



# EMC Test Report

**Product Name: Fixed Wireless Terminal**

**Model Number: F285/PCDF285DPC**

**Report No: SYBH(Z-EMC)078042013-2**

**FCC ID: QISF285**

**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.
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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.10, 2013

**Start Date of Test:** May.13, 2013

**End Date of Test:** May.17, 2013

**Test Result:** Pass

**Approved By  
(Lab Manager)**

2013-05-22  
Date

Dai Linjun  
Name

Signature

**Operator  
(Test Engineer)**

2013-05-22  
Date

Yue Meng  
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	Fixed Wireless Terminal
Model Number	F285/PCDF285DPC
Serials Number	V4V01A9332900150 V4V01A9340100137
Working Voltage	5Vdc
TX Frequency	CDMA BC0: 824MHz To 849MHz CDMA BC1: 1850MHz To 1910MHz CDMA BC10: 816MHz To 824MHz DECT: 2400MHz To 2483.5MHz
RX Frequency	CDMA BC0: 869MHz To 894MHz CDMA BC1: 1930MHz To 1990MHz CDMA BC10: 861MHz To 869MHz DECT: 2400MHz To 2483.5MHz
HW Version	WL1F285I
SW Version	V100R001
EUT Accessory	
Base Adapter	BRAND: HUAWEI Model:HW-050100U6W Input voltage: 100-240V~50/60Hz, 0.2A Output voltage: +5.0V $\overline{\text{---}}$ 1A SN: XQHD20531960 SN: HKACC1014799
Base Battery	BRAND: HUAWEI Model: HGB-15AAx3 Rated capacity: 1500mAh Nominal Voltage: $\overline{\text{---}}$ +3.6V SN: GRP13022022721 SN: HGY13010705173
Handset Adapter	BRAND: HUAWEI Model:HW-050055U1W Input voltage: 100-240V~50/60Hz, 0.2A Output voltage: +5.0V $\overline{\text{---}}$ 550mA SN: TPACB1662912 SN: HKACA2868731
Handset Battery	BRAND: HUAWEI Model: HNBAAA6-21 Rated capacity: 600mAh Nominal Voltage: $\overline{\text{---}}$ +2.4V SN: GRP13010801823 SN: HGY13010500166 SN: BYD13011702617

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
<u>Radiated Emissions</u> Enclosure Port	Mode2 Mode4	CLASS B	Pass	Site1
<u>Conducted Emissions</u> <input checked="" type="checkbox"/> DC Power Port <input checked="" type="checkbox"/> AC Power Port <input type="checkbox"/> Telecommunication Ports	Mode1 Mode3	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

