



FCC RF Test Report

Product Name: Smart Watch

Model Number: MIL-B19

Report No.: SYBH(Z-EMC) 20210626012001-2

FCC ID: 2ATEYMIL-B19

Authorized	PREPARED (Test Engineer)	REVIEWED (Test Engineer)	APPROVED (Lab Manager)
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DATE	2021-09-02	2021-09-03	2021-09-03

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※ ※ Notice ※ ※

1. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
2. 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, and the Test Firm Registration Number is 294140.
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.
4. The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named "Global Compliance and Testing Center of Huawei Technologies Co., Ltd", the both names have coexisted since 2009.
5. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. The test report is only valid for the test samples.
8. 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.
9. If any question about this report, please contact the laboratory (PublicGCTC@huawei.com).



MODIFICATION RECORD

No.	Report No.	Modification Description
1	NA	First release.

DECLARATION

Type	Description
Multiple Models Applications	<input checked="" type="checkbox"/> The present report applies to single model.
	<input type="checkbox"/> The present report applies to several models. The practical measurements are performed with the model.
	The present report only presents the worst test case of all modes, see relevant test results for detailed.

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2 General Information

1.1 Test standard/s

Applied Rules :	47 CFR FCC Part 02 47 CFR FCC Part 15 Subpart C
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1.2 Test Environment

Temperature :	TN	15 to 30	°C during room temperature tests
Ambient Relative Humidity:	25 to 75 %		
Atmospheric Pressure:	Not applicable		
Power supply :	VL	3.5	V
	VN	3.87	V DC by Battery
	VH	4.45	V

NOTE 1: 1) VN= nominal voltage, VL= low extreme test voltage, VH= High extreme test voltage;

TN= normal temperature, TL= low extreme test temperature, TH= High extreme test temperature.

NOTE 2: The values used in the test report may be stringent than the declared.

1.3 Test Laboratories

Test Location 1 :	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Address of Test Location 1 :	No.2, New City Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C

1.4 Applicant and Manufacturer

Company Name :	HUAWEI Device Co., Ltd.
Address :	No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China

1.5 Application details

Date of Receipt Sample:	2021-07-15
Start of test:	2021-07-16
End of test:	2021-09-02

3 Summary

FCC Rule No.	Test Description	Test Limit	Test Condition	Test Result	Reference
15.225 (a)	In-Band Emissions	15,848 μ V/m @ 30m 13.553 – 13.567 MHz	RADIATED	Pass	Section 5.2
2.1049 15.215	Bandwidth	N/A		Pass	Section 5.1
15.225(b)	In-Band Emissions	334 μ V/m @ 30m 13.410 – 13.553 MHz 13.567 – 13.710 MHz		Pass	Section 5.2
15.225(c)	In-Band Emissions	106 μ V/m @ 30m 13.110 – 13.410 MHz 13.710 – 14.010 MHz		Pass	Section 5.2
15.225(d) 15.209	Out-of-Band Emissions	FCC: Emissions outside of the specified band (13.110 – 14.010 MHz) must meet the radiated limits detailed in 15.209		Pass	Section 5.3
15.225(e)	Frequency Stability Tolerance	\pm 0.01% of Operating Frequency	Temperature Chamber	Pass	Section 5.4
15.207	AC Conducted Emissions 150kHz – 30MHz	FCC: < FCC 15.207 limits	LINE CONDUCTED	Pass	Section 5.5
NOTE: The transmitter has an integral PCB loop antenna that is enclosed within the housing of the EUT and meets the requirements of FCC 15.203					



4 Product Description

4.1 Product Information

4.1.1 General 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.

Note: this report is only for NFC.

4.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

4.2.1 Board

Board		
Description	Software Version	Hardware Version
Main Board	2.0.1.137	R3

4.2.2 Sub-Assembly

Sub-Assembly	
Name	Description
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

4.3 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N
Adapter	HW-050200U02	HUAWEI	B95532J4M00016

4.4 Technical Description

NOTE: For the detailed technical descriptions, see the applicant/manufacturer's specifications or user manual.

