

# FCC EMC TEST REPORT

**Name of Sample:** Mobile Cellular Phone  
**Model of Sample:** XT2401-1  
**Applicant:** Motorola Mobility LLC  
**Issued Date:** 2024-04-02



**ADR TEST AND CERTIFICATION CENTER**

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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	IHDT56AQ7
Applicant No.	RF174531 RF175552	Sample No.	SN: N4VR230551 SN: N4VR2K0163
Delivering Date	2024-02-23	Test Date(s)	2024-02-26 to 2024-03-12
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
24ADRTCC5011	Rev. 01	Initial issue of report	2024-03-04
24ADRTCC5011	Rev. 02	Added 2nd source sample test	2024-03-12
24ADRTCC5011	Rev. 03	Updated sample 2 information	2024-04-02

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**1. Information Of Equipment Under Test(EUT)**

<b>Product Name:</b>	Mobile Cellular Phone	
<b>Brand Name:</b>	Motorola	
<b>Model Name:</b>	XT2401-1	
<b>FCC ID:</b>	IHDT56AQ7	
<b>Software Version:</b>	Sample 1(UUV34.77), Sample 2 (U3UV34.17)	
<b>Hardware Version:</b>	DVT2	
<b>IMEI Code:</b>	Conduction: 357505570032471/357505570032489 for Sample 1 357505570038692/357505570038700 for Sample 2 Radiation: 357505570032471/ 357505570032489 for Sample 1 357505570038692/357505570038700 for Sample 2	
<b>Supports Radio application in this standard:</b>		
GSM/WCDMA/LTE/5G NR/WLAN/BLUETOOTH/GNSS/NFC/WPT/UWB		
<b>Accessory</b>		
<b>Product</b>	<b>Brand</b>	<b>model</b>
AC Adapter 1(US)	Motorola (Chenyang)	MC-1251
AC Adapter 1(EU)	Motorola (Chenyang)	MC-1252
AC Adapter 1(UK)	Motorola (Chenyang)	MC-1253
AC Adapter 1(AU)	Motorola (Chenyang)	MC-1255
AC Adapter 1(AR)	Motorola (Chenyang)	MC-1256
AC Adapter 1(BR)	Motorola (Chenyang)	MC-1257
AC Adapter 2(US)	Motorola (AOHAI)	MC-1251
AC Adapter 2(EU)	Motorola (AOHAI)	MC-1252
AC Adapter 2(UK)	Motorola (AOHAI)	MC-1253
AC Adapter 2(IN)	Motorola (AOHAI)	MC-1254
AC Adapter 2(AU)	Motorola (AOHAI)	MC-1255
AC Adapter 2(AR)	Motorola (AOHAI)	MC-1256
AC Adapter 2(BR)	Motorola (AOHAI)	MC-1257
AC Adapter 2(CHILE)	Motorola (AOHAI)	MC-1259
Battery	Motorola (ATL)	QV45
USB Cable 1	Motorola (Saibao)	SC18D71644
Wireless Earphones	Motorola	XT2441-1
Wireless Charging dock	TurboPower 50W Wireless Charging Stand	MW-02

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 report includes the first and second source sample. The first source sample (SN: N4VR230551, Applicant No. is RF174531) collectively referred to as sample 1, and the second source sample (SN:

N4VR2K0163, Applicant No. is RF175552) collectively referred to as sample 2.

3. There is only one type of EUT. It is XT2401-1. Details can be found in the separate Product Equality Statement. Based on the differences, we selected XT2401-1 (sample 1) for full testing, and XT2401-1 (sample 2) to verify the differences.

