TEST REPORT

No.I20N03224-EMC

for

HMD Global Oy

Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN

Model Name：TA-1338

With

Hardware Version: 99652_1_11

Software Version: 000T_0_080

FCC ID: 2AJOTTA-1338

Issued Date: 2021-01-17

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
I20N03224-EMC	Rev.0	1st edition	2021-01-17

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	Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN
Model Name	TA-1338
Applicant's name	HMD Global Oy
Manufacturer's Name	HMD Global Oy

1.2. Test Standards

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

1.3. Test Result

Pass

Total test 1 items, pass 1 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: 2020-12-15 Testing End Date: 2021-01-12

1.6. Signature

Ma Shoujian
(Prepared this test report)

Zhang Yunzhuan
(Reviewed this test report)

Cao Junfei
(Approved this test report)

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2. ClientInformation

2.1. Applicant Information

Company Name:	HMD Global Oy
Address:	Bertel Jungin aukio 902600 Espoo，Finland
Contact	Rosario Casillo
Email	Rosario Casillo@hmdglobal.com

2.2. Manufacturer Information

Company Name:	HMD Global Oy
Address:	Bertel Jungin aukio 902600 Espoo，Finland
Contact	Rosario Casillo
Email	Rosario Casillo@hmdglobal.com

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

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN
Model Name	TA-1338
FCC ID	2AJOTTA-1338
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
UT06aa	358457300006582	99652_1_11	000T_0_080	2020-12-15

*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	WT340
Manufacturer	Guangdong Fenghua New Energy Co.,Ltd
Capacity	4900mAh
Nominal Voltage	3.85V

AE2-1

Model	PA-US5V2A-036
Manufacturer	Yutong Electronics(Huizhou) Co., Ltd

AE2-2

Model	CH-21U
Manufacturer	Shenzhen Tianyin Electronics Co., Ltd

AE3-1

Model	CB-36A
Manufacturer	ShenZhen BRL Technology Co., Ltd

AE3-2

Model	CB-36A
Manufacturer	Huizhou Washin Electronics co.,LTD

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AE4-1

Model	HS-34
Manufacturer	New Leader Industry Co.,Ltd

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

AE: ancillary equipment

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3.4. EUT set-ups

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

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3.5. General Description

The Equipment Under Test (EUT) is a model of Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN 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,Wi-Fi and GNSS functions.

It consists of normal options: Battery, Charger and USB Cable and Headset

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

Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN TA-1338 manufactured by HMD Global Oy is a variant model based on TA-1346 manufactured by HMD Global Oy for conformance test. According to client's description, the table below shows the difference between model TA-1346 and TA-1338:

Changes	TA-1346	TA-1338
MMS/STK/USAT/ USIM changes	single SIM	dual SIM

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

NO.	Test iteam	EUT Operating Mode
1	Radiated Emission	Camera/Video Player/GNSS/FM receiver/LTE receiver/ Data Transfer

Other results are cited from the initial report.

The report number for initial model is I20N03221-EMC.

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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

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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

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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

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.

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7. Measurement uncertainty

Test item	Frequency ranges	Measurement uncertaint
Radiated Emission	30MHz-1GHz	4.84dB(*k*=2)
	1GHz-18GHz	4.68dB(*k*=2)
Conducted Emission	150kHz-30MHz	3.00dB(*k*=2)

8. Test Facilities Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CALDUE DATE	CAL PERIOD
1.	Test Receiver	ESR7	101676	R&S	2021.12.25	1 year
2.	Test Receiver	ESCI	100701	R&S	2021.08.09	1 year
3.	Spectrum Analyzer	FSV40	101192	R&S	2022.01.13	1 year
4.	BiLog Antenna	3142E	0224831	ETS-Lindgren	2021.05.17	3 years
5.	Horn Antenna	3117	00066577	ETS-Lindgren	2022.04.02	3 years
6.	Universal Radio Communication Tester	CMU200	114545	R&S	2022.01.13	1 year
7.	Universal Radio Communication Tester	CMW500	152499	R&S	2021.07.16	1 year
8.	Signal Generator	SMB100A	179725	R&S	2021.11.25	1 year
9.	Chamber	FACT3-2.0	1285	ETS-Lindgren	2021.07.19	2 years
10.	Software	EMC32	V10.01.00	R&S	/	/

9. Test Accessory Utilized

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

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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.

GNSS: The EUT is connected to a charger for charging. A vector signal generator is used to provide the simulated GNSS signal, and the frequency is set to 1575.42 MHz. Before the test starts, the integrated GNSS application in EUT is started up and locked to the simulated GNSS signal.

Meanwhile, the EUT is synchronized to System Simulator (SS), and able to respond to paging messages and incoming call. An established call has been released.

LTE 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:LTE Band 12.

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.

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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

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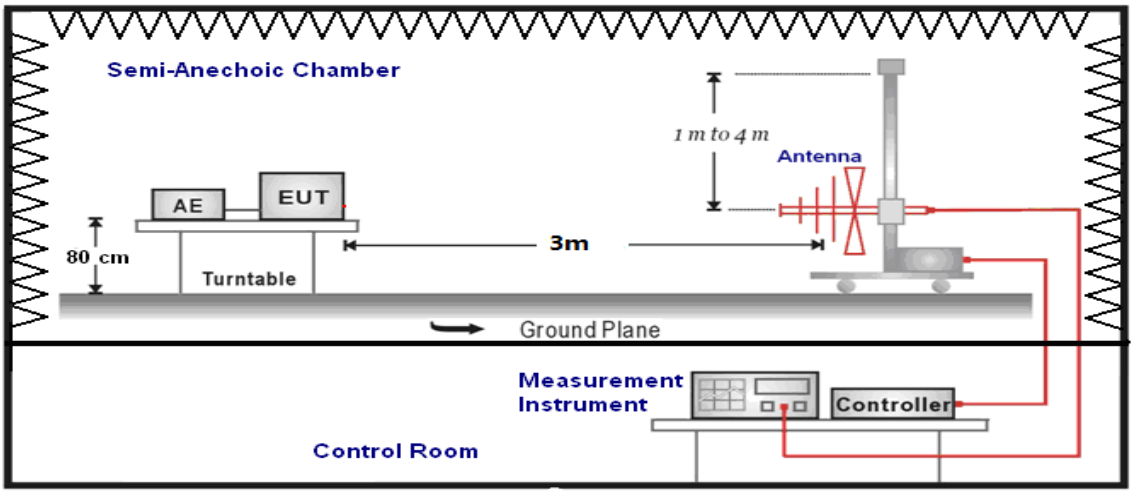
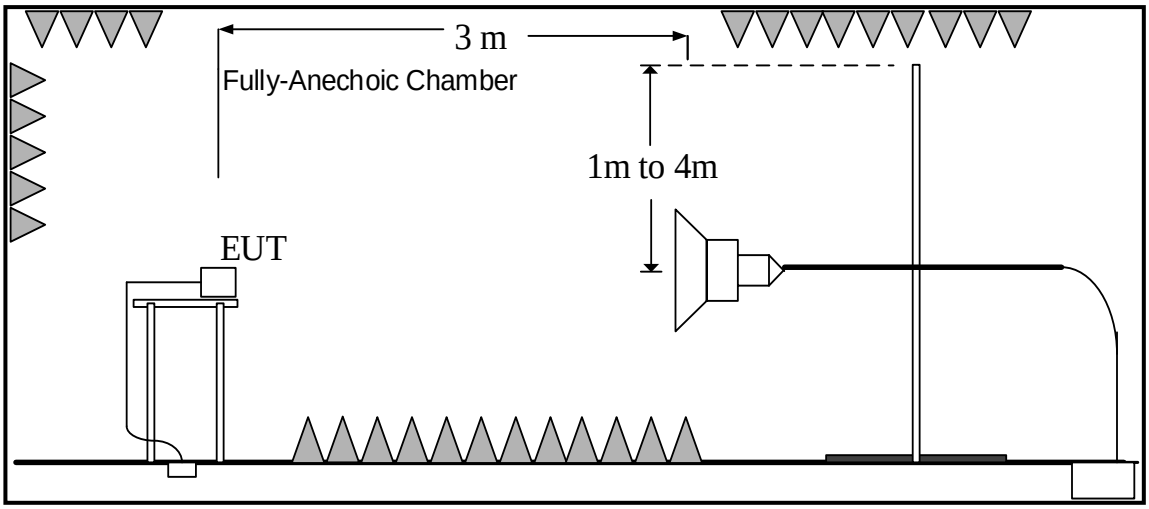
A.1.5 Test set-up:

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

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LTE Receiver Band 12

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.2	Conclusion
30-88	40.00	See Fugure 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) UT06aa/Set.2	Conclusion
1000 to 3000	54	74	See Fugure A.1.2.	P
3000to 18000	54	74	See Fugure A.1.3.	P

FM receiver

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.1	Conclusion
30-88	40.00	See Fugure A.1.4.	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) UT06aa/Set.1	Conclusion
1000 to 3000	54	74	See Fugure A.1.5.	P
3000to 18000	54	74	See Fugure A.1.6.	P

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Video Player

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.1	Conclusion
30-88	40.00	See Fugure 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) UT06aa/Set.1	Conclusion
1000 to 3000	54	74	See Fugure A.1.8.	P
3000to 18000	54	74	See Fugure A.1.9.	P

Camera

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.1	Conclusion
30-88	40.00	See Fugure A.1.10.	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) UT06aa/Set.1	Conclusion
1000 to 3000	54	74	See Fugure A.1.11.	P
3000to 18000	54	74	See Fugure A.1.12.	P

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GPS

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.1	Conclusion
30-88	40.00	See Fugure A.1.13.	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) UT06aa/Set.1	Conclusion
1000 to 3000	54	74	See Fugure A.1.14.	P
3000to 18000	54	74	See Fugure A.1.15.	P

GLONASS

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.1	Conclusion
30-88	40.00	See Fugure A.1.16.	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) UT06aa/Set.1	Conclusion
1000 to 3000	54	74	See Fugure A.1.17.	P
3000to 18000	54	74	See Fugure A.1.18.	P

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Video Player

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.2	Conclusion
30-88	40.00	See Fugure A.1.19.	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) UT06aa/Set.2	Conclusion
1000 to 3000	54	74	See Fugure A.1.20.	P
3000to 18000	54	74	See Fugure A.1.21.	P

Data Transfer : EUT to PC

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.3	Conclusion
30-88	40.00	See Fugure A.1.22.	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) UT06aa/Set.3	Conclusion
1000 to 3000	54	74	See Fugure A.1.23.	P
3000to 18000	54	74	See Fugure A.1.24.	P

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Data Transfer : PC to EUT

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.3	Conclusion
30-88	40.00	See Fugure A.1.25.	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) UT06aa/Set.3	Conclusion
1000 to 3000	54	74	See Fugure A.1.26.	P
3000to 18000	54	74	See Fugure A.1.27.	P

Data Transfer : PC to TF Card

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.3	Conclusion
30-88	40.00	See Fugure A.1.28.	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) UT06aa/Set.3	Conclusion
1000 to 3000	54	74	See Fugure A.1.29.	P
3000to 18000	54	74	See Fugure A.1.30.	P

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Data Transfer : TF Card to PC

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.3	Conclusion
30-88	40.00	See Fugure A.1.31.	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) UT06aa/Set.3	Conclusion
1000 to 3000	54	74	See Fugure A.1.32.	P
3000to 18000	54	74	See Fugure A.1.33.	P

Data Transfer : PC to TF Card

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)	Result (dBμV/m) UT06aa/Set.4	Conclusion
30-88	40.00	See Fugure A.1.34.	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) UT06aa/Set.4	Conclusion
1000 to 3000	54	74	See Fugure A.1.35.	P
3000to 18000	54	74	See Fugure A.1.36.	P

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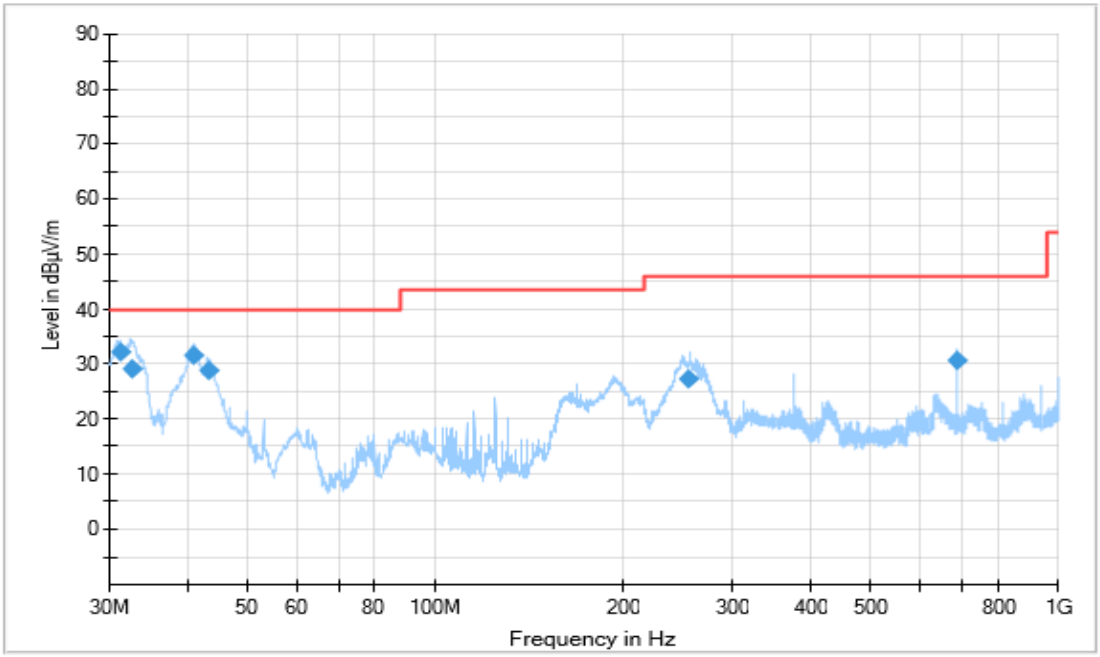

