



EMC Test Report

Product Name: Smart Phone

Model Number: CLT-L0J

Report No: SYBH(Z-EMC) 20180228012001-2

FCC ID: QISCLT-L0J

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District,
Shenzhen, 518129, P.R.C

Tel: +86 755 28780808 Fax: +86 755 89652518

Notice

1. The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.
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.
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.
5. The laboratory has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Declaration Of Conformity (DOC) and Certification rules. The Designation Number is CN1173, and the Test Firm Registration Number is 294140.”
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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. 27, 2018
Start Date of Test: Mar. 29, 2018
End Date of Test: Apr.,7, 2018

Test Result: Pass

**Approved By
(Lab Manager)**

2018-4-10
Date

Roger Zhang
Name

Roger Zhang

Signature

**Prepared by
(Test Engineer)**

2018-4-9
Date

Peng Shao Hua
Name

Peng Shao Hua

Signature



Modification Record

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

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1 General Information

1.1 EUT Description

EUT Description	
Product Name	Smart Phone
Model Number	CLT-L0J
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 12: 699MHz to 716MHz LTE BAND 17: 704MHz to 716MHz Bluetooth: 2400MHz to 2483.5MHz WIFI 2.4G: 2400MHz to 2472MHz 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 12: 729MHz to 746MHz LTE BAND 17: 734MHz to 746MHz Bluetooth: 2400MHz to 2483.5MHz WIFI 2.4G: 2400MHz to 2472MHz WIFI 5G:5150MHz to 5350MHz 5470MHz to 5850MHz NFC:13.56MHz GPS: 1575.42MHz
S/N	LPF0118228000231
HW Version	HL2CLTM
SW Version	18031663
EUT Accessory	
Earphone	Manufacturer: JIANGXI LIANCHUANG HONGSHENG ELECTRONIC CO., LTD BOLUO COUNTY QUANCHENG ELECTRONIC CO., LTD Goer Tek Inc MERRY ELECTRONICS (SHENZHEN) CO., LTD.

Earphone Transfer Line	Manufacturer: JIANGXI LIANCHUANG HONGSHENG ELECTRONIC CO., LTD MERRY ELECTRONICS (SHENZHEN) CO., LTD. FOSTER ELECTRIC CO.(HONG KONG)LTD BOLUO COUNTY QUANCHENG ELECTRONIC CO., LTD
Micro SD Card Reader	Manufacturer: FOXLINK
Rechargeable Li-ion	Manufacturer: Huawei Technologies Co.,Ltd. Battery Model: HB436486ECW Rated capacity: 3900mAh Nominal Voltage:  +3.82V Charging Voltage:  +4.4V SN: 4XSDSIH405X00092 4XTDLCH31990010D

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 Test Site Information

Test Site 1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, 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	Mode1~ Mode4 Mode6~M ode7	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)
Mode 7	SD Card Copy(EUT with Micro SD Card Reader)

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:

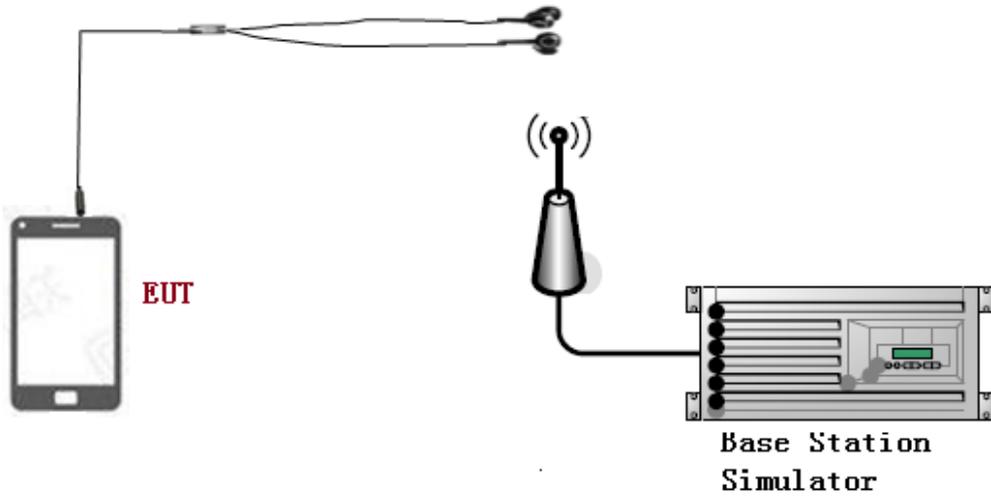
When the EUT state is switched on but without Radio Resource Control (RRC) connection.

