



EMC Test Report

Product Name: WCDMA Digital Mobile Phone

Model Number: HUAWEI W2-U051

Report No: SYBH(Z-EMC)080082013-2

FCC ID: QISW2-U051

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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.
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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: Aug.20, 2013
Start Date of Test: Aug.21, 2013
End Date of Test: Sep.10, 2013
Test Result: Pass

**Approved By
(Lab Manager)**

2013-09-12
Date

Liu Chunlin
Name

Signature

**Operator
(Test Engineer)**

2013-09-12
Date

Su Yuguang
Name

Signature



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1 General Information

1.1 EUT Description

EUT Description	
Product Name	WCDMA Digital Mobile Phone
Model Number	HUAWEI W2-U051
TX Frequency	GSM850: 824MHz To 849MHz GSM1900:1850 MHz To 1910MHz WCDMA II: 1850 MHz To 1910MHz WCDMA V: 824MHz To 849MHz Bluetooth: 2402MHz To 2480MHz WIFI: 2412MHz To 2462MHz
RX Frequency	GSM850: 869MHz To 894MHz GSM1900:1930 MHz To 1990MHz WCDMA II: 1930 MHz To 1990MHz WCDMA V: 869MHz To 894MHz Bluetooth: 2402MHz To 2480MHz WIFI: 2412MHz To 2462MHz GPS: 1575.42MHz
S/N	G7Y01A9373000050
HW Version	HD1W2M Ver. A
SW Version	W2_U051_V100R001C00B001
EUT Accessory	
Data cable	Data Cable USB A Male to Micro USB, shielded
Adapter	Brand: HUAWEI Model: HW-050100U2W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V  1A Rated Power: 5W S/N: HWHKAAD60303477; S/N: HWBYAAD52501789
Rechargeable Li-ion	Brand: HUAWEI Battery Model: HB4W1H Rated capacity: 1750mAh Nominal Voltage:  +3.7V S/N: LQCD308924300029; S/N: MAID321X28430490

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



1.2 Test Site Information

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 15:2012, 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	Mode 1~ Mode 2 Mode 4	CLASS B	Pass	Site1
<u>Conducted Emissions</u> ☒ DC Power Port ☒ AC Power Port ☐ Telecommunication Ports	Mode 1~ Mode 3	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the measurement uncertainty of measurement 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

Huawei has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was in this test report and defined as below:

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:

- 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:

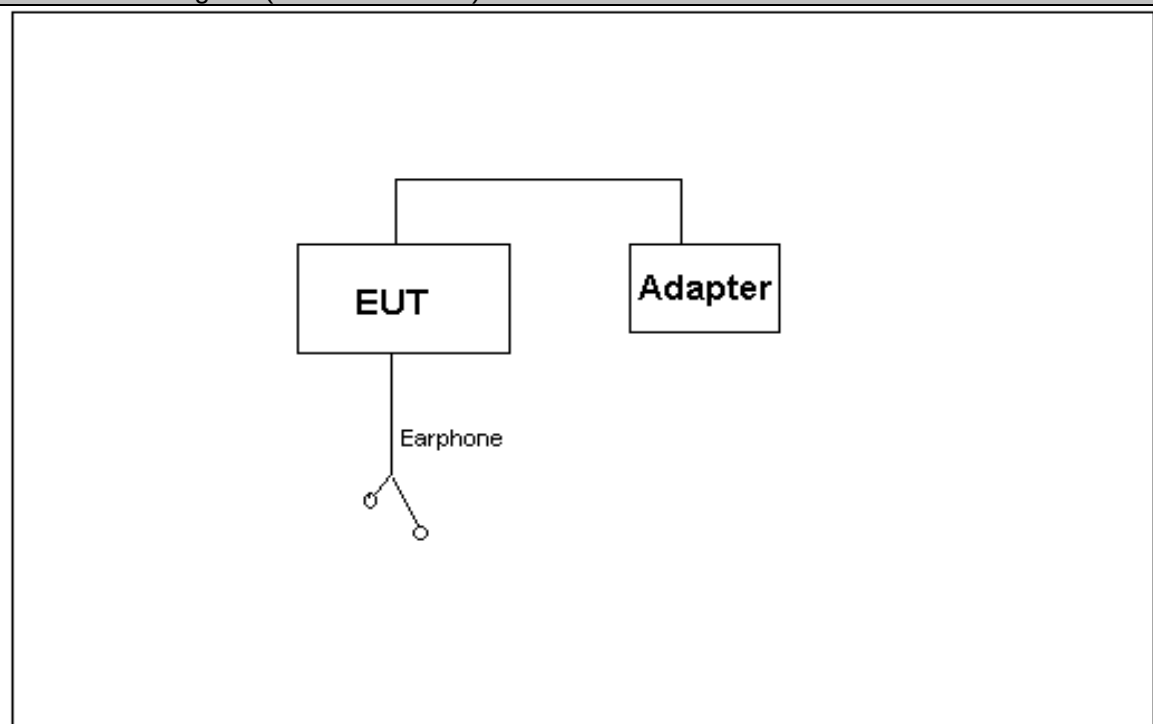
When the EUT state is switched on and with Radio Resource Control (RRC) connection established.