## 2. Details Of Test

### 2.1 Applicant

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

### 2.2 Location of Test

<b>Test Site 1:</b>	ADR TEST AND CERTIFICATION CENTER
<b>Address:</b>	NO.19, Gao Xin 4 <sup>th</sup> 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	23~25	35~40	/	Feb.26,2024~ Mar.12-2024	Man Cao Mingzhu Li Rencong Liu Chuanghui Xiao
Conducted emissions	23~25	35~41	/	Feb.26,2024~ Mar.12-2024	Mingzhu Li Chuanghui 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	<p>Mode 1: GSM 850 Idle + Bluetooth earphone link + WLAN (2.4G) Idle + Camera (Rear) + Battery + USB Cable1(Charging from Adapter1) + UWB + SIM for Sample 1</p> <p>Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + Camera (Rear) + Battery + USB Cable 1(Charging fromAdapter2) + E-SIM for Sample 1</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth earphone link + WLAN(5G)Idle + Battery + USB Cable1(Charging from Adapter1) + SIM 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 for Sample 1</p> <p>Mode 5: LTE Band 12 Idle + Bluetooth Earphone link + WLAN(5G)Idle + MPEG4 (Run Color Bar) + USB Cable1(Charging from Adapter1) + Battery + SIM for Sample 1</p> <p>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 + SIM for Sample 1</p> <p>Mode 7: LTE Band 26 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front) + Battery + USB Cable1(Data Link with Notebook) + NB USB Data Link to EUT(eMMC) + SIM for Sample 1</p> <p>Mode 8: n5 Idle + Bluetooth earphone link + WLAN(2.4G)Idle + Camera(Rear) + Battery + USB Cable1(Charging from Adapter1) + SIM for Sample 1</p> <p>Mode 9: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front) + Battery + USB Cable1 (EUT Charging from Wireless charger ) Adapter2 Connect to Wireless charger + SIM for Sample 1</p> <p>Mode 10: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable1 (EUT Charging from Wireless charger ) Adapter1 Connect to Wireless charger + SIM for Sample 1</p> <p>Mode 11: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front) + Battery + USB Cable1 (EUT Charging from Wireless charger ) Adapter2 Connect to Wireless charger + SIM for Sample 2</p>
	<p>Mode 1: GSM 850 Idle + Bluetooth earphone link + WLAN (2.4G) Idle + Camera(Rear) + Battery + USB Cable1(Charging from Adapter1) + UWB + SIM for Sample 1</p> <p>Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + Camera(Rear) + USB Cable 1(Charging fromAdapter2) + E-SIM for Sample 1</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN(5G)Idle+ Battery + USB Cable1(Charging from Adapter1) + SIM for Sample 1</p> <p>Mode 4: LTE Band 17 Idle + Bluetooth earphone link + WLAN(2.4G)Idle + NFC On + Battery + USB Cable1(Charging from Adapter2) + SIM for Sample</p>

AC Conducted Emission	1
	Mode 5: LTE Band 12 Idle + Bluetooth Idle + WLAN(5G)Idle + MPEG4(Run Color Bar) + Battery + USB Cable1(Charging from Adapter1) + SIM 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 + SIM for Sample 1 Mode 7: LTE Band 26 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Rear) + Battery + USB Cable1(Data Link with Notebook) + NB USB Data Link to EUT(eMMC) + SIM for Sample 1 Mode 8: n5 Idle + Bluetooth Idle + WLAN(2.4G)Idle + Camera(Rear) + Battery + USB Cable1(Charging from Adapter2) + SIM for Sample 1 Mode 9: GSM1900 Idle + Bluetooth Idle + WLAN(5G)Idle + Camera(Front) + Battery + USB Cable1 (EUT Charging from Wireless charger ) Adapter2 Connect to Wireless charger + SIM for Sample 1 Mode 10: LTE Band 17 Idle + Bluetooth Idle + WLAN(2.4G)Idle + NFC On + Battery + USB Cable1 (EUT Charging from Wireless charger ) Adapter1 Connect to Wireless charger + SIM for Sample 1 Mode 11: 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 + SIM for Sample 2

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:

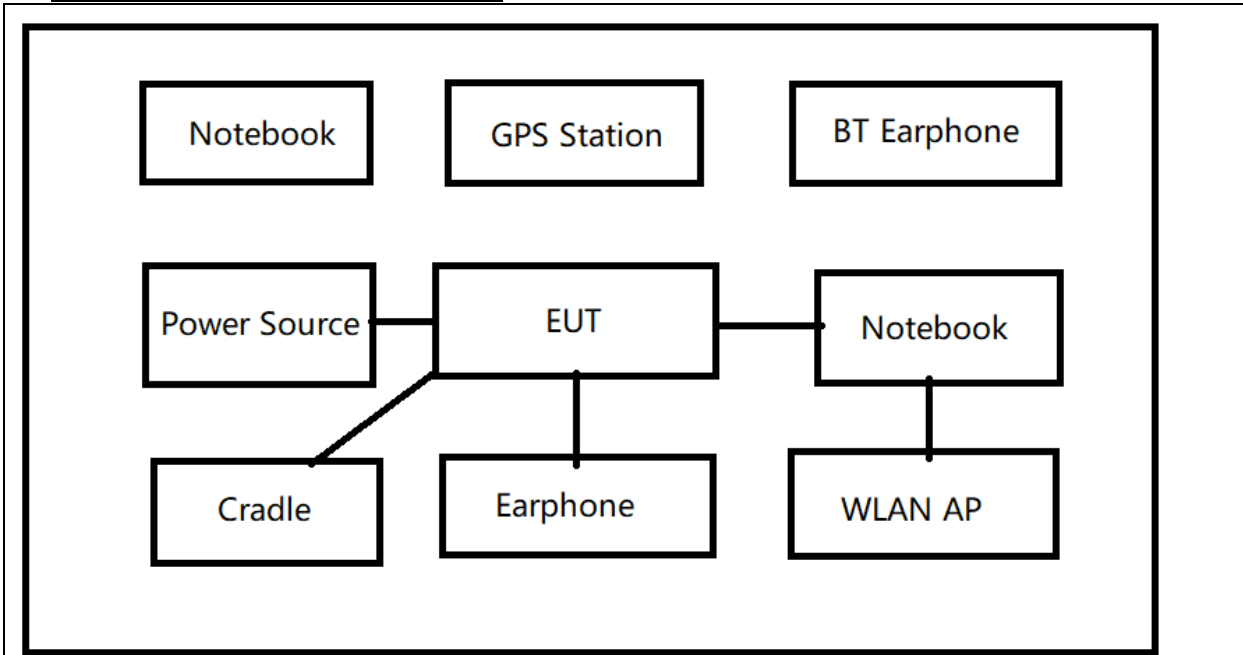
When the EUT state is switch on but without Radio Resource Control (RRC) connection.

