TCT 通测检测 TESTING CENTRE TECHNOLOGY

Test Report

Test Report No..... :	TCT230224E005
Date of issue..... :	Mar. 02, 2023
Testing laboratory ..... :	Shenzhen TCT Testing Technology Co., Ltd.
Testing location/ address:	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Applicant's name..... :	Shenzhen Huafurui Technology Co., Ltd
Address..... :	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
Manufacturer's name ... :	Shenzhen Huafurui Technology Co., Ltd
Address..... :	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
Standard(s) ..... :	ETSI EN 301 489-17 V3.2.4 (2020-09) ETSI EN 301 489-1 V2.2.3 (2019-11)
Product Name..... :	SmartWatch
Trade Mark ..... :	CUBOT
Model/Type reference..... :	C20_Pro
Rating(s)..... :	Rechargeable Li-ion Battery DC 3.7V
Date of receipt of test item ..... :	Feb. 24, 2023
Date (s) of performance of test..... :	Feb. 24, 2023 ~ Mar. 02, 2023
Tested by (+signature) ... :	Yannie ZHONG
Check by (+signature).... :	Beryl ZHAO
Approved by (+signature):	Tomsin

General disclaimer:

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Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. General Product Information

1.1. EUT description

Product Name.....:	SmartWatch
Model/Type reference.....:	C20_Pro
Hardware Version .....:	MOY.M81006.02
Software Version .....:	MOY-DGG5-2.0.3-DD06EB5F
Operation Frequency.....:	2402MHz~2480MHz
Modulation Type.....:	For BT: GFSK, π/4-DQPSK, 8DPSK For BLE: GFSK
Antenna Type.....:	Internal Antenna
Antenna Gain.....:	0dBi
Rating(s).....:	Rechargeable Li-ion Battery DC 3.7V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

None.

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2. Test Result Summary

EMI Test				
Test Item	**Test Requirement**	**Test Method**	**Application**	**Result**
Radiated Emission	ETSI EN301 489-1	EN 55032	Enclosure	PASS
Conducted Emission	ETSI EN301 489-1	EN 55032	AC port	PASS
Harmonic Current Emissions	ETSI EN301 489-1	EN 61000-3-2	AC port	N/A
Voltage Fluctuations and Flicker	ETSI EN301 489-1	EN 61000-3-3	AC port	N/A
EMS Test				
ESD (Electrostatic Discharge)	ETSI EN301 489-1	EN 61000-4-2	Enclosure	PASS
Radiated Immunity	ETSI EN301 489-1	EN 61000-4-3	Enclosure	PASS
EFT (Electrical Fast Transients)	ETSI EN301 489-1	EN 61000-4-4	AC port	N/A
Surge Immunity	ETSI EN301 489-1	EN 61000-4-5	AC port	N/A
Injected Currents	ETSI EN301 489-1	EN 61000-4-6	AC port	N/A
Voltage Dips and Interruptions	ETSI EN301 489-1	EN 61000-4-11	AC port	N/A

Note:

1 Pass: Test item meets the requirement.

2. N/A: Test case does not apply to the test object.

3. The test result judgment is decided by the limit of test standard.

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3. General Information

3.1. Test environment and mode

Item	Normal condition
Temperature	+25ºC
Voltage	DC 5V(Adapter Input AC 230V/50Hz), DC 3.7V
Humidity	56%
Atmospheric Pressure:	1008 mbar
Test Mode:	
TM1	Charging
TM2	Normal Operation
Remark	The worst mode (Mode 1) reported only for Radiated emission (30MHz-1GHz) test; The worst mode (Mode 2) reported only for Radiated emission (1GHz-6GHz) test.

3.2. Description of Support Units

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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Adapter	ETA0U82CBC	RT10206CS/AE	/	SAMSUNG

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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3.1. Test Instruments List

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Disturbance voltage at mains terminals				
EMI Test Receiver	R&S	ESCI3	100898	2023/07/03
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	2024/02/20
Attenuator	N/A	10 dB	164080	2023/07/03
Radiated emission (30 MHz to 1 GHz)				
Broadband Antenna	Schwarzbeck	VULB9163	340	2023/07/05
EMI Test Receiver	R&S	ESIB7	100197	2023/07/03
Pre-amplifier	HP	8447D	2727A05017	2023/07/03
Radiated emission (1 GHz to 6 GHz)				
Horn Antenna	Schwarzbeck	BBHA 9120 D	02372	2024/02/24
EMI Test Receiver	R&S	FSQ40	200061	2023/07/03
Pre-amplifier	SKET	LNPA_0118 G-45	SK2021012102	2024/02/20
Electrostatic discharge immunity (ESD)				
Electrostatic Discharge Generator	HAEFELY	PESD300	H012056	2023/07/01
Radiated, radio-frequency, electromagnetic field immunity (RS)				
Antenna	SKET	STLP 9129_Plus	/	/
Signal Generator	Agilent	N5181A	MY50141997	2024/02/20
Amplifier	SKET	HAP_80M01 G-250W	/	2024/02/23
Amplifier	SKET	HAP_01G03 G-75W	202104180	2023/07/03
Amplifier	SKET	HAP_03G06 G-80W	202004044	2023/07/03
Field Probe	Narda	EP-601	811ZX01057	2023/07/05
USB Power Sensor	Agilent	U2000A	MY53410013	2024/02/21
USB Power Sensor	Agilent	U2001A	MZ54330012	2024/02/21
Wideband Radio Communication Tester	CMW500	R&S	105017	2023/07/03

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3.2. Facilities and Accreditations

3.3. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

  SHENZHEN TONGCE TESTING LAB

  Designation Number: CN1205

  The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

  SHENZHEN TONGCE TESTING LAB

  CAB identifier: CN0031

  The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

3.4. Location

Shenzhen TCT Testing Technology Co., Ltd.

Address: 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

3.5. Measurement Uncertainty

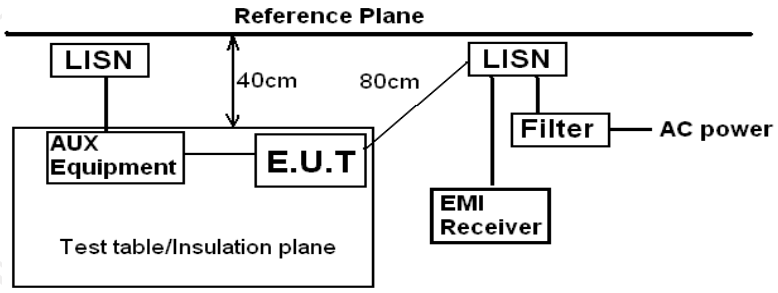
The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Temperature	±0.1℃
2	Humidity	±1.0 %
3	Spurious Emissions, Conducted	±3.10 dB
4	All Emissions, Radiated (30 MHz to 1 GHz)	±4.56 dB
5	All Emissions, Radiated (1 GHz to 6 GHz)	±4.22 dB

4. Emission Test

4.1. Conducted Emission

4.1.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>ETSI EN 301 489-1</td></tr>
<tr><td>Test Method:</td><td>EN 55032</td></tr>
<tr><td>Test Frequency Range:</td><td>150kHz to 30MHz</td></tr>
<tr><td>Class / Severity:
Class B</td><td>Class B</td></tr>
<tr><td>Receiver Setup:</td><td>RBW=9kHz, VBW=30kHz</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Procedure</td><td>The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to EN55032 Class B on conducted measurement.</td></tr>
<tr><td>Test Instrument:</td><td>Refer to section 3.3 for details</td></tr>
<tr><td>Test Mode:</td><td>Refer to section 3.1 for details</td></tr>
<tr><td>Test Results:</td><td>PASS</td></tr>
</table>

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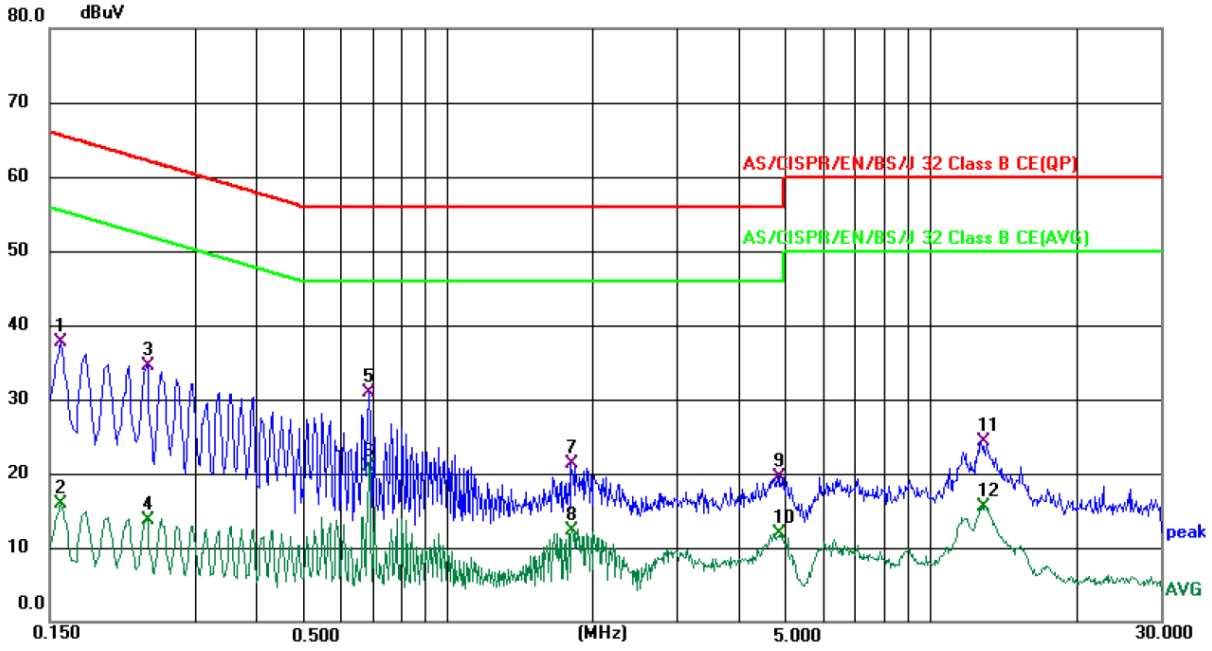
4.1.2. Test Data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room | Phase: *L1* | Temperature: 25.4 (℃) | Humidity: 54 %

