

FCC EMC TEST REPORT

Name of Sample: Mobile Cellular Phone
Model of Sample: XT2307-1
Applicant: Motorola Mobility LLC
Issued Date: 2023-08-08



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	IHDT56AM7
Applicant No.	RF165830	Sample No.	SN: NNSR240364 SN: NNSA230146
Delivering Date	2023-06-17	Test Date(s)	2023-06-19 to 2023-07-05
Sample Illustration	None		
Standard	47 CFR FCC PART 15 Subpart B ANSI C63.4-2014		
Conclusion	PASS		
Remarks	None		

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
23ADRTCC50018	Rev. 01	Initial issue of report	2023-07-25
23ADRTCC50018	Rev. 02	Add variant information	2023-08-08

1. Information Of Equipment Under Test(EUT)

Product Name:		Mobile Cellular Phone
Brand Name:		Motorola
Model Name:		XT2307-1
FCC ID:		IHDT56AM7
Software Version:		T3TM33.3
Hardware Version:		DVT2
IMEI Code:		Conduction: 353852880033334/353852880033342 for Sample1 359632920010250/359632920010268 for Sample2 Radiation: 353852880033334/353852880033342 for Sample1 359632920010250/359632920010268 for Sample2
Supports Radio application in this standard:		
GSM/WCDMA/LTE/5G NR/WLAN/BLEETOOTH/GNSS/NFC		
Accessory		
Product	Brand	model
AC Adapter 1(US)	Motorola (Acbel)	MC-681N
AC Adapter 1(EU)	Motorola (Acbel)	MC-682N
AC Adapter 1(UK)	Motorola (Acbel)	MC-683N
AC Adapter 1(AU)	Motorola (Acbel)	MC-685N
AC Adapter 1(AR)	Motorola (Acbel)	MC-686N
AC Adapter 1(BR)	Motorola (Acbel)	MC-687N
AC Adapter 2(US)	Motorola (Chenyang)	MC-681N
AC Adapter 2(EU)	Motorola (Chenyang)	MC-682N
AC Adapter 2(UK)	Motorola (Chenyang)	MC-683N
AC Adapter 2(AU)	Motorola (Chenyang)	MC-685N
AC Adapter 2(AR)	Motorola (Chenyang)	MC-686N
AC Adapter 2(BR)	Motorola (Chenyang)	MC-687N
AC Adapter 2(CHILE)	Motorola (Chenyang)	MC-689N
AC Adapter 2(KR)	Motorola (Chenyang)	MC-680N
Base Battery	Motorola (SUNWODA)	QM50
Base Battery	Motorola (CosMX)	QM50
Earphone 1	Motorola(Lyand)	MI181C(SH38D62338)
USB Cable 1	Motorola (Saibao)	SC18D71644
USB Cable 2	Motorola (Saibao)	SC18D86731

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.
2. This is a report for the original (sample 1) and variant (sample 2) of XT2323-1. The specific differences could be referred to the Operational Description of Product Equality Declaration which is exhibit separately. According to the difference, the original (sample 1) perform full test and variant (sample 2) verify the worst case.

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	24~26	52~55	100	Jun. 19, 2023 ~ July. 5, 2023	Liu ren cong
Conducted emissions	24~26	52~55	100	Jun. 19, 2023 ~ July. 5, 2023	Cao man

