



EMC Test Report

Product Name: Fixed Wireless Gateway

Model Number: F256-B,F256-BVW

Report No: SYBH(Z-EMC)073022014-2

FCC ID: QISF256-BVW

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 Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Date of Receipt Test Item: Feb.24, 2014
Start Date of Test: Feb.24, 2014
End Date of Test: Feb.27, 2014
Test Result: Pass

Approved By
(Lab Manager)

2014-02-27
Date

Liu Chunlin
Name

Signature

Operator
(Test Engineer)

2014-02-27
Date

Yue Meng
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	Fixed Wireless Gateway
Model Number	F256-B,F256-BVW
Serials Number	H5F6R14114990520
Working Voltage	12Vdc
TX Frequency	CDMA BC0: 824MHz To 849MHz CDMA BC1: 1850MHz To 1910MHz
RX Frequency	CDMA BC0: 869MHz To 894MHz CDMA BC1: 1930MHz To 1990MHz
HW Version	WL1F256BI
SW Version	V100R001
EUT Accessory	
Adapter	BRAND: HUAWEI Model: CNR2260 Input voltage: 100V-240V~50/60 Hz,0.25A Output voltage: 12.0V  500mA S/N: TPIC312021672
Battery	BRAND: HUAWEI Model: HGB-15AA10x3 Rated capacity: 1500mAh Nominal Voltage:  +3.6V Charging Voltage:  +4.2V S/N: HGY11051411997

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 15:2013, 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	CLASS B	Pass	Site1
<u>Conducted Emissions</u> ☒ DC Power Port ☒ AC Power Port ☐ Telecommunication Ports	Mode1	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	25% ~ 75%
Atmospheric pressure	86kPa ~ 106kPa

