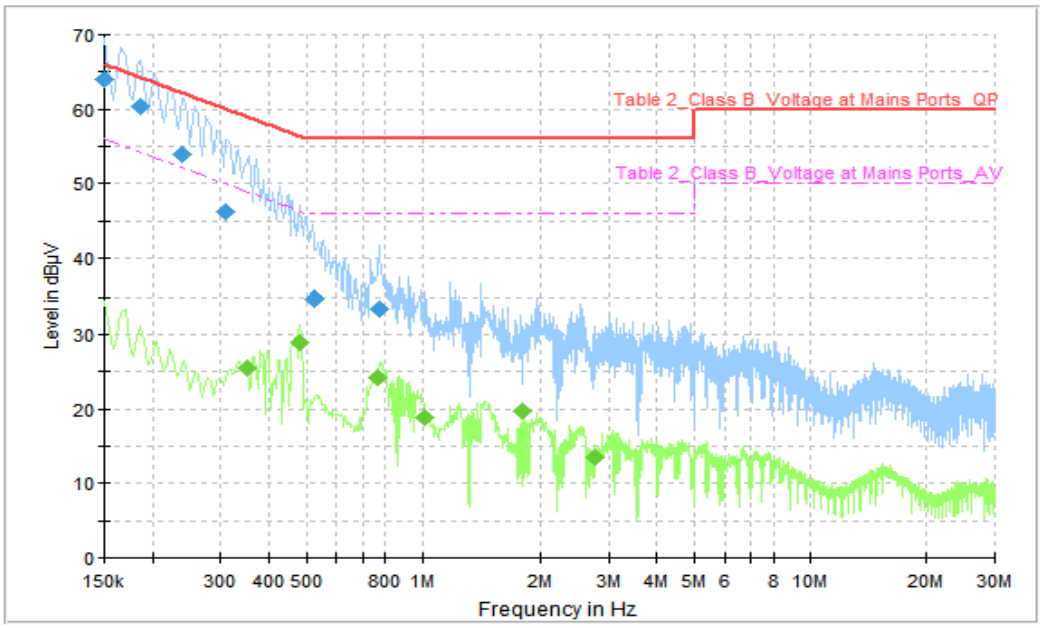


Figure A.2.2. Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.150000	63.97	66.00	2.03	L1	10	53.97
0.186000	60.43	64.21	3.79	N	10	50.43
0.238000	53.96	62.17	8.20	L1	10	43.96
0.310000	46.23	59.97	13.74	N	10	36.23
0.522000	34.63	56.00	21.37	L1	10	24.63
0.770000	33.50	56.00	22.50	L1	10	23.50

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.350000	25.39	48.96	23.57	L1	10	15.39
0.482000	28.98	46.31	17.33	L1	10	18.98
0.766000	24.20	46.00	21.80	L1	10	14.20
1.010000	18.78	46.00	27.22	L1	10	8.78
1.798000	19.72	46.00	26.28	L1	10	9.72
2.758000	13.39	46.00	32.61	L1	10	3.39

