



TEST REPORT

No.I22N01723-EMC

for

HMD Global Oy

Smart Phone

Model Name: TA-1413

With

Hardware Version: V01

Software Version: 00WW_0_010

FCC ID: 2AJOTTA-1413

Issued Date: 2022-09-05

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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No.I22N01723-EMC

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I22N01723-EMC	Rev.0	1st edition	2022-09-05

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	Smart Phone
Model Name	TA-1413
Applicant's name	HMD Global Oy
Manufacturer's Name	HMD Global Oy

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: 2022-09-01

Testing End Date: 2022-09-01

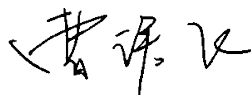
1.6. Signature



Liang Yong
(Prepared this test report)



Zhang Yunzhuan
(Reviewed this test report)



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2. CLIENT INFORMATION

2.1. Applicant Information

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2.2. Manufacturer Information

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3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT

(AE)

3.1. About EUT

Description	Smart Phone
Model Name	TA-1413
FCC ID	2AJOTTA-1413
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	355400570293087	V01	00WW_0_010	2022-09-05

*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	GH6581
Manufacturer	Shenzhen Aerospace Electronic CO.,Ltd.
Capacity	4850mAh
Nominal Voltage	3.85v

AE2-1

Model	AD-010E
Manufacturer	Shenzhen Baijunda Electronics Co. LTD

AE2-2

Model	AD-010U
Manufacturer	Shenzhen Baijunda Electronics Co. LTD

AE2-3

Model	AD-010A
Manufacturer	Shenzhen Baijunda Electronics Co. LTD

AE2-4

Model	AD-010X
Manufacturer	Shenzhen Baijunda Electronics Co. LTD

AE3-1

Model	MO56B2000100
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Manufacturer Qianyang FKY Electronic Technology Co., Ltd.
AE4

Model JWEP1199-M01H /

Manufacturer JUWEI ELECTRONICS CO.,LTD /

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

AE: ancillary equipment

AE2: The circuit boards of model AD-010E (AE2-1), AD-010U (AE2-2), AD-010A (AE2-3), and AD-010X (AE2-4), are the same.

3.4. EUT Set-ups

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

3.5. General Description

The Equipment Under Test (EUT) is a model of Smart Phone.

It supports GSM 850/900/1800/1900MHz, WCDMA Bands 1/2/4/5/8 and

LTE Bands 1/2/3/4/5/7/8/12/13/17/28/66.

It has Video Player, Camera, FM Receiver, USB memory, Bluetooth, Wi-Fi and GNSS functions.

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

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

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

This report serves as a record of Smart Phone TA-1413 manufactured by HMD Global Oy.

According to the declaration of differences by manufacturer. The table below shows the details;

Model Differences	TA-1413(Initial)	TA-1413(Record)
CPU	/	Add 3rd substrate for CPU UMS9230, only assembly Site changes, to expand capacity.
Software	/	1.Android A12 provides common Patch upgrade for UMS9230 1st and 2nd substrate software engineering; 2.Android A12 provides a baseline version, compatible with UMS9230 1st and 2nd substrate;
Software Version	00WW_0_017	00WW_0_010

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

NO.	Test item	EUT Operating Mode
1	Radiated Emission	Video Player
2	Conducted Emission	Video Player/FM receiver

Other results are cited from the initial report.

The report number for initial model is I22N00716-EMC.

4. REFERENCE DOCUMENTS

4.1. Reference Documents for Testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices	(10-1-2020 Edition)
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber did not exceed following limits along the EMC testing:

9.10m×6.10m×5.60m (L×W×H)

Temperature	Min. = 15 °C, Max. = 35°C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-18000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω
Normalised site attenuation (NSA)	<±4 dB, 3 m distance, from 30 to 1000 MHz

Shield room did not exceed following limits along the EMC testing:

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

Fully-anechoic chamber did not exceed following limits along the EMC testing:

9.10m×6.10m×5.60m (L×W×H)

Temperature	Min. = 15 °C, Max. = 35°C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-18000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18GHz, 3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