Fugure A.1.1. Radiated Emission (LTE Receiver Band 12, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
31.203889	32.32	40.00	7.68	V	-25.3	57.62
32.662222	29.02	40.00	10.98	V	-25.8	54.82
41.065556	31.58	40.00	8.42	V	-29.7	61.28
43.355000	28.69	40.00	11.31	V	-31.6	60.29
254.588889	27.43	46.00	18.57	H	-30.8	58.23
687.518333	30.59	46.00	15.41	V	-19.7	50.29

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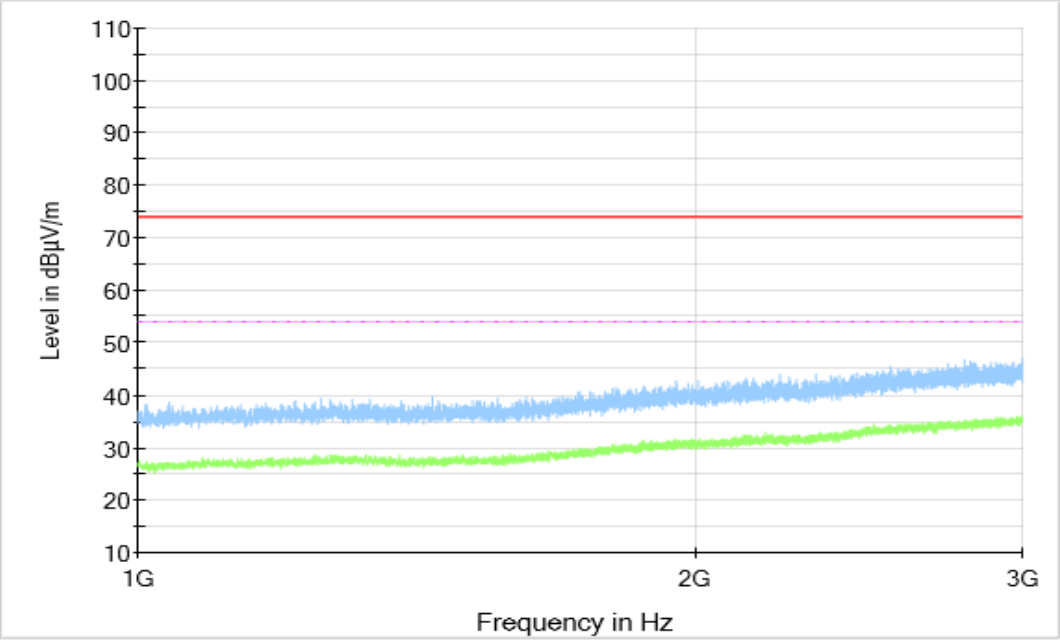

Fugure A.1.2. Radiated Emission (LTE Receiver Band 12, 1GHz to 3GHz)

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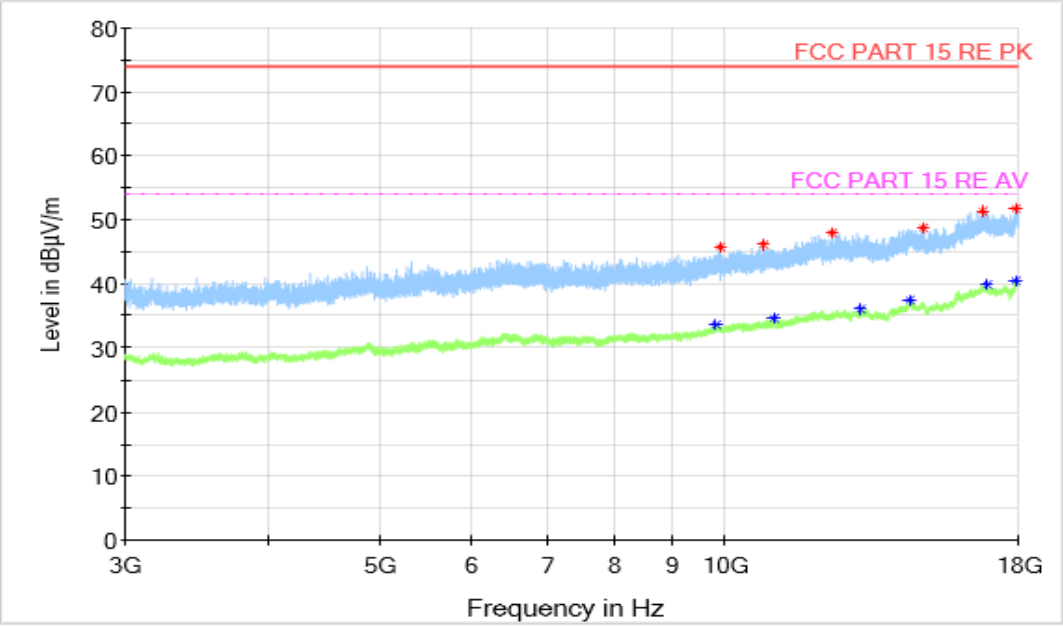

Fugure A.1.3. Radiated Emission (LTE Receiver Band 12, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9892.000000	45.79	74.00	28.21	H	5.3	40.49
10789.500000	46.08	74.00	27.92	H	6.5	39.58
12374.500000	47.99	74.00	26.01	H	8.3	39.69
14868.000000	48.80	74.00	25.20	H	11.7	37.10
16734.500000	51.31	74.00	22.69	H	15.4	35.91
17913.500000	51.81	74.00	22.19	H	17.2	34.61

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9793.000000	33.63	54.00	20.37	V	5.0	28.63
11008.000000	34.73	54.00	19.27	V	6.6	28.13
13098.000000	36.12	54.00	17.88	H	9.8	26.32
14459.500000	37.44	54.00	16.56	V	11.8	25.64
16883.000000	39.84	54.00	14.16	V	16.1	23.74
17907.000000	40.56	54.00	13.44	H	17.3	23.26

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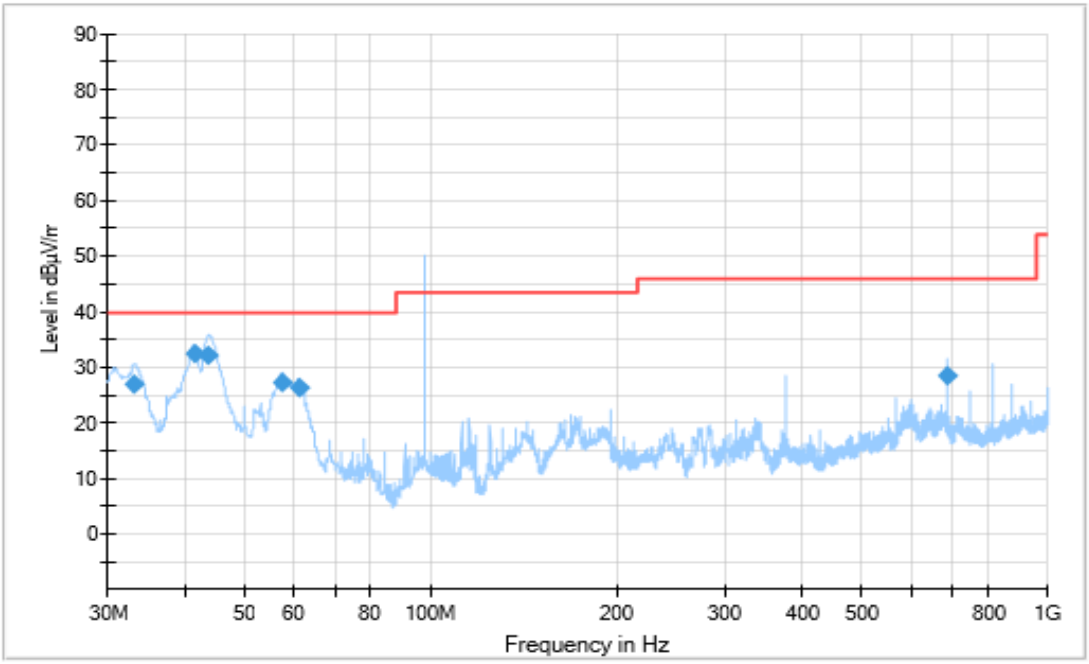

Fugure A.1.4. Radiated Emission (FM receiver, 30MHz to 1GHz)

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)	P_{Mea} (dBµV)
33.051667	27.09	40.00	12.91	V	-25.8	52.89
41.470556	32.42	40.00	7.58	V	-30.0	62.42
43.765000	32.18	40.00	7.82	V	-31.8	63.98
57.621667	27.36	40.00	12.64	V	-37.6	64.96
61.209444	26.35	40.00	13.65	V	-36.4	62.75
687.518333	28.55	46.00	17.45	V	-19.7	48.25

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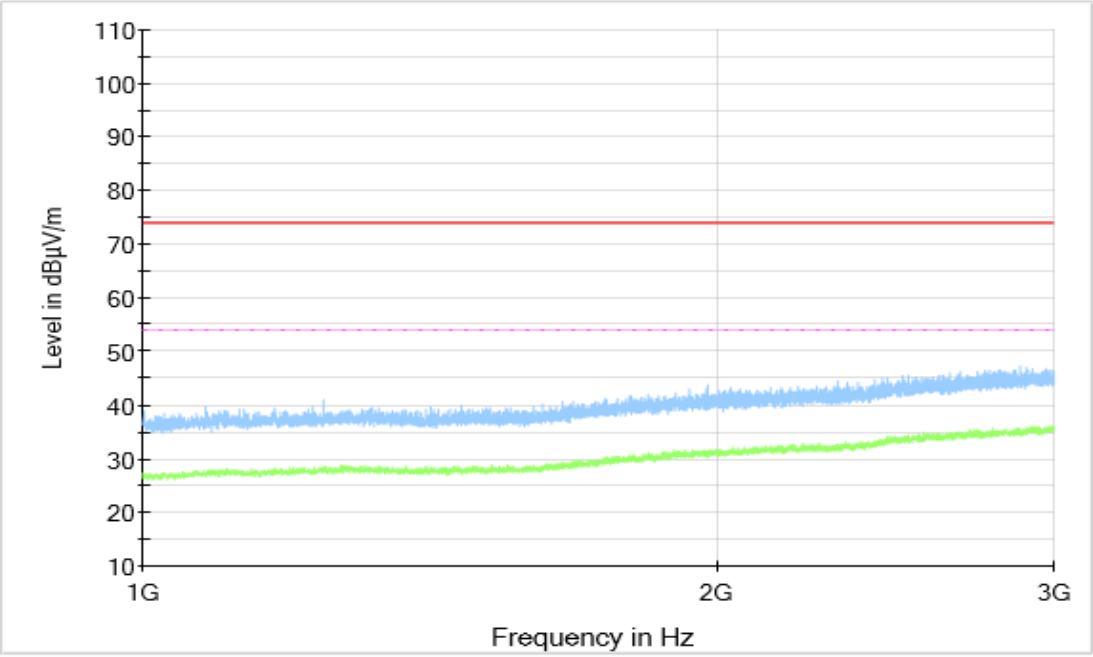

Fugure A.1.5. Radiated Emission (FM receiver, 1GHz to 3GHz)

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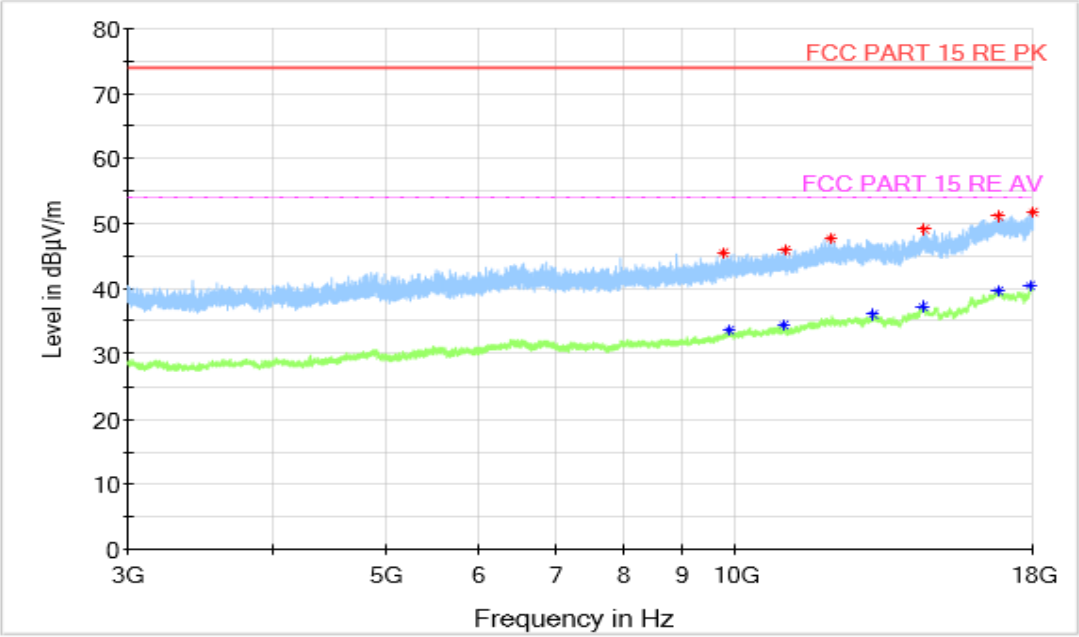

Fugure A.1.6. Radiated Emission (FM receiver , 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9738.000000	45.49	74.00	28.51	H	4.8	40.69
11009.000000	46.03	74.00	27.97	H	6.5	39.53
12038.000000	47.85	74.00	26.15	H	8.2	39.65
14507.500000	49.07	74.00	24.93	V	11.7	37.37
16795.500000	51.25	74.00	22.75	H	15.7	35.55
17993.500000	51.69	74.00	22.31	H	16.9	34.79

