

# TEST REPORT

**Product Name** : DTOF LiDAR  
**Model Number** : LiDAR\_LD19\_LD, LiDAR\_LD12, LiDAR\_LD06R,  
LiDAR\_LD06Y\_LD, LiDAR\_LD06\_DM,  
LiDAR\_LD06, LiDAR\_LD06\_PB

**Prepared for** : SHENZHEN LDROBOT CO.,LTD  
**Address** : 16/F, BLOCK A, BUILDING 6, INTERNATIONAL  
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**Report Number** : ED210622081E  
**Date(s) of Tests** : June 22, 2021 to July 06, 2021  
**Date of issue** : August 05, 2021



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## TEST REPORT VERIFICATION

Applicant : SHENZHEN LDROBOT CO.,LTD  
EUT : DTOF LiDAR  
Model No. : LiDAR\_LD19\_LD, LiDAR\_LD12, LiDAR\_LD06R, LiDAR\_LD06Y\_LD,  
LiDAR\_LD06\_DM, LiDAR\_LD06, LiDAR\_LD06\_PB  
Input Rating : 5Vdc 0.2A  
Measurement Procedure Used:

EN 55014-1:2017/A11:2020  
EN 55014-2: 2015  
(IEC 61000-4-2: 2008)

The device described above is tested by EMTEK (DONGGUAN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (DONGGUAN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the EN 55014-1 and EN 55014-2 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (DONGGUAN) CO., LTD.

Date of Test : June 22, 2021 to July 06, 2021

Prepared by :

Galen Xiao

Galen Xiao / Editor

Tim Dong

Reviewer :

Tim Dong / Supervisor

Approved & Authorized Signer :

Sam Lv / Manager

## Modified Information

Version	Summary	Revision Date	Report No.
	Original Report	/	ED210622081E



## 1. DESCRIPTION OF STANDARDS AND RESULTS

EMISSION			
Description of Test Item	Standard	Limits	Results
Radiated Disturbance	EN 55014-1:2017/A11:2020	Table 7	Pass
IMMUNITY			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic Discharge (ESD)	IEC 61000-4-2: 2008	B	Pass



## 2. GENERAL INFORMATION

### 2.1 Description of Device (EUT)

EUT : DTOF LiDAR

Model Number : LiDAR\_LD19\_LD, LiDAR\_LD12, LiDAR\_LD06R,  
LiDAR\_LD06Y\_LD, LiDAR\_LD06\_DM, LiDAR\_LD06,  
LiDAR\_LD06\_PB

(Note: These model are the same expect the model name and appearance, Here select LiDAR\_LD19\_LD for full test.)

Trade Mark : 

Power Supply for Test : DC 5V 0.2A

Operate Mode : ON

Applicant : SHENZHEN LDROBOT CO.,LTD

Address : 16/F, BLOCK A, BUILDING 6, INTERNATIONAL INNOVATION  
VALLEY, NANSHAN DISTRICT, SHENZHEN, PRC

Date of sample received : June 22, 2021

Date of Test : June 22, 2021 to July 06, 2021

### 2.2 Description of Support Device

Notebook : Thinkbook 14 G2 ITL

### 2.3 Description of Test Facility

Site Description  
EMC Lab : Accredited by CNAS, 2020.08.27  
The certificate is valid until 2024.07.05  
The Laboratory has been assessed and proved to be in  
compliance with CNAS/CL01:2018  
The Certificate Registration Number is L3150

Name of Firm : EMTEK (DONGGUAN) CO., LTD.  
Site Location : -1&2/F.,Building 2, Zone A, Zhongda Marine Biotechnology  
Reserch and Development Base, No.9, Xincheng Avenue,  
Songshanhu High-technology Industrial Development Zone,  
Dongguan, Guangdong, China

## 2.4 Measurement Uncertainty

Test Item	Uncertainty
Radiated Emission Uncertainty (3m Chamber)	: 3.24dB (30M~1GHz Polarize: H) 3.32dB (30M~1GHz Polarize: V)
Uncertainty for test site temperature and humidity	: 0.6℃ 4%



### 3. MEASURING DEVICES AND TEST EQUIPMENT

#### 3.1 For Radiated Emission Measurement

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/> EED244	EMI Test Receiver	Rohde & Schwarz	ESCI	101415	2021/5/21	1Year
<input checked="" type="checkbox"/> EED161	Bilog Antenna	Schwarzbeck	VULB9163	141	2021/5/26	1Year
<input checked="" type="checkbox"/> EED184	Power Amplifier	HP	8447F	OPTH64	2021/5/21	1Year
<input checked="" type="checkbox"/> EED195	Cable	N/A	CIL02	A0783566	2021/5/21	1Year
<input checked="" type="checkbox"/> EED196	Cable	N/A	RG 223/U	525178	2021/5/21	1Year
<input checked="" type="checkbox"/> EED196-2	Cable	N/A	RG 223/U	525179	2021/5/21	1Year

#### 3.2 For Electrostatic Discharge Test

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/> EED166	ESD Tester	TESEQ	NSG 437	409	2021/5/21	1 Year



