



# EMC Test Report

**Product Name: cdma2000 Digital Mobile Phone**

**Model Number: C8655,Orinoquia C8655,C8688V,Orinoquia C8688V**

**Report No: SYBH(Z-EMC)098052012-2  
FCC ID: QISC8688V**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China

Tel: +86 755 28780808    Fax: +86 755 89652518



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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:** May.04, 2012  
**Start Date of Test:** May.05, 2012  
**End Date of Test:** May.11, 2012

**Test Result:** Pass

**Approved By** 2012-05-29 **Liuchunlin**   
(Lab Manager) Date Name Signature

**Operator** 2012-05-29 **Daniel**   
Date Name Signature



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## 1 General Information

### 1.1 EUT Description

EUT Description	
Product Name	cdma2000 Digital Mobile Phone
Model Number	C8655,Orinoquia C8655,C8688V,Orinoquia C8688V
IMEI Number	H2K01A9242700443
TX Frequency	CDMA/EVDO 800: 824 MHz To 849MHz Bluetooth: 2400MHz To 2483.5MHz WIFI/ Bluetooth: 2400MHz To 2483.5MHz
RX Frequency	CDMA/EVDO 800: 869 MHz To 894MHz Bluetooth: 2400MHz To 2483.5MHz WIFI/ Bluetooth: 2400MHz To 2483.5MHz GPS: 1575.42MHz
HW Version	HC1C8655M
SW Version	C8688VV100R001C32B823
EUT Accessory	
Data cable	Data Cable USB A Male to Micro USB, Black
Adapter	Manufacturer: Huawei Technologies Co., Ltd. Adapter Model: HW-050100U1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V <del>—</del> 1A Rated Power: 5W S/N: HKABB2414118 S/N: TPAC10558067
Rechargeable Li-ion	Manufacturer: Huawei Technologies Co., Ltd. Battery Model: HB5K1H Rated capacity: 1400mAh Nominal Voltage: <del>—</del> +3.7V Charging Voltage: <del>—</del> +4.2V S/N: UAIC508X153000235 S/N: WHCBA10HI40E6235

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 Standards

APPLIED STANDARD

47 CFR FCC Part 15:2011, 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~ Mode2 Mode4 Mode6 Mode8~ Mode10	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~ Mode5	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.

Test environment condition:

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**

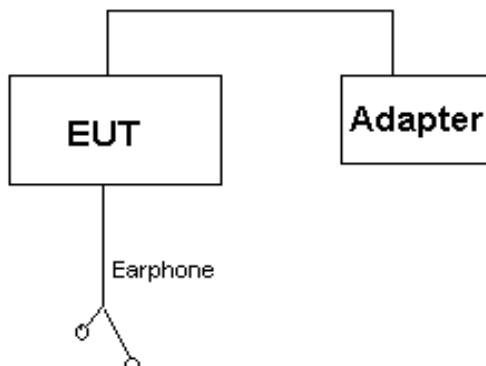
Huawei has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was in this test report and defined as:

Test Mode	
Mode 1:	Adapter + earphone + Camera On + Idle
Mode 2:	Adapter + earphone + MP3 + Idle
Mode 3:	Adapter + earphone + Traffic
Mode 4:	Adapter + earphone + FM + Idle
Mode 5:	Adapter + Traffic
Mode 6:	USB Copy(EUT with PC) + earphone + Idle
Mode 7:	Traffic
Mode 8:	Camera On + earphone + Idle
Mode 9:	Earphone + MP3 + Idle
Mode 10:	Earphone + FM + 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.

