

235

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 VIVOTEK INC  
 6TH FL, 192 LIEN CHENG RD  
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 NEW TAIPEI  
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Date: 2017/03/07  
 Subscriber: 100504413  
 PartySite: 125336  
 File No: E324690  
 Project No: 4787827945  
 PD No: 17009915  
 Type: R  
 PO Number:

Subject: **Procedure And/Or Report Material**

The following material resulting from the investigation under the above numbers is enclosed.

**Issue**

<u>Date</u>	<u>Vol</u>	<u>Sec</u>	<u>Pages</u>	<u>Revised Date</u>
	X2		Index Page(s)	
2015/11/25	X2	A84	Cert of Compliance	
2015/11/25	X2	A84	Revised Proc/Rpt Section	

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Please file revised pages and illustrations in place of material of like identity. New material should be filed in its proper numerical order.

NOTE: Follow-Up Service Procedure revisions DO NOT include Cover Pages, Test Records and Conclusion Pages. Report revisions DO NOT include Authorization Pages, Indices, Section General Pages and Appendixes.

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TPI File

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	FXX(W)(X= 0-9, a-z, A-Z, "-", "/" or blank for marketing purpose)		
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Network Camera	MV21-HW, MV71-HW	E324690-A91-UL	
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# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20170307-E324690  
**Report Reference** E324690-A84-UL  
**Issue Date** 2017-March-07

**Issued to:** VIVOTEK INC  
6TH FL, 192 LIEN CHENG RD  
CHUNG HO DISTRICT  
NEW TAIPEI  
235 TAIWAN

**This is to certify that  
representative samples of**

INFORMATION TECHNOLOGY EQUIPMENT INCLUDING  
ELECTRICAL BUSINESS EQUIPMENT  
Network Camera-FD816C-HF2, FD816CA-HF2


Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

**Standard(s) for Safety:** UL 60950-1 & CAN/CSA C22.2 No. 60950-1-07;  
Information Technology Equipment - Safety - Part 1:  
General Requirements.

**Additional Information:** See the UL Online Certifications Directory at  
[www.ul.com/database](http://www.ul.com/database) for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's  
Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Director North American Certification Program  
UL LLC

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contact a local UL Customer Service Representative at <http://ul.com/aboutul/locations/>



## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements)
<b>Certification Type:</b>	Listing
<b>CCN:</b>	NWGG, NWGQ7 (Information Technology Equipment Including Electrical Business Equipment)
<b>Product:</b>	Network Camera
<b>Model:</b>	FD816C-HF2, FD816CA-HF2
<b>Rating:</b>	For model : FD816C-HF2 36-57Vdc, 0.09-0.06A (PoE)  For model : FD816CA-HF2 36-57Vdc, 0.11-0.07A (PoE)
<b>Applicant Name and Address:</b>	VIVOTEK INC 6TH FL, 192 LIEN CHENG RD CHUNG HO DISTRICT NEW TAIPEI 235 TAIWAN

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

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Prepared by: Rommy Huang

Reviewed by: Vincent Lai

### Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
  - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
  - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
  - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

### Product Description

The equipment is a Class III Network Camera, consists of electronic components mounted on PWB and is equipped with a progressive scan CCD sensor then housed with metal/plastic enclosure, also provides a RJ45.

The EUT intended to install on the wall or ceiling.

### Model Differences

Model FD816CA-HF2 is similar to model FD816C-HF2 except for PCB layout, Rating, Tma and model designation.

### Technical Considerations

- Equipment mobility : stationary
- Connection to the mains : N/A
- Operating condition : continuous
- Access location : operator accessible
- Over voltage category (OVC) : OVC I
- Mains supply tolerance (%) or absolute mains supply values : No direct connection
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class III (supplied by SELV)
- Considered current rating of protective device as part of the building installation (A) : N/A
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : Up to 2000
- Altitude of test laboratory (m) : Below 2000
- Mass of equipment (kg) : Unit only: 0.138kg
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 40°C for model FD816C-HF2, 45°C for model FD816CA-HF2.
- The following circuit locations (with circuit/schematic designation) were investigated as a limited

power source (LPS): All output ports

- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual
- LEDs provided in the product are considered low power devices: Yes
- Based upon the product specification provided by the manufacturer, this unit is intended to be supplied by an UL Listed power supply suitable for use at Tma 40 degree C (for model FD816C-HF2) or Tma 45 degree C (for model FD816CA-HF2) whose output meets SELV, and is rated PoE 36-57Vdc, 0.09-0.06A (for model:FD816C-HF2) or PoE 36-57Vdc, 0.11-0.07A (for model:FD816CA-HF2).
- This equipment is to be connected only to PoE networks without routing to the outside plant.

**Additional Information**

Indoor use only.

**Additional Standards**

The product fulfills the requirements of: N/A

**Markings and instructions**

Clause Title	Marking or Instruction Details
Inter-connecting cables - External detachable	Listee's Name and Part number (Marking or Instruction)
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Instruction/Installation/Safety	<p>Instruction/Installation/Safety Manual shall be shipped with unit</p> <p>If the power adapter doesn't ship with the unit, the user manual shall have the description as below or equivalent: "This product is intended to be supplied by a Listed Direct Plug-In Power Unit marked "Class 2", Listed Power Adapter or DC power source marked "L.P.S." (or "Limited Power Source"), rated 36 - 57Vdc, 0.09-0.06A minimum (for model FD816C-HF2) or 36 - 57Vdc, 0.11-0.07A minimum (for model FD816CA-HF2), Tma = 40 degree C (for model FD816C-HF2) or Tma= 45 degree C (for model FD816CA-HF2). If need further assistance with purchasing the power source, please contact to VIVOTEK INC (mfr.) for further information."</p>
Manual	See enclosure 6-01.

**Special Instructions to UL Representative**

If the Power Adapter doesn't mark with "LPS" or "Limited Power source", please check the UL report for Power Adapter and confirm whether it complies with Limited Power source in Technical Consideration.

The Field Representative should verify the Tma (maximum ambient temperature) is minimum 40 degree C (for model FD816C-HF2) or 45 degree C (for model FD816CA-HF2) from the updated version of UL reports for power adapter which was/were certified by UL 60950-1, 2nd edition, 2014-10-14 (provided from customer).

**Production-Line Testing Requirements**

**Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.**

Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
N/A	-	-	-	-	-	-

**Earthing Continuity Test Exemptions - This test is not required for the following models:**

All Models

**Electric Strength Test Exemptions - This test is not required for the following models:**

All Models

**Electric Strength Test Component Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test:**

-

**Sample and Test Specifics for Follow-Up Tests at UL**

Model	Component	Material	Test	Sample(s)	Test Specifics
-	-	-	-	-	-

1.5.1	<b>TABLE: list of critical components</b>					Pass
Object/part or Description	Manufacturer/ trademark	type/model	technical data	Product Category CCN(s)	Required Marks of Conformity	Supplement ID
01. Label	Interchangeable	Interchangeable	70 degree C if max. Surface temperature is not specified.	PGDQ2, PGJI2	UL	
02. Cover	LG CHEMICAL (GUANGZHOU) ENGINEERING PLASTICS CO LTD	LUPOY GN-5001RF(T)	HB minimum, measured 1.8 mm thickness minimum, overall see Cover Lens and Cover /Diagrams for details	QMFZ2	UL	
03. Cover Lens	MITSUBISHI ENGINEERING-PLASTICS CORP	S-3000+(f1), S-3001+(f1), S-3003+(f1)	HB minimum, measured 1.8 mm thickness minimum, overall see Cover Lens and Cover /Diagrams for details	QMFZ2	UL	
04. Top Enclosure	LG CHEMICAL (GUANGZHOU) ENGINEERING PLASTICS CO LTD	LUPOY GN-5001RF(T)	HB minimum, measured 1.8 mm thickness minimum, overall see Top Enclosure /Diagrams for details	QMFZ2	UL	
05. Bottom Enclosure	LG CHEMICAL (GUANGZHOU) ENGINEERING PLASTICS CO LTD	LUPOY GN-5001RF(T)	HB minimum, measured 1.8 mm thickness minimum, overall see Bottom Enclosure /Diagrams for details	QMFZ2	UL	
06. Internal Chassis	Interchangeable	Interchangeable	Aluminium alloy, 1.8 mm thickness minimum, overall see Enclosure /Diagrams for details	QMFZ2	UL	
07. Wiring, internal secondary SELV circuits	Interchangeable	Interchangeable	FEP, PTFE, PVC, TFE, neoprene, polyimide or marked VW-1 or FT-1, min 30V, 90 degree C	AVLV2	UL	
08. Internal Plastic Part/Materials	Interchangeable	Interchangeable	Rated HB minimum.	QMFZ2	UL	
09. PWB	Interchangeable	Interchangeable	V-1 minimum, 105 degree C minimum	ZPMV2	UL	
10. Electric Double Layer Capacitor (BT1)	ELNA CO., LTD	DSK Series	Rated 3.3Vdc, 0.2F	--	--	
11. Connectors and Receptacles (secondary)	Interchangeable	Interchangeable	Metal/plastics, Copper alloy pins housed in bodies of plastic	DUXR2, ECBT2, QMFZ2	UL	

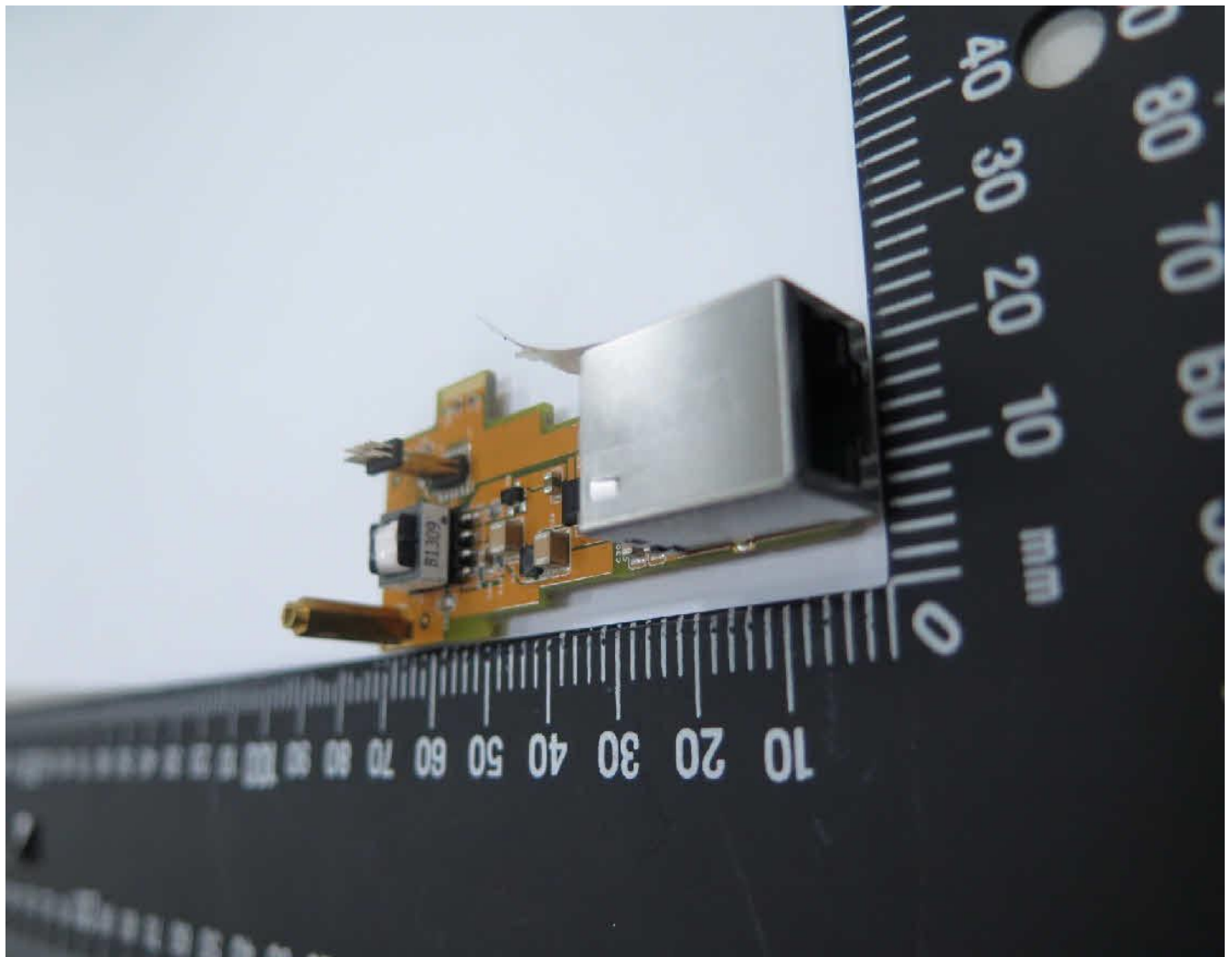
SELV circuits)			rated HB min.			
12. Interconnecting Cable (Optional)	Interchangeable	Interchangeable	Maximum length 3.05 m. FEP, PTFE, PVC, TFE, neoprene, polyimide or rated VW-1 or FT-1. Minimum 90 degree C. Minimum 30 V.	AVLV2 or ZPFW2	UL	
12a. Interconnecting Cable (Optional) (alternate)	Interchangeable	Interchangeable	Maximum 3.05 m long, type CMP, CMR, CMG, CM, CMX, CMUC, or CMH.	DUZX or ZPFW2 or DUXR/2	UL	

