



TEST REPORT

No.I20N03484-EMC

for

TCL Communication Ltd.

True Wireless Headphones

Model Name: TW30

With

Hardware Version: 40-00TW30-MAD4G(CHARGING

CASE)40-00TW309MID6H (EARPHONES)

Software Version: V1.1.0.12

FCC ID: 2ACCJB145

Issued Date: 2021-01-25

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.I20N03484-EMC

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I20N03484-EMC	Rev.0	1st edition	2021-01-25

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	True Wireless Headphones
Model Name	TW30
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

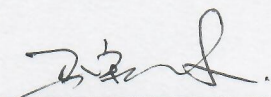
Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China

1.5. Project data

Testing Start Date: 2021-01-18

Testing End Date: 2021-01-20

1.6. Signature



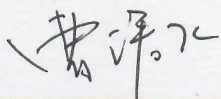
Ma Shoujian

(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
E-mail: zhizhou.gong@tcl.com
Tel: 0086-755-36611722
Fax: 0086-755-36612000-81722

2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science
Park, Shatin, NT, Hong Kong
Contact: Gong Zhizhou
E-mail: zhizhou.gong@tcl.com
Tel: 0086-755-36611722
Fax: 0086-755-36612000-81722

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

3.1. About EUT

Description	True Wireless Headphones
Model Name	TW30
FCC ID	2ACCJB145
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	/	40-00TW30-MAD4G(Charging case)40-00TW309MID6H (earphones)	V1.1.0.12	2021-01-08

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

3.3. Internal Identification of AE

AE ID*	Description
AE1	Charging Box
AE2	Charger
AE3	USB Cable
AE4-1	The battery of Charging Box
AE4-2	The battery of headset
AE5	Mobile Phone
AE1	
Model	TW30
Manufacturer	TCL Communication Ltd.
AE2	
Model	A152A-090200U-CN1
Manufacturer	Dongguan Aohai Technology Co.,Ltd.
AE3-1	
Model	ZW-TCL200623001
Manufacturer	Shenzhen Zhanwang Precision Technology Co.,Ltd.
AE3-2	
Model	ZW-TCL200713001
Manufacturer	Shenzhen Zhanwang Precision Technology Co.,Ltd.
AE4-1	



Model	652040
Manufacturer	Chongqing VDL Electronics Co., LTD.
Capacity	500mAh
Nominal Voltage	3.7V

AE4-2

Model	1254
Manufacturer	Chongqing VDL Electronics Co., LTD.
Capacity	55mAh
Nominal Voltage	3.7V

AE5

Model	MATE30 PRO
Manufacturer	Huawei

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

AE: ancillary equipment.

* AE3:The USB Cable of model ZW-TCL200623001(AE3-1) and ZW-TCL200713001 (AE3-2) are the same except the the colour.

AE5 is just for testing.



3.4. EUT set-ups

EUT set-up No.

Set.1

Set.2

Combination of EUT and AE

EUT+AE1+AE2+AE3-1+AE4-1+AE4-2

EUT+AE4-2+AE5

3.5. General Description

The Equipment Under Test (EUT) is a model of True Wireless Headphones weared on the right ear with internal antenna

It has Bluetooth functions.

It consists of normal options: Charging Box、 USB Cable and battery.

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

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 °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 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)
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	2021.12.25	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.	LISN	ENV216	102067	R&S	2021.07.16	1 year
6.	Horn Antenna	3117	00066577	ETS-Lindgren	2022.04.02	3 years
7.	Chamber	FACT3-2.0	1285	ETS-Lindgren	2021.07.19	2 years
8.	Software	EMC32	V10.01.00	R&S	/	/

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:

Charging Mode: Put EUT into the charging box and connecting with Charger, enter the charging state.

Normal Working: EUT is powered on. Turn on the Bluetooth function of the mobile phone; establish a communication connection with the EUT, and mobile phone playing songs through EUT.

This device does not contains the receivers which tune and operate between 30MHz-960MHz.