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9853.500000	33.62	54.00	20.38	H	5.3	28.32
10974.000000	34.46	54.00	19.54	V	6.7	27.76
13127.500000	36.01	54.00	17.99	V	9.7	26.31
14466.000000	37.34	54.00	16.66	V	11.7	25.64
16819.000000	39.67	54.00	14.33	V	15.9	23.77
17907.000000	40.48	54.00	13.52	H	17.3	23.18

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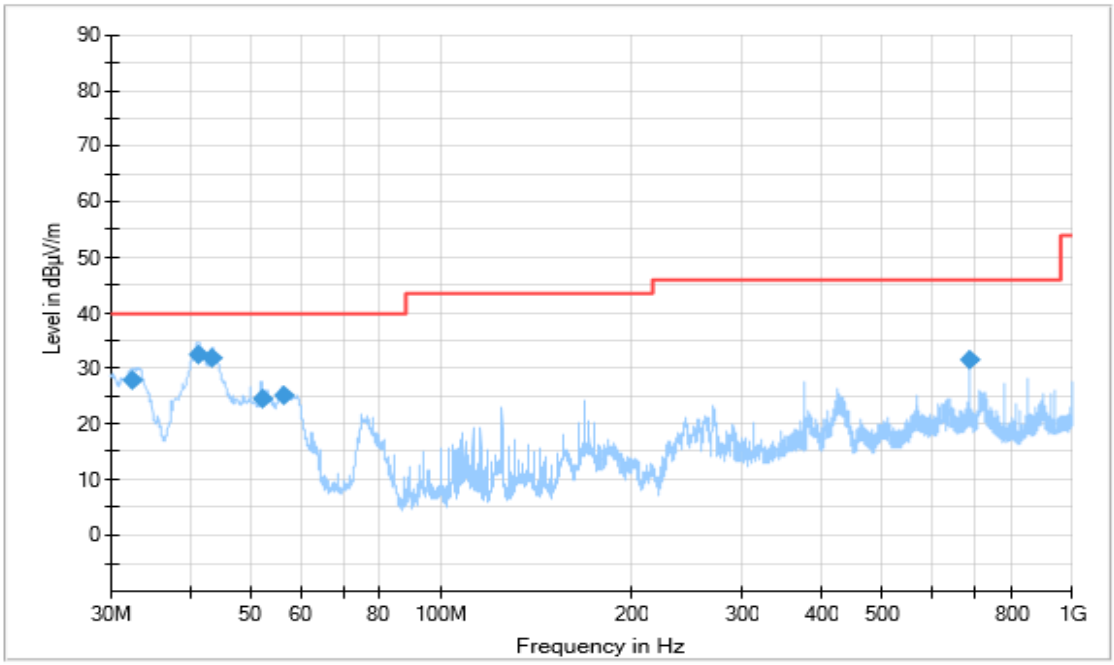

Fugure A.1.7. Radiated Emission (Video Player , 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
32.471111	27.78	40.00	12.22	V	-25.8	53.58
41.268889	32.62	40.00	7.38	V	-29.8	62.42
43.492222	31.99	40.00	8.01	V	-31.6	63.59
52.232778	24.56	40.00	15.44	V	-37.8	62.36
56.183889	25.23	40.00	14.77	V	-38.4	63.63
687.518333	31.73	46.00	14.27	V	-19.7	51.43

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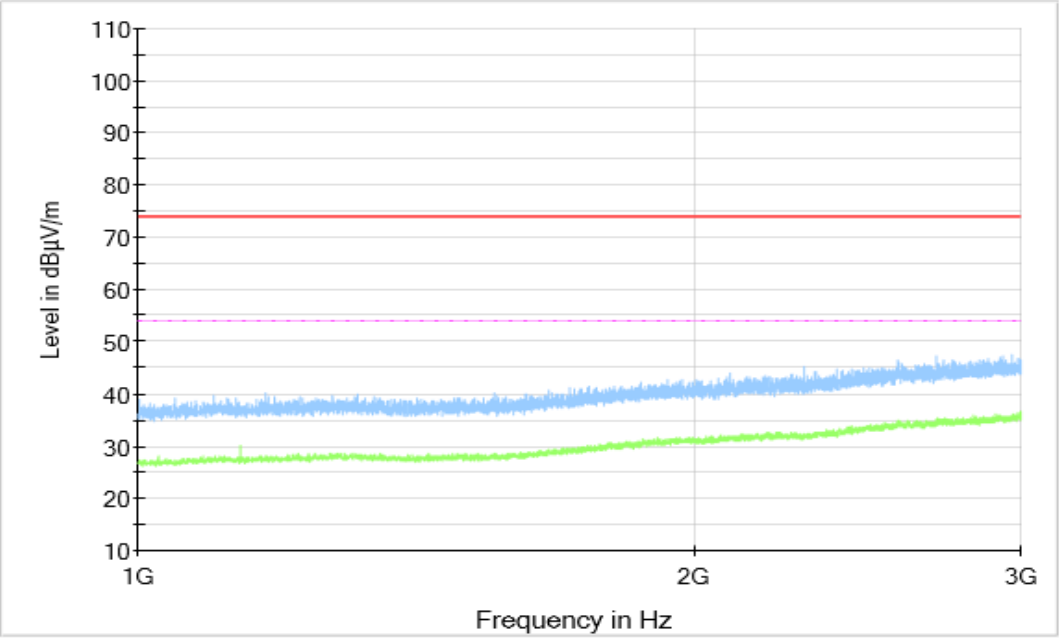

Fugure A.1.8. Radiated Emission (Video Player, 1GHz to 3GHz)

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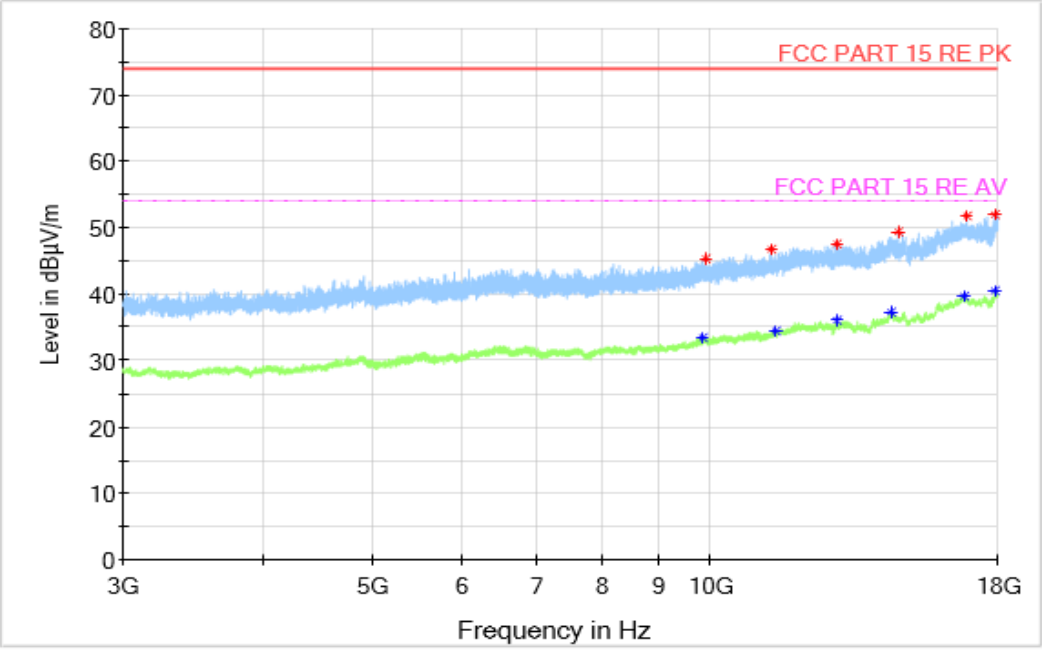

Fugure A.1.9. Radiated Emission (Video Player , 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9889.000000	45.40	74.00	28.60	H	5.3	40.10
11314.500000	46.80	74.00	27.20	V	6.3	40.5
12960.500000	47.65	74.00	26.35	V	9.2	38.45
14702.000000	49.32	74.00	24.68	H	11.3	38.02
16895.500000	51.69	74.00	22.31	H	15.9	35.79
17870.500000	52.00	74.00	22.00	V	17.0	35.00

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9847.000000	33.47	54.00	20.53	H	5.2	28.27
11423.000000	34.56	54.00	19.44	V	6.7	27.86
12967.500000	36.03	54.00	17.97	H	9.4	26.63
14464.000000	37.30	54.00	16.70	H	11.7	25.60
16782.000000	39.70	54.00	14.30	V	15.9	23.8
17912.000000	40.54	54.00	13.46	H	17.3	23.24

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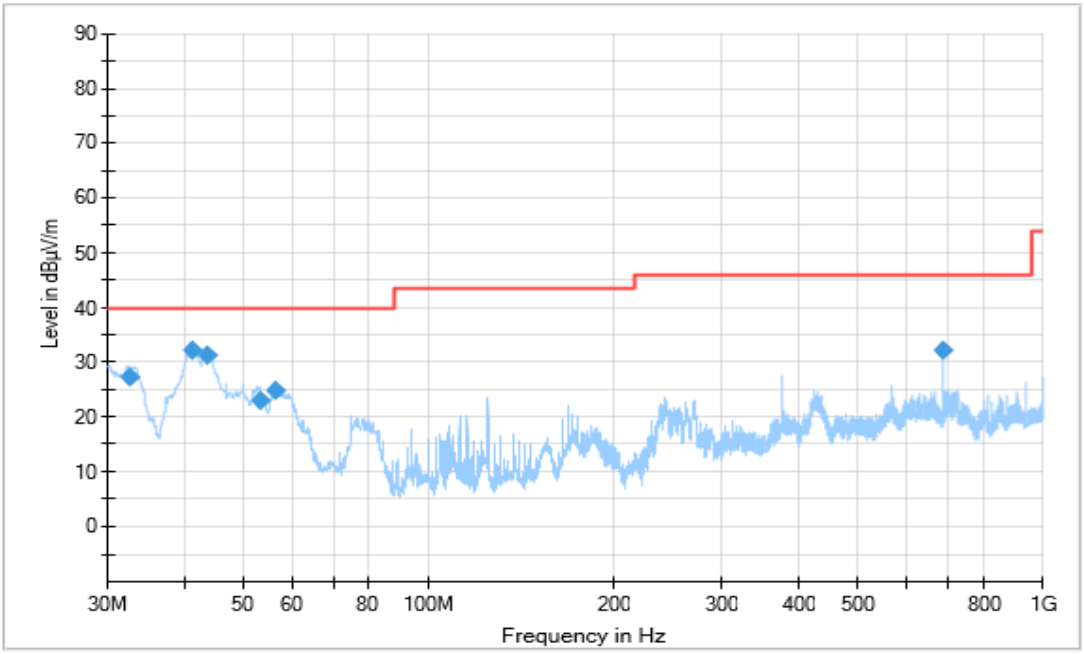

Fugure A.1.10. Radiated Emission (Camera , 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
32.551111	27.38	40.00	12.62	V	-25.8	53.18
41.204444	32.06	40.00	7.94	V	-29.8	61.86
43.735556	31.28	40.00	8.72	V	-31.8	63.08
53.124444	22.90	40.00	17.10	V	-38.1	61.00
56.263889	24.83	40.00	15.17	V	-38.3	63.13
687.518333	32.21	46.00	13.79	V	-19.7	51.91

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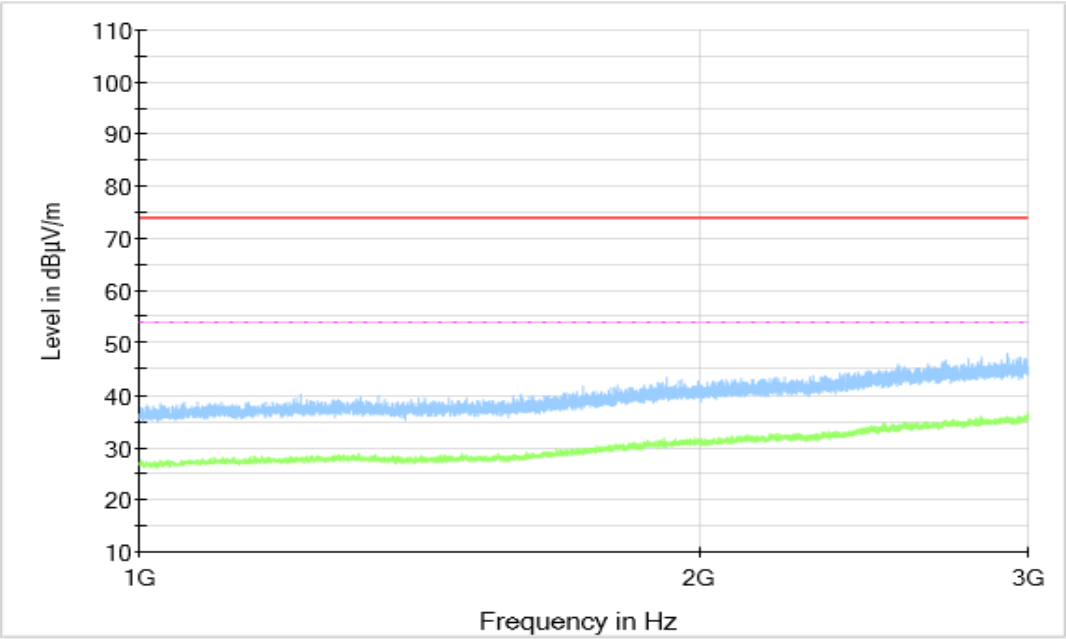