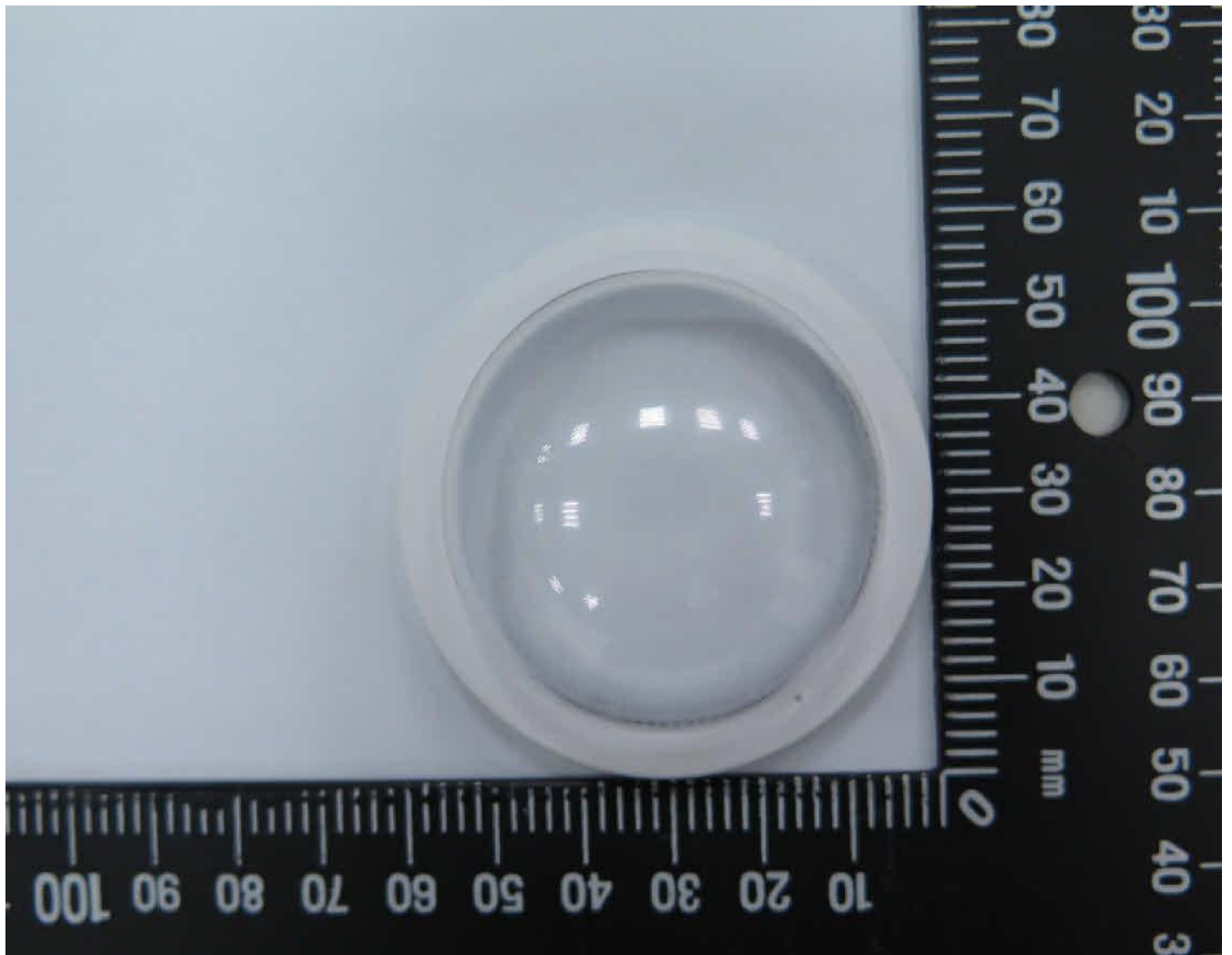
## Enclosures

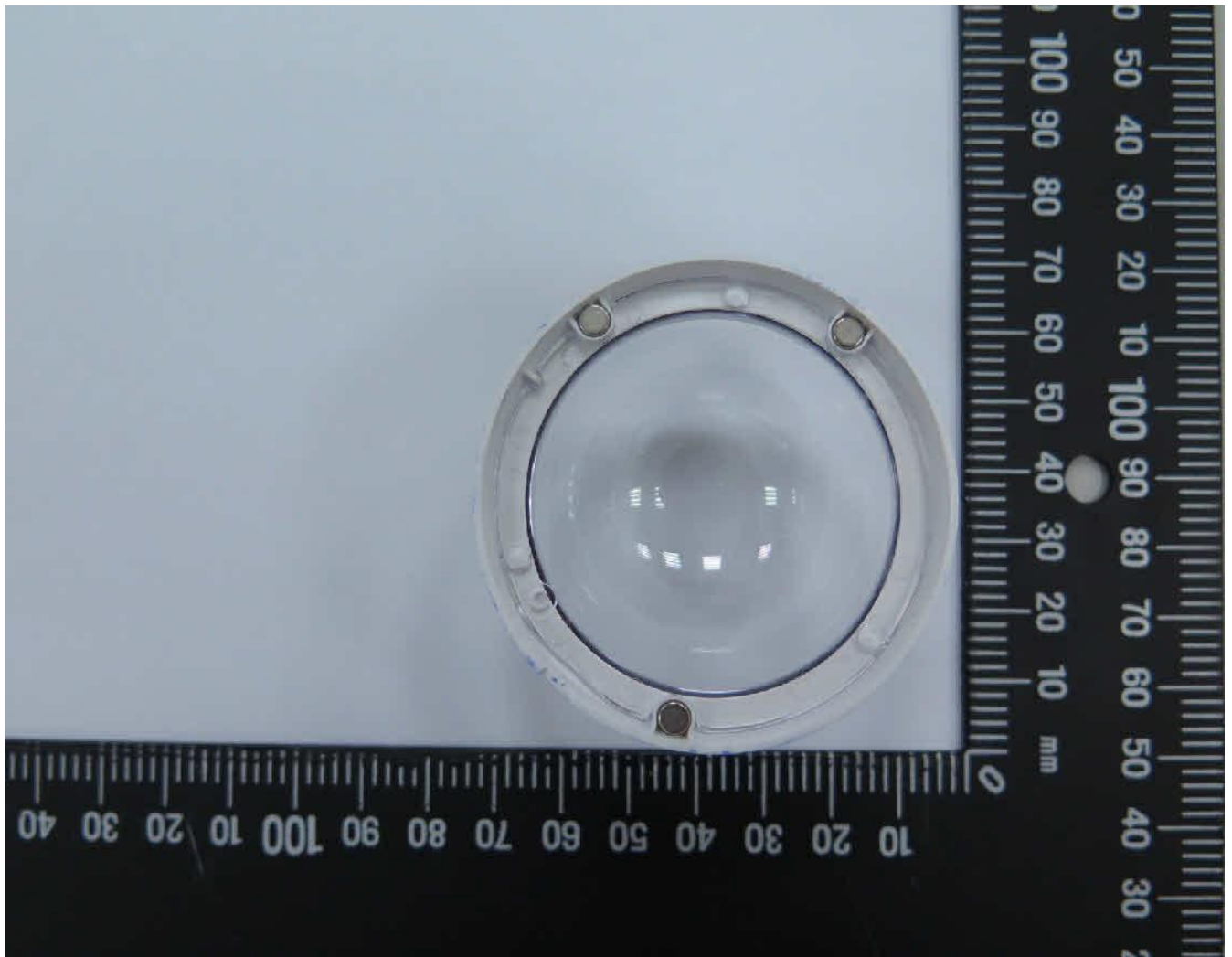
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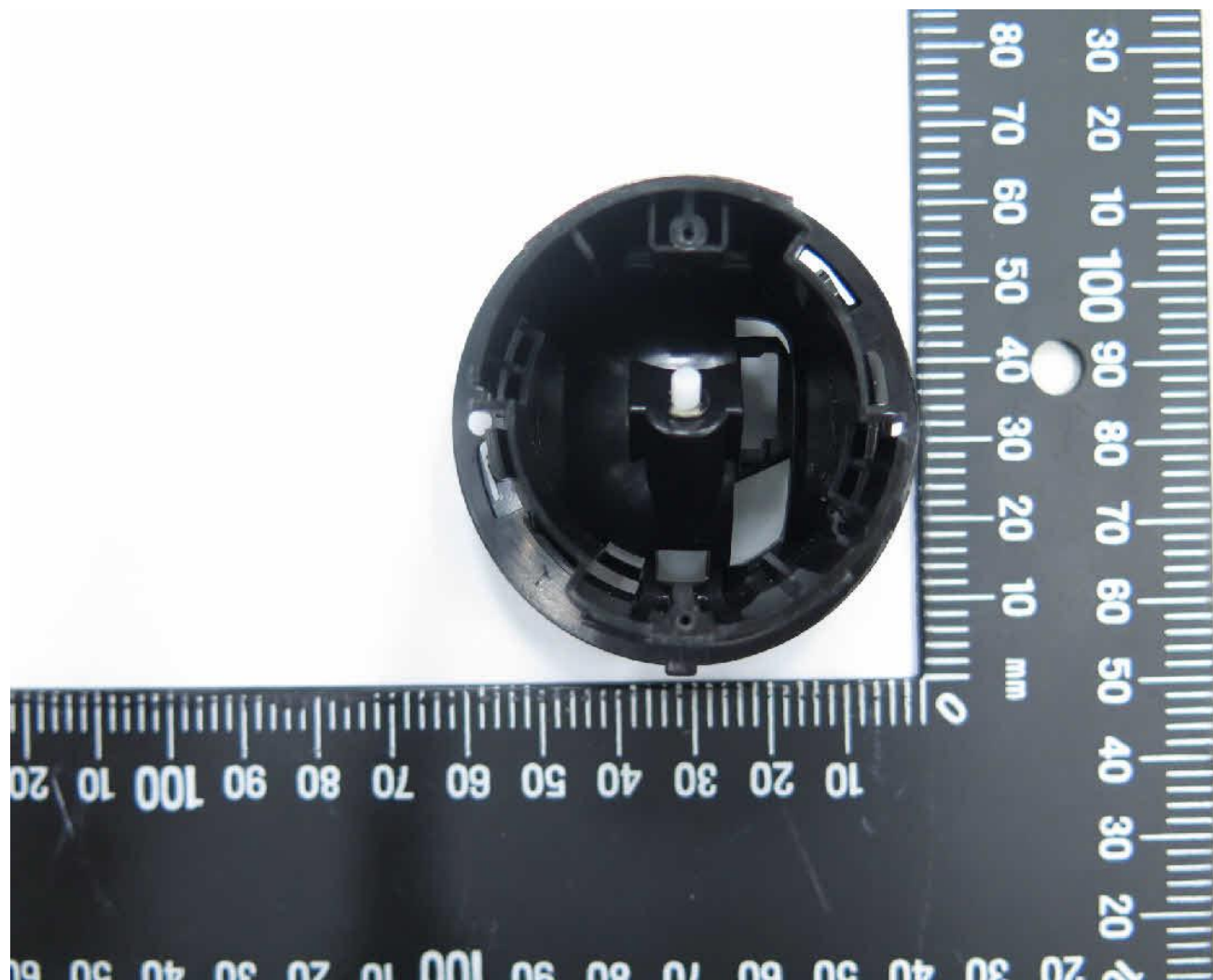


