

FCC EMC TEST REPORT

Name of Sample: Mobile Cellular Phone
Model of Sample: XT2429-1
Applicant: Motorola Mobility LLC
Issued Date: 2024-03-22



ADR TEST AND CERTIFICATION CENTER

Motorola Mobility LLC, a Lenovo Company

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Name of Client	Motorola Mobility LLC		
Address of Client	222 W, Merchandise Mart Plaza, Chicago IL 60654 USA		
Trademark	Motorola	Type Name or ID	IHDT56AR4
Applicant No.	RF173514 RF174599	Sample No.	SN: NGCL2N0443 SN: NGCLC30112
Delivering Date	2024-01-24	Test Date(s)	2024-01-24 to 2024-02-21
Sample Illustration	None		
Standard	47 CFR FCC PART 15 Subpart B ANSI C63.4-2014		
Conclusion	PASS		
Remarks	None		

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Matters Needing Attention

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
24ADRTCC5006	Rev. 01	Initial issue of report	2024-01-29
24ADRTCC5006	Rev. 02	Added 2nd source sample test	2024-02-21
24ADRTCC5006	Rev. 03	Update product information	2024-03-20
24ADRTCC5006	Rev. 04	Update product information	2024-03-22

Catalogue

1. Information Of Equipment Under Test(EUT)	5
2. Details Of Test	7
2.1 Applicant	7
2.2 Location of Test	7
2.3 Applied Standards	7
3. Result Summary	8
4. Tests Configuration Of EUT	9
4.1 EUT Test Modes	9
4.2 Configuration Of Test System	11
4.3 Support Unit For Test	11
5. Test Result	12
5.1 Radiated Emissions	12
5.2 Conducted Emissions	14
6. Test Equipment And Software	15
7. System Measurement Uncertainty	15
8. Test Data	16
8.1 Radiated Emissions	16
8.2 Conducted Emissions	18
9. EUT And Test Set-up Photos	19
9.1 EUT	19
9.2 Radiated Emissions	20
9.3 Conducted Emissions	21

1. Information Of Equipment Under Test(EUT)

Product Name:	Mobile Cellular Phone	
Brand Name:	Motorola	
Model Name:	XT2429-1	
FCC ID:	IHDT56AR4	
Software Version:	Sample 1 (U2UU34.10), Sample 2 (U2UU34.16)	
Hardware Version:	DVT2	
IMEI Code:	Conduction: 356305710029797/ 356305710029805 for Sample 1 356305710045413/ 356305710045421 for Sample 2 Radiation: 356305710029797/ 356305710029805 for Sample 1 356305710045413/ 356305710045421 for Sample 2	
Supports Radio application in this standard:		
GSM/WCDMA/LTE/5G NR/WLAN/BLUETOOTH/GNSS/NFC		
Accessory		
Product	Brand	model
AC Adapter 1(US)	Motorola (Chenyang)	MC-681N
AC Adapter 1(EU)	Motorola (Chenyang)	MC-682N
AC Adapter 1(UK)	Motorola (Chenyang)	MC-683N
AC Adapter 1(AR)	Motorola (Chenyang)	MC-686N
AC Adapter 1(AU)	Motorola (Chenyang)	MC-685N
AC Adapter 1(BR)	Motorola (Chenyang)	MC-687N
AC Adapter 1(CHILE)	Motorola (Chenyang)	MC-689N
AC Adapter 2(US)	Motorola (Acbel)	MC-681N
AC Adapter 2(EU)	Motorola (Acbel)	MC-682N
AC Adapter 2(UK)	Motorola (Acbel)	MC-683N
AC Adapter 2(AU)	Motorola (Acbel)	MC-685N
AC Adapter 2(AR)	Motorola (Acbel)	MC-686N
AC Adapter 2(BR)	Motorola (Acbel)	MC-687N
AC Adapter 2(IN)	Motorola (Acbel)	MC-684N
Battery1	Motorola (ATL)	QC50
Battery2	Motorola (SCUD)	QC50
USB Cable 1	Motorola (Saibao)	SLQ-A248A
USB Cable 2	Motorola (Juwei)	S928E13829
USB Cable 3	Motorola (Saibao)	SLQ-A248A

Remark:

- The EUT's information was declared by manufacturer. Please refer to the manufacturer's specifications or user's manual for more detailed description.
- This report includes the first and second source sample. The first source sample (SN: NGCL2N0443, Applicant No. is RF173514) collectively referred to as sample 1, and the second source sample (SN: NGCLC30112, Applicant No. is RF174599) collectively referred to as sample 2.