Idle Mode:

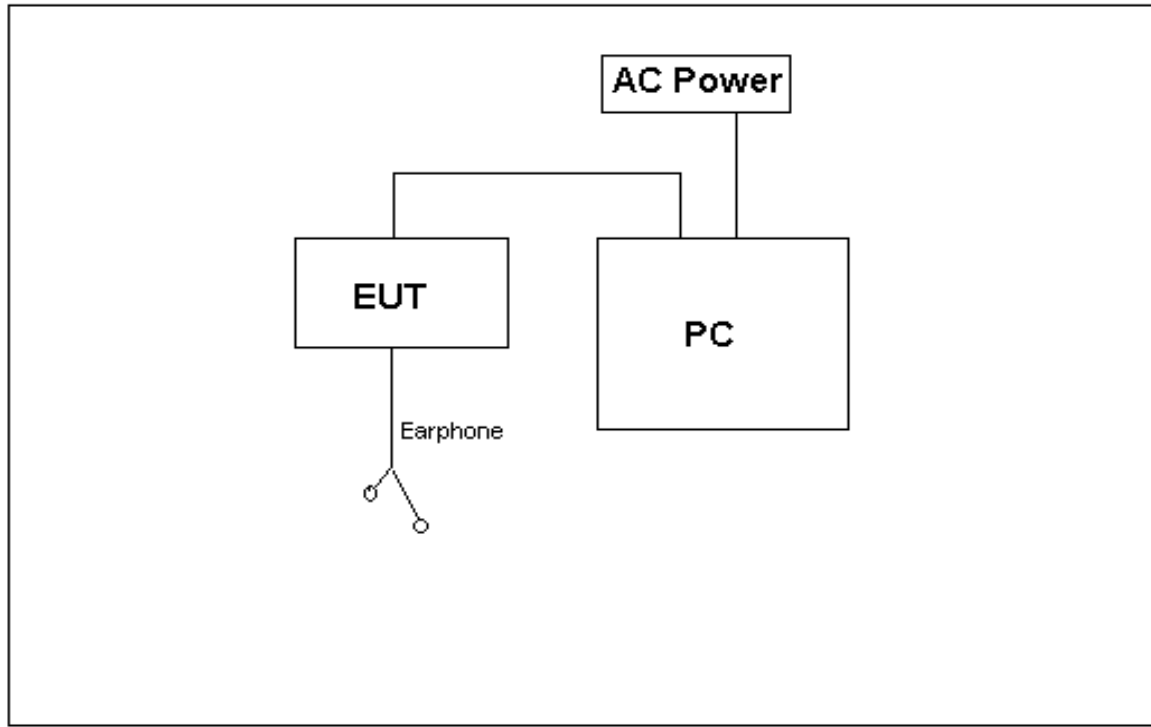
When the EUT state is switched on but without Radio Resource Control (RRC) connection.

3.2 Test System Configuration

Connection Diagram (Mode 1~Mode 3)



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 (month)	FCC ID/DoC
Radio Communication Tester	CMU200	R&S	3608105673	2013-12-22	12	/
Notebook	X200	ThinkPad	31090403588	/	/	DoC
Mouse	M-SBF96	Lenovo	LZ941BG0FT3	/	/	DoC
Gateway	B681-54	Huawei	C9W6RB1211	/	/	QISB681-54

