



EMC Test Report

Product Name: Vodafone Mobile Wi-Fi

Model Number: R208

Report No: SYBH(Z-EMC)101082012-2

FCC ID: QISR208

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: Jul.27, 2012
Start Date of Test: Jul.27, 2012
End Date of Test: Sep.03, 2012

Test Result: Pass

**Approved By
(Lab Manager)**

2012-09-03
Date

Liu Chunlin
Name



Signature

Operator

2012-09-03
Date

Xiang Zaiji
Name



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	Vodafone Mobile Wi-Fi
Model Number	R208
Serials Number	Z9K01B9271300334
TX Frequency	GSM850: 824MHz To 849MHz GSM1900: 1850MHz To 1910MHz WCDMA Band V: 824MHz To 849MHz WIFI: 2400MHz To 2483.5MHz
RX Frequency	GSM850: 869MHz To 894MHz GSM1900: 1930MHz To 1990MHz WCDMA Band V: 869MHz To 894MHz WIFI: 2400MHz To 2483.5MHz
HW Version	CH1E5756SM
SW Version	21.136.05.00.11
EUT Accessory	
Data cable	Terminal Accessory, Data Cable, USB A male to Micro USB 120cm, White, Terminal Dedicated
Adapter	BRAND: HUAWEI Model: HW-050200U3W Input:100-240V~ 50/60Hz, 0.5A MAX Output: 5.0V $\overline{\text{---}}$ 2.0A SN: HWHKAAC50900613
Adapter	BRAND: HUAWEI Model: HW-050200U3W Input:100-240V~ 50/60Hz, 0.5A Output: 5.0V $\overline{\text{---}}$ 2.0A SN: HWXQAAC60100138
Li-ion Battery	BRAND: HUAWEI Model: HB5P1H Rated capacity: 3000mAh Nominal Voltage: $\overline{\text{---}}$ +3.7V Charging Voltage: $\overline{\text{---}}$ +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

47 CFR FCC Part 15:2011, 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 <input checked="" type="checkbox"/> DC Power Port <input checked="" type="checkbox"/> AC Power Port <input type="checkbox"/> Telecommunication Ports	Mode1 Mode2	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:	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: 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.

