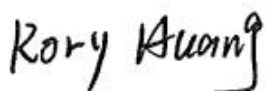




中国认可  
国际互认  
检测  
TESTING  
CNAS L18588

# TEST REPORT

Report No.	CISRR24062720301
Applicant	SNOKO ELECTRONIC TECHNOLOGY CO.,LTD
Address	Room 1302,Building 3,Songhu Wisdom Valley Scientific Research Center,Liaobu Town,Dongguan
Manufacturer	SNOKO ELECTRONIC TECHNOLOGY CO.,LTD
Address	Room 1302,Building 3,Songhu Wisdom Valley Scientific Research Center,Liaobu Town,Dongguan
Product Name	Smart Audio Glasses
Trade Mark	--
Model/Type reference	MINISO-088
Listed Model(s)	--
Standard	ETSI EN 300 328 V2.2.2
Test date	June 27, 2024~ July 8, 2024
Issue date	July 10, 2024
Test result	<b>Complied</b>



Prepared by: Rory Huang



Approved by: Genry Long

*The test results relate only to the tested samples.*

*The test report should not be reproduced except in full without the written approval of Shenzhen Bangce Testing Technology Co., Ltd.*

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## 1. REPORT VERSION

Version No.	Issue date	Description
00	July 10, 2024	Original

## 2. TEST DESCRIPTION

Standard clause	Report clause	Test item	Result	Remark
4.3.1.2	5.1	RF Output Power	Pass	
4.3.1.3	-	Duty cycle, Tx-Sequence, Tx-gap	N/R	Only for non-Adaptive equipment with RF output power >10dBm
4.3.1.4	5.2	Accumulated Transmit time, Frequency Occupation & Hopping Sequence	Pass	Only for FHSS
4.3.1.5	5.3	Hopping Frequency Separation	Pass	Only for FHSS
4.3.1.6	-	Medium Utilization	N/R	Only for non-Adaptive equipment RF output power >10dBm
4.3.1.7	-	Adaptivity	N/R	Only for Adaptive Equipment RF output power >10dBm
4.3.1.8	5.4	Occupied Channel Bandwidth	Pass	
4.3.1.9	5.5	Transmitter unwanted emissions in the OOB domain	Pass	
4.3.1.10	5.6	Transmitter unwanted emissions in the spurious domain	Pass	
4.3.1.11	5.7	Receiver spurious emissions	Pass	
4.3.1.12	5.8	Receiver Blocking	Pass	
4.3.1.13	-	Geo-location capability	N/R	Not used

Note:

- 1) Pass: The EUT meet this standard requirement.  
N/R: Not required by this standard for the EUT.
- 2) #1: The test result does not include measurement uncertainty value.

### 3. SUMMARY

#### 3.1. Product Description

Main unit information:	
Product Name:	Smart Audio Glasses
Trade Mark:	--
Model No.:	MINISO-088
Listed Model(s):	--
Power supply:	Input: DC 5V DC 3.7V from Battery
Hardware version:	V1.0
Software version:	V1.0

### 3.2. Radio Specification Description

Technical index for Bluetooth	
Bluetooth function:	BR, EDR
Modulation:	GFSK, $\pi/4$ QPSK, 8DPSK
Operation Frequency:	2402MHz~2480MHz
Channel Number:	79
Channel Separation:	1MHz
Modulation:	<input checked="" type="checkbox"/> FHSS <input type="checkbox"/> Other forms of modulation
Type of Equipment:	<input checked="" type="checkbox"/> Stand-alone <input type="checkbox"/> Combined Equipment <input type="checkbox"/> Plug-in radio device <input type="checkbox"/> Other
Adaptive / Non-adaptive Equipment:	<input type="checkbox"/> non-adaptive Equipment <input checked="" type="checkbox"/> adaptive Equipment without the possibility to switch to a non-adaptive mode <input type="checkbox"/> adaptive Equipment which can also operate in a non-adaptive mode
Receiver Categories:	<input type="checkbox"/> Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p. shall be considered as receiver category 1 equipment. <input checked="" type="checkbox"/> Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment with a maximum RF output power of 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment. <input type="checkbox"/> Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment with a maximum RF output power of 0 dBm e.i.r.p. shall be considered as receiver category 3 equipment.
Operating Mode:	<input checked="" type="checkbox"/> Single Antenna Equipment <input checked="" type="checkbox"/> Equipment with only 1 antenna <input type="checkbox"/> Equipment with 2 diversity antennas but only 1 antenna active at any moment in time <input type="checkbox"/> Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1 antenna is used. <input type="checkbox"/> Smart Antenna Systems - Multiple Antennas without beam forming <input type="checkbox"/> Single spatial stream / Standard throughput <input type="checkbox"/> High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1 <input type="checkbox"/> High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2 <input type="checkbox"/> Smart Antenna Systems - Multiple Antennas with beam forming <input type="checkbox"/> Single spatial stream / Standard throughput <input type="checkbox"/> High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1 <input type="checkbox"/> High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2
Antenna Type: #	<input checked="" type="checkbox"/> Chip Antenna <input checked="" type="checkbox"/> Temporary RF connector provided <input type="checkbox"/> No temporary RF connector provided Antenna Gain: 0dBi Beamforming gain: ....0.....dB <input type="checkbox"/> Dedicated Antennas (equipment with antenna connector) <input type="checkbox"/> Single power level with corresponding antenna(s) <input type="checkbox"/> Multiple power settings and corresponding antenna(s) Number of different Power Levels: ..... Power Level 1: ..... dBm Power Level 2: ..... dBm

Power Level 3: ..... dBm	
<b>Information is Provided by the Supplier</b>	
<input type="checkbox"/> In Case of FHSS Modulation:	<input type="checkbox"/> In case of non-Adaptive Frequency Hopping equipment: The number of Hopping Frequencies: .....
	<input type="checkbox"/> In case of Adaptive Frequency Hopping Equipment: The maximum number of Hopping Frequencies: ..... The minimum number of Hopping Frequencies: .....
	The Dwell Time: .....
	The Minimum Channel Occupation Time: .....
<input checked="" type="checkbox"/> In Case of Adaptive Equipment:	The Channel Occupancy Time implemented by the equipment:../. ms <input checked="" type="checkbox"/> The equipment has implemented an LBT based DAA mechanism In case of equipment using modulation different from FHSS: <input type="checkbox"/> The equipment is Frame Based equipment <input checked="" type="checkbox"/> The equipment is Load Based equipment <input type="checkbox"/> The equipment can switch dynamically between Frame Based and Load Based equipment The CCA time implemented by the equipment: .... µs
	<input type="checkbox"/> The equipment has implemented an non-LBT based DAA mechanism
	<input type="checkbox"/> The equipment can operate in more than one adaptive mode
<input type="checkbox"/> In Case of Non-adaptive Equipment	The maximum RF Output Power (e.i.r.p.): ..... dBm The maximum (corresponding) Duty Cycle: ..... %
<b>The worst case operational mode for each of the following tests:</b>	
RF Output Power	Reference to section 5.1
Occupied Channel Bandwidth	Reference to section 5.4
Transmitter Unwanted Emissions in the OOB Domain	Reference to section 5.5
Transmitter Unwanted Emissions in the Spurious Domain	Reference to section 5.6
Receiver Spurious Emissions	Reference to section 5.7
<input checked="" type="checkbox"/> FHSS	
Dwell time:	Reference to section 5.2
Minimum Frequency Occupation:	Reference to section 5.2
Hopping Sequence:	Reference to section 5.2
Hopping Frequency Separation	Reference to section 5.3
<input type="checkbox"/> Other	
Power Spectral Density:	
<input checked="" type="checkbox"/> Adaptive Equipment	
Adaptivity:	-
Receiver Blocking:	Reference to section 5.8
<input type="checkbox"/> Non-adaptive Equipment	
Duty cycle:	-
Tx-Sequence:	-
Tx-gap:	-
Medium Utilisation:	-

### 3.3. Modification of EUT

No modifications are made to the EUT during all test items.

