



# FCC EMC Test Report

**Product Name: HSPA USB Stick**

**Model Number: E173z-6**

**Report No: SYBH(Z-EMC)021092011-2**

**FCC ID: QISE173Z-6**

**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



## Notice

1. The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.
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.
4. The test report is invalid if not marked with "exclusive stamp for the test report".
5. The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.
8. Normally, the test report is only responsible for the samples that have undergone the test.
9. Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.





## TABLE OF CONTENT

1	General Information .....	5
1.1	EUT Description .....	5
1.2	Test Site Information .....	6
1.3	Applied Standard .....	6
2	Summary of Results.....	7
3	System Configuration during EMC Test.....	8
3.1	Test Mode .....	8
3.2	Configurations of Test System.....	8
3.3	Cables Used during Test.....	9
3.4	Associated Equipment Used during Test .....	9
4	Electromagnetic Interference (EMI).....	10
4.1	Radiated Disturbance 30MHz to 18GHz .....	10
4.2	Conducted Disturbance 0.15 MHz to 30MHz.....	12
5	Main Test Instruments.....	13
6	System Measurement Uncertainty .....	13
7	Graph and Data of Emission Test .....	14
7.1	Radiated Disturbance .....	14
7.2	Conducted Disturbance.....	16

## 1 General Information

### 1.1 EUT Description

EUT Description	
Product Name	HSPA USB Stick
Model Number	E173z-6
Serials Number	D8Z3456789ABCDEF
TX Frequency	GSM850: 824MHz To 849MHz PCS1900: 1850MHz To 1910MHz WCDMA850: 824MHz To 849MHz WCDMA1900: 1850MHz To 1910MHz
RX Frequency	GSM850: 869MHz To 894MHz PCS1900: 1930MHz To 1990MHz WCDMA850: 869MHz To 894MHz WCDMA1900: 1930MHz To 1990MHz
HW Version	CH2E303SM
SW Version	21.133.02.00.864
EUT Accessory	
USB Cable	Quantity :1 Type of Cable : shielded

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

<b>Site1:</b>	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
<b>Test Site Location:</b>	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 Mode3	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 Mode3 Mode4	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 Copy(EUT with PC)+Idle
Mode 2:	USB Copy(EUT with PC)+Traffic
Mode 3:	USB Cable + USB Copy(EUT with PC)+Idle
Mode 4:	USB Cable + USB Copy(EUT with 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.

USB Copy:

State of EUT when transfered the data between the EUT and PC

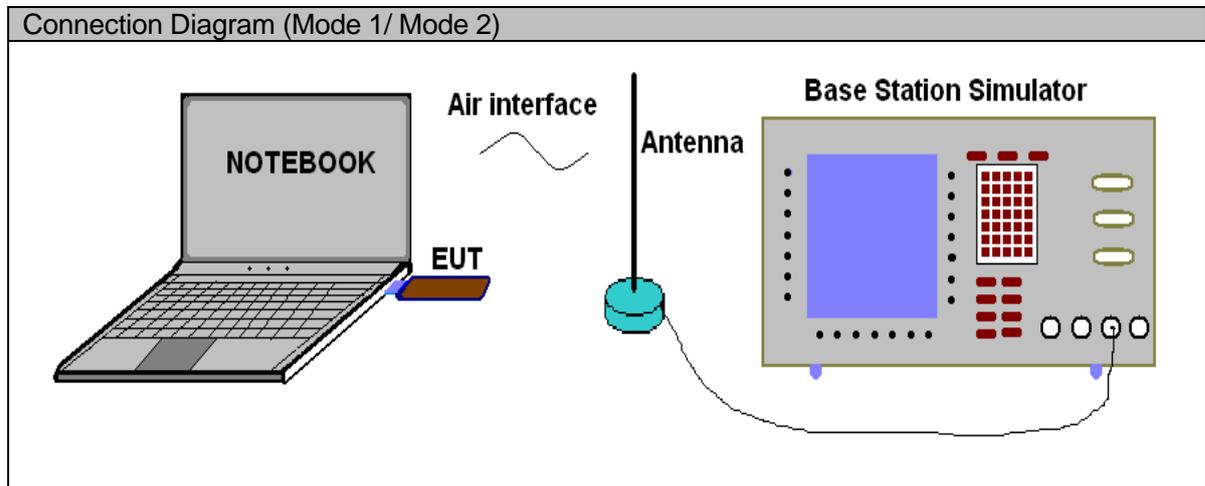
Traffic Mode:

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

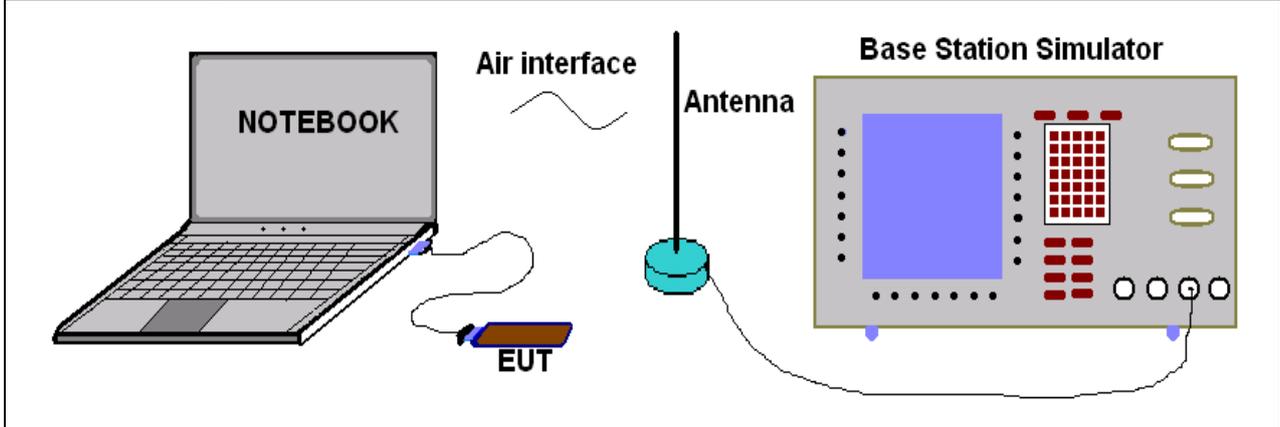
Idle Mode:

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

#### 3.2 Configurations of Test System



Connection Diagram (Mode 3/ Mode 4)