AC Input Port/ Voltage: 120V/60Hz

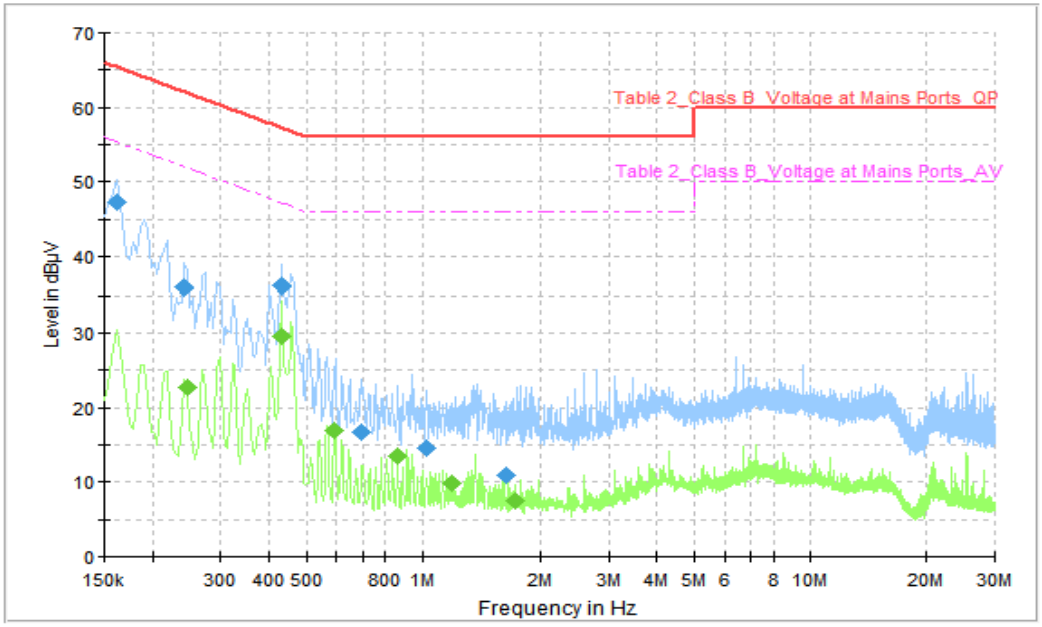


Figure A.2.3. Conducted Emission(Data Transfer)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.162000	47.40	65.36	17.96	N	10	37.40
0.242000	36.01	62.03	26.02	N	10	26.01
0.430000	36.25	57.25	21.00	N	10	26.25
0.698000	16.67	56.00	39.33	N	10	6.67
1.026000	14.47	56.00	41.53	L1	10	4.47
1.622000	10.92	56.00	45.08	L1	10	0.92

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.246000	22.70	51.89	29.19	N	10	12.70
0.430000	29.44	47.25	17.81	L1	10	19.44
0.590000	16.83	46.00	29.17	L1	10	6.83
0.862000	13.44	46.00	32.56	N	10	3.44
1.186000	9.89	46.00	36.11	L1	10	-0.11
1.722000	7.49	46.00	38.51	L1	10	-2.51

AC Input Port/ Voltage: 120V/60Hz

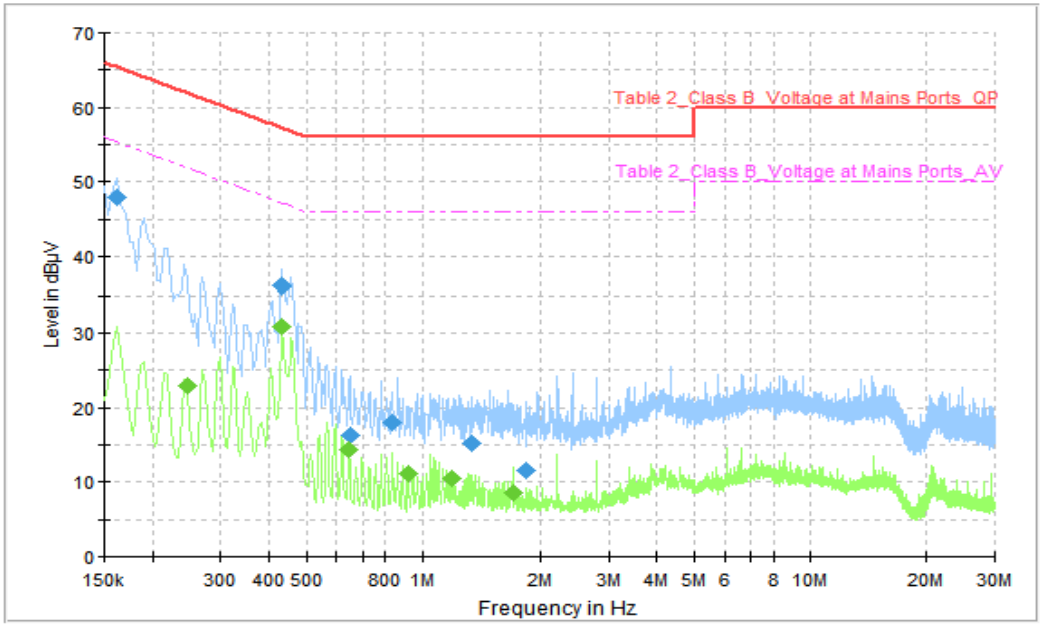


Figure A.2.4. Conducted Emission(Data Transfer)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.162000	47.90	65.36	17.46	N	10	37.90
0.434000	36.24	57.18	20.93	N	10	26.24
0.650000	16.17	56.00	39.83	N	10	6.17
0.834000	18.06	56.00	37.94	N	10	8.06
1.342000	15.14	56.00	40.86	L1	10	5.14
1.842000	11.54	56.00	44.46	N	10	1.54

