

# FCC Test Report

Report No.: AGC11606201201FE03

**FCC ID** : 2ASJR-RSM0002  
**APPLICATION PURPOSE** : Original Equipment  
**PRODUCT DESIGNATION** : GLOBEL SENSOR  
**BRAND NAME** : Globe Tracker  
**MODEL NAME** : BROADBAND  
**APPLICANT** : Globetracker, ApS  
**DATE OF ISSUE** : Jan. 16, 2021  
**STANDARD(S)** : FCC Part 15 Rules  
**TEST PROCEDURE(S)**  
**REPORT VERSION** : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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### REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jan. 16, 2021	Valid	Initial Release

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## 1. VERIFICATION OF CONFORMITY

<b>Applicant</b>	Globetracker, ApS
<b>Address</b>	Strandgade 91 4th Floor DK-1401 Copenhagen K, 38102885 Denmark
<b>Manufacturer</b>	NEOSEN ENERGY LLC
<b>Address</b>	2637 SUMMIT AVE., SUITE 301, PLANO, TX, 75074, United States Of America (Excluding The States Of Alaska)
<b>Factory</b>	NEOSEN ENERGY LLC
<b>Address</b>	2637 SUMMIT AVE., SUITE 301, PLANO, TX, 75074, United States Of America (Excluding The States Of Alaska)
<b>Product Designation</b>	GLOBEL SENSOR
<b>Brand Name</b>	Globe Tracker
<b>Test Model</b>	BROADBAND
<b>Date of test</b>	Jan. 16, 2021 to Jan. 16, 2021
<b>Deviation</b>	No any deviation from the test method
<b>Condition of Test Sample</b>	Normal
<b>Test Result</b>	Pass
<b>Report Template</b>	AGCRT-US-BR/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.249.

Prepared By



Eddy Liu  
(Project Engineer)

Jan. 16, 2021

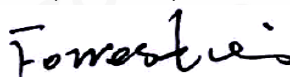
Reviewed By



Max Zhang  
(Reviewer)

Jan. 16, 2021

Approved By



Forrest Lei  
(Authorized Officer)

Jan. 16, 2021

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## 2. GENERAL INFORMATION

### 2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

<b>Operation Frequency</b>	903.87MHz
<b>Maximum field strength</b>	90.16dBuV/m(Peak)@3m
<b>Modulation</b>	OOK
<b>Number of channels</b>	1
<b>Antenna Gain</b>	3dBi
<b>Antenna Designation</b>	Integral Antenna (Met 15.203 Antenna requirement)
<b>Hardware Version</b>	02
<b>Software Version</b>	03
<b>Power Supply</b>	DC 3V by battery

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### 3. MEASUREMENT UNCERTAINTY

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

- Uncertainty of Conducted Emission,  $U_c = \pm 3.1$  dB
- Uncertainty of Radiated Emission below 1GHz,  $U_c = \pm 4.0$  dB
- Uncertainty of Radiated Emission above 1GHz,  $U_c = \pm 4.8$  dB
- Uncertainty of Occupied Channel Bandwidth:  $U_c = \pm 2$  %

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#### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	TX: 903.87MHz
<p>Note: 1. For Radiated Emission, 3axis were chosen for testing for each applicable mode.</p> <p>2. All the requirements have been tested by modulating the transmitter with a 2.5 kHz tone at a fixed level which set to the manufacturer's maximum rated input to the modulator.</p> <p>3. Only the result of the worst case was recorded in the report, if no other cases.</p> <p>4. For battery operated equipment, the equipment tests are performed using a new battery.</p>	

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## 5. SYSTEM TEST CONFIGURATION

### 5.1. CONFIGURATION OF EUT SYSTEM



### 5.2. EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	GLOBEL SENSOR	BROADBAND	2ASJR-RSM0002	EUT

### 5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249&15.209	Radiated Emission	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	N/A

Note: The conducted emission tests at AC port are not required for devices which only employ battery power for operation.

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## 6. TEST FACILITY

<b>Test Site</b>	Attestation of Global Compliance (Shenzhen) Co., Ltd
<b>Location</b>	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
<b>Designation Number</b>	CN1259
<b>FCC Test Firm Registration Number</b>	975832
<b>A2LA Cert. No.</b>	5054.02
<b>Description</b>	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

## TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Sep. 20, 2019	Sep. 19, 2021
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

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## 7. RADIATED EMISSION

### 7.1. TEST LIMIT

#### Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
900-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

#### Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		$\mu$ V/m	dB( $\mu$ V)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB( $\mu$ V)/m (Peak) 54.0 dB( $\mu$ V)/m (Average)	

Remark: (1) Emission level dB  $\mu$  V = 20 log Emission level  $\mu$  V/m  
(2) The smaller limit shall apply at the cross point between two frequency bands.  
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

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## 7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use minimum resolution bandwidth of 1 MHz. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

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The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~10GHz 1.5MHz/ VBW 8MHz for Peak, 1.5MHz/10Hz for Average

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

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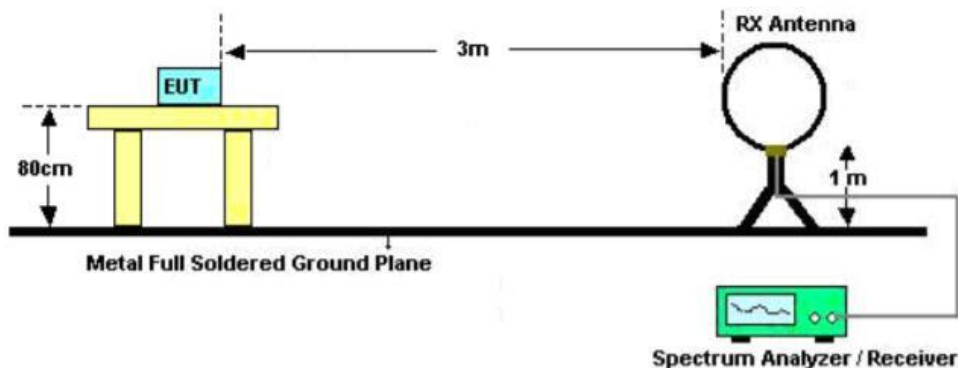
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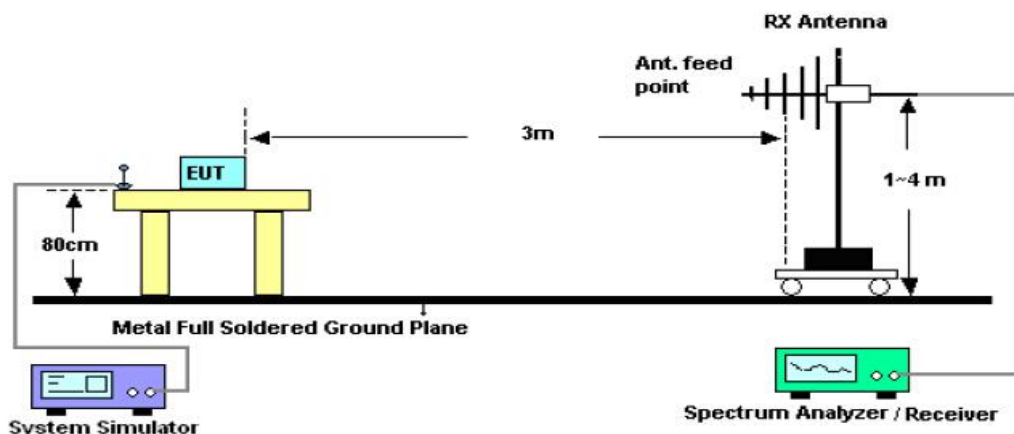


