EMC Test Report

Product Name: **Mobile WiFi**

Product Model: **HWD37**

Report Number: **SYBH(Z-EMC)20180903005001**

FCC ID：QISRUCOLA

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Compliance and Testing Center of Huawei Technologies Co., Ltd)

No.2 New City Avenue Songshan Lake Sci. &Tech. Industry Park, Dongguan, Guangdong, 523808, P.R.C

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

Notice

1. **The laboratory has passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310 for site 1 and L0570 for site 2.**
2. **The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01 for site 1 and 4353.01 for site 2.**
3. **The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.**
4. **The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named "Global Compliance and Testing Centre of Huawei Technologies Co., Ltd", the both names have coexisted since 2009.**
5. **The laboratory has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN1173 for site 1 and CN1210 for site 2, and the Test Firm Registration Number is 294140 for site 1 and 182947 for site 2.**
6. **The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.**
7. **The test report is invalid if there is any evidence of erasure and/or falsification.**
8. **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.**
9. **Normally, the test report is only responsible for the samples that have undergone the test.**
10. **Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.**

Applicant:	Huawei Technologies Co., Ltd.
Address:	No.2 New City Avenue Songshan Lake Sci. &Tech. Industry Park, Dongguan, Guangdong, P.R.C
Date of Receipt Test Item:	2018-09-18
Start Date of Test:	2018-09-18
End Date of Test:	2018-10-10
Test Result:	Pass

Approved By (Lab Manager)	**2018-10-15**	**HeHao**	He Hao
	Date	**Name**	**Signature**
Operator (Test Engineer)	**2018-10-12**	**FuLiangliang**	Fu Liang liang
	Date	**Name**	**Signature**

Modification Record

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

TABLE OF CONTENT

1 General Information

1.1 EUT Description

EUT Description	
Product Name	Mobile WiFi
Model Number	HWD37
Input voltage	Vnom 3.8V
TX Frequency	UMTS Band 2: 1850MHz to 1910MHz UMTS Band 5: 824MHz to 849MHz LTE BAND 5: 824MHz to 849MHz LTE BAND 17: 704MHz to 716MHz WIFI: 2400MHz to 2472MHz Bluetooth(BLE) : 2400MHz to 2483.5MHz
RX Frequency	UMTS Band 2: 1930MHz to 1990MHz UMTS Band 5: 869MHz to 894MHz LTE BAND 5: 869MHz to 894MHz LTE BAND 17: 734MHz to 746MHz WIFI: 2400MHz to 2472MHz Bluetooth (BLE) : 2400MHz to 2483.5MHz
S/N	869424030014528
HW Version	CL2KD20M VER. B
SW Version	8.0.1.31(H25SP2C824)
EUT Accessory	
B receptacle-TYPE C plug	Signal Cable,5V2A Adapter,B receptacle,TYPE C plug,LSZH Manufacturer: FOXCONN Luxshare DEHONG
Rechargeable Li-ion	Manufacturer: Huawei Technologies Co.,Ltd. Battery Model: HB494590EBC-B Rated capacity: 3000mAh Nominal Voltage: ⎓ +3.8V Charging Voltage: ⎓ +4.25V SN: 5XNHSCI519900200

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

1.2 Test Site Information

Test Site 1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	No.2 New City Avenue Songshan Lake Sci. &Tech. Industry Park, Dongguan, Guangdong, P.R.C
Test Site 2:	Shenzhen Academy of Information and Communications Technology
Test Site Location:	Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, People’s Republic of China 518000

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15 2016, Subpart B
ICES-003 Issue 5

2 Summary of Results

Summary of Results				
Test Items	**Test Mode**	**Performance Class & Required Performance Criteria**	**Result**	**Site**
Radiated Emissions Enclosure Port	Mode1 Mode3	CLASS B	Pass	Site2
Conducted Emissions ☒ DC Power Port ☒ AC Power Port ☐ Telecommunication Ports	Mode1~Mode 4	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the uncertainty of test system. 2, ☒ The item has been tested; ☐ 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

The EUT was configured, installed, arranged and operated in a manner consistent with typical application. The following mode(s) were applied during the compliance test.

Test Mode	
Mode 1:	EUT with adapter +USB Cable +Idle Mode
Mode 2:	EUT with adapter +USB Cable +Traffic Mode
Mode 3:	EUT with PC+USB Cable +Idle Mode
Mode 4:	EUT with PC +USB Cable +Traffic Mode

Remark:

1) If there is one kind of accessories with different models, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.
2) If EUT has more than one typical operation, only the worst test mode will be recorded in this report.

Traffic Mode:
When the EUT state is switched on and with Radio Resource Control (RRC) connection established.

