TESTREPORT

No.I21N02462-EMC

TCL Communication Ltd.

LTE/UMTS/GSM Smartphone

Model Name：4065F

With

Hardware Version: Proto

Software Version: V1.0

FCC ID: 2ACCJB156

Issued Date: 2021-08-20

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:

SAICT, Shenzhen Academy of Information and Communications Technology

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I21N02462-EMC	Rev.0	1st edition	2021-08-20

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

CONTENTS

1. SUMMARY OF TEST REPORT

1.1. Test Items

Description	LTE/UMTS/GSM Smartphone
Model Name	4065F
Applicant's name	TCL Communication Ltd.
Manufacturer's Name	TCL Communication Ltd.

1.2. Test Standards

FCC Part 15, Subpart B 10-1-2019 Edition; ANSI C63.4 2014

1.3. Test Result

Pass

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, P. R. China

1.5. Project data

Testing Start Date: 2021-08-12 Testing End Date: 2021-08-18

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
Contact	Gong Zhizhou
Email	zhizhou.gong@tcl.com
Tel.	0086-755-36611722
Fax	/

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	Gong Zhizhou
Email	zhizhou.gong@tcl.com
Tel.	0086-755-36611722
Fax	/

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

3.1. About EUT

Description	LTE/UMTS/GSM Smartphone
Model Name	4065F
FCC ID	2ACCJB156
Antenna Type	Internal Antenna
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	867400020316612	Proto	V1.0	2021-08-10

*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

AE1-1

Model	TLp029D7
SN	CAC2900009C7
Manufacturer	BYD
Capacity	3000mAh
Nominal Voltage	3.85V

AE1-2

Model	TLp029D1
SN	CAC2900019C1
Manufacturer	BYD
Capacity	3000mAh
Nominal Voltage	3.85V

AE2-1

Model	UC11US / CBA0058AGAC5
Manufacturer	PUAN

AE2-2

Model	UC11US/ CBA0058AGAC7
Manufacturer	Chenyang

AE3-1

Name	CDA3122005C8
Manufacturer	PUAN

AE3-2

Name	CDA3122005C2
Manufacturer	SHENGHUA

AE4-1

Type	WH15
Wh15	CCB0046A10C1(alcatel logo)
Manufacturer	DALIN

AE4-2

Type	WH15
Name	CCB0046A10C4(alcatel logo)
Manufacturer	MEIHAO

AE4-3

Type	WH15
Name	CCB0046A15C1(no logo)
Manufacturer	DALIN

AE4-4

Type	WH15
Name	CCB0046A15C4(no logo)
Manufacturer	MEIHAO

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

*AE Label: To distinguish the type and number of AE

AE4：The material of model CCB0046A10C1 (AE4-1) and CCB0046A15C1 (AE4-3) are the same. The material of model CCB0046A10C4 (AE4-2) and CCB0046A15C4 (AE4-4) are the same.

AE: ancillary equipment

3.4. EUT set-ups

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

3.5. General Description

The Equipment Under Test (EUT) is a model of LTE/UMTS/GSM Smartphone with internal antenna.
It supports GSM 850/900/1800/1900MHz, WCDMA Bands 1/2/4/5/8, and LTE Bands 1/2/3/4/5/7/8/12/17/28/66.
It has Camera, Video Player, FM Receiver, USB Data Transfer, Bluetooth and Wi-Fi functions.
It consists of normal options: Battery, Charger USB Cable and Headset
Samples (EUT+AE) undergoing test were selected by the Client. Relevant information is provided by the Client.

This report serves as a record of LTE/UMTS/GSM Smartphone 4065F manufactured by TCL Communication Ltd. According to client's description, the table below shows the difference;

NO.	Changes	Before	After
1	PCB Layout	/	Add one LDO

According to the declaration of differences by manufacturer, the following tests need to be performed.

NO.	Test items	EUT set-up No.	Operating modes of EUT
1	Radiated Emission	Set.1/Set.2	GSM receiver /Camera/Video Player/ FM receiver
2	Conducted Emission	Set.1/Set.2	Camera/Video Player/ FM receiver

Other results are cited from the initial report.
The report number for initial model is I21N01673-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	10-1-2019 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 rules	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	4.84dB(k=2)
	1GHz-18GHz	4.68dB(k=2)
	18GHz-40GHz	3.76dB(k=2)
Conducted Emission	150kHz-30MHz	3.00dB(k=2)

8. TEST FACILITIES UTILIZED

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL.DUE DATE	CAL. PERIOD
1.	Test Receiver	ESR7	101676	R&S	2021.11.25	1 year
2.	Test Receiver	ESCI	100701	R&S	2022.08.08	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.	LISN	ENV216	102067	R&S	2022.07.15	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	QSH-SL-8-26-40-K-20	17014	Q-par	2023.01.06	3 years
9.	Universal Radio Communication Tester	CMU200	114545	R&S	2022.01.13	1 year
10.	Universal Radio Communication Tester	CMW500	152499	R&S	2022.07.15	1 year
11.	Signal Generator	SMB100A	179725	R&S	2021.11.25	1 year
12.	Chamber	FACT3-2.0	1285	ETS-Lindgren	2023.05.29	2 years
13.	Software	EMC32	V10.50.40	R&S	/	/

Note: CAL.: Calibration

9. TEST ACCESSORY UTILIZED

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL.DUE DATE	CAL. PERIOD
1.	PC	ThinkPad T480	PF-13LW0C	Lenovo	/	/
2.	Printer	V1.0008	VNF6C12491	HP	/	/
3.	Mouse	MOEUUOA	44NY517	Lenovo	/	/

Note: CAL.: Calibration

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 EUT and charging mode of EUT) 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:

FM receiver: The EUT is connected to a charger for charging and open FM function. The EUT is synchronized to a FM signal generator. The EUT is keeping on demodulating the FM signal and outputting the audio signal through the headset.

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 MS 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 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, WCDMA Band 5, LTE Band 5, LTE Band 12, LTE Band 17.

The EUT was tested while operating in licensed band Rx mode. All licensed band receivers that tune in the range of 30MHz-960MHz, 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 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

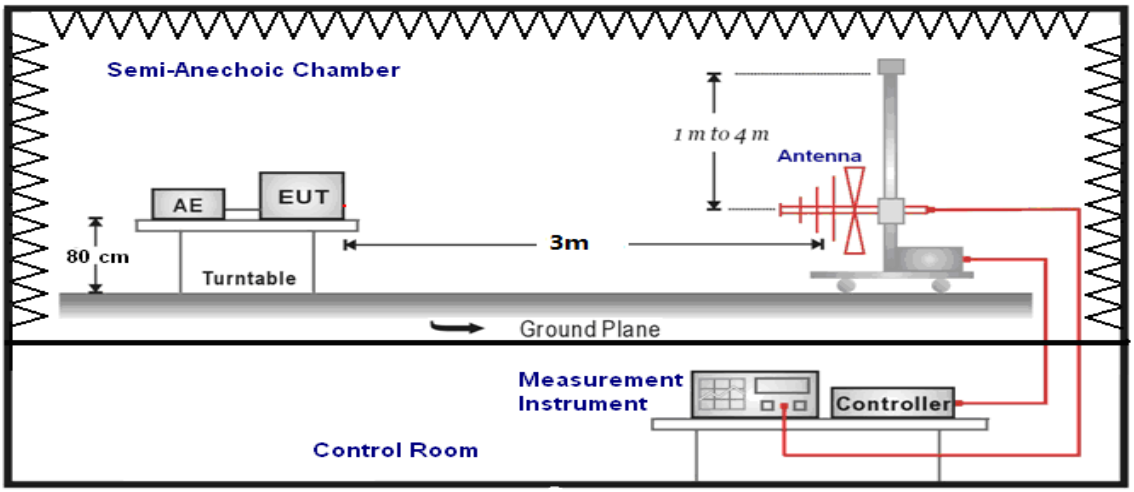
*Note: The original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

A.1.4 Test Condition

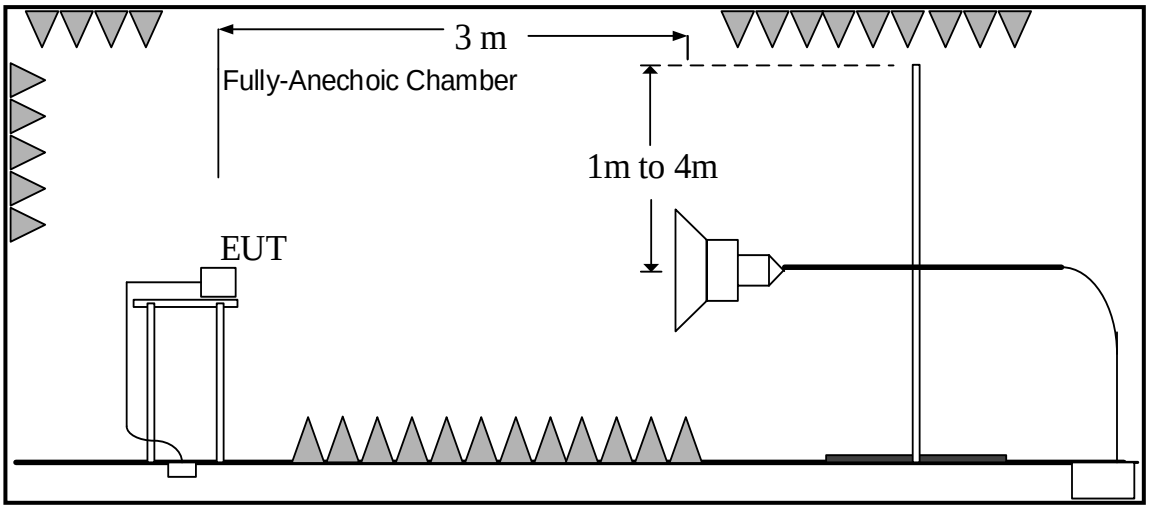
Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz (IF bandwidth)	5
Above 1000	1MHz/3MHz	15