### 7.3. TEST SETUP

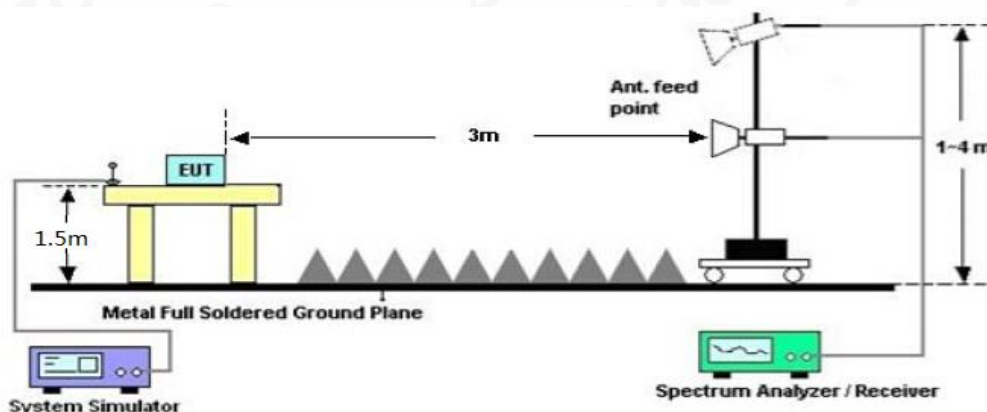
#### Radiated Emission Test-Setup Frequency Below 30MHz



#### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



#### RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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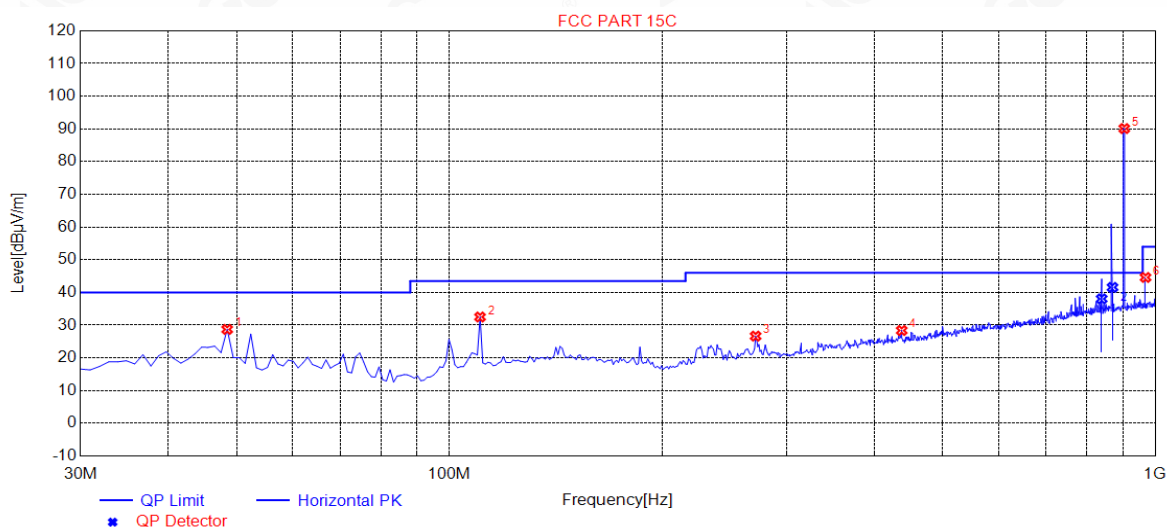
## 7.4. TEST RESULT

### RADIATED EMISSION BELOW 30MHZ

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

### RADIATED EMISSION 30MHz- 1GHZ

EUT	GLOBEL SENSOR	Model Name	BROADBAND
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Test Voltage	DC 3V
Test Mode	Mode 1	Polarization	Horizontal



#### Peak data list

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	48.4300	28.71	11.71	40.00	11.29	150	359	Horizontal
2	110.5100	32.51	12.47	43.50	10.99	150	74	Horizontal
3	271.5300	26.66	15.55	46.00	19.34	150	74	Horizontal
4	437.4000	28.38	20.69	46.00	17.62	150	103	Horizontal
5	903.9700	90.12	30.16	94.00	3.88	150	134	Horizontal
6	968.9600	44.60	30.80	54.00	9.40	150	2	Horizontal

#### QP data list

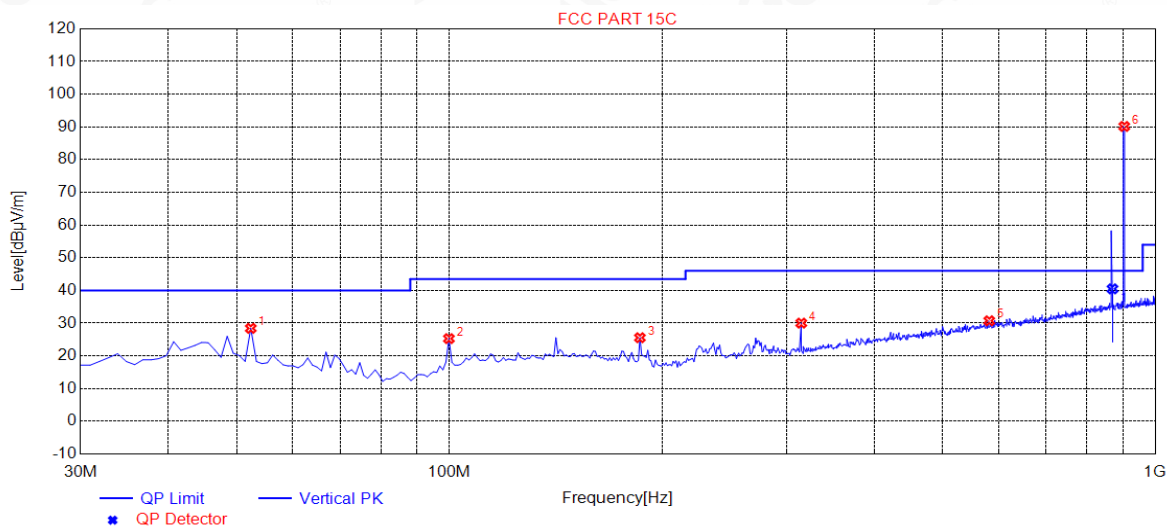
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	839.8828	29.12	38.05	46.00	7.95	170	300	Horizontal
2	869.9955	29.60	41.57	46.00	4.43	150	98	Horizontal