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	<p>Mode1: GSM 850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Battery + USB Cable1(Charging from Adapter1) + SIM 1 for Sample 1</p> <p>Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + Camera(Rear) + USB Cable 2(Charging from Adapter2) + SIM 1 for Sample 1</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle + Battery + USB Cable1(Charging from Adapter1) + SIM 2 for Sample 1</p> <p>Mode 4: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable1(Charging from Adapter2) + SIM 2 for Sample 1</p> <p>Mode 5: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + MPEG4(RunColor Bar) + Battery + Earphone 1 + SIM 2 for Sample 1</p> <p>Mode 6: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G)Idle + GNSS Rx + USBCable1(Data Link with Notebook) + EUT(eMMC)USB Data Link to NB + Battery + SIM 2 for Sample 1</p> <p>Mode 7: LTE Band 26 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front) + Battery + USB Cable2(Data Link with Notebook) + NB USB Data Link toEUT(eMMC) + SIM 2 for Sample 1</p> <p>Mode 8: n5 Idle + Bluetooth Idle + WLAN(2.4G)Idle + Camera(Rear) + Battery + USB Cable2(Charging from Adapter1) + SIM1 for Sample 1</p> <p>Mode 9: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front)+ Battery + USB Cable1(Charging from Adapter 2) + SIM 1 for Sample 1</p> <p>Mode 10: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front)+ Battery + USB Cable1(Charging from Adapter 2) + SIM 1 for Sample 2</p>
AC Conducted Emission	<p>Mode1: GSM 850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Battery + USB Cable1(Charging from Adapter1) + SIM 1 for Sample 1</p> <p>Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + Camera(Rear) + USB Cable 1(Charging fromAdapter2) + SIM 1 for Sample 1</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle + Battery + USB Cable2(Charging from Adapter2) + SIM 2 for Sample 1</p> <p>Mode 4: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable1(Charging from Adapter1) + SIM 1 for Sample 1</p> <p>Mode 5: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + MPEG4(RunColor Bar) + Battery + USB Cable1(Charging from Adapter2) + SIM 1 for Sample 1</p> <p>Mode 6: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G)Idle + GNSS Rx + USBCable1(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 Cable2(Data Link with Notebook) + NB USB Data Link toEUT(eMMC) + SIM 1 for Sample 1</p> <p>Mode 8: n5 Idle + Bluetooth Idle + WLAN(2.4G)Idle + Camera(Rear) + Battery + USB Cable1(Charging from Adapter1) + for Sample 1</p> <p>Mode 9: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front)+</p>

	Battery + USB Cable2(Charging from Adapter2) + SIM 1 for Sample 1 Mode 10: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable1(Charging from Adapter1) + SIM 1 for Sample 2
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Remark:

1. If there is over one kind of accessories, each one should be applied in 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:

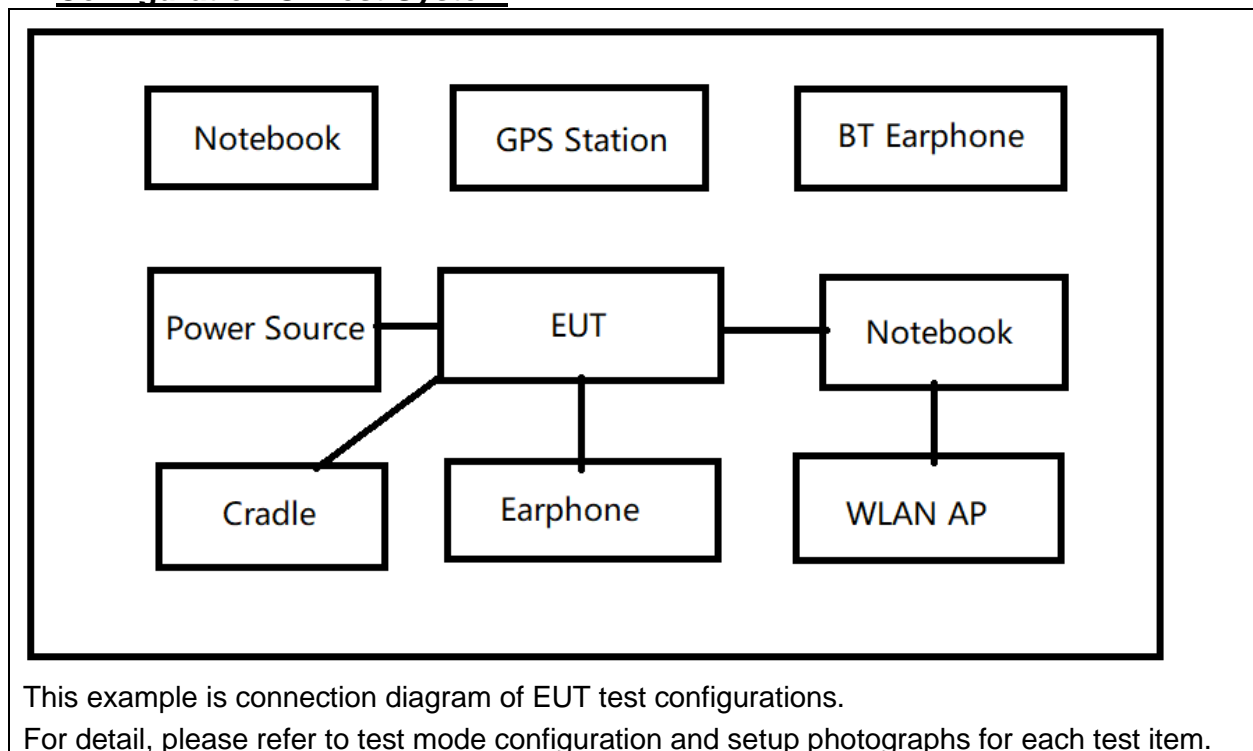
When the EUT state is switch on but without Radio Resource Control (RRC) connection.

