



# EMC Test Report

**Product Name: Smart Phone**

**Model Number: NAM-LX9**

**FCC ID: 2ATEYNAM-LX9**

**Report No: SYBH(Z-EMC)20210816008001-2**

**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.
4. The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named as "Global Compliance and Testing Center of Huawei Technologies Co., Ltd", the both names have coexisted since 2009.
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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:** 2021-08-16

**Start Date of Test:** 2021-08-17

**End Date of Test:** 2021-09-06

**Test Result:** Pass

Prepared by (Test Engineer)	<u>2021-09-06</u> Date	Chang Lina Name	<i>Chang Lina</i> Signature
Reviewed by (Test Engineer)	<u>2021-09-07</u> Date	Rao Legian Name	<i>Rao Legian</i> Signature
Approved By (Lab Manager)	<u>2021-09-07</u> Date	He Hao Name	<i>He Hao</i> Signature



**Modification Record**

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

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## 1 General Information

### 1.1 EUT Description

NAM-LX9 is subscriber equipment in the GSM/WCDMA/LTE system. 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, NFC etc. Externally it provides earphone port (to provide voice service), and dual SIM/single SIM card interface. NAM-LX9 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	NAM-LX9
Input 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 949MHz 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 716 MHz LTE BAND 17 704 MHz to 716 MHz LTE BAND 26: 814MHz to 849MHz LTE BAND 38: 2570MHz to 2620MHz LTE BAND 41: 2496MHz to 2690MHz LTE BAND 66: 1710MHz to 1780MHz 2.4G WIFI:2412MHz to 2462MHz Bluetooth: 2402MHz to 2480MHz 5G WIFI:5150MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5850MHz NFC: 13.56MHz
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 12 729MHz to 746MHz LTE BAND 17 734 MHz to 746 MHz LTE BAND 26: 859MHz to 894MHz LTE BAND 38: 2570MHz to 2620MHz LTE BAND 41: 2496MHz to 2690MHz LTE BAND 66: 2110MHz to 2200MHz 2.4G WIFI:2412MHz to 2462MHz Bluetooth: 2402MHz to 2480MHz



	5G WIFI: 5150MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5850MHz GPS: 1575.42MHz GLONASS: 1597~1607MHz Galileo: 1575.42MHz BDS: 1561.098 MHz NFC: 13.56MHz
S/N	EJM0121716000128
HW Version	HL1NTHM
SW Version	9.1.1.75M (C900E51R1P4) GPU Turbo
EUT Accessory	
Data Cable(04072004)	Data Cable USB A Male to USB Type C, 1m, Shielded Model: 213-01011-0 Manufacturer: GUANDONG MINGJI HI-TECH ELECTRONICS CO.,LTD.
Data Cable(04072004)	Data Cable USB A Male to USB Type C, 1m, Shielded Model: L99UC139-CS-H Manufacturer: ASAP TECHNOLOGY (JIANGXI) CO.,LTD.
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600E00 Input: 100-240V~50/60Hz, 1.8A Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX SN: YD62YEL8C04398
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600B00 Input: 100-240V~50/60Hz, 1.8A Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600A00 Input: 100-240V~50/60Hz, 1.8A Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600U00 Input: 100-240V~50/60Hz, 1.8A Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600E01 Input: 100-240V~50/60Hz, 1.8A Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX SN: YE80YEM5L00150
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600B01 Input: 100-240V~50/60Hz, 1.8A Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600A01 Input: 100-240V~50/60Hz, 1.8A



	Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600U01 Input: 100-240V~50/60Hz, 1.8A Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600E02 Input: 100-240V~50/60Hz, 1.8A Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX SN:JF01YELC700020
Adapter	Manufacturer: Huawei Device Co.,Ltd. Model: HW-110600B02 Input: 100-240V~50/60Hz, 1.8A Output voltage: 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 Output voltage: 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 Output voltage: 5V --- 2A OR 10V --- 4A OR 11V --- 6A MAX
Rechargeable Li-ion	Manufacturer: Huawei Device Co., Ltd. (Sunwoda/SCUD) Battery Model: HB476489EFW Rated capacity: 4200 mAh/ Nominal Voltage: 3.87V Charging Voltage: 4.45V
Earphone(22040351)	Model: 1311-3291-6001-TC-351 Manufacturer: Boluo County Quancheng Electronic Co., Ltd.