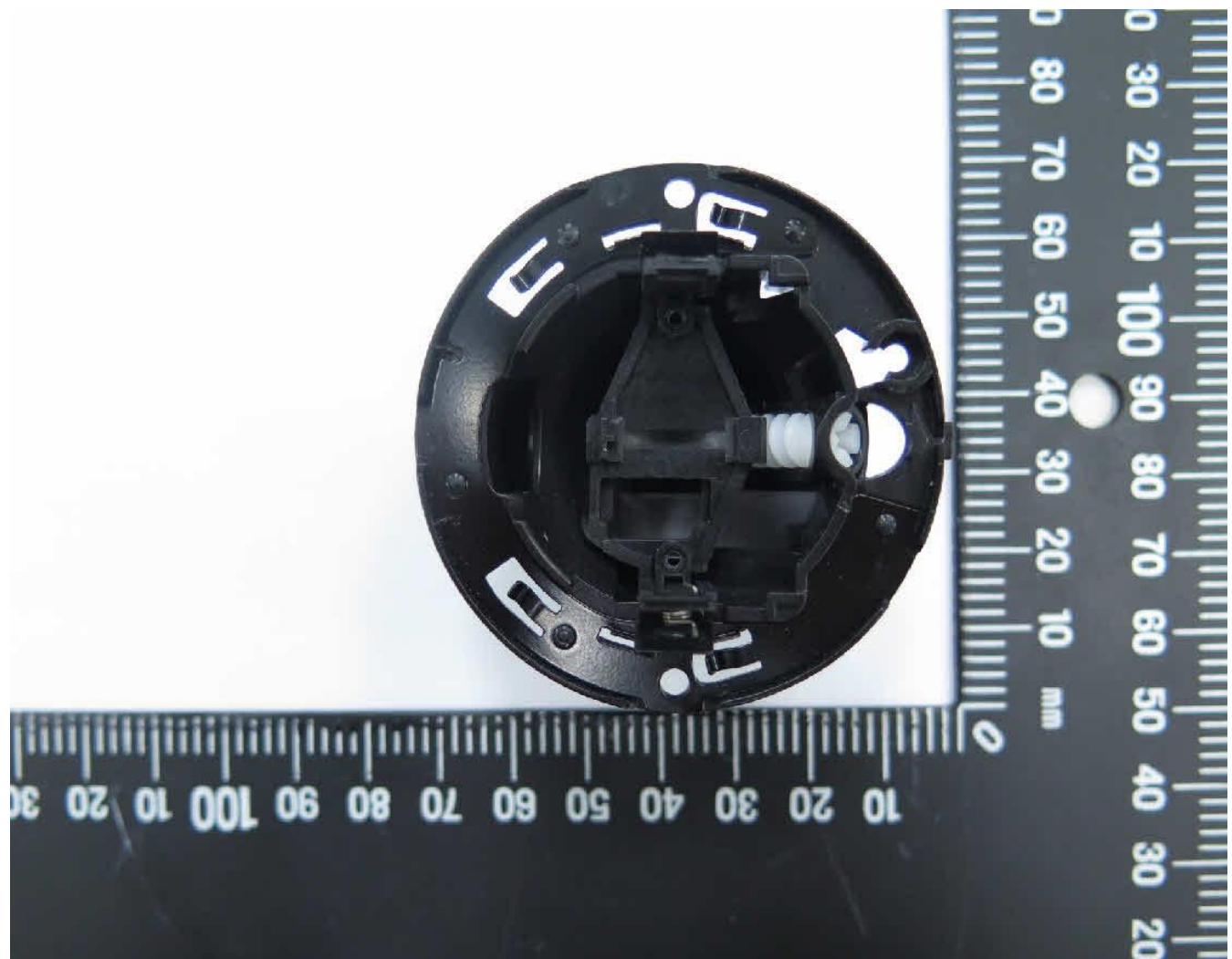


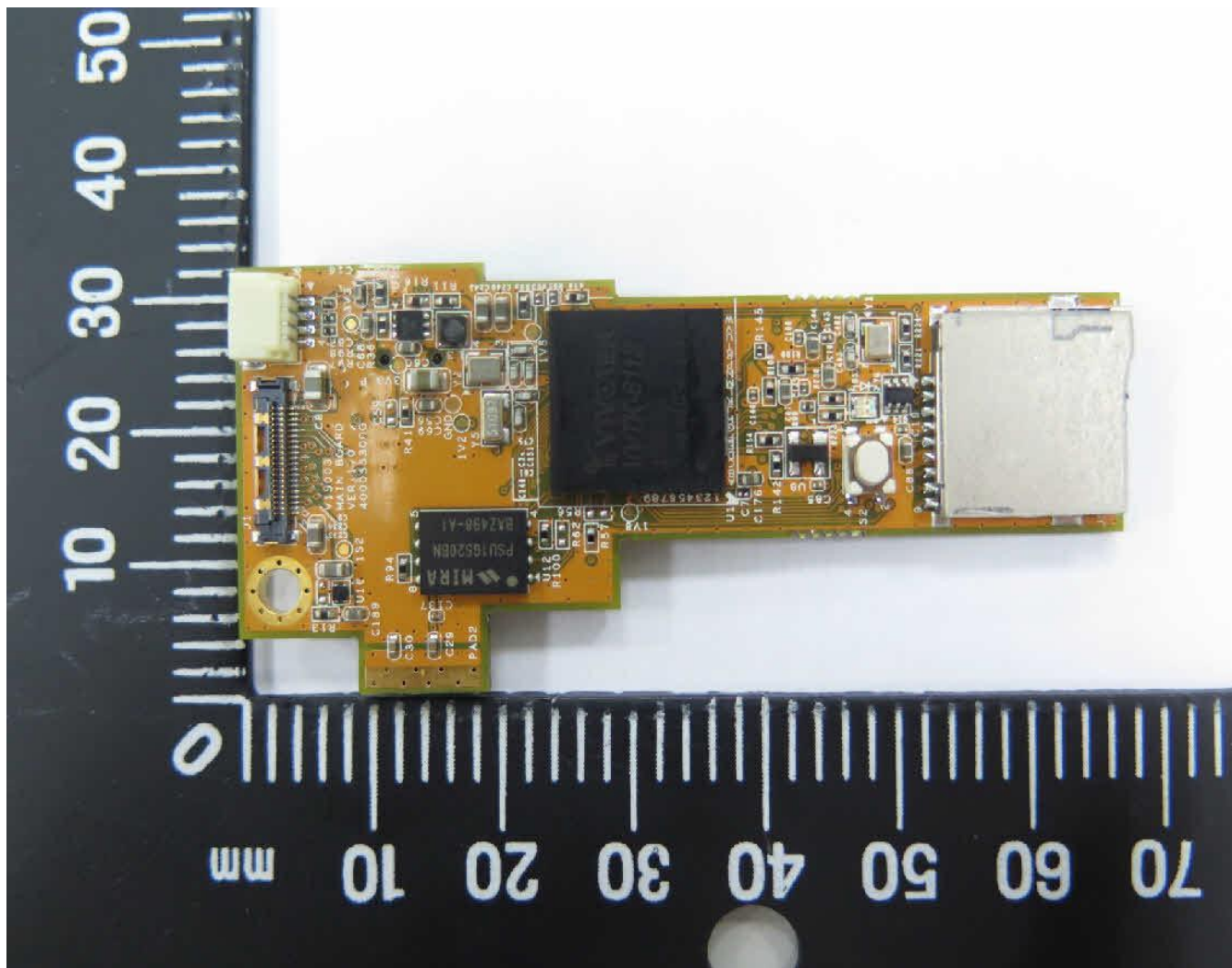


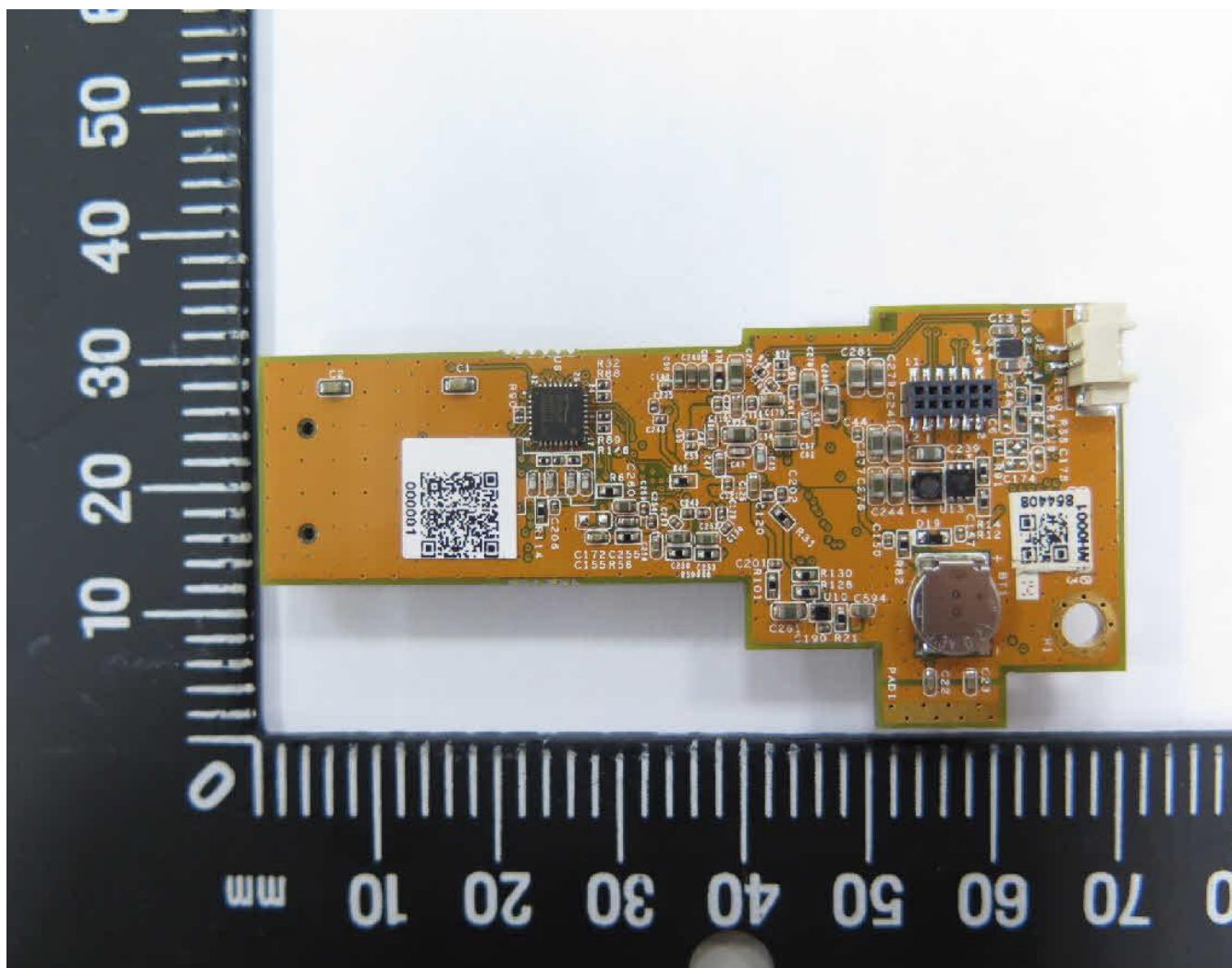


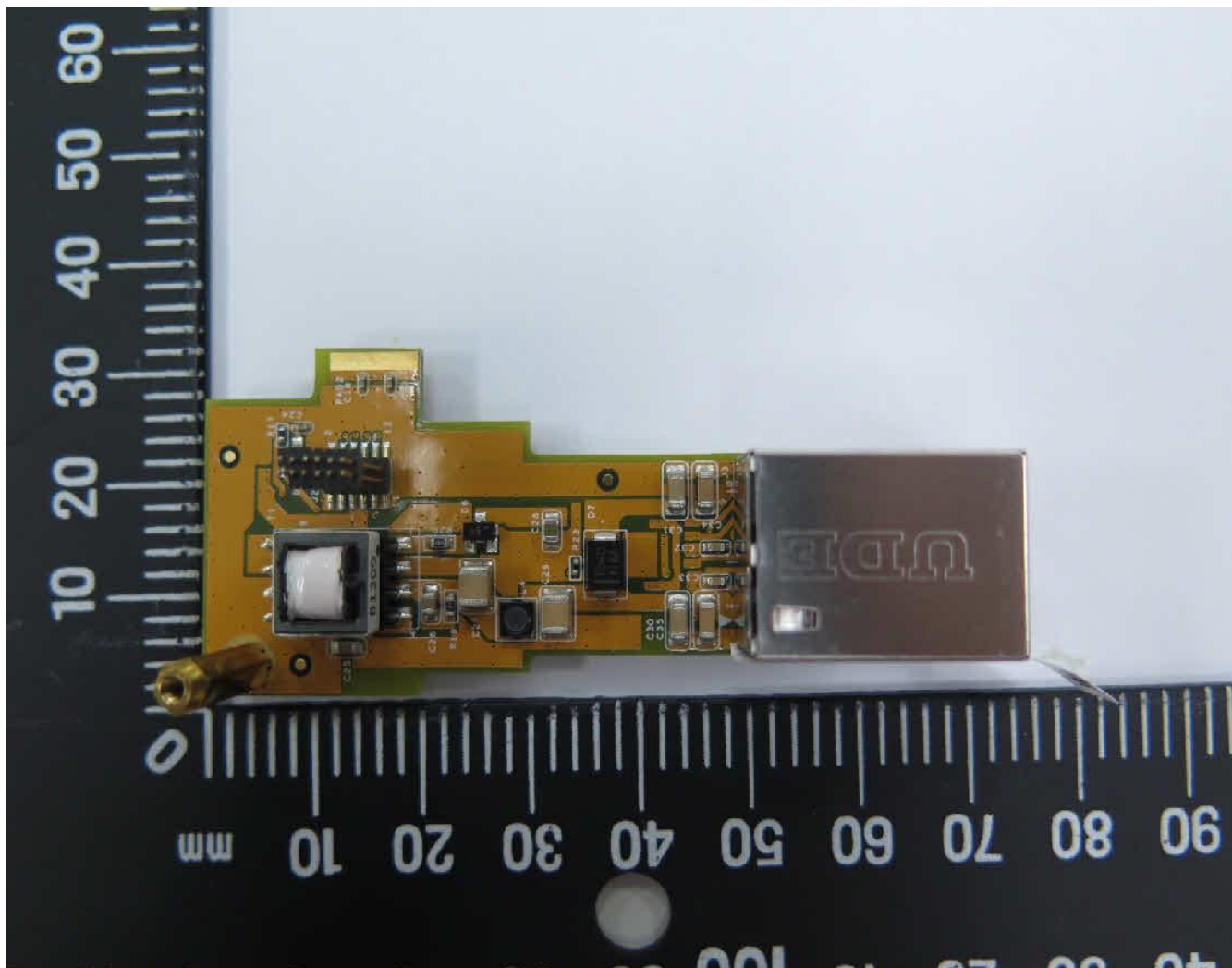


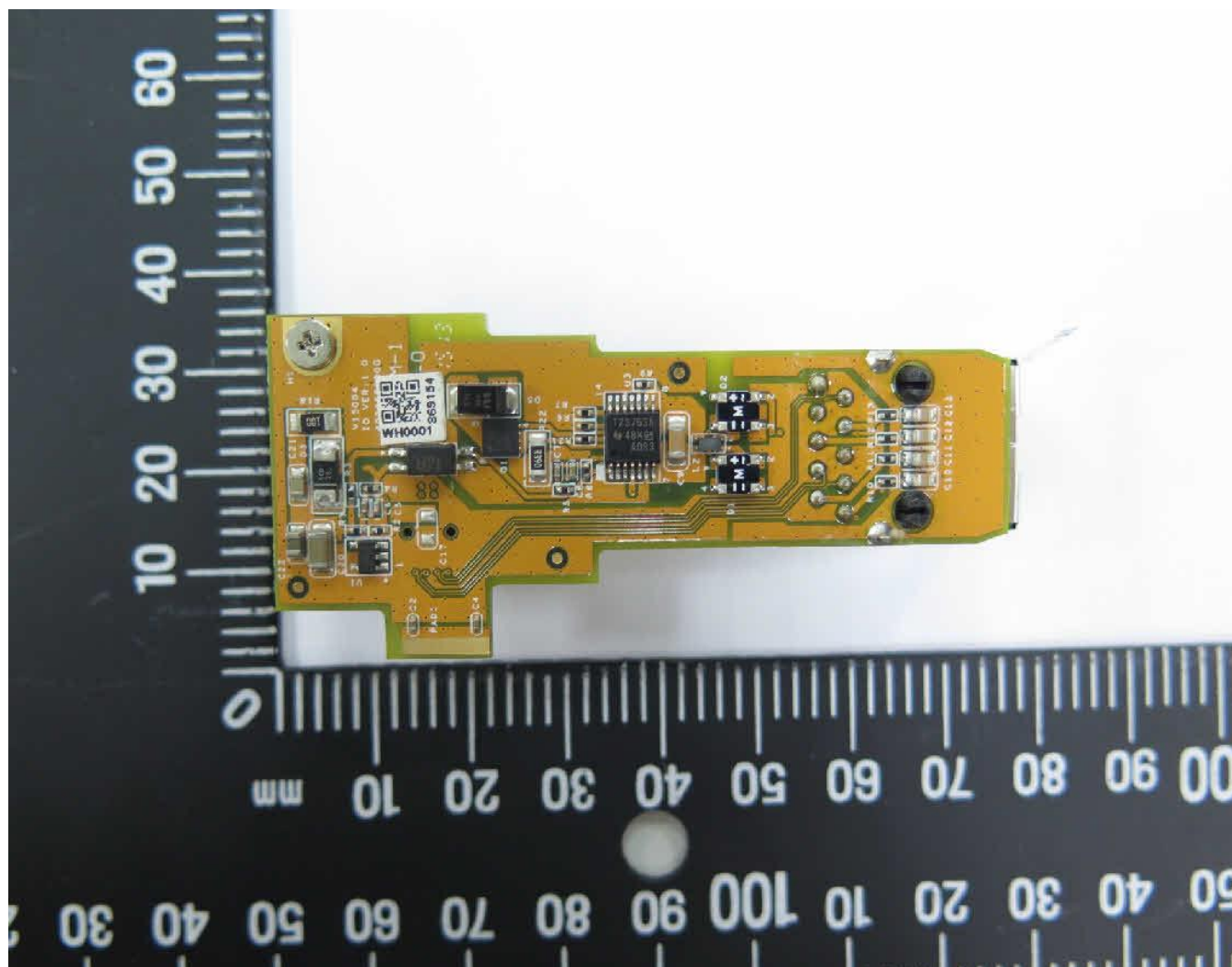