Worst mode of all test items listed in section 4.1

Test items	Worst mode
Radiated Emission	9
Conducted Emission	4

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

4.2 Configuration Of Test System



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

5. Test Result

5.1 Radiated Emissions

5.1.1 Limit

Frequency range MHz	Quasi-peak limits dB (μ V/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 (μ V/m)	Average limits dB (μ V/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

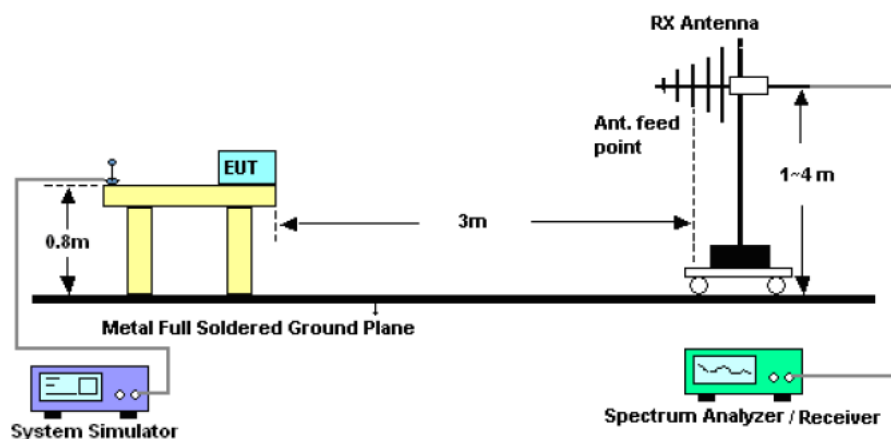


Figure.1 Test set-up of radiated emissions (30MHz~1000MHz)

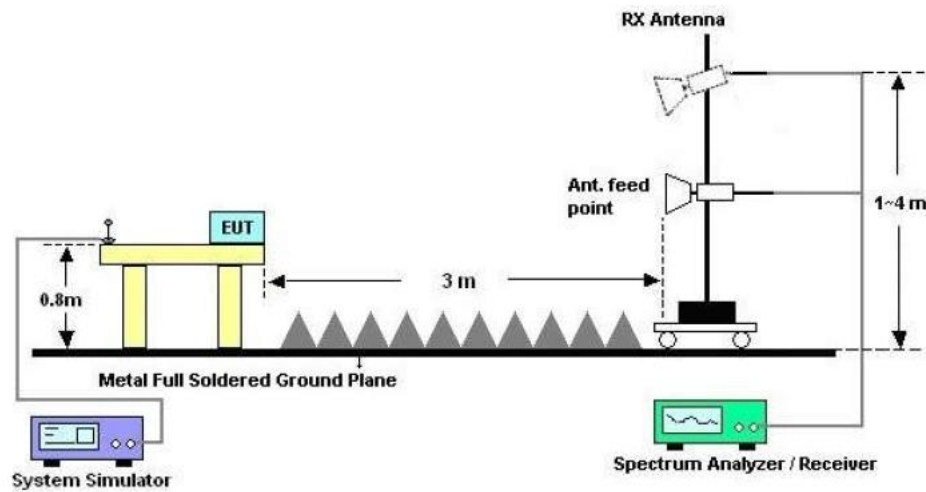


Figure.2 Test set-up of radiated emissions (above 1GHz)

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 (μ V)		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

