

FCC EMC Test Report



Subject to

Supplier's Declaration of Conformity

Procedure

Product : Smartwatch

Trade Mark : CUBOT/HAFURY

Model Number : N1

Prepared for

Shenzhen Huafului Technology Co., Ltd.

Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden),
Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District,
Shenzhen, P.R. China

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

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TEST RESULT CERTIFICATION

Applicant's Name: Shenzhen Huafurui Technology Co., Ltd.
Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of
Address.....: Chongwen Garden), Crossing of the Liuxian Street and Tangling
Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China
Manufacturer's Name.....: Shenzhen Huafurui Technology Co., Ltd.
Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of
Address.....: Chongwen Garden), Crossing of the Liuxian Street and Tangling
Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China

Product description

Product name.....: Smartwatch
Model and/or type reference ..: N1
Standards.....: 47 CFR FCC part15 subpart B, 10-1-2020
ANSI C63.4:2014

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests: 22 Mar. 2021 ~ 31 Mar. 2021

Date of Issue: 31 Mar. 2021

Test Result.....: **Pass**

Testing Engineer :

Estelle Chen

(Estelle Chen)

Technical Manager :

Sky Zhang

(Sky Zhang)

Authorized Signatory :

Alex

(Alex)

Table of Contents	Page
1 . TEST SUMMARY	4
1.1 TEST FACILITY	5
1.2 MEASUREMENT UNCERTAINTY	5
2 . GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	8
2.3 DESCRIPTION OF TEST SETUP	9
2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL	10
2.5 MEASUREMENT INSTRUMENTS LIST	11
3 . EMC EMISSION TEST	12
3.1 CONDUCTED EMISSION MEASUREMENT	12
3.1.1 POWER LINE CONDUCTED EMISSION	12
3.1.2 TEST PROCEDURE	13
3.1.3 TEST SETUP	13
3.1.4 EUT OPERATING CONDITIONS	13
3.1.5 TEST RESULTS	14
3.2 RADIATED EMISSION MEASUREMENT	16
3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	16
3.2.2 TEST PROCEDURE	16
3.2.3 TEST SETUP	17
3.2.4 EUT OPERATING CONDITIONS	17
3.2.5 TEST RESULTS(30-1000MHz)	18
3.2.6 TEST RESULTS(Above 1000MHz)	20
4 . EUT TEST PHOTO	22
ATTACHMENT PHOTOGRAPHS OF EUT	24

1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC part15 subpart B, 10-1-2020 ANSI C63.4: 2014	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

Shenzhen NTEK Testing Technology Co., Ltd.

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street Bao'an District, Shenzhen 518126 P.R. China

CNAS-Lab. : The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)
The Certificate Registration Number is L5516

IC-Registration : The Certificate Registration Number is CN0074

FCC- Accredited : Test Firm Registration Number: 463705
Designation Number: CN1184

A2LA-Lab. : The Certificate Registration Number is 4298.01
This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

Test Item	Measurement Frequency Range	K	U(dB)
AC Mains Conducted Emission	0.009kHz ~ 0.15MHz	2	2.66
AC Mains Conducted Emission	0.15MHz ~ 30MHz	2	2.80
Telecom Conducted Emission (Cat 3)	0.15MHz ~ 30MHz	2	2.40
Telecom Conducted Emission (Cat 5)	0.15MHz ~ 30MHz	2	2.58
Radiated Emission	30MHz ~ 1000MHz	2	2.64
Radiated Emission	1000MHz ~ 6000MHz	2	5.10
Radiated Emission	6000MHz ~ 18000MHz	2	2.52
Power Clamp	30MHz ~ 300MHz	2	2.20

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Smartwatch	
Model Name	N1	
Additional Model Number(s)	N/A	
Model Difference	N/A	
Product Description	The EUT is a Smartwatch.	
	Operating frequency:	2.4 GHz (Declaration by factory)
	Connecting I/O port:	N/A
	Based on the application, features, or specification exhibited in User's Manual. More details of EUT technical specification, please refer to the User's Manual.	
Power Source	DC Voltage	
Power Rating	DC 5V powered by USB port or DC 3.8V, 450mAh, 1.71Wh powered by Battery	

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

All test modes in the table below are tested, the worst case is listed on this report.

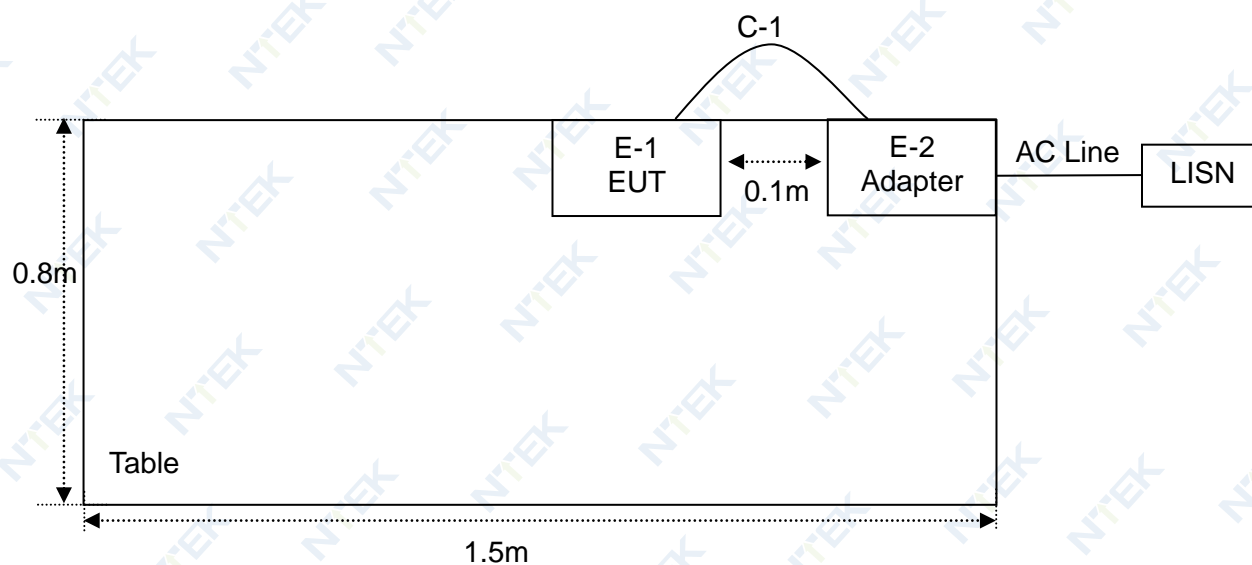
Pretest Mode	Description
Mode 1	Charging
Mode 2	Working

For Conducted Test	
Final Test Mode	Description
Mode 1	Charging

For Radiated Test	
Final Test Mode	Description
Mode 1	Charging
Mode 2	Working

2.3 DESCRIPTION OF TEST SETUP

Mode CE: Charging



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Smartwatch	CUBOT/HAFURY	N1	N/A	EUT
E-2	Adapter	N/A	KSA29B0500200D5	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	60cm	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) "YES" means "shielded" "with core"; "NO" means "unshielded" "without core".