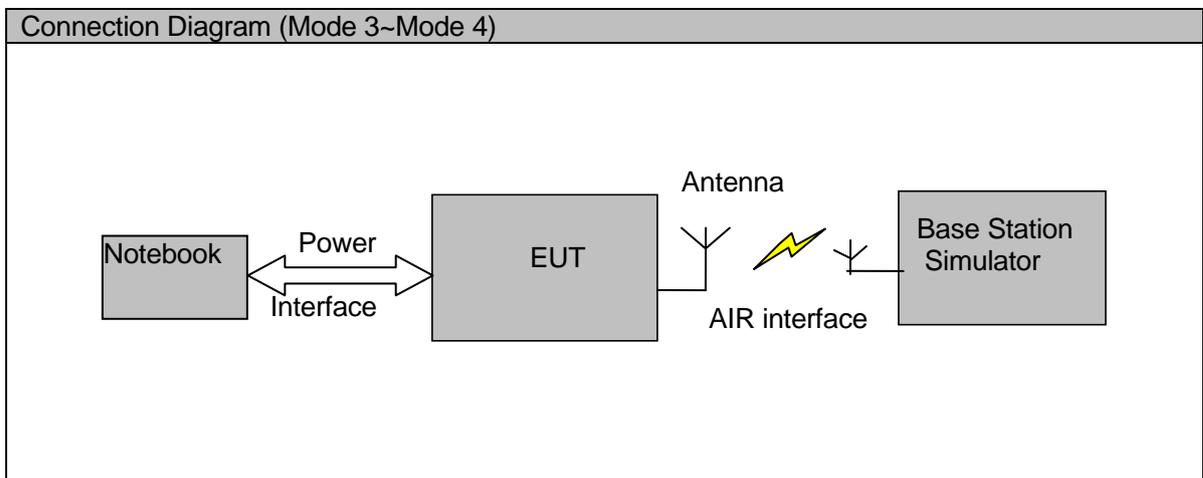
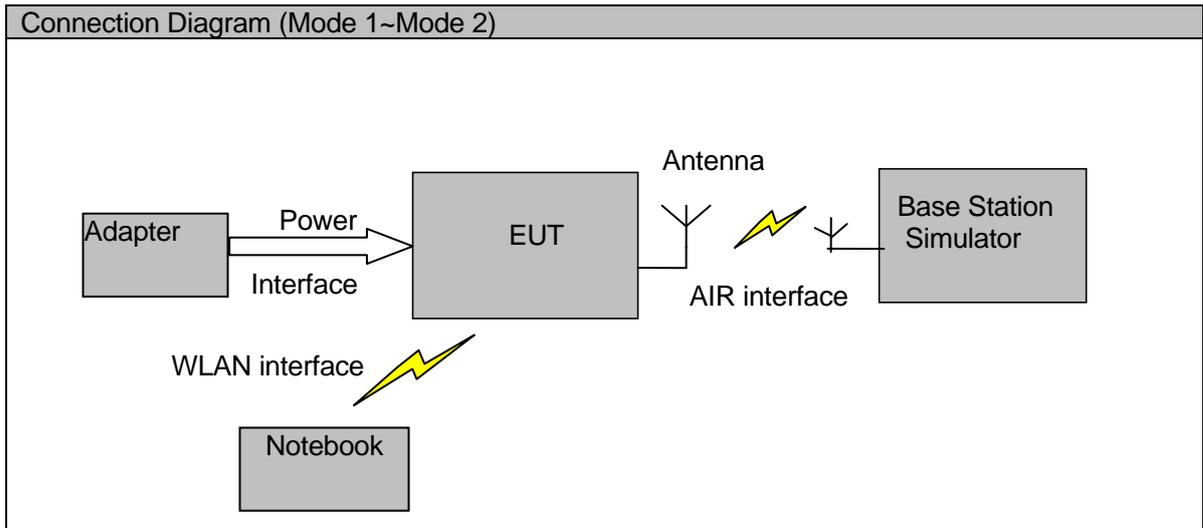
Traffic Mode:

State of EUT when switched on and with Radio Resource Control (RRC) connection established.

Idle Mode:

State of EUT when switched on but with no 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	120cm	shielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal. interval (month)
Radio Communication Tester	CMU200	R&S	1117057	2012-9-3	12
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 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