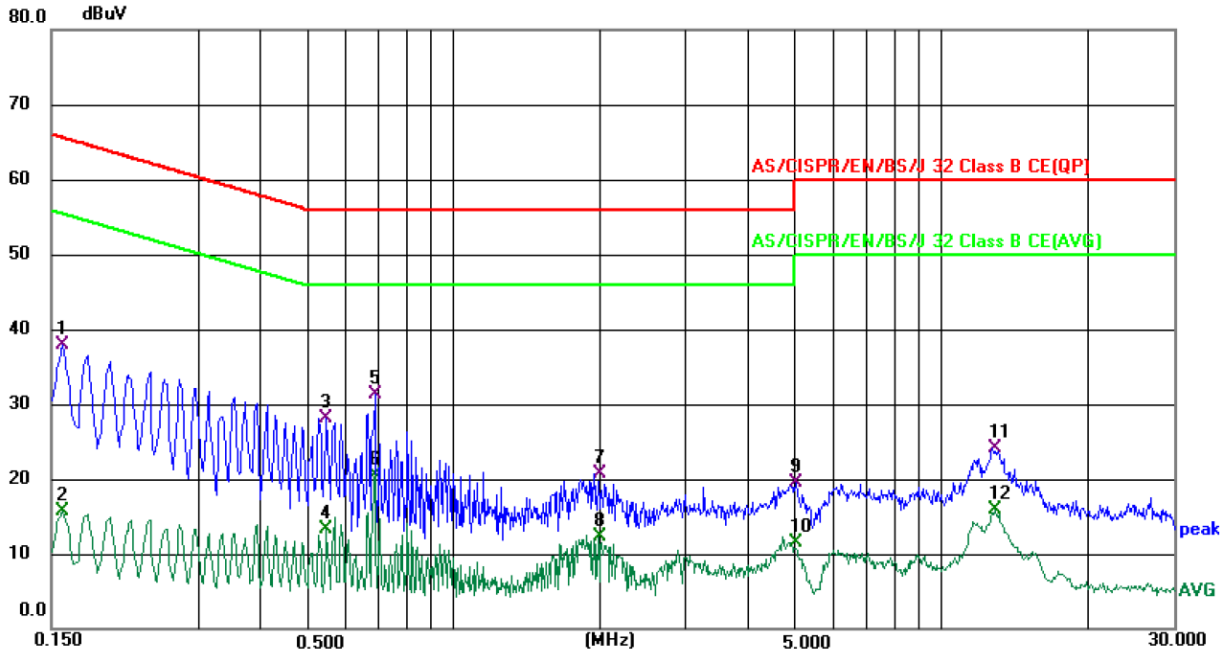
Limit: AS/CISPR/EN/BS/J 32 Class B CE(QP) | Power:DC 5 V(Adapter Input AC 230V/50Hz)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1580	27.17	10.53	37.70	65.57	-27.87	QP	
2		0.1580	5.44	10.53	15.97	55.57	-39.60	AVG	
3		0.2379	24.30	10.27	34.57	62.17	-27.60	QP	
4		0.2379	3.50	10.27	13.77	52.17	-38.40	AVG	
5	*	0.6860	20.86	10.10	30.96	56.00	-25.04	QP	
6		0.6860	10.73	10.10	20.83	46.00	-25.17	AVG	
7		1.8100	11.22	10.04	21.26	56.00	-34.74	QP	
8		1.8100	2.33	10.04	12.37	46.00	-33.63	AVG	
9		4.8339	9.44	10.15	19.59	56.00	-36.41	QP	
10		4.8339	1.83	10.15	11.98	46.00	-34.02	AVG	
11		12.8059	14.07	10.27	24.34	60.00	-35.66	QP	
12		12.8059	5.26	10.27	15.53	50.00	-34.47	AVG	

Note:

Freq. = Emission frequency in MHz
Reading level (dBμV) = Receiver reading
Corr. Factor (dB) = LISN factor + Cable loss
Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)
Limit (dBμV) = Limit stated in standard
Margin (dB) = Measurement (dBμV) – Limits (dBμV)
Q.P. =Quasi-Peak
AVG =average
** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room Phase: *N* Temperature: 25.4 (℃) Humidity: 54 %

Limit: AS/CISPR/EN/BS/J 32 Class B CE(QP) Power:DC 5 V(Adapter Input AC 230V/50Hz)

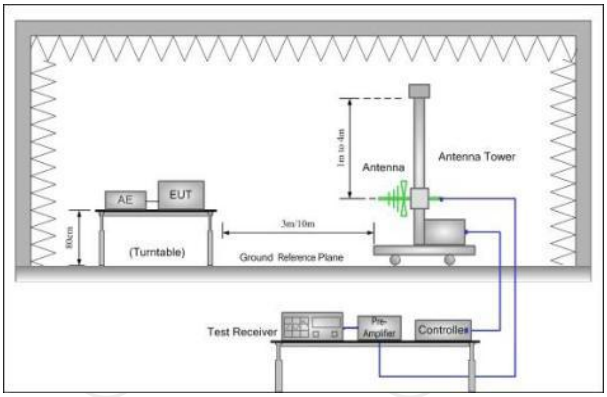
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1580	27.43	10.45	37.88	65.57	-27.69	QP	
2		0.1580	5.18	10.45	15.63	55.57	-39.94	AVG	
3		0.5500	18.04	10.12	28.16	56.00	-27.84	QP	
4		0.5500	3.23	10.12	13.35	46.00	-32.65	AVG	
5	*	0.6900	21.17	10.10	31.27	56.00	-24.73	QP	
6		0.6900	10.35	10.10	20.45	46.00	-25.55	AVG	
7		1.9860	10.60	10.12	20.72	56.00	-35.28	QP	
8		1.9860	2.17	10.12	12.29	46.00	-33.71	AVG	
9		5.0500	9.34	10.17	19.51	60.00	-40.49	QP	
10		5.0500	1.39	10.17	11.56	50.00	-38.44	AVG	
11		12.9180	13.68	10.37	24.05	60.00	-35.95	QP	
12		12.9180	5.59	10.37	15.96	50.00	-34.04	AVG	

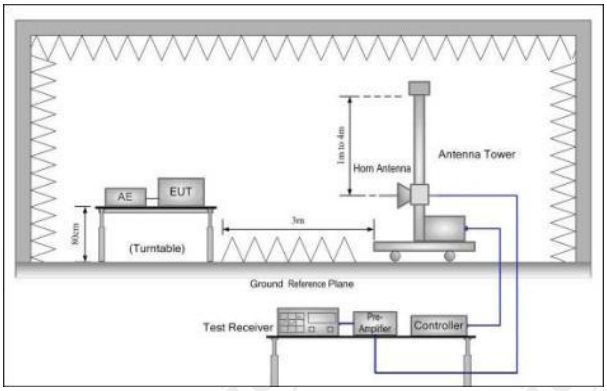
Note:

Freq. = Emission frequency in MHz
Reading level (dBμV) = Receiver reading
Corr. Factor (dB) = LISN factor + Cable loss
Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)
Limit (dBμV) = Limit stated in standard
Margin (dB) = Measurement (dBμV) – Limits (dBμV)
Q.P. =Quasi-Peak
AVG =average
** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

4.2. Radiated Emission

4.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>ETSI EN 301 489-1</td></tr>
<tr><td>Test Method:</td><td>EN 55032</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 6GHz</td></tr>
<tr><td>Test Site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Average</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td>30MHz-230MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>230MHz-1GHz</td><td>47.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">1GHz-6GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>74.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td>Below 1GHz
 

Above 1GHz
 

For 3m distance description:</td></tr>
</table>

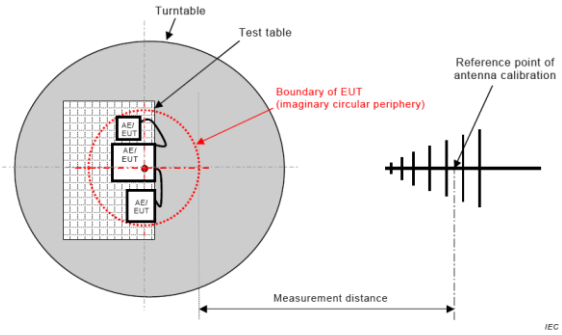


Figure C.1 – Measurement distance

Test Procedure:

From 30MHz to 1GHz:

1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

Above 1GHz:

1. The radiated emissions test was conducted in a fully-anechoic chamber.
2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT.
4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

Test Instrument:	Refer to section 3.3 for details
Test Mode:	Refer to section 3.1 for details
Test Results:	PASS

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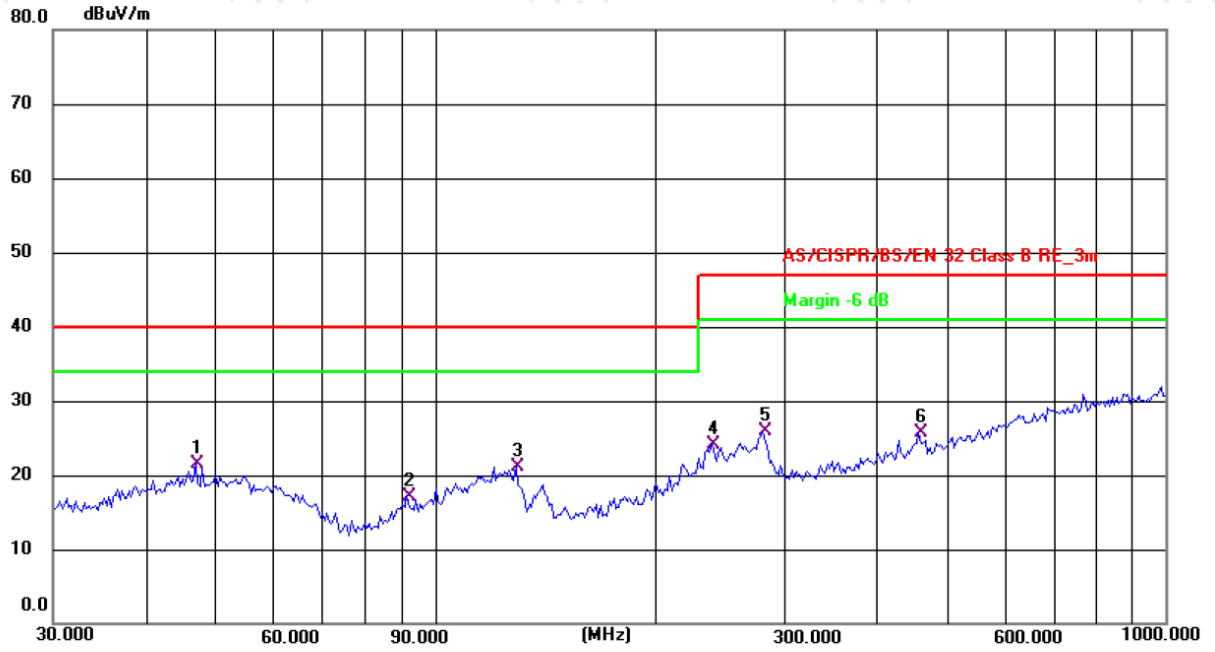
4.2.2. Test Data