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)

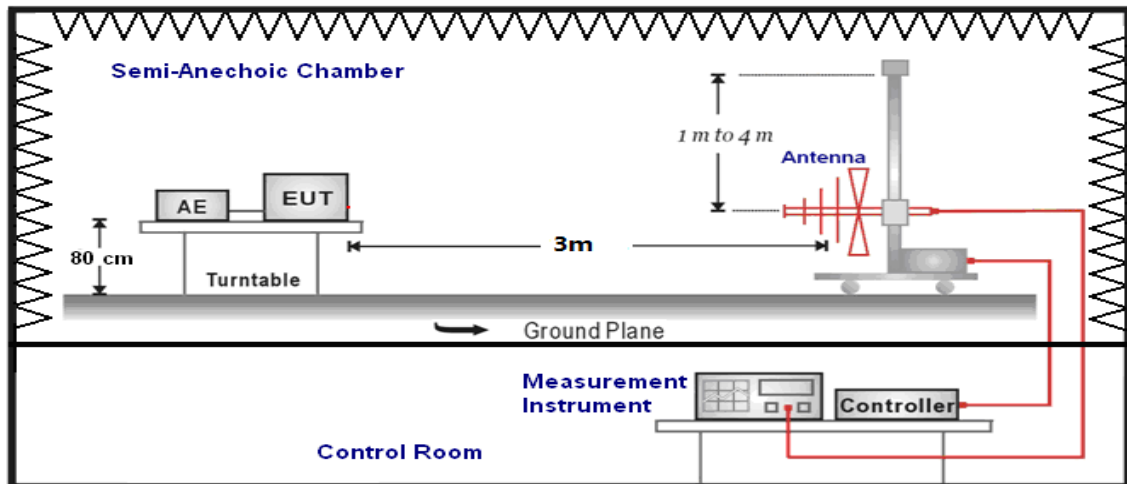
Frequency range (MHz)	Field strength limit (μV/m)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

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

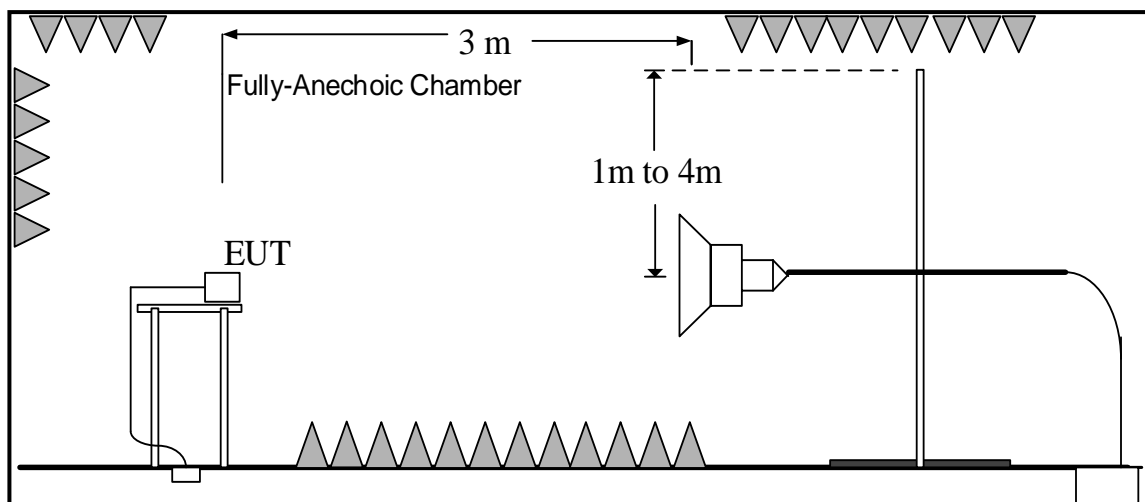
A.1.4 Test Condition

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-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:

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

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

Charging Mode

Frequency range (MHz)	Quasi-Peak Limit (dB μ V/m)	Result (dB μ V/m) UT01aa/Set.1	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 (dB μ V/m)	Peak Limit (dB μ V/m)	Result (dB μ V/m) UT01aa/Set.1	Conclusion
1000 to 3000	54	74	See Fugure A.1.2.	P
3000to 18000	54	74	See Fugure A.1.3.	P

Normal Working

Frequency range (MHz)	Quasi-Peak Limit (dB μ V/m)	Result (dB μ V/m) UT01aa/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 (dB μ V/m)	Peak Limit (dB μ V/m)	Result (dB μ V/m) UT01aa/Set.1	Conclusion
1000 to 3000	54	74	See Fugure A.1.5.	P
3000to 18000	54	74	See Fugure A.1.6.	P

