



EMC Test Report

Product Name: Smart Watch

Product Model: MIL-B19

Report Number: SYBH(Z-EMC)20210626012001-1

FCC ID: 2ATEYMIL-B19

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

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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 recognized by the Innovation, Science and Economic Development Canada (ISED) to test to Canadian radio equipment requirements. The CAB identifier is CN0003, and the ISED# is 21741.
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Applicant: Huawei Device Co., Ltd.
Address: No.2 of Xincheng Road, Songshan Lake Zone,
Dongguan, Guangdong 523808, People's Republic of
China
Date of Receipt Test Item: 2021-07-12
Start Date of Test: 2021-07-13
End Date of Test: 2021-07-29
Test Result: Pass

**Prepared by
(Test Engineer)**

2021-07-29
Date

Yang Jiajie
Name

Yang Jiajie

Signature

**Reviewed by
(Test Engineer)**

2021-07-30
Date

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Signature

**Approved By
(Lab Manager)**

2021-07-30
Date

He Hao
Name

He Hao

Signature



Modification Record

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

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1 General Information

1.1 EUT Description

MIL-B19 is a smart watch, it can be communicated with mobile phone via Bluetooth. Watch also support alarm clock, intelligent user can judge the state of motion, scientific sleep monitoring, information assistance, heart rate monitoring, GPS functionalities and supports music playback and Bluetooth calling. The BT/WIFI frequency is 2.4GHz.

EUT Description	
Product Name	Smart Watch
Model Number	MIL-B19
TX Frequency	2.4G WIFI: 2412MHz to 2462MHz Bluetooth: 2402MHz to 2480MHz WPT: 110.5kHz to 148kHz NFC:13.56MHz
RX Frequency	2.4G WIFI: 2412MHz to 2462MHz Bluetooth: 2402MHz to 2480MHz BDS: 1176.45MHz/1561.098MHz Galileo: 1176.45MHz/1575.42MHz GLONASS: 1597MHz to 1607MHz GPS: 1176.45MHz/1575.42MHz WPT: 110.5kHz to 148kHz NFC:13.56MHz
SN	CSNTQ21627000011
HW Version	R3
SW Version	2.0.1.137
EUT Accessory	
Watch Wireless Charger	Manufacturer: Huawei Devices Co., Ltd. Model: CP81-1 Input voltage: 5V
Li-polymer Battery	Manufacturer: Huawei Devices Co., Ltd. (NVT/Sunwoda) Battery Model: HB522025EFW Capacity: 292 mAh Rated Voltage:3.87V Charging Voltage:4.45V

Remark 1: 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. Global Compliance and Testing Center of Huawei Technologies Co., Ltd.
Test Site Location:	No.2, New City Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15, 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 1~ Mode 2	CLASS B	Pass	Site1
<u>Conducted Emissions</u> ☐ DC Power Port ☒ AC Power Port ☐ Telecommunication Ports	Mode 1~ Mode 2	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:	WPT Wireless Charging (adaptor +Watch Wireless Charger+ Smart Watch)+ BT+ WIFI+ NFC+ GNSS
Mode 2:	WPT Wireless Charging (adaptor +Watch Wireless Charger+ Smart Watch)+ Music Playing+ Heart Rate Measurement

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.

Worst Case:

Radiated Emission

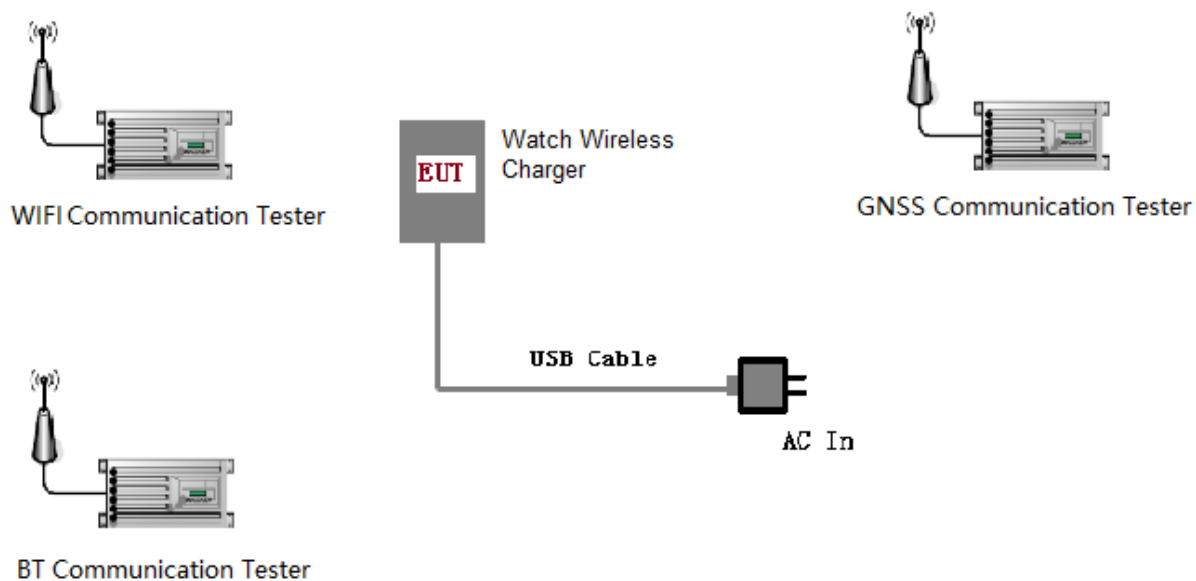
WPT Wireless Charging (adaptor +Watch Wireless Charger+ Smart Watch)+ Music Playing+ Heart Rate Measurement the result is the worst

Conducted Emission

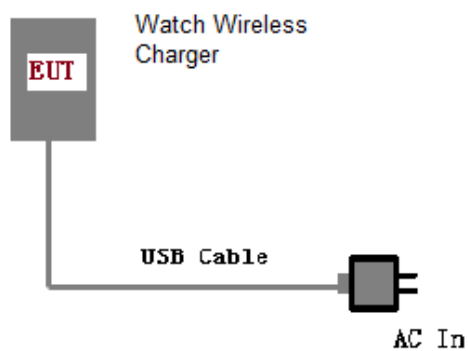
WPT Wireless Charging (adaptor +Watch Wireless Charger+ Smart Watch)+ BT+ WIFI+ NFC+ GNSS the result is the worst

3.2 Test System Configuration

Connection Diagram (Mode 1)



Connection Diagram (Mode 2)



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
Charger Cable	1	<1m	Unshielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval (month)
Radio Communication Tester	CMU200	R&S	117057	Jan. 29, 2022	12
Radio Communication Tester	CMU500	R&S	163743	Mar. 13, 2022	12
GSS7000 Signal Generator	GSS7000	Spirent	108	Nov. 10, 2021	12
Adaptor	HW-050200E01	HUAWEI	P78719H8232183	N/A	N/A

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 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