A.1.5 Test set-up:

30MHz-1GHz



1GHz-26.5GHz



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

GSM Receiver 850MHz

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.1	Conclusion
30-88	40.00	See Figure A.1.1.	P
88-216	43.50		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.1	Conclusion
1000 to 18000	54.00	74.00	See Figure A.1.2.	P

GSM Receiver 850MHz

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.2	Conclusion
30-88	40.00	See Figure A.1.3.	P
88-216	43.50		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.2	Conclusion
1000 to 18000	54.00	74.00	See Figure A.1.4.	P

FM receiver

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.1	Conclusion
30-88	40.00	See Figure A.1.5.	P
88-216	43.50		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.1	Conclusion
1000 to 18000	54.00	74.00	See Figure A.1.6.	P

Video Player

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.1	Conclusion
30-88	40.00	See Figure A.1.7.	P
88-216	43.50		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.1	Conclusion
1000 to 18000	54.00	74.00	See Figure A.1.8.	P

Camera

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.1	Conclusion
30-88	40.00	See Figure A.1.9.	P
88-216	43.50		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m) UT01aa/Set.1	Conclusion
1000 to 18000	54.00	74.00	See Figure A.1.10.	P

Video Player

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m)	Conclusion
		UT01aa/Set.2	
30-88	40.00	See Figure A.1.11.	P
88-216	43.50		
216-960	46.02		
960-1000	54.00		

Frequency range (MHz)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Result (dBμV/m)	Conclusion
			UT01aa/Set.2	
1000 to 18000	54.00	74.00	See Figure A.1.12.	P

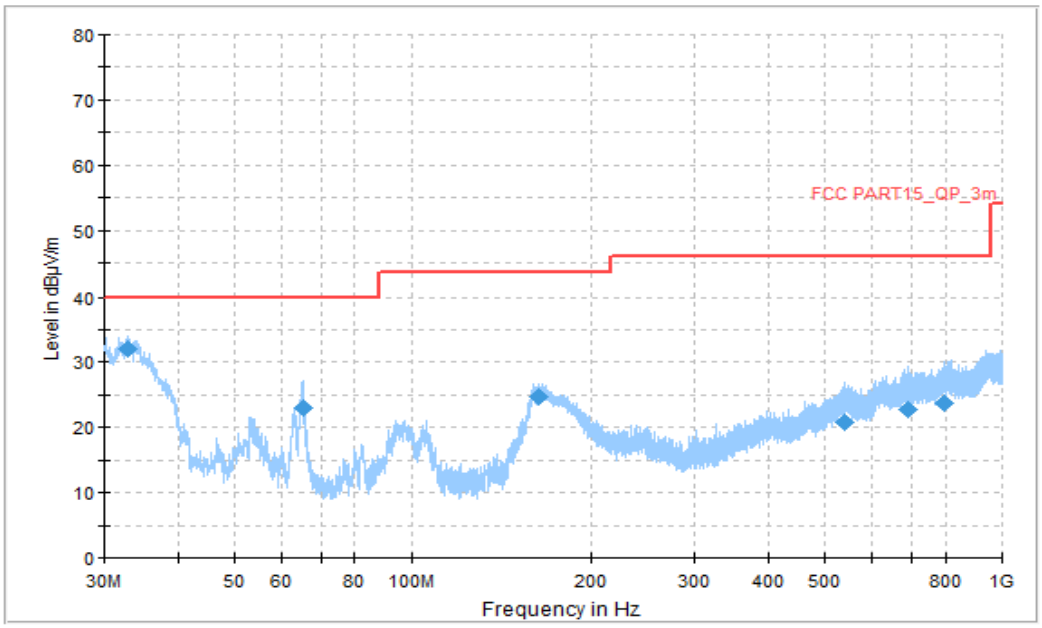


Figure A.1.1. Radiated Emission (GSM Receiver 850MHz, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
32.963889	32.11	40.00	8.51	V	-14	46.11
65.189444	22.95	40.00	15.38	V	-21	43.95
162.728333	24.73	43.52	21.48	H	-18	42.73
541.782778	20.79	46.02	23.98	V	-4	24.79
690.516111	22.86	46.02	18.98	H	-2	24.86
797.701111	23.79	46.02	22.87	H	-1	24.79

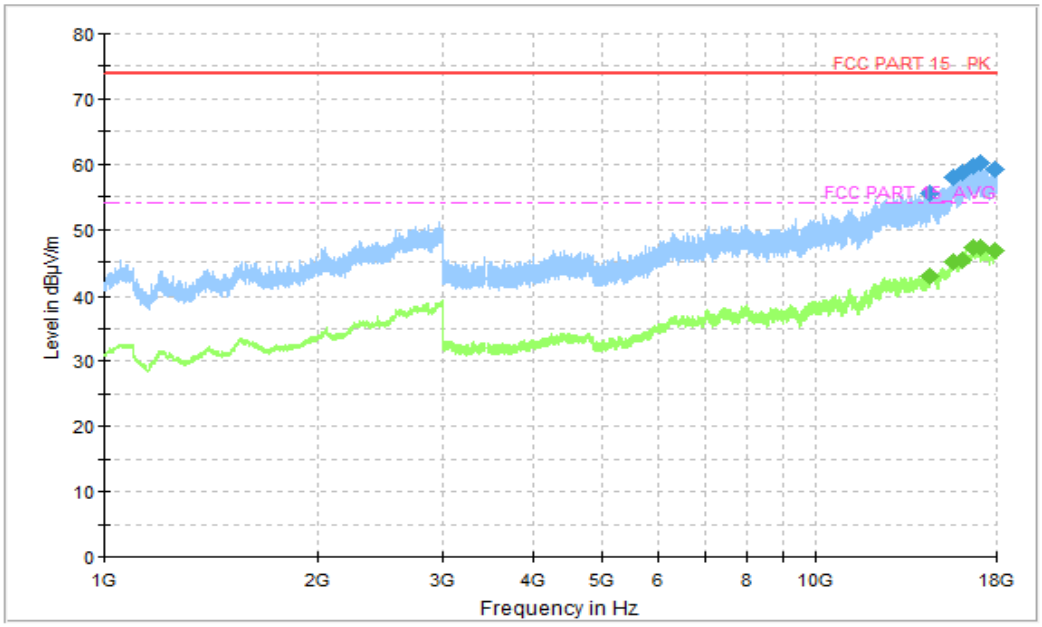


Figure A.1.2. Radiated Emission (GSM Receiver 850MHz,1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14511.750000	55.46	74.00	18.54	H	18	37.46
15647.750000	57.92	74.00	16.08	H	20	37.92
16125.500000	58.69	74.00	15.31	V	21	37.69
16653.250000	59.68	74.00	14.32	V	22	37.68
17023.500000	60.27	74.00	13.73	H	23	37.27
17868.000000	59.19	74.00	14.81	V	24	35.19

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14511.750000	42.84	54.00	11.16	150.0	H	42.84
15647.750000	45.13	54.00	8.87	150.0	H	45.13
16125.500000	45.32	54.00	8.68	150.0	V	45.32
16653.250000	47.10	54.00	6.90	150.0	V	47.1
17023.500000	47.14	54.00	6.86	150.0	H	47.14
17868.000000	46.77	54.00	7.23	150.0	V	46.77

