



EMC Test Report

**Product Name: HSDPA/UMTS/GPRS/GSM/EDGE Mobile
Phone with Bluetooth**

Model Number: HUAWEI Discovery, D51, D51-3

Report No: SYBH(Z-EMC)120092011-2

FCC ID: QISD51-3

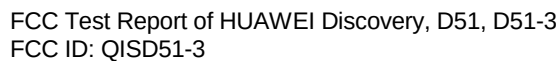
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1 General Information

1.1 EUT Description

EUT Description	
Product Name	HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth
Model Number	HUAWEI Discovery, D51, D51-3
Serials Number	L2P7NB1180400072
Working Voltage	120V/60Hz
TX Frequency	GSM850:824MHz-849MHz; PCS1900:1850MHz-1910MHz WCDMA1700:1710MHz-1755MHz Bluetooth: 2400MHz To 2483.5MHz
RX Frequency	GSM850:869MHz-894MHz; PCS1900:1930MHz-1990MHz WCDMA1700:2110MHz-2155MHz Bluetooth: 2400MHz To 2483.5MHz
HW Version	Ver.B
SW Version	D51CBYB103
EUT Accessory	
Data cable	Data Cable USB A Male to Micro Usb ,Black,
Adapter 1	Manufacture: Huawei Technologies Co., Ltd. Model: HS-050040U6 Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V  400mA Rated Power: 2W S/N: hkab41408066
Adapter 2	Manufacture: Huawei Technologies Co., Ltd. Model: HS-050040E5 Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V  400mA Rated Power: 2W S/N: HKAB52684128
Adapter 3	Manufacture: Huawei Technologies Co., Ltd. Model: HS-050040U5 Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V  400mA Rated Power: 2W S/N: TPAB62311969
Adapter 4	Manufacture: Huawei Technologies Co., Ltd. Model: HW-050055B1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V  550mA Rated Power: 2.75W S/N: BYAA92802252
Adapter 5	Manufacture: Huawei Technologies Co., Ltd. Model: HW-050055E1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V  550mA

	Rated Power: 2.75W S/N: HKAB52819794
Li-ion	Battery Model: HB5A2 Rated capacity: 1000mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V S/N:GAGB711XC27C0957

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

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

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~ Mode2 Mode5 Mode7~ Mode8	CLASS B	Pass	Site1
<u>Conducted Emissions</u> ☐ DC Power Port ☒ AC Power Port ☐ Telecommunication Ports	Mode1~ Mode4	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

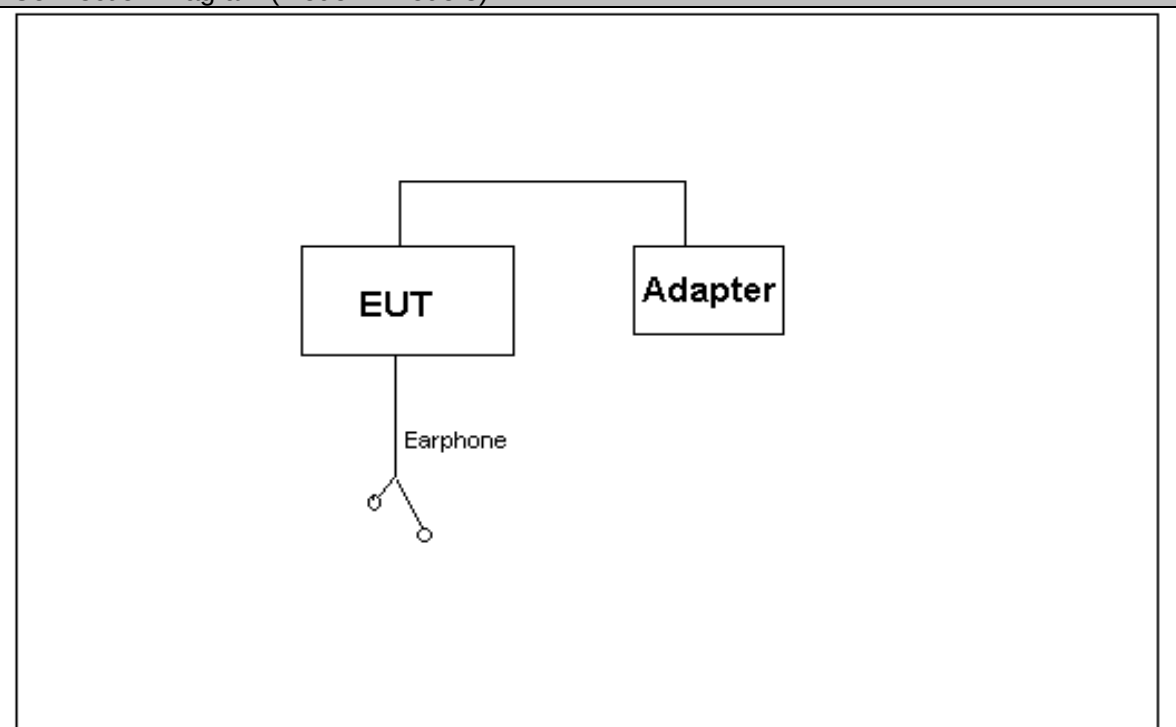
Huawei has verified the construction and function in typical operation. All the test were carried out with the EUT in normal operation status, which was in defined in this test report .