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.246000	22.89	51.89	29.00	N	10	12.89
0.434000	30.78	47.18	16.39	L1	10	20.78
0.646000	14.37	46.00	31.63	N	10	4.37
0.918000	11.21	46.00	34.79	N	10	1.21
1.186000	10.49	46.00	35.51	N	10	0.49
1.694000	8.49	46.00	37.51	N	10	-1.51

AC Input Port/ Voltage: 240V/60Hz

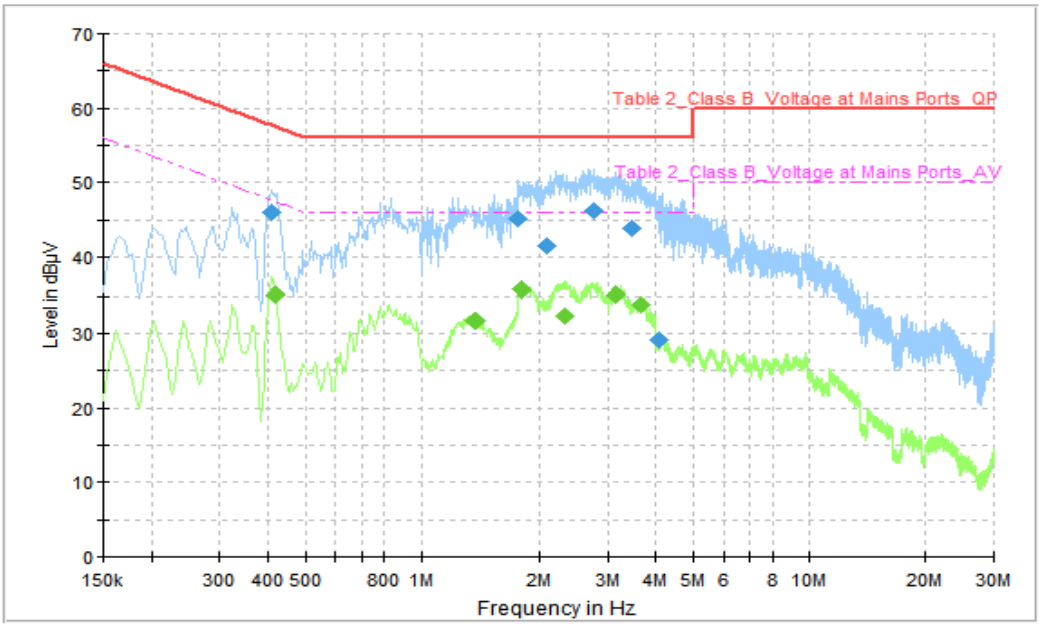


Figure A.2.5. Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.410000	46.06	57.65	11.59	N	10	36.06
1.754000	45.09	56.00	10.91	N	10	35.09
2.082000	41.51	56.00	14.50	L1	10	31.51
2.750000	46.34	56.00	9.66	N	10	36.34
3.470000	43.86	56.00	12.14	N	10	33.86
4.094000	29.09	56.00	26.91	L1	10	19.09

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.418000	35.16	47.49	12.33	N	10	25.16
1.366000	31.76	46.00	14.24	L1	10	21.76
1.802000	35.69	46.00	10.31	N	10	25.69
2.326000	14.26	46.00	31.74	N	10	4.26
3.138000	35.11	46.00	10.89	N	10	25.11
3.674000	33.77	46.00	12.23	N	10	23.77

