



EMC Test Report

Product Name: Fixed Wireless Terminal

Model Number: F258, H258C

Report No: SYBH(Z-EMC)109012015-2

FCC ID: QISF256-BVW

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.
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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 03, 2015

Start Date of Test: Feb 03, 2015

End Date of Test: Feb 09, 2015

Test Result: Pass

Approved By (Lab Manager)	<u>2015-02-02</u>	Liu Chunlin	
	Date	Name	Signature
Prepared by (Test Engineer)	<u>2015-02-09</u>	Li Zonghai	
	Date	Name	Signature



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1 General Information

1.1 EUT Description

EUT Description	
Product Name	Fixed Wireless Terminal
Model Number	F258, H258C
Input voltage	DC 12.0V
S/N	FXD0115115000090
HW Version	WL1F256BI
SW Version	V100R001
TX Frequency	CDMA BC0: 824MHz to 829MHz CDMA BC1: 1850MHz to 1910MHz
RX Frequency	CDMA BC0: 869MHz to 894MHz CDMA BC1: 1930MHz to 1990MHz
EUT Accessory	
Adapter	BRAND: HUAWEI Model: HW-120050U1W Input: 100-240V~50/60Hz, 0.5A Output: 12.0V  0.5A SN: HKAEB3002909 SN: XQHEC0904031
Battery	BRAND: HUAWEI Battery Model: HGB-15AAx3 Rated capacity: 1500mAh Nominal Voltage:  3.6V Charging Voltage:  4.2V SN: GRP14111002000
Battery	BRAND: HUAWEI Battery Model: HGB-15AAx3 Rated capacity: 1500mAh Nominal Voltage:  3.6V Charging Voltage:  4.2V SN: HGY14111103126

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:	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	Mode1	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 Mode2	CLASS B	Pass	Site1
Note: Measurement taken is within the uncertainty of test system.				

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

Huawei has verified the construction and function in typical operation. All the test modes were carried out with the EUT under normal operation, which were shown in this test report and defined as below:

Test Mode	
Mode 1:	Adapter +USB + wireless service TRAFFIC mode
Mode 2:	Adapter +USB + 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.

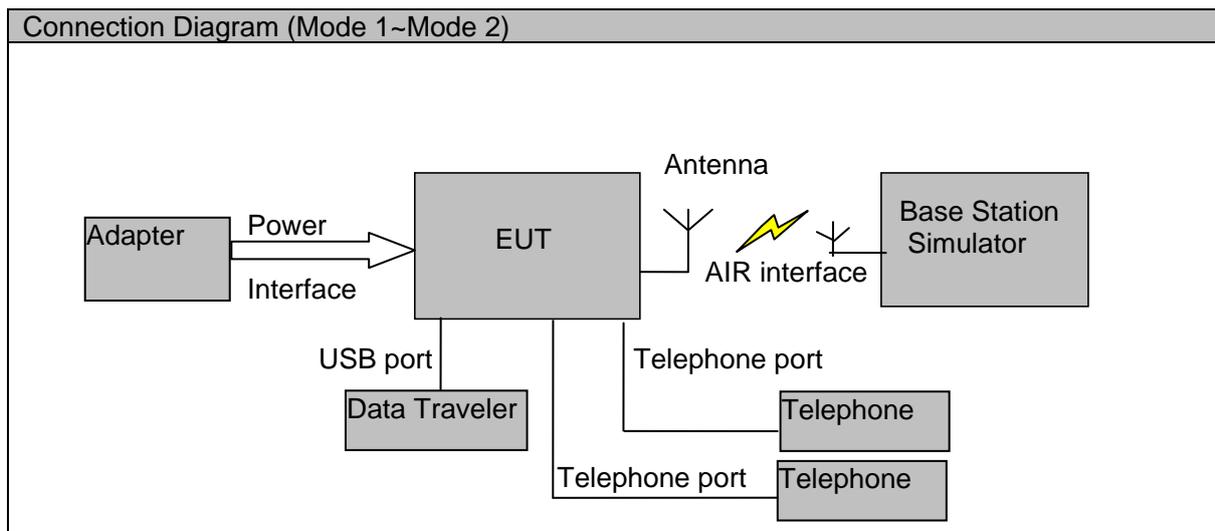
Traffic Mode:

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
Telephone Cable	2	3m	unshielded

