



# EMC Test Report

**Product Name: Smart Watch**

**Product Model: YDA-B09S**

**Report Number: SYBH(Z-EMC)20220518014001 -2**

**FCC ID: 2ATEYYDA-B09S**

**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:** 2022-01-20  
**Start Date of Test:** 2022-01-21  
**End Date of Test:** 2022-03-01

**Test Result:** Pass

<b>Prepared by</b> (Test Engineer)	<u>2022-05-20</u>	<u>Chang Lina</u>	<i>Chang Lina</i>
	<b>Date</b>	<b>Name</b>	<b>Signature</b>
<b>Reviewed by</b> (Test Engineer)	<u>2022-05-24</u>	<u>Rao Legian</u>	<i>Rao Legian</i>
	<b>Date</b>	<b>Name</b>	<b>Signature</b>
<b>Approved By</b> (Lab Manager)	<u>2022-05-24</u>	<u>He Hao</u>	<i>He Hao</i>
	<b>Date</b>	<b>Name</b>	<b>Signature</b>



**Modification Record**

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



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## 1 General Information

### 1.1 EUT Description

YDA-B09S is a high-end smart watch with 5ATM waterproof level, color screen, full screen touch and a side button control. It can be communicated with mobile phone via Bluetooth. It Integrates smart features such as heart rate monitoring, GPS positioning, workout companion , multiple workout modes, sleep monitoring, message reminder, blood oxygen monitoring ,etc.

<b>EUT Description</b>	
Product Name	Smart Watch
Model Number	YDA-B09S
TX Frequency	Bluetooth: 2400MHz to 2483.5MHz
RX Frequency	Bluetooth: 2400MHz to 2483.5MHz GPS: 1575.42MHz Galileo: 1575.42MHz BDS:1561.098MHz GLONASS:1579-1607 MHz
S/N	285471FBC89E21
HW Version	WD6106A_MBKB_V4_A
SW Version	2.1.2.102SP1
<b>EUT Accessory</b>	
Li-polymer Battery	Manufacturer: Huawei Devices Co., Ltd. (NVT/Sunwoda) Battery Model: HB522025EFW Capacity: 292 mAh Rated Voltage:3.87V Charging Voltage:4.45V
HUAWEI EasyCharge Cable	Manufacturer: Huawei Devices Co., Ltd. Model: POWER-CA010

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. 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	Site 1
<u>Conducted Emissions</u> <input type="checkbox"/> DC Power Port <input checked="" type="checkbox"/> AC Power Port	Mode 1	CLASS B	Pass	Site 1
Note: 1, Measurement taken is within the uncertainty of test 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

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:	Charging + Smart Watch+ Music Playing + BT+ GNSS
Mode 2:	Smart Watch + 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

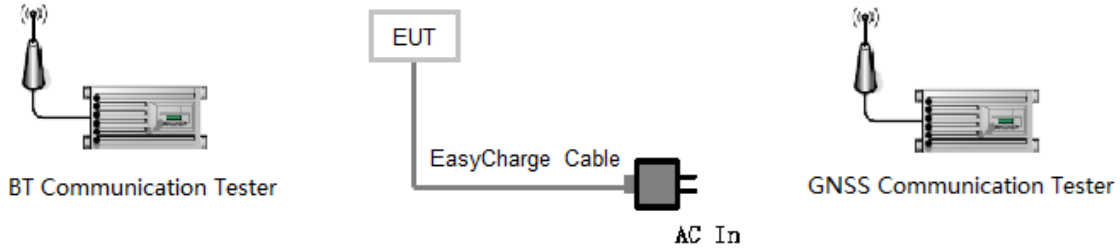
Charging + Smart Watch+ Music Playing + BT+ GNSS the result is the worst.