### 3.4. Testing Site

Laboratory Name	Shenzhen Bangce Testing Technology Co., Ltd.
Laboratory Location	101, building 10, Yunli Intelligent Park, Shutianpu community, Matian Street, Guangming District, Shenzhen, Guangdong, China
Contact information	Tel: 86-755-2319 6848, email: <a href="mailto:service@cis-cn.net">service@cis-cn.net</a> Website: <a href="http://www.cis-cn.net/">http://www.cis-cn.net/</a>



## 4. TEST CONFIGURATION

### 4.1. Test frequency list

Channel	Frequency (MHz)
CH-L	2402
CH-M	2441
CH-H	2480

### 4.2. Test mode

TX mode	Keep the EUT in continuously transmitting mode by test software.
Hopping mode	Keep the EUT in continuously hopping mode by test software.
RX mode	Keep the EUT in continuously receiving mode by test software.
Normal mode	Keep the EUT in continuously communication mode

### 4.3. Support unit used in test configuration and system

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

Item	Equipment name	Trade Name	Model No.
1	Phone	Huawei	Mate 20
2	Adapter	--	--

### 4.4. Testing environmental condition

Normal Condition	Temperature	15 °C to +35 °C
	Relative humidity	20 % to 75 %.
	Voltage	the equipment shall be the nominal voltage for which the equipment was designed.
Extreme Condition	Temperature	Measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer
	Voltage	Measurements shall be made over the extremes of the operating voltage range as declared by the manufacturer

Normal Condition	T <sub>N</sub> =Normal Temperature	25 °C
Extreme Condition	T <sub>L</sub> =Lower Temperature	-20 °C
	T <sub>H</sub> =Higher Temperature	55 °C

#### 4.5. Measurement uncertainty

No.	Test Items	Measurement Uncertainty
1	RF power, conducted	1.34dB
2	Power spectral density, conducted	1.34dB
3	Conducted spurious emission	1.93dB
4	Radiated spurious emission	3.55dB for 30MHz-1GHz 4.63dB for above 1GHz
5	Occupied bandwidth	0.002%
6	Temperature	1°C
7	Humidity	5%

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

#### 4.6. Equipments Used During the Test

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	SKET	9.3*6.3*6	N/A	2021.10.15	3Year
Spectrum analyzer	Agilent	N9020A	MY50530263	2024.01.08	1Year
Receiver	ROHDE&SCHWARZ	ESCI	100853	2024.01.08	1Year
Spectrum analyzer	R&S	FSV-40N	/	2024.01.08	1Year
Bilog Antenna	Schwarzbeck	VULB 9163	1463	2023.01.09	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	2487	2023.01.09	2Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	/	2023.01.09	2Year
RF Cable	Tonscend	Cable 1	/	2024.01.08	1Year
RF Cable	Tonscend	Cable 2	/	2024.01.08	1Year
RF Cable	SKET	Cable 3	/	2024.01.08	1Year
Pre-amplifier	Tonscend	TAP9K3G32	AP21G806153	2024.01.08	1Year
Pre-amplifier	Tonscend	TAP01018050	AP22E806229	2024.01.08	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8127	/	2024.01.08	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	2024.01.08	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	1130	2023.01.09	2 Year
Preamplifier	Tonscend	TAP18040048	AP21C806126	2024.01.08	1 Year
variable-frequency power source	Pinhong	PH1110	/	2024.01.08	1 Year
6dB Attenuator	SKET	DC-6G	/	N/A	N/A

## 5. TEST RESULTS

### 5.1. RF Output Power

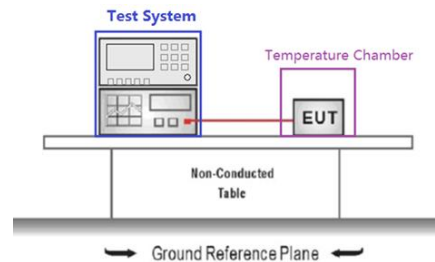
Limit:

ETSI EN 300 328 Sub-clause 4.3.1.2.3

The maximum RF output power for adaptive Frequency Hopping equipment shall be equal to or less than 20 dBm.

The maximum RF output power for non-adaptive Frequency Hopping equipment shall be declared by the supplier. The maximum RF output power for this equipment shall be equal to or less than the value declared by the supplier. This declared value shall be equal to or less than 20 dBm.

Test configuration:



Test procedure:

1. The test conditions.

☒ Normal condition      ☒ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.2.2.1 for the measurement method.

Test mode:

Refer to the clause 4.2

Test data:

Refer to the Appendix A

Result:

**Passed**

## 5.2. Accumulated Transmit Time, Minimum Frequency Occupation and Hopping Sequence

### Limit:

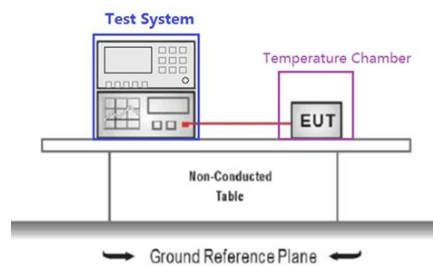
ETSI EN 300 328 Sub-clause 4.3.1.4.3

Adaptive Frequency Hopping systems shall be capable of operating over a minimum of 70 % of the band specified in the band 2,4 GHz to 2,4835 GHz.

The Accumulated Transmit Time on any hopping frequency shall not be greater than 400 ms within any observation period of 400 ms multiplied by the minimum number of hopping frequencies (N) that have to be used.

The hopping sequence(s) shall contain at least N hopping frequencies at all times, where N is 15 or 15 divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

### Test configuration:



### Test procedure:

1. The test conditions.

☒ Normal condition      ☐ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.4.2.1 for the measurement method.

### Test mode:

Refer to the clause 4.2

### Test data:

Refer to the Appendix A

### Result:

**Passed**

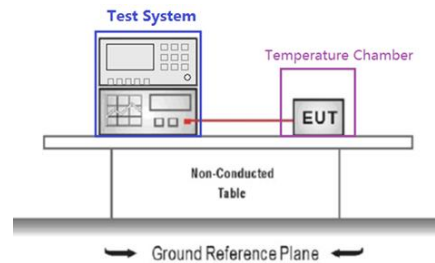
### 5.3. Hopping Frequency Separation

Limit:

ETSI EN 300 328 Sub-clause 4.3.1.5.3.2

For adaptive Frequency Hopping equipment, the minimum Hopping Frequency Separation shall be 100 kHz

Test configuration:



Test procedure:

1. The test conditions.

☒ Normal condition      ☐ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.5.2.1 for the measurement method.

Test mode:

Refer to the clause 4.2

Test data:

Refer to the Appendix A

Result:

**Passed**

## 5.4. Occupied Channel Bandwidth

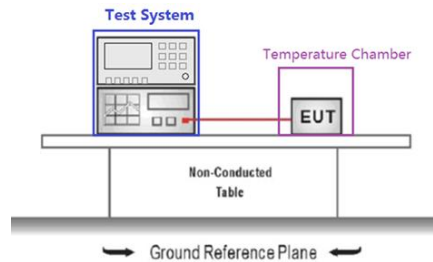
### Limit:

ETSI EN 300 328 Sub-clause 4.3.1.8.3

The Occupied Channel Bandwidth for each hopping frequency shall fall completely within the band given in the band 2,4 GHz to 2,4835 GHz

For non-adaptive Frequency Hopping equipment with e.i.r.p greater than 10 dBm, the Occupied Channel Bandwidth for every occupied hopping frequency shall be equal to or less than the value declared by the supplier. This declared value shall not be greater than 5 MHz.

### Test configuration:



### Test procedure:

1. The test conditions.

☒ Normal condition      ☐ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.7.2.1 for the measurement method.

### Test mode:

Refer to the clause 4.2

### Test data:

Refer to the Appendix A

### Result:

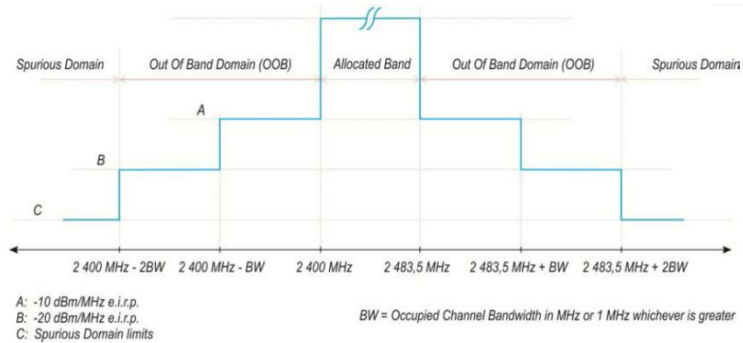
**Passed**

## 5.5. Transmitter Unwanted Emissions in the Out-of-band Domain

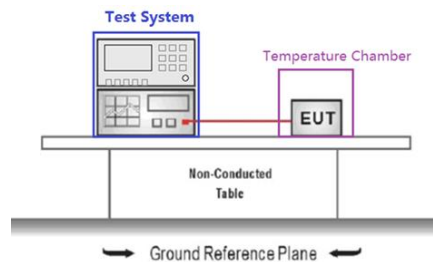
### Limit:

ETSI EN 300 328 Sub-clause 4.3.1.9.3

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in the below figure.