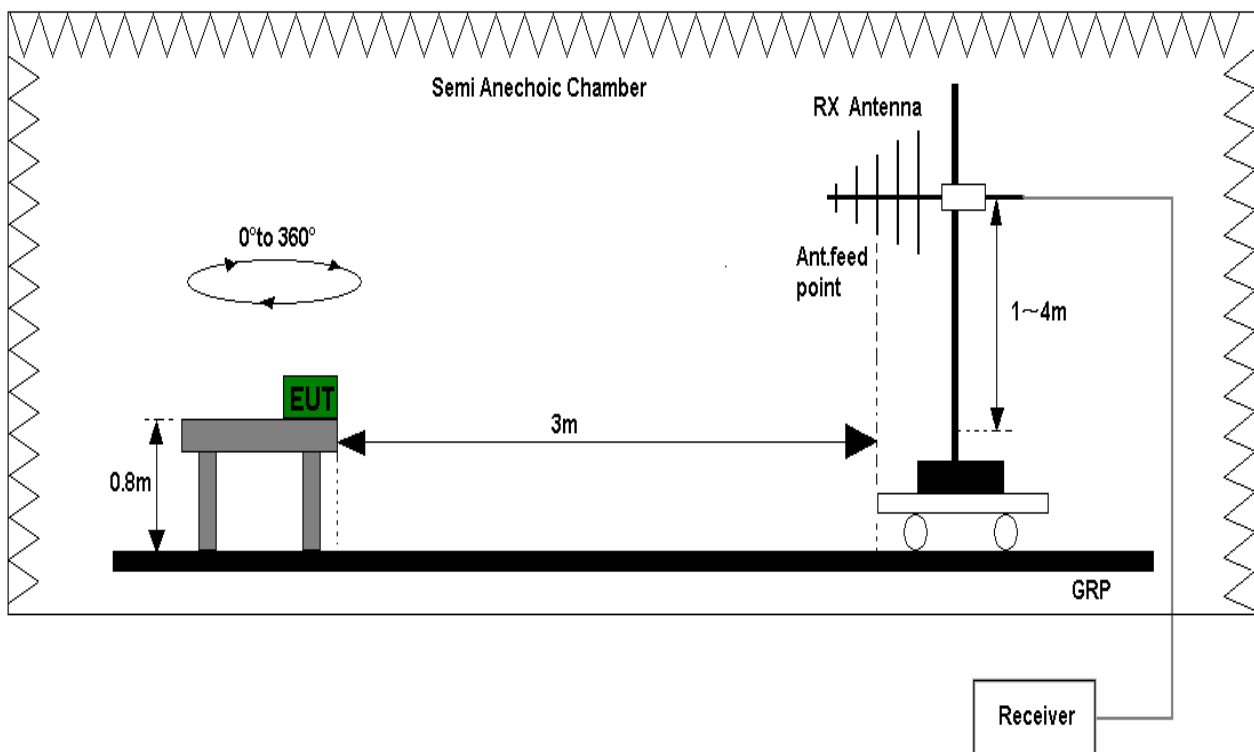


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

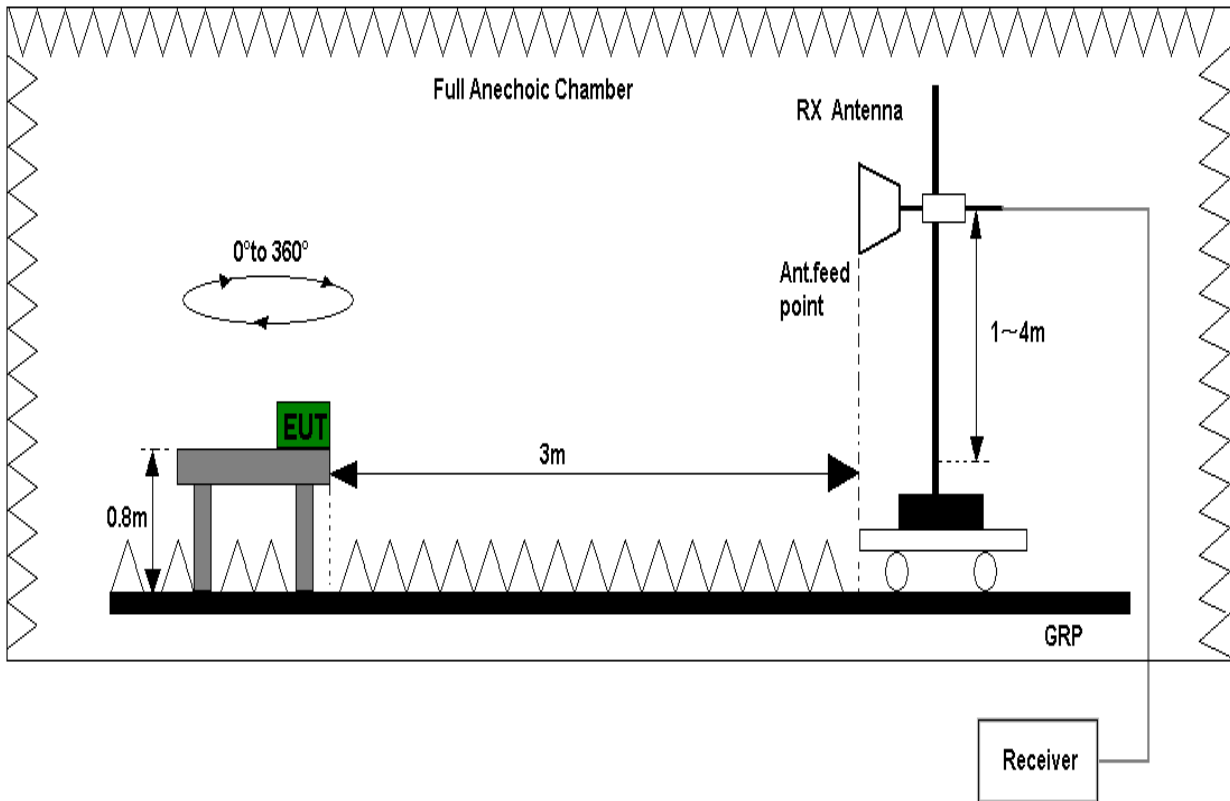


Figure 2. Test set-up of radiated disturbance (above 1GHz)

4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
Refer to the section 7 of this report for test data.

