



EMC Test Report

Product Name: Smart Phone

Model Number: ALP-L29, ALP-L09

Report No: SYBH(Z-EMC)20180205020001-2

FCC ID: QISALP-LX9

Reliability Laboratory 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 listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.
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Applicant: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Date of Receipt Test Item: Mar.18,2018
Start Date of Test: Mar.18,2018
End Date of Test: Mar.28,2018

Test Result: Pass

**Approved By
(Lab Manager)**

2018-3-29
Date

Roger Zhang
Name

Roger Zhang

Signature

**Prepared by
(Test Engineer)**

2018-3-28
Date

Peng Shao Hua
Name

Peng Shao Hua

Signature



Modification Record

No.	Last Report No.	Modification Description
1	NA	NA
2	SYBH(Z-EMC)060072017-2	CA_2C, CA_7C, CA_38C,CA_41CSupported

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1 General Information

1.1 EUT Description

EUT Description	
Product Name	Smart Phone
Model Number	ALP-L29, ALP-L09
Input voltage	3.82V DC
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 38: 2570MHz to 2620MHz LTE BAND 41: 2545MHz to 2655MHz WIFI/Bluetooth: 2400MHz to 2483.5MHz WIFI 5G:5150MHz to 5350MHz 5470MHz to 5850MHz NFC: 13.56MHz
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 894MHz LTE BAND 38: 2570MHz to 2620MHz LTE BAND 41: 2545MHz to 2655MHz WIFI/Bluetooth: 2400MHz to 2483.5MHz WIFI 5G:5150MHz to 5350MHz 5470MHz to 5850MHz NFC:13.56MHz GPS: 1575.42MHz
S/N	D3H011722000155/ D3H011722002651
HW Version	HL1AALPSM
SW Version	ALP-L29:ALP-L29 8.0.0.129 (C900log) ALP-L09:ALP-L09 8.0.0.129 (C900log)
EUT Accessory	
USB(04071289)	Data Cable USB A Male to USB Type C, Shielded Manufacturer: LUXSHARE-ICT Co., Ltd.



Chang Shu Honglin Technology Co.,Ltd.	
Earphone(22040296)	Manufacturer: JIANGXI LIANCHUANG HONGSHENG ELECTRONIC CO., LTD BOLUO COUNTY QUANCHENG ELECTRONIC CO., LTD Goer Tek Inc MERRY ELECTRONICS (SHENZHEN) CO., LTD.
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450U00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V $\overline{\overline{\overline{\quad}}}$ 2A OR 5V $\overline{\overline{\overline{\quad}}}$ 4.5A OR 4.5V $\overline{\overline{\overline{\quad}}}$ 5A Rated Power: 10W/22.5W SN:K83171H4J05129 C82708H5J05554 H828K8H3V05002 P8281OH6920035
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450E00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V $\overline{\overline{\overline{\quad}}}$ 2A OR 5V $\overline{\overline{\overline{\quad}}}$ 4.5A OR 4.5V $\overline{\overline{\overline{\quad}}}$ 5A Rated Power: 10W/22.5W SN:P8301OH7412711 C82708H5J05553 H828K8H3V05001 K83059H4V07826
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450B00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V $\overline{\overline{\overline{\quad}}}$ 2A OR 5V $\overline{\overline{\overline{\quad}}}$ 4.5A OR 4.5V $\overline{\overline{\overline{\quad}}}$ 5A Rated Power: 10W/22.5W SN: C82708H5J05554 H828K8H3V05003 K82971H3R11886 P82922H3J31706
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450A00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V $\overline{\overline{\overline{\quad}}}$ 2A OR 5V $\overline{\overline{\overline{\quad}}}$ 4.5A OR 4.5V $\overline{\overline{\overline{\quad}}}$ 5A Rated Power: 10W/22.5W SN: C82708H5J05557 H828K8H3V05006 K83171H4J05584 P82922H3J31708
Rechargeable Li-ion	Manufacturer: Huawei Technologies Co.,Ltd. Battery Model: HB436486ECW Rated capacity: 3900mAh Nominal Voltage: $\overline{\overline{\overline{\quad}}}$ +3.82V Charging Voltage: $\overline{\overline{\overline{\quad}}}$ +4.4V SN:4XSCAYH315X000FS 4XTDLCH319900131



	4XSDSIH405X00092
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Remark: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed information.

1.2 Differences Description

1 The changed points:

	Before	After
Supported uplink CA	Unsupported	CA_2C, CA_7C, CA_38C,CA_41CSupported

With the consideration of difference, all the EMC tests were tested on the model ALPS-L29 (report number: SYBH(Z-EMC)060072017-2).

