



EMC Test Report

Product Name: Wireless Gateway

Model Number: B683

Report No: SYBH(Z-EMC)091082011-2

FCC ID: QISB683-74V

IC ID: 6369A-B68374V

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1 General Information

1.1 EUT Description

EUT Description	
Product Name	Wireless Gateway
Model Number	B683
Serials Number	C9D6RA1171400086
TX Frequency	GSM850: 824MHz To 849MHz GSM1900: 1850MHz To 1910MHz WCDMA850: 824MHz To 849MHz WCDMA1900: 1850MHz To 1910MHz WCDMA-AWS: 1712MHz To 1753MHz WIFI: 2410MHz To 2483.5MHz
RX Frequency	GSM850: 869MHz To 894MHz GSM1900: 1930MHz To 1990MHz WCDMA850: 869MHz To 894MHz WCDMA1900: 1930MHz To 1990MHz WCDMA-AWS: 2122MHz To 2183MHz WIFI: 2410MHz To 2483.5MHz
Hardware Version	WL1B683I074
SW Version	V100R001
EUT Accessory	
Adapter	Manufacture: Huawei Technologies CO.,LTD. Model:HW-050200U2W Input voltage: 100V-240V~50-60Hz, 0.5A Output voltage: +5V --- 2A Rated Power: 10W

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

Test Site 1:	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
 ICES-003 Issue 4

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: 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