Worst Case:

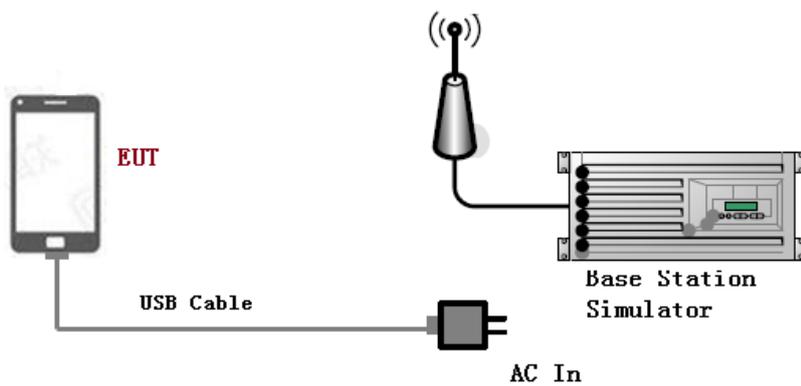
- 1) Radiated Emission
Adapter (Model: HW-050450U00, SN: P8281OH6920035) + Camera On + Idle
the result is the worst(30MHz~1GHz).
USB Copy(EUT with PC) the result is the worst(1GHz~18GHz).
USB Copy(EUT with PC) the result is the worst(18GHz~25.6GHz).
USB Copy(EUT with PC) the result is the worst(25.6GHz~40GHz).
- 2) Conducted Emission
Adapter(Model: HW-050450U00, SN: P8281OH6920035) + Camera On + Idle
the result is the worst.

3.2 Test System Configuration

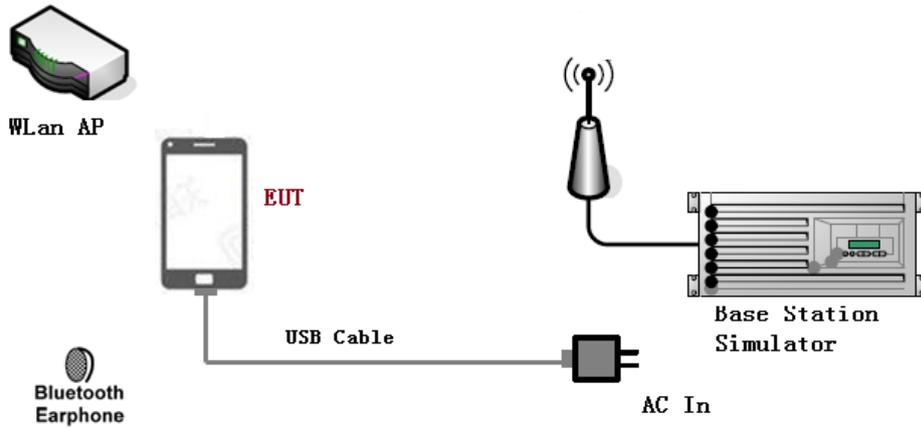
Connection Diagram (Mode 2/Mode 4)



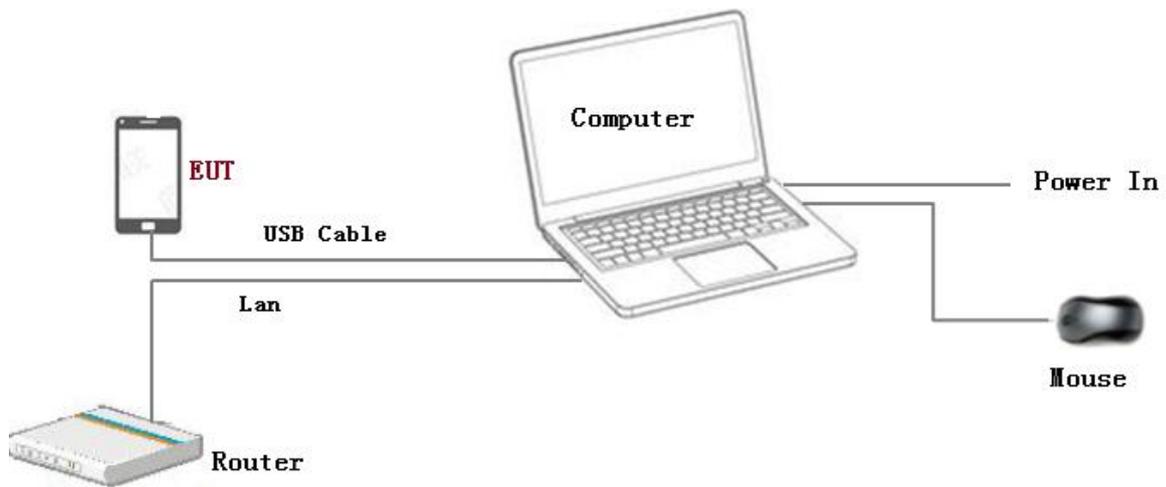
Connection Diagram (Mode 1/Mode 3)