AC Input Port/ Voltage: 240V/60Hz

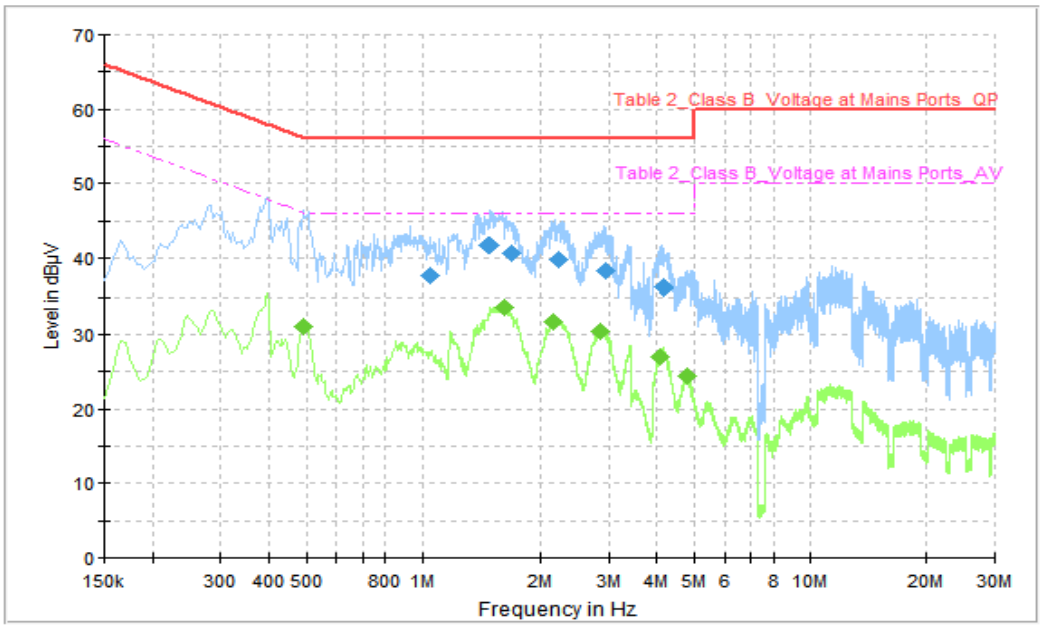


Figure A.2.6. Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
1.046000	37.70	56.00	18.30	L1	10	27.70
1.478000	41.79	56.00	14.21	N	10	31.79
1.674000	40.63	56.00	15.37	N	10	30.63
2.222000	39.84	56.00	16.16	N	10	29.84
2.958000	38.40	56.00	17.60	N	10	28.4
4.174000	36.21	56.00	19.79	N	10	26.21

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.494000	9.97	46.10	36.13	L1	10	-0.03
1.606000	33.56	46.00	12.44	N	10	23.56
2.154000	31.62	46.00	14.38	N	10	21.62
2.854000	30.45	46.00	15.55	N	10	20.45
4.074000	27.04	46.00	18.96	N	10	17.04
4.810000	6.36	46.00	39.64	N	10	-3.64