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

## 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

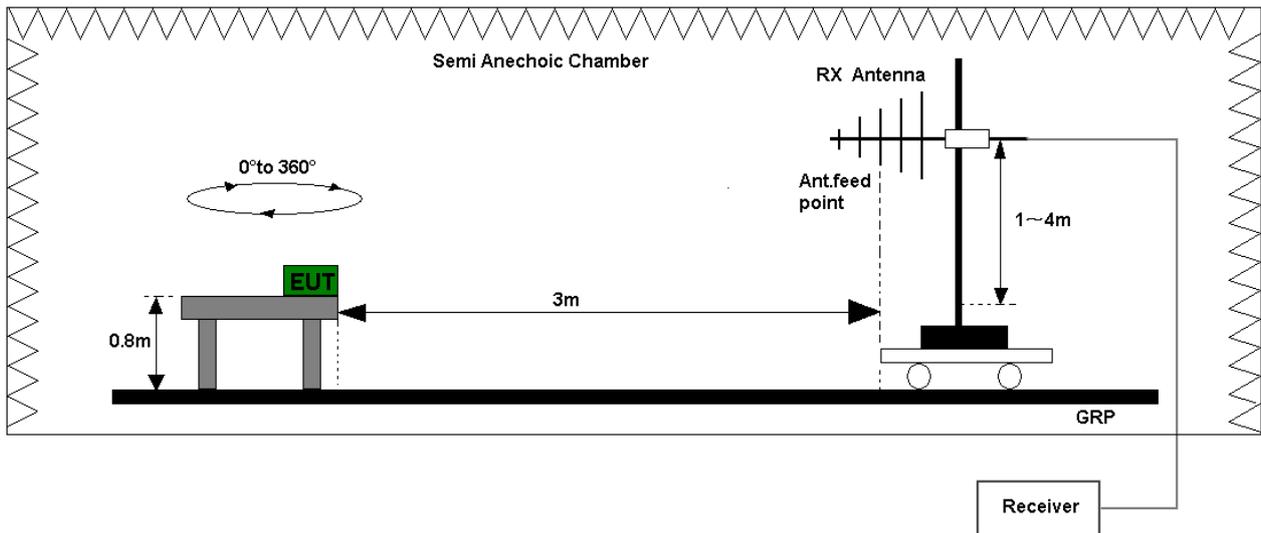


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

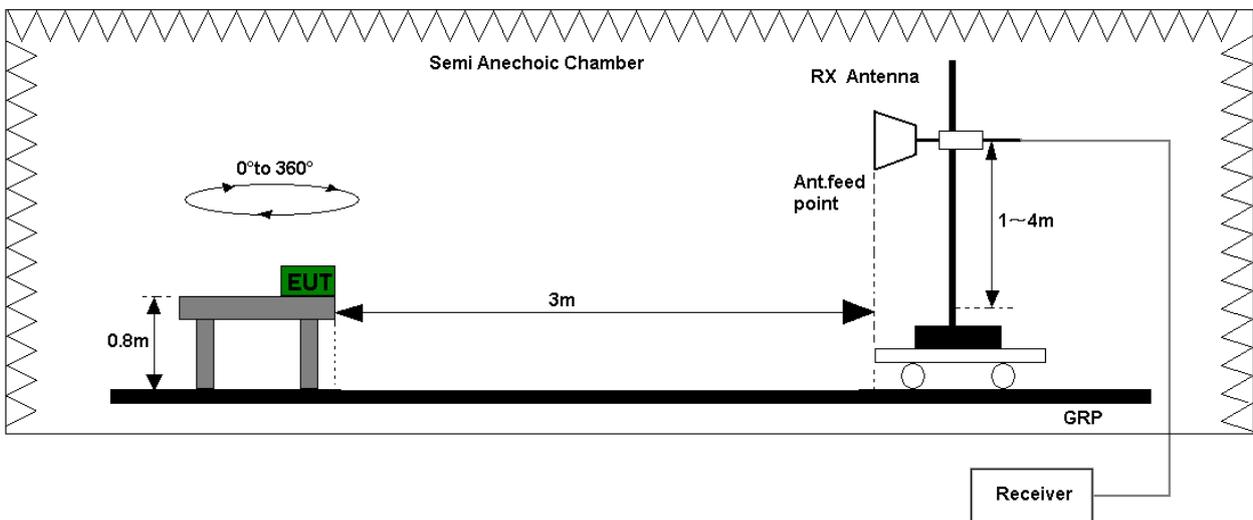


Figure 2. Test set-up of radiated disturbance(above 1GHz)

### 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( $\mu$ 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

Test environment condition:

Performed Item	Item	Required	Actual
Radiated Emission	Ambient temperature	15°C ~ 35°C	22°C
	Relative humidity	25% ~ 75%	52%
	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