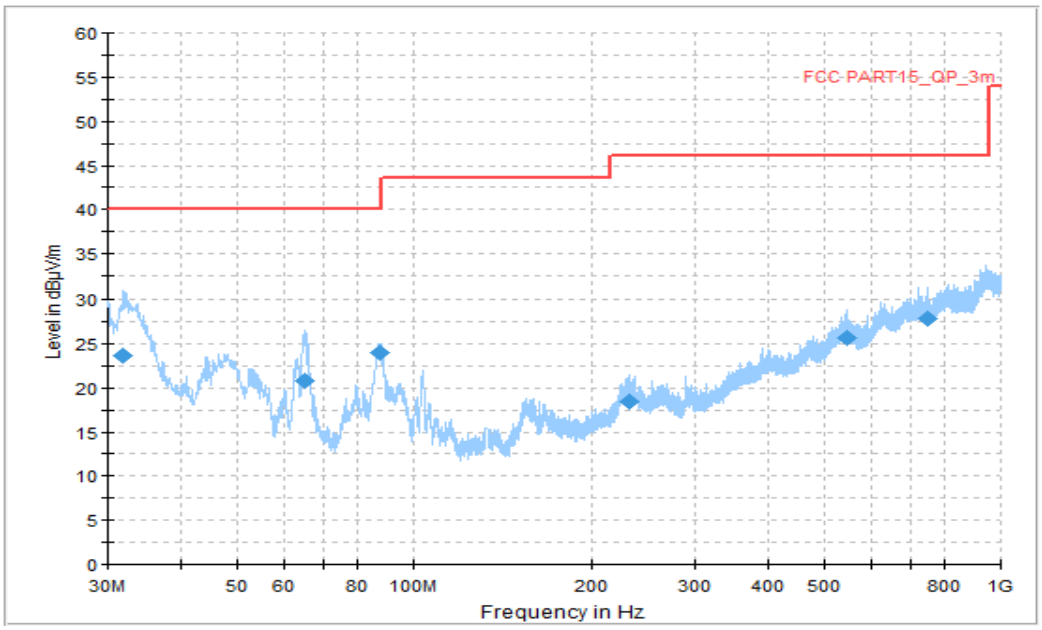


Figure A.1.3. Radiated Emission (GSM Receiver 850MHz, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	PMea (dBµV)
31.940000	23.70	40.00	16.30	V	-14	37.70
65.189444	20.82	40.00	19.18	V	-21	41.82
87.553333	23.98	40.00	16.02	V	-22	45.98
232.622222	18.40	46.02	27.62	V	-16	34.40
545.070000	25.71	46.02	20.31	V	-4	29.71
751.626111	27.87	46.02	18.15	V	-2	29.87

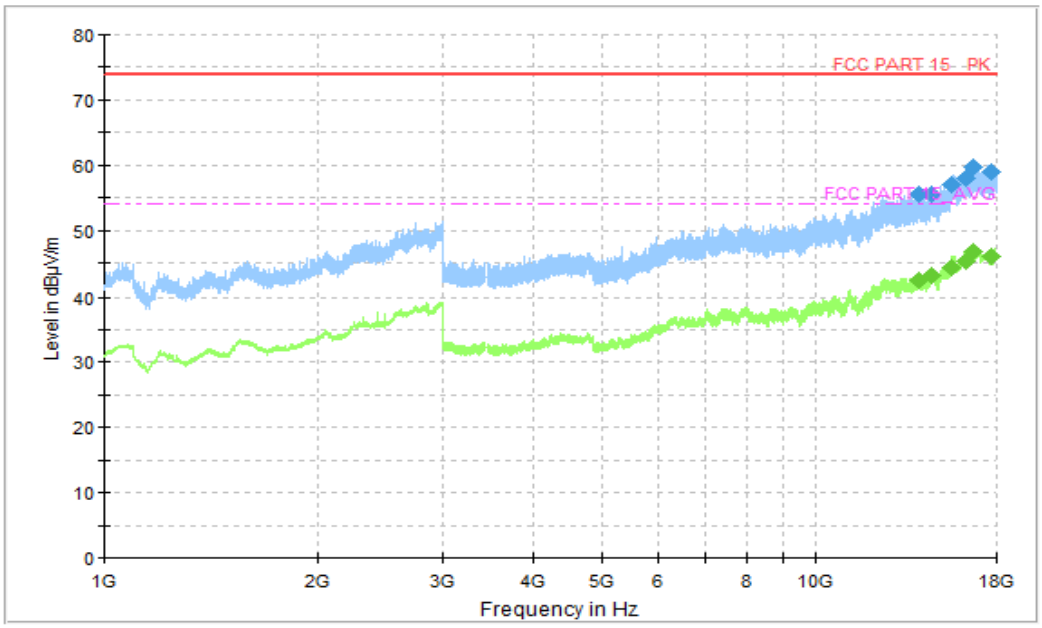


Figure A.1.4. Radiated Emission (GSM Receiver 850MHz,1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
13983.250000	55.48	74.00	18.52	150.0	H	55.48
14552.000000	55.51	74.00	18.49	150.0	V	55.51
15543.000000	56.99	74.00	17.01	150.0	V	56.99
16276.750000	58.10	74.00	15.90	150.0	H	58.10
16658.000000	59.60	74.00	14.40	150.0	H	59.6
17661.250000	58.87	74.00	15.13	150.0	H	58.87

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
13983.250000	42.22	54.00	11.78	150.0	H	42.22
14552.000000	43.03	54.00	10.97	150.0	V	43.03
15543.000000	44.24	54.00	9.76	150.0	V	44.24
16276.750000	45.36	54.00	8.64	150.0	H	45.36
16658.000000	46.76	54.00	7.24	150.0	H	46.76
17661.250000	45.88	54.00	8.12	150.0	H	45.88

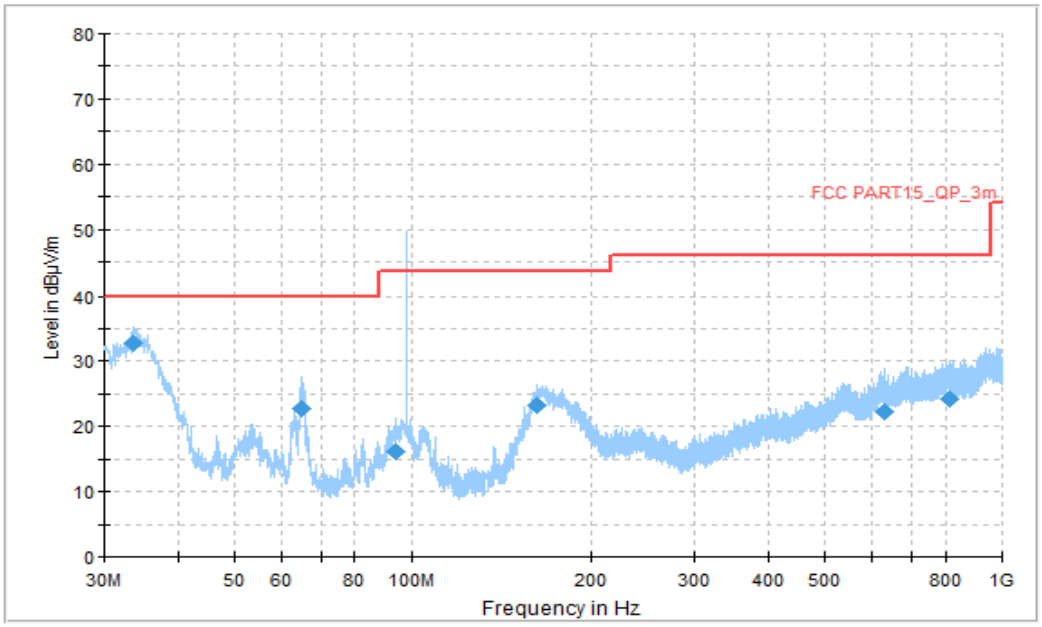


Figure A.1.5. Radiated Emission (FM receiver, 30MHz to 1GHz)

Note: the spike over the limit is coming from the traffic carrier.

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	PMea (dBµV)
33.718333	32.78	40.00	7.22	V	-15	47.78
65.135556	22.75	40.00	17.25	V	-21	43.75
93.966111	16.24	43.52	27.28	V	-21	37.24
161.866111	23.33	43.52	20.19	H	-18	41.33
633.070556	22.31	46.02	23.71	H	-3	25.31
814.298889	24.21	46.02	21.81	H	-1	25.21

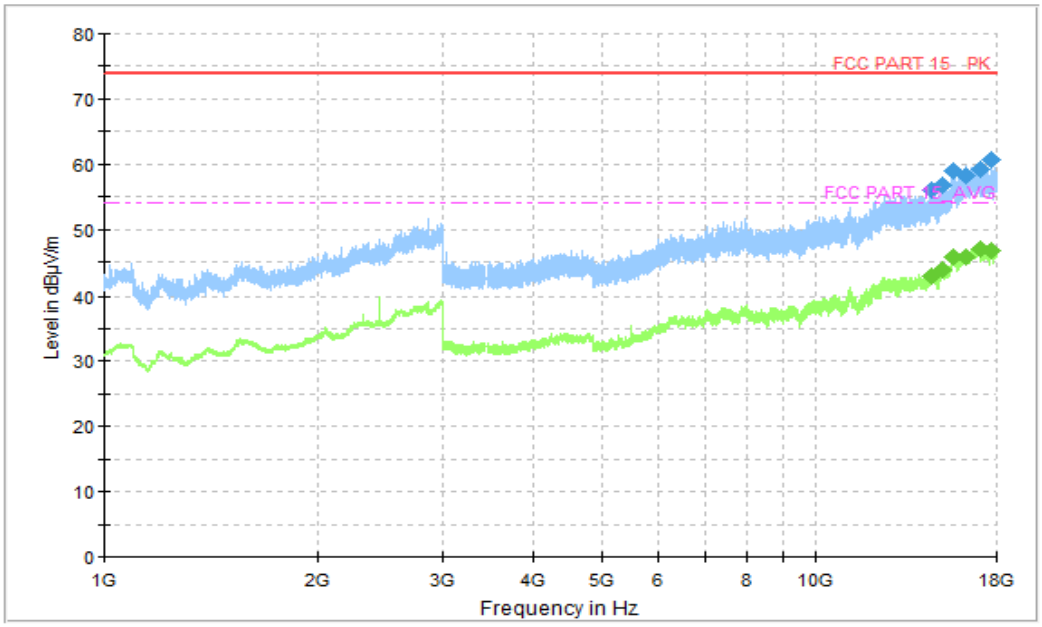


Figure A.1.6. Radiated Emission (FM receiver,1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14572.000000	55.91	74.00	18.09	150.0	V	55.91
15094.500000	56.81	74.00	17.19	150.0	V	56.81
15678.000000	58.84	74.00	15.16	150.0	H	58.84
16260.000000	58.11	74.00	15.89	150.0	V	58.11
17053.750000	59.14	74.00	14.86	150.0	H	59.14
17709.250000	60.73	74.00	13.27	150.0	H	60.73

