EMC Test Report

Product Name: Mobile WiFi

Model Number: HW-02G

Report No: SYBH(Z-EMC)073092014-2

FCC ID：QISHW-02G

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

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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 on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.**
4. **The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.**
5. **The test report is invalid if not marked with "exclusive stamp for the test report".**
6. **The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.**
7. **The test report is invalid if there is any evidence of erasure and/or falsification.**
8. **If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.**
9. **Normally, the test report is only responsible for the samples that have undergone the test.**
10. **Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of 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:	Oct.07, 2014
Start Date of Test:	Oct.07, 2014
End Date of Test:	Nov.23, 2014
Test Result:	Pass

Approved By (Lab Manager)	**2014-11-24**	**Liu Chunlin**	Liu Chunlin
	Date	**Name**	**Signature**
Operator (Test Engineer)	**2014-11-24**	**Xiang Zaiji**	XiangZaiji
	Date	**Name**	**Signature**

Modification Record

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

TABLE OF CONTENT

1 General Information

1.1 EUT Description

EUT Description	
Product Name	Mobile WiFi
Model Number	HW-02G
Serials Number	P5G0114914000154
TX Frequency	WCDMA Band V: 824MHz To 849MHz WIFI: 2402MHz To 2472MHz BT: 2402MHz To 2480MHz
RX Frequency	WCDMA Band V: 869MHz To 894MHz WIFI: 2402MHz To 2472MHz BT: 2402MHz To 2480MHz
HW Version	CL1E5383SM Ver A
SW Version	21.298.01.20.736
EUT Accessory	
Data cable	USB A male to Micro USB 100cm Cable, Shielded
Adapter	BRAND: HUAWEI Model: HW-050200U3W Input Voltage:AC100-240V~ 50/60Hz 0.5A Output Voltage: 5.0V ⎓ 2.0A SN: B65032E8M00042 SN: H6500E9400007
Li-ion Battery	BRAND: HUAWEI Model: HB624666RDW Rated capacity: 2400mAh Nominal Voltage: ⎓ +3.8V Charging Voltage: ⎓ +4.35V SN: YAIE307X53804952 SN: OXCE818F00075382
WiFi Station	BRAND: HUAWEI Model: HW01 SN: K4E0114A20000060

Remark: The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.

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 15:2013, Subpart B

2 Summary of Results

Summary of Results				
Test Items	**Test Mode**	**Performance Class & Required Performance Criteria**	**Result**	**Site**
Radiated Emissions Enclosure Port	Mode1 Mode3 Mode5	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:	EUT with Adapter+ Idle Mode
Mode 2:	EUT with Adapter+ Traffic Mode
Mode 3:	EUT with PC+ Idle Mode
Mode 4:	EUT with PC+ Traffic Mode
Mode 5	EUT with WiFi Station+ Adapter+ Idle Mode
Mode 6	EUT with WiFi Station+ Adapter+ Traffic Mode

Remark:

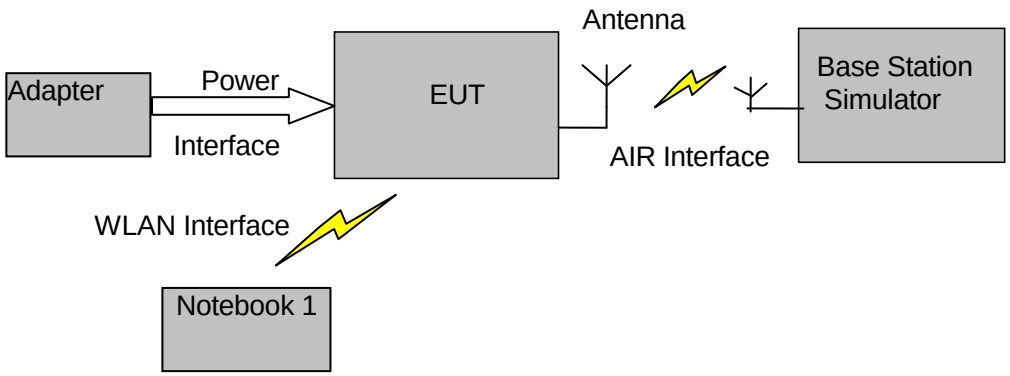
1) If there is one kind of accessories with different models, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.
2) If EUT has more than one typical operation, only the worst test mode will be recorded in this report.

