



中国认可  
国际互认  
检测  
TESTING  
CNAS L0310

# EMC Test Report

**Product Name: Smart Phone**

**Model Number: EVA-L19**

**Report No: SYBH(Z-EMC)149122015-2**

**FCC ID: QISEVA-L19**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District,  
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## Notice

1. The laboratories including located in Shenzhen, Shanghai and Chengdu have passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory located in Shenzhen 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 the US Federal Communications Commission to perform electromagnetic emission measurements.
  - The recognition number for the test site located in Shenzhen is 97456
  - The recognition number for the test site located in Shanghai is 684868.
  - The recognition number for the test site located in Chengdu is 216797.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements.
  - The recognition number for the test site located in Shenzhen is 6369A, which contains 6369A-1 (3m chamber in G2 building) and 6369A-3 (10m chamber in K3 building);
  - The recognition numbers for the test site located in Shanghai is 6369D, which contains 6369D-1 (3m chamber) and 6369D-2 (10m chamber).
  - The recognition number for the test site located in Chengdu is 6369E-1.
5. The laboratory located in Shenzhen has been listed by the VCCI to perform EMC measurements. The accreditation numbers for the test site No.1 located at G2 building are R-3892, G-415, C-4361, and T-1348, and the accreditation numbers for the test site No.2 located at K3 building are R-3760, G-485, C-4210 and T-1237.
6. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
7. The test report is invalid if there is any evidence of erasure and/or falsification.
8. The test report is only valid for the test samples.
9. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.



**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:** Dec.10.2015  
**Start Date of Test:** Feb.01.2016  
**End Date of Test:** Feb.04.2016

**Test Result:** Pass

<b>Approved By (Lab Manager)</b>	<u>2016-02-29</u>	<u>Liu Chunlin</u>	<u>Liu Chunlin</u>
	<b>Date</b>	<b>Name</b>	<b>Signature</b>
<b>Prepared by (Test Engineer)</b>	<u>2016-02-29</u>	<u>Wu Yafeng</u>	<u>Wu Ya feng</u>
	<b>Date</b>	<b>Name</b>	<b>Signature</b>

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## 1 General Information

### 1.1 EUT Description

EUT Description	
Product Name	Smart Phone
Model Number	EVA-L19
Input voltage	DC 3.8V
TX Frequency	GSM 850: 824MHz to 849MHz GSM 1900: 1850MHz to 1910MHz WCDMA Band II: 1850MHz to 1910MHz WCDMA Band IV: 1710MHz to 1755MHz WCDMA Band V: 824MHz to 849MHz LTE BAND 4: 1710MHz to 1755MHz LTE BAND 7: 2500MHz to 2570MHz LTE BAND 38: 2570MHz to 2620MHz LTE BAND 41: 2555MHz to 2655MHz WIFI/Bluetooth: 2400MHz to 2483.5MHz WIFI 5G:5150MHz to 5350MHz 5470MHz to 5825MHz
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 4: 2110MHz to 2155MHz LTE BAND 7: 2620MHz to 2690MHz LTE BAND 38: 2570MHz to 2620MHz LTE BAND 41: 2555MHz to 2655MHz WIFI/Bluetooth: 2400MHz to 2483.5MHz WIFI 5G:5150MHz to 5350MHz 5470MHz to 5825MHz GPS: 1575.42MHz
S/N	C4Y5T15C22000204
HW Version	HL1UEVAM
SW Version	A168-L19C900B072
EUT Accessory	
Data cable	Data Cable USB A Male to Micro Usb, Shielded
Adapter	Brand: HUAWEI Model: HW-050200U01 Input voltage: 100-240V 50/60Hz ,0.5A Output voltage: 5V <b>===</b> 2A Rated Power: 10W Manufacturer: HUIZHOU BYD ELECTRONIC CO.,LTD. DONGGUAN PHITEK ELECTRONICS CO.,LTD. SHENZHEN HUNTKEY ELECTRONIC CO.,LTD.
Adapter	Brand: HUAWEI Model: HW-050200E01 Input voltage: 100-240V 50/60Hz ,0.5A Output voltage: 5V <b>===</b> 2A