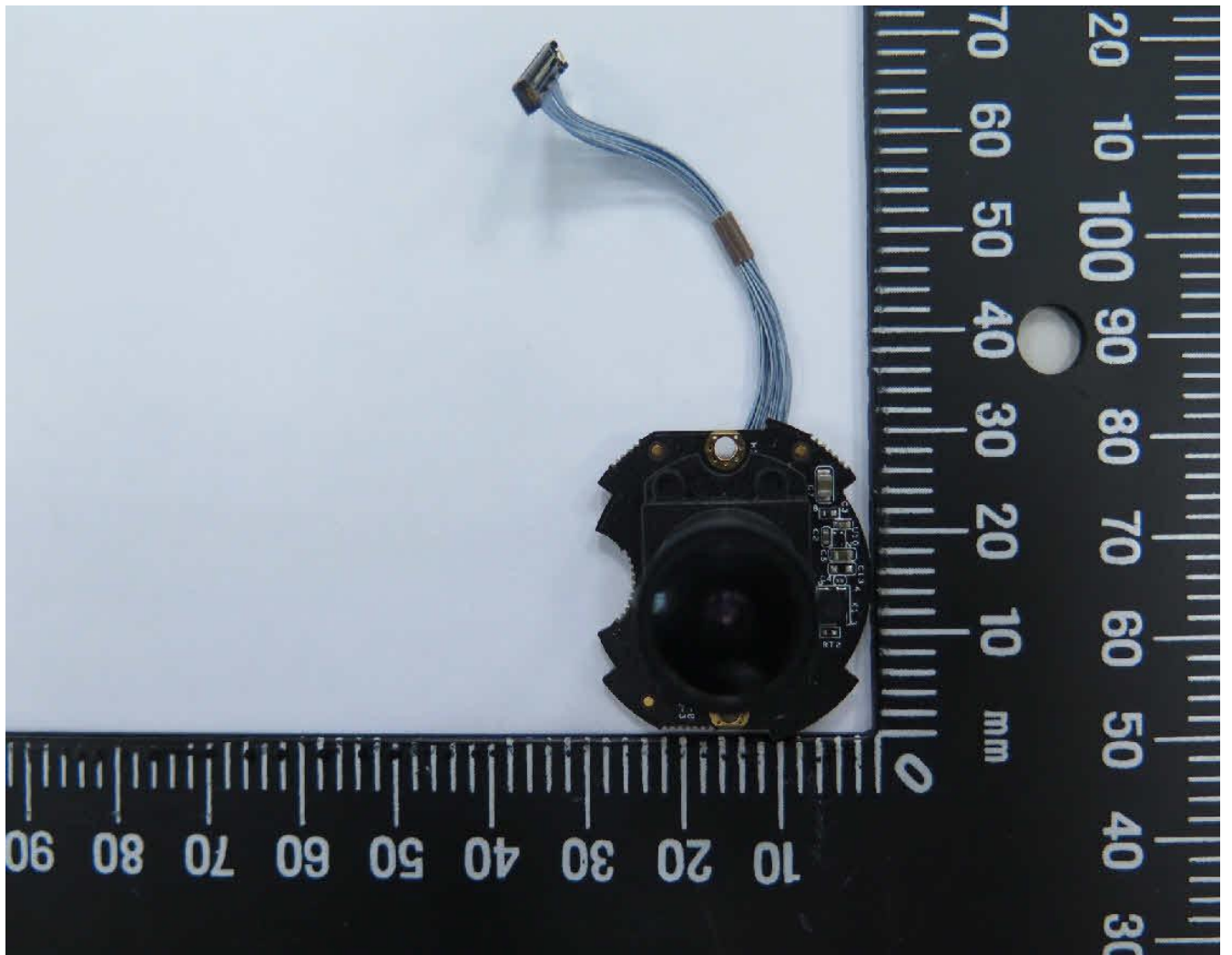


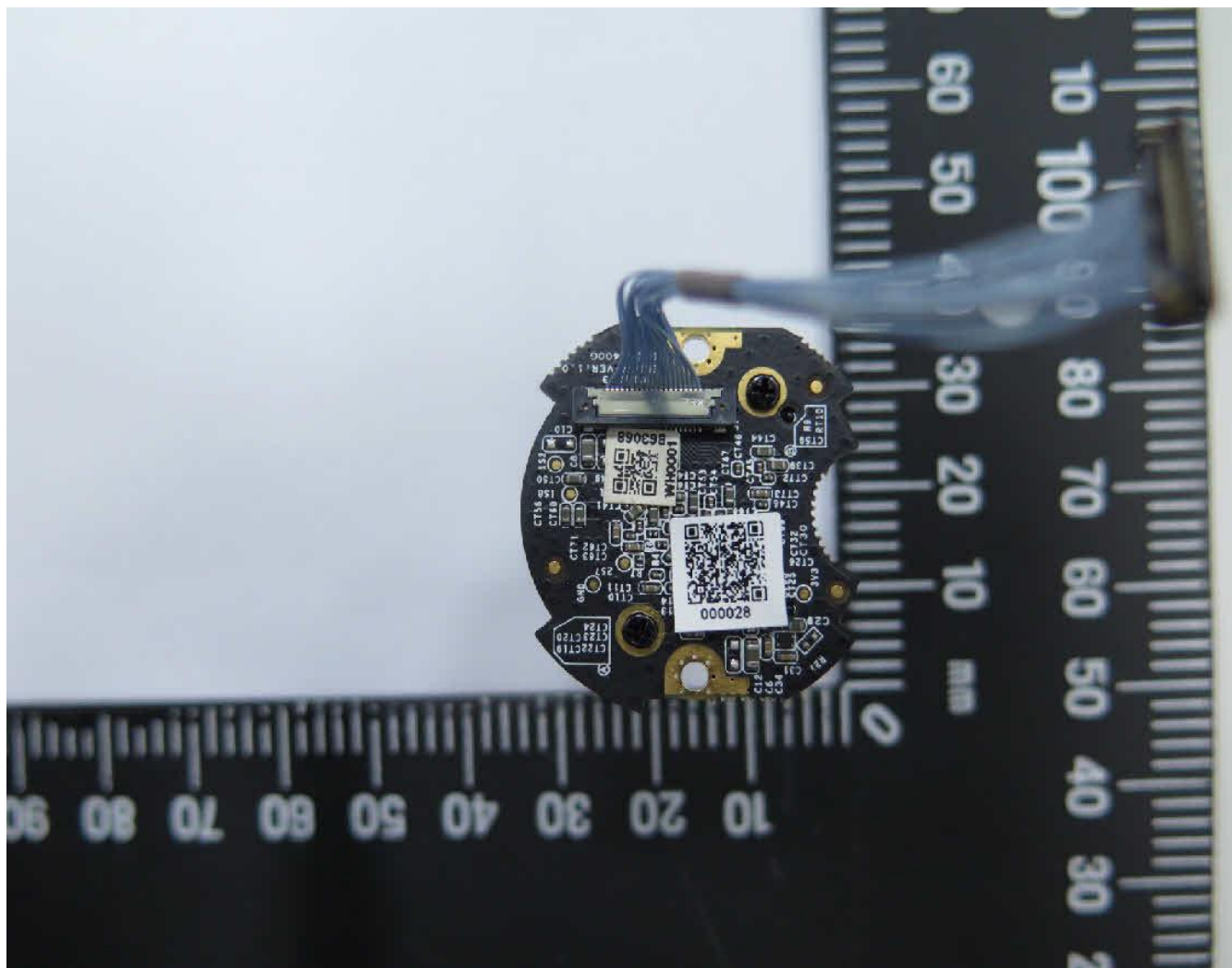


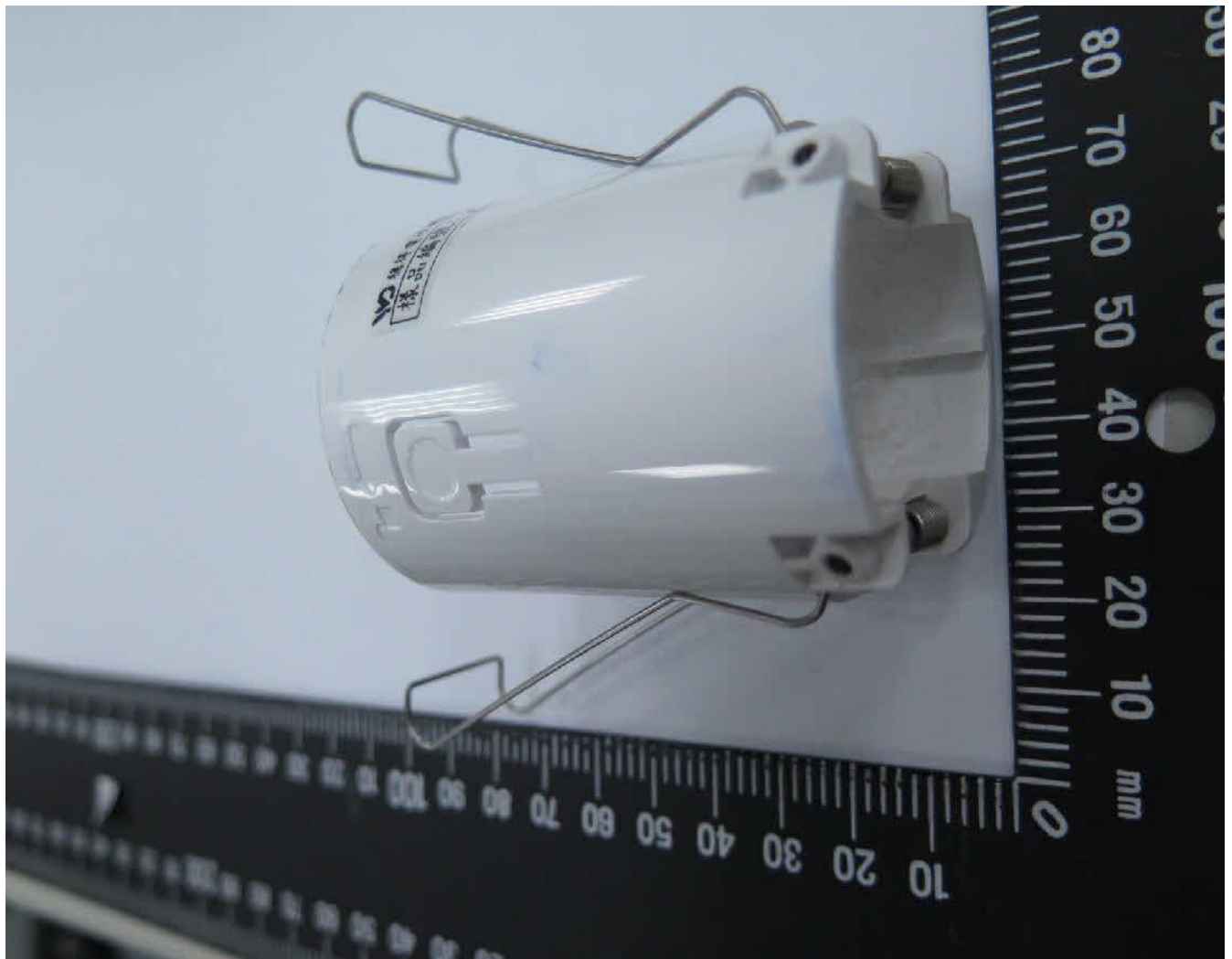


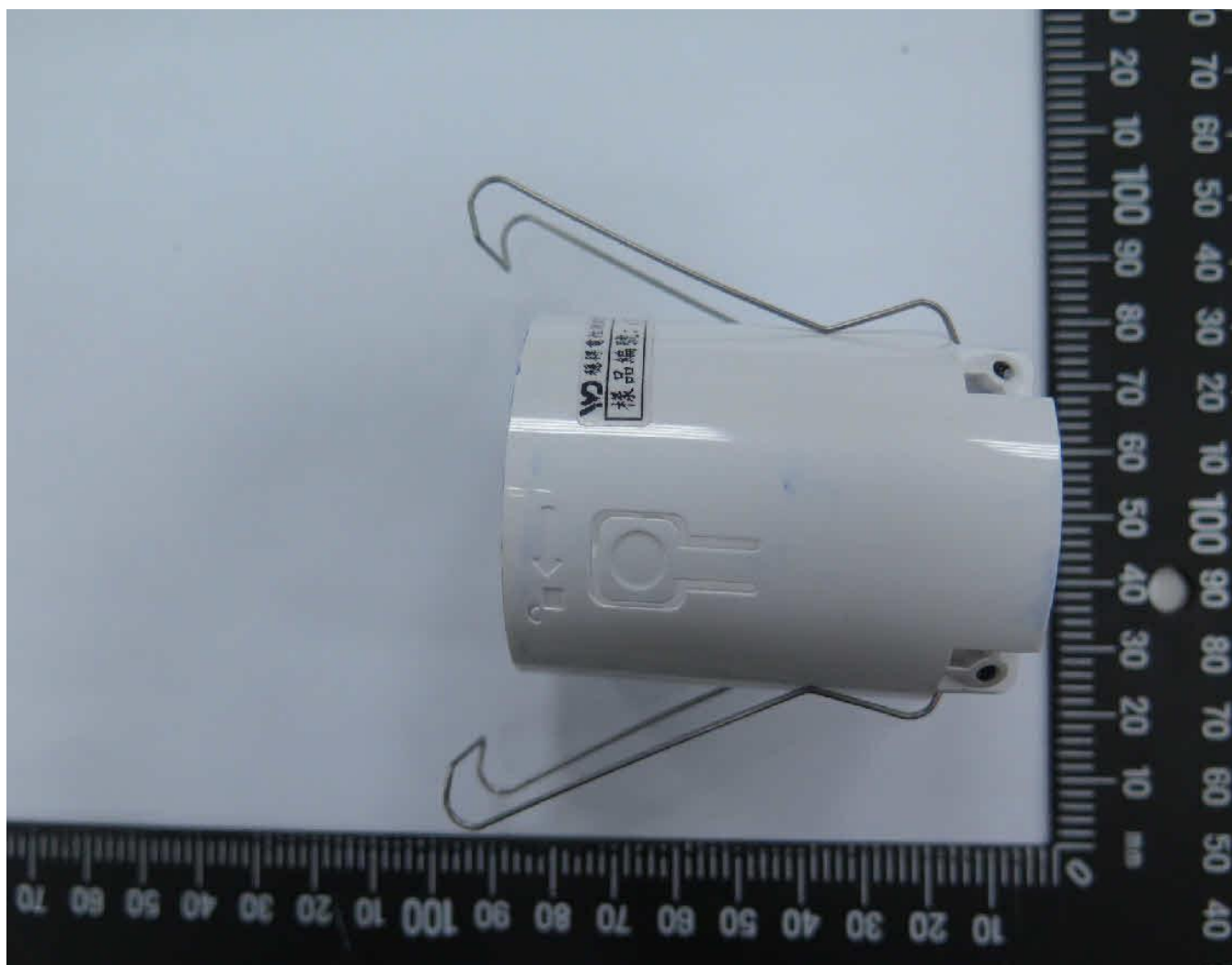


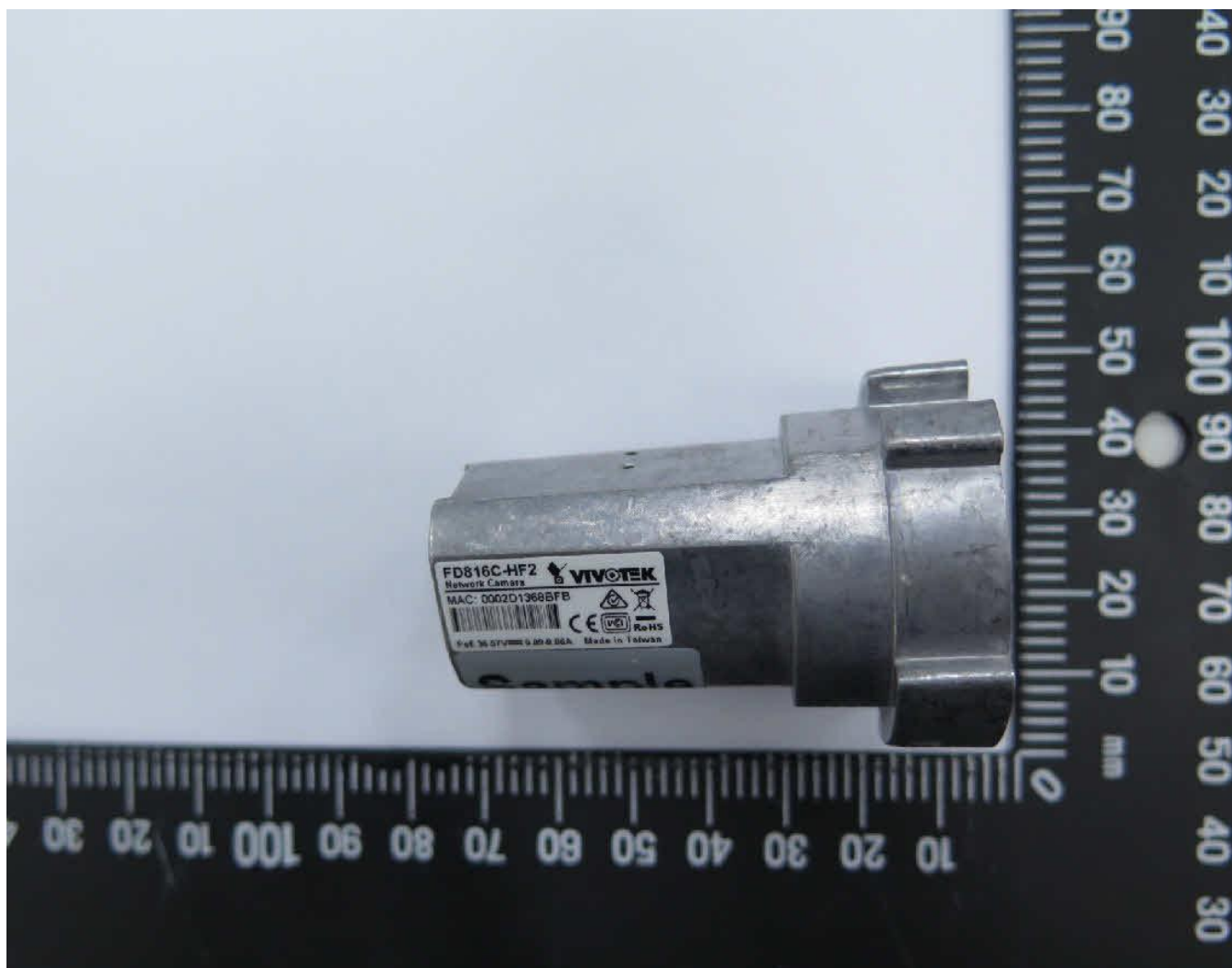