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

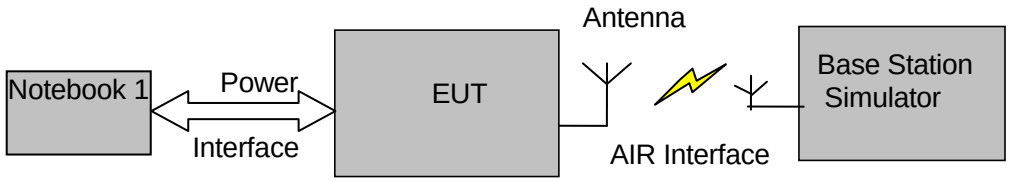
Idle Mode:
When the EUT state is switched on but without Radio Resource Control (RRC) connection.

3.2 Test System Configuration

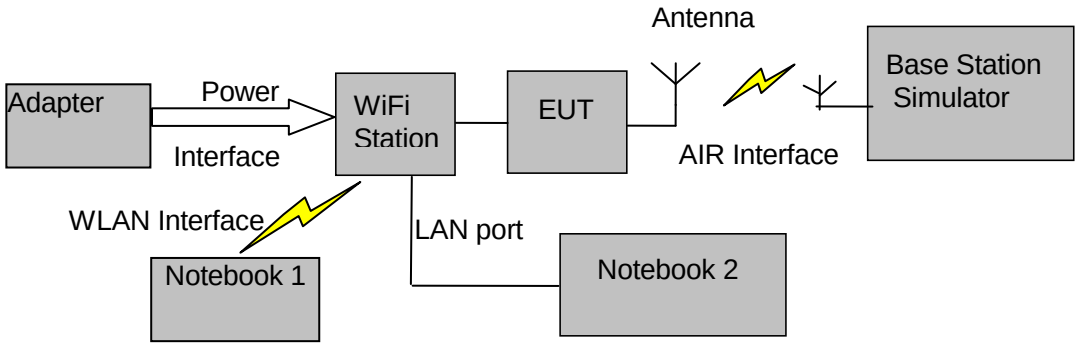
Connection Diagram (Mode 1~Mode 2)



Connection Diagram (Mode 3~Mode 4)



Connection Diagram (Mode 5~Mode 6)



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB Cable	1	100cm	shielded
LAN Cable	1	>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	3607033573	2015-09-12	12
Notebook	MS2220	Acer	3107084890	/	/
Notebook	X200	Lenovo	A100502902	/	/

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 is 3m.The set-up and test methods are according to ANSI C63.4-2009.
A preliminary scan and a final scan of the emissions are made from 30 MHz to18 GHz by using test script of software; The emissions are measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna is 1m to 4m. The azimuth range of turntable is 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 is configured in idle mode and the test performed at worst emission state.