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-110600E00, HW-110600B00, HW-110600U00 and HW-110600A00 have the same PCB circuit. HW-110600E01, HW-110600B01, HW-110600U01 and HW-110600A01 have the same PCB circuit. HW-110600E02, HW-110600B02, HW-110600U02 and HW-110600A02 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 7	CLASS B	Pass	Site1
<u>Conducted Emissions</u> <input type="checkbox"/> DC Power Port <input checked="" type="checkbox"/> AC Power Port <input type="checkbox"/> Telecommunication Ports	Mode 1, Mode 3~Mode 5, Mode 7	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+NFC On
Mode 2:	Traffic*+ BT+ WIFI+ NFC+ GNSS+NFC On+ Earphone
Mode 3:	Charging+ Video playing+ Idle
Mode 4:	Charging+ Camera on + Idle
Mode 5:	Charging+ Music Playing + Idle
Mode 6:	Music playing+ Earphone+ Idle
Mode 7:	USB Copy(EUT with PC)

Note: 'traffic\*' it includes GSM/UTRA/E-UTRA modes.  
GSM, DCS, UTRA, E-UTRA 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.

The Worst Case:

Radiated Emission:

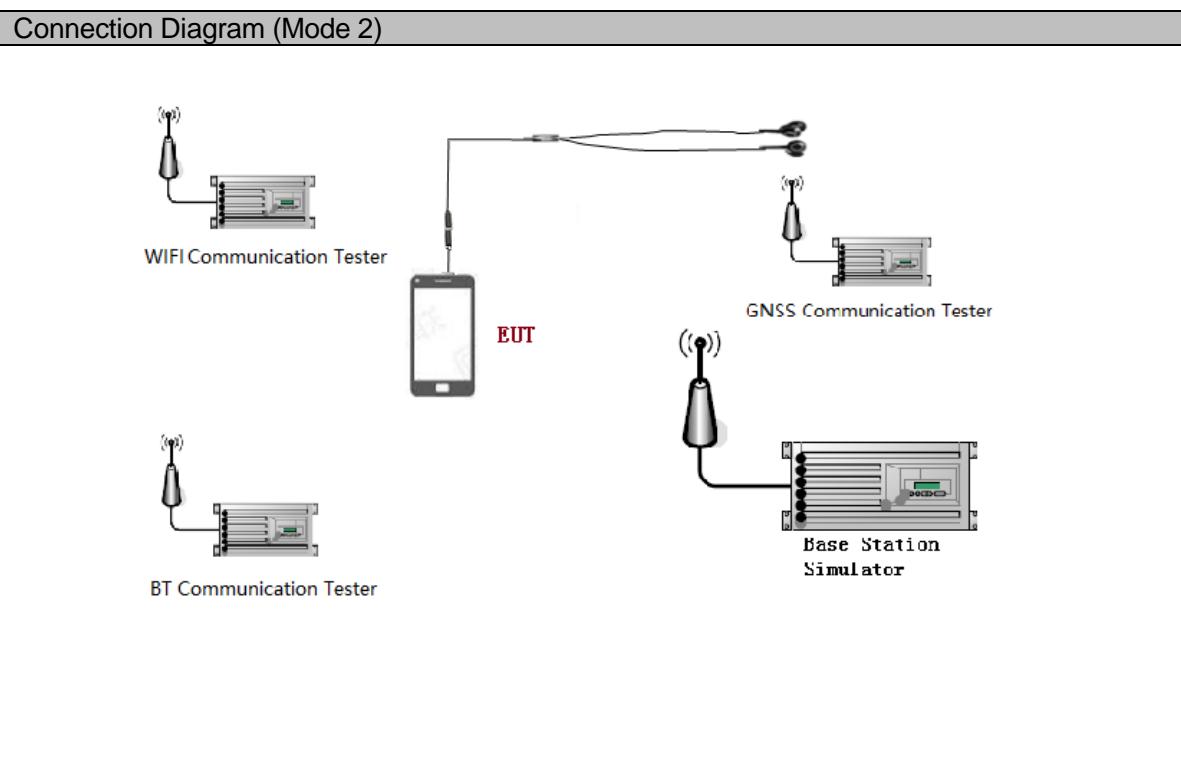
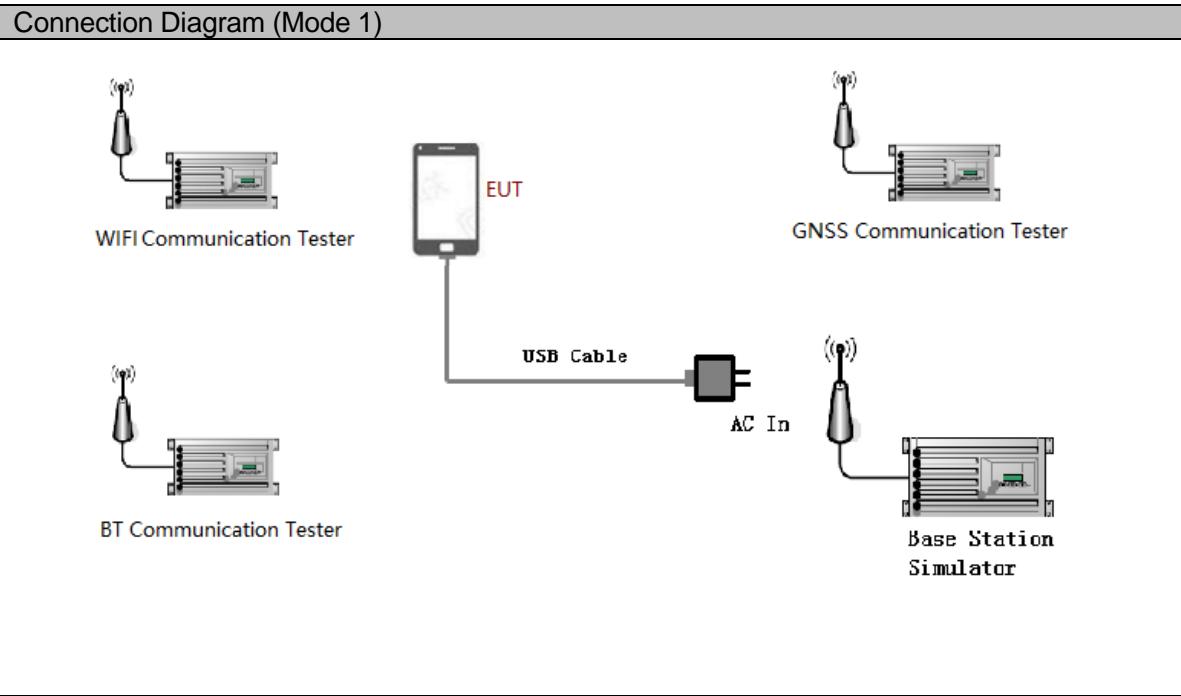
Charging (Adapter model: HW-110600B01, SN: JF01YELC700020) + Camera on + Idle the result is the worst (30MHz-1GHz).