2 The only difference between ALP-L29 and ALP-L09 is that ALP-L09 deletes into single SIM card by software. Other parts of the two models are the same. With the consideration of difference, all the EMC tests were tested on the model ALP-L29

1.3 Test Site Information

Test Site 1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	No.2 New City Avenue Songshan Lake Sci. &Tech. Industry Park, Dongguan, Guangdong, P.R.C

1.4 Applied Standards

APPLIED STANDARD

47 FR FCC Part 15:2017, 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	Mode1~ Mode4 , Mode6	CLASS B	Pass	Site1
<u>Conducted Emissions</u> <input checked="" type="checkbox"/> DC Power Port <input checked="" type="checkbox"/> AC Power Port <input type="checkbox"/> Telecommunication Ports	Mode1~ Mode6	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the uncertainty of test system. 2, <input checked="" type="checkbox"/> The item has been tested; <input type="checkbox"/> 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+ Camera On + Idle
Mode 2:	Earphone + Camera On + Idle
Mode 3:	Charging+ video Playing + Idle
Mode 4:	Earphone + video Playing + Idle
Mode 5	Charging+Traffic+BT+WIFI+NFC+GPS ON
Mode 6	USB Copy(EUT with PC)

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.

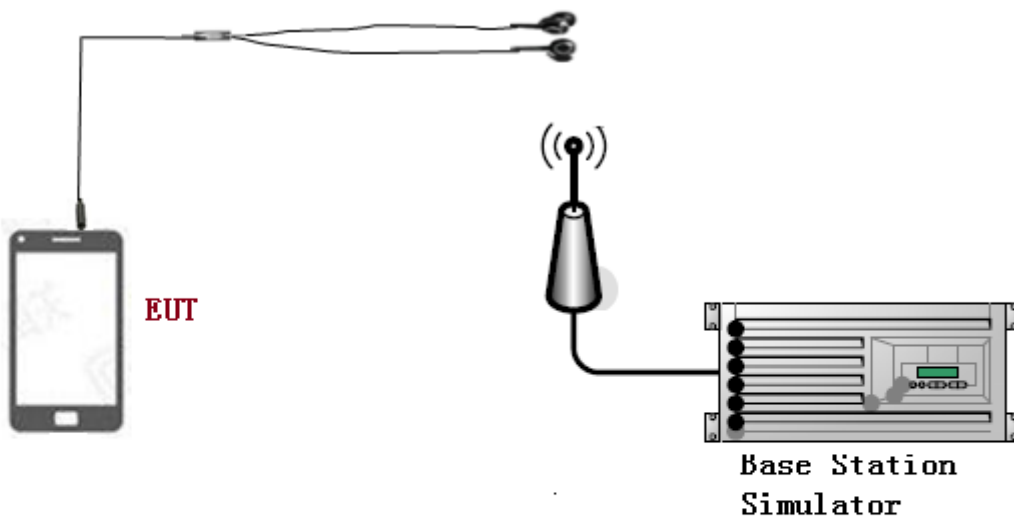
Worst Case:

- 1) Radiated Emission
Adapter(Model: HW-050450U00, SN: K83059H4V07826) + Camera On + Idle
the result is the worst(30MHz~1GHz).
USB Copy(EUT with PC) the result is the worst(1GHz~18GHz).
USB Copy(EUT with PC) the result is the worst(18GHz~25.6GHz).
USB Copy(EUT with PC) the result is the worst(25.6GHz~40GHz).

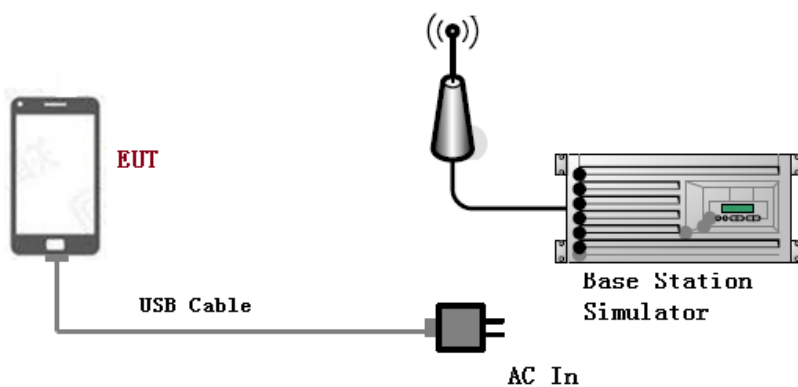
- 2) Conducted Emission
Adapter(Model: HW-050450U00, SN: P8281OH6920035) + Camera On + Idle
the result is the worst.