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EUT	GLOBEL SENSOR	Model Name	BROADBAND
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Test Voltage	DC 3V
Test Mode	Mode 1	Polarization	Vertical



Peak data list

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.3100	28.43	11.49	40.00	11.57	150	261	Vertical
2	99.8400	25.29	11.30	43.50	18.21	150	111	Vertical
3	186.1700	25.56	12.69	43.50	17.94	150	179	Vertical
4	315.1800	30.03	16.48	46.00	15.97	150	266	Vertical
5	581.9300	30.74	23.95	46.00	15.26	150	98	Vertical
6	903.9700	90.16	30.16	94.00	3.84	150	254	Vertical

QP data list

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	869.9655	29.60	40.50	46.00	5.50	150	359	Vertical

## RESULT: PASS

**Note:** Factor=Antenna Factor + Cable loss, Margin= Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

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### RADIATED EMISSION ABOVE 1GHZ

EUT	GLOBEL SENSOR	Model Name	BROADBAND
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Test Voltage	DC 3V
Test Modulation	Mode 1	Polarization	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
1807.8	72.16	-13.62	58.54	74.00	-15.46	peak
1807.8	53.49	-13.62	39.87	54.00	-14.13	AVG
2711.7	58.49	-9.53	48.96	74.00	-25.04	peak
2711.7	38.12	-9.53	28.59	54.00	-25.41	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	GLOBEL SENSOR	Model Name	BROADBAND
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Test Voltage	DC 3V
Test Modulation	Mode 1	Polarization	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
1807.8	70.12	-13.62	56.50	74.00	-17.50	peak
1807.8	51.43	-13.62	37.81	54.00	-16.19	AVG
2711.7	54.96	-9.53	45.43	74.00	-28.57	peak
2711.7	36.88	-9.53	27.35	54.00	-26.65	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

**Note:** Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

Other emissions from 1G to 9.2 GHz are considered as ambient noise. No recording in the test report.

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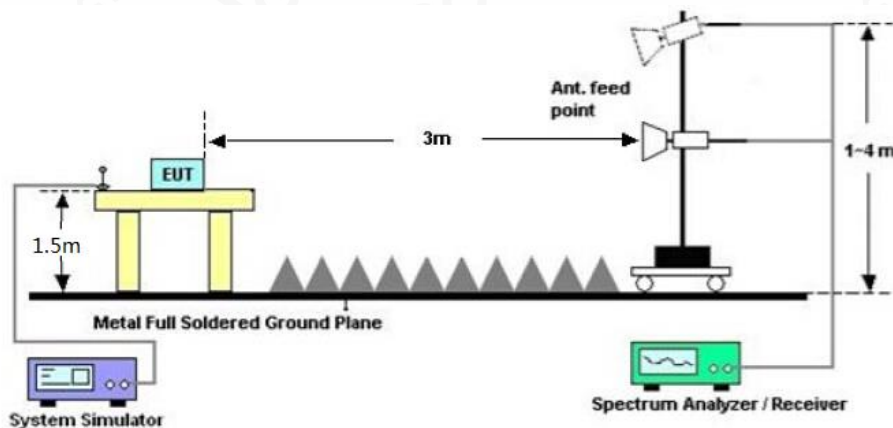


## 8. 20DB BANDWIDTH

### 8.1. MEASUREMENT PROCEDURE

1. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
2. Set SPA Centre Frequency = Operation Frequency, RBW= 1~5% OBW, VBW  $\geq 3 \times$  RBW.
3. Set SPA Trace 1 Max hold, then View.

### 8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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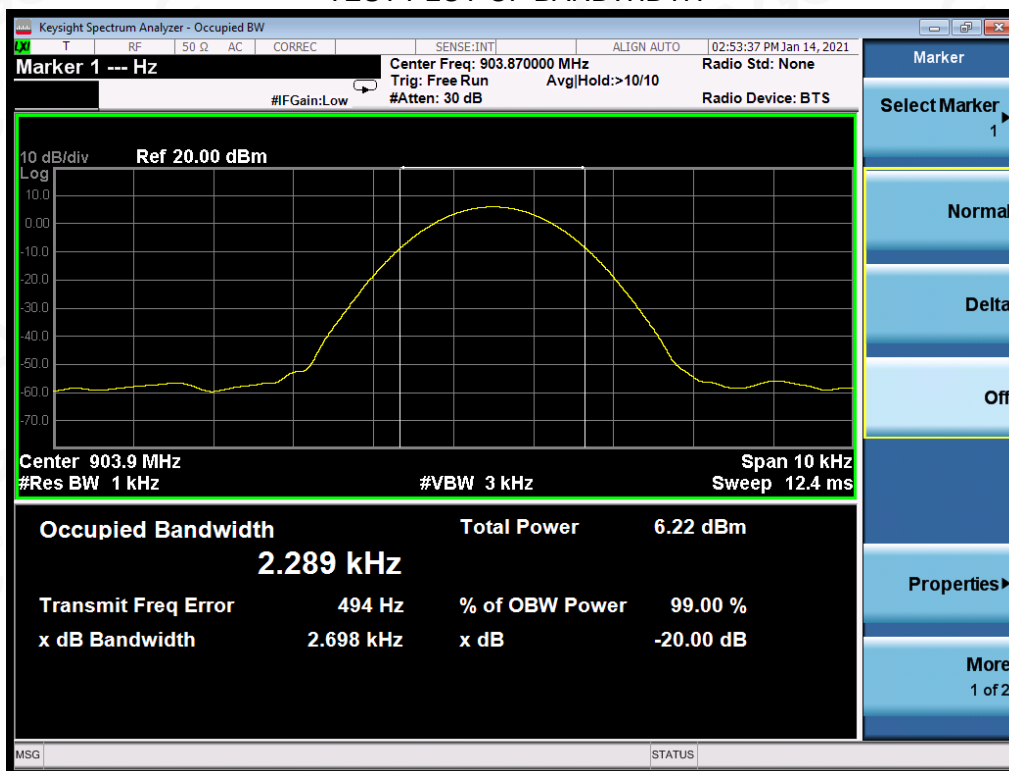