	<p>Rated Power: 10W          Manufacturer:          HUIZHOU BYD ELECTRONIC CO.,LTD.          DONGGUAN PHITEK ELECTRONICS CO.,LTD.          SHENZHEN HUNTKEY ELECTRONIC CO.,LTD.</p>
Adapter	<p>Brand: HUAWEI          Model: HW-050200B01          Input voltage: 100-240V 50/60Hz ,0.5A          Output voltage: 5V  2A          Rated Power: 10W          Manufacturer:          HUIZHOU BYD ELECTRONIC CO.,LTD.          DONGGUAN PHITEK ELECTRONICS CO.,LTD.          SHENZHEN HUNTKEY ELECTRONIC CO.,LTD.</p>
Adapter	<p>Brand: HUAWEI          Model: HW-050200A01          Input voltage: 100-240V 50/60Hz ,0.5A          Output voltage: 5V  2A          Rated Power: 10W          Manufacturer:          HUIZHOU BYD ELECTRONIC CO.,LTD.          DONGGUAN PHITEK ELECTRONICS CO.,LTD.          SHENZHEN HUNTKEY ELECTRONIC CO.,LTD.</p>
Rechargeable Li-ion	<p>Brand: HUAWEI          Battery Model: HB366481ECW          Rated capacity: 2900mAh          Nominal Voltage:  +3.82V          Charging Voltage:  +4.4V</p>

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 15:2014

## 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 Mode2 Mode 4	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 Mode2 Mode3 Mode 4	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

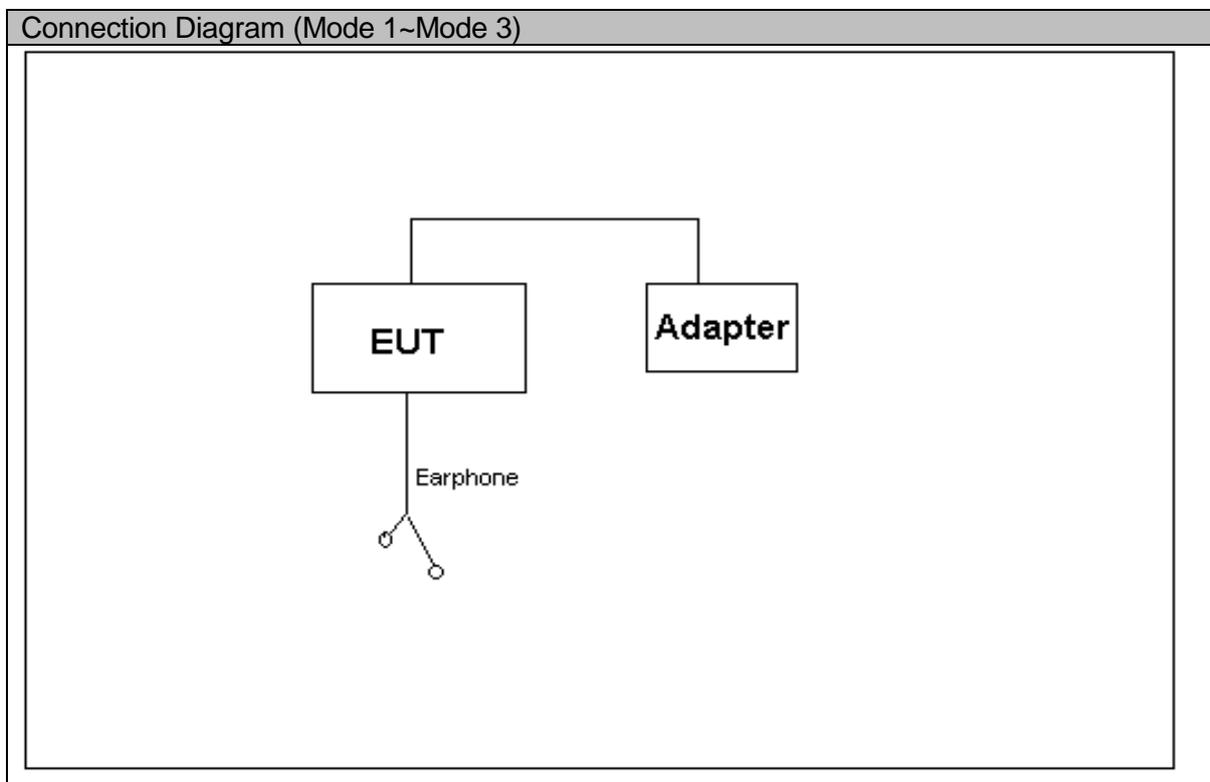
#### 3.1 Test Mode

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.