### Test configuration:



### Test procedure:

1. The test conditions.

☒ Normal condition    ☐ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.8.2.1 for the measurement method

### Test mode:

Refer to the clause 4.2

### Test data:

Refer to the Appendix A

### Result:

**Passed**



## 5.6. Transmitter Unwanted Emissions in the Spurious Domain

### 5.6.1. Conducted Measurements

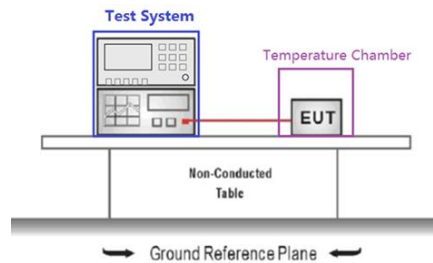
#### Limit:

ETSI EN 300 328 Sub-clause 4.3.1.10.3

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in the below table

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 694 MHz	-54 dBm	100 kHz
694 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

#### Test configuration:



#### Test procedure:

1. The test conditions.

☒ Normal condition      ☐ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.9.2.1 for the measurement method.

#### Test mode:

Refer to the clause 4.2

#### Test data:

Refer to the Appendix A

#### Result:

**Passed**

## 5.6.2. Radiated Measurements

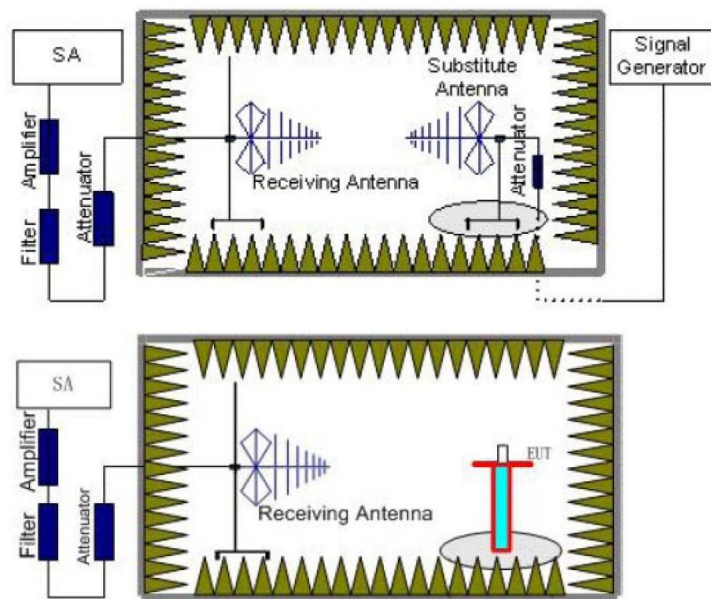
### Limit:

ETSI EN 300 328 Sub-clause 4.3.1.10.3

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in the below table

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 694 MHz	-54 dBm	100 kHz
694 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

### Test configuration:



### Test procedure:

1. The test conditions.

☒ Normal condition ☐ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.9.2.2 for the measurement method.

### Test mode:

Refer to the clause 4.2

### Result:

**Passed**

All the test data for each data rate were verified, found GFSK Modulation which is worse case mode, so only the worse case data on this report.

### Note:

Factor=Antenna Factor+Cable Factor- Pre-amplifier Factor

Margin=Emission Level - Limit

Left:

GFSK\_CH00

Transmitter Spurious Emission below 1GHz (30MHz-1GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
139.67	H	-69.93	-6.092	-76.02	-36	-40.02
160.96	H	-65.35	-8.823	-74.17	-54	-20.17
357.36	H	-68.91	2.503	-66.41	-36	-30.41
425.08	H	-73.92	2.589	-71.33	-36	-35.33
567.37	H	-69.15	2.292	-66.86	-54	-12.86
828.72	H	-72.63	3.495	-69.14	-36	-33.14
126.87	V	-83.386	-2.316	-85.70	-36	-49.70
227.07	V	-81.823	-7.794	-89.62	-54	-35.62
452.35	V	-80.561	1.024	-79.54	-36	-43.54
598.64	V	-83.119	2.402	-80.72	-54	-26.72
631.85	V	-73.576	2.805	-70.77	-54	-16.77
828.05	V	-82.453	3.663	-78.79	-36	-42.79

Transmitter Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
1687.49	H	-61.02	-4.33	-65.35	-30	-35.35
4804.02	H	-56.27	-4.39	-60.66	-30	-30.66
7206.14	H	-56.27	-4.39	-60.66	-30	-30.66
9752.60	H	-58.77	-2.50	-61.26	-30	-31.26
10809.23	H	-58.51	-5.35	-63.86	-30	-33.86
12250.49	H	-58.51	-5.35	-63.86	-30	-33.86
1843.67	V	-59.38	-1.32	-60.70	-30	-30.70
4804.37	V	-59.32	-1.36	-60.68	-30	-30.68
6725.72	V	-59.67	-1.81	-61.48	-30	-31.48
7398.41	V	-60.93	-1.81	-62.73	-30	-32.73
9608.18	V	-60.53	-2.47	-62.99	-30	-32.99
11721.91	V	-61.10	-2.46	-63.56	-30	-33.56

**GFSK\_CH78**

Transmitter Spurious Emission below 1GHz (30MHz-1GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
139.39	H	-70.06	-6.094	-76.15	-36	-40.15
161.12	H	-65.36	-8.861	-74.22	-54	-20.22
357.44	H	-69.16	2.601	-66.56	-36	-30.56
425.35	H	-74.07	2.562	-71.51	-36	-35.51
567.07	H	-68.98	2.260	-66.72	-54	-12.72
829.04	H	-72.59	3.620	-68.97	-36	-32.97
127.11	V	-83.457	-2.313	-85.77	-36	-49.77
227.32	V	-81.720	-7.780	-89.50	-54	-35.50
452.47	V	-80.430	1.116	-79.31	-36	-43.31
598.75	V	-83.131	2.324	-80.81	-54	-26.81
632.13	V	-73.586	2.857	-70.73	-54	-16.73
827.85	V	-82.485	3.654	-78.83	-36	-42.83

Transmitter Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
1680.88	H	-60.18	-4.42	-64.60	-30	-34.60
4962.24	H	-56.10	-4.39	-60.49	-30	-30.49
7460.25	H	-56.09	-4.39	-60.48	-30	-30.48
9929.60	H	-57.26	-2.40	-59.66	-30	-29.66
10659.37	H	-58.51	-5.35	-63.86	-30	-33.86
11651.41	H	-58.18	-5.35	-63.54	-30	-33.54
1863.04	V	-60.03	-1.45	-61.48	-30	-31.48
4811.33	V	-59.17	-1.46	-60.63	-30	-30.63
7437.18	V	-56.11	-1.75	-57.86	-30	-27.86
7688.14	V	-58.72	-1.79	-60.50	-30	-30.50
9786.42	V	-58.89	-2.49	-61.38	-30	-31.38
11110.59	V	-59.33	-2.52	-61.85	-30	-31.85

Right:

GFSK\_CH00

Transmitter Spurious Emission below 1GHz (30MHz-1GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
139.62	H	-69.83	-6.044	-75.87	-36	-39.87
161.02	H	-65.23	-8.702	-73.93	-54	-19.93
357.23	H	-69.04	2.579	-66.46	-36	-30.46
425.37	H	-73.77	2.469	-71.30	-36	-35.30
567.35	H	-69.01	2.235	-66.78	-54	-12.78
828.65	H	-72.51	3.490	-69.01	-36	-33.01
127.04	V	-83.394	-2.334	-85.73	-36	-49.73
226.96	V	-81.778	-7.744	-89.52	-54	-35.52
452.23	V	-80.512	1.183	-79.33	-36	-43.33
598.82	V	-83.087	2.499	-80.59	-54	-26.59
631.90	V	-73.645	2.811	-70.83	-54	-16.83
827.88	V	-82.608	3.591	-79.02	-36	-43.02

Transmitter Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
1687.26	H	-61.06	-4.29	-65.35	-30	-35.35
4804.14	H	-56.27	-4.39	-60.66	-30	-30.66
7206.31	H	-56.27	-4.39	-60.66	-30	-30.66
9752.36	H	-56.65	-2.46	-59.11	-30	-29.11
10809.46	H	-58.51	-5.35	-63.86	-30	-33.86
12250.54	H	-58.51	-5.35	-63.86	-30	-33.86
1843.67	V	-62.30	-1.37	-63.67	-30	-33.67
4804.20	V	-59.80	-1.46	-61.26	-30	-31.26
6726.08	V	-57.15	-1.68	-58.82	-30	-28.82
7398.37	V	-59.58	-1.80	-61.38	-30	-31.38
9608.15	V	-59.70	-2.52	-62.21	-30	-32.21
11722.23	V	-57.90	-2.40	-60.29	-30	-30.29