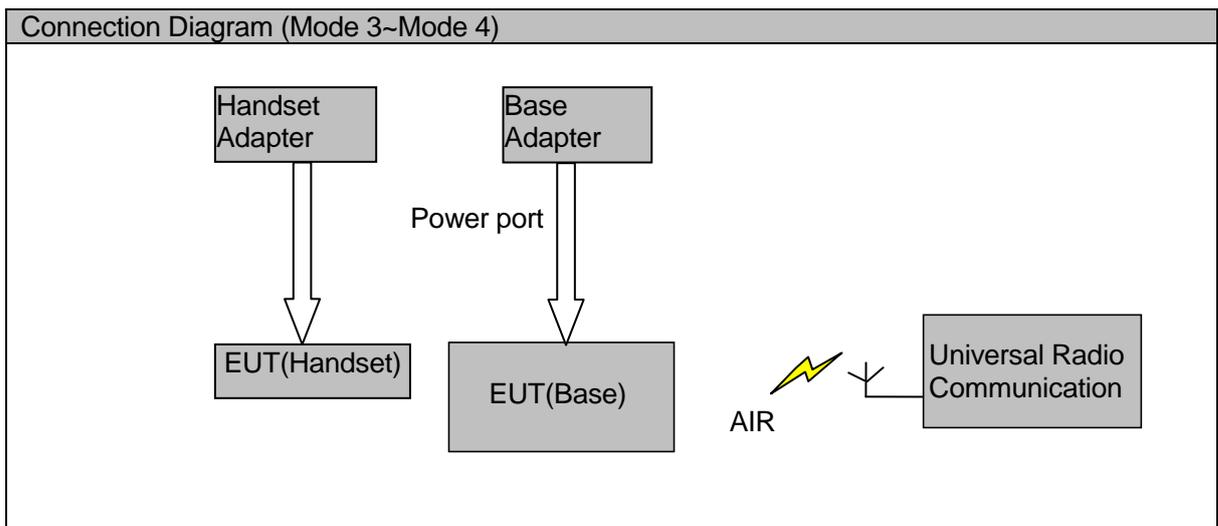
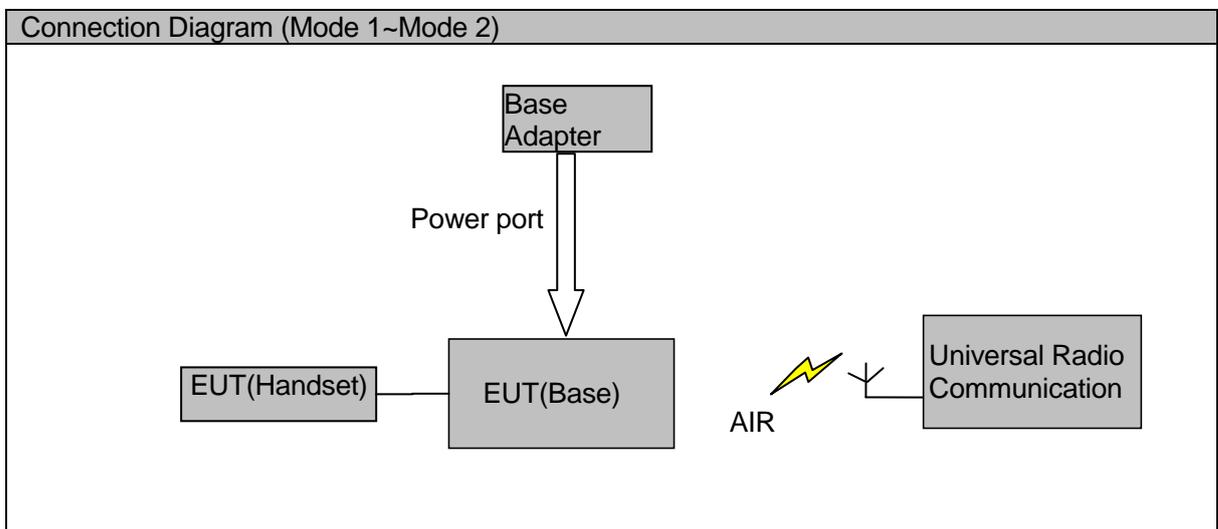
#### 3.1 Test Mode

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:	Base Adapter + Handset(on the Base) + Traffic Mode
Mode 2:	Base Adapter + Handset(on the Base) + Idle Mode
Mode 3:	Base Adapter + Handset(with handset adapter) + Traffic Mode
Mode 4:	Base Adapter + Handset(with handset adapter) + Idle 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.

#### 3.2 Test System Configuration



### 3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
DC Power Cable	1	<3m	unshielded

### 3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval (month)
Radio Communication Tester	CMU200	R&S	117385	2013-12-22	12