Fugure A.1.11. Radiated Emission (Camera ,1GHz to 3GHz)

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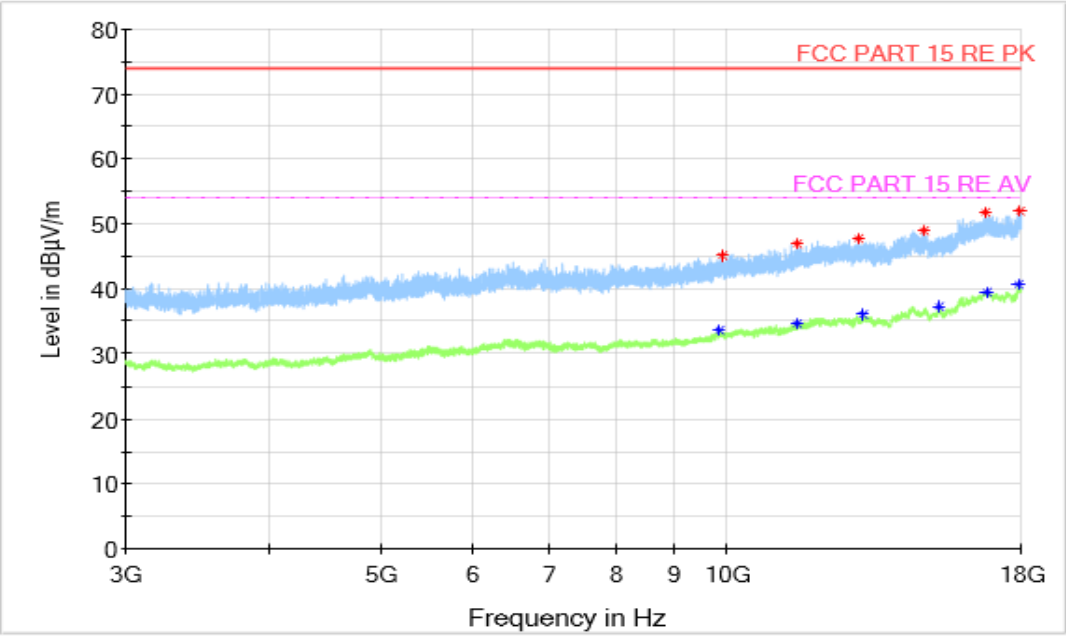

Fugure A.1.12. Radiated Emission (Camera ,3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9887.000000	45.19	74.00	28.81	H	5.3	39.89
11494.000000	47.03	74.00	26.97	V	6.9	40.13
12979.500000	47.72	74.00	26.28	H	9.1	38.62
14811.000000	48.98	74.00	25.02	H	11.2	37.78
16742.000000	51.86	74.00	22.14	V	15.5	36.36
17937.500000	51.90	74.00	22.10	H	17.1	34.80

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9849.500000	33.65	54.00	20.35	V	5.3	28.35
11490.500000	34.61	54.00	19.39	V	7.0	27.61
13098.000000	35.98	54.00	18.02	H	9.8	26.18
15292.000000	37.27	54.00	16.73	H	12.2	25.07
16782.000000	39.43	54.00	14.57	H	15.9	23.53
17911.500000	40.75	54.00	13.25	V	17.3	23.45

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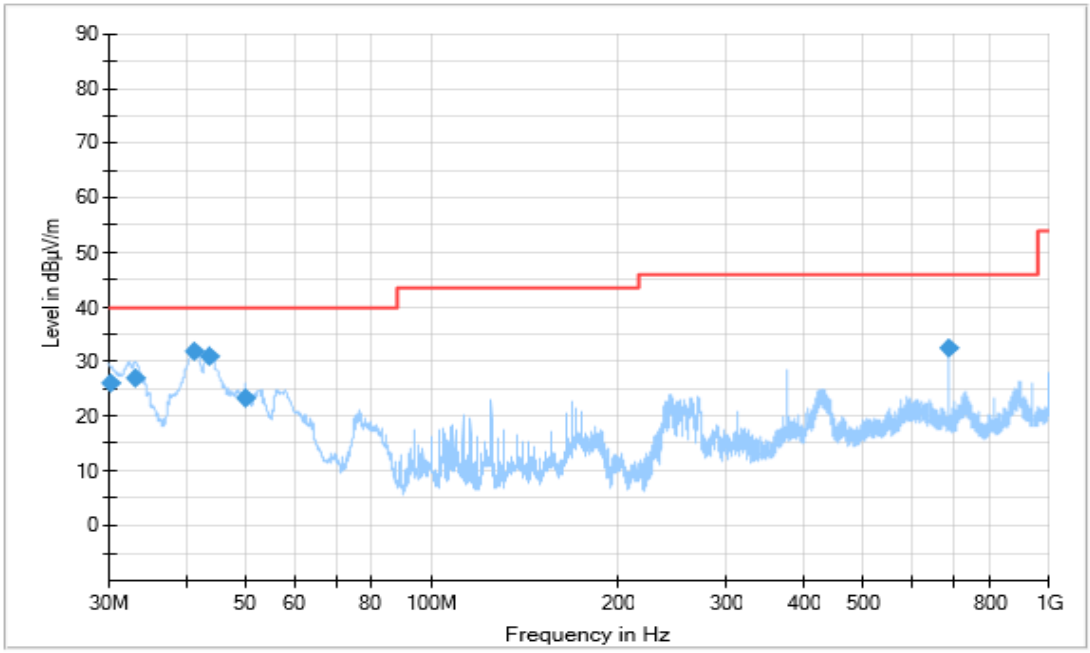

Fugure A.1.13. Radiated Emission (GPS, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
30.117222	26.02	40.00	13.98	V	-24.2	50.22
33.175000	27.15	40.00	12.85	V	-25.9	53.05
41.267222	31.78	40.00	8.23	V	-29.8	61.58
43.721667	30.99	40.00	9.01	V	-31.8	62.79
49.998889	23.36	40.00	16.64	V	-36.5	59.86
687.518333	32.44	46.00	13.56	V	-19.7	52.14

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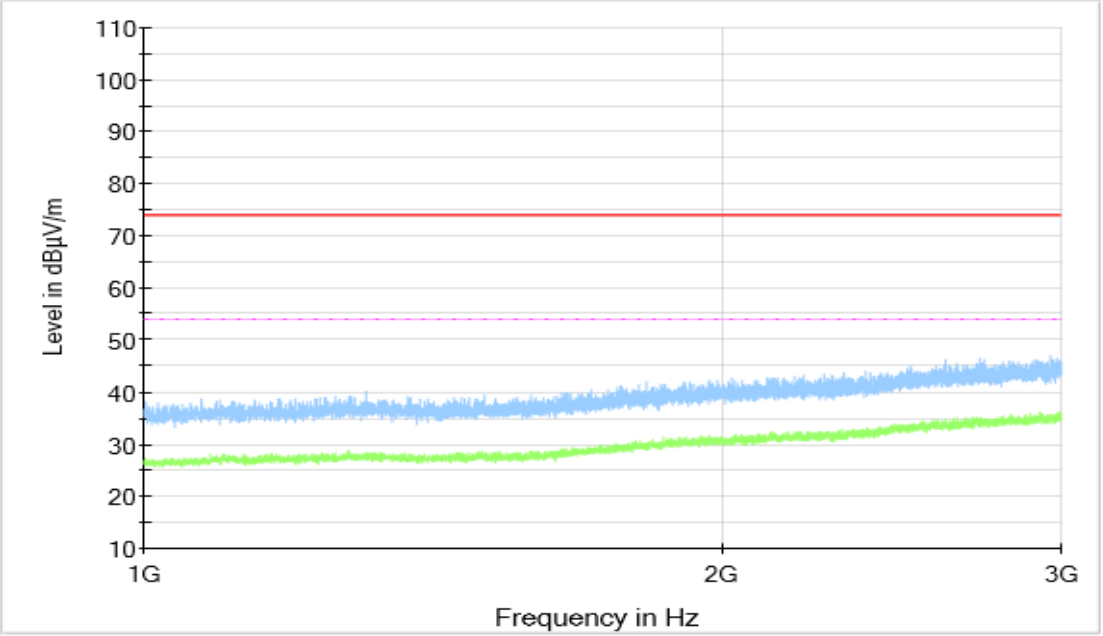

Fugure A.1.14. Radiated Emission (GPS,1GHz to 3GHz)

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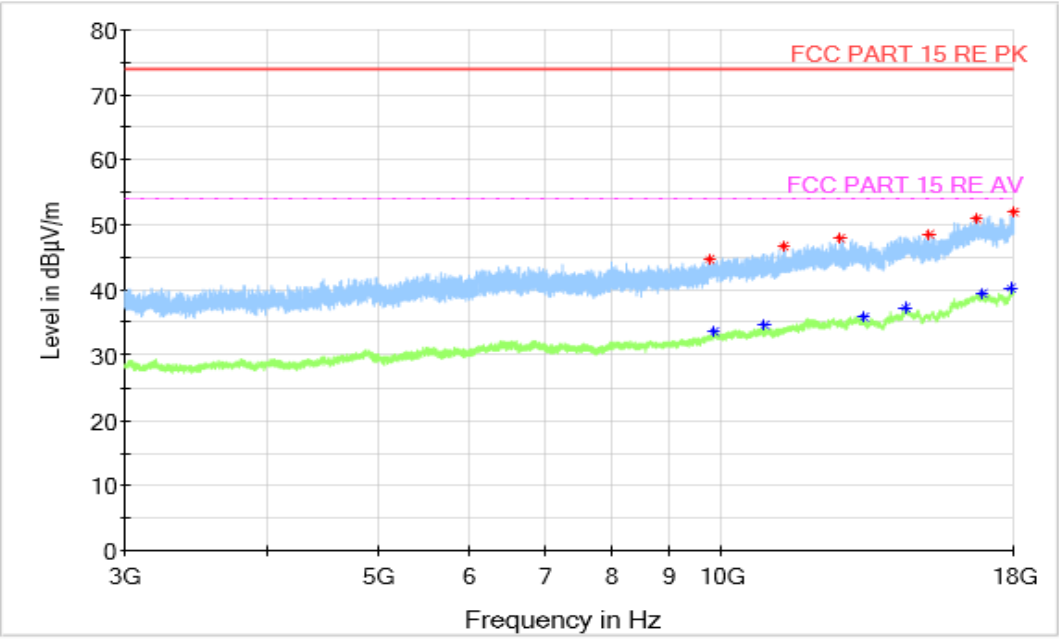

Fugure A.1.15. Radiated Emission (GPS, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9762.000000	44.65	74.00	29.35	V	5.0	39.65
11306.000000	46.71	74.00	27.29	H	6.3	40.41
12678.500000	47.89	74.00	26.11	V	8.8	39.09
15193.000000	48.48	74.00	25.53	H	11.6	36.88
16714.000000	51.08	74.00	22.92	V	15.4	35.68
17980.500000	51.95	74.00	22.05	V	16.9	35.05

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9849.500000	33.57	54.00	20.43	H	5.3	28.27
10886.500000	34.56	54.00	19.44	H	6.4	28.16
13309.000000	35.89	54.00	18.11	H	9.8	26.09
14462.000000	37.26	54.00	16.74	H	11.8	25.46
16896.500000	39.57	54.00	14.43	V	15.9	23.67
17910.500000	40.39	54.00	13.61	H	17.4	22.99

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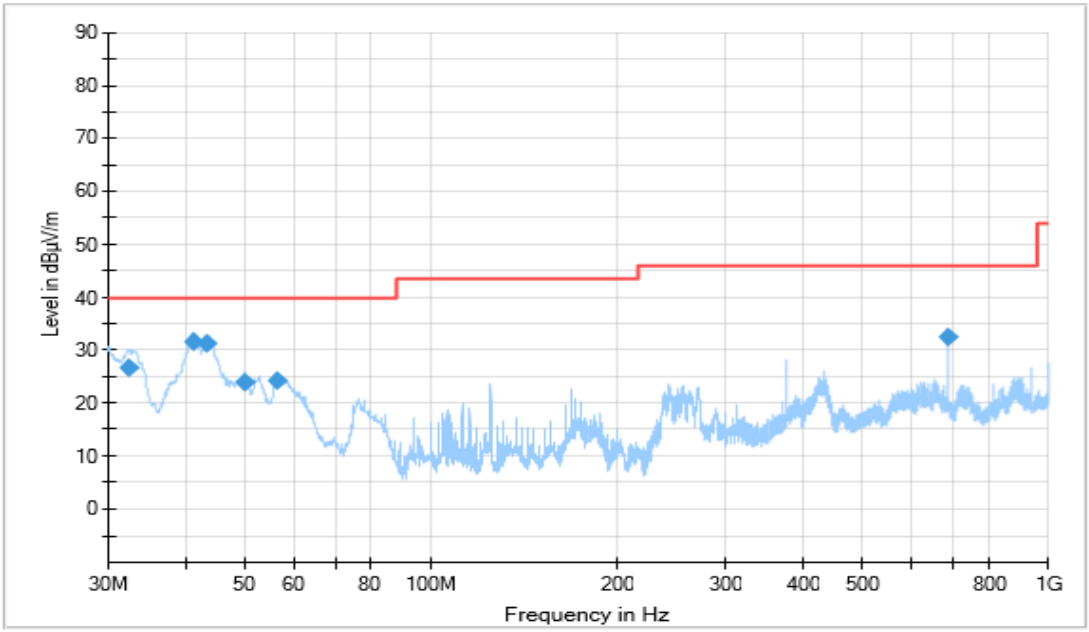

Fugure A.1.16. Radiated Emission (GLONASS, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
32.526667	26.74	40.00	13.26	V	-25.8	52.54
41.375000	31.72	40.00	8.28	V	-29.9	61.62
43.384444	31.28	40.00	8.72	V	-31.6	62.88
49.998889	23.92	40.00	16.08	V	-36.5	60.42
56.263889	24.16	40.00	15.84	V	-38.3	62.46
687.518333	32.42	46.00	13.58	V	-19.7	52.12