Conducted Emission

Charging + Smart Watch+ Music Playing + BT+ 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
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	117057	Jul. 08, 2022	12
Radio Communication Tester	CMU500	R&S	163743	Mar. 13, 2022	12
GSS7000 Signal Generator	GSS7000	Spirent	108	Nov. 10, 2022	12
Adapter	HW-050200C01	HUAWEI	B77980H3F06131	N/A	N/A



## 4 Electromagnetic Interference (EMI)

### 4.1 Radiated Emission 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

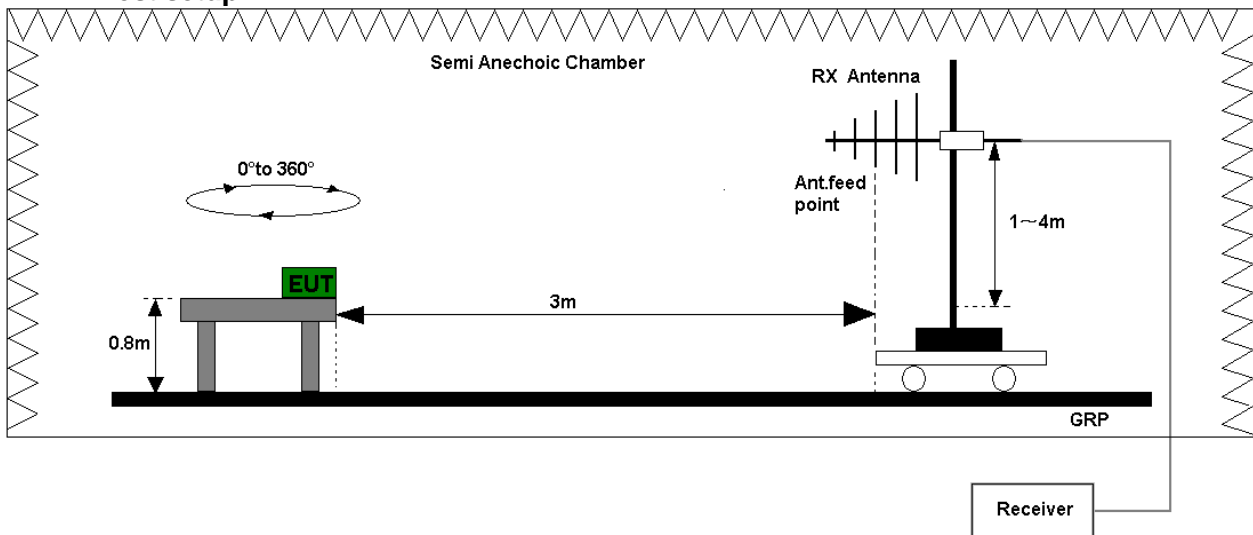


Figure 1. Test set-up of radiated emission (30MHz-1GHz )

