



FCC EMC Test Report

Product Name: HSPA+ Module

Model Number: MU733

Report No: SYBH(Z-EMC)043022012-2

FCC ID: QISMU733

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.
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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: Feb.10, 2012
Start Date of Test: Feb.13, 2012
End Date of Test: Feb.19, 2012

Test Result: Pass

**Approved By
(Lab Manager)**

2012-02-20
Date

Liuchunlin
Name

Liuchunlin
Signature

Operator

2012-02-20
Date

Daniel
Name

Daniel
Signature



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1 **General Information**

1.1 **EUT Description**

EUT Description	
Product Name	HSPA+ Module
Model Number	MU733
Serials Number	06F01A9211700176
TX Frequency	GSM850: 824MHz To 849MHz PCS1900: 1850MHz To 1910MHz WCDMA Band V: 824MHz To 849MHz WCDMA Band VI (AWS): 1710MHz To 1755MHz WCDMA Band II: 1850MHz To 1910MHz
RX Frequency	GSM850: 869MHz To 894MHz PCS1900: 1930MHz To 1990MHz WCDMA Band V: 869MHz To 894MHz WCDMA Band VI(AWS): 2110MHz To 2155MHz WCDMA Band II: 1930MHz To 1990MHz
HW Version	MD1MU733M
SW Version	11.102.13.00.00
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	
	47 CFR FCC Part 15:2010, 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> <input checked="" type="checkbox"/> DC Power Port <input checked="" type="checkbox"/> AC Power Port <input type="checkbox"/> Telecommunication Ports	Mode1	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the measurement uncertainty of measurement system. 2, <input checked="" type="checkbox"/> The item has been tested; <input type="checkbox"/> 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:	USB+ Demo board + Traffic
Mode 2:	USB+ Demo board +Idle

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

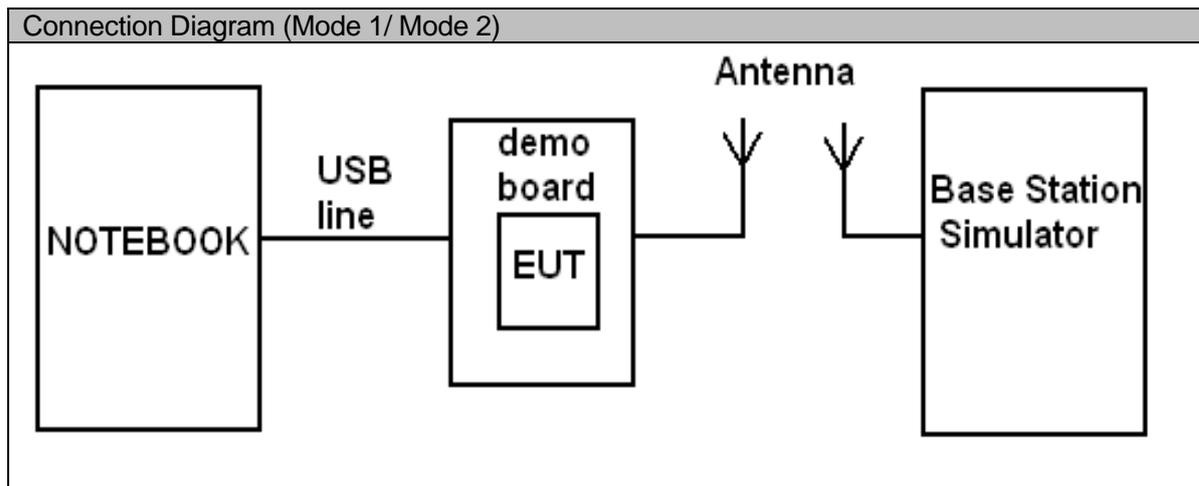
Traffic Mode:

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	M11 94V-0	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 30MHz to 18GHz 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