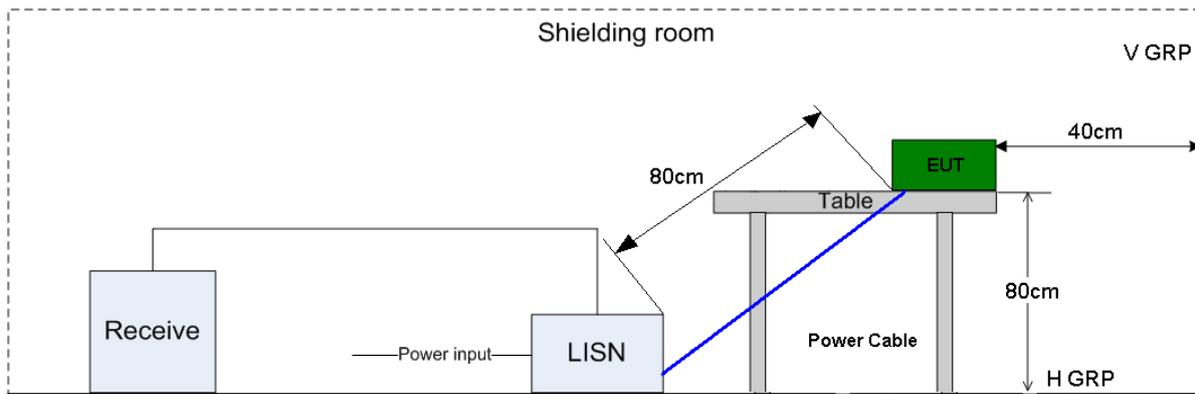


Figure 3. Test Set-up of conducted disturbance

### 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 $\mu$ 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

Test environment condition:

Performed Item	Item	Required	Actual
Conducted Disturbance	Ambient temperature	15°C ~ 35°C	22°C
	Relative humidity	25% ~ 75%	52%
	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

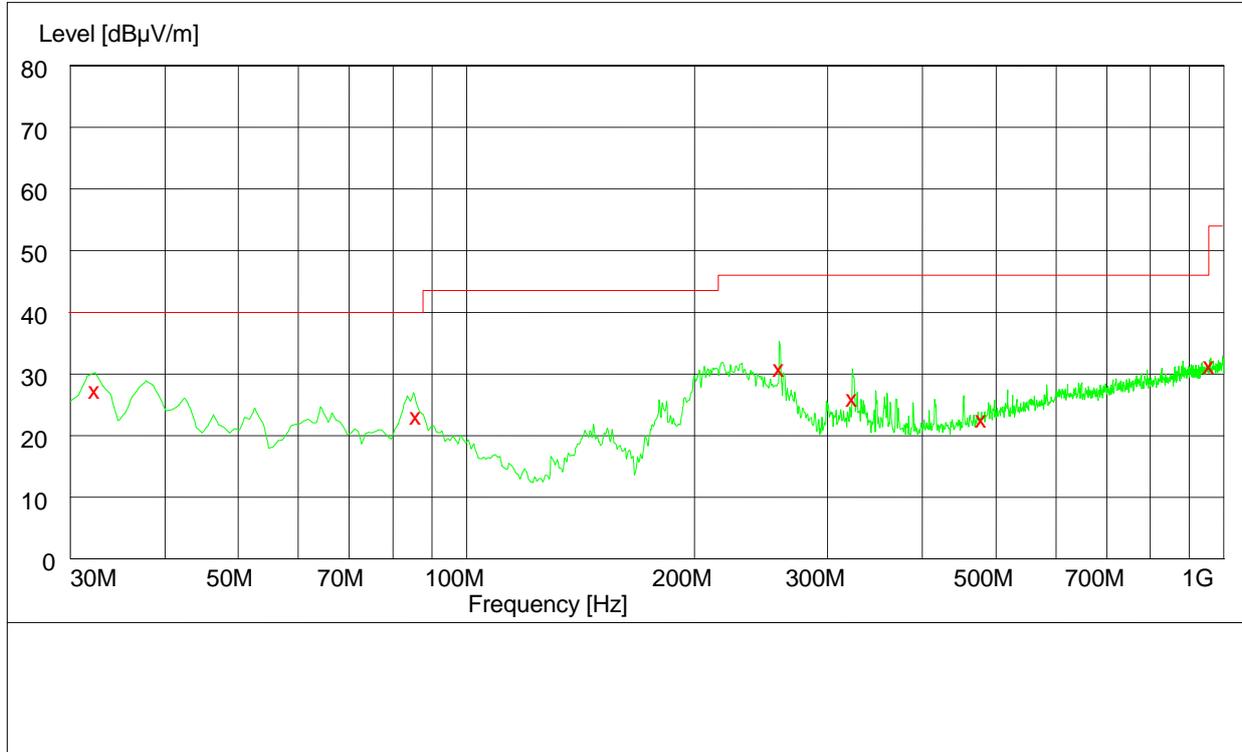
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz,)	Field strength (dB $\mu$ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB $\mu$ V/m)	U=4.1dB; k=2
CE	Disturbance Voltage (dB $\mu$ V)	U=3.4dB; k=2

