EMC Test Report

Product Name: **Mobile WiFi**

Product Model: **801HW**

Report Number: **SYBH(Z-EMC)20180926023001**

FCC ID：QIS801HW

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

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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 laboratory has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Declaration Of Conformity (DOC) and Certification rules. The Designation Number is CN5019, and the Test Firm Registration Number is 577730 for site 3.**
7. **The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (NVLAP). The accreditation number is 4086F-1 for site 3.**
8. **The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.**
9. **The test report is invalid if there is any evidence of erasure and/or falsification.**
10. **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.**
11. **Normally, the test report is only responsible for the samples that have undergone the test.**
12. **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:	2018-11-01
Start Date of Test:	2018-11-01
End Date of Test:	2018-11-10
Test Result:	Pass

Approved By (Lab Manager)	**2018-11-12**	**HeHao**	He Hao
	Date	**Name**	**Signature**
Operator (Test Engineer)	**2018-11-10**	**FengJinhua**	Feng Jinhua
	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	801HW
Input voltage	Vnom 3.8V
TX Frequency	UMTS Band 2: 1850MHz to 1910MHz UMTS Band 4: 1710MHz to 1755MHz LTE BAND 2: 1850MHz to 1910MHz LTE Band 4: 1710MHz to 1755MHz LTE Band 12: 699MHz to 716MHz LTE BAND 17: 704MHz to 716MHz LTE BAND 25: 1850MHz to 1915MHz LTE BAND 26: 814MHz to 849MHz LTE BAND 41: 2496MHz to 2690MHz WIFI: 2400MHz to 2472MHz WIFI:5170MHz to 5250MHz 5250MHz to 5330 MHz 5490MHz to 5710MHz
RX Frequency	UMTS Band 2: 1930MHz to 1990MHz UMTS Band 4: 2110MHz to 2155MHz LTE BAND 2: 1930MHz to 1990MHz LTE Band 4: 2110MHz to 2155MHz LTE Band 12: 729MHz to 746MHz LTE BAND 17: 734MHz to 746MHz LTE BAND 25: 1930MHz to 1995MHz LTE BAND 26: 859MHz to 894MHz LTE BAND 41: 2496MHz to 2690MHz WIFI: 2400MHz to 2472MHz WIFI:5170MHz to 5250MHz 5250MHz to 5330 MHz 5490MHz to 5710MHz
S/N	9TR0118912000318
HW Version	CL1SB08M
SW Version	8.0.1.31(H60SP9C643)
EUT Accessory	
Li-Polymer Battery	Manufacturer: Huawei Technologies Co.,Ltd. Battery Model: HB494590EBC-B Rated capacity: 3000mAh Nominal Voltage: ⎓ +3.8V Charging Voltage: ⎓ +4.25V SN: 5XNHSCI6139007AC

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
Test Site 3:	Sporton International (Shenzhen) Inc.
Test Site Location:	No.3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.China

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15 2016, Subpart B

2 Summary of Results

Summary of Results				
Test Items	**Test Mode**	**Performance Class & Required Performance Criteria**	**Result**	**Site**
Radiated Emissions Enclosure Port(30M-18G)	Mode1 Mode3	CLASS B	Pass	Site2
Radiated Emissions Enclosure Port(18G-40G)	Mode1 Mode3	CLASS B	Pass	Site3
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.

