EMC Test Report

Product Name: Smart Phone

Model Number: NEN-LX3

Report No: SYBH(Z-EMC) 20201128017001-2

FCC ID: 2ATEYNEN-LX3

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

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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:	2021-01-18
Start Date of Test:	2021-01-19
End Date of Test:	2021-02-25
Test Result:	Pass

Prepared by (Test Engineer)	**2021-02-25**	**Li Tao**	Li Tao
	Date	**Name**	**Signature**
Reviewed By (Test Engineer)	**2021-02-25**	**Zheng Ke**	zheng ke
	Date	**Name**	**Signature**
Approved By (Lab Manager)	**2021-02-26**	**He Hao**	He Hao
	Date	**Name**	**Signature**

Modification Record

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

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1 General Information

1.1 EUT Description

NEN-LX3 is subscriber equipment in the GSM/WCDMA/LTE system.The GSM frequency bands include GSM850, GSM900, DCS1800 and PCS1900. The UMTS frequency band includes band I,band II,band IV,band V and band VIII. The LTE frequency bands include band 1,band 2,band 3,band 4,band 5,band 7,band 8,band 12,band 17,band 26,band 28 and band 66. But only GSM850 and GSM1900, UMTS frequency band II,band IV and band V, LTE frequency band 2,band 4,band 5,band 7,band 12,band 17,band 26 and band 66 bands test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/UMTS and GSM/GPRS/EDGE 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. NEN-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	NEN-LX3
Input voltage	3.87V
Extreme Voltage	3.6V and 4.45V
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 12: 699MHz to 716MHz LTE BAND 17: 704MHz to 716MHz LTE BAND 26: 814MHz to 849MHz LTE BAND 66: 1710MHz to 1780MHz 2.4G WIFI: 2412MHz to 2462MHz Bluetooth: 2400MHz to 2483.5MHz 5G WIFI:5150MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5850MHz
RX Frequency	GSM 850: 869MHz to 894MHz GSM 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 12: 729MHz to 746MHz LTE BAND 17: 734MHz to 746MHz LTE BAND 26: 859MHz to 876MHz LTE BAND 66: 2110MHz to 2200MHz

	2.4G WIFI: 2412MHz to 2462MHz Bluetooth: 2400MHz to 2483.5MHz 5G WIFI:5150MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5850MHz FM: 87.5MHz to 108MHz BDS: 1561.098MHz GPS: 1575.42MHz GLONASS: 1597MHz to 1607MHz
S/N	H5Q0120C10000139
HW Version	HL1NTNM
SW Version	11.0.1.103(C900E48R1P2)
EUT Accessory	
Data cable(04072004)	Data Cable USB A Male to USB Type C, 1m, Shielded Manufacturer: Luxshare Precision industry Co.,Ltd. MING JI ELECTRONICS CO., LTD.
Adapter	Manufacturer: Huawei Device Co., Ltd. Model: HW-110600E02 Input: 100-240V ~50/60Hz 1.8A DC Output: 5V ⎓ 2A OR 10V ⎓ 4A OR 11V ⎓ 6A MAX SN: JF82YELC700044
Adapter	Manufacturer: Huawei Device Co., Ltd. Model: HW-110600B02 Input: 100-240V ~50/60Hz 1.8A DC Output: 5V ⎓ 2A OR 10V ⎓ 4A OR 11V ⎓ 6A MAX
Adapter	Manufacturer: Huawei Device Co., Ltd. Model: HW-110600U02 Input: 100-240V ~50/60Hz 1.8A DC Output: 5V ⎓ 2A OR 10V ⎓ 4A OR 11V ⎓ 6A MAX
Adapter	Manufacturer: Huawei Device Co., Ltd. Model: HW-110600A02 Input: 100-240V ~50/60Hz 1.8A DC Output: 5V ⎓ 2A OR 10V ⎓ 4A OR 11V ⎓ 6A MAX
Rechargeable Li-ion	HUAWEI Device Co., Ltd. (Sunwoda/SCUD) Battery Model: HB466589EFW Rated capacity: 4200mAh Nominal Voltage: +3.87V Charging Voltage: +4.45V
Earphone(22040339)	Model: MEND1532B528A11 Manufacturer: Jiangxi Lianchuang Hongsheng Electronic Co., LTD.
Earphone(22040339)	Model: 1293-3283-3.5mm-339 Manufacturer: Boluo County Quancheng Electronic Co., Ltd.
Earphone(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-110600E02, HW-110600B02, HW-110600U02 and HW-110600A02 have the same PCB circuit