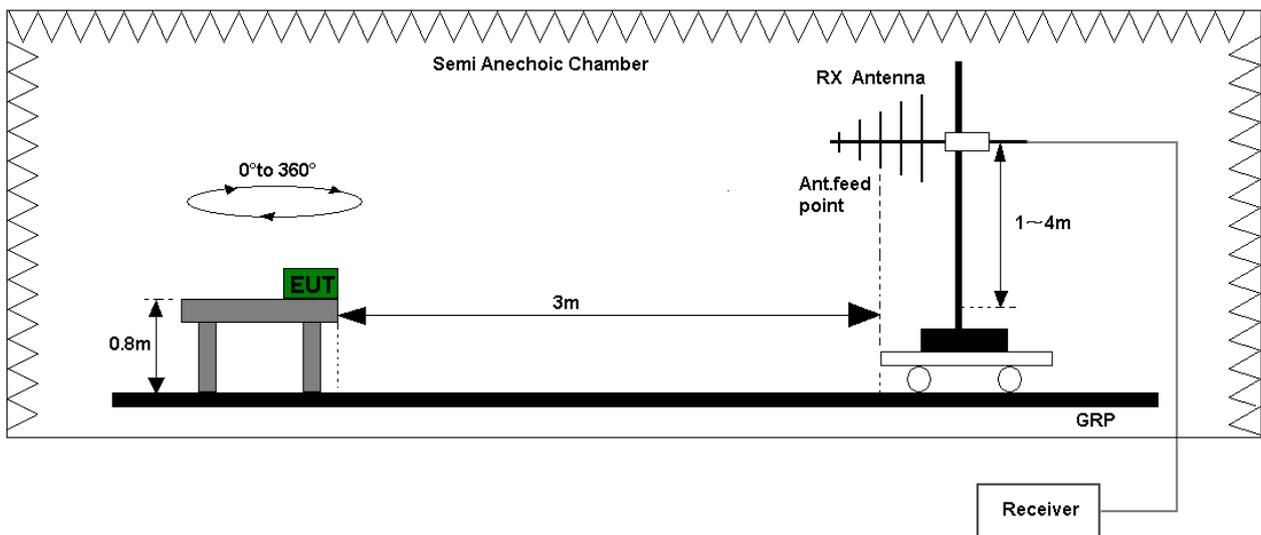


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

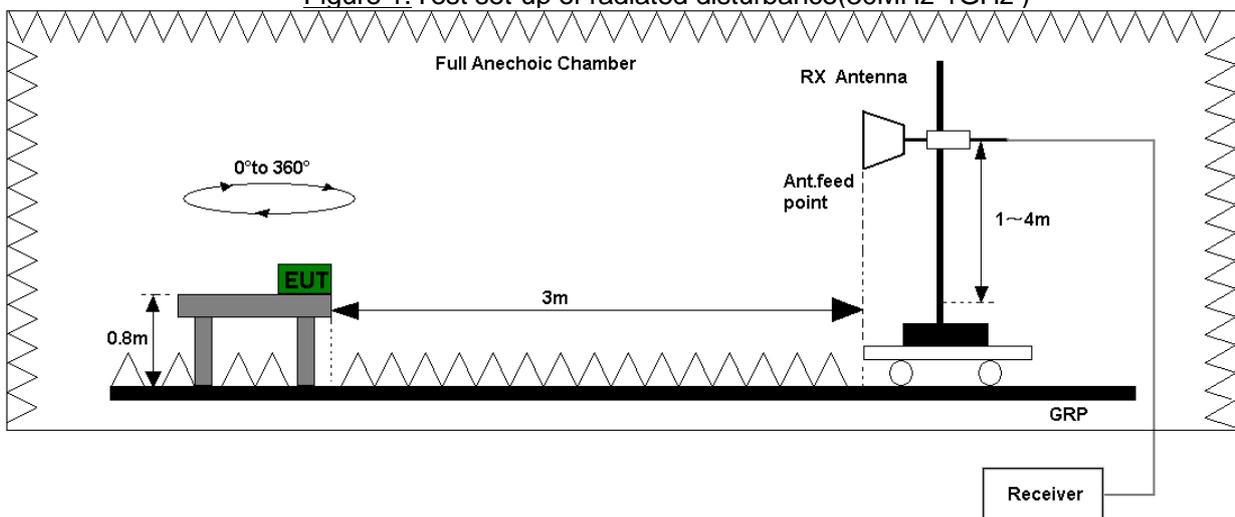


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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(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