## 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

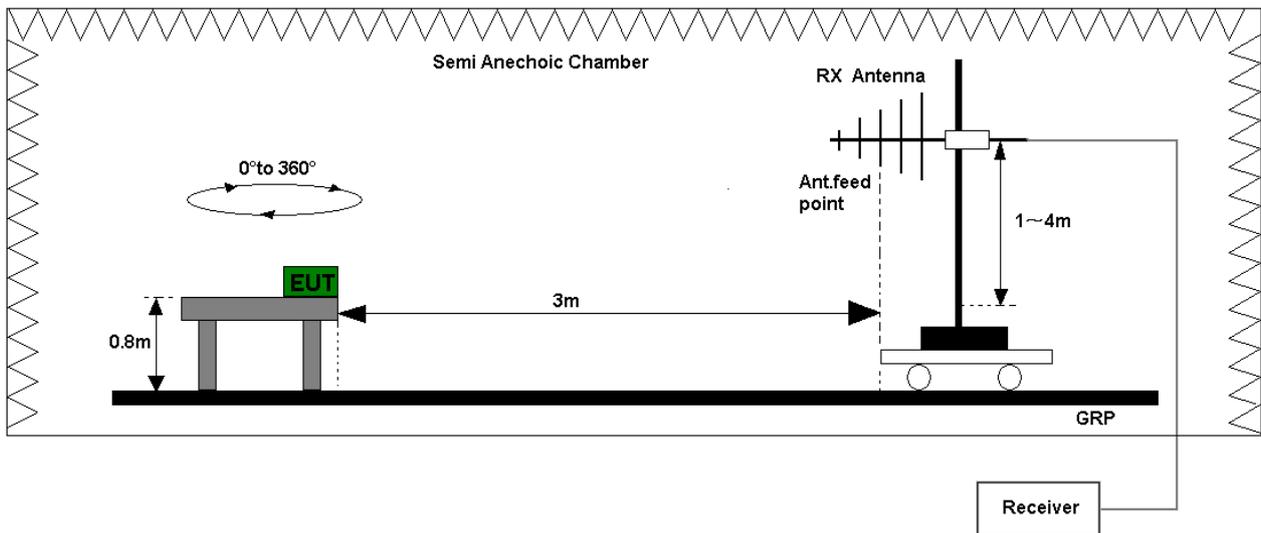


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

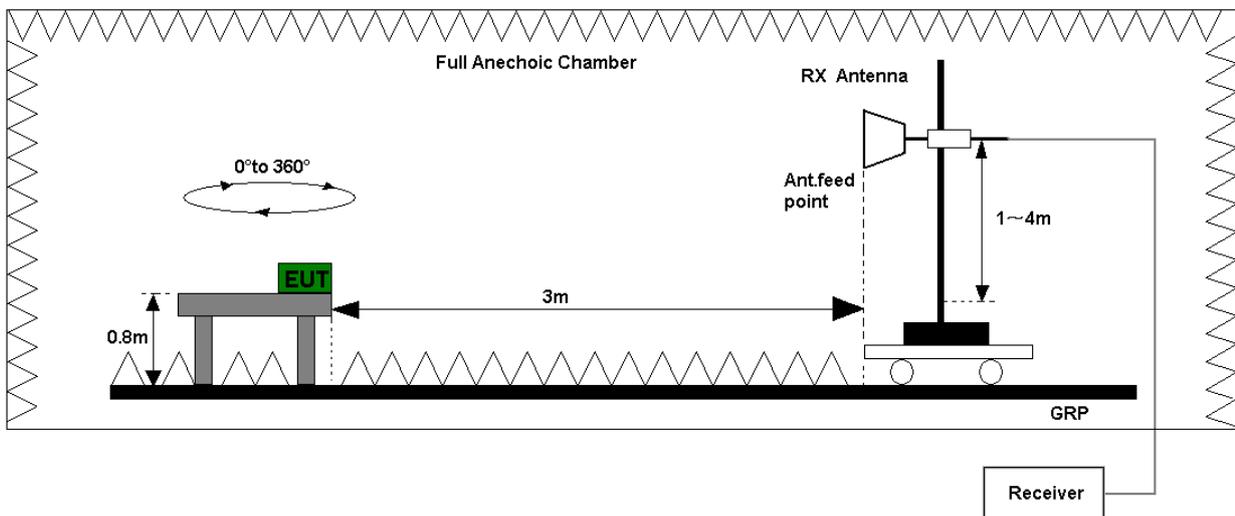


Figure 2. Test set-up of radiated disturbance(above 1GHz)

### 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 A)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit( $\mu$ V/m)		Unit(dB $\mu$ V/m)	
30-88	300		59	
88-216	500		54	
216-960	700		56.4	
Above 960	1000		60	
Above 1000	AV	PK	AV	PK
	1000	10000	60	80

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 setup in the shielded chamber and operated under nominal conditions.