3. There is only one type of EUT. It is XT2429-1. Details can be found in the separate Product Equality Statement. Based on the differences, we selected XT2429-1 (sample 1) for full testing, and XT2429-1 (sample 2) to verify the differences.

2. Details Of Test

2.1 Applicant

Applicant Name:	Motorola Mobility LLC
Address:	222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

2.2 Location of Test

Test Site 1:	ADR TEST AND CERTIFICATION CENTER
Address:	NO.19, Gao Xin 4 th Road, Wuhan, 430205, P.R China

2.3 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

47 CFR FCC PART 15 Subpart B

ANSI C63.4-2014

3. Result Summary

Test Items	Test Standard	Limit	Result (PASS/FAIL)	Site
Radiated emissions	ANSI C63.4-2014	15.109 Class B	PASS	Site 1
Conducted emissions	ANSI C63.4-2014	15.107 Class B	PASS	Site 1

decision rules: Statements of conformity (e.g. Pass/Fail) to specifications are made in this report without taking measurement uncertainty into account except when requested by the customer. Where statements of conformity are made in this report, the following decision rules are applied:
 PASS- Results within limits/specifications
 FAIL- Results exceed limits/specifications

Remark: For the test result, the EUT had been tested with all test modes. But only the worst case was shown in test report.

Summary of Environment Condition, Test Date and Test Engineer for all Test Items

Test items	Ambient Temperature (°C)	Relative Humidity (%)	Atmospheric Pressure (kPa)	Test Date	Test Engineer
Radiated emissions	19~24	30~37	/	Jan.25,2024~ Feb.21-2024	Man Cao Mingzhu Li Rencong Liu
Conducted emissions	21~24	31~36	/	Jan.24,2024~ Feb.21-2024	Rencong Liu Chuangh Xiao

4. Tests Configuration Of EUT

4.1 EUT Test Modes

All the test modes were carried out with the EUT under the normal operation, which were shown in this test report and defined as below:

Test Items	configuration
Radiated Emissions	Mode 1: GSM 850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Battery + USB Cable 1(Charging from Adapter 1) + SIM 1 for Sample 1
	Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + Camera(Rear) + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 1
	Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle + Battery + USB Cable 3(Charging from Adapter 2) + SIM 1 for Sample 1
	Mode 4: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable 2(Charging from Adapter 1) + SIM 1 for Sample 1
	Mode 5: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + MPEG4(Run Color Bar) + Battery + SIM 1 for Sample 1
	Mode 6: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G)Idle + GNSS Rx + USB Cable 1(Data Link with Notebook) + EUT(eMMC)USB Data Link to NB + Battery + SIM 1 for Sample 1
	Mode 7: LTE Band 26 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front) + Battery + USB Cable 2(Data Link with Notebook) + NB USB Data Link to EUT(eMMC) + SIM 1 for Sample 1
	Mode 8: n5 Idle + Bluetooth Idle + WLAN(2.4G)Idle + Camera(Rear) + Battery + USB Cable 2(Charging from Adapter 1) + SIM 1 for Sample 1
	Mode 9: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front) + Battery + USB Cable 1(Charging from Adapter 2) + SIM 1 for Sample 1
	Mode 10: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 1
	Mode 11: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Camera (Rear) + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 2
	Mode 12: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Camera(Front) + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 2
	Mode 13: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable 2(Data Link with Notebook) + NB USB Data Link to EUT(eMMC) + SIM 1 for Sample 2
	Mode 14: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + MPEG4(Run Color Bar) + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 2
	Mode 15: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G)Idle + GNSS Rx + USB Cable 3(Data Link with Notebook) + EUT(eMMC)USB Data Link to NB + Battery + SIM 1 for Sample 1