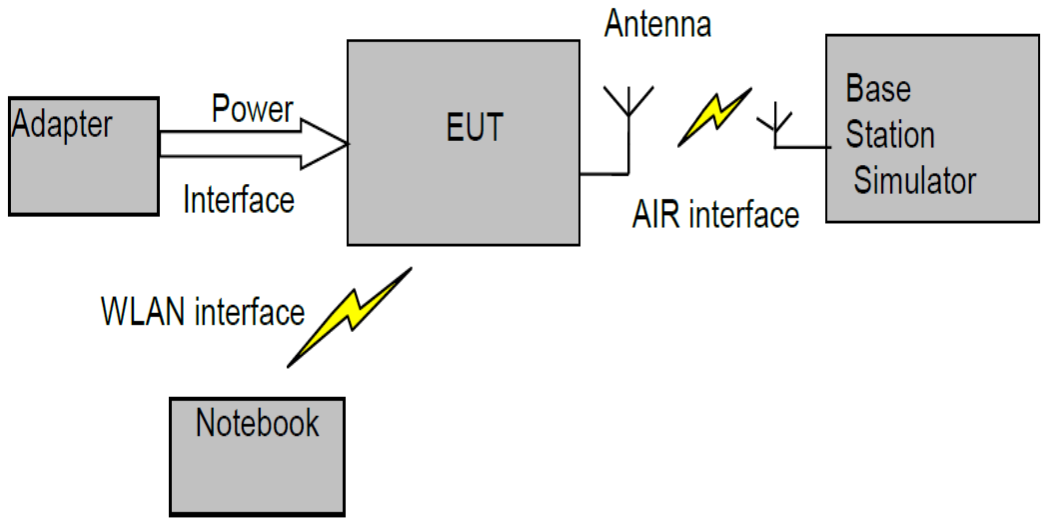
Worst Case:

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

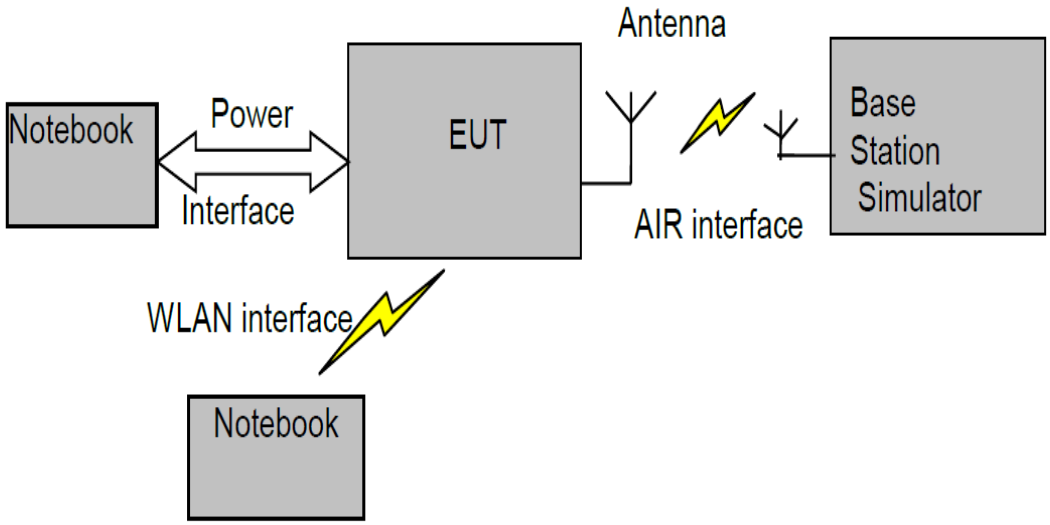
2) Conducted Emission
Mode 4： EUT with PC +USB Cable +Traffic Mode
This result is the worst case.

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	unshielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval
Radio Communication Tester	CMU200	R&S	3608105673	2019-03-14	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 40GHz

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 40000 MHz: 1MHz;
EUT was configured in idle mode and the test performed at worst emission state.