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

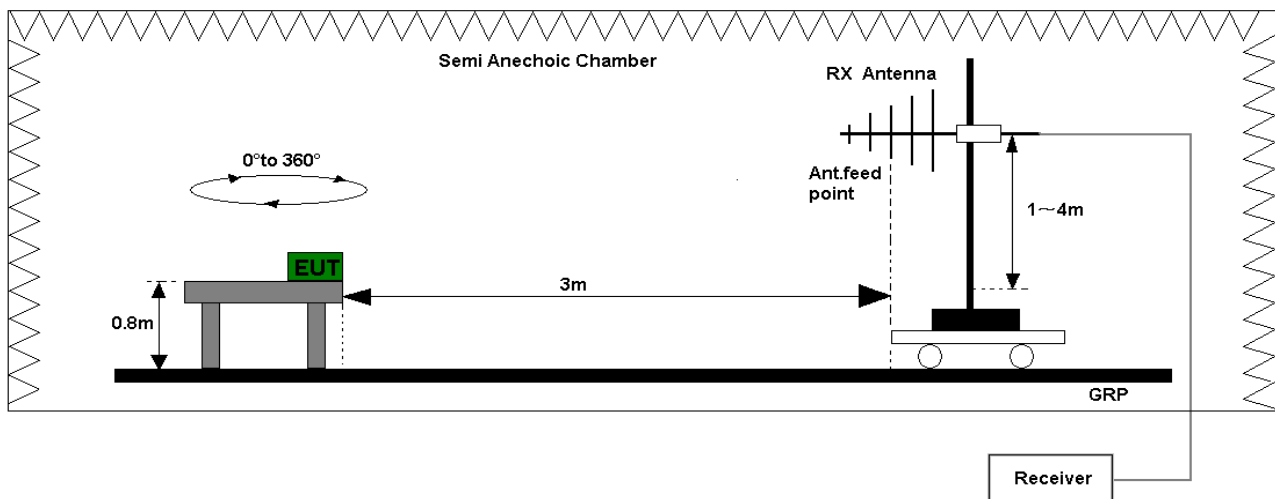


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

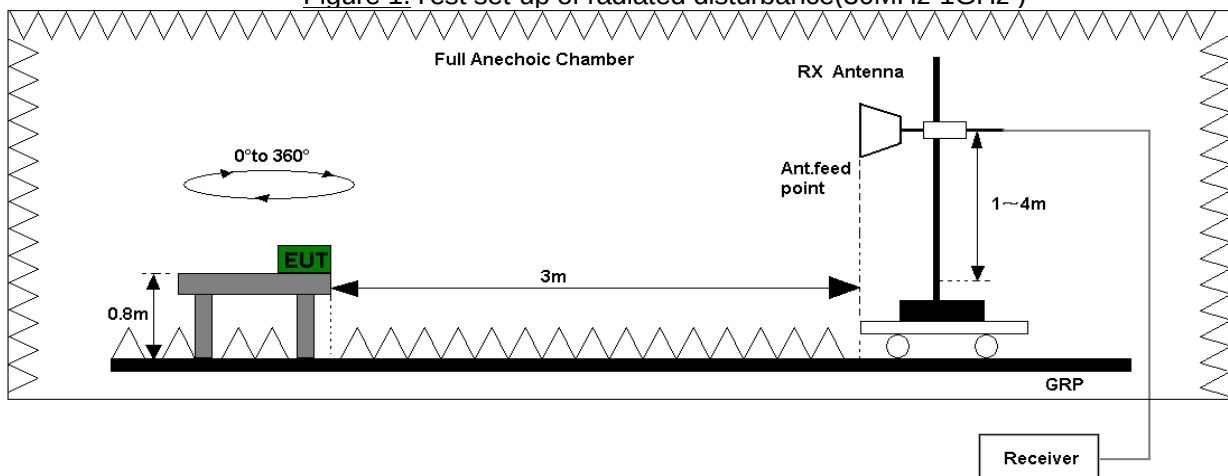


Figure 2. Test set-up of radiated disturbance(above 1GHz)



4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
The test data see section 7.1 of this report.