Test Mode	
Mode 1:	adapter+earphone+Camera On +Idle
Mode 2:	adapter+earphone+MP3 +Idle
Mode 3:	adapter+earphone+Traffic
Mode 4:	adapter+Traffic
Mode 5:	USB Copy(EUT with PC)+earphone +Idle
Mode 6:	Traffic
Mode 7:	Camera On+earphone+Idle
Mode 8:	earphone+MP3+Idle

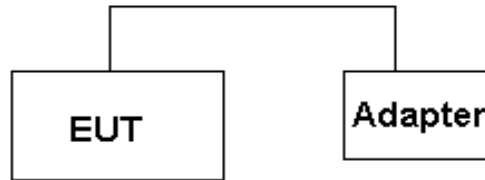
Remark: When the EUT have multiple adapters, need separate test with multiple adapters. All test modes are performed, only the worst cases are recorded in this report.

3.2 Configurations of Test System

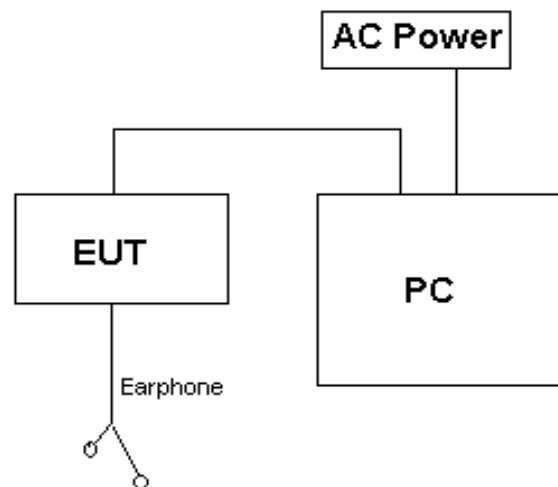
Connection Diagram (Mode 1~Mode 3)