4.1.2 Test setup

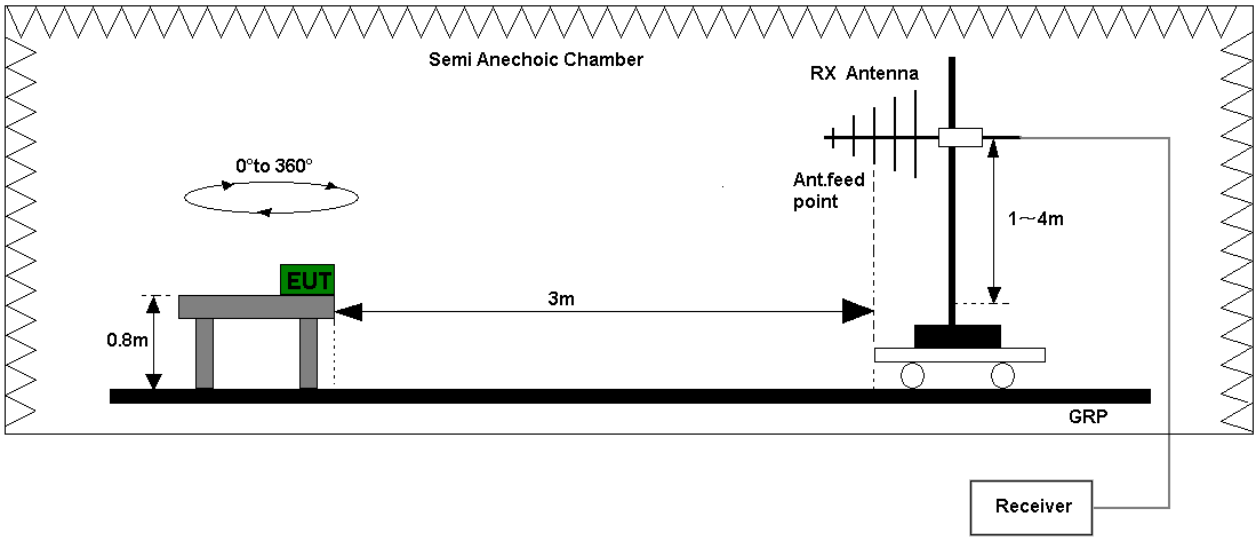


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

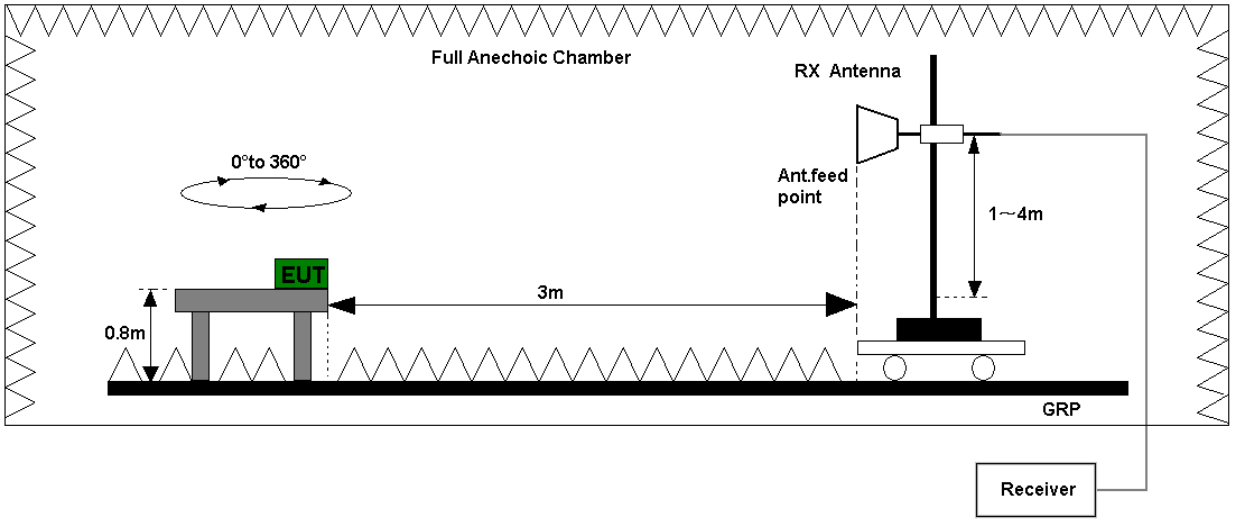


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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