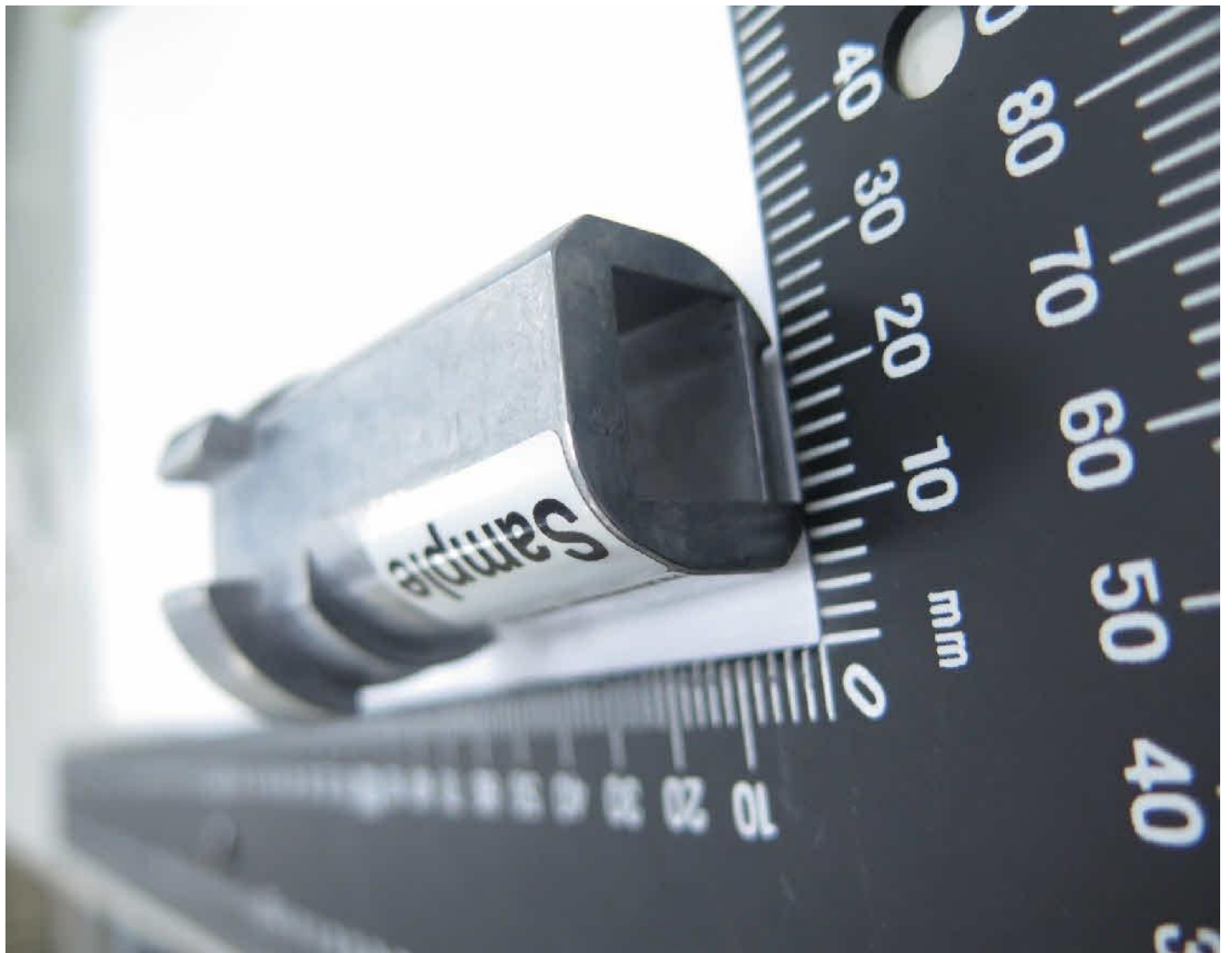




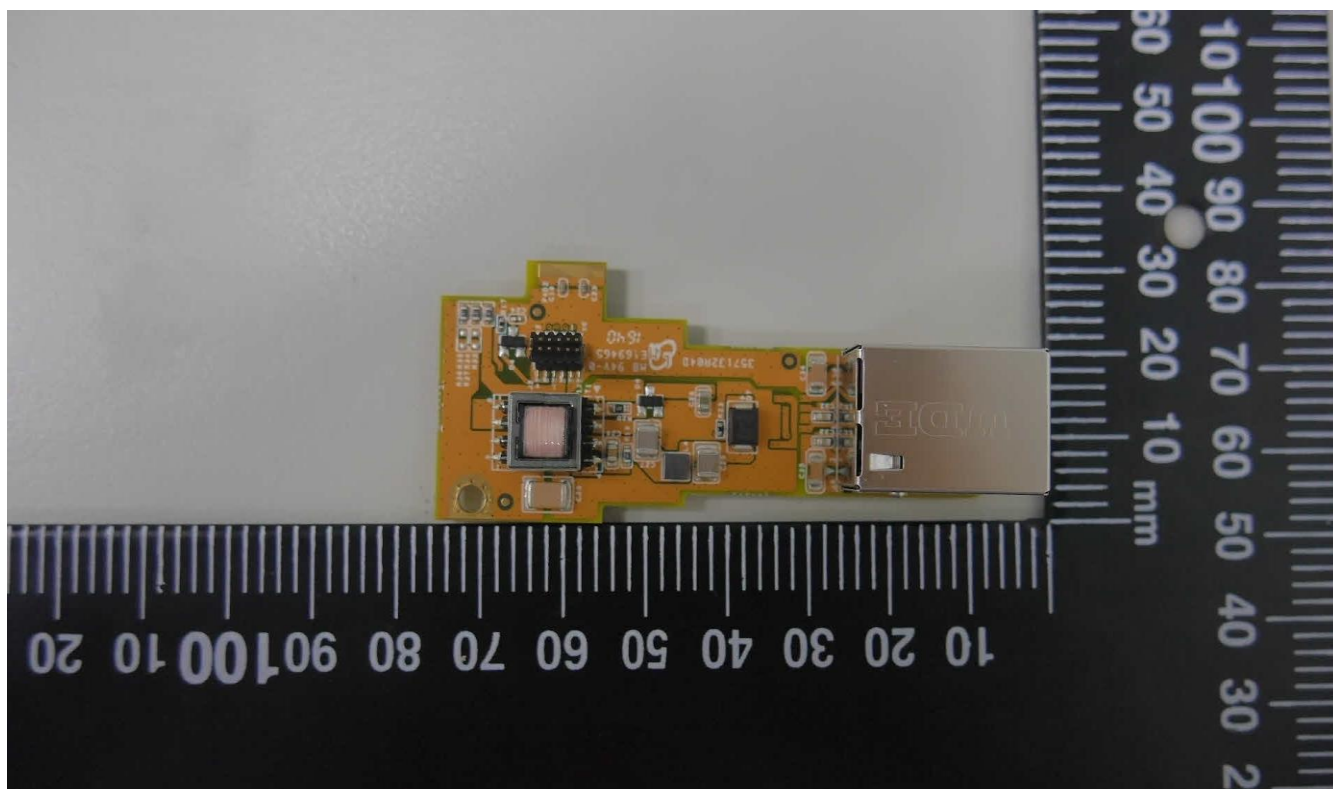


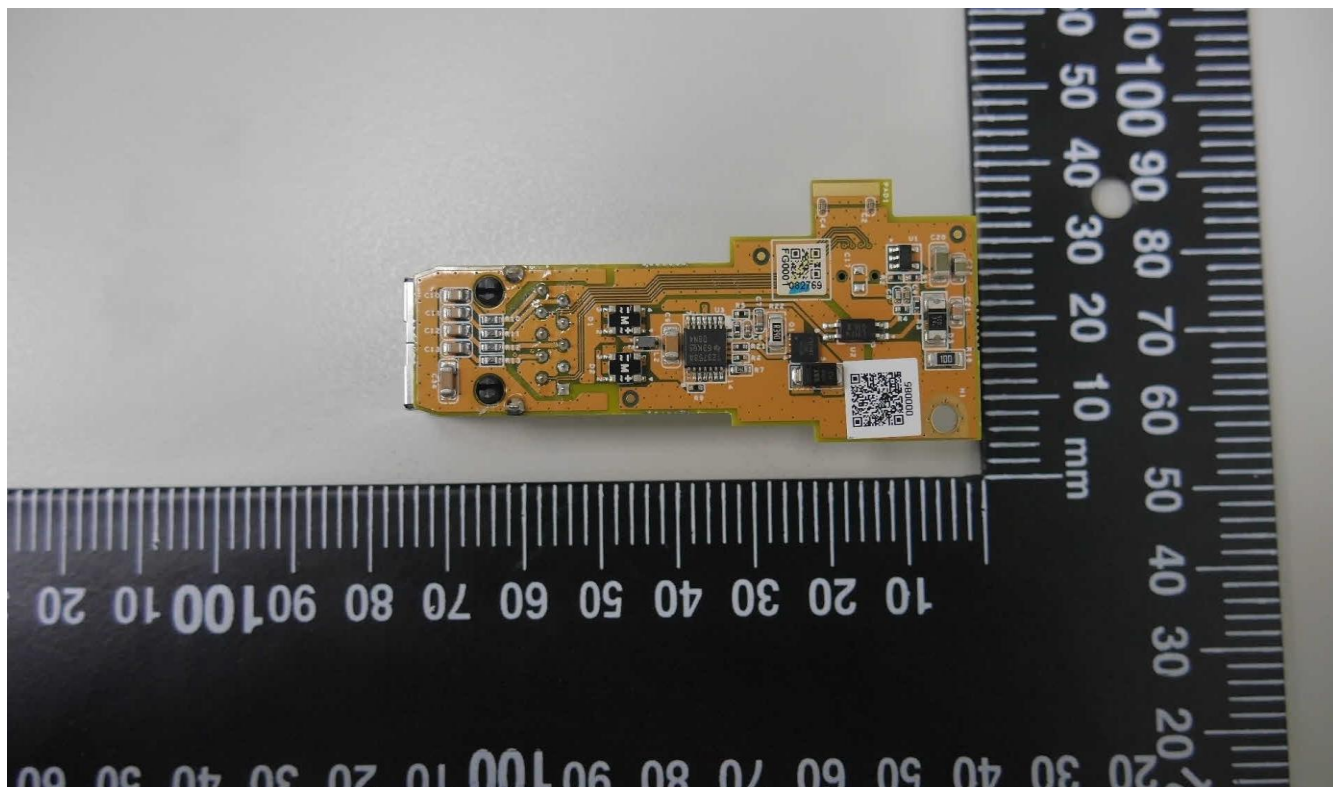


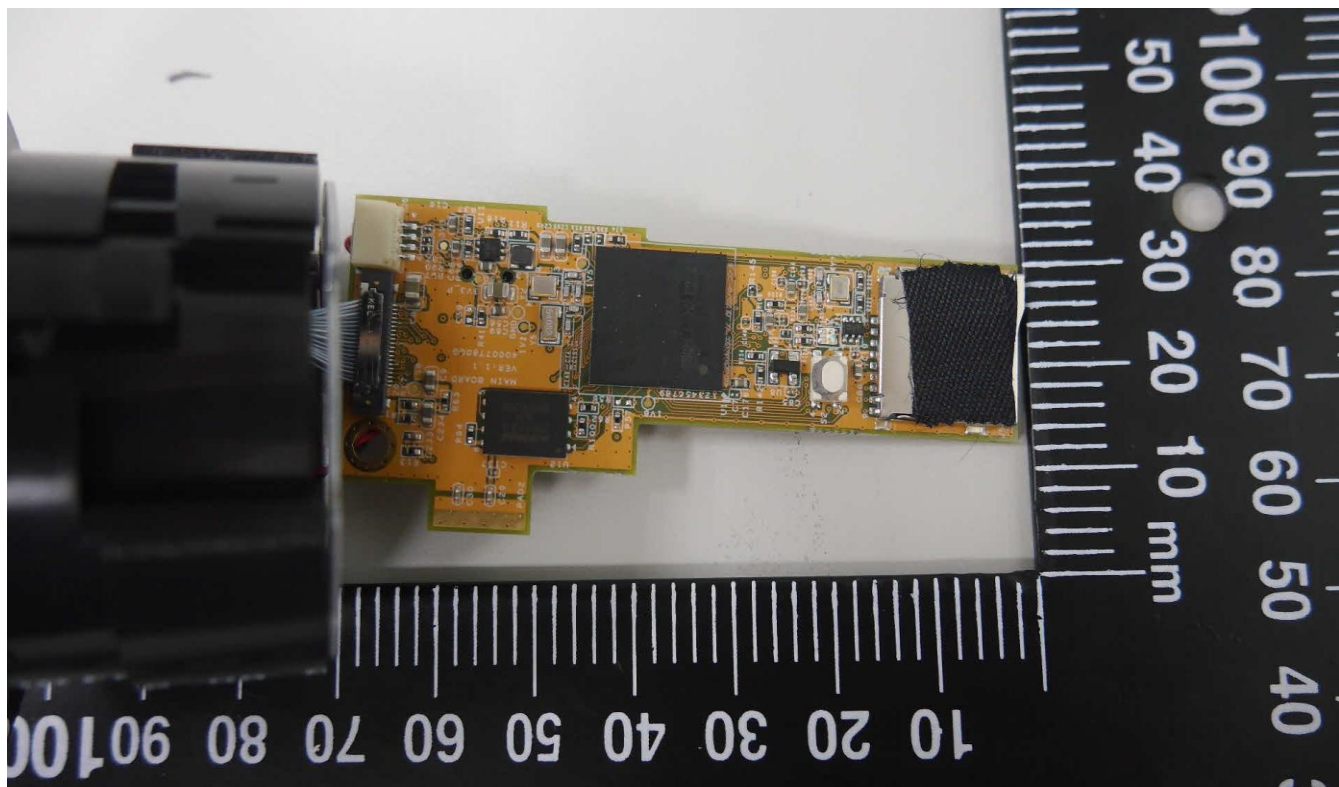


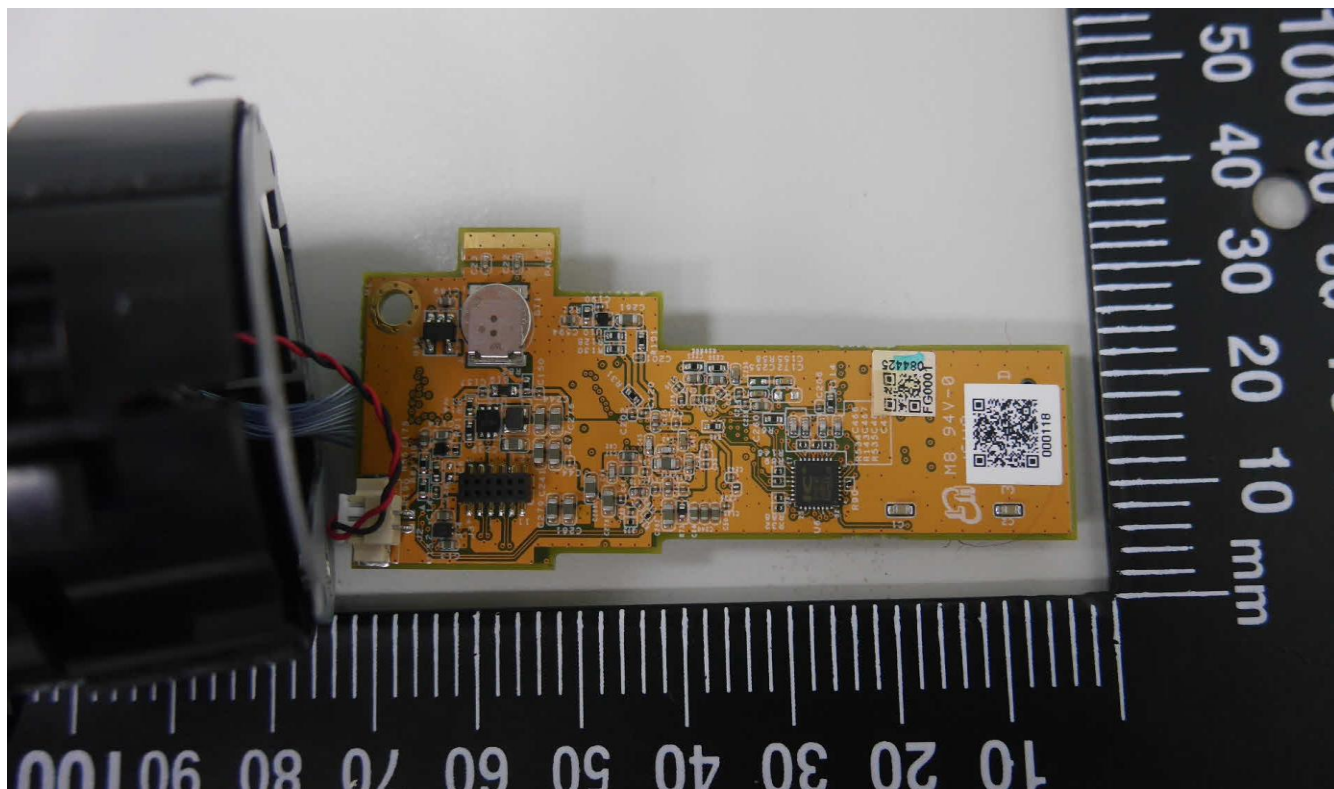