### 8.3. MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	OOK

Test Data		Criteria
903.87MHz	2.698KHz	PASS

TEST PLOT OF BANDWIDTH



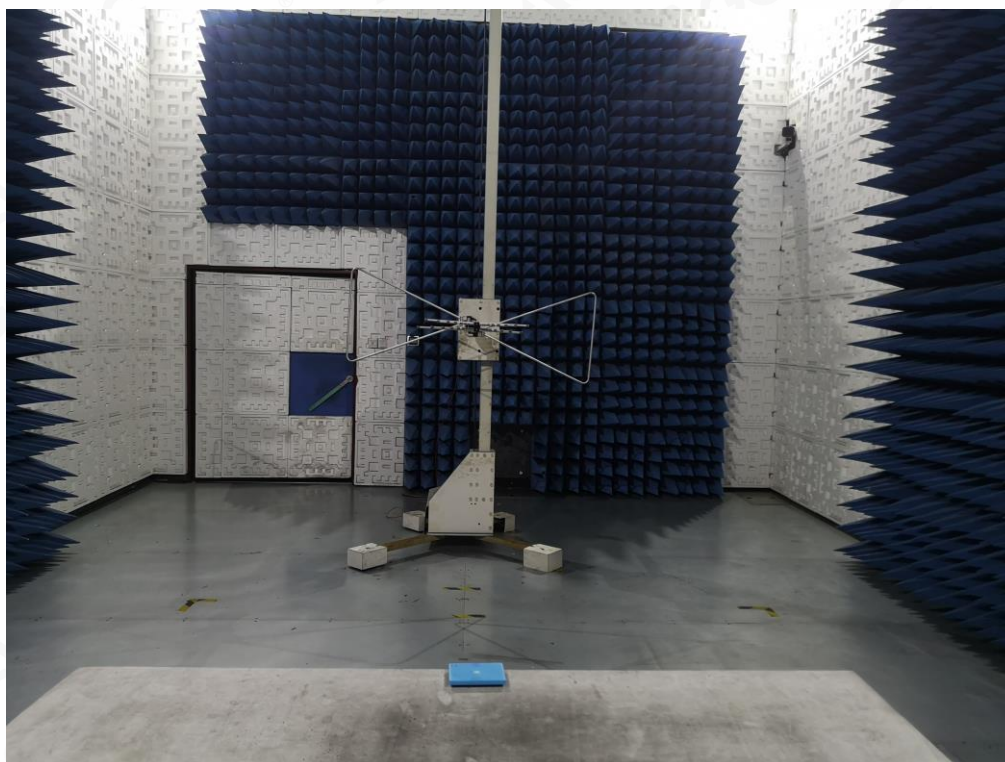
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## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

### FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ



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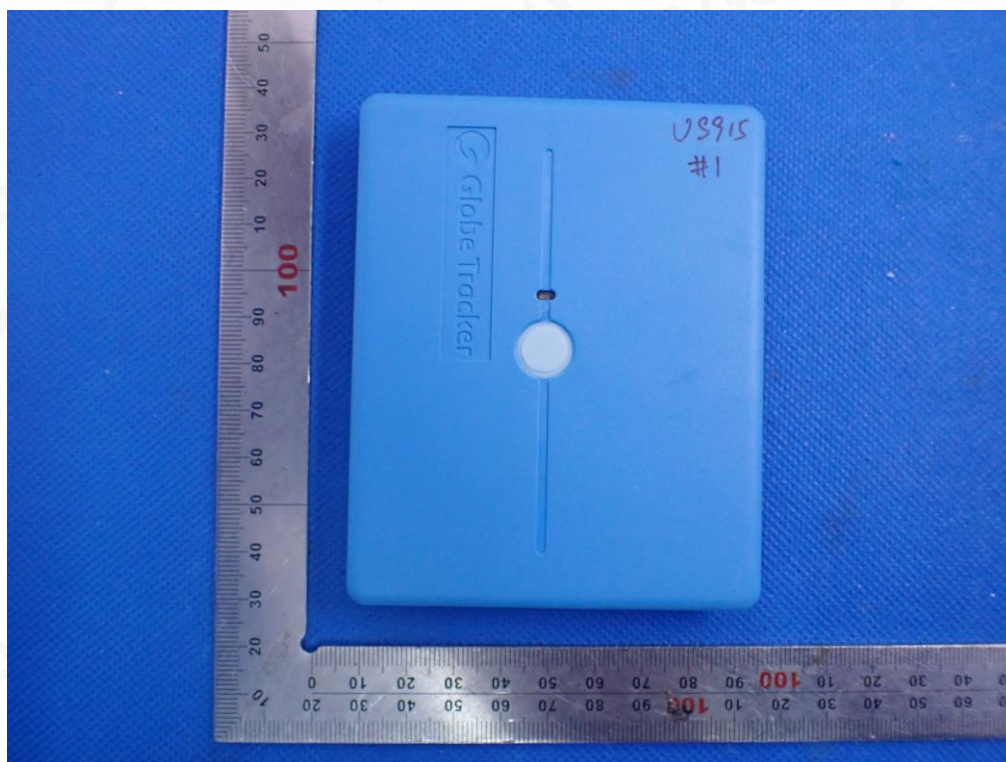
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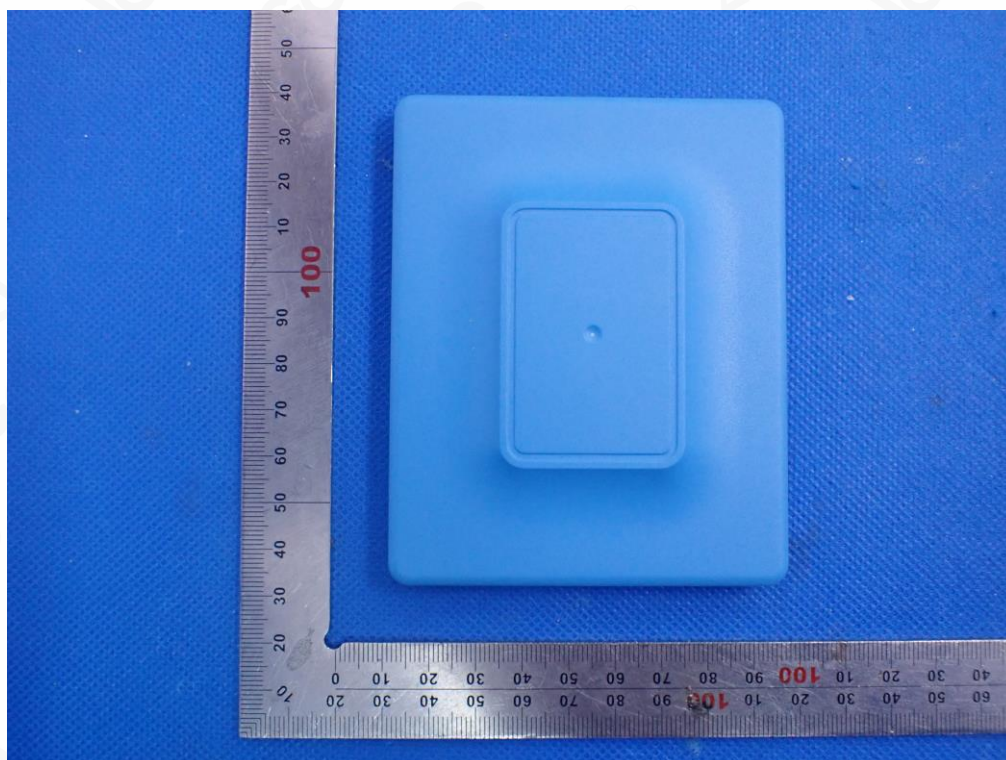