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14572.000000	42.72	54.00	11.28	150.0	V	42.72
15094.500000	43.67	54.00	10.33	150.0	V	43.67
15678.000000	45.82	54.00	8.18	150.0	H	45.82
16260.000000	45.63	54.00	8.37	150.0	V	45.63
17053.750000	46.96	54.00	7.04	150.0	H	46.96
17709.250000	46.75	54.00	7.25	150.0	H	46.75

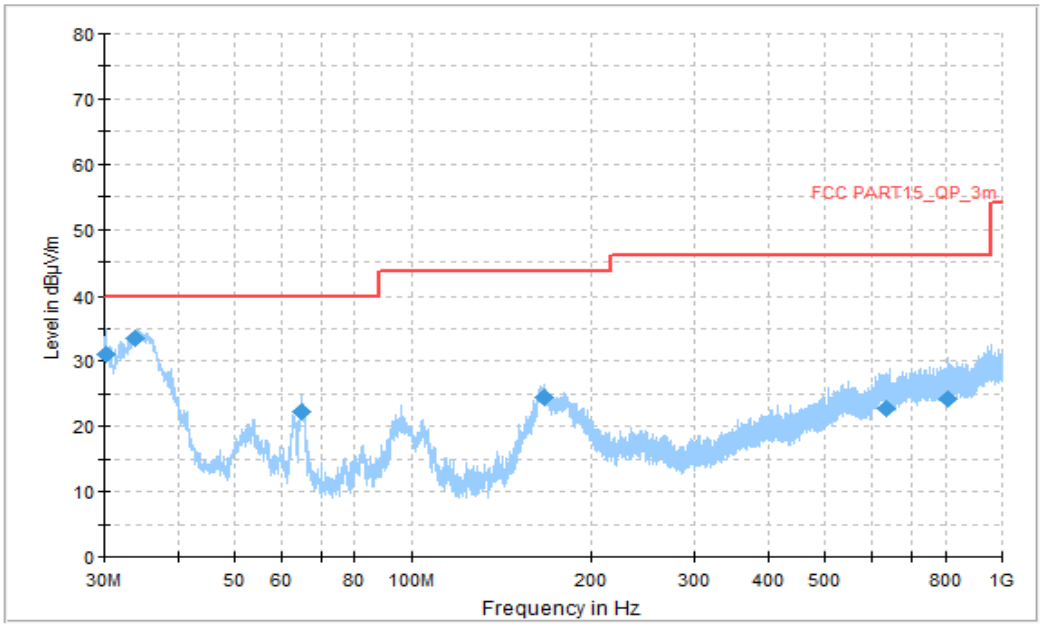


Figure A.1.7. Radiated Emission (Video Player, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	PMea (dBµV)
30.107778	31.17	40.00	8.83	V	-13	44.17
33.933889	33.49	40.00	6.51	V	-15	48.49
64.866111	22.21	40.00	17.79	V	-21	43.21
166.123333	24.36	43.52	19.16	H	-18	42.36
634.363889	22.64	46.02	23.38	V	-3	25.64
809.395000	24.31	46.02	21.71	H	-1	25.31

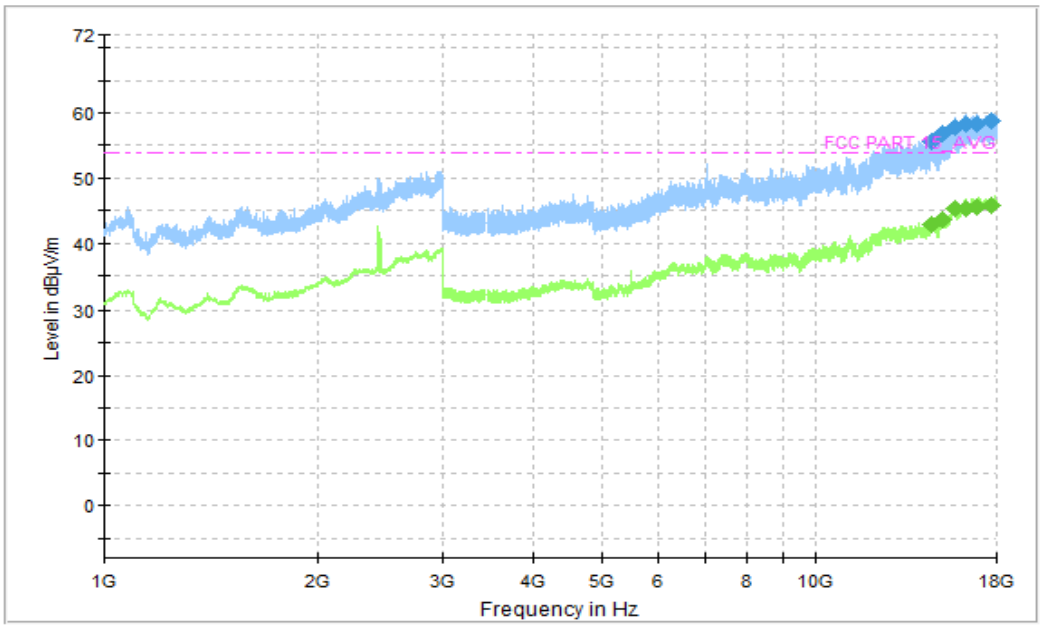


Figure A.1.8. Radiated Emission (Video Player,1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14589.000000	55.60	74.00	18.40	150.0	H	55.60
15097.750000	56.73	74.00	17.27	150.0	V	56.73
15715.500000	57.93	74.00	16.07	150.0	V	57.93
16278.750000	58.26	74.00	15.74	150.0	H	58.26
16862.000000	58.20	74.00	15.80	150.0	V	58.2
17659.500000	58.70	74.00	15.30	150.0	V	58.2

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14589.000000	42.81	54.00	11.19	150.0	H	42.81
15097.750000	43.61	54.00	10.39	150.0	V	43.61
15715.500000	45.23	54.00	8.77	150.0	V	45.23
16278.750000	45.40	54.00	8.60	150.0	H	45.40
16862.000000	45.65	54.00	8.35	150.0	V	45.65
17659.500000	45.85	54.00	8.15	150.0	V	45.65

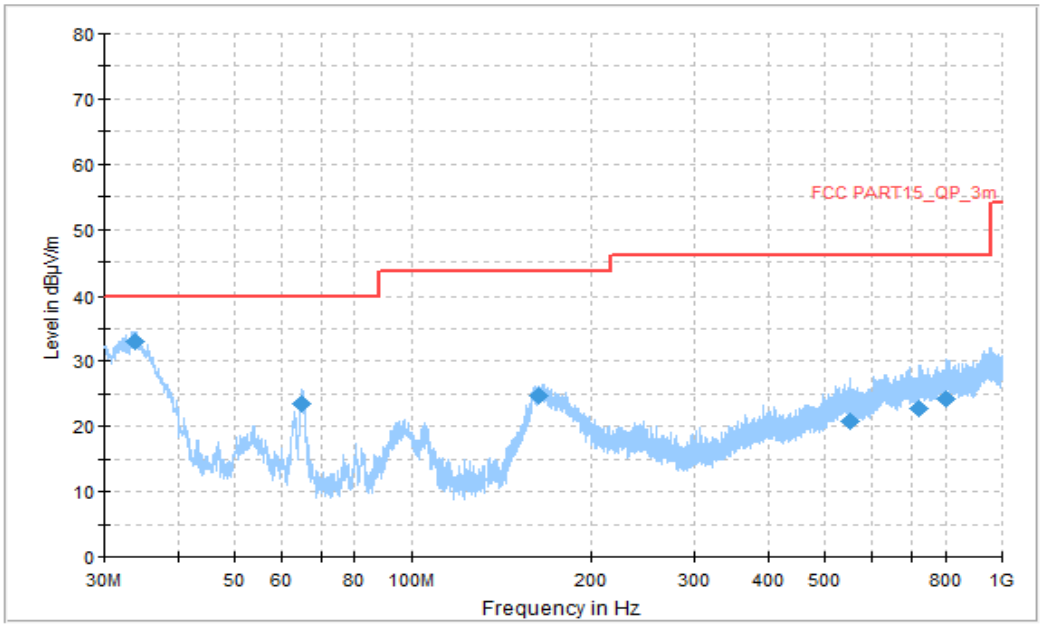


Figure A.1.9. Radiated Emission (Camera, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	PMea (dBµV)
33.826111	33.06	40.00	6.94	V	-15	48.06
65.135556	23.44	40.00	16.56	V	-21	44.44
163.482778	24.65	43.52	18.87	H	-18	42.65
550.458889	20.83	46.02	25.19	V	-5	25.83
720.316667	22.68	46.02	23.34	V	-2	24.68
802.928333	24.11	46.02	21.91	V	-1	25.11

