



EMC Test Report

Product Name: Vodafone Mobile Wi-Fi

Model Number: R210

Report No: SYBH(Z-EMC)001042012-2

FCC ID: QISR210

Reliability Laboratory of Huawei Technologies Co., Ltd.

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China

Tel: +86 755 28780808 Fax: +86 755 89652518

Notice

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2. 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.
3. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
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Applicant: Huawei Technologies Co., Ltd.
Address: Huawei Base, Bantian, Longgang District, Shenzhen
518129, P.R. China
Date of Receipt Test Item: Mar.26, 2012
Start Date of Test: Mar.26, 2012
End Date of Test: Apr.09, 2012
Test Result: Pass

Approved By
(Lab Manager)

2012-04-09
Date

Liuchunlin
Name



Signature

Operator

2012-04-09
Date

Wenjianfeng
Name



Signature

Modification Record

No.	Last Report No.	Modification Description
1	N/A	First report

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1 General Information

1.1 EUT Description

EUT Description	
Product Name	Vodafone Mobile Wi-Fi
Model Number	R210
Serials Number	T6P01A9231900076
TX Frequency	GSM 850: 824 MHz To 849 MHz GSM 1900: 1850 MHz To 1910 MHz WIFI: 2400 MHz To 2483.5 MHz
RX Frequency	GSM 850: 869 MHz To 894 MHz GSM 1900: 1930 MHz To 1990 MHz WIFI: 2400 MHz To 2483.5 MHz
HW Version	CL1E589M22
SW Version	11.433.11.01.11
EUT Accessory	
Data cable	Manufacturer: Huawei Technologies Co., Ltd. Terminal Accessory, Data Cable, USB A male to Micro USB 120cm ,Black no Braid, Can Not Meet USB2.0 standard, Terminal Dedicated
Adapter	Manufacturer: Huawei Technologies Co., Ltd. Adapter Model: HW-050200U3W Input Voltage : ~100-240V 50/60Hz, 0.5A MAX Output Voltage: === 5.0V 2.0A SN:XQAC11100060
Li-ion Battery	Manufacturer: Huawei Technologies Co., Ltd. Battery Model: HB5P1H Rated capacity: 3000mAh Nominal Voltage: === +3.7V Charging Voltage: === +4.2V SN:SKCBC076I48A0486

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:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	Bantian Longgang District Shenzhen, P.R. China

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15:2010, 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	Mode1 Mode3	CLASS B	Pass	Site1
<u>Conducted Emissions</u> ☒ DC Power Port ☒ AC Power Port ☐ Telecommunication Ports	Mode2 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	30% ~ 60%
Atmospheric pressure	86kPa ~ 106kPa