Connection Diagram (Mode 5)



Connection Diagram (Mode 6)



Connection Diagram (Mode7)



EUT

Micro SD Card Reader

3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
Earphone	1	<3m	Unshielded
Earphone Transfer Line	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	/	/
Shielded USB Line	04071289 Length: 0.8M:	HL	/	/	/
16GB SD Card	MB-MP 16D	SAMSUNG	/	/	/

Adapter information as below:

Model: HW-050450U00

Specification: (Input Voltage:100V-240V~50/60Hz, 0.75A. Output Voltage: 5V **===** 2A OR 4.5V **===** 5A OR 5V **===** 4.5A. Rated Power: 10W/22.5W.)

SN: P8281OH6920035.

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

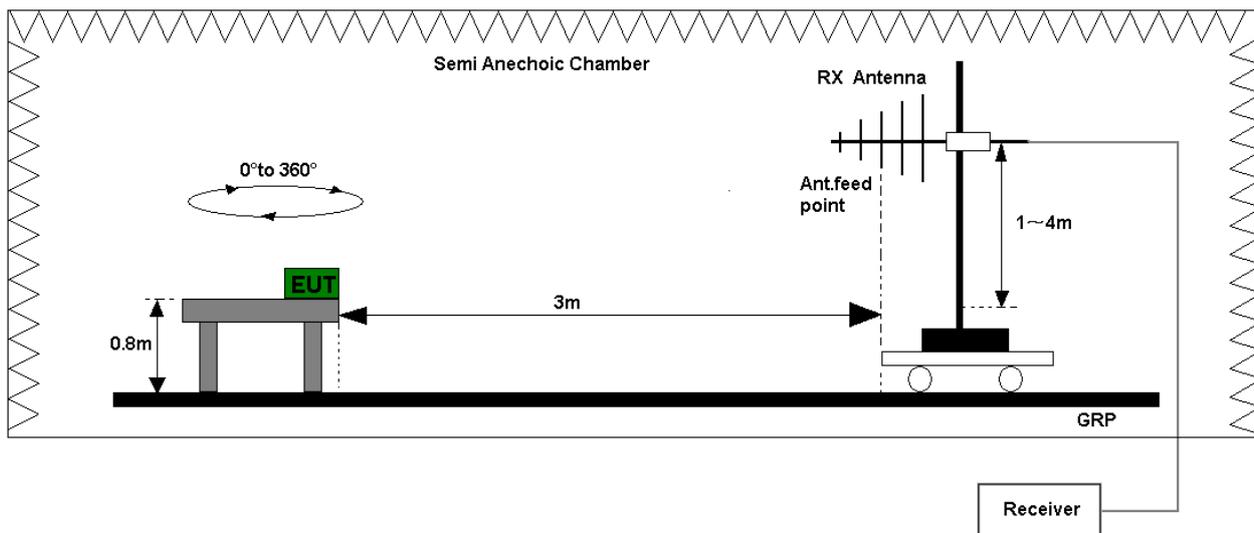


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

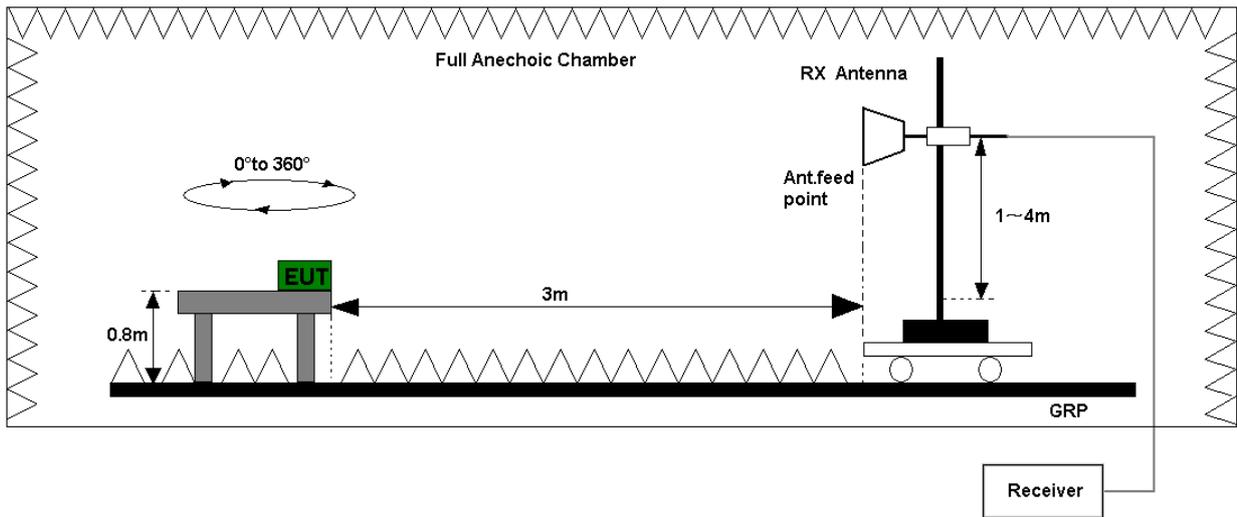


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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

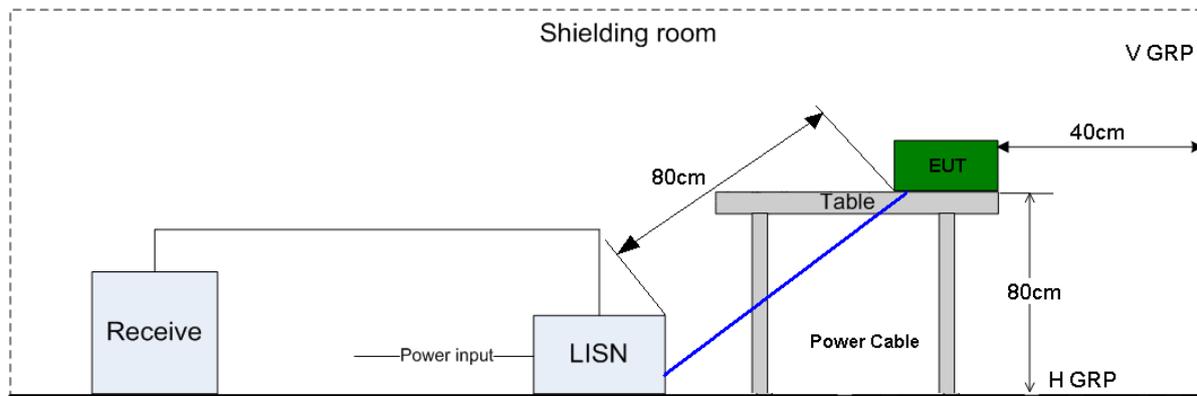


Figure 3. Test Set-up of conducted disturbance

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 (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
RE	EMI Test receiver	ESU26	100150	R&S	Jun. 20, 2018	12
	Broadband Antenna	VULB 9163	9163-491	SCHWARZBECK	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

