



FCC EMC Test Report

Product Name: HSDPA Module

Model Number: MU509-g

Report No: SYBH(Z-EMC)122092011-2

FCC ID: QISMU509G

Reliability Laboratory of Huawei Technologies Co., Ltd.

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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: Sep.20, 2011
Start Date of Test: Sep.22, 2011
End Date of Test: Sep.27, 2011

Test Result: Pass

Approved By 2011-09-28 Liuchunlin Liuchunlin
Date Name Signature

Reviewed By 2011-09-28 Dailinjun Dailinjun
Date Name Signature

Operator 2011-09-28 Daniel Daniel
Date Name Signature

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1 General Information

1.1 EUT Description

EUT Description	
Product Name	HSDPA Module
Model Number	MU509-g
Serials Number	3DA6RB1183000151
TX Frequency	GSM850: 824MHz To 849MHz PCS1900: 1850MHz To 1910MHz WCDMA850: 824MHz To 849MHz
RX Frequency	GSM850: 869MHz To 894MHz PCS1900: 1930MHz To 1990MHz WCDMA850: 869MHz To 894MHz
HW Version	MD1MU509M
SW Version	11.813.03.01.00
EUT Accessory	
NA	NA

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



1.2 Test Site Information

Site1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	Bantian Longgang District Shenzhen, P.R. China

1.3 Applied Standard

APPLIED STANDARD	
	FCC 47 CFR FCC Part 15 SubpartB

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> ☒ DC Power Port ☒ AC Power Port ☐ Telecommunication Ports	Mode2	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the measurement uncertainty of measurement system. 2, ☒ The item has been tested; ☐ The item has not been tested.				

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 in normal operation, which was in this test report and defined as:

Test Mode	
Mode 1:	PC+ Idle
Mode 2:	PC + Traffic

Remark: When the EUT have multiple Data cable, need separate test with Data cable. Here only the worst cases are recorded in this report.

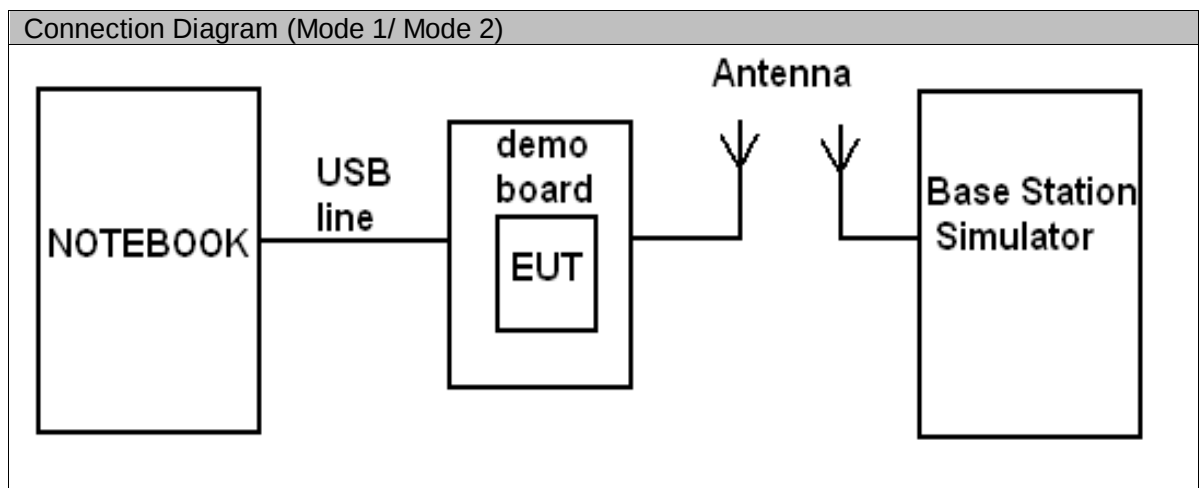
Traffic Mode:

State of EUT when switched on and with Radio Resource Control (RRC) connection established

