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Please note, Follow-Up Procedure Revisions or Report Revisions do not include Authorization Pages, Indices, Section General, and/or Appendices unless revisions were required or requested.

Should you have any questions, after reviewing the material, or need to report any inaccuracies, please reach out to your UL representative or find UL contact details for your local Customer Service Department at <https://www.ul.com/about/locations>.

Please find attached the related material

For your convenience, the below describes the related updates:

For revised documentation, please reference 2022-11-15 in the page headings.

E158873-volX13-Index
E158873-20210620-CertificateofCompliance
E158873-A6075-DescriptionUL
Figure-39-Total
E158873-A6075-TestRecordUL

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Times change, Trust Remains™

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NETWORK VIDEO ENCODER	SPE-420	E158873-A6133-UL	
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SECURITY LED MONITOR	SMT-2212	E158873-A6140-UL	

# CERTIFICATE OF COMPLIANCE

**Certificate Number** UL-US-2131256-1  
**Report Reference** E158873-20210620  
**Date** 15-Nov-2022

**Issued to:** Hanwha Techwin Co Ltd  
6, Pangyo-ro 319beon-gil, Bundang-gu Seongnam-si,  
Gyeonggi-do 13488  
Republic of Korea

**This is to certify that representative samples of** AZOT - Audio/Video, Information and Communication Technology Equipment  
See Addendum Page for Product Designation(s).

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

**Standard(s) for Safety:** UL 62368-1, 2nd Ed., Issue Date: 2014-12-01

**Additional Information:** See the UL Online Certifications Directory at <https://iq.ulprospector.com> for additional information

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

  
Deborah Jennings-Conner, VP Regulatory Services  
UL LLC



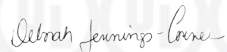
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# CERTIFICATE OF COMPLIANCE

Certificate Number UL-US-2131256-1  
Report Reference E158873-20210620  
Date 15-Nov-2022

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

Model	Category Description
TNO-7180R	NETWORK CAMERA
TNO-7180RLP	NETWORK CAMERA

  
Deborah Jennings-Conner, VP Regulatory Services  
UL LLC



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# CERTIFICATE OF COMPLIANCE

**Certificate Number** UL-CA-2126073-1  
**Report Reference** E158873-20210620  
**Date** 15-Nov-2022

**Issued to:** Hanwha Techwin Co Ltd  
6, Pangyo-ro 319beon-gil, Bundang-gu Seongnam-si,  
Gyeonggi-do 13488  
Republic of Korea

**This is to certify that representative samples of** AZOT7 - Audio/Video, Information and Communication Technology Equipment Certified for Canada  
See Addendum Page for Product Designation(s).

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

**Standard(s) for Safety:** CSA C22.2 No. 62368-1-14, 2nd Ed., Issue Date: 2014-12-01

**Additional Information:** See the UL Online Certifications Directory at <https://iq.ulprospector.com> for additional information

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

  
Deborah Jennings-Conner, VP Regulatory Services  
UL LLC



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# CERTIFICATE OF COMPLIANCE

Certificate Number UL-CA-2126073-1  
Report Reference E158873-20210620  
Date 15-Nov-2022

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

Model	Category Description
TNO-7180R	NETWORK CAMERA
TNO-7180RLP	NETWORK CAMERA

  
Deborah Jennings-Conner, VP Regulatory Services

UL LLC



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## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 62368-1, 2nd Ed, 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1-14, 2nd Ed, Issued: 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements)
<b>Certification Type:</b>	Listing
<b>CCN:</b>	AZOT, AZOT7 (Audio/video, Information and Communication Technology Equipment)
<b>Complementary CCN:</b>	N/A
<b>Product:</b>	NETWORK CAMERA
<b>Model:</b>	TNO-7180R, TNO-7180RLP
<b>Rating:</b>	12 Vdc, 4.0 A or PoE (55 Vdc), 0.92 A
<b>Applicant Name and Address:</b>	HANWHA TECHWIN CO LTD 6, PANGYO-RO 319BEON-GIL, BUNDANG-GU SEONGNAM-SI GYEONGGI-DO 13488 KOREA

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.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared By: Lawrence Lee / Project Handler      Reviewed By: SeulKi Park / Reviewer

### 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

NETWORK CAMERA has been designed for INDOOR use and integrated a bracket for wall or ceiling mount. It is a commercial equipment supplied from 12 Vdc or PoE (Power over Ethernet) and installed by service personnel.

### Model Differences

TNO-7180R is basic model.

TNO-7180RLP is identical to basic model except model designation.

### Test Item Particulars

Classification of use by	Instructed person
Supply Connection	External Circuit - not Mains connected ES1
Supply % Tolerance	None
Supply Connection – Type	DC or PoE (Power over Ethernet)
Considered current rating of protective device as part of building or equipment installation	N/A
Equipment mobility	wall-mounted
Over voltage category (OVC)	OVC I
Class of equipment	Class III
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	55
IP protection class	IPX0
Power Systems	N/A
Altitude during operation (m)	2000 m or less
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	4.76

### Technical Considerations

- ☐ The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 55
- ☐ The product is intended for use on the following power systems : No direct connection
- ☐ Considered current rating of protective device as part of the building installation (A) : N/A
- ☐ Mains supply tolerance (%) or absolute mains supply values : No direct connection
- ☐ The Risk Group of a lamp or lamp system (including LEDs) is : RG 1
- ☐ The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual

**Additional Information**

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- Maximum Normal Load: Continuous operation with IR LED, Fan and Heater on.

4790638801

- Add model name; TNO-7180RLP/

**Additional Standards**

The product fulfills the requirements of: N/A

**Markings and Instructions**

Clause Title	Marking or Instruction Details
Equipment identification marking – Manufacturer identification	Listee's or Recognized companys name, Trade Name, Trademark or File Number
Equipment identification marking – model identification	Model Number
Equipment rating marking – ratings	"Input Ratings (voltage, frequency/dc, current/power)", "Output Ratings (voltage, frequency/dc, current/power)"
Website Manual -1	Website Manual -1 This product is intended to be supplied by a Listed Power Supply Unit marked "Class 2" or "LPS" or "PS2" and rated from 12 Vdc, 4.0 A or PoE (55 Vdc), 0.92 A.
Website Manual -2	The wired LAN hub providing power over the Ethernet (PoE) in accordance with IEEE 802.3.at shall be a UL Listed device with the output evaluated as a Limited Power Source as defined in UL60950-1 or PS2 as defined in UL62368-1.
Hard Copy	A. IMPORTANT B. Please check 'Manuals' from our website, before connecting to the supply. C. Company website URL ( <a href="https://www.~~">https://www.~~</a> )

**Special Instructions to UL Representative**

N/A

<b>BD1.0</b>	<b>TABLE: Production-Line Testing Requirements</b>					
<b>BD1.1</b>	<b>Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information.</b>					
Model	Component	Removable parts	Test probe location	Test V rms	Test V dc	Test Time, s
N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>BD1.2</b>	<b>Earthing Continuity Test Exemptions – This test is not required for the following models:</b>					
	All models					
<b>BD1.3</b>	<b>Electric Strength Test Exemptions – This test is not required for the following models:</b>					
	All models					
<b>BD1.4</b>	<b>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.</b>					
	All models					

<b>BE1.0</b>	<b>Sample and Test Specifics for Follow-Up Tests at UL</b>				
Model	Component	Material	Test	Sample (s)	Test Specifics
N/A	N/A	N/A	N/A	N/A	N/A

4.1.2	TABLE: List of critical components					Pass
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Product Category CCN(s)	Mark(s) of conformity	Supplement ID
Enclosure - Front cover (Metal)	Interchangeable	Interchangeable	Aluminium, Min. 1.5 mm thickness, See enclosure for more detail.	-	Tested in equipment	
Enclosure – Body (Metal)	Interchangeable	Interchangeable	Aluminium, Min. 2.5 mm thickness, See enclosure for more detail.	-	Tested in equipment	
Enclosure - Bracket (Metal)	Interchangeable	Interchangeable	Aluminium, Min. 3.0 mm thickness, See enclosure for more detail.	-	Tested in equipment	
Enclosure - Front Lens Cover (Plastic)	CHI MEI CORPORATION	PC-6715VT(f1)(a)	Min. 2.0 mm thickness, rated Min. V-0, 115 deg. C.	QMFZ2	UL (E56070)	
Internal Plastic Part	LOTTE CHEMICAL CORPORATION	HN-1068(+)(f1)	Min. 1.6 mm thickness, rated Min. V-0, 130 deg. C.	QMFZ2	UL (E115797)	
Lens Module (Include 3 stepping motors)	ZMAX	F130X-5	Max. 5 Vdc (Motors)	-	Tested in equipment	
Transformer(T1)	DONG IN SYSTEM CO LTD	SNP-6320RH-T1	130 deg. C, See enclosure for more detail.	-	Tested in equipment	
Transformer(T1) - Alternate	DONG HEUNG ELECTRONICS CO LTD	SNP-6320RH-T1	130 deg. C, See enclosure for more detail.	-	Tested in equipment	
Transformer (L32)	DONG IN SYSTEM CO LTD	SNP-6320RH-L32	130 deg. C, See enclosure for more detail.	-	Tested in equipment	

Transformer (L32) - Alternate	DONG HEUNG ELECTRONICS CO LTD	SNP-6320RH-L32	130 deg. C, See enclosure for more detail.	-	Tested in equipment	
Line Filter (LF1)	TNC CO.,LTD	CV620180SH	Rated Min. 18.0 mH, Base: V-0, See enclosure for more detail.	-	Tested in equipment	
Line Filter (LN1)	TNC CO.,LTD	CV36045USA2	Rated Min. 0.45 mH, Base: V-0, See enclosure for more detail.	-	Tested in equipment	
Optocoupler (PC1, PC2)	LITE-ON Technology Corporation	LTV-817	Isolation Voltage: 5300. Max. Operation Temperature:110 deg. C	FPQU2	UL (E113898)	
Optocoupler (PC1, PC2) - Alternate	EVERLIGHT ELECTRONICS CO LTD	EL817	Isolation Voltage: 5000. Max. Operation Temperature:110 deg. C	FPQU2	UL (E214129)	
Lithium Battery (BAT1)	SEIKO INSTRUMENTS INC MICRO-ENERGY DIV	ML414H	Rechargeable, Lithium (Coin), Rechargeable, Max. Charging Voltage: 3.4 Vdc, Max. Charging Current: 300 mAh	BBCV2	UL (MH15628)	
Fuse (Power board_F1)	ORISEL CO LTD	OS5	250 V, 6.3 A	JDYX2	UL (E126056)	
Fuse (Backbox board_F1)	LITTELFUSE INC	452*\$, 454*	75V, 7.0 A	JDYX2	UL (E10480)	
DC Fan	HUI TONG ELECTRONIC CO LTD	HTD-025(X)12L	12 Vdc, 0.06 A	GPWV2/8	UL (E311396)	
Heater Resister (31 ea, R4 to R33, R35)	Interchangeable	Interchangeable	5.6 ohm, 0.12W	-	Tested in equipment	