6. SUMMARY OF TEST RESULTS

6.1. Testing Environment

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

6.2. Summary of Measurement Results

Abbreviations used in this clause:	
P	Pass
NA	Not applicable
F	Fail

Items	Test Name	Clause in FCC	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	2023.01.12	1 year
3.	Spectrum Analyzer	FSV40	101192	R&S	2023.01.12	1 year
4.	BiLog Antenna	3142E	0224831	ETS-Lindgren	2024.05.27	3 years
5.	Horn Antenna	3117	00066577	ETS-Lindgren	2025.03.15	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.	Horn Antenna	QSH-SL-18-2 6-S-20	17013	Q-par	2023.01.06	3 years
10.	Horn Antenna	QSH-SL-8-26- 40-K-20	17014	Q-par	2023.01.06	3 years

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:

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

FM receiver: The EUT is connected to a charger for charging. 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.

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

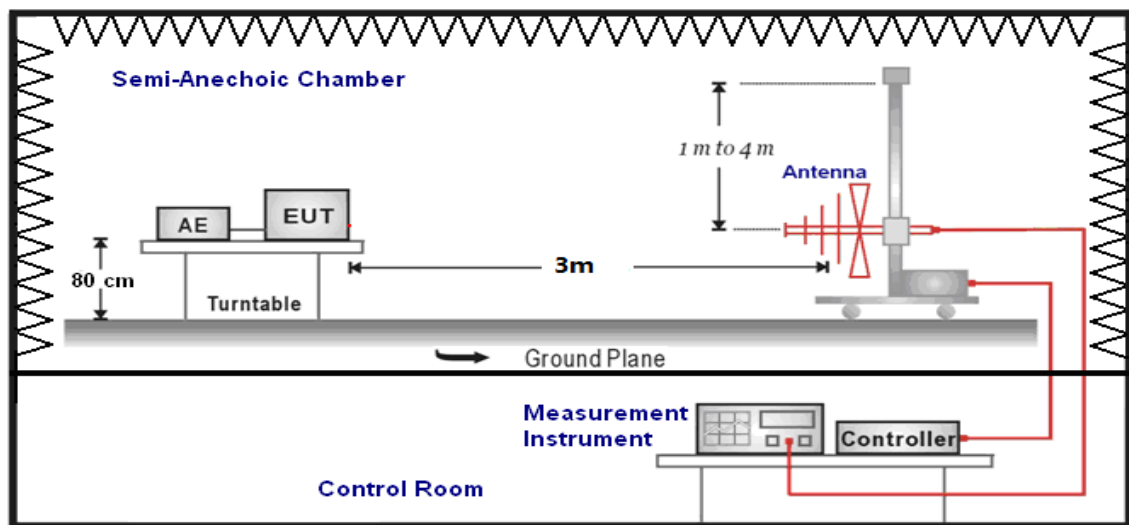
*Note: The original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

A.1.4 Test Condition

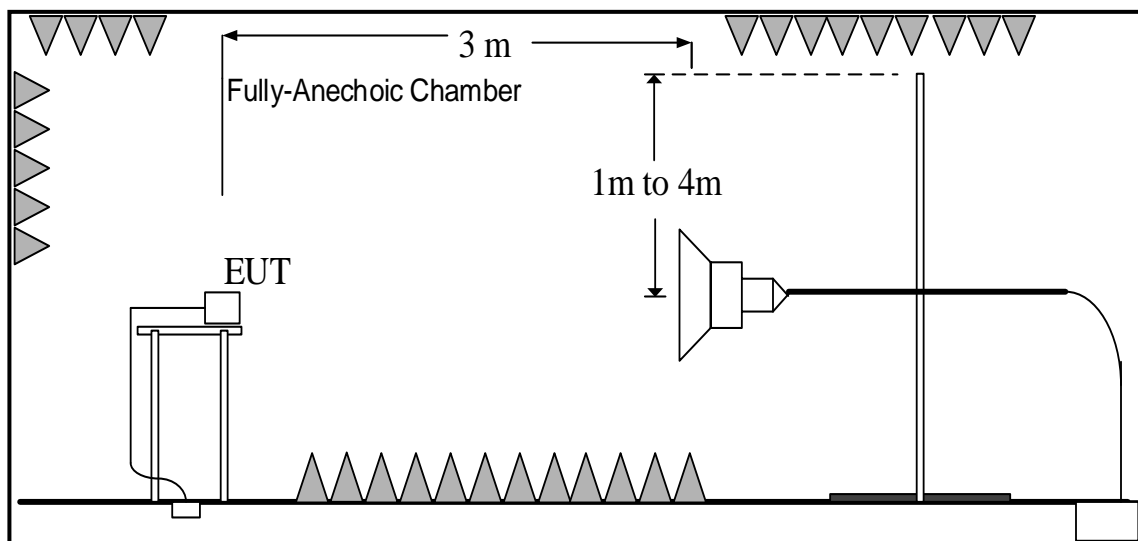
Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz (IF bandwidth)	5
Above 1000	1MHz/3MHz	15