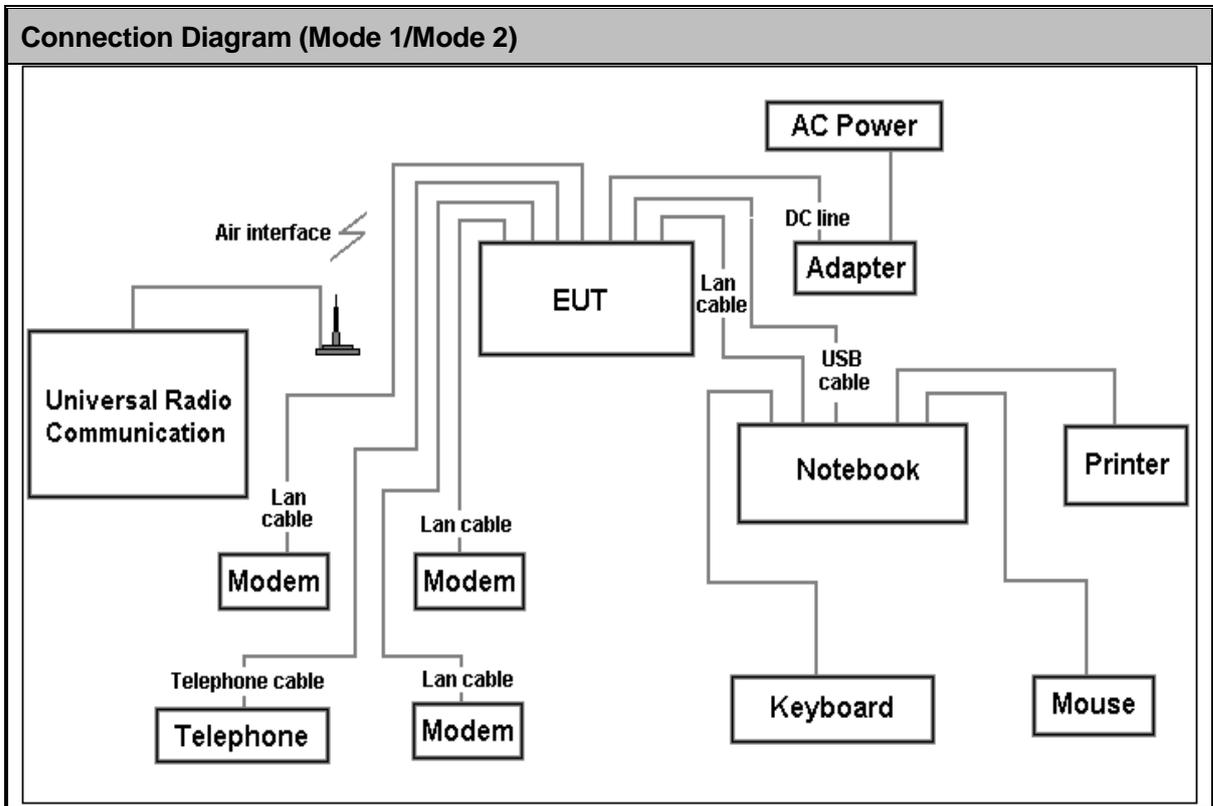
3.1 Test Mode

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:	adapter + Idle + USB + LAN + Telephone
Mode 2:	adapter + Traffic + USB + LAN + Telephone

Remark: When the EUT have multiple adapters, need separate test with multiple adapters . All test modes are performed, only the worst cases are recorded in this report.

3.2 Configurations of Test System



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
DC Power	1	1.8m	Unshielded
LAN Cable	4	>3m	Unshielded
USB Cable	1	1.5m	shielded
Telephone Cable	1	>3m	Unshielded

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	E6400	DELL	31091101289	N/A
Modem	MT800b	HUAWEI	21500802378068000074	N/A
Modem	MT800b	HUAWEI	21500802378068000075	N/A
Modem	MT800b	HUAWEI	2199040XWC7S86146674	N/A
Telephone	HCD8166TSD	HUAWEI	21990482848X65001901	N/A
Printer	SNPRB-0721	HP	MY83CQP08P	N/A
Keyboard	KB-8	ShuangFeiYan	N/A	N/A
Mouse	MO28UOL	Lenovo	31043131	N/A