AC Conducted Emission	<p>Mode 1: GSM 850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Battery + USB Cable 1(Charging from Adapter 1) + SIM 1 for Sample 1</p> <p>Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + Camera(Rear) + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 1</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle + Battery + USB Cable 3(Charging from Adapter 2) + SIM 1 for Sample 1</p> <p>Mode 4: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable 1(Charging from Adapter 2) + SIM 1 for Sample 1</p> <p>Mode 5: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + MPEG4(Run Color Bar) + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 1</p> <p>Mode 6: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G)Idle + GNSS Rx + USB Cable 1(Data Link with Notebook) + EUT(eMMC)USB Data Link to NB + Battery + SIM 1 for Sample 1</p> <p>Mode 7: LTE Band 26 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Rear) + Battery + USB Cable 2(Data Link with Notebook) + NB USB Data Link to EUT(eMMC) + SIM 1 for Sample 1</p> <p>Mode 8: n5 Idle + Bluetooth Idle + WLAN(2.4G)Idle + Camera(Rear) + Battery + USB Cable 1(Charging from Adapter 2) + SIM 1 for Sample 1</p> <p>Mode 9: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front) + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 1</p> <p>Mode 10: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable 2(Charging from Adapter 1) + SIM 1 for Sample 1</p> <p>Mode11: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G)Idle + GNSS Rx + USB Cable 1(Data Link with Notebook) + EUT(eMMC)USB Data Link to NB + Battery + SIM 1 for Sample 2</p> <p>Mode12: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front) + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 2</p> <p>Mode13: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Rear) + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 2</p> <p>Mode14: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + MPEG4 (Run Color Bar) + Battery + USB Cable 2(Charging from Adapter 2) + SIM 1 for Sample 2</p> <p>Mode 15: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G)Idle + GNSS Rx + USB Cable 3(Data Link with Notebook) + EUT(eMMC)USB Data Link to NB + Battery + SIM 1 for Sample 1</p>
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Remark:

1. If there is over one kind of accessories, each one should be applied in the all test modes. However, only the worst case will be recorded in this report.
2. If EUT has more than one typical operation, only the worst case will be recorded in this report.

Link Mode:

When the EUT state is switched on and worked.

Idle Mode:

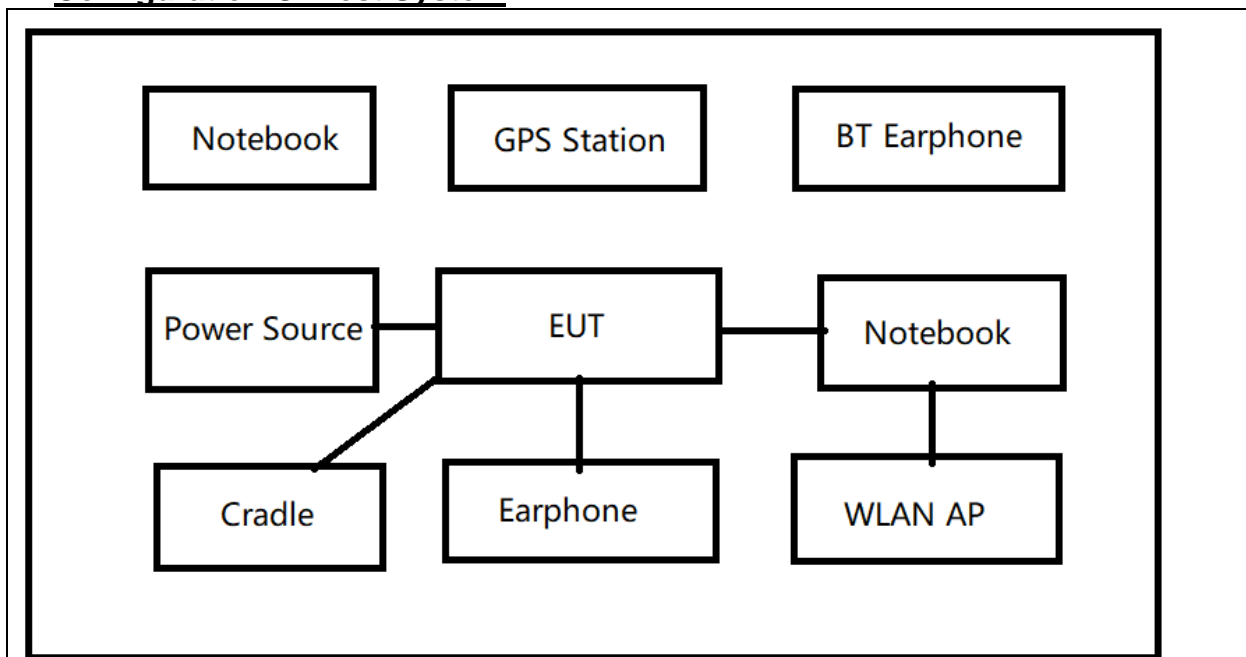
When the EUT state is switch on but without Radio Resource Control (RRC) connection.