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

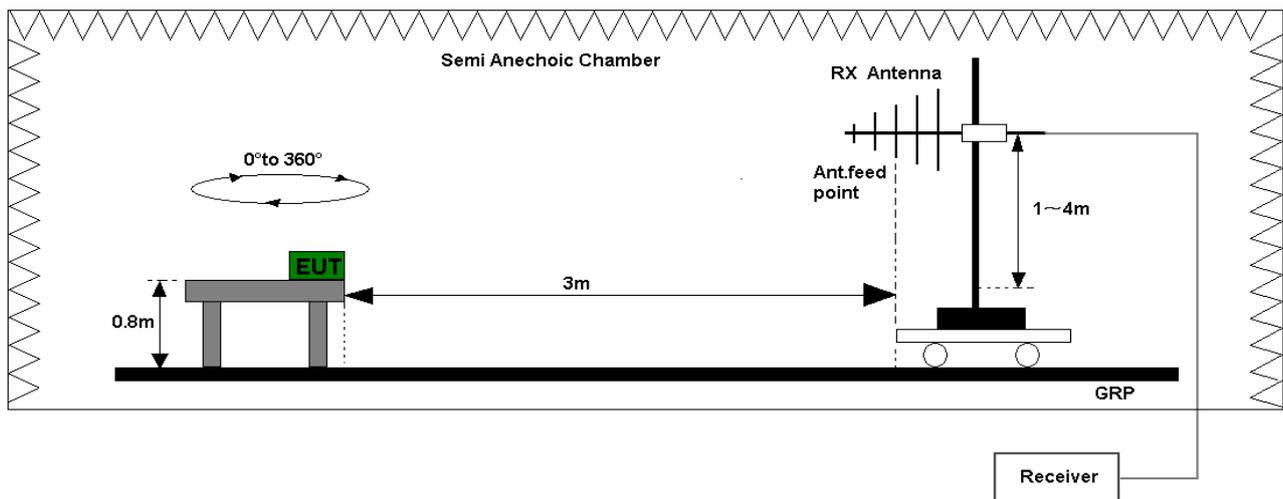


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

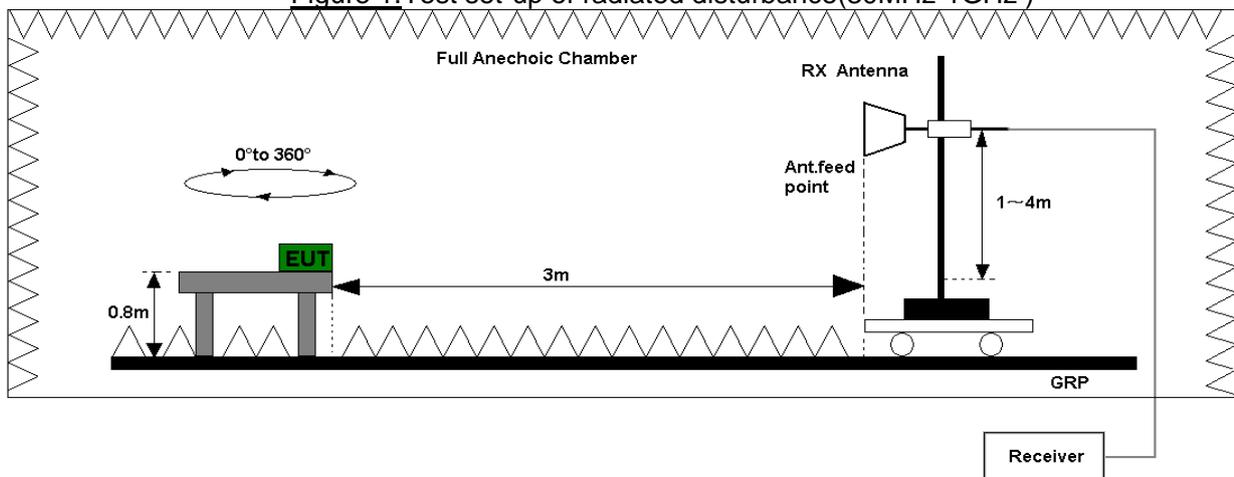


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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 main cable of the EUT being measured shall be connected to LISN. The LISN shall be placed 0.8m away from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All the other units of the EUT and associated equipment shall be at least 0.8m away from the LISN.