Idle Mode:
When the EUT state is switched on but without Radio Resource Control (RRC) connection.

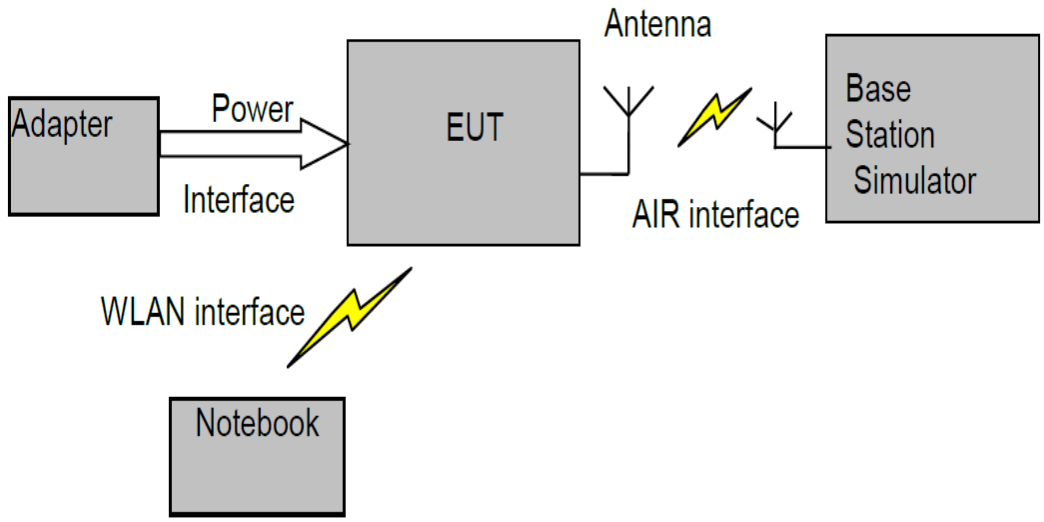
Worst Case:

1) Radiated Emission
Mode 3： EUT with PC+USB Cable +Idle Mode
This result is the worst case.

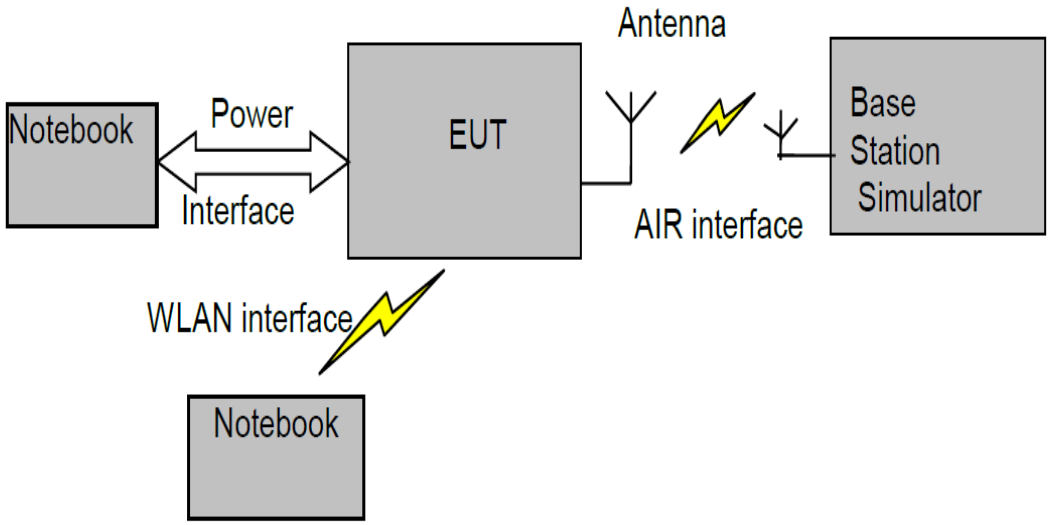
2) Conducted Emission
Mode 4： EUT with PC +USB Cable +Traffic Mode
This result is the worst case.