## APPENDIX B: PHOTOGRAPHS OF EUT

TOP VIEW OF EUT



BOTTOM VIEW OF EUT



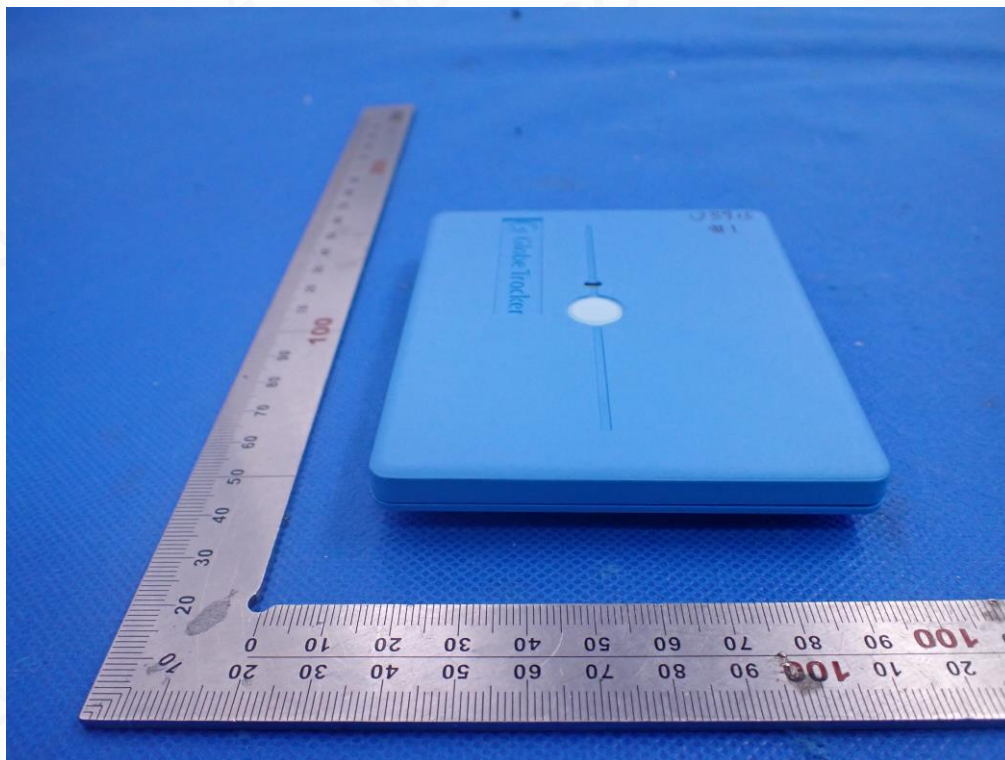
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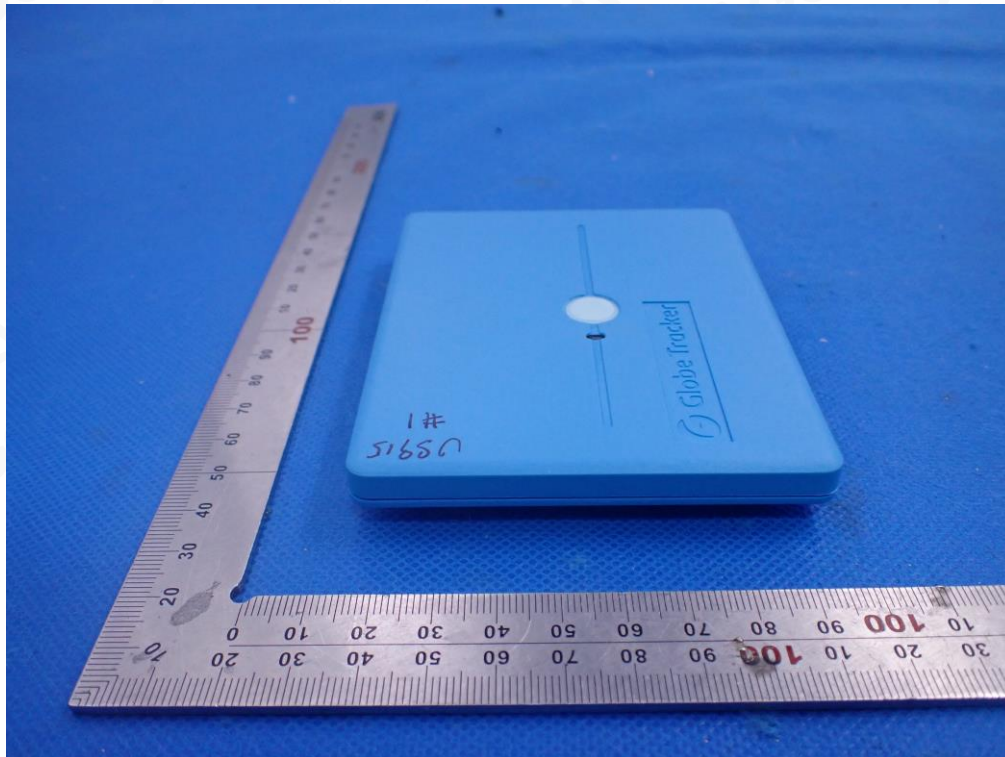