3 System Configuration during EMC Test

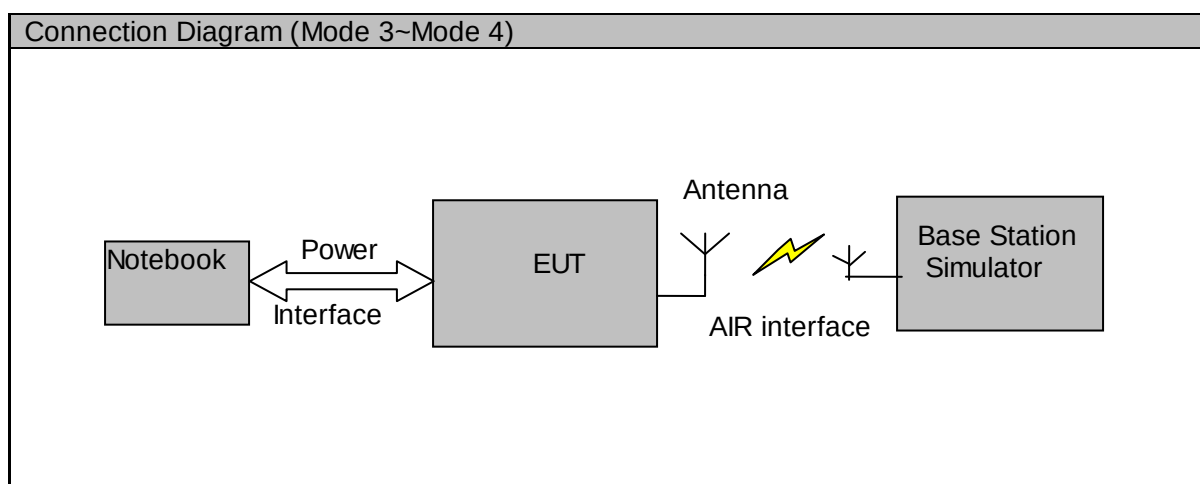
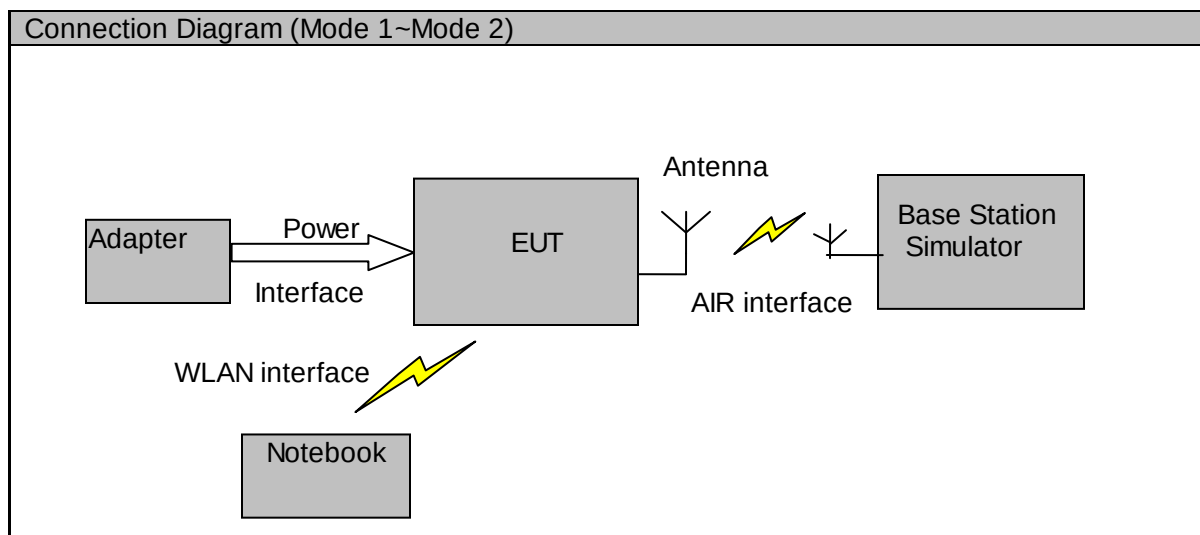
3.1 Test Mode

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 2:	EUT with Adapter +Traffic
Mode 3:	EUT with PC + Idle
Mode 4:	EUT with PC + Traffic

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 Configurations of Test System



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
Radio Communication Tester	CMU200	R&S	3607111817	2012-7-23
Notebook	X200	Lenovo	A100502902	N/A

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 C63.4-2003. The test distance was 3m. The set-up and test methods were according to ANSI C63.4-2003.

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 receive antenna has two polarizations V and H.