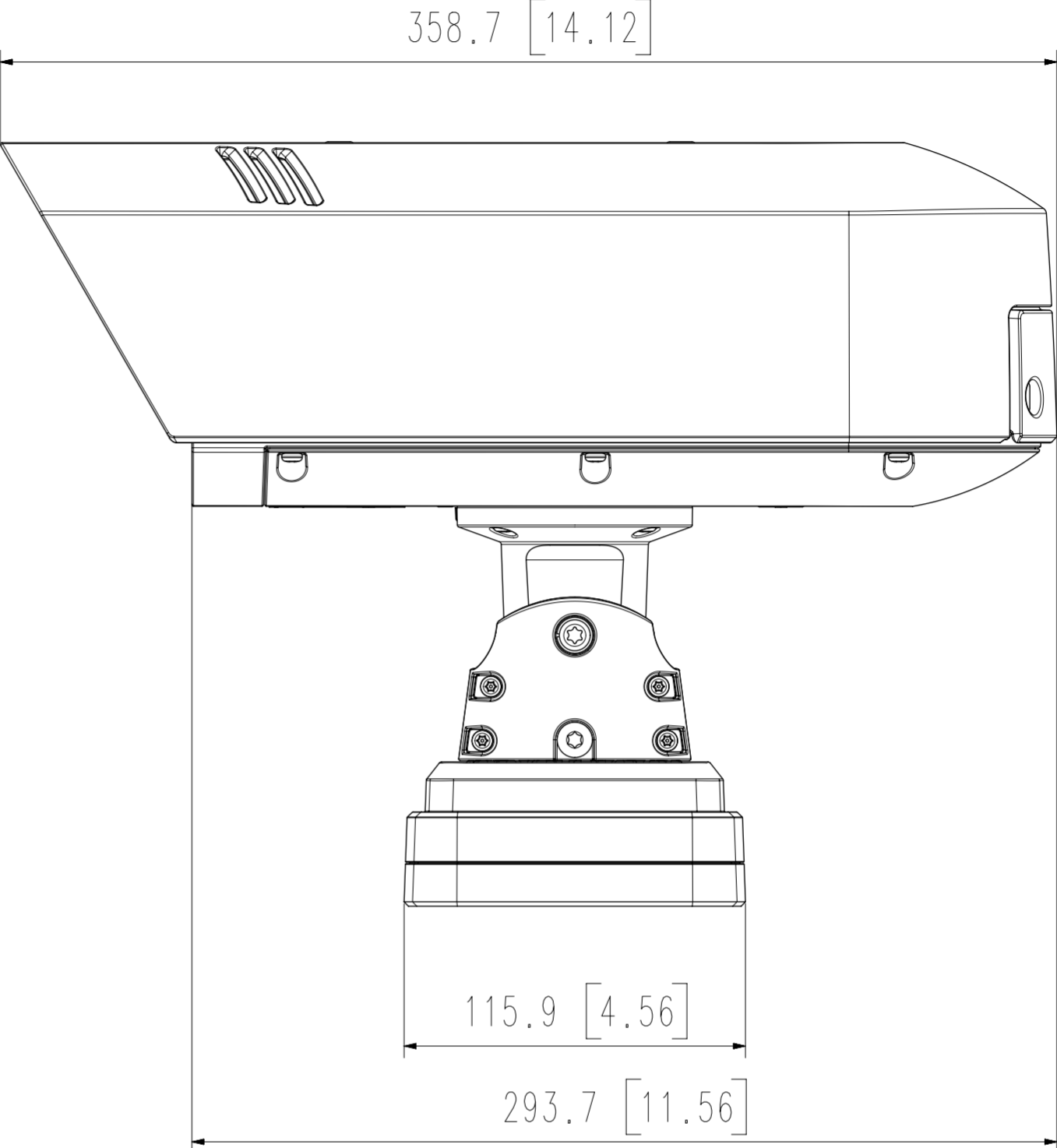
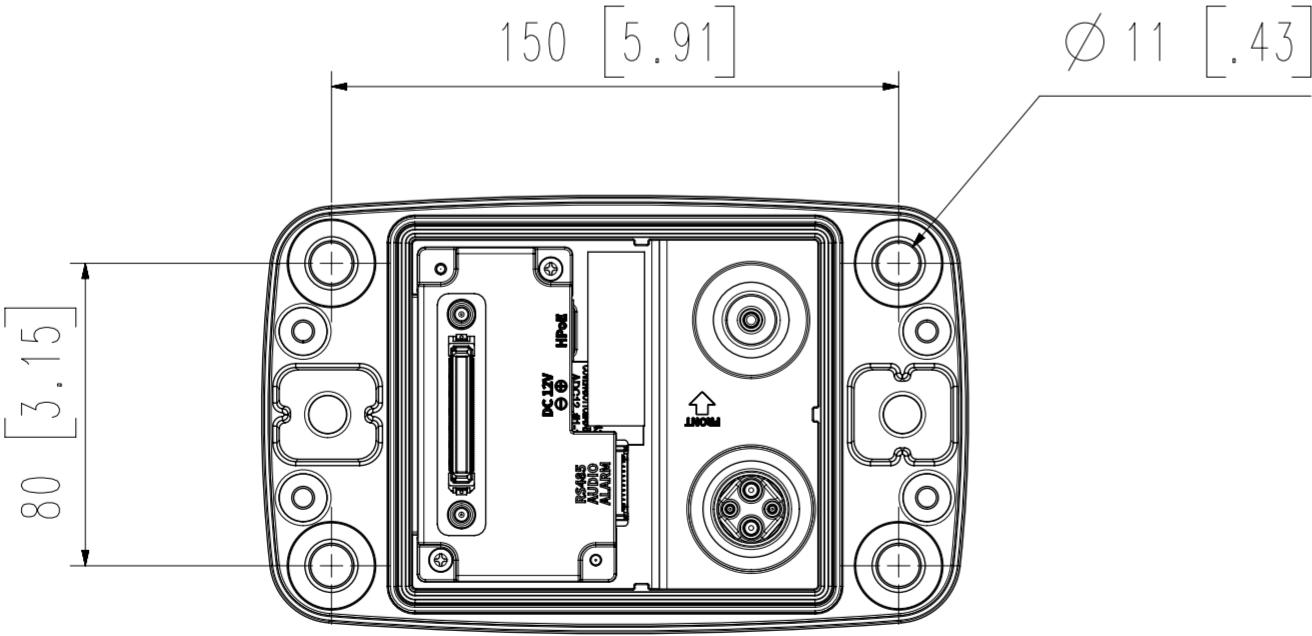
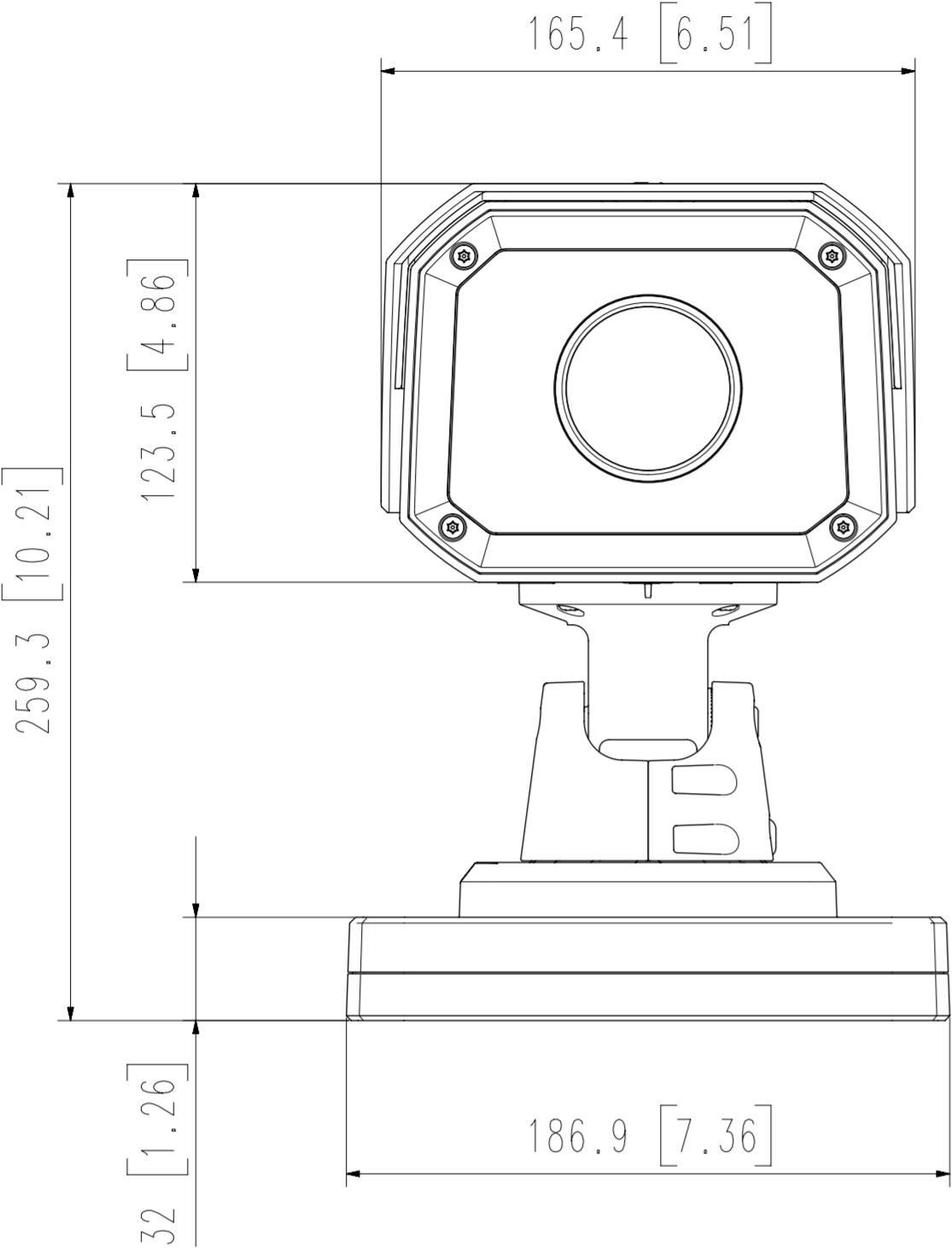
Thermal Pad	KOMOTECH CO LTD	KGP-1(a)	Rated V-0, min. 0.2 mm thickness, 150 deg. C	QMFZ2/8	UL (E245303)	
Internal Wiring	Interchangeable	Interchangeable	Marked VW-1	AVLV2	UL	
Connectors and Receptacles	Interchangeable	Interchangeable	Min. V-2	ECBT2	UL	
Connectors and Receptacles - Alternate	Interchangeable	Interchangeable	Copper alloy pins housed in bodies of plastic rated Min. V-2	QMFZ2	UL	
PWB	HANNSTAR BOARD CORP	MV-1	Min. V-1, 130 deg. C.	ZPMV2	UL	
PWB - Alternate	Interchangeable	Interchangeable	Min. V-1, Min 105 deg. C.	ZPMV2	UL	
FPWB	Interchangeable	Interchangeable	Min. V-0, 80 deg. C.	QMFZ2 or QMTS2	UL	
Outdoor Label	Interchangeable	Interchangeable	Max Temp 100 deg. C, Min Temp -40 deg. C	PGDQ2 or PGJI2	UL	
LED_ IR-LED Right board (LD1 to LD3), IR-LED Left board (LD1 to LD3) (Total 6ea)	OSRAM	SFH4715AS	Vf = Max. 4.7 V, If = Max. 3 A	-	-	

### Enclosures

Type	Supplement Id	Description
Photographs	03-01	External View - 1
Photographs	03-02	External View - 2
Photographs	03-03	Internal View - 1
Photographs	03-04	Internal View - 2
Photographs	03-05	Internal View - 3
Photographs	03-06	Internal View - 4
Photographs	03-07	Lens Module - 1
Photographs	03-08	Lens Module - 2
Photographs	03-09	Lens Module - 3
Photographs	03-10	Heater board
Photographs	03-11	Fan
Photographs	03-12	IR-LED Left board
Photographs	03-13	IR-LED Right board
Photographs	03-14	Sensor board Top
Photographs	03-15	Sensor board Bottom
Photographs	03-16	Drive board Top
Photographs	03-17	Drive board Bottom
Photographs	03-18	Interface board Top
Photographs	03-19	Interface board Bottom
Photographs	03-20	Back box board Top
Photographs	03-21	Back box board Bottom
Photographs	03-22	Main board Top
Photographs	03-23	Main board Bottom
Photographs	03-24	LED Driver board
Photographs	03-25	Power board Top
Photographs	03-26	Power board Bottom
Photographs	03-27	Connection board Top
Photographs	03-28	Connection board Bottom
Diagrams	04-01	Enclosure Dimension
Manuals	06-01	Manual
Miscellaneous	07-01	Transformer (T1) specification - Dong Heung Electronics Co., LTD.
Miscellaneous	07-02	Transformer (T1) specification - Dong In System Co., LTD.
Miscellaneous	07-03	Transformer (L32) specification - Dong Heung Electronics Co., LTD.

Miscellaneous	07-04	Transformer (L32) specification - Dong In System Co., LTD.
Miscellaneous	07-05	Line Filter (LF1) Specifications - TNC Co., LTD.
Miscellaneous	07-06	Line Filter (NL1) Specifications - TNC Co., LTD.
Miscellaneous	07-07	Dual language safety labeling CRD
Miscellaneous	07-08	Label
Miscellaneous	07-09	IEC 62471 Label

The following Page(s) are related to Diagrams-01. The next supplement, if applicable, will be identified with a new Supplement Page Heading.



1	TNO-7180R	'21.04.29
No.	MODEL NAME	DATE
Unit:mm[inch]	SCALE:1/2	Hanwha Techwin

The following Page(s) are related to Manuals-01. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

## IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean the contaminated area on the product surface with a soft, dry cloth or a damp cloth. (Do not use a detergent or cosmetic products that contain alcohol, solvents or surfactants or oil constituents as they may deform or cause damage to the product.)
7. Do not block any ventilation openings, Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/ accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/ apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lighting storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. This product is intended to be supplied by a Listed Power Supply Unit marked "Class 2" or "LPS" and rated from 12 Vdc, 4.0A / PoE(55 Vdc), 0.92A
16. This product is intended to be supplied by isolation power.
17. If you use excessive force when installing the product, the camera may be damaged and malfunction. If you forcibly install the product using non-compliant tools, the product may be damaged.
18. Do not install the product in a place where chemical substances or oil mist exists or may be generated. As edible oils such as soybean oil may damage or warp the product, do not install the product in the kitchen or near the kitchen table. This may cause damage to the product.
19. When installing the product, be careful not to allow the surface of the product to be stained with chemical substance. Some chemical solvents such as cleaner or adhesives may cause serious damage to the product's surface.
20. If you install/disassemble the product in a manner that has not been recommended, the production functions/ performance may not be guaranteed. Install the product by referring to "Installation & connection" in the user manual.