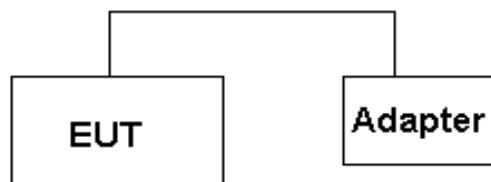
#### **3.2 Test System Configuration**

Connection Diagram (Mode 1~Mode 4)

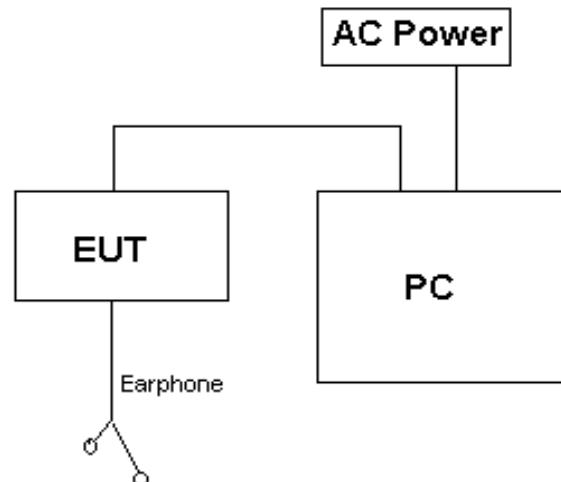




Connection Diagram (Mode 5)



Connection Diagram (Mode 6)

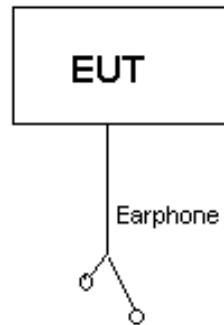




Connection Diagram (Mode 7)



Connection Diagram (Mode 8~Mode 10)





### 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	Calibrated Deadline
Radio Communication Tester	CMU200	R&S	3608105673	2012-11-06
Notebook	T61	IBM	3108052508	N/A
Notebook	D630	DELL	3108060273	N/A

## 4 Electromagnetic Interference (EMI)

### 4.1 Radiated Disturbance 30MHz to 18GHz

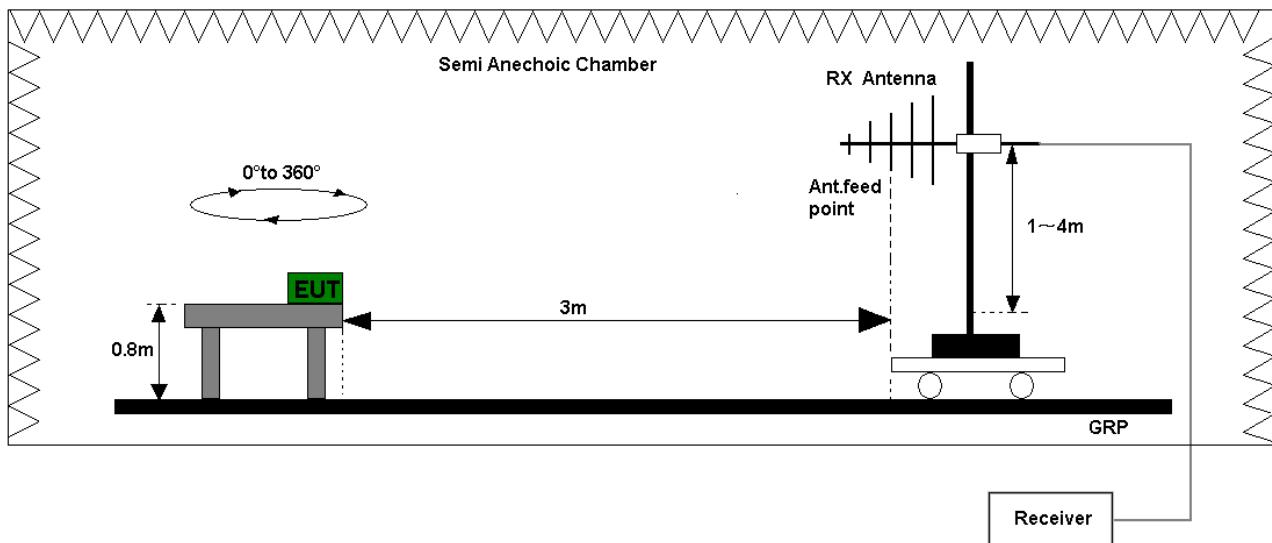
#### Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4-2009. The test distance was 3m. The set-up and test methods were according to ANSI C63.4-2009.