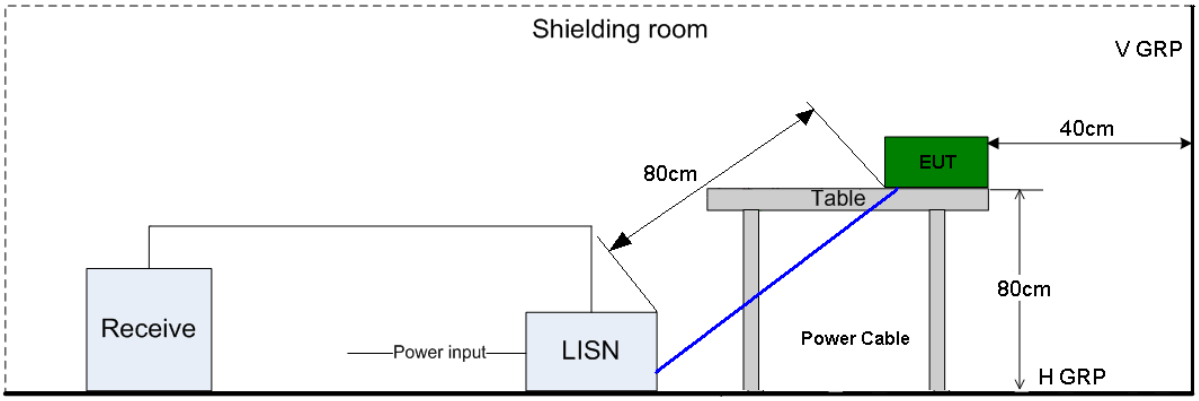


Figure 3. Test Set-up of conducted disturbance

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	May. 05, 2019	24
	HF Amplifier(18G-40G)	TTA1840-35-HG	1871923	MITEQ	Jul. 16,2019	12
	EMI Test Receiver&SA	N9038A	MY52260185	Agilent	Aug. 29,2019	12
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
RE	E3	AUDIX	6.2009-8-24(sporton)
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
RE(18GHz-26.5GHz)	Field strength (dBμV/m)	U=4.3dB; k=2
RE(26.5GHz-40GHz)	Field strength (dBμV/m)	U=4.3dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.3dB; k=2