1.2 Test Site Information

Site 1:	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**
Radiated Emissions Enclosure Port	Mode 1~ Mode 6	CLASS B	Pass	Site1
Conducted Emissions ☐DC Power Port ☒AC Power Port ☐Telecommunication Ports	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*+ BT+ WIFI+GNSS+ Earphone
Mode 2:	Charging+ Video playing+ Earphone+ Idle
Mode 3:	Charging+ Camera on+ Earphone + Idle
Mode 4:	Charging+ FM+ Earphone + Idle
Mode 5:	Charging+ Music Playing+ Earphone + Idle
Mode 6:	USB Copy(EUT with PC)+ Earphone
Note: 'traffic*' it includes GSM/UTRA/E-UTRA traffic modes. GSM, DCS, UTRA, E-UTRA traffic mode were pre-tested. Only the worse mode data is showed on this report.	

Remark:

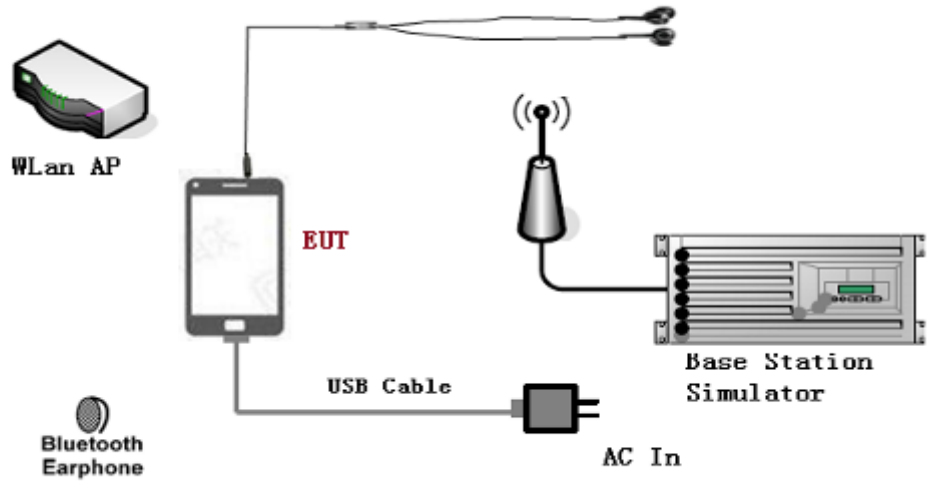
1) If there is one kind of accessories with different models, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.
2) If EUT has more than one typical operation, only the worst test mode will be recorded in this report.

Traffic Mode:
When the EUT state is switched on and with Radio Resource Control (RRC) connection established.

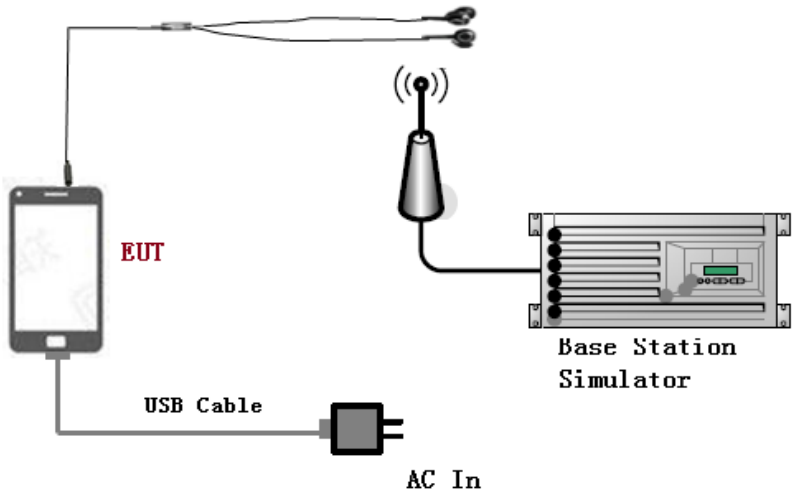
Idle Mode:
When the EUT state is switched on but without Radio Resource Control (RRC) connection.

