



# EMC Test Report

**Product Name: HSPA Module**

**Model Number: MU609**

**Report No: SYBH(Z-EMC)024052013-2**

**FCC ID: QISMU609**

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

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## 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 passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
3. 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.
4. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
5. The test report is invalid if not marked with "exclusive stamp for the test report".
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9. Normally, the test report is only responsible for the samples that have undergone the test.
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**Applicant:** Huawei Technologies Co., Ltd.  
**Address:** Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C  
**Date of Receipt Test Item:** May.06, 2013  
**Start Date of Test:** May.08, 2013  
**End Date of Test:** May.14, 2013  
**Test Result:** Pass

**Approved By  
(Lab Manager)**

2013-05-20  
Date

Liu Chunlin  
Name

Signature

**Operator  
(Test Engineer)**

2013-05-20  
Date

Zheng Ke  
Name

Signature



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**Modification Record**

No.	Last Report No.	Modification Description
1	NA	First report



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## 1 General Information

### 1.1 EUT Description

EUT Description	
Product Name	HSPA Module
Model Number	MU609
Input voltage	DC 3.3V
TX Frequency	GSM 850:824 MHz To 849 MHz GSM1900:1850MHz To 1910MHz WCDMA BAND II:1850 MHz To 1910 MHz WCDMA BAND V: 824MHz To 849 MHz
RX Frequency	GSM850:869MHz To 894MHz GSM1900:1930MHz To 1990MHz WCDMA BAND II:1930 MHz To 1990 MHz WCDMA BAND V: 869MHz To 894MHz GPS: 1575.42MHz;
S/N	R8U01A9341100194
HW Version	MD1MU609M01
SW Version	11.103.65.02.00

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



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## 1.2 Test Site Information

Site 1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

## 1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15:2012, 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	Mode 2	CLASS B	Pass	Site1
<u>Conducted Emissions</u> <input checked="" type="checkbox"/> AC Power Port	Mode 1~Mode 2	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.				

During the measurement, the environmental conditions complied with the range listed as below.

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 below:

Test Mode	
Mode 1:	Traffic
Mode 2:	Idle

Traffic Mode:

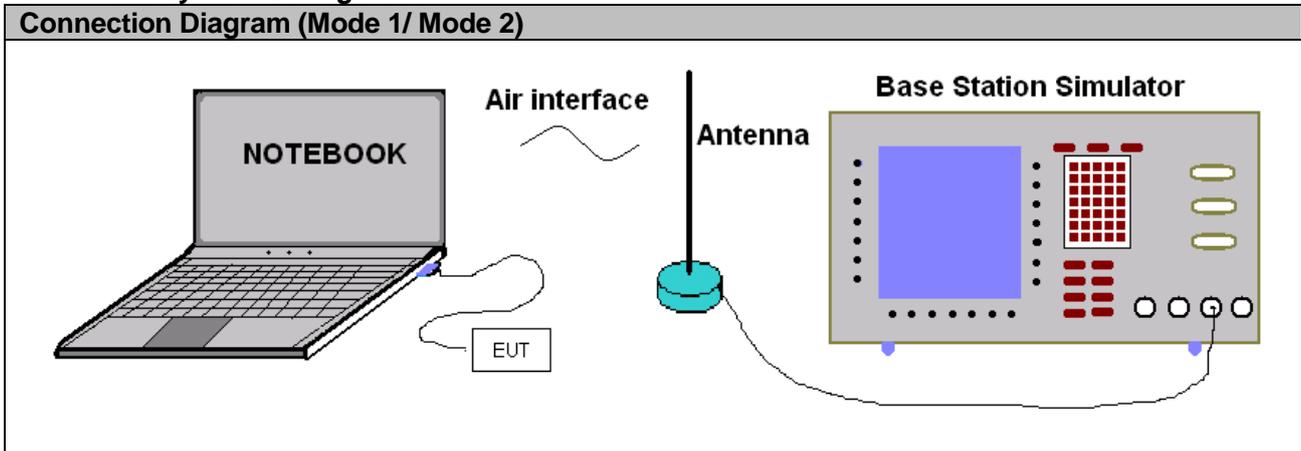
State of EUT when switched on and with Radio Resource Control (RRC) connection established