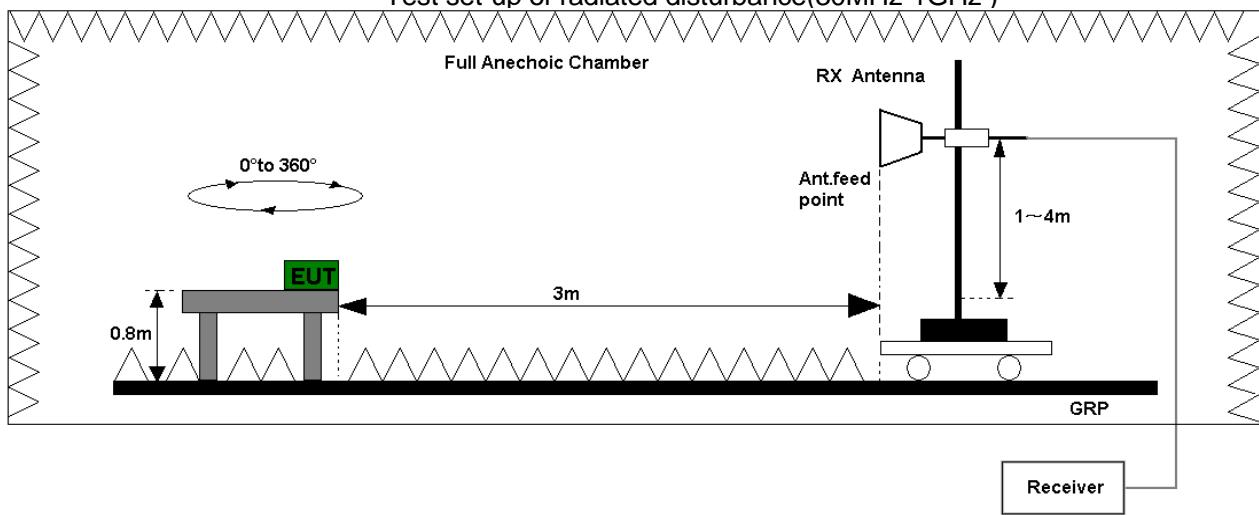
A preliminary scan and a final scan of the emissions were made from 30 MHz to 18 GHz by using test script of software; the emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value was acquired by adjusting the antenna height, polarisation 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.

EUT was configured in idle mode and the test performed at worst emission state.

#### Test setup



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



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( $\mu$ V/m)		Unit(dB $\mu$ 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

### Test Procedure

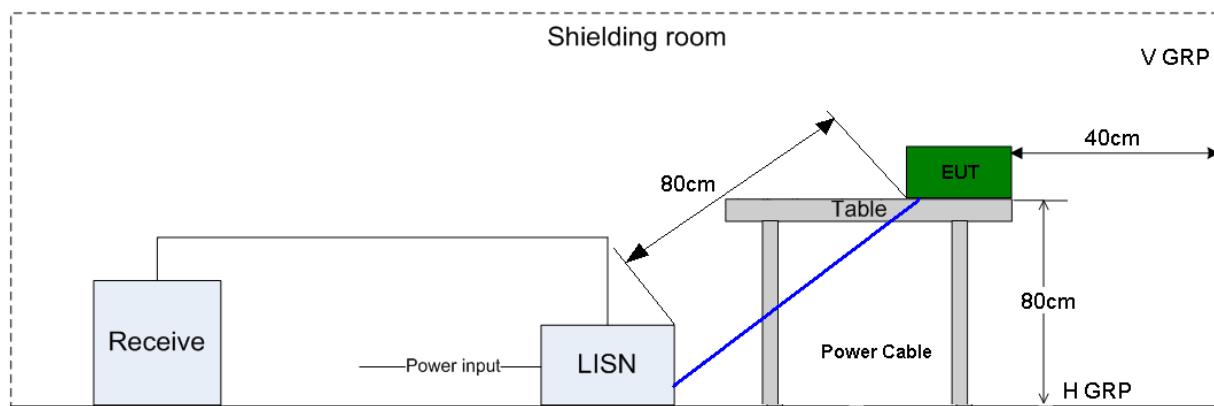
The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm away from LISN. The set-up and test methods were according to ANSI C63.4-2009. Conducted Disturbance 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 shielded chamber and operated under nominal conditions.