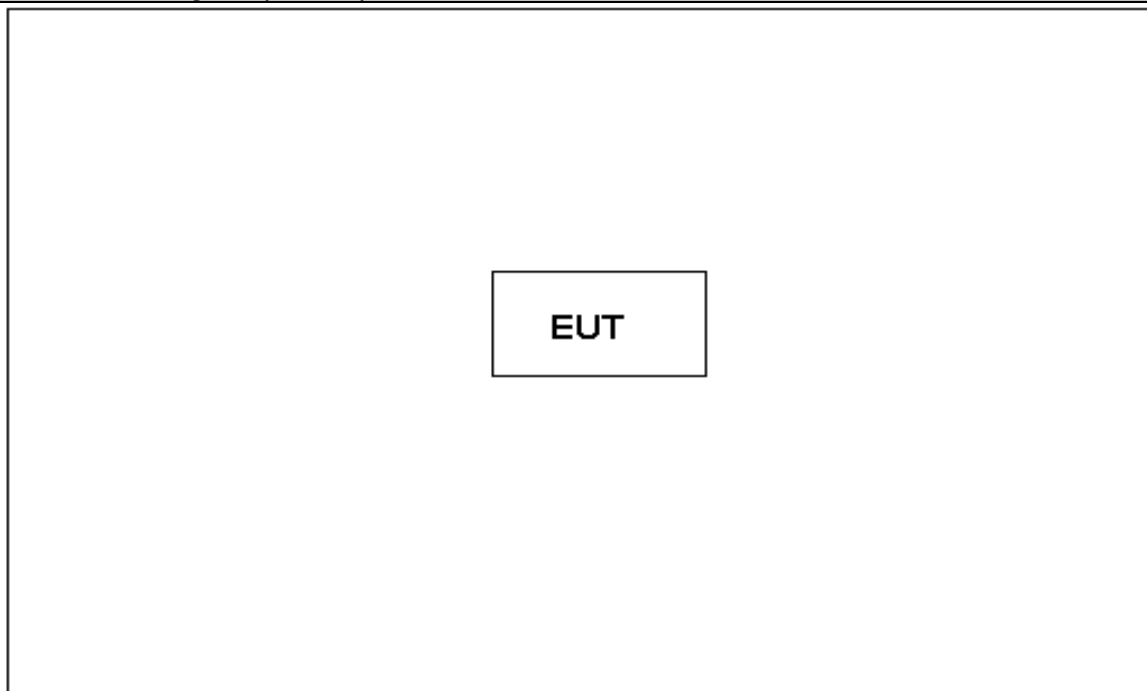
Connection Diagram (Mode 4)



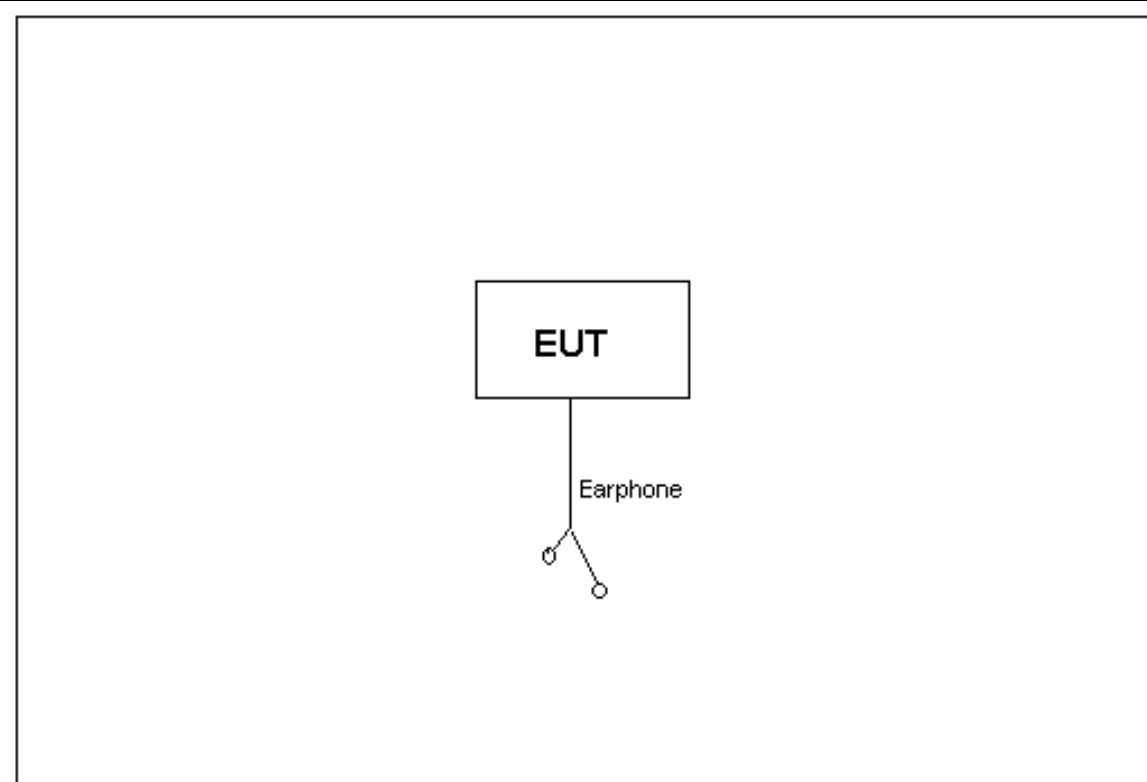
Connection Diagram (Mode 5)