USB Copy (EUT with PC) the result is the worst the result is the worst (1GHz-40GHz).

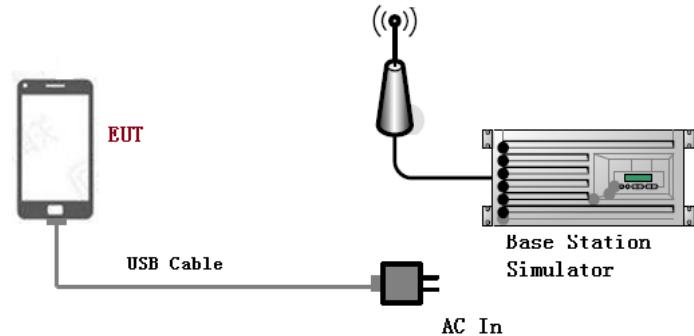
Conducted Emission:

Charging (Adapter model: HW-110600B01, SN: JF01YELC700020) + Traffic (GSM850) + BT+ WIFI+ GNSS+NFC On the result is the worst.

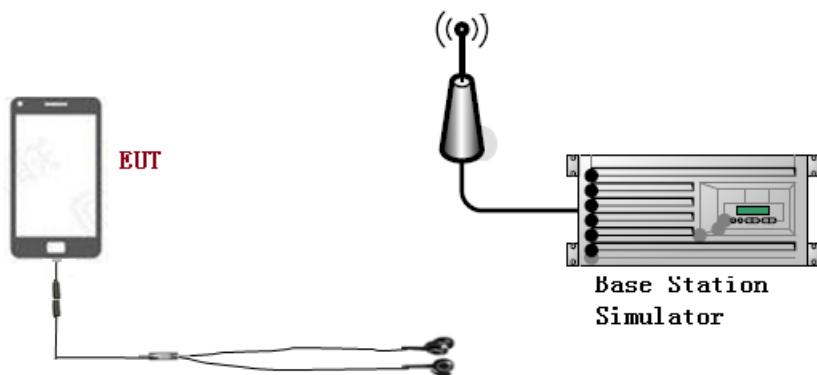
### 3.2 Test System Configuration

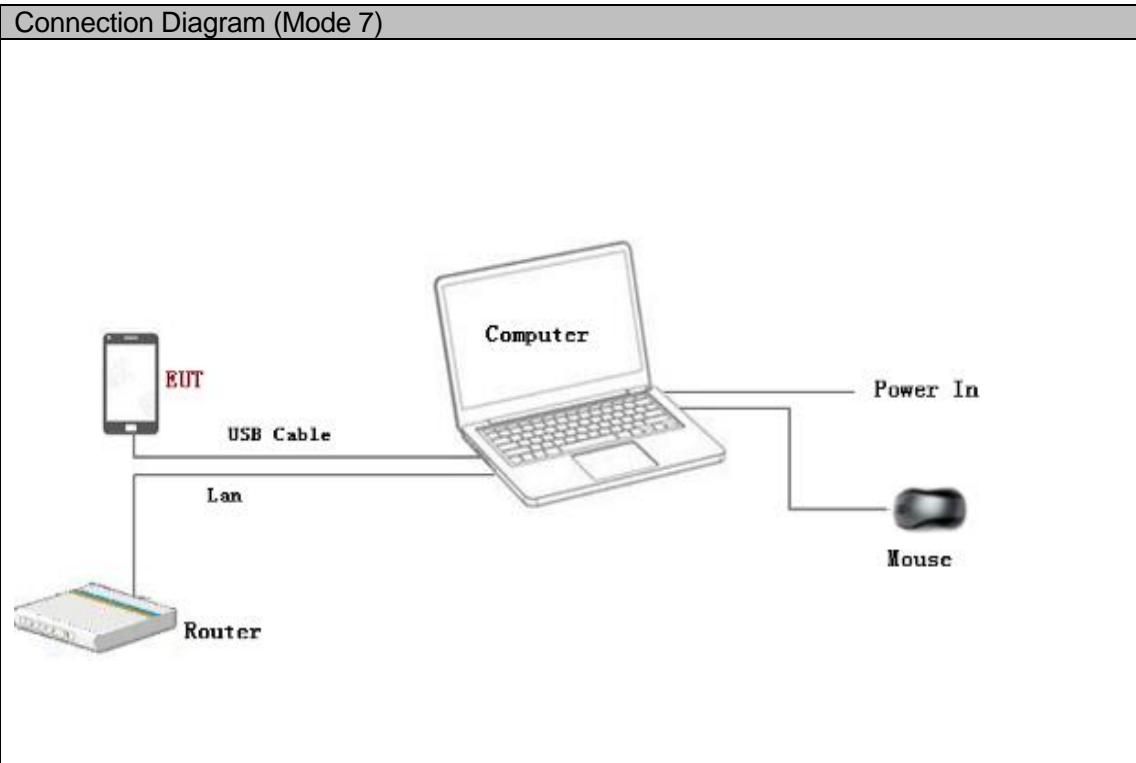


## Connection Diagram (Mode 3 ~ Mode 5)



## Connection Diagram (Mode 6)







### 3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB	1	<3m	Shielded
Earphone	1	<3m	Unshielded

### 3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval
Radio Communication Tester	CMU200	R&S	110932	Nov. 10, 2021	12
Radio Communication Tester	MT8820C	Anritsu	6200971028	Jan. 30. 2022	12
Radio Communication Tester	MT8821C	Anritsu	6261760791	Jan. 29, 2022	N/A
WLAN Tester	8862A	Anritsu	6261782432	Jul. 02, 2022	N/A
GSS7000 Signal Generator	GSS7000	Spirent	108	Nov. 10, 2021	N/A
Notebook	S3	ThinkPad	A140714638	N/A	N/A
Mouse	M3111-P	DELL	6913XT1014605	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