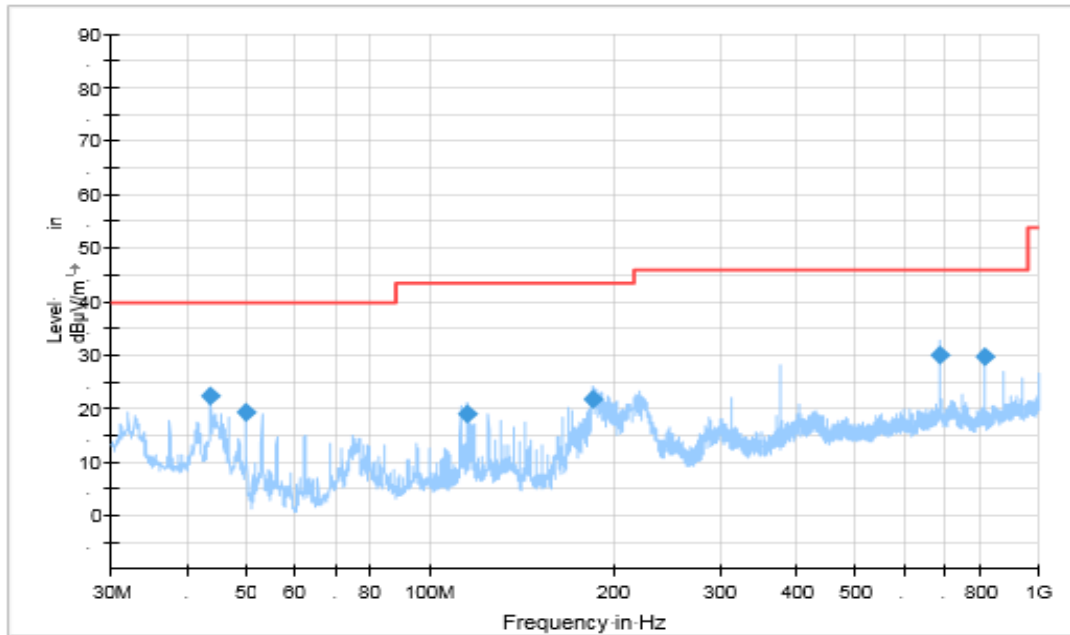


Figure A.1.1. Radiated Emission (Charging Mode, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	ARpl (dB/m)	P _{Mea} (dBμV)
43.761667	22.34	40.00	17.66	V	-31.8	54.14
50.012778	19.47	40.00	20.53	V	-36.5	55.97
115.635556	19.01	43.50	24.49	V	-31.5	50.51
185.385000	21.74	43.50	21.76	V	-33.8	55.54
687.518333	30.04	46.00	15.96	V	-19.7	49.74
812.540556	29.78	46.00	16.22	V	-18.5	48.28