Radiated Emission In Horizontal (30MHz----1000MHz)



Site: #1 3m Anechoic Chamber Polarization: *Horizontal* Temperature: 24.8(C) Humidity: 52 %

Limit: AS/CISPR/BS/EN 32 Class B RE_3m Power: DC 5 V(Adapter Input AC 230 V/50 Hz)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	46.9948	7.59	13.95	21.54	40.00	-18.46	QP	P	
2	91.4949	6.56	10.55	17.11	40.00	-22.89	QP	P	
3	129.0146	12.58	8.62	21.20	40.00	-18.80	QP	P	
4	239.1473	11.16	13.00	24.16	47.00	-22.84	QP	P	
5	281.0075	11.92	13.92	25.84	47.00	-21.16	QP	P	
6	459.1144	8.00	17.62	25.62	47.00	-21.38	QP	P	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

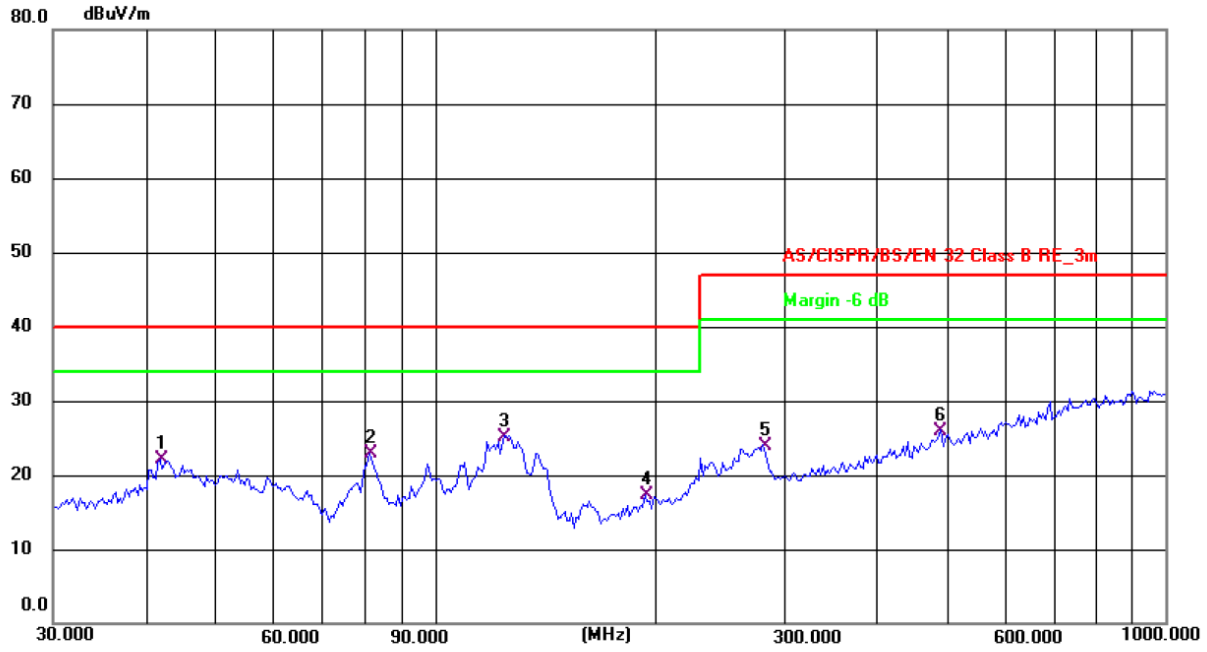
Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

** is meaning the worst frequency has been tested in the test frequency range*

Radiated Emission In Vertical (30MHz----1000MHz)



Site: #1 3m Anechoic Chamber Polarization: *Vertical* Temperature: 24.8(C) Humidity: 52 %

Limit: AS/CISPR/BS/EN 32 Class B RE_3m Power: DC 5 V(Adapter Input AC 230 V/50 Hz)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	42.0066	8.46	13.64	22.10	40.00	-17.90	QP	P	
2	81.2117	14.74	8.15	22.89	40.00	-17.11	QP	P	
3 *	124.5690	16.05	9.15	25.20	40.00	-14.80	QP	P	
4	193.7728	5.96	11.35	17.31	40.00	-22.69	QP	P	
5	281.0075	10.07	13.92	23.99	47.00	-23.01	QP	P	
6	492.4685	7.55	18.29	25.84	47.00	-21.16	QP	P	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

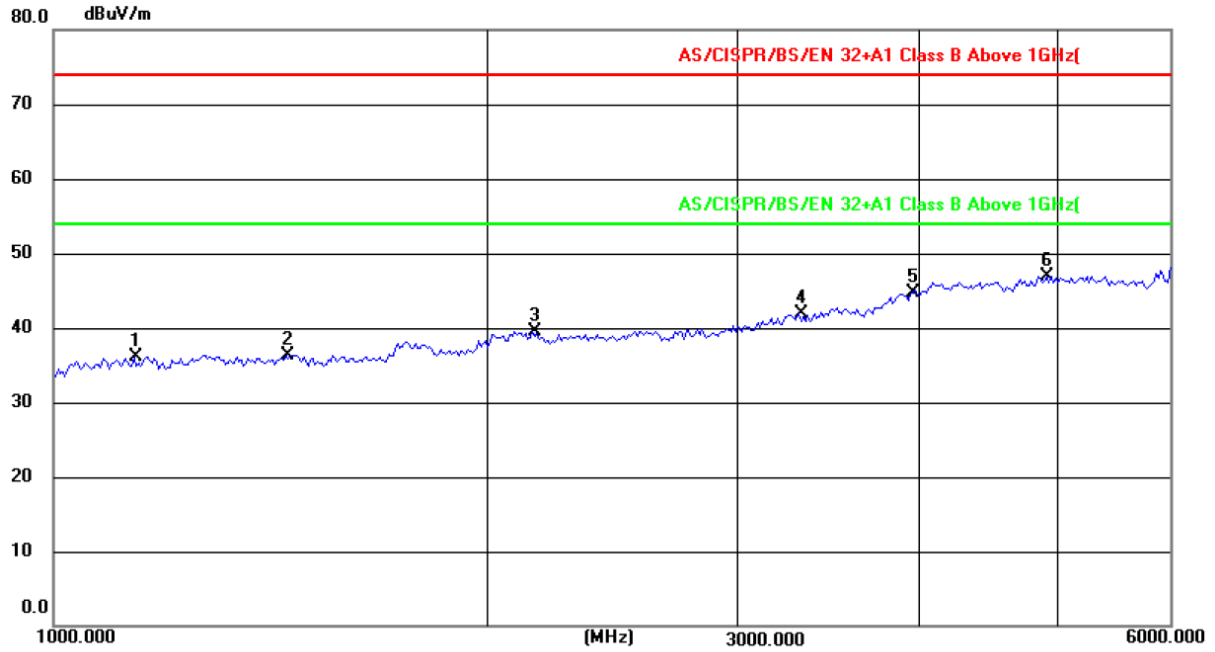
Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

** is meaning the worst frequency has been tested in the test frequency range*

Radiated Emission In Horizontal (1000MHz----6000MHz)



Site: #1 3m Anechoic Chamber Polarization: ***Horizontal*** Temperature: 24.8(C) Humidity: 52%

Limit: AS/CISPR/BS/EN 32+A1 Class B Above 1GHz(Power: DC 3.7 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1137.992	48.39	-12.34	36.05	74.00	-37.95	peak	P	
2	1452.713	48.05	-11.73	36.32	74.00	-37.68	peak	P	
3	2156.335	48.20	-8.75	39.45	74.00	-34.55	peak	P	
4	3305.882	46.84	-4.94	41.90	74.00	-32.10	peak	P	
5	3970.249	42.77	1.95	44.72	74.00	-29.28	peak	P	
6 *	4924.737	41.89	4.97	46.86	74.00	-27.14	peak	P	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

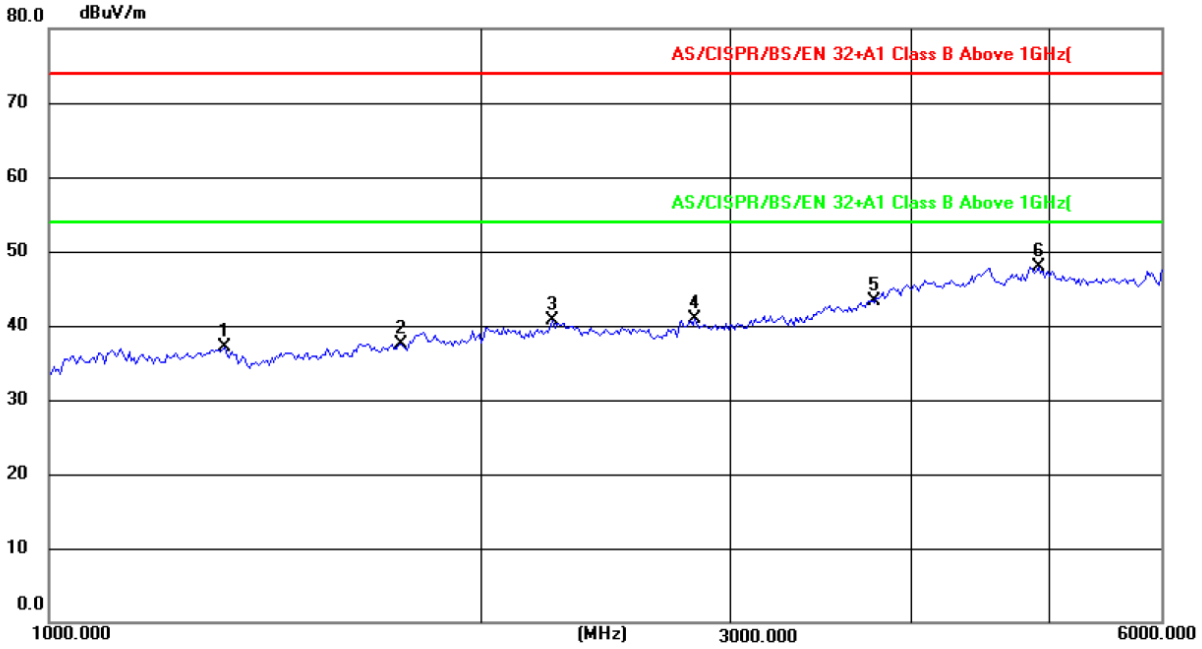
Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Any value more than 10dB below limit have not been specifically reported