### GFSK\_CH78

Transmitter Spurious Emission below 1GHz (30MHz-1GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
139.74	H	-70.00	-5.983	-75.98	-36	-39.98
161.31	H	-64.98	-8.682	-73.66	-54	-19.66
357.52	H	-69.06	2.519	-66.54	-36	-30.54
425.32	H	-73.98	2.635	-71.34	-36	-35.34
566.89	H	-69.08	2.240	-66.84	-54	-12.84
828.63	H	-72.27	3.507	-68.77	-36	-32.77
127.12	V	-83.372	-2.384	-85.76	-36	-49.76
226.92	V	-81.779	-7.838	-89.62	-54	-35.62
452.53	V	-80.487	1.103	-79.38	-36	-43.38
598.66	V	-83.121	2.403	-80.72	-54	-26.72
632.02	V	-73.595	2.832	-70.76	-54	-16.76
827.87	V	-82.529	3.600	-78.93	-36	-42.93

Transmitter Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
1680.91	H	-60.21	-4.42	-64.63	-30	-34.63
4962.08	H	-56.24	-4.39	-60.63	-30	-30.63
7460.26	H	-56.21	-4.39	-60.59	-30	-30.59
9929.88	H	-57.21	-2.40	-59.62	-30	-29.62
10659.48	H	-58.51	-5.35	-63.86	-30	-33.86
11651.40	H	-58.11	-5.35	-63.46	-30	-33.46
1862.99	V	-60.11	-1.45	-61.57	-30	-31.57
4811.27	V	-59.11	-1.46	-60.57	-30	-30.57
7436.93	V	-56.09	-1.75	-57.85	-30	-27.85
7688.25	V	-58.83	-1.79	-60.62	-30	-30.62
9786.58	V	-58.92	-2.49	-61.41	-30	-31.41
11110.78	V	-59.49	-2.52	-62.00	-30	-32.00

## 5.7. Receiver Spurious Emissions

### 5.7.1. Conducted Measurements

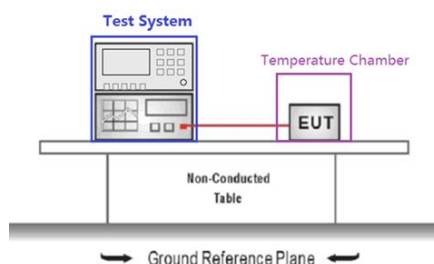
#### Limit:

ETSI EN 300 328 Sub-clause 4.3.1.11.3

The spurious emissions of the receiver shall not exceed the values given in the below table

Frequency range	Maximum power	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12,75 GHz	-47 dBm	1 MHz

#### Test configuration:



#### Test procedure:

1. The test conditions.

☒ Normal condition      ☐ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.10.2.1 for the measurement method.

#### Test mode:

Refer to the clause 4.2

#### Test data:

Refer to the Appendix A

#### Result:

**Passed**

## 5.7.2. Radiated Measurements

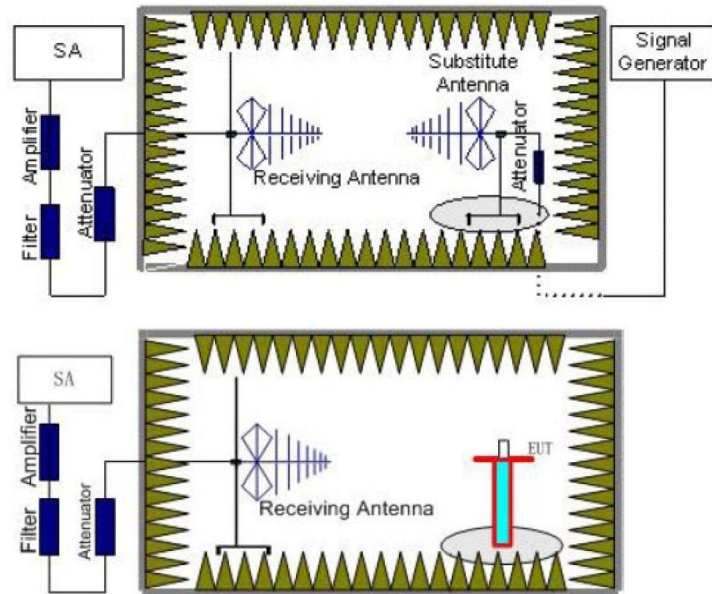
Limit:

ETSI EN 300 328 Sub-clause 4.3.1.11.3

The spurious emissions of the receiver shall not exceed the values given in the below table

Frequency range	Maximum power	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12.75 GHz	-47 dBm	1 MHz

Test configuration:



Test procedure:

1. The test conditions.

☒ Normal condition ☐ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.10.2.2 for the measurement method.

Test mode:

Refer to the clause 4.2

Result:

**Passed**

All the test data for each data rate were verified, found GFSK Modulation which is worse case mode, so only the worse case data on this report.

**Note:**

Factor=Antenna Factor+Cable Factor- Pre-amplifier Factor

Margin=Emission Level - Limit



Left:

### GFSK\_CH00

Receiver Spurious Emission below 1GHz (30MHz-1GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
32.40	H	-78.41	-5.96	-84.37	-57	-27.37
98.70	H	-78.25	-6.73	-84.98	-57	-27.98
136.56	H	-76.33	-9.30	-85.63	-57	-28.63
332.46	H	-76.42	-3.29	-79.71	-57	-22.71
566.80	H	-75.24	0.95	-74.29	-57	-17.29
629.59	H	-79.35	2.50	-76.85	-57	-19.85
32.79	V	-79.56	-6.28	-85.84	-57	-28.84
98.35	V	-78.82	-5.80	-84.62	-57	-27.62
136.88	V	-76.22	-9.60	-85.82	-57	-28.82
331.30	V	-76.18	-3.18	-79.36	-57	-22.36
730.41	V	-76.67	2.68	-73.99	-57	-16.99
989.15	V	-76.56	5.52	-71.03	-57	-14.03

Receiver Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
1652.85	H	-61.36	-13.58	-74.94	-47	-27.94
1998.67	H	-63.42	-14.88	-78.30	-47	-31.30
2336.26	H	-58.79	-13.10	-71.89	-47	-24.89
3332.41	H	-58.13	-10.23	-68.36	-47	-21.36
4566.58	H	-63.82	-7.98	-71.80	-47	-24.80
5629.46	H	-58.20	-7.45	-65.65	-47	-18.65
1333.09	V	-61.92	-14.25	-76.17	-47	-29.17
1998.51	V	-66.42	-13.51	-79.93	-47	-32.93
2336.88	V	-64.38	-10.66	-75.03	-47	-28.03
3331.30	V	-63.74	-11.10	-74.84	-47	-27.84
4730.64	V	-63.73	-10.06	-73.79	-47	-26.79
5689.08	V	-65.22	-9.22	-74.44	-47	-27.44

## GFSK\_CH78

### Receiver Spurious Emission below 1GHz (30MHz-1GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
32.67	H	-78.43	-6.11	-84.54	-57	-27.54
98.80	H	-78.10	-6.72	-84.81	-57	-27.81
136.70	H	-76.45	-9.29	-85.73	-57	-28.73
332.54	H	-76.30	-3.29	-79.60	-57	-22.60
566.52	H	-75.33	1.11	-74.21	-57	-17.21
629.49	H	-79.44	2.47	-76.98	-57	-19.98
32.83	V	-79.68	-6.32	-86.00	-57	-29.00
98.28	V	-78.89	-5.82	-84.72	-57	-27.72
137.32	V	-76.11	-9.62	-85.73	-57	-28.73
331.47	V	-76.21	-3.11	-79.31	-57	-22.31
730.32	V	-76.65	2.64	-74.00	-57	-17.00
989.34	V	-76.50	5.39	-71.11	-57	-14.11

### Receiver Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
1652.39	H	-61.50	-13.84	-75.34	-47	-28.34
1998.81	H	-61.48	-14.70	-76.18	-47	-29.18
2336.26	H	-60.68	-13.24	-73.91	-47	-26.91
3332.36	H	-61.82	-10.34	-72.16	-47	-25.16
4566.95	H	-59.86	-8.14	-68.01	-47	-21.01
5629.32	H	-59.05	-7.39	-66.44	-47	-19.44
1332.98	V	-61.43	-14.37	-75.81	-47	-28.81
1998.55	V	-66.27	-13.39	-79.66	-47	-32.66
2337.18	V	-60.56	-10.49	-71.05	-47	-24.05
3331.39	V	-61.13	-11.11	-72.23	-47	-25.23
4730.52	V	-60.43	-10.16	-70.59	-47	-23.59
5689.21	V	-66.96	-9.50	-76.47	-47	-29.47

Right:

### GFSK\_CH00

Receiver Spurious Emission below 1GHz (30MHz-1GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
32.81	H	-78.52	-6.05	-84.57	-57	-27.57
98.86	H	-78.12	-6.74	-84.86	-57	-27.86
136.52	H	-76.43	-9.29	-85.72	-57	-28.72
332.65	H	-76.46	-3.30	-79.76	-57	-22.76
566.77	H	-75.37	0.97	-74.39	-57	-17.39
629.24	H	-79.45	2.44	-77.02	-57	-20.02
32.87	V	-79.66	-6.45	-86.11	-57	-29.11
98.57	V	-78.90	-5.77	-84.67	-57	-27.67
136.84	V	-76.07	-9.67	-85.74	-57	-28.74
331.66	V	-76.22	-3.23	-79.44	-57	-22.44
730.63	V	-76.51	2.73	-73.78	-57	-16.78
989.26	V	-76.63	5.45	-71.18	-57	-14.18

Receiver Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
1652.43	H	-61.21	-13.84	-75.05	-47	-28.05
1998.87	H	-65.84	-14.66	-80.51	-47	-33.51
2336.31	H	-58.77	-13.26	-72.03	-47	-25.03
3332.78	H	-60.05	-10.02	-70.07	-47	-23.07
4566.89	H	-64.00	-8.07	-72.07	-47	-25.07
5629.43	H	-58.43	-7.29	-65.73	-47	-18.73
1332.99	V	-64.63	-14.44	-79.07	-47	-32.07
1998.62	V	-67.93	-13.54	-81.47	-47	-34.47
2337.09	V	-61.19	-10.77	-71.96	-47	-24.96
3331.34	V	-63.64	-10.87	-74.51	-47	-27.51
4730.44	V	-61.62	-10.45	-72.07	-47	-25.07
5689.10	V	-64.02	-9.07	-73.09	-47	-26.09

## GFSK\_CH78

### Receiver Spurious Emission below 1GHz (30MHz-1GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
32.75	H	-78.53	-6.00	-84.53	-57	-27.53
98.64	H	-78.06	-6.74	-84.80	-57	-27.80
136.37	H	-76.40	-9.25	-85.65	-57	-28.65
332.83	H	-76.34	-3.40	-79.74	-57	-22.74
566.88	H	-75.23	1.10	-74.13	-57	-17.13
629.32	H	-79.34	2.44	-76.90	-57	-19.90
33.19	V	-79.63	-6.35	-85.98	-57	-28.98
98.21	V	-78.84	-5.83	-84.66	-57	-27.66
136.99	V	-76.04	-9.71	-85.74	-57	-28.74
331.61	V	-76.22	-3.26	-79.48	-57	-22.48
730.30	V	-76.65	2.72	-73.93	-57	-16.93
988.92	V	-76.53	5.46	-71.07	-57	-14.07

### Receiver Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency	Antenna	Meter Reading	Factor	Emission Level	Limits	Margin
(MHz)	Polarization	(dBm)	(dB)	(dBm)	(dBm)	(dB)
1652.44	H	-60.46	-13.57	-74.03	-47	-27.03
1998.86	H	-62.14	-14.55	-76.69	-47	-29.69
2336.55	H	-61.22	-13.30	-74.52	-47	-27.52
3332.80	H	-60.41	-10.33	-70.75	-47	-23.75
4566.78	H	-61.59	-7.98	-69.57	-47	-22.57
5629.23	H	-59.13	-7.53	-66.66	-47	-19.66
1333.04	V	-63.34	-14.56	-77.90	-47	-30.90
1998.26	V	-66.37	-13.66	-80.04	-47	-33.04
2337.33	V	-63.08	-10.51	-73.59	-47	-26.59
3331.55	V	-62.45	-10.73	-73.17	-47	-26.17
4730.54	V	-61.09	-10.26	-71.36	-47	-24.36
5689.19	V	-64.34	-9.33	-73.66	-47	-26.66

## 5.8. Receiver blocking

### Limit:

#### Performance Criteria:

- For equipment that supports a PER or FER test to be performed, the minimum performance criterion shall be a PER or FER less than or equal to 10 %.
- For equipment that does not support a PER or a FER test to be performed, the minimum performance criterion shall be no loss of the wireless transmission function needed for the intended use of the equipment.

**Receiver Category 1:** Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p. shall be considered as receiver category 1 equipment.

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × log <sub>10</sub> (OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW
(-139 dBm + 10 × log <sub>10</sub> (OCBW)) or -74 dBm whichever is less (see note 3)	2 300		
	2 330		
	2 360		
	2 524		
	2 584		
2 674			
NOTE 1: OCBW is in Hz.			
NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P <sub>min</sub> + 26 dB where P <sub>min</sub> is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.			
NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P <sub>min</sub> + 20 dB where P <sub>min</sub> is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.			
NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

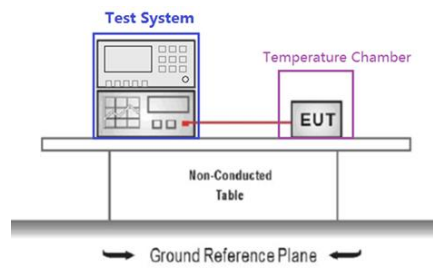
**Receiver Category 2:** Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment with a maximum RF output power of 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment.

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
$(-139 \text{ dBm} + 10 \times \log_{10}(\text{OCBW}) + 10 \text{ dB})$ or $(-74 \text{ dBm} + 10 \text{ dB})$ whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{\min} + 26 \text{ dB}$ where $P_{\min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

**Receiver Category 3:** Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment with a maximum RF output power of 0 dBm e.i.r.p. shall be considered as receiver category 3 equipment.

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
$(-139 \text{ dBm} + 10 \times \log_{10}(\text{OCBW}) + 20 \text{ dB})$ or $(-74 \text{ dBm} + 20 \text{ dB})$ whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{\min} + 30 \text{ dB}$ where $P_{\min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

Test configuration:



Test procedure:

1. The test conditions.

☒ Normal condition      ☐ Extreme conditions

2. Refer to ETSI EN 300 328 Sub-clause 5.4.11.2.1 for the measurement method.

Test mode:

Refer to the clause 4.2

Test data:

Refer to the Appendix A

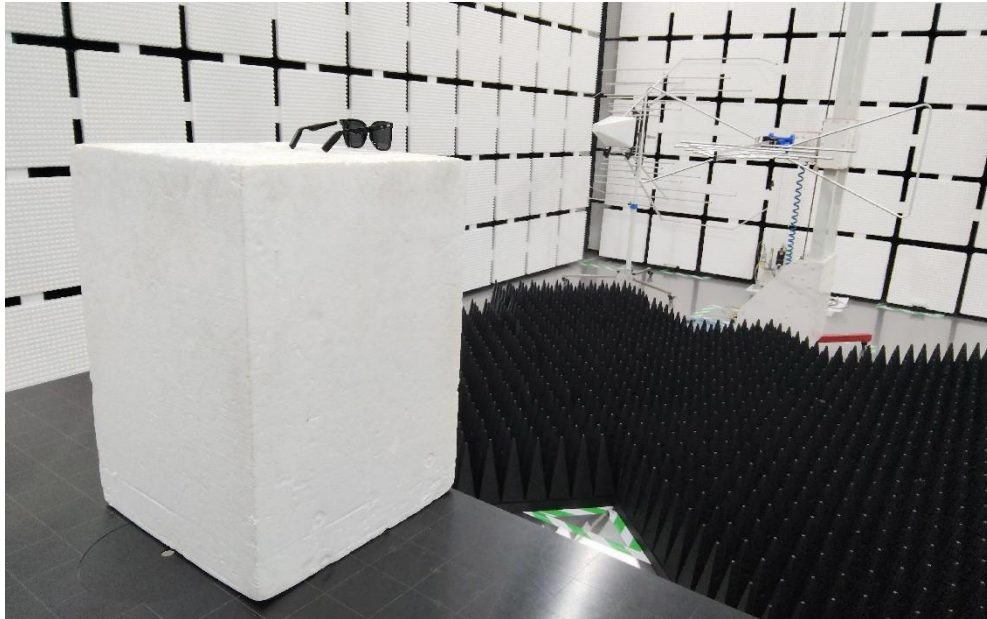
Result:

**Passed**

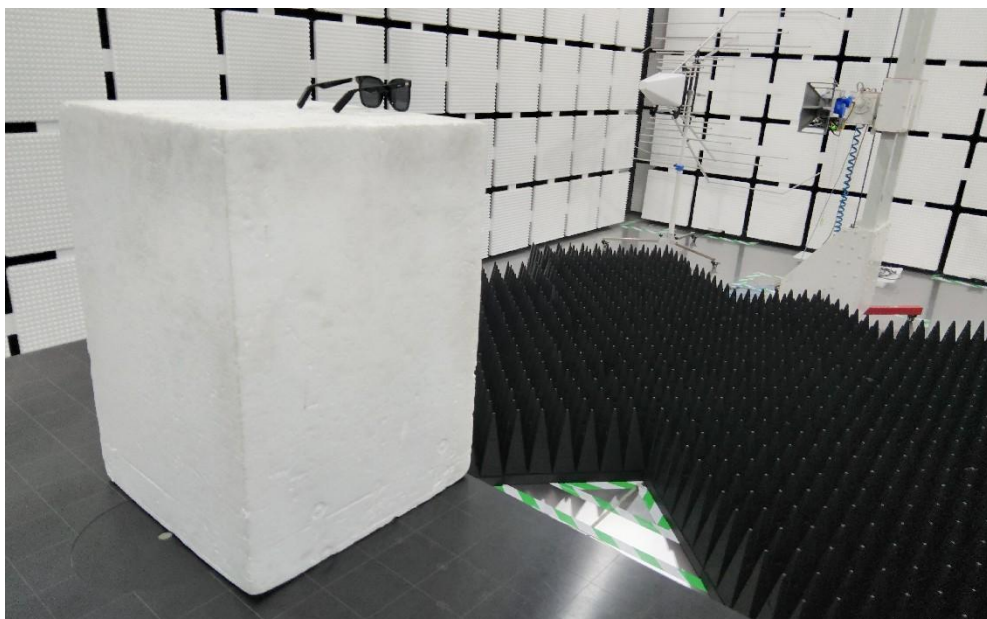
## 6. TEST SETUP PHOTOS OF THE EUT

Radiated measurements

Below 1GHz:



Above 1GHz:





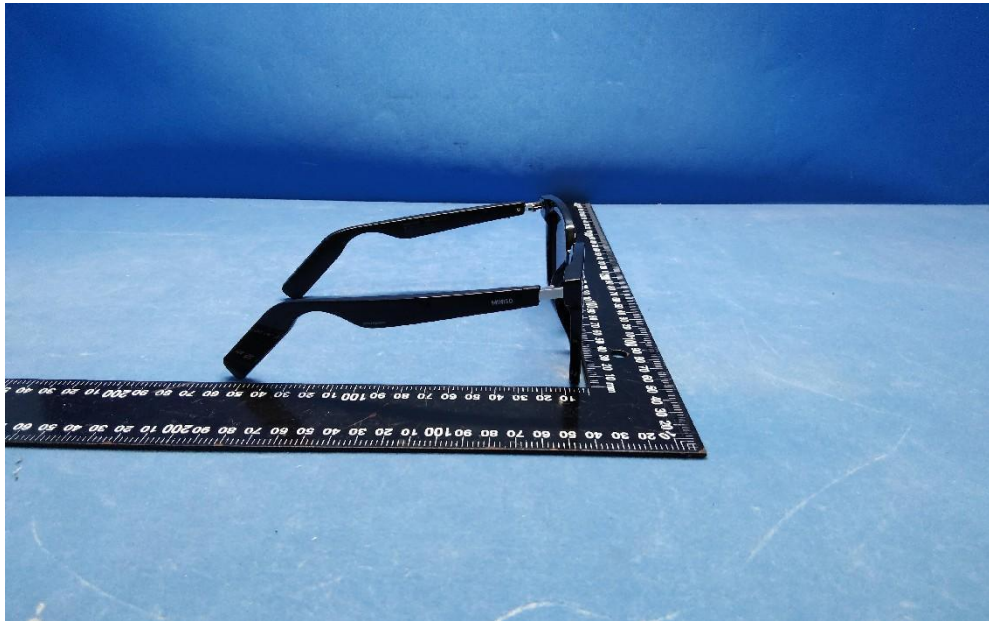
## 7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

### 7.1 External photos





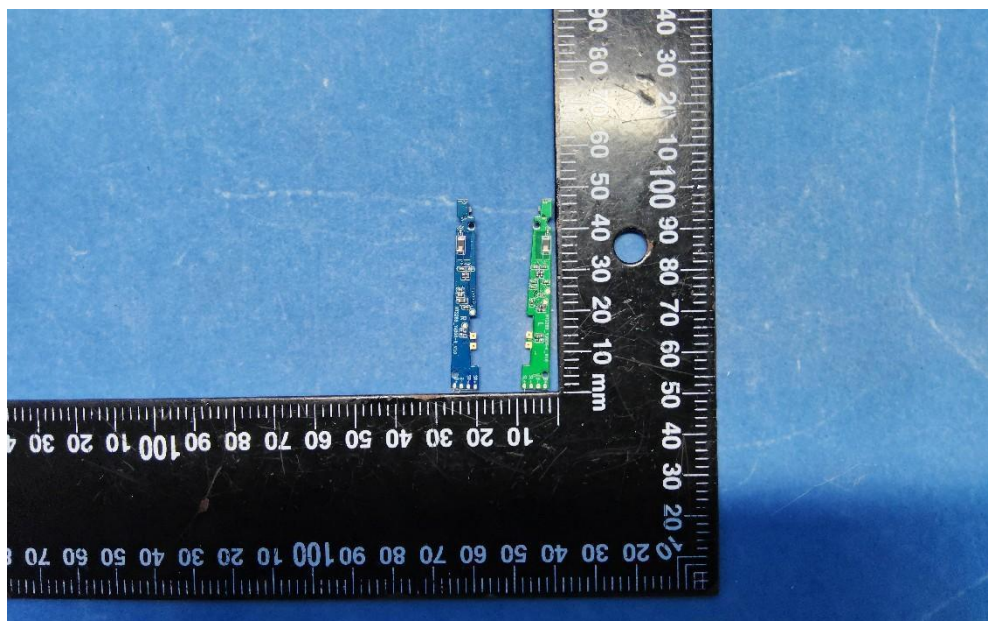


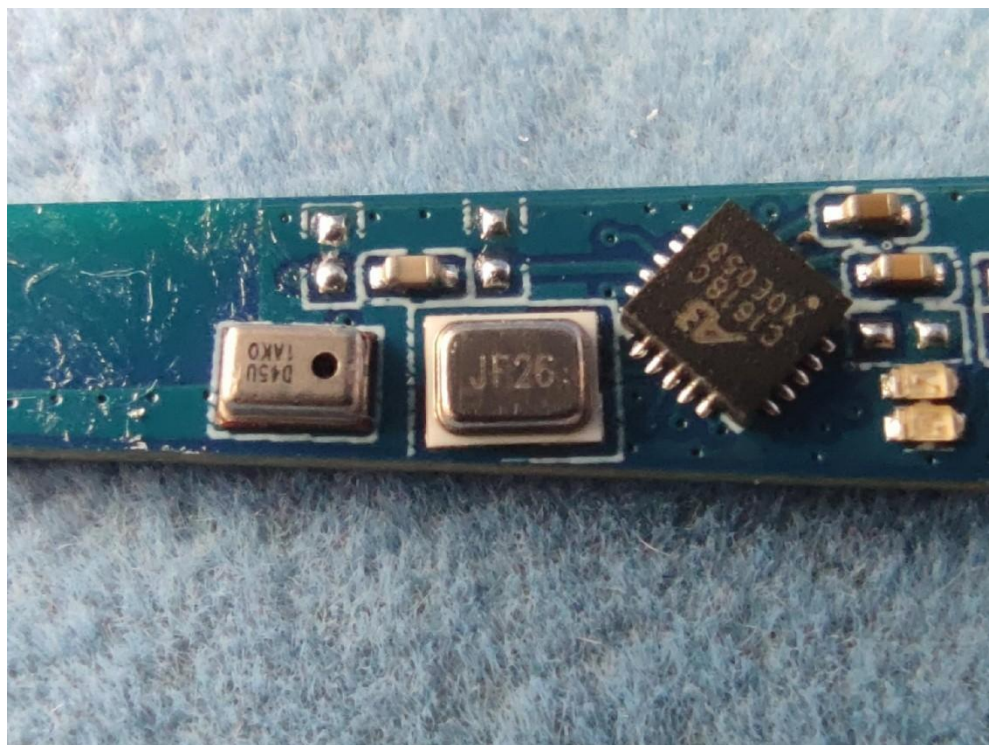
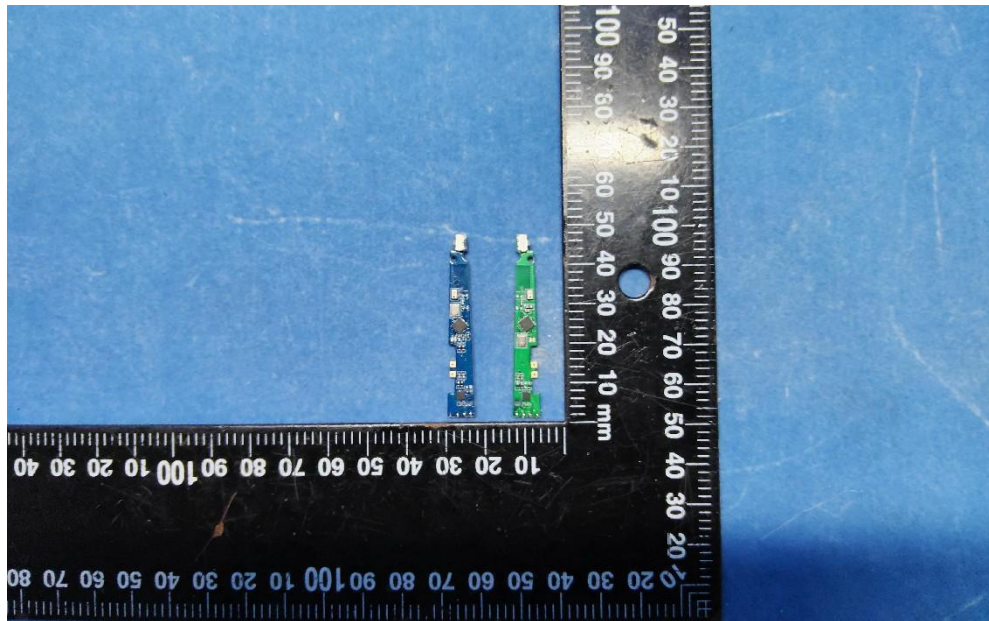