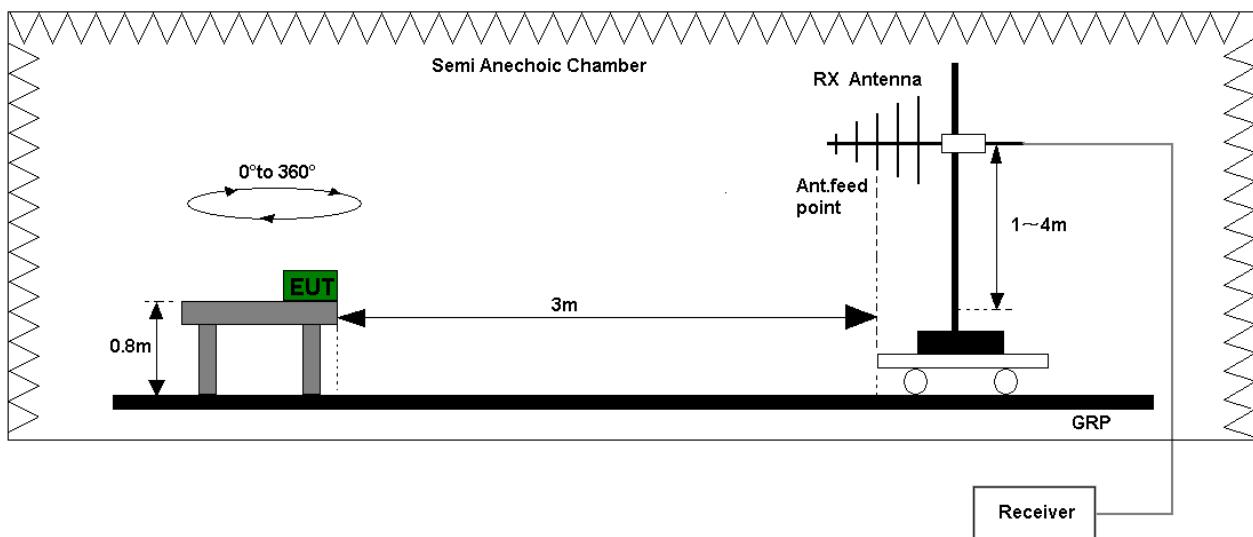


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz )

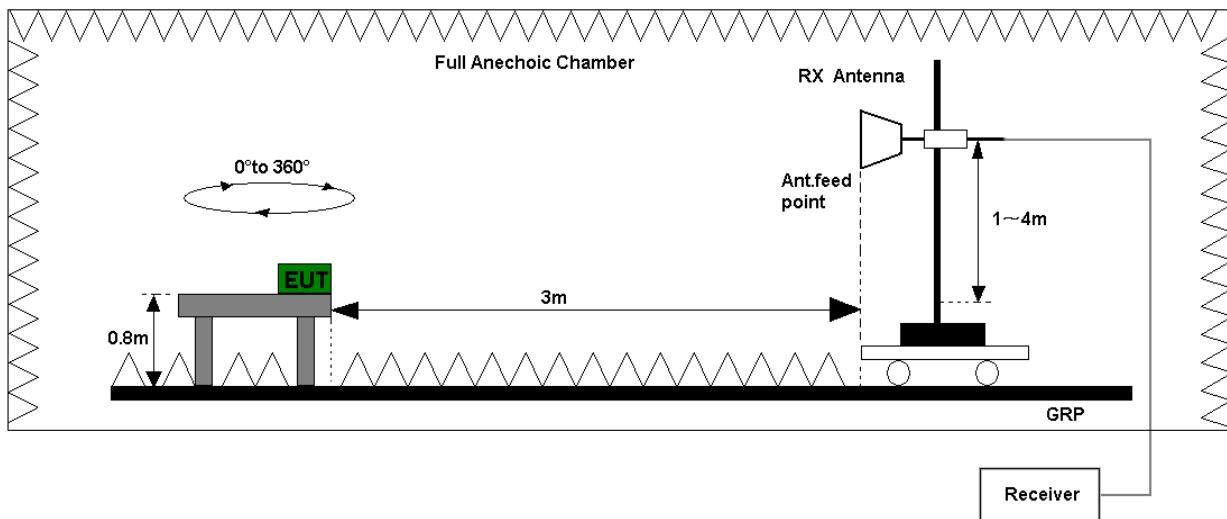


Figure 2. Test set-up of radiated disturbance(above 1GHz)



#### 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( $\mu$ V/m)		Unit(dB $\mu$ 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