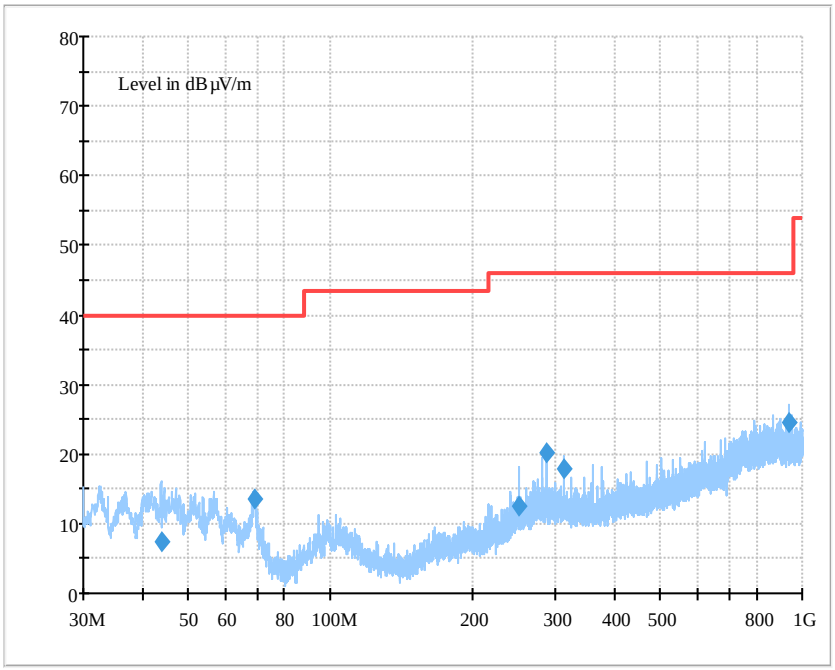
7 Test Data and Graph

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



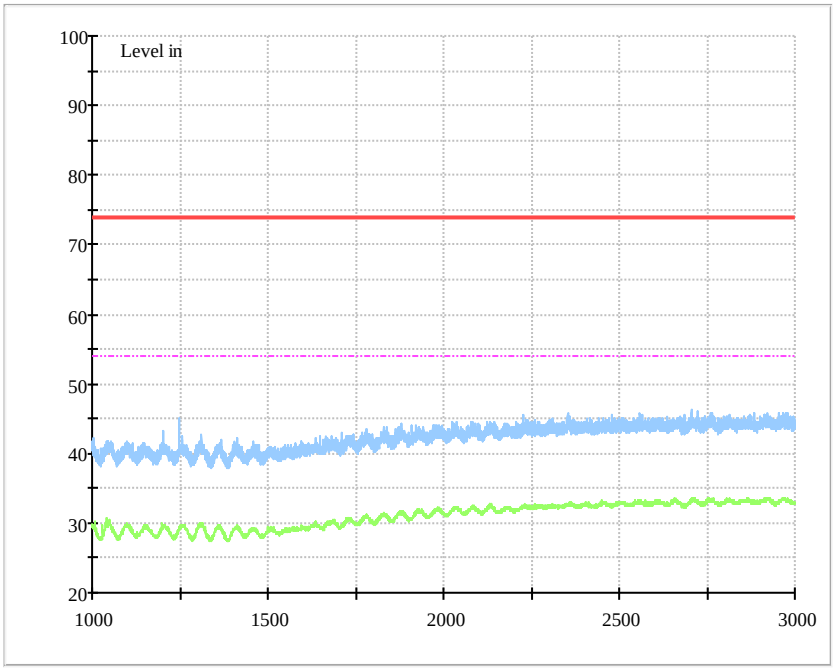
MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
43.849444	7.36	-23.1	40.00	32.64	100.0	63.0	V
69.015556	13.57	-26.4	40.00	26.43	100.0	311.0	V
250.621111	12.49	-22.7	46.00	33.51	100.0	96.0	H
287.966111	20.30	-21.6	46.00	25.70	100.0	279.0	H
313.401667	17.84	-21.1	46.00	28.16	100.0	215.0	V
940.560556	24.63	-10.2	46.00	21.37	100.0	311.0	V

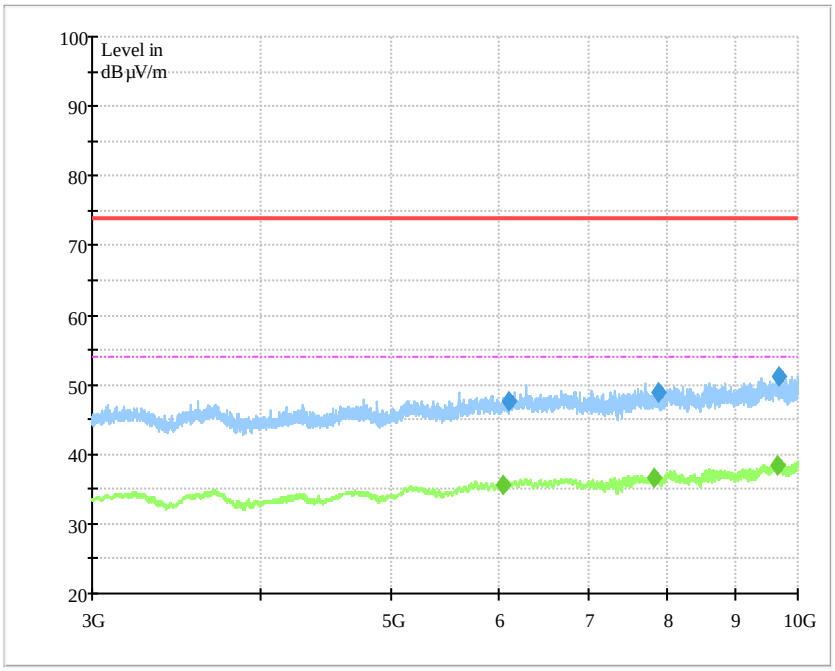
Note:
Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