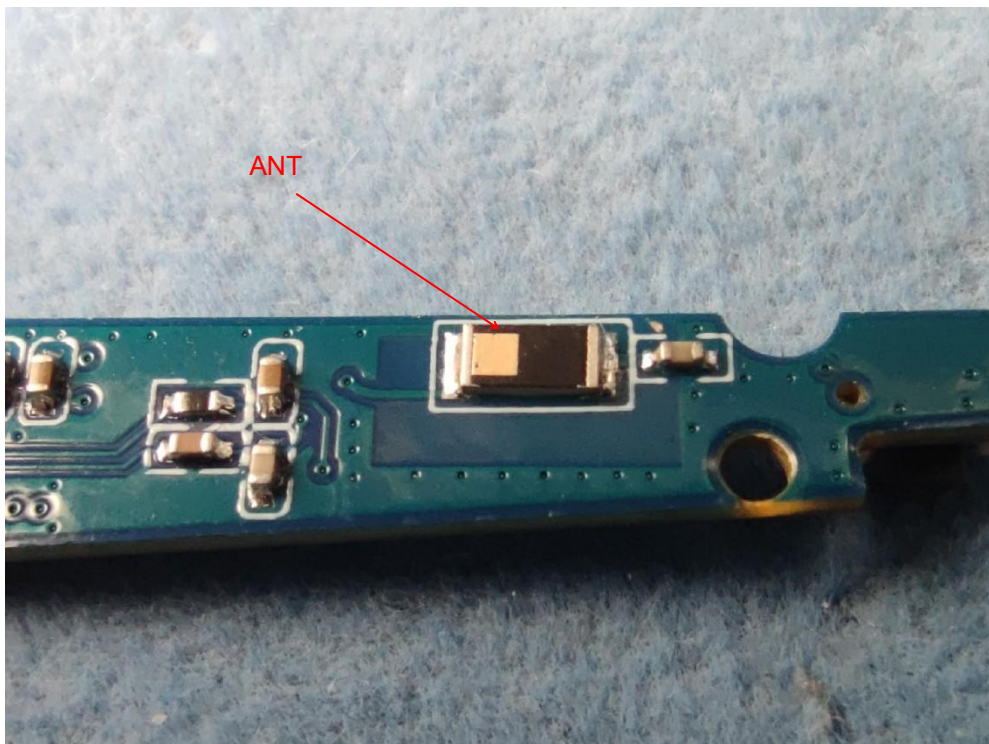
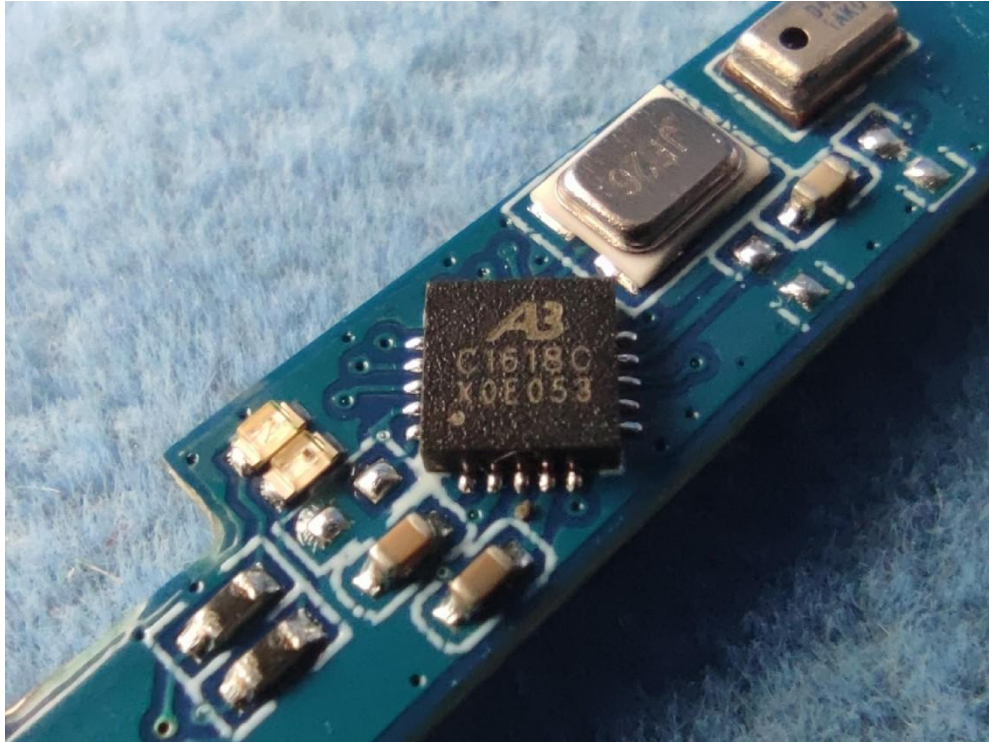


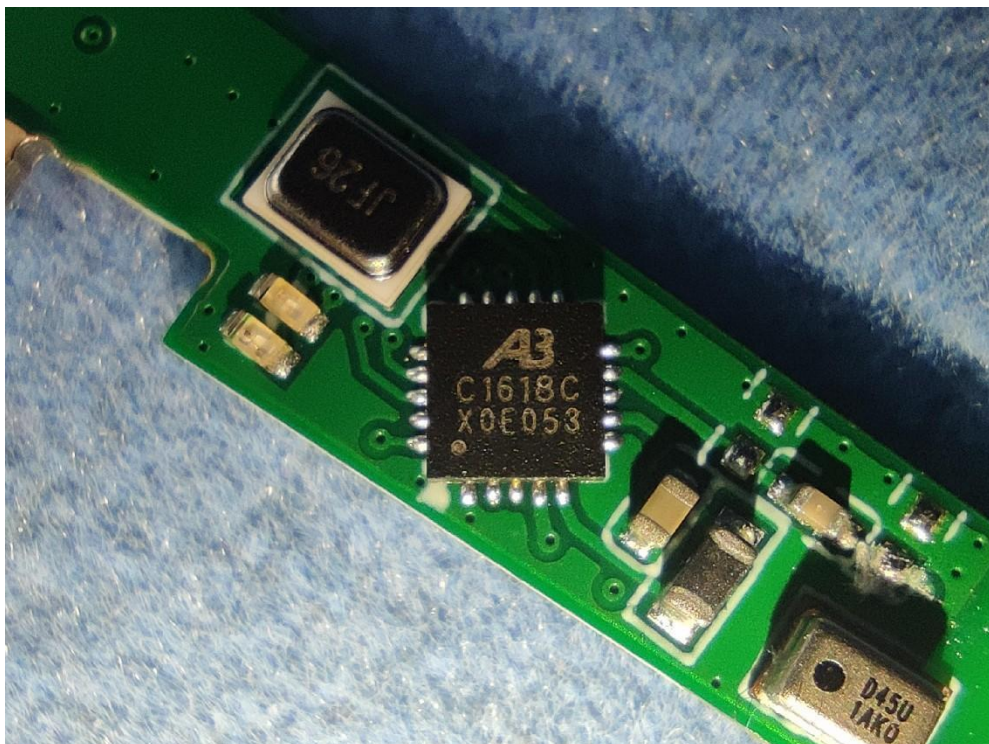
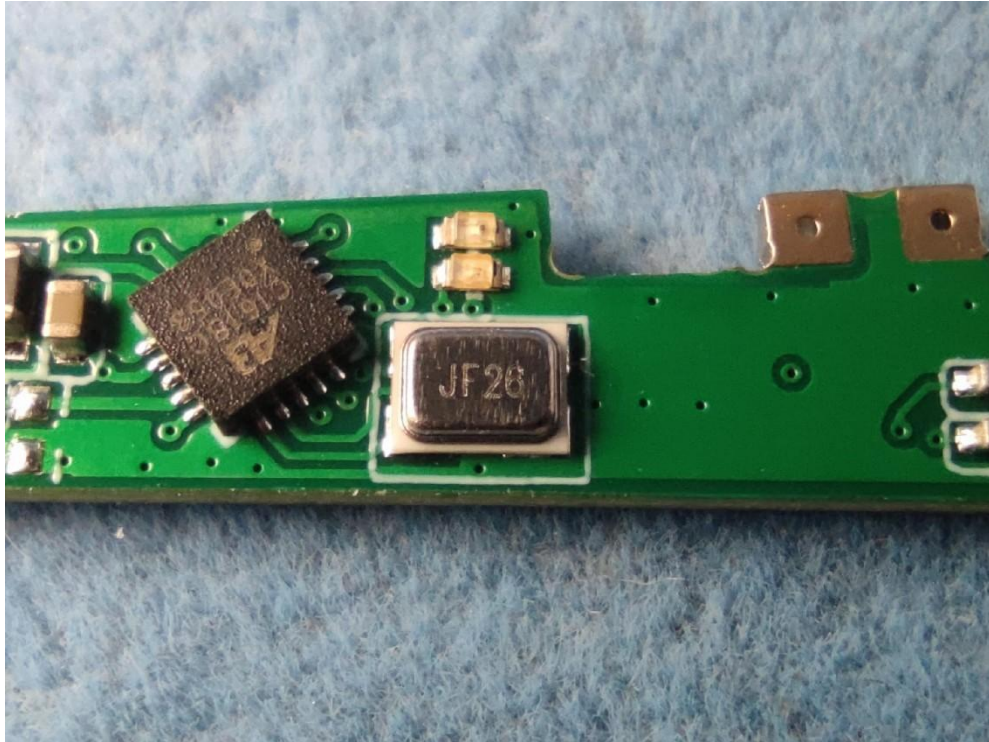
## 7.2 Internal photos