3.2 Test System Configuration

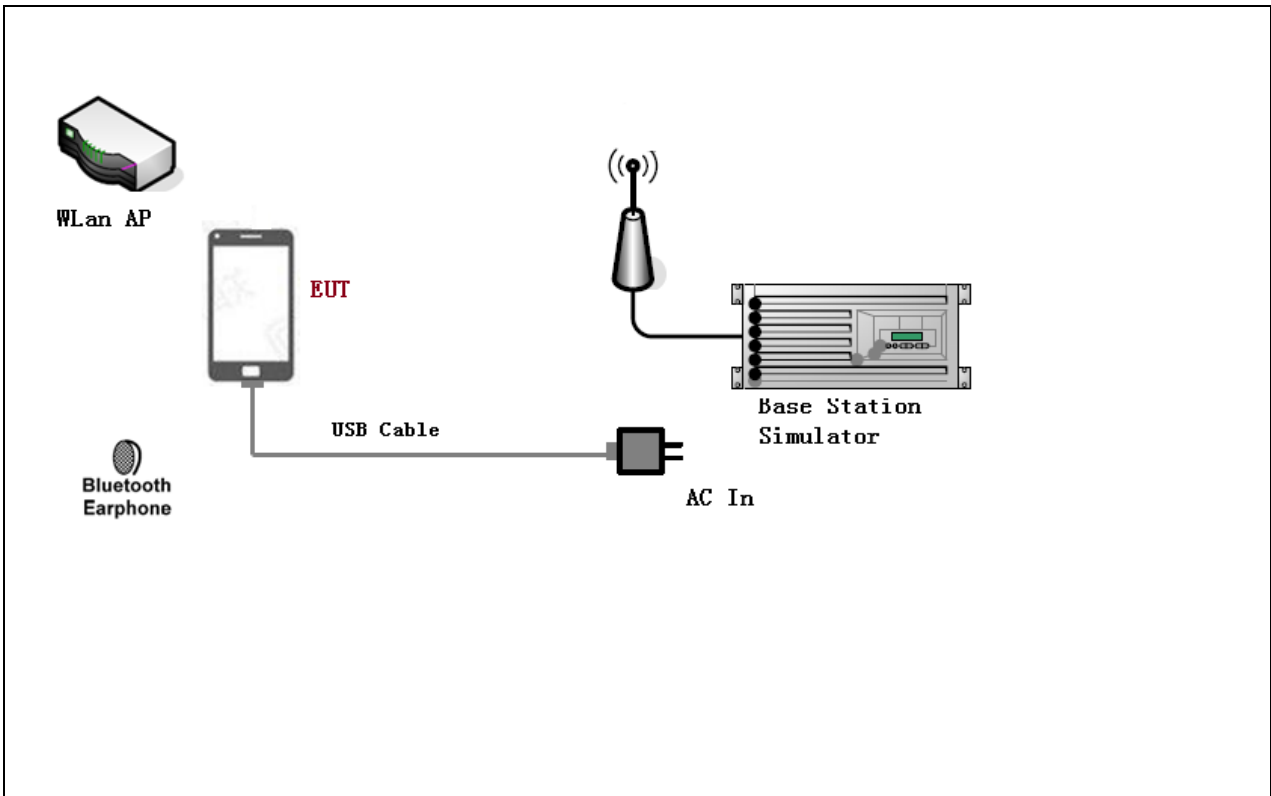
Connection Diagram (Mode 2/Mode 4)



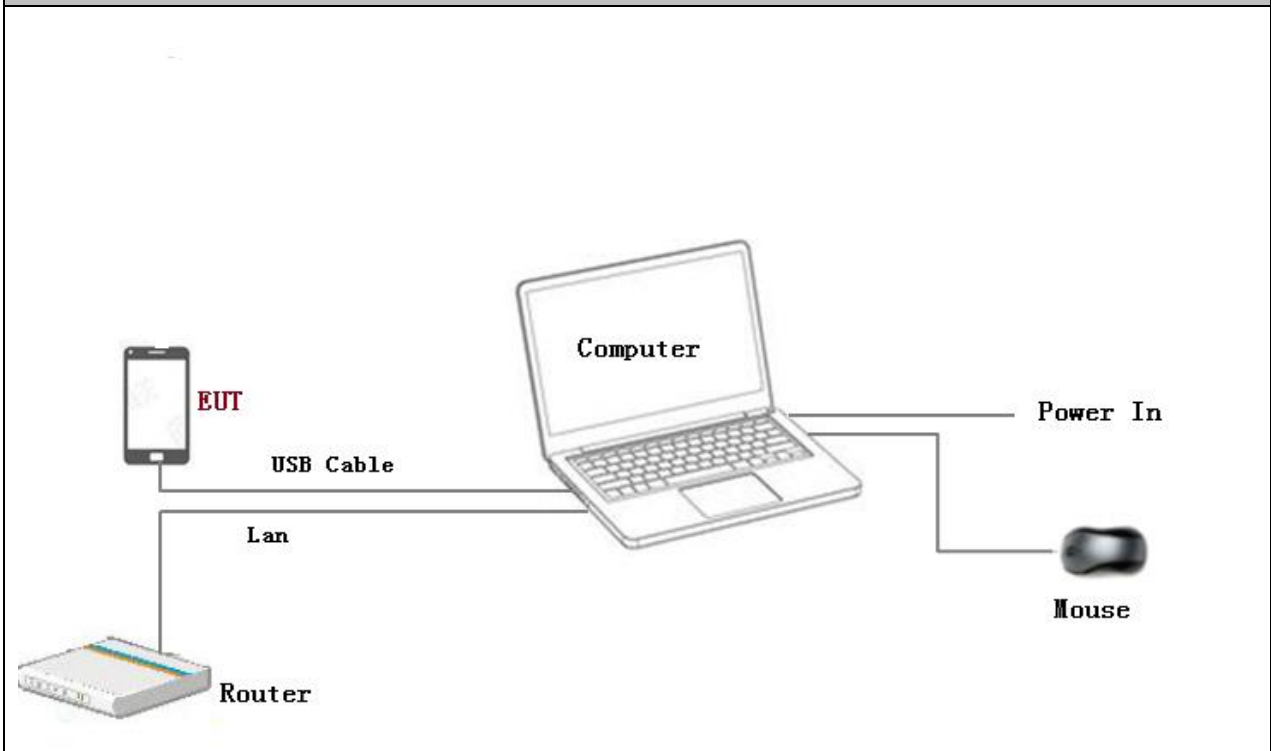
Connection Diagram (Mode 1/Mode 3)



Connection Diagram (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	3608082535	2019-03-01	12
Radio Communication Tester	MT8820C	Anritsu	A110518805	2018-05-15	12
Notebook	S3	ThinkPad	A140714638	/	/
Mouse	MOHQUO	HP	G1K28AA		/

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: ANSI C63.4-2009. The test distance was 3m. The set-up and test methods were according to ANSI C63.4-2009.