3.2 Test System Configuration

Connection Diagram (Mode 1~Mode 2)



Connection Diagram (Mode3~ Mode 4



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB Cable	1	1m	shielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval
Radio Communication Tester	CMU200	R&S	3608105673	2019-3-14	12
Radio Communication Tester	MT8820C	Anritsu	A110518805	2019-05-07	12
Notebook	X230	ThinkPad	31090403579	/	/
Notebook	X230	ThinkPad	31090403578	/	/
Mouse	N231	Logitech	/	/	/
Adapter	HW-050200A01	HUAWEI	B78930HB320558	/	/

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 C63.4-2014. The test distance was 3m.The set-up and test methods were according to ANSI C63.4-2014.
A preliminary scan and a final scan of the emissions were made from 30 MHz to18 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

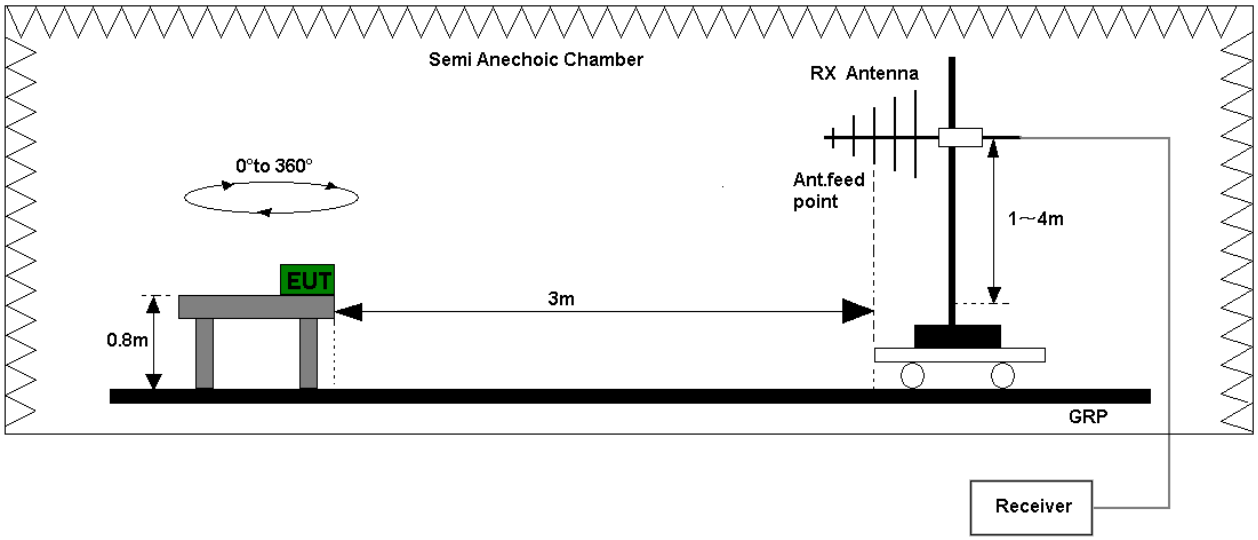


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

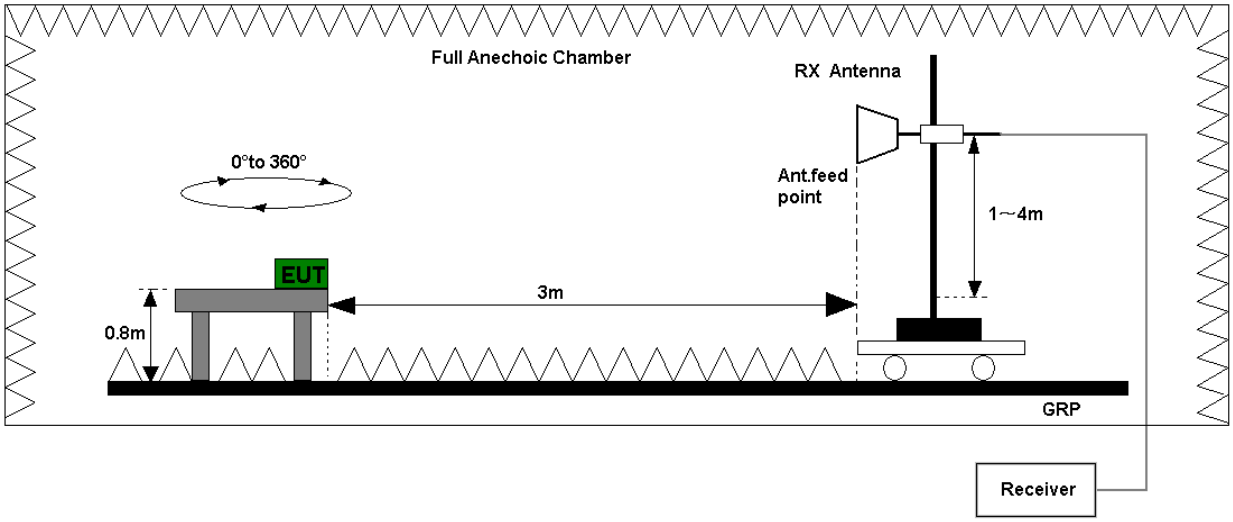


Figure 2. Test set-up of radiated disturbance(above 1GHz)

4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
Refer to the section 7.1 of this report for test data.

Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μV/m)		Unit(dBμV/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 C63.4-2014. 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

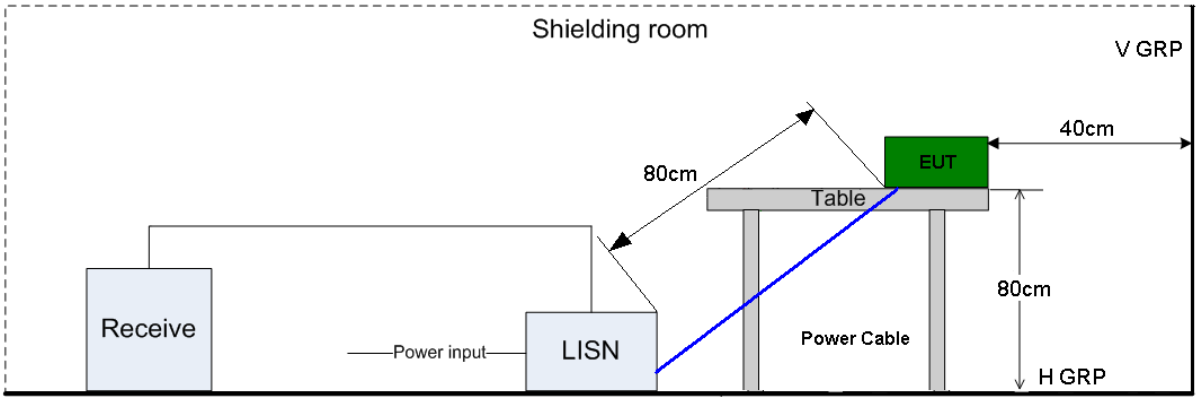


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance of power lines.
Refer to the section 7.2 of this report for test data.

Test Limit of AC Power Port		
Frequency range	150kHz ~ 30MHz	
Frequency	Voltage limits	
	QP (dBμV)	AV (dBμV)
0.15MHz~0.5MHz	66-56	56-46
0.5MHz-5MHz	56	46
5MHz~30MHz	60	50

5 Main Test Instruments

Main Test Equipments						
Test item	**Test Instrument**	**Model**	**S/N**	**Manufacturer**	**Calibrated Deadline**	**Cal interval**
RE	EMI Test receiver	FSP40	100378	R&S	Dec. 15, 2018	12
	Broadband Antenna	VULB 9163	9163-319	SCHWARZBECK	Feb. 27, 2020	24
	Horn Antenna	3117	66585	ETS-lindgren	Mar. 05, 2019	24
CE	EMI Test receiver	ESCI	101163	R&S	Jan. 18, 2019	12
	Artificial Mains Network	ENV4200	100134	R&S	May. 07, 2019	12
	Artificial Mains Network	ENV216	100382	R&S	May. 07, 2019	12

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EMC32	R&S	V10.01.00
CE	EMC32	R&S	V9.25.0

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 (dBμV/m)	U=5.12dB; k=2
RE(1GHz-18GHz)	Field strength (dBμV/m)	U=4.48dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.3dB; k=2

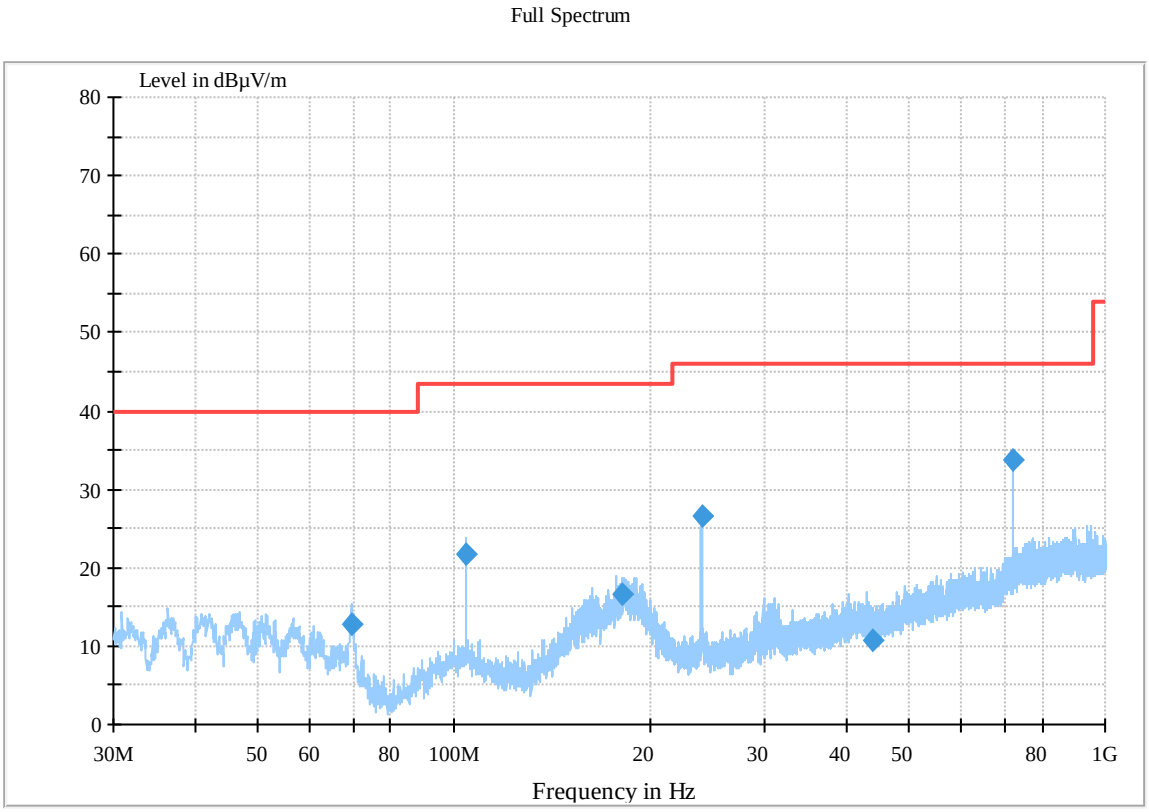
7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