Worst mode of all test items listed in section 4.1

Test items	Worst mode
Radiated Emission	4
Conducted Emission	6

Remark: Only data of worst mode (if test item has) was reported in test result.

4.2 Configuration Of Test System



This example is connection diagram of EUT test configurations.

For detail, please refer to test mode configuration and setup photographs for each test item.

4.3 Support Unit For Test

Name	Model Name	Manufacturer	S/N
System Simulator	CMW500	R&S	141518
System Simulator	CMW500	R&S	171184
System Simulator	CMX500	R&S	101840
Vector Signal Generator	SMBV100A	R&S	258462
WLAN AP	TP-Link-8342	TP-Link	NA
WLAN AP	H3C Magic NX54	H3C	NA
Notebook	YOGA Pro 14s	Lenovo	PF48HYHV
Bluetooth Earphone	TR6	SOAY	NA
Bluetooth Earphone	Earbuds X2	COSONIC	NA
SD Card	128 PRO Plus	Samsung	NA
U disk	L7C	Lenovo	NA

5. Test Result

5.1 Radiated Emissions

5.1.1 Limit

Frequency range MHz	Quasi-peak limits dB ($\mu\text{V}/\text{m}$)		RBW kHz
30 to 88	40		120
88 to 216	43.5		120
216 to 960	46		120
960 to 1000	54		120
Frequency range MHz	Peak limits dB ($\mu\text{V}/\text{m}$)	Average limits dB ($\mu\text{V}/\text{m}$)	RBW MHz
Above 1000	74	54	1
At transitional frequencies the lower limit applies.			

5.1.2 Test Procedure

1. The test site, test set-up and test methods were according to ANSI C63.4-2014.
2. The EUT was placed on a non-metallic table 0.8m above the reference ground plane. The table was rotated 360 degrees to determine the position of the highest radiation.
3. The EUT was set 3m from the receiving antenna, which was mounted on a variable height antenna tower. The height range of tower was 1m to 4m.
4. A preliminary scan and a final scan of the emissions were made by using test script of software; The emissions were measured using quasi-peak detector (30M~1000MHz) and PK/AV detector (above 1GHz).
5. The maximal emission was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup.
6. The EUT was configured in the typical operating mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported for frequency range below 1GHz.
8. If emission level of the EUT in Peak measurement mode is 20dB lower than Peak limit line (that means the emission level in Peak measurement mode complies with both Peak and Average limit lines), then only Peak measurement result is reported. Otherwise, emissions in Average measurement mode shall be measured and reported above 1GHz.

5.1.3 Test Set-up

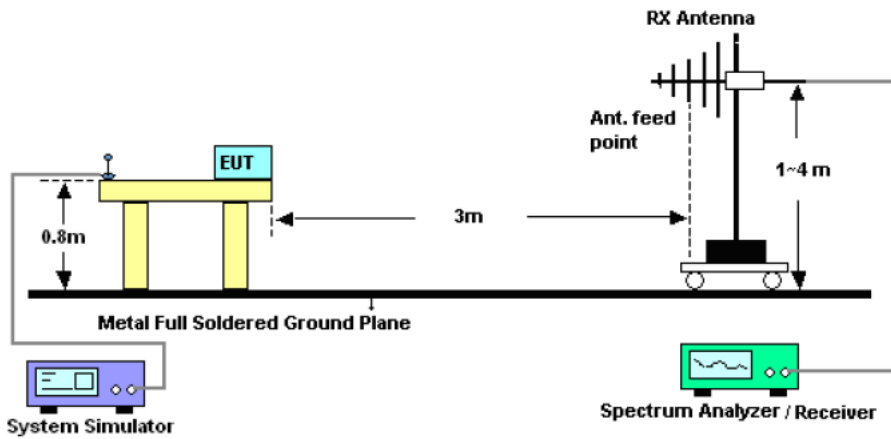


Figure.1 Test set-up of radiated emissions (30MHz~1000MHz)

