



EMC Test Report

Product Name: Mobile WiFi

Model Number: R226

Report No: SYBH(Z-EMC)063052014-2

FCC ID: QISR226

Reliability Laboratory of Huawei Technologies Co., Ltd.

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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 on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
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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: May.28, 2014
Start Date of Test: June.16, 2014
End Date of Test: June.25, 2014
Test Result: Pass

**Approved By
(Lab Manager)**

2014-06-25
Date

Liu Chunlin
Name

Liu Chunlin
Signature

**Operator
(Test Engineer)**

2014-06-25
Date

Xiang Zaiji
Name

Xiang Zaiji
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	Mobile WiFi
Model Number	R226
Serials Number	N4W0114429000130
TX Frequency	GSM850: 824MHz To 849MHz GSM1900: 1850MHz To 1910MHz WCDMA Band II : 1850 MHz To 1910 MHz WCDMA Band V : 824 MHz To 849 MHz LTE Band 5: 824MHz To 849MHz LTE Band 7: 2500MHz To 2570MHz WIFI 2.4G: 2402MHz To 2462MHz 5G: 5170MHz To 5250MHz 5735MHz To 5835MHz
RX Frequency	GSM850: 869MHz To 894MHz GSM1900: 1930MHz To 1990MHz WCDMA Band II : 1930 MHz To 1990 MHz WCDMA Band V: 869 MHz To 894 MHz LTE Band 5: 869MHz To 894MHz LTE Band 7: 2620MHz To 2690MHz WIFI 2.4G: 2402MHz To 2462MHz 5G: 5170MHz To 5250MHz 5735MHz To 5835MHz
HW Version	CL3E5786SM
SW Version	21.280.07.00.11
EUT Accessory	
USB Cable	Signal Cable,USB3.0 Data Cable,1m,USB3.0 AM-Customization Micro USB 5+6pin,Terminal Dedicated
Adapter	RAND: HUAWEI MODEL.:HW-050200E3W INPUT:100-240V~50/60Hz 0.5A OUTPUT:5.0V  2.0A SN: HWBYA65E40100689 SN: HWHKA4E30200812
Li-ion Battery	BRAND: HUAWEI Model: HB5P1H Rated capacity: 3000mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

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

FCC 47 CFR 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	CLASS B	Pass	Site1
Conducted Emissions ☒ DC Power Port ☒ AC Power Port ☐ Telecommunication Ports	Mode1~ Mode4	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

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.