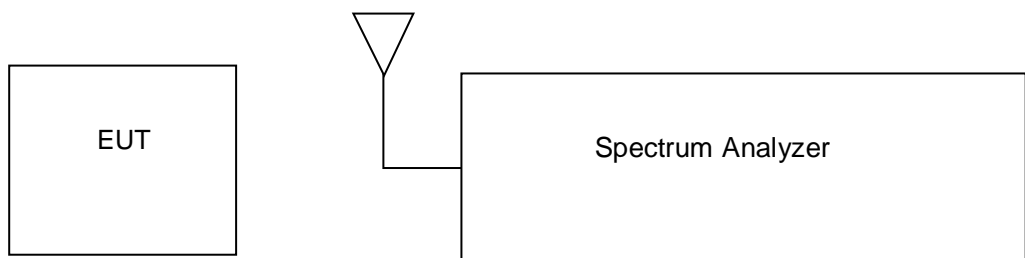
Characteristics	Description	
Operating Frequency	13.56MHz	
Modulation Type	ASK	
Antenna Type	Loop Antenna	
Description of product Class:	<input checked="" type="checkbox"/> product Class 1, <input type="checkbox"/> product Class 2, <input type="checkbox"/> product Class 3, <input type="checkbox"/> product Class 4	
Power Supply	Power Supply Type: <ul style="list-style-type: none"> <input type="checkbox"/> External DC mains, <input checked="" type="checkbox"/> Battery, <input type="checkbox"/> AC/DC Adapter, <input type="checkbox"/> Powered over Ethernet (PoE). <input type="checkbox"/> USB <input type="checkbox"/> Other_____ 	
	Input Rated Voltage	3.87V
	Operating Voltage Range	3.5V~4.45V

5 Test Results

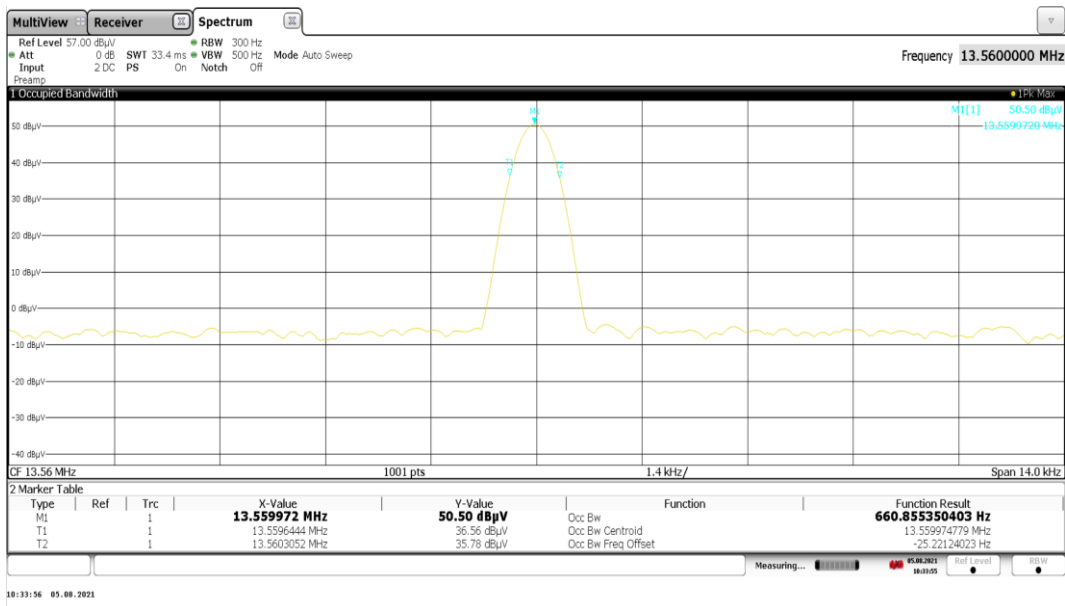
5.1 Bandwidth Measurement

The 99% emission bandwidth and 20dB bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