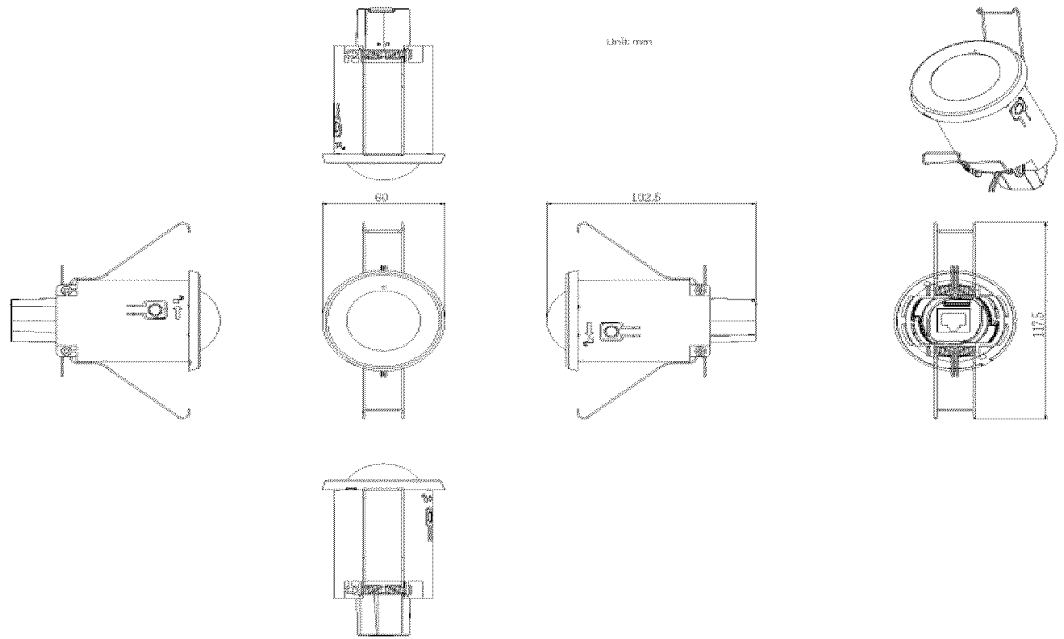








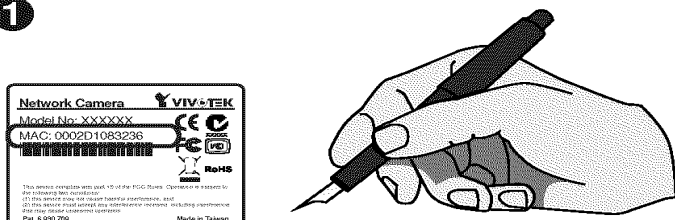




### Hardware Installation

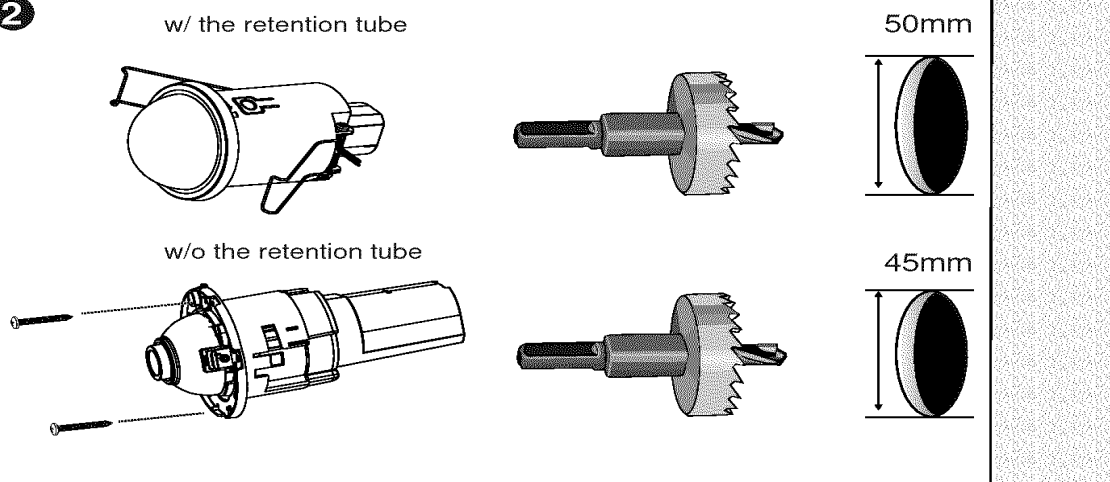
1. Jot down the camera's MAC address for later reference. This is important if you have multiple cameras at one installation site.

1

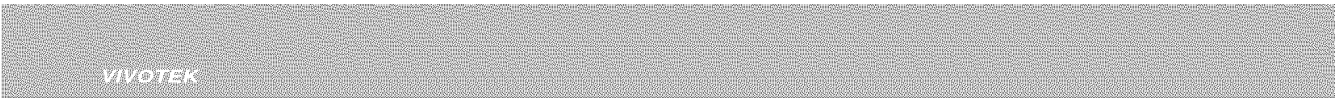


Drill a hole on ceiling or wall. The diameters for the installations with or without the retention tube are different.