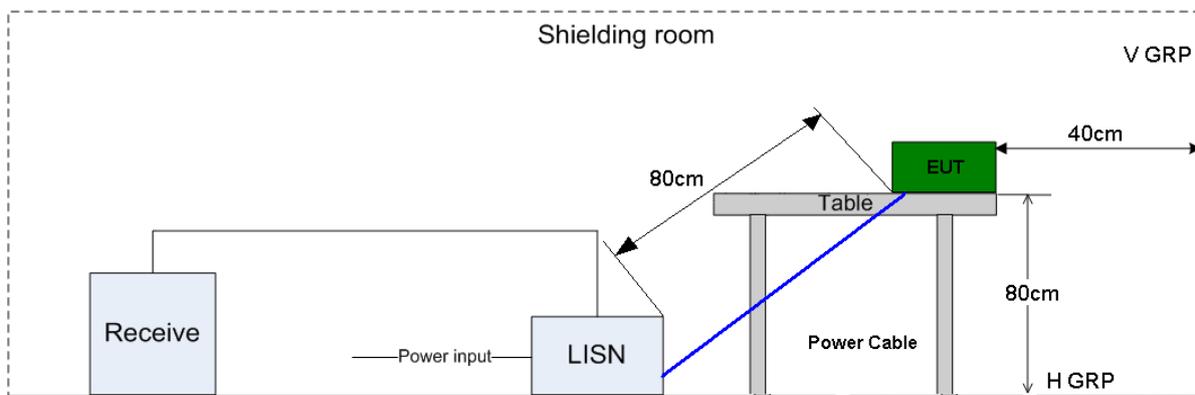


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance of power lines. 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 μ V)	AV (dB μ 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 (month)
RE/CE	EMI Test receiver	ESU26	100150	R&S	May.27, 2013	12
	EMI Test receiver	ESCI	101163	R&S	Mar.05, 2013	12
	Broadband Antenna	VULB 9163	9163-941	SCHWARZ BECK	Jul.07, 2013	24
	Horn Antenna	HF906	10084	R&S	May.15, 2013	24
	Artificial Mains Network	ENV216	100382	R&S	Mar.21, 2013	12
Software Information						
Test Item	Software Name	Manufacturer		Version		
RE	ES-K1	R&S		1.7.1		
CE	EMC32	R&S		V8.52.0		

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:

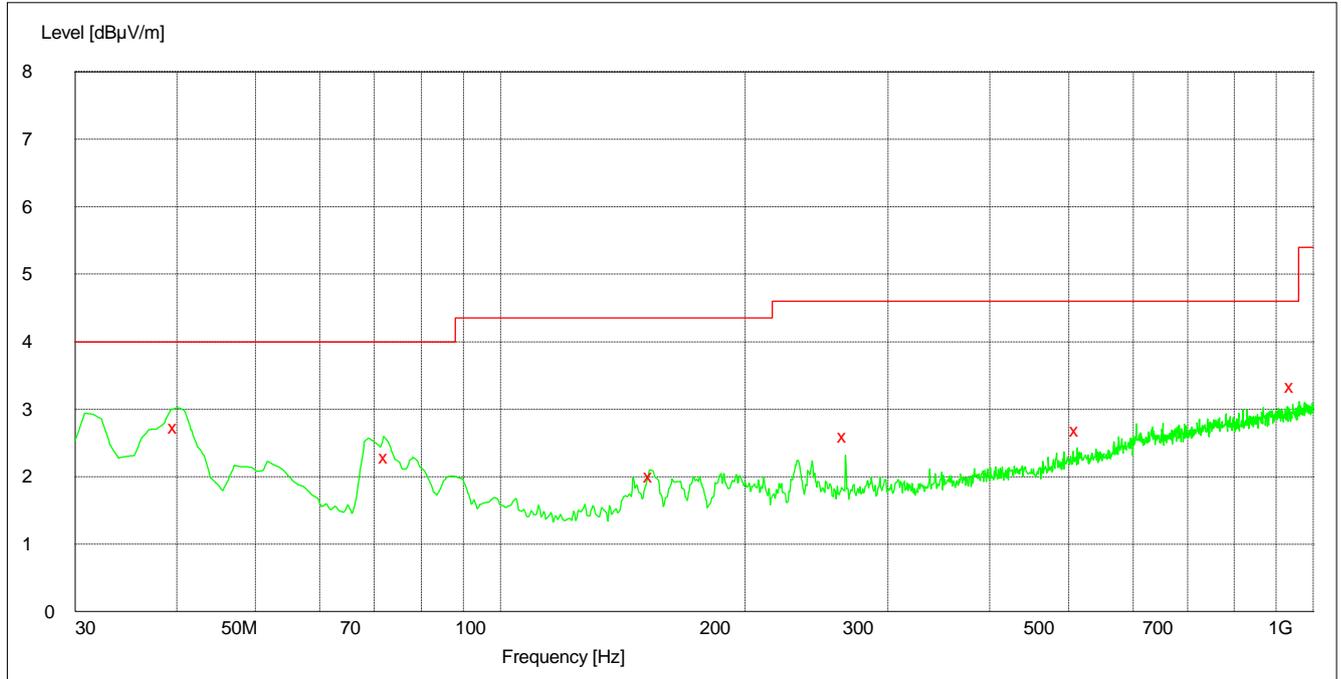
System Measurement Uncertainty		
Items	Extended Uncertainty	
RE(30MHz-1GHz)	Field strength (dB μ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB μ V/m)	U=5.1dB; k=2
CE	Disturbance Voltage (dB μ V)	U=2.6dB; k=2