Idle Mode:

State of EUT when switched on but with no Radio Resource Control (RRC) connection

3.2 Configurations of Test System



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB	1	<3m	shielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Cal Date
Radio Communication Tester	CMU200	R&S	3607033573	2011-03-17
Notebook	T61	ThinkPad	3108052581	NA
Demo board	E170968	NA	NA	NA

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

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

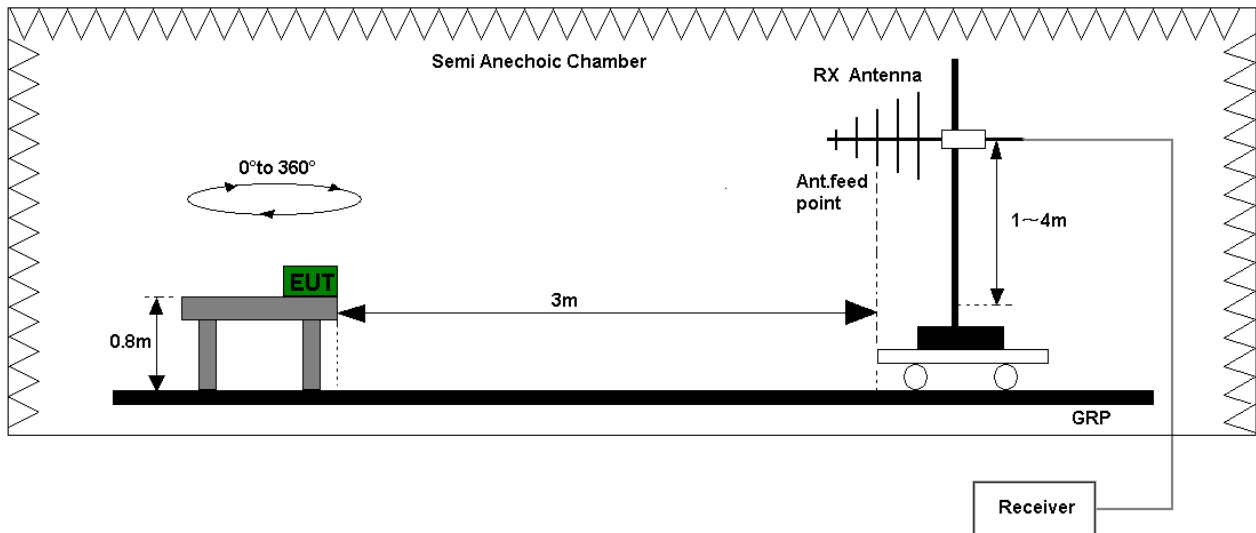


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

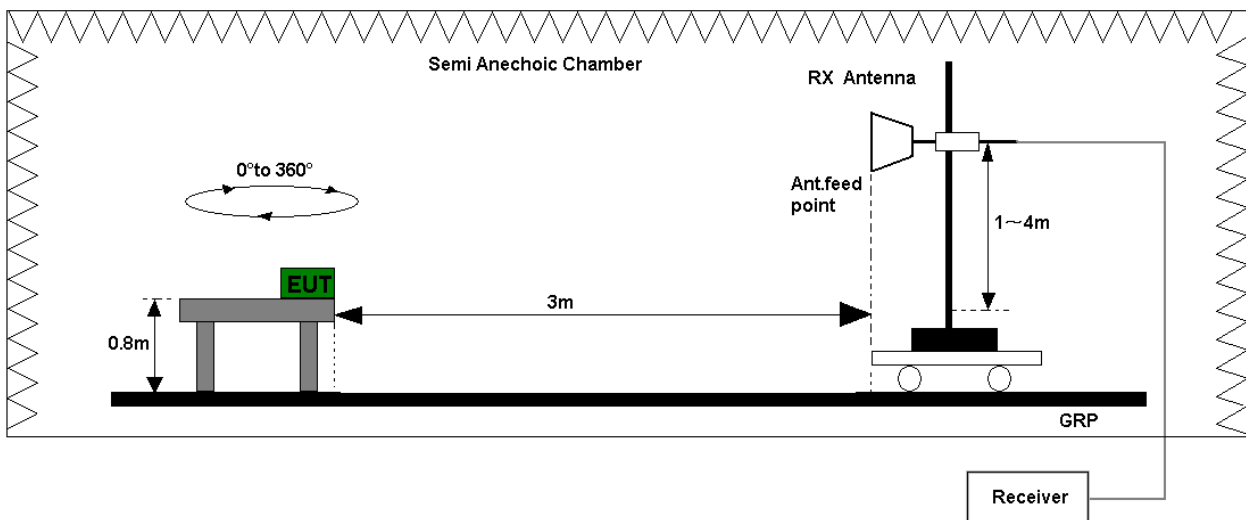


Figure 2. Test set-up of radiated disturbance(above 1GHz)

4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
The test data see section 7.1 of this report.

Test Limits				
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

Test environment condition:

Performed Item	Item	Required	Actual
Radiated Emission	Ambient temperature	15°C ~ 35°C	22°C
	Relative humidity	25% ~ 75%	58%
	Atmospheric pressure	86 kPa ~ 106kPa	100kPa

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.