FRONT VIEW OF EUT



BACK VIEW OF EUT

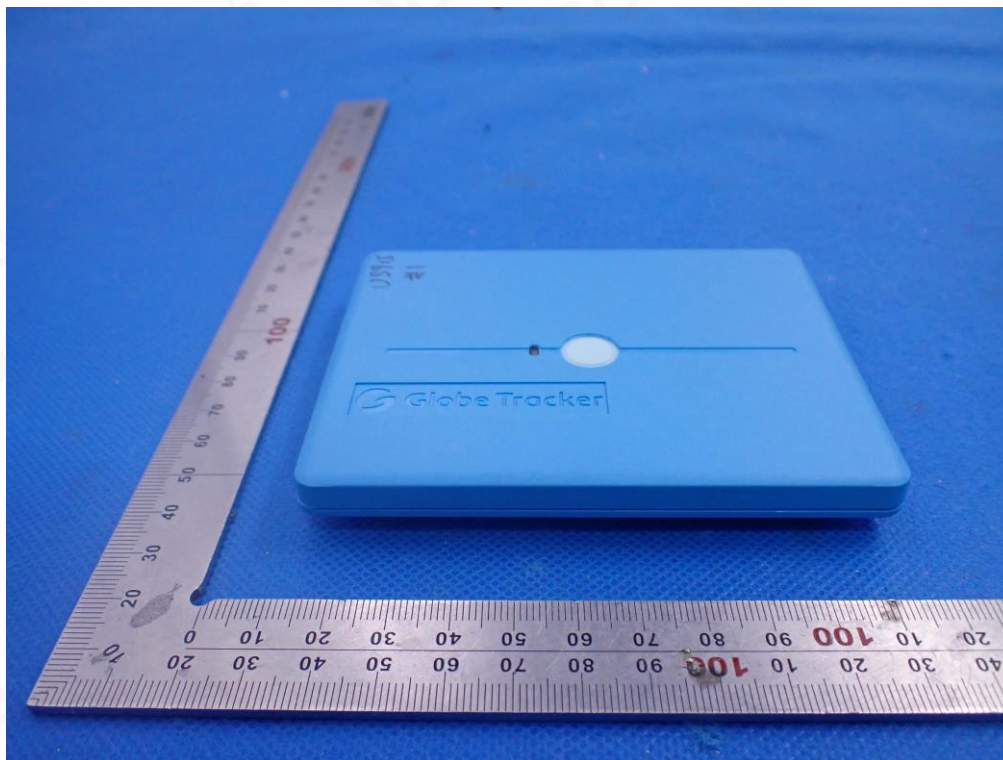


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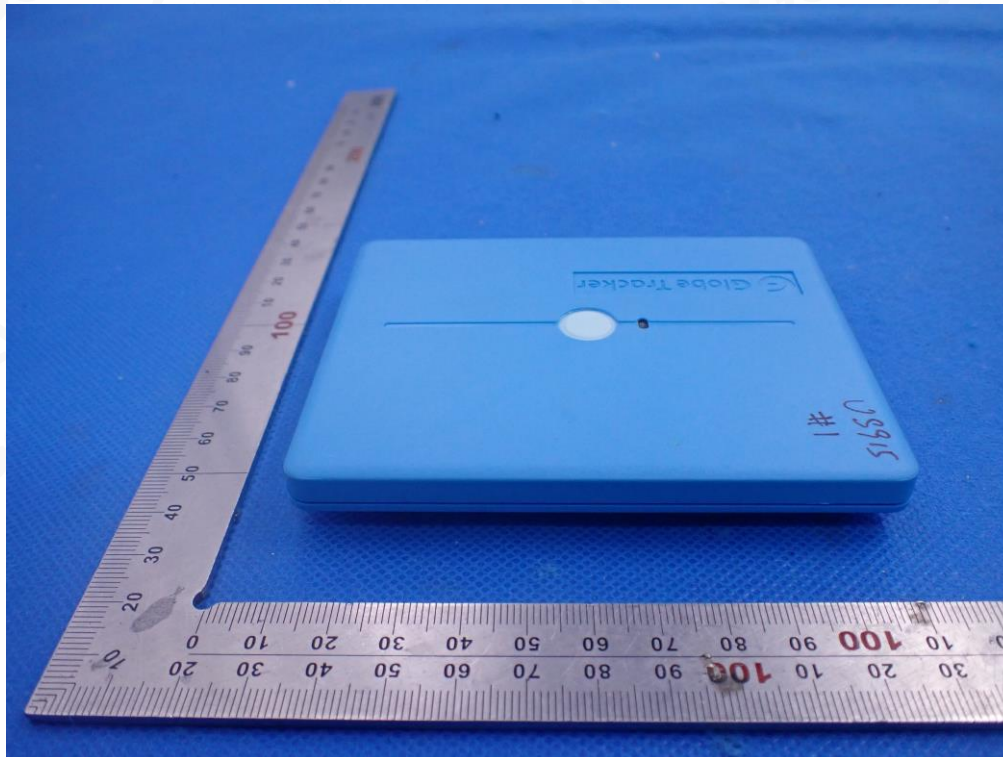
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LEFT VIEW OF EUT



RIGHT VIEW OF EUT



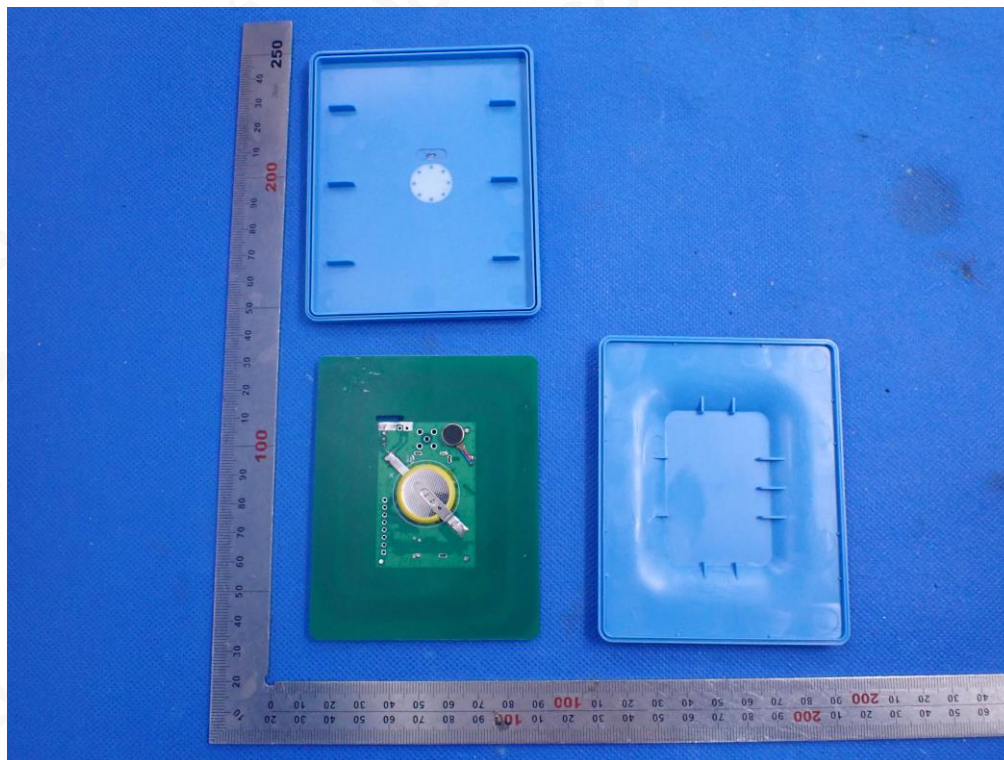
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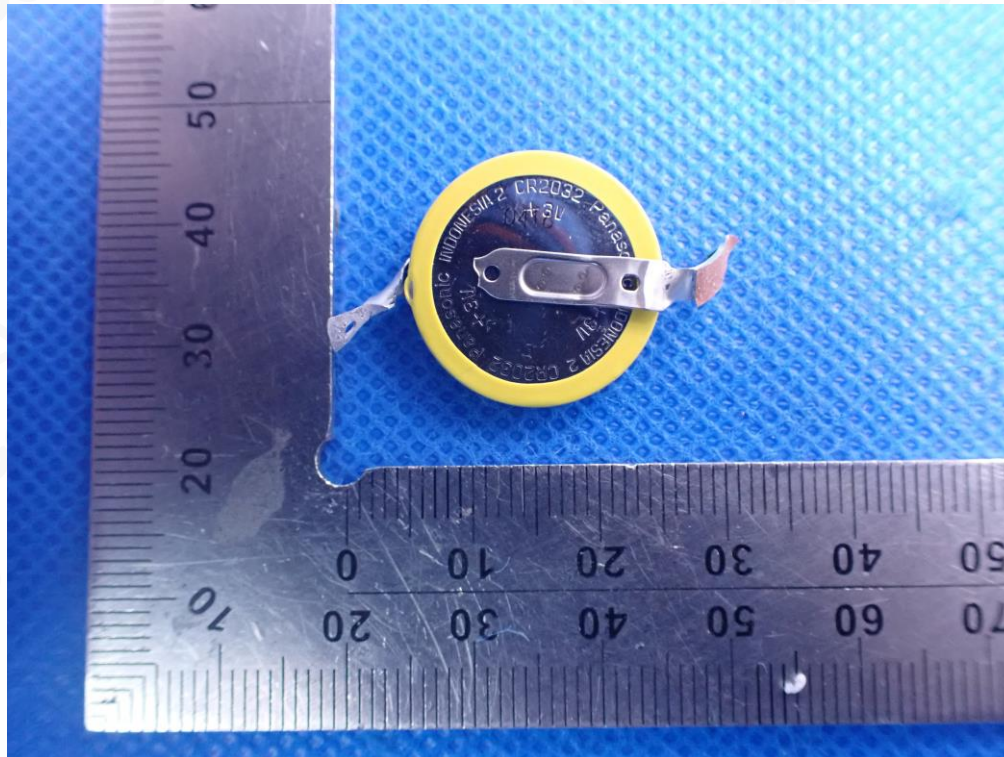