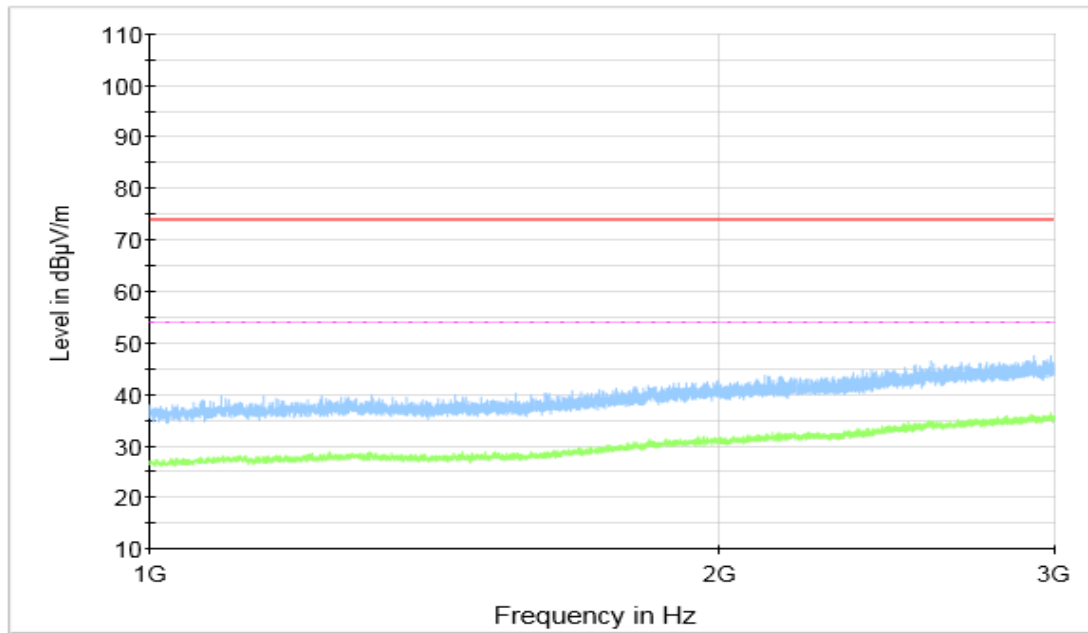


Figure A.1.2. Radiated Emission (Charging Mode, 1GHz to 3GHz)

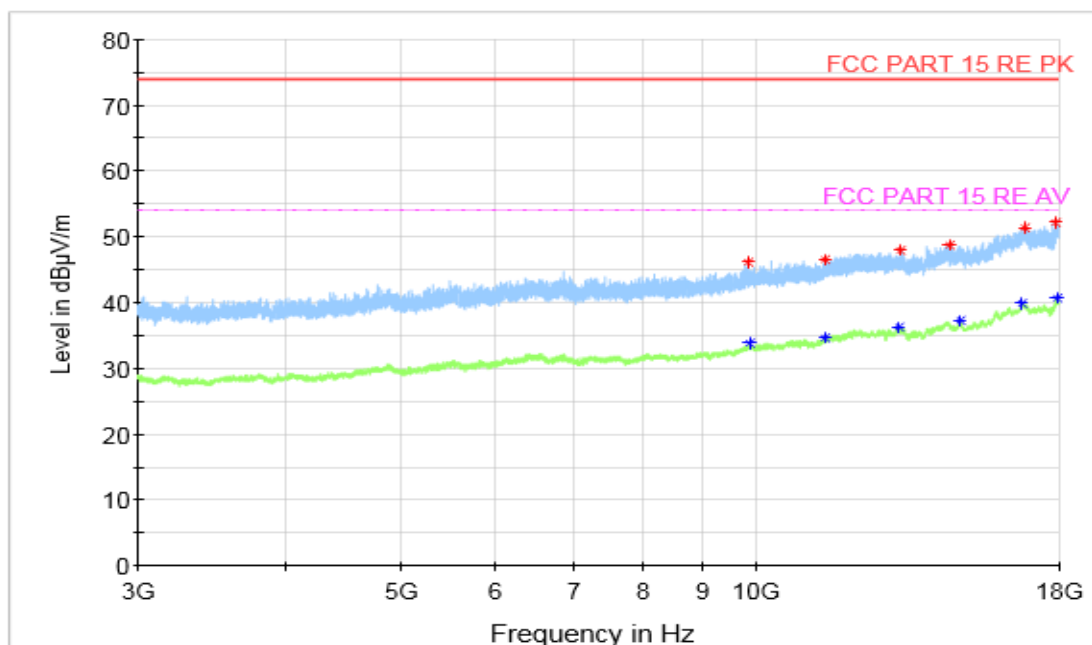


Figure A.1.3. Radiated Emission (Charging Mode, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
9829.000000	46.08	74.00	27.92	V	5.0	41.08
11430.500000	46.54	74.00	27.46	H	6.8	39.74
13223.500000	47.99	74.00	26.01	V	9.6	38.39
14540.500000	48.71	74.00	25.29	V	11.7	37.01
16873.500000	51.42	74.00	22.58	H	15.9	35.52
17914.000000	52.29	74.00	21.71	H	17.2	35.09

Final_Results_AVG

Frequency(MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
9857.000000	33.78	54.00	20.22	H	5.3	28.48
11434.500000	34.60	54.00	19.40	V	6.8	27.8
13190.000000	36.24	54.00	17.76	H	9.8	26.44
14885.000000	37.29	54.00	16.71	V	11.7	25.59
16761.500000	39.87	54.00	14.13	V	15.5	24.37
17950.500000	40.66	54.00	13.34	V	17.2	23.46