3 System Configuration during EMC Test

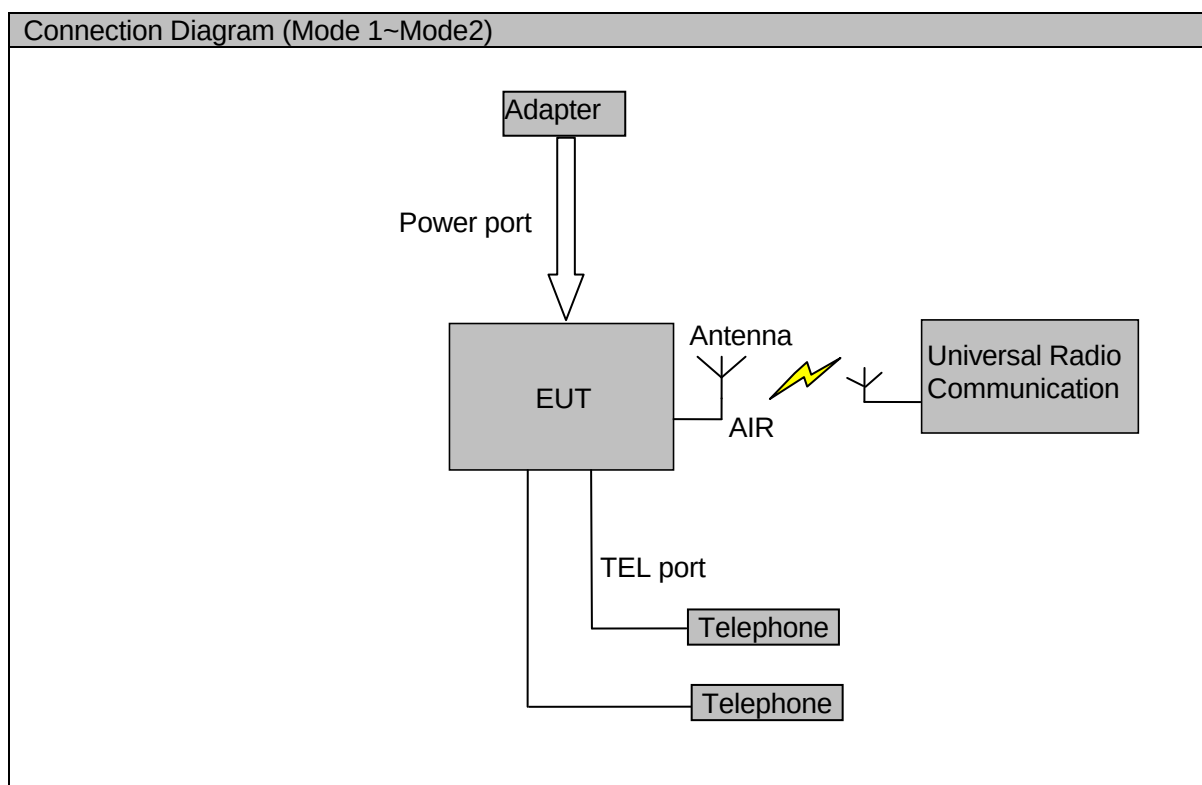
3.1 Test Mode

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:	Adapter + wireless service TRAFFIC mode
Mode 2:	Adapter + wireless service 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
Telephone Cable	2	<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	117057	2014-10-28	12
Telephone	HCD868(37)TSD	TCL	010Y0B20L70913402225	/	/
Telephone	HCD8188TSDL-868	HUAWEI	117041000919	/	/