4.1.2 Test setup

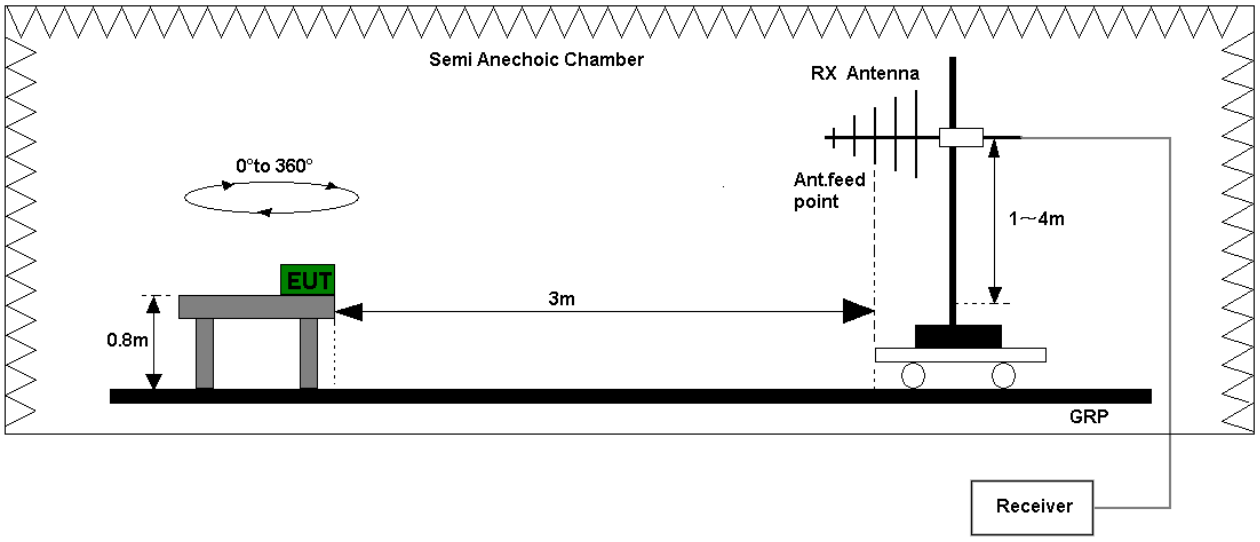


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

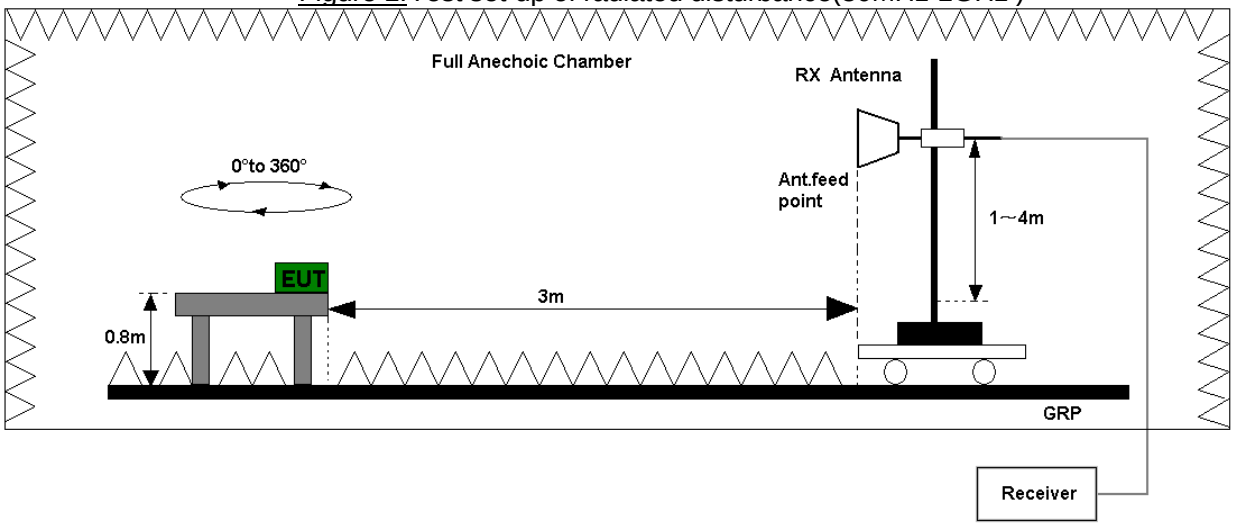


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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(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 is placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT is connected to LISN and LISN is connected to reference Ground Plane. EUT is 80cm away from LISN. The set-up and test methods are according to ANSI C63.4-2009.
Conducted Disturbance at AC Port measurements are undertaken on the L and N Lines. The emissions are measured using a Quasi-Peak Detector and Average Detector.
EUT is 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 is set in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