## 4. RADIATED EMISSION MEASUREMENT

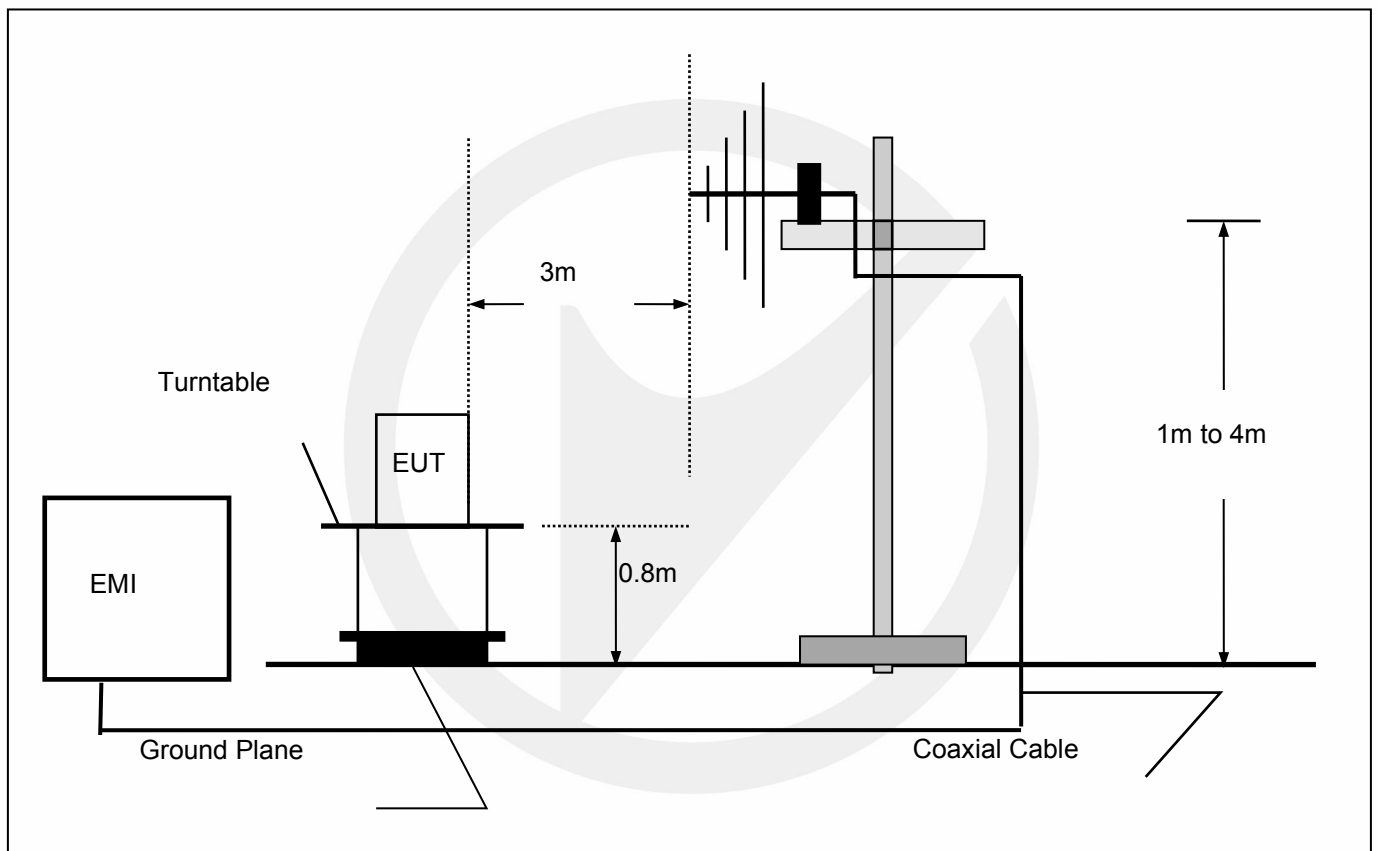
### 4.1 Block Diagram of Test

#### 4.1.1 Block diagram of connection between the EUT and simulators



(EUT: DTOF LiDAR)

#### 4.1.2 Block diagram of test setup (In chamber)



(EUT: DTOF LiDAR)

### 4.2 Measuring Standard

EN 55014-1:2017/A11:2020

### 4.3 Radiated Emission Limits

All emanations from devices or system shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB $\mu$ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The smaller limit shall apply at the combination point between two frequency bands.  
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

### 4.4 EUT Configuration on Test

The EN55014-1 regulations test method must be used to find the maximum emission during radiated emission measurement.

EUT : DTOF LiDAR  
Model Number : LiDAR\_LD19\_LD

### 4.5 Operating Condition of EUT

Step 1: Turn on the power

Step 2: After that, let the EUT work in test mode (ON) and measure it.

### 4.6 Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on test.

The bandwidth of the Receiver (ESCI) is set at 120kHz.

### 4.7 Measuring Results

Pass.

Please refer to the following Pages.