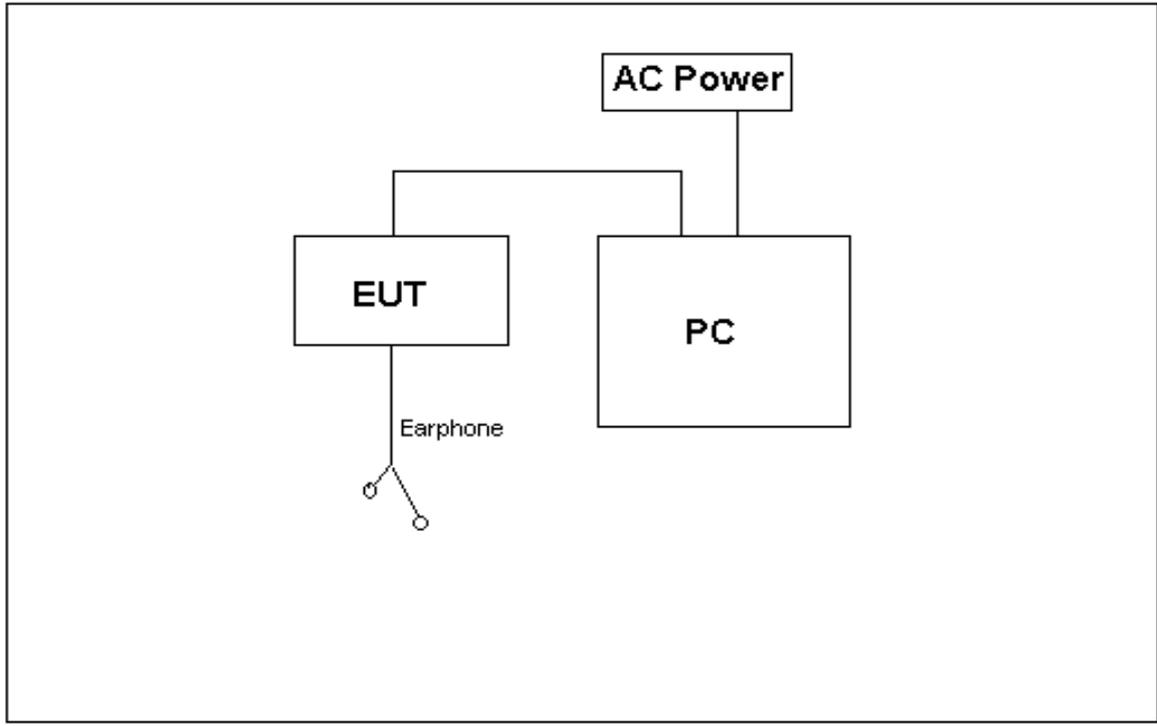
Test Mode	
Mode 1:	Adapter + Earphone + Camera On + Idle
Mode 2:	Adapter + Earphone + Playing + Idle
Mode 3:	Adapter + Earphone +Traffic
Mode 4:	USB Copy(EUT with PC) + Earphone + Idle

Remark: If there is more than one adapter, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.

#### 3.2 Test System Configuration



Connection Diagram (Mode 4)



### 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	2016-06-14	12
Radio Communication Tester	MT8820C	R&S	A110518805	2016-06-15	12
Notebook	X230	ThinkPad	A131211611	/	/

## 4 Electromagnetic Interference (EMI)

### 4.1 Radiated Disturbance 30MHz to 18GHz

#### 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 18 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 18000 MHz: 1MHz;