3.2 Test System Configuration

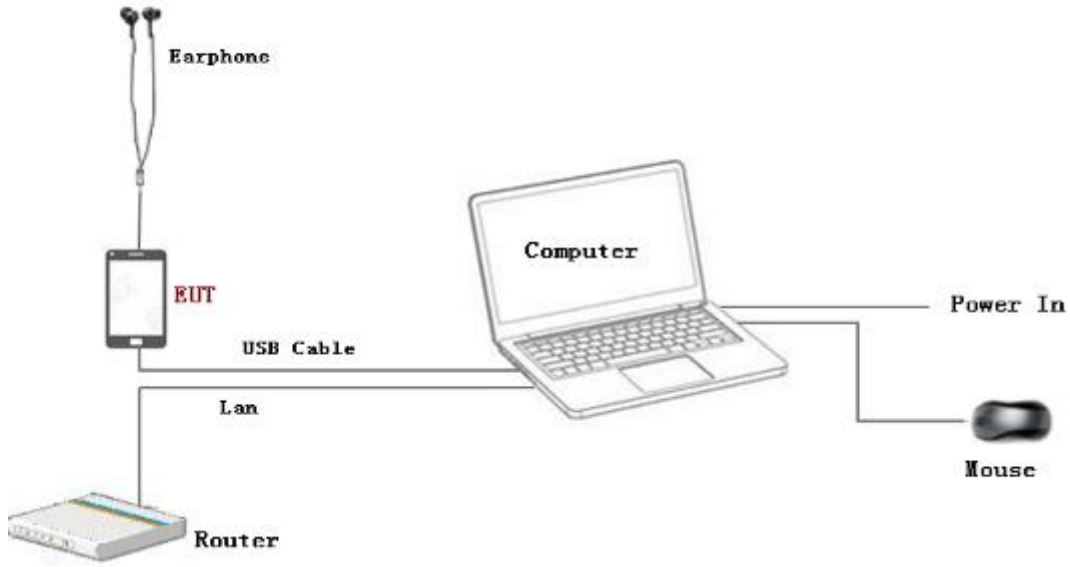
Connection Diagram (Mode 1)



Connection Diagram (Mode 2~ Mode 5)



Connection Diagram (Mode 6)



3.3 Cables Used during Test

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

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval (month)
Radio Communication Tester	CMU200	R&S	117057	Jan. 29, 2022	12
Radio Communication Tester	MT8820C	Anritsu	6200971028	Jan. 12, 2022	12
Notebook	S3	ThinkPad	A140714638	N/A	N/A
Mouse	M3111-P	DELL	6913XT1014605	N/A	N/A
WLan AP	B6125-51d	HUAWEI	J6Y7S18419000311	N/A	N/A
Bluetooth Earphone	CM-SHK00	HUAWEI	#1	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