Idle Mode:

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

#### 3.2 Test System Configuration

##### Connection Diagram (Mode 1/ Mode 2)





### 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	Calibrated Deadline	Cal interval (month)
Radio Communication Tester	CMU200	R&S	3607111924	2013-06-07	12
Demo Board	MD1EM770T VER. A	Huawei	/	/	/
Notebook	X200	ThinkPad	31090403588	/	/

## 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 C63.4-2009. 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.

Measurement bandwidth (RBW) for 30MHz to 1000 MHz: 120 kHz;

Measurement bandwidth (RBW) for 1000MHz to 18000 MHz: 1MHz;

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

#### 4.1.2 Test setup

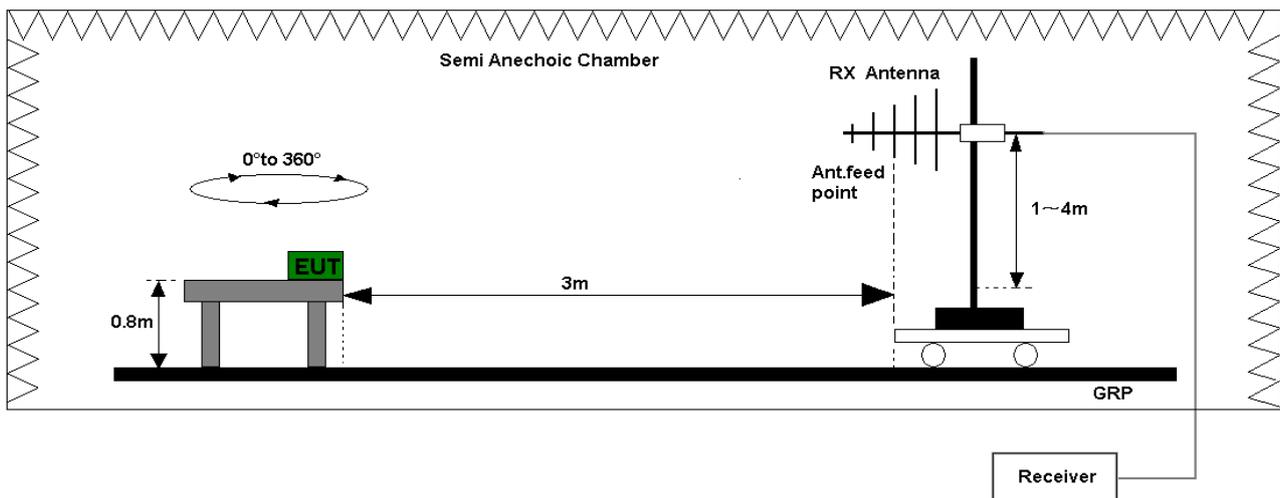


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

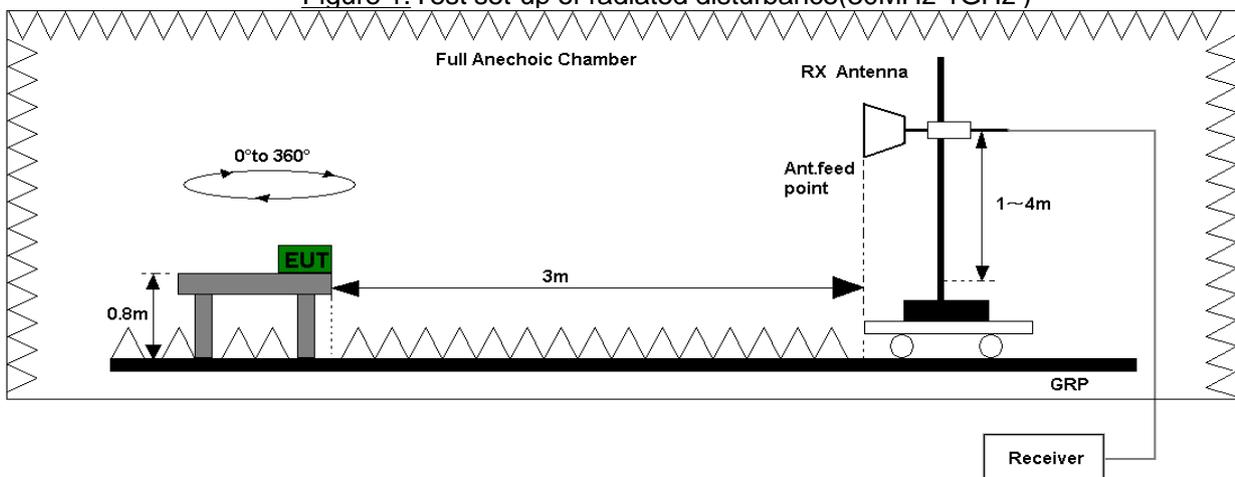


Figure 2. Test set-up of radiated disturbance(above 1GHz)