### Test Setup



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	66-56dB $\mu$ V	56-46 dB $\mu$ V
0.5MHz~5MHz	56dB $\mu$ V	46 dB $\mu$ V
5MHz~30MHz	60dB $\mu$ V	50 dB $\mu$ V



## 5 Main Test Instruments

Main Test Equipments					
Test item	Test Instrument	Model	S/N	Manufacturer	Calibrated Deadline
RE	EMI Test receiver	ESU26	100150	R&S	May.29, 2012
	Broadband Antenna	VULB 9163	9163-941	SCHWARZBEC K	Jul.07, 2013
	Horn Antenna	HF906	100683	R&S	May.15, 2013
CE	EMI Test receiver	ESCI	101163	R&S	Mar. 05, 2013
	Artificial Mains Network	ENV216	100382	R&S	May.29, 2012
Software Information					
Test Item	Software Name	Manufacturer		Version	
RE	ES-K1	R&S		1.7.1	
CE	EMC32	R&S		8.52.0	

## 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 $\mu$ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB $\mu$ V/m)	U=5.1dB; k=2
CE	Disturbance Voltage (dB $\mu$ V)	U=2.6dB; k=2

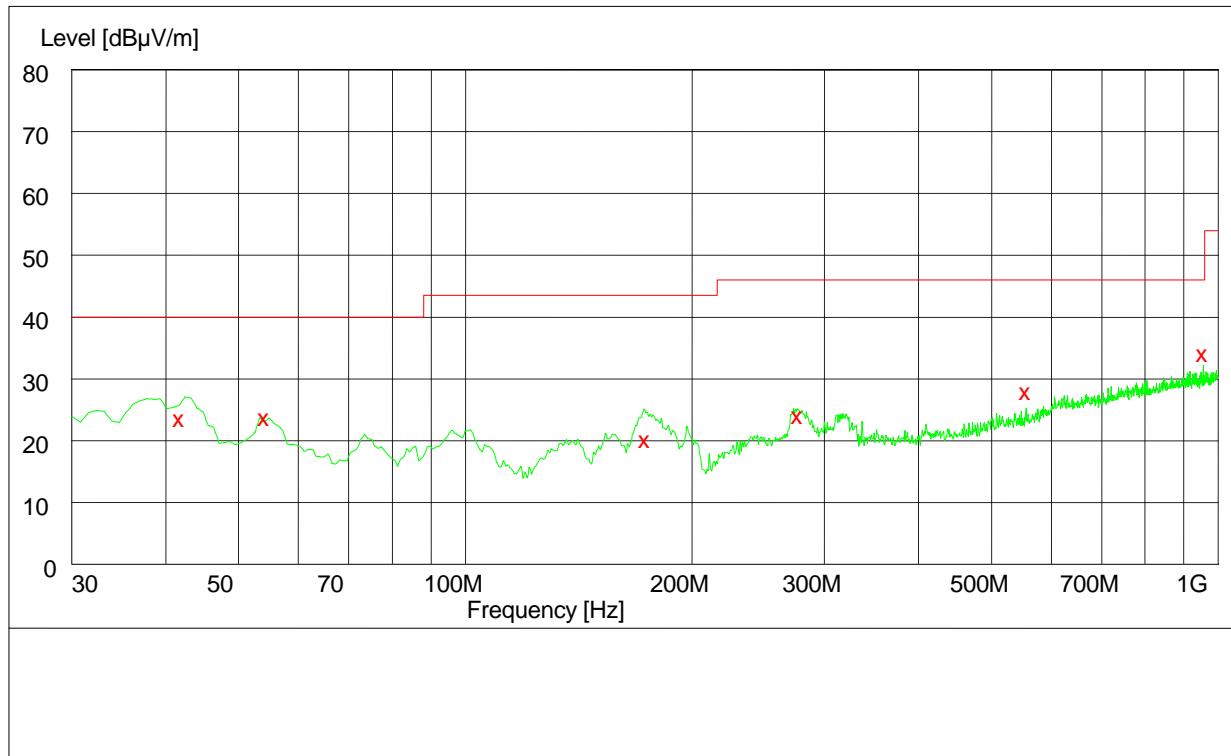


## 7 Test Graph and Data

Only the worst test result was shown in this report.