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 screened chamber and operated under nominal conditions.

4.2.2 Test Setup

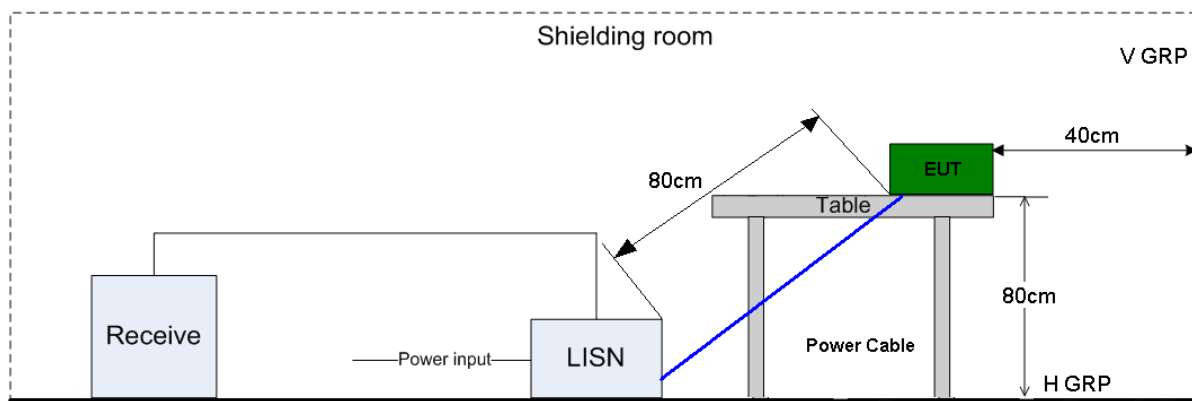


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance of power lines.

The test data see section 7.2 of this report.

Test Limit of AC Power Port		
Frequency range	150kHz ~ 30MHz	
Frequency	Voltage limits	
	QP	AV
0.15MHz~0.5MHz	66-56dBμV	56-46 dBμV
0.5MHz-5MHz	56dBμV	46 dBμV
5MHz~30MHz	60dBμV	50 dBμV

Test environment condition:

Performed Item	Item	Required	Actual
Conducted Disturbance	Ambient temperature	15°C ~ 35°C	22°C
	Relative humidity	25% ~ 75%	58%
	Atmospheric pressure	86 kPa ~ 106kPa	100kPa

5 Main Test Instruments

Main Test Equipments					
Test item	Test Instrument	Model	Manufacturer	Cal-Date	Cal Interval (month)
RE/CE	EMI Test receiver	ESU26	R&S	May.30, 2011	12
	Broadband Antenna	VULB 9163	SCHWARZBECK	May.16, 2011	12
	Horn Antenna	HF906	R&S	May.16, 2011	12
	Artificial Mains Network	ENV216	R&S	May.30, 2011	12
Software Information					
Test Item	Software Name	Manufacturer		Version	
RE/CE	ES-K1	R&S		1.7.1	