Site Chamber #1

Limit: EN55014-1\_3m(RE)

Mode: ON

Note:

Polarization: **Horizontal**

Power: DC 5V

Temperature: 23

Humidity: 58 %

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree
1	*	32.7486	48.23	-15.01	33.22	40.00	-6.78	QP		
2		35.8746	43.60	-15.06	28.54	40.00	-11.46	QP		
3		39.4371	36.95	-14.60	22.35	40.00	-17.65	QP		
4		143.8295	37.50	-19.64	17.86	40.00	-22.14	QP		
5		189.0743	40.72	-16.95	23.77	40.00	-16.23	QP		
6		228.4904	42.92	-15.09	27.83	40.00	-12.17	QP		

\*:Maximum data x:Over limit !:over margin

Operator: Ccyf



Site Chamber #1

Polarization: **Vertical**

Temperature: 23

Limit: EN55014-1\_3m(RE)

Power: DC 5V

Humidity: 58 %

Mode: ON

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		30.9620	43.65	-18.68	24.97	40.00	-15.03	QP		
2	*	35.1278	48.30	-18.14	30.16	40.00	-9.84	QP		
3		40.1347	40.38	-17.51	22.87	40.00	-17.13	QP		
4		61.9951	34.30	-16.63	17.67	40.00	-22.33	QP		
5		116.9495	36.19	-18.05	18.14	40.00	-21.86	QP		
6		226.8936	38.73	-15.14	23.59	40.00	-16.41	QP		

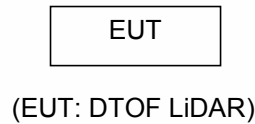
!:Maximum data x:Over limit !:over margin

Operator: Ccyf

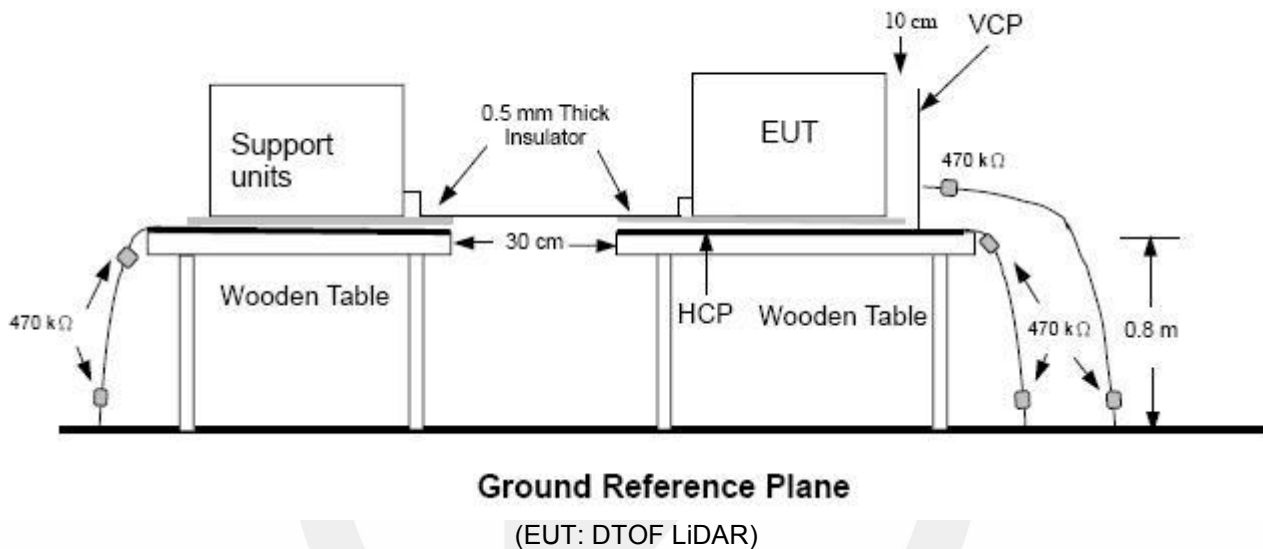
## 5. ELECTROSTATIC DISCHARGE TEST

### 5.1 Block Diagram of Test Setup

#### 5.1.1. Block Diagram of connection between the EUT and simulators



#### 5.1.2. Block Diagram of ESD Test Setup



### 5.2 Test Standard

EN 55014-2: 2015

(IEC 61000-4-2: 2008 (Severity Level: 2 / Contact Discharge:  $\pm 4\text{KV}$ ; Severity Level: 3 / Air Discharge:  $\pm 8\text{KV}$ ))

### 5.3 Severity Levels and Performance Criterion

#### 5.1.3. Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	$\pm 2$	$\pm 2$
2.	$\pm 4$	$\pm 4$
3.	$\pm 6$	$\pm 8$
4.	$\pm 8$	$\pm 15$
X	Special	Special

**Performance criterion: B**

## 5.4 EUT Configuration

The configuration of EUT is listed in Section 5.1

## 5.5 Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 5.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (ON) and measure it.

## 5.6 Test Procedure

### 5.6.1 Air Discharge

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

### 5.6.2 Contact Discharge

All the procedure shall be same as Section 5.6.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### 5.6.3 Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

### 5.6.4 Indirect discharge for vertical coupling plane

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## 5.7 Test Results

**PASS.**

Please refer to the following page.

# Electrostatic Discharge Test Results

EMTEK (DONGGUAN) CO., LTD.