### 4.2.2 Test Setup

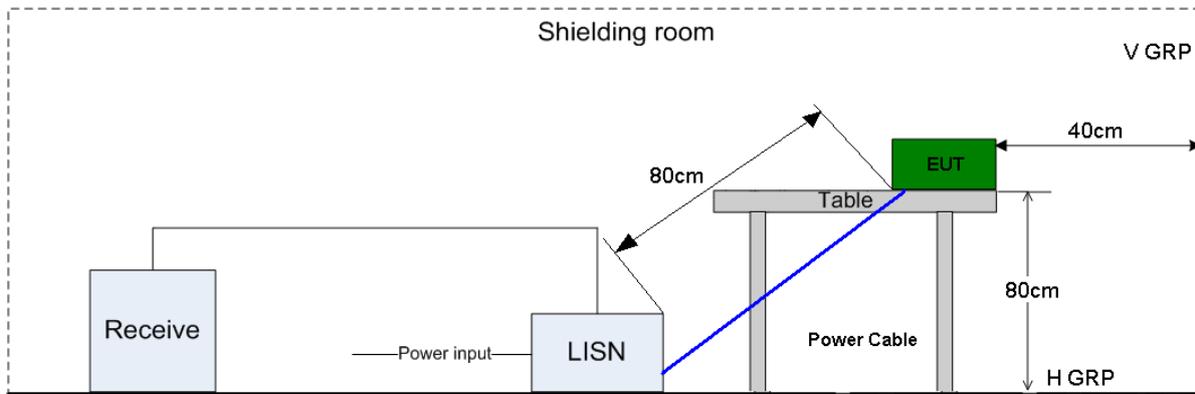


Figure 3. Test Set-up of conducted disturbance

### 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 (dB $\mu$ V)	AV (dB $\mu$ 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	EMI Test receiver	ESU26	100387	R&S	Nov.08, 2013	12
	Broadband Antenna	VULB 9163	9163-356	SCHWARZBECK	May.27, 2014	24
	Double Ridged Horn Antenna	HF907	100683	R&S	Feb.01, 2015	24
CE	EMI Test receiver	ESCI	101163	R&S	Jan.28, 2014	12
	Line Impedance Stabilization Network	ENV216	100382	R&S	Jan.28, 2014	12
Software Information						
Test Item	Software Name		Manufacturer		Version	
RE	ES-K1		R&S		V1.7.1	
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:

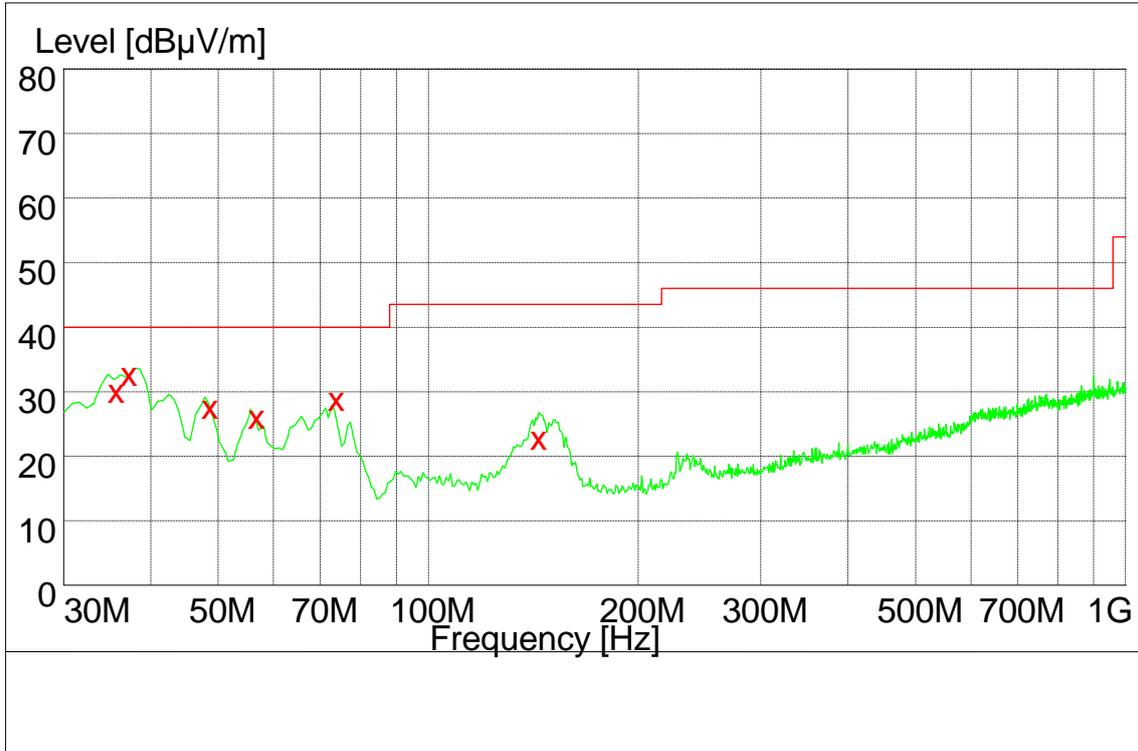
System Measurement Uncertainty		
	Items	Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dB $\mu$ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB $\mu$ V/m)	U=5.0dB; k=2
CE	Disturbance Voltage (dB $\mu$ V)	U=2.6dB; k=2