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

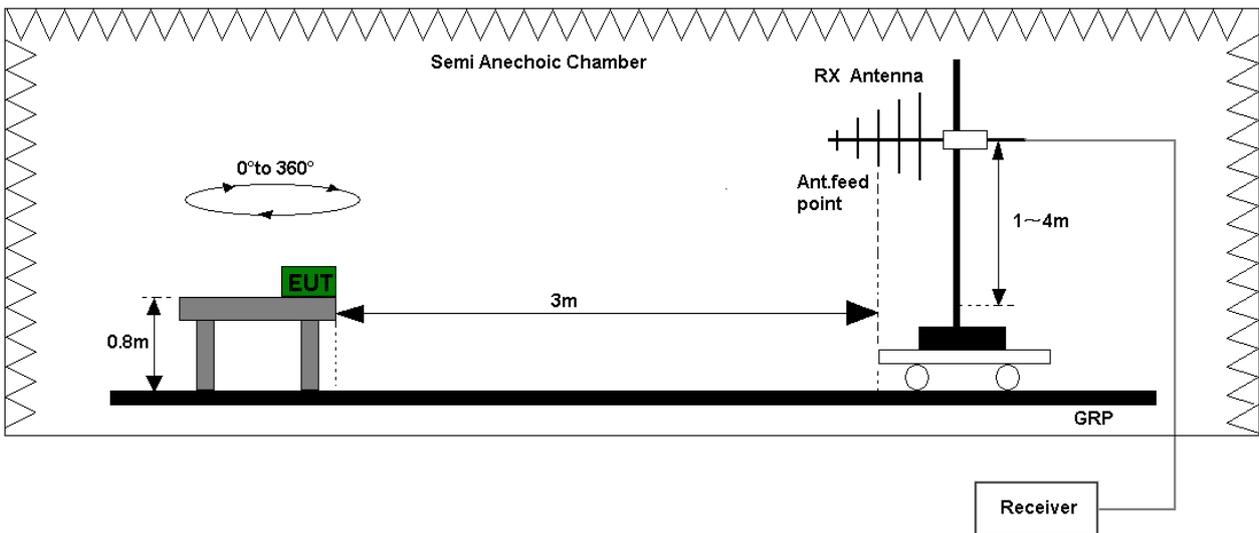


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

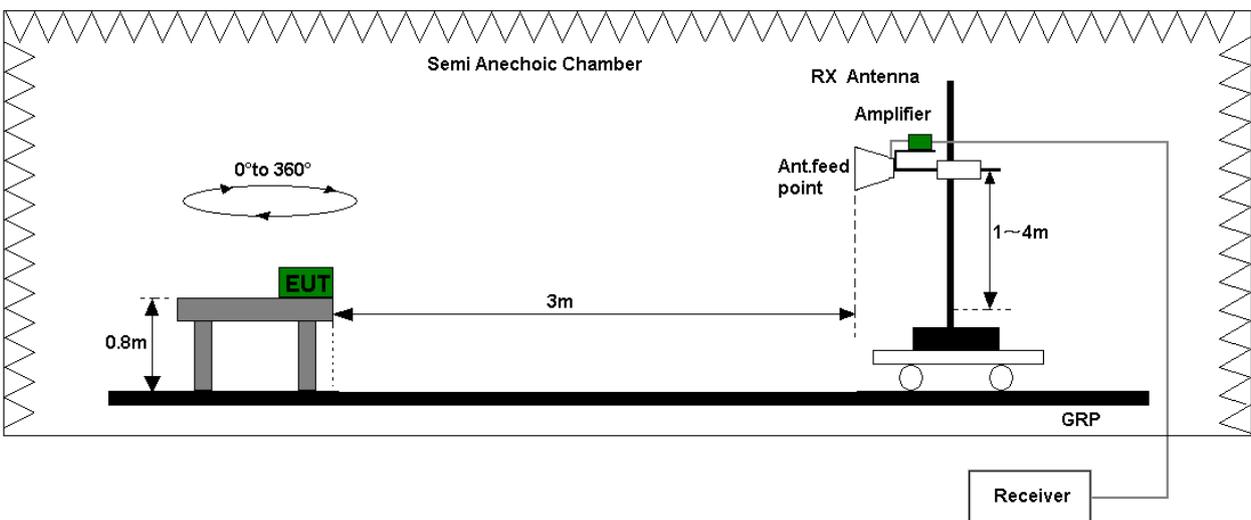


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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	21.7°C
	Relative humidity	25% ~ 75%	54.2%
	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

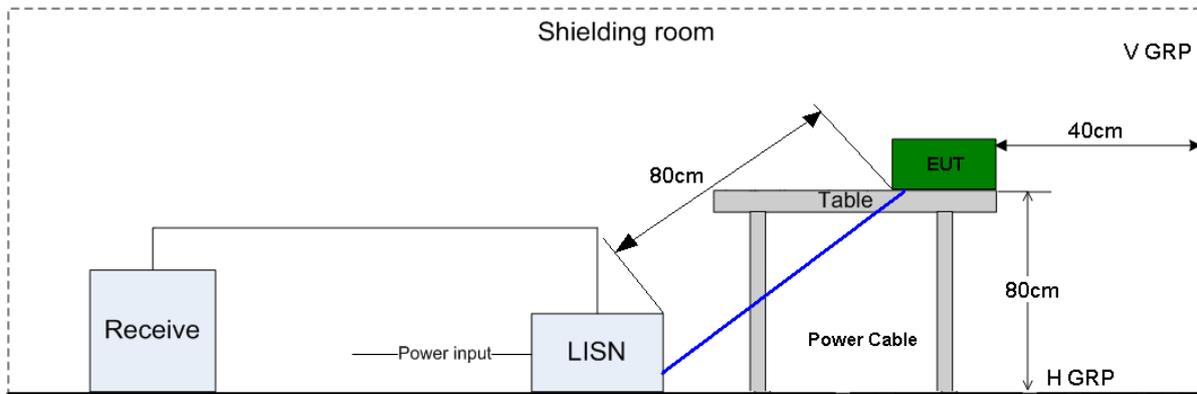


Figure 3. Test Set-up of conducted disturbance

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	66-56dB 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	22.7°C
	Relative humidity	25% ~ 75%	53.6%
	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