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

#### 4.1.2 Test setup

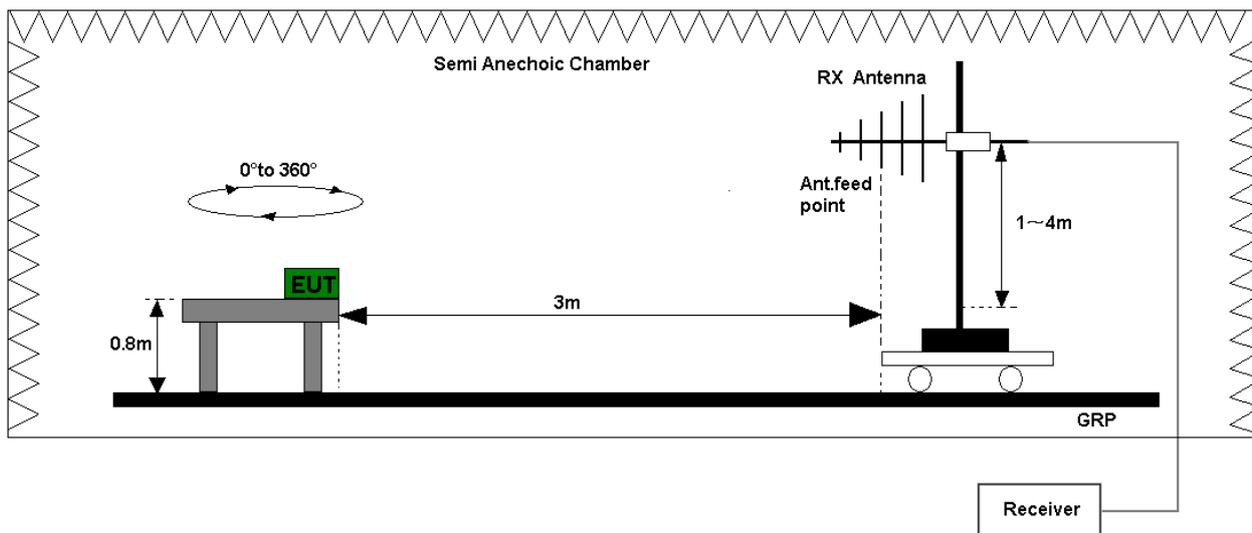


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

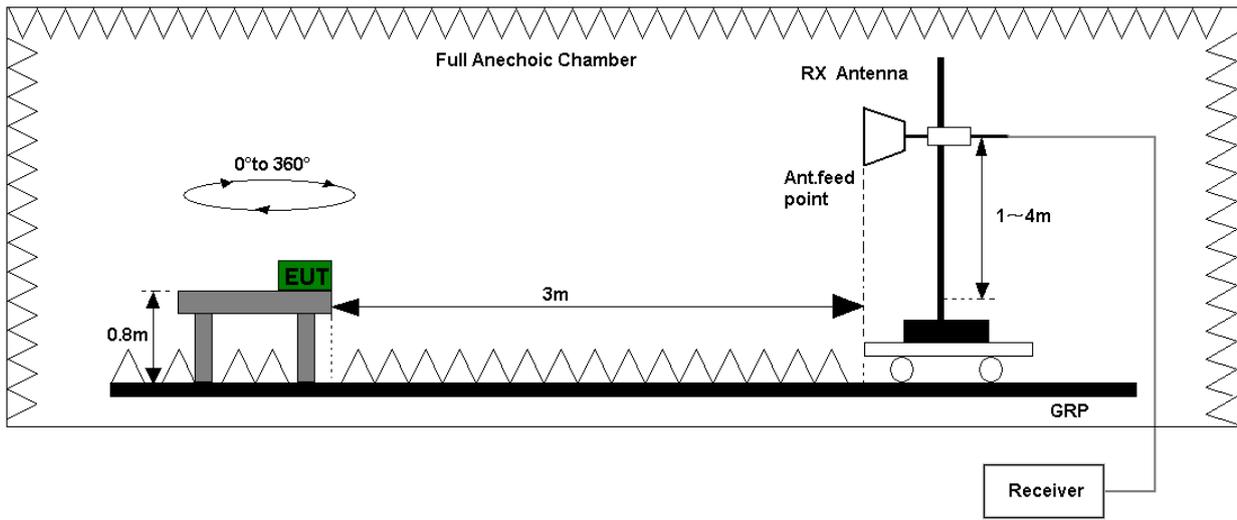


Figure 2. Test set-up of radiated disturbance(above 1GHz)

### 4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.  
Refer to the section 7.1 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 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