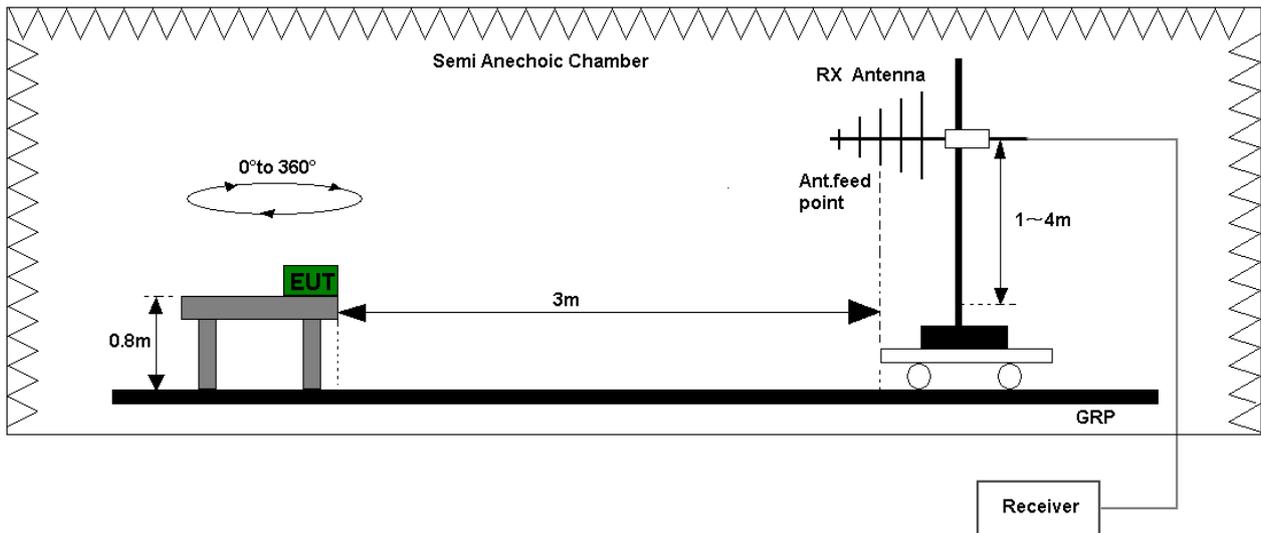


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

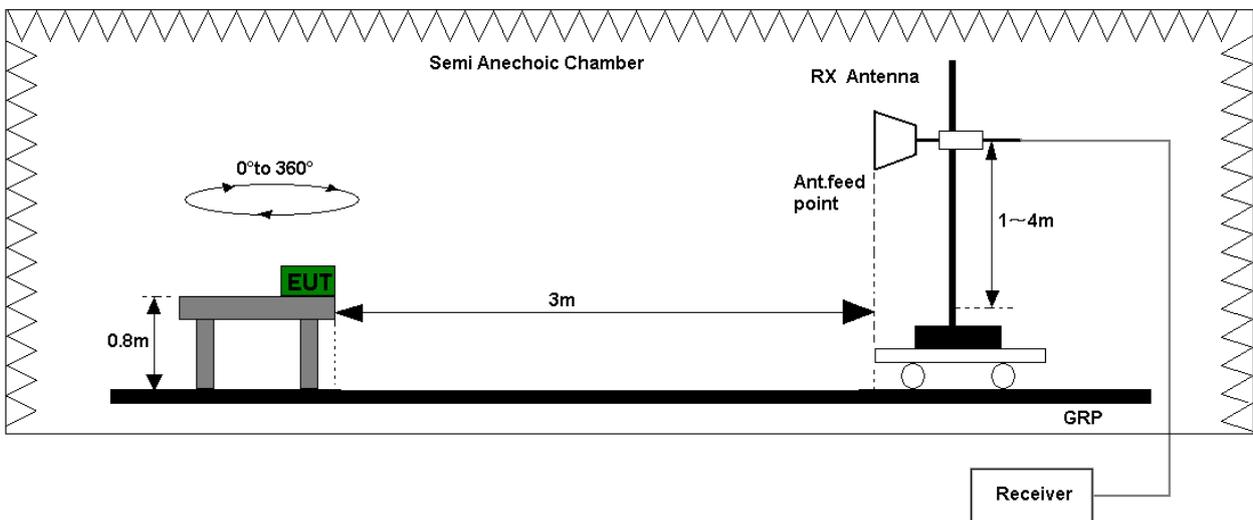


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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%	55%
	Atmospheric pressure	86 kPa ~ 106kPa	101kPa

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 0.8m 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.

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 150kHz to 30 MHz: 9 kHz;

The EUT was setup in the screened chamber and operated under nominal conditions.

