



EMC Test Report

Product Name: Smart Phone

Model Number: MGA-LX3

FCC ID:2ATEYMGA-LX3

Report No: SYBH(Z-EMC)20220105022001-2

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Compliance and Testing Center of Huawei Technologies Co., Ltd)

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Notice

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2. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01
3. The laboratory has been recognized by the Innovation, Science and Economic Development Canada (ISED) to test to Canadian radio equipment requirements. The CAB identifier is CN0003, and the ISED# is 21741.
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Applicant: HUAWEI Device Co., Ltd.
Address: No.2 of Xincheng Road, Songshan Lake Zone,
Dongguan, Guangdong 523808, People's Republic of
China
Date of Receipt Test Item: 2022-01-10
Start Date of Test: 2022-01-11
End Date of Test: 2022-02-08
Test Result: Pass

**Prepared by
(Test Engineer)**

2022-02-08
Date

Chang Lina
Name

Chang Lina

Signature

**Reviewed by
(Test Engineer)**

2022-02-09
Date

Rao Legian
Name

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Signature

**Approved By
(Lab Manager)**

2022-02-09
Date

He Hao
Name

He Hao

Signature

Modification Record

No.	Last Report No.	Modification Description
1	NA	First Report.

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1 General Information

1.1 EUT Description

MGA-LX3 is subscriber equipment in the GSM/WCDMA/LTE system. The GSM frequency bands include GSM850, GSM900, DCS1800 and PCS1900. The WCDMA frequency band includes band I, band II, band IV, band V, band VIII. The LTE frequency bands include band 1, band 2, band 3, band 4, band 5, band 7, band 8, band 13, band 28, band 38, band 26, band 66. But only GSM850 and GSM1900, WCDMA frequency band II, band IV, band V, LTE frequency band 2, band 4, band 5, band 7, band 13, band 38, band 26 and band 66 bands test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/WCDMA and GSM protocol processing, voice, video MMS service, GPS, AGPS, Wi-Fi etc. Externally it provides earphone port (to provide voice service), and dual SIM/single SIM card interface. MGA-LX3 is dual/single SIM smart phone. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

EUT Description	
Product Name	Smart Phone
Model Number	MGA-LX3
Input Rated Voltage	3.87V
TX Frequency	GSM 850: 824MHz to 849MHz PCS 1900: 1850MHz to 1910MHz WCDMA Band II: 1850MHz to 1910MHz WCDMA Band IV: 1710MHz to 1755MHz WCDMA Band V: 824MHz to 849MHz LTE BAND 2: 1850MHz to 1910MHz LTE BAND 4: 1710MHz to 1755MHz LTE BAND 5: 824MHz to 849MHz LTE BAND 7: 2500MHz to 2570MHz LTE BAND 13: 777MHz to 787MHz LTE BAND 26: 814MHz to 849MHz LTE BAND 38: 2570MHz to 2620MHz LTE BAND 66: 1710MHz to 1780MHz 2.4G WIFI: 2412MHz to 2462MHz Bluetooth: 2402MHz to 2480MHz
RX Frequency	GSM 850: 869MHz to 894MHz PCS 1900: 1930MHz to 1990MHz WCDMA Band II: 1930MHz to 1990MHz WCDMA Band IV: 2110MHz to 2155MHz WCDMA Band V: 869MHz to 894MHz LTE BAND 2: 1930MHz to 1990MHz LTE BAND 4: 2110MHz to 2155MHz LTE BAND 5: 869MHz to 894MHz LTE BAND 7: 2620MHz to 2690MHz LTE BAND 13: 746MHz to 756MHz LTE BAND 26: 859MHz to 894MHz LTE BAND 38: 2570MHz to 2620MHz LTE BAND 66: 2110MHz to 2200MHz 2.4G WIFI: 2412MHz to 2462MHz Bluetooth: 2402MHz to 2480MHz BDS: 1561.098MHz GPS/Galileo: 1575.42MHz