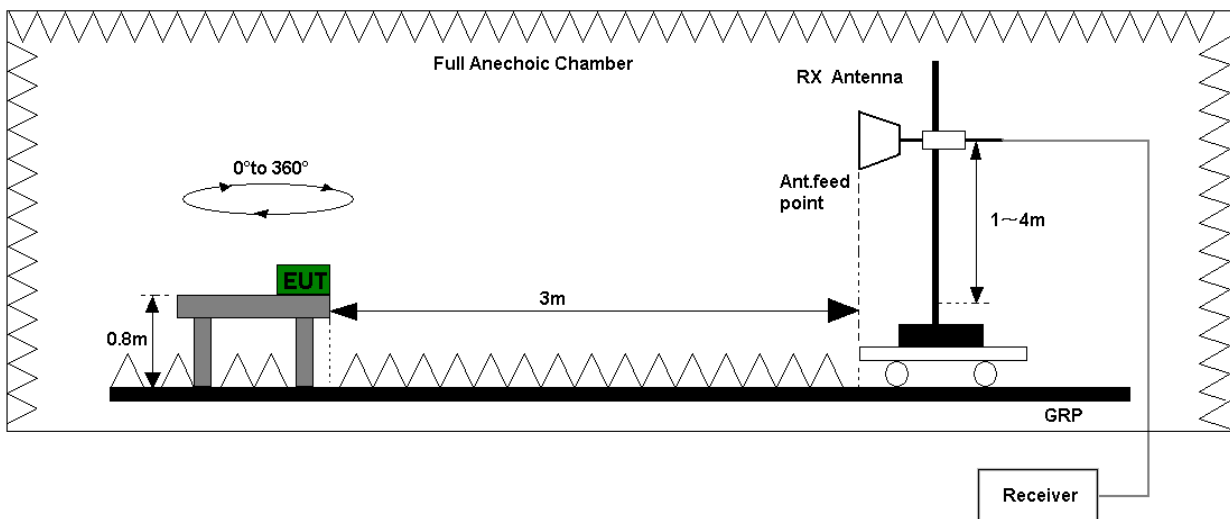


Figure 2. Test set-up of radiated emission (above 1GHz)



### 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.

FCC Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit( $\mu$ V/m) Quasi-peak		Unit(dB $\mu$ V/m) Quasi-peak	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	Unit( $\mu$ V/m)AV	Unit( $\mu$ V/m)PK	Unit(dB $\mu$ V/m)AV	Unit(dB $\mu$ V/m)PK
	500	5000	54	74



## 4.2 Conducted Emission 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 Emission 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

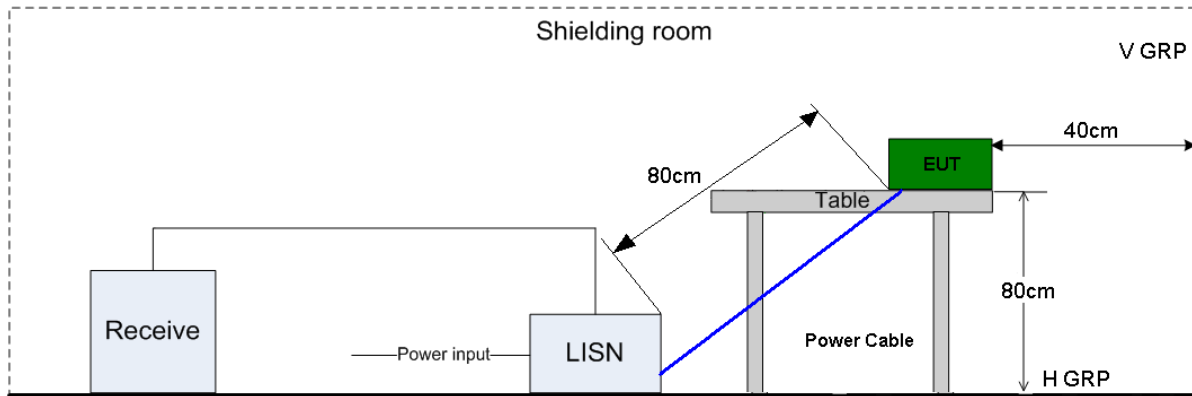


Figure 3. Test Set-up of conducted emission

### 4.2.3 Test Results

The EUT has met requirements for Conducted Emission 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 (dB $\mu$ V)	AV (dB $\mu$ V)
0.15MHz~0.5MHz	66-56	56-46
0.5MHz-5MHz	56	46
5MHz~30MHz	60	50



**5 Main Test Instruments**

Main Test Equipment						
Test item	Test Instrument	Model	S/N	Manufacturer	Calibrated Deadline	Cal interval
RE-2 (30M-1G)	EMI Test receiver	ESW44	101878	R&S	Nov. 12, 2022	12
	Broadband Antenna	VULB 9163	01303	SCHWARZ BECK	Aug. 09, 2022	24
RE1 (1G-18G)	Horn Antenna (1 to 18G)	HF906	100683	R&S	May. 01, 2023	24
	Amplifier	SCA-SCU 18	10162	R&S	Nov. 12, 2022	12
	EMI Test receiver	ESW44	101879	R&S	Nov. 12, 2022	12
CE	EMI Test receiver	ESU26	100150	R&S	Nov. 10, 2022	12
	Artificial Mains Network	ENV216	101176	R&S	Jul. 19, 2022	12
Software Information						
Test Item	Software Name	Manufacturer		Version		
RE1	EMC32	R&S		V10.60.20		
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
RE(30MHz-1GHz)	Field strength (dB $\mu$ V/m)	U=5.24dB; k=2
RE(1GHz-18GHz)	Field strength (dB $\mu$ V/m)	U=4.68dB; k=2
CE	Disturbance Voltage (dB $\mu$ V)	U=2.3dB; k=2