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

4.1.2 Test setup

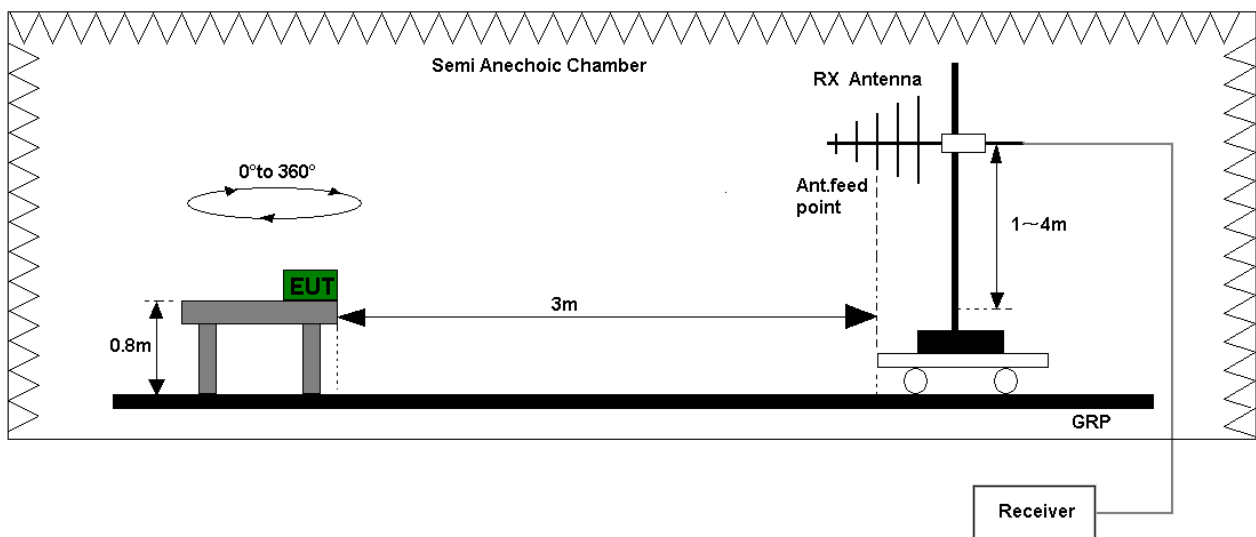


Figure 1.

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

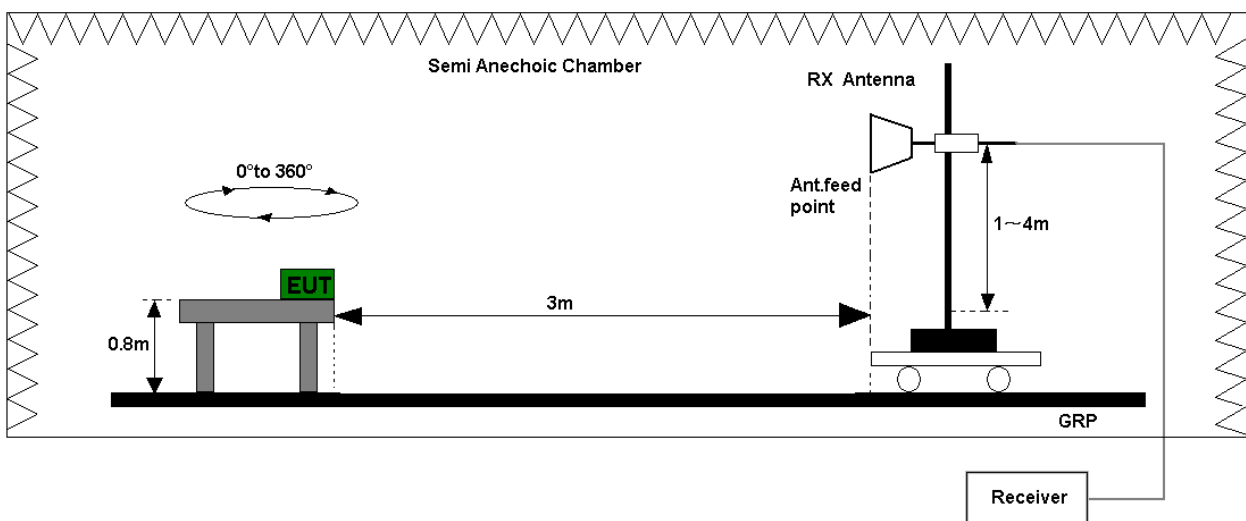


Figure 2.

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 from LISN. The set-up and test methods were according to ANSI C63.4-2003.

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.

Huawei Mobile Station was communicated with the BTS simulator through Air interface, the BTS simulator controls the Mobile Station to transmitter the maximum power which defined in specification of product. The Mobile Station operated on the typical channel.