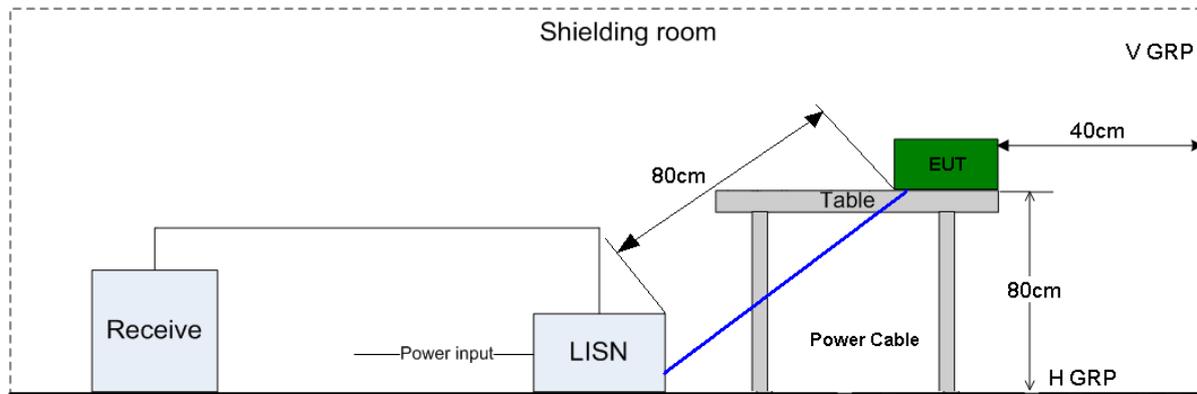


Figure 3. Test Set-up of conducted disturbance

### 4.2.3 Test Results

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

Refer to the section 7.2 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
RE	EMI test receiver	ESU40	100144	R&S	2016-05-13	12
	Bilog antenna	CBL 6112B	2536	Schaffner	2017-04-16	24
	Horn Antenna	HF906	359287	R&S	2016-03-22	24
CE	EMI test receiver	ESCI	100929	R&S	2016-10-30	12
	Artificial Mains Network	ENV4200	100046	R&S	2016-05-19	12
Software Information						
Test Item	Software Name	Manufacturer		Version		
RE	ES-K1	R&S		1.7.1		
CE	ES-K1	R&S		1.7.1		

## 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=4.15 dB; k=2
RE(1GHz-18GHz)	Field strength (dB $\mu$ V/m)	U=4.20 dB; k=2
CE	Disturbance Voltage (dB $\mu$ V)	U=3.3dB; k=2