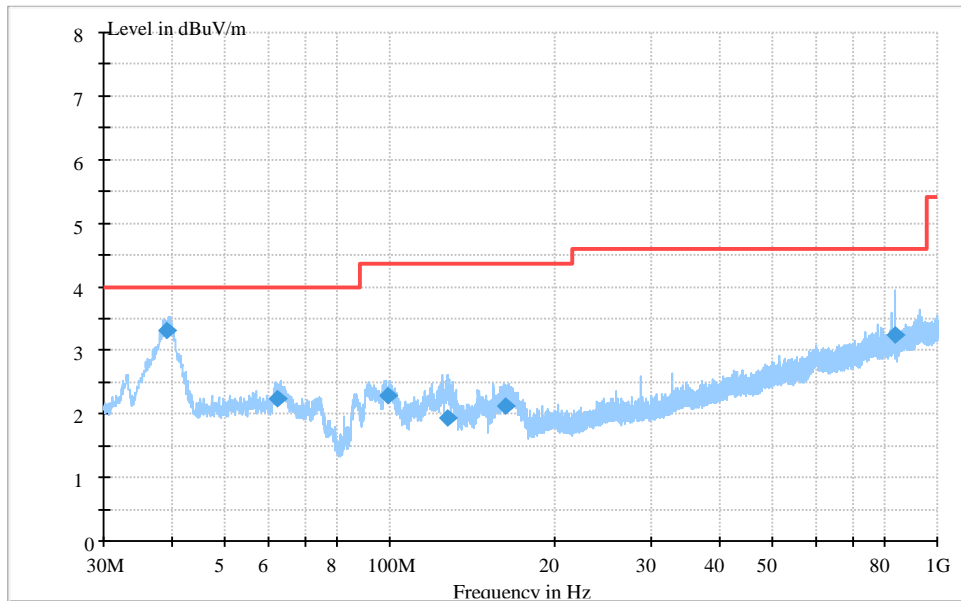
## 7 Test Data and Graph

Only the worst test results were shown

### 7.1 Radiated Emission

#### 7.1.1 30MHz~1GHz

Test Mode 1: Charging + Smart Watch+ Music Playing + BT+ GNSS



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
39.197840	33.14	19.0	40.00	6.86	100.0	172.0	V
62.265980	22.28	18.7	40.00	17.72	247.0	10.0	V
99.305420	22.77	18.6	43.50	20.73	100.0	237.0	V
127.839500	19.25	15.5	43.50	24.25	100.0	307.0	V
162.142640	21.12	15.5	43.50	22.38	100.0	285.0	V
835.637780	32.37	29.4	46.00	13.63	196.0	143.0	H