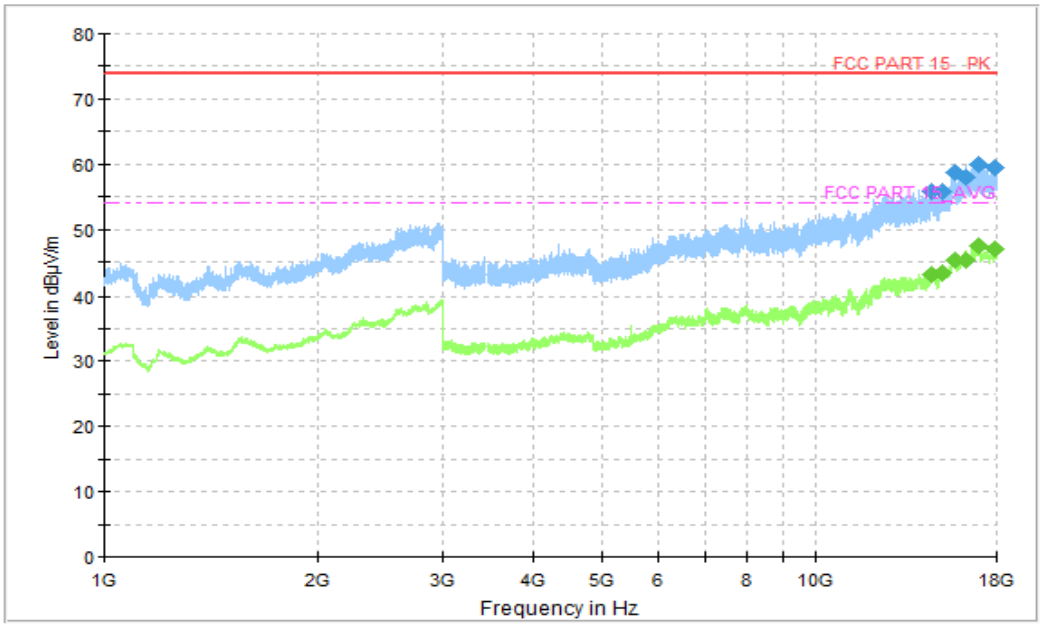


Figure A.1.10. Radiated Emission (Camera,1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14550.250000	55.88	74.00	18.12	150.0	H	55.88
15079.500000	55.77	74.00	18.23	150.0	V	55.77
15703.250000	58.67	74.00	15.33	150.0	V	58.67
16273.500000	58.05	74.00	15.95	150.0	V	58.05
17013.750000	60.06	74.00	13.94	150.0	H	60.06
17899.250000	59.49	74.00	14.51	150.0	H	60.06

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14550.250000	43.10	54.00	10.90	150.0	H	43.10
15079.500000	43.36	54.00	10.64	150.0	V	43.36
15703.250000	45.28	54.00	8.72	150.0	V	45.28
16273.500000	45.22	54.00	8.78	150.0	V	45.22
17013.750000	47.47	54.00	6.53	150.0	H	47.47
17899.250000	46.92	54.00	7.08	150.0	H	47.47

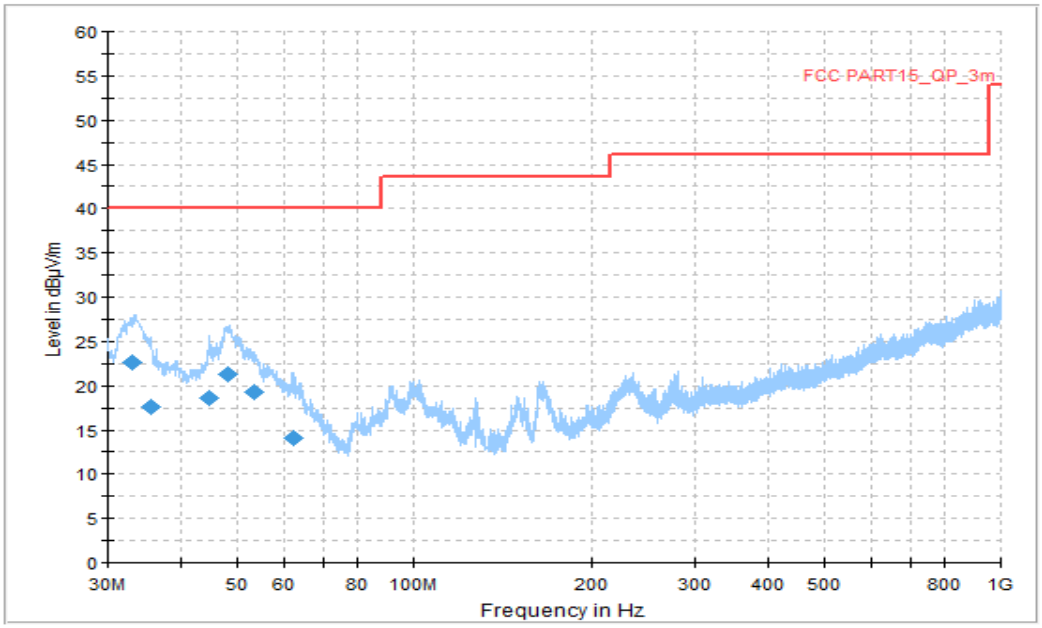


Figure A.1.11. Radiated Emission (Video Player, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	PMea (dBµV)
32.963889	22.57	40.00	17.43	V	-17	39.57
35.550556	17.66	40.00	22.34	V	-16	33.66
44.711667	18.59	40.00	21.41	V	-15	33.59
48.160556	21.31	40.00	18.69	V	-15	36.31
53.226111	19.21	40.00	20.79	V	-15	34.21
62.117778	14.13	40.00	25.87	V	-16	30.13

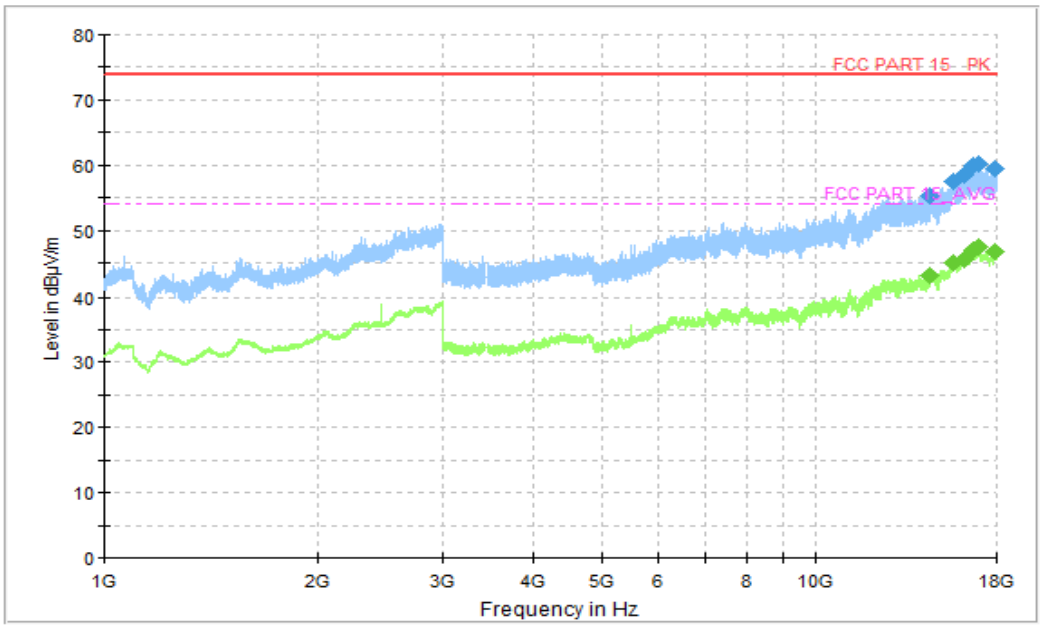


Figure A.1.12. Radiated Emission (Video Player,1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14514.750000	55.41	74.00	18.59	150.0	H	55.41
15650.750000	57.48	74.00	16.52	150.0	H	57.48
16187.000000	58.37	74.00	15.63	150.0	V	58.37
16637.250000	59.95	74.00	14.05	150.0	H	59.95
17018.500000	60.09	74.00	13.91	150.0	H	60.09
17900.500000	59.57	74.00	14.43	150.0	H	60.09

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
14514.750000	43.11	54.00	10.89	150.0	H	43.11
15650.750000	45.08	54.00	8.92	150.0	H	45.08
16187.000000	45.56	54.00	8.44	150.0	V	45.56
16637.250000	47.00	54.00	7.00	150.0	H	47.00
17018.500000	47.40	54.00	6.60	150.0	H	47.4
17900.500000	46.79	54.00	7.21	150.0	H	47.4

A.2 Conducted Emission (§15.107(a))

Reference

FCC: CFR Part 15.107(a)

A.2.1 Method of measurement

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 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:

FM receiver: he EUT is connected to a charger for charging and open FM function. The EUT is synchronized to a FM signal generator. The EUT is keeping on demodulating the FM signal and outputting the audio signal through the headset.