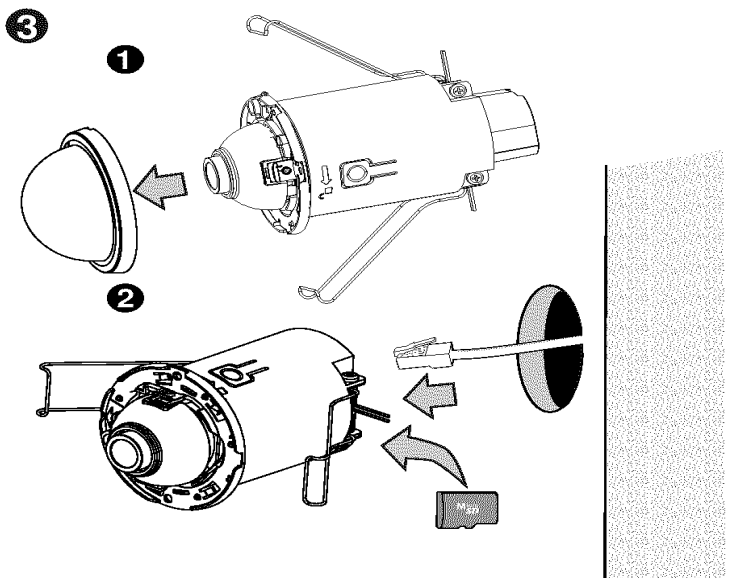
2



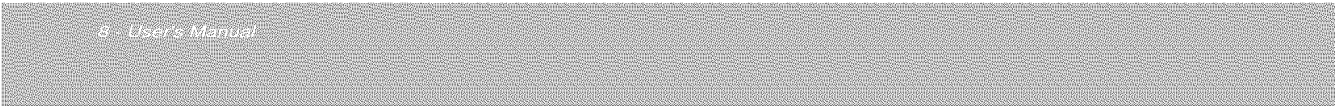
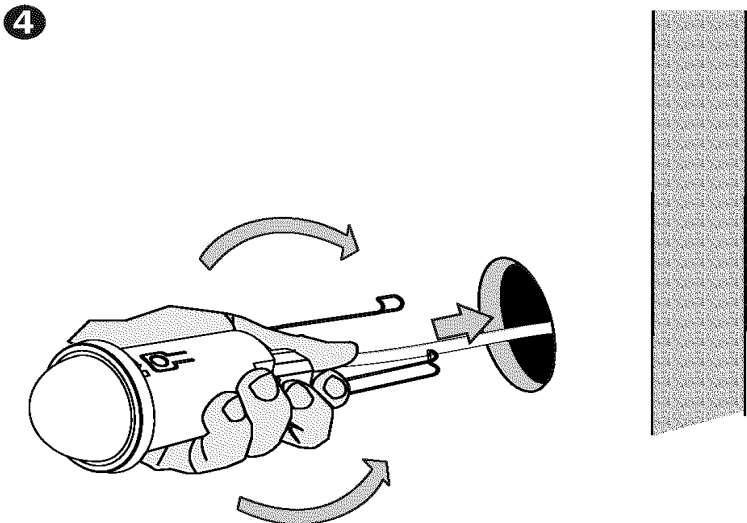
Use the M3 self tapping screws if installed without the retention tube. Note that this type of installation does not apply to hard surfaces, such as a concrete wall.



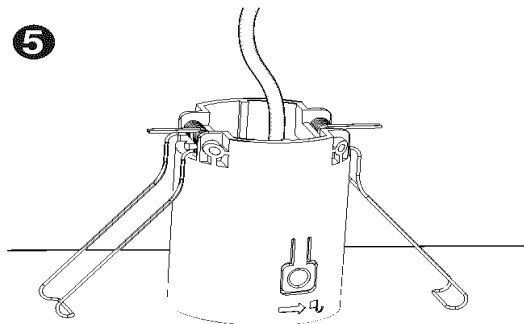
- 3-1. Detach the top cover.
- 3-2. Route an Ethernet cable through the pre-drill hole and then connect it to the camera. The camera can only be powered through PoE connection. If preferred, install a MicroSD card.



- 4. Pull the retention clips to the back of the camera, and then insert the camera into the wall.

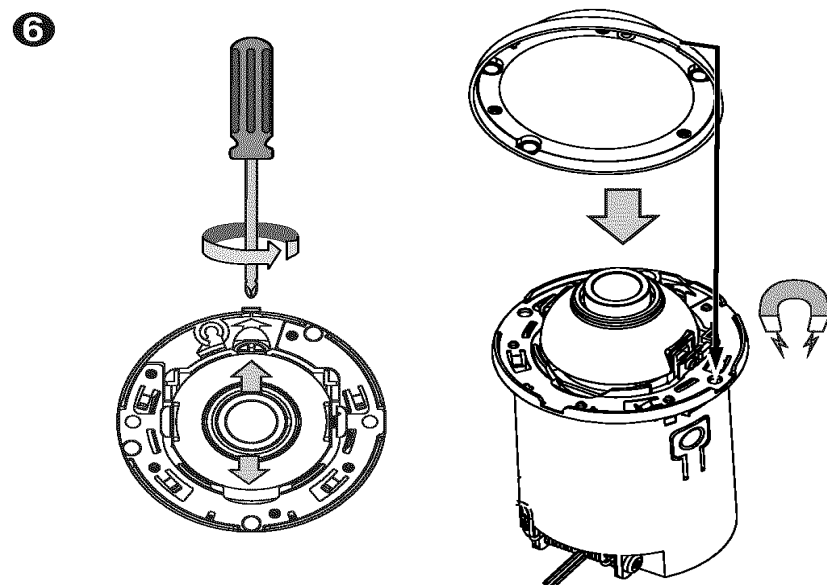


5. The retention clips will hold the module in place.



6. Note that the shooting angle of a fixed lens can only be vertically adjusted. This mark should be on top.

- 6-1. Use a small-size Phillips screwdriver to change the shooting angle of a fixed focal lens.
- 6-2. Attach the top cover to camera by aligning the notch. The magnets will hold the cover in place.



## Network Deployment

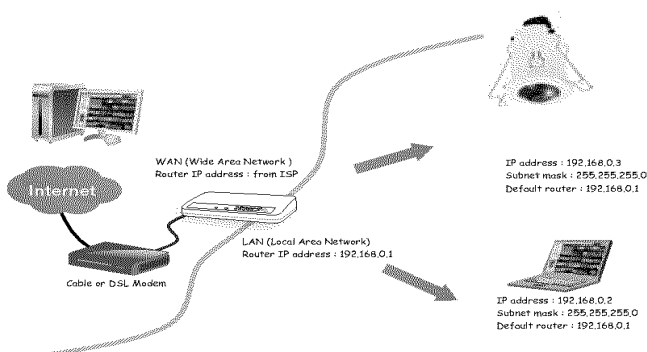
### Setting up the Network Camera over the Internet

There are several ways to set up the Network Camera over the Internet. The first way is to set up the Network Camera behind a router. The second way is to utilize a static IP. The third way is to use PPPoE.

#### Internet connection via a router

Before enabling the access to the Network Camera over the Internet, make sure you have a router and follow the steps below.

1. Connect your Network Camera behind a router, the Internet environment is illustrated below. Regarding how to obtain your IP address, please refer to Software Installation on page 14 for details.



2. In this case, if the Local Area Network (LAN) IP address of your Network Camera is 192.168.0.3, please forward the following ports for the Network Camera on the router.

- Secondary HTTP port: 8080
- RTSP port: 554
- RTP port for audio: 5558
- RTCP port for audio: 5559
- RTP port for video: 5556
- RTCP port for video: 5557

If you have changed the port numbers on the Network page, please open the ports accordingly on your router. For information on how to forward ports on the router, please refer to your router's user's manual.

3. Find out the public IP address of your router provided by your ISP (Internet Service Provider). Use the public IP and the secondary HTTP port to access the Network Camera from the Internet. Please refer to Network Type on page 58 for details.

### Internet connection with static IP

Choose this connection type if you are required to use a static IP for the Network Camera. Please refer to LAN configuration on page 58 for details.

### Internet connection via PPPoE (Point-to-Point over Ethernet)

Choose this connection type if you are connected to the Internet via a DSL Line. Please refer to PPPoE on page 78 for details.

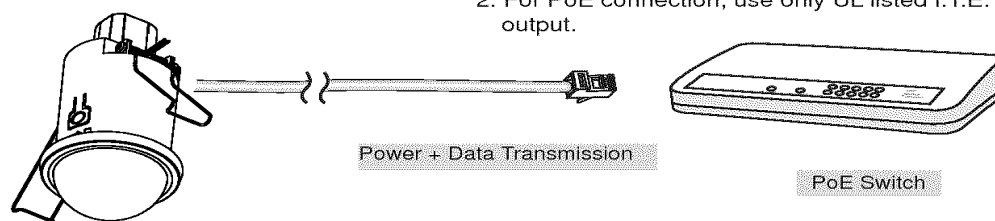
### Set up the Network Camera through Power over Ethernet (PoE)

#### When using a PoE-enabled switch

The Network Camera is PoE-compliant, allowing transmission of power and data via a single Ethernet cable. Follow the below illustration to connect the Network Camera to a PoE-enabled switch via an Ethernet cable.

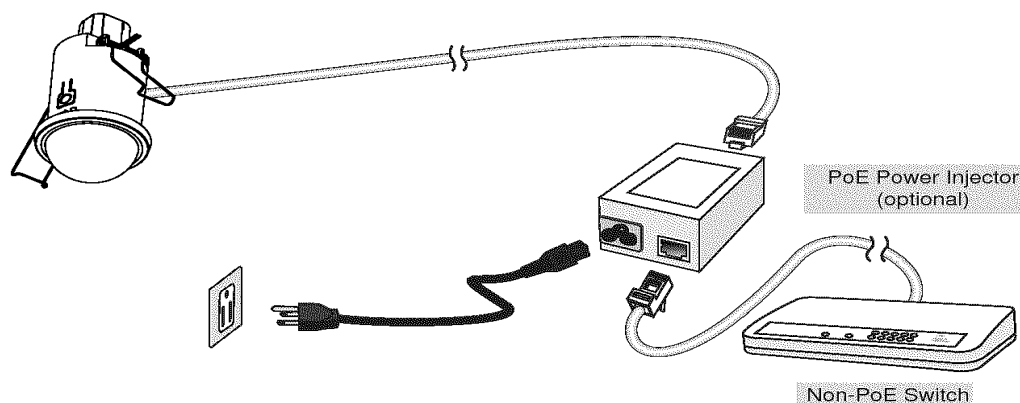
#### NOTE:

1. The camera is only to be connected to PoE networks without routing to outside plants.
2. For PoE connection, use only UL listed I.T.E. with PoE output.



#### When using a non-PoE switch

If your switch/router does not support PoE, use a PoE power injector (optional) to connect between the Network Camera and a non-PoE switch.



**Test Record No. 1**

-- The manufacturer submitted representative production sample of Network Camera. Model FD816C-HF2.

-- Only the test checked in "List of Tests" pages were deemed necessary.

-- All tests were conducted under WTDP by Wendell Industrial Co., LTD; Located on 5F, No. 4, Baociao Rd., Sin-Dian District, New Taipei City 231, Taiwan.

The following tests were conducted:

Test	Testing Location/Comments
End Product Reference Page	
General Guidelines	
Input: Single-Phase (1.6.2)	
SELV Reliability Test Including Hazardous Voltage Measurements (2.2.2, 2.2.3, 2.2.4, Part 22 6.1)	
Limited Power Source Measurements (2.5)	
Steady Force (4.2.1 - 4.2.4)	
Impact (4.2.5, 4.2.1, Part 22 10.2)	
Stress Relief (4.2.7, 4.2.1)	
Loading - Wall and Ceiling Mounted Equipment (4.2.10)	
Heating (4.5.1, 1.4.12, 1.4.13)	
Overload of Operator Accessible Connector (5.3.7)	

Test results are valid only for the tested equipment. These tests are considered representative of the products covered by this Test Report. The test methods and results of the above tests have been reviewed and found to be in accordance with the requirements in the Standard(s) referenced at the beginning of this Test Report.

The following supplements are provided as a part of this Test Record. NOTE: These supplements are only available to the Applicant via the CDA system.

Type	Supplement Id	Description
Attachment	2-01	CRD
Datasheet	2-02	Datasheet

**Test Record No. 2**

- The manufacturer submitted representative production samples of Network Camera, Model FD816C-HF2 employing (1) Add new model : FD816CA-HF2; (2) Alternate one main board for new model.

- Only limited test were performed due to testing previously performed on the subject unit.

- All tests were conducted by Wendell Industrial Co.,Ltd located at Xindian Dist., New Taipei City, Taiwan under WTDP program.

The following tests were conducted:

Test	Testing Location/Comments
End Product Reference Page	
General Guidelines	
Input: Single-Phase (1.6.2)	
SELV Reliability Test Including Hazardous Voltage Measurements (2.2.2, 2.2.3, 2.2.4, Part 22 6.1)	
Stress Relief (4.2.7, 4.2.1)	
Heating (4.5.1, 1.4.12, 1.4.13)	
Component Failure (5.3.1, 5.3.4, 5.3.7)	
Overload of Operator Accessible Connector (5.3.7)	

Test results are valid only for the tested equipment. These tests are considered representative of the products covered by this Test Report. The test methods and results of the above tests have been reviewed and found to be in accordance with the requirements in the Standard(s) referenced at the beginning of this Test Report.

The following supplements are provided as a part of this Test Record. NOTE: These supplements are only available to the Applicant via the CDA system.

Type	Supplement Id	Description
Attachment	2-03	CRD
Datasheet	2-04	Data sheet