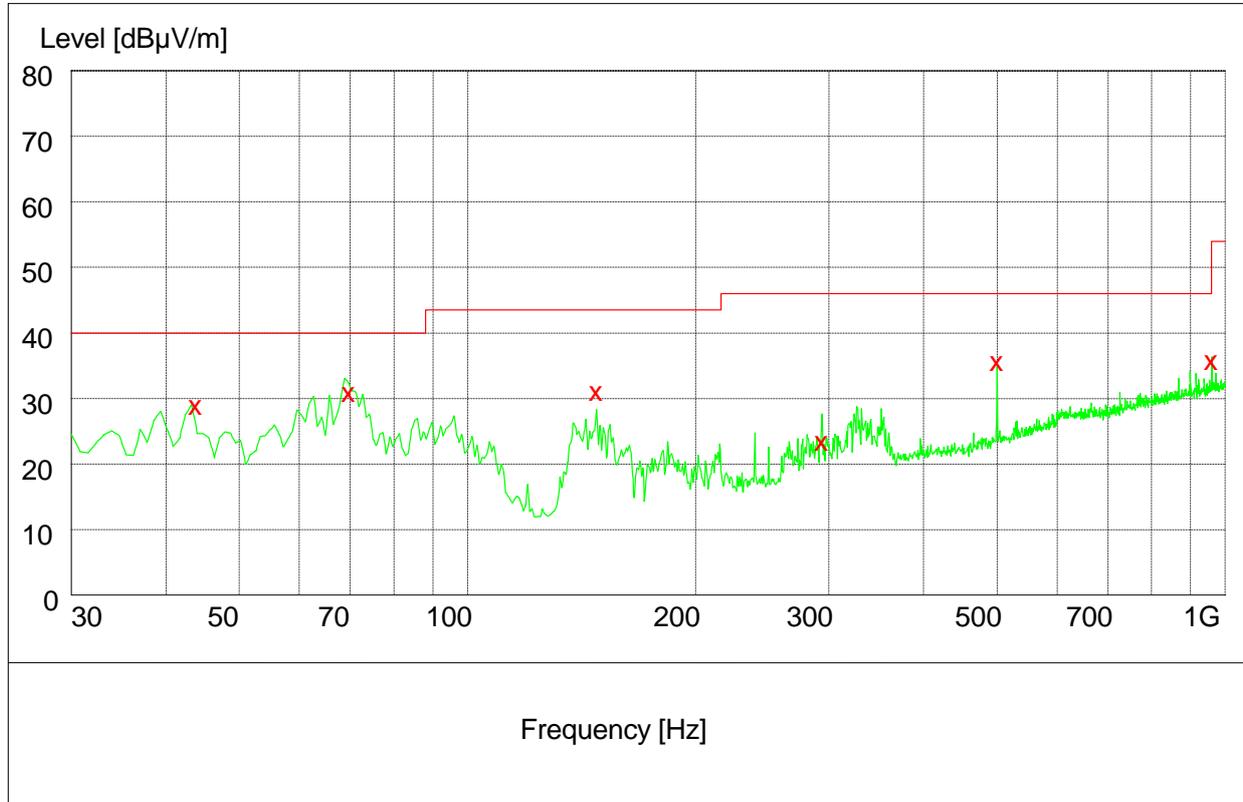
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

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=4.9dB; k=2
CE	Disturbance Voltage (dB μ V)	U=3.4dB; k=2