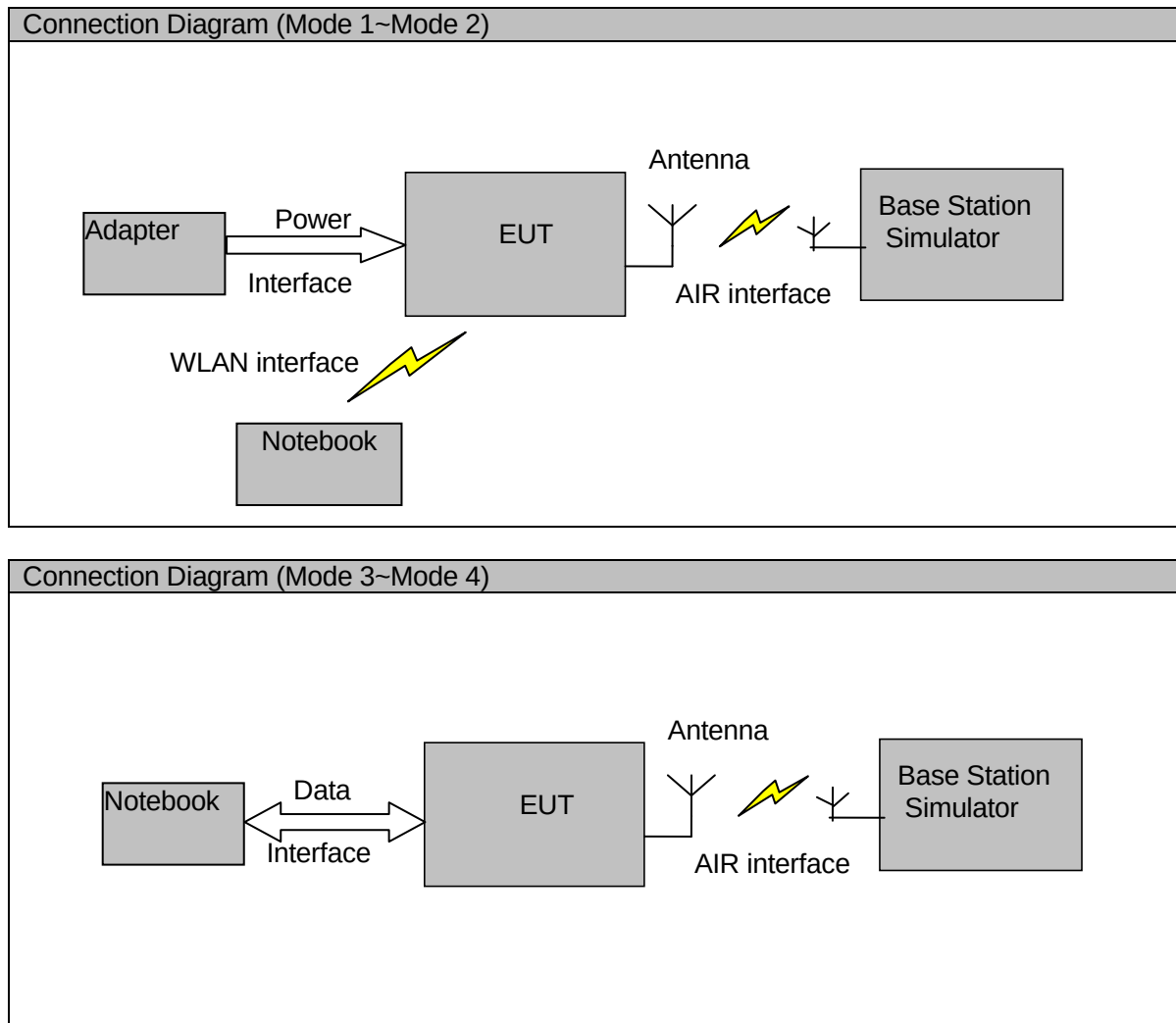
Traffic Mode:

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



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB Cable	1	1m	shielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval (month)
Radio Communication tester	CMU200	R&S	3607033573	2014-10-14	12
Notebook	MS2220	Acer	3107084890	/	/

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 to 18 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