** is meaning the worst frequency has been tested in the test frequency range*

Radiated Emission In Vertical (1000MHz----6000MHz)



Site: #1 3m Anechoic Chamber Polarization: *Vertical* Temperature: 24.8C) Humidity: 52 %

Limit: AS/CISPR/BS/EN 32+A1 Class B Above 1GHz(Power: DC 3.7 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1327.988	49.04	-11.88	37.16	74.00	-36.84	peak	P	
2	1763.553	49.77	-12.18	37.59	74.00	-36.41	peak	P	
3	2251.278	48.93	-8.24	40.69	74.00	-33.31	peak	P	
4	2832.906	47.16	-6.27	40.89	74.00	-33.11	peak	P	
5	3762.067	44.02	-0.80	43.22	74.00	-30.78	peak	P	
6 *	4924.737	42.89	4.97	47.86	74.00	-26.14	peak	P	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Any value more than 10dB below limit have not been specifically reported

** is meaning the worst frequency has been tested in the test frequency range*

4.3. Harmonic Current Emissions

4.3.1. Test Specification

Test Result:	EUT belongs to portable equipment, Not applicable

4.4. Flicker and Voltage Fluctuation

4.4.1. Test Specification

Test result:	EUT belongs to portable equipment, Not applicable

5. Immunity Test

5.1. Performance Criteria

Performance Criteria of ETSI EN 301 489-1, sub clause 6

Criteria	Performance Criteria
CT/CR	During and after the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.
TT/TR	After the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.

Performance Criteria of ETSI EN 301 489-17, sub clause 6

Criteria	Performance Criteria
CT/CR	The performance criteria A shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or Not acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.
TT/TR	The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

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5.2. Surges

5.2.1. Test Specification

Test result:	EUT belongs to portable equipment, Not applicable

5.3. Electrical Fast Transient (EFT)

5.3.1. Test Specification

Test result:	EUT belongs to portable equipment, Not applicable

5.4. Radio-frequency Continuous Conducted (CS)

5.4.1. Test Specification

Test result:	EUT belongs to portable equipment, Not applicable

5.5. Voltage Dips and Voltage Interruption

5.5.1. Test Specification

Test result:	EUT belongs to portable equipment, Not applicable

5.6. Electrostatic Discharge

5.6.1. Test Specification

Test Requirement:	EN 301489-1
Test Method:	EN 61000-4-2
Discharge Voltage:	Contract Discharge: ±2kV, ±4kV Air Discharge: ±2kV, ±4kV, ±8kV HCP/VCP: ±2kV, ±4kV
Polarity:	Positive & Negative
Number of Discharge:	Contact Discharge: Minimum 25 times at each test point, Air Discharge: Minimum 10 times at each test point.
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

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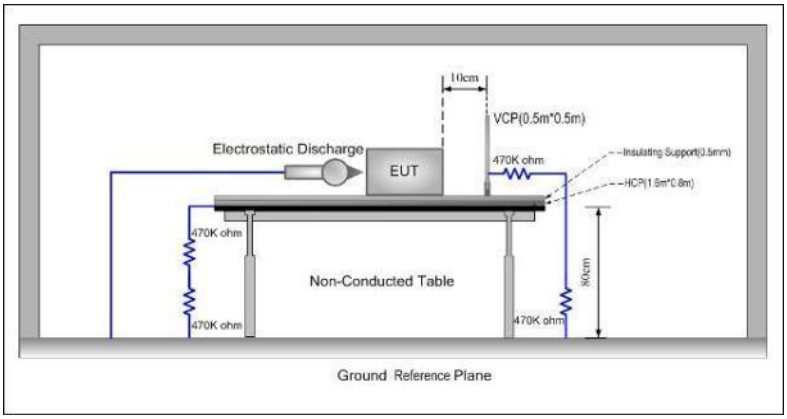
Test Setup:	
Test Procedure:	**1) Air discharge:** The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure was repeated until all the air discharge completed **2) Contact Discharge:** The test was applied on conductive surfaces of EUT. the generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated. **3) Indirect discharge for horizontal coupling plane** At least 10 single discharges shall be applied at the front edge of each HCP opposite the centre point of each unit of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge. Consideration should be given to exposing all sides of the EUT. **4) Indirect discharge for vertical coupling plane** At least 10 single discharges were applied to the centre of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.
Test Instrument:	Refer to Section 3.3 for Details
Test Mode:	Refer to Section 3.1 for Details
Test Results:	PASS

5.6.2. Test data

Test points:	I: Please refer to red arrows as below plots
	II: Please refer to yellow arrows as below plots

Air Discharge				
Discharge Voltage (KV)	**Type of discharge**	**Test points**	**Observation Criterion**	**Result**
± 2, ± 4	Contact	II	A	PASS
± 2, ± 4,± 8	Air	I	A	PASS

Indirect Discharge				
Discharge Voltage (KV)	**Type of discharge**	**Test points**	**Observation Criterion**	**Result**
± 2, ± 4	HCP-Bottom/Top/ Front/Back/Left/ Right	Edge of the HCP	A	PASS
± 2, ± 4	VCP-Front/Back /Left/Right	Centre of the VCP	A	PASS

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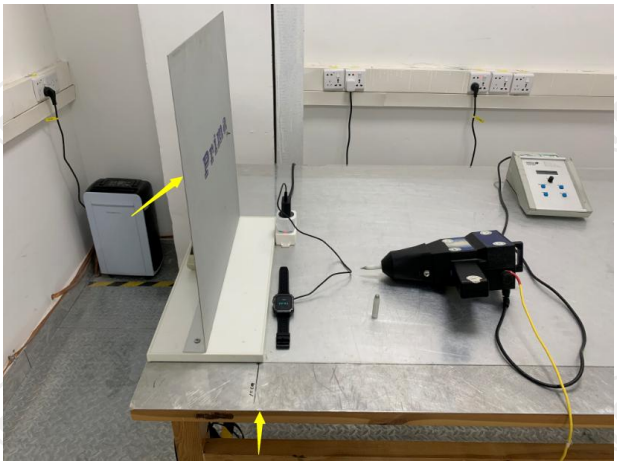
Test point as follows:



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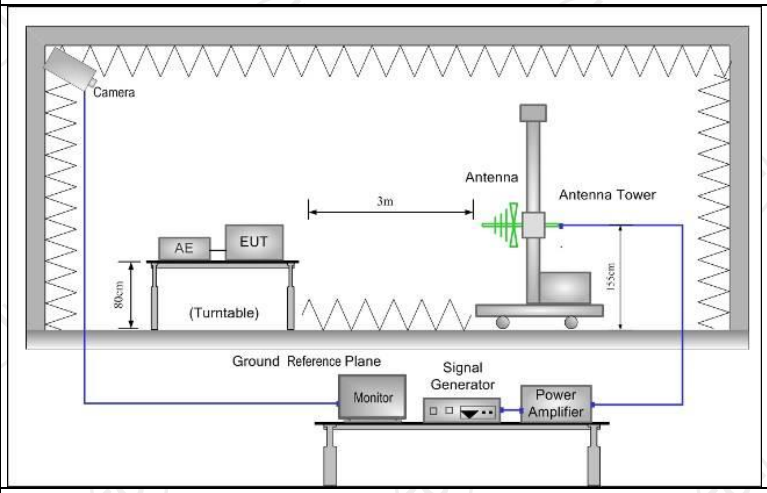
5.7. Radio-frequency Electromagnetic Field Amplitude Modulated (RS)

5.7.1. Test Specification

Test Requirement:	ETSI EN 301 489-1
Test Method:	EN 61000-4-3
Frequency Range:	80MHz to 6.0GHz
Test Level:	3V/m
Modulation:	80%, 1kHz Amplitude Modulation
Test Setup:	
Test Procedure:	1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items. 2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate centre of the cable to form a bundle 30 cm to 40 cm in length. 3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area). 4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Where the frequency range was swept incrementally, the step size was not exceeding 1 % of the preceding frequency value. 5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0,5 s.

	6. The test normally was performed with the generating antenna facing each side of the EUT. 7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. The EUT was performed in a configuration to actual installation conditions, a video camera and/or audio monitor were used to monitor the performance of the EUT.
Test Instrument:	Refer to Section 3.3 for Details
Test Mode:	Refer to Section 3.1 for Details
Test Result:	PASS