7.1.2 1GHz~18GHz

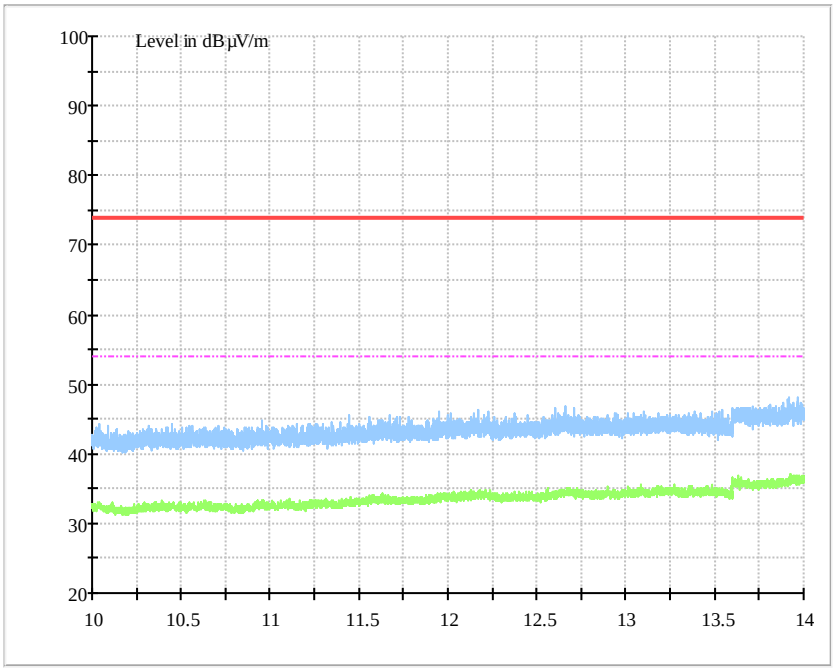
Test Mode 3: EUT with PC+USB Cable +Idle Mode



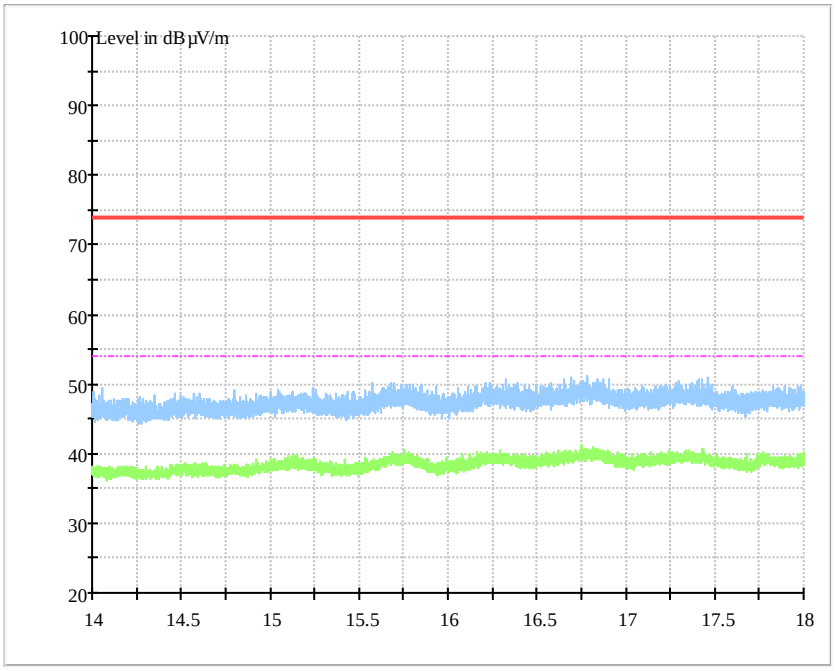
1GHz~3GHz



3GHz~10GHz



10GHz~14GHz



14GHz~18GHz

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
6113.250000	47.5	9	74.00	26.5	100	41	V
7878.125000	48.89	8.8	74	25.11	100	355	H
9675.375000	51.19	10.6	74.00	22.81	100	0	V