FCC Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μ V/m) Quasi-peak		Unit(dB μ V/m) Quasi-peak	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	Unit(μ V/m)AV	Unit(μ V/m)PK	Unit(dB μ V/m)AV	Unit(dB μ V/m)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

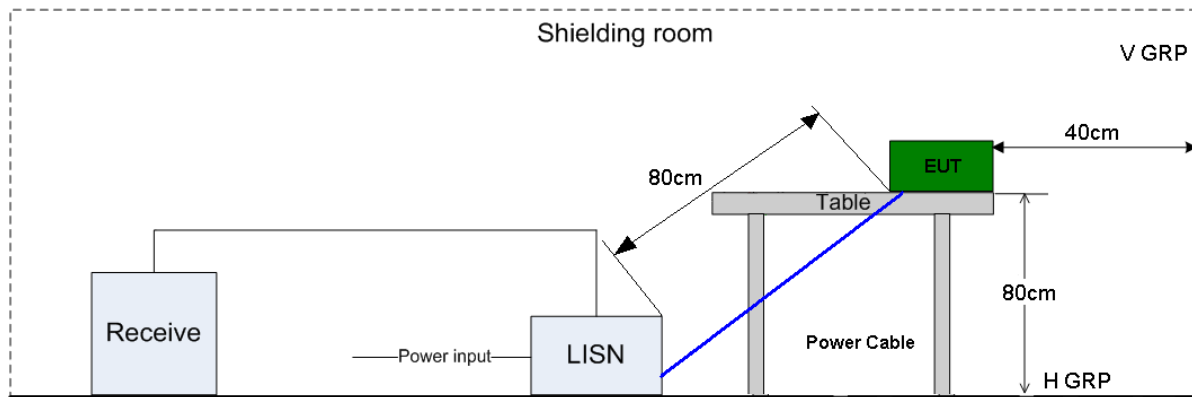


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance of power lines.
Refer to the section 7 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
RE1	Horn Antenna	HF907	100391	R&S	Oct. 15, 2021	24
	EMI Test receiver	ESW44	101879	R&S	Jan. 30, 2022	12
RE2	Broadband Antenna	VULB 9163	01303	SCHWARZB ECK	Aug. 10, 2022	24
	EMI Test receiver	ESW44	101878	R&S	Jan. 30, 2022	12
CE	EMI Test receiver	ESU26	100150	R&S	Nov. 05, 2021	12
	Artificial Mains Network	ENV216	100382	R&S	Jul. 20, 2022	12
Software Information						
Test Item	Software Name	Manufacturer		Version		
RE1	EMC32	R&S		V10.60.10		
RE2	EMC32	R&S		V10.60.20		
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
RE2(30MHz-1GHz)	Field strength (dB μ V/m)	U=5.24dB; k=2
RE1(1GHz-18GHz)	Field strength (dB μ V/m)	U=4.68dB; k=2
CE	Disturbance Voltage (dB μ V)	U=2.3dB; k=2