OPEN VIEW OF EUT-1



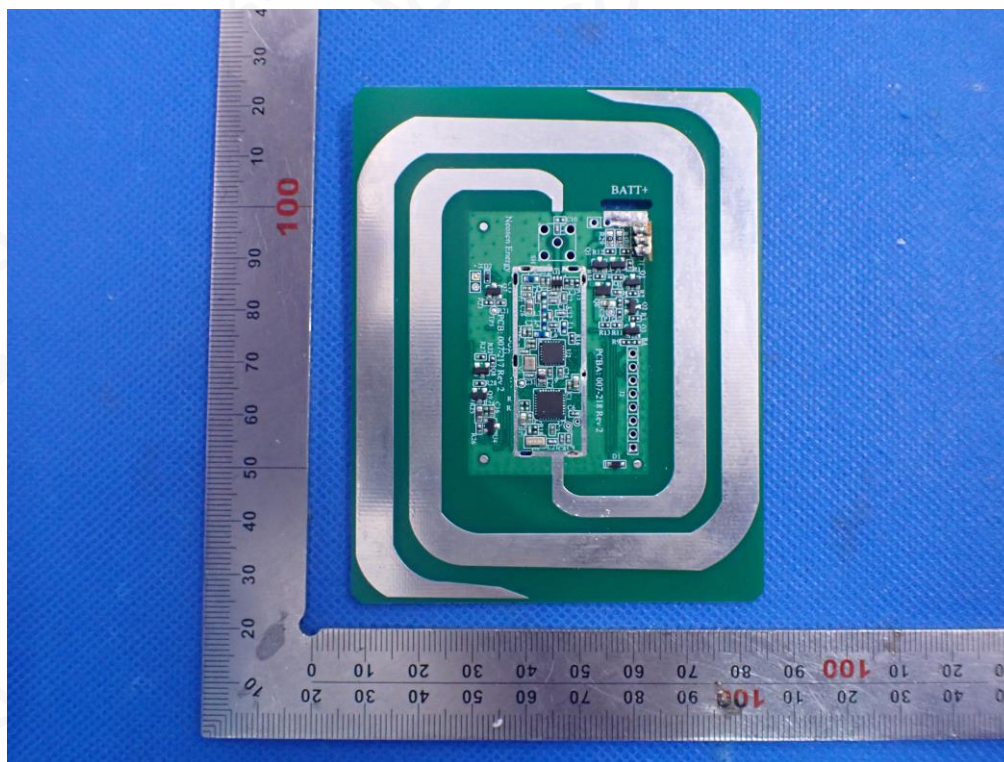
VIEW OF BATTERY



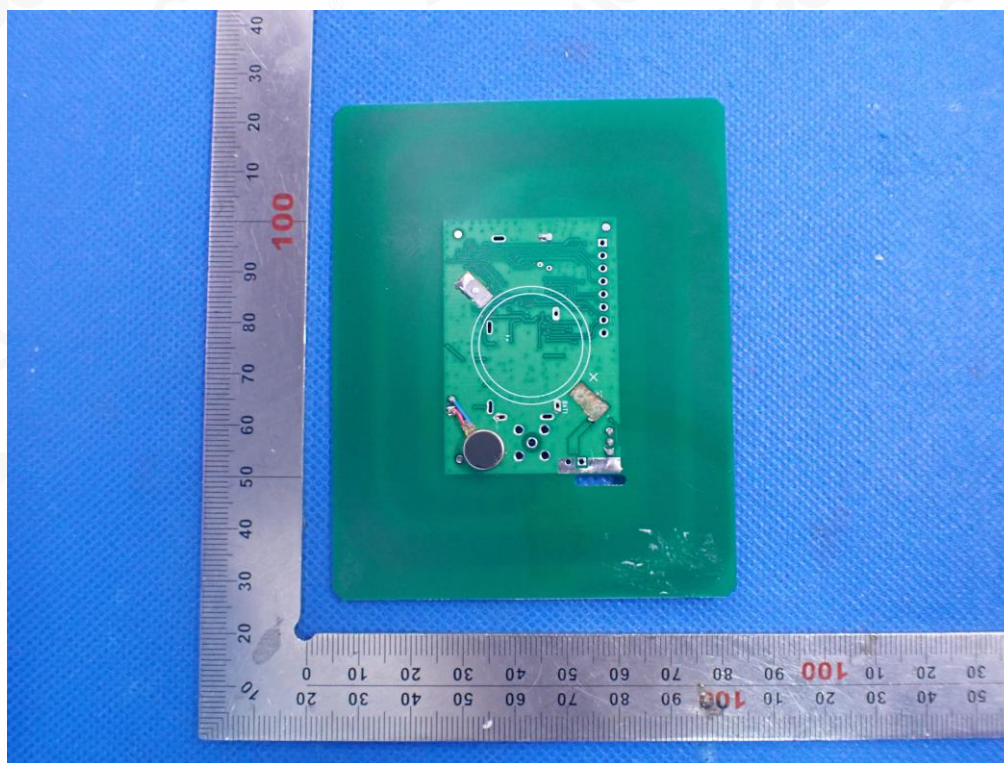
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INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