A.1.5 Test set-up:

30MHz-1GHz



1GHz-40GHz



A.1.6 Measurement Results

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss". It includes the antenna factor of receive antenna and the path loss.

The measurement results are obtained as described below:

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

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

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

Note: the result contains vertical part and Horizontal part

Video Player

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

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

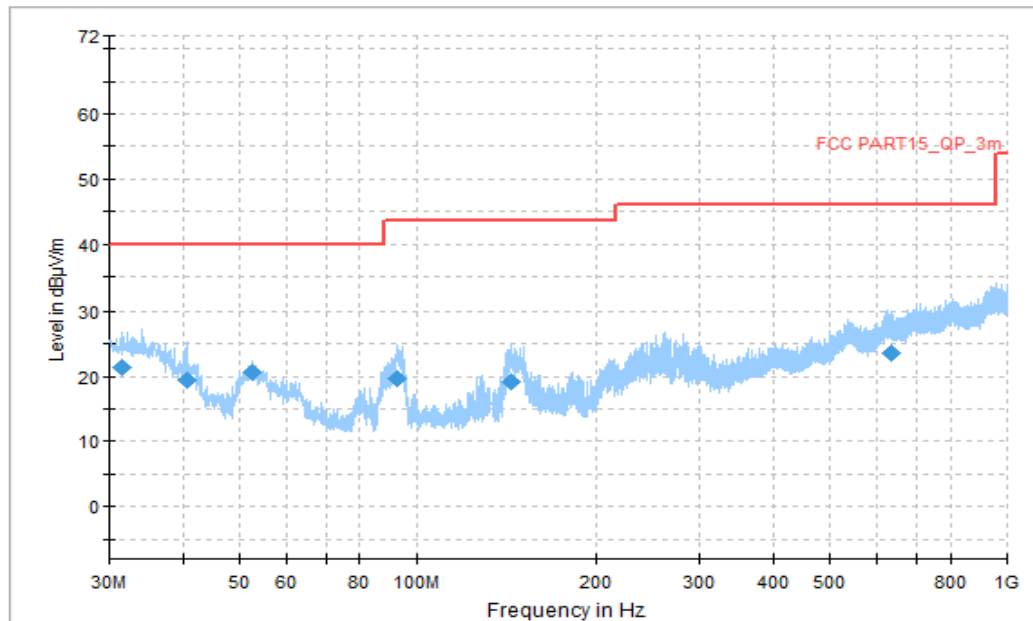


Figure A.1.1. Radiated Emission (Video Player , 30MHz to 1GHz)

Final_Results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	ARpl (dB/m)	PMea (dBµV)
31.616667	21.44	40.00	18.56	V	-13	34.44
40.723889	19.34	40.00	20.66	V	-19	38.34
52.525556	20.71	40.00	19.29	V	-22	42.71
92.726667	19.75	43.52	23.77	V	-21	40.75
143.921111	19.24	43.52	24.28	V	-20	39.24
636.842778	23.46	46.02	22.56	H	-3	26.46