### 7.1 Radiated Disturbance

30MHz~1GHz

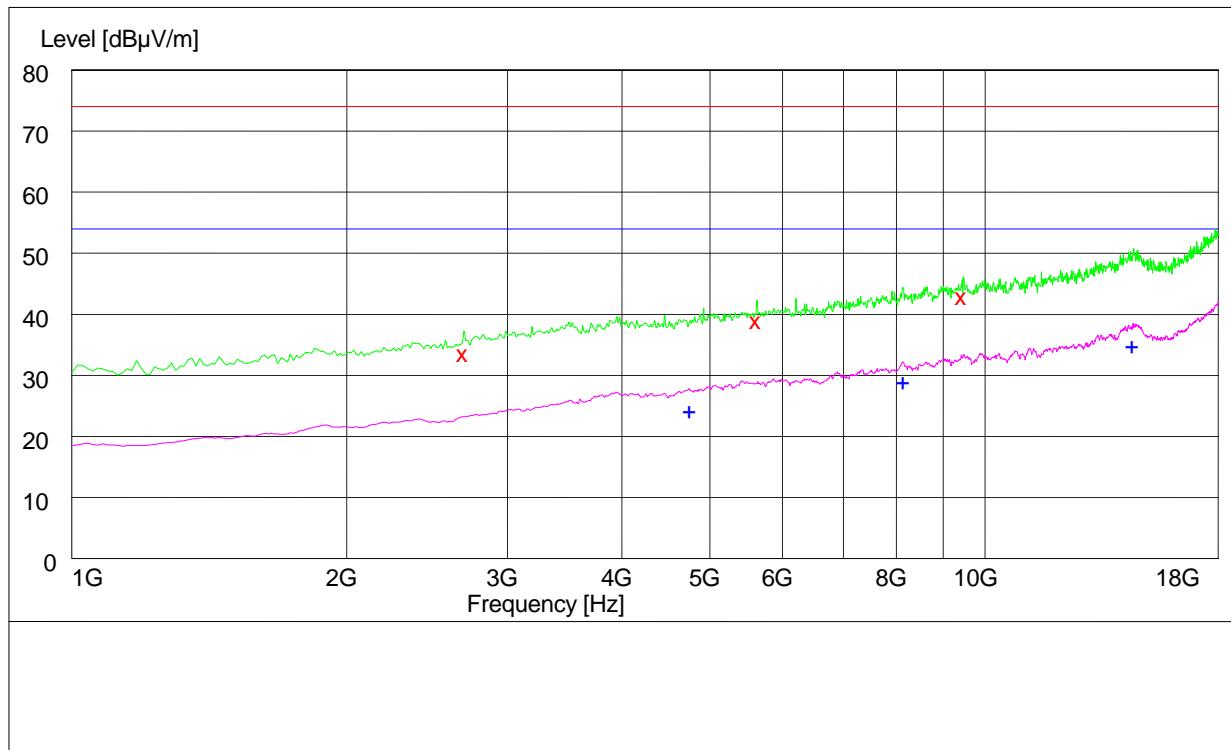


#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB $\mu$ V/m	Transducer dB	Limit dB $\mu$ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
41.820000	23.00	15.2	40.0	17.0	104.0	19.00	VERTICAL
54.180000	23.20	14.7	40.0	16.8	100.0	103.00	VERTICAL
173.640000	19.60	10.8	43.5	23.9	100.0	205.00	VERTICAL
276.840000	23.60	14.6	46.0	22.4	112.0	276.00	HORIZONTAL
556.020000	27.50	20.0	46.0	18.5	198.0	272.00	VERTICAL
955.860000	33.60	25.2	46.0	12.4	146.0	27.00	VERTICAL