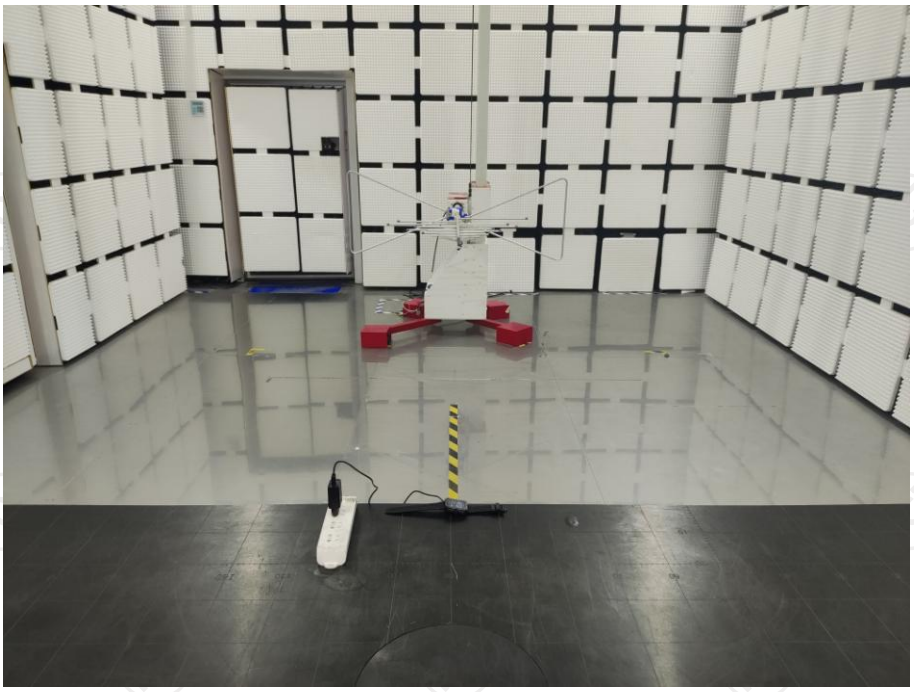
5.7.2. Test data

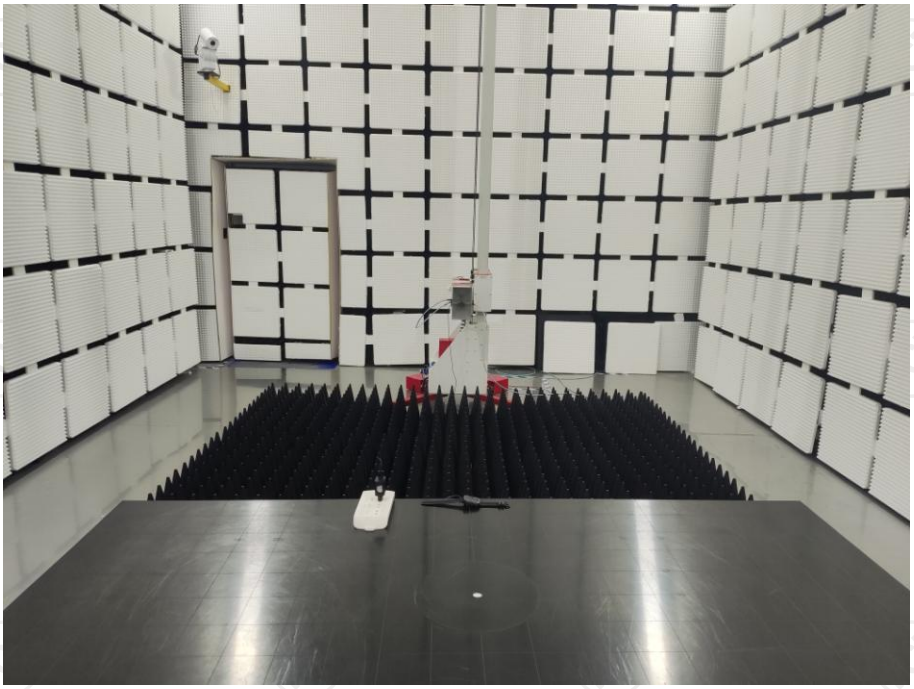
Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observation Criterion
80 MHz-6.0GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3 seconds	V	Front	A
			H		
			V	Rear	
			H		
			V	Left	
			H		
			V	Right	
			H		
			V	Top	
			H		
			V	Bottom	
			H		

Note: The worst PER has been monitored is 0.89%.

6. Photographs of Test Configuration

Radiated Emission





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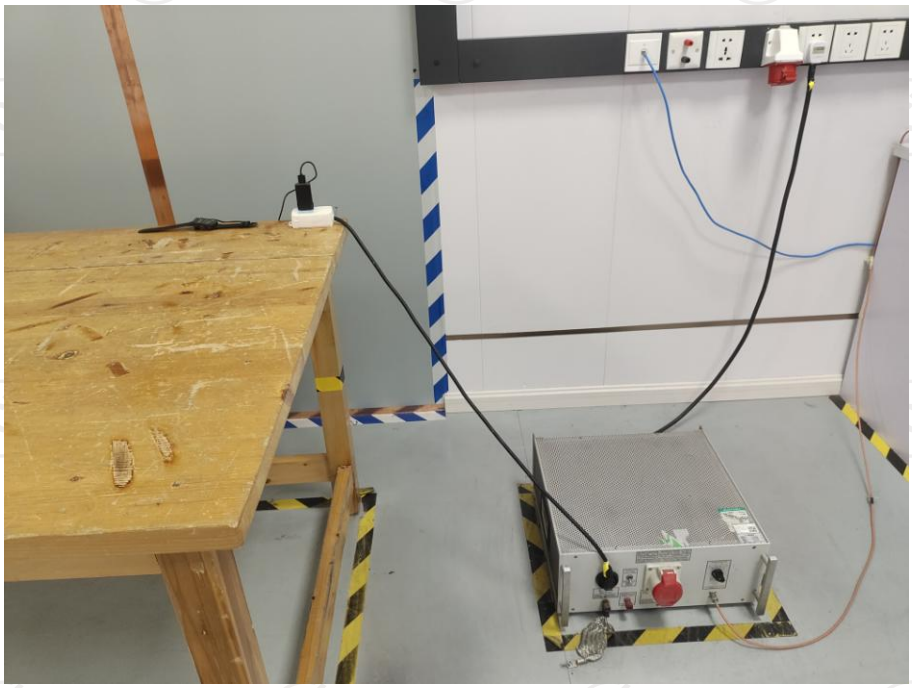
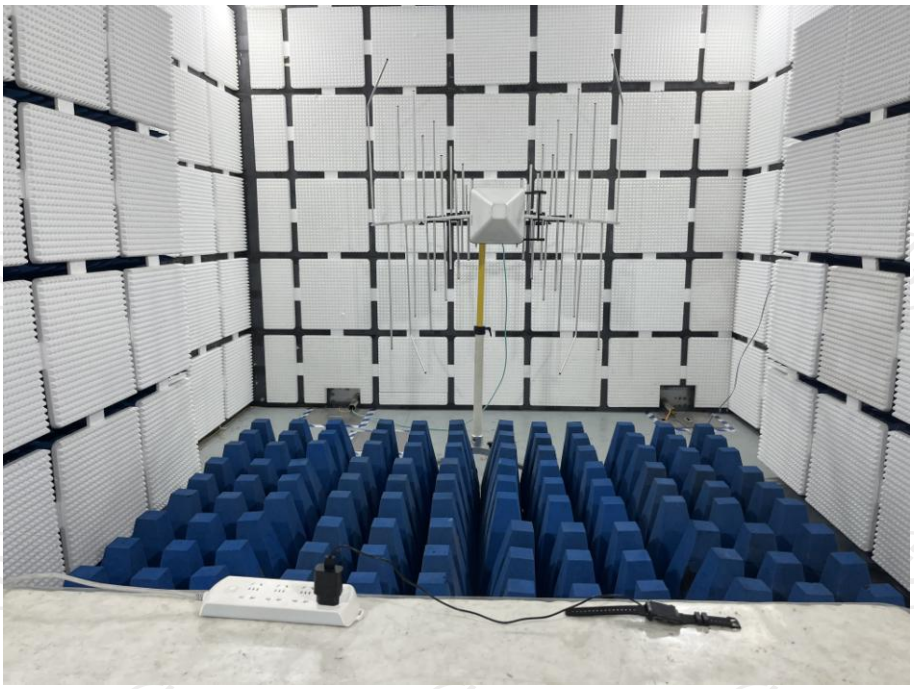
ESD