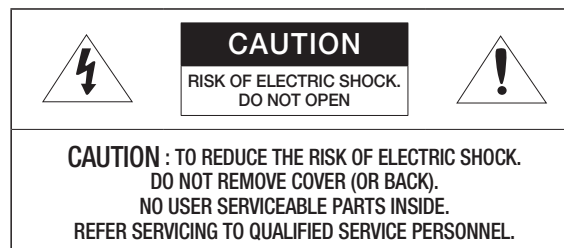


21. Installing or using the product in water can cause serious damage to the product.
22. This device has been verified using STP cable. The use of appropriate GND grounding and STP cable is recommended to effectively protect your product and property from transient voltage, thunderstroke, communication interruption.

## WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECT THROUGH THE VENTILATION GRILLS OR OTHER OPENINGS ON THE EQUIPMENT.

## CAUTION



## EXPLANATION OF GRAPHICAL SYMBOLS



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Class I construction

An apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

Battery

Batteries(battery pack or batteries installed) shall not be exposed to excessive heat such as sunshine, fire or the like.

The battery cannot be replaced.

Disconnection Device

Disconnect the main plug from the apparatus, if it’s defected. And please call a repair man in your location.

When used outside of the U.S., it may be used HAR code with fittings of an approved agency is employed.

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.  
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

ATTENTION

IL Y A RISQUE D’EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UNE BATTERIE DE TYPE INCORRECT.  
METTRE AU REBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS.

CAUTION

These servicing instructions are for use by qualified service personnel only.  
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

Please use the input power with just one camera and other devices must not be connected.

When a new product box is opened (or during the initial use of the product), moisture might build up on the glass of the camera. The built-up moisture disappears naturally within a few hours after powered on.

Do not arbitrarily loosen or tighten the gore valve.

The ITE is to be connected only to PoE networks without routing to the outside plant.

The wired LAN hub providing power over the Ethernet (PoE) in accordance with IEEE 802.3bt shall be a UL Listed device with the output evaluated as a Limited Power Source as defined in UL60950-1 or PS2 as defined in UL62368-1.

Unit is intended for installation in a Network Environment 0 as defined in IEC TR 62102.  
As such, associated Ethernet wiring shall be limited to inside the building.

Please read the following recommended safety precautions carefully.

- Do not place this apparatus on an uneven surface.
- Do not install on a surface where it is exposed to direct sunlight, near heating equipment or heavy cold area.
- Do not place this apparatus near conductive material.
- Do not attempt to service this apparatus yourself.
- Do not install near any magnetic sources.
- Do not block any ventilation openings.
- Do not place heavy items on the product.
- Please wear protective gloves when installing/removing the camera.  
The high temperature of the product surface may cause a burn.
- When connecting the HPoE injector to the external Internet, use either one of network cable port (LAN) or fiber optic port (SFP) but not both.

User’s Manual is a guidance book for how to use the products.

The meaning of the symbols are shown below.

- Reference : In case of providing information for helping of product’s usages
- Notice : If there’s any possibility to occur any damages for the goods and human caused by not following the instruction

※ Please read this manual for the safety before using of goods and keep it in the safe place.

We do not guarantee the quality of third-party products (e.g. lenses, accessories) that you separately purchase.

In particular installation environments, there might be interference in radio communications. When interference of electromagnetic waves occurs between the product and radio communication device, it is recommended to keep a certain distance between the two or change the direction of the receiving antenna.

WARNING

To Prevent damage which may caused by IR LED, don’t stare at operating lamp.  
For below models only.

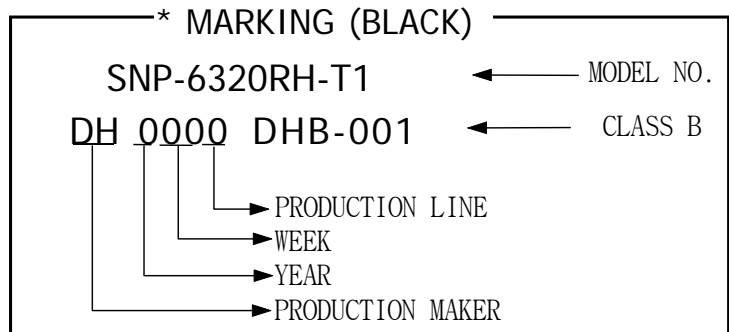
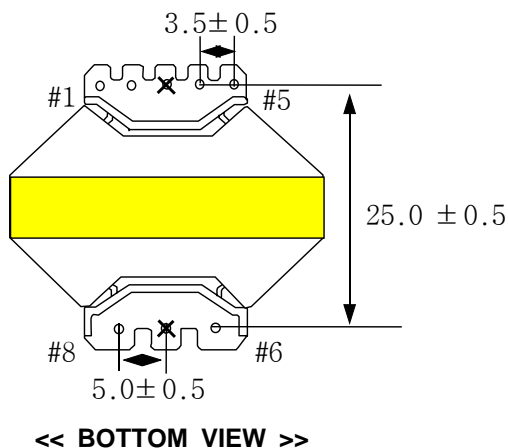
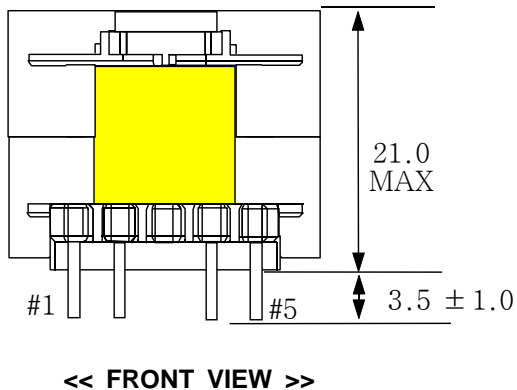
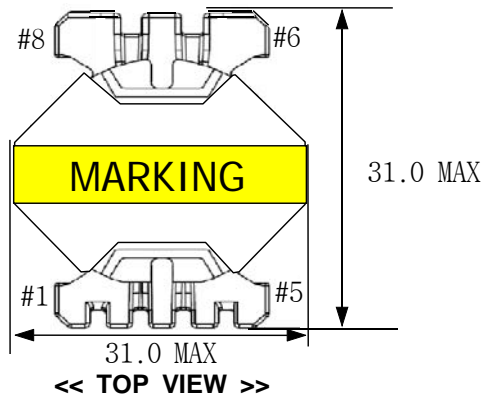
TNO-7180R

Risk Group 1
NOTICE IR emitted from this product. Use appropriate shielding or eye protection.
Product tested against IEC 62471

The following Page(s) are related to Miscellaneous-01. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

SPECIFICATION		SHEET NO.	1 OF 16
		D A T E	2014. 10. 14.
PART NAME	TRANS	MODEL NAME	SNP-6320RH-T1
CODE NO.	MSS10-404C	DESCRIPTION	RM10

## 1. APPEARANCE &amp; DIMENSION (UNIT:mm)

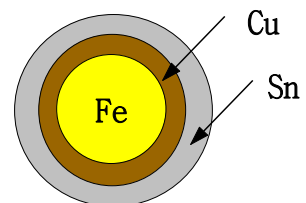
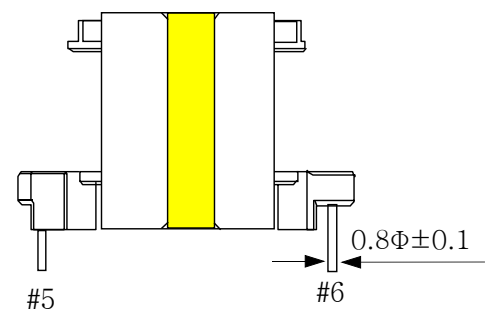


※ PRODUCTION LINE

1. A : CHUN AN

2. B : BAZHOU

3. Y : YANTAI

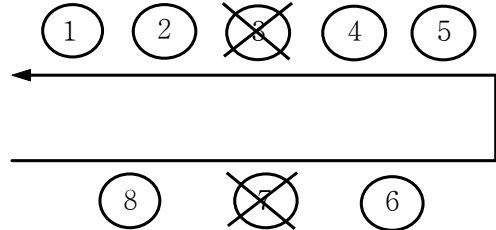
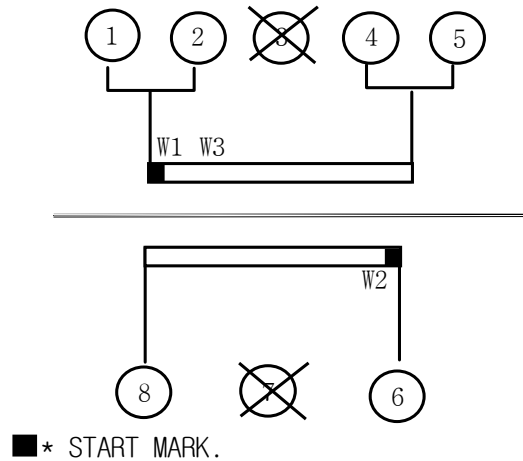


※ PIN LENGTH: BEFORE SOLDERING

NO	REVISION	DATE	CHECK	DRAWN	CHECKED	APPROVED
1						
2						
3						
4						

SPECIFICATION		SHEET NO.	2 OF 16
		D A T E	2014. 10. 14.
PART NAME	TRANS	MODEL NAME	SNP-632ORH-T1
CODE NO.	MSS10-404C	DESCRIPTION	RM10

## 2. WINDING SPECIFICATION



WINDING	BOTTOM VIEW	C.C.W
REMOVED PIN	#3,7	
CUT PIN		
N.C PIN		
TUBE		

## 3. WINDING SPECIFICATION

NO	TERMINAL		WIRE	TURNS	WINDING METHOD	INSULATION			BARRIER	
	S	F				MATERIAL	T/W	TS	TOP	BOTTOM
W1	1,2	4,5	USTC 0.1ØX30#X2	12 T	SOLENOID	POLYESTER TAPE	0.025/10.5	2		
W2	6	8	USTC 0.1ØX40	10 T	SOLENOID	POLYESTER TAPE	0.025/10.5	2		
W3	1,2	4,5	USTC 0.1ØX30#X2	12 T	SOLENOID	POLYESTER TAPE	0.025/10.5(Y)	2		
* CORE FIX TAPE (YELLOW)						POLYESTER TAPE	0.025/7.0	3		

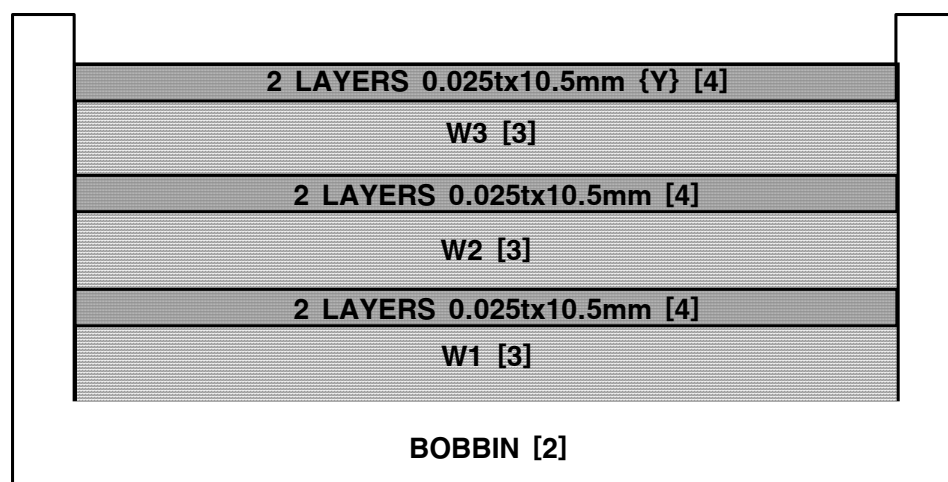
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1						
2						
3						
4						

<b>SPECIFICATION</b>		SHEET NO.	5 OF 16
		D A T E	2014. 10. 14.
PART NAME	TRANS	MODEL NAME	SNP-6320RH-T1
CODE NO.	MSS10-404C	DESCRIPTION	RM10

## 7. INTERNAL CONSTRUCTION

TOP

BOTTOM



NO GAP FERRITE CORE [1]	NO GAP FERRITE CORE [1]
-------------------------	-------------------------

↑  
**3 LAYERS**  
 0.025tx7.0mm{Y} [5]

\* WINDING



\* P.S TAPE






NO	REVISION	DATE	CHECK	DRAWN	CHECKED	APPROVED
1						
2						
3						
4						

SPECIFICATION		SHEET NO.	6 OF 16
		D A T E	2014. 10. 14.
PART NAME	TRANS	MODEL NAME	SNP-632ORH-T1
CODE NO.	MSS10-404C	DESCRIPTION	RM10