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.

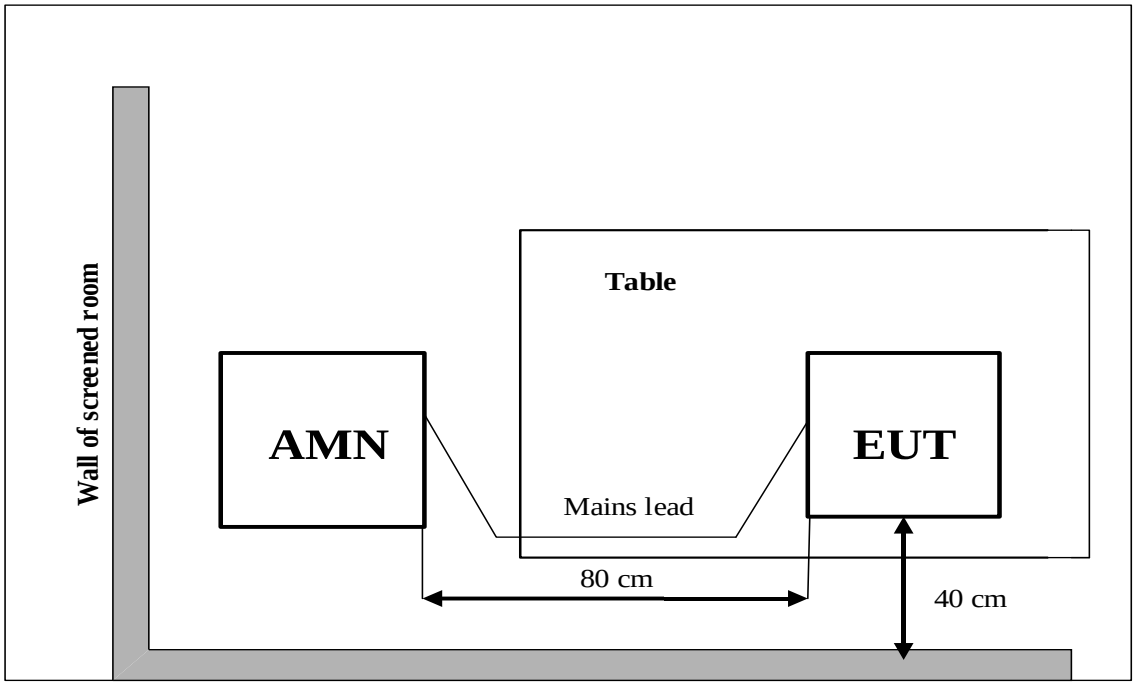
Video Player: The EUT is connected to a charger for charging and keeping on playing mp3.

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 MS 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) UT01aa/Set.1	Conclusion
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.				

Video Player

AC Input Port/ Voltage: 120V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT01aa/Set.1	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.				

FM receiver

AC Input Port/ Voltage: 120V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT01aa/Set.1	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.				

FM receiver

AC Input Port/ Voltage: 120V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT01aa/Set.2	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) UT01aa/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.				

Video Player

AC Input Port/ Voltage: 240V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT01aa/Set.1	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.				

FM receiver

AC Input Port/ Voltage: 240V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT01aa/Set.1	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.				

Video Player

AC Input Port/ Voltage: 240V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) UT01aa/Set.2	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

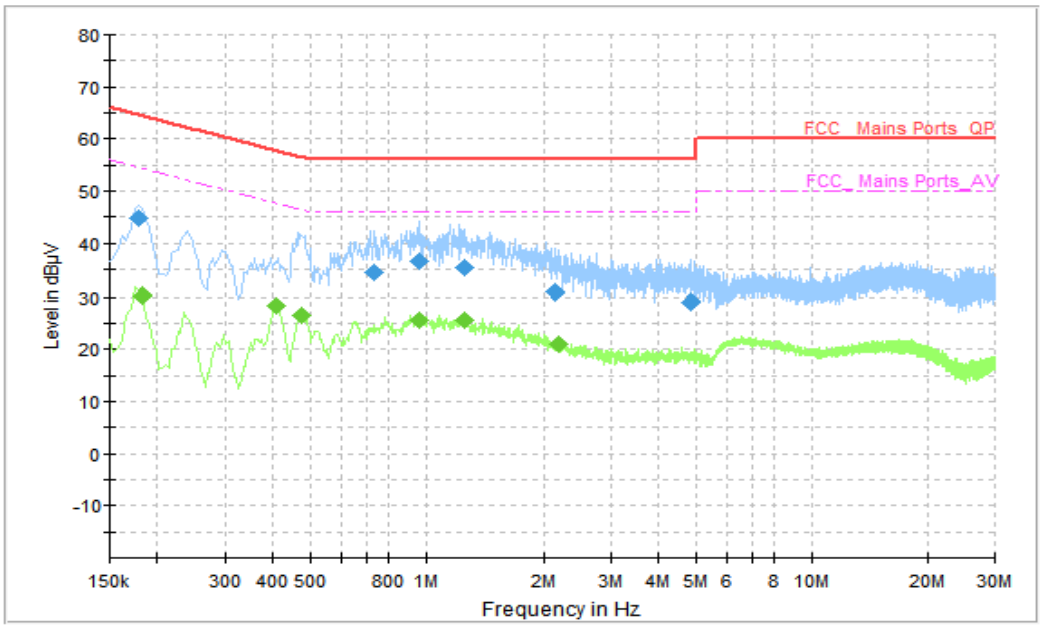


Figure A.2.1 Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.178000	44.86	64.58	19.72	N	10	34.86
0.734000	34.44	56.00	21.56	N	10	24.44
0.958000	36.60	56.00	19.40	N	10	26.6
1.258000	35.36	56.00	20.64	N	10	25.36
2.150000	30.82	56.00	25.18	N	10	20.82
4.818000	28.78	56.00	27.22	N	10	18.78

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.182000	30.05	54.39	24.34	L1	10	20.05
0.406000	28.22	47.73	19.51	L1	10	18.22
0.474000	26.53	46.44	19.92	L1	10	16.53
0.958000	25.45	46.00	20.55	N	10	15.45
1.258000	25.56	46.00	20.44	N	10	15.56
2.194000	21.13	46.00	24.87	N	10	11.13

AC Input Port/ Voltage: 120V/60Hz

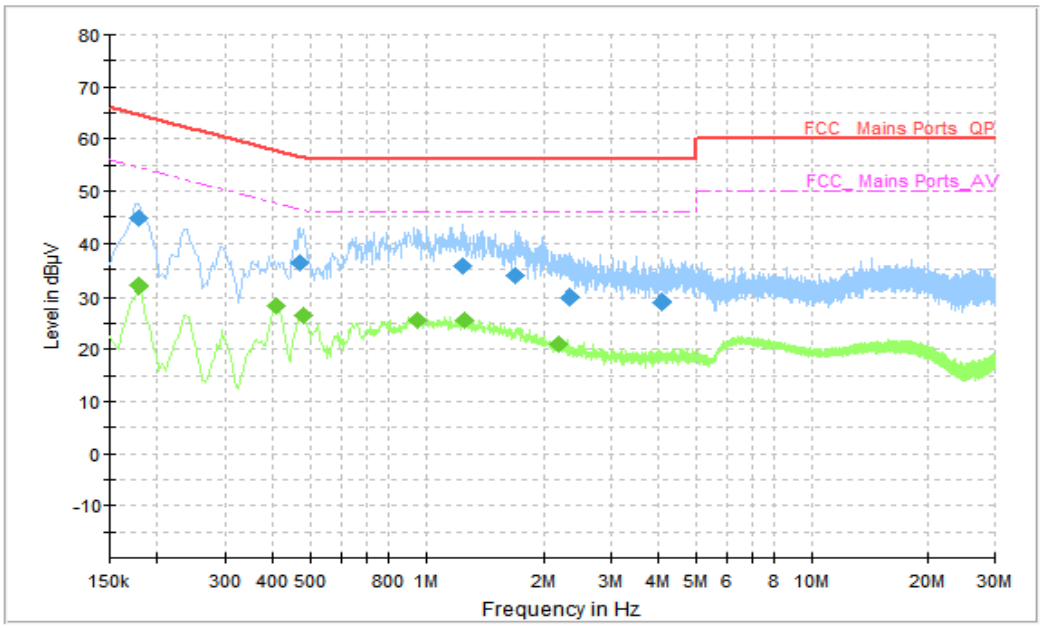


Figure A.2.2 Conducted Emission(Video Player)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.178000	44.98	64.58	19.60	L1	10	34.98
0.470000	36.29	56.51	20.23	N	10	26.29
1.242000	35.81	56.00	20.19	N	10	25.81
1.690000	33.73	56.00	22.27	N	10	23.73
2.330000	29.93	56.00	26.07	N	10	19.93
4.090000	28.97	56.00	27.03	N	10	18.97

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.178000	31.94	54.58	22.64	L1	10	21.94
0.406000	28.29	47.73	19.44	L1	10	18.29
0.478000	26.61	46.37	19.76	L1	10	16.61
0.946000	25.48	46.00	20.52	N	10	15.48
1.254000	25.57	46.00	20.43	N	10	15.57
2.182000	20.92	46.00	25.08	N	10	10.92