Measurement bandwidth (RBW) for 150kHz to 30 MHz: 9 kHz;

The Mobile Station was setup in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

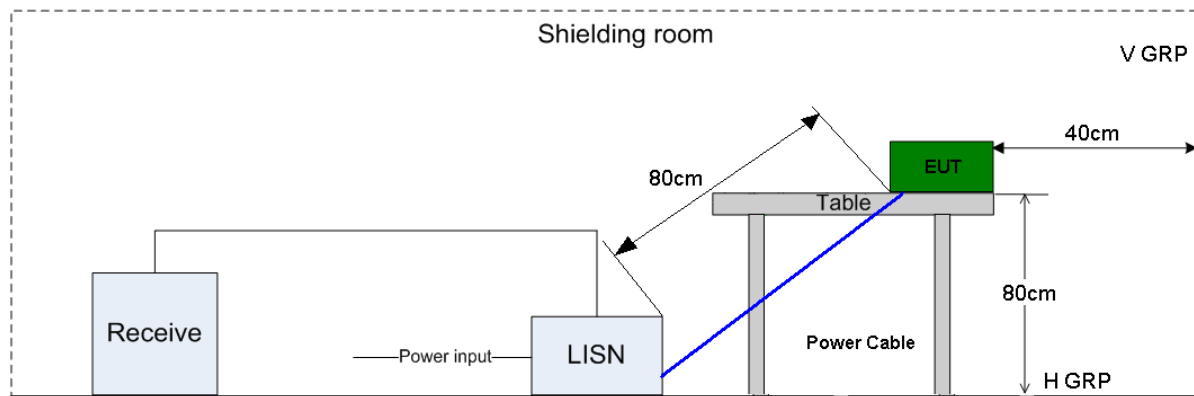


Figure 3.

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
RE/CE	EMI Test receiver	ESU26	100150	R&S	May.29, 2012
	EMI Test receiver	ESCI	101163	R&S	Mar.05, 2013
	Broadband Antenna	VULB 9163	9163-941	SCHWARZBEC K	May.15, 2012
	Horn Antenna	HF906	100683	R&S	May.15, 2012
	Artificial Mains Network	ENV216	100382	R&S	May.29, 2012
Software Information					
Test Item	Software Name	Manufacturer		Version	
RE	ES-K1	R&S		1.7.1	
CE	EMC32	R&S		8.52.0	

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:

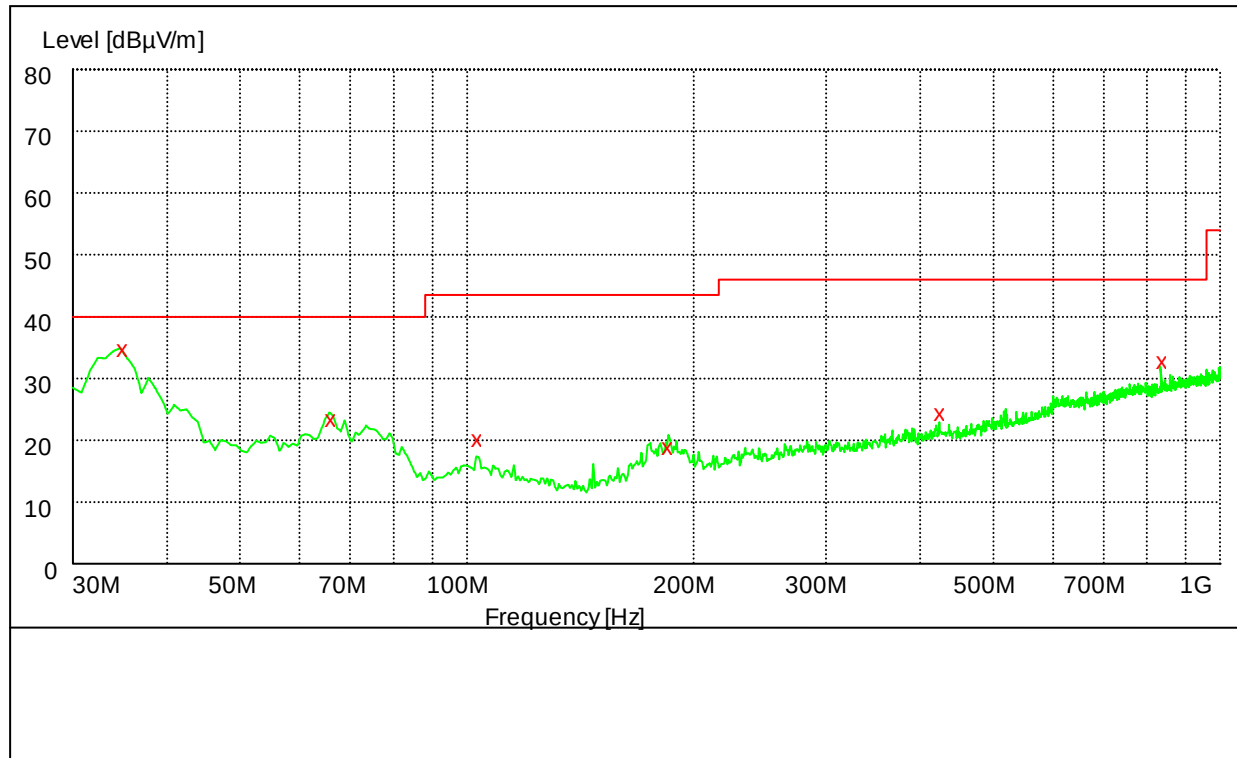
System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dB μ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB μ V/m)	U=5.0dB; k=2
CE	Disturbance Voltage (dB μ V)	U=2.6dB; k=2