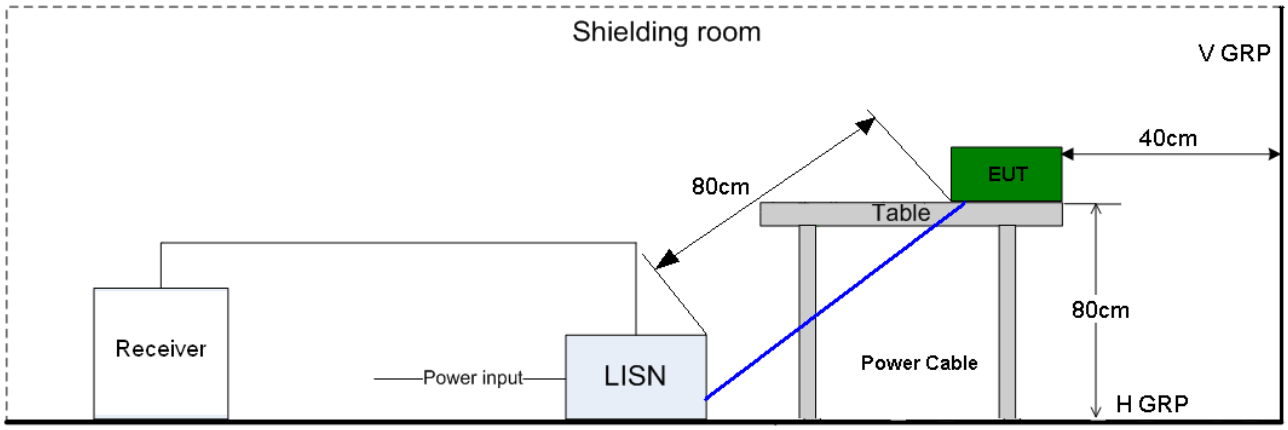


Figure 3. Test Set-up of conducted disturbance

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 (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 (month)**
RE	EMI Test receiver	ESU26	100150	R&S	May. 08, 2015	12
	Broadband Antenna	VULB 9163	9163-356	SCHWARZBECK	Mar. 21 2016	24
	Horn Antenna	HF906	100683	R&S	Feb. 01, 2015	24
CE	Artificial Mains Network	ENV216	100382	R&S	Nov.03, 2015	12
	Artificial Mains Network	ENV4200	100134	R&S	Nov.03, 2015	12
	EMI Test receiver	ESCI	101163	R&S	Nov.03, 2015	12

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	ES-K1	R&S	1.7.1
CE	EMC32	R&S	V8.40.0

6 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 are:

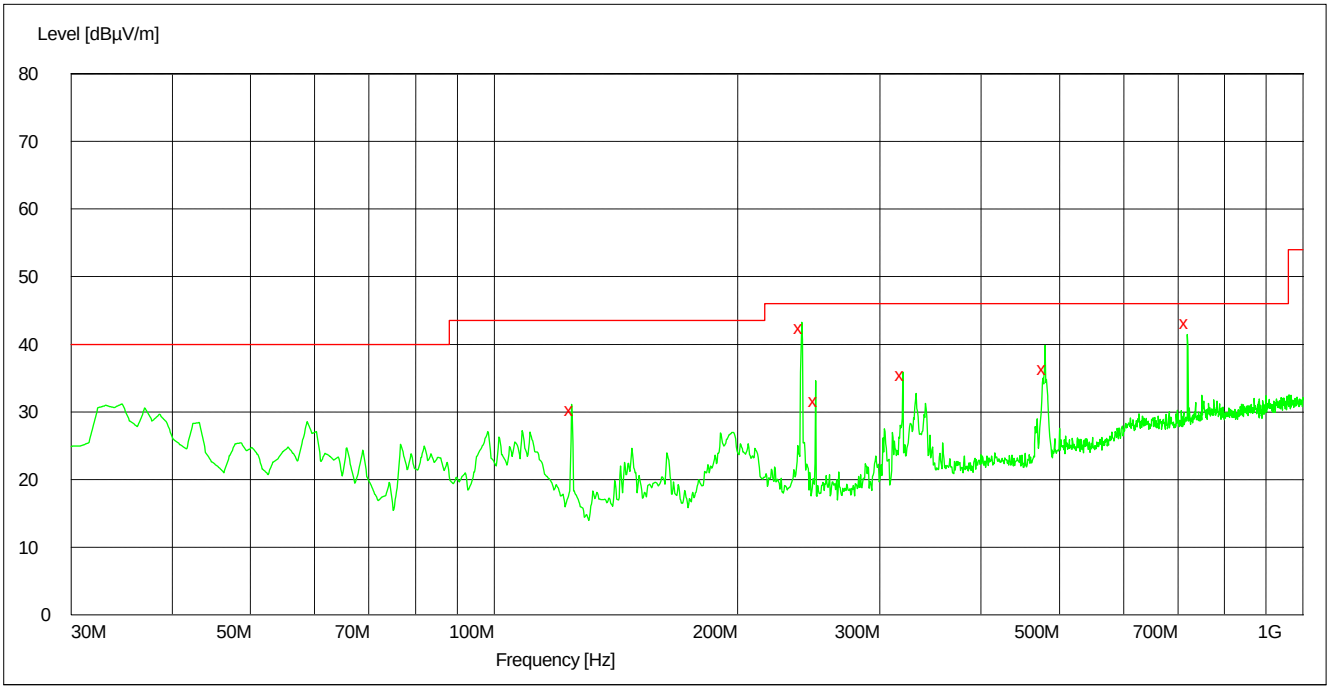
System Measurement Uncertainty		
Items		**Extended Uncertainty**
RE(30MHz-1GHz)	Field strength (dBμV/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dBμV/m)	U=5.1dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.6dB; k=2

7 Test Data and Graph

Only the worst test results are shown.