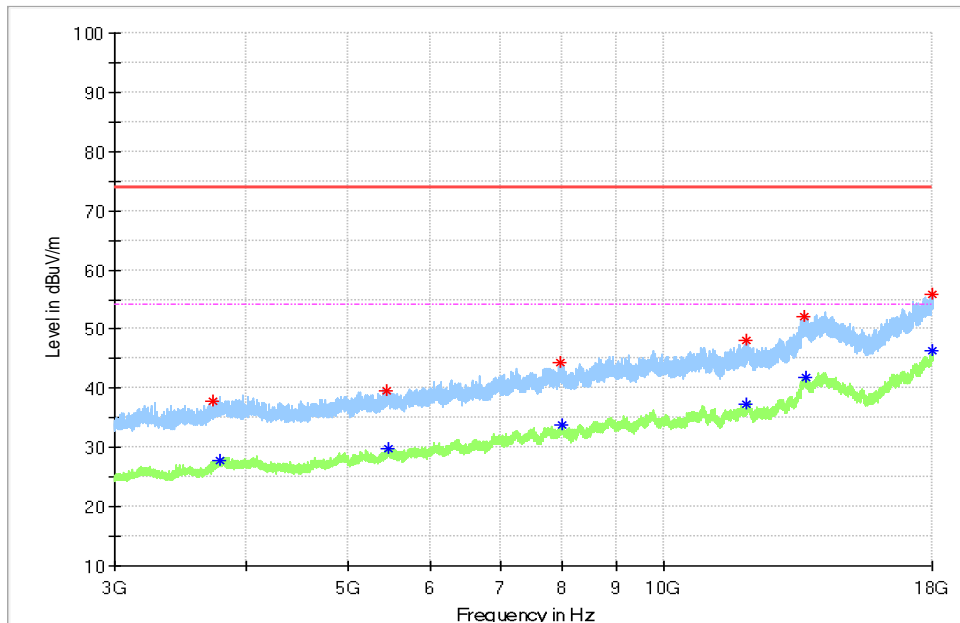
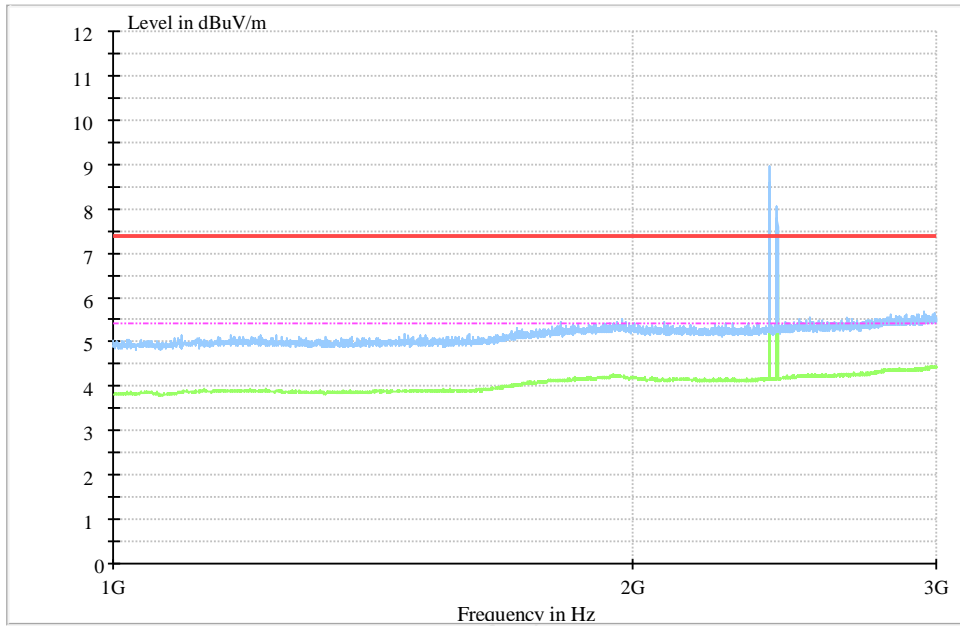
Note:

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.



### 7.1.2 1GHz~18GHz

Test Mode 1: Charging + Smart Watch+ Music Playing + BT+ GNSS





MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dB $\mu$ V/ m	Transd dB	Limit dB $\mu$ V/ m	Margin dB	Height cm	Azimuth deg	Polarisation
3726.5	37.88	-7.2	74.00	36.12	100	246	V
5441	39.49	-4.1	74.00	34.51	100	213	V
7977	44.38	0.7	74.00	29.62	100	123	V
11953.5	48.12	5	74.00	25.88	100	20	V
13616.5	52.18	8.6	74.00	21.82	100	131	V
17994.5	55.78	15.5	74.00	18.22	100	302	V

