



# EMC Test Report

**Product Name: Vodafone Mobile Wi-Fi**

**Model Number: R206**

**Report No: SYBH(Z-EMC)020022013-2**

**FCC ID: QISR206**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

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## Notice

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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.
4. 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:** Administration Building, Headquarters of Huawei  
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Shenzhen, 518129, P.R.C  
**Date of Receipt Test Item:** Mar.13, 2013  
**Start Date of Test:** Mar.13, 2013  
**End Date of Test:** Mar.16, 2013  
**Test Result:** Pass

**Approved By**  
(Lab Manager)

2013-03-18  
Date

Liu Chunlin  
Name

Signature

**Operator**  
(Test Engineer)

2013-03-18  
Date

Xiang Zaiji  
Name

Signature



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**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	R206
Serials Number	J7V5TB9330700231
TX Frequency	GSM850: 824MHz To 849MHz GSM1900: 1850MHz To 1910MHz WIFI: 2412MHz To 2462MHz
RX Frequency	GSM850: 869MHz To 894MHz GSM1900: 1930MHz To 1990MHz WIFI: 2412MHz To 2462MHz
HW Version	CH1E5220SM
SW Version	21.143.05.00.11
EUT Accessory	
Data cable	Terminal Accessory, Data Cable, USB A male to Micro USB , Terminal Dedicated
Adapter	BRAND: HUAWEI Model: HW-050100U1W Input:100-240V~ 50/60Hz, 0.2A MAX Output: 5.0V  1.0A SN: HKACB2576801 SN: TPACB0510271
Li-ion Battery	BRAND: HUAWEI Model: HB5A2H Rated capacity: 1150mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V SN: UNDCC04X15700171 SN: YACCC02215716676

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 15:2012, 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.

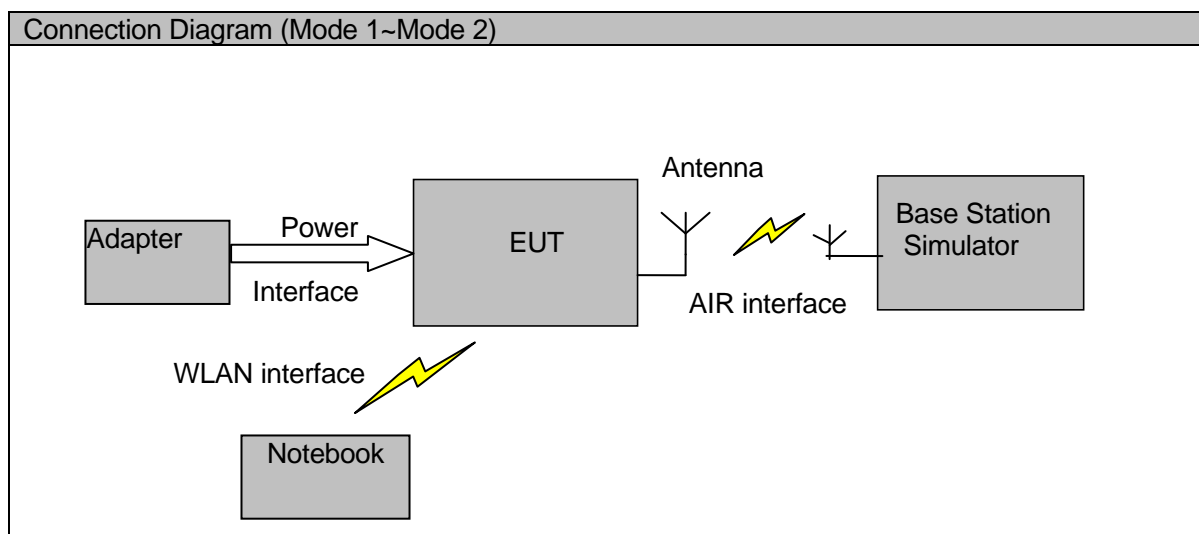
Traffic Mode:

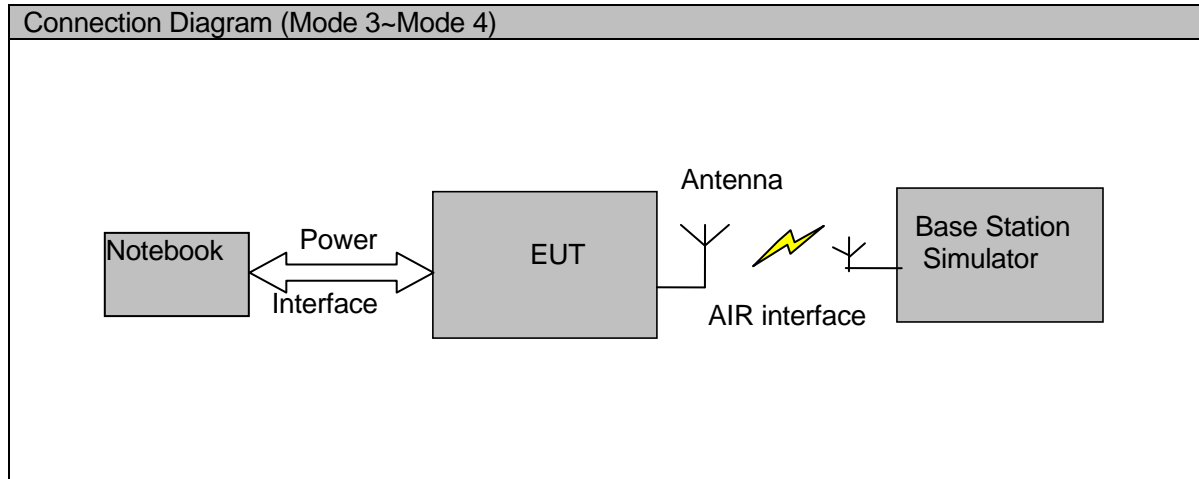
When the EUT state is switched on and with Radio Resource Control (RRC) connection established.

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	17cm	shielded

### 3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal. interval (month)
Radio Communication Tester	CMU200	R&S	3608082535	2013-5-16	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