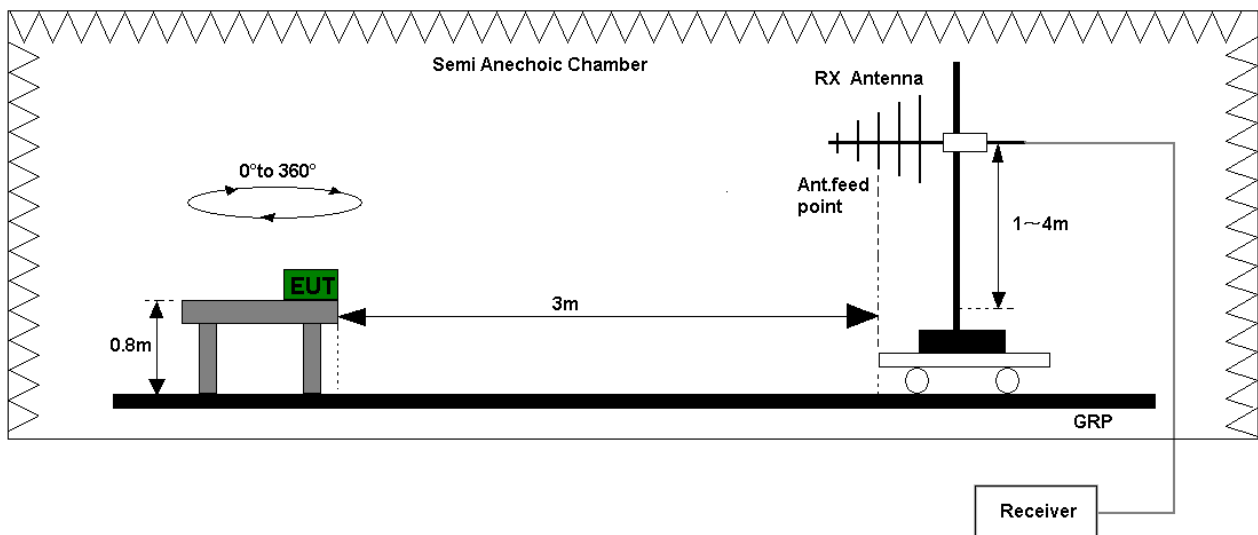


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

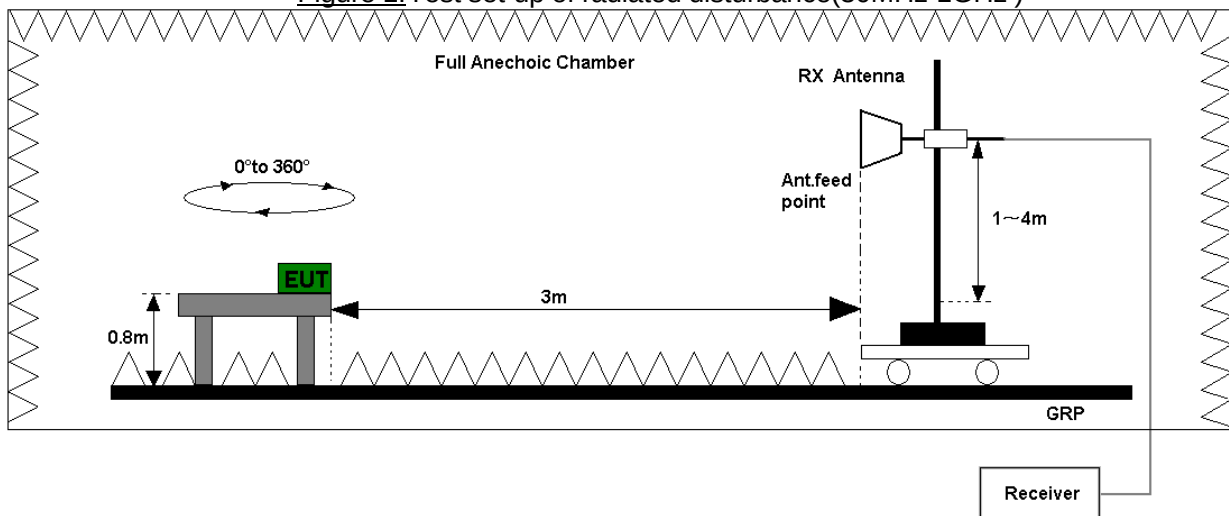


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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(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 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