## 8. MATERIAL LIST

NO	I T E M	MATERIALS & DIMENSIONS	MANUFACTURER	REMARK
1	CORE	RM 10 PL-7, KP-4, DMR40, K2.3P, NH2B, JF4, KP4, TY40 or Equiv.	SAM HWA ELECTRONICS CO., LTD. ZAOZHUNG KINGTECH ELECTRONICS CO.,LTD. ZHEJING DONGYANG DMEGC MAGNETIC CO.,LTD ZHEJIANG LINAN HE SHUN MAGNETIC FLUX ELECTRONIC CO.,LTD. ZHEJIANG HAINING LIANFENG MAGNET INDUSTRY CO., LTD. WUXI SPINEL MAGNETICS CO.,LTD. SHANGHAI KANGSHUN MAGNETIC COMPONENT CO., LTD. Guangzhou Tongyang Electronics Co., Ltd or Equiv.	
2	BOBBIN	RM10 [8P] PHENOL (94V-0)	SUMITOMO BAKELITE CO., LTD. HITACHI CHEMICAL CO LTD	E41429 E42926
3	COPPER WIRE	USTC 0.10 $\phi$ x30# USTC 0.10 $\phi$ x40#	DONG YANG ELECTRONICS IND CO.,LTD. SHANDONG PENGTAI STOCK CO., LTD. ZHEJIANG XIANDENG ELECTRICAL APPLIANCES CO., LTD JIANGSU DARTONG M&E CO.,LTD HANGZHOU WEIFENG ELECTRONIC CO LTD	E102761 E166187 E218270 E237377 E229341
4	INSULATION TAPE	POLYESTER TAPE 0.025t x 10.5mm 0.025t x 10.5mm {YELLOW}	DUCK SUNG HITECH CO., LTD. JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD. METAL LINE CO., LTD.	E105147 E165111 E162848
5	CORE FIXING TAPE	POLYESTER TAP 0.025t x 7.0mm {YELLOW}		
6	IMPREGNATION	EPOXY	HITACHI CHEMICAL CO., LTD. KYOCERA CHEMICAL CORP SE KYE CHEMICAL CO LTD NOROO PAINT & COATINGS CO LTD	E72979 E83702 E257443 E93947
7	SOLDER BAR	SN98CU2-B20	SAMWOO METAL CO., LTD. YUNNAN TIN CO.,LTD. ASIA GENERAL ELECTRONICS CO.,LTD	
8	INK	JP-K12, K33 BON MARQUE MS-6853	HITACHI INDUSTRIAL EQUIPMENT CO.,LTD T&K TOKA CO.,LTD SHANGHAI LEADJET INKJET PRINTER TECHNIQUE CO., LTD.	
9	FLUX	SV-PBF-304 FC-113	KOKI SANEI KOREA CO.,LTD TAMURA KAKEN CORPORATION	

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The following Page(s) are related to Miscellaneous-02. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

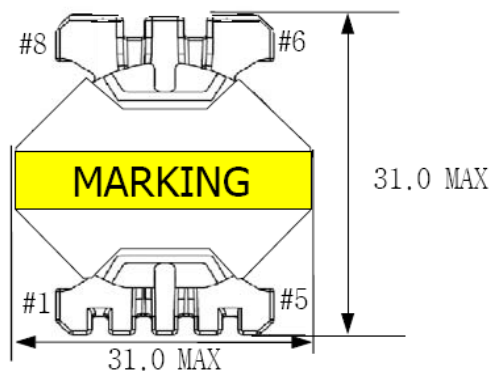
# APPROVAL SHEET

DATE 2014. 11. 07.

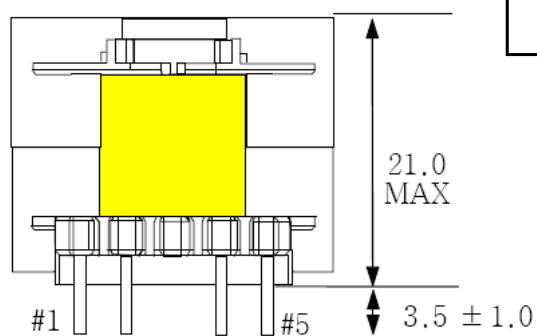
PAGE OF

CUSTOMER	M S P		
PART NAME	SWITCHING TRANS	MODEL NO.	
PART NO.	SNP-6320RH-T1	DESCRIPTION	RM10 5+3P

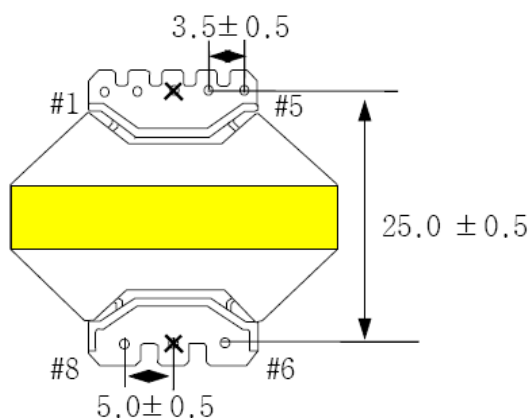
## 1. DIMENSIONS (UNIT:mm)



◎TOP VIEW◎



◎FRONT VIEW◎

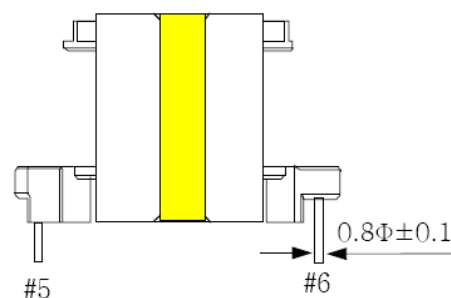


◎BOTTOM VIEW ◎

* MARKING *	
PART NO. → SNP-6320RH-T1	DIS-10B ← INSULATION SYSTEM
DONGIN AA BB ← LOT NO	← MONTH
	← YEAR
	← MAKER

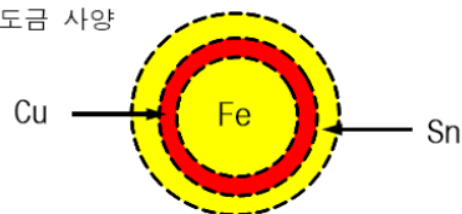
  

MARKING	
PART NO.	SNP-6320RH-T1
(LOT NO)	AA : YEAR
	BB : MONTH
MAKER	DONG IN SYSTEM
DIS-10B	INSULATION SYSTEM



◎SIDE VIEW◎

★. PIN 도금 사양



DRAWN BY	CHECK BY	APPR. BY	REVISION		DATE

DIS

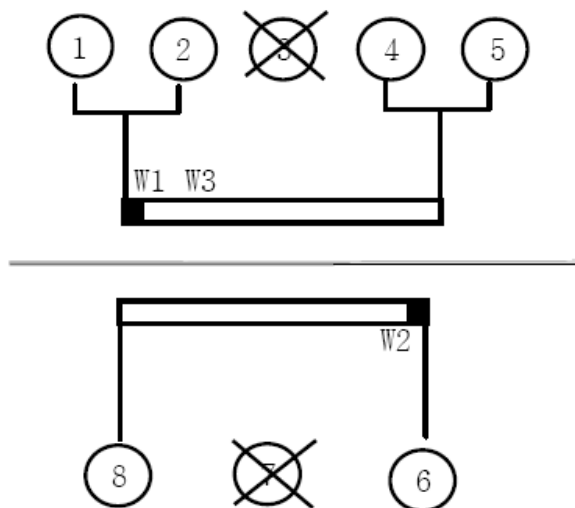
DONG - IN SYSTEM CO.,LTD.

# APPROVAL SHEET

DATE 2014. 11. 07.  
PAGE OF

CUSTOMER	M S P		
PART NAME	SWITCHING TRANS	MODEL NO.	
PART NO.	SNP-6320RH-T1	DESCRIPTION	RM10 5+3P

## 2. CONNECTION (BOTTOM VIEW)



REMOVED PIN	#3,7
CUT PIN	#
N.C PIN	#
TEFLON TUBE	#
FLUX BAND	#
DOT MARK	■ START OF WINDING

## 3. WINDING SPECIFICATION

NO	TERMINAL		WIRE	Ts	WINDING METHOD	INSULATION		BARRIER		
	S	F				MATERIAL ( t / mm )	Ts	TOP	PIN	Ts
W1	1,2	4,5	USTC 0.10Ø X 30P X 2	12	SOLENOID	POLYESTER TAPE 0.025 / 10.5	2			
W2	6	8	USTC 0.10Ø X 40P	10	SOLENOID	POLYESTER TAPE 0.025 / 10.5	2			
W3	1,2	4,5	USTC 0.10Ø X 30P X 2	12	SOLENOID	POLYESTER TAPE 0.025 / 10.5 (YELLOW)	2			
CORE FIXING TAPE				POLYESTER TAPE 0.025 / 7.0 (YELLOW)			3			

DRAWN BY	CHECK BY	APPR. BY	REVISION		DATE

# APPROVAL SHEET

DATE 2014. 11. 07.

PAGE OF

CUSTOMER	M S P		
PART NAME	SWITCHING TRANS	MODEL NO.	
PART NO.	SNP-6320RH-T1	DESCRIPTION	RM10 5+3P

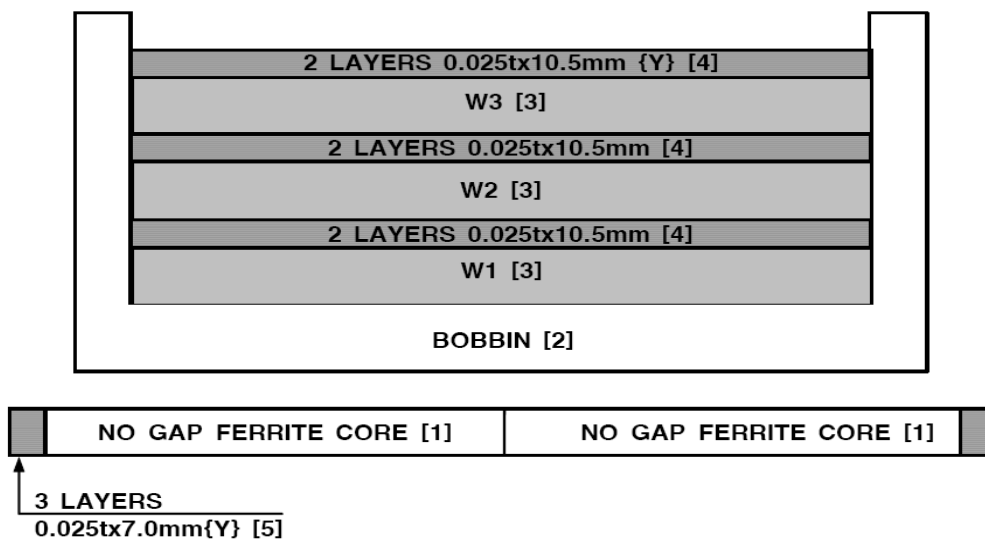
## 6. ELECTRICAL CHARACTERISTICS

NO	ITEM	TERMINAL	SPECIFICATION	REMARKS
1	INDUCTANCE	1,2 - 4,5	400 $\mu$ H $\pm$ MIN (NO GAP)	HP 4284A LCR-METER AT 1kHz 1V
2	DC RESISTANCE	1,2 - 4,5	0.09ohm MAX	HIOKI-3540 m $\Omega$ TESTER
3	WITHSTANDING VOLTAGE	P COIL - CORE	AC 1,5 KV RMS 10mA 60 SEC.	KIKUSUI TOS8850
4	INSULATION RESISTANCE	P COIL - S COIL	100Mohm MIN DC 500V	KIKUSUI TOS8850
5	SURGE TEST	PRI. - SEC.	AC 1.5 KV 1SEC.	

## 7. CONSTRUCTION

TOP

BOTTOM



\* WINDING

\* P.S TAPE



DRAWN BY	CHECK BY	APPR. BY	REVISION		DATE

DIS

DONG - IN SYSTEM CO.,LTD.