AC Input Port/ Voltage: 240V/60Hz

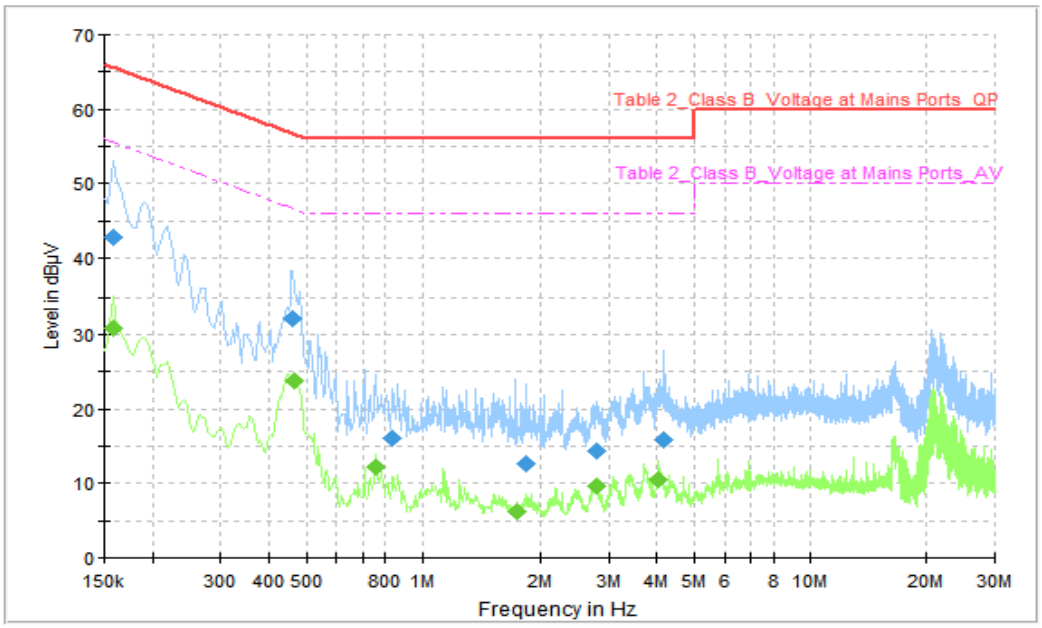


Figure A.2.7. Conducted Emission(Data Transfer)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.158000	42.88	65.57	22.69	N	10	32.88
0.462000	32.19	56.66	24.47	N	10	22.19
0.838000	16.03	56.00	39.97	L1	10	6.03
1.830000	12.71	56.00	43.29	N	10	2.71
2.794000	14.31	56.00	41.69	N	10	4.31
4.186000	15.94	56.00	40.06	L1	10	5.94

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.158000	30.73	55.57	24.84	N	10	20.73
0.466000	23.80	46.59	22.78	L1	10	13.8
0.758000	12.23	46.00	33.77	N	10	2.23
1.738000	6.22	46.00	39.78	N	10	-3.78
2.794000	9.55	46.00	36.45	N	10	-0.45
4.018000	10.52	46.00	35.48	N	10	0.52

AC Input Port/ Voltage: 240V/60Hz

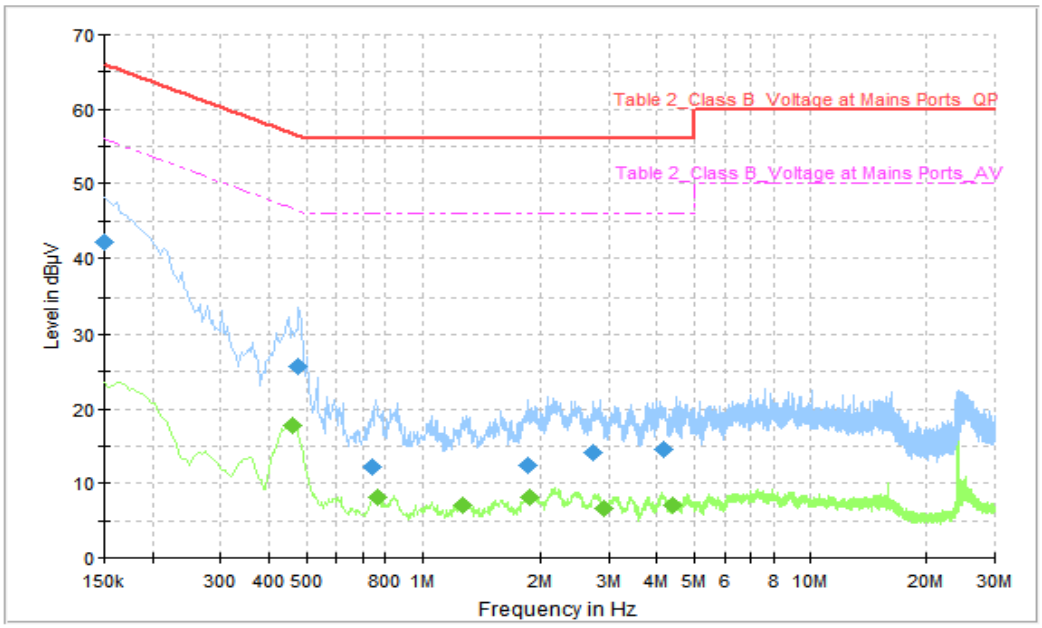


Figure A.2.8. Conducted Emission(Data Transfer)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.150000	42.19	66.00	23.81	N	10	32.19
0.478000	25.66	56.37	30.71	N	10	15.66
0.738000	12.22	56.00	43.78	L1	10	2.22
1.850000	12.44	56.00	43.56	N	10	2.44
2.734000	14.13	56.00	41.87	N	10	4.13
4.154000	14.55	56.00	41.45	L1	10	4.55

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{Mea} (dBµV)
0.462000	17.69	46.66	28.96	L1	10	7.69
0.762000	8.21	46.00	37.79	L1	10	-1.79
1.274000	7.07	46.00	38.93	N	10	-2.93
1.878000	8.06	46.00	37.94	L1	10	-1.94
2.914000	6.74	46.00	39.26	L1	10	-3.26
4.382000	7.05	46.00	38.95	L1	10	-2.95

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