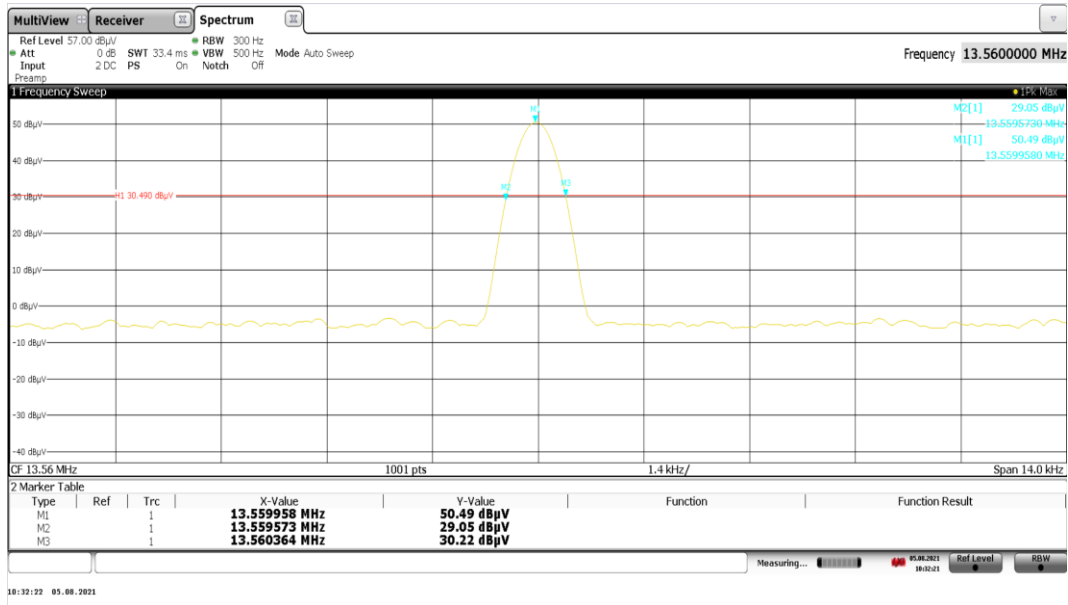
5.1.1 Test Setup



5.1.2 Test Result



Emission bandwidth	Result (Hz)	FL@OBW (MHz)	FH@OBW (MHz)	Verdict
99% emission bandwidth	660.8	13.5596444	13.5603052	PASS

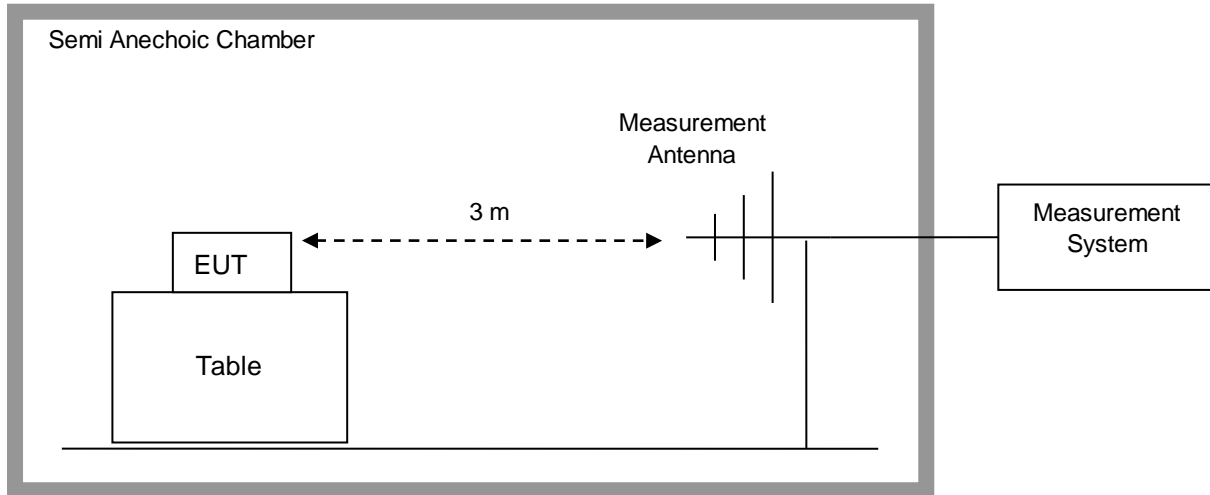


Emission bandwidth	Result (Hz)	FL@OBW (MHz)	FH@OBW (MHz)	Verdict
20dB bandwidth	791	13.559573	13.560364	PASS

The result of the measurement is passed.