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

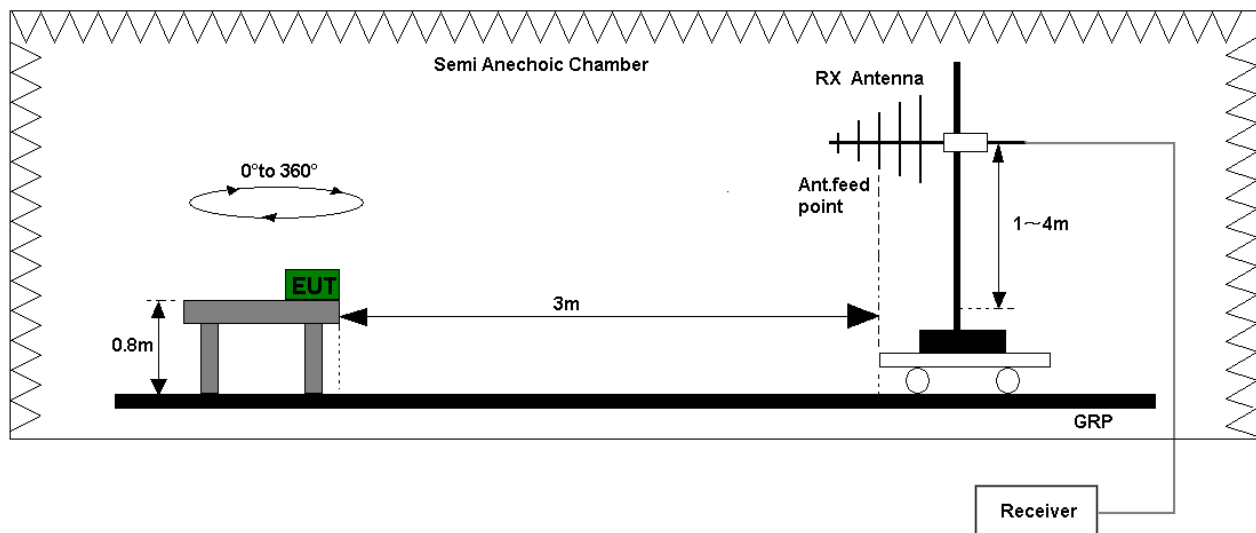


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

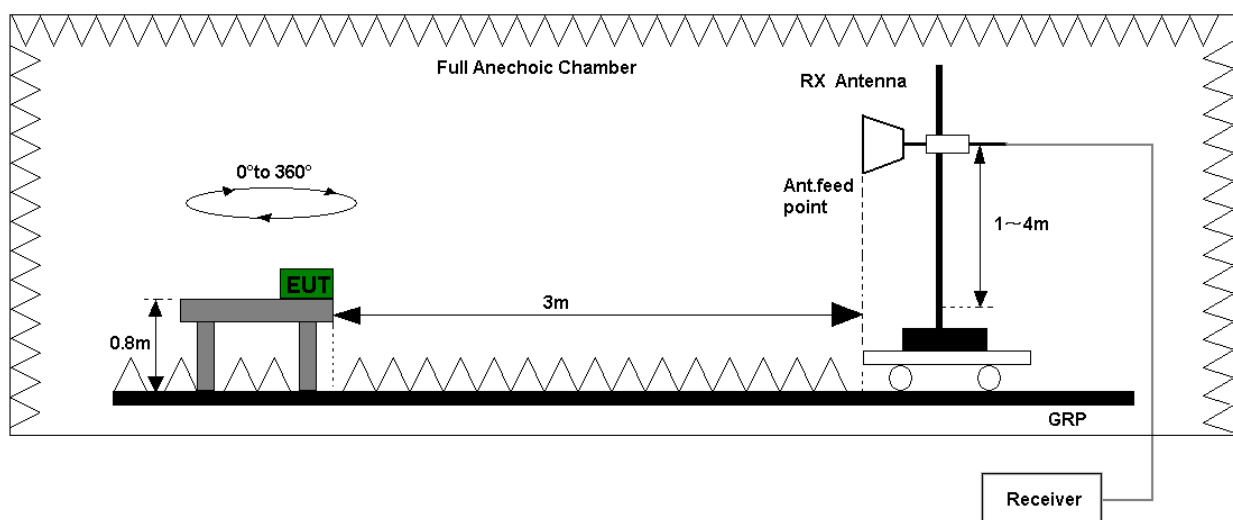


Figure 2. Test set-up of radiated disturbance(above 1GHz)



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 setup in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

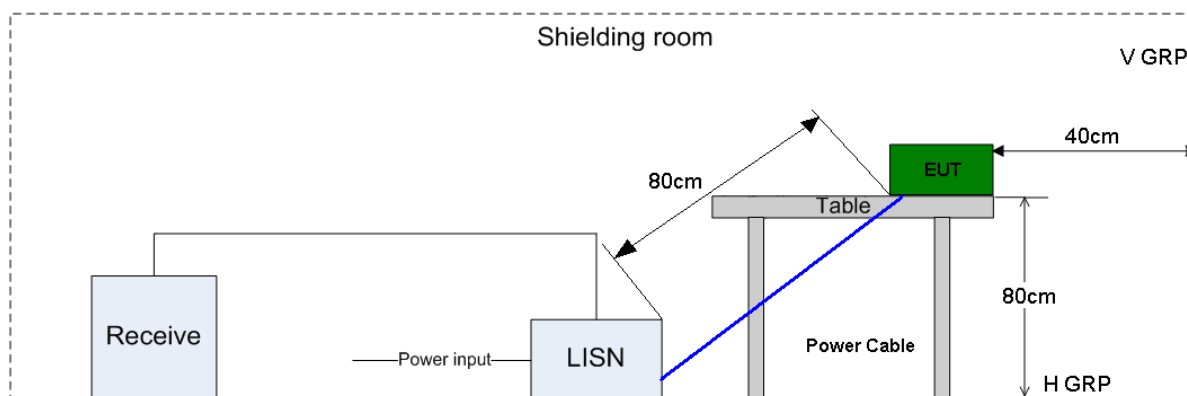


Figure 3. Test Set-up of conducted disturbance

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 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	EMI Test receiver	ESU26	100150	R&S	May.14, 2014	12
	Broadband Antenna	VULB 9163	9163-356	SCHWARZBECK	May.27, 2014	24
	Double Ridged Horn Antenna	HF906	100683	R&S	Feb.01, 2015	24
CE	EMI Test receiver	ESCI	101163	R&S	Dec.23, 2014	12
	Line Impedance Stabilization Network	ENV216	100382	R&S	Dec.23, 2014	12
	Line Impedance Stabilization Network	ENV4200	100134	R&S	Dec.23, 2014	12
Software Information						
Test Item	Software Name		Manufacturer		Version	
RE	ES-K1		R&S		V1.7.1	
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:

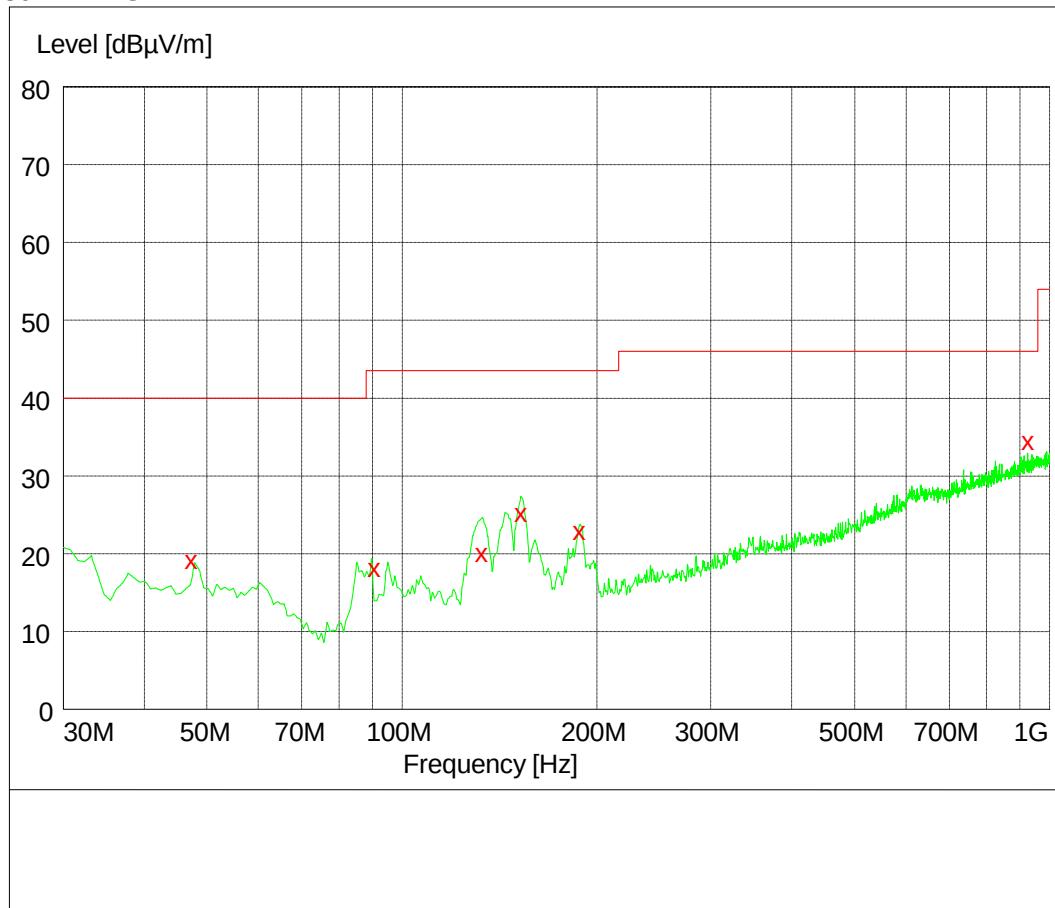
System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dBμV/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dBμV/m)	U=5.0dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.6dB; k=2