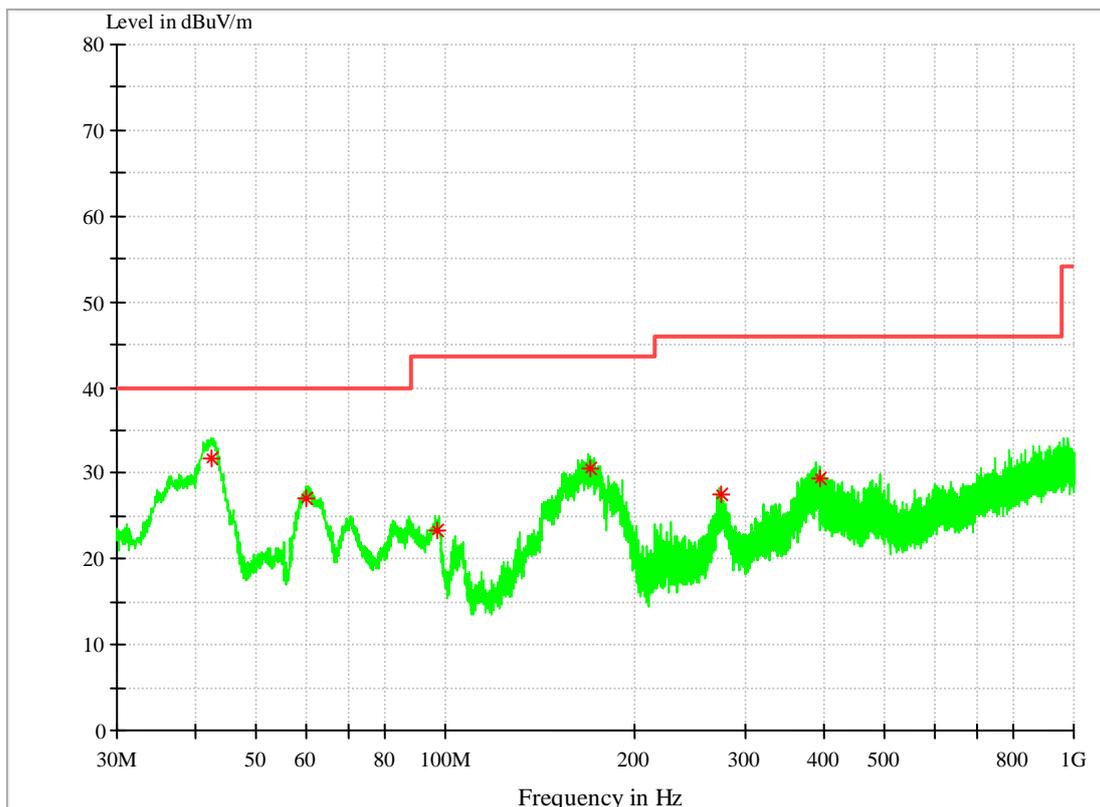
7 Test Data and Graph

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

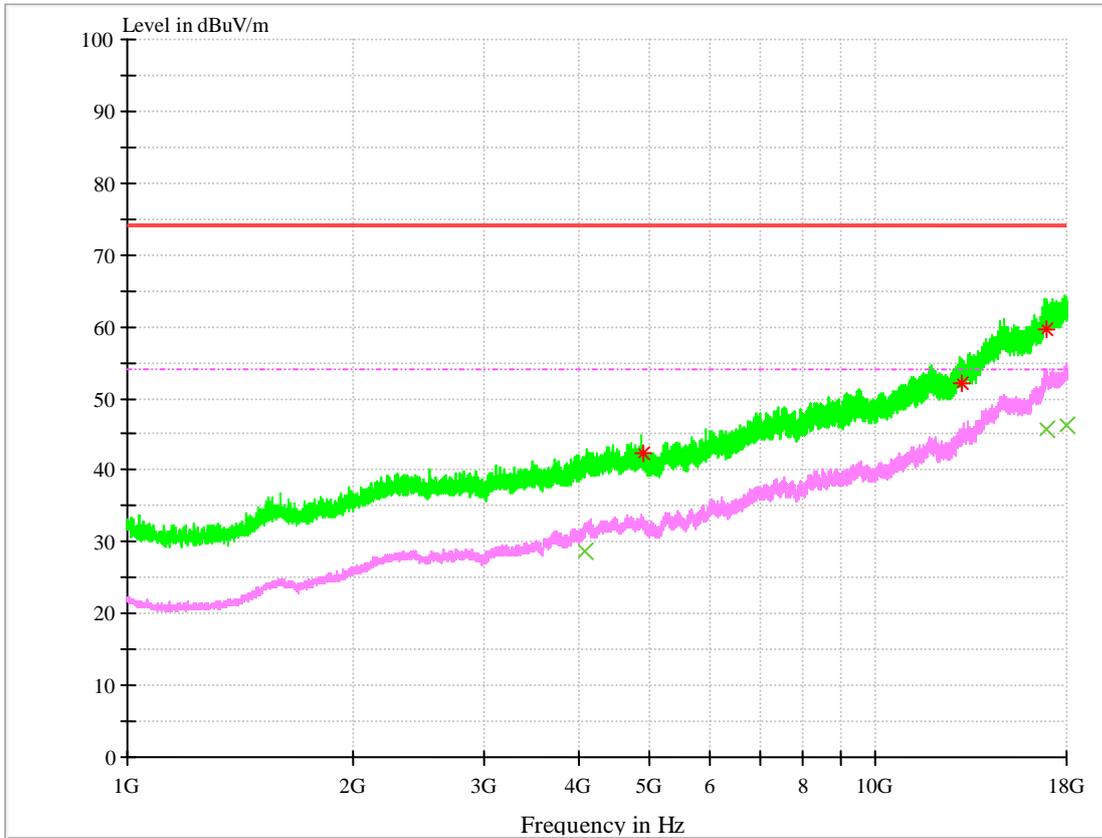
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
42.504000	31.62	17.5	40.00	8.38	100.0	16.0	VERTICAL
60.050860	27.12	12.2	40.00	12.88	101.0	6.0	VERTICAL
96.887640	23.24	10.8	43.50	20.26	102.0	328.0	VERTICAL
170.113200	30.48	11.5	43.50	13.02	101.0	260.0	HORIZONTAL
275.320900	27.49	14.9	46.00	18.51	110.0	286.0	HORIZONTAL
393.199840	29.42	18.7	46.00	16.58	100.0	321.0	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.