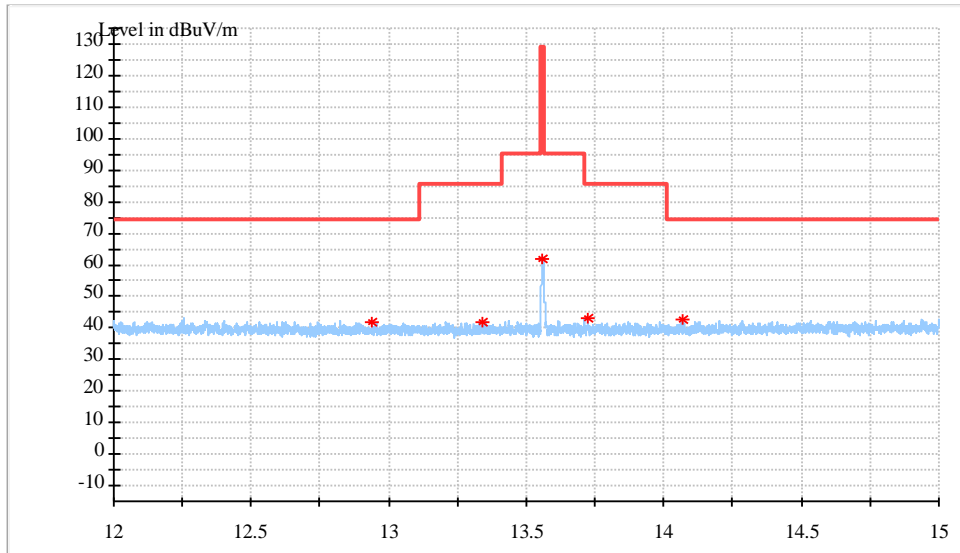
5.2 In-Band Radiated Spurious Emission Measurements

5.2.1 Test Setup



Measurement parameters	
Detector:	Quasi Peak
Sweep time:	-/-
Resolution bandwidth:	9 kHz
Video bandwidth:	30 kHz
Span:	-/-
Trace-Mode:	Max Hold

Test Result



MEASUREMENT RESULT: QP Detector

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Azimuth (deg)
12.939938	36.94	69.50	32.56	V	133.0
13.342875	36.78	80.50	43.72	V	107.0
13.558125	56.83	124.00	67.17	V	324.0
13.725000	37.92	80.50	42.58	V	48.0
14.065875	37.47	69.50	32.03	V	223.0

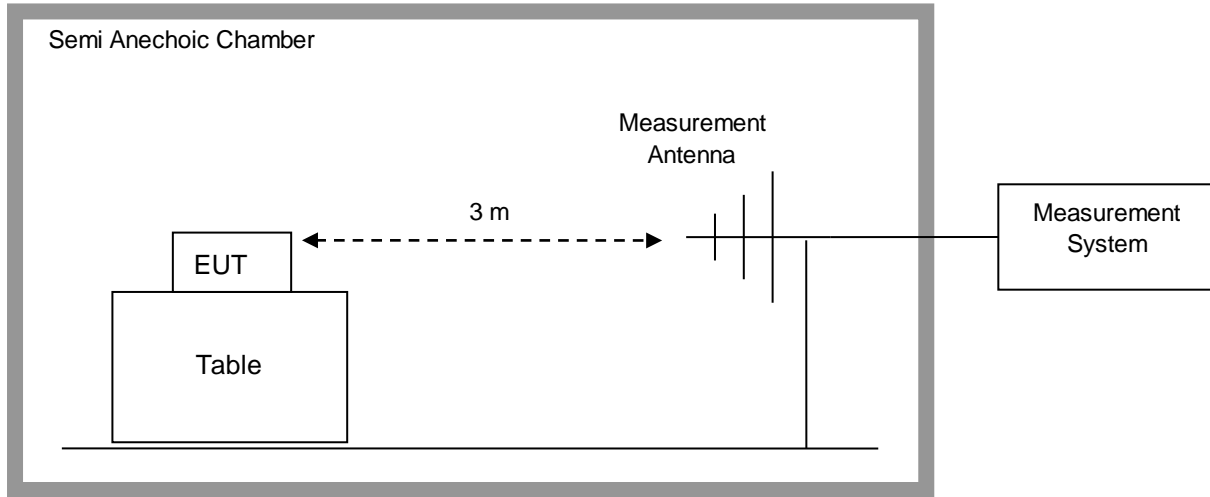
NOTES:

1. All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.
2. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40\text{dB}$
3. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.
4. 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.