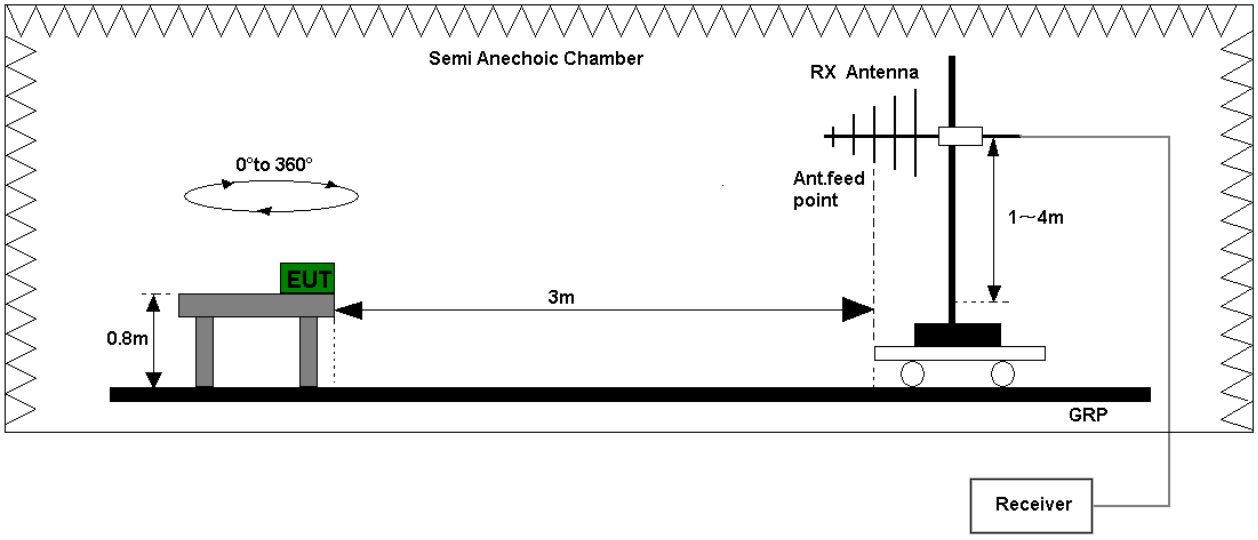


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

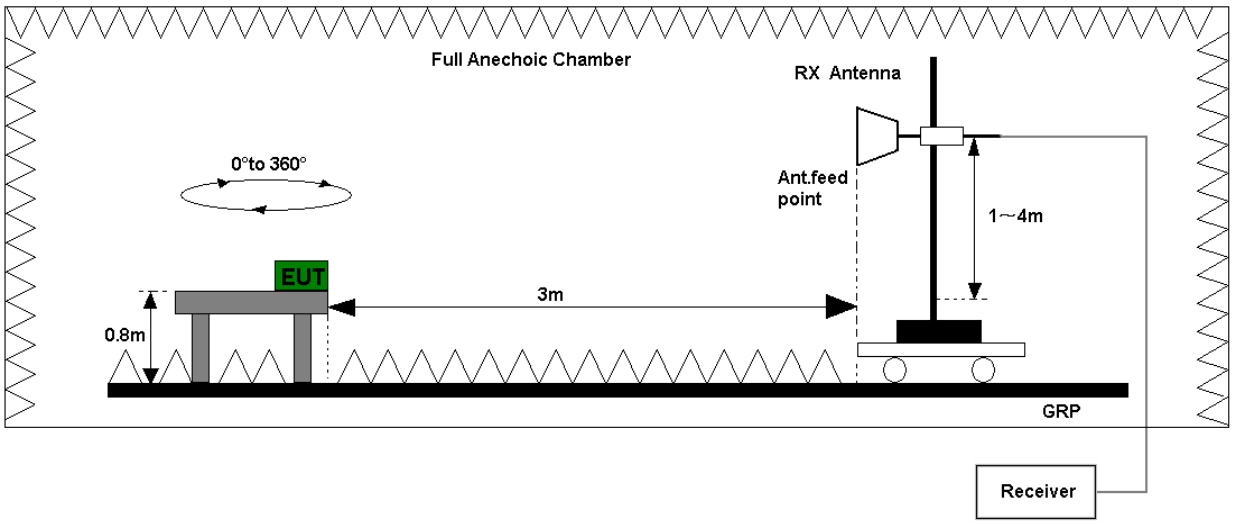


Figure 2. Test set-up of Radiated Disturbance(above 1GHz)

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(μV/m)		Unit(dBμV/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