Test Limits				
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

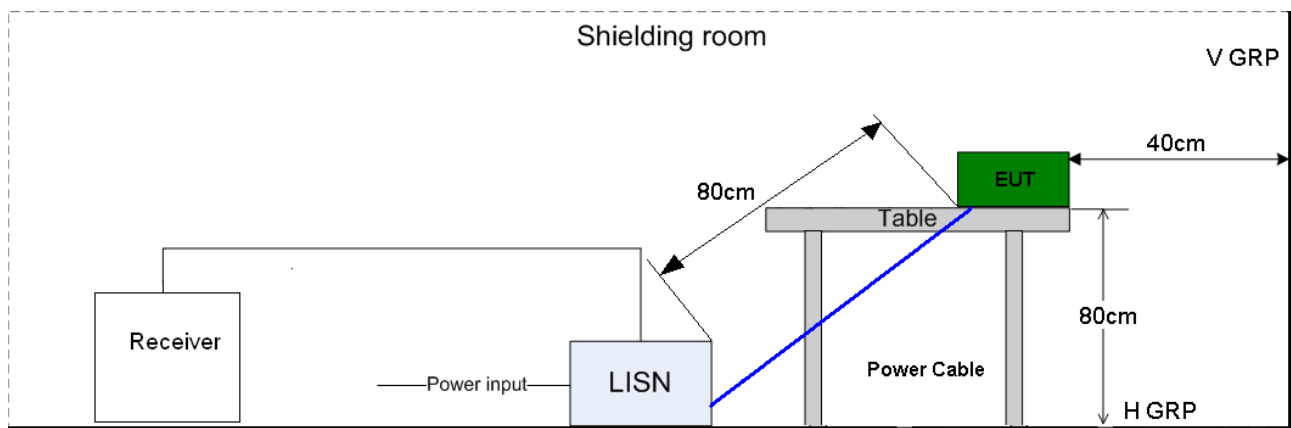


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

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

The test data see section 7.2 of this report.

Test Limit of AC Power Port		
Frequency range	150kHz ~ 30MHz	
Frequency	Voltage limits	
	QP	AV
0.15MHz~0.5MHz	66-56dBμV	56-46 dBμV
0.5MHz-5MHz	56dBμV	46 dBμV
5MHz~30MHz	60dBμV	50 dBμV



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.14, 2014	12
	Broadband Antenna	VULB 9163	9163-491	SCHWARZBECK	Feb.21, 2015	24
	Horn Antenna	HF906	100683	R&S	Feb.01, 2015	24
CE	EMI Test receiver	ESCI	101163	R&S	Jan. 28, 2014	12
	Artificial Mains Network	ENV216	100382	R&S	Jan. 28, 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 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
CE	Disturbance Voltage (dB μ V)	U=2.6dB; k=2