7 Graph and Data of Emission Test

7.1 Radiated Disturbance

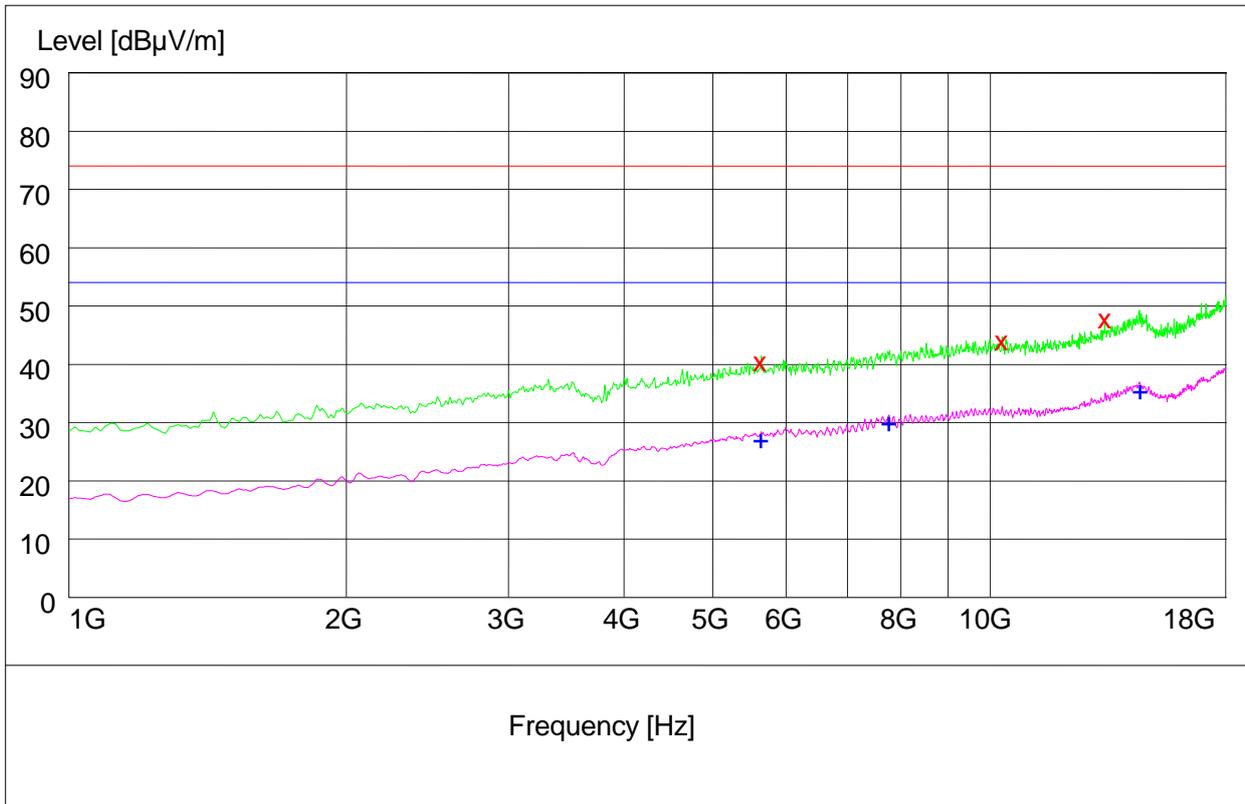
7.1.1 30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
43.800000	28.90	13.1	40.0	11.1	100.0	227.00	VERTICAL
69.660000	30.20	8.5	40.0	9.8	117.0	83.00	VERTICAL
148.080000	30.30	8.9	43.5	13.2	100.0	1.00	VERTICAL
293.820000	23.50	15.3	46.0	22.5	100.0	272.00	VERTICAL
499.980000	35.20	20.2	46.0	10.8	100.0	71.00	HORIZONTAL
960.000000	34.20	26.8	46.0	11.8	158.0	196.00	VERTICAL