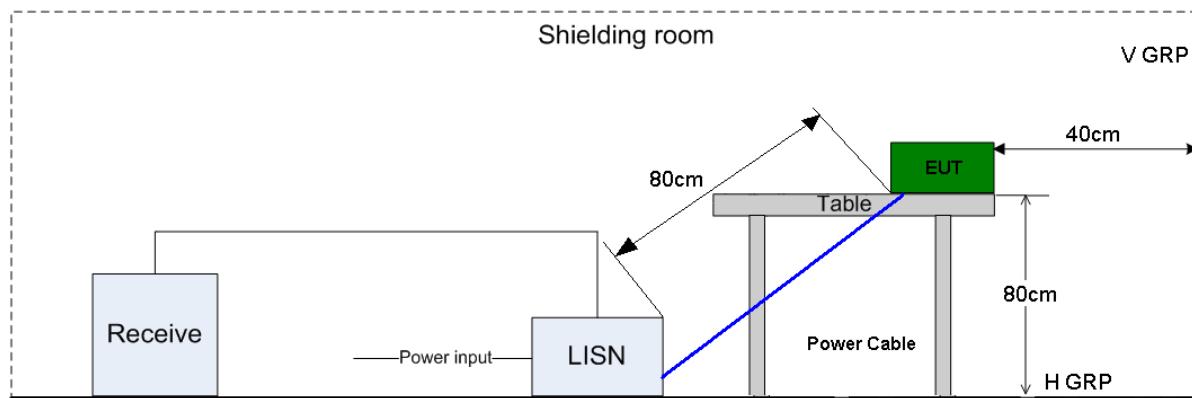


Figure 3. Test Set-up of conducted disturbance

### 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 $\mu$ V)	AV (dB $\mu$ 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
RE2 (30M-1G)	EMI Test receiver	ESW44	101878	R&S	Jan. 30, 2022	12
	Broadband Antenna	VULB 9163	9163-01303	SCHWARZ BECK	Aug. 09, 2022	24
RE1 (1G-40G)	Horn Antenna (1 to 18G)	HF906	100684	R&S	Jul. 10, 2023	24
	Amplifier	SCA-SCU 18	10162	R&S	Mar. 13, 2022	12
	Horn antenna (18 to 40G)	BBHA9170 644	BBHA9170 644	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. 06, 2021	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 $\mu$ V/m)	U=5.24dB; k=2
RE(1GHz-18GHz)	Field strength (dB $\mu$ V/m)	U=4.68dB; k=2
RE(18 GHz-40GHz)	Field strength (dB $\mu$ V/m)	U=4.52dB; k=2
CE	Disturbance Voltage (dB $\mu$ V)	U=2.3dB; k=2

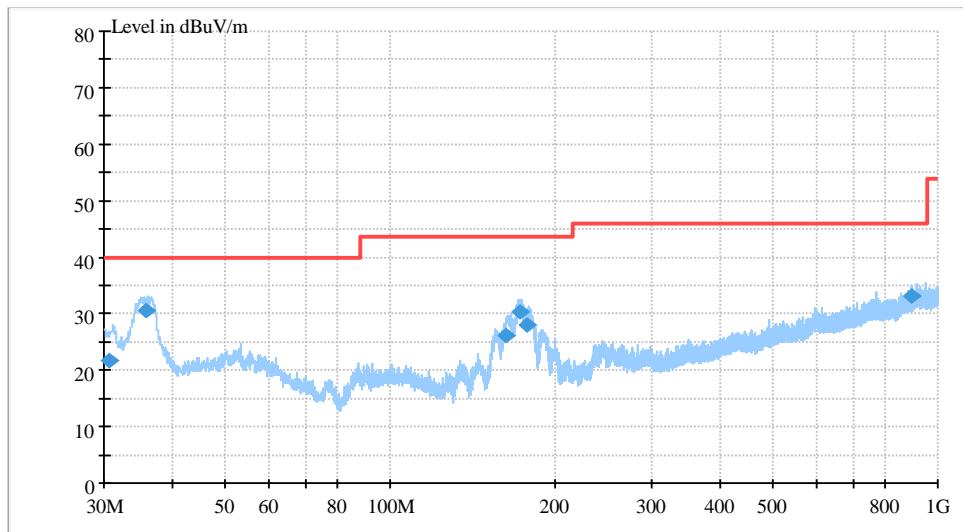
## 7 Test Data and Graph

Only the worst test results were shown

### 7.1 Radiated Disturbance

#### 7.1.1 30MHz~1GHz

Test Mode 4: Charging+ Camera on + Idle



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
30.701920	21.80	16.5	40.00	18.20	122.0	4.0	V
35.826580	30.58	17.7	40.00	9.42	100.0	145.0	V
163.105260	26.19	15.5	43.50	17.31	101.0	117.0	V
172.756520	30.25	15.9	43.50	13.25	100.0	117.0	V
177.966180	28.03	16.2	43.50	15.47	101.0	130.0	V
894.251180	33.20	30.5	46.00	12.80	101.0	8.0	V