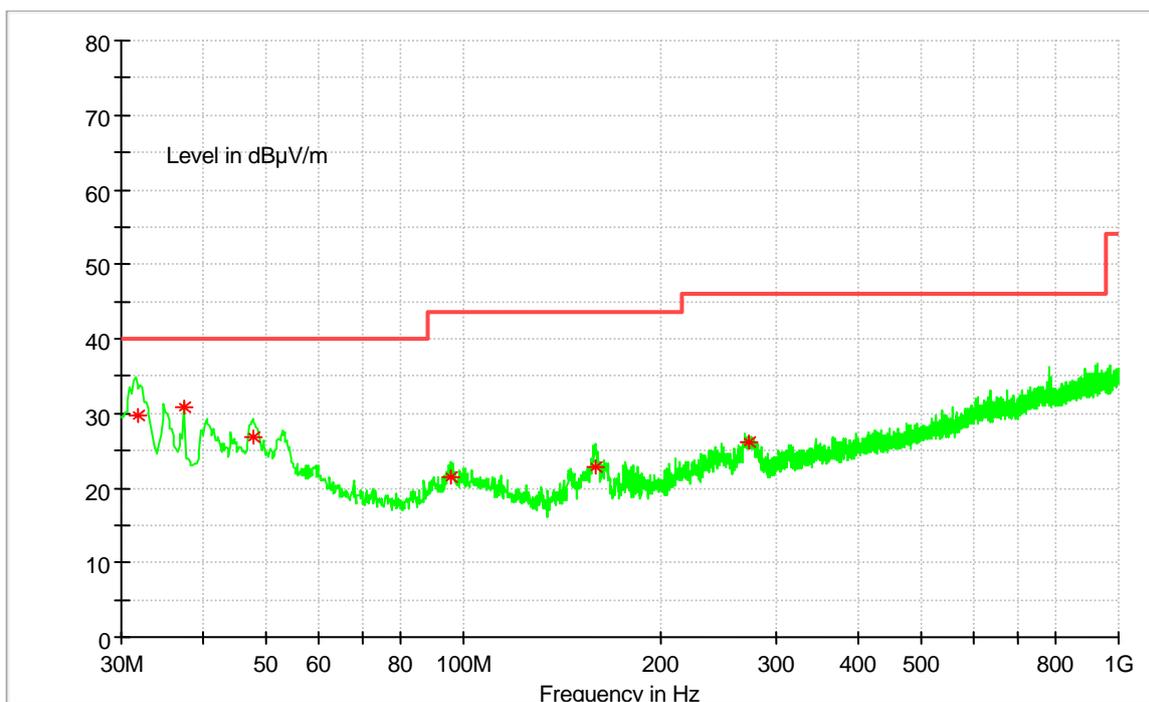
## 7 Test Data and Graph

Only the worst test results were shown

### 7.1 Radiated Disturbance

#### 7.1.1 30MHz~1GHz

Test Mode: Mode 4



#### MEASUREMENT RESULT: QP Detector

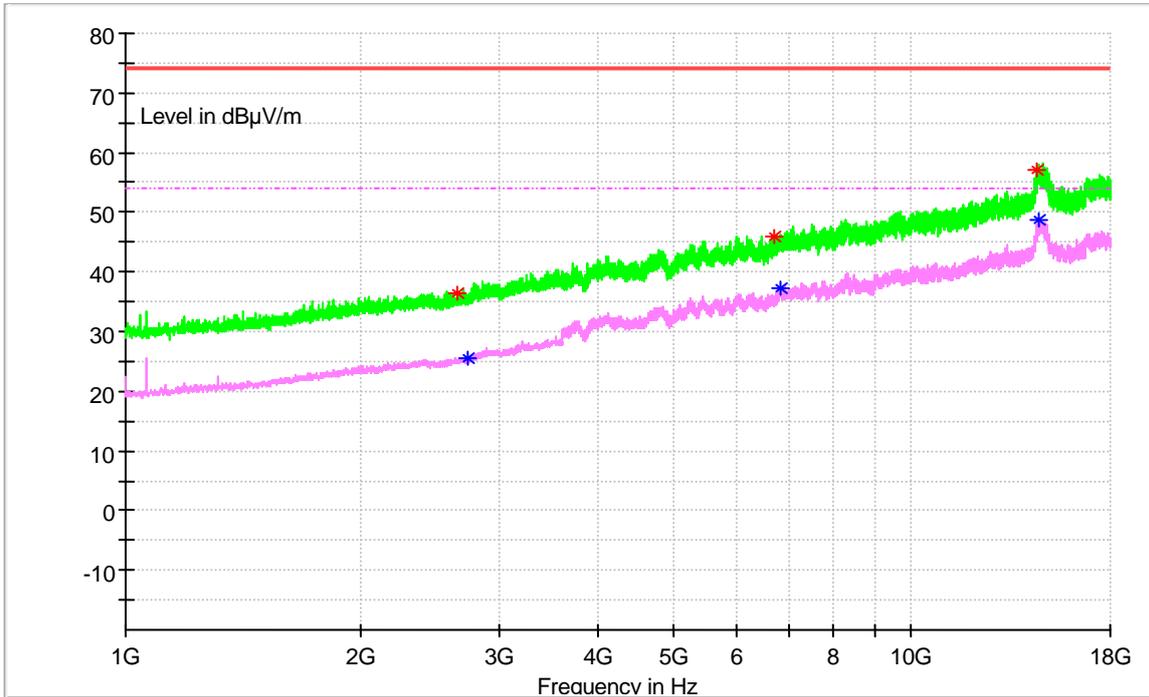
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
31.7152	29.69	14.7	40	10.31	106	46	VERTICAL
37.53616	30.74	15.2	40	9.26	200	51	VERTICAL
47.79264	26.75	15.1	40	13.25	100	288	VERTICAL
95.584	21.45	13.2	43.5	22.05	200	339	VERTICAL
158.7046	22.69	10.4	43.5	20.81	100	75	VERTICAL
271.7975	26.25	14.8	46	19.75	137	256	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: Mode 4



#### MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
2643.9	36.48	-9.8	74	37.52	100	138	HORIZONTAL
6717.1	45.96	1.3	74	28.04	100	348	VERTICAL
14549.85	57.07	22.1	74	16.93	100	281	VERTICAL

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
2736.55	25.42	-9.3	54	28.58	100	30	VERTICAL
6841.2	37.39	2.4	54	16.61	100	0	VERTICAL
14639.1	48.82	21.5	54	5.18	100	286	HORIZONTAL

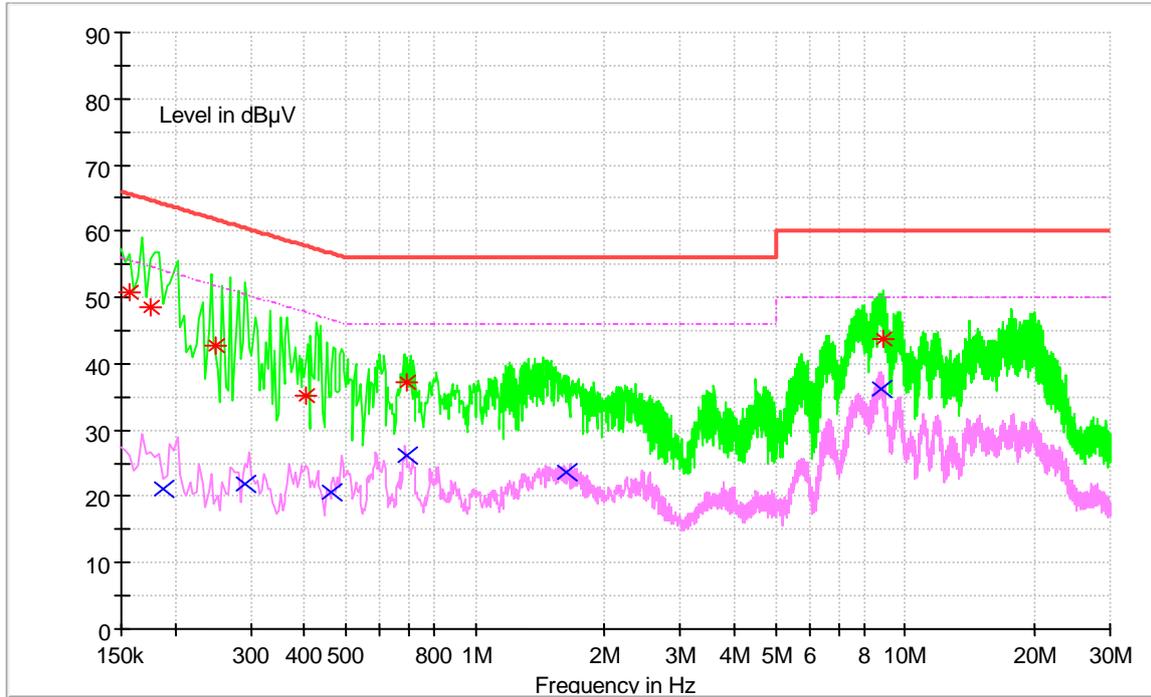
Note:

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.

## 7.2 Conducted Disturbance

### 7.2.1 AC Port Test Data

Test Mode: Mode 1



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.156848	50.69	N	9.7	14.93	65.63	FLO
0.176088	48.57	N	9.7	16.1	64.67	FLO
8.893462	43.74	N	10	16.26	60	FLO
0.250162	42.65	N	9.7	19.11	61.75	FLO
0.692148	37.2	L1	9.7	18.8	56	FLO
0.401718	35.18	N	9.7	22.64	57.82	FLO

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.188785	21.04	N	9.7	33.05	54.09	FLO
0.292838	21.95	L1	9.7	28.49	50.44	FLO
0.464508	20.73	N	9.7	25.88	46.61	FLO
0.690256	26.21	N	9.7	19.79	46	FLO
1.63471	23.7	N	9.7	22.3	46	FLO
8.754622	36.22	N	10	13.78	50	FLO

-----END-----