Connection Diagram (Mode 6)



Connection Diagram (Mode 7~Mode 8)



3.3 Cables Used during Test

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

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Cal Date
Radio Communication Tester	CMU200	R&S	3608105673	2010-10-24
Notebook	T61	IBM	3108052508	N/A

4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 18GHz

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.

Test setup

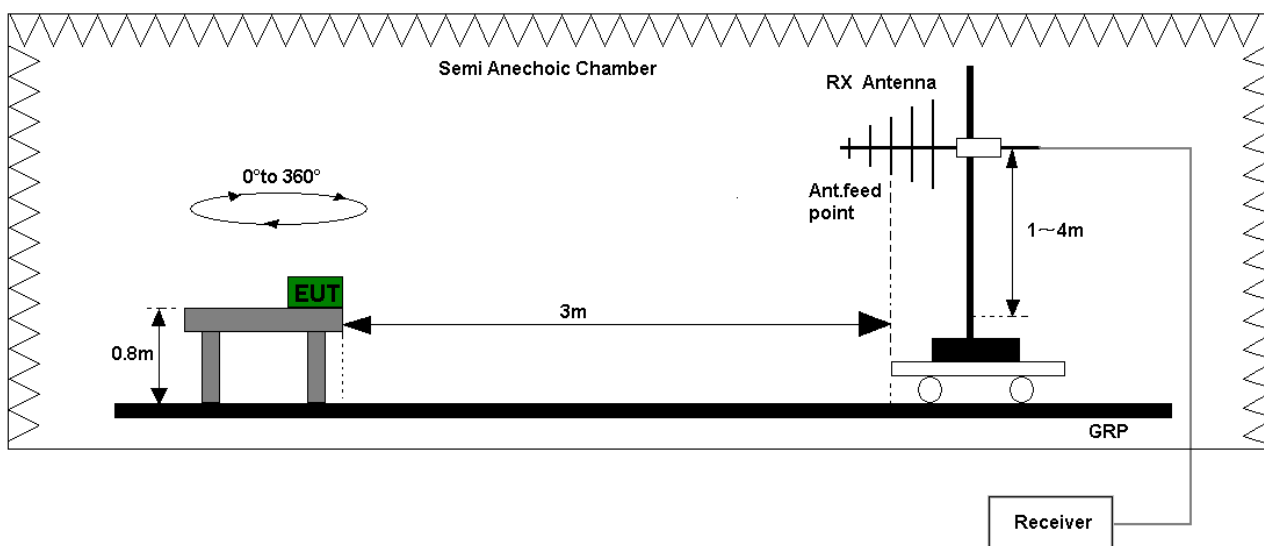


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

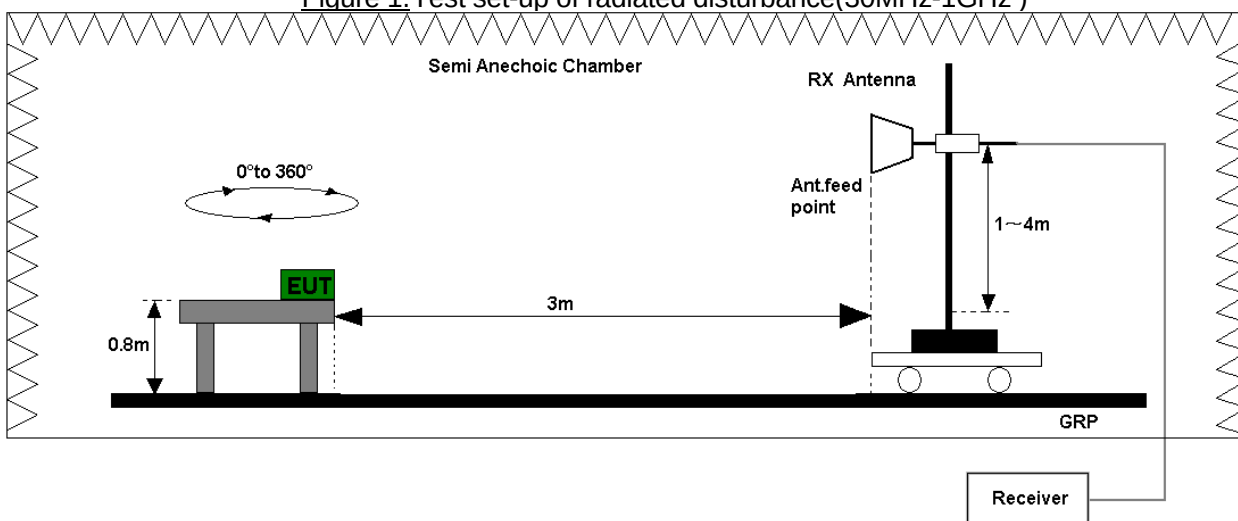