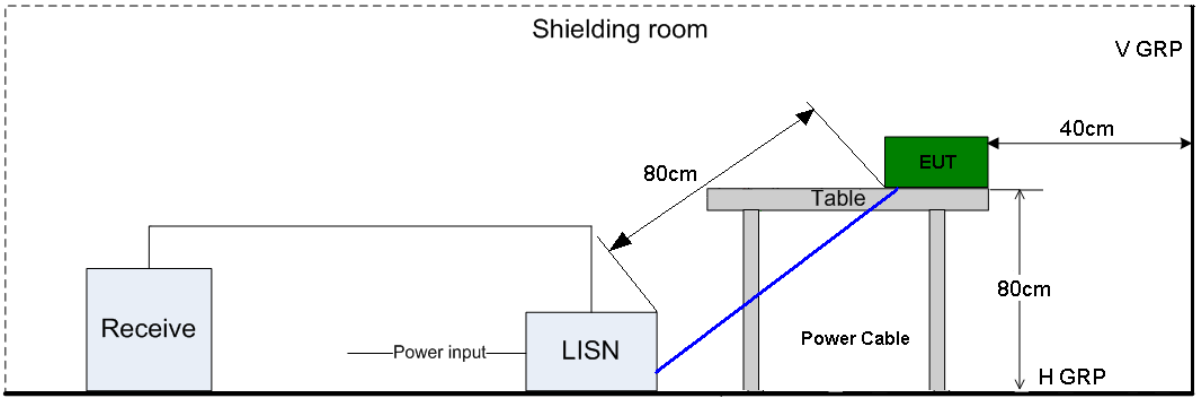


Figure 3. Test Set-up of Conducted Disturbance

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 (dBμV)	AV (dBμV)
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**
RE2 (30M-1G)	EMI Test receiver	ESW44	101878	R&S	Jan. 30, 2022	12
	Broadband Antenna	VULB 9163	9163-1330	SCHWARZBECK	Aug. 10, 2022	24
RE1 (1G-40G)	Horn Antenna (1 to 18G)	HF906	100684	R&S	Jun. 13, 2021	24
	Amplifier	SCA-SCU 18	10162	R&S	Mar. 17, 2021	12
	Horn antenna (18 to 40G)	BBHA9170	BBHA9170644	SCHWARZBECK	Oct. 28, 2021	12
	Amplifier	TPA-184050	P180012	Tonscend	Nov. 09, 2021	12
	EMI Test receiver	ESW44	101879	R&S	Jan. 30,2022	12
CE	EMI Test receiver	ESU26	100150	R&S	Nov. 05, 2021	12
	Artificial Mains Network	ENV216	101176	R&S	Jul. 12, 2021	12

Software Information			
Test Item	Software Name	Manufacturer	Version
RE1	EMC32	R&S	V10.60.10
RE2	EMC32	R&S	V10.60.10
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**
RE2(30MHz-1GHz)	Field strength (dBμV/m)	U=5.24dB; k=2
RE1(1GHz-18GHz)	Field strength (dBμV/m)	U=4.68dB; k=2
RE1(18 GHz-40GHz)	Field strength (dBμV/m)	U=4.52dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.3dB; k=2