## 7 Graph and Data of Emission Test

### 7.1 Radiated Disturbance

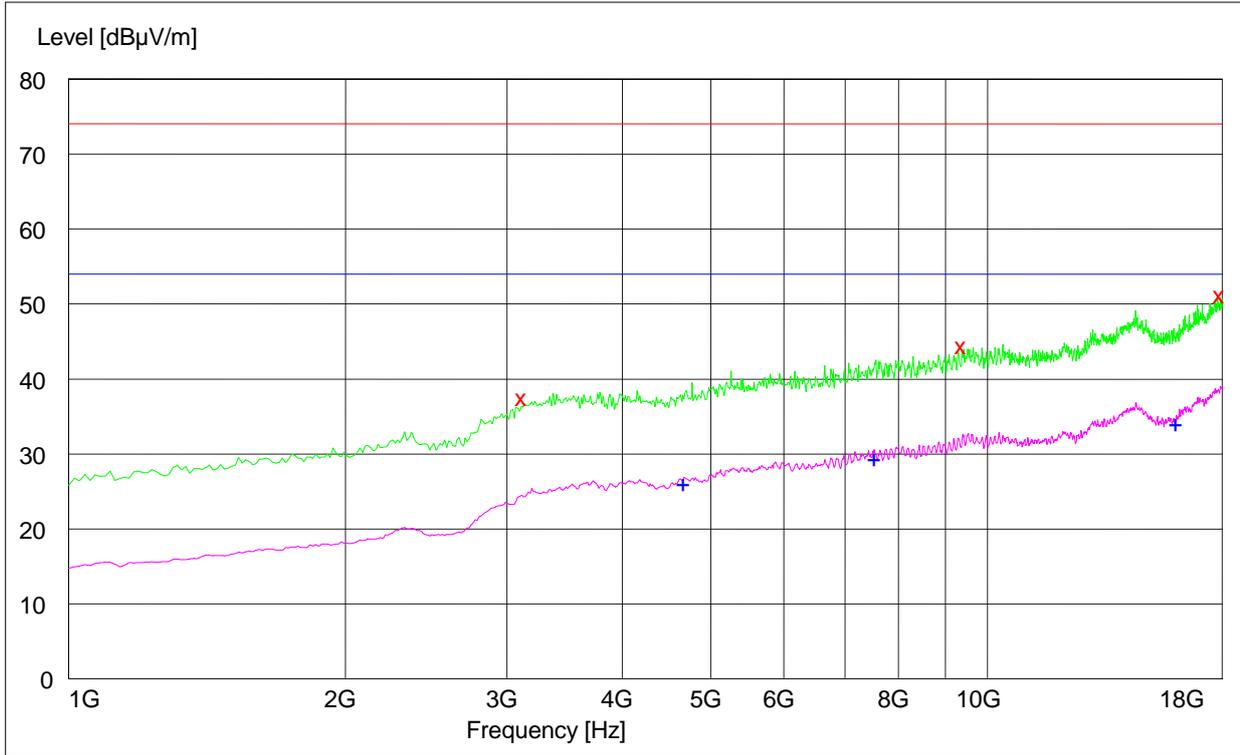
#### 7.1.1 30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
32.388000	27.90	11.7	40.0	12.1	100.0	152.00	VERTICAL
85.996000	23.70	10.5	40.0	16.3	100.0	298.00	VERTICAL
259.220000	31.50	14.2	46.0	14.5	100.0	100.00	HORIZONTAL
323.988000	26.70	16.2	46.0	19.3	100.0	232.00	HORIZONTAL
479.956000	21.90	19.6	46.0	24.1	100.0	305.00	VERTICAL
959.644000	31.50	26.8	46.0	14.5	100.0	309.00	HORIZONTAL