The result of the measurement is passed.

5.3 Radiated Spurious Emission Measurements, Out-of-Band

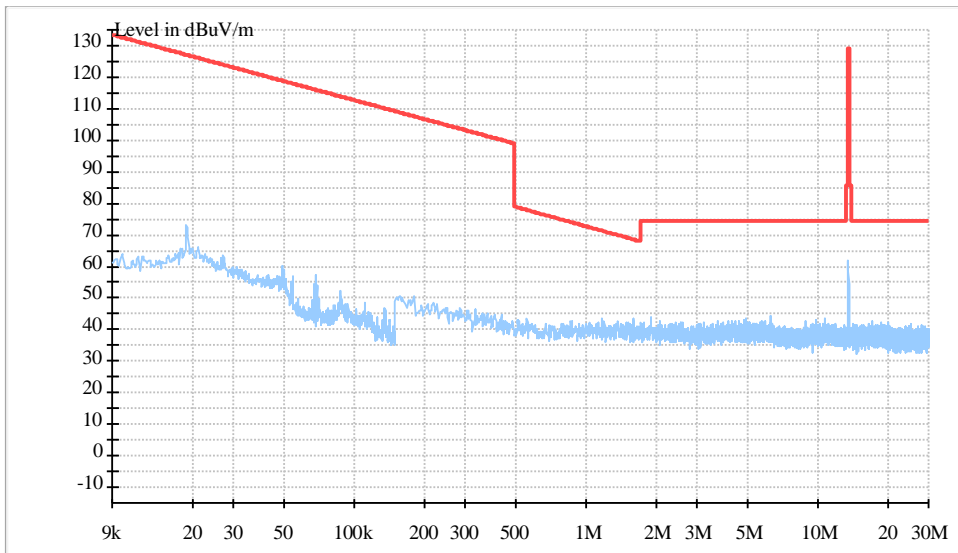
5.3.1 Test Setup



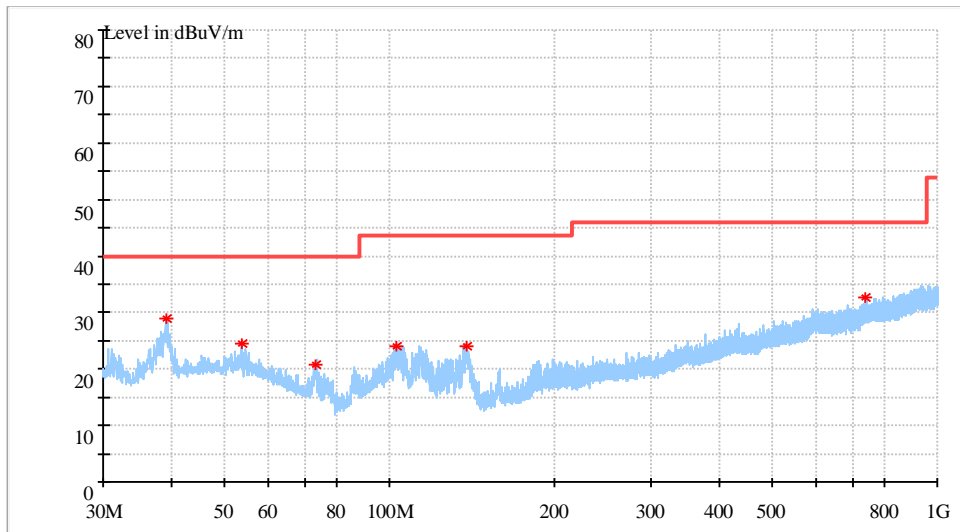
Measurement parameters	
Detector:	Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	9 kHz – 150 kHz: 200 Hz 150 kHz – 30 MHz: 9 kHz 30 MHz – 1000 MHz: 100 kHz
Video bandwidth:	9 kHz – 150 kHz: 500 Hz 150 kHz – 30 MHz: 30 kHz 30 MHz – 1000 MHz: 300 kHz
Span:	See Plots
Trace-Mode:	Max Hold