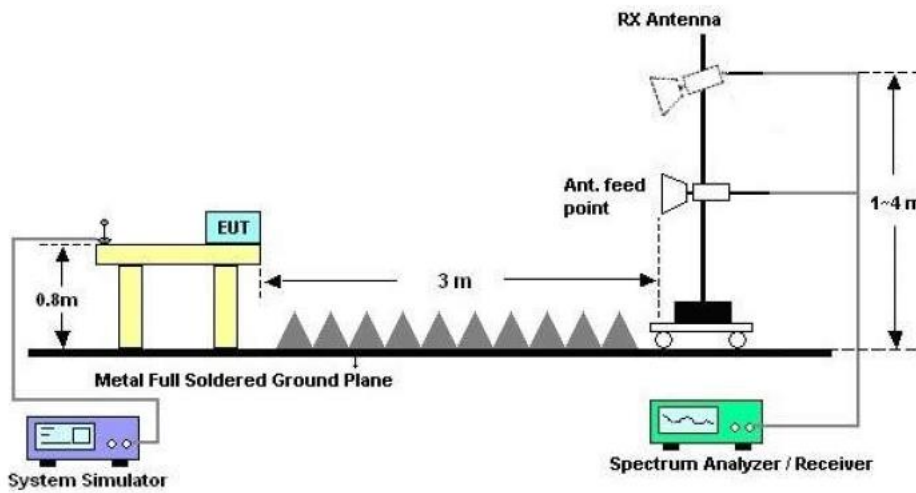


Figure.2 Test set-up of radiated emissions (above 1GHz)

5.1.4 Test Results

The EUT has met the requirements for Radiated Emissions.

Test data refer to the section 8.1 of this report.

Only the worst test result was shown in this report.

5.2 Conducted Emissions

5.2.1 Limit

Frequency range MHz	Class B Limits dB (μV)		RBW kHz
	Quasi-peak	Average	
0.15 to 0.50	66 to 56	56 to 46	9
0.50 to 5	56	46	9
5 to 30	60	50	9

NOTE 1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

NOTE 2: The lower limit is applicable at the transition frequency.

5.2.2 Test Procedure

1. The test site, test set-up and test methods were according to ANSI C63.4-2014.
2. The EUT was placed on a non-metallic table 0.8m above the reference ground plane.
3. The EUT was connected to LISN and LISN was connected to the reference ground plane. EUT was 80cm away from LISN.
4. A preliminary scan and a final scan of the emissions were made by using test script of software; the emissions were measured using quasi-peak and average detector.
5. Conducted Emission at AC port measurements were undertaken on the L and N lines.
6. The EUT was configured in the typical operating mode.

5.2.3 Test Set-up

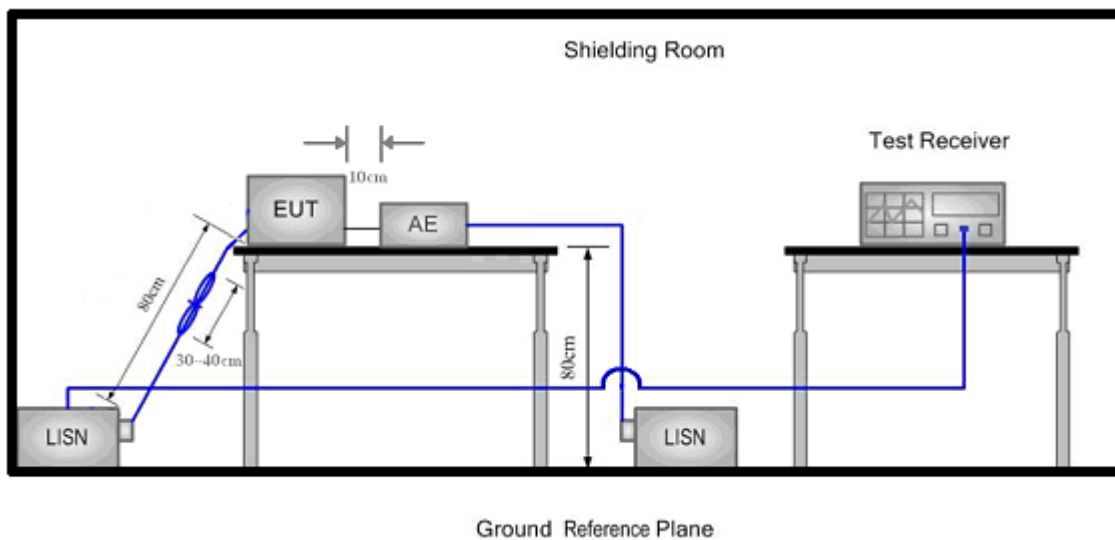


Figure.3 Test set-up of conducted emissions

5.2.4 Test Results

The EUT has met the requirements for Conducted Emissions. Test data refer to the section 8.2 of this report. Only the worst test result was shown in this report.