7 Graph and Test Data

Only the worst test results were shown

7.1 Radiated Disturbance

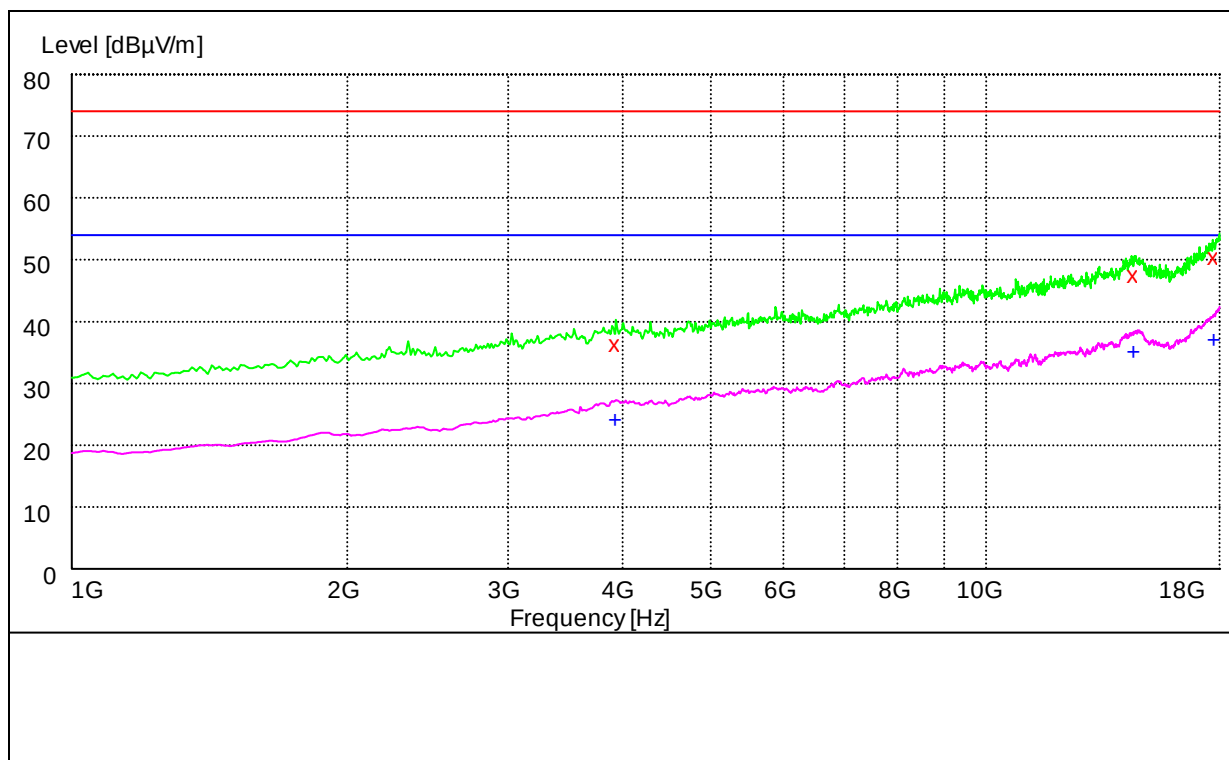
7.1.1 30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
35.040000	35.80	15.0	40.0	4.2	100.0	187.00	VERTICAL
66.300000	23.10	11.5	40.0	16.9	100.0	19.00	VERTICAL
103.680000	20.10	13.5	43.5	23.4	200.0	359.00	HORIZONTAL
185.640000	19.40	11.8	43.5	24.1	100.0	192.00	VERTICAL
424.380000	25.20	18.0	46.0	20.8	169.0	144.00	VERTICAL
837.360000	32.00	24.1	46.0	14.0	143.0	236.00	HORIZONTAL