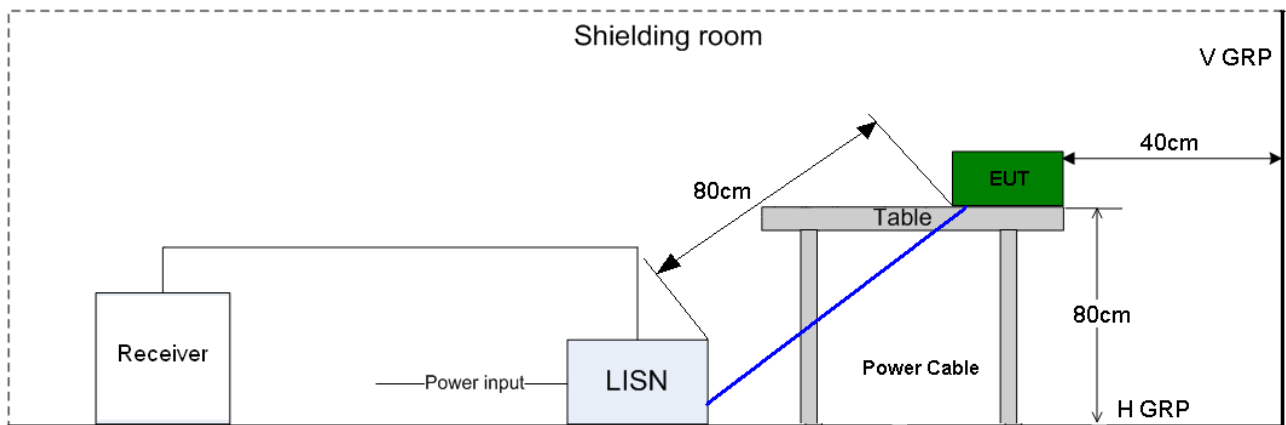


Figure 3. Test Set-up of conducted disturbance

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	9163-520	SCHWARZ BECK	Dec.20, 2015	24
	Horn Antenna	HF906	100683	R&S	Feb.01, 2015	24
CE	Line Impedance Stabilization Network	ENV216	100382	R&S	Dec.23, 2014	12
	Artificial Main Network	ENV4200	100134	R&S	Dec.23, 2014	12
	EMI Test receiver	ESCI	101163	R&S	Dec.23, 2014	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:

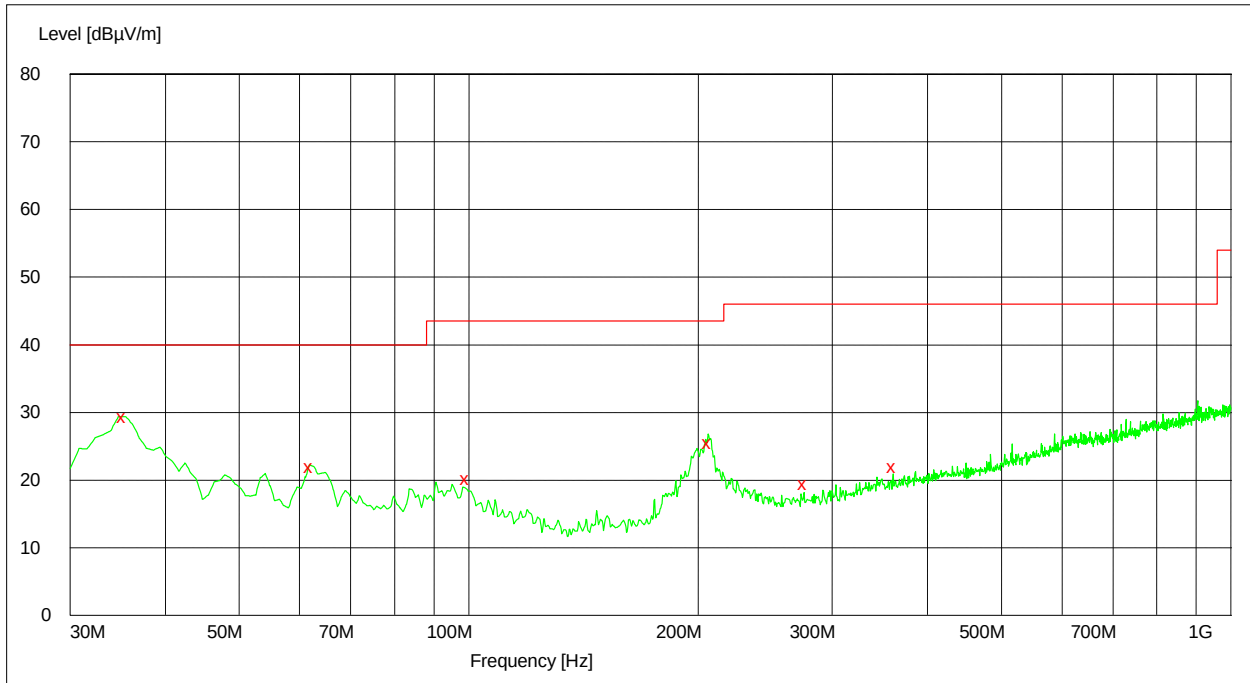
System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dBμV/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dBμV/m)	U=5.1dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.6dB; k=2