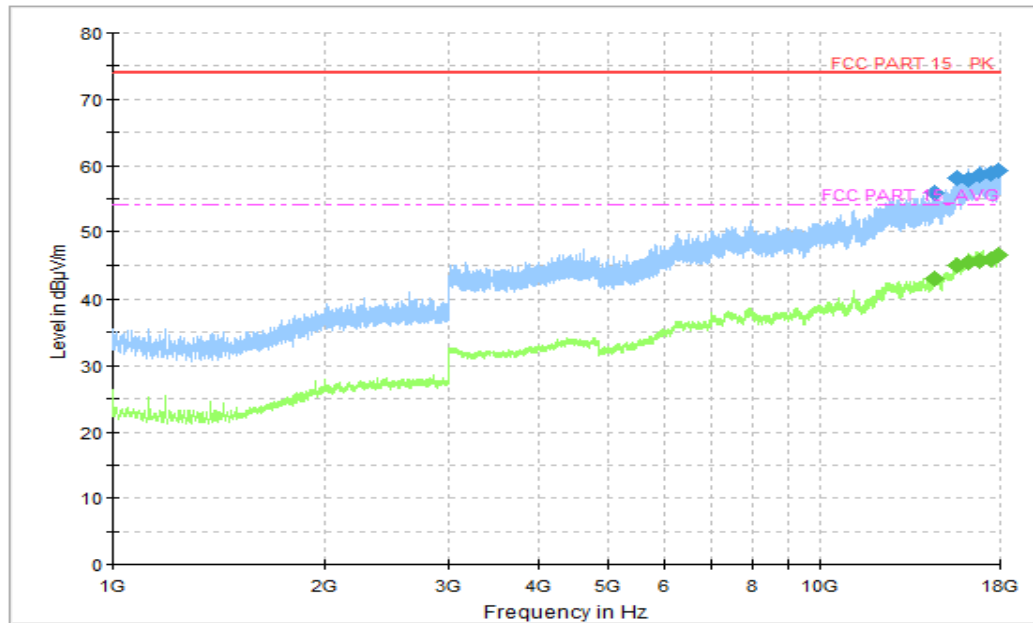


Figure A.1.2. Radiated Emission (Video Player , 1GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBμV)
14544.250000	55.77	74.00	18.23	V	20	35.77
15594.750000	58.04	74.00	15.96	H	21	37.04
16261.750000	57.80	74.00	16.20	V	22	35.80
16858.250000	58.57	74.00	15.43	V	23	35.57
17434.000000	58.71	74.00	15.29	H	23	35.71
17913.500000	59.12	74.00	14.88	H	24	35.12

Final_Results_AVG

Frequency(MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	PMea (dBμV)
14544.250000	42.82	54.00	11.18	V	20	22.82
15594.750000	44.95	54.00	9.05	H	21	23.95
16261.750000	45.38	54.00	8.62	V	22	23.38
16858.250000	45.52	54.00	8.48	V	23	22.52
17434.000000	45.82	54.00	8.18	H	23	22.82
17913.500000	46.53	54.00	7.47	H	24	22.53