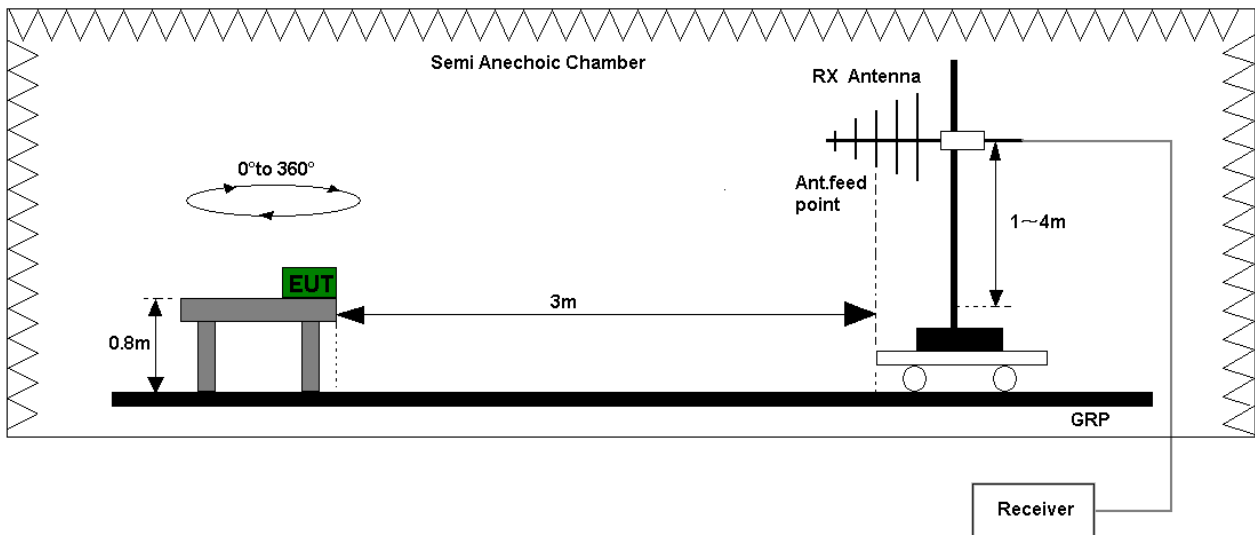


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

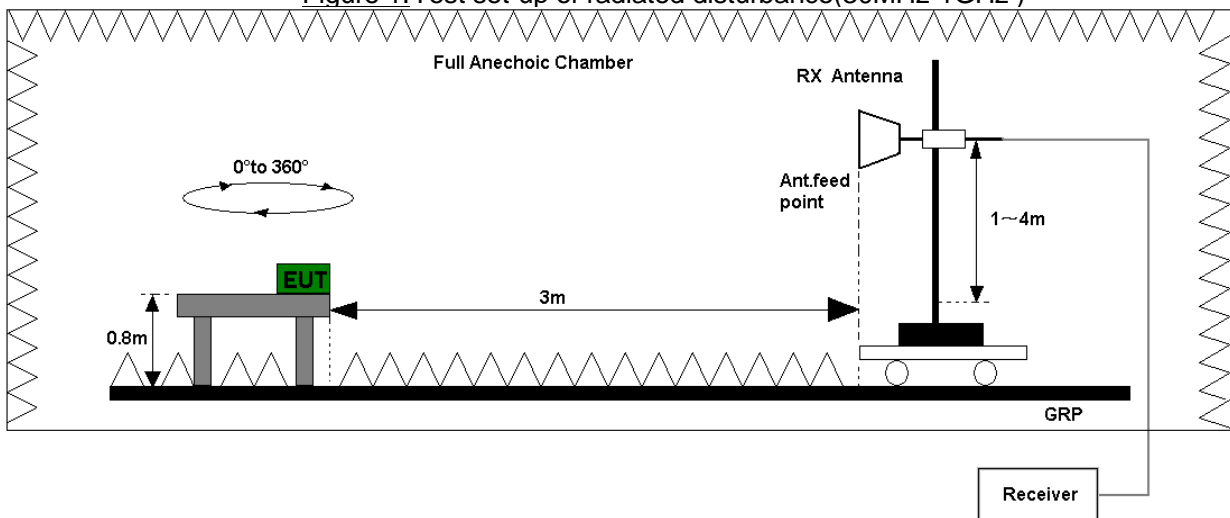


Figure 2. Test set-up of radiated disturbance(above 1GHz)

#### 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( $\mu$ V/m)		Unit(dB $\mu$ 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