## 1GHz~18GHz



### MEASUREMENT RESULT: PK Detector

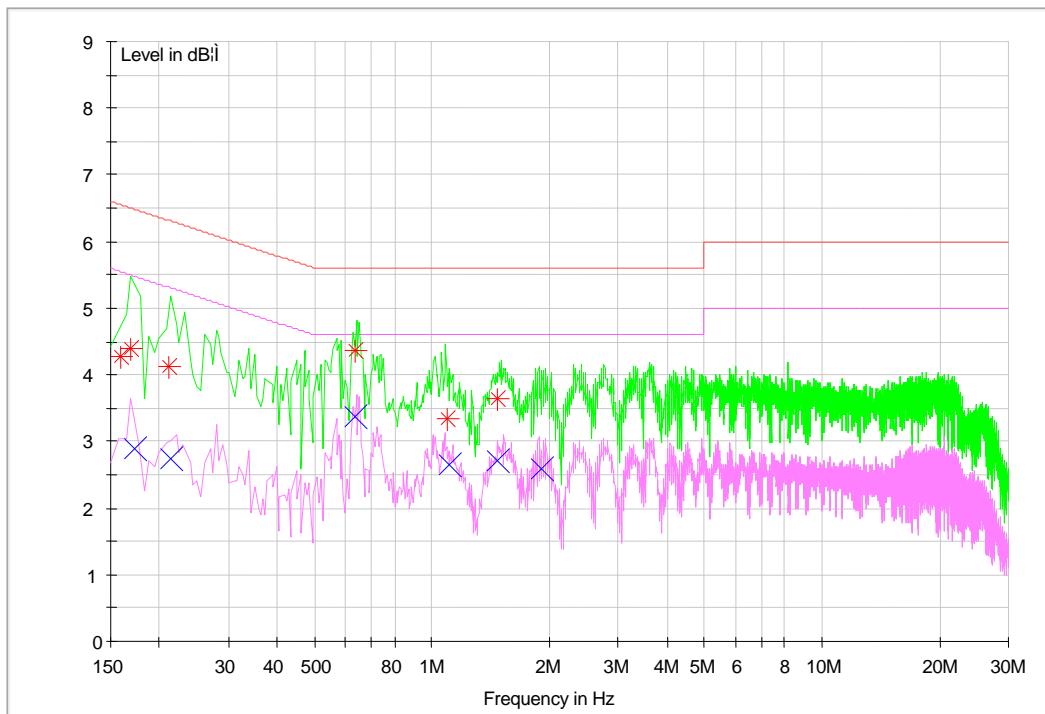
Frequency MHz	Level dB $\mu$ V/m	Transducer dB	Limit dB $\mu$ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
2687.000000	34.10	-9.6	74.0	39.9	100.0	180.00	HORIZONTAL
5619.500000	39.60	-0.4	74.0	34.4	100.0	357.00	HORIZONTAL
9439.500000	43.60	7.2	74.0	30.4	100.0	247.00	VERTICAL

### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB $\mu$ V/m	Transducer dB	Limit dB $\mu$ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
4756.000000	24.90	-2.8	54.0	29.1	200.0	171.00	HORIZONTAL
8142.000000	29.60	5.2	54.0	24.4	100.0	337.00	HORIZONTAL
14507.000000	35.50	14.5	54.0	18.5	200.0	155.00	HORIZONTAL

## 7.2 Conducted Disturbance

### AC Port Test Data



### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB $\mu$ V	Transducer dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.159602	42.8	9.7	65.5	22.7	L1	FLO
0.168814	43.9	9.7	65.0	21.1	L1	FLO
0.210439	41.1	9.7	63.2	22.1	L1	FLO
0.634249	43.8	9.7	56.0	12.2	N	FLO
1.093632	33.5	9.7	56.0	22.5	L1	FLO
1.468376	36.3	9.7	56.0	19.7	N	FLO

### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB $\mu$ V	Transducer dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.171989	28.8	9.7	54.9	26.1	L1	FLO
0.213566	27.5	9.7	53.1	25.6	N	FLO
0.634699	33.6	9.7	46.0	12.4	N	FLO
1.110198	26.5	9.7	46.0	19.5	N	FLO
1.474428	27.2	9.7	46.0	18.8	N	FLO
1.902248	25.8	9.7	46.0	20.2	N	FLO

-----END-----