5.3.2 Test Result

9k~30MHz



30M~1GHz



Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Polarisation	Azimuth (deg)	Transd (dB)
39.021000	29.02	40.00	10.98	100.0	V	273.0	19.0
53.571000	24.39	40.00	15.61	100.0	V	31.0	20.3
73.116500	20.83	40.00	19.17	100.0	V	31.0	15.0
102.750000	24.02	43.50	19.48	100.0	V	121.0	18.6
137.912500	24.04	43.50	19.46	100.0	V	121.0	15.0
740.040000	32.58	46.00	13.42	100.0	H	164.0	29.1

NOTES:

1. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector for emissions below 960MHz.
2. Both Vertical and Horizontal polarities of the receive antenna were evaluated with the worst case emissions being reported. Below 30MHz the Loop antenna was positioned in 3 separate radials.
3. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
4. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
5. Level =Reading level by receiver + Trends (Antenna factor + cable loss – preamplifier gain). The reading level is calculated by software which is not shown in the sheet.

The result of the measurement is passed.

5.4 Frequency Stability

5.4.1 Test Setup

The EUT was placed in a Climatic Chamber. A small whip antenna was placed close to the EUT, and connected to the measuring Spectrum Analyzer. Measurement performed without modulation on TX.

5.4.2 Test Result

VOLTAGE (%)	POWER Battery	TEMP (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	VN	-20	13560384	384	0.00283
100%		-10	13560160	160	0.00117
100%		0	13560384	384	0.00283
100%		10	13560384	384	0.00283
100%		20	13560160	160	0.00117
100%		30	13560160	160	0.00117
100%		40	13560384	384	0.00283
100%		50	13560160	160	0.00117
85%	VL	20	13559911	-89	-0.00065
115%	VH	20	13559903	-97	-0.00071

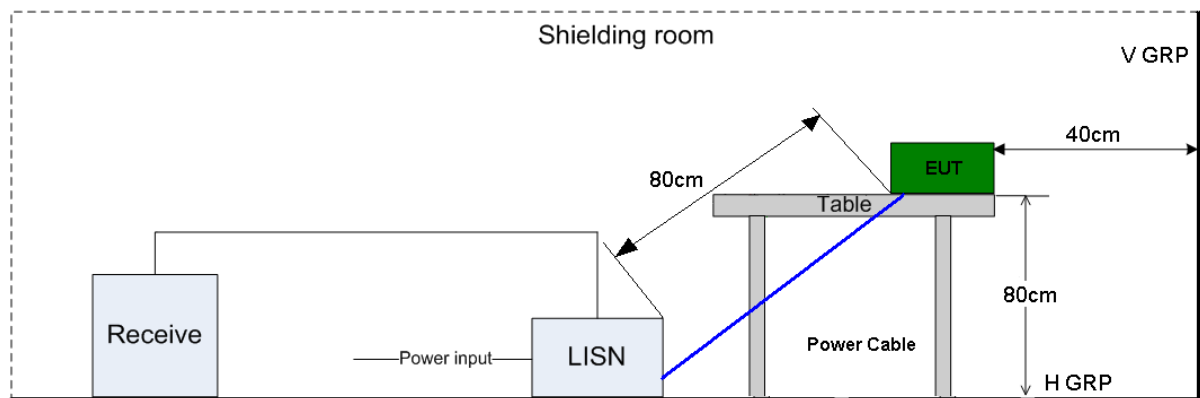
The result of the measurement is passed.

