

No. 23ADRTCC5006

FCC EMC 检测报告

FCC EMC TEST REPORT

样品名称

Name of Sample: Mobile Cellular Phone

样品型号

Model of Sample: XT2323-1

样品 FCC ID

FCC ID of Sample: IHDT56AL8

送检单位

Examinee: Motorola Mobility LLC

报告日期

Date: 2023-05-15



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Motorola Mobility LLC, a Lenovo Company

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样品名称 Name of sample	Mobile Cellular Phone	商 标 Trademark	Motorola
型 号 Model	XT2323-1	FCC ID	IHDT56AL8
客户名称地址 Name and address of client	Motorola Mobility LLC 222 W, Merchandise Mart Plaza, Chicago IL 60654 USA	送样日期 Delivering date	2023-04-06
实验室名称地址 Name and address of Laboratory	ADR TEST AND CERTIFICATION CENTER No. 19, Gao Xin 4th Road Wuhan	检测日期 Inspection date	2023-04-23 to 2023-05-15
申请单编号 Requisition No.	RF163469	样品编号 Sample No.	SN: NUZR220027
样品说明 Sample illustration	None		
检测依据 Inspection reference	47 CFR FCC PART 15 Subpart B ANSI C63.4-2014		
检 测 结 论 Conclusion	PASS		
备注 Remarks	None		

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REVISION HISTORY

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1. Information Of Equipment Under Test(EUT)

Product Name:		Mobile Cellular Phone
Brand Name:		Motorola
Model Name:		XT2323-1
FCC ID:		IHDT56AL8
Software Version:		T2TV33.19
Hardware Version:		DVT2
IMEI Code:		Conduction: 350492020026618/350492020026626 for Sample1 Radiation: 350492020026618/350492020026626 for Sample1
Supports Radio application in this standard:		
GSM/WCDMA/LTE/5G NR/WLAN/BLEETOOTH/GNSS/NFC/WPT		
Accessory		
Product	Brand	model
AC Adapter 1(US)	Motorola (Acbel)	MC-331
AC Adapter 1(EU)	Motorola (Acbel)	MC-332
AC Adapter 1(UK)	Motorola (Acbel)	MC-333
AC Adapter 2(US)	Motorola (Chenyang)	MC-331
AC Adapter 2(EU)	Motorola (Chenyang)	MC-332
AC Adapter 2(AU)	Motorola (Chenyang)	MC-335
AC Adapter 2(AR)	Motorola (Chenyang)	MC-336
AC Adapter 2(BR)	Motorola (Chenyang)	MC-337
AC Adapter 3(US)	Motorola (Salcomp)	MC-331
AC Adapter 3(EU)	Motorola (Salcomp)	MC-332
AC Adapter 3(UK)	Motorola (Salcomp)	MC-333
AC Adapter 3(IN)	Motorola (Salcomp)	MC-334
AC Adapter 3(AU)	Motorola (Salcomp)	MC-335
AC Adapter 3(AR)	Motorola (Salcomp)	MC-336
AC Adapter 3(BR)	Motorola (Salcomp)	MC-337
AC Adapter 3(CHILE)	Motorola (Salcomp)	MC-339
AC Adapter 3(KR)	Motorola (Salcomp)	MC-330
AC Adapter 4(BR)	Motorola (Cliptech)	MC-337
Base Battery	Motorola (ATL)	PM29
Flip Battery	Motorola (ATL)	PV11
Earphone 1	Motorola(Lyand)	MD211(SH38D20195)
Earphone 2	Motorola(LCHSE)	MD211(SH38D41948)
USB Cable 1	Motorola (Saibao)	SC18D22297
USB Cable 2	Motorola(Cabletech)	SC18D22298

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USB Cable 3	Motorola (Luxshare)	SC18D22299
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Remark:

1. The EUT's information was declared by manufacturer. Please refer to the manufacturer's specifications or user's manual for more detailed description.