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

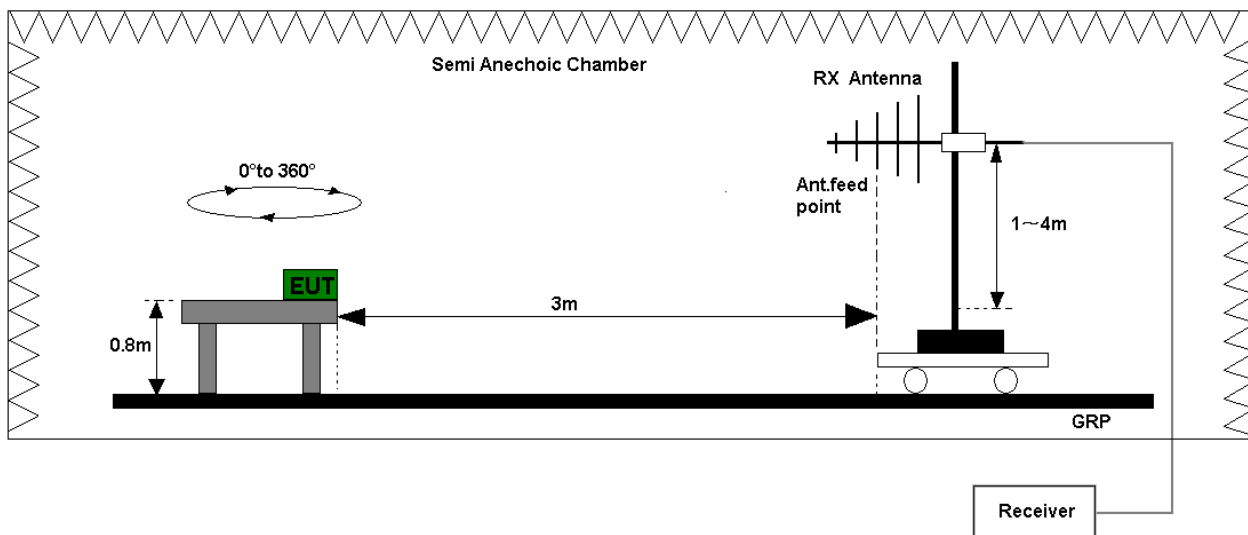


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

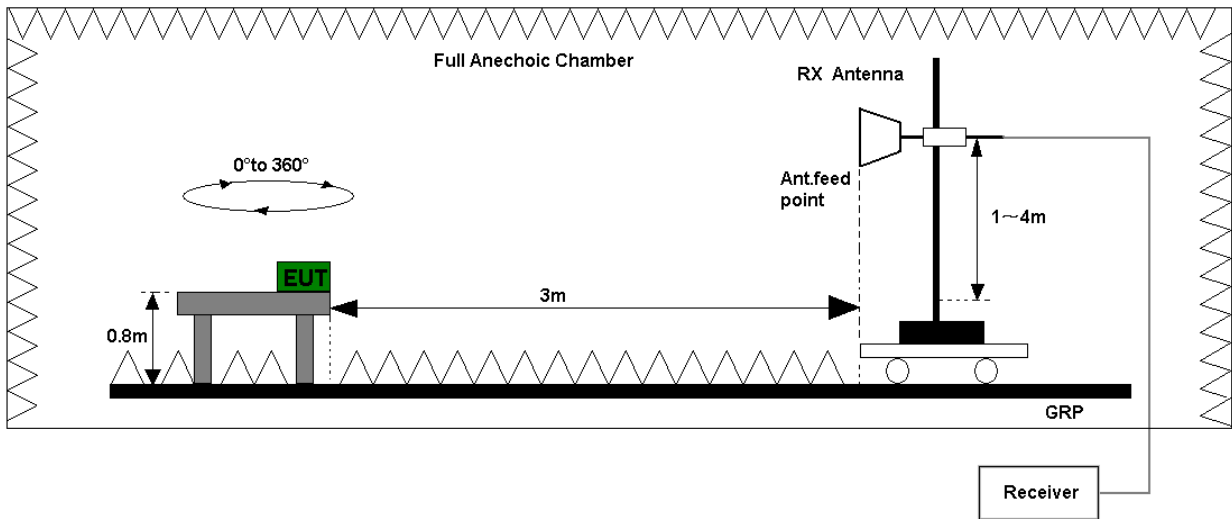


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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 ANSI C63.4-2009. 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