	GLONASS: 1597MHz to 1607MHz FM:87.5MHz -108MHz
S/N	5VEBB21C24200033
HW Version	HL1MGASU
SW Version	6.0.0.28(C900E28R1P1)
EUT Accessory	
Data cable(04072179)	Data Cable USB A Male to USB Type C, Shielded Model: WA0072 Manufacturer: NingBo Broad Telecommunication Co., Ltd.
Data cable(04072179)	Data Cable USB A Male to USB Type C, Shielded Model: CUDU01B-HC450-EH Manufacturer: FOXCONN INTERCONNECT TECHNOLOGY LIMITED
Data cable(04072179)	Data Cable USB A Male to USB Type C, Shielded Model: L99UC154-CS-H Manufacturer: Luxshare Precision industry Co., Ltd.
Adapter(02221279)	Manufacturer: Huawei Devices Co., Ltd. Model: HW-100225E00 Input voltage: 100-240V ~50/60Hz 0.75A Output voltage: 5V  2A OR 9V  2A OR 10V  2.25A 22.5W MAX S/N: HC79E6L6A00553
Adapter(02221280)	Manufacturer: Huawei Devices Co., Ltd. Model: HW-100225B00 Input voltage: 100-240V ~50/60Hz 0.75A Output voltage: 5V  2A OR 9V  2A OR 10V  2.25A 22.5W MAX
Adapter(02221281)	Manufacturer: Huawei Devices Co., Ltd. Model: HW-100225U00 Input voltage: 100-240V ~50/60Hz 0.75A Output voltage: 5V  2A OR 9V  2A OR 10V  2.25A 22.5W MAX S/N:HC81E6L3720312
Adapter(02221288)	Manufacturer: Huawei Devices Co., Ltd. Model: HW-100225A00 Input voltage: 100-240V ~50/60Hz 0.75A Output voltage: 5V  2A OR 9V  2A OR 10V  2.25A 22.5W MAX
Adapter(02221268)	Manufacturer: Huawei Devices Co., Ltd. Model: HW-100225E00 Input voltage: 100-240V ~50/60Hz 0.75A Output voltage: 5V  2A OR 9V  2A OR 10V  2.25A 22.5W MAX S/N:BC6834L9H21989
Adapter(02221269)	Manufacturer: Huawei Devices Co., Ltd. Model: HW-100225B00 Input voltage: 100-240V ~50/60Hz 0.75A Output voltage: 5V  2A OR 9V  2A OR 10V  2.25A 22.5W MAX
Adapter(02221270)	Manufacturer: Huawei Devices Co., Ltd.

	Model: HW-100225U00 Input voltage: 100-240V ~50/60Hz 0.75A Output voltage: 5V  2A OR 9V  2A OR 10V  2.25A 22.5W MAX S/N:BC7089L3N07696
Adapter(02221277)	Manufacturer: Huawei Devices Co., Ltd. Model: HW-100225A00 Input voltage: 100-240V ~50/60Hz 0.75A Output voltage: 5V  2A OR 9V  2A OR 10V  2.25A 22.5W MAX
Adapter(02221268)	Manufacturer: Huawei Devices Co., Ltd. Model: HW-100225E00 Input voltage: 100-240V ~50/60Hz 0.75A Output voltage: 5V  2A OR 9V  2A OR 10V  2.25A 22.5W MAX S/N:PC6806L3G02739
Rechargeable Li-ion (9905018992)	Huawei Device Co., Ltd. (NVT) Battery Model: HB536896EFW Rated capacity: 5900 mAh Nominal Voltage: 3.87V Charging Voltage: 4.45V
Rechargeable Li-ion (9905019000)	Huawei Device Co., Ltd. (Desay) Battery Model: HB536896EFW Rated capacity: 5900 mAh Nominal Voltage: 3.87V Charging Voltage: 4.45V
Rechargeable Li-ion (9905019016)	Huawei Device Co., Ltd. (NVT) Battery Model: HB536896EFW-1 Rated capacity: 5900 mAh Nominal Voltage: 3.87V Charging Voltage: 4.45V
Rechargeable Li-ion (9905019009)	Huawei Device Co., Ltd. (Desay) Battery Model: HB536896EFW-1 Rated capacity: 5900 mAh Nominal Voltage: 3.87V Charging Voltage: 4.45V
Headset(22040339)	Model: 1293-3283-3.5mm-339 Manufacturer: Boluo County Quancheng Electronic Co.,ltd
Headset(22040339)	Model: EPAB542-2WH05-DH Manufacturer: FOXCONN INTERCONNECT TECHNOLOGY LIMITED.

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

Remark 2: HW-100225B00(02221280), HW-100225U00(02221281) and HW-100225A00(02221288) have the same PCB circuit.HW-100225B00(02221269), HW-100225U00(02221270) and HW-100225A00(02221277) have the same PCB circuit.

1.2 Test Site Information

Site :	Reliability Laboratory of Huawei Technologies Co., Ltd. Global Compliance and Testing Center of Huawei Technologies Co., Ltd.
Test Site Location:	No.2, New City Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15, Subpart B

2 Summary of Results

Summary of Results				
Test Items	Test Mode	Performance Class & Required Performance Criteria	Result	Site
<u>Radiated Emissions</u> Enclosure Port	Mode 1~Mode 6	CLASS B	Pass	Site1
<u>Conducted Emissions</u> ☐ DC Power Port ☒ AC Power Port	Mode 1~Mode 6	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the uncertainty of test system. 2, ☒ The item has been tested; ☐ The item has not been tested.				

During the measurement, the environmental conditions complied with the range listed as below.

Item	Required
Ambient temperature	15°C ~ 35°C
Relative humidity	25% ~ 75%
Atmospheric pressure	86kPa ~ 106kPa

3 System Configuration during EMC Test

3.1 Test Mode

The EUT was configured, installed, arranged and operated in a manner consistent with typical application. The following mode(s) were applied during the compliance test.

Test Mode	
Mode 1:	Charging +traffic +WIFI +BT+GNSS On +Earphone
Mode 2:	Charging+ Camera On+ earphone + idle
Mode 3:	Charging+ Video Playing+ earphone + idle
Mode 4:	Charging+ Music Playing+ earphone + idle
Mode 5:	Charging+ FM+ earphone + idle
Mode 6:	USB Copy (EUT with PC) + earphone

Remark:

- 1) If there is one kind of accessories with different models, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.
- 2) If EUT has more than one typical operation, only the worst test mode will be recorded in this report.