2.5 MEASUREMENT INSTRUMENTS LIST

2.5.1 CONDUCTED TEST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Low frequency cable	N/A	C-01	N/A	May 11, 2020	May 10, 2023	3 years
2	50Ω Switch	Anritsu	MP59B	6200983704	May 11, 2020	May 10, 2023	3 years
3	LISN	R&S	ENV216	101490	Jul. 13, 2020	Jul. 12, 2021	1 year
4	LISN	R&S	ENV216	101313	May 11, 2020	May 10, 2021	1 year
5	LISN	SCHWARZBECK	NNLK 8129	8129245	May 11, 2020	May 10, 2021	1 year
6	EMI Test Receiver	R&S	ESCI	101160	May 11, 2020	May 10, 2021	1 year

2.5.2 RADIATED TEST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	R&S	ESCI	101160	May 11, 2020	May 10, 2021	1 year
2	Bilog Antenna	TESEQ	CBL6111D	31216	Apr. 11, 2020	Apr. 10, 2021	1 year
3	System Controller	SKET	N/A	N/A	N/A	N/A	N/A
4	Antenna Mast	SKET	N/A	N/A	N/A	N/A	N/A
5	System Controller	ADT	SC100	N/A	N/A	N/A	N/A
6	Antenna Mast	ADT	N/A	N/A	N/A	N/A	N/A
7	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	May 11, 2020	May 10, 2023	3 years
8	Low Frequency Cable	N/A	R-03	N/A	Jun. 28, 2019	Jun. 27, 2022	3 years
9	RF Cable	Pasternack	PE332-1000C M	N/A	Nov. 10, 2019	Nov. 09, 2022	3 years
10	Broadband Horn Antenna	EM	EM-AH-10180	2011071402	Apr. 08, 2018	Apr. 07, 2021	3 years
11	Spectrum Analyzer	Agilent	E4407B	MY45108040	May 11, 2020	May 10, 2021	1 year
12	Low Noise Amplifier	B&Z	BZ-P540-5508 50-452727	16476-11729	Apr. 15, 2020	Apr. 14, 2021	1 year
13	Cable	Keysight	A40-2.92M2.9 2M-2M	1808041	Nov. 18, 2019	Nov. 17, 2022	3 years

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150kHz-30MHz)

FREQUENCY (MHz)	<input type="checkbox"/> Class A (dB μ V)		<input checked="" type="checkbox"/> Class B (dB μ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 - 5.0	73.00	60.00	56.00	46.00
5.0 - 30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

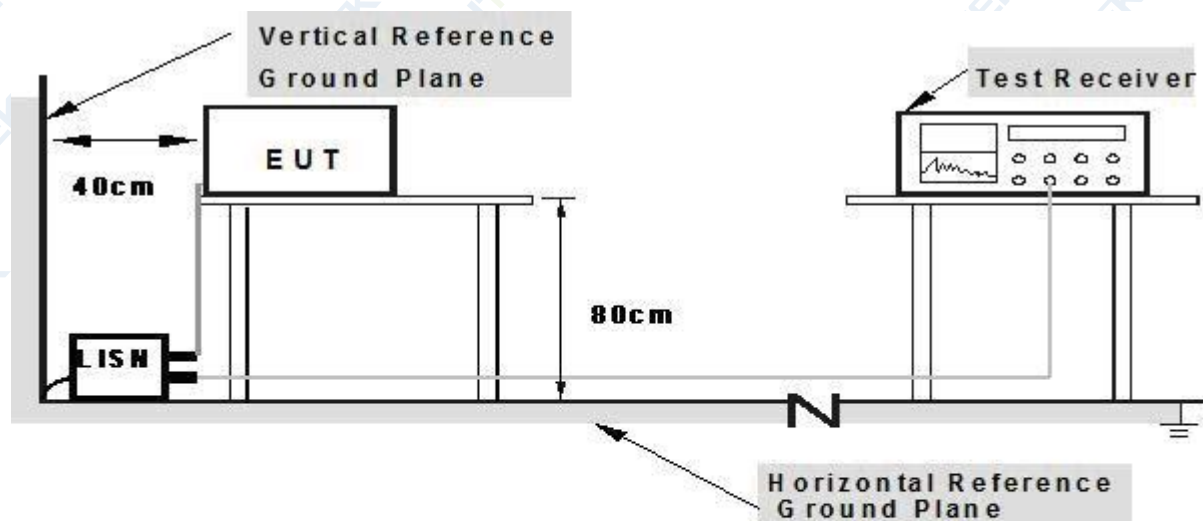
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of The cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

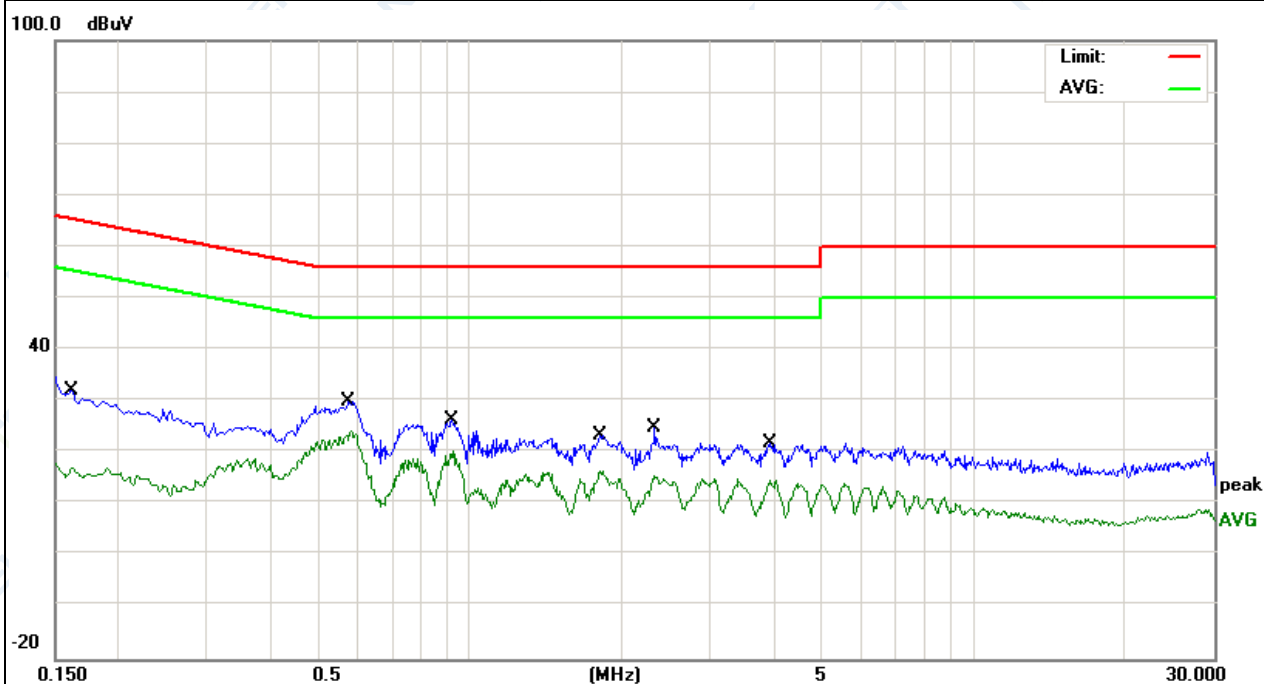
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.5 TEST RESULTS

EUT:	Smartwatch	Model Name:	N1
Temperature:	21.1℃	Relative Humidity:	51%
Pressure:	1010hPa	Test Date:	2021-03-25
Test Mode:	Charging	Phase:	L
Test Voltage:	DC 5V powered by Adapter AC 120V/60Hz		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1620	22.57	9.56	32.13	65.36	-33.23	QP	
2		0.1620	7.51	9.56	17.07	55.36	-38.29	AVG	
3		0.5740	20.43	9.55	29.98	56.00	-26.02	QP	
4	*	0.5740	14.62	9.55	24.17	46.00	-21.83	AVG	
5		0.9220	16.69	9.56	26.25	56.00	-29.75	QP	
6		0.9220	10.89	9.56	20.45	46.00	-25.55	AVG	
7		1.8180	13.79	9.58	23.37	56.00	-32.63	QP	
8		1.8180	6.84	9.58	16.42	46.00	-29.58	AVG	
9		2.3220	15.21	9.58	24.79	56.00	-31.21	QP	
10		2.3220	5.87	9.58	15.45	46.00	-30.55	AVG	
11		3.9580	12.27	9.60	21.87	56.00	-34.13	QP	
12		3.9580	5.03	9.60	14.63	46.00	-31.37	AVG	