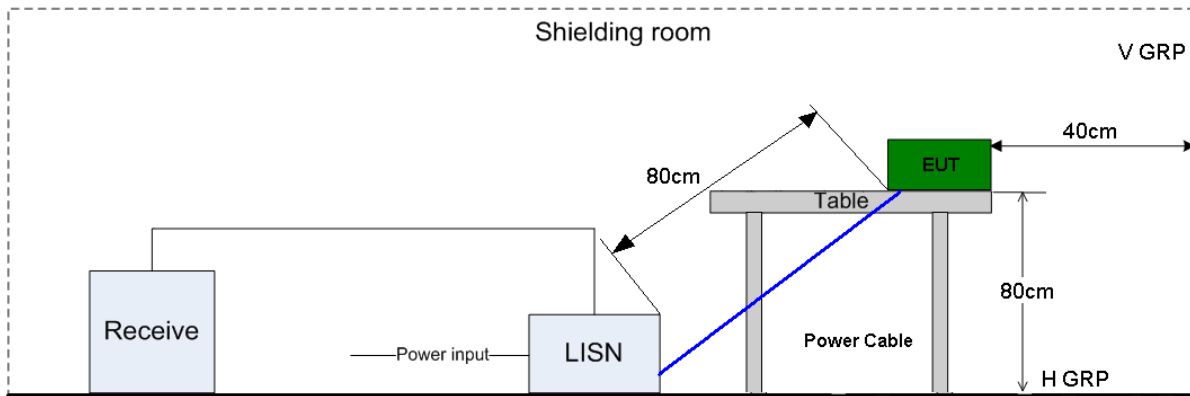


Figure 3. Test Set-up of conducted disturbance

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	EMI Test receiver	ESU26	100150	R&S	Jun. 20, 2018	12
	Broadband Antenna	VULB 9163	9163-491	SCHWARZ BECK	Mar. 28, 2019	24
	Horn Antenna (1-18G)	HF906	100683	R&S	Mar. 28, 2019	24
	Horn Antenna (26.5-40G)	ETS 3160-10	LM5947	ETS-LINDGREN	Jul. 19, 2019	24
	Horn Antenna (18-26.5G)	ETS 3160-9	5140299	ETS-LINDGREN	Jul. 19, 2019	24
	Amplifier	R&S	SCU-40	10016	May. 15, 2018	12
CE	EMI Test receiver	ESU26	100150	R&S	May. 15, 2018	12
	Artificial Mains Network	ENV4200	100134	R&S	May. 15, 2018	12
	Artificial Mains Network	ENV216	100382	R&S	May. 15, 2018	12
Software Information						
Test Item	Software Name	Manufacturer		Version		
RE	EMC32	R&S		V9.25.0		
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=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB μ V/m)	U=5.1dB; k=2
RE(18GHz-26.5GHz)	Field strength (dB μ V/m)	U=4.82dB; k=2
RE(26.5GHz-40GHz)	Field strength (dB μ V/m)	U=5.22dB; k=2
CE	Disturbance Voltage (dB μ V)	U=2.5dB; k=2

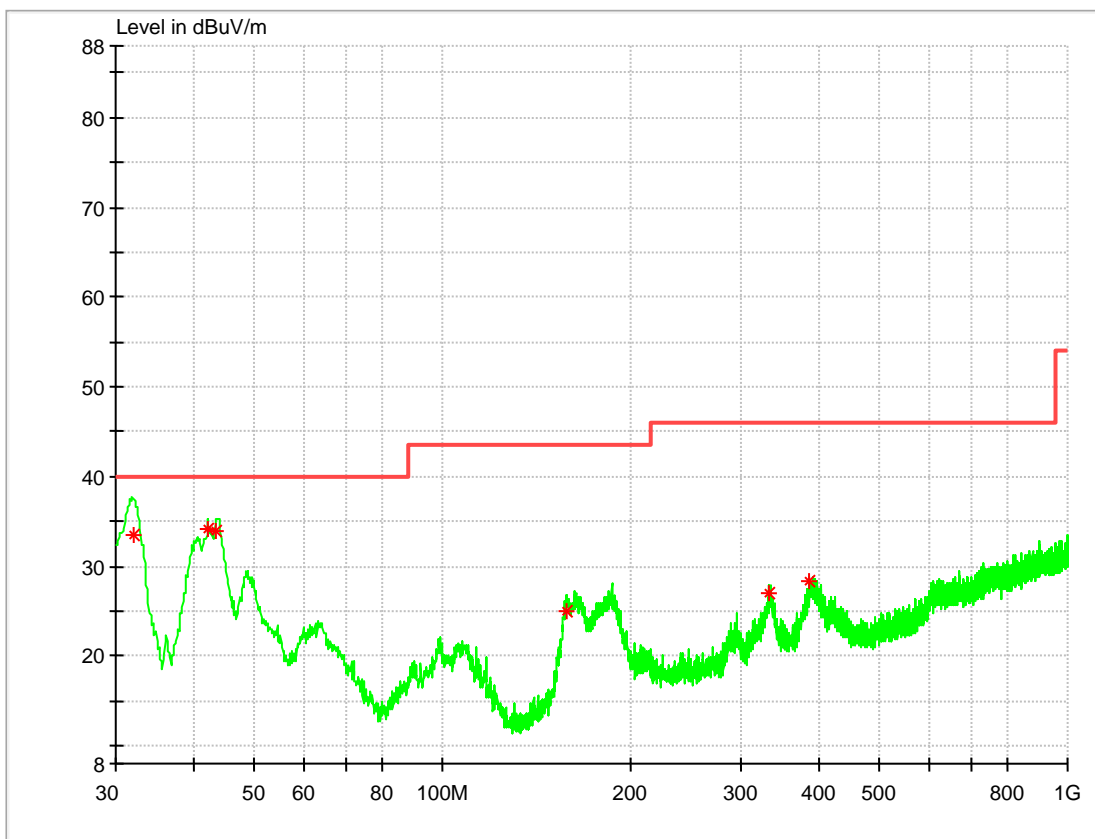
7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