The Worst Case:

Radiated Emission:

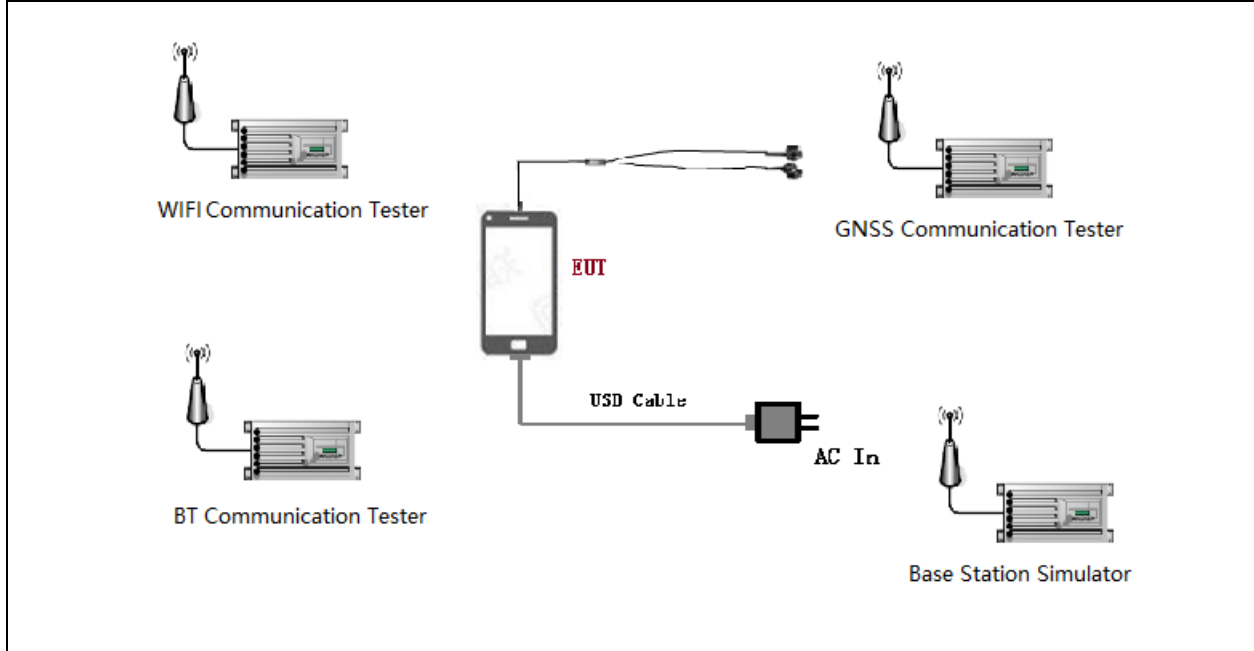
USB Copy(EUT With PC) + earphone the result is the worst (30MHz-40GHz).

Conducted Emission:

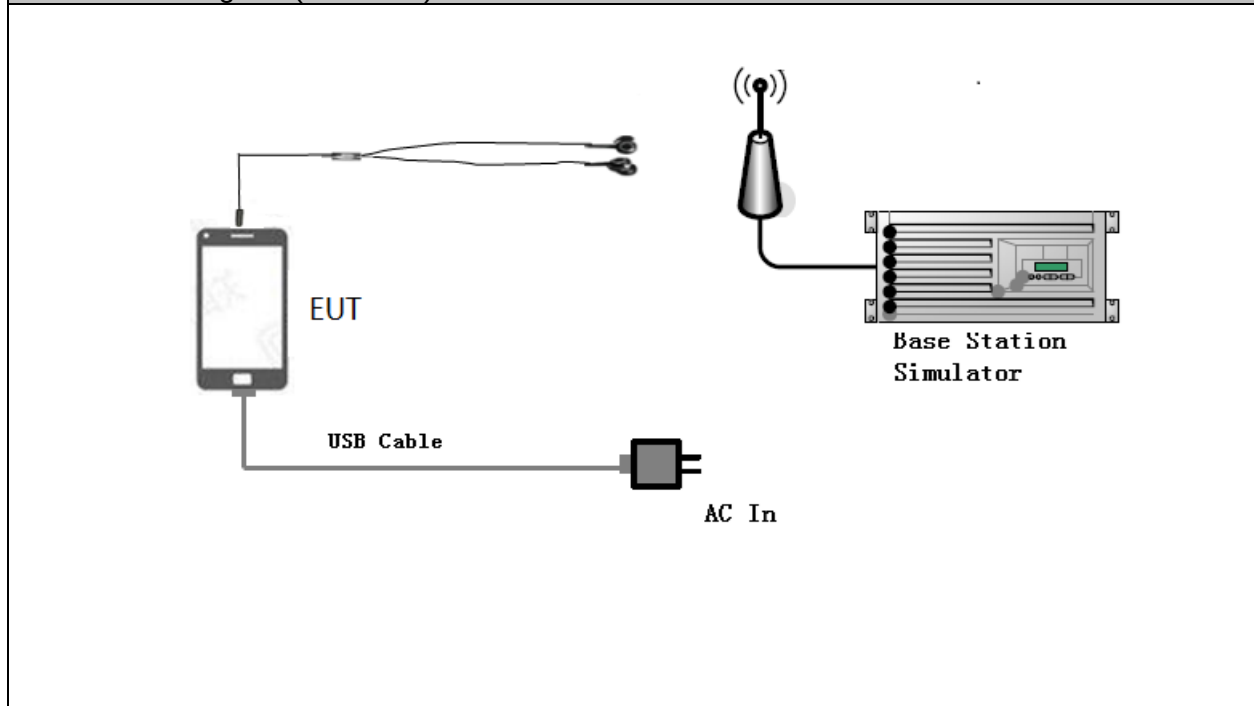
USB Copy(EUT With PC) + earphone the result is the worst.