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2. Details Of Test

2.1 Applicant

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

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

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3. Result Summary

Test Items	Test Standard	Limit	Result (PASS/FAIL)	Site
Radiated emissions	ANSI C63.4-2014	15.107 Class B	PASS	Site 1
Conducted emissions	ANSI C63.4-2014	15.109 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	21~23	39~41	101	Apr. 23, 2023 ~ May. 15, 2023	Liu ren cong
Conducted emissions	21~23	39~41	101	Apr. 23, 2023 ~ May. 15, 2023	Liu ren cong

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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 Cable1(Charging from Adapter1) + open folding screen + SIM 1 for Sample 1
	Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN(2.4G) Idle + Camera(Rear) + USB Cable 2(Charging from Adapter1) + open folding screen + SIM 1 for Sample 1
	Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G) Idle + Battery + USB Cable2(Charging from Adapter2) + Closed folding screen + SIM 2 for Sample 1
	Mode 4: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G) Idle + NFC On + Battery+ USB Cable3(Charging from Adapter3) + open folding screen + SIM 2 for Sample 1
	Mode 5: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G) Idle + MPEG4(Run Color Bar)+ Battery + Earphone1 + open folding screen + SIM 2 for Sample 1
	Mode 6: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G) Idle + GNSS Rx + USB Cable1(Data Link with Notebook) + EUT(eMMC)USB Data Link to NB + Battery + open folding screen + SIM 2 for Sample 1
	Mode 7: LTE Band 26 Idle + Bluetooth Idle + WLAN(5G) Idle + Camera(Front) + Battery+ USB Cable2(Data Link with Notebook) + NB USB Data Link to EUT(eMMC)+ open folding screen+ SIM 2 for Sample 1
	Mode 8: n5 Idle + Bluetooth Idle + WLAN(2.4G) Idle + Camera(Rear) + Battery + USB Cable3(EUT Charging from Wireless charger) + open folding screen + Adapter3 Connect to Wireless charger for Sample 1
	Mode 9: WCDMA Band V Idle+ Bluetooth Idle + WLAN(5G) Idle + Camera(Front)+ Battery + USB Cable2(Charging from Adapter 2) + open folding screen+ eSIM for Sample 1
	Mode 10: GSM850 Idle + Bluetooth Idle + WLAN(5G) Idle + Camera(Rear)+ Battery + Earphone2 + open folding screen + SIM 2 for Sample 1
	Mode 11: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G) Idle + NFC On + Battery+ USB Cable3(Charging from Adapter4) + open folding screen + SIM 2 for Sample 1
	Mode 1: GSM 850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Battery + USB Cable1(Charging from Adapter1) + open folding screen + SIM 1 for Sample 1
	Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN(2.4G) Idle + Camera(Rear) + USB Cable 2(Charging from Adapter1) + open folding screen + SIM 1 for

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AC Conducted Emission	Sample 1
	Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G) Idle + Battery + USB Cable2(Charging from Adapter2) + Closed folding screen + SIM 2 for Sample 1
	Mode 4 : LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G) Idle + NFC On + Battery+ USB Cable3(Charging from Adapter3) + open folding screen + SIM 1 for Sample 1
	Mode 5: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G) Idle + MPEG4(Run Color Bar) + Battery + USB Cable1(Charging from Adapter1) + open folding screen + SIM 1 for Sample 1
	Mode 6: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G) Idle + GNSS Rx+ USB Cable1(Data Link with Notebook) + EUT(eMMC)USB Data Link to NB + Battery + open folding screen + SIM 1 for Sample 1
	Mode 7: LTE Band 26 Idle + Bluetooth Idle + WLAN(5G) Idle + Camera(Rear) + Battery + USB Cable2(Data Link with Notebook) + NB USB Data Link to EUT(eMMC) + open folding screen + SIM 1 for Sample 1
	Mode 8: n5 Idle + Bluetooth Idle + WLAN(2.4G) Idle + Camera(Rear) + Battery + USB Cable3(EUT Charging from Wireless charger) + open folding screen + Adapter3 Connect to Wireless charger for Sample 1
	Mode 9: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G) Idle + Camera(Front) + Battery + USB Cable2(Charging from Adapter2) + open folding screen + SIM 1 for Sample 1
	Mode 10: n5 Idle + Bluetooth Idle + WLAN(2.4G) Idle + Camera(Rear) + Battery + USB Cable3(Charging from Adapter4) + open folding screen + Adapter3 Connect to Wireless charger for Sample 1