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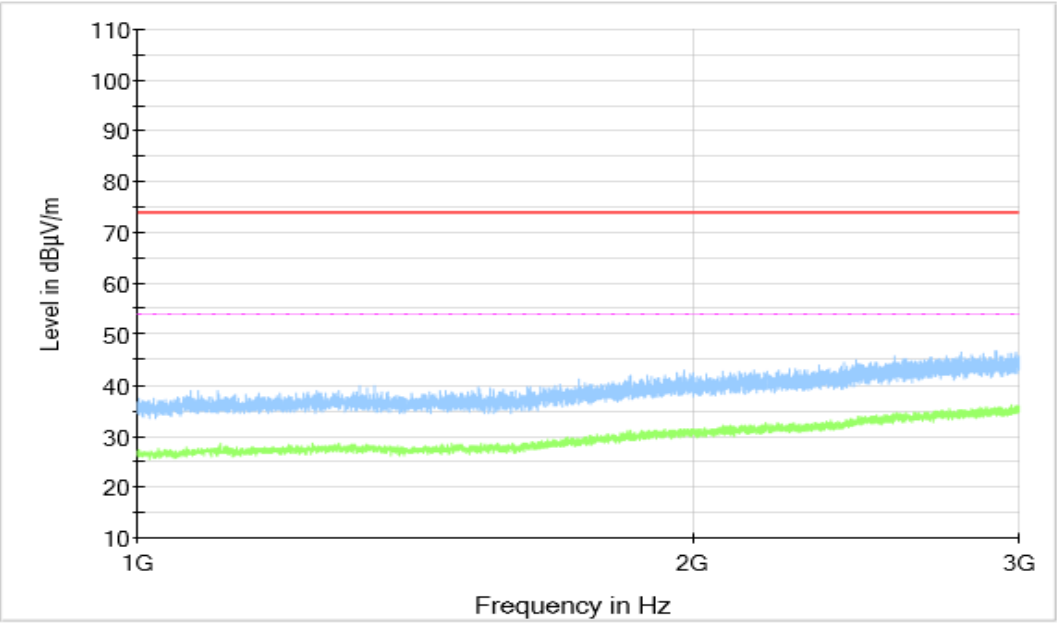

Fugure A.1.17. Radiated Emission (GLONASS,1GHz to 3GHz)

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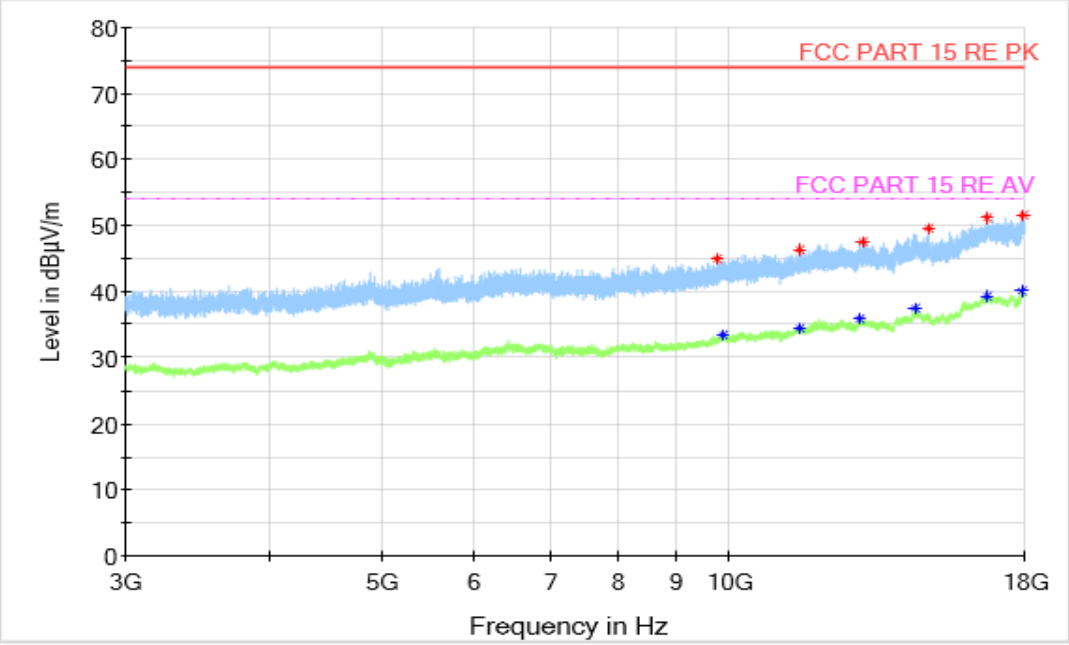

Fugure A.1.18. Radiated Emission (GLONASS, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9745.000000	44.97	74.00	29.03	H	4.7	40.27
11497.500000	46.28	74.00	27.72	H	6.8	39.48
13015.000000	47.61	74.00	26.39	V	9.2	38.41
14872.000000	49.65	74.00	24.35	H	11.7	37.95
16694.000000	51.11	74.00	22.89	V	15.4	35.71
17966.000000	51.50	74.00	22.50	V	16.8	34.70

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9875.000000	33.37	54.00	20.63	V	5.2	28.17
11492.500000	34.43	54.00	19.57	V	6.9	27.53
12940.000000	35.92	54.00	18.08	H	9.4	26.52
14461.000000	37.49	54.00	16.51	V	11.8	25.69
16696.500000	39.35	54.00	14.65	H	15.4	23.95
17914.000000	40.08	54.00	13.92	V	17.2	22.88

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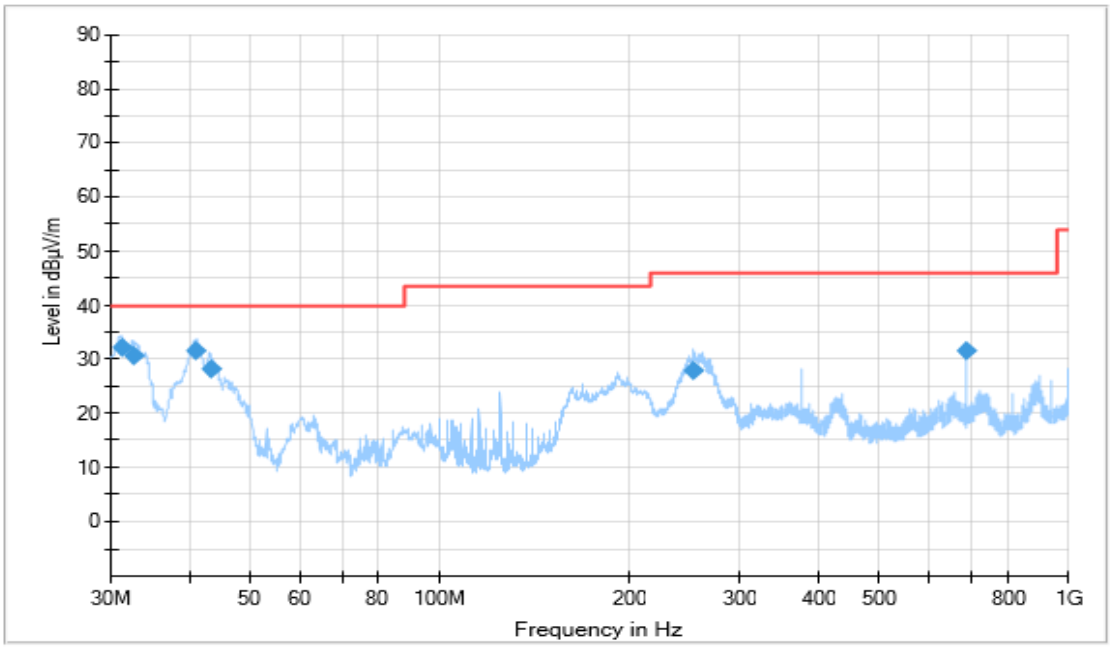

Fugure A.1.19. Radiated Emission (Video Player, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
31.231667	32.07	40.00	7.93	V	-25.3	57.37
32.596111	30.72	40.00	9.28	V	-25.8	56.52
40.971667	31.48	40.00	8.52	V	-29.6	61.08
43.248889	28.31	40.00	11.69	V	-31.5	59.81
253.872778	27.78	46.00	18.22	H	-30.8	58.58
687.532222	31.65	46.00	14.35	V	-19.7	51.35

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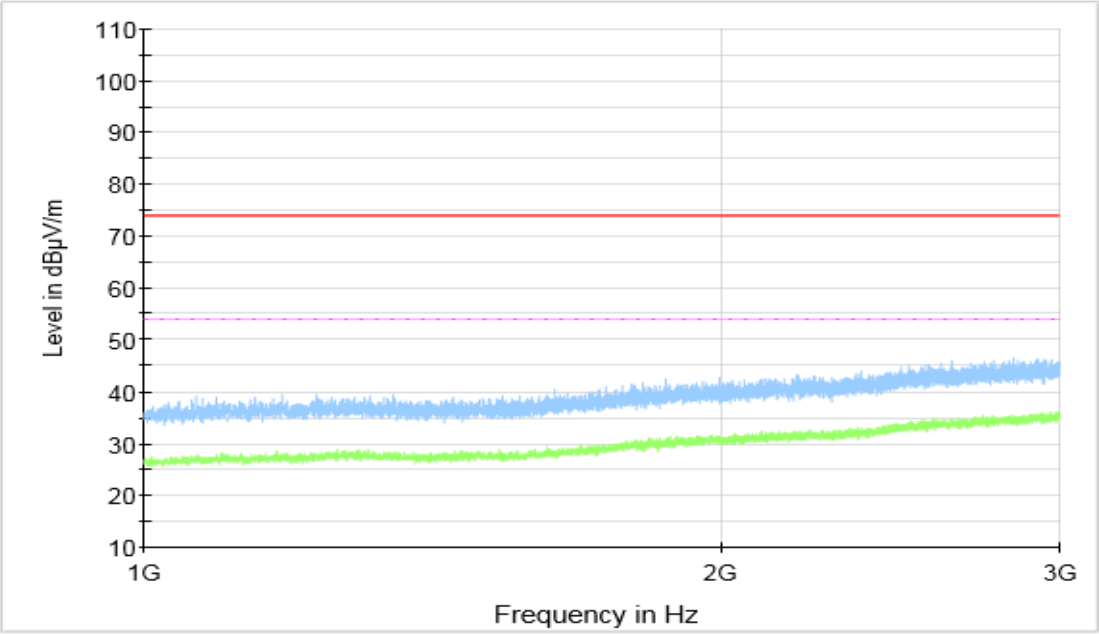

Fugure A.1.20. Radiated Emission (Video Player 1GHz to 3GHz)

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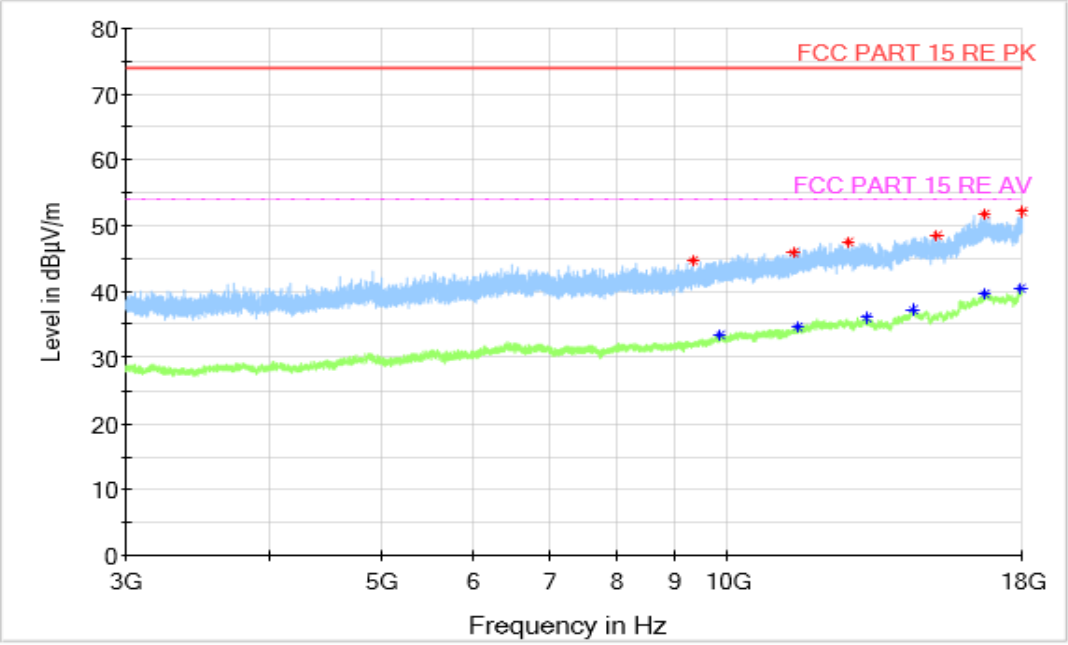

Fugure A.1.21. Radiated Emission (Video Player 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9330.500000	44.82	74.00	29.18	V	3.8	41.02
11392.500000	45.94	74.00	28.06	V	6.7	39.24
12713.500000	47.56	74.00	26.44	H	8.7	38.86
15174.000000	48.56	74.00	25.44	V	11.6	36.96
16707.500000	51.76	74.00	22.24	V	15.4	36.36
17996.000000	52.23	74.00	21.77	V	16.9	35.33

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9850.000000	33.54	54.00	20.46	H	5.3	28.24
11491.000000	34.66	54.00	19.34	V	7.0	27.66
13186.500000	36.08	54.00	17.92	V	9.7	26.38
14467.000000	37.37	54.00	16.63	H	11.7	25.67
16720.500000	39.60	54.00	14.40	V	15.4	24.2
17948.000000	40.44	54.00	13.56	V	17.2	23.24