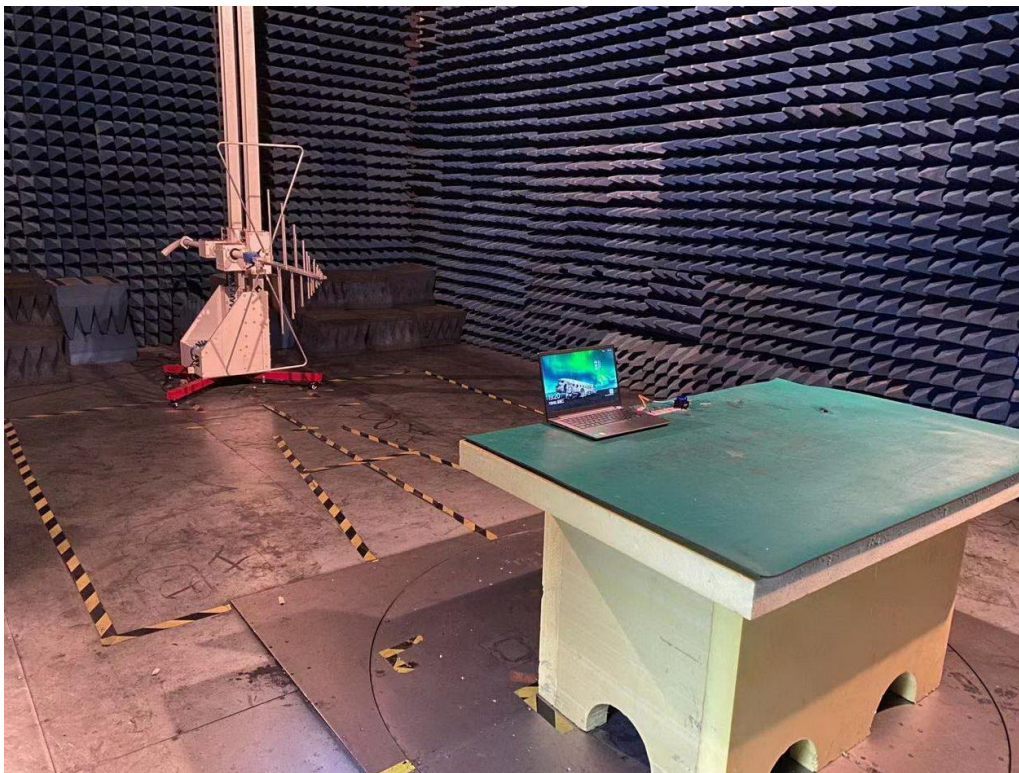
Applicant	: SHENZHEN LDROBOT CO.,LTD	Test Date	: July 06, 2021
EUT	: DTOF LiDAR	Temperature	: 23.1℃
M/N	: LiDAR_LD19_LD	Humidity	: 56.1%
Power Supply	: DC 5V	Test Engineer:	Ccyf
Test Mode	: ON	Criterion	: B
Air Discharge: ±8KV			
Contact Discharge: ±4KV # For each point positive 10 times and negative 10 times			
<b>Location</b>	<b>Kind</b> A-Air Discharge C-Contact Discharge	<b>Result</b>	
HCP	C	PASS	
VCP	C	PASS	
Enclosure	A	PASS	
Gap	A	PASS	
Remark :	Test Equipment : ESD Tester (TESEQ, 409)		

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).