4.2.2 Test Setup

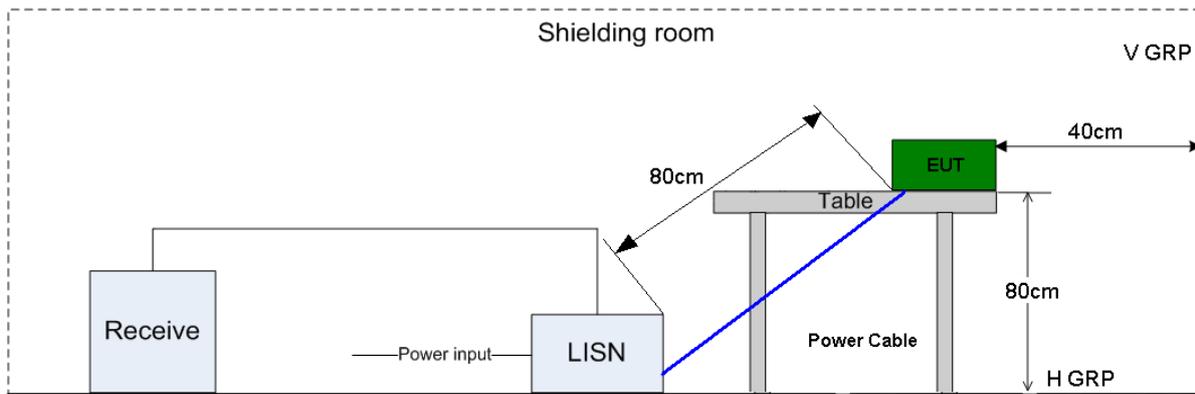


Figure 3. Test Set-up of conducted disturbance

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	66-56dB 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

Test environment condition:

Performed Item	Item	Required	Actual
Conducted Disturbance	Ambient temperature	15°C ~ 35°C	22°C
	Relative humidity	25% ~ 75%	55%
	Atmospheric pressure	86 kPa ~ 106kPa	101kPa

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

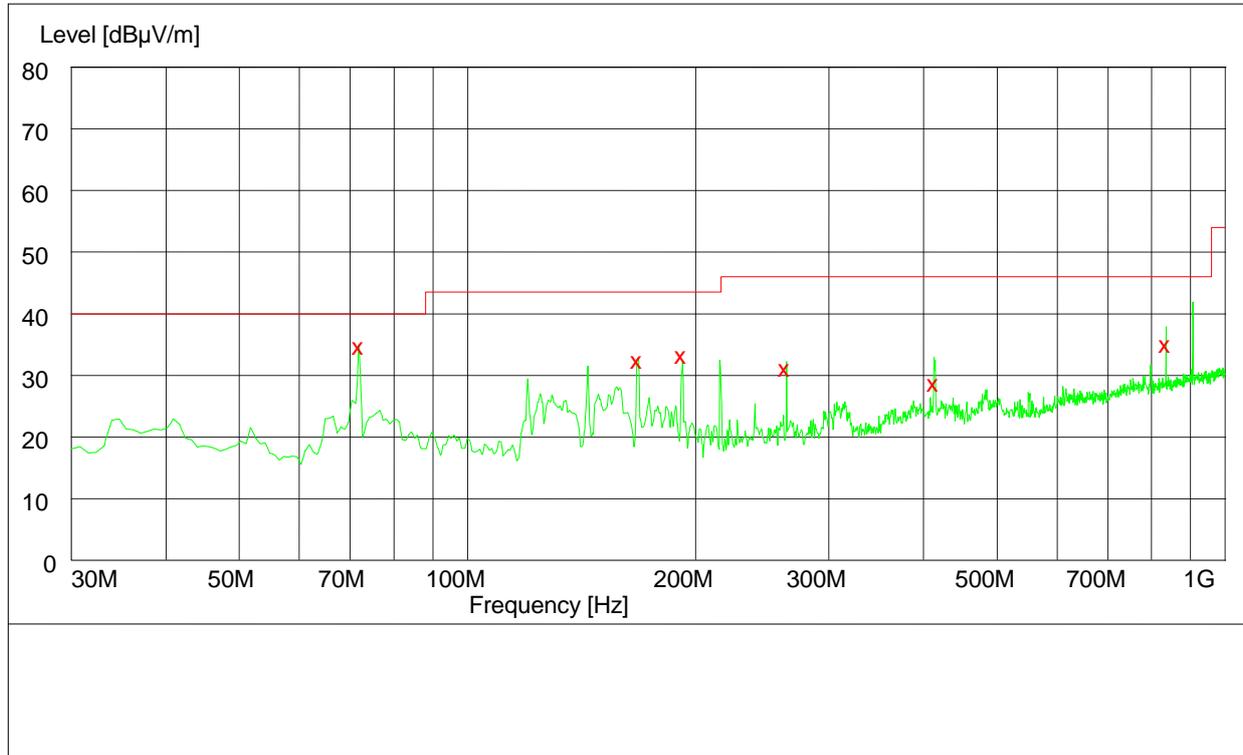
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