Worst mode of all test items listed in section 4.1

Test items	Worst mode
Radiated Emission	9
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	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 ( $\mu\text{V}/\text{m}$ )		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

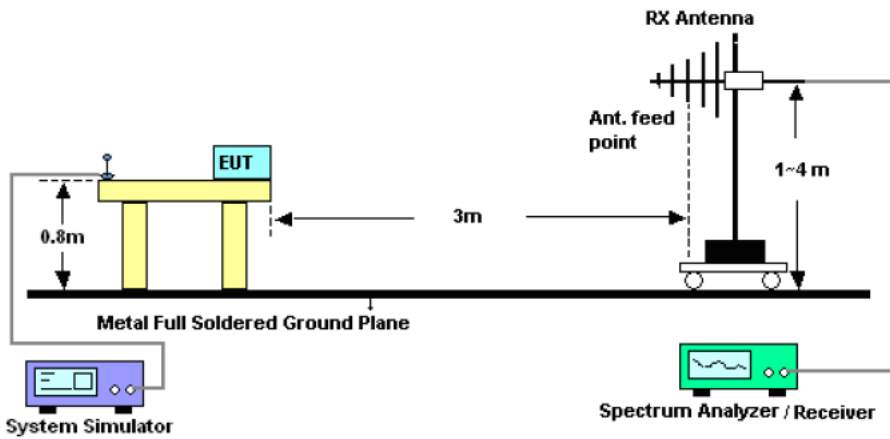


Figure.1 Test set-up of radiated emissions (30MHz~1000MHz)

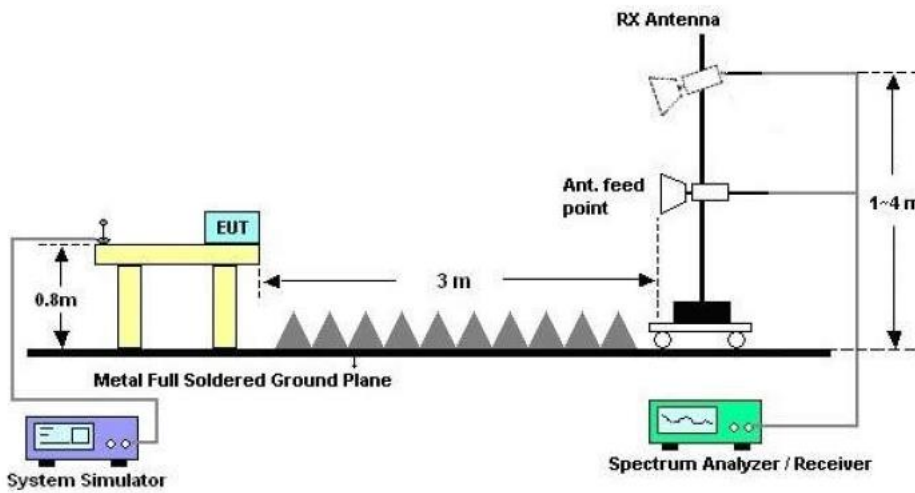


Figure.2 Test set-up of radiated emissions (above 1GHz)