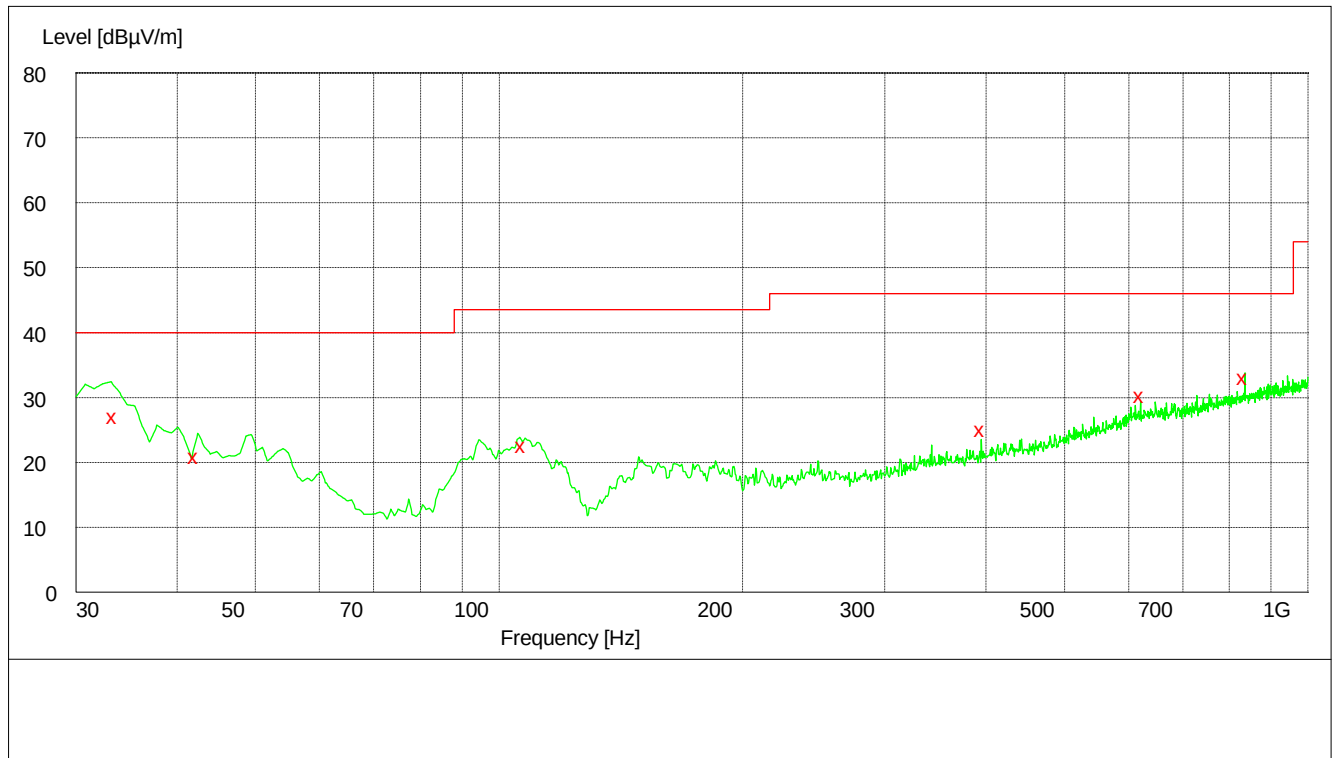


7 Test Data and Graph

Only the worst test result was shown in this report.

7.1 Radiated Disturbance

30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
33.480000	27.20	11.8	40.0	12.8	100.0	320.00	VERTICAL
42.180000	21.20	13.1	40.0	18.8	100.0	14.00	VERTICAL
107.100000	22.80	12.6	43.5	20.7	100.0	39.00	VERTICAL
395.040000	25.30	18.1	46.0	20.7	227.0	13.00	HORIZONTAL
621.900000	30.60	22.8	46.0	15.4	168.0	106.00	HORIZONTAL
835.020000	33.30	25.5	46.0	12.7	101.0	355.00	VERTICAL

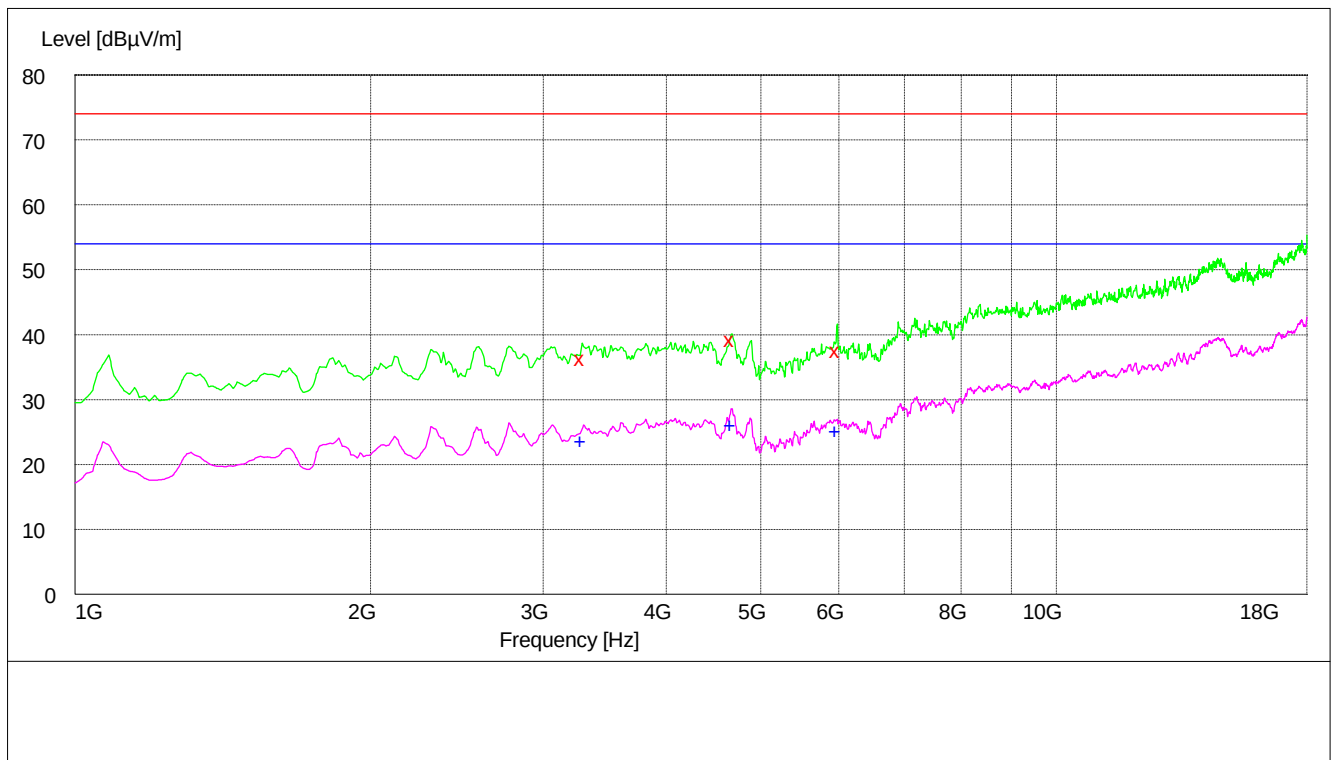
Note:

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.