6 System Measurement Uncertainty

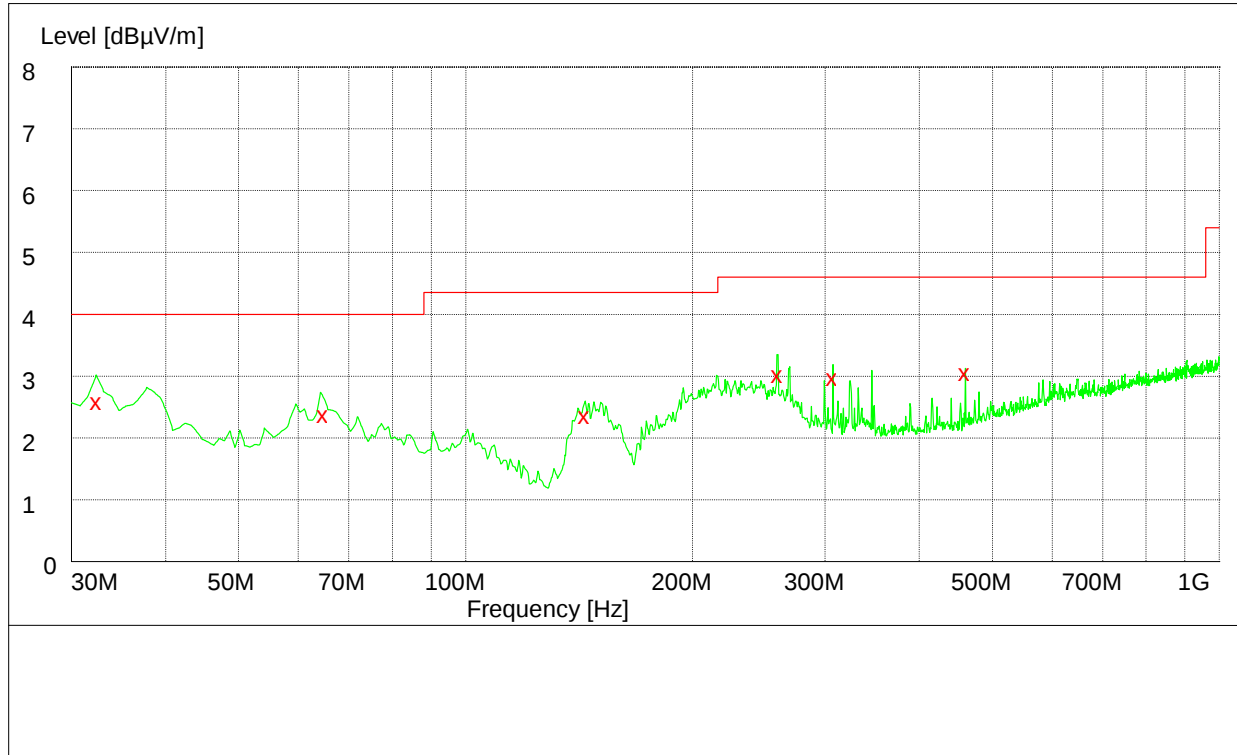
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

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=4.1dB; k=2
CE	Disturbance Voltage (dB μ V)	U=3.4dB; k=2