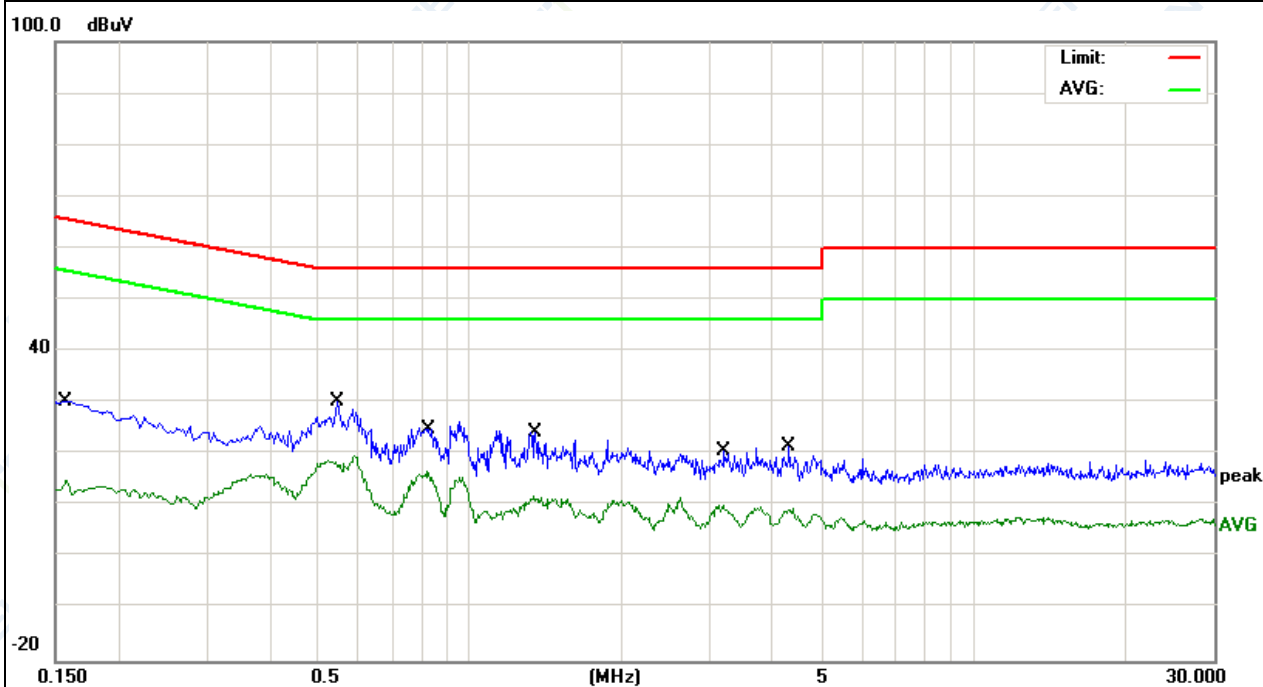
Remark:

Correct Factor = Insertion Loss + Cable Loss

Measurement Level = Reading Level + Correct Factor

Over Level = Measurement Level - Limit

EUT:	Smartwatch	Model Name:	N1
Temperature:	21.1℃	Relative Humidity:	51%
Pressure:	1010hPa	Test Date:	2021-03-25
Test Mode:	Charging	Phase:	N
Test Voltage:	DC 5V powered by Adapter AC 120V/60Hz		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1580	20.75	9.55	30.30	65.56	-35.26	QP	
2		0.1580	5.47	9.55	15.02	55.56	-40.54	AVG	
3	*	0.5460	20.85	9.54	30.39	56.00	-25.61	QP	
4		0.5460	9.19	9.54	18.73	46.00	-27.27	AVG	
5		0.8300	16.89	9.54	26.43	56.00	-29.57	QP	
6		0.8300	6.90	9.54	16.44	46.00	-29.56	AVG	
7		1.3420	13.15	9.55	22.70	56.00	-33.30	QP	
8		1.3420	2.30	9.55	11.85	46.00	-34.15	AVG	
9		3.1900	10.92	9.59	20.51	56.00	-35.49	QP	
10		3.1900	0.15	9.59	9.74	46.00	-36.26	AVG	
11		4.3099	11.89	9.61	21.50	56.00	-34.50	QP	
12		4.3099	-0.20	9.61	9.41	46.00	-36.59	AVG	

Remark:

Correct Factor = Insertion Loss + Cable Loss

Measurement Level = Reading Level + Correct Factor

Over Level = Measurement Level - Limit

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	<input type="checkbox"/> Class A (at 3m)	<input checked="" type="checkbox"/> Class B (at 3m)
	dB μ V/m	dB μ V/m
30 ~ 88	49.5	40.0
88 ~ 216	53.9	43.5
216 ~ 960	56.9	46.0
Above 960	60.0	54.0

Notes:

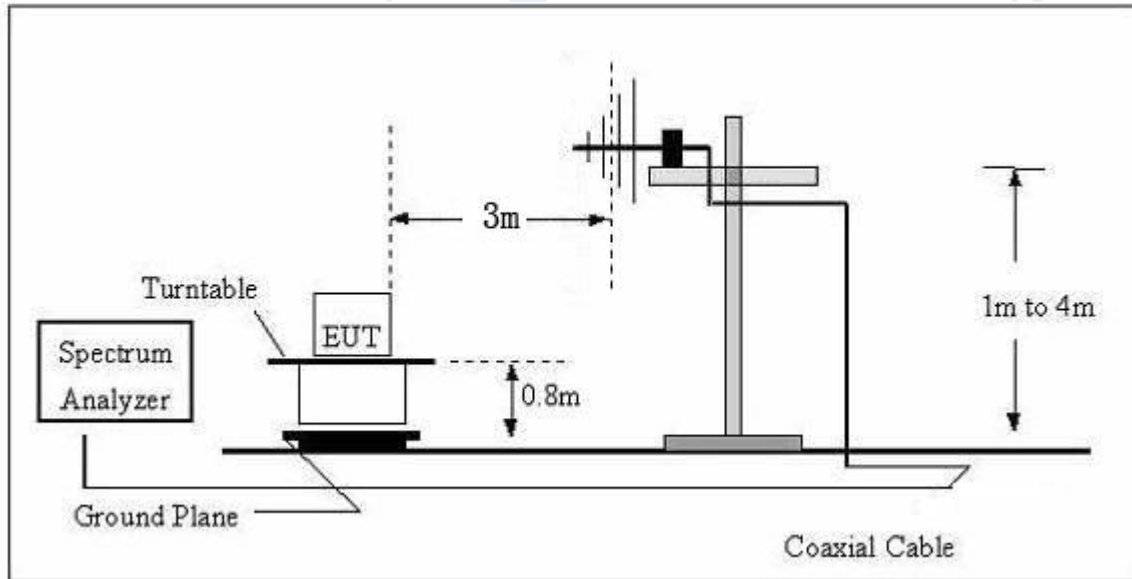
- (1) The limit for radiated test was performed according to as following: FCC PART 15B.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dB μ V/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

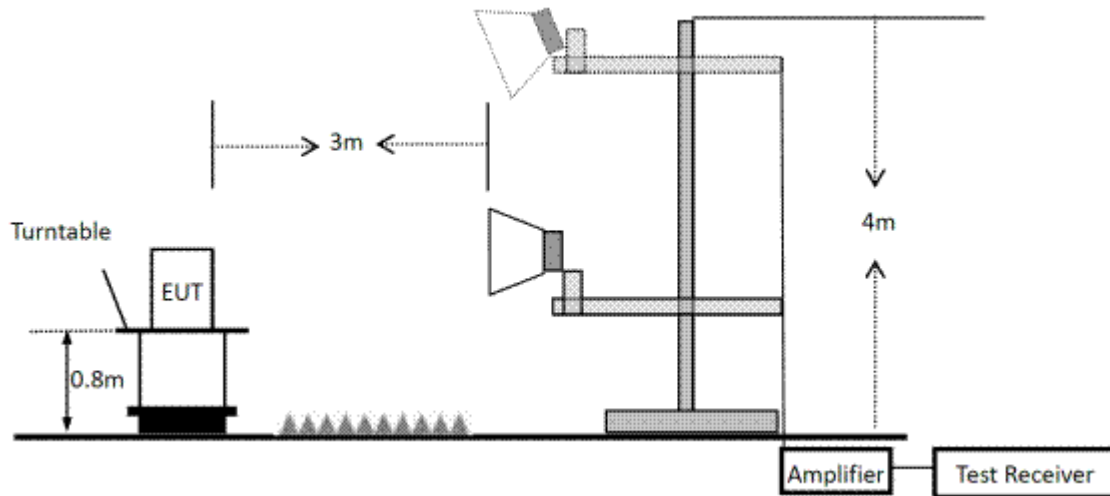
- a. The measuring distance of at 3m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked And then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz

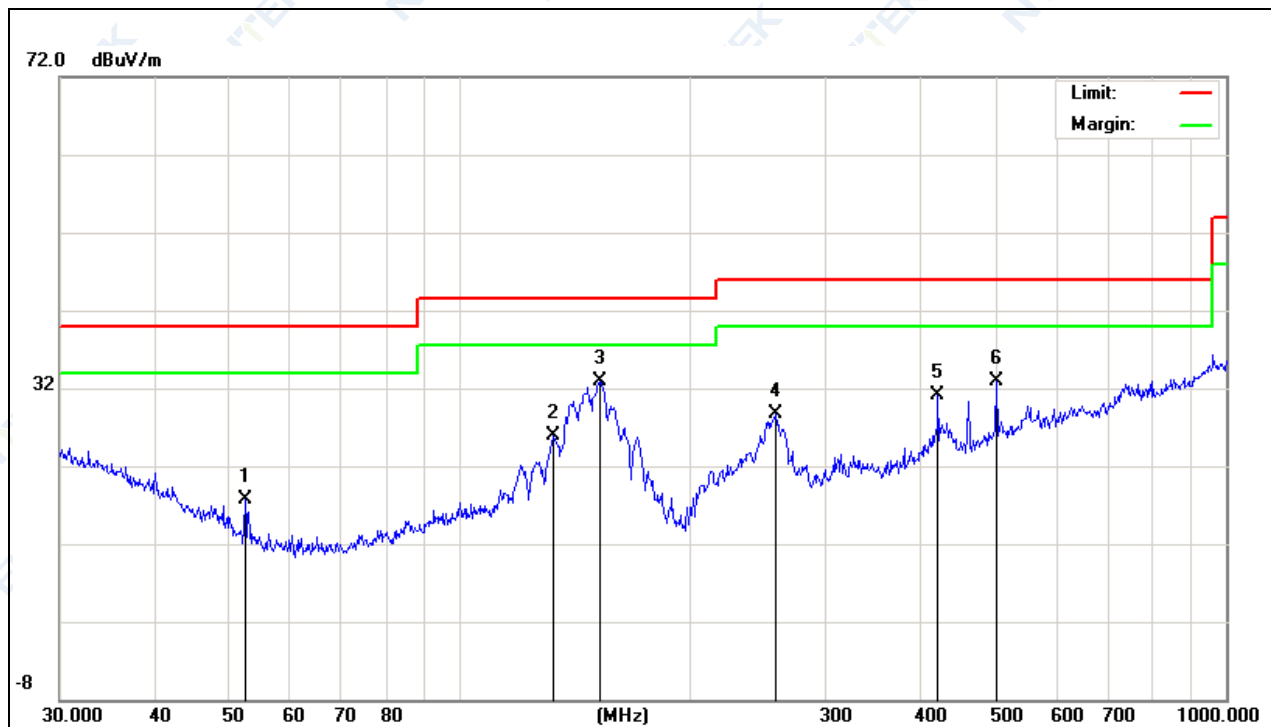


3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 TEST RESULTS(30-1000MHz)

EUT:	Smartwatch	Model Name:	N1
Temperature:	25.3℃	Relative Humidity:	51%
Pressure:	1010hPa	Test Date:	2021-03-23
Test Mode:	Charging	Polarization:	Horizontal
Test Power:	DC 5V powered by Adapter AC 120V/60Hz		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		52.3912	10.24	7.55	17.79	40.00	-22.21	QP		
2		132.2205	13.41	12.54	25.95	43.50	-17.55	QP		
3	*	152.1297	21.09	11.84	32.93	43.50	-10.57	QP		
4		258.3264	14.13	14.60	28.73	46.00	-17.27	QP		
5		420.5803	12.81	18.27	31.08	46.00	-14.92	QP		
6		501.1790	12.27	20.64	32.91	46.00	-13.09	QP		

Remark:

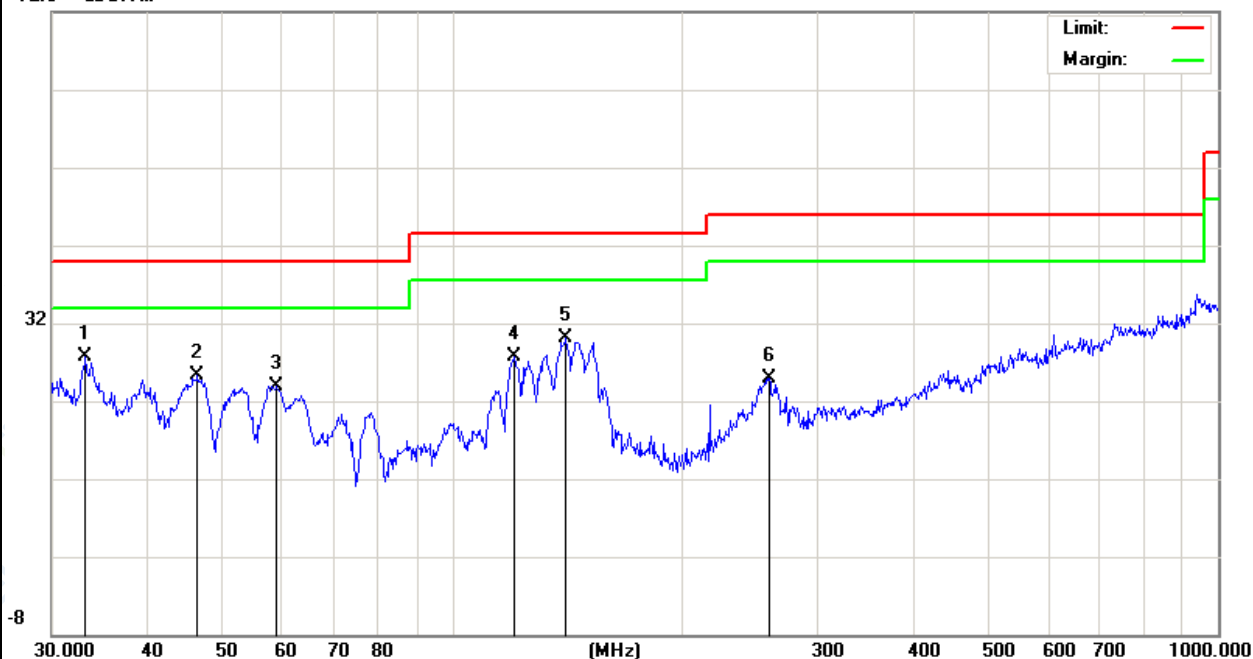
Correct Factor = Antenna Factor + Cable Loss – Pre-Amplifier gain

Measurement Level = Reading Level + Correct Factor

Over Level = Measurement Level - Limit

EUT:	Smartwatch	Model Name:	N1
Temperature:	25.3℃	Relative Humidity:	51%
Pressure:	1010hPa	Test Date:	2021-03-23
Test Mode:	Charging	Polarization:	Vertical
Test Power:	DC 5V powered by Adapter AC 120V/60Hz		

72.0 dBuV/m



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	*	33.2112	10.28	17.50	27.78	40.00	-12.22	QP		
2		46.5030	14.55	10.71	25.26	40.00	-14.74	QP		
3		59.0251	17.74	6.13	23.87	40.00	-16.13	QP		
4		120.6991	15.25	12.39	27.64	43.50	-15.86	QP		
5		140.8351	17.73	12.35	30.08	43.50	-13.42	QP		
6		259.2338	10.18	14.80	24.98	46.00	-21.02	QP		

Remark:

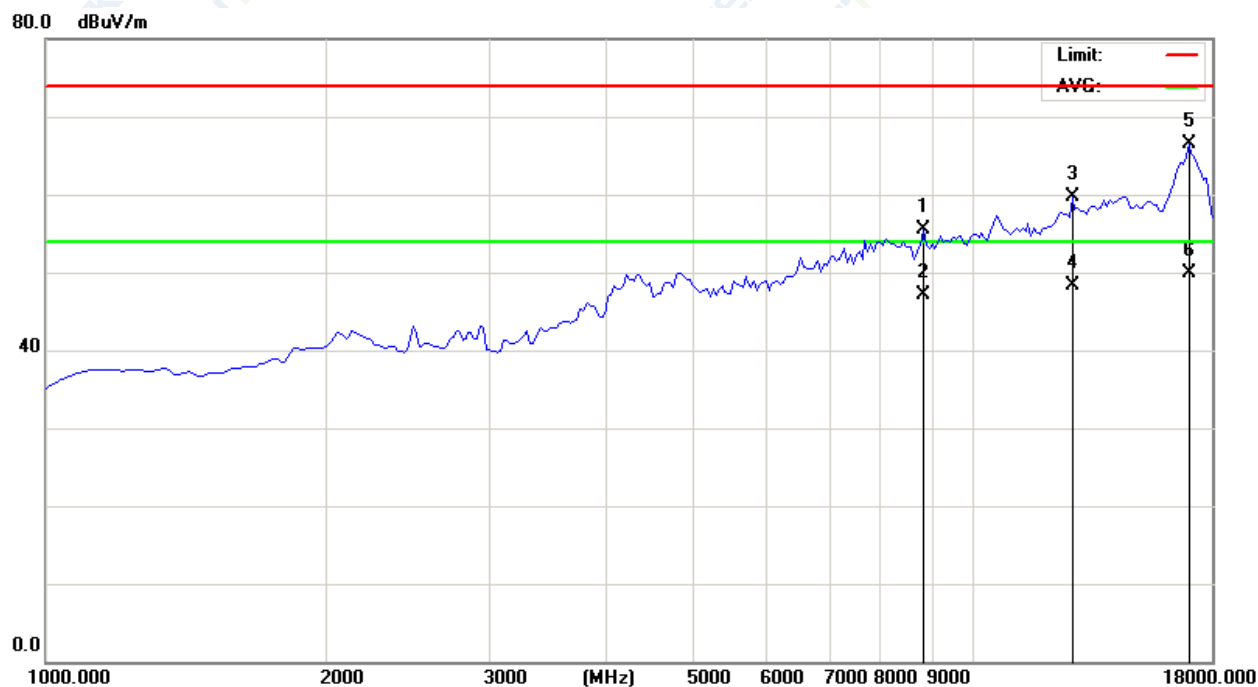
Correct Factor = Antenna Factor + Cable Loss – Pre-Amplifier gain

Measurement Level = Reading Level + Correct Factor

Over Level = Measurement Level - Limit

3.2.6 TEST RESULTS(Above 1000MHz)

EUT:	Smartwatch	Model Name:	N1
Temperature:	25.2°C	Relative Humidity:	49%
Pressure:	1010hPa	Test Date:	2021-03-24
Test Mode:	Working	Polarization:	Horizontal
Test Power:	DC 3.8V powered by Battery		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		8820.000	64.66	-9.12	55.54	74.00	-18.46	peak		
2		8820.000	56.32	-9.12	47.20	54.00	-6.80	AVG		
3		12815.00	64.01	-4.37	59.64	74.00	-14.36	peak		
4		12815.00	52.67	-4.37	48.30	54.00	-5.70	AVG		
5		17107.50	62.08	4.42	66.50	74.00	-7.50	peak		
6	*	17107.50	45.48	4.42	49.90	54.00	-4.10	AVG		

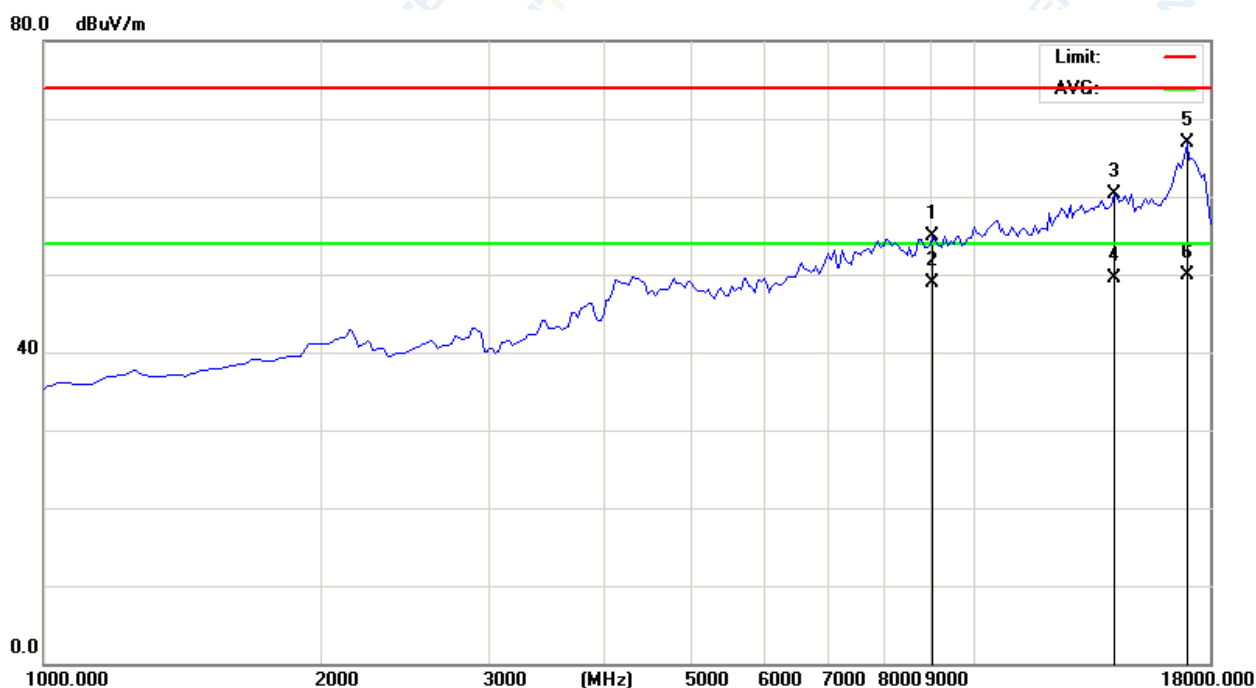
Remark:

Correct Factor = Antenna Factor + Cable Loss – Pre-Amplifier gain

Measurement Level = Reading Level + Correct Factor

Over Level = Measurement Level - Limit

EUT:	Smartwatch	Model Name:	N1
Temperature:	25.2°C	Relative Humidity:	49%
Pressure:	1010hPa	Test Date:	2021-03-24
Test Mode:	Working	Polarization:	Vertical
Test Power:	DC 3.8V powered by Battery		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		9117.500	64.02	-9.16	54.86	74.00	-19.14	peak		
2		9117.500	58.16	-9.16	49.00	54.00	-5.00	AVG		
3		14260.00	63.89	-3.54	60.35	74.00	-13.65	peak		
4		14260.00	53.14	-3.54	49.60	54.00	-4.40	AVG		
5		17107.50	62.44	4.42	66.86	74.00	-7.14	peak		
6	*	17107.50	45.48	4.42	49.90	54.00	-4.10	AVG		

Remark:

Correct Factor = Antenna Factor + Cable Loss – Pre-Amplifier gain

Measurement Level = Reading Level + Correct Factor

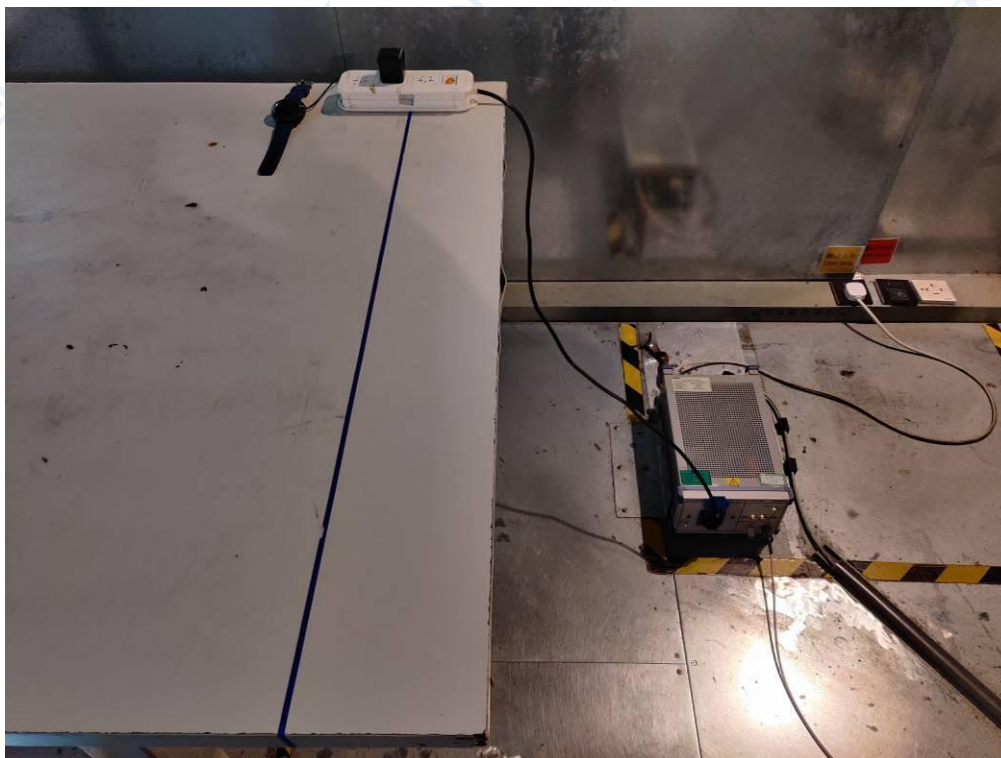
Over Level = Measurement Level - Limit

4. EUT TEST PHOTO

Radiated Measurement Photo



Conducted Measurement Photo



ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7

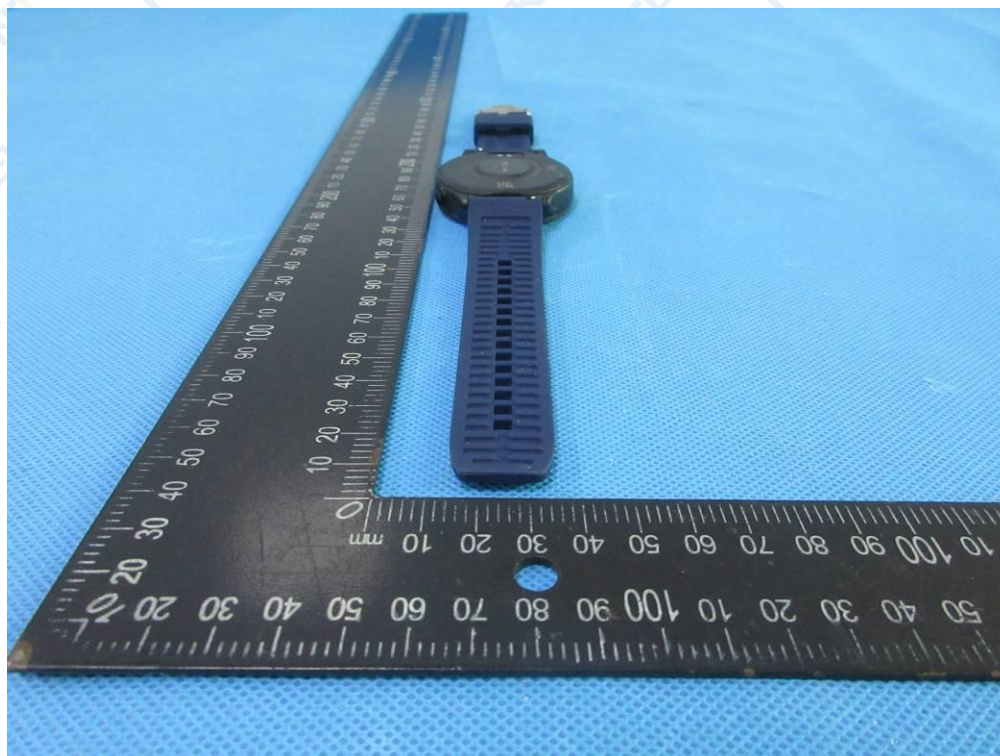


Photo 8



Photo 9

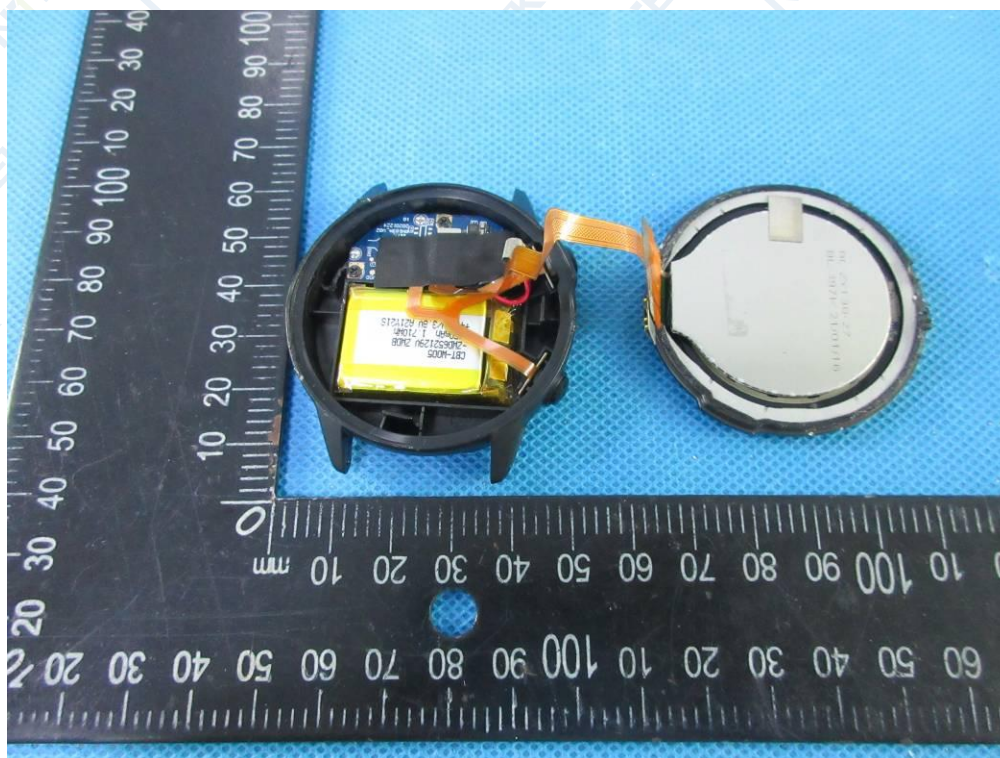


Photo 10



Photo 11

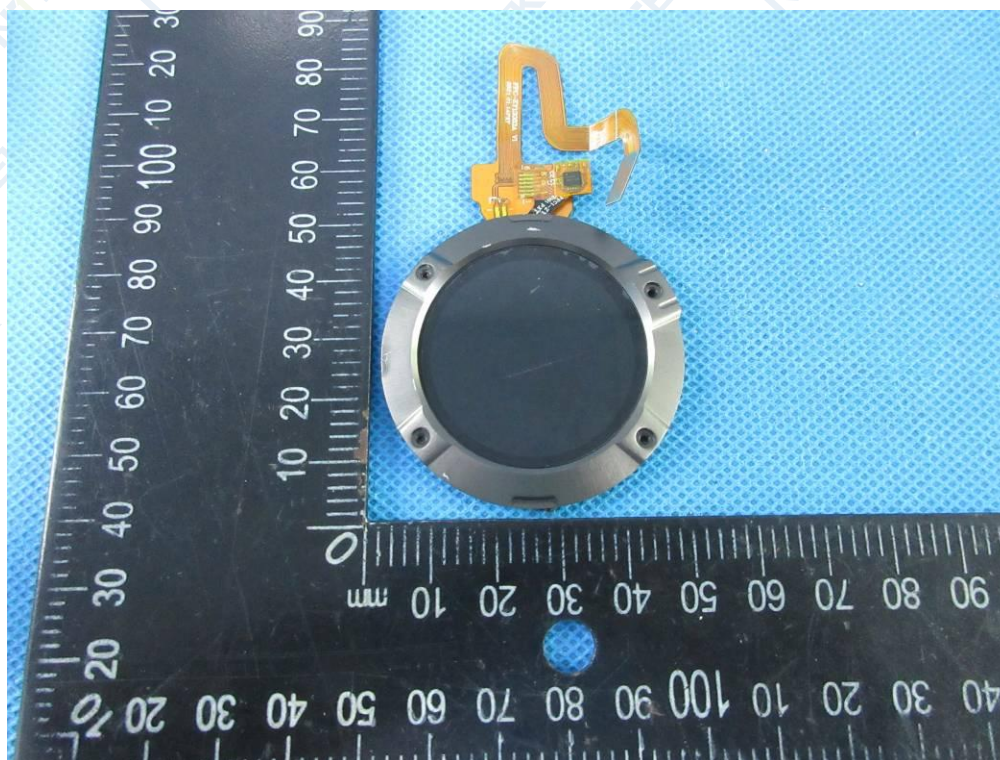


Photo 12

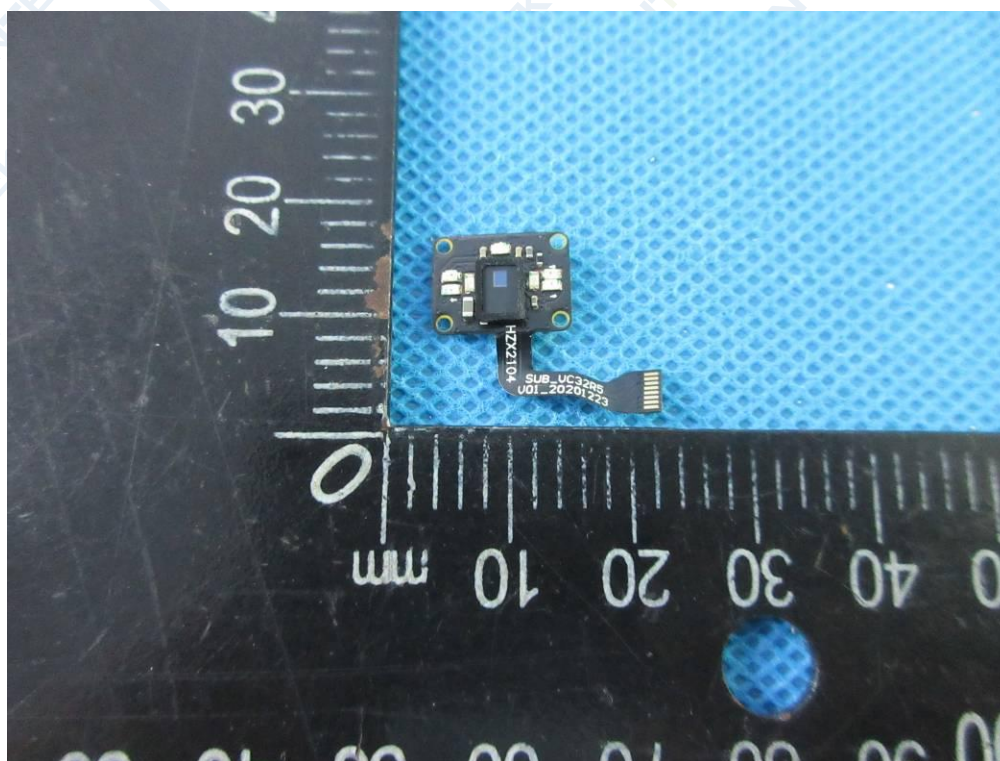


Photo 13