7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz



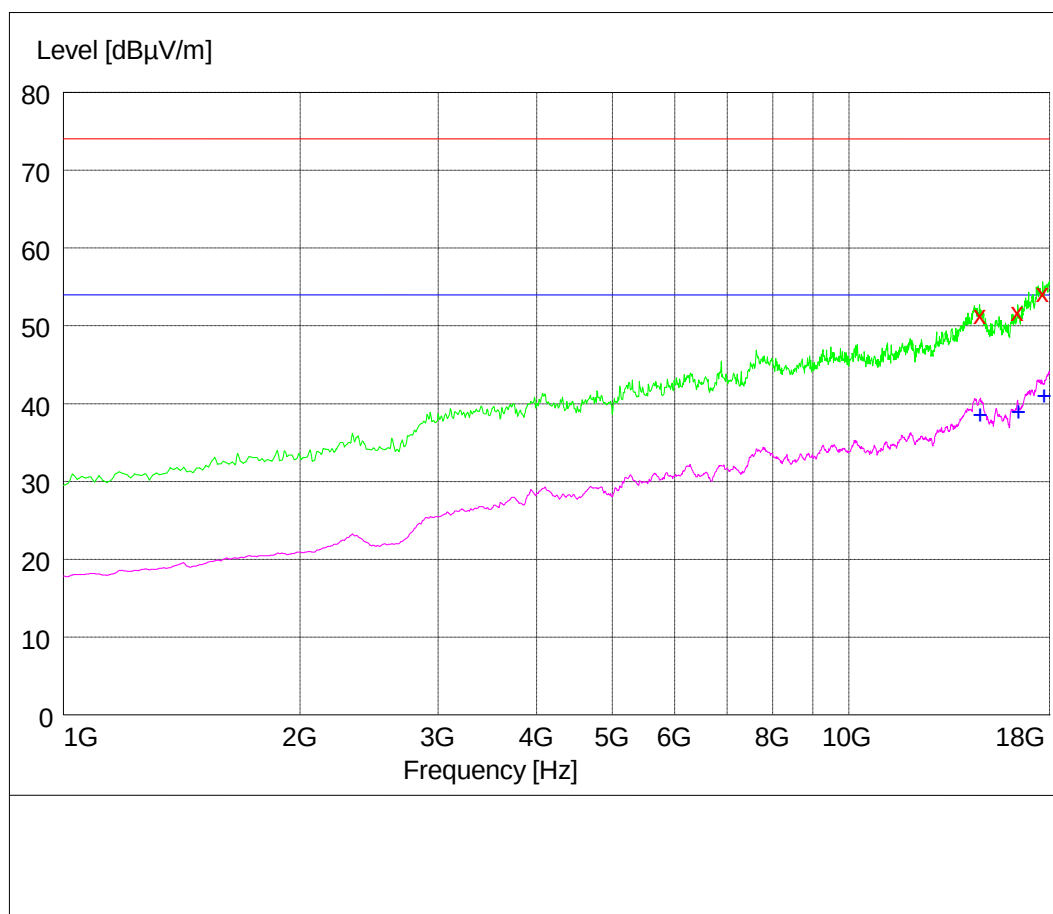
MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
47.220000	19.60	13.0	40.0	20.4	100.0	73.00	VERTICAL
90.480000	18.50	11.9	43.5	25.0	100.0	78.00	VERTICAL
132.660000	20.40	9.2	43.5	23.1	100.0	291.00	VERTICAL
152.520000	25.60	9.2	43.5	17.9	100.0	0.00	VERTICAL
187.680000	23.30	11.7	43.5	20.2	100.0	178.00	VERTICAL
926.160000	34.80	26.5	46.0	11.2	151.0	57.00	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	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
14663.500000	51.70	16.5	74.0	22.3	100.0	279.00	VERTICAL
16384.800000	52.20	17.7	74.0	21.8	100.0	346.00	VERTICAL
17631.400000	54.60	20.6	74.0	19.4	100.0	170.00	VERTICAL