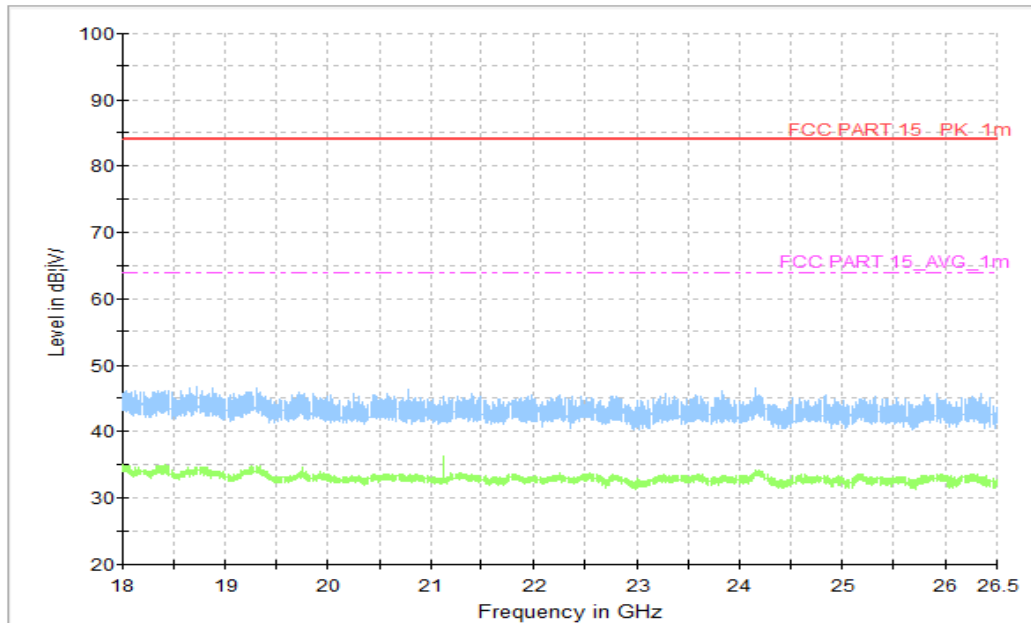


Figure A.1.3. Radiated Emission (Video Player , 18GHz to 26.5GHz)

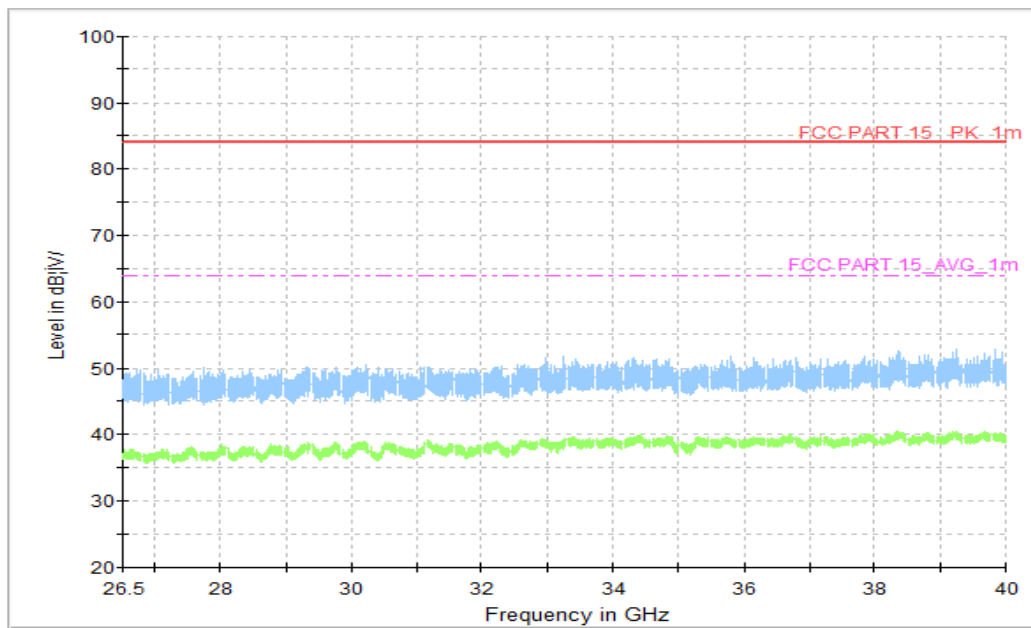


Figure A.1.4. Radiated Emission (Video Player , 26.5GHz to 40GHz)

A.2 Conducted Emission (§15.107(a))**Reference**

FCC: Part 15.107(a)

A.2.1 Method of measurement

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 -2014, section 7.3.

A.2.2 EUT Operating Mode:

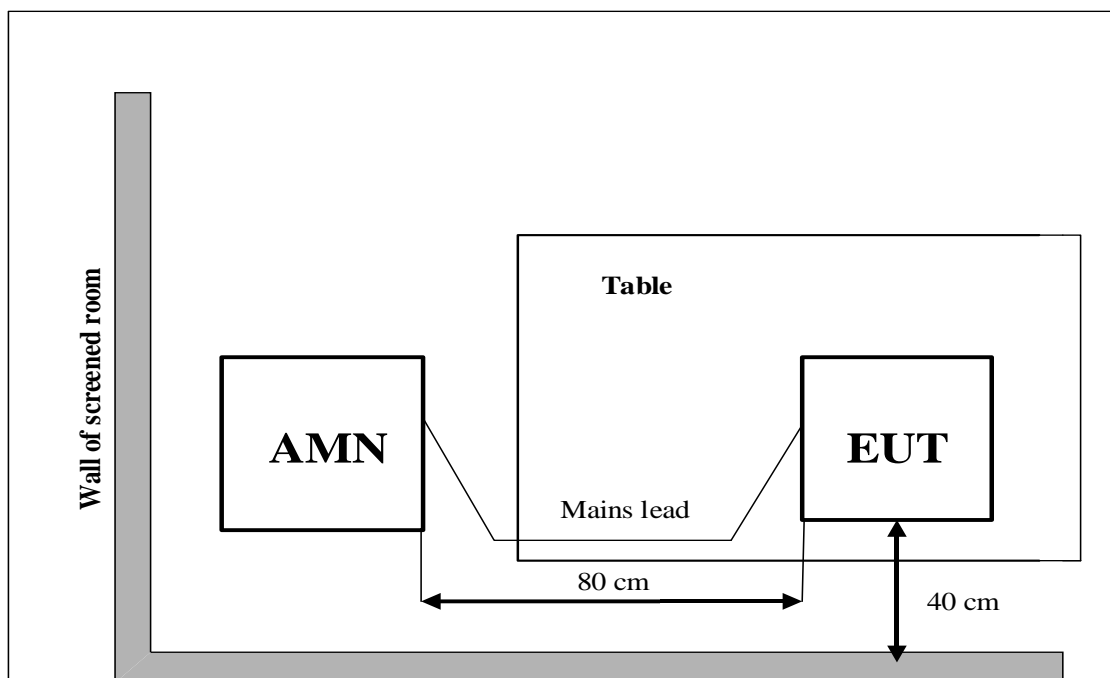
Video Player: The EUT is connected to a charger for charging and keeping on playing mp3.

FM receiver: The EUT is connected to a charger for charging. 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.

A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency		

A.2.4 Test set-up:



A.2.5 Test Condition in charging mode

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

RBW	Sweep Time(s)
9kHz	1

A.2.6 Measurement Results

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

Where

Corr: PathLoss + Voltage Division Factor

PMea: Measurement result on receiver.

Video Player

AC Input Port/ Voltage: 120V/60Hz

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

FM receiver

AC Input Port/ Voltage: 240V/60Hz

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV)	Conclusion
			UT01aa/Set.1	
0.15 to 0.5	66 to 56	56 to 46	See Figure A.2.2.	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.				