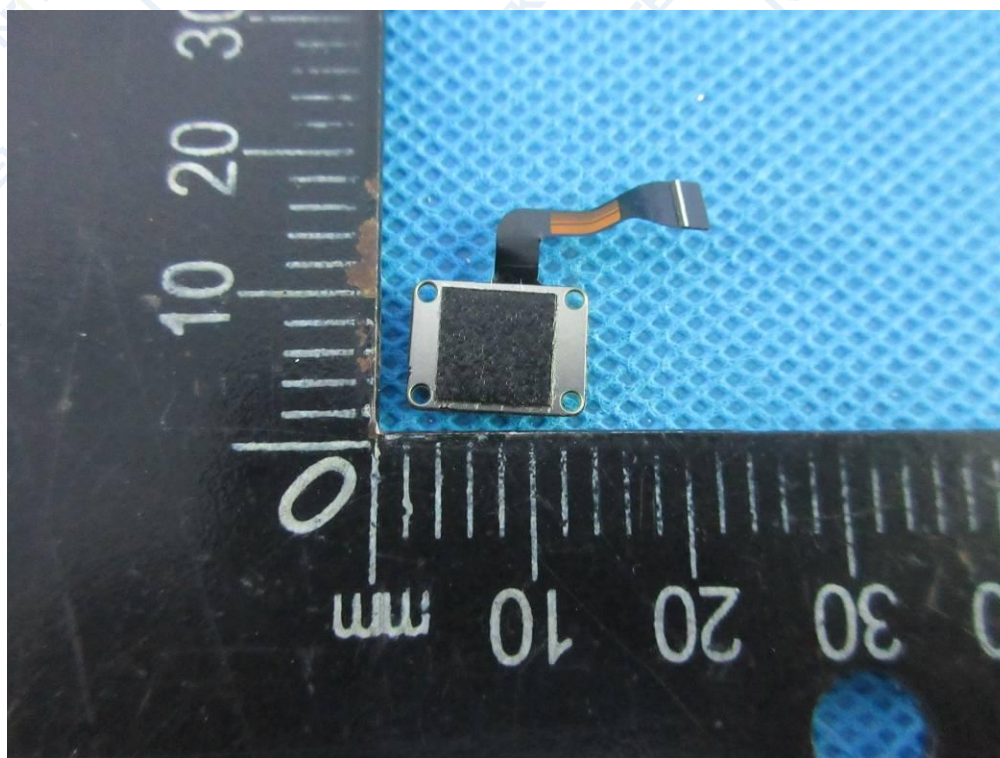


Photo 14

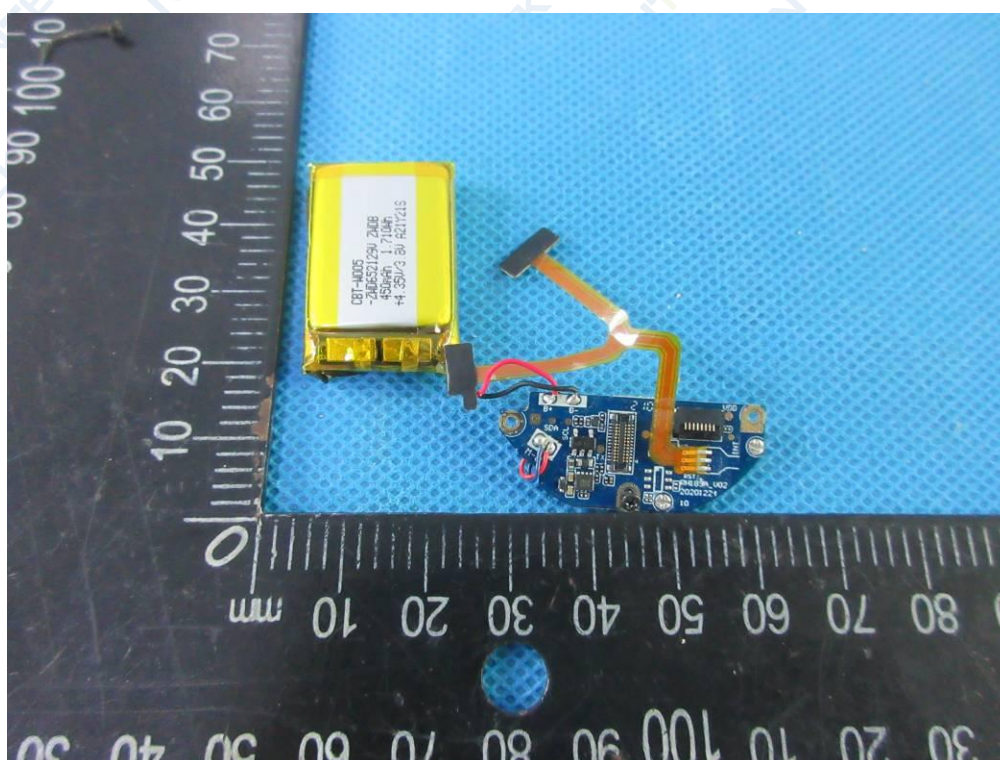


Photo 15

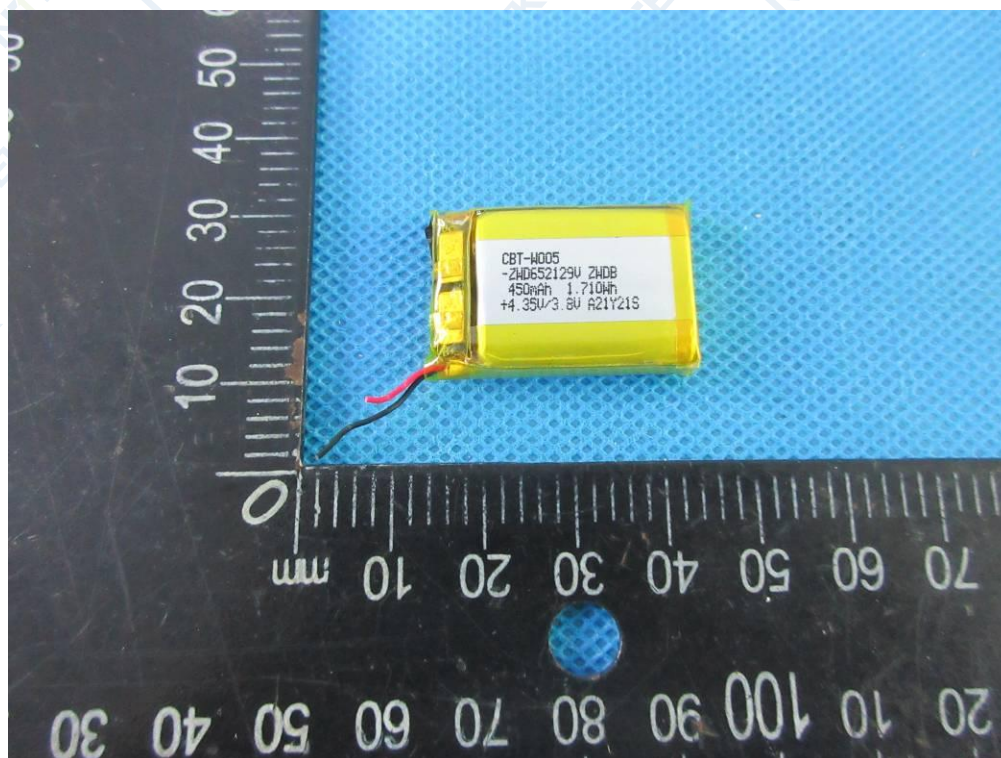


Photo 16

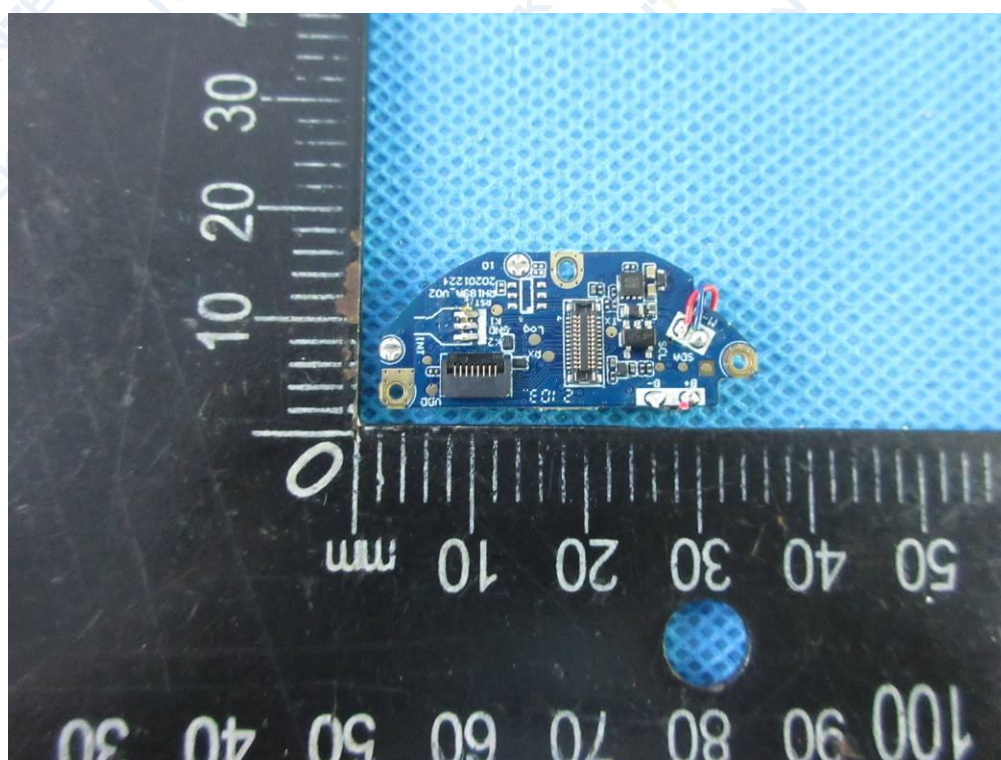
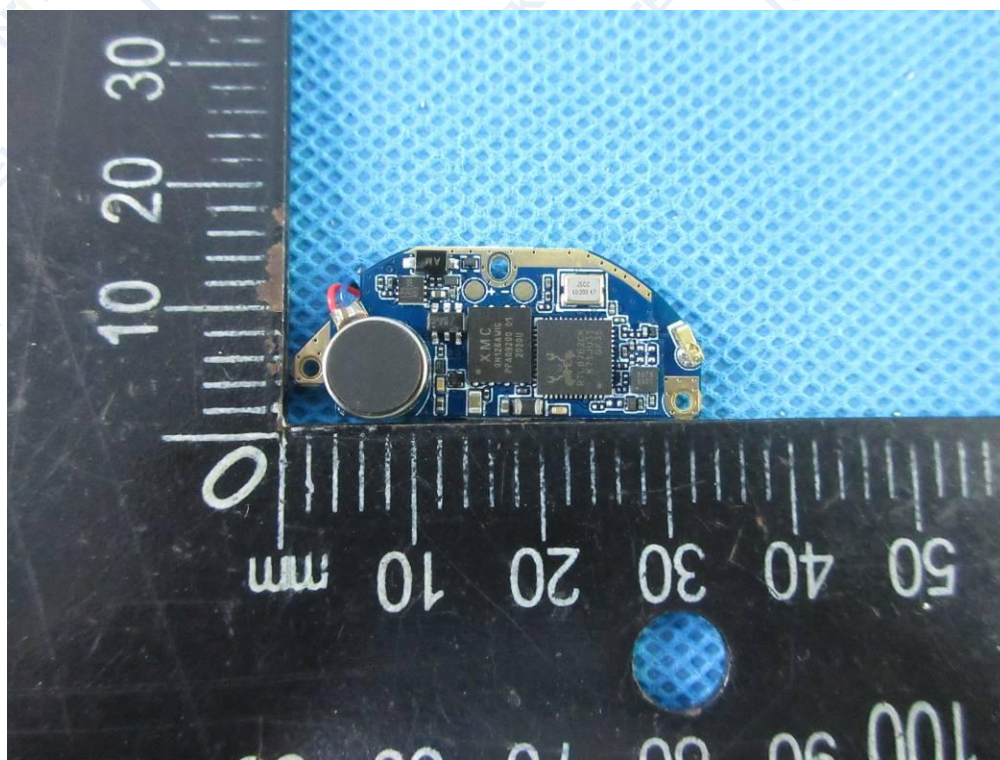


Photo 17



----- End of Report -----