3.2 Test System Configuration

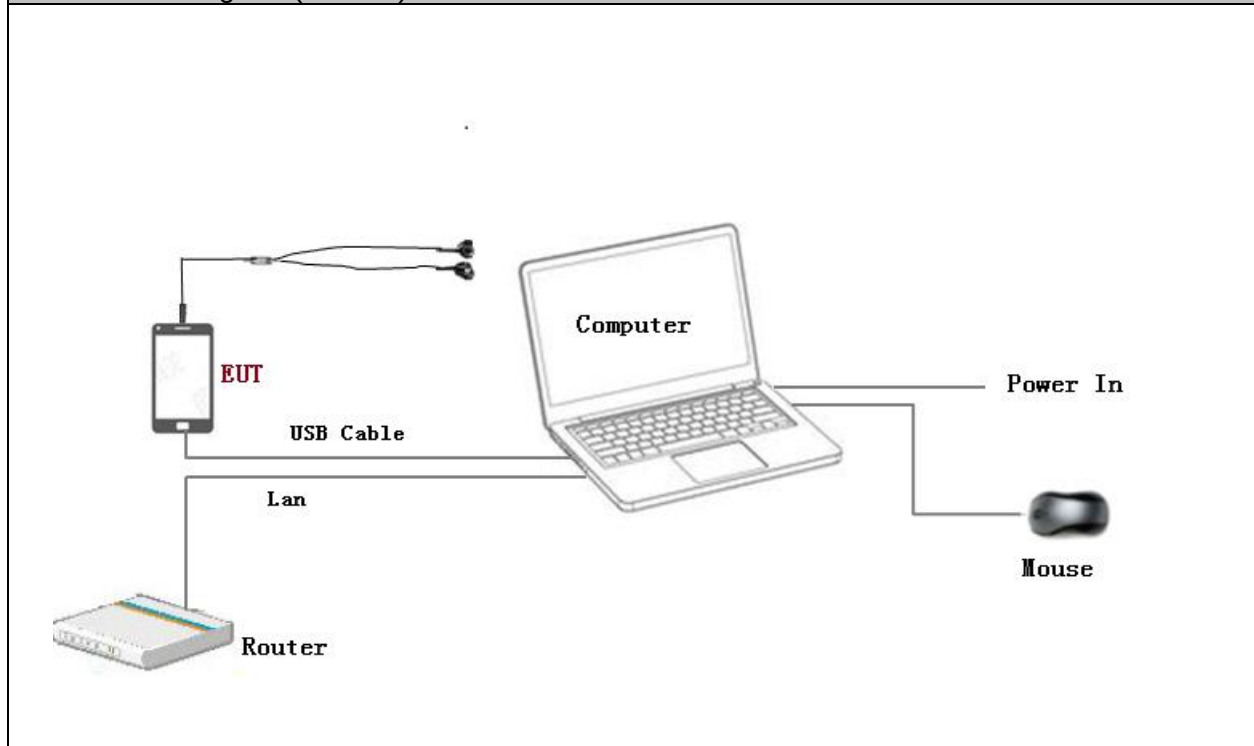
Connection Diagram (Mode 1)



Connection Diagram (Mode 2-5)



Connection Diagram (Mode 6)



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB	3	<3m	Shielded
Earphone	2	<3m	Unshielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval (month)
GSS7000 Signal Generator	GSS7000	Spirent	108	Nov. 10, 2022	12
Radio Communication Tester	CMU200	R&S	117057	Jul. 08, 2022	12
Radio Communication Tester	MT8820C	Anritsu	6200971028	Jul. 08, 2022	12
WLAN Tester	8862A	Anritsu	6261782432	Jul. 02, 2022	12
Notebook	X270	ThinkPad	A171010066	N/A	N/A
Mouse	MS111-P	DELL	6913XT1014605	N/A	N/A
Router	B6125-51d	HUAWEI	J6Y7S18419000311	N/A	N/A

4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 40GHz

4.1.1 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANCI C63.4: 2014. The test distance was 3m. The set-up and test methods were according to ANCI C63.4: 2014.

A preliminary scan and a final scan of the emissions were made from 30 MHz to 40 GHz by using test script of software; The emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m. The azimuth range of turntable was 0° to 360°. The receiving antenna has two polarizations V and H.