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB $\mu$ V/ m	Transd dB	Limit dB $\mu$ V/ m	Margin dB	Height cm	Azimuth deg	Polarisation
3773.5	27.88	-6.6	54.00	26.12	100.0	268	V
5463	29.77	-4	54.00	24.23	100.0	286	V
7999	33.93	1.2	54.00	20.07	100.0	205	V
11996	37.41	5.5	54.00	16.59	100.0	270	V
13632.5	41.9	8.7	54.00	12.1	100.0	54	V
17998	46.29	15.6	54.00	7.71	100.0	164	V

Note 1:

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.

Note 2:

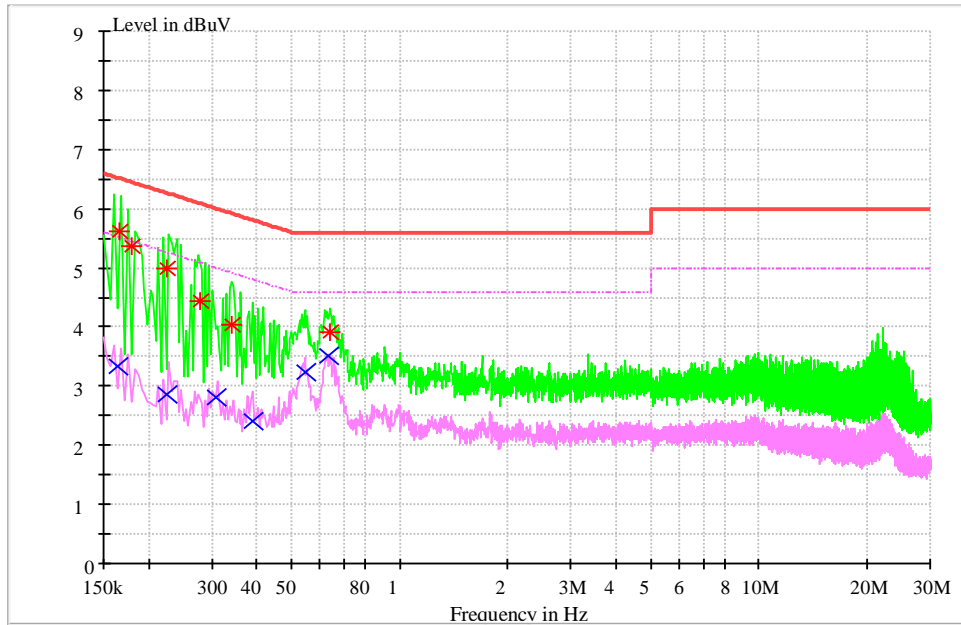
The emission which exceeds the limit is the BT fundamental frequency.



## 7.2 Conducted Emission

### 7.2.1 AC Port Test Data

Test Mode 1: Charging + Smart Watch+ Music Playing + BT+ GNSS



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB $\mu$ V	Line	Transd dB	Margin dB	Limit dB $\mu$ V	PE
0.165314	56.11	L1	9.6	9.08	65.19	FLO
0.179155	53.59	L1	9.6	10.94	64.53	FLO
0.224217	49.89	L1	9.6	12.77	62.66	FLO
0.27946	44.45	L1	9.6	16.38	60.83	FLO
0.339951	40.45	N	9.7	18.75	59.20	FLO
0.638385	39.09	L1	9.6	16.91	56.00	FLO

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB $\mu$ V	Line	Transd dB	Margin dB	Limit dB $\mu$ V	PE
0.164247	33.40	L1	9.6	21.85	55.25	FLO
0.224548	28.63	L1	9.6	24.02	52.65	FLO
0.308259	28.20	L1	9.6	21.82	50.02	FLO
0.388354	24.05	N	9.7	24.05	48.10	FLO
0.547278	32.29	L1	9.6	13.71	46.00	FLO
0.631982	35.03	L1	9.6	10.97	46.00	FLO

Note:

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

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

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