7 Test Data and Graph

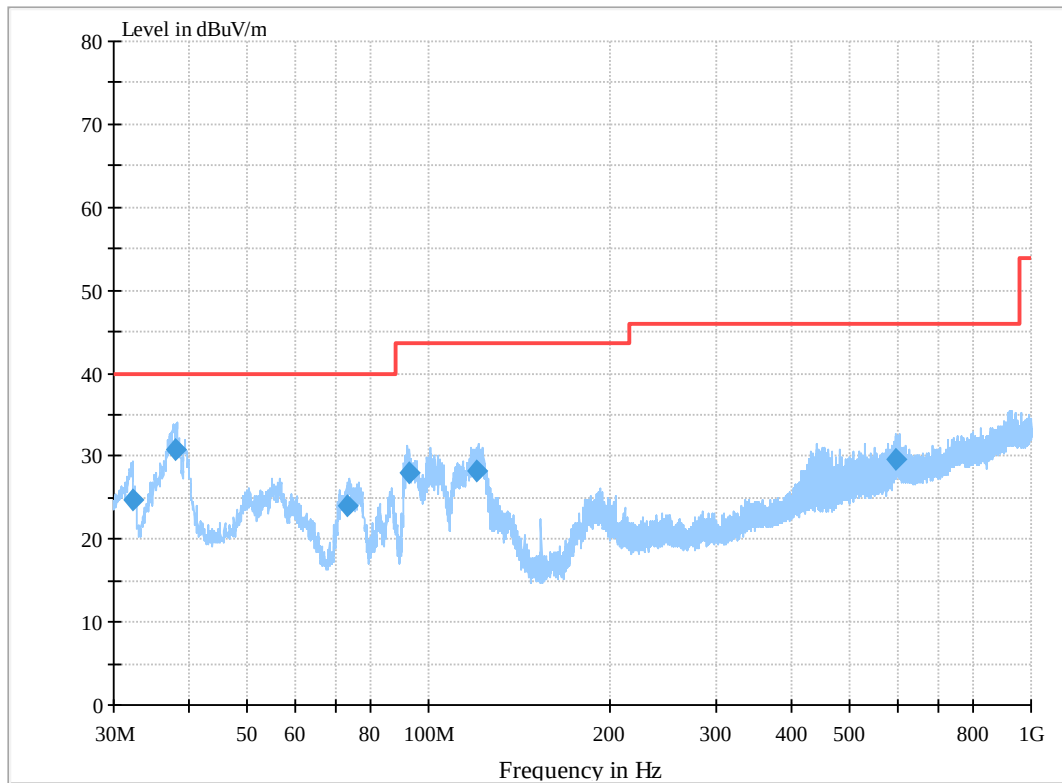
Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

Test Mode: WPT Wireless Charging (adaptor +Watch Wireless Charger+ Smart Watch)+ Music Playing+ Heart Rate Measurement

Full Spectrum



MEASUREMENT RESULT: QP Detector

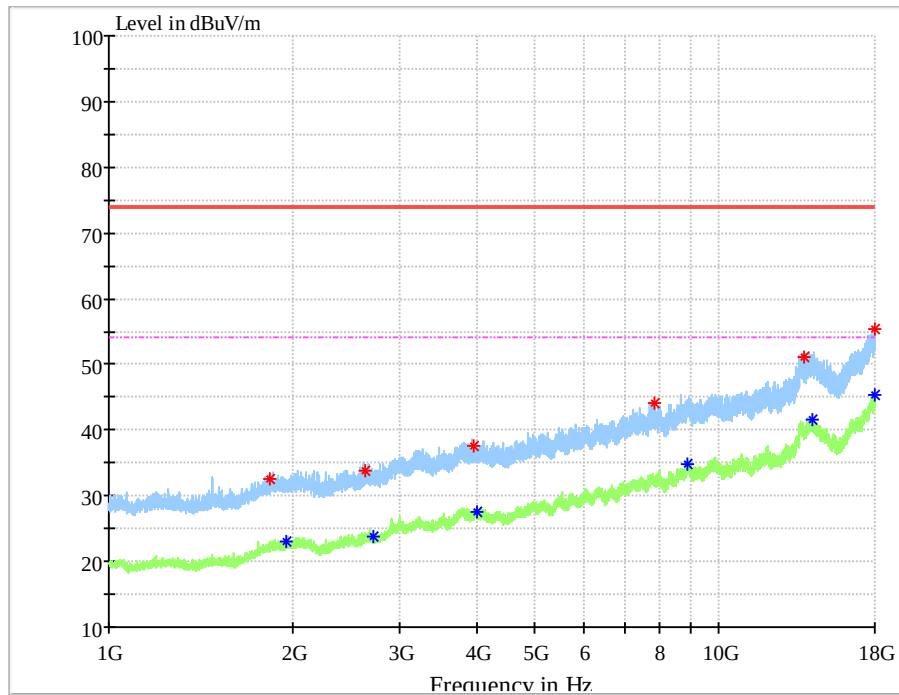
Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Height cm	Azimuth deg	Polarisation
32.265180	24.62	16.5	40.00	15.38	101.0	269.0	V
37.903820	30.78	18.6	40.00	9.22	101.0	171.0	V
73.493400	24.11	14.8	40.00	15.89	124.0	24.0	V
92.815480	28.01	17.4	43.50	15.49	122.0	43.0	V
120.327940	28.28	16.4	43.50	15.22	102.0	150.0	V
597.178840	29.64	27.3	46.00	16.36	159.0	260.0	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: WPT Wireless Charging (adaptor +Watch Wireless Charger+ Smart Watch)+ Music Playing+ Heart Rate Measurement