### 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

## 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 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 150 kHz to 30 MHz: 9 kHz;

The EUT was set in the shielded chamber and operated under nominal conditions.

### 4.2.2 Test Setup

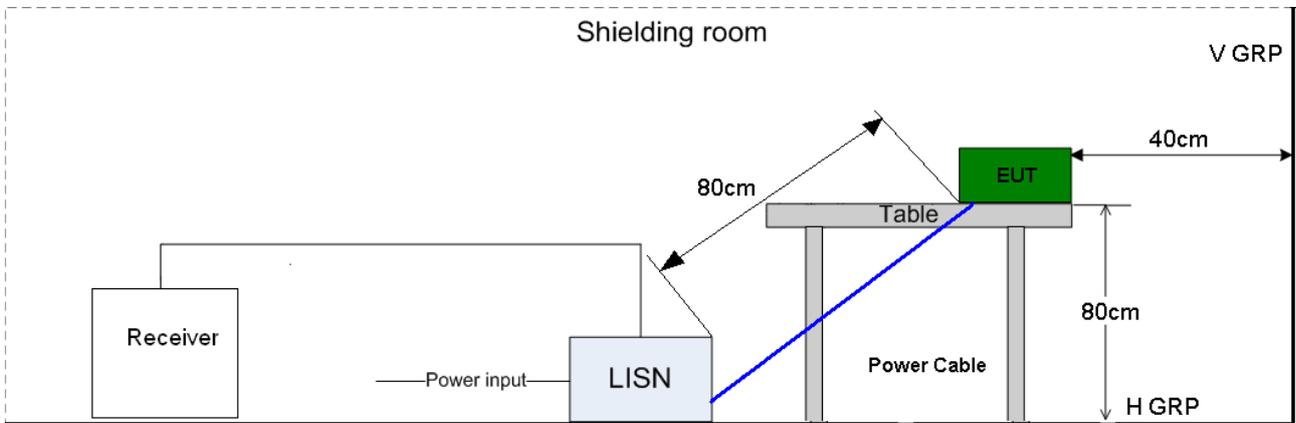


Figure 3. Test Set-up of conducted disturbance

### 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



## 5 Main Test Instruments

Main Test Equipments						
Test item	Test Instrument	Model	S/N	Manufacturer	Calibrated Deadline	Cal interval (month)
RE	EMI Test receiver	ESU26	100150	R&S	May.27, 2013	12
	Broadband Antenna	VULB 9163	9163-356	SCHWARZ BECK	May.27, 2014	24
	Horn Antenna	HF906	100683	R&S	Feb.01, 2015	24
CE	EMI Test receiver	ESCI	101163	R&S	Jan. 28, 2014	12
	Artificial Mains Network	ENV216	100382	R&S	Jan. 28, 2014	12
Software Information						
Test Item	Software Name	Manufacturer		Version		
RE	ES-K1	R&S		1.7.1		
CE	EMC32	R&S		V8.52.0		