Measurement bandwidth (RBW) for 30MHz to 1000 MHz: 120 kHz;

Measurement bandwidth (RBW) for 1000MHz to 40000 MHz: 1MHz;

EUT was configured in idle mode and the test performed at worst emission state.

4.1.2 Test setup

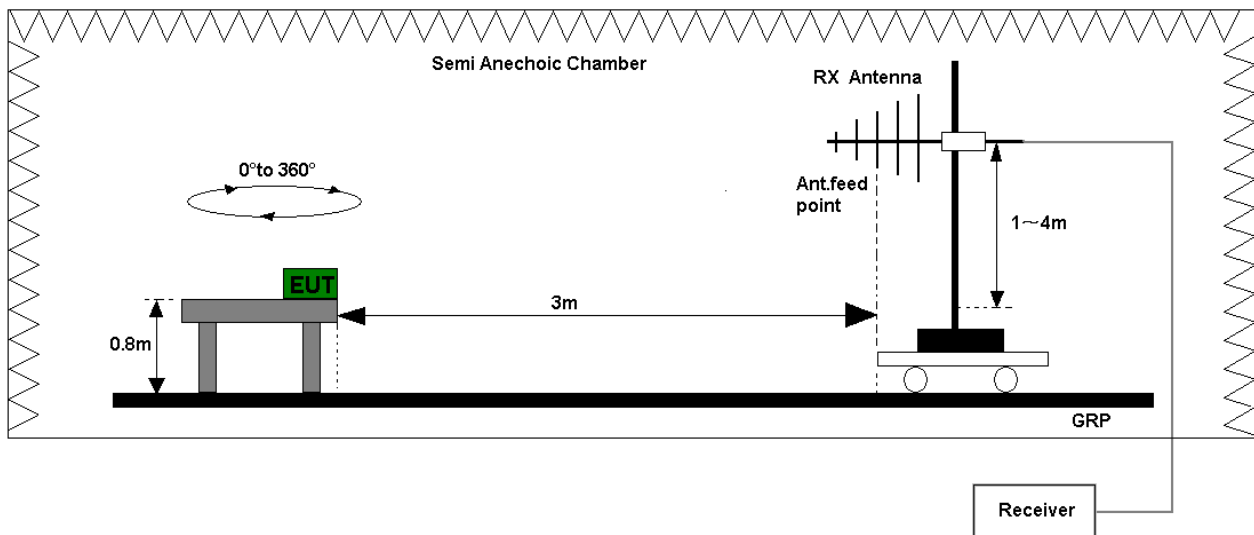


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

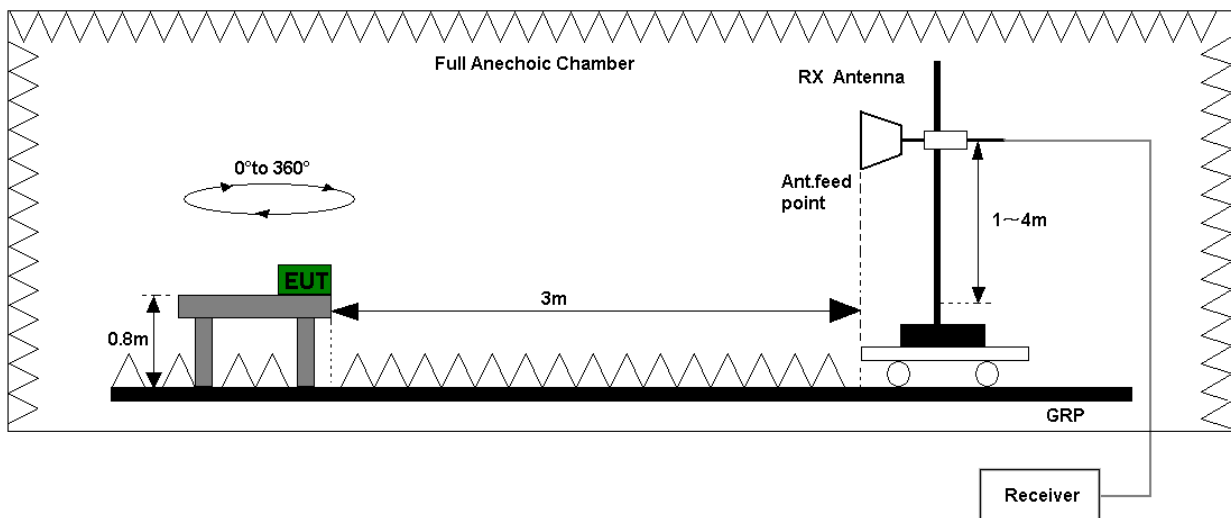


Figure 2. Test set-up of radiated disturbance (above 1GHz)

4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
Refer to the section 7.1.1 of this report for test data.

Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μ V/m)		Unit(dB μ V/m)	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	AV	PK	AV	PK
	500	5000	54	74

4.2 Conducted Disturbance 0.15 MHz to 30MHz

4.2.1 Test Procedure

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm away from LISN. The set-up and test methods were according to ANCI C63.4: 2014 Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

EUT was communicated with the simulator through Air interface, the simulator controls the EUT to transmitter the maximum power which defined in specification of product. The EUT operated on the typical channel.