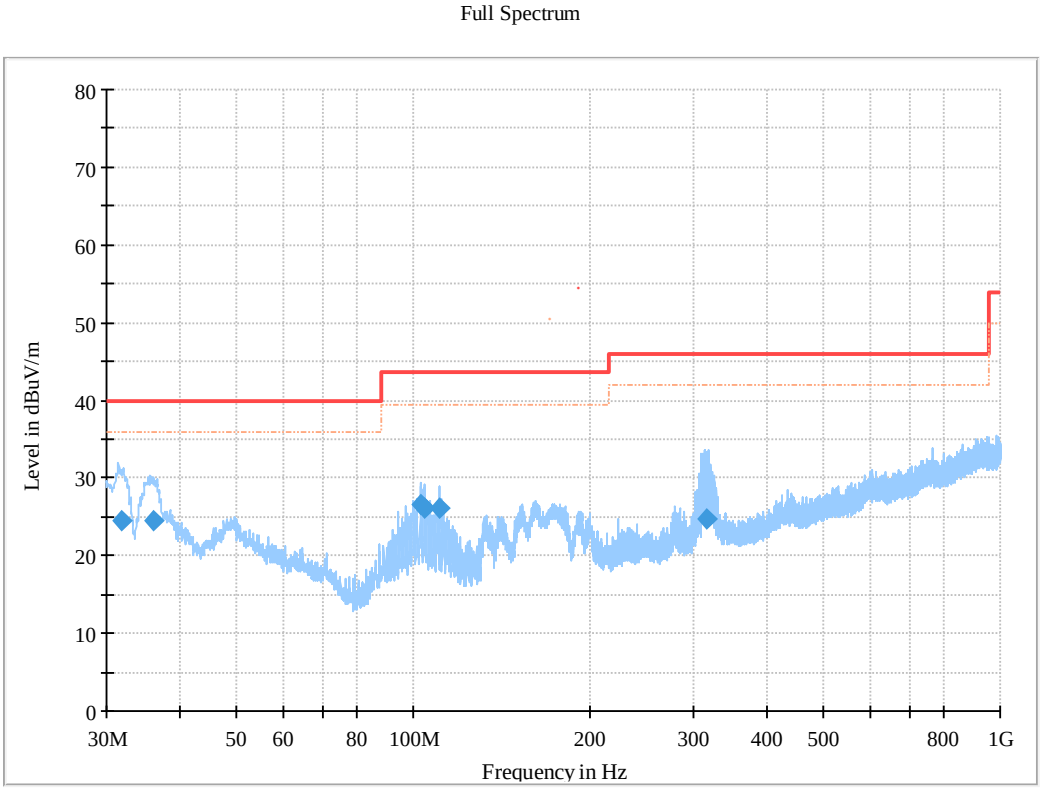
7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

Test Mode 5: Charging+ Music Playing+ Earphone + Idle



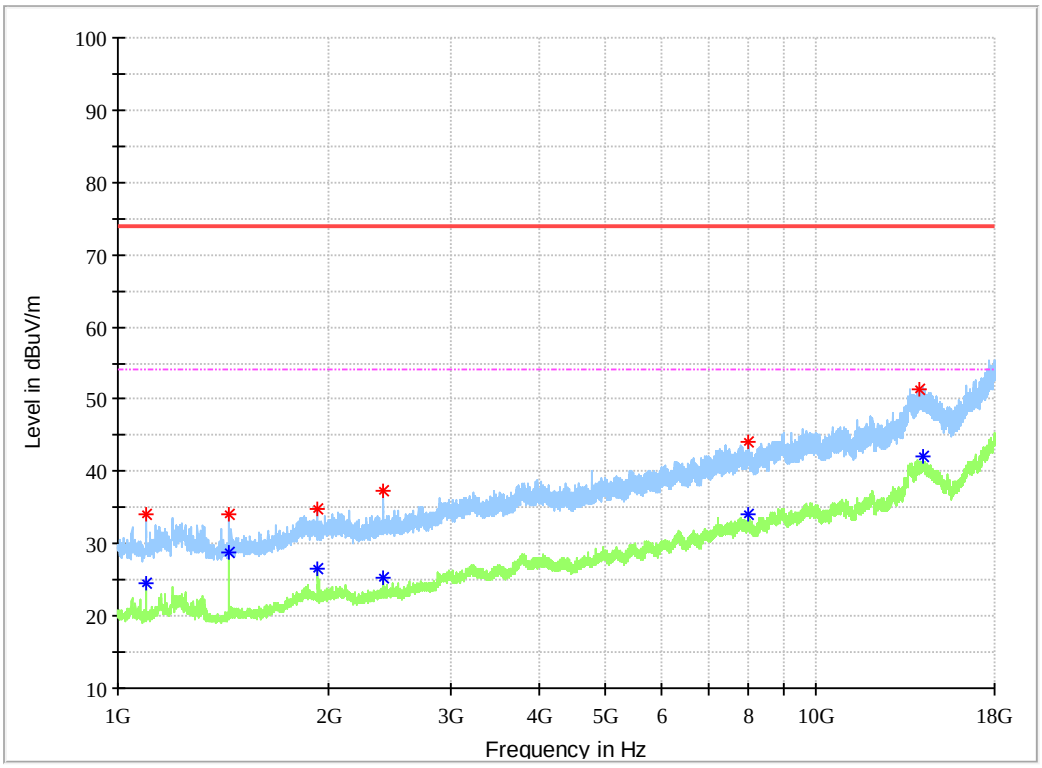
MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
31.710120	24.48	16.4	40.00	15.52	100.0	228.0	V
35.986760	24.57	17.8	40.00	15.43	123.0	238.0	V
102.705600	26.49	18.5	43.50	17.01	100.0	105.0	V
104.101300	26.05	18.5	43.50	17.45	101.0	146.0	V
110.964660	26.18	17.9	43.50	17.32	100.0	128.0	V
315.778160	24.63	20.9	46.00	21.37	122.0	220.0	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 1GMHz~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
1097.466667	33.99	-16.3	74	40.01	200	104	V
1439.166667	34.14	-16	74	39.86	100	151	V
1934.433333	34.81	-12.6	74	39.19	200	0	V
2398.533333	37.27	-12.1	74	36.73	100	356	V
8002.866667	44.00	1.2	74	30.00	100	0	V
14070.166667	51.31	10.7	74	22.69	100	89	H