Test Mode 3: EUT with PC+USB Cable +Idle Mode



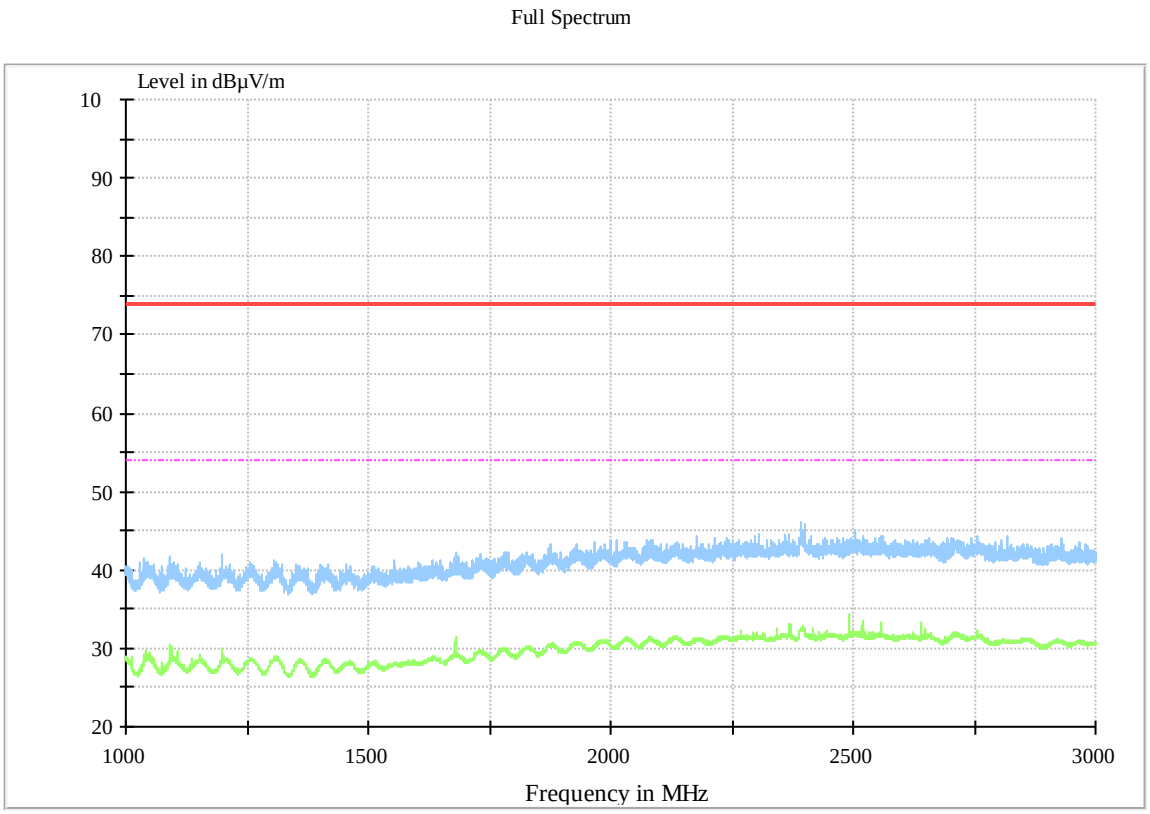
MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
69.770000	12.82	-26.7	40.00	27.18	100.0	178.0	V
104.312778	21.64	-24.0	43.52	21.88	100.0	81.0	H
180.888889	16.49	-26.1	43.52	27.03	100.0	54.0	V
240.005000	26.50	-22.8	46.02	19.52	100.0	226.0	H
439.232222	10.64	-17.6	46.02	35.38	100.0	195.0	V
719.993333	33.63	-11.3	46.02	12.39	100.0	308.0	V

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.