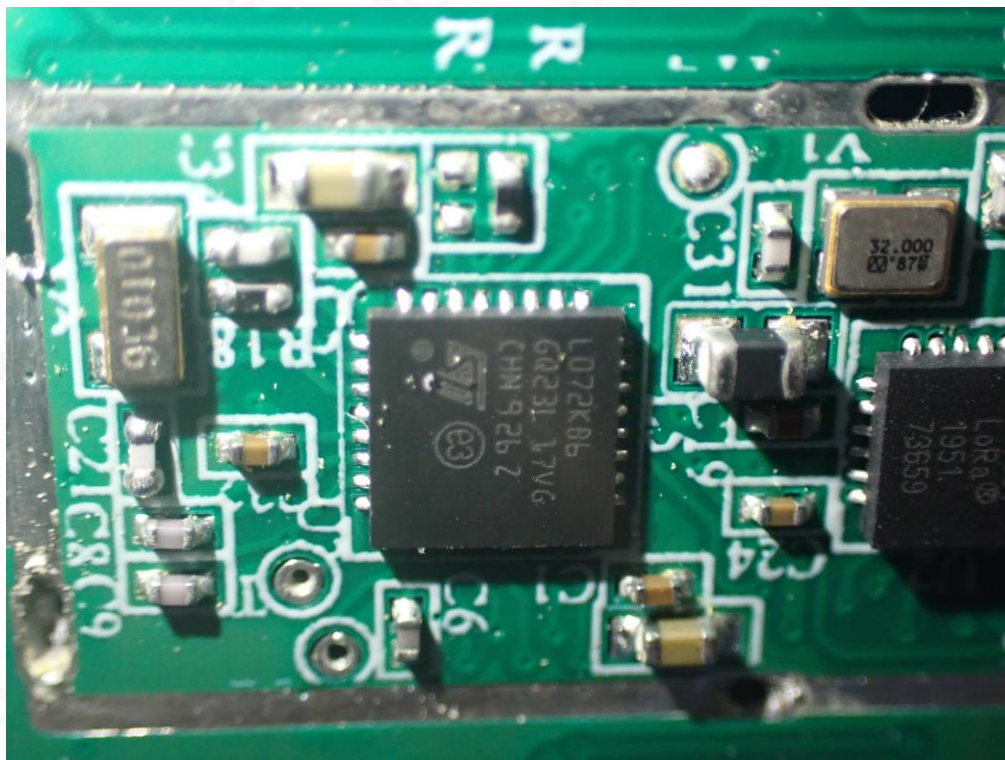
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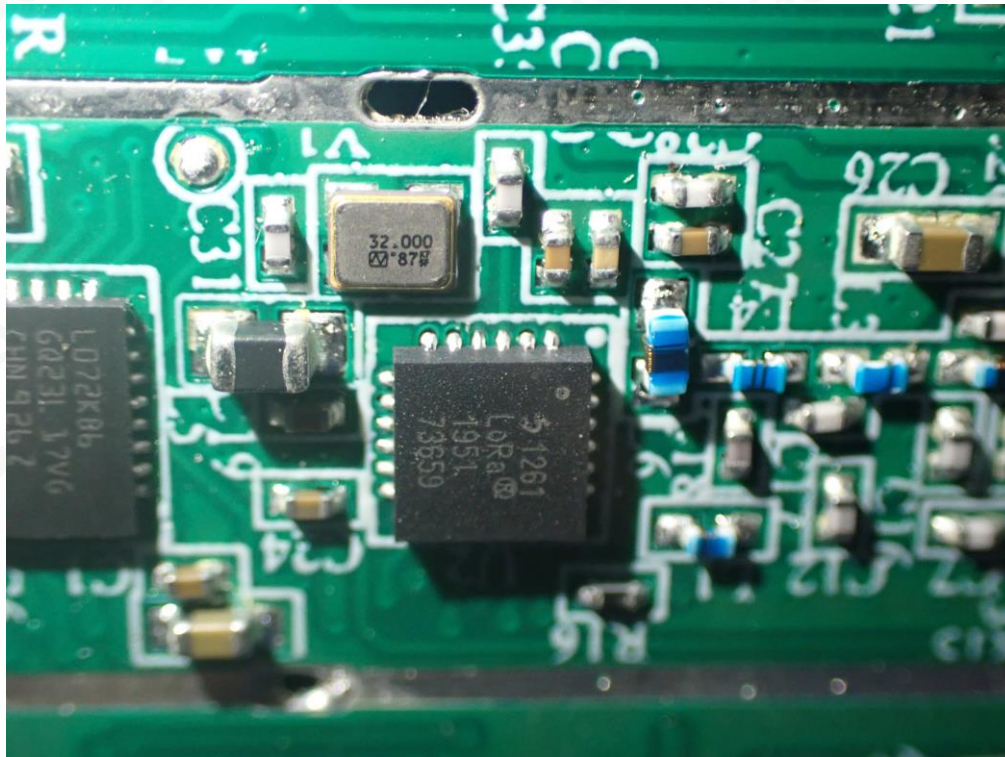




INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4

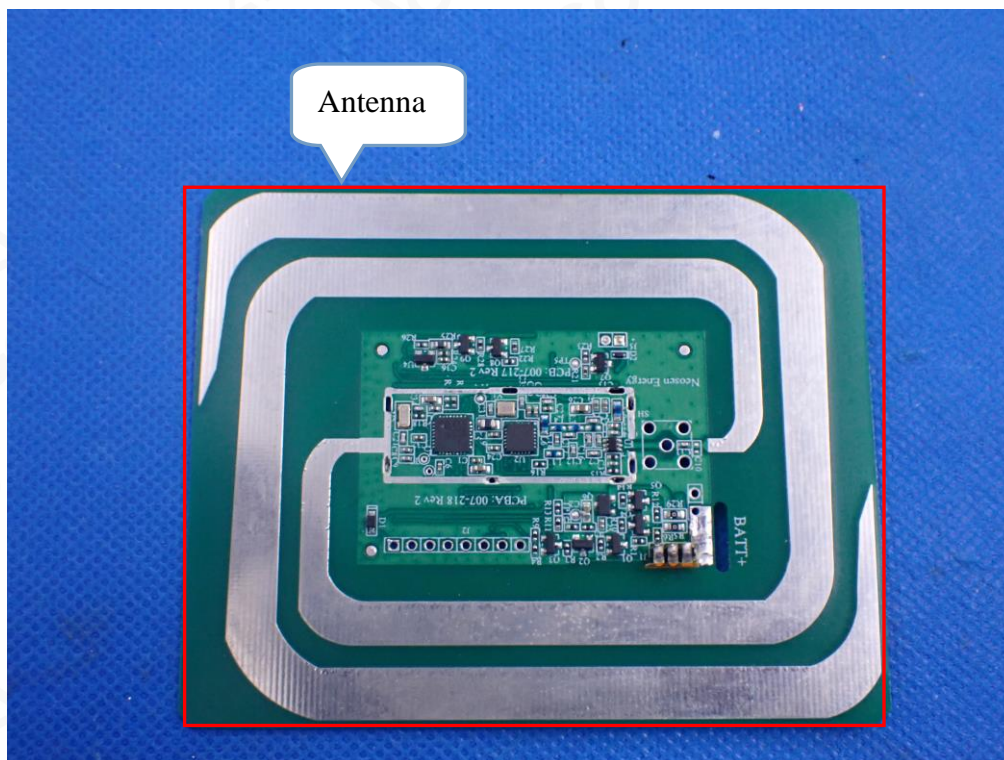


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INTERNAL VIEW OF EUT-5



----END OF REPORT----

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## Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. The non-CMA report issued by AGC is only permitted to be used by the client as internal reference use and shall not be used for public demonstration purpose.
5. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
6. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
7. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
8. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
9. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
10. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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