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

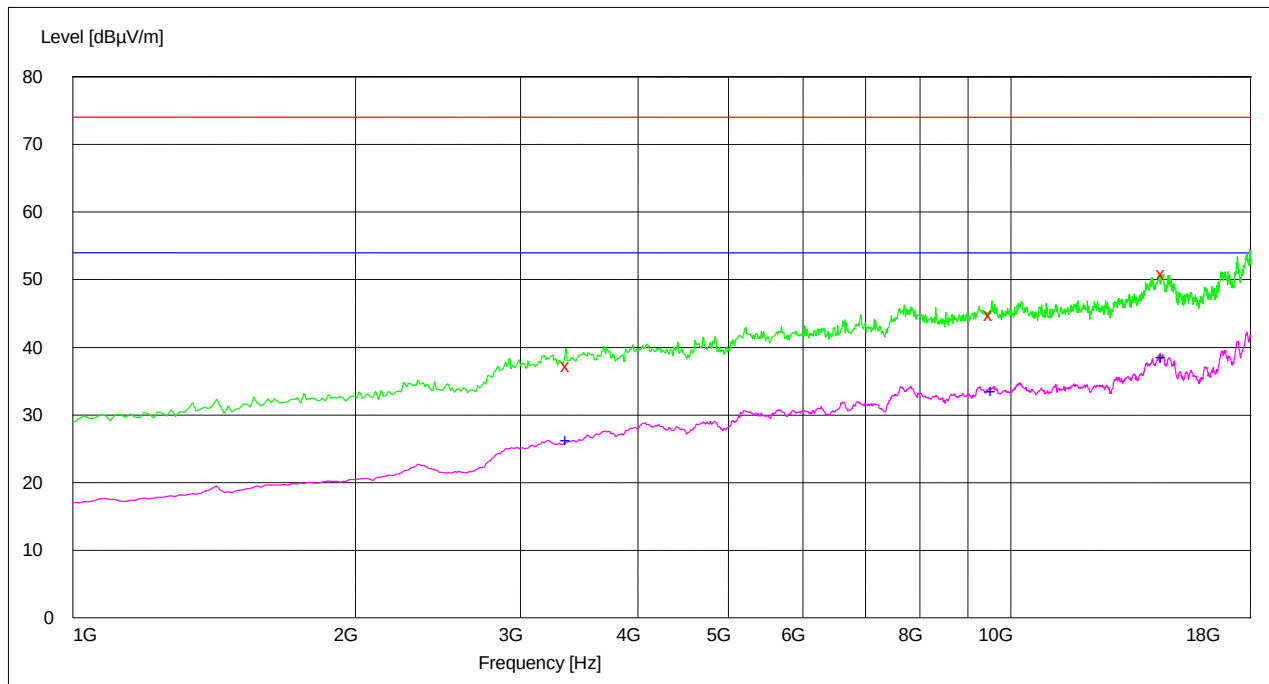
Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
35.340000	29.40	14.5	40.0	10.6	112.0	360.00	VERTICAL
276.340000	19.40	14.5	40.0	20.6	112.0	360.00	VERTICAL
62.160000	21.90	12.4	40.0	18.1	100.0	107.00	VERTICAL
99.600000	20.20	13.3	43.5	23.3	149.0	63.00	VERTICAL
206.880000	25.50	12.6	43.5	18.0	100.0	181.00	VERTICAL
361.380000	21.90	16.8	46.0	24.1	103.0	112.00	HORIZONTAL

Note:

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

The reading level is calculated by software which is not shown in the sheet.