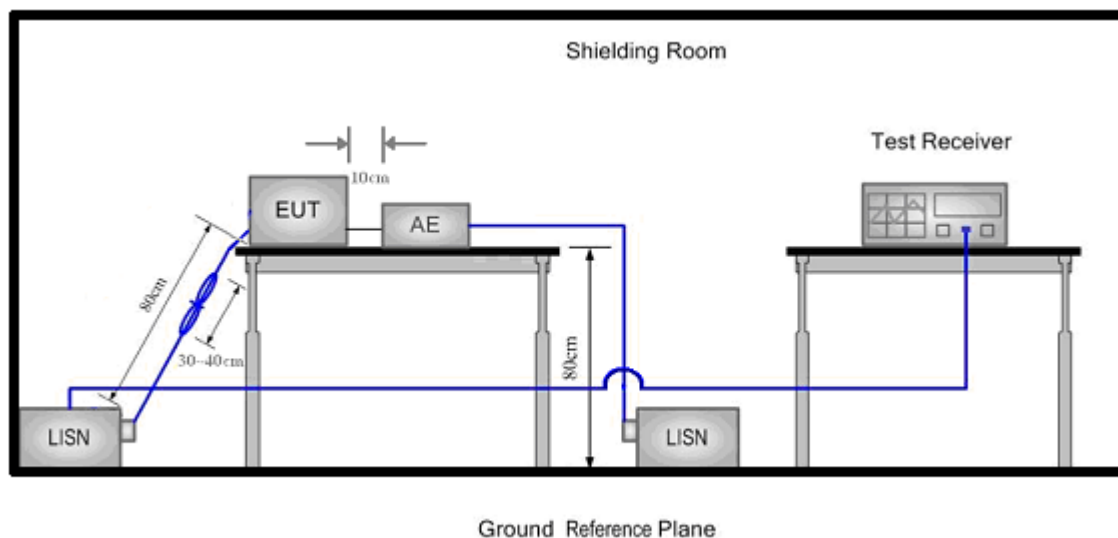


Figure.3 Test set-up of conducted emissions

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	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

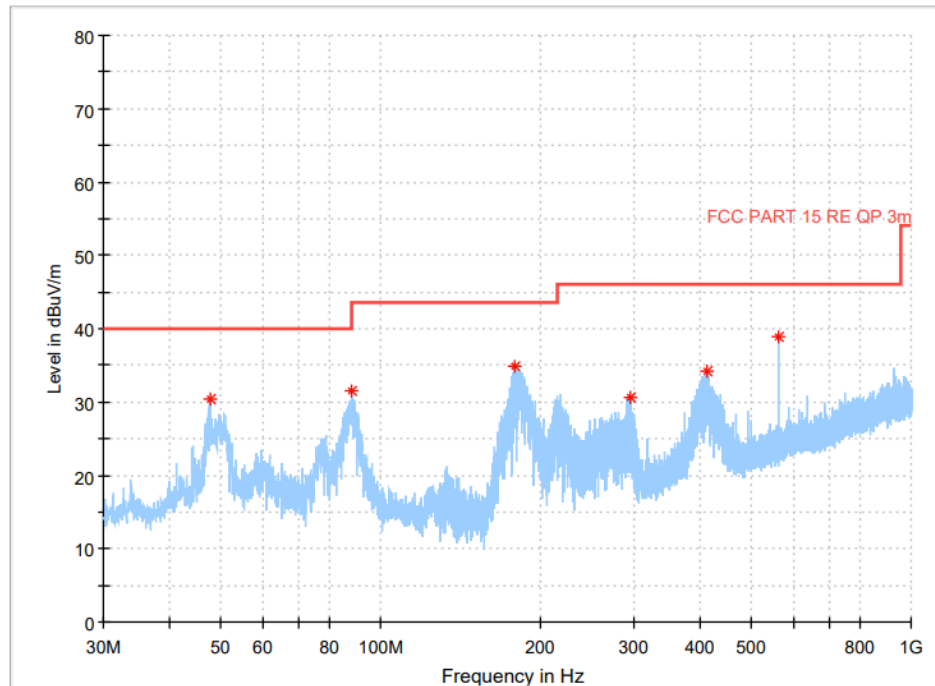
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