## 6. PHOTOGRAPH


### 6.1 Photo of Radiation Emission Measurement



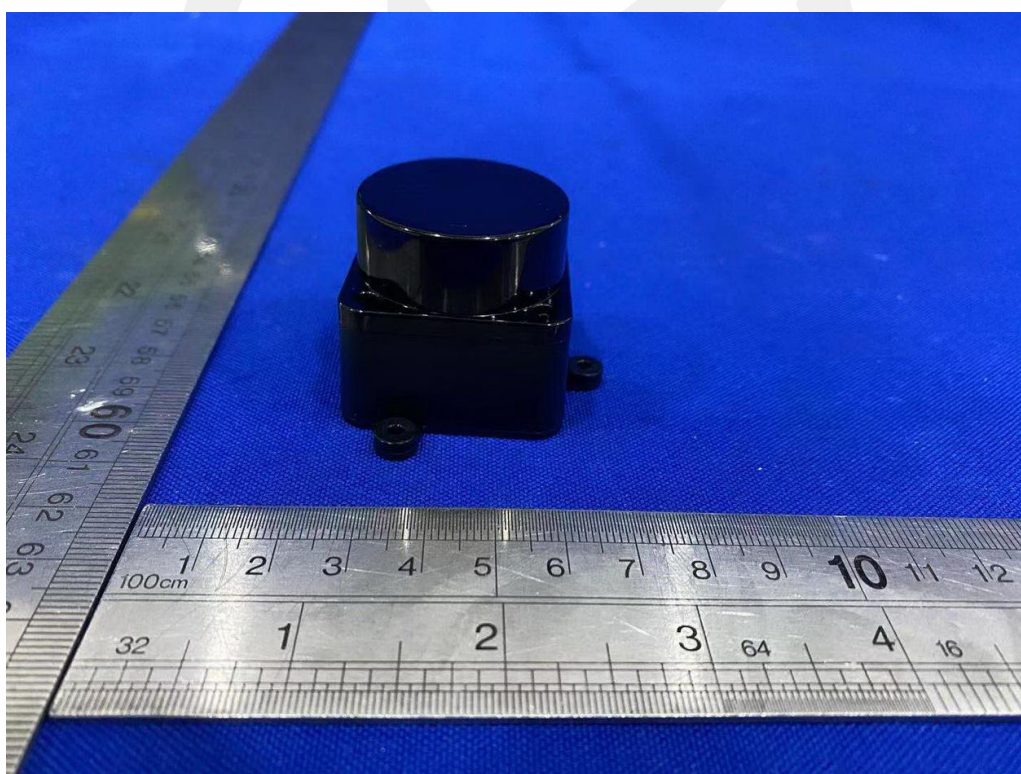
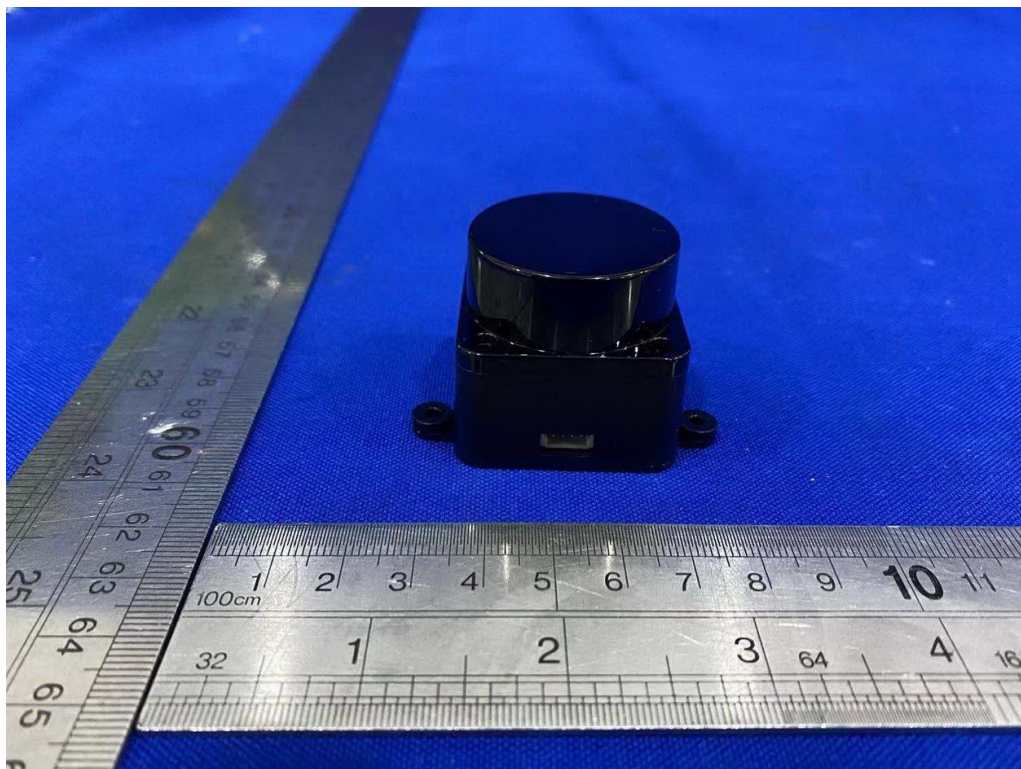
### 6.2 Photo of Electrostatic Discharge Test