## 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

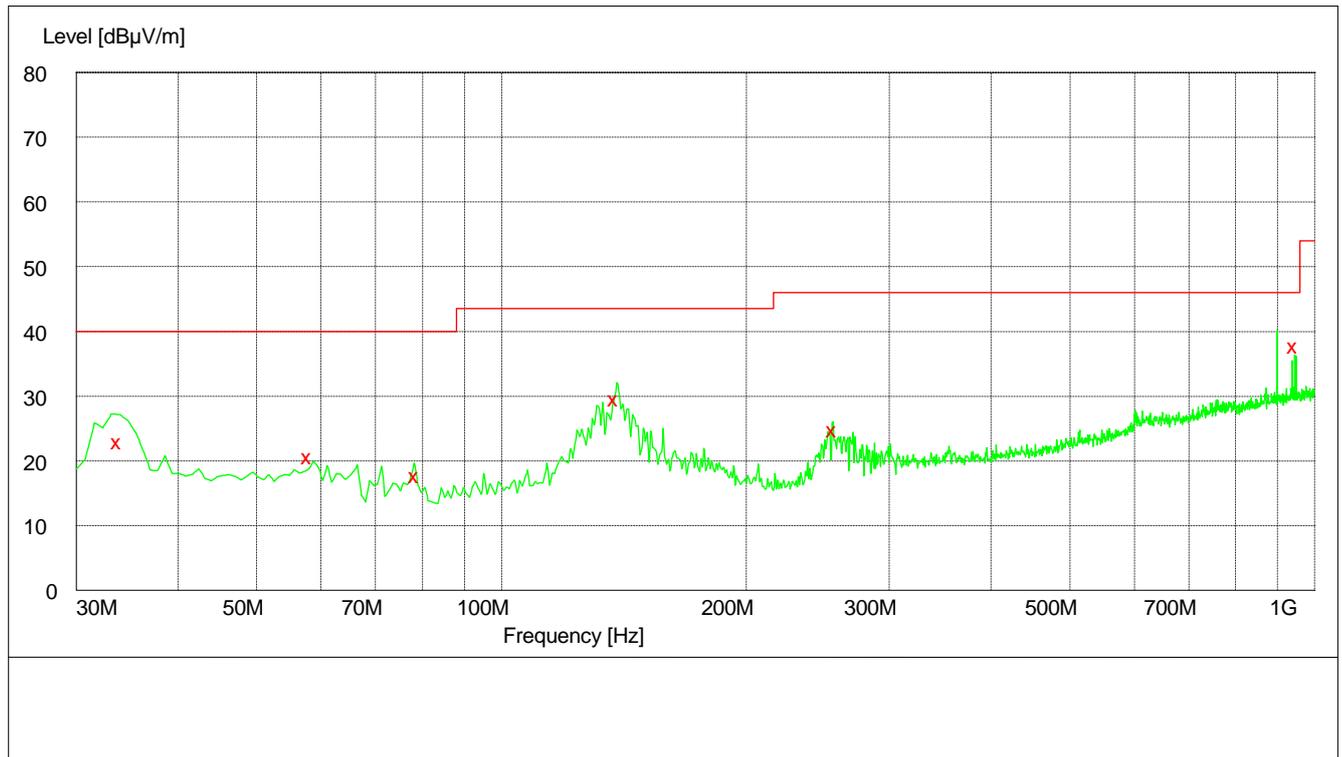


## 7 Test Data and Graph

Only the worst test result was shown in this report.