Test Mode 1: Charging+Camera On +idle



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
32.168450	33.48	14.8	40.00	6.52	107.0	221.0	VERTICAL
42.194750	34.08	15.4	40.00	5.92	100.0	309.0	VERTICAL
43.537250	33.99	15.3	40.00	6.01	100.0	302.0	VERTICAL
157.651150	24.96	10.5	43.50	18.54	100.0	291.0	VERTICAL
333.998650	27.05	16.8	46.00	18.95	117.0	99.0	HORIZONTAL
386.053000	28.25	17.8	46.00	17.75	100.0	284.0	HORIZONTAL

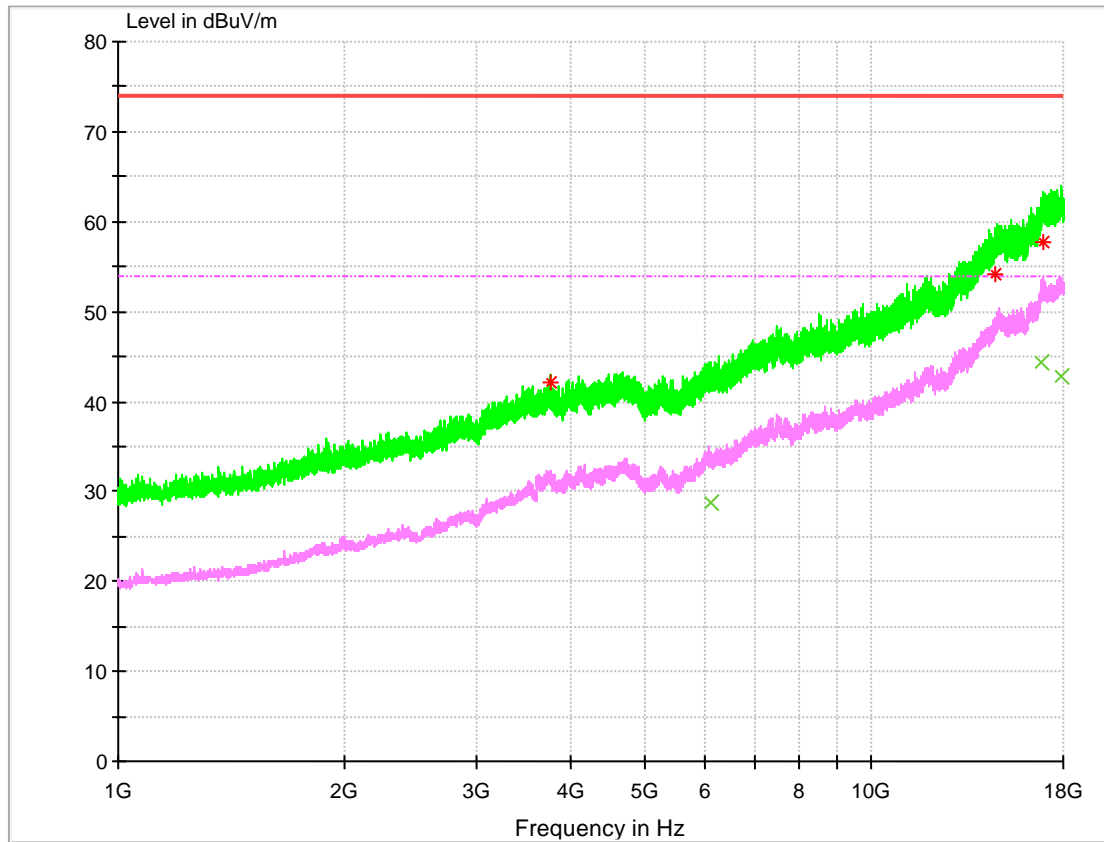
Note:

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)



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
3749.836000	42.15	-3.3	74.00	31.85	110.0	225.0	VERTICAL
14589.356000	54.25	16.9	74.00	19.75	117.0	286.0	VERTICAL
16949.612666	57.78	20.7	74.00	16.22	100.0	82.0	HORIZONTAL