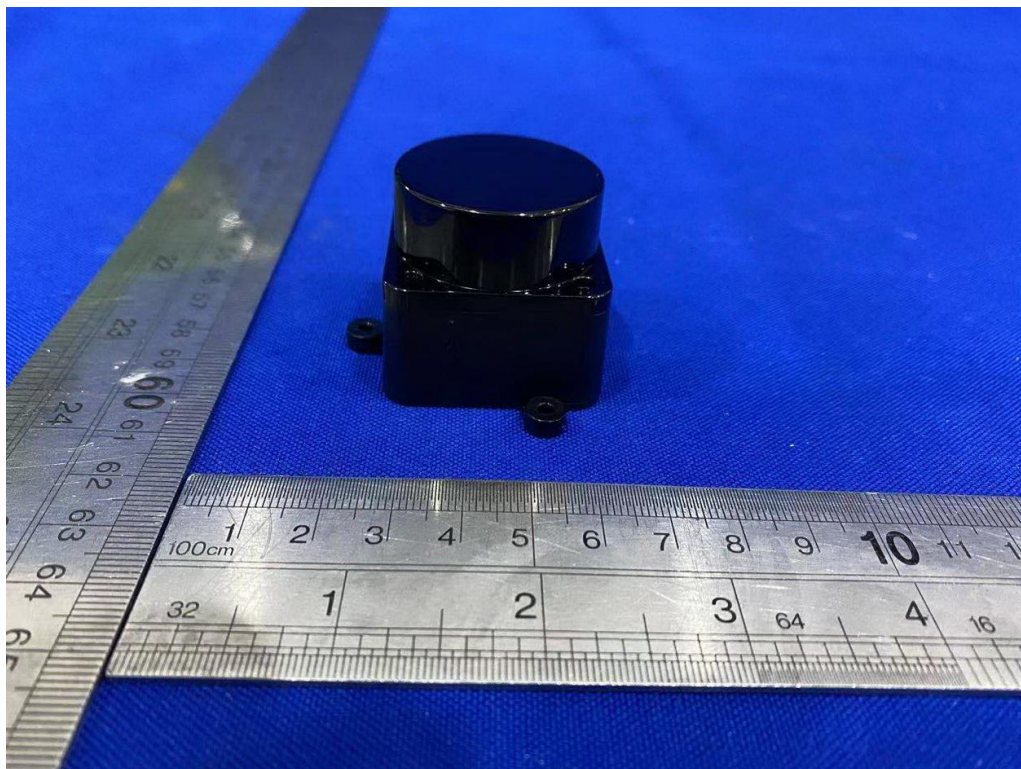




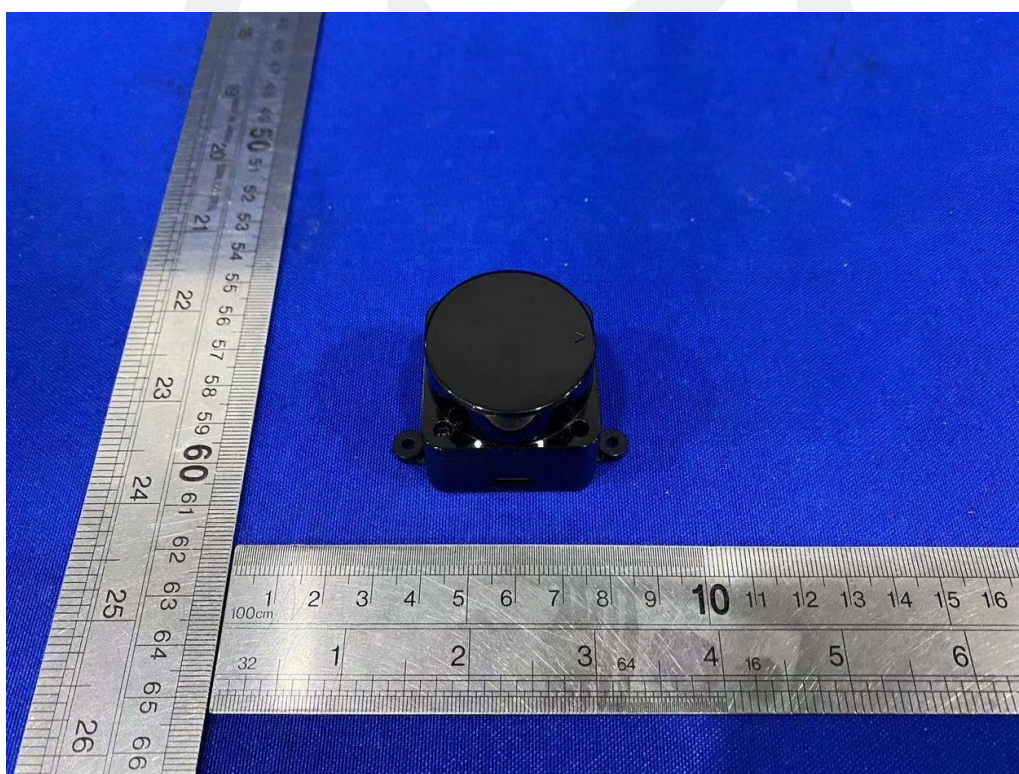
## APPENDIX (Photos of EUT)