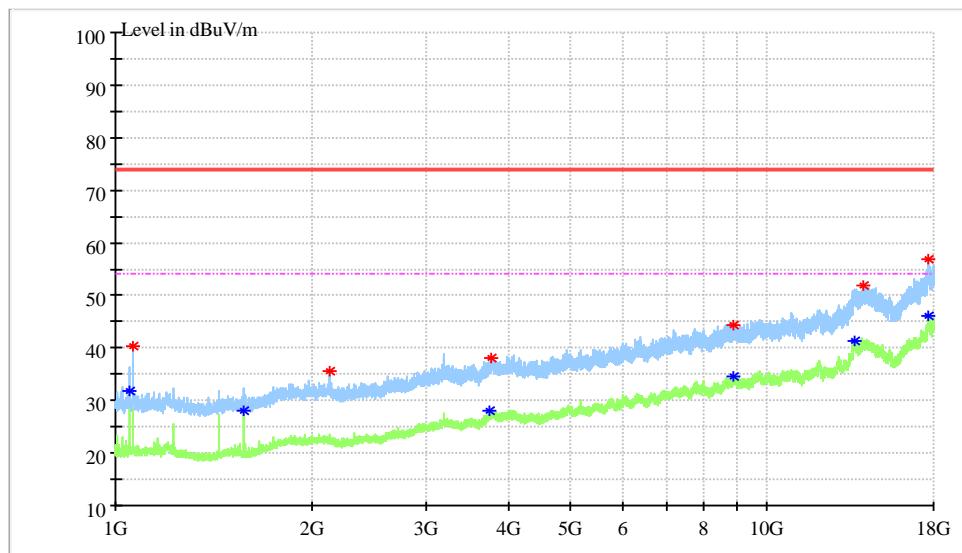
Note:

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.

### 7.1.2 1GHz~18GHz

Test Mode 7: USB Copy (EUT with PC)



#### MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
1064.600000	40.38	-16.3	74.00	33.62	100.0	16.0	H
2132.200000	35.67	-12.5	74.00	38.33	100.0	190.0	V
3767.600000	38.07	-6.7	74.00	35.93	100.0	168.0	H
8891.966667	44.38	2.3	74.00	29.62	200.0	26.0	H
14053.733333	51.92	10.7	74.00	22.08	200.0	348.0	V
17697.966667	56.77	13.7	74.00	17.23	200.0	191.0	H

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
1049.866667	31.71	-16.6	54.00	22.29	100.0	82.0	V
1574.600000	28.06	-15.5	54.00	25.94	200.0	60.0	V
3744.366667	28.07	-7.0	54.00	25.93	100.0	135.0	V
8882.900000	34.58	2.2	54.00	19.42	100.0	186.0	H
13610.600000	41.41	8.5	54.00	12.59	100.0	0.0	V
17705.333333	46.21	13.7	54.00	7.79	100.0	349.0	H