CE

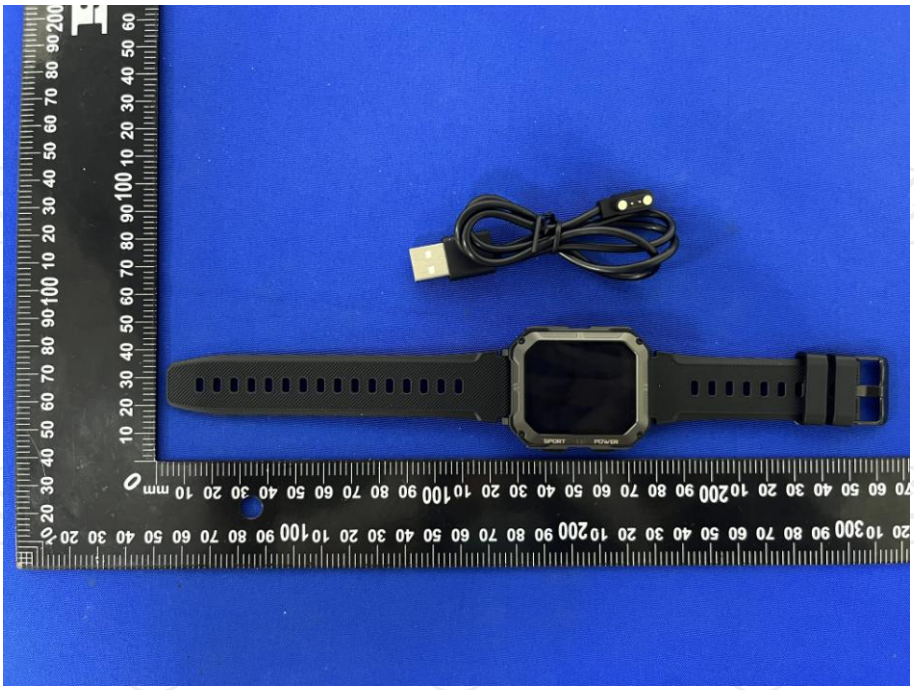


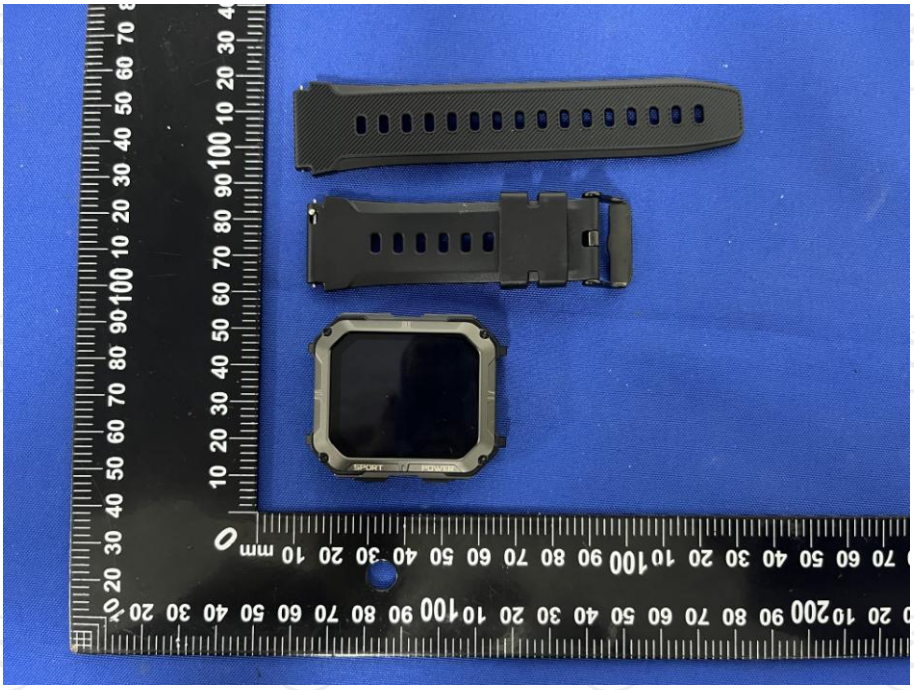
RS

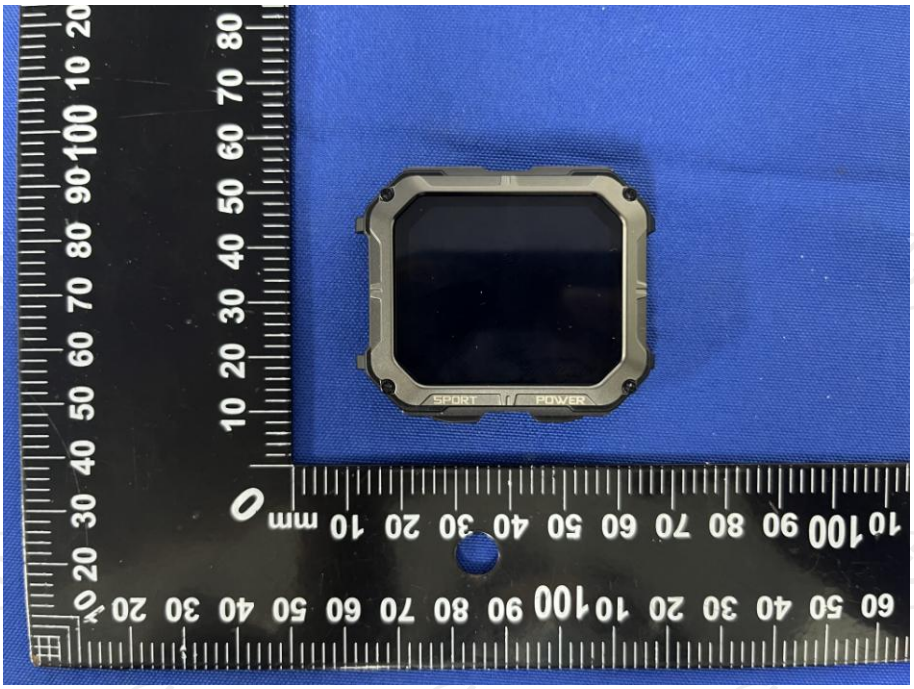


7. Photographs of EUT

Outside View



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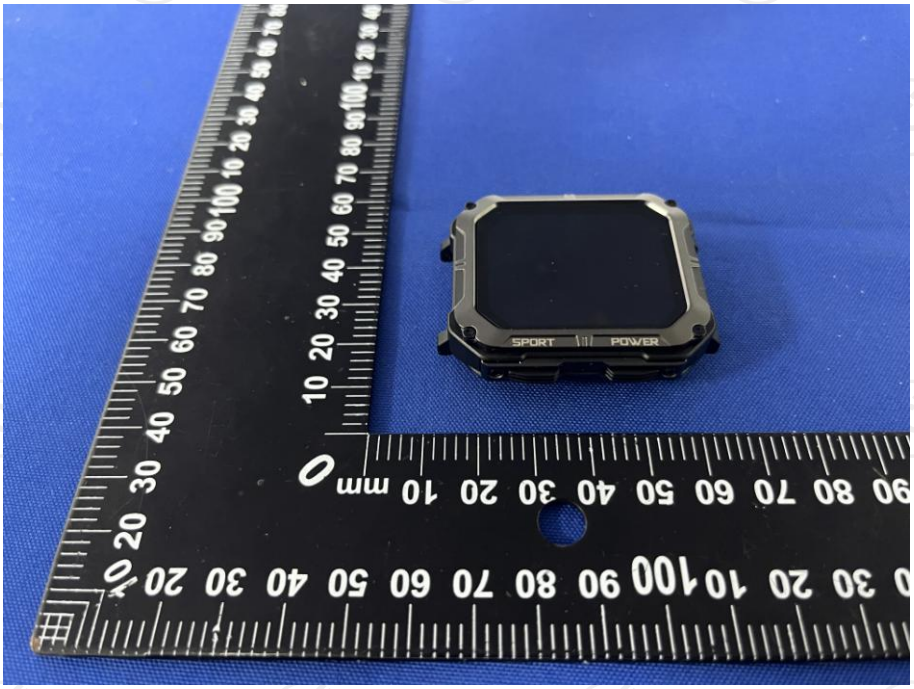
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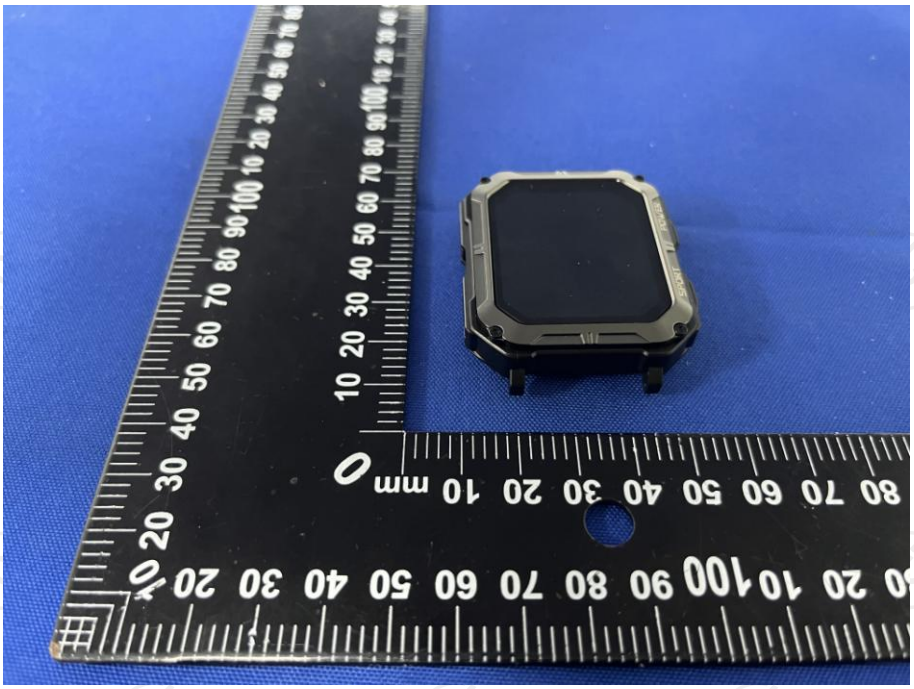