Measurement bandwidth (RBW) for 150 kHz to 30 MHz: 9 kHz;

The EUT was set in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

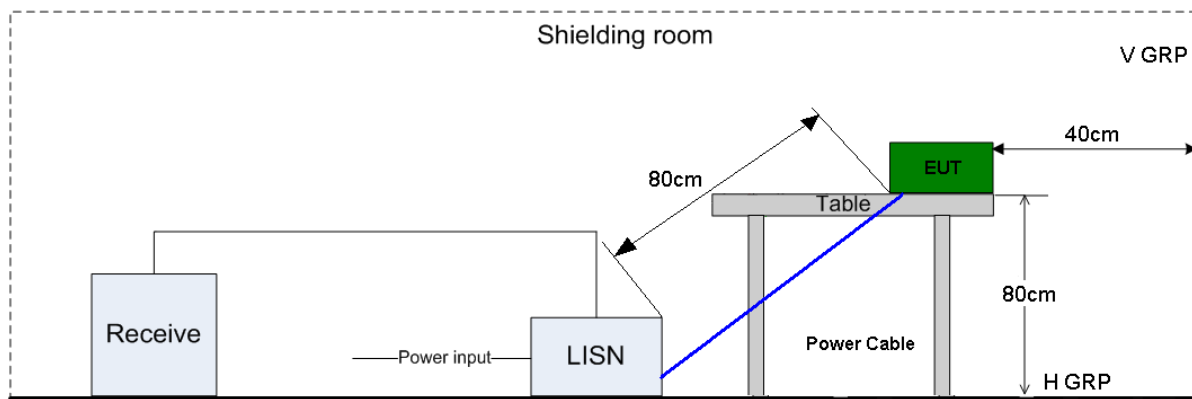


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance of power lines.

Refer to the section 7.2.1 of this report for test data.

Test Limit of AC Power Port		
Frequency range	150kHz ~ 30MHz	
Frequency	Voltage limits	
	QP (dB μ V)	AV (dB μ V)
0.15MHz~0.5MHz	66-56	56-46
0.5MHz-5MHz	56	46
5MHz~30MHz	60	50

5 Main Test Instruments

Main Test Equipments						
Test item	Test Instrument	Model	S/N	Manufacturer	Calibrated Deadline	Cal interval
RE-2 (30M-1G)	EMI Test receiver	ESW44	101878	R&S	Nov. 12, 2022	12
	Broadband Antenna	VULB 9163	01303	SCHWARZ BECK	Aug. 09, 2022	24
RE1 (1G-40G)	Horn Antenna (1 to 18G)	HF906	100683	R&S	May. 01, 2023	24
	Amplifier	SCA-SCU 18	10162	R&S	Nov. 12, 2022	12
	Horn antenna (18 to 40G)	BBHA9170	BBHA9170 644	SCHWARZBECK	Nov. 12, 2022	12
	Amplifier	TPA-184050	P180012	Tonscend	Nov. 12, 2022	12
	EMI Test receiver	ESW44	101879	R&S	Nov. 12, 2022	12
CE	EMI Test receiver	ESU26	100150	R&S	Nov. 10, 2022	12
	Artificial Mains Network	ENV216	101176	R&S	Jul. 19, 2022	12
Software Information						
Test Item	Software Name	Manufacturer		Version		
RE1	EMC32	R&S		V10.60.10		
RE2	EMC32	R&S		V10.60.20		
CE	EMC32	R&S		V9.25.0		

6 System Measurement Uncertainty

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

System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dB μ V/m)	U=5.24dB; k=2
RE(1GHz-18GHz)	Field strength (dB μ V/m)	U=4.68dB; k=2
RE(18 GHz-40GHz)	Field strength (dB μ V/m)	U=4.52dB; k=2
CE	Disturbance Voltage (dB μ V)	U=2.3dB; k=2

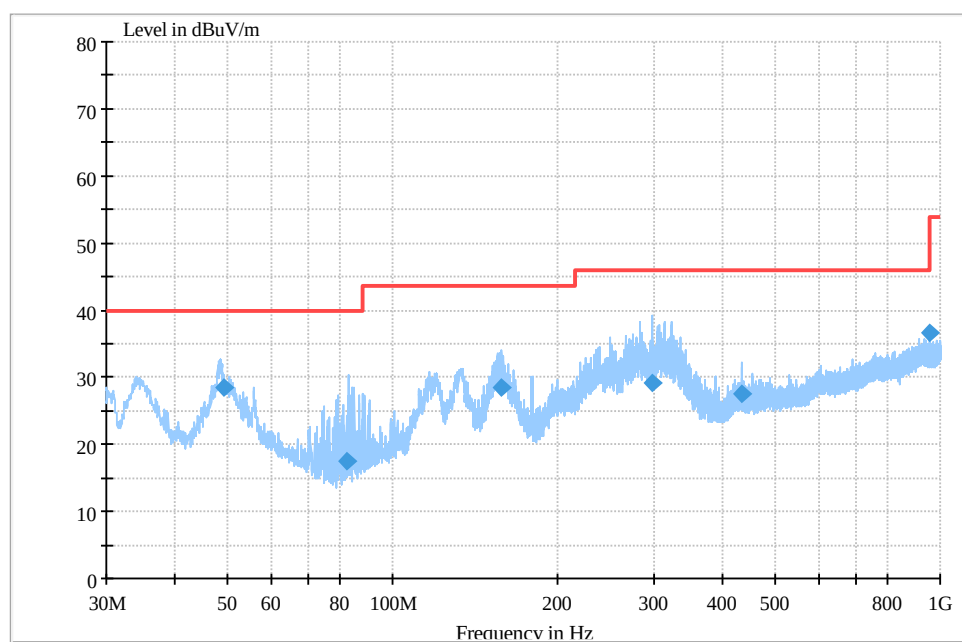
7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