All telecommunication and signal ports must be correctly terminated using either appropriate associated equipment or a representative termination during the measurement of the conducted disturbances at the mains.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of the same length as the main cable and run parallel to the mains connection at a separation distance of not more than 0.1m.

The setup of Conducted Disturbance for telecommunication port is according to Annex C of EN 55022/CISPR 22.

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

The EUT is setup in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

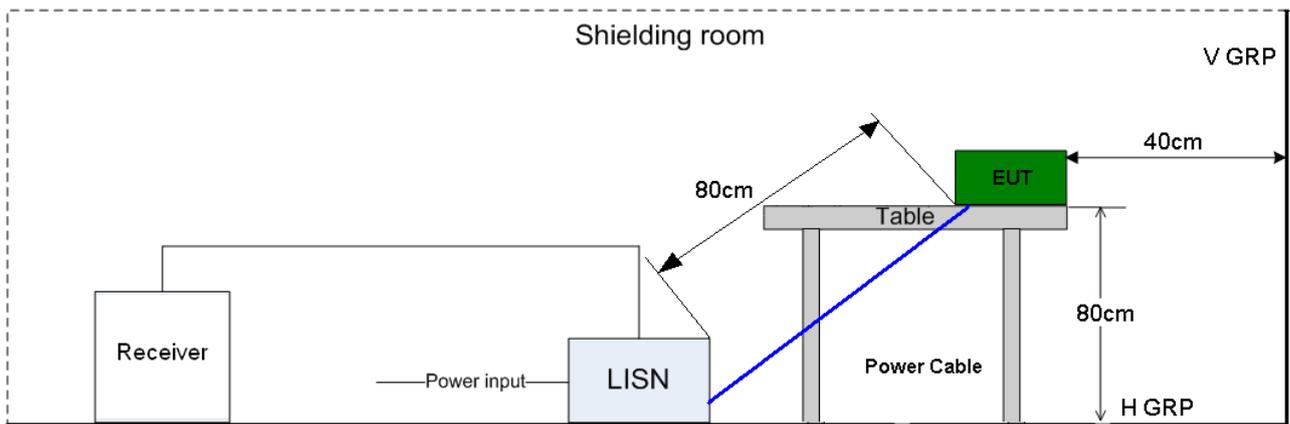


Figure 1. Test set-up of conducted disturbance for power port

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance.

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	AV
0.15MHz~0.5MHz	66-56dB μ V	56-46 dB μ V
0.5MHz-5MHz	56dB μ V	46 dB μ V
5MHz~30MHz	60dB μ V	50 dB μ V



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	May 08, 2015	12
	Broadband Antenna	VULB 9163	9163-520	SCHWAR ZBECK	Dec.20, 2015	24
	Horn Antenna	HF907	100365	R&S	Dec.20, 2015	24
CE	Artificial Mains Network	ENV216	100382	R&S	Nov.03, 2015	12
	EMI Test receiver	ESCI	101163	R&S	Nov.03, 2015	12
	Artificial Mains Network	ENV4200	100134	R&S	Nov.03, 2015	12
	Impedance Stabilization Network	ISN T400A	24867	TESEQ	Nov.03, 2015	12
Software Information						
Test Item	Software Name		Manufacturer		Version	
RE	EMC 32		R&S		V8.40.0	
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:

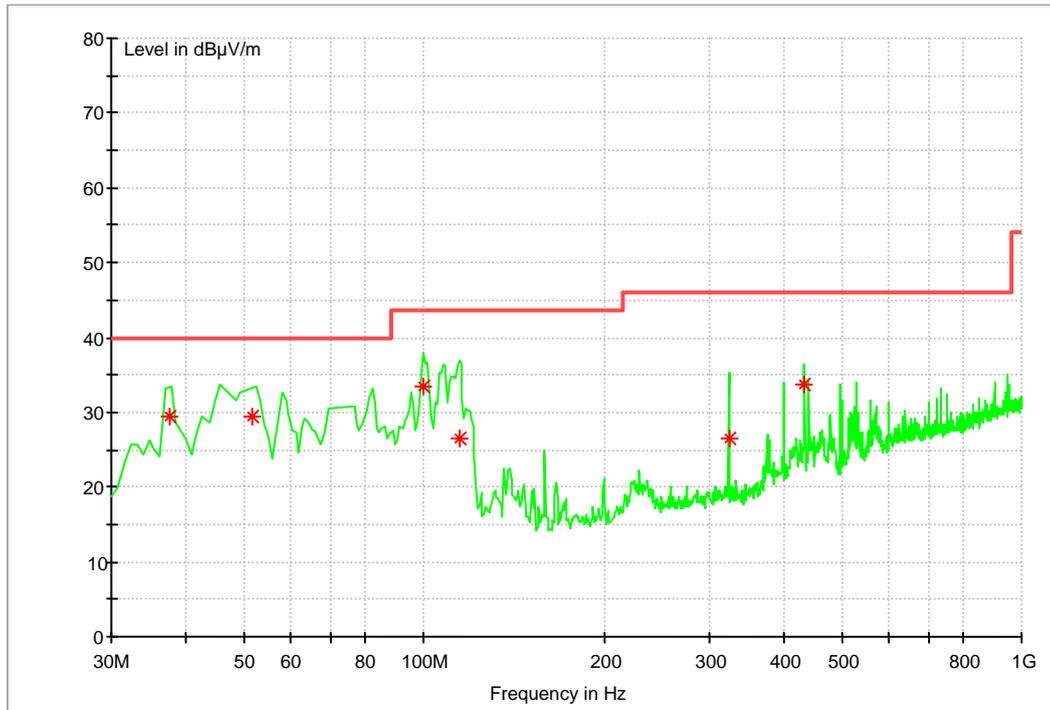
System Measurement Uncertainty		
	Items	Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dB μ V/m)	U=4.2dB; k=2
RE(1GHz-18GHz)	Field strength (dB μ V/m)	U=5.3dB; k=2
CE	Disturbance Voltage (dB μ V)	U=2.6dB; k=2

7 Test Data and Graph

Only the worst test result was shown in this report.

7.1 Radiated Disturbance

30MHz~1GHz



MEASUREMENT RESULT: QP Detector

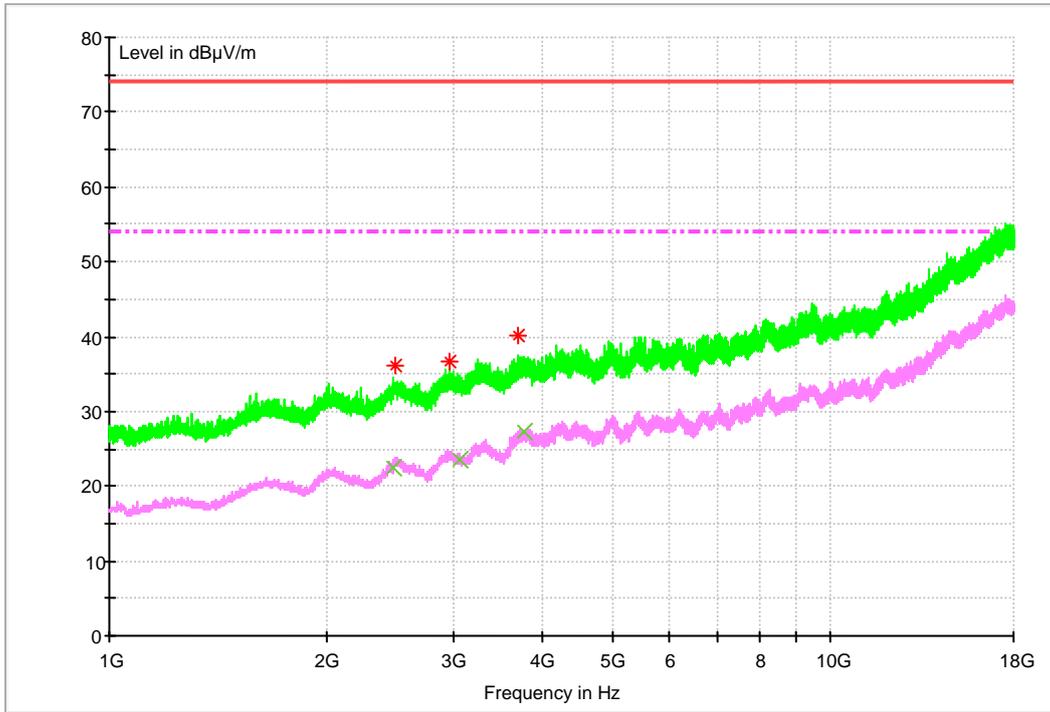
Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
37.543040	29.5	14.9	40.0	10.5	100.0	202.0	HORIZONTAL
51.818560	29.6	15.1	40.0	10.4	130.0	202.0	HORIZONTAL
99.991680	33.4	13.6	43.5	10.1	114.0	61.0	VERTICAL
114.810560	26.5	12.5	43.5	17.0	140.0	233.0	VERTICAL
324.326720	26.5	16.2	46.0	31.5	100.0	212.0	HORIZONTAL
433.306880	33.8	18.6	46.0	12.2	119.0	0.0	HORIZONTAL