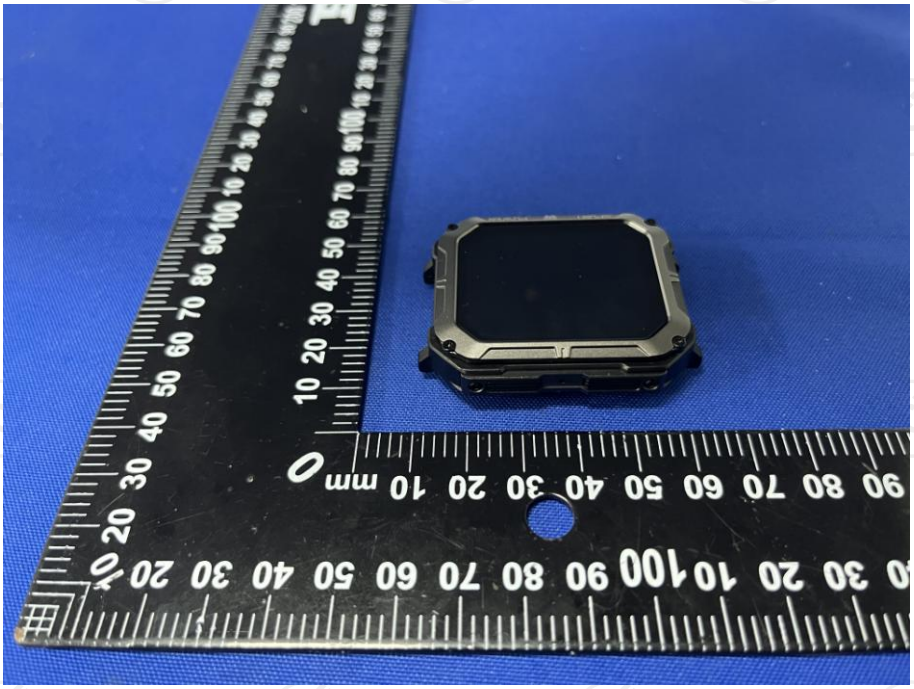

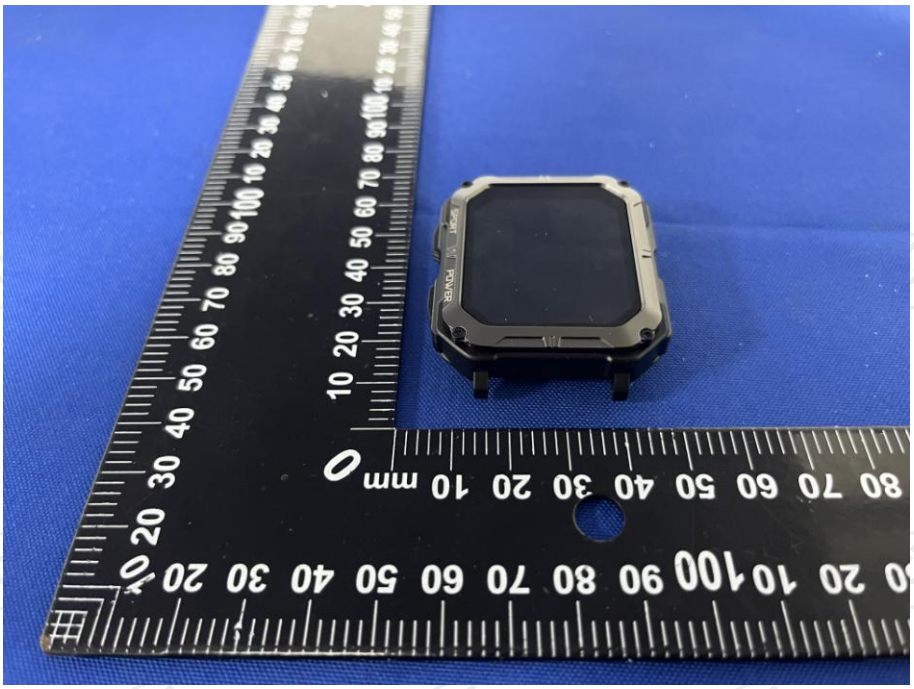

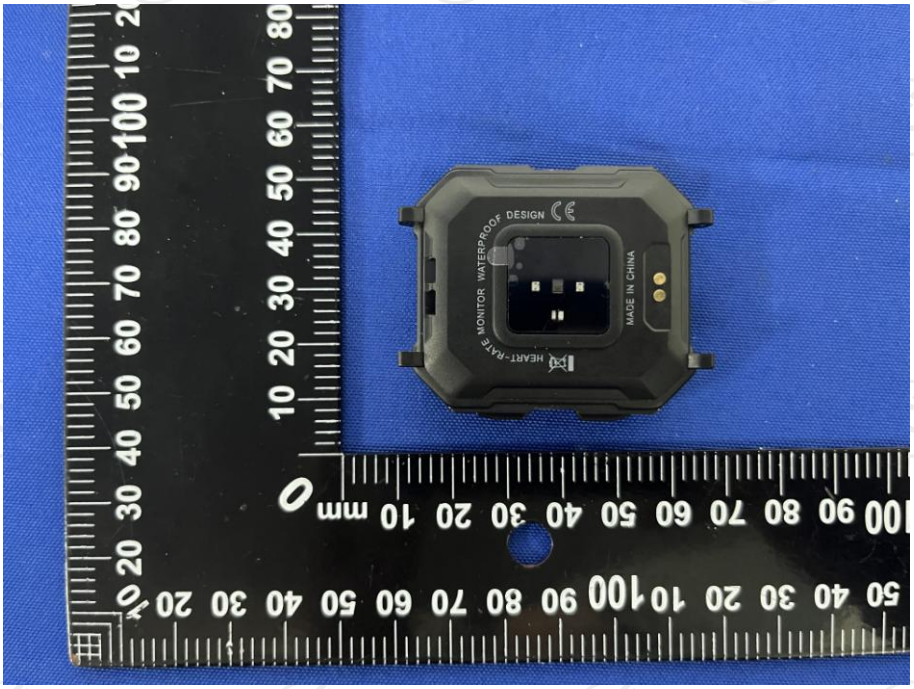

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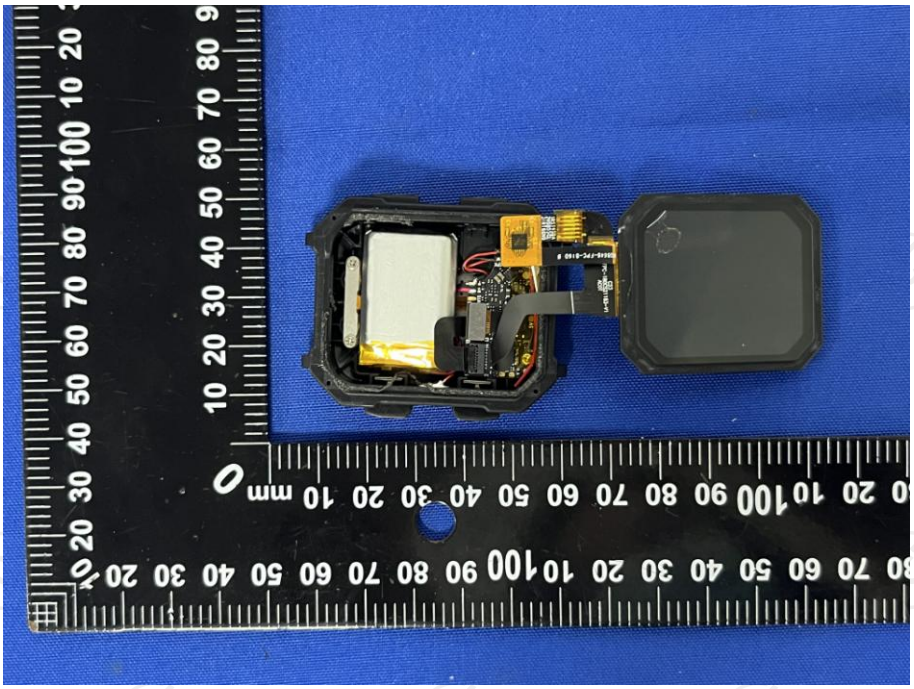
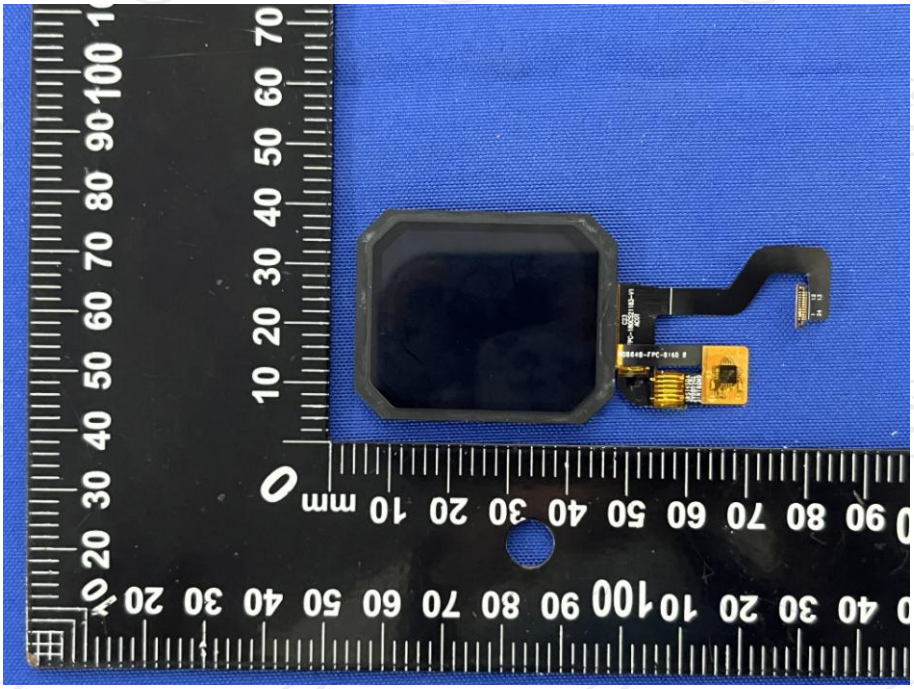
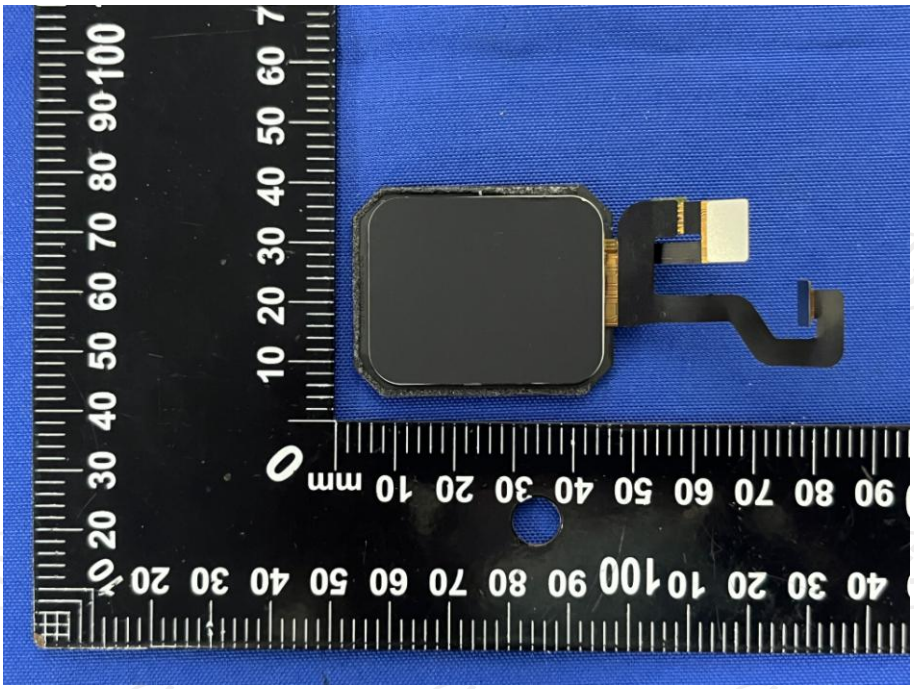
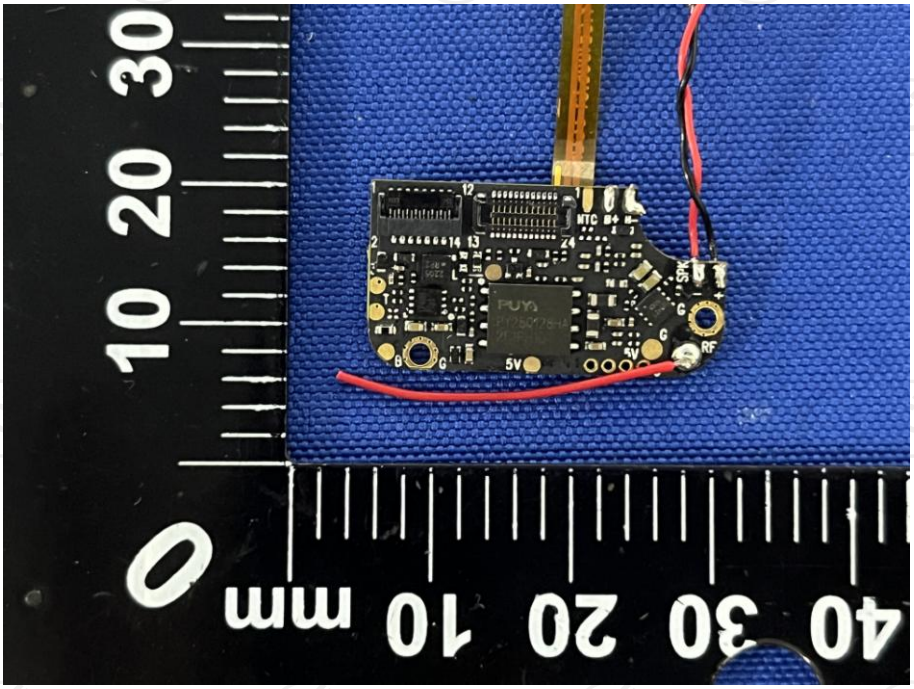
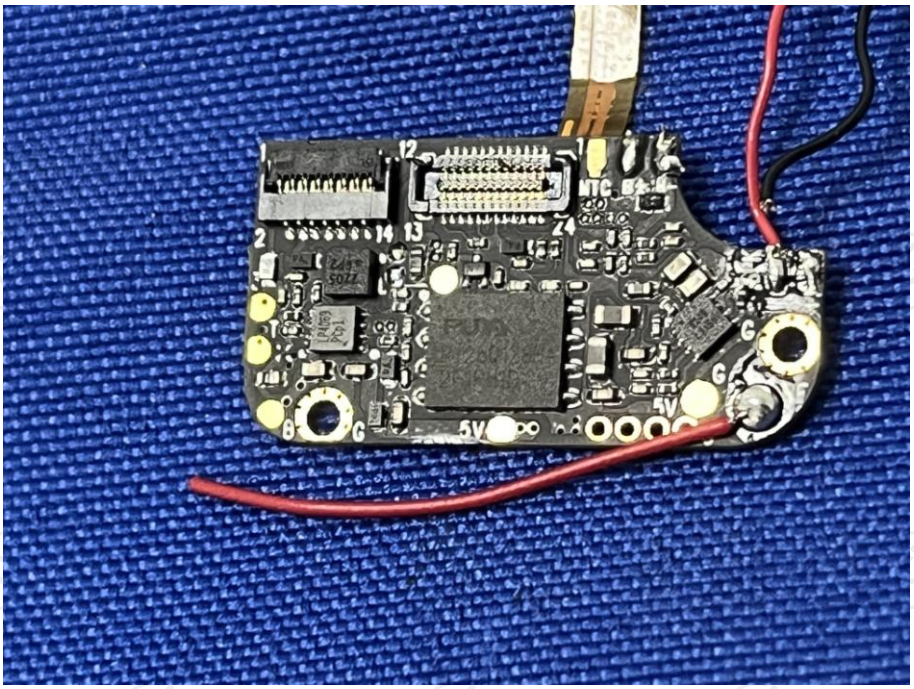
Inside View