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	8

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

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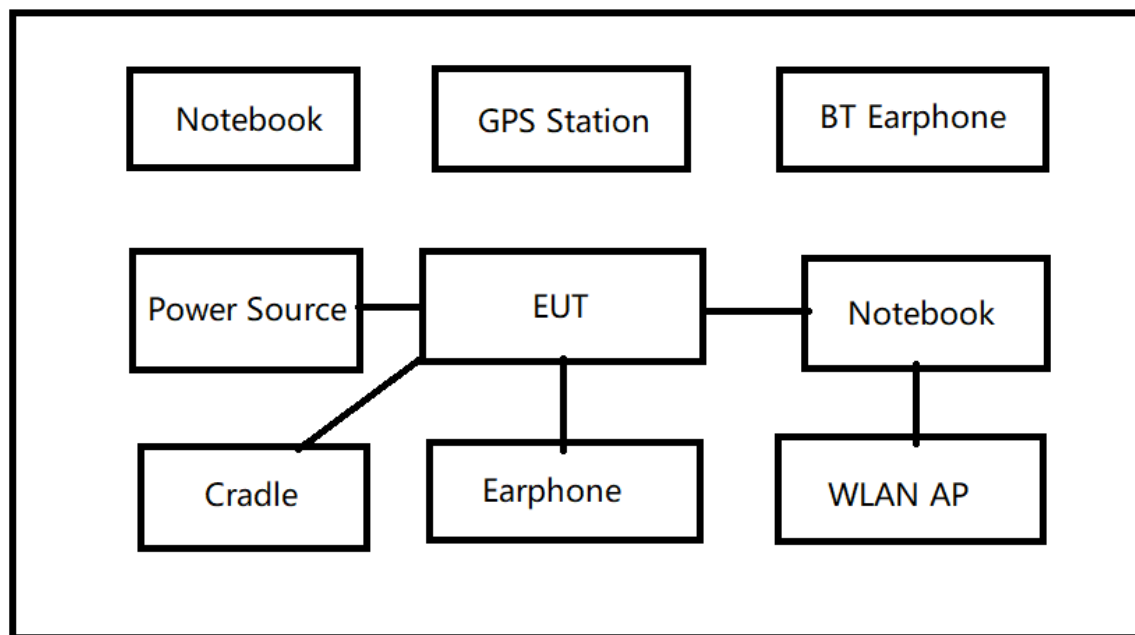
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4.2 Configuration Of Test System



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	SOA/Y	NA
Bluetooth Earphone	Earbuds X2	COSONIC	NA
SD Card	128 PRO Plus	Samsung	NA
U disk	L7C	Lenovo	NA
Wireless charger	MW-03	Moto 15W	SA18D71288

5. Test Result

5.1 Radiated Emissions

5.1.1 Limit

Frequency range MHz	Quasi-peak limits dB (μV/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 (μV/m)	Average limits dB (μV/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.

5.1.3 Test Set-up

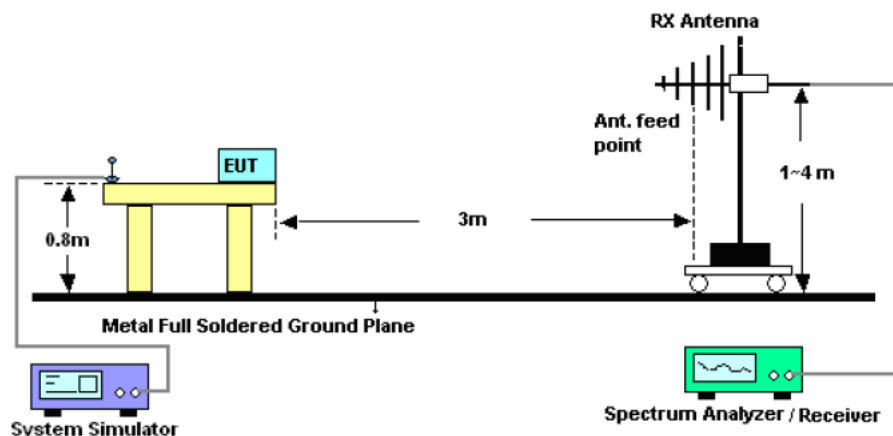


Figure.1 Test set-up of radiated emissions (30MHz~1000MHz)