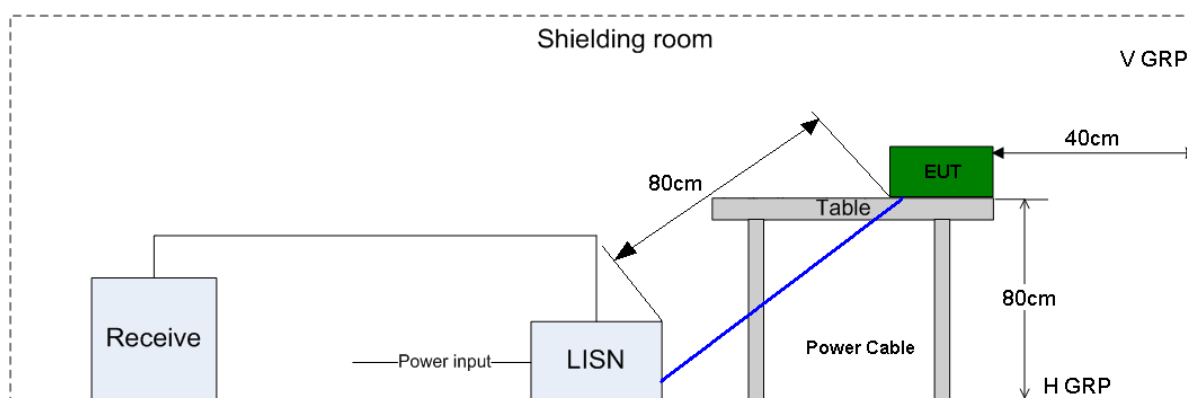


Figure 3. Test Set-up of conducted disturbance

### 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 (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/CE	EMI Test receiver	ESU26	100150	R&S	May.27, 2013	12
	EMI Test receiver	ESCI	101163	R&S	Jan.28, 2014	12
	Broadband Antenna	VULB 9163	9163-356	SCHWARZ BECK	May.27, 2014	24
	Horn Antenna	HF906	100683	R&S	May.15, 2013	24
	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		V8.52.0		

## 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:

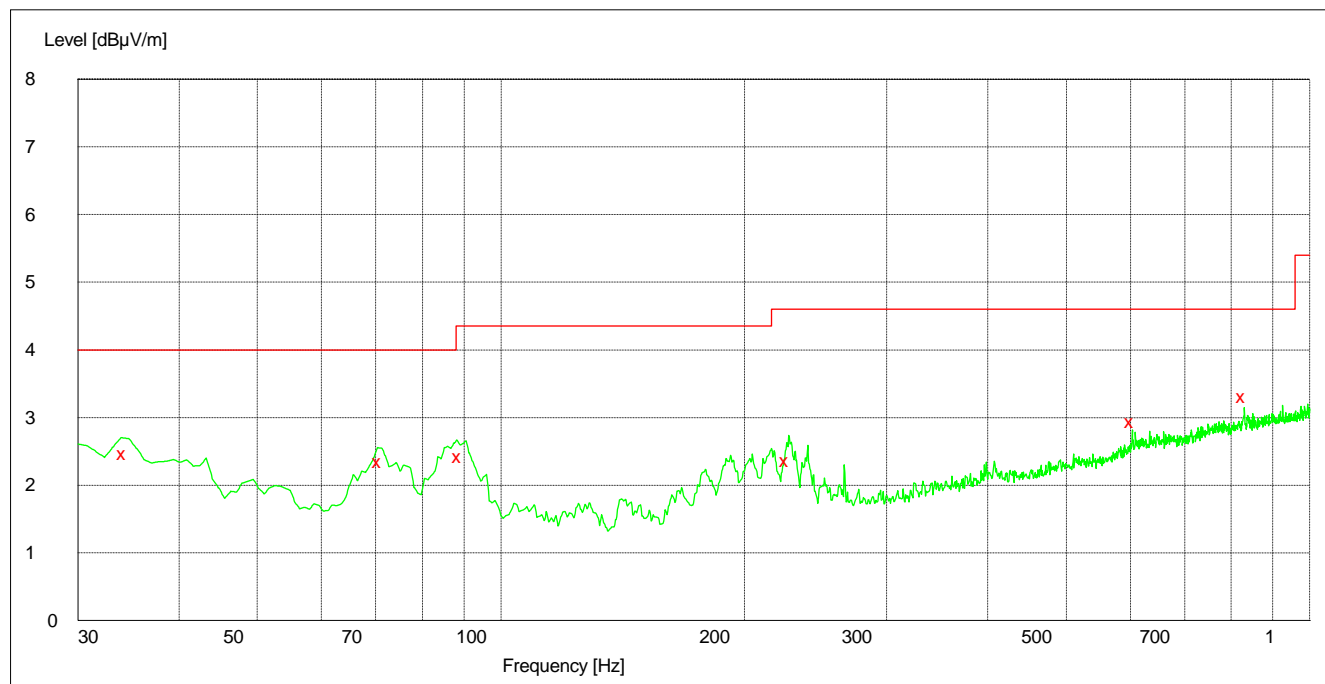
System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dB $\mu$ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB $\mu$ V/m)	U=5.1dB; k=2
CE	Disturbance Voltage (dB $\mu$ V)	U=2.6dB; k=2