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

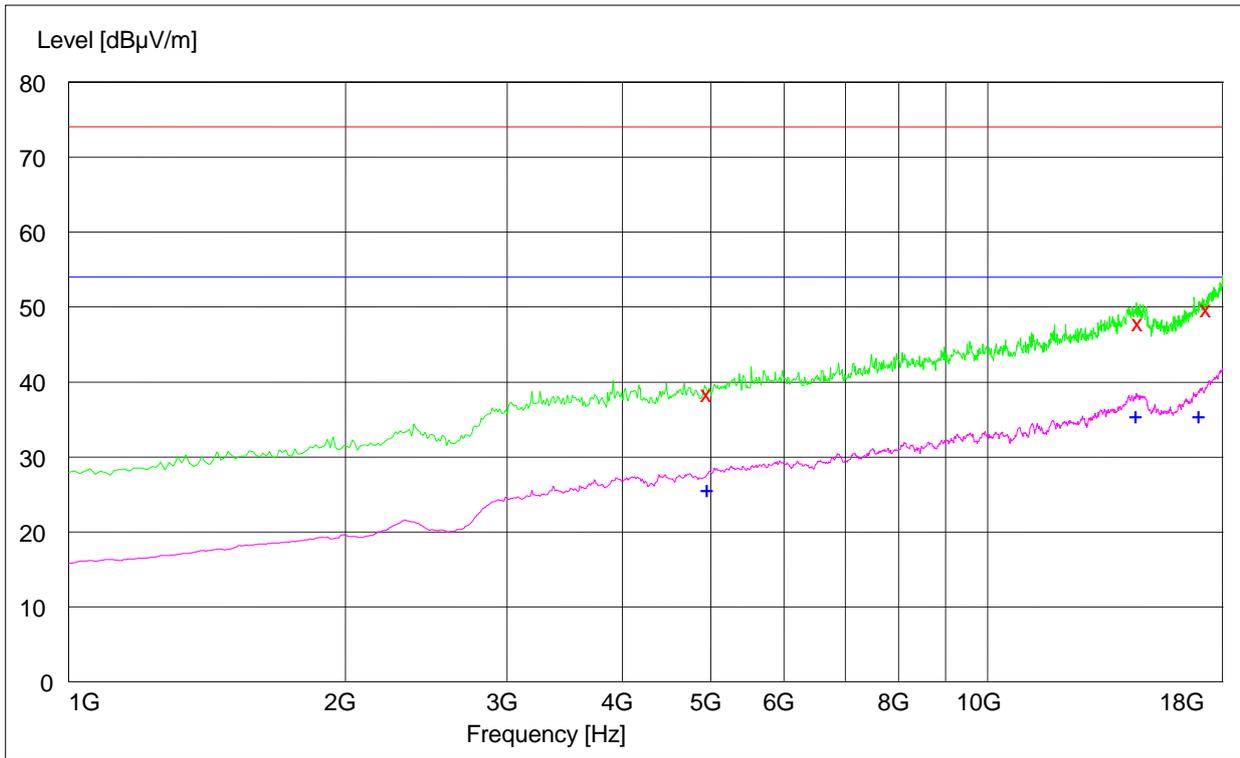
7.1.1 30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
72.000000	35.20	10.7	40.0	4.8	127.0	359.00	HORIZONTAL
168.000000	32.10	10.5	43.5	11.4	100.0	306.00	VERTICAL
192.000000	33.10	12.1	43.5	10.4	102.0	4.00	VERTICAL
263.000000	31.10	14.1	46.0	14.9	110.0	214.00	HORIZONTAL
413.200000	29.40	17.7	46.0	16.6	114.0	107.00	VERTICAL
836.600000	35.70	24.0	46.0	10.3	104.0	300.00	VERTICAL