# APPROVAL SHEET

DATE 2014. 11. 07.  
PAGE OF

CUSTOMER	M S P		
PART NAME	SWITCHING TRANS	MODEL NO.	
PART NO.	SNP-6320RH-T1	DESCRIPTION	RM10 5+3P

## 8. MATERIAL LIST

NO	ITEM	MATERIAL	MANUFACTURER	FILE NO.
1	CORE	PC-40 RM10 HX-4P RM10	JI SHUN MAGNETIC CO.,LTD. NANTONG HUAXING MAGNETIC MATERIAL CO.,LTD	
2	BOBBIN	PHENOL 94V-0 RM10 8PIN	SUMITOMO BAKELITE CO., LTD.	E41429
3	WIRE	POLYURETHANE ENAMELED COPPER WIRE USTC 0.10Ø X 30P USTC 0.10Ø X 40P	DONG YANG ELECTRONICS IND CO LTD.	E102761
4	INSULATION TAPE	POLYESTERS TAPE T = 0.025mm , T = 0.050mm W = 10.5mm (YELLOW)	DUCK SUNG HITECH CO LTD.	E105147
5	CORE FIXING TAPE	POLYESTERS TAPE T = 0.025mm , W=7.0mm (YELLOW)		
6	PIN TERMINAL	SOLDER COATED COPPER	DAE-A LEAD CO.,LTD.	
7	VARNISH	SR-337A,B	SEKYE CHEMICAL CO.,LTD.	E257443
8	SOLDER	Sn99.3 / Cu0.7 or EQV.	ALPHA METALS CO.,LTD or EQV.	
9	MARKING	INK ( BON MARQUE) or EQV.	ATL CO.,LTD or EQV.	
10	FLUX	EF9301, DP-500K	ALPHA METALS CO.,LTD DUIYUAN TECH(HUIZHOU)CO.,LTD	

DRAWN BY	CHECK BY	APPR. BY	REVISION		DATE
					

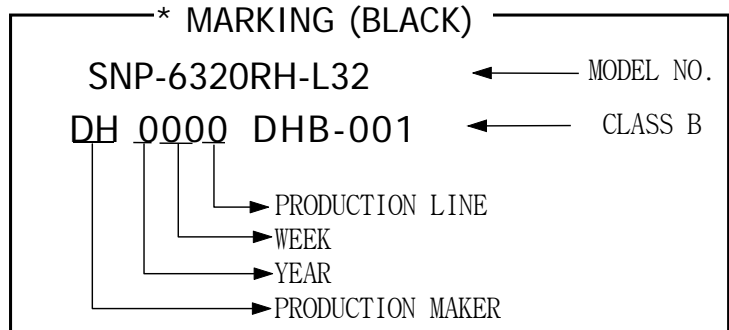
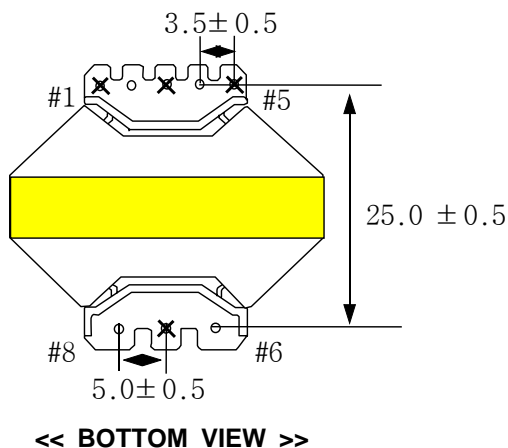
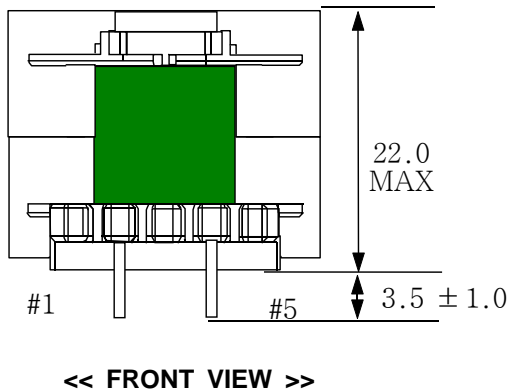
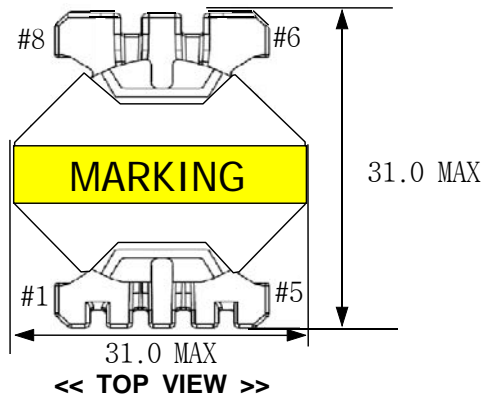
DIS

DONG - IN SYSTEM CO.,LTD.

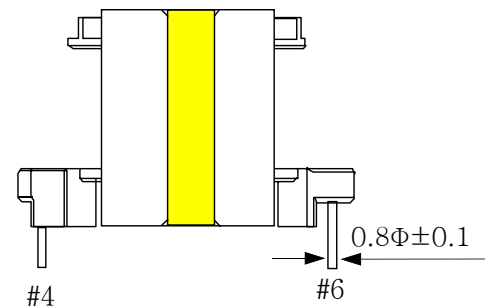
The following Page(s) are related to Miscellaneous-03. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

SPECIFICATION		SHEET NO.	1 OF 16
		D A T E	2014. 10. 14.
PART NAME	TRANS	MODEL NAME	SNP-6320RH-L32
CODE NO.	MSS10-405C	DESCRIPTION	RM10

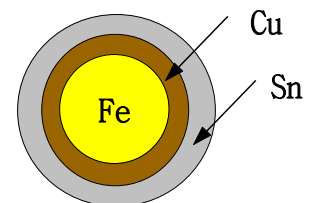
1. APPEARANCE & DIMENSION (UNIT:mm)



※ PRODUCTION LINE  
1. A : CHUN AN  
2. B : BAZHOU  
3. Y : YANTAI



<< SIDE VIEW >>

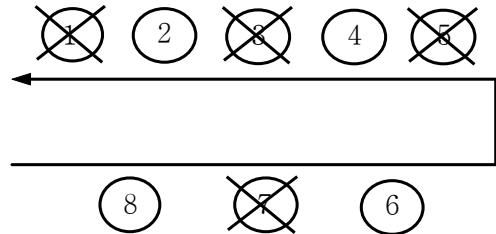
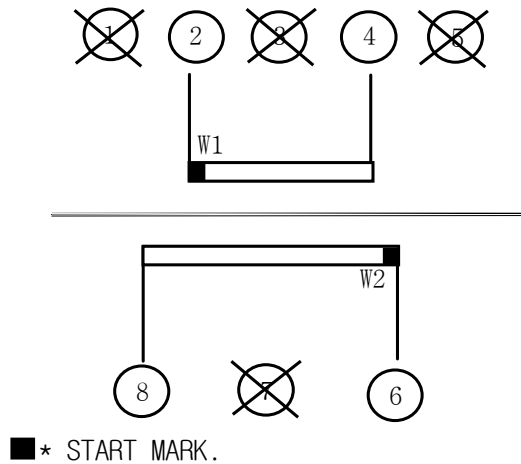


※ PIN LENGTH: BEFORE SOLDERING

NO	REVISION	DATE	CHECK	DRAWN	CHECKED	APPROVED
1						
2						
3						
4						

SPECIFICATION		SHEET NO.	2 OF 16
		D A T E	2014. 10. 14.
PART NAME	TRANS	MODEL NAME	SNP-632ORH-L32
CODE NO.	MSS10-405C	DESCRIPTION	RM10

## 2. WINDING SPECIFICATION



WINDING	BOTTOM VIEW	C.C.W
REMOVED PIN	#1,3,5,7	
CUT PIN		
N.C PIN		
TUBE		

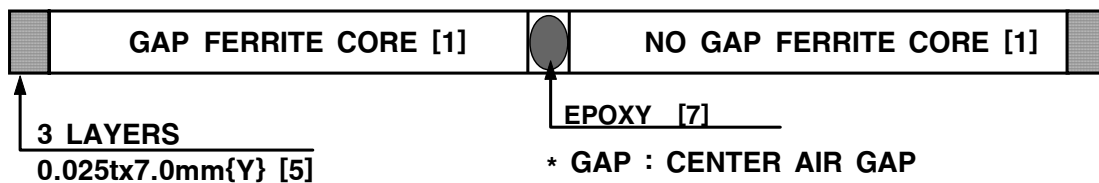
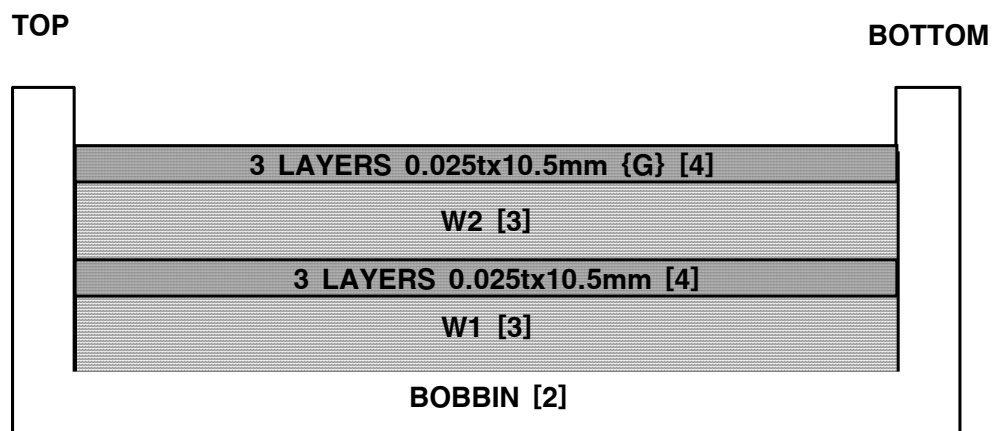
## 3. WINDING SPECIFICATION

NO	TERMINAL		WIRE	TURNS	WINDING METHOD	INSULATION			BARRIER	
	S	F				MATERIAL	T/W	TS	TOP	BOTTOM
W1	2	4	UEW 0.40Ø X2	11 T	SOLENOID	POLYESTER TAPE	0.025/10.5	3		
W2	6	8	USTC 0.1ØX50X2	14 T	SOLENOID	POLYESTER TAPE	0.025/10.5(G)	3		
* CORE FIX TAPE (YELLOW)						POLYESTER TAPE	0.025/7.0	3		

NO	REVISION	DATE	CHECK	DRAWN	CHECKED	APPROVED
1						
2						
3						
4						

<b>SPECIFICATION</b>		SHEET NO.	5 OF 16
		D A T E	2014. 10. 14.
PART NAME	TRANS	MODEL NAME	SNP-6320RH-L32
CODE NO.	MSS10-405C	DESCRIPTION	RM10

## 7. INTERNAL CONSTRUCTION



\* WINDING



\* P.S TAPE






NO	REVISION	DATE	CHECK	DRAWN	CHECKED	APPROVED
1						
2						
3						
4						

SPECIFICATION		SHEET NO.	6 OF 16
		D A T E	2014. 10. 14.
PART NAME	TRANS	MODEL NAME	SNP-632ORH-L32
CODE NO.	MSS10-405C	DESCRIPTION	RM10

## 8. MATERIAL LIST

NO	I T E M	MATERIALS & DIMENSIONS	MANUFACTURER	REMARK
1	CORE	RM 10 PL-7, KP-4, DMR40, K2.3P, NH2B, JF4, KP4, TY40 or Equiv.	SAM HWA ELECTRONICS CO., LTD. ZAOZHUNG KINGTECH ELECTRONICS CO.,LTD. ZHEJING DONGYANG DMEGC MAGNETIC CO.,LTD ZHEJIANG LINAN HE SHUN MAGNETIC FLUX ELECTRONIC CO.,LTD. ZHEJIANG HAINING LIANFENG MAGNET INDUSTRY CO., LTD. WUXI SPINEL MAGNETICS CO.,LTD. SHANGHAI KANGSHUN MAGNETIC COMPONENT CO., LTD. Guangzhou Tongyang Electronics Co., Ltd or Equiv.	
2	BOBBIN	RM10 [8P] PHENOL (94V-0)	SUMITOMO BAKELITE CO., LTD. HITACHI CHEMICAL CO LTD	E41429 E42926
3	COPPER WIRE	UEW 0.40Ø USTC 0.10Øx50#	DONG YANG ELECTRONICS IND CO.,LTD. SHANDONG PENGTAI STOCK CO., LTD. ZHEJIANG XIANDENG ELECTRICAL APPLIANCES CO., LTD JIANGSU DARTONG M&E CO.,LTD HANGZHOU WEIFENG ELECTRONIC CO LTD	E102761 E166187 E218270 E237377 E229341
4	INSULATION TAPE	POLYESTER TAPE 0.025t x 10.5mm 0.025t x 10.5mm {GREEN}	DUCK SUNG HITECH CO., LTD. JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD. METAL LINE CO., LTD.	E105147 E165111 E162848
5	CORE FIXING TAPE	POLYESTER TAP 0.025t x 7.0mm {YELLOW}		
6	EPOXY	UNI-BOND #812 SK-015B H-907	GREENSTAR CO.,LTD. SE KYE CHEMICAL CO., LTD. DONG GUAN SHI PAI HUA CHUANG MATERIAL FTY.	
7	IMPREGNATION	EPOXY	HITACHI CHEMICAL CO., LTD. KYOCERA CHEMICAL CORP SE KYE CHEMICAL CO LTD NOROO PAINT & COATINGS CO LTD	E72979 E83702 E257443 E93947
8	SOLDER BAR	SN98CU2-B20	SAMWOO METAL CO., LTD. YUNNAN TIN CO.,LTD. ASIA GENERAL ELECTRONICS CO.,LTD	
9	INK	JP-K12, K33 BON MARQUE MS-6853	HITACHI INDUSTRIAL EQUIPMENT CO.,LTD T&K TOKA CO.,LTD SHANGHAI LEADJET INKJET PRINTER TECHNIQUE CO., LTD.	
10	FLUX	SV-PBF-304 FC-113	KOKI SANEI KOREA CO.,LTD TAMURA KAKEN CORPORATION	

NO	REVISION	DATE	CHECK	DRAWN	CHECKED	APPROVED
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3						
4						

The following Page(s) are related to Miscellaneous-04. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

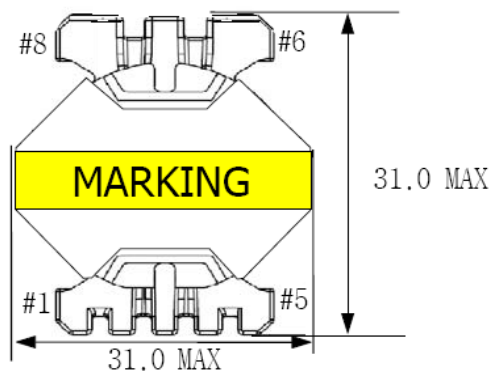
# APPROVAL SHEET

DATE 2014. 11. 07.