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

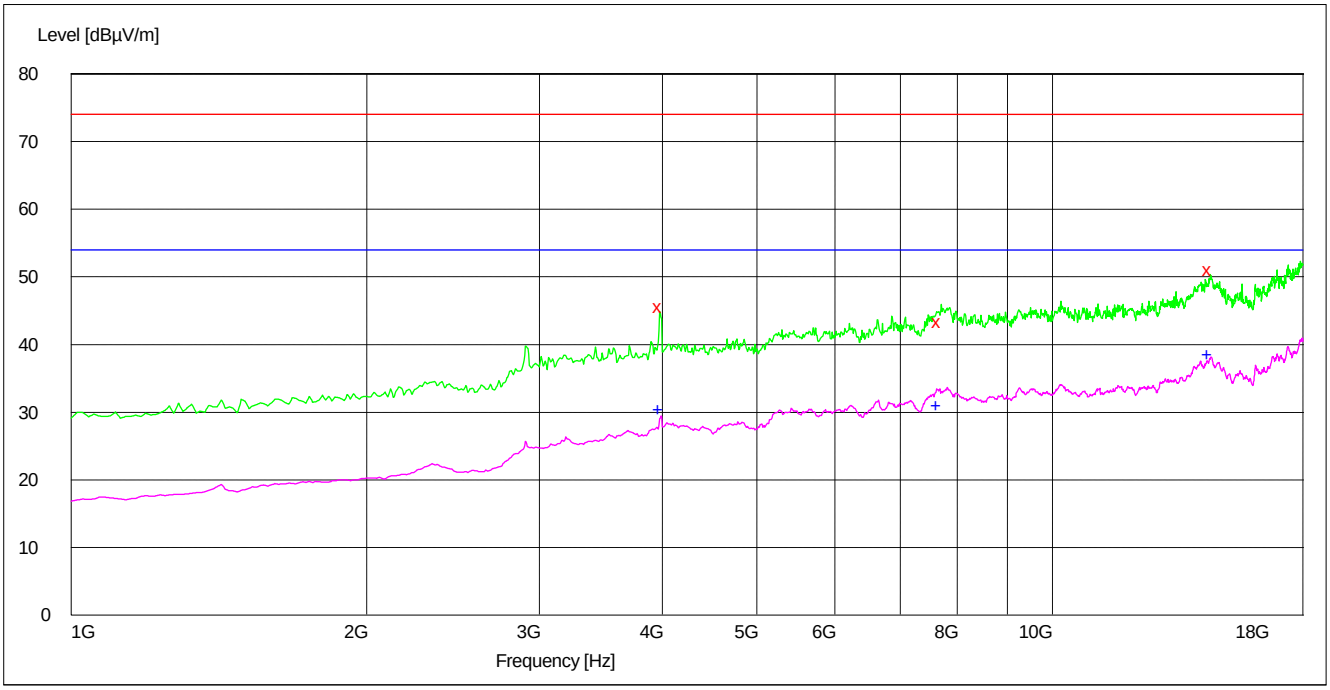


MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
124.972000	30.40	11.0	43.5	13.1	100.0	336.00	VERTICAL
240.000000	41.80	13.8	46.0	4.2	118.0	308.00	HORIZONTAL
250.028000	31.70	13.9	46.0	14.3	100.0	1.00	VERTICAL
319.984000	35.50	15.5	46.0	10.5	100.0	0.00	HORIZONTAL
480.020000	36.40	18.8	46.0	9.6	100.0	306.00	HORIZONTAL
299.210880	19.8	15.5	46.0	26.2	100.0	96.0	HORIZONTAL

Note:
Level= Reading level+ Transducer (cable loss + correction factor)
The reading level is calculated by software which is not shown in the sheet.