## 7 Test Data and Graph

Only the worst test results were shown

### 7.1 Radiated Disturbance

#### 7.1.1 30MHz~1GHz



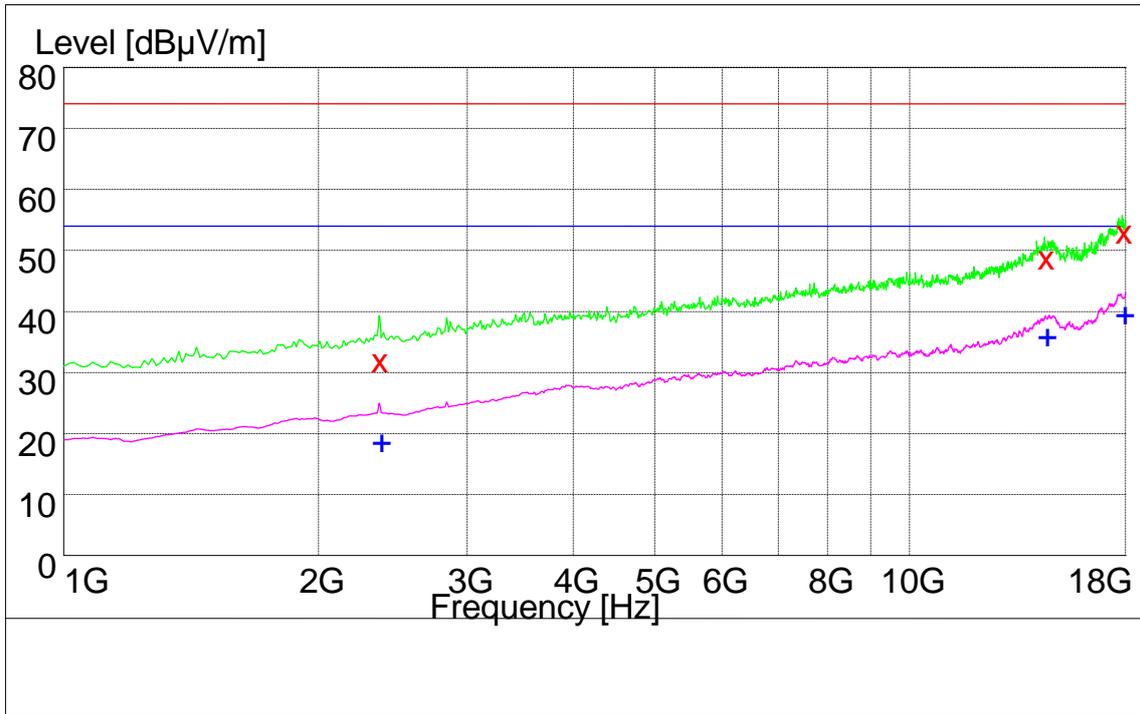
#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
35.520000	31.60	15.1	40.0	8.4	100.0	321.00	VERTICAL
37.020000	34.30	15.2	40.0	5.7	100.0	193.00	VERTICAL
48.360000	29.20	15.1	40.0	10.8	100.0	33.00	VERTICAL
56.460000	27.50	14.2	40.0	12.5	100.0	41.00	VERTICAL
73.440000	30.40	10.7	40.0	9.6	100.0	314.00	VERTICAL
143.220000	24.30	9.9	43.5	19.2	100.0	359.00	VERTICAL