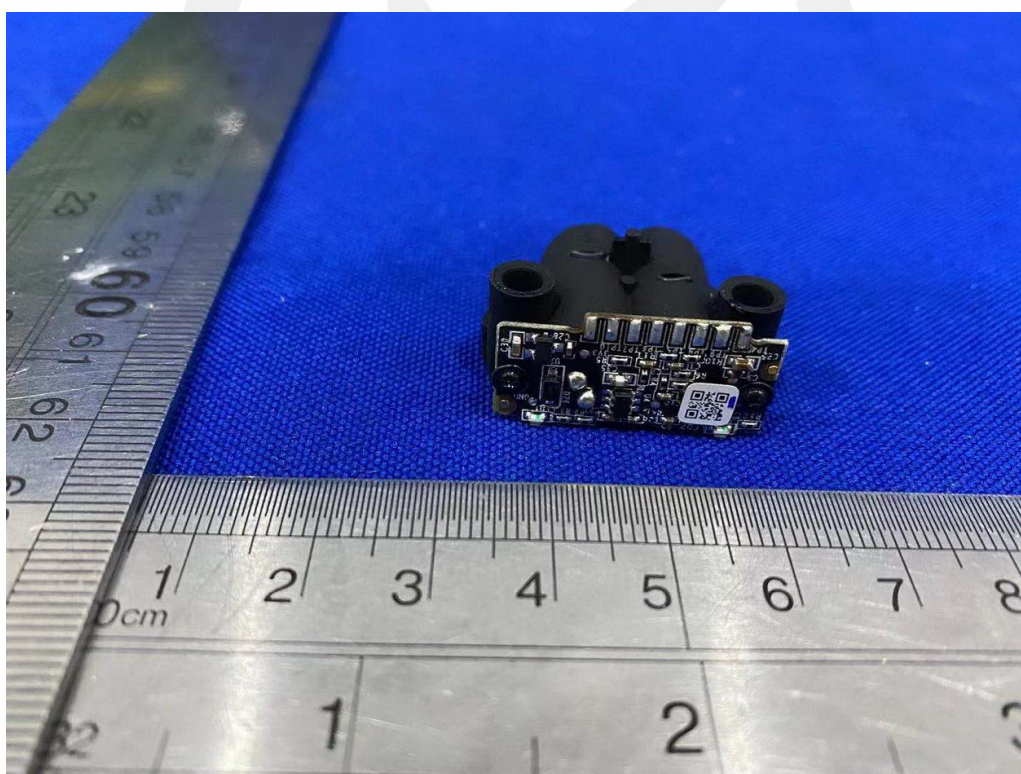
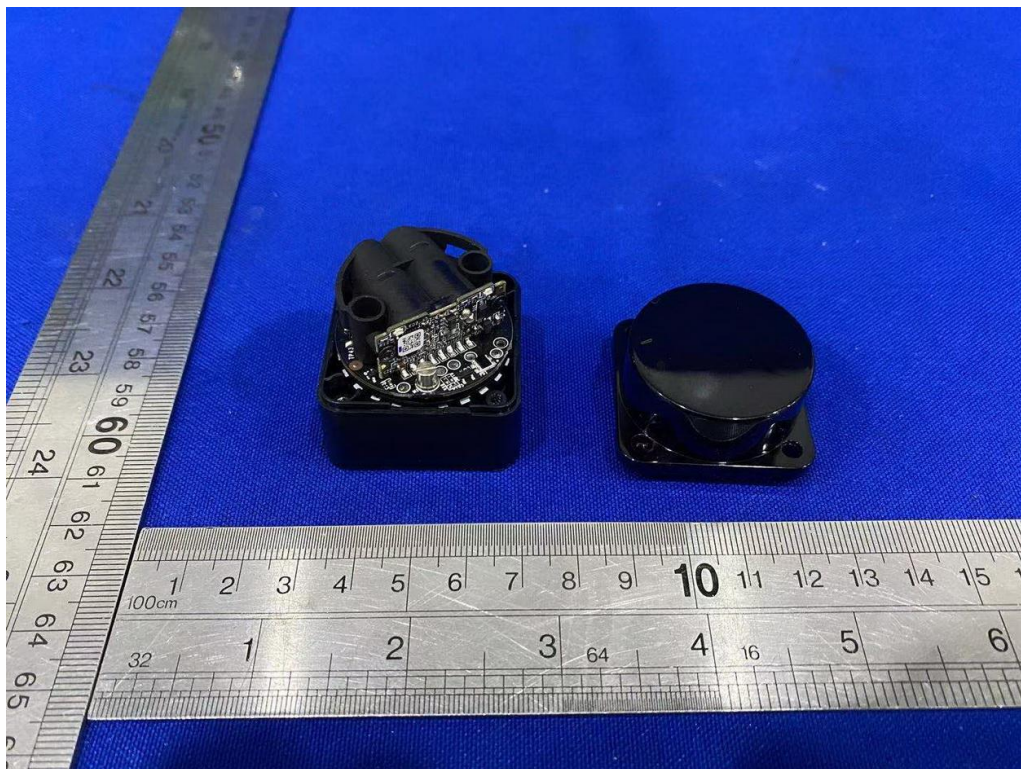