7.1.2 1GHz~18GHz



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3376.300000	37.30	-5.5	74.0	36.7	150.0	315.00	VERTICAL
9525.800000	44.80	5.7	74.0	29.2	126.0	355.00	HORIZONTAL
14558.600000	50.80	16.7	74.0	23.2	118.0	0.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3369.800000	26.10	-5.5	54.0	27.9	103.0	359.00	HORIZONTAL
9565.800000	33.30	6.0	54.0	20.7	103.0	341.00	VERTICAL
14525.100000	38.50	17.1	54.0	15.5	103.0	28.00	HORIZONTAL

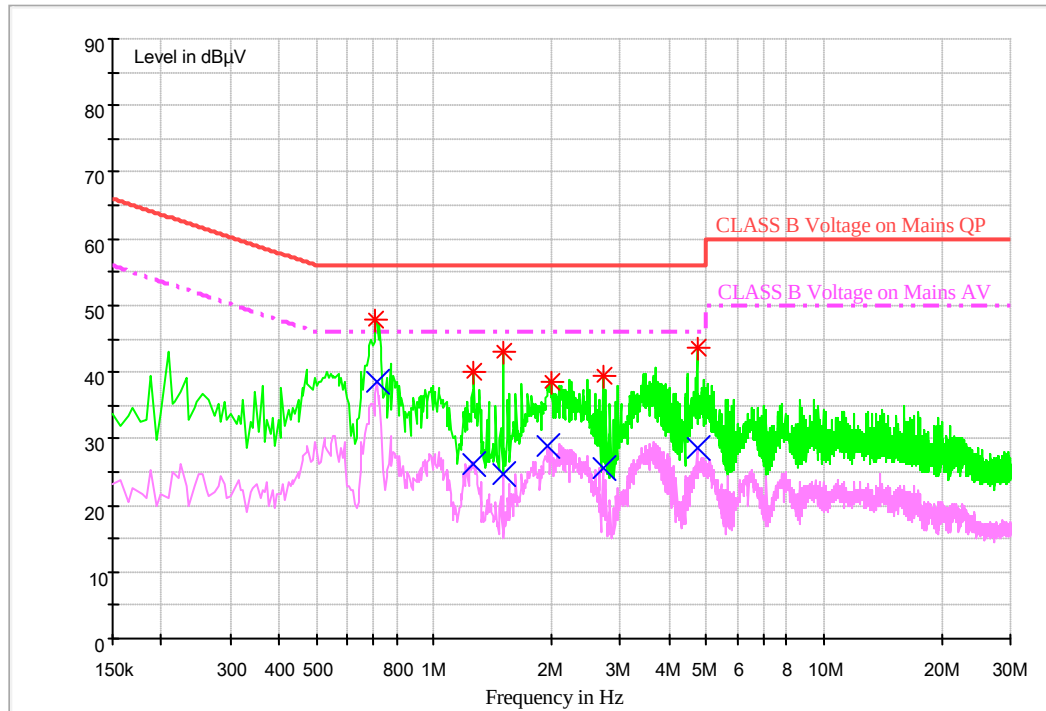
Note:

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 MHz	Level dBμV	Line	Transd dB	Margin dB	Limit dBμV	PE
0.705956	47.9	L1	9.7	8.1	56.0	FLO
1.261912	40.0	N	9.7	16.0	56.0	FLO
1.500712	42.9	L1	9.7	13.1	56.0	FLO
1.996969	38.4	N1	9.8	17.6	56.0	FLO
2.705906	39.5	L1	9.8	16.5	56.0	FLO
4.713319	43.5	L1	9.9	12.5	56.0	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Line	Transd dB	Margin dB	Limit dBμV	PE
0.713419	38.6	L1	9.7	7.4	46.0	FLO
1.265644	26.1	L1	9.7	19.9	46.0	FLO
1.500712	24.7	N	9.7	21.3	46.0	FLO
1.959656	29.0	N	9.8	17	46.0	FLO
2.705906	25.5	L1	9.8	20.5	46.0	FLO
4.713319	28.7	L1	9.9	17.3	46.0	FLO

Note:

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

The reading level is calculated by software which is not shown in the sheet.

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