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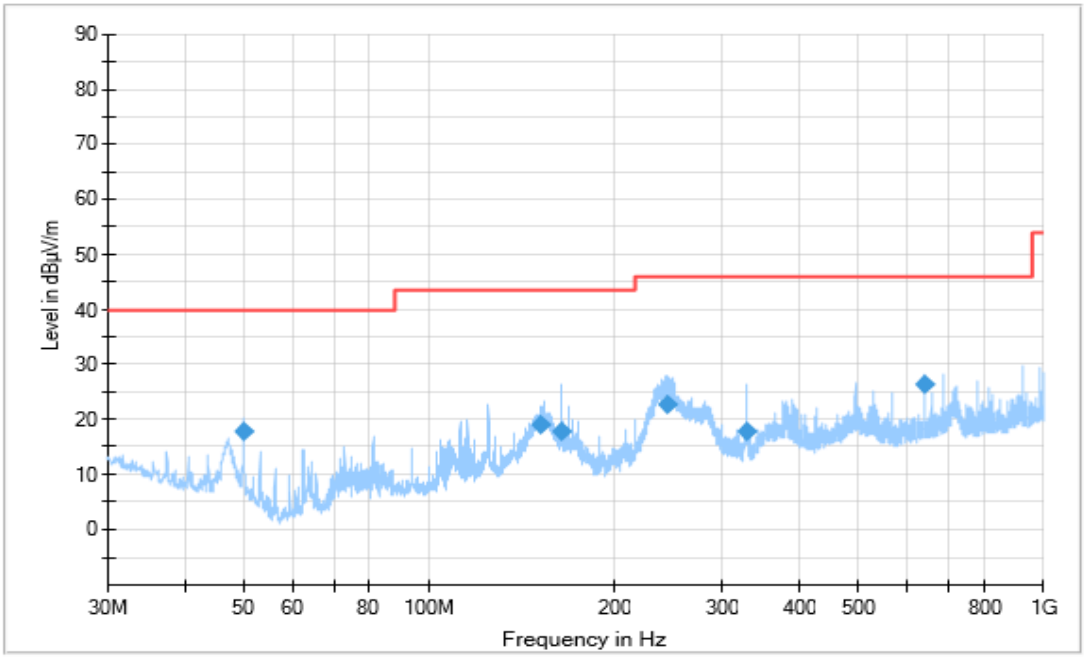

Fugure A.1.22. Radiated Emission (Data Transfer : EUT to PC, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
49.998889	17.98	40.00	22.02	V	-36.5	54.48
151.661111	19.11	43.50	24.39	V	-33.6	52.71
164.095556	17.98	43.50	25.52	V	-32.8	50.78
244.379444	22.73	46.00	23.27	H	-31.1	53.83
328.133333	17.98	46.00	28.02	H	-28.3	46.28
638.992222	26.48	46.00	19.52	H	-20.6	47.08

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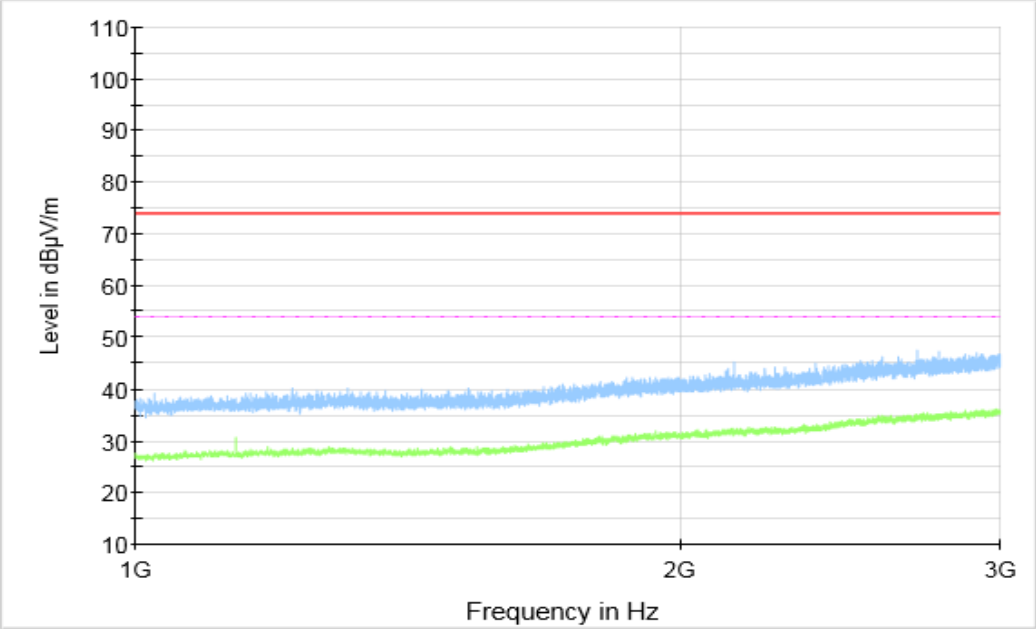

Fugure A.1.23. Radiated Emission (Data Transfer : EUT to PC,1GHz to 3GHz)

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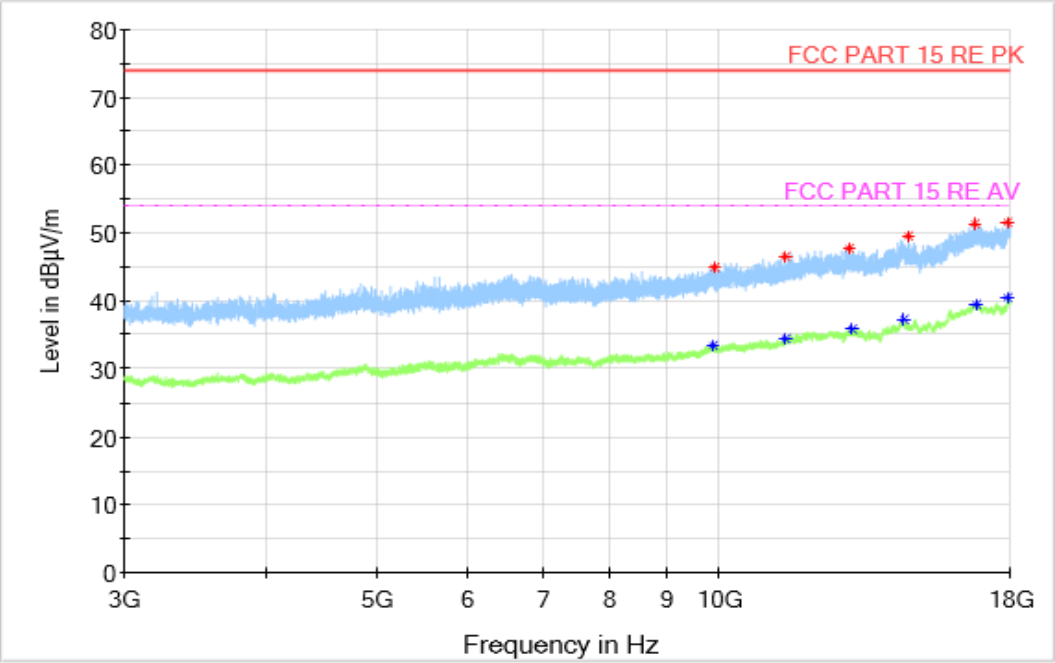

Fugure A.1.24. Radiated Emission (Data Transfer : EUT to PC, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9892.500000	45.00	74.00	29.00	H	5.3	39.70
11435.500000	46.57	74.00	27.43	V	6.8	39.77
12985.000000	47.85	74.00	26.15	V	9.1	38.75
14647.500000	49.61	74.00	24.39	H	11.6	38.01
16740.500000	51.39	74.00	22.61	V	15.5	35.89
17876.000000	51.56	74.00	22.44	H	17.0	34.56

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9853.000000	33.51	54.00	20.49	H	5.3	28.21
11429.000000	34.56	54.00	19.44	H	6.7	27.86
13071.000000	35.82	54.00	18.18	V	9.6	26.22
14504.500000	37.28	54.00	16.72	H	11.7	25.58
16784.500000	39.41	54.00	14.59	V	15.9	23.51
17909.500000	40.42	54.00	13.58	H	17.4	23.02

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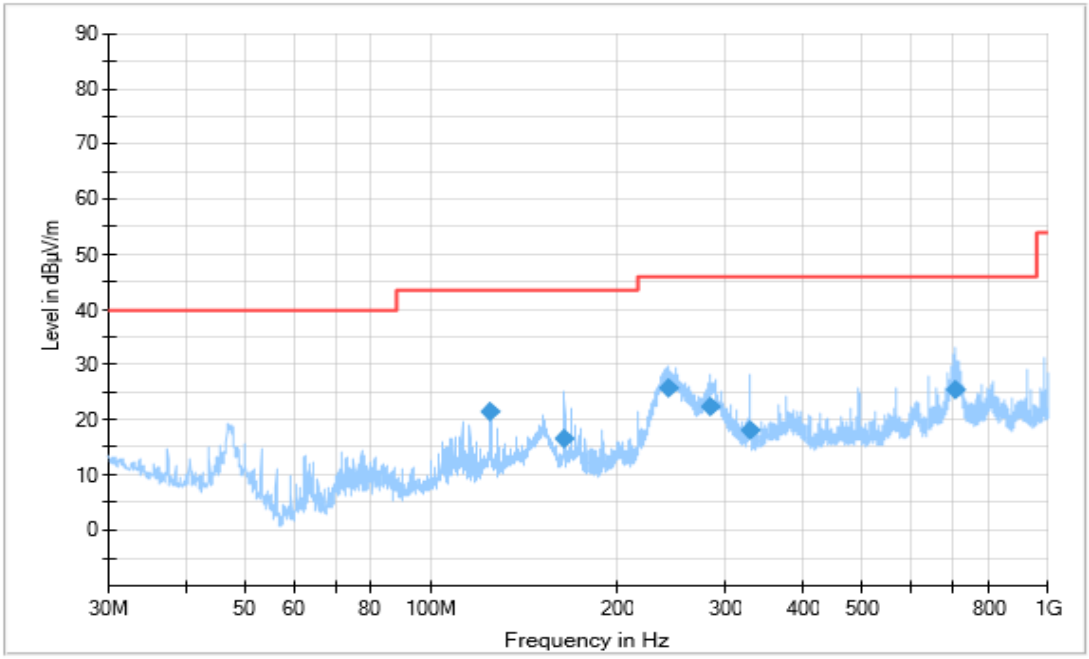

Fugure A.1.25. Radiated Emission (Data Transfer : PC to EUT, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
124.986111	21.36	43.50	22.14	V	-31.6	52.96
164.728333	16.69	43.50	26.81	V	-32.6	49.29
242.811667	25.78	46.00	20.22	H	-31.3	57.08
283.539444	22.52	46.00	23.48	H	-29.9	52.42
329.466667	18.05	46.00	27.95	H	-28.3	46.35
705.449444	25.60	46.00	20.40	H	-20.1	46.35

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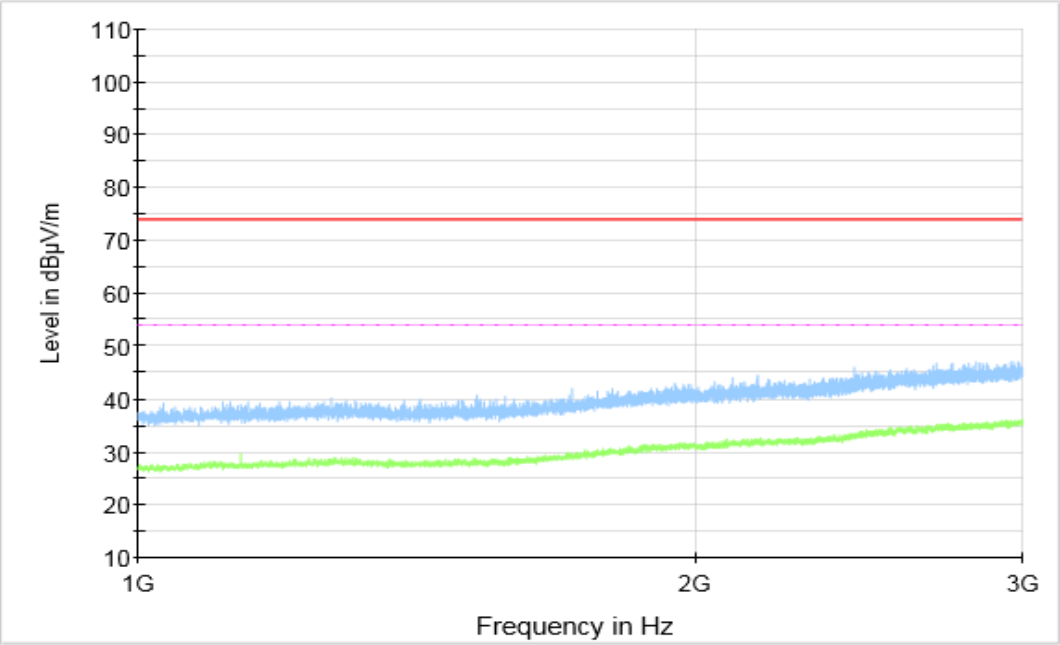

Fugure A.1.26. Radiated Emission (Data Transfer : PC to EUT,1GHz to 3GHz)