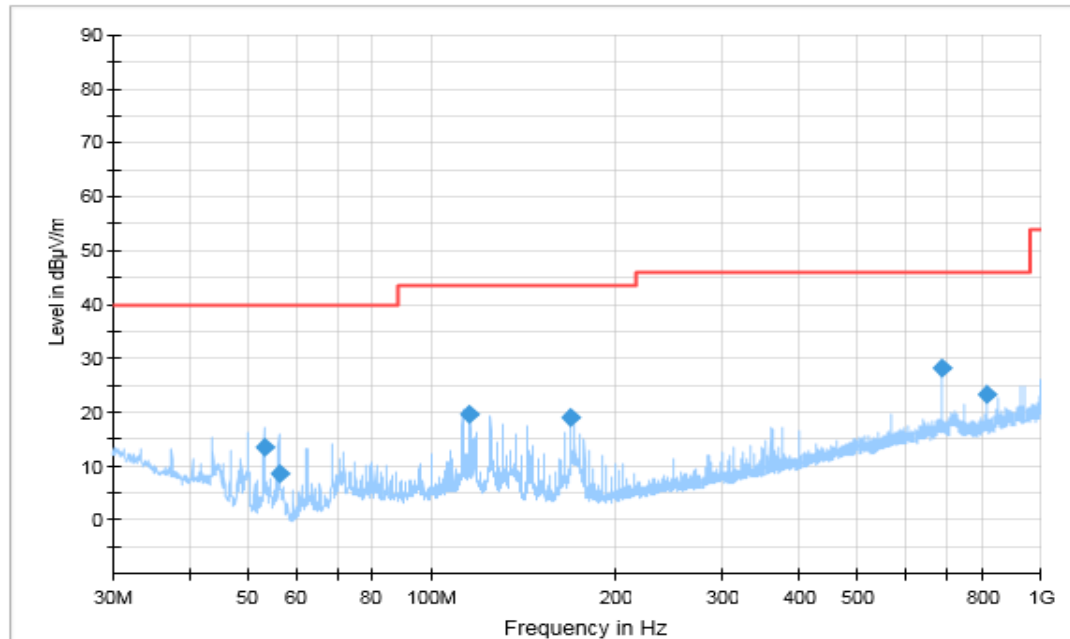


Figure A.1.4. Radiated Emission (Normal Working, 30MHz to 1GHz)

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	ARpl (dB/m)	P _{Mea} (dBμV)
53.124444	13.45	40.00	26.55	V	-38.1	51.55
56.250000	8.58	40.00	31.42	V	-38.3	46.88
115.635556	19.71	43.50	23.79	V	-31.5	51.21
168.770000	19.00	43.50	24.50	V	-31.5	50.5
687.518333	28.34	46.00	17.66	V	-19.7	48.04
812.540556	23.43	46.00	22.57	V	-18.5	41.93