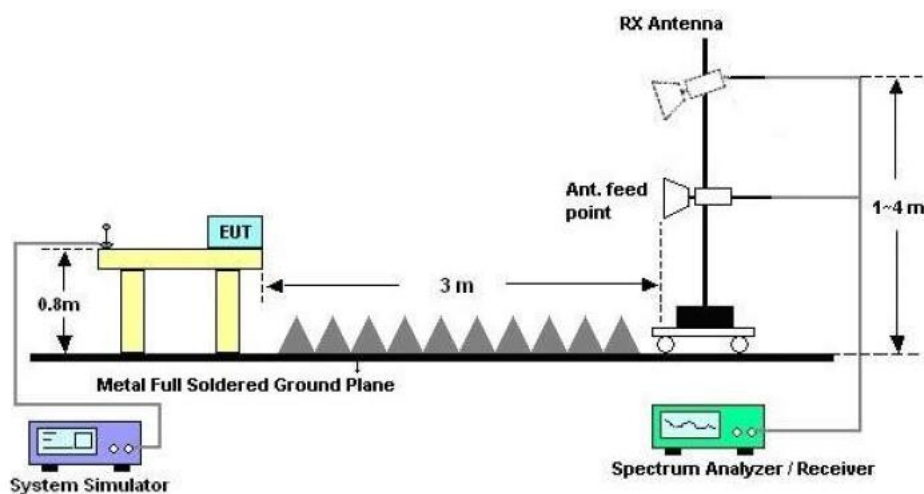


Figure.2 Test set-up of radiated emissions (above 1GHz)

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

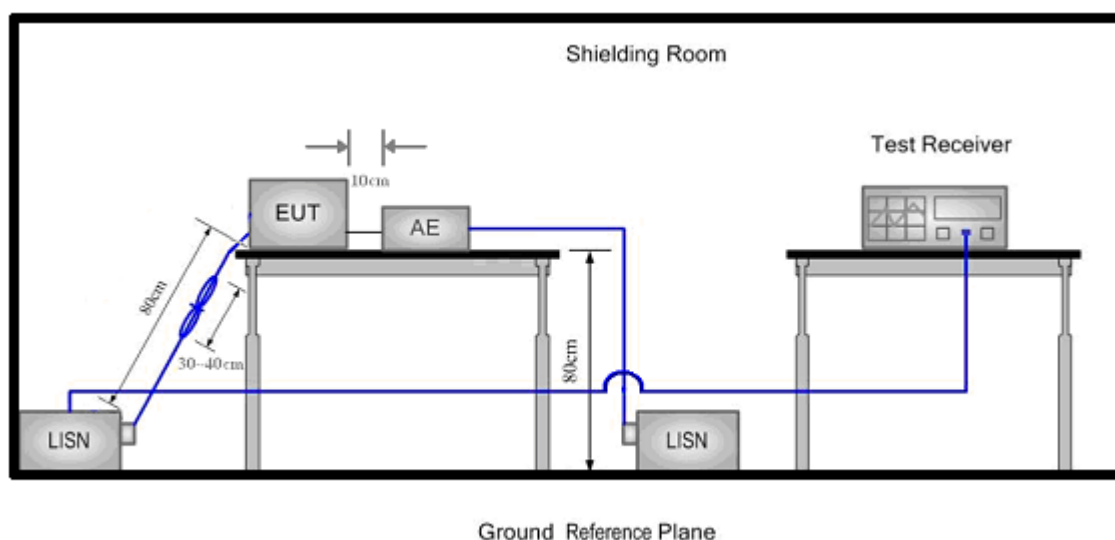


Figure.3 Test set-up of conducted emissions

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.