7.1.2 1GHz~18GHz



MEASUREMENT RESULT: PK Detector

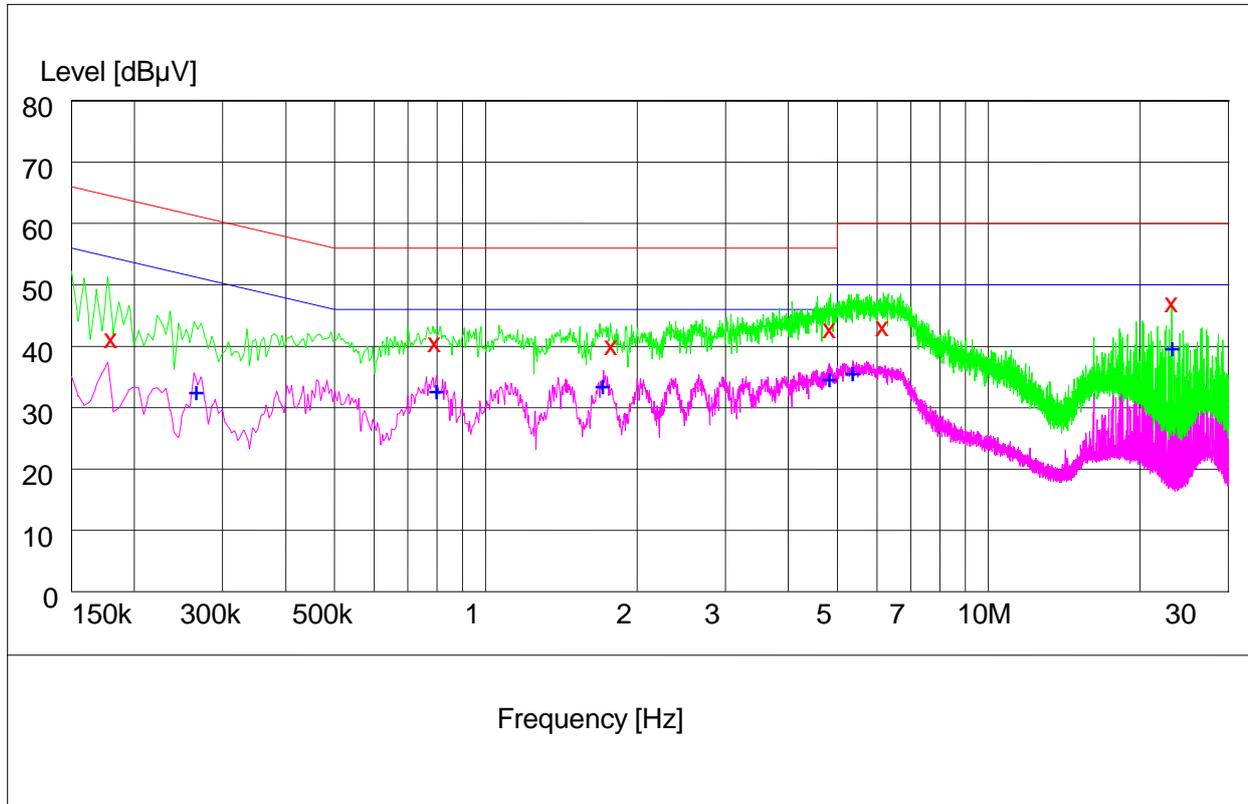
Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
5632.000000	40.50	-1.2	74.0	33.5	163.0	349.00	VERTICAL
10296.500000	44.40	6.9	74.0	29.6	157.0	321.00	VERTICAL
13312.000000	47.20	11.4	74.0	26.8	100.0	96.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
5635.000000	27.50	-1.3	54.0	26.5	100.0	171.00	VERTICAL
7755.000000	30.00	3.0	54.0	24.0	200.0	8.00	HORIZONTAL
14523.000000	36.10	14.9	54.0	17.9	100.0	315.00	HORIZONTAL

7.2 Conducted Disturbance

7.2.1 AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.180000	41.70	10.1	65	23.3	N	FLO
0.794000	40.80	10.1	56	15.2	N	FLO
1.782000	40.00	10.1	56	16.0	N	FLO
4.836000	43.00	10.2	56	13.0	N	FLO
6.156000	44.00	10.2	60	16.0	N	FLO
23.128000	47.50	10.4	60	12.5	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.266000	33.10	10.0	51	17.9	N	FLO
0.798000	33.60	10.1	46	12.4	N	FLO
1.704000	34.00	10.1	46	12.0	N	FLO
4.826000	35.80	10.2	46	10.2	N	FLO
5.354000	36.20	10.2	50	13.8	N	FLO
23.128000	40.00	10.4	50	10.0	L1	FLO



8 Attachment

8.1 Setup Photographs of EUT

See Appendix A

8.2 Photographs of EUT

See Appendix A

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