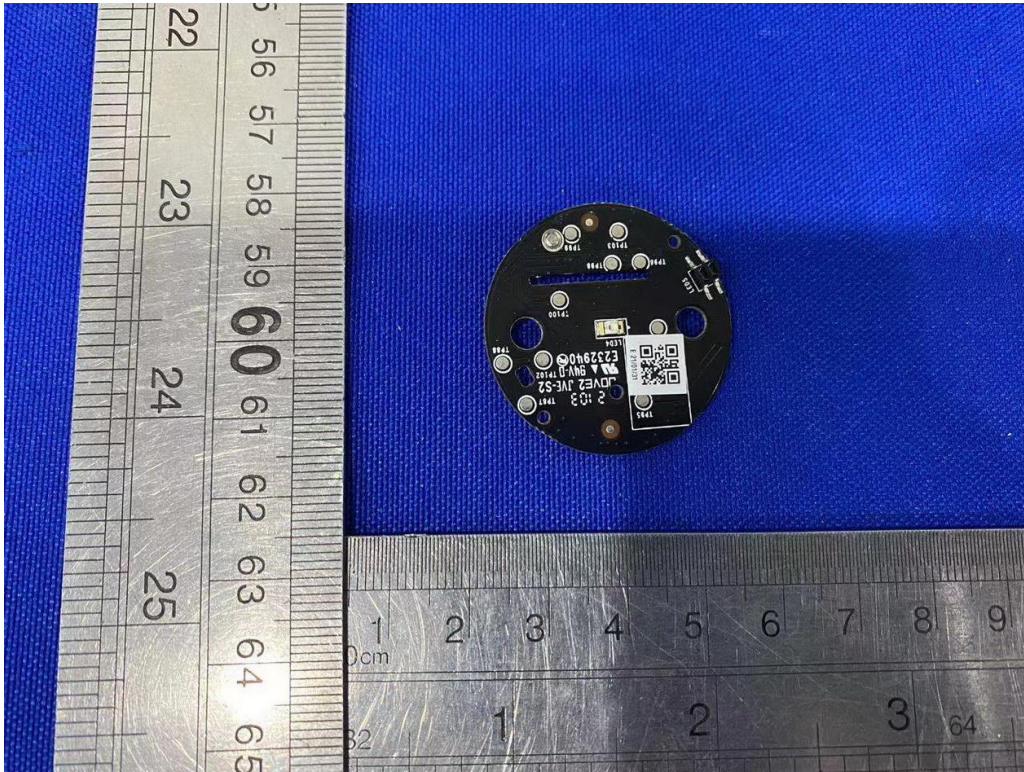




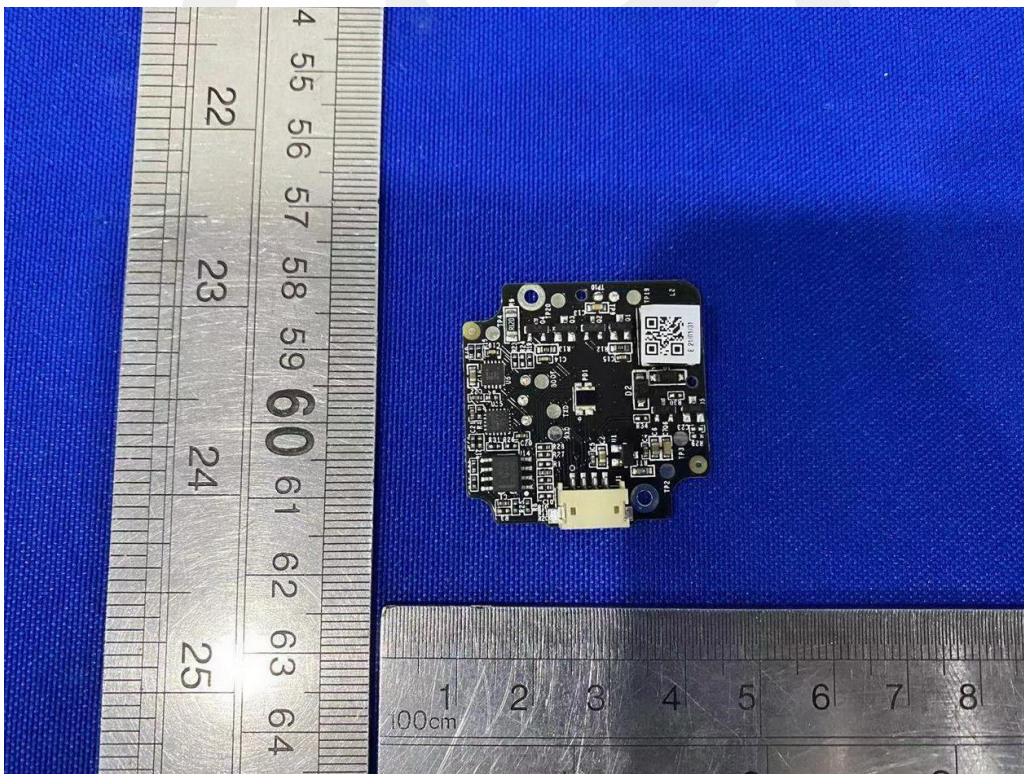
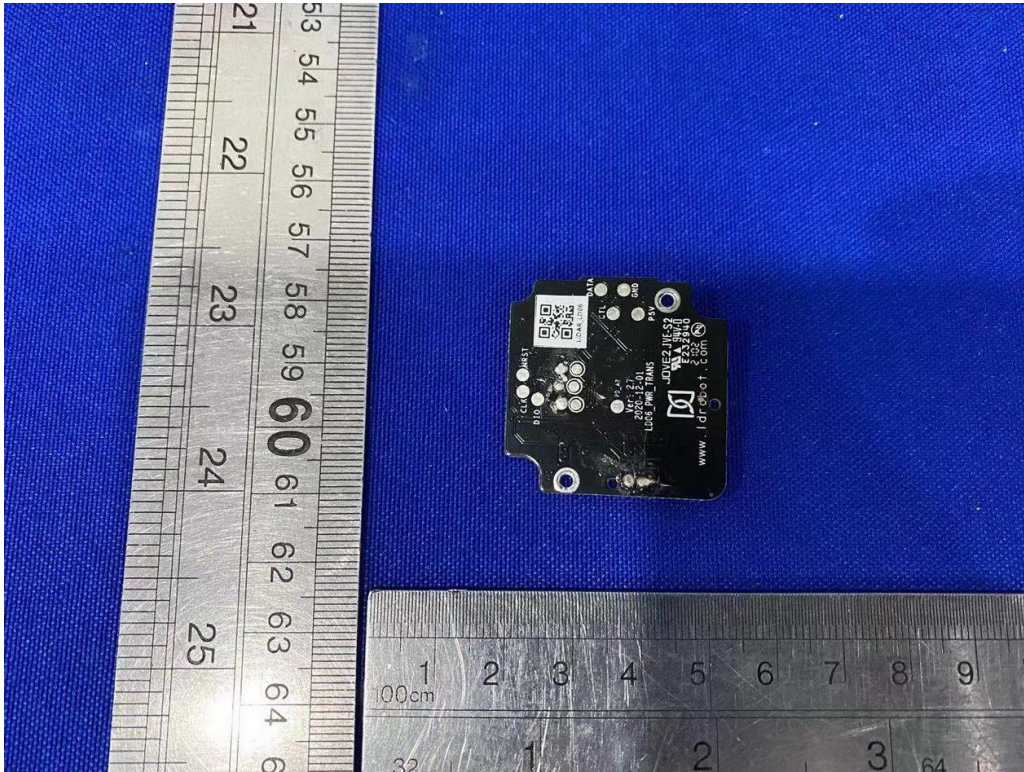












\*\*\* End of Report \*\*\*

# 声 明

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Objections shall be raised within 20 days from the date receiving the report.