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1842.066667	32.61	-12.6	74	41.39	100	52	V
2630.866667	33.90	-11.1	74	40.1	100	141	H
3960.266667	37.61	-6.8	74	36.39	100	101	V
7863.466667	44.21	-0.2	74	29.79	100	178	V
13746.033333	51.10	9.1	74	22.9	100	296	V
17990.933333	55.49	15.5	74	18.51	100	166	H

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1951.433333	23.10	-12.5	54	30.9	100	322	H
2713.600000	23.84	-10.9	54	30.16	100	19	V
4005.600000	27.49	-6.6	54	26.51	100	0	V
8868.166667	34.75	2.2	54	19.25	100	166	H
14178.966667	41.64	11.1	54	12.36	100	358	V
17997.733333	45.32	15.6	54	8.68	100	257	H

Note:

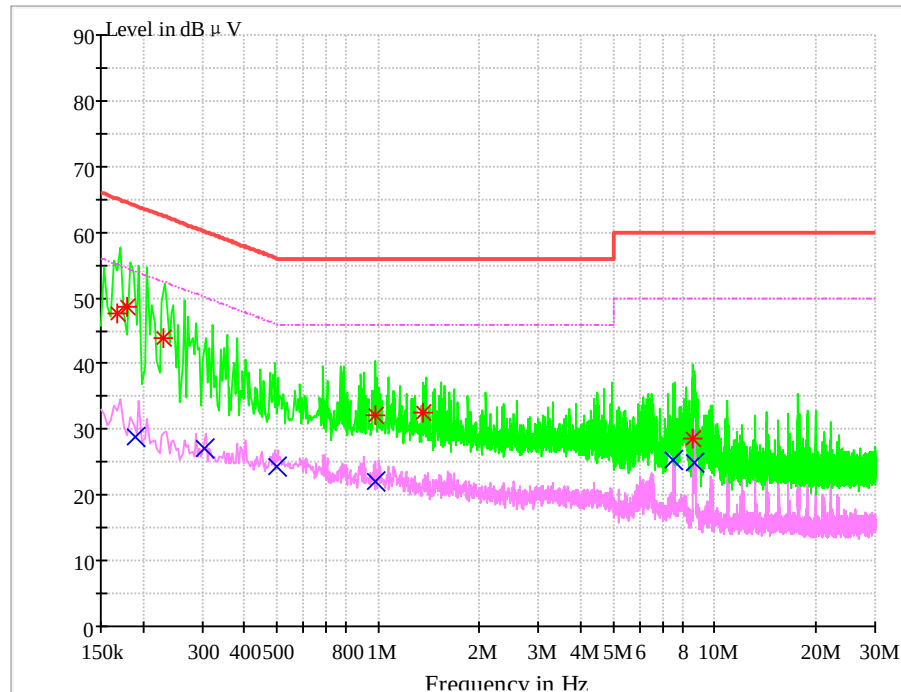
Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.



7.2 Conducted Disturbance

7.2.1 AC Port Test Data

Test Mode: WPT Wireless Charging (adaptor +Watch Wireless Charger+ Smart Watch)+ BT+ WIFI+ NFC+ GNSS



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV	Line	Transd dB	Margin dB	Limit dBμV	PE
0.168588	47.65	L1	9.7	17.38	65.03	FLO
0.179116	48.71	L1	9.7	15.82	64.53	FLO
0.230150	43.84	N	9.7	18.6	62.44	FLO
0.983825	32.65	N	9.7	23.35	56.00	FLO
1.362280	33.07	N	9.7	22.93	56.00	FLO
8.600546	28.59	N	10.0	31.41	60.00	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Line	Transd dB	Margin dB	Limit dBμV	PE
0.190460	28.94	N	9.7	25.08	54.02	FLO
0.305091	26.95	N	9.7	23.15	50.10	FLO
0.500550	24.40	N	9.7	21.60	46.00	FLO
0.981423	22.06	N	9.7	23.94	46.00	FLO
7.508413	25.38	N	9.9	24.62	50.00	FLO
8.661440	25.81	N	10.0	24.19	50.00	FLO

-----END-----