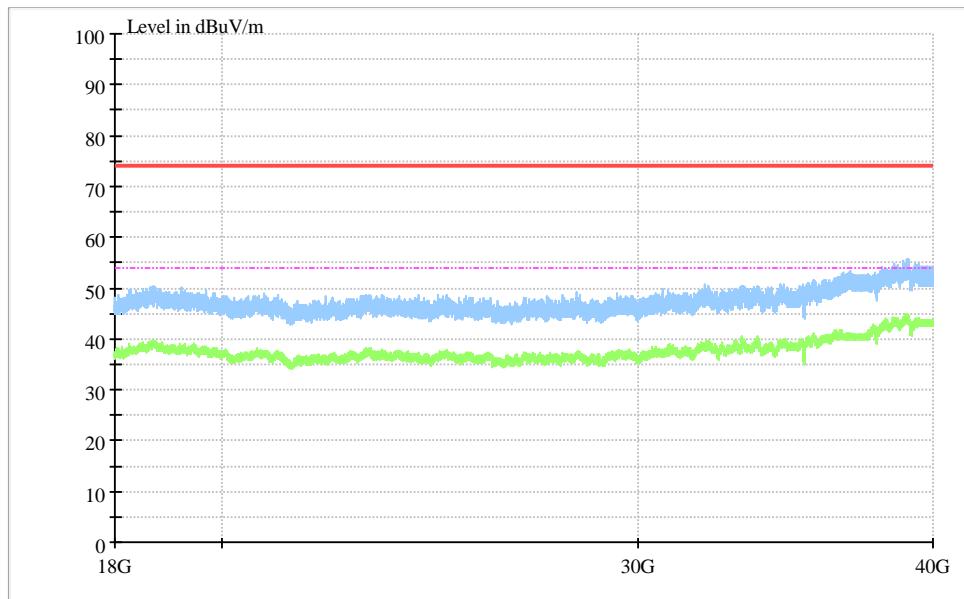
#### Note:

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.

### 7.1.3 18GHz~40GHz

Test Mode 7: USB Copy (EUT with PC)

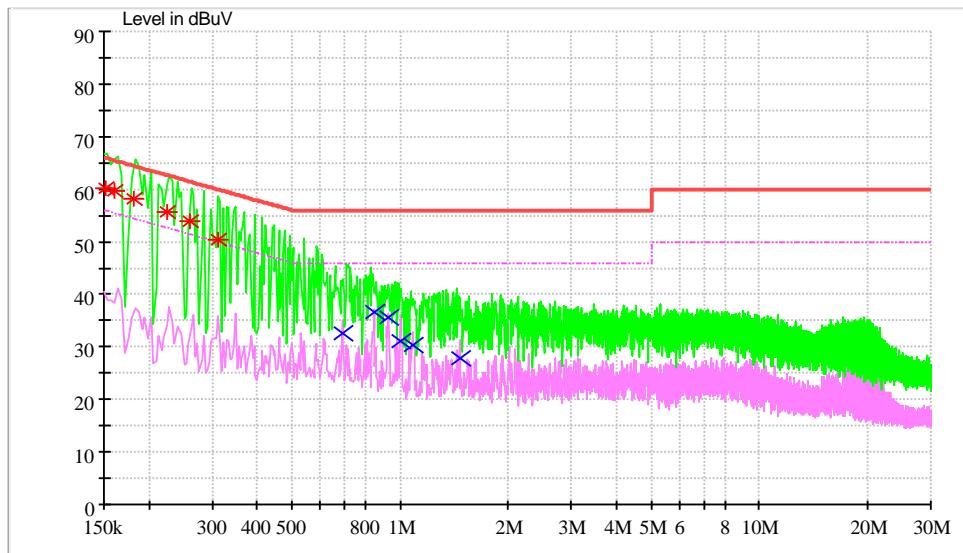


Note: The emission is less than the measurement system noise floor, so no peak found in the Test Range of "18 GHz to 40 GHz".

## 7.2 Conducted Disturbance

### 7.2.1 AC Port Test Data

Test Mode 1: Charging+ Traffic (GSM850) + BT+ WIFI+ GNSS+NFC On



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB $\mu$ V	Line	Transd dB	Margin dB	Limit dB $\mu$ V	PE
0.151776	60.05	N	9.6	5.85	65.90	FLO
0.160718	59.66	L1	9.6	5.77	65.43	FLO
0.181231	58.16	L1	9.6	6.27	64.43	FLO
0.225843	55.76	L1	9.6	6.84	62.60	FLO
0.260180	53.99	L1	9.6	7.44	61.43	FLO
0.312919	50.29	L1	9.6	9.60	59.89	FLO

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB $\mu$ V	Line	Transd dB	Margin dB	Limit dB $\mu$ V	PE
0.688760	32.69	L1	9.6	13.31	46.00	FLO
0.850801	36.70	L1	9.6	9.30	46.00	FLO
0.930712	35.52	L1	9.6	10.48	46.00	FLO
1.003156	31.11	L1	9.6	14.89	46.00	FLO
1.082909	30.45	L1	9.6	15.55	46.00	FLO
1.465483	27.78	L1	9.6	18.22	46.00	FLO

-----END-----