7.1.2 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
4881.231333	42.21	1.5	74.00	31.79	100.0	310.0	HORIZONTAL
13019.566000	52.22	17.5	74.00	21.78	100.0	0.0	VERTICAL
16887.833334	59.66	20.9	74.00	31.79	258.0	237.0	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
4080.234000	28.68	1.3	54.00	25.32	101.0	48.0	HORIZONTAL
16926.986000	45.69	21.0	54.00	8.31	110.0	133.0	VERTICAL
17989.668000	46.16	21.2	54.00	7.84	100.0	33.0	HORIZONTAL

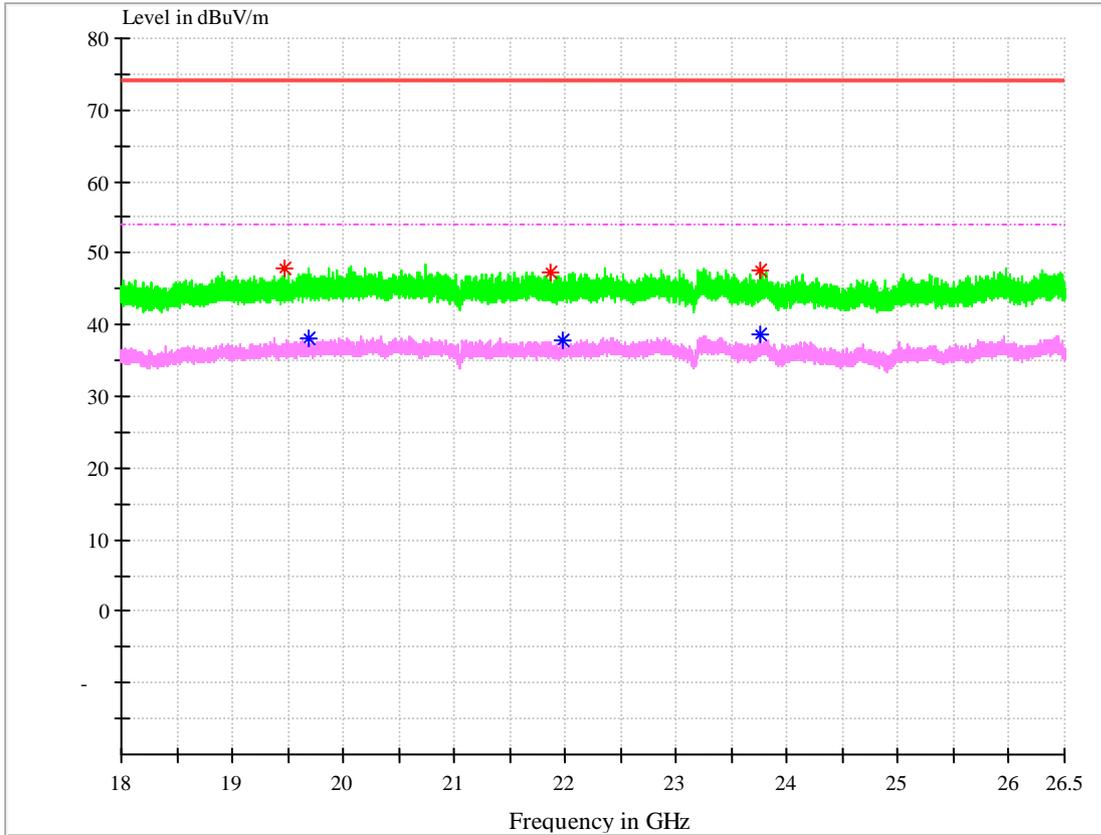
Note:

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.

7.1.3 18GHz~26.5GHz

Test Mode 6: USB Copy(EUT with PC)



MEASUREMENT RESULT: PK Detector

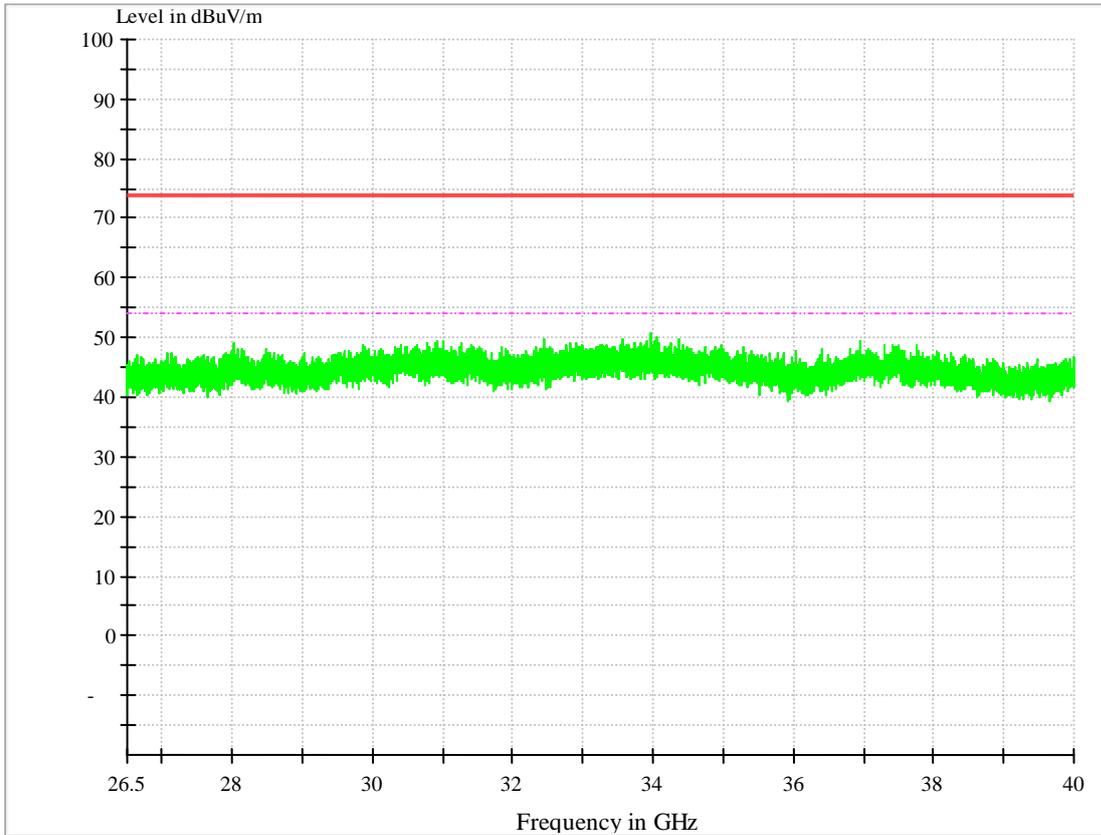
Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
19462.850000	47.93	-5.0	74.00	26.07	100.0	0.0	HORIZONTAL
21866.650000	47.38	-4.0	74.00	26.62	100.0	158.0	VERTICAL
23753.650000	47.48	-2.9	74.00	26.52	100.0	0.0	HORIZONTAL