AC Input Port/ Voltage: 120V/60Hz

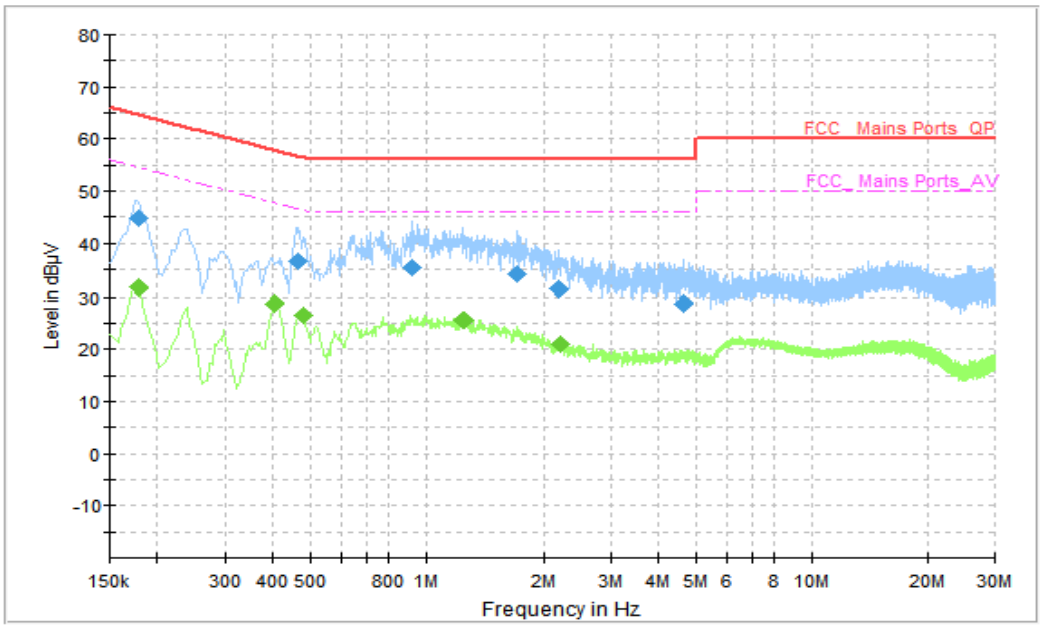


Figure A.2.3 Conducted Emission(FM receiver)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.178000	44.93	64.58	19.65	N	10	34.93
0.466000	36.45	56.59	20.13	N	10	26.45
0.922000	35.44	56.00	20.56	N	10	25.44
1.714000	34.01	56.00	21.99	N	10	24.01
2.186000	31.46	56.00	24.54	N	10	21.46
4.618000	28.56	56.00	27.44	N	10	18.56

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.178000	31.54	54.58	23.04	N	10	21.54
0.402000	28.58	47.81	19.23	L1	10	18.58
0.478000	26.60	46.37	19.78	L1	10	16.6
1.246000	25.51	46.00	20.49	N	10	15.51
1.254000	25.56	46.00	20.44	N	10	15.56
2.214000	20.87	46.00	25.13	N	10	10.87

AC Input Port/ Voltage: 120V/60Hz

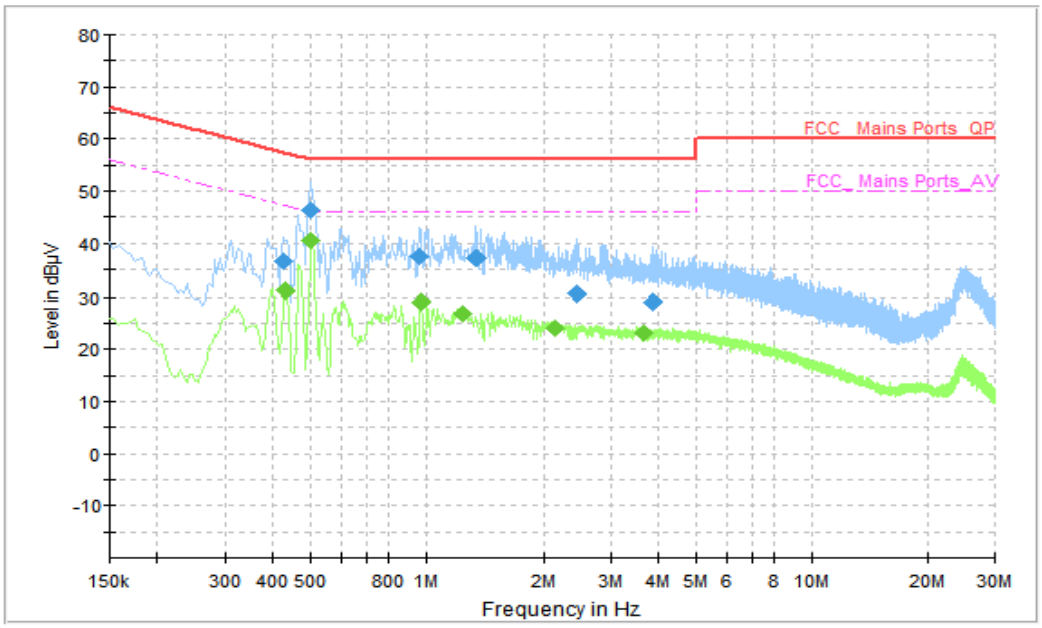


Figure A.2.4 Conducted Emission(FM receiver)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.426000	36.69	57.33	20.64	N	10	26.69
0.498000	46.40	56.03	9.63	N	10	36.4
0.958000	37.35	56.00	18.65	N	10	27.35
1.350000	37.15	56.00	18.85	N	10	27.15
2.438000	30.56	56.00	25.44	N	10	20.56
3.866000	29.06	56.00	26.94	N	10	19.06

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.430000	31.14	47.25	16.11	L1	10	21.14
0.502000	40.69	46.00	5.31	L1	10	30.69
0.970000	28.80	46.00	17.20	L1	10	18.8
1.250000	26.80	46.00	19.20	L1	10	16.8
2.146000	24.03	46.00	21.97	L1	10	14.03
3.654000	23.10	46.00	22.90	L1	10	13.10

AC Input Port/ Voltage: 240V/60Hz

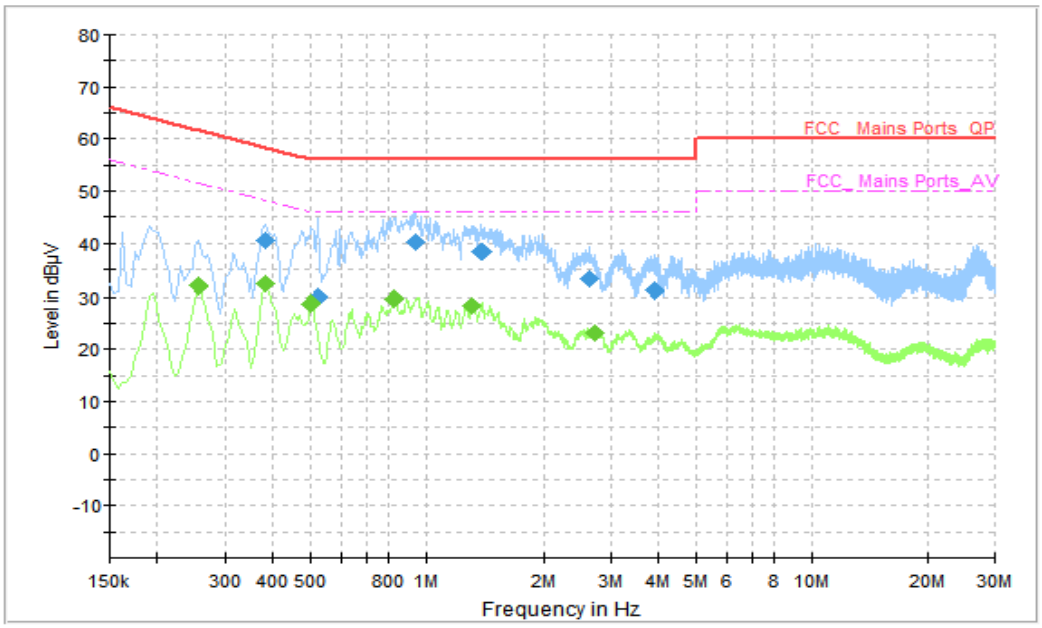


Figure A.2.5 Conducted Emission(Camera)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.382000	40.49	58.24	17.74	N	10	30.49
0.522000	29.83	56.00	26.17	L1	10	19.83
0.938000	40.36	56.00	15.64	N	10	30.36
1.386000	38.38	56.00	17.62	N	10	28.38
2.630000	33.30	56.00	22.70	N	10	23.3
3.898000	31.06	56.00	24.94	N	10	21.06

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.254000	31.89	51.63	19.74	L1	10	21.89
0.382000	32.31	48.24	15.92	L1	10	22.31
0.502000	28.77	46.00	17.23	N	10	18.77
0.826000	29.52	46.00	16.48	N	10	19.52
1.322000	28.27	46.00	17.73	N	10	18.27
2.734000	23.12	46.00	22.88	L1	10	13.12