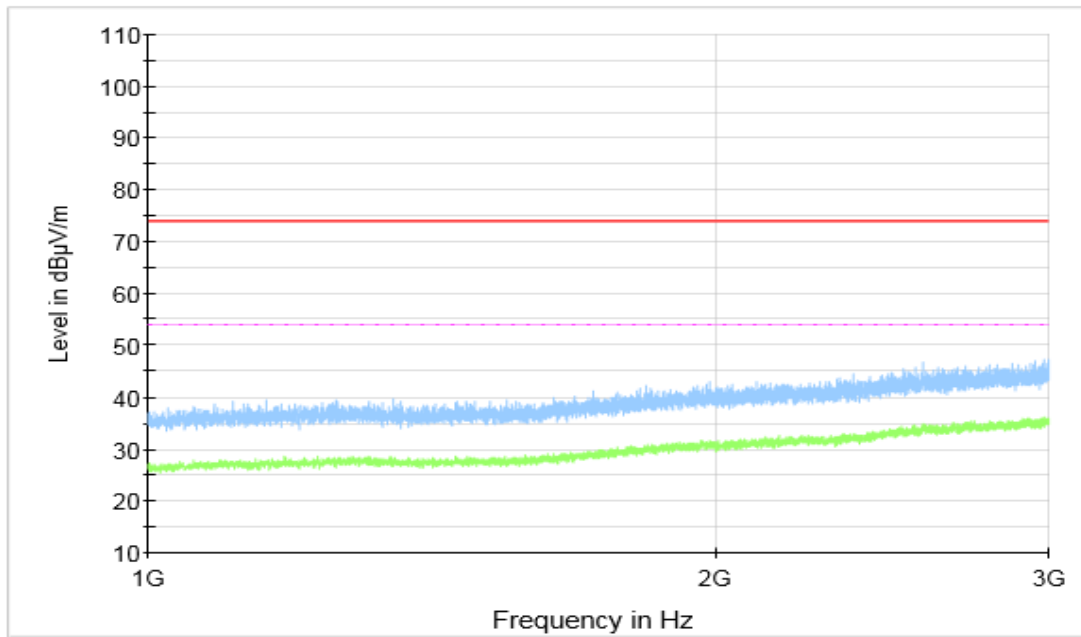


Figure A.1.5. Radiated Emission (Normal Workingz, 1GHz to 3GHz)

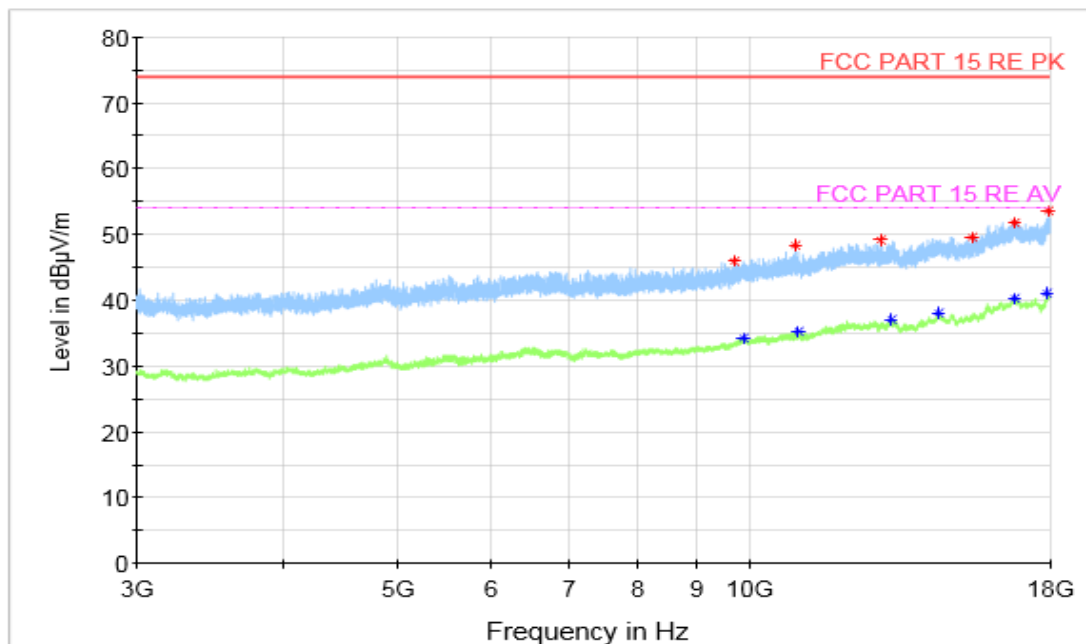


Figure A.1.6. Radiated Emission (Normal Working, 3GHz to 18GHz)

Final_Results_PK

Frequency(MHz)	Peak (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
9705.000000	45.98	74.00	28.02	V	4.8	41.18
10916.000000	48.30	74.00	25.70	H	6.6	41.7
12906.500000	49.13	74.00	24.87	V	9.3	39.83
15471.000000	49.65	74.00	24.35	H	12.6	37.05
16818.500000	51.88	74.00	22.12	H	16.0	35.88
17936.000000	53.54	74.00	20.46	H	17.0	36.54

Final_Results_AVG

Frequency(MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P _{Mea} (dBμV)
9856.000000	34.21	54.00	19.79	H	5.3	28.91
10973.500000	35.35	54.00	18.65	H	6.6	28.75
13190.000000	37.04	54.00	16.96	H	9.8	27.24
14485.500000	38.03	54.00	15.97	V	11.7	26.33
16784.000000	40.30	54.00	13.70	H	15.9	24.4
17907.500000	41.02	54.00	12.98	H	17.3	23.72

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.