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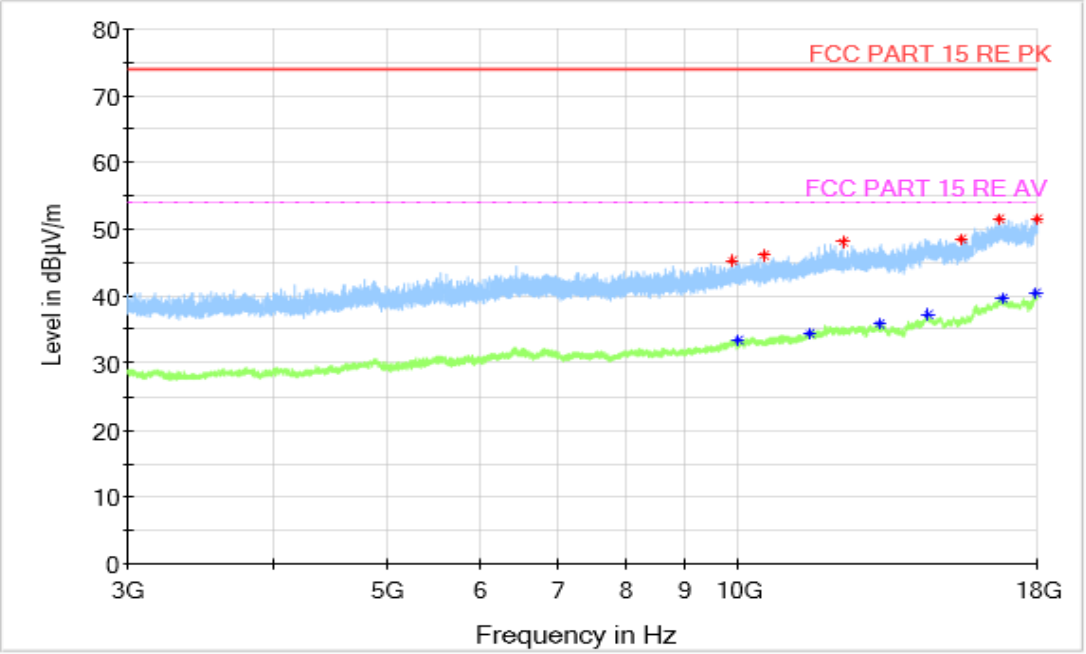

Fugure A.1.27. Radiated Emission (Data Transfer : PC to EUT, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9860.500000	45.28	74.00	28.72	H	5.2	40.08
10520.500000	46.14	74.00	27.86	V	5.4	40.74
12289.500000	48.10	74.00	25.90	V	8.4	39.70
15499.500000	48.65	74.00	25.35	H	12.6	36.05
16698.000000	51.55	74.00	22.45	V	15.4	36.15
17994.500000	51.66	74.00	22.34	H	16.9	34.76

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBµV)
9983.000000	33.52	54.00	20.48	H	5.3	28.22
11498.500000	34.45	54.00	19.55	H	6.8	27.65
13190.000000	35.95	54.00	18.05	H	9.8	26.15
14506.000000	37.25	54.00	16.75	V	11.7	25.55
16781.500000	39.67	54.00	14.33	V	15.9	23.77
17939.500000	40.48	54.00	13.52	H	17.1	23.38

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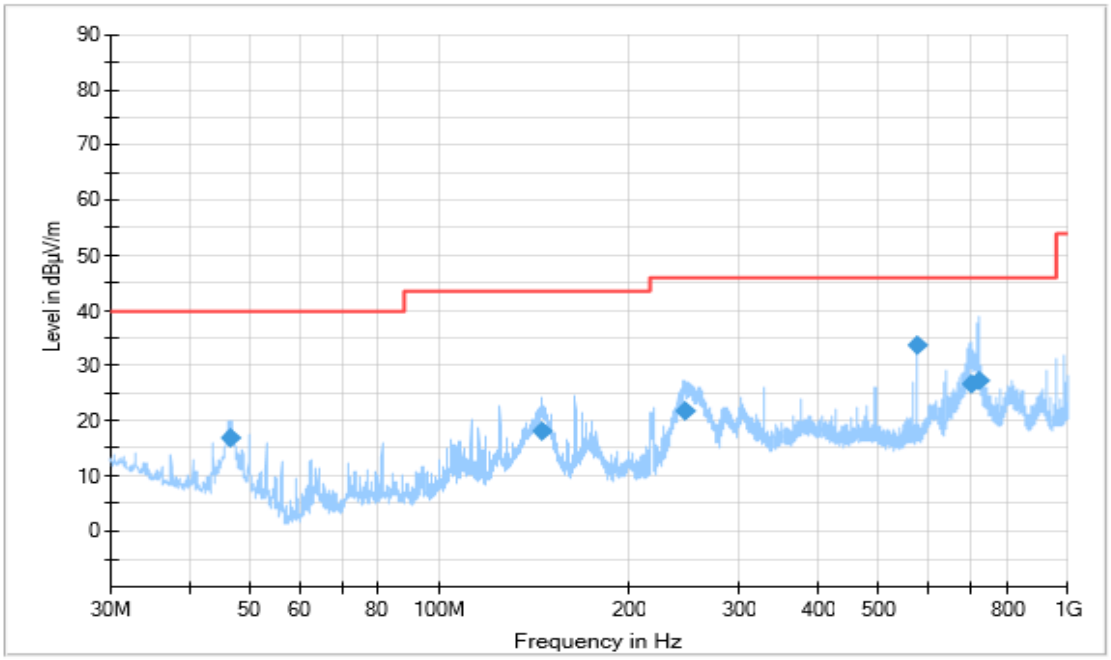

Fugure A.1.28. Radiated Emission (Data Transfer : PC to TF Card, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
46.445556	16.94	40.00	23.06	V	-33.8	50.74
145.434444	18.22	43.50	25.28	V	-33.4	51.62
245.102778	21.92	46.00	24.08	H	-31.1	53.02
575.982222	33.59	46.00	12.41	V	-22.0	55.59
701.155556	26.79	46.00	19.21	H	-20.1	46.89
719.985556	27.33	46.00	18.67	H	-19.0	46.33

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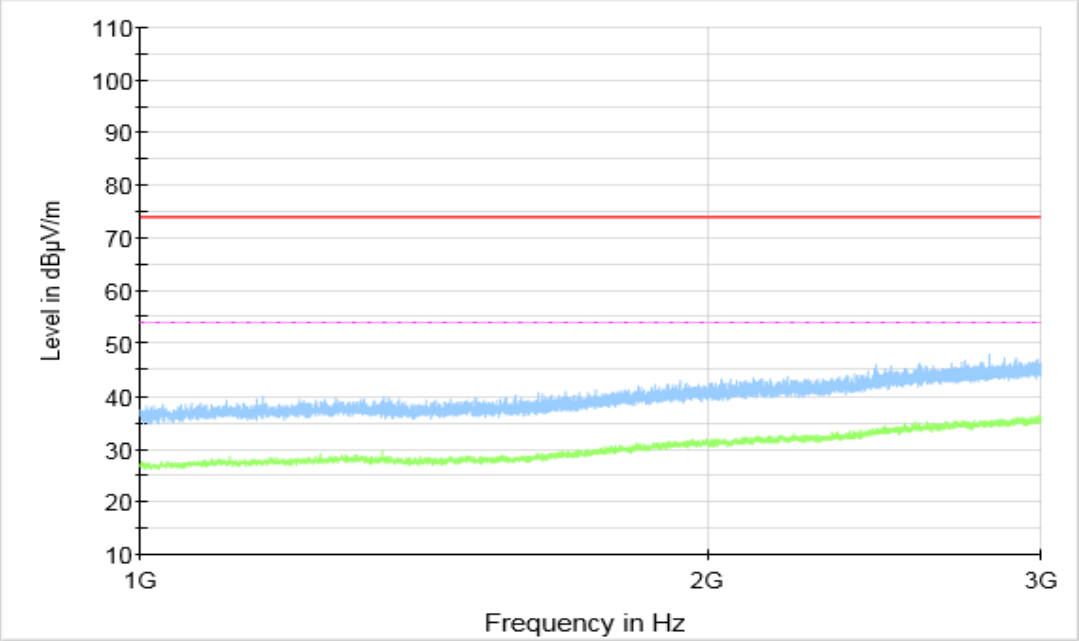

Fugure A.1.29. Radiated Emission (Data Transfer : PC to TF Card,1GHz to 3GHz)

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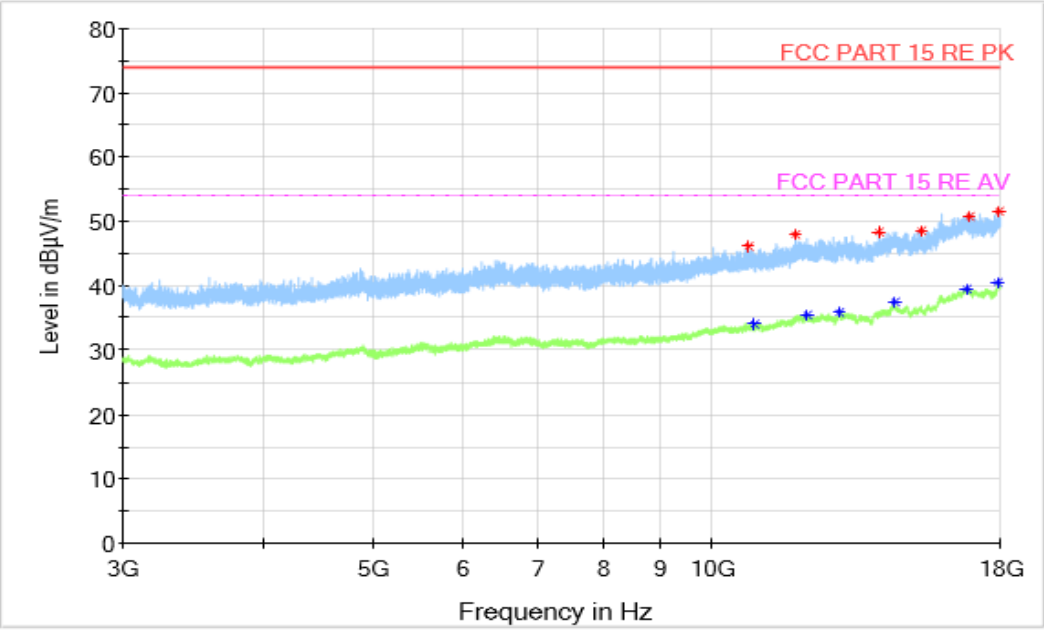

Fugure A.1.30. Radiated Emission (Set.8, Data Transfer : PC to TF Card, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
10762.000000	46.13	74.00	27.87	H	6.4	39.73
11837.500000	47.99	74.00	26.01	H	7.6	40.39
14062.500000	48.31	74.00	25.69	H	10.7	37.61
15299.500000	48.64	74.00	25.36	V	12.2	36.44
16905.500000	50.88	74.00	23.12	V	15.9	34.98
17954.000000	51.66	74.00	22.34	V	17.1	34.56

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
10883.500000	33.95	54.00	20.05	V	6.3	27.65
12124.500000	35.46	54.00	18.54	H	8.3	27.16
12940.500000	35.84	54.00	18.16	H	9.4	26.44
14492.500000	37.41	54.00	16.59	V	11.7	25.71
16785.000000	39.47	54.00	14.53	H	15.9	23.57
17911.500000	40.49	54.00	13.51	V	17.3	23.19

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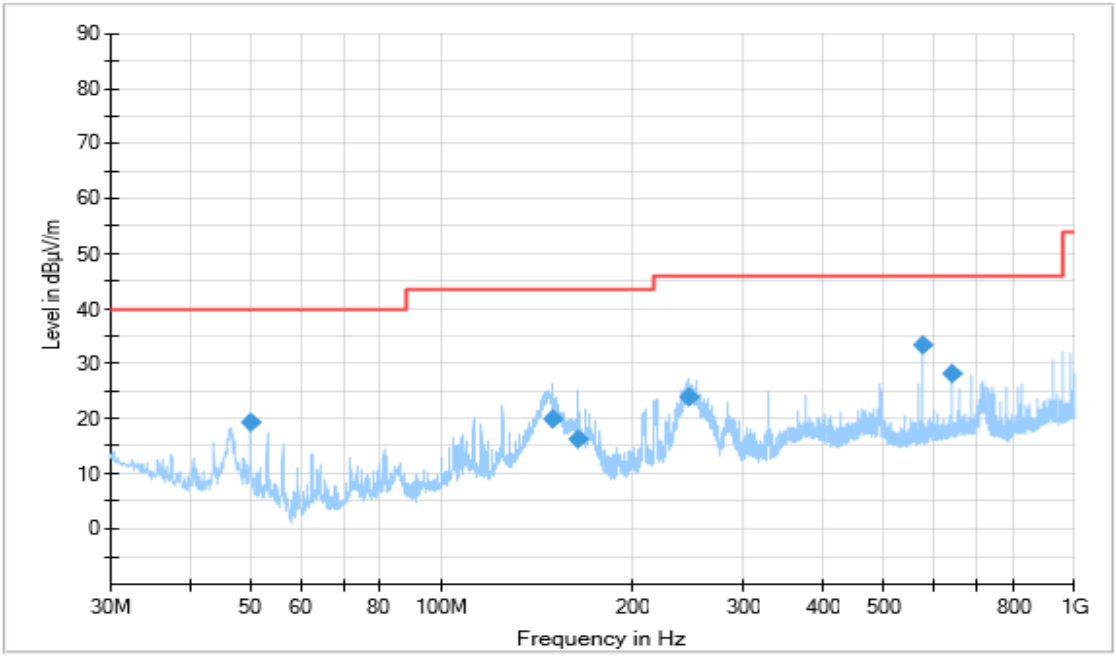

Fugure A.1.31. Radiated Emission (Data Transfer : TF Card to PC, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
50.012778	19.48	40.00	20.52	V	-36.5	55.98
149.856667	20.08	43.50	23.42	V	-33.7	53.78
164.097222	16.34	43.50	27.16	V	-32.8	49.14
246.505556	23.89	46.00	22.11	H	-31.0	54.89
575.982222	33.44	46.00	12.56	V	-22.0	55.44
639.018333	28.10	46.00	17.90	H	-20.6	48.70