6. Test Equipment And Software

Main Test Equipments						
Test items	Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration interval (year)
RE	Double Ridged Horde Antenna	R&S	HF907	100545	2022/02/23	3
	Log-per.-Antenna	R&S	VULB9163	630	2022/02/22	2
	broadband Antenna	R&S	QWH-SL-18-40-K-SG	12004	2022/01/20	3
	EMI Test Receiver (30M~1GHz)	R&S	ESR7	101188	2023/07/14	1
	Signal Analyzer (Above 1GHz)	R&S	FSV40	100956	2023/11/17	1
CE	LISN	R&S	ENV216	101223	2023/07/14	1
	EMI Test Receiver	R&S	ESR7	101188	2023/07/14	1
Software Information						
Test Item	Software Name			Version		
RE	EMC32			V 10.40.10		
CE	EMC32			V 10.40.10		

7. System Measurement Uncertainty

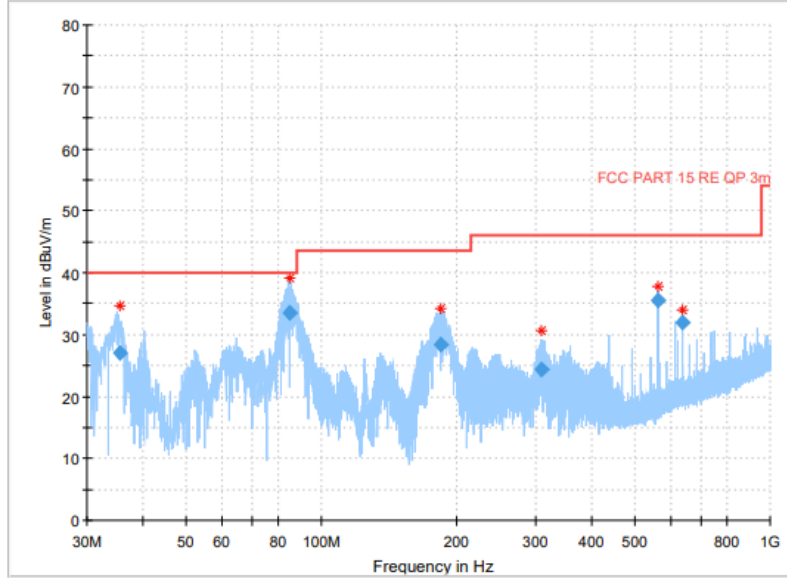
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Measurement Uncertainty		
Items	Extended Uncertainty	
RE(30MHz~1GHz)	Field strength(dB μ V/m)	U=5.8dB; k=2
RE(1GHz~18GHz)	Field strength(dB μ V/m)	U=4.9dB; k=2
RE(18GHz-40GHz)	Field strength(dB μ V/m)	U=5.1dB; k=2
CE(150kHz~30MHz)	Voltage(dB μ V)	U=3.3dB; k=2