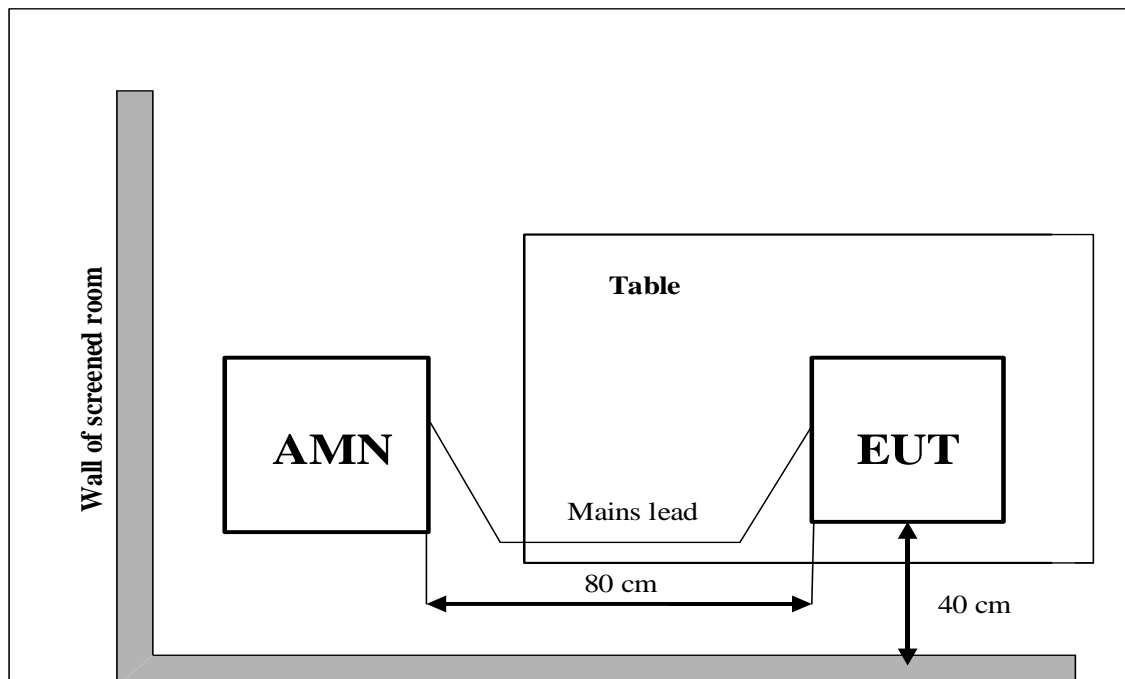
A.2.2 EUT Operating Mode:

Charging Mode: Put EUT into the charging box and connecting with Charger, enter the charging state.

A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	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.

Charging Mode

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.				