### 7.1 Radiated Disturbance

#### 30MHz~1GHz



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
33.840000	23.20	14.9	40.0	16.8	100.0	148.00	VERTICAL
57.960000	20.90	13.8	40.0	19.1	100.0	259.00	VERTICAL
78.540000	18.00	10.6	40.0	22.0	162.0	184.00	VERTICAL
137.940000	29.80	10.1	43.5	13.7	102.0	0.00	VERTICAL
256.680000	25.00	14.1	46.0	21.0	102.0	262.00	HORIZONTAL
945.240000	38.00	25.3	46.0	8.0	100.0	217.00	VERTICAL

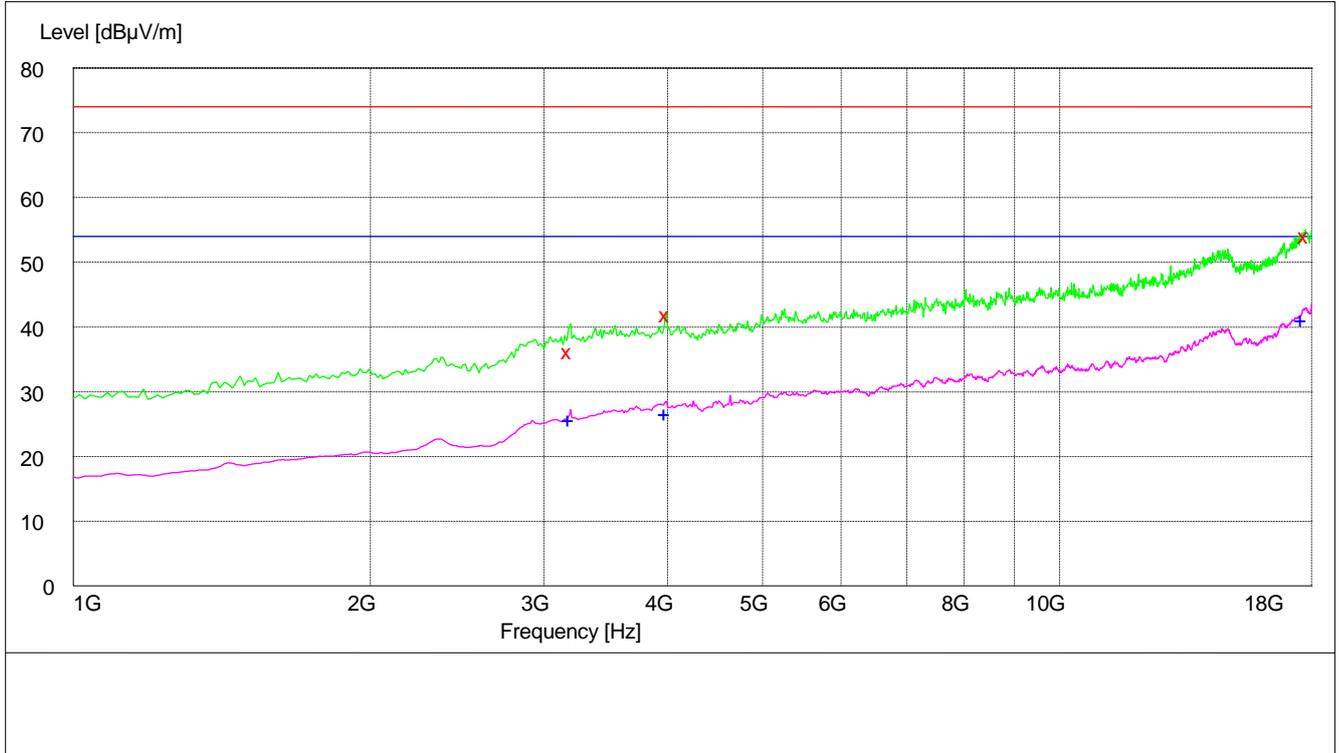
Note:

Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.