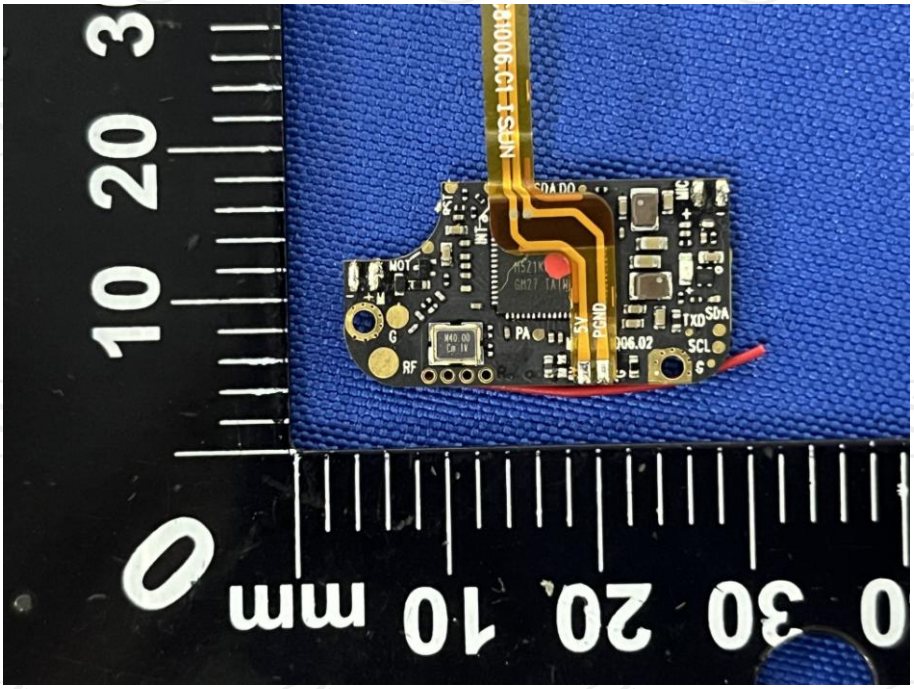












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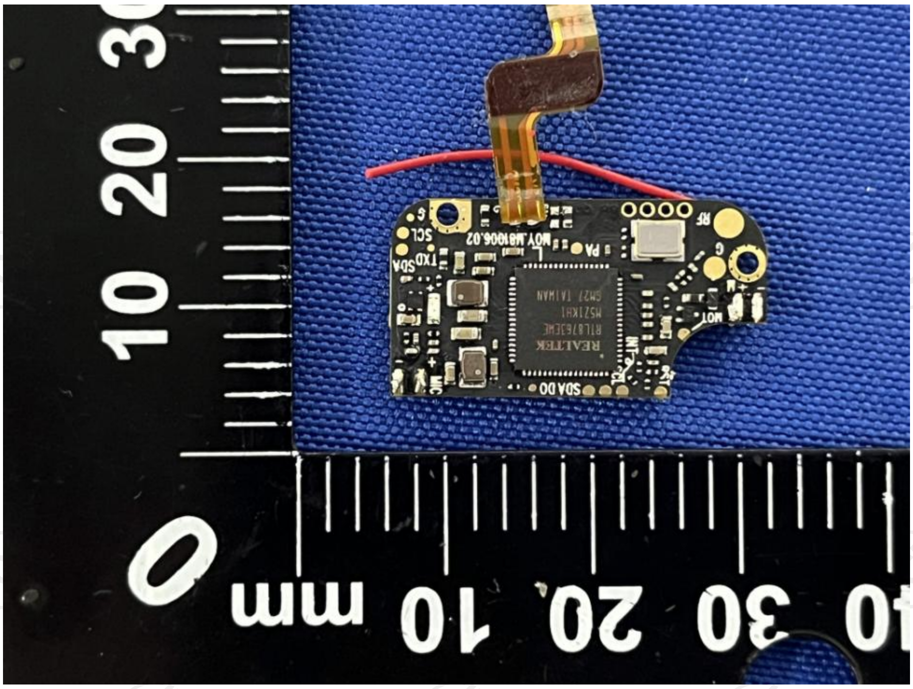
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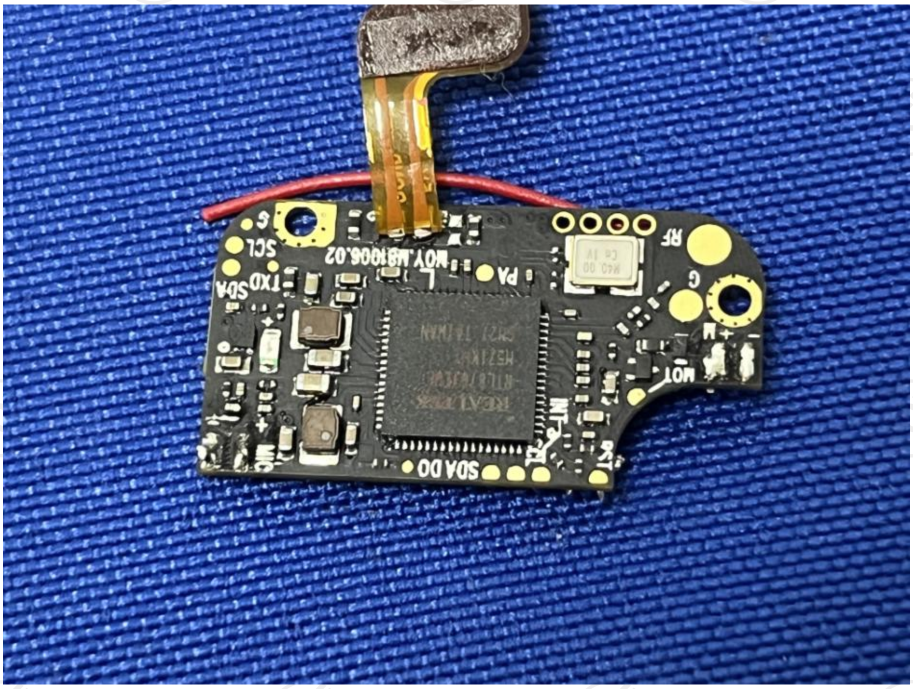
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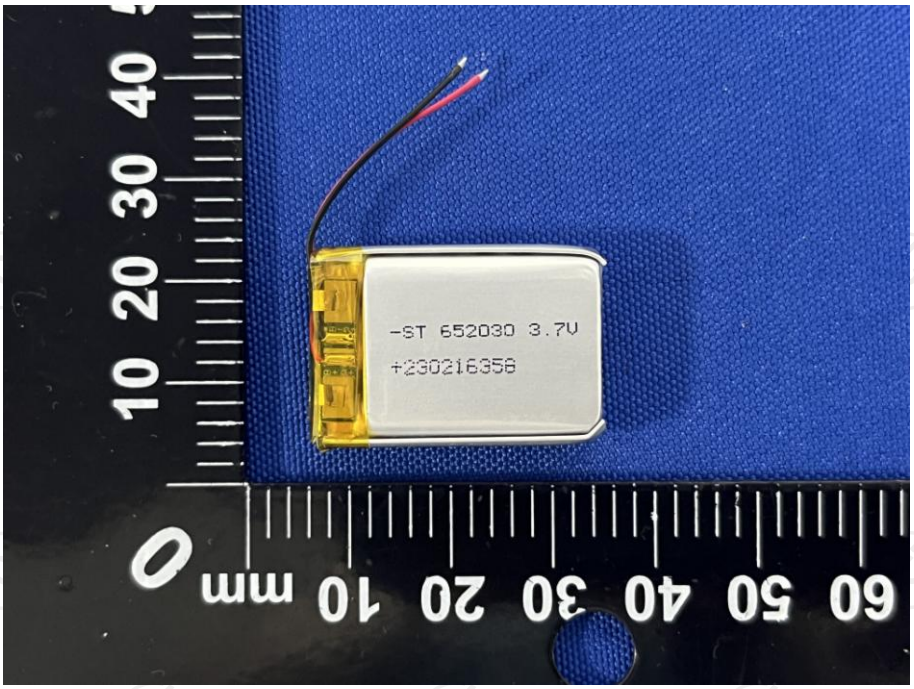

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