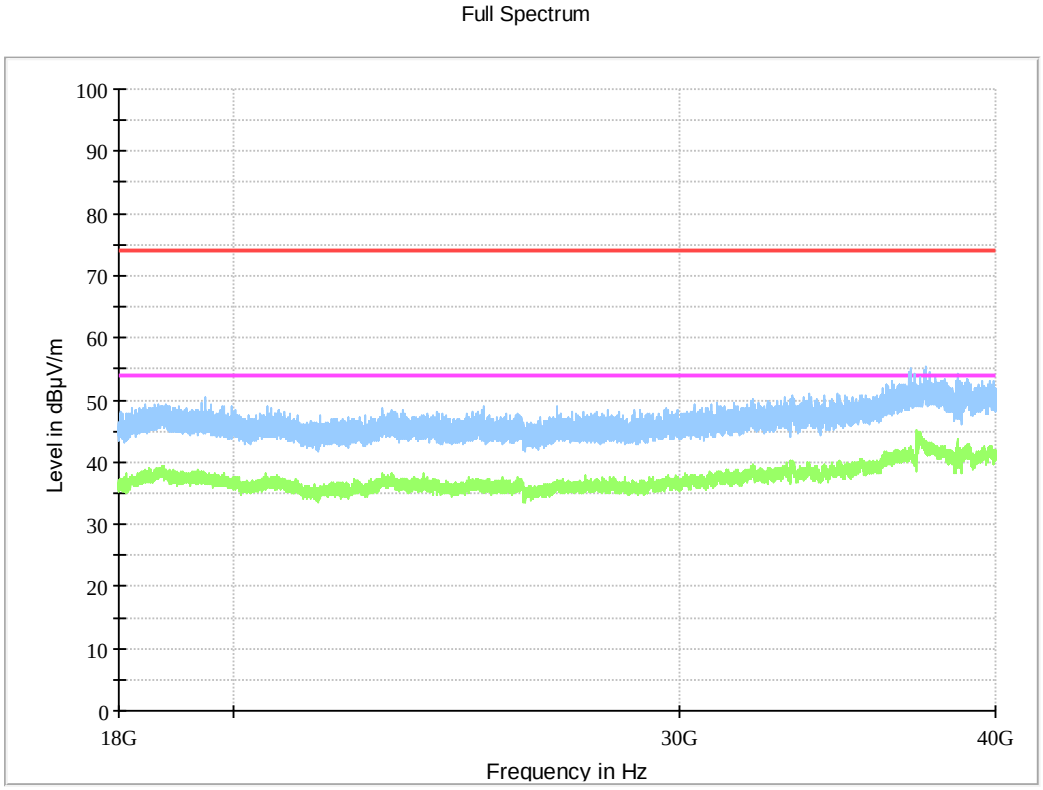
MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1096.900000	24.66	-16.3	54	29.34	200	104	V
1439.733333	28.73	-16	54	25.27	100	151	V
1933.866667	26.49	-12.6	54	27.51	200	0	V
2396.266667	25.21	-12.1	54	28.79	100	356	V
7999.466667	33.97	1.2	54	20.03	100	230	H
14236.766667	42.03	11.3	54	11.97	100	343	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