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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	21.3°C
	Relative humidity	25%~75%	50.5%
	Atmospheric pressure	86 kPa~106kPa	100kPa

4.2 Conducted Disturbance 0.15 MHz to 30MHz

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.

Test Setup

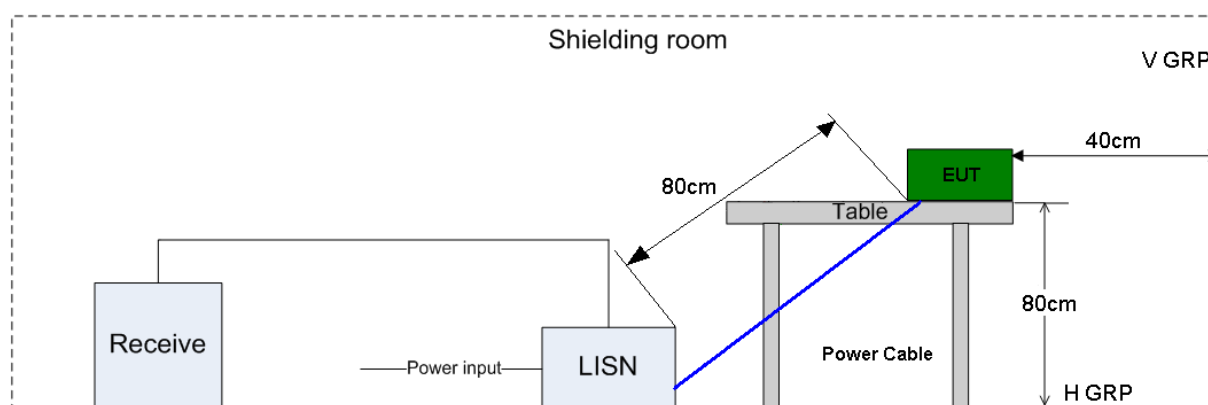


Figure 3. Test Set-up of conducted disturbance

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	20.5°C
	Relative humidity	25%~75%	50.5%
	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