8. Test Data

8.1 Radiated Emissions

30MHz~1GHz



Final Result

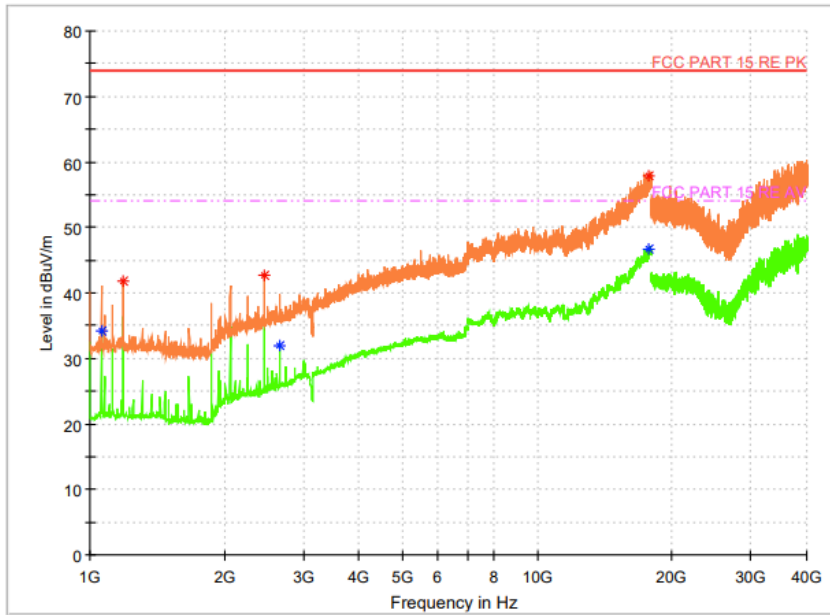
Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
35.439550	26.96	40.00	13.04	120.000	V	226.0	12.6
84.731850	33.52	40.00	6.48	120.000	V	315.0	9.5
184.029150	28.37	43.50	15.13	120.000	H	58.0	11.1
309.782950	24.37	46.00	21.63	120.000	H	74.0	15.4
562.540500	35.54	46.00	10.46	120.000	V	136.0	20.6
638.212950	32.05	46.00	13.95	120.000	V	13.0	22.0

Note:

Level = Reading level by receiver + Corr. (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

1GHz~40GHz



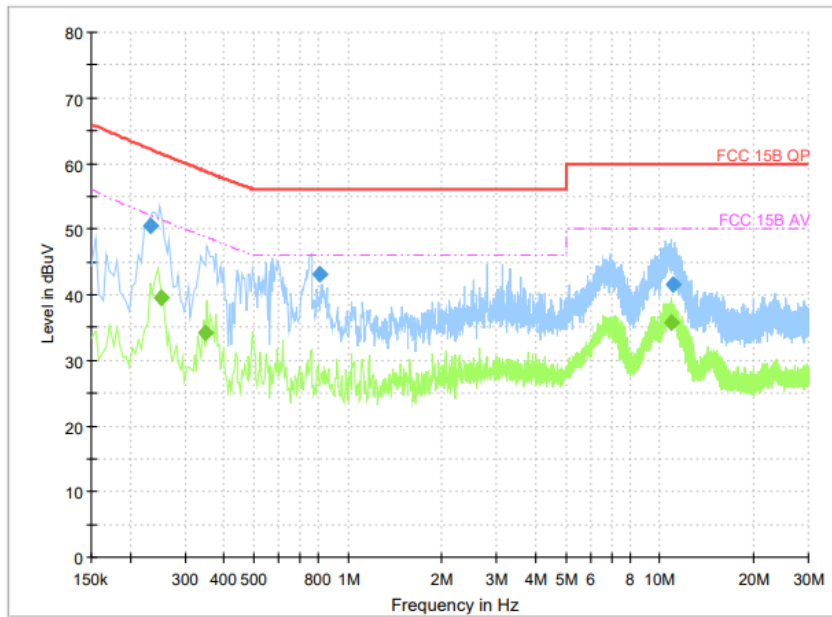
Critical Freqs

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
1061.200000	---	34.21	54.00	19.79	---	V	180.0	-14.3
1187.000000	41.70	---	74.00	32.30	---	H	45.0	-14.2
2453.500000	42.60	---	74.00	31.40	---	H	45.0	-8.3
2650.700000	---	32.04	54.00	21.96	---	V	225.0	-7.6
17790.900000	---	46.74	54.00	7.26	---	V	315.0	14.2
17811.300000	57.92	---	74.00	16.08	---	V	0.0	14.2

Level = Reading level by receiver + Corr. (Antenna factor + cable loss – preamplifier gain)
 The reading level is calculated by software which is not shown in the sheet.

8.2 Conducted Emissions

AC Port Test Data



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.231500	50.51	---	62.21	11.70	9.000	L1	ON	9.9
0.250977	---	39.46	51.48	12.02	9.000	L1	ON	9.9
0.347523	---	34.09	48.82	14.73	9.000	L1	ON	9.9
0.815091	43.06	---	56.00	12.94	9.000	N	ON	9.8
10.841296	---	35.86	50.00	14.14	9.000	L1	ON	10.2
11.055091	41.65	---	60.00	18.35	9.000	L1	ON	10.2

Note:

Level = Reading level by receiver + Corr. (cable loss+ insertion loss)

The reading level is calculated by software which is not shown in the sheet.