Note:

Level = Reading level by receiver + Transducer (Antenna factor + cable loss – preamplifier gain)  
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
2356.000000	33.60	-9.5	74.0	40.4	150.0	240.00	VERTICAL
14429.800000	50.40	16.6	74.0	23.6	100.0	86.00	HORIZONTAL
17832.300000	54.70	21.3	74.0	19.3	117.0	315.00	VERTICAL

#### MEASUREMENT RESULT: AV Detector

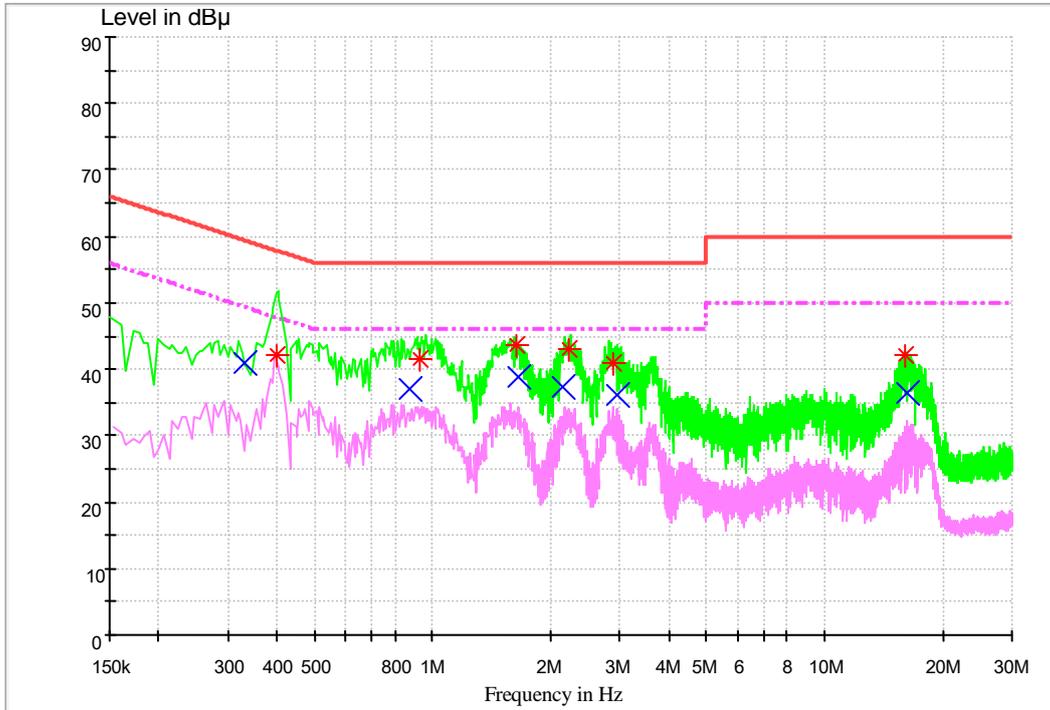
Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
2359.500000	20.40	-9.5	54.0	33.6	128.0	335.00	VERTICAL
14429.800000	37.70	16.6	54.0	16.3	117.0	214.00	VERTICAL
17830.300000	41.40	21.3	54.0	12.6	150.0	256.00	HORIZONTAL

Note:

Level = Reading level by receiver + Transducer (Antenna factor + cable loss – preamplifier gain)  
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	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.401722	42.2	9.7	57.8	15.6	N	FLO
0.928924	41.6	9.7	56	14.4	N	FLO
1.631374	43.6	9.7	56	12.4	N	FLO
2.213565	42.9	9.7	56	13.1	N	FLO
2.879884	41	9.7	56	15	N	FLO
16.019876	42.1	10.1	60	17.9	N	FLO

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.330674	41	9.7	49.4	8.4	N	FLO
0.86934	37.1	9.7	46	8.9	N	FLO
1.645076	38.7	9.7	46	7.3	N	FLO
2.143932	37.3	9.7	46	8.7	N	FLO
2.946672	36.2	9.7	46	9.8	N	FLO
16.187614	36.3	10.1	50	13.7	N	FLO

Note:

Level = Reading level by receiver + Transducer (LISN factor + cable loss)



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

-----**END**-----