5.5 AC Power Line Conducted Emissions

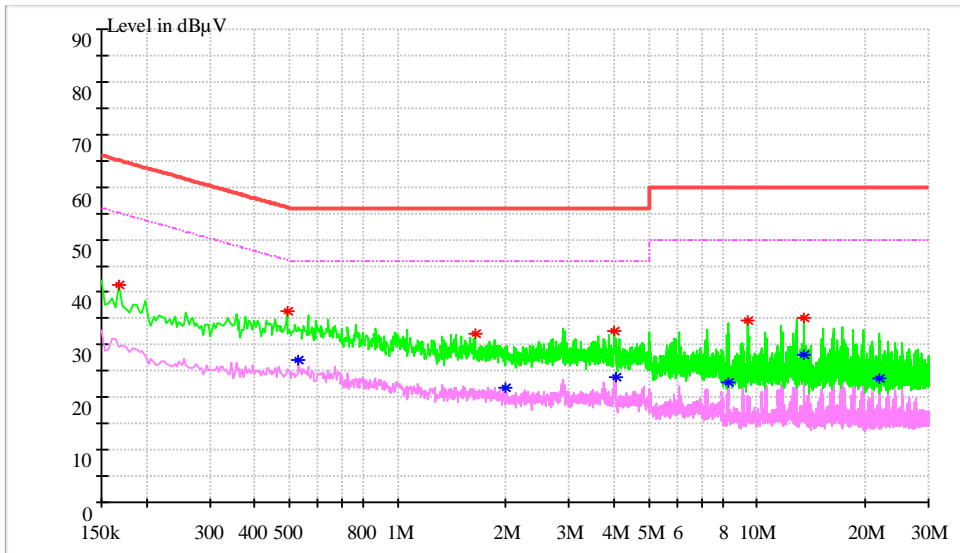
5.5.1 Test Setup

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.



5.5.2 Test Result



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Limit dBµV	Transd dB	Margin dB	Line	PE
0.168656	41.48	65.03	9.7	23.55	N	FLO
0.493275	36.39	56.11	9.7	19.72	N	FLO
1.638769	32.16	56.00	9.7	23.84	L1	FLO
4.008112	32.66	56.00	9.8	23.34	N	FLO
9.410962	34.48	60.00	10.1	25.52	N	FLO
13.556381	35.03	60.00	10.4	24.97	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Limit dBµV	Transd dB	Margin dB	Line dBµV	PE
0.530588	27.11	46.00	9.7	18.89	L1	FLO
1.996969	21.91	46.00	9.7	24.09	N	FLO
4.037962	23.70	46.00	9.8	22.30	N	FLO
8.351288	22.71	50.00	10.0	27.29	N	FLO
13.560112	28.06	50.00	10.4	21.94	L1	FLO
22.000200	23.53	50.00	10.3	26.47	N	FLO

Note1:

1, Level =Reading level by receiver + Transd (cable loss – correction factor)

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

2, Margin=Limit - Level

The result of the measurement is passed.

6 MAIN TEST INSTRUMENTS

6.1 Current Test Project/Report

Main Test Equipments(RE test system)					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal-Due
Test receiver	R&S	ESW44	101878	Jan. 13, 2021	Jan. 12, 2022
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100262	Jan. 30,2020	Jan. 30, 2022
Trilog Broadband Antenna (30M~3GHz)	SCHWARZ BECK	VULB 9163	9163-01303	Aug. 11, 2020	Aug. 10, 2022
Software Information					
Test Item	Software Name		Manufacturer		Version
RE	EMC32		R&S		V10.60.20

Main Test Equipment(CE test system)					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal-Due
Test receiver	R&S	ESU26	100150	Nov. 06, 2020	Nov. 05, 2021
Artificial Mains Network	R&S	ENV216	100382	Jul. 13, 2021	Jul. 12, 2022
Software Information					
Test Item	Software Name		Manufacturer		Version
CE	EMC32		R&S		V9.25.0

7 System Measurement Uncertainty

For a 95% confidence level ($k = 2$), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Test Item		Extended Uncertainty
All Emissions, Radiated	Field Strength [dB μ V/m]	For 3 m Chamber: U = 3.868 dB (9 kHz to 150 kHz) U = 3.872 dB (150 kHz to 30 MHz) U = 5.24 dB (30 MHz-1 GHz)
AC Power Line Conducted Emissions	Disturbance Voltage[dB μ V]	U=2.3 dB

-----The END-----