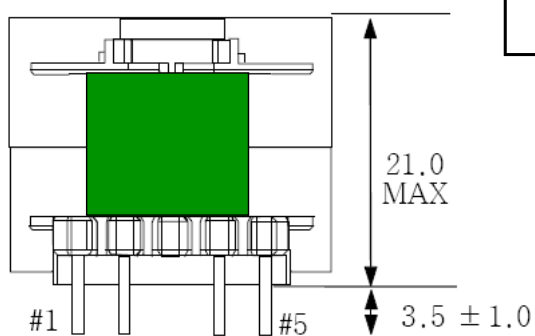
PAGE OF

CUSTOMER	M S P		
PART NAME	SWITCHING TRANS	MODEL NO.	
PART NO.	SNP-6320RH-L32	DESCRIPTION	RM10 5+3P

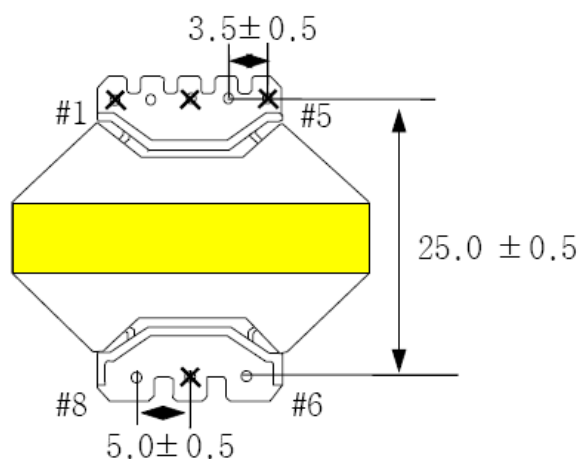
## 1. DIMENSIONS (UNIT:mm)



◎TOP VIEW◎

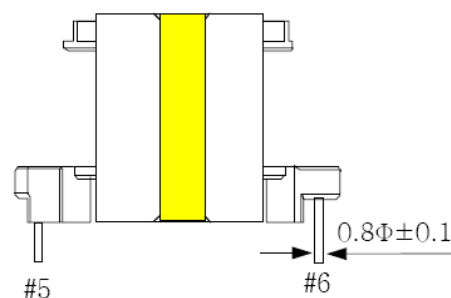


◎FRONT VIEW◎



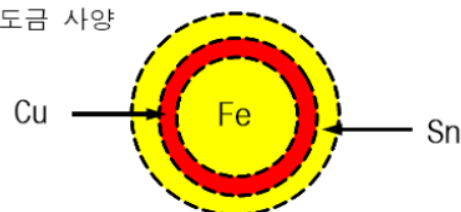
◎BOTTOM VIEW ◎

* MARKING *	
PART NO. → SNP-6320RH-L32	DIS-10B ← INSULATION SYSTEM
DONGIN AA BB ← LOT NO	
	MONTH
	YEAR
	MAKER
MARKING	
PART NO.	SNP-6320RH-L32
(LOT NO)	AA : YEAR
	BB : MONTH
MAKER	DONG IN SYSTEM
DIS-10B	INSULATION SYSTEM



◎SIDE VIEW◎

★. PIN 도금 사양



DRAWN BY	CHECK BY	APPR. BY	REVISION		DATE

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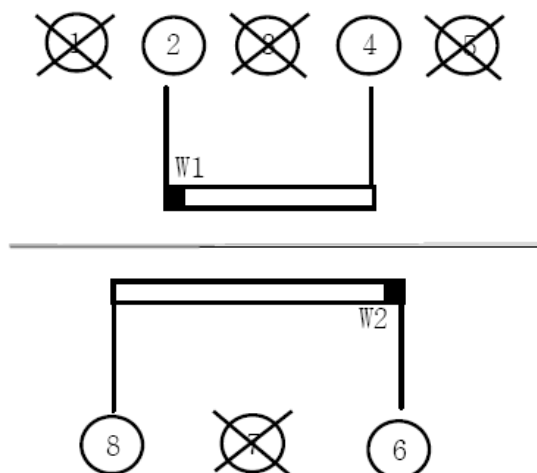
# APPROVAL SHEET

DATE 2014. 11. 07.

PAGE OF

CUSTOMER	M S P		
PART NAME	SWITCHING TRANS	MODEL NO.	
PART NO.	SNP-6320RH-L32	DESCRIPTION	RM10 5+3P

## 2. CONNECTION (BOTTOM VIEW)



REMOVED PIN	#1,3,5,7
CUT PIN	#
N.C PIN	#
TEFLON TUBE	#
FLUX BAND	#6
DOT MARK	#START OF WINDING
* CORE CENTER BOND	

## 3. WINDING SPECIFICATION

NO	TERMINAL		WIRE	Ts	WINDING METHOD	INSULATION		BARRIER		
	S	F				MATERIAL ( t / mm )	Ts	TOP	PIN	Ts
W1	2	4	UEW 0.40Ø X 2	11	SOLENOID	POLYESTER TAPE 0.025 / 10.5	2			
W2	6	8	USTC 0.10Ø X 50P X 2	14	SOLENOID	POLYESTER TAPE 0.025 / 10.5 (GREEN)	2			
CORE FIXING TAPE						POLYESTER TAPE 0.025 / 7.0 (YELLOW)	3			

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DIS

DONG - IN SYSTEM CO.,LTD.

# APPROVAL SHEET

DATE 2014. 11. 07.

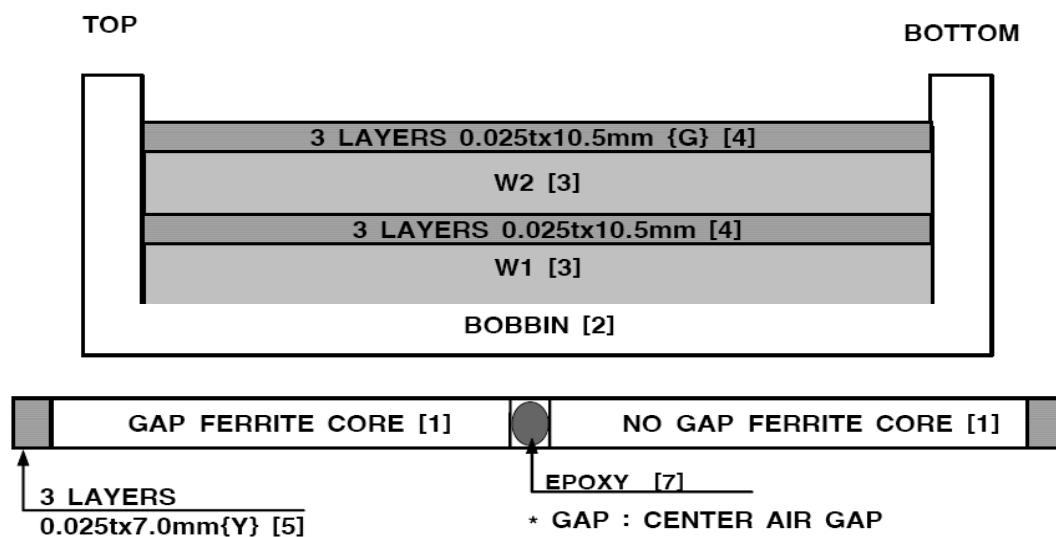
PAGE OF

CUSTOMER	M S P		
PART NAME	SWITCHING TRANS	MODEL NO.	
PART NO.	SNP-6320RH-L32	DESCRIPTION	RM10 5+3P

## 6. ELECTRICAL CHARACTERISTICS

NO	ITEM	TERMINAL	SPECIFICATION	REMARKS
1	INDUCTANCE	6 - 8	25.0uH $\pm$ 12%	HP 4284A LCR-METER AT 1kHz 1V
2	DC RESISTANCE	6 - 8	0.06ohm MAX	HIOKI-3540 m $\Omega$ TESTER
3	WITHSTANDING VOLTAGE	P COIL - CORE	AC 1,5 KV RMS 10mA 60 SEC.	KIKUSUI TOS8850
4	INSULATION RESISTANCE	P COIL - S COIL	100Mohm MIN DC 500V	KIKUSUI TOS8850
5	SURGE TEST	PRI. - SEC.	AC 1.5 KV 1SEC.	

## 7. CONSTRUCTION



- \* WINDING
- \* P.S TAPE



DRAWN BY	CHECK BY	APPR. BY	REVISION		DATE

DIS

DONG - IN SYSTEM CO.,LTD.




# APPROVAL SHEET

DATE 2014. 11. 07.  
PAGE OF

CUSTOMER	M S P		
PART NAME	SWITCHING TRANS	MODEL NO.	
PART NO.	SNP-6320RH-L32	DESCRIPTION	RM10 5+3P

## 8. MATERIAL LIST

NO	ITEM	MATERIAL	MANUFACTURER	FILE NO.
1	CORE	PC-40 RM10 HX-4P RM10	JI SHUN MAGNETIC CO.,LTD. NANTONG HUAXING MAGNETIC MATERIAL CO.,LTD	
2	BOBBIN	PHENOL 94V-0 RM10 8PIN	SUMITOMO BAKELITE CO., LTD.	E41429
3	WIRE	POLYURETHANE ENAMELED COPPER WIRE UEW 0.40Ø USTC 0.10Ø X 50P	DONG YANG ELECTRONICS IND CO LTD.	E102761
4	INSULATION TAPE	POLYESTERS TAPE T = 0.025mm , T = 0.050mm W = 10.5mm(GREEN)	DUCK SUNG HITECH CO LTD.	E105147
5	CORE FIXING TAPE	POLYESTERS TAPE T = 0.025mm , W=7.0mm (YELLOW)		
6	PIN TERMINAL	SOLDER COATED COPPER	DAE-A LEAD CO.,LTD.	
7	ADHESIVE	SK-015B	SEKYE EPOXY RESIN CO., LTD.	
8	VARNISH	SR-337A,B	SEKYE CHEMICAL CO.,LTD.	E257443
9	SOLDER	Sn99.3 / Cu0.7 or EQV.	ALPHA METALS CO.,LTD or EQV.	
10	MARKING	INK ( BON MARQUE) or EQV.	ATL CO.,LTD or EQV.	
11	FLUX	EF9301, DP-500K	ALPHA METALS CO.,LTD DUIYUAN TECH(HUIZHOU)CO.,LTD	

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DIS

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The following Page(s) are related to Miscellaneous-05. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

SPECIFICATIONS	ITEM	LINE FILTER	Rev
	TNC SPEC NO	CV620180SH	0

## 2. ELECTRICAL CHARACTERISTIC

NO	ITEM	TERMINAL	SPECIFICATION			REMARKS
1	RATED VOLTAGE	LINE TO LINE	AC 300V			
2	RATED CURRENT	START-FINISH	2.0A			
3	INDUCTANCE	START-FINISH	16KHz	18.0mH	+ 50%, -30%	HP-4194A 1V (25℃±2℃)
4	TEMPERATURE RISE	AT RATED CURRENT	55℃ MAX			
5	DC RESISTANCE	START-FINISH	163.0 mΩ MAX			HIOKI 3540 (25℃±2℃)
6	WITHSTANDING VOLTAGE	LINE TO LINE	AC 1,500V 1 MINUTE.			TOS-5101 CUT OFF CURRENT (5mA)
7	INSULATION RESISTANCE	LINE TO COVER	DC 500V, 300MΩ MIN.			TOS-8850

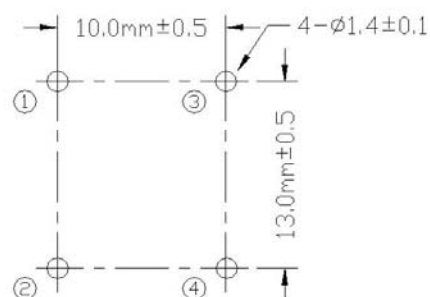
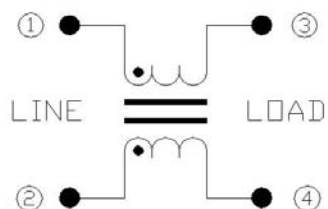
## 3. OPERATING TEMPERATURE

-40℃ TO +120℃ INCLUDING TEMPERATURE RISE.