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
19684.700000	38.21	-4.9	54.00	15.79	100.0	123.0	VERTICAL
21983.100000	37.84	-3.9	54.00	16.16	100.0	254.0	VERTICAL
23748.550000	38.53	-2.9	54.00	15.47	100.0	0.0	VERTICAL

7.1.4 26.5GHz~40GHz

Test Mode 6: USB Copy(EUT with PC)



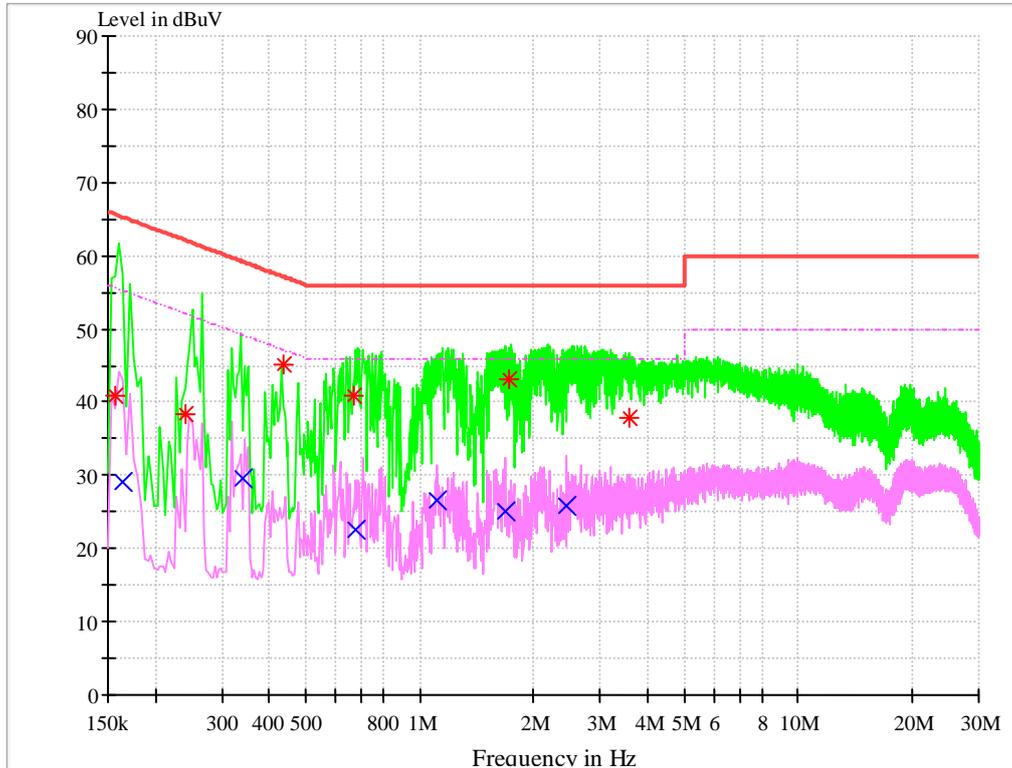
NOTE 1: The data was measured by Peak detector.

NOTE 2: No peak found in the Test Range of "26.5 GHz to 40GHz"

7.2 Conducted Disturbance

7.2.1 AC Port Test Data

Test Mode 1: Charging+Camera On +idle



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB μ V	Line	Transd dB	Margin dB	Limit dB μ V	PE
0.156975	40.85	N	9.7	24.77	65.62	FLO
0.239303	38.35	L1	9.7	23.77	62.12	FLO
0.439092	45.11	N	9.7	11.97	57.08	FLO
0.666645	40.80	N	9.7	15.20	56.00	FLO
1.730888	43.21	N	9.7	12.79	56.00	FLO
3.594118	37.91	N	9.7	18.09	56.00	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB μ V	Line	Transd dB	Margin dB	Limit dB μ V	PE
0.164413	29.02	N	9.7	26.22	55.24	FLO
0.341436	29.50	N	9.7	19.67	49.17	FLO
0.679570	22.50	N	9.7	23.50	46.00	FLO
1.116469	26.55	N	9.7	19.45	46.00	FLO
1.680912	24.96	N	9.7	21.04	46.00	FLO
2.434142	25.92	N	9.7	20.08	46.00	FLO

-----END-----