MEASUREMENT RESULT: AV Detector

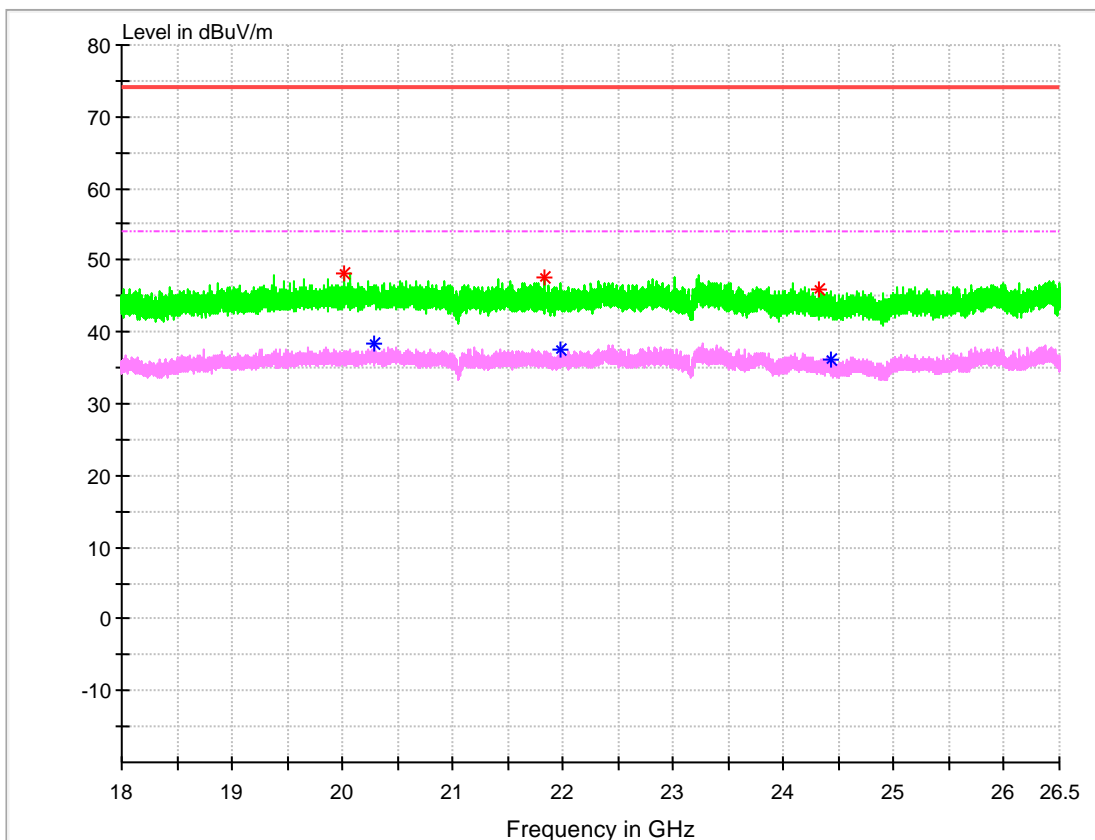
Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
6125.288667	28.72	1.7	54.00	25.28	117.0	213.0	HORIZONTAL
16878.915333	44.39	21.0	54.00	9.61	133.0	323.0	VERTICAL
17879.881333	42.77	21.6	54.00	11.23	126.0	34.0	VERTICAL

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~26.5GHz

Test Mode 6: USB Copy(EUT with PC)



MEASUREMENT RESULT: PK Detector

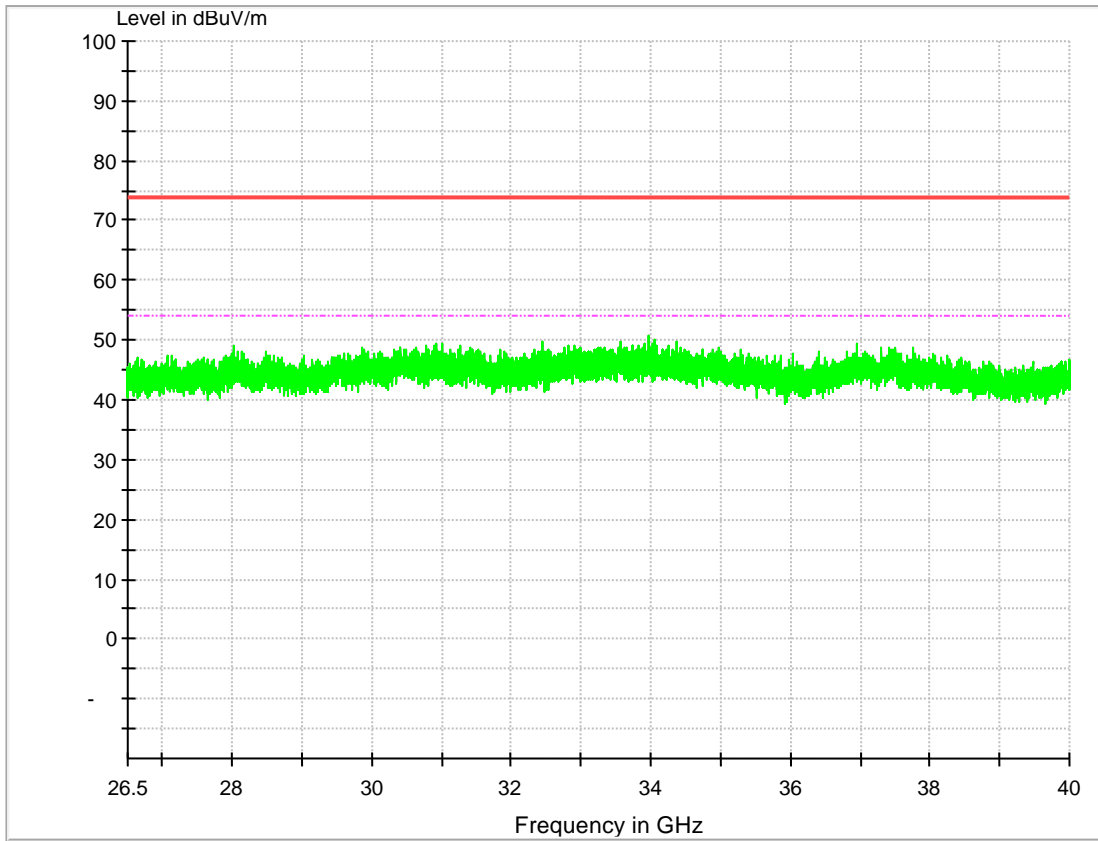
Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
20014.075000	48.16	-4.7	74.00	25.84	100.0	298.0	HORIZONTAL
21834.350000	47.57	-4.0	74.00	26.43	100.0	286.0	VERTICAL
24328.675000	46.06	-2.7	74.00	27.94	100.0	15.0	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
20296.275000	38.37	-4.7	54.00	15.63	100.0	230.0	VERTICAL
21979.275000	37.62	-3.9	54.00	16.38	100.0	286.0	VERTICAL
24431.950000	36.05	-2.7	54.00	17.95	100.0	286.0	VERTICAL