Charging Mode

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

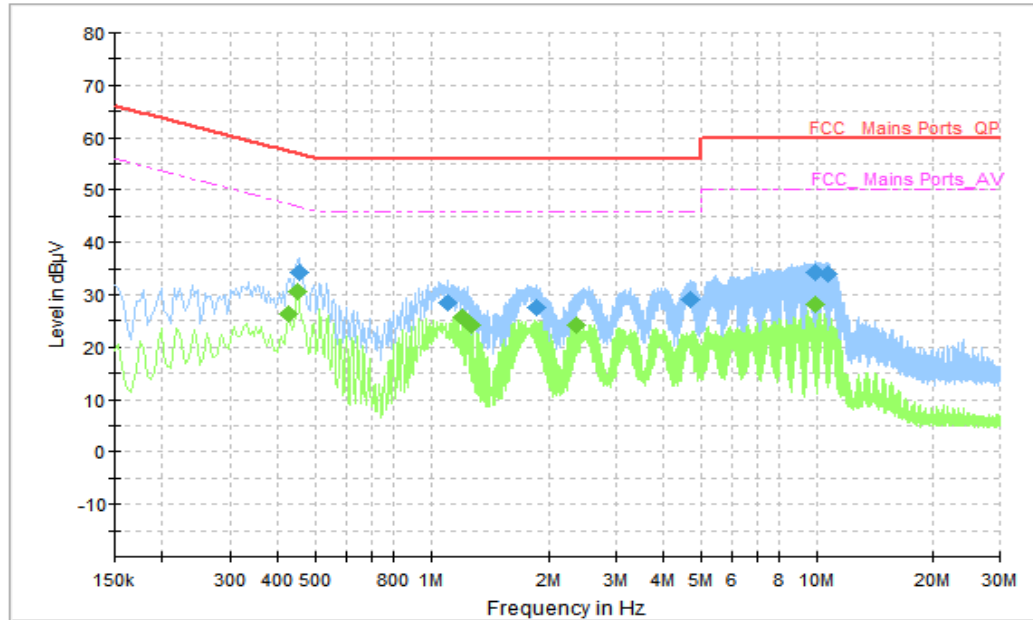


Figure A.2.1 Conducted Emission(Charging Mode)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.454000	34.19	56.80	22.62	L1	10	24.19
1.110000	28.53	56.00	27.47	N	10	18.53
1.866000	27.54	56.00	28.46	N	10	17.54
4.710000	28.95	56.00	27.05	N	10	18.95
9.862000	34.22	60.00	25.78	N	10	24.22
10.706000	34.12	60.00	25.88	N	10	24.12

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.426000	26.38	47.33	20.95	L1	10	16.38
0.450000	30.46	46.88	16.41	L1	10	20.46
1.202000	25.77	46.00	20.23	L1	10	15.77
1.270000	24.17	46.00	21.83	L1	10	14.17
2.374000	24.33	46.00	21.67	L1	10	14.33
9.950000	28.13	50.00	21.87	L1	10	18.13

AC Input Port/ Voltage: 240V/60Hz

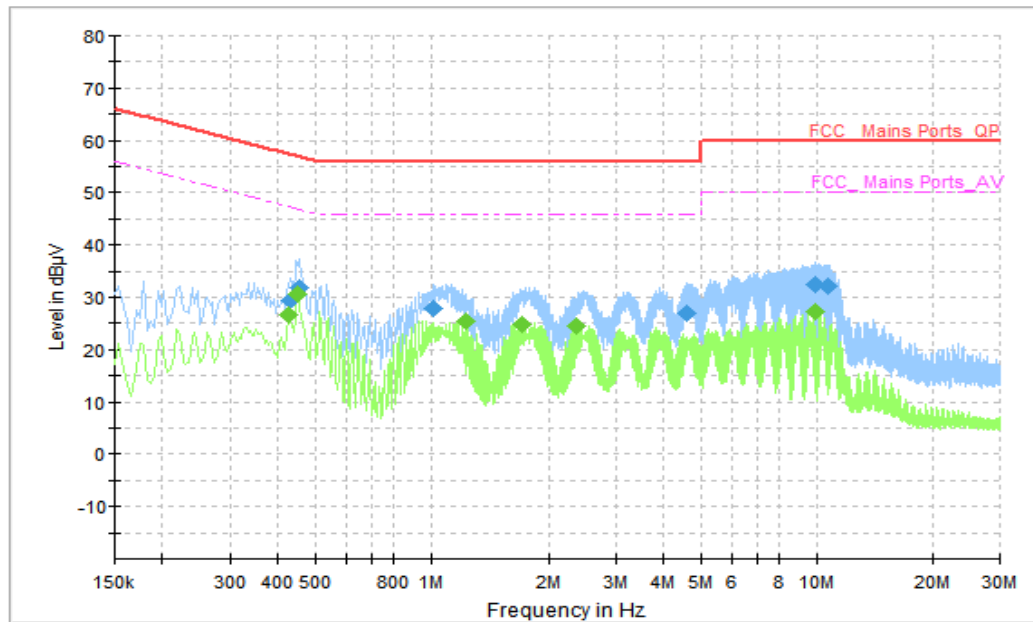


Figure A.2.2 Conducted Emission(Charging Mode)

Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.430000	29.49	57.25	27.76	N	10	19.49
0.454000	31.89	56.80	24.91	N	10	21.89
1.014000	27.88	56.00	28.12	N	10	17.88
4.602000	27.00	56.00	29.00	L1	10	17.00
9.958000	32.42	60.00	27.58	N	10	22.42
10.670000	32.10	60.00	27.90	N	10	22.10

Final_Result_AVG

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	P _{Mea} (dBμV)
0.426000	26.68	47.33	20.65	L1	10	16.68
0.450000	30.62	46.88	16.25	L1	10	20.62
1.226000	25.51	46.00	20.49	L1	10	15.51
1.706000	24.91	46.00	21.09	L1	10	14.91
2.374000	24.62	46.00	21.38	L1	10	14.62
9.914000	27.20	50.00	22.80	L1	10	17.20

END OF REPORT