7.1.2 1GHz~18GHz



MEASUREMENT RESULT: PK Detector

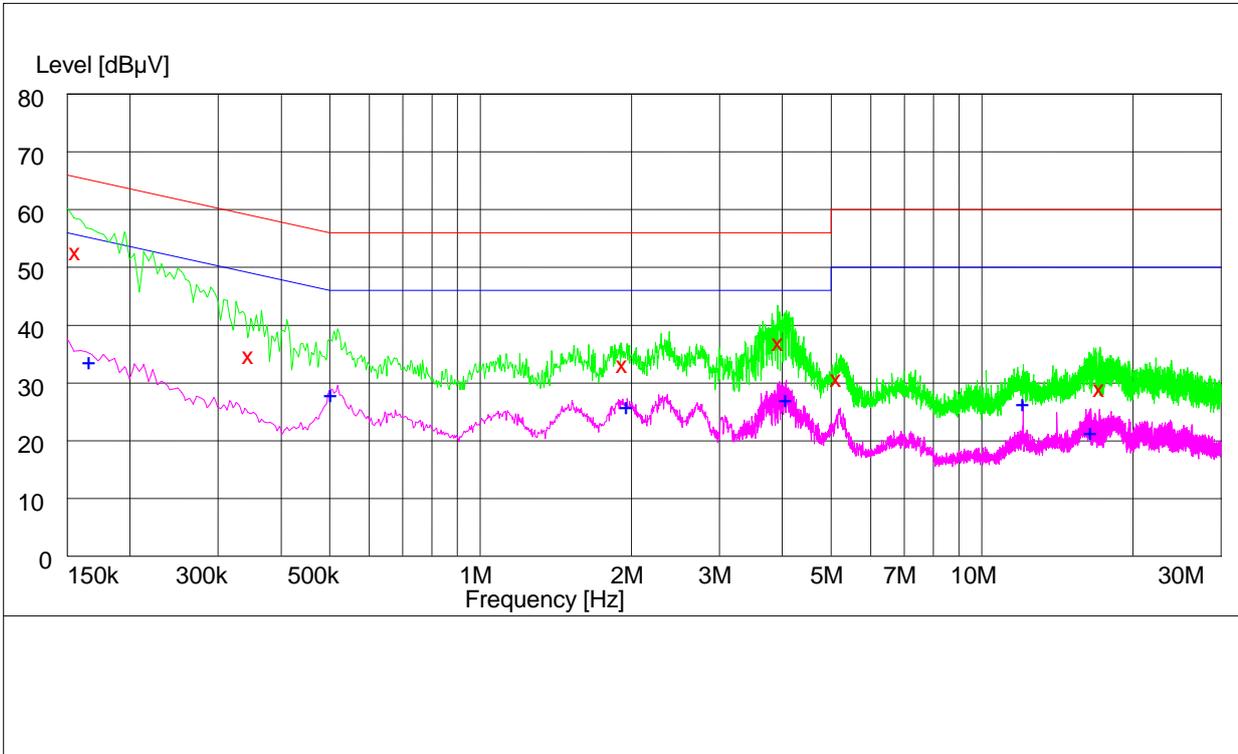
Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
4957.500000	38.60	-2.1	74.0	35.4	100.0	272.00	VERTICAL
14593.000000	48.10	14.3	74.0	25.9	145.0	293.00	HORIZONTAL
17327.500000	49.80	16.6	74.0	24.2	100.0	354.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
4961.500000	25.80	-2.1	54.0	28.2	150.0	265.00	HORIZONTAL
14515.500000	35.70	14.5	54.0	18.3	100.0	233.00	HORIZONTAL
16990.000000	35.60	15.5	54.0	18.4	113.0	212.00	HORIZONTAL

7.2 Conducted Disturbance

7.2.1 AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency	Level	Transducer	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.156000	52.00	10.1	66	14	N	FLO
0.346000	34.40	10.0	59	24.6	N	FLO
1.926000	32.50	10.1	56	23.5	N	FLO
3.936000	37.60	10.2	56	18.4	N	FLO
5.144000	30.10	10.2	60	29.9	N	FLO
17.228000	29.00	10.3	60	31	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transducer	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.166000	34.50	10.1	55	20.5	N	FLO
0.504000	28.70	10.1	46	17.3	N	FLO
1.962000	26.70	10.1	46	19.3	N	FLO
4.060000	27.80	10.2	46	18.2	N	FLO
12.084000	27.10	10.3	50	22.9	N	FLO
16.488000	22.10	10.3	50	27.9	N	FLO



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