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

8. Test Data

8.1 Radiated Emissions

30MHz~1GHz



Critical Freqs

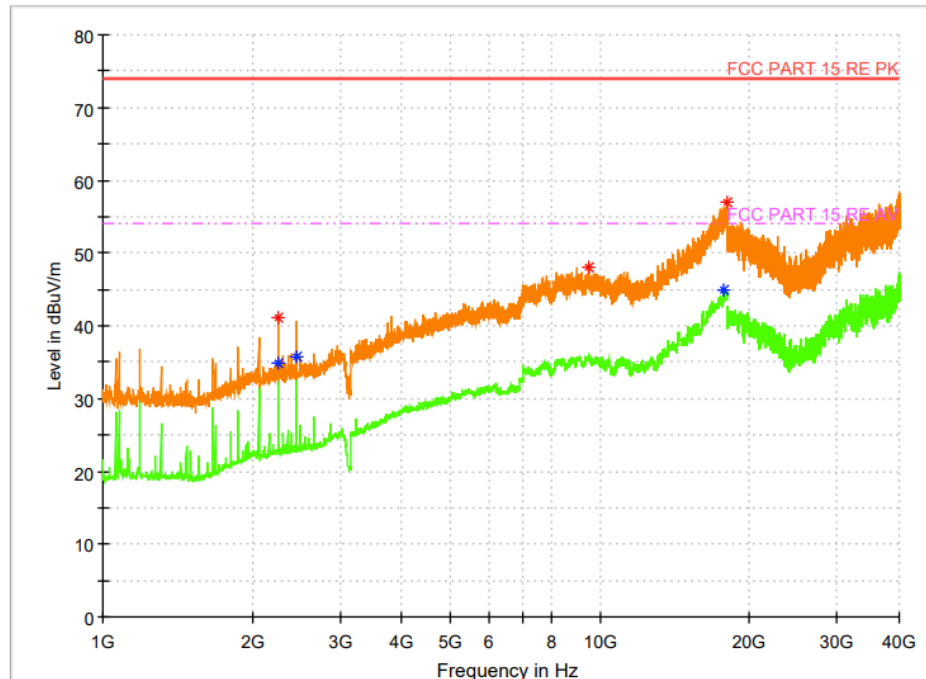
Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
47.605500	30.48	40.00	9.52	---	V	0.0	20.2
88.200000	31.49	43.50	12.01	---	V	45.0	15.7
178.507000	34.82	43.50	8.68	---	H	90.0	16.3
294.810000	30.70	46.00	15.30	---	H	90.0	20.6
412.568000	34.13	46.00	11.87	---	V	315.0	23.3
562.530000	38.80	46.00	7.20	---	V	45.0	26.1

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

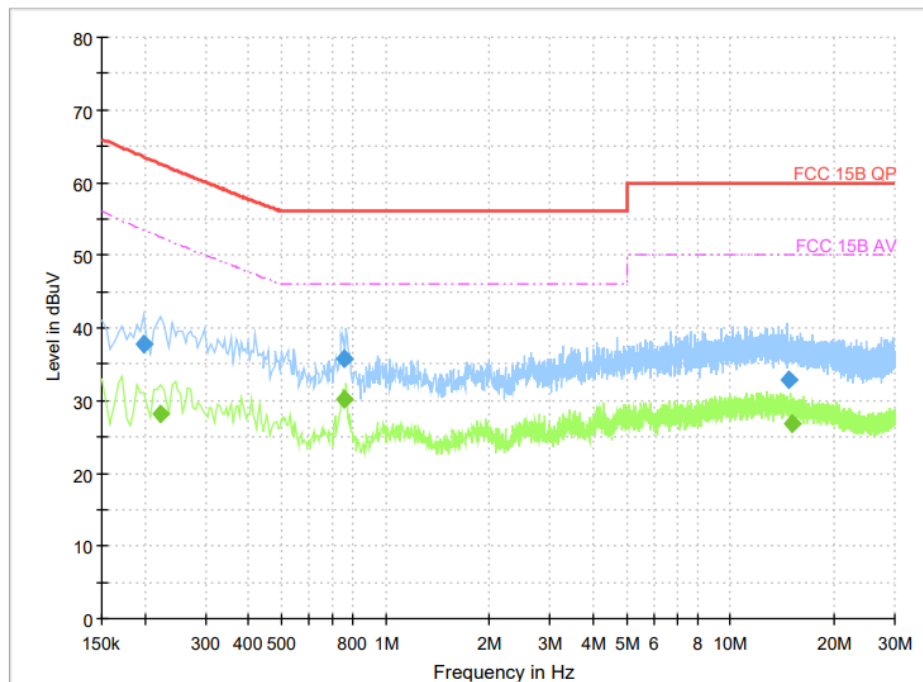
Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
2258.000000	41.22	---	74.00	32.78	---	V	315.0	-9.0
2258.000000	---	34.77	54.00	19.23	---	V	0.0	-9.0
2453.500000	---	35.78	54.00	18.22	---	H	270.0	-8.3
9513.600000	48.15	---	74.00	25.85	---	H	270.0	3.6
17796.000000	---	44.97	54.00	9.03	---	V	90.0	14.2
17954.100000	57.04	---	74.00	16.96	---	V	270.0	14.4

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)
0.198000	37.69	---	63.55	25.86	9.000	N	ON	9.7
0.222977	---	28.18	52.49	24.31	9.000	N	ON	9.8
0.759614	---	30.11	46.00	15.89	9.000	L1	ON	9.8
0.759614	35.81	---	56.00	20.19	9.000	L1	ON	9.8
14.753432	32.91	---	60.00	27.09	9.000	L1	ON	10.3
15.088114	---	26.85	50.00	23.15	9.000	L1	ON	10.3

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.