AC Input Port/ Voltage: 120V/60Hz

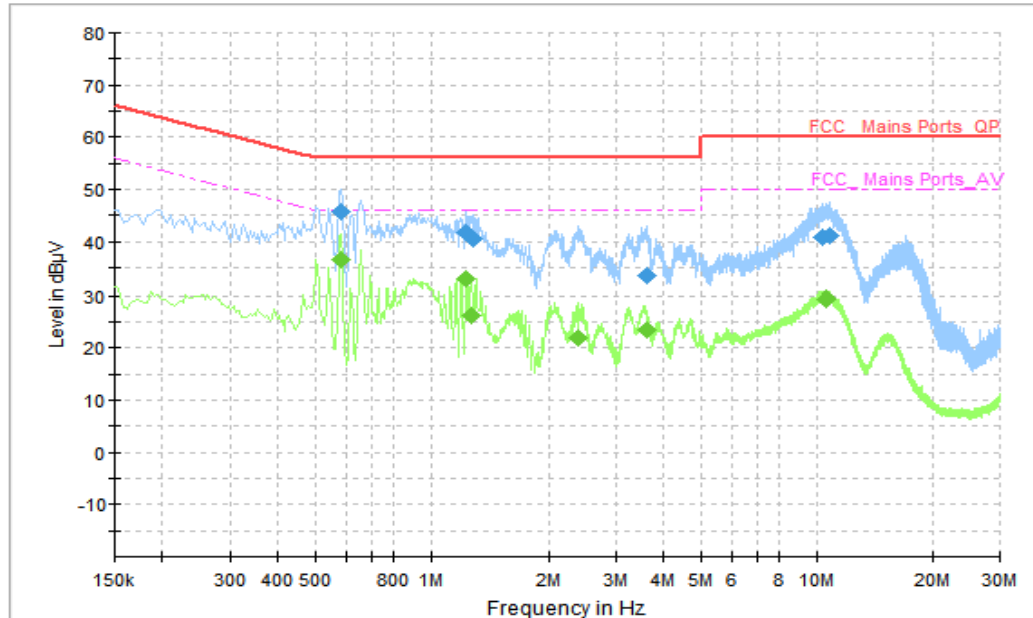


Figure A.2.1. Conducted Emission(Video Player)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.582000	45.73	56.00	10.27	N	10	35.73
1.230000	41.88	56.00	14.12	N	10	31.88
1.282000	40.50	56.00	15.50	N	10	30.50
3.614000	33.45	56.00	22.55	N	10	23.45
10.350000	40.98	60.00	19.02	N	10	30.98
10.806000	41.31	60.00	18.69	N	10	31.31

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.582000	36.61	46.00	9.39	N	10	26.61
1.234000	32.80	46.00	13.20	N	10	22.8
1.274000	26.22	46.00	19.78	N	10	16.22
2.394000	21.80	46.00	24.20	N	10	11.80
3.614000	23.41	46.00	22.59	N	10	13.41
10.634000	29.27	50.00	20.73	N	10	19.27

AC Input Port/ Voltage:240 V/60Hz

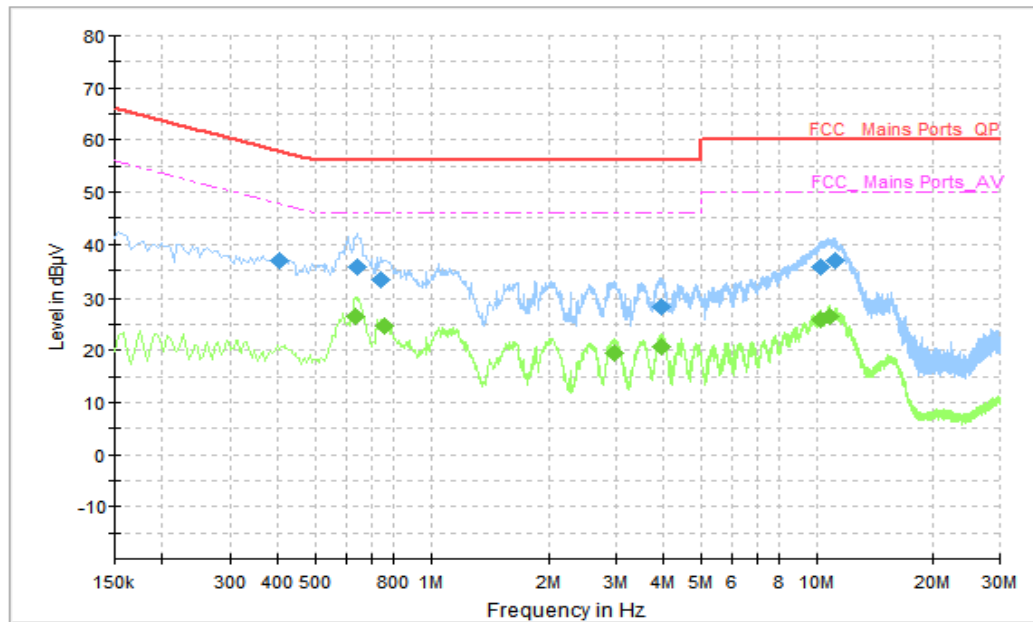


Figure A.2.2. Conducted Emission(FM receiver)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.402000	36.90	57.81	20.91	N	10	26.90
0.642000	35.66	56.00	20.34	N	10	25.66
0.742000	33.18	56.00	22.82	N	10	23.18
3.942000	28.45	56.00	27.55	N	10	18.45
10.266000	35.72	60.00	24.28	N	10	25.72
11.118000	36.87	60.00	23.13	N	10	26.87

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.638000	26.49	46.00	19.51	N	10	16.49
0.758000	24.58	46.00	21.42	N	10	14.58
2.982000	19.46	46.00	26.54	N	10	9.46
3.942000	20.52	46.00	25.48	N	10	10.52
10.242000	25.75	50.00	24.25	N	10	15.75
10.774000	26.59	50.00	23.41	N	10	16.59

END OF REPORT