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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	2022/08/29	1
	Signal Analyzer (Above 1GHz)	R&S	FSV40	100956	2022/12/26	1
CE	LISN	R&S	ENV216	101223	2022/12/26	1
	EMI Test Receiver	R&S	ESR7	101188	2022/08/29	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

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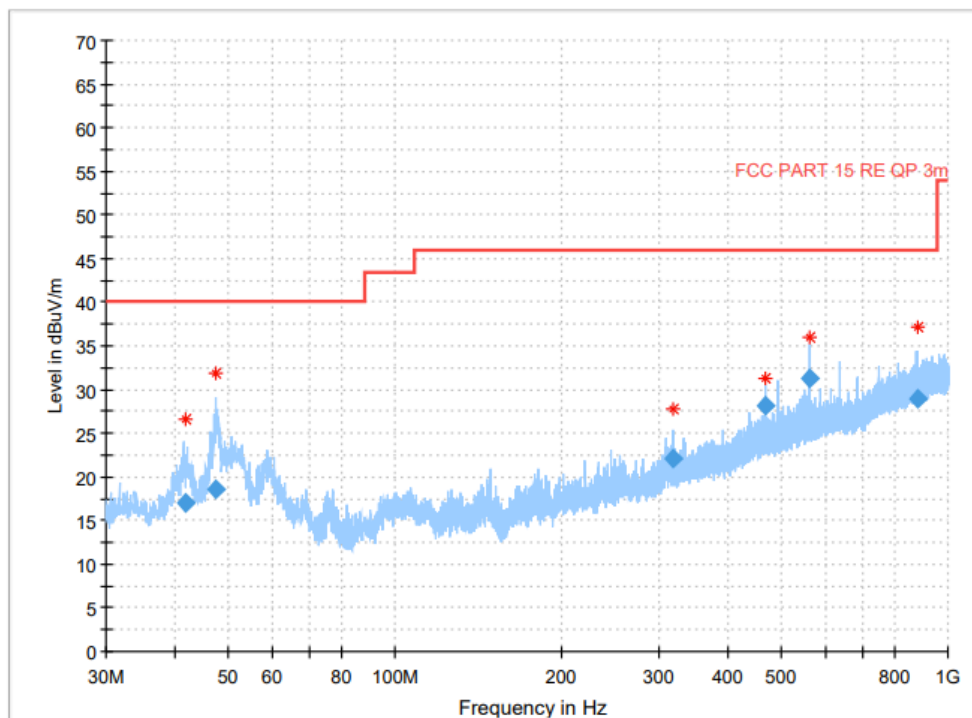
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8. Test Data

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)
41.711812	16.95	40.00	23.05	120.000	V	45.0	19.4
47.351508	18.59	40.00	21.41	120.000	V	225.0	20.2
319.094870	22.11	47.00	24.89	120.000	V	90.0	21.5
466.335509	28.20	47.00	18.80	120.000	H	0.0	24.3
562.550944	31.28	47.00	15.72	120.000	V	315.0	26.1
883.636065	29.01	47.00	17.99	120.000	V	45.0	30.4

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.

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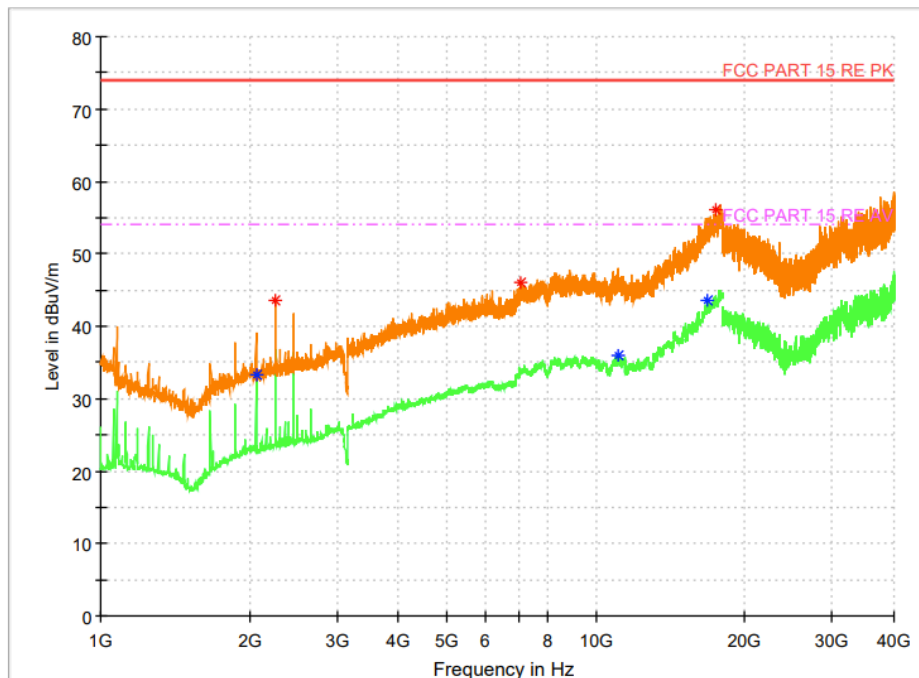
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1GHz~40GHz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
2060.800000	---	33.30	54.00	20.70	---	V	225.0	-9.5
2258.000000	43.47	---	74.00	30.53	---	V	315.0	-9.0
7040.100000	46.04	---	74.00	27.96	---	V	135.0	1.7
11132.000000	---	35.87	54.00	18.13	---	H	45.0	3.8
16772.600000	---	43.56	54.00	10.44	---	H	0.0	11.8
17415.200000	55.99	---	74.00	18.01	---	V	180.0	13.3