7.1.3 18GHz~40GHz

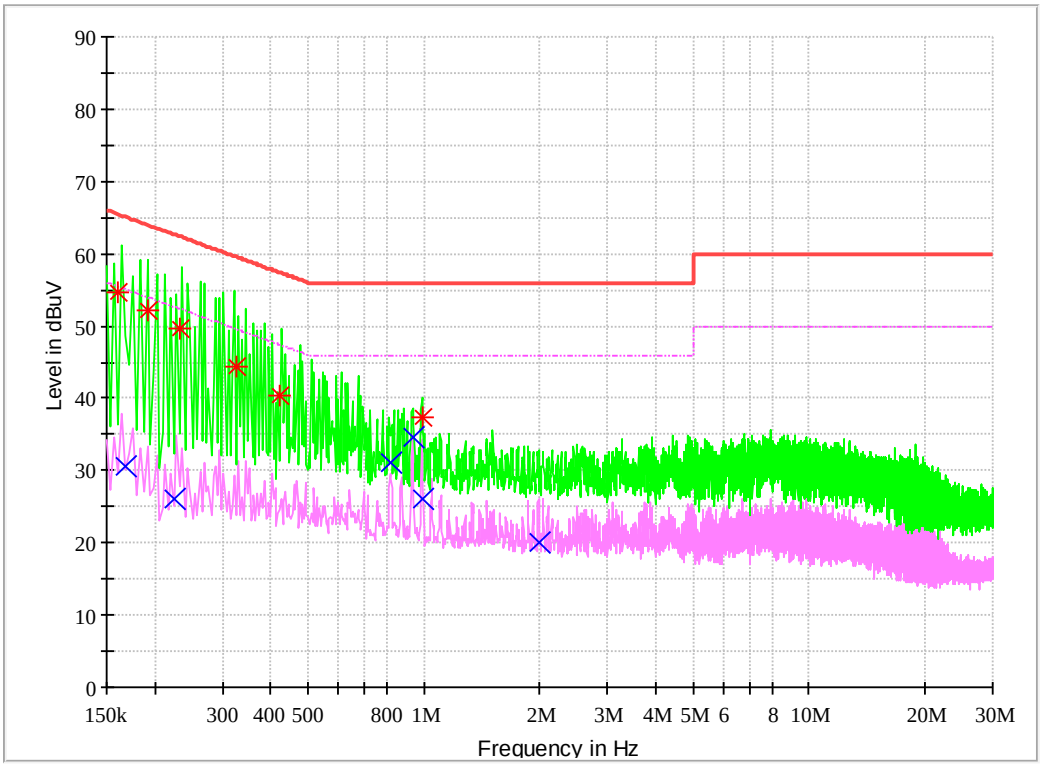
NOTE1: No peak found in the Test Range of “18 GHz to 40GHz”
Test Mode 6: USB Copy (EUT with PC) + Earphone



7.2 Conducted Disturbance

7.2.1 AC Port Test Data

Test Mode 4: Charging+ FM+ Earphone + Idle



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.160698	54.67	L1	9.7	10.76	65.43	FLO
0.191170	52.27	L1	9.7	11.72	63.99	FLO
0.231861	49.73	N	9.7	12.65	62.38	FLO
0.324957	44.50	N	9.7	15.08	59.58	FLO
0.421974	40.37	L1	9.7	17.04	57.41	FLO
0.993030	37.46	N	9.7	18.54	56.00	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.168235	30.70	L1	9.7	24.35	55.05	FLO
0.224885	26.13	N	9.7	26.51	52.64	FLO
0.821161	31.05	L1	9.7	14.95	46.00	FLO
0.937952	34.68	L1	9.7	11.32	46.00	FLO
0.991302	26.06	N	9.7	19.94	46.00	FLO
1.986021	19.97	N	9.7	26.03	46.00	FLO

----------END----------