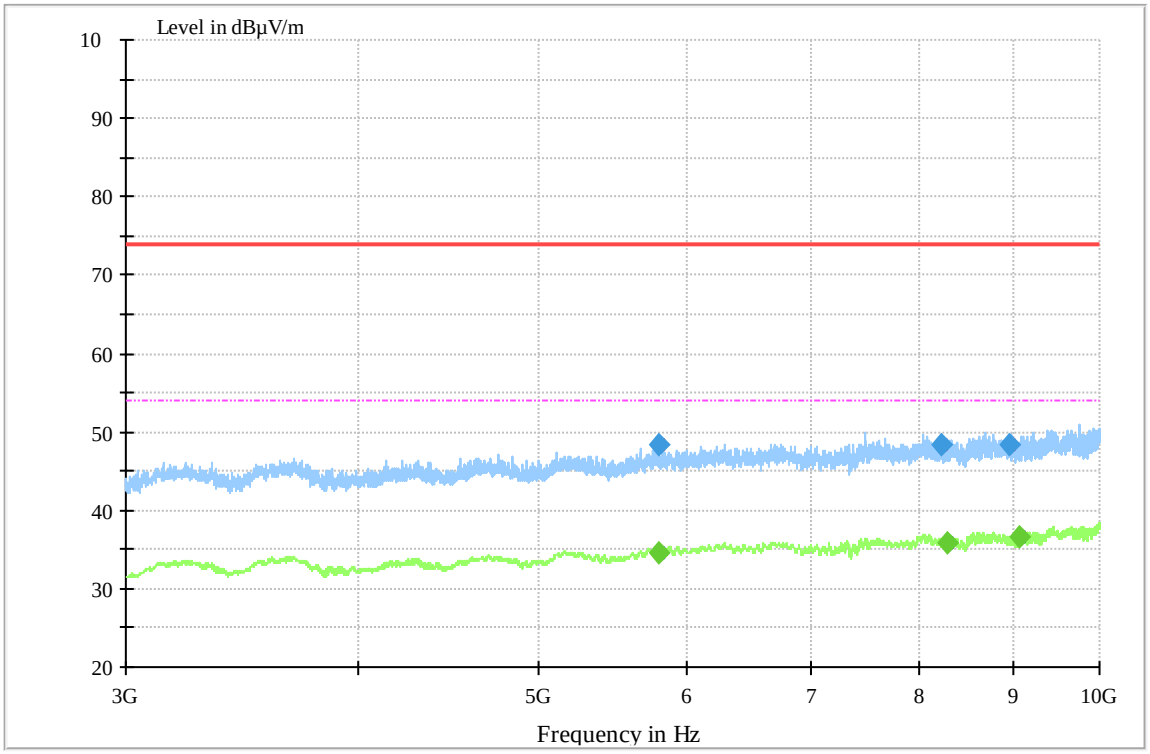
7.1.2 1GHz~18GHz

Test Mode 3: EUT with PC+USB Cable +Idle Mode



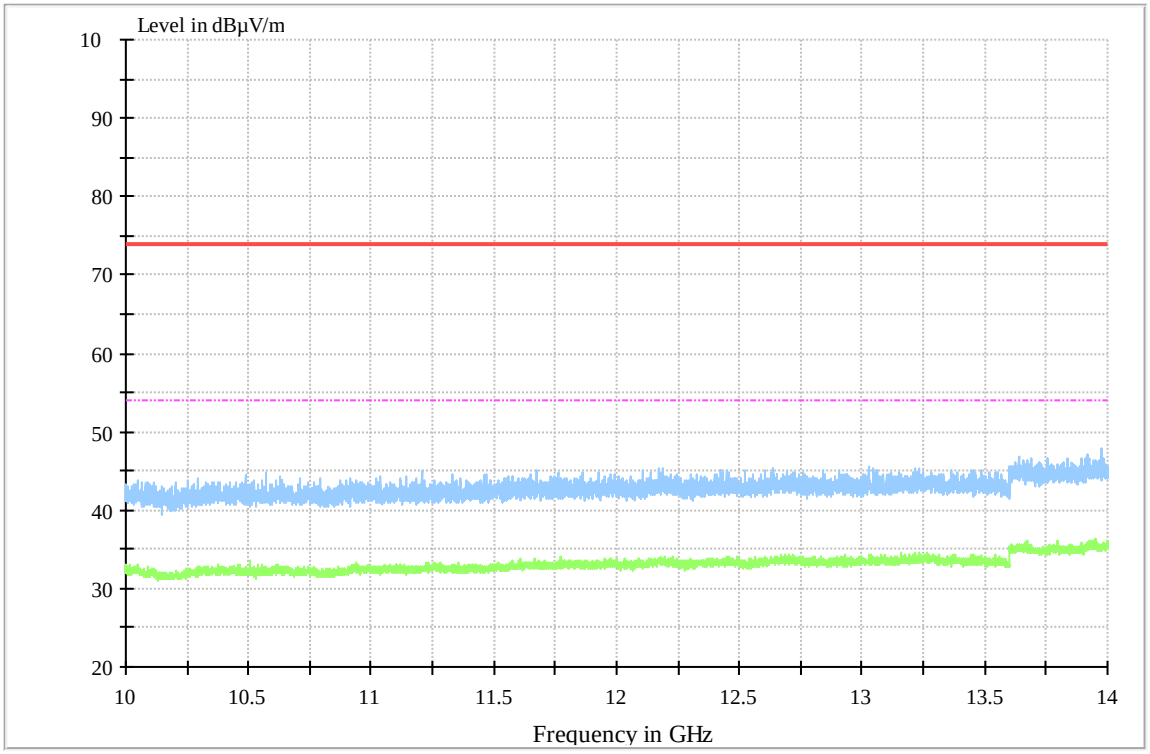
1GHz~3GHz

Full Spectrum



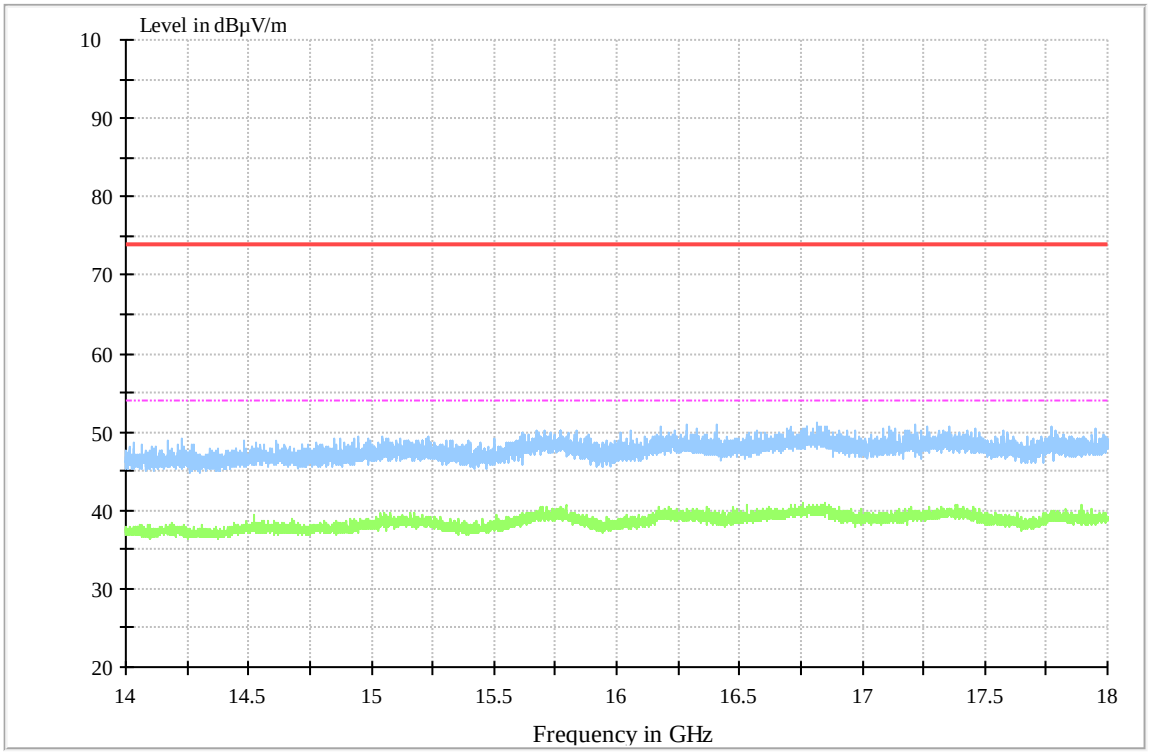
3GHz~10GHz

Full Spectrum



10GHz~14GHz

Full Spectrum



14GHz~18GHz

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
5792.125000	28.26	8.9	54.00	25.74	100	98.0	V
8225.500000	28.32	8.9	54.00	25.68	100	121.0	H
8943.000000	28.45	9.5	54.00	25.55	100	126.0	V