7 Graph and Data of Emission Test

7.1 Radiated Disturbance

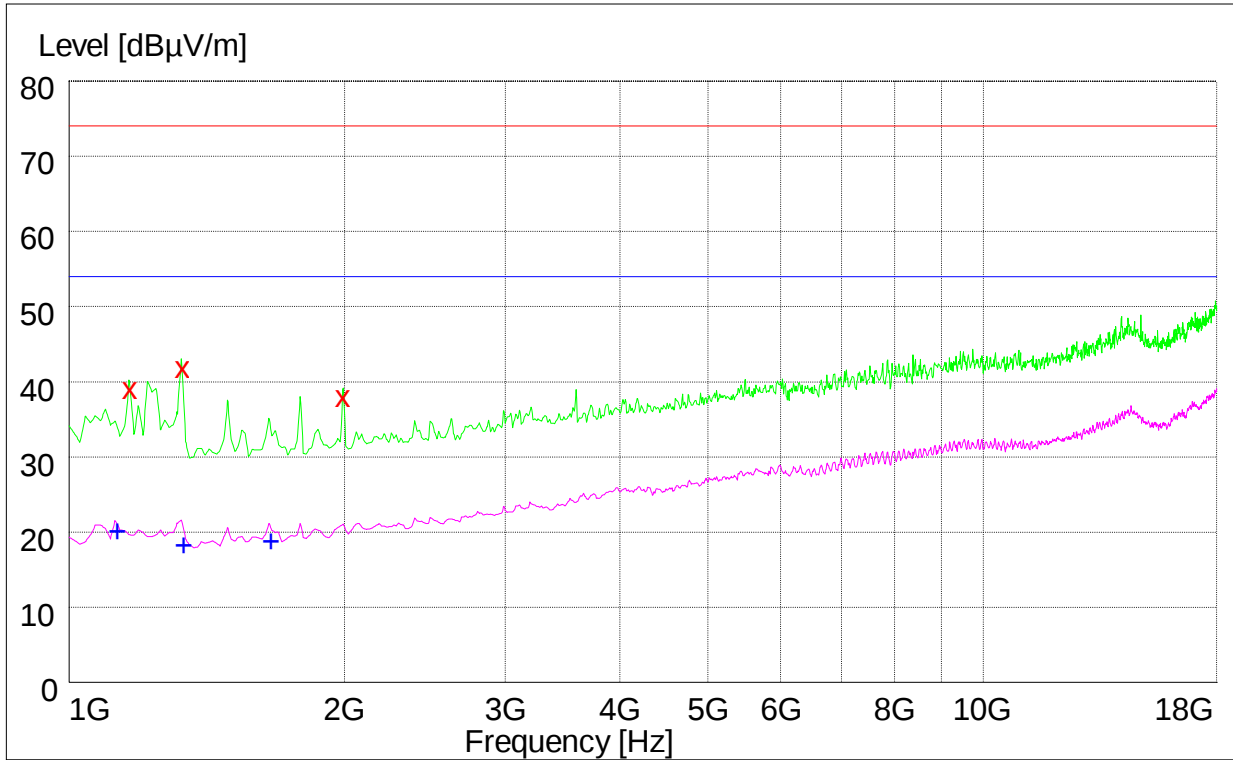
7.1.1 30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
32.460000	26.70	11.7	40.0	13.3	100.0	145.00	VERTICAL
64.860000	24.60	10.5	40.0	15.4	100.0	64.00	VERTICAL
144.000000	24.50	8.8	43.5	19.0	112.0	354.00	VERTICAL
259.320000	30.90	14.2	46.0	15.1	100.0	88.00	HORIZONTAL
307.200000	30.60	15.7	46.0	15.4	100.0	161.00	HORIZONTAL
460.800000	31.20	19.1	46.0	14.8	100.0	167.00	HORIZONTAL