Note:

Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

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

1GHz~18GHz



MEASUREMENT RESULT: PK Detector

Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarization
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
5001.244000	36.1	-7.8	74.0	37.9	100.0	283.0	VERTICAL
7499.974000	36.7	-6.0	74.0	37.3	113.0	348.0	VERTICAL
10000.054667	40.2	-3.1	74.0	33.8	114.0	168.0	VERTICAL

MEASUREMENT RESULT: AV Detector

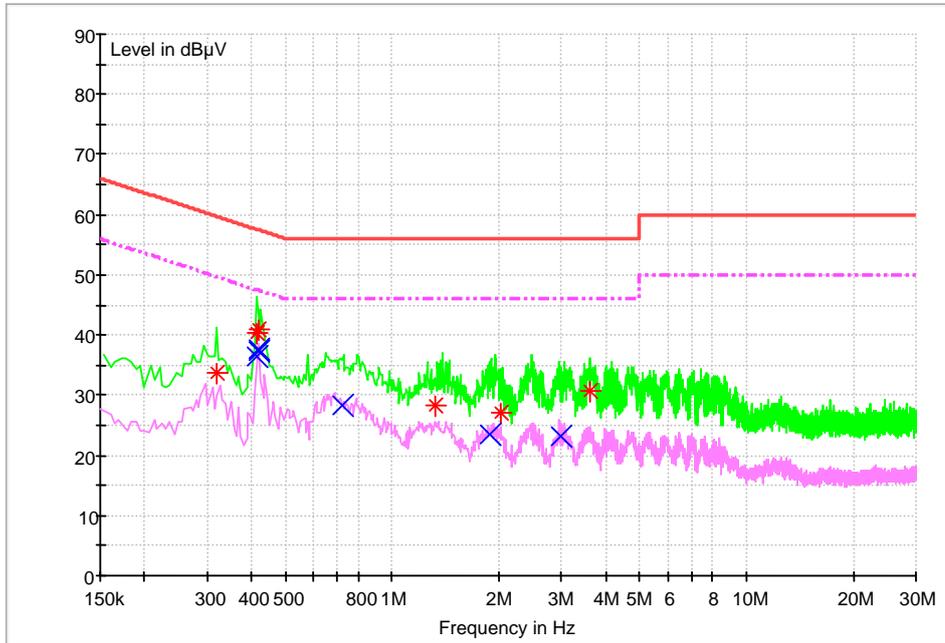
Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarization
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
2479.528666	22.4	-7.8	54.0	31.6	100.0	117.0	HORIZONTAL
3056.367334	23.5	-5.1	54.0	30.5	100.0	0.0	HORIZONTAL
3758.757333	27.2	-2.9	54.0	26.8	100.0	268.0	HORIZONTAL

Note:

Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

7.2 Conducted Disturbance

AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.318941	33.7	9.7	59.7	26.0	L1	FLO
0.417134	40.4	9.7	57.5	17.1	L1	FLO
0.417552	40.9	9.7	57.5	16.6	L1	FLO
1.317698	28.4	9.7	56.0	27.6	L1	FLO
2.033712	27.1	9.7	56.0	28.9	L1	FLO
3.614022	30.8	9.7	56.0	25.2	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.417052	36.5	9.7	47.5	11.0	L1	FLO
0.417934	37.3	9.7	47.5	10.2	L1	FLO
0.418448	37.7	9.7	47.5	9.8	L1	FLO
0.722490	28.3	9.7	46.0	17.7	L1	FLO
1.874276	23.5	9.7	46.0	22.5	N	FLO
2.997922	23.1	9.7	46.0	22.9	N	FLO

Note:

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

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

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