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**

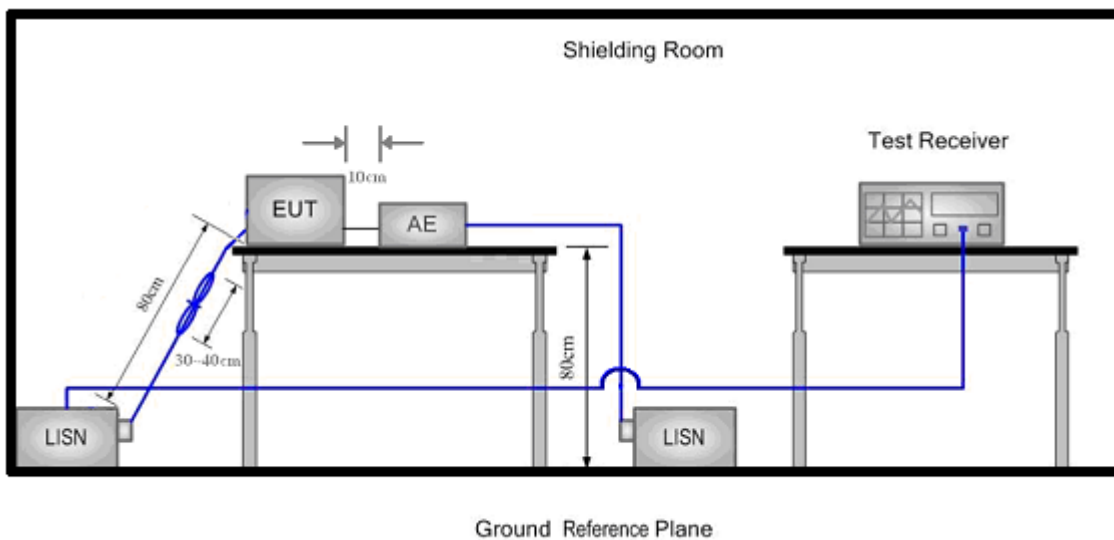


Figure.3 Test set-up of conducted emissions

**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	9163-893	2024/01/19	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**

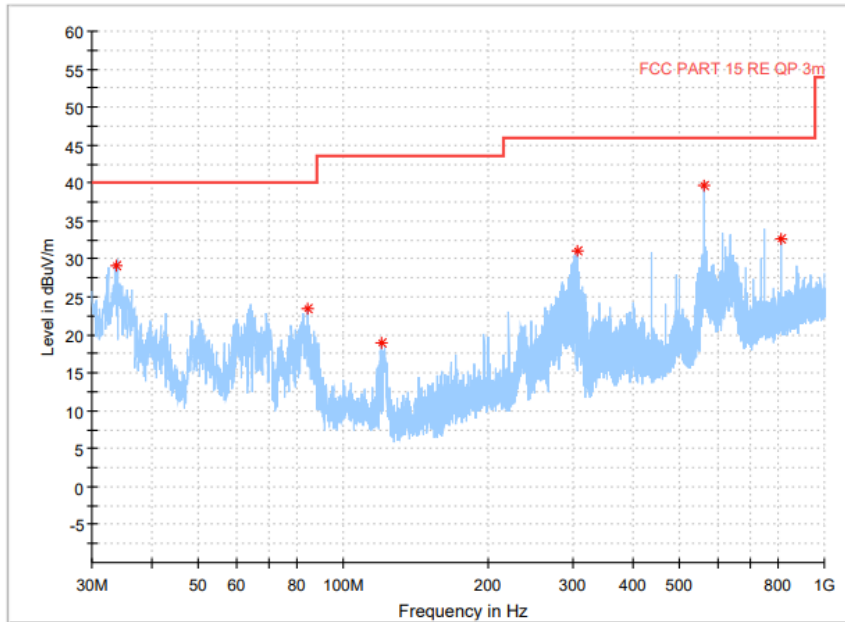
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Measurement Uncertainty		
Items	Extended Uncertainty	
RE(30MHz~1GHz)	Field strength(dBμV/m)	U=5.8dB; k=2
RE(1GHz~18GHz)	Field strength(dBμV/m)	U=4.9dB; k=2
RE(18GHz-40GHz)	Field strength(dBμV/m)	U=5.1dB; k=2
CE(150kHz~30MHz)	Voltage(dBμV)	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)
33.783000	29.02	40.00	10.98	---	V	0.0	11.9
84.126000	23.36	40.00	16.64	---	V	90.0	8.9
120.016000	18.85	43.50	24.65	---	V	135.0	10.6
305.868000	30.97	46.00	15.03	---	H	225.0	14.8
562.530000	39.70	46.00	6.30	---	V	90.0	20.1
812.596000	32.64	46.00	13.36	---	V	225.0	23.2