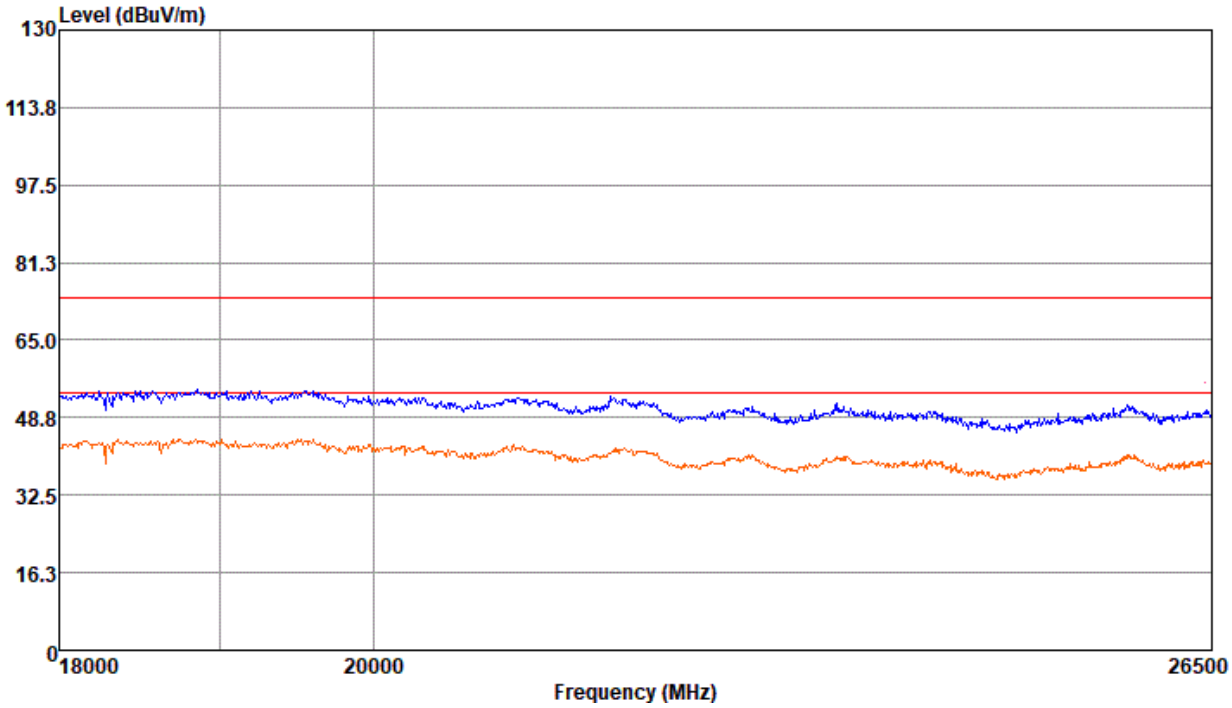
MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
6042.375	35.54	8.9	54.00	18.46	100	0	V
7830.875	36.52	8.5	54.00	17.48	100	5	V
9670.125	38.34	10.6	54.00	15.66	100	126	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.

7.1.3 18GHz~26.5GHz

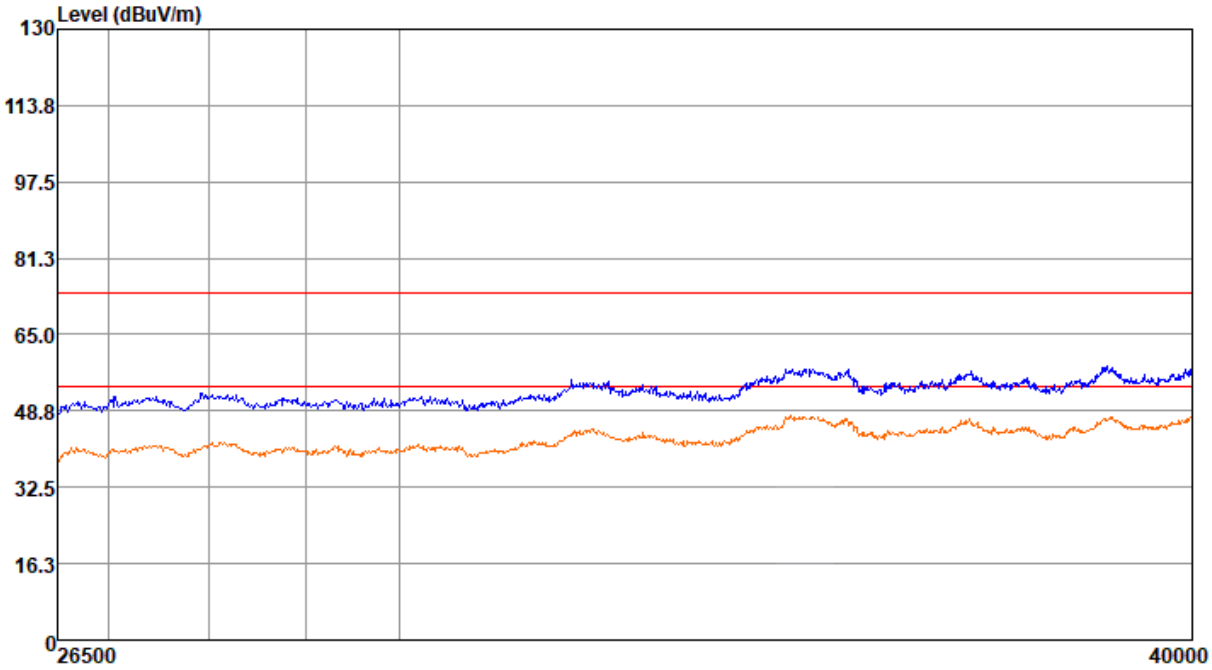
Test Mode 3: EUT with PC+USB Cable +Idle Mode