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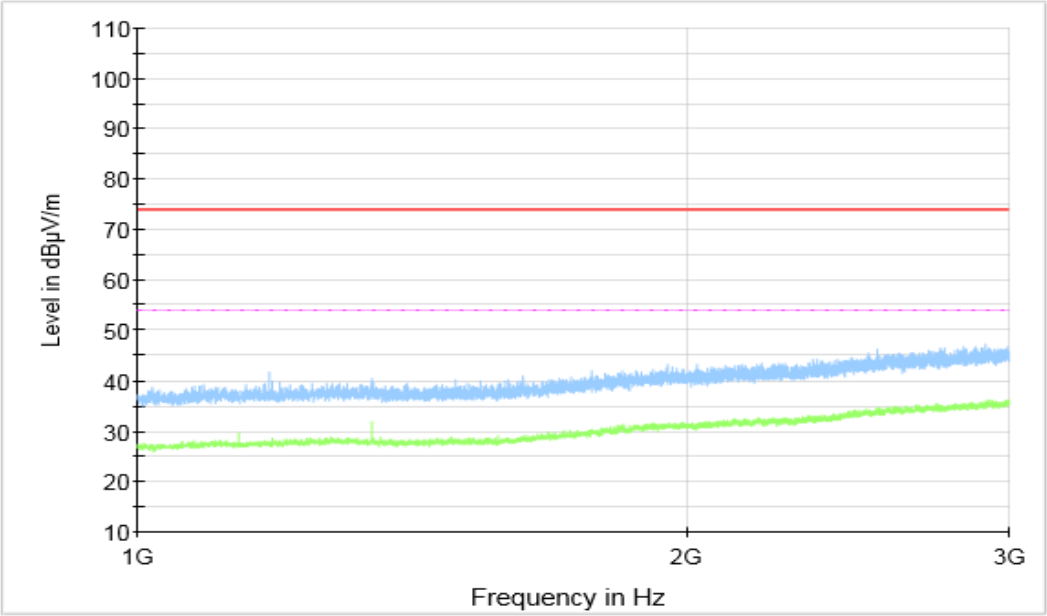

Fugure A.1.32. Radiated Emission (Data Transfer : TF Card to PC,1GHz to 3GHz)

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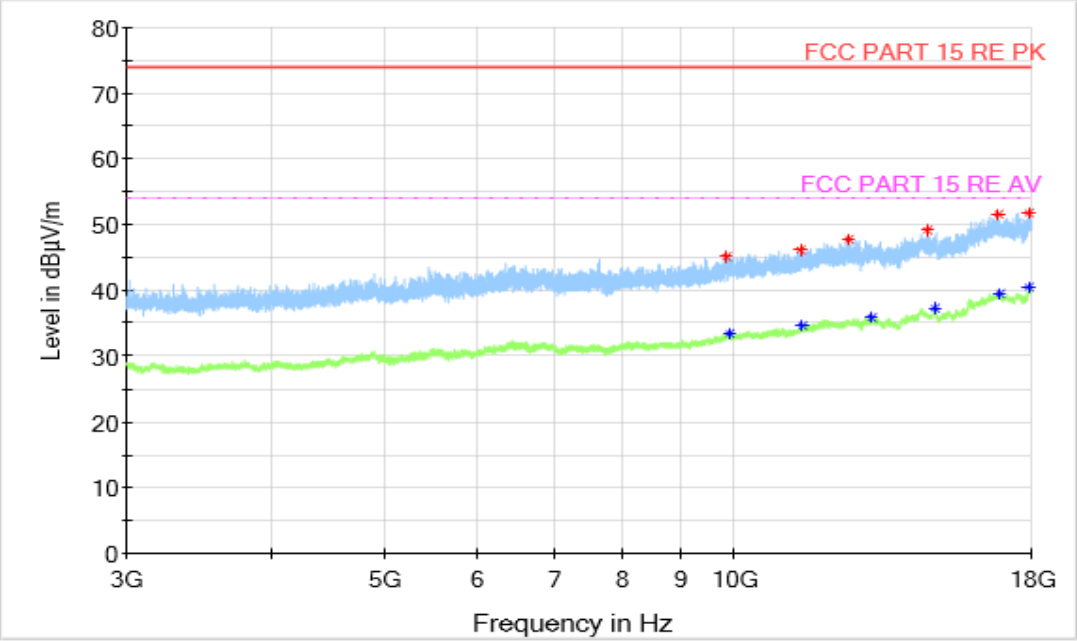

Fugure A.1.33. Radiated Emission (Data Transfer : TF Card to PC, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9845.000000	45.20	74.00	28.80	V	5.2	40.00
11402.500000	46.11	74.00	27.89	V	6.7	39.41
12543.500000	47.68	74.00	26.32	H	8.7	38.98
14625.500000	49.08	74.00	24.92	V	11.6	37.48
16835.000000	51.51	74.00	22.49	H	15.7	35.81
17907.500000	51.82	74.00	22.18	H	17.3	34.52

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9883.500000	33.40	54.00	20.60	H	5.4	28.00
11423.500000	34.59	54.00	19.41	V	6.7	27.89
13124.000000	35.91	54.00	18.09	V	9.8	26.11
14862.500000	37.31	54.00	16.69	H	11.6	25.71
16880.500000	39.42	54.00	14.58	V	16.1	23.32
17913.500000	**40.53**	**54.00**	**13.47**	**V**	**17.2**	23.33

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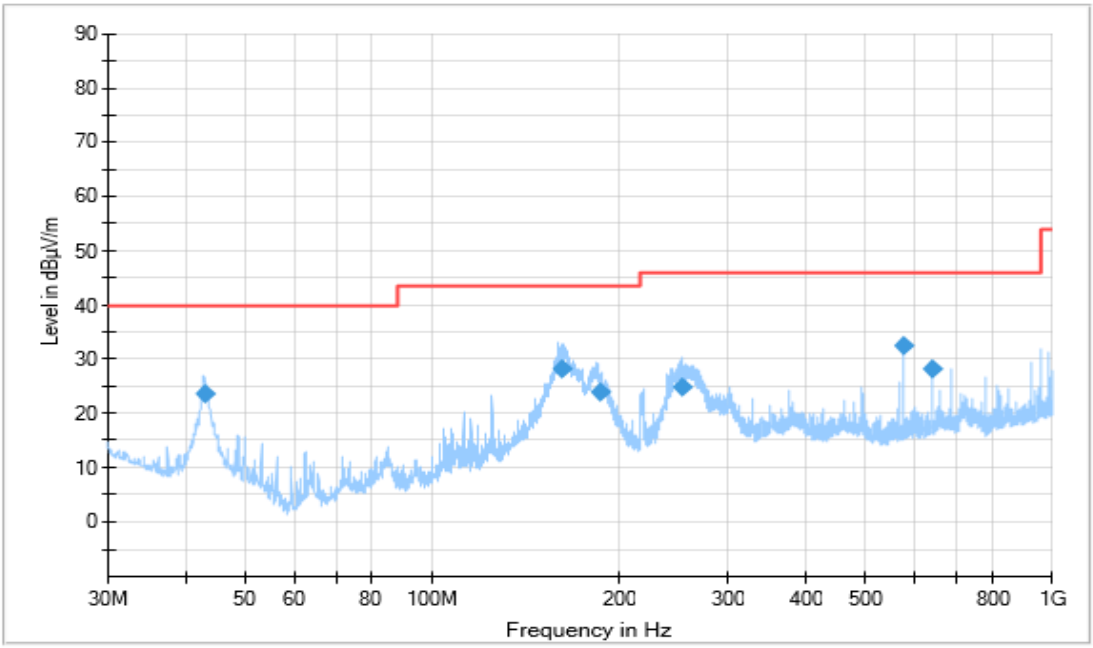

Fugure A.1.34. Radiated Emission (Data Transfer : PC to TF Card, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	P_{Mea} (dBµV)
43.085556	23.65	40.00	16.35	V	-31.5	55.15
161.656667	28.13	43.50	15.37	V	-33.3	61.43
187.109444	23.84	43.50	19.66	H	-33.7	57.54
253.672778	24.91	46.00	21.09	H	-30.8	55.71
575.982222	32.63	46.00	13.37	V	-22.0	54.63
639.018333	28.25	46.00	17.75	H	-20.6	48.85

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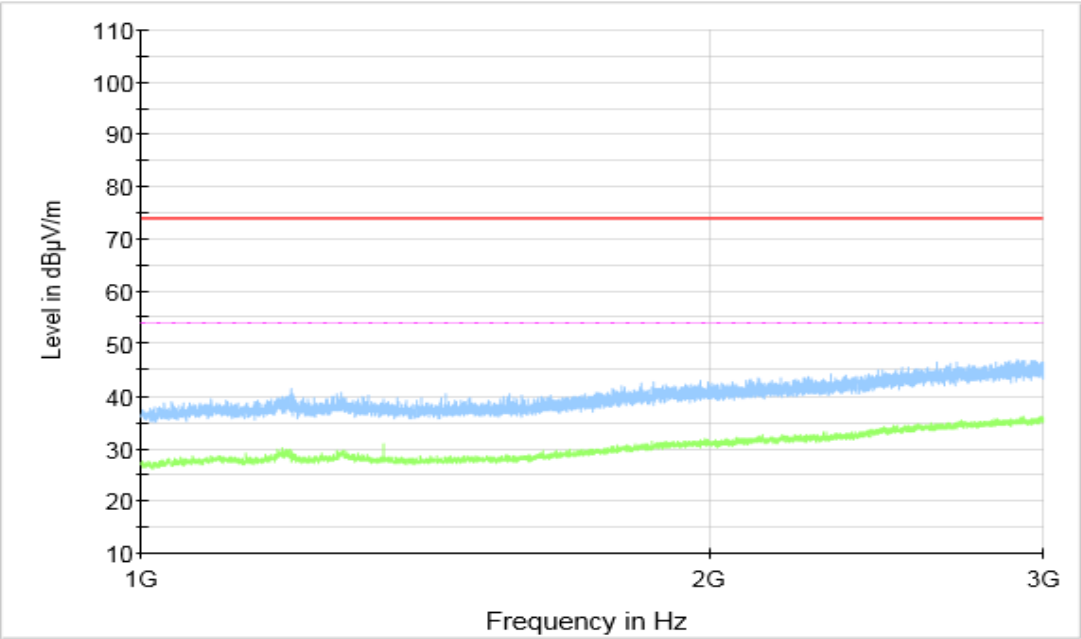

Fugure A.1.35. Radiated Emission (Data Transfer : PC to TF Card,1GHz to 3GHz)

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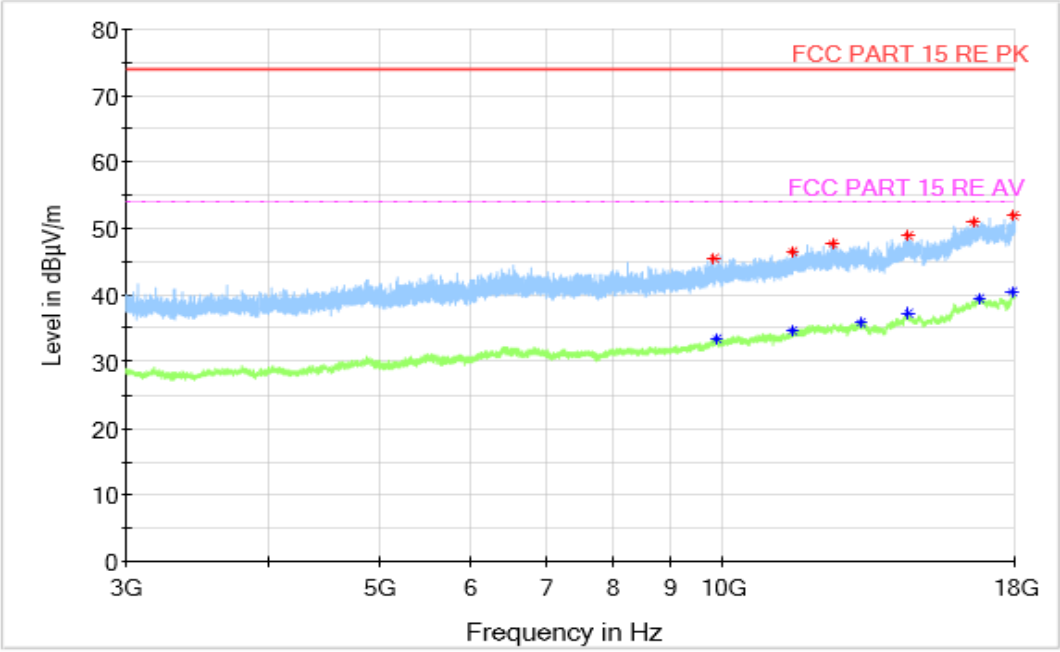

Fugure A.1.36. Radiated Emission (Data Transfer : PC to TF Card, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9806.500000	45.64	74.00	28.36	H	4.8	40.84
11488.000000	46.61	74.00	27.39	V	6.9	39.71
12463.000000	47.67	74.00	26.33	H	8.8	38.87
14504.000000	49.07	74.00	24.93	H	11.7	37.37
16550.500000	50.95	74.00	23.05	H	15.3	35.65
17920.500000	51.90	74.00	22.10	H	16.9	35.00

Final_Results_AVG

Frequency(MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_{Mea} (dBµV)
9878.000000	33.52	54.00	20.48	V	5.3	28.22
11489.000000	34.74	54.00	19.26	H	7.0	27.74
13189.500000	35.92	54.00	18.08	H	9.8	26.12
14491.500000	37.20	54.00	16.80	H	11.7	25.50
16754.500000	39.55	54.00	14.45	V	15.6	23.95
17907.500000	40.47	54.00	13.53	V	17.3	23.17

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

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