1GHz~18GHz



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3286.300000	36.50	-6.0	74.0	37.5	102.0	191.00	VERTICAL
4667.000000	39.50	-2.8	74.0	34.5	101.0	0.00	VERTICAL
5980.600000	37.80	0.0	74.0	36.2	150.0	141.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3288.800000	23.80	-6.0	54.0	30.2	101.0	149.00	VERTICAL
4664.500000	26.30	-2.8	54.0	27.7	115.0	326.00	VERTICAL
5977.600000	25.20	0.0	54.0	28.8	109.0	220.00	HORIZONTAL

Note:

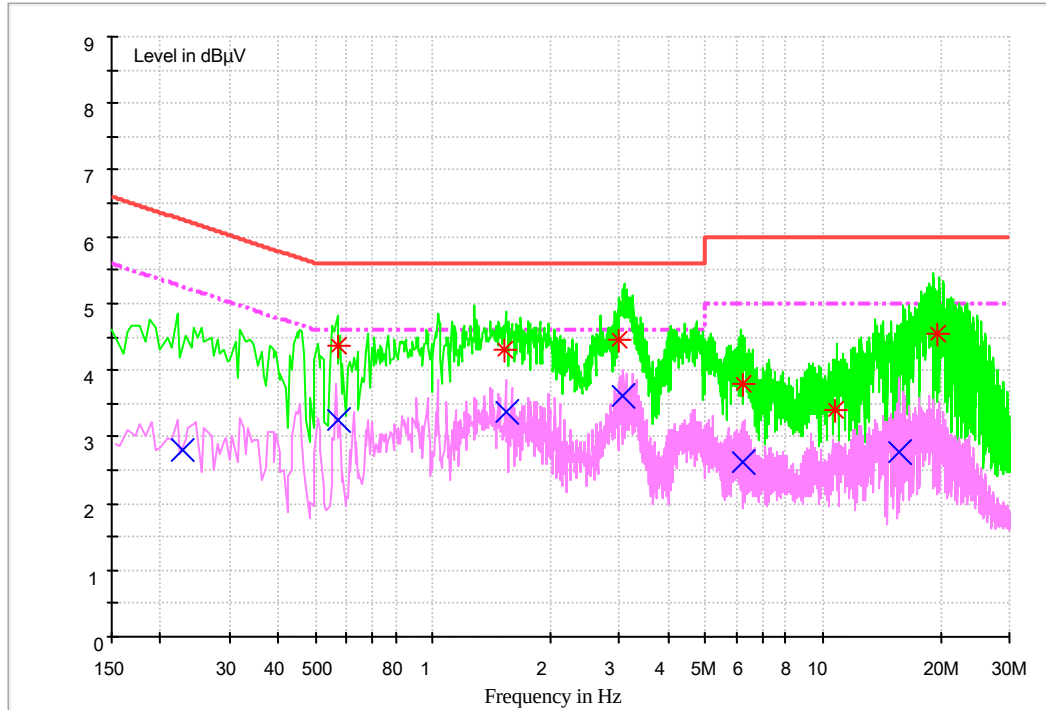
Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

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



7.2 Conducted Disturbance

AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV	Line	Transd dB	Margin dB	Limit dBμV	PE
0.570960	43.5	L1	9.7	12.5	56.0	FLO
1.530626	43.0	N	9.7	13.0	56.0	FLO
3.005726	44.7	L1	9.7	11.3	56.0	FLO
6.203058	37.8	N	9.8	22.2	60.0	FLO
10.723699	34.1	N	9.9	25.9	60.0	FLO
19.681906	45.6	L1	10.1	14.4	60.0	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Line	Transd dB	Margin dB	Limit dBμV	PE
0.227692	28.3	L1	9.7	24.2	52.5	FLO
0.569006	32.6	N	9.7	13.4	46.0	FLO
1.535622	33.7	N	9.7	12.3	46.0	FLO
3.069720	36.1	N	9.7	9.9	46.0	FLO
6.199410	26.3	N	10.1	23.7	50.0	FLO
15.593022	27.8	N	10.1	22.2	50.0	FLO

Note:

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

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



END