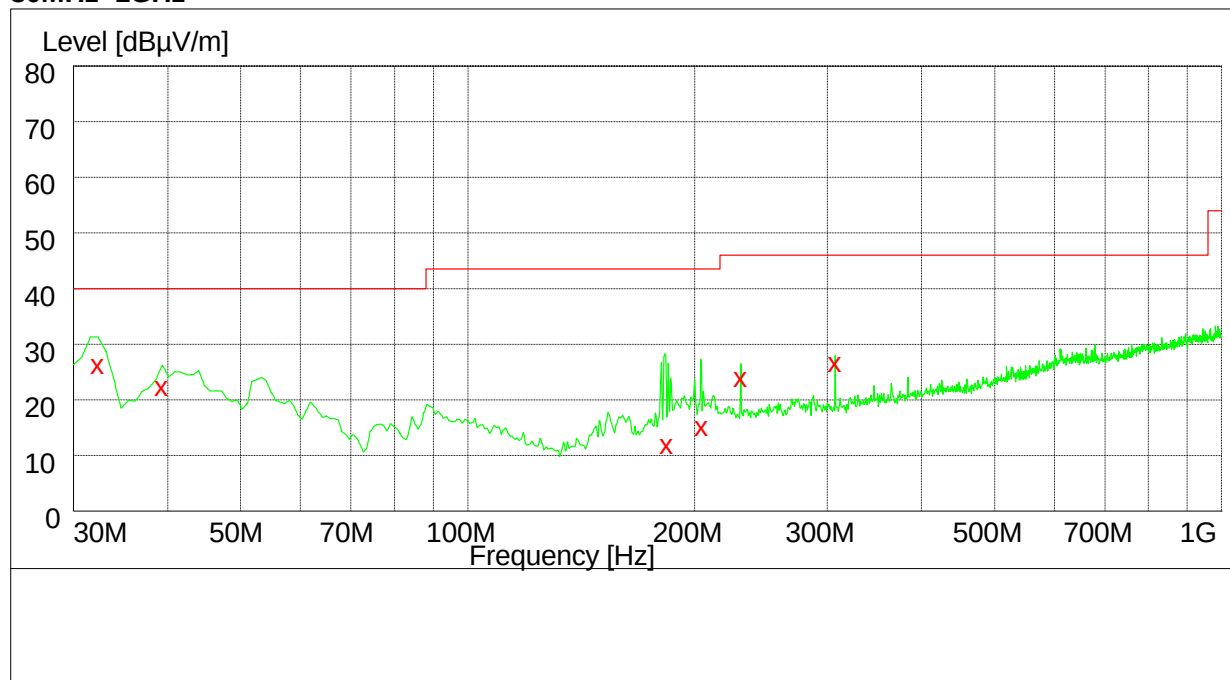
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025