Test Mode 6: USB Copy (EUT With PC)+ Earphone



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
49.095280	28.56	20.5	40.00	11.44	125.0	219.0	V
82.338460	17.56	14.0	40.00	22.44	242.0	147.0	H
157.384740	28.37	15.2	43.50	15.13	100.0	343.0	V
297.870280	29.22	20.6	46.00	16.78	101.0	60.0	H
435.628140	27.55	23.8	46.00	18.45	214.0	125.0	V
959.985600	36.70	31.0	46.00	9.30	101.0	192.0	H

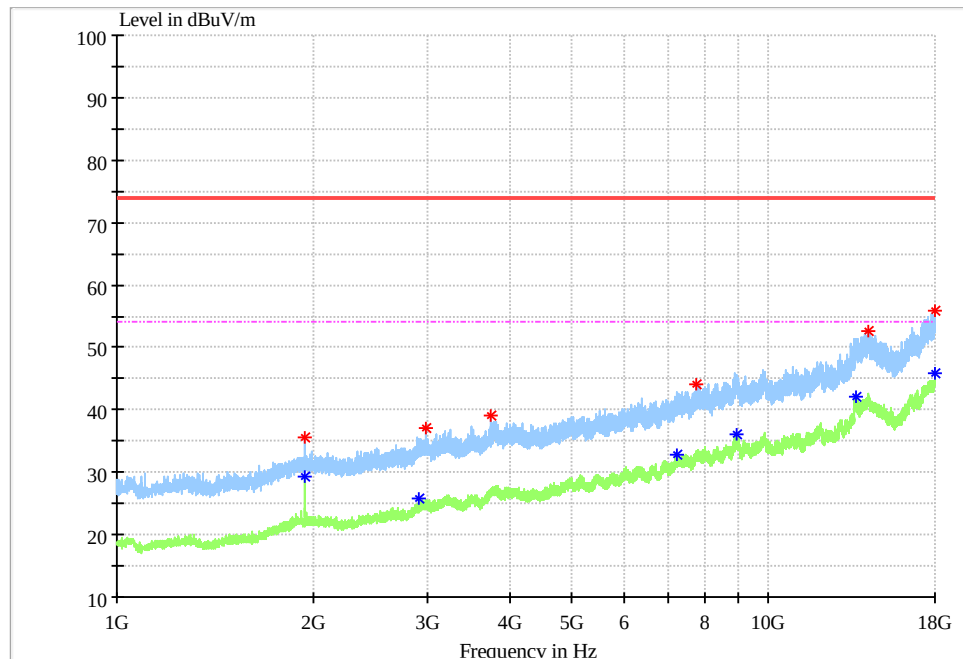
Note:

Level =Reading level by receiver + Transd (Antenna factor + cable loss - preamplifier gain)

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

7.1.2 1GHz~18GHz

Test Mode 6: USB Copy (EUT With PC) +Earphone



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1942.93333	35.52	-12.6	74.00	38.48	100.0	36	V
2973.70000	36.98	-10	74.00	37.02	100.0	177	H
3740.40000	39.10	-7	74.00	34.90	100.0	177	H
7766.00000	43.99	0.5	74.00	30.01	100.0	323	V
14192.00000	52.67	11.2	74.00	21.33	100.0	72	H
17963.16670	55.88	15	74.00	18.12	100.0	160	H

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1942.93333	29.4	-12.3	54.00	24.6	100.0	36	V
2913.63333	25.75	-9.4	54.00	28.25	100.0	0	V
7239.00000	32.78	-3.6	54.00	21.22	100.0	89	H
8941.26667	36.00	1.3	54.00	18.00	100.0	304	H
13610.60000	42.21	3.8	54.00	11.79	100.0	195	H
17993.20000	45.97	7.4	54.00	8.03	100.0	16	V