### 7.1.2 1GHz~18GHz



MEASUREMENT RESULT: PK Detector

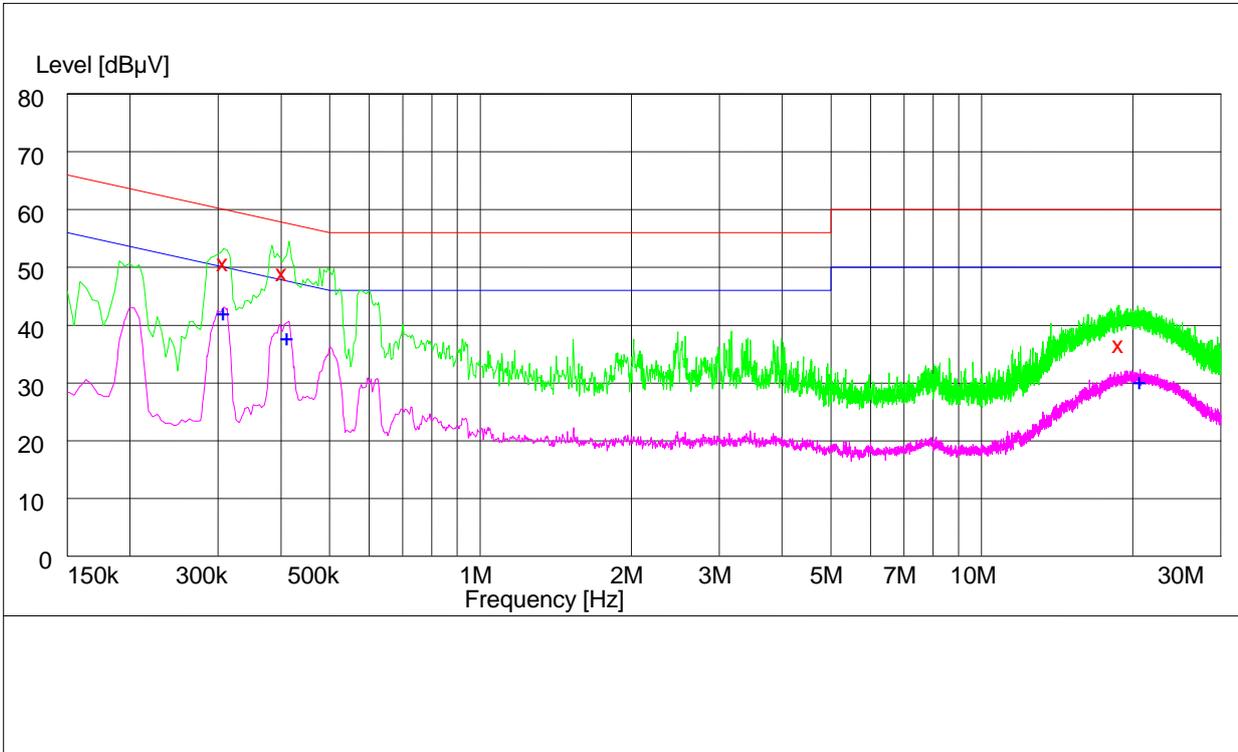
Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
3118.500000	37.70	-7.3	74.0	36.3	100.0	287.00	HORIZONTAL
9384.000000	44.60	6.1	74.0	29.4	100.0	141.00	HORIZONTAL
17912.000000	51.30	19.2	74.0	22.7	100.0	213.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
4672.000000	26.20	-4.1	54.0	27.8	100.0	31.00	HORIZONTAL
7535.000000	29.60	2.5	54.0	24.4	100.0	360.00	VERTICAL
16036.000000	34.10	14.3	54.0	19.9	100.0	347.00	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
0.308000	51.50	10.0	60	8.5	N	FLO
0.404000	49.70	10.0	58	8.3	L1	FLO
18.818000	37.30	10.3	60	22.7	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.308000	42.80	10.0	50	7.2	L1	FLO
0.412000	38.60	10.0	48	9.4	L1	FLO
20.726000	31.00	10.4	50	19	N	FLO

-----END-----