MEASUREMENT RESULT: AV Detector

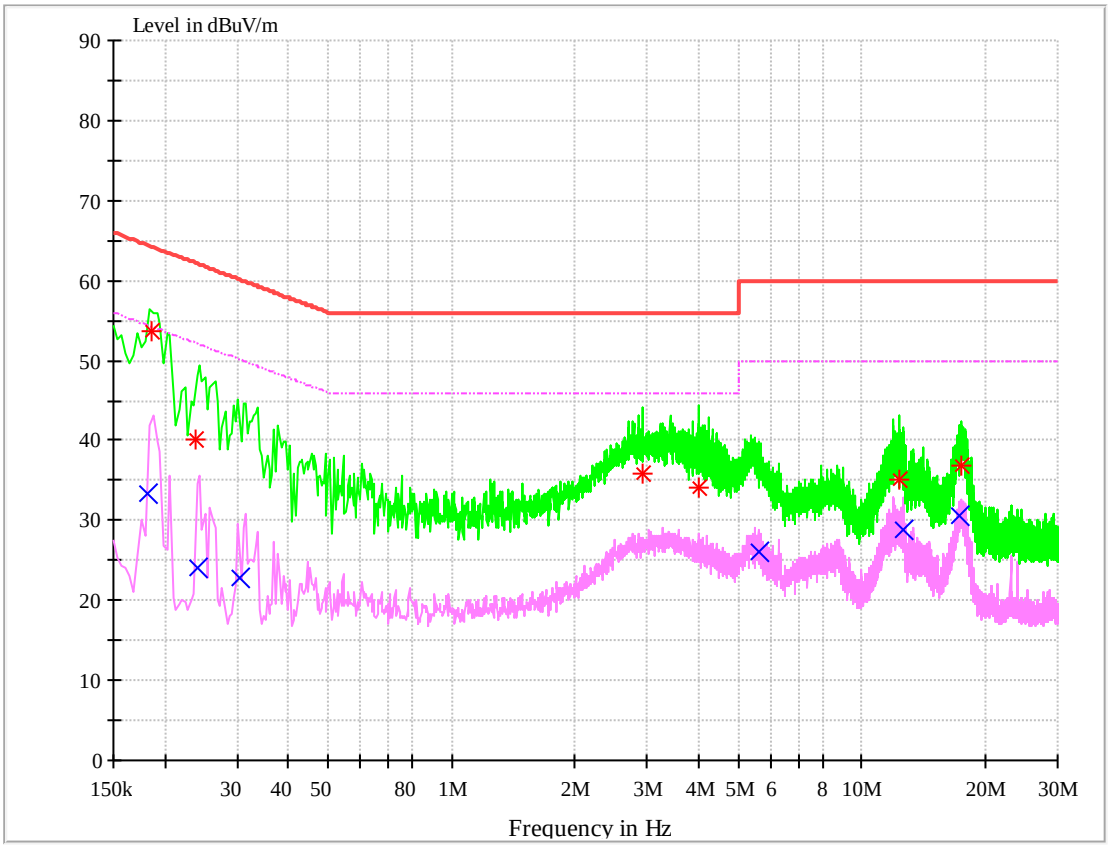
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
5801.750000	34.51	8.8	54.00	19.49	100	0.0	V
8290.250000	35.79	8.8	54.00	18.21	100	13.0	V
9056.750000	36.58	9.8	54.00	17.42	100	13.0	V

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

7.2.1 AC Port Test Data

Test Mode 4: EUT with PC +USB Cable +Traffic Mode



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.185754	53.64	L1	9.7	10.58	64.22	FLO
0.237328	40.16	N	9.7	22.03	62.19	FLO
2.923148	35.83	L1	9.8	20.17	56.00	FLO
4.006337	34.08	L1	9.8	21.92	56.00	FLO
12.353297	35.21	N	10.0	24.79	60.00	FLO
17.486641	36.80	N	10.1	23.20	60.00	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.18231	33.39	L1	9.7	20.99	54.38	FLO
0.240419	24.17	N	9.7	27.91	52.08	FLO
0.305042	22.90	L1	9.7	27.20	50.10	FLO
5.582653	26.04	N	9.8	23.96	50.00	FLO
12.603859	28.81	L1	10.0	21.19	50.00	FLO

17.36374	30.70	N	10.1	19.30	50.00	FLO

----------END----------