**1GHz~18GHz**



**MEASUREMENT RESULT: PK Detector**

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3180.500000	36.50	-6.3	74.0	37.5	149.0	213.00	VERTICAL
3994.500000	42.10	-3.5	74.0	31.9	100.0	321.00	VERTICAL
17737.100000	54.30	21.4	74.0	19.7	128.0	62.00	VERTICAL

**MEASUREMENT RESULT: AV Detector**

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3186.600000	25.90	-6.3	54.0	28.1	101.0	248.00	VERTICAL
3984.500000	26.90	-3.6	54.0	27.1	114.0	323.00	VERTICAL
17622.700000	41.40	21.0	54.0	12.6	101.0	193.00	VERTICAL

Note:

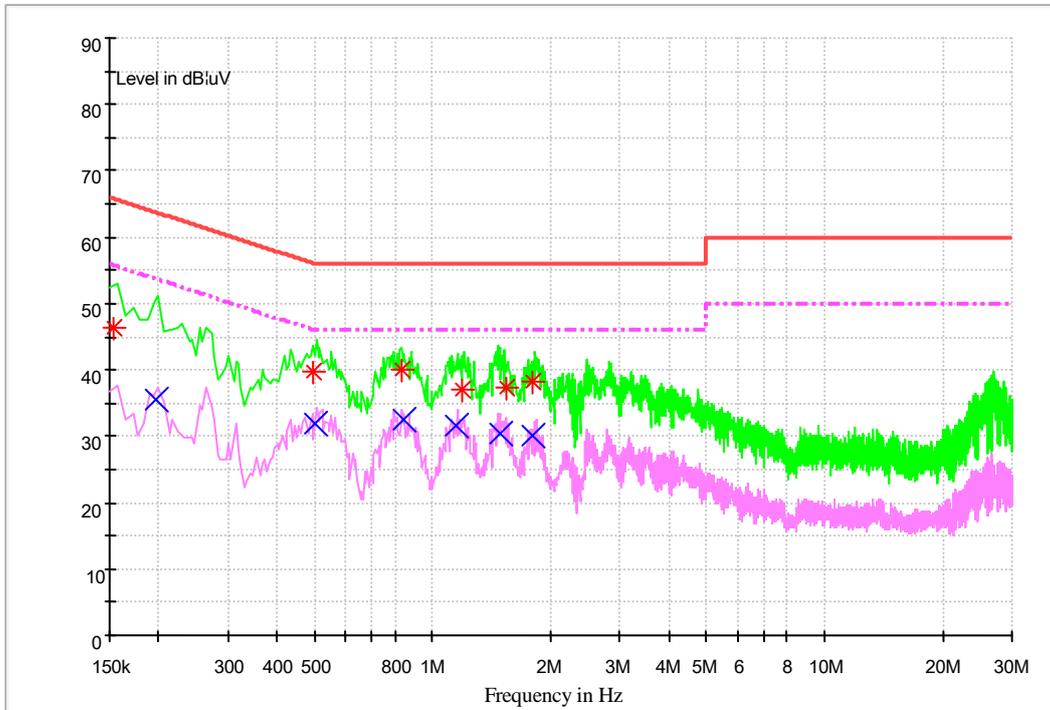
Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.



## 7.2 Conducted Disturbance

### AC Port Test Data



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.153472	46.5	L1	9.7	19.3	65.8	FLO
0.497742	39.8	N	9.7	16.2	56.0	FLO
0.833198	40.1	N	9.7	15.9	56.0	FLO
1.194408	37.1	L1	9.7	18.9	56.0	FLO
1.540159	37.2	N	9.7	18.8	56.0	FLO
1.806224	38.2	N	9.7	17.8	56.0	FLO

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.196526	35.4	N	9.7	18.4	53.8	FLO
0.503682	31.9	N	9.7	14.2	46.0	FLO
0.839352	32.5	N	9.7	13.5	46.0	FLO
1.153073	31.7	N	9.7	14.3	46.0	FLO
1.493708	30.4	N	9.7	15.6	46.0	FLO
1.799104	30.1	N	9.7	15.9	46.0	FLO

Note:

Level= Reading level+ Transd (cable loss + correction factor)



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The reading level is calculated by software which is not shown in the sheet.

-----**END**-----