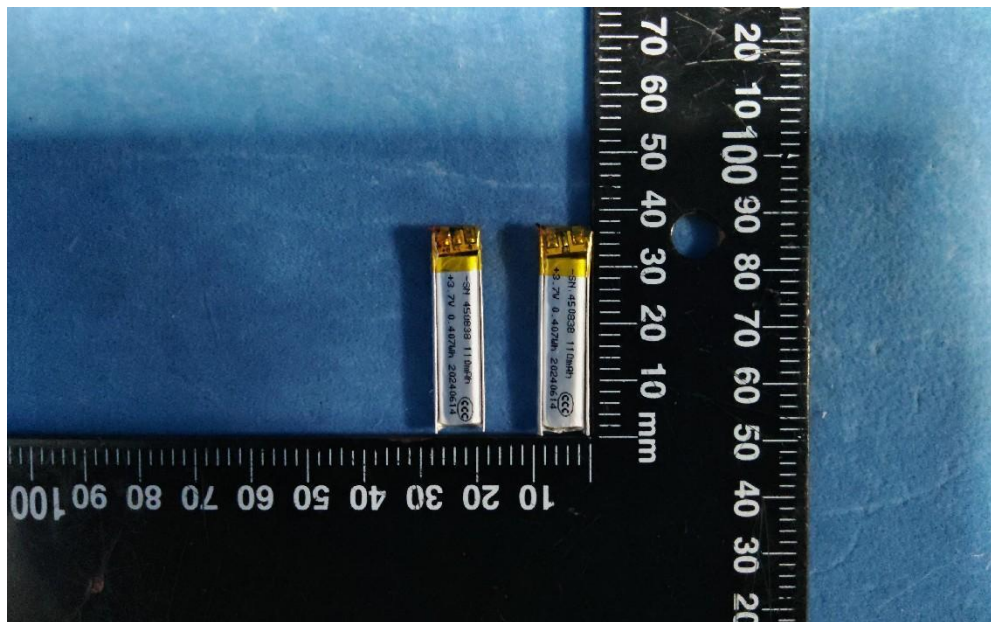
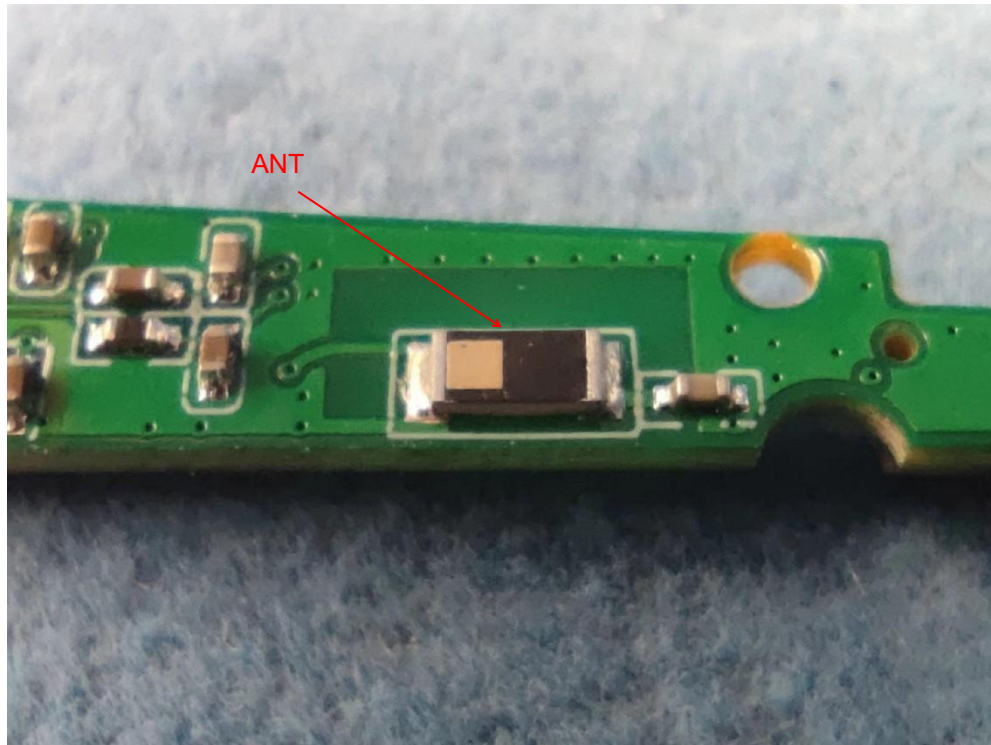




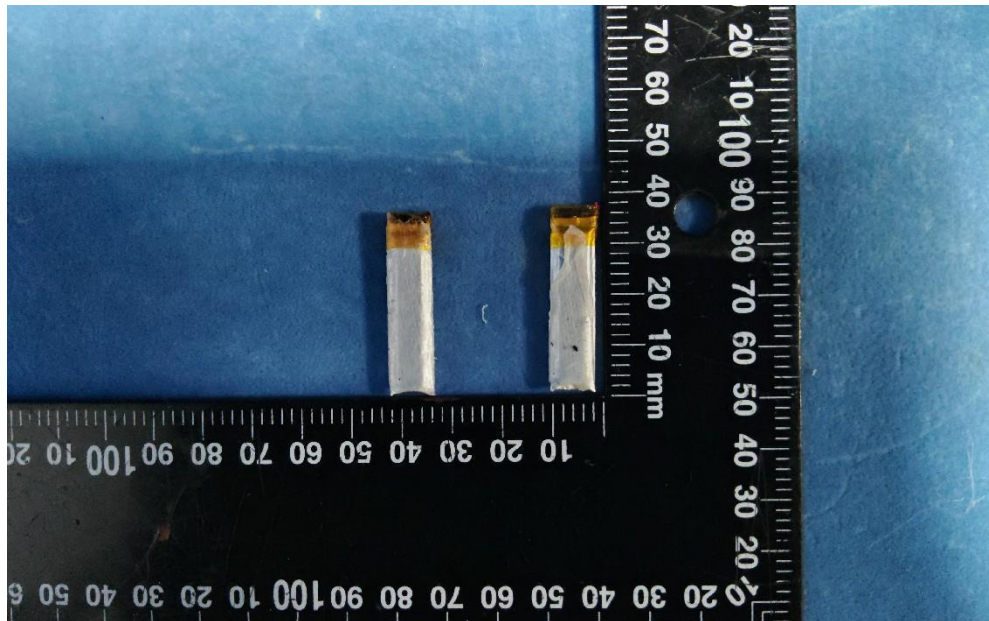












-----End of the report-----