7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz



MEASUREMENT RESULT: QP Detector

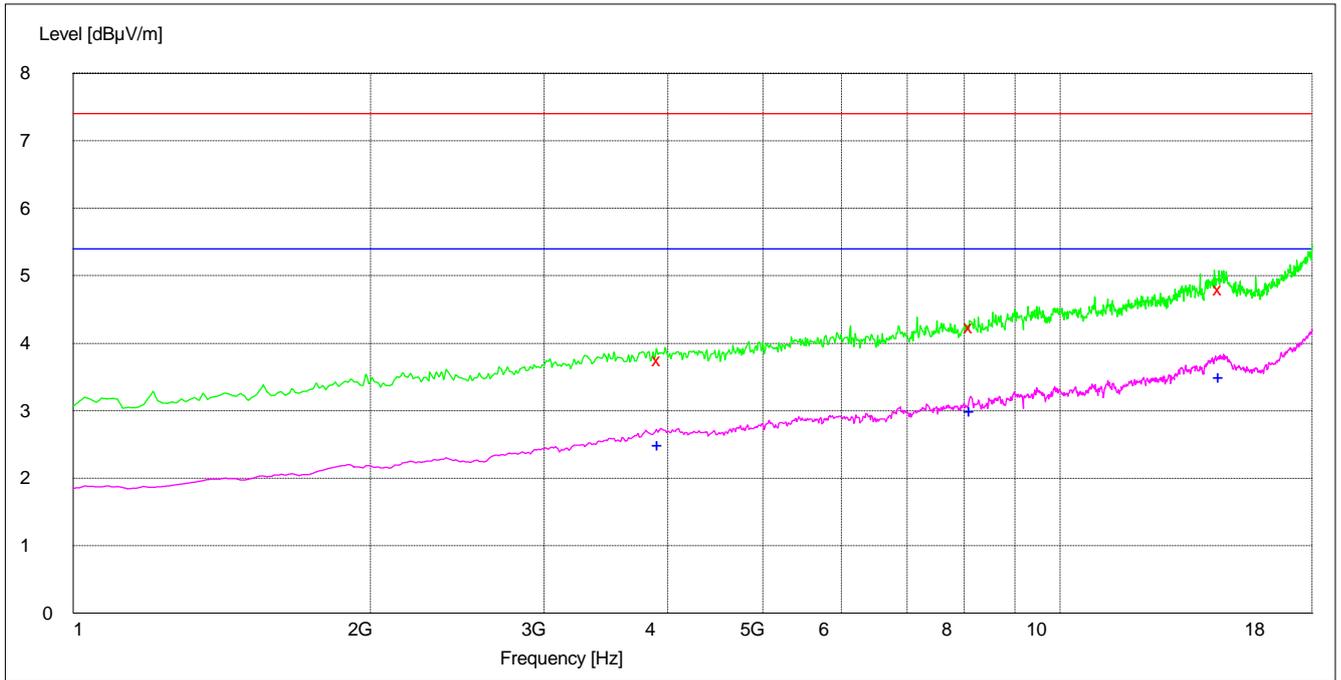
Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
39.960000	27.30	15.3	40.0	12.7	100.0	133.00	VERTICAL
72.540000	22.90	10.7	40.0	17.1	100.0	0.00	VERTICAL
153.480000	20.00	9.9	43.5	23.5	100.0	42.00	VERTICAL
265.980000	25.90	14.2	46.0	20.1	100.0	6.00	VERTICAL
513.120000	26.90	19.5	46.0	19.1	100.0	222.00	VERTICAL
944.160000	33.40	25.1	46.0	12.6	100.0	146.00	VERTICAL

Note:

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

The reading level is used to calculate 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
3929.500000	37.50	-4.6	74.0	36.5	100.0	337.00	HORIZONTAL
8140.000000	42.30	5.2	74.0	31.7	100.0	276.00	VERTICAL
14554.200000	48.00	14.5	74.0	26.0	100.0	300.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3930.000000	24.90	-4.6	54.0	29.1	100.0	37.00	HORIZONTAL
8132.500000	29.90	5.1	54.0	24.1	100.0	15.00	HORIZONTAL
14561.700000	35.00	14.5	54.0	19.0	100.0	95.00	HORIZONTAL

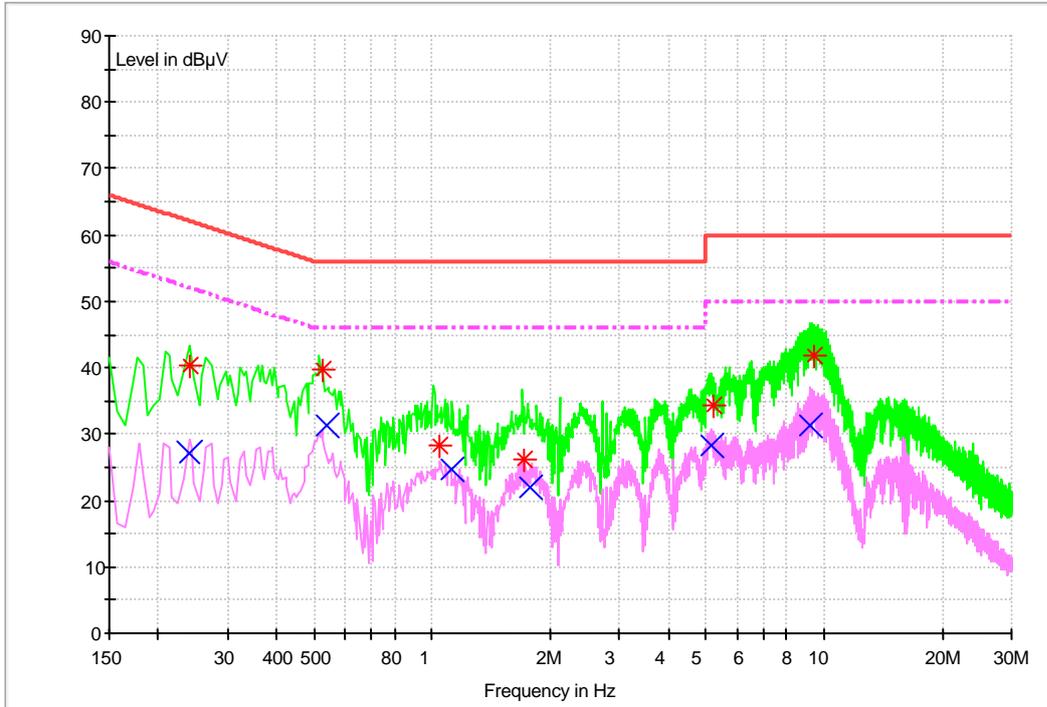
Note:

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

The reading level is used to calculate 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	Transd dB	Limit dBµV	Margin dB	Line	PE
0.241481	40.5	9.7	62.0	21.5	L1	FLO
0.526304	39.6	9.7	56.0	16.4	L1	FLO
1.040164	28.3	9.7	56.0	27.7	L1	FLO
1.723692	26.2	9.7	56.0	29.8	L1	FLO
5.189790	34.3	9.8	60.0	25.7	N	FLO
9.363487	41.7	9.9	60.0	18.3	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.242760	27.5	9.7	52.0	24.5	L1	FLO
0.537772	31.4	9.7	46.0	14.6	N	FLO
1.113694	24.6	9.7	46.0	21.4	N	FLO
1.769880	22.0	9.7	46.0	24.0	N	FLO
5.156884	28.4	9.8	50.0	21.6	N	FLO
9.209539	31.4	9.9	50.0	18.6	N	FLO

Note:

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

The reading level is used to calculate by software which is not shown in the sheet.



END