7.1.2 1GHz~18GHz



MEASUREMENT RESULT: PK Detector

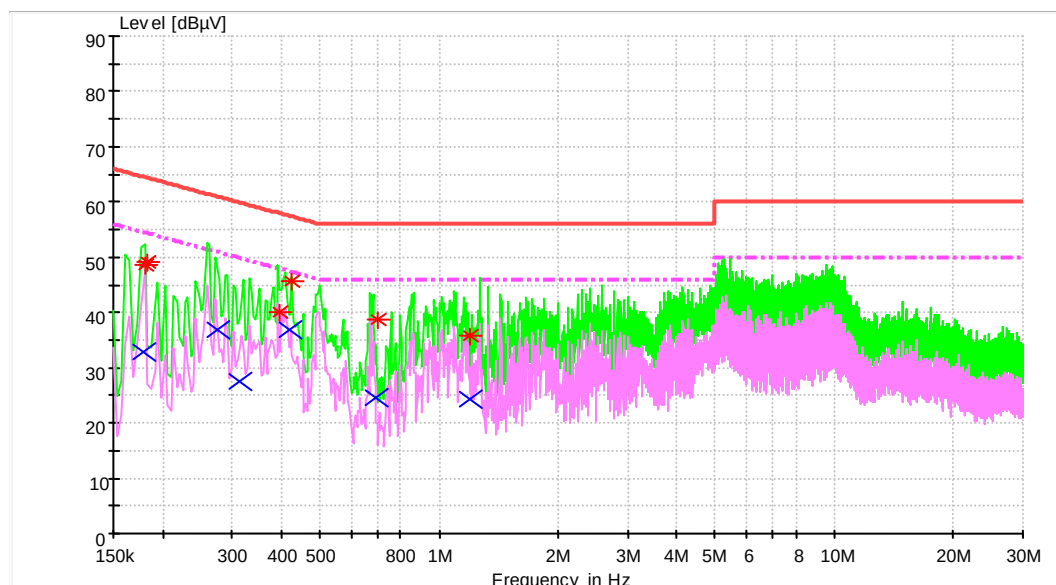
Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
3931.500000	37.40	-4.6	74.0	36.6	135.0	108.00	VERTICAL
14515.500000	48.60	14.5	74.0	25.4	103.0	43.00	VERTICAL
17704.000000	51.30	18.3	74.0	22.7	100.0	101.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
3931.500000	25.20	-4.6	54.0	28.8	200.0	177.00	VERTICAL
14514.500000	36.30	14.5	54.0	17.7	200.0	75.00	HORIZONTAL
17722.500000	38.20	18.3	54.0	15.8	164.0	290.00	VERTICAL

7.2 Conducted Disturbance

7.2.1 AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency	Level	Transducer	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.181416	48.7	9.7	64.4	15.7	L1	FLO
0.182224	49.1	9.7	64.4	15.3	L1	FLO
0.396086	40.0	9.7	57.9	17.9	N	FLO
0.424170	45.6	9.7	57.4	11.8	L1	FLO
0.698502	38.7	9.7	56.0	17.3	L1	FLO
1.191660	35.8	9.7	56.0	20.2	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transducer	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.177835	32.9	9.7	54.6	21.7	L1	FLO
0.274226	36.8	9.7	51.0	14.2	L1	FLO
0.311374	27.5	9.7	49.9	22.4	N	FLO
0.418328	36.8	9.7	47.5	10.7	L1	FLO
0.695392	24.7	9.7	46.0	21.3	L1	FLO
1.199805	24.4	9.7	46.0	21.6	N	FLO

-----END-----