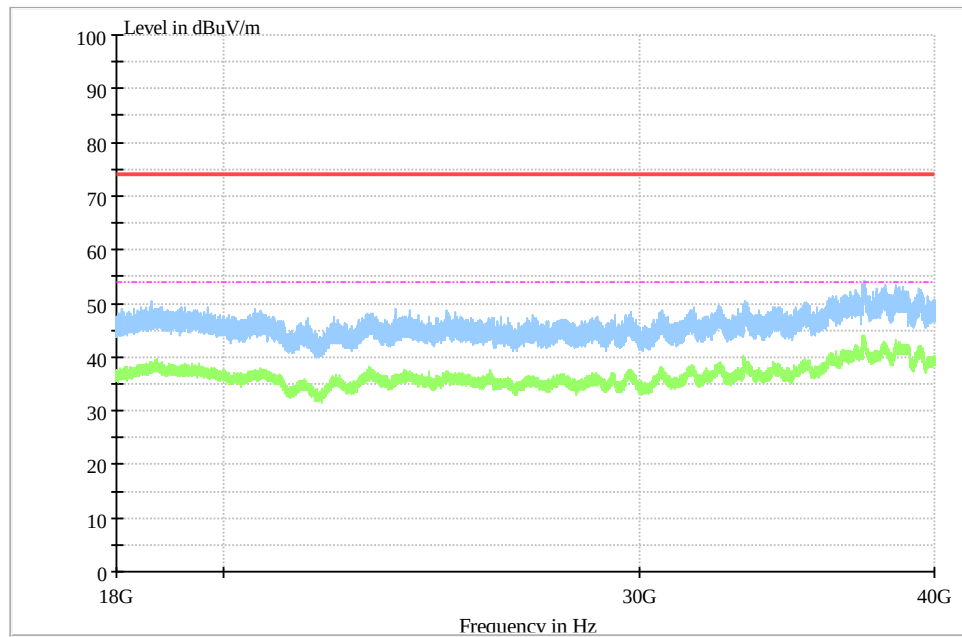
Note:

Level =Reading level by receiver + Transd (Antenna factor + cable loss - preamplifier gain)

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

7.1.3 18GHz~40GHz

Test Mode 6: USB Copy (EUT With PC)+ Earphone

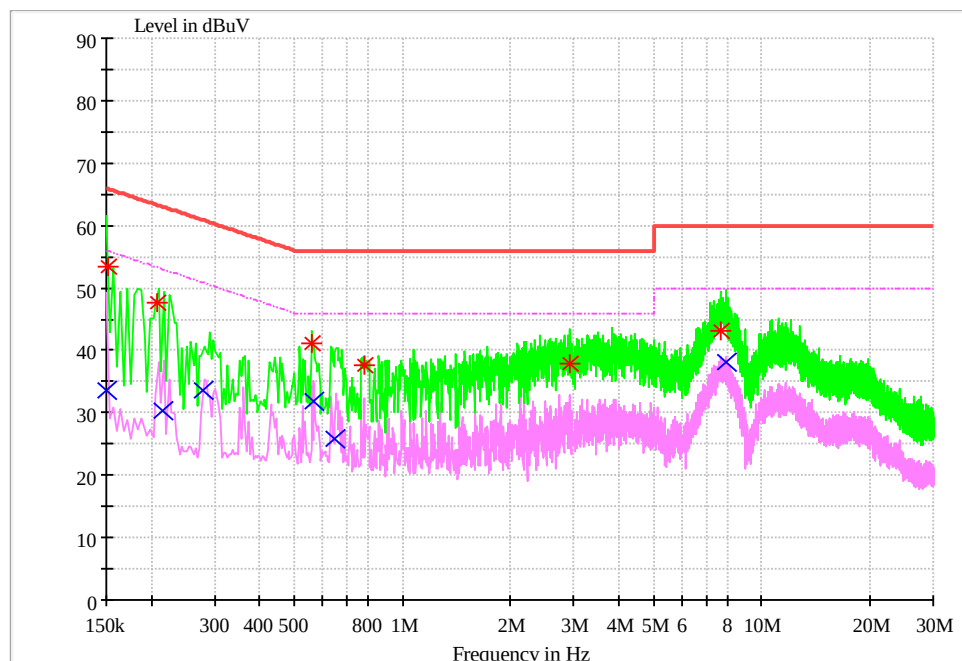


Note: The emission is less than the measurement system noise floor, so no peak found in the Test Range of "18 GHz to 40 GHz".

7.2 Conducted Disturbance

7.2.1 AC Port Test Data

Test Mode 6: USB Copy (EUT With PC)+ Earphone



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB μ V	Line	Transd dB	Margin dB	Limit dB μ V	PE
0.151592	53.48	N	9.6	12.44	65.92	FLO
0.207135	47.54	L1	9.6	15.78	63.32	FLO
0.558128	41.13	L1	9.6	14.87	56.00	FLO
0.783193	37.5	L1	9.6	18.5	56.00	FLO
2.923612	37.92	L1	9.6	18.08	56.00	FLO
7.670825	43.01	N	9.9	16.99	60.00	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB μ V	Line	Transd dB	Margin dB	Limit dB μ V	PE
0.15025	33.58	N	9.6	22.41	55.99	FLO
0.214948	30.26	N	9.7	22.75	53.01	FLO
0.279454	33.51	L1	9.6	17.32	50.83	FLO
0.56771	31.94	L1	9.6	14.06	46.00	FLO
0.650855	25.79	L1	9.6	20.21	46.00	FLO
7.924506	38.03	N	9.9	11.97	50.00	FLO

Note:

Level= Reading level+ Transd (cable loss + correction factor)

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

-----END-----