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.

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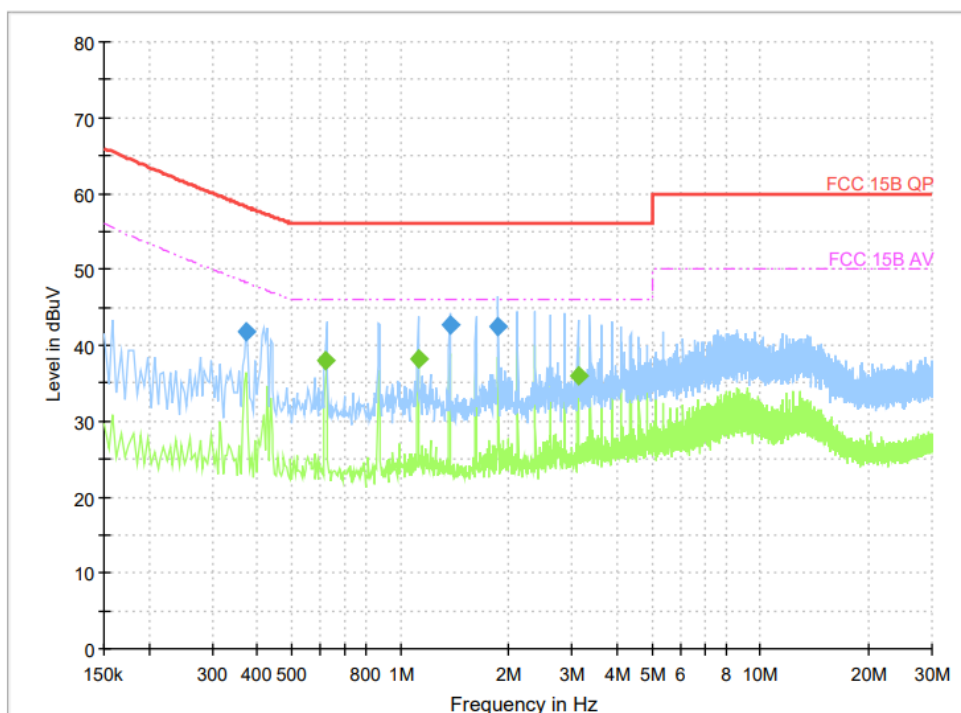
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8.2 Conducted Emissions

AC Port Test Data



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.372552	41.90	---	58.29	16.40	9.000	L1	ON	9.8
0.622088	---	37.90	46.00	8.10	9.000	L1	ON	9.8
1.122125	---	38.12	46.00	7.88	9.000	L1	ON	9.8
1.372338	42.75	---	56.00	13.25	9.000	L1	ON	9.8
1.872375	42.42	---	56.00	13.58	9.000	L1	ON	9.8
3.115052	---	36.03	46.00	9.97	9.000	L1	ON	9.8

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.