## 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

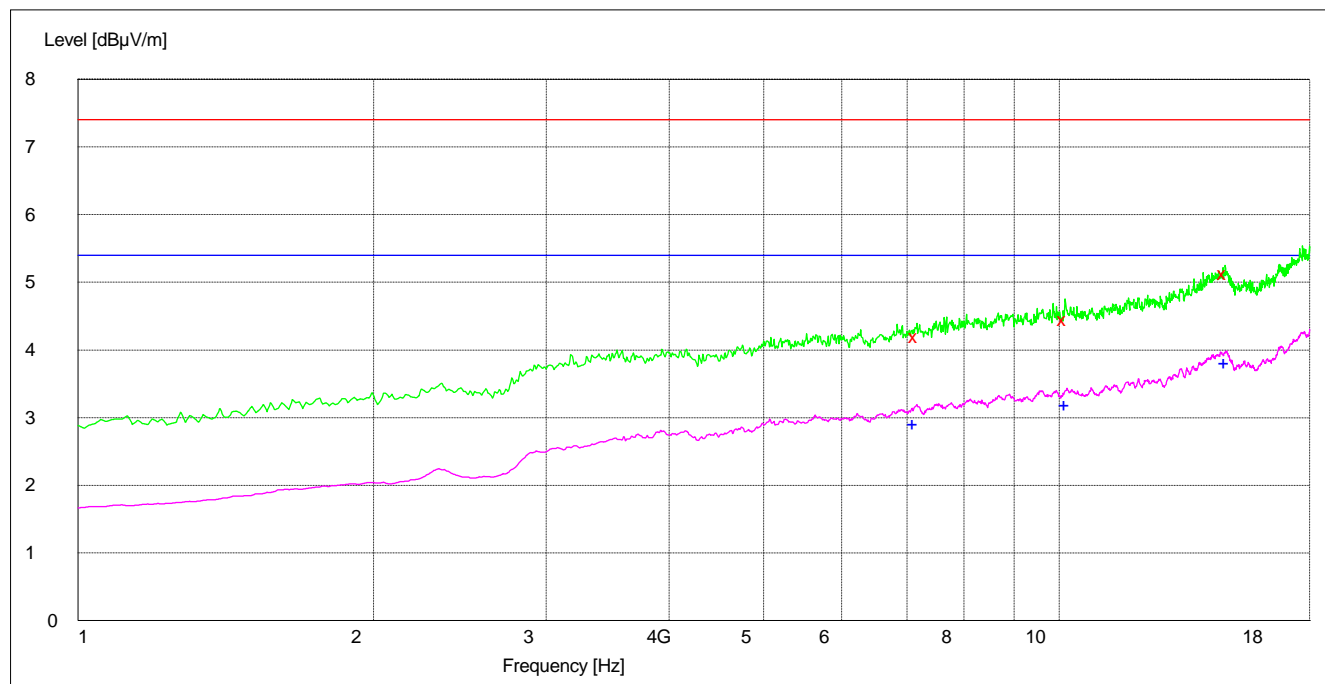
Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
34.260000	24.70	14.9	40.0	15.3	101.0	359.00	VERTICAL
70.920000	23.50	10.9	40.0	16.5	107.0	103.00	VERTICAL
89.100000	24.20	11.8	43.5	19.3	133.0	90.00	VERTICAL
226.140000	23.70	13.3	46.0	22.3	115.0	221.00	HORIZONTAL
603.960000	29.30	21.5	46.0	16.7	178.0	151.00	HORIZONTAL
829.320000	33.10	24.1	46.0	12.9	104.0	138.00	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
7153.300000	41.90	2.4	74.0	32.1	149.0	55.00	VERTICAL
10131.700000	44.50	6.6	74.0	29.5	139.0	112.00	VERTICAL
14759.200000	51.30	16.8	74.0	22.7	100.0	171.00	HORIZONTAL

### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
7128.600000	29.10	2.3	54.0	24.9	100.0	358.00	VERTICAL
10174.000000	31.90	6.6	54.0	22.1	144.0	182.00	HORIZONTAL
14796.500000	38.10	16.7	54.0	15.9	109.0	44.00	VERTICAL

Note:

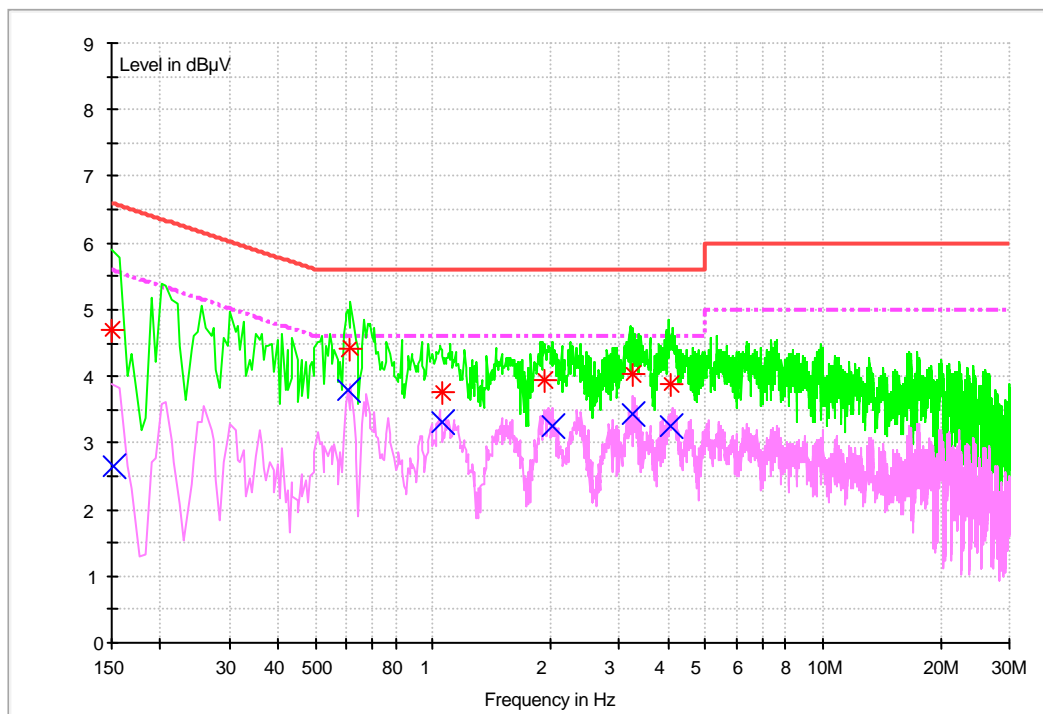
Level= Reading level+ Transducer (cable loss + correction factor)

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	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150889	46.8	9.7	66.0	19.2	N	FLO
0.608818	44.3	9.7	56.0	11.7	L1	FLO
1.052186	37.6	9.7	56.0	18.4	N	FLO
1.940944	39.5	9.7	56.0	16.5	L1	FLO
3.236329	40.3	9.7	56.0	15.7	L1	FLO
4.073655	38.8	9.8	56.0	17.2	L1	FLO

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.151806	26.6	9.7	55.9	29.3	N	FLO
0.608778	38.1	9.7	46.0	7.9	L1	FLO
1.050120	33.2	9.7	46.0	12.8	L1	FLO
2.015456	32.5	9.7	46.0	13.5	L1	FLO
3.264225	34.3	9.7	46.0	11.7	L1	FLO
4.051392	32.6	9.8	46.0	13.4	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.

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