Note : No abnormalities were found in the “18 GHz to 26.5 GHz” test range, so no mark point was made

7.1.4 26.5GHz~40GHz

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

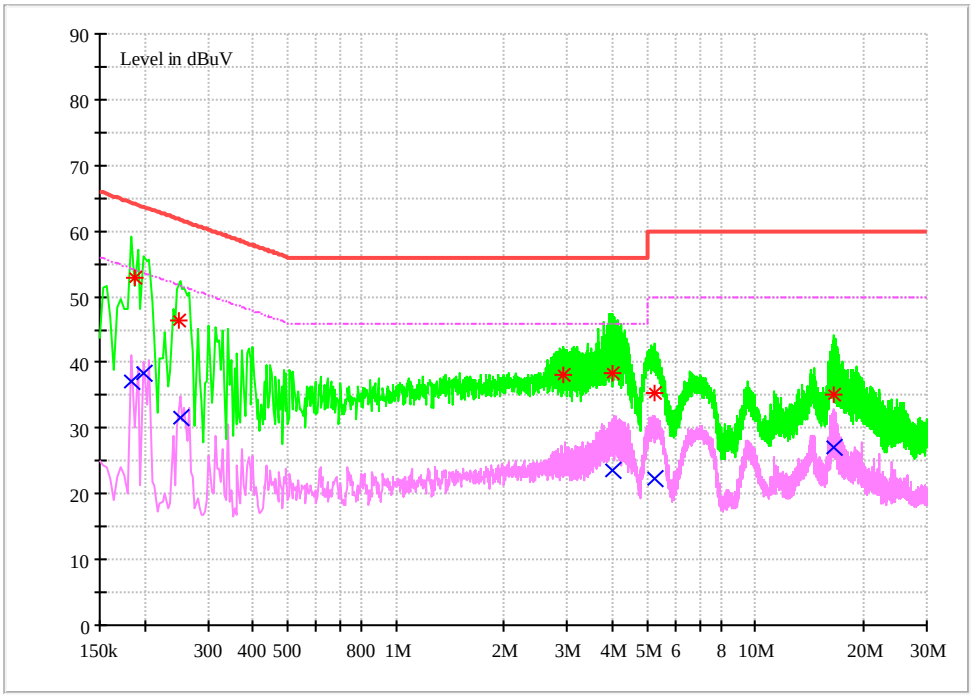


Note : No abnormalities were found in the “26.5 GHz to 40 GHz” test range, so no mark point was made

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
0.186814	52.95	N	9.7	11.23	64.18	FLO
0.24826	46.34	N	9.7	15.48	61.82	FLO
2.933033	38.07	L1	9.8	17.93	56	FLO
3.999394	38.48	L1	10.1	17.52	56	FLO
5.242709	35.24	L1	10	24.76	60	FLO
16.619688	35.06	L1	11.4	24.94	60	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Line	Transd dB	Margin dB	Limit dBµV	PE
0.184072	37.2	L1	9.7	20.1	54.3	FLO
0.198506	38.4	L1	9.7	15.86	54.26	FLO
0.250771	31.6	L1	9.7	20.13	51.73	FLO
4.026452	23.49	L1	10.1	22.51	46	FLO
5.250204	22.39	L1	10	27.61	50	FLO
17.36374	30.70	N	10.1	19.30	50.00	FLO

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