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

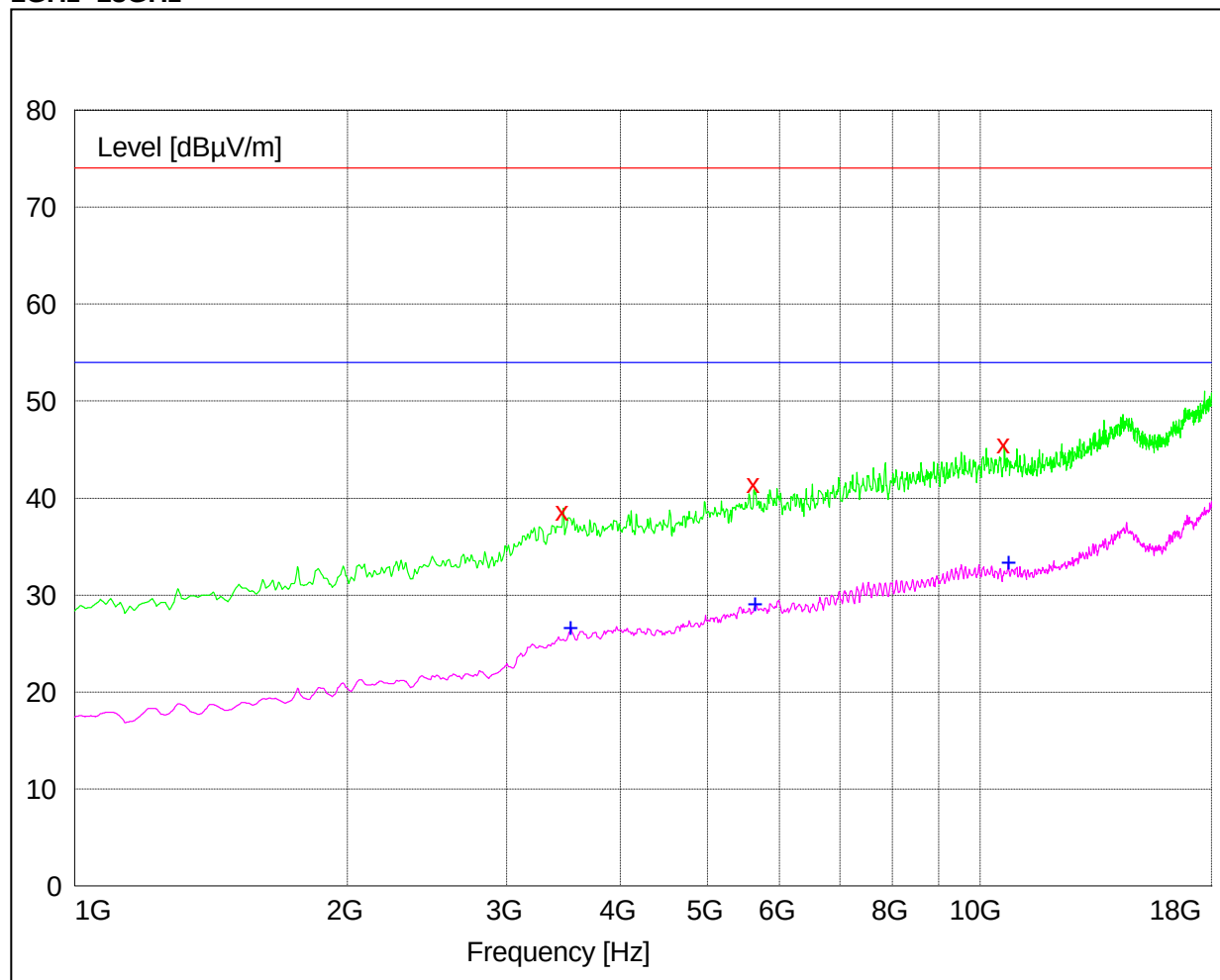
30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
32.340000	26.70	11.7	40.0	13.3	100.0	156.00	VERTICAL
39.360000	22.60	12.9	40.0	17.4	100.0	204.00	VERTICAL
183.720000	12.30	11.3	43.5	31.2	168.0	335.00	VERTICAL
204.720000	15.50	12.3	43.5	28.0	143.0	260.00	HORIZONTAL
230.400000	24.60	13.5	46.0	21.4	100.0	49.00	VERTICAL
307.200000	27.30	15.7	46.0	18.7	100.0	314.00	HORIZONTAL