MEASUREMENT RESULT: AV Detector

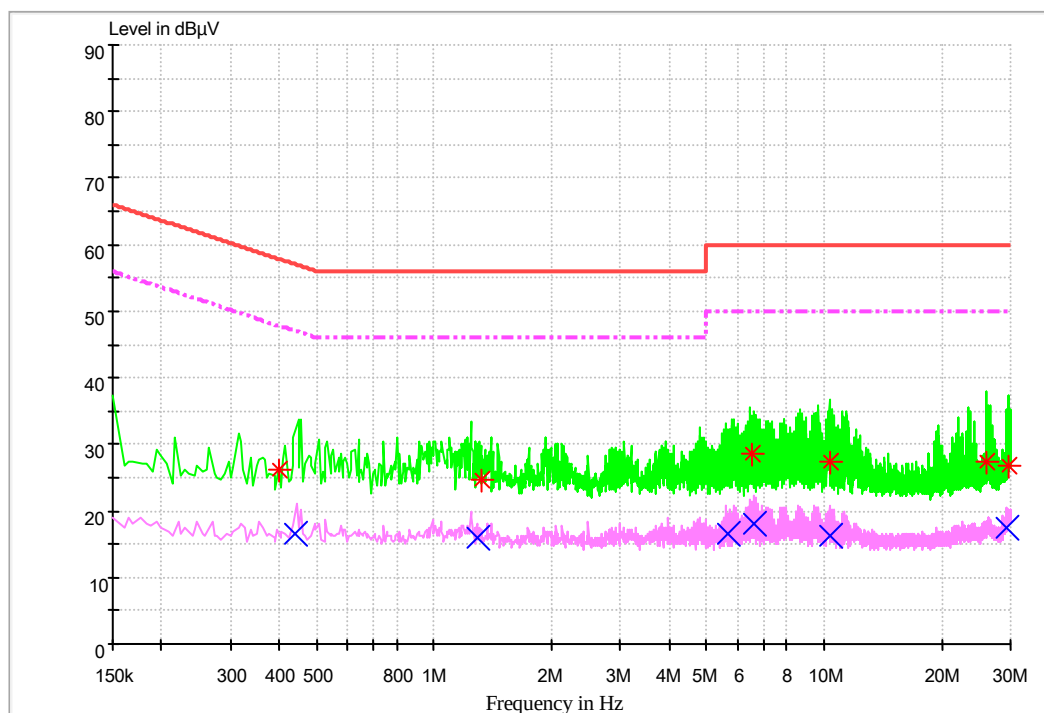
Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
14643.500000	38.90	16.4	54.0	15.1	100.0	103.00	VERTICAL
16390.800000	39.20	17.8	54.0	14.8	100.0	346.00	VERTICAL
17665.900000	41.40	20.9	54.0	12.6	100.0	60.00	VERTICAL

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.

7.2 Conducted Disturbance

7.2.1 AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV	Line	Transducer dB	Margin dB	Limit dBμV	PE
0.401452	26.1	L1	9.7	31.7	57.8	FLO
1.319535	24.8	N	9.7	31.2	56	FLO
6.48984	28.6	N	9.8	31.4	60	FLO
10.310081	27.4	N	9.9	32.6	60	FLO
26.175862	27.4	L1	10.2	33.6	60	FLO
29.53515	26.8	L1	10.3	33.2	60	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Line	Transducer dB	Margin dB	Limit dBμV	PE
0.438852	16.6	N	9.7	30.5	47.1	FLO
1.286932	15.9	N	9.7	30.1	46	FLO
5.659354	16.5	N	9.8	33.5	50	FLO
6.629333	17.9	N	9.8	32.1	50	FLO
10.302228	16.3	N	9.9	33.7	50	FLO
29.262972	17.3	N	10.4	32.7	50	FLO

Note:

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

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

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