## 4. KEEP TEMPERATURE RANGE

-40℃ TO +120℃

## 5. CIRCUIT DIAGRAM



Minimum PCB Piercing HOLE

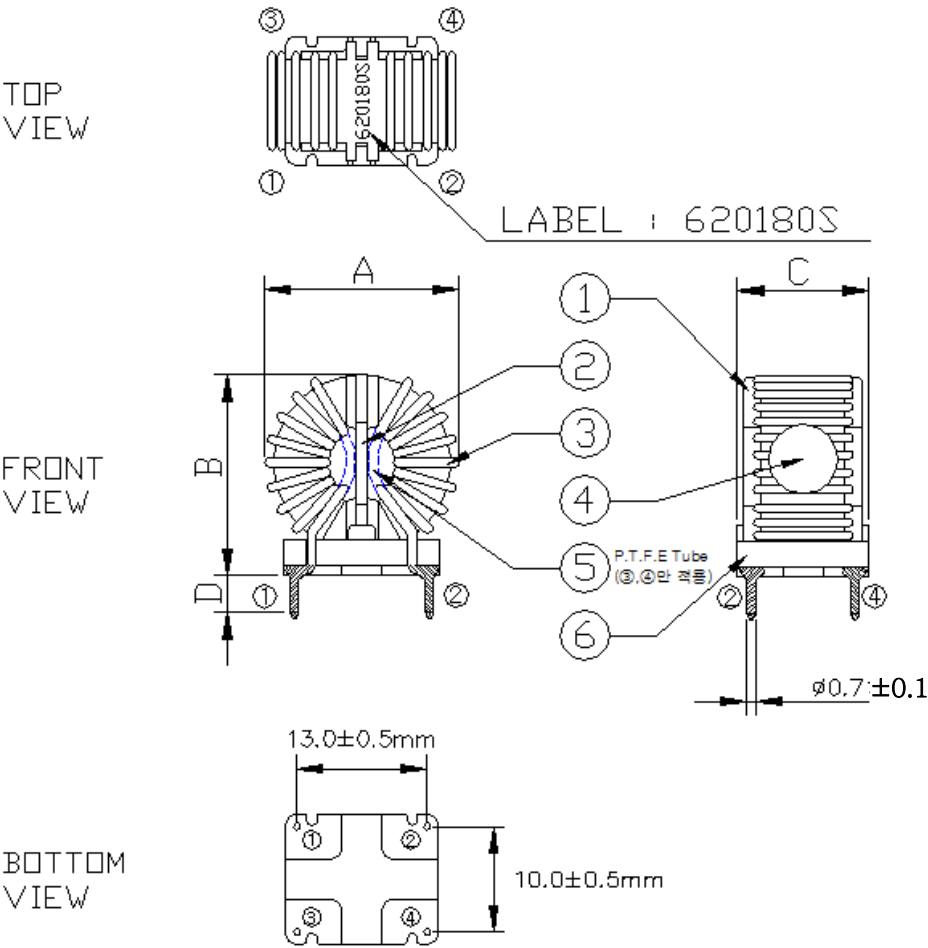
 TNC CO.,LTD	DESIGN	CHECK	APPROVAL	PAGE
				3/15

SPECIFICATIONS	ITEM		LINE FILTER	Rev
	TNC SPEC NO		CV620180SH	0

6. WINDING SPECIFICATION

NO	TERMINAL		WIRE	TURNS	WINDING METHOD	UNBALANCE SPECIFICATION
	START	FINISH				
L1	1	3	UEW 0.50Φ	53 ±3Ts	HANDMADE	BETWEEN L1 AND L2 (0.4mH MAX)
L2	2	4				

7. SHAPE AND DIMENSION



DIMENSION	A	B	C	D
	21.0mm MAX	22.0mm MAX	15.0mm MAX	Not include solder fillet 4.0±1.0mm

<div>TNC</div> <div>TNC CO.,LTD</div>	DESIGN	CHECK	APPROVAL	PAGE
	<div>JEONG.B.G</div> <div>R&amp;D</div>	<div>KANG.S.W</div> <div>R&amp;D</div>	<div>KOO.J.H</div> <div>R&amp;D</div>	4/15


SPECIFICATIONS	ITEM	LINE FILTER	Rev
	TNC SPEC NO	CV620180SH	0

## 8. MATERIAL LIST

No.	NAME	SPECIFICATION		MANUFACTURER	COLOR	UL No.
1 / 2	Core Cover / Coil Separator	NYLON A 50H1(r3)(f2)		SOLVAY ENGINEERING PLASTICS GBU	WHITE	E44716
		PBT LUPOX GP-2156F(#)		LG CHEM LTD	WHITE	E67171
		PBT 4130		CHANG CHUN PLASTICS CO LTD	WHITE	E59481
3	Enamel Wire	UEW 0.50Φ / 53±3T	UEW	HWA IL ELECTRONICS CO.,LTD	YELLOW	E140246
			UEW	SHANDONG PENGTAI STOCK CO LTD	YELLOW	E166187
			UEW	SIAM PACIFIC ELECTRIC WIRE & CABLE CO.,LTD	YELLOW	E142108
4	Ferrite Core	MA100 R-16-10-7 HL10 H16X10X7		JFE Ferrite Corp Ruyuan Dongyangguang Magnetic Materials CO.,LTD	BLACK	
5	Insulation tube	P.T.F.E Tube (Teflon Tube) NOT HEAT-SHRINKABLE PTFE TUBING		SHENZHEN WOER HEAT- SHRINKABLE MATERIAL CO.,LTD	Transparent	E203950
6	Coil Base	Phenolic (PF 2736(a)(b)) UL 94 V-0 Class		Hexion GmbH	BLACK	E61040
		Phenolic (T375HF) UL 94 V-0 Class		CHANG CHUN PLASTICS CO LTD	BLACK	E59481

## 9. MARKING

MODEL	LABEL	COLOR
CV620180SH	620180S	black letters on transparent

 TNC CO.,LTD	DESIGN	CHECK	APPROVAL	PAGE
				5/15

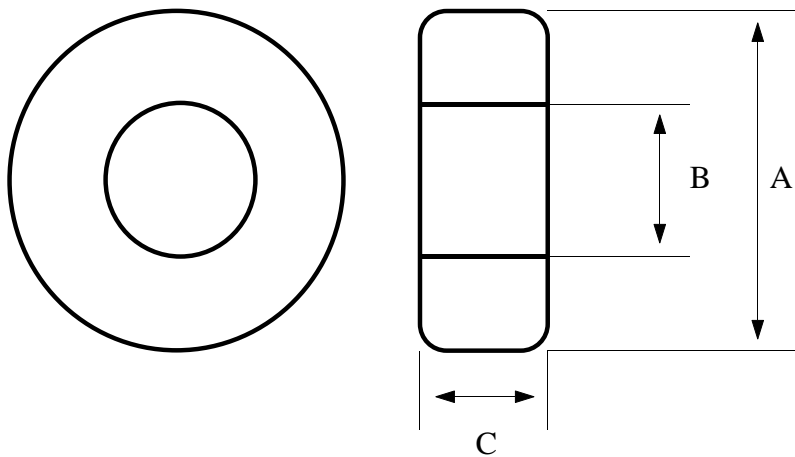
SPECIFICATIONS	ITEM	LINE FILTER	Rev
	TNC SPEC NO	CV620180SH	0

## 15. FERRITE CORE SPECIFICATION

### - Characteristics

Symbol	Unit	MA100 R-16/10/7	HL10 H16X10X7
$\mu_i$	-	10,000±30%	10,000±30%
B <sub>ms</sub>	mT	415	400
H <sub>cms</sub>	A/m	3.0	7.2
B <sub>rms</sub>	mT	76	90
T <sub>c</sub>	℃	>115	>130
TAN $\delta$ / $\mu$ iac	*10 <sup>-6</sup>	<1.9	<7.0
$\alpha\mu_r$	*10 <sup>-6</sup> /℃	-0.5~2.0	-0.5~1.5
$\rho$	$\Omega$ .m	0.1	0.15
d	g/cm <sup>3</sup>	5.0	4.9

### - Dimension



**A: 16.0 ±0.35**

**B: 10.0 ±0.3**

**C: 7.0 ±0.3**

The following Page(s) are related to Miscellaneous-06. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

SPECIFICATIONS	ITEM	LINE FILTER	Rev
	TNC SPEC NO	CV36045USA2	0

## 2. ELECTRICAL CHARACTERISTIC

NO	ITEM	TERMINAL	SPECIFICATION			REMARKS
1	RATED VOLTAGE	LINE TO LINE	AC 300V			
2	RATED CURRENT	START-FINISH	7.5A			
3	INDUCTANCE	START-FINISH	160KHz	450uH	+ 50%, -30%	HP-4194A 1V (25℃±2℃)
4	TEMPERATURE RISE	AT RATED CURRENT	60℃ MAX			
5	DC RESISTANCE	START-FINISH	19.0 mΩ MAX			HIOKI 3540 (25℃±2℃)
6	WITHSTANDING VOLTAGE	LINE TO LINE	AC 1,500V 1 MINUTE			TOS-5101 CUT OFF CURRENT (5mA)

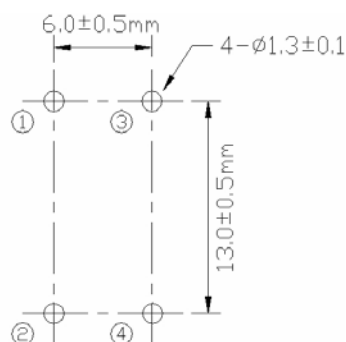
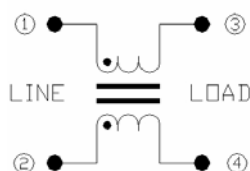
## 3. OPERATING TEMPERATURE RANGE

-30℃ TO +105℃ INCLUDING TEMPERATURE RISE.


## 4. KEEP TEMPERATURE RANGE

-30℃ ~ +60℃.

## 5. CIRCUIT DIAGRAM



Minimum PCB Piercing HOLE

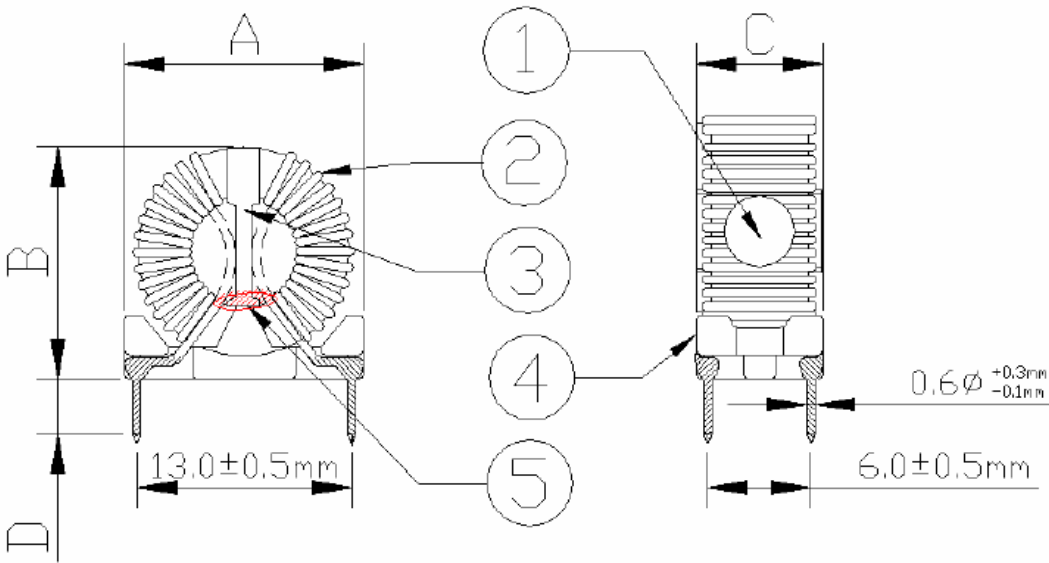
 TNC CO.,LTD	DESIGN	CHECK	APPROVAL	PAGE
				3/13

SPECIFICATIONS	ITEM		LINE FILTER	Rev
	TNC SPEC NO		CV36045USA2	0

6. WINDING SPECIFICATION

NO	TERMINAL		WIRE	TURNS	WINDING METHOD	UNBALANCE SPECIFICATION
	START	FINISH				
L1	1	3	UEW 0.7Φ	9 ±1Ts	HANDMADE	BETWEEN L1 AND L2 (52.78uH MAX)
L2	2	4				

7. SHAPE AND DIMENSION



DIMENSION	A	B	C	D
	18.0mm MAX	18.5mm MAX	10.0mm MAX	4.0±1.0mm

<div>TNC</div> <div>TNC CO.,LTD</div>	DESIGN	CHECK	APPROVAL	PAGE
	<div>RYU.H.E</div> <div>R&amp;D</div>	<div>KANG.S.W</div> <div>R&amp;D</div>	<div>KOO.J.H</div> <div>R&amp;D</div>	4/13

SPECIFICATIONS	ITEM	LINE FILTER	Rev
	TNC SPEC NO	CV36045USA2	0

## 8. MATERIAL LIST

No.	NAME	SPECIFICATION		MANUFACTURER	COLOR	UL No.
1	Ferrite Core	MA100 R-13/7/5 R10KF TR13X7X5C		JFE Ferrite Corp LAIWU CHAINWELL ELECTRONIC&MATERIAL CO.,LTD Equal.	GRAY	
2	Enamel Wire	UEW 0.7Φ / 9±1Ts	UEW	Hwa Il Electronics Co.,Ltd	YELLOW	E140246
			UEW	SHANDONG PENGTAI STOCK CO LTD Equal.	YELLOW	E166187
3	Coil Separator	LCP L304T40		TORAY Industries INC	BLACK	E41797
		NYLON A 50H1(r3)(f2)		SOLVAY ENGINEERING PLASTICS GBU	BLACK	E44716
4	Coil Base	Phenolic (PF 2736(a)(b)) UL 94 V-0 Class		Hexion GmbH	BLACK	E61040
		Phenolic (T375HF) UL 94 V-0 Class		Chang chun Plastics LTD	BLACK	E59481
5	Epoxy	EPOXY RESIN	NA-010	ND Chemical	WHITE	
			EA610A / EA610B	Chem Tech	Transparent	