1GHz~18GHz



MEASUREMENT RESULT: PK Detector

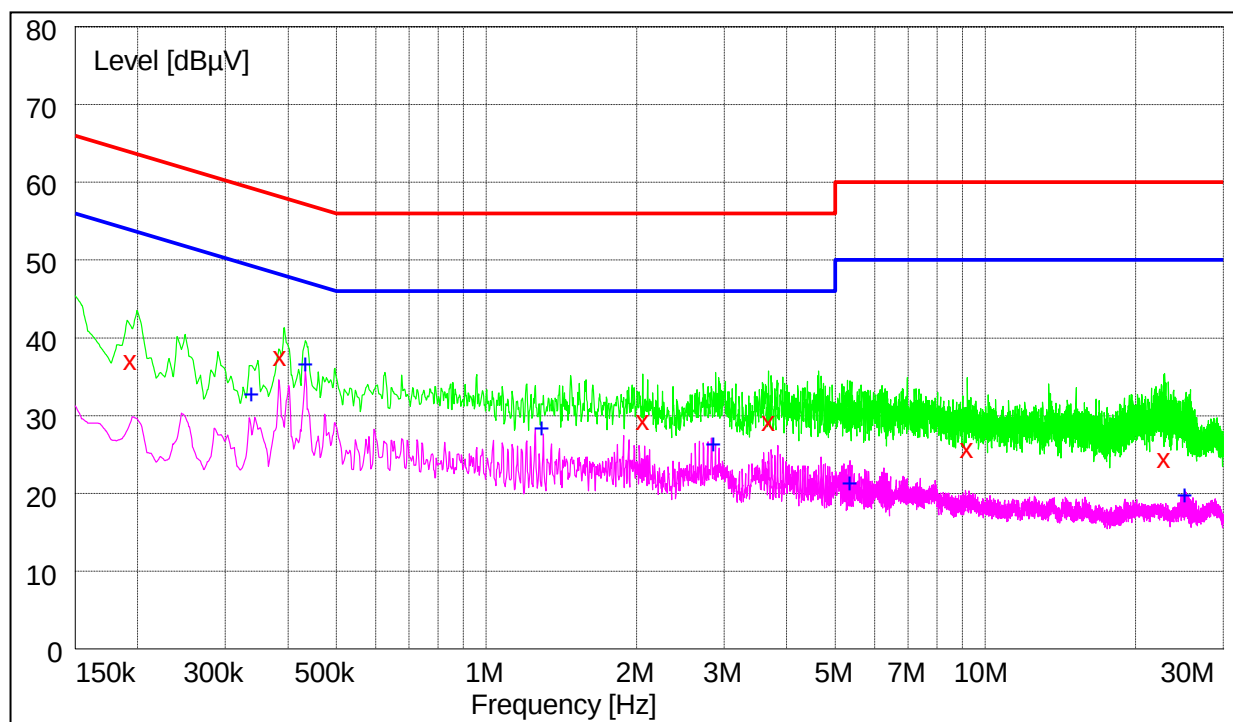
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3457.000000	37.90	-5.5	74.0	36.1	100.0	28.00	VERTICAL
5620.000000	41.20	-1.7	74.0	32.8	100.0	129.00	VERTICAL
10629.000000	44.80	6.7	74.0	29.2	100.0	42.00	VERTICAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3525.000000	26.00	-5.2	54.0	28.0	100.0	10.00	VERTICAL
5640.500000	28.50	-1.3	54.0	25.5	100.0	195.00	VERTICAL
10738.500000	32.50	7.3	54.0	21.5	100.0	89.00	VERTICAL

7.2 Conducted Disturbance

AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.194000	37.60	10.1	64	26.4	N	FLO
0.386000	38.00	10.0	58	20.0	N	FLO
2.066000	29.90	10.1	56	26.1	N	FLO
3.690000	29.80	10.2	56	26.2	N	FLO
9.210000	26.30	10.3	60	33.7	N	FLO
22.892000	25.00	10.4	60	35.0	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.338000	33.20	10.0	49	15.8	N	FLO
0.434000	37.00	10.1	47	10.0	N	FLO
1.292000	28.90	10.1	46	17.1	N	FLO
2.848000	26.80	10.2	46	19.2	N	FLO
5.340000	21.70	10.2	50	28.3	N	FLO
25.102000	20.20	10.4	50	29.8	N	FLO

-----END-----