7.1.2 1GHz~18GHz



MEASUREMENT RESULT: PK Detector

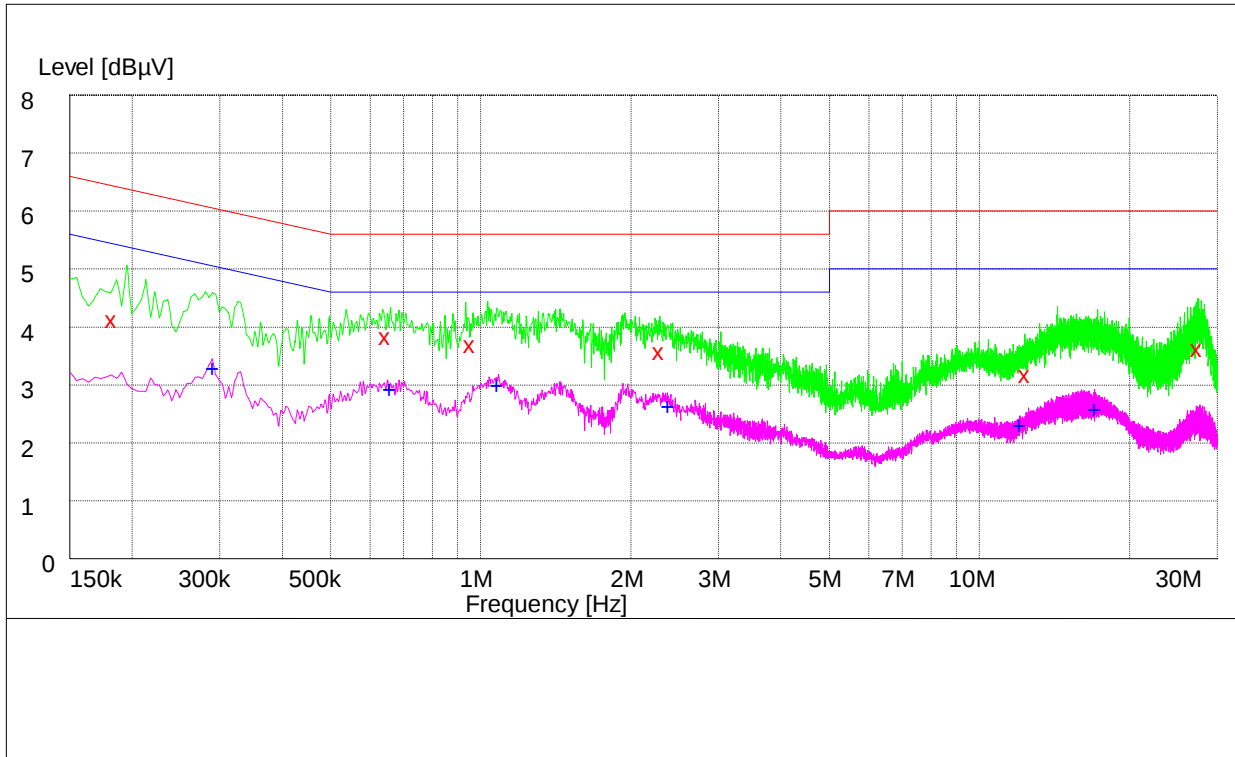
Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
1164.500000	39.70	-15.9	74.0	34.3	100.0	212.00	VERTICAL
1329.000000	41.40	-15.2	74.0	32.6	100.0	283.00	VERTICAL
1991.500000	38.80	-11.7	74.0	35.2	100.0	324.00	VERTICAL

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
1126.000000	20.20	-16.2	54.0	33.8	100.0	220.00	VERTICAL
1328.000000	19.40	-15.2	54.0	34.6	100.0	360.00	VERTICAL
1659.500000	19.80	-13.5	54.0	34.2	100.0	58.00	VERTICAL

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
0.182000	42.20	10.1	64	21.8	N	FLO
0.646000	39.10	10.1	56	16.9	N	FLO
0.954000	37.90	10.1	56	18.1	N	FLO
2.284000	36.70	10.1	56	19.3	N	FLO
12.334000	32.70	10.3	60	27.3	N	FLO
27.346000	37.10	10.4	60	22.9	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.290000	33.60	10.0	51	17.4	N	FLO
0.658000	30.10	10.1	46	15.9	N	FLO
1.080000	30.90	10.1	46	15.1	N	FLO
2.378000	27.30	10.1	46	18.7	N	FLO
12.072000	23.90	10.3	50	26.1	N	FLO
17.018000	26.70	10.3	50	23.3	N	FLO



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