7.1.4 26.5GHz~40GHz

Test Mode 6: USB Copy(EUT with PC)

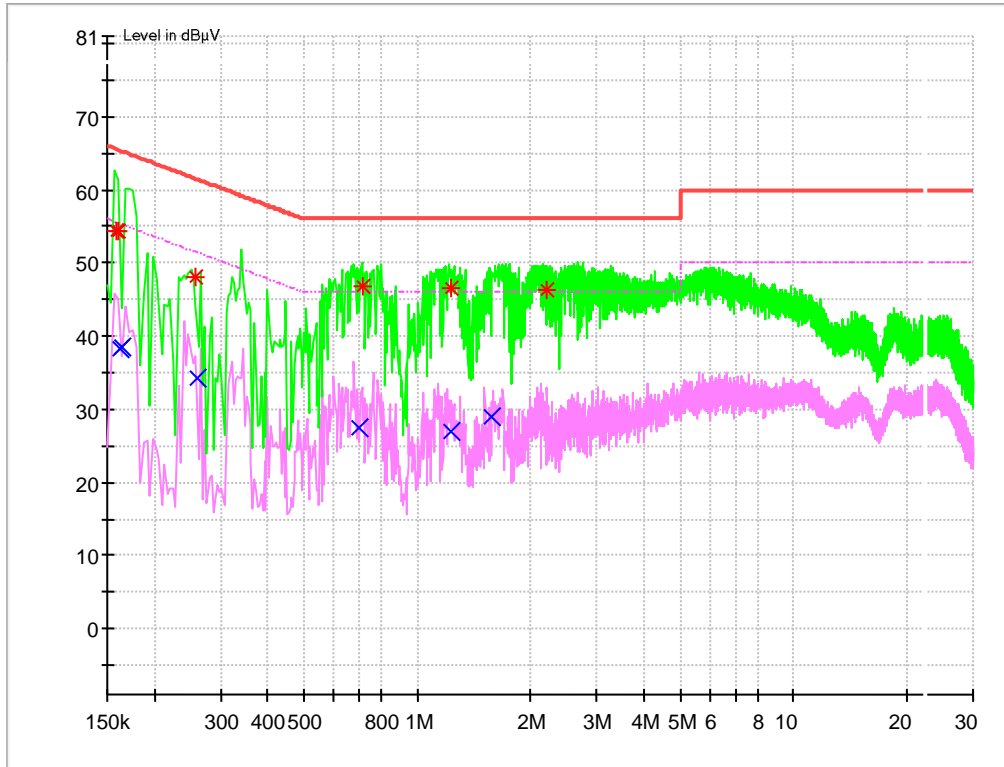


NOTE 1: The data was measured by Peak detector.
NOTE 2: No peak found in the Test Range of "26.5 GHz to 40GHz"

Conducted Disturbance

7.2 AC Port Test Data

Test Mode 1: Charging+Camera On +idle



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.159551	54.35	L1	9.7	11.14	65.49	FLO
0.159914	54.27	L1	9.7	11.20	65.47	FLO
0.257426	48.10	N	9.7	13.41	61.51	FLO
1.224344	46.78	N	9.7	9.22	56.00	FLO
1.236038	46.57	L1	9.7	9.43	56.00	FLO
2.215012	46.37	N	9.7	9.63	56.00	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.162748	38.18	N	9.7	17.14	55.32	FLO
0.164022	38.61	L1	9.7	16.65	55.26	FLO
0.261585	34.17	N	9.7	17.21	51.38	FLO
0.701190	27.43	N	9.7	18.57	46.00	FLO
1.224344	26.89	L1	9.7	19.11	46.00	FLO
0.162748	28.86	N	9.7	17.14	46.00	FLO

-----END-----