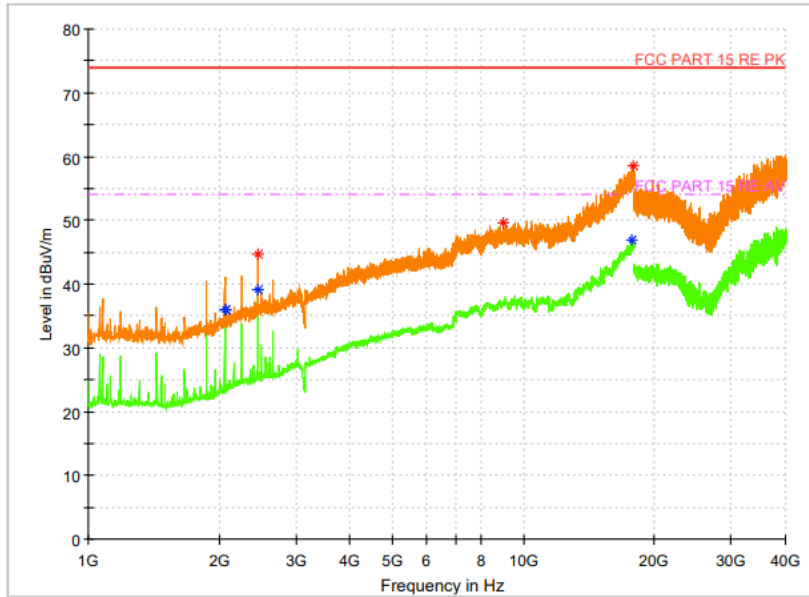
Note:

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



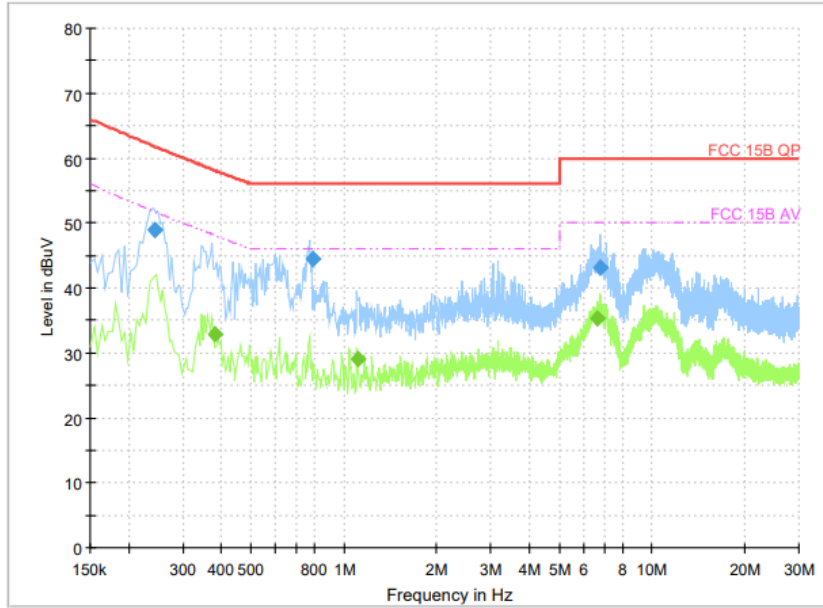
**Critical Freqs**

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
2060.800000	---	35.90	54.00	18.10	---	V	90.0	-9.5
2060.800000	---	35.90	54.00	18.10	---	V	90.0	-9.5
2453.500000	44.72	---	74.00	29.28	---	H	45.0	-8.3
2453.500000	---	39.18	54.00	14.82	---	H	0.0	-8.3
9022.300000	49.67	---	74.00	24.33	---	H	45.0	3.5
17807.900000	---	46.98	54.00	7.02	---	H	270.0	14.2
17821.500000	58.51	---	74.00	15.49	---	H	225.0	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)
0.242454	48.88	---	61.81	12.93	9.000	L1	ON	9.9
0.380568	---	32.74	48.10	15.36	9.000	L1	ON	9.9
0.796136	44.56	---	56.00	11.44	9.000	L1	ON	9.9
1.110296	---	29.06	46.00	16.94	9.000	N	ON	9.8
6.629750	---	35.23	50.00	14.77	9.000	L1	ON	10.1
6.821796	43.23	---	60.00	16.77	9.000	L1	ON	10.1

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.