7.1.2 1GHz~18GHz



MEASUREMENT RESULT: PK Detector

Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
3987.900000	45.50	-3.1	74.0	28.5	100.0	202.00	VERTICAL
7681.800000	43.30	4.7	74.0	30.7	150.0	131.00	VERTICAL
14475.700000	51.00	17.5	74.0	23.0	100.0	216.00	HORIZONTAL

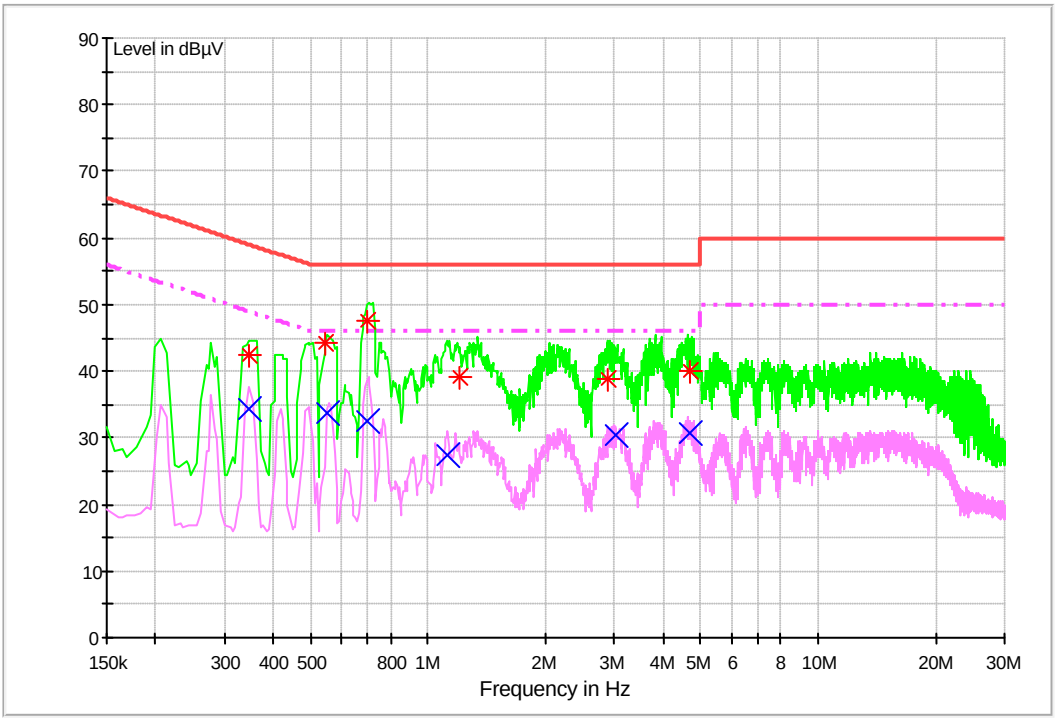
MEASUREMENT RESULT: AV Detector

Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
3989.500000	30.40	-3.1	54.0	23.6	150.0	202.00	VERTICAL
7660.100000	30.90	5.0	54.0	23.1	105.0	258.00	VERTICAL
14466.200000	38.50	17.5	54.0	15.5	150.0	317.00	HORIZONTAL

Note:
Level= Reading level+ Transducer (cable loss + correction factor)
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



MEASUREMENT RESULT: QP Detector

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.349196	42.5	9.7	59.0	16.5	N	FLO
0.543094	44.2	9.7	56.0	11.8	L1	FLO
0.699844	47.4	9.7	56.0	8.6	L1	FLO
1.203514	39.1	9.7	56.0	16.9	L1	FLO
2.881838	38.9	9.7	56.0	17.1	N	FLO
4.689945	39.9	9.8	56.0	16.1	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.346451	34.3	9.7	49.0	14.7	L1	FLO
0.550901	33.9	9.7	46.0	12.1	L1	FLO
0.698310	32.6	9.7	46.0	13.4	L1	FLO
1.126402	27.3	9.7	46.0	18.7	L1	FLO
3.041688	30.5	9.7	46.0	15.5	N	FLO
4.711072	30.6	9.8	46.0	15.4	L1	FLO

Note:
Level= Reading level+ Transducer (cable loss + correction factor)
The reading level is calculated by software which is not shown in the sheet.

----------**END**----------