 TNC CO.,LTD	DESIGN	CHECK	APPROVAL	PAGE
				5/13

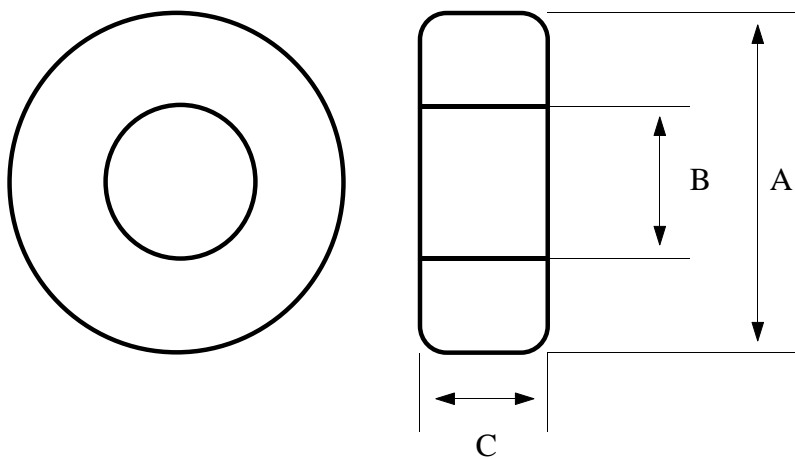
SPECIFICATIONS	ITEM	LINE FILTER	Rev
	TNC SPEC NO	CV36045USA2	0

## 14. FERRITE CORE SPECIFICATION

### - Characteristics

Symbol	Unit	MA100 R-13/7/5	R10KF TR13X7X5C
$\mu_i$	-	10,000±25%	10,000±30%
Bms	mT	415	390
Hcms	A/m	3.0	7.0
Brms	mT	76	100
Tc	℃	>115	>120
TAN $\delta$ / $\mu$ iac	*10 <sup>-6</sup>	<1.9	<7.0
$\alpha_{\mu r}$	*10 <sup>-6</sup> /℃	-0.5~2.0	0~1.5
$\rho$	$\Omega$ .m	0.1	0.15
d	g/cm <sup>3</sup>	5.0	4.8

### - Dimension (before coating)



A: 13.0 ±0.35

B: 7.0 ±0.3

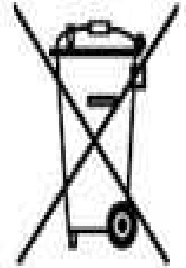
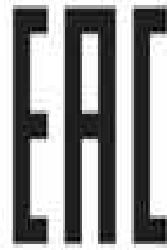
C: 5.0 ±0.3

The following Page(s) are related to Miscellaneous-07. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

Standard SCC Requirements and Guidance - Product Certification Body Accreditation Program Edition/ Revision Date 2016-04-06

Clause/Par. Reference and Construction Requirement	Comply			Comments/Measurements	Inst. ID No.
	Yes	No	N/A		
9.2.3 CBs shall include dual language safety labeling within their product certification requirements, if so required by the standard or by the authority having jurisdiction.					
The manufacturer has confirmed they have the ability to include English and French safety labeling exactly as specified in the product standard; or, if NOT specified in the product standard, the ability to include English and French safety labelling consisting of markings associated with the signal words DANGER, WARNING, and CAUTION when required.	X			The ability of the manufacturer to include these markings was verified by either (1) visual inspection of the markings on the actual product or (2) draft of labels that will be applied to the product or (3) written confirmation from the customer of the markings that will appear on the product. If the product standard provides the exact translation, the evidence must match the exact translation. If the product standard does NOT provide the exact translation, the evidence must simply include both the English and French text (no verification of translation is required).	N/A

Clause/Par. Reference and Construction Requirement	Comply			Comments/Measurements	Inst. ID No.
	Yes	No	N/A		
Manufacturer has a method to manage distribution of products, IF all products with the Canadian certification mark are NOT going to include the dual language.	X			Evaluation staff are to only verify that the manufacturer has a method to control distribution. Evaluation staff do not have to record the method of control nor are the evaluation staff expected to verify the effectiveness of the method of control. This requirement to verify that a method exists will be noted in the FUS Procedure. The UL Field Engineer will verify the method during surveillance. If the manufacturer is going to include the dual language on all products with the Canadian certification mark, then this item is N/A; no further action required.	N/A



NETWORK CAMERA

MODEL:TNO-7180R

DC 12V  4.0A /

PoE(55V  ) 0.92A

M/C:TNO-7180R/KUS Fac. ID: D



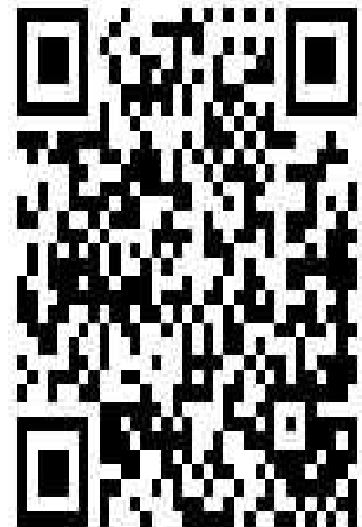
2021.05 S/N: Serial No.

MAC ADDRESS: XX-XX-XX-XX-XX-XX

CAN ICES-3(A)/NMB-3(A)

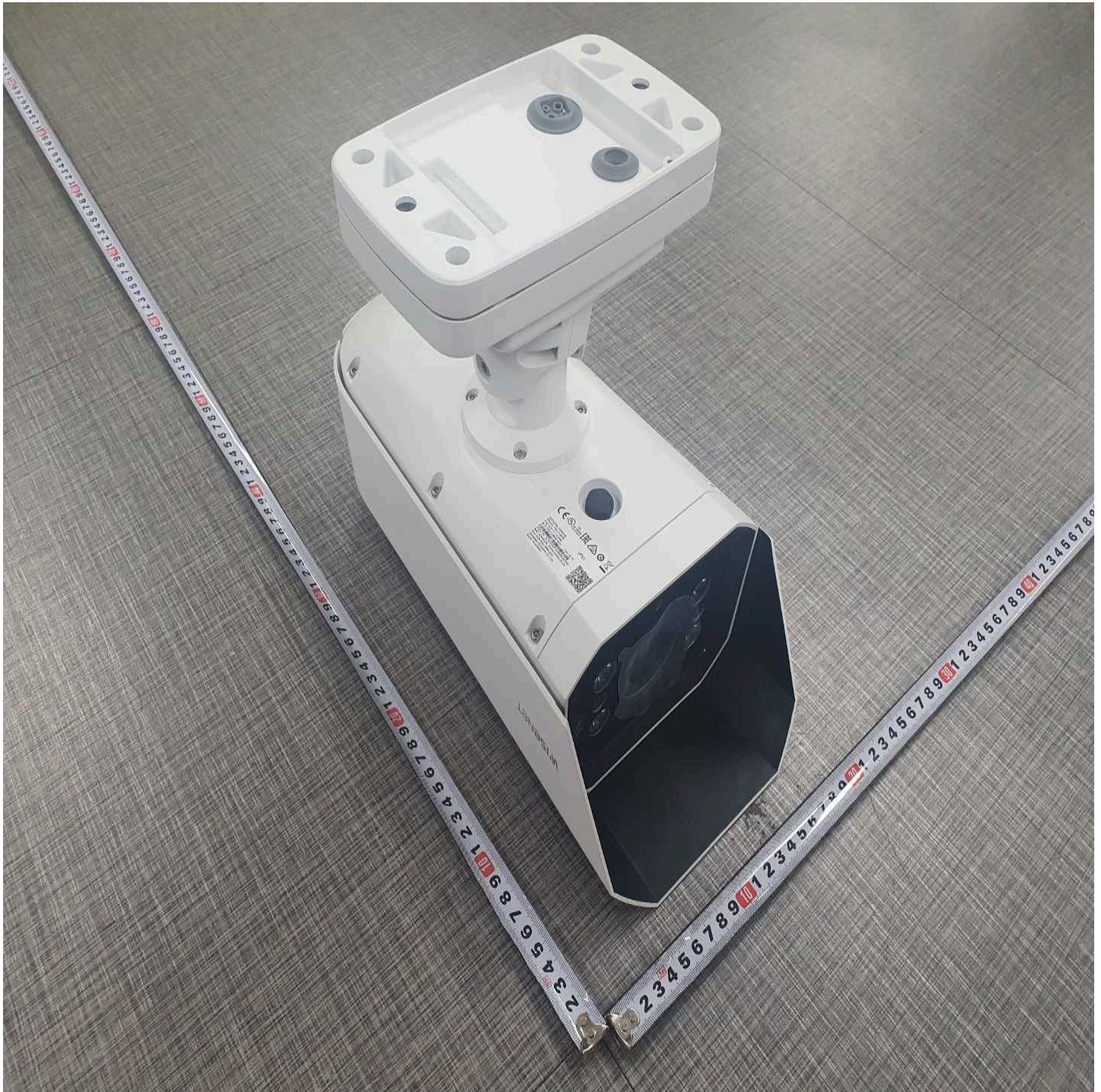
HANWHA TECHWIN CO.,LTD.

MADE IN KOREA



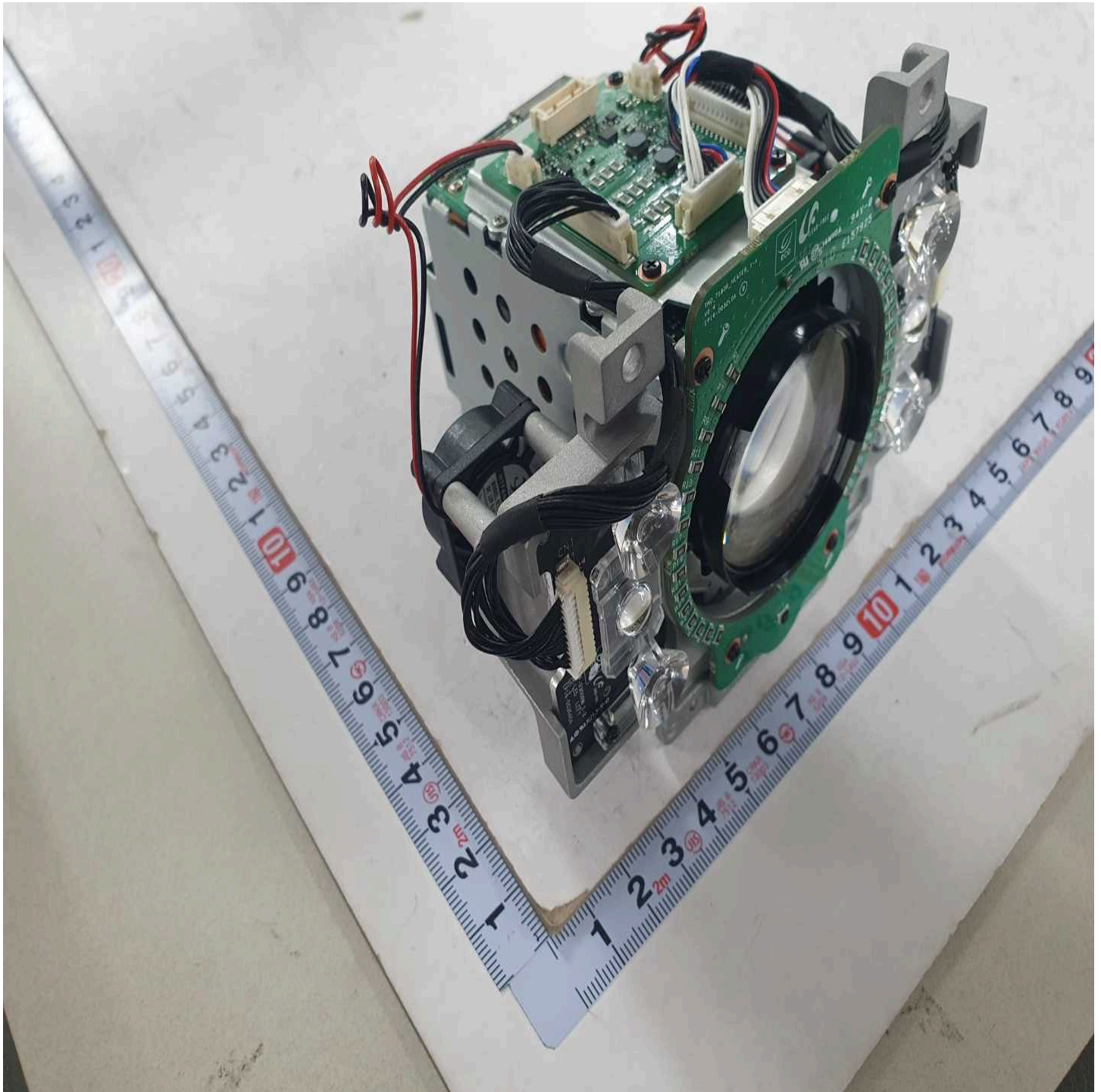