AC Input Port/ Voltage: 240V/60Hz

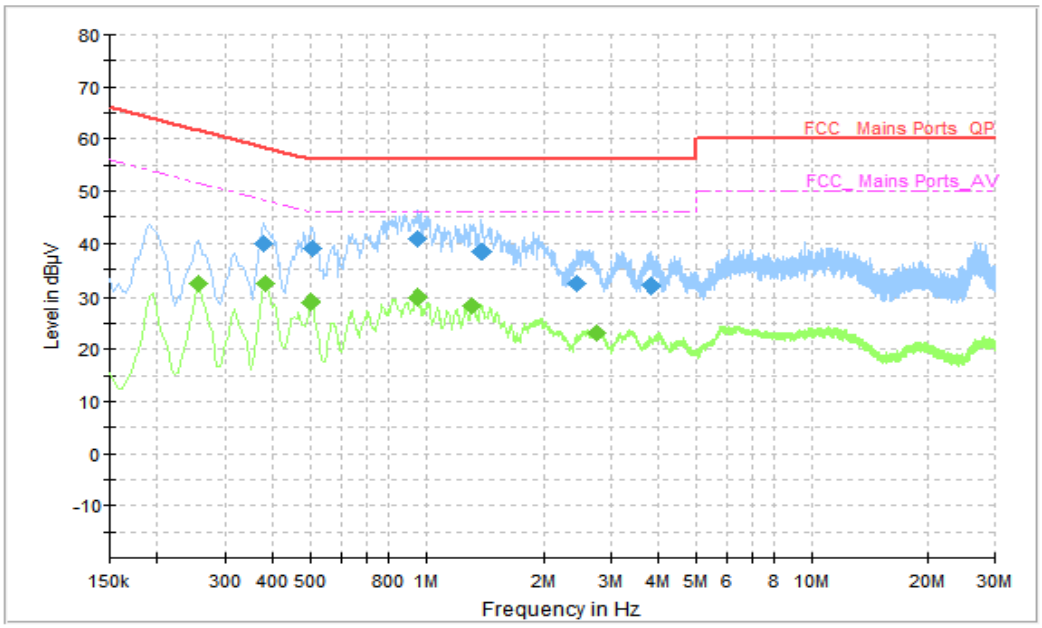


Figure A.2.6 Conducted Emission(Video Player)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.378000	39.81	58.32	18.51	N	10	29.81
0.506000	39.01	56.00	16.99	N	10	29.01
0.954000	40.86	56.00	15.14	N	10	30.86
1.386000	38.45	56.00	17.55	N	10	28.45
2.434000	32.27	56.00	23.73	N	10	22.27
3.826000	32.03	56.00	23.97	N	10	22.03

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.254000	32.22	51.63	19.41	L1	10	22.22
0.382000	32.33	48.24	15.91	L1	10	22.33
0.502000	28.98	46.00	17.02	N	10	18.98
0.950000	29.94	46.00	16.06	N	10	19.94
1.322000	28.35	46.00	17.65	N	10	18.35
2.758000	23.24	46.00	22.76	L1	10	13.24

AC Input Port/ Voltage: 240V/60Hz

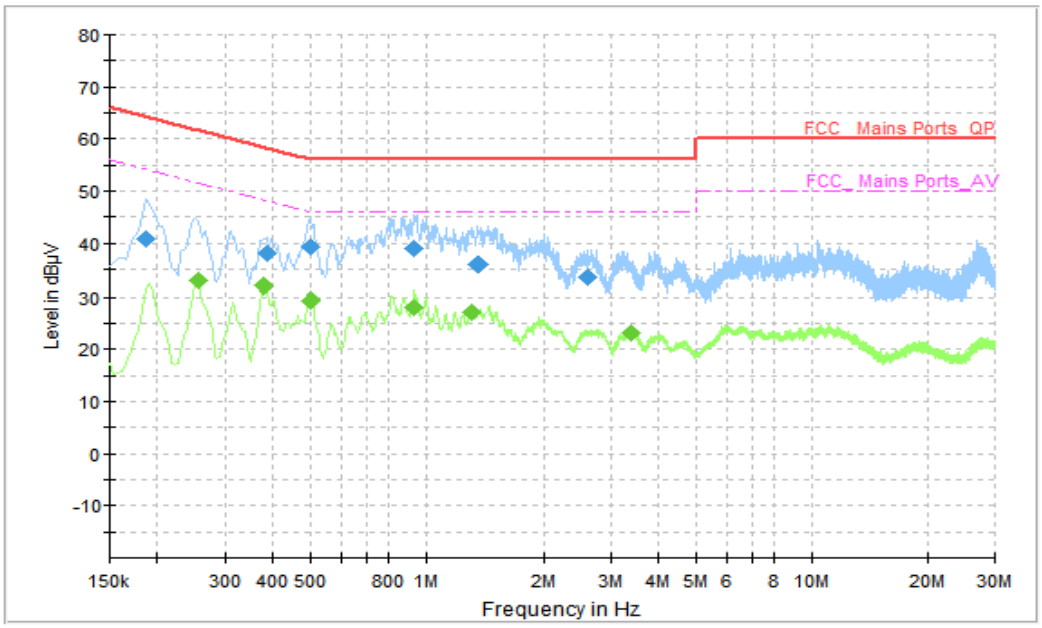


Figure A.2.7 Conducted Emission(FM receiver)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.186000	40.74	64.21	23.47	N	10	33.36
0.386000	38.06	58.15	20.09	N	10	25.01
0.502000	39.34	56.00	16.66	N	10	26.78
0.934000	38.95	56.00	17.05	N	10	26.78
1.362000	36.02	56.00	19.98	N	10	23.36
2.606000	33.42	56.00	22.58	N	10	19.86

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.254000	32.94	51.63	18.69	L1	10	19.98
0.378000	32.08	48.32	16.24	L1	10	30.62
0.502000	29.36	46.00	16.64	L1	10	22.08
0.934000	28.04	46.00	17.96	N	10	21.95
1.310000	27.10	46.00	18.90	N	10	18.82
12.302000	16.56	50.00	33.44	L1	10	6.56

AC Input Port/ Voltage: 240V/60Hz

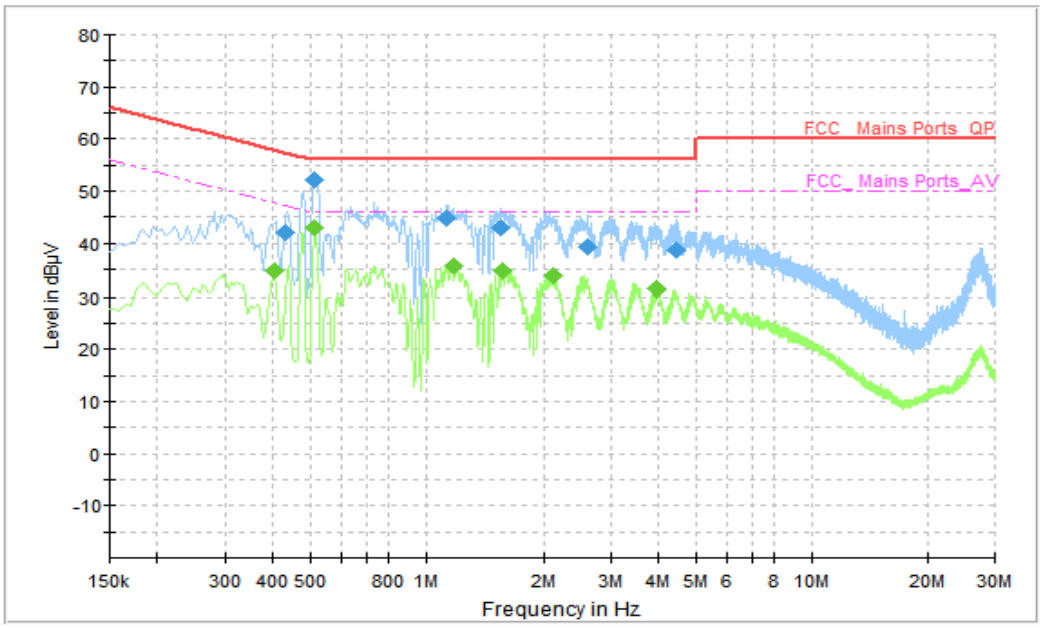


Figure A.2.8 Conducted Emission(Video Player)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.430000	42.02	57.25	15.23	N	10	30.50
0.510000	52.16	56.00	3.84	N	10	23.49
1.134000	44.83	56.00	11.17	N	10	20.40
1.554000	42.94	56.00	13.06	N	10	21.65
2.610000	39.19	56.00	16.81	N	10	20.44
4.418000	38.58	56.00	17.42	N	10	24.86

Final_Result_AVG

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	PMea (dBµV)
0.402000	34.82	47.81	13.00	L1	10	20.99
0.514000	42.95	46.00	3.05	L1	10	18.64
1.174000	35.70	46.00	10.30	L1	10	15.40
1.570000	34.61	46.00	11.39	L1	10	17.74
2.122000	33.74	46.00	12.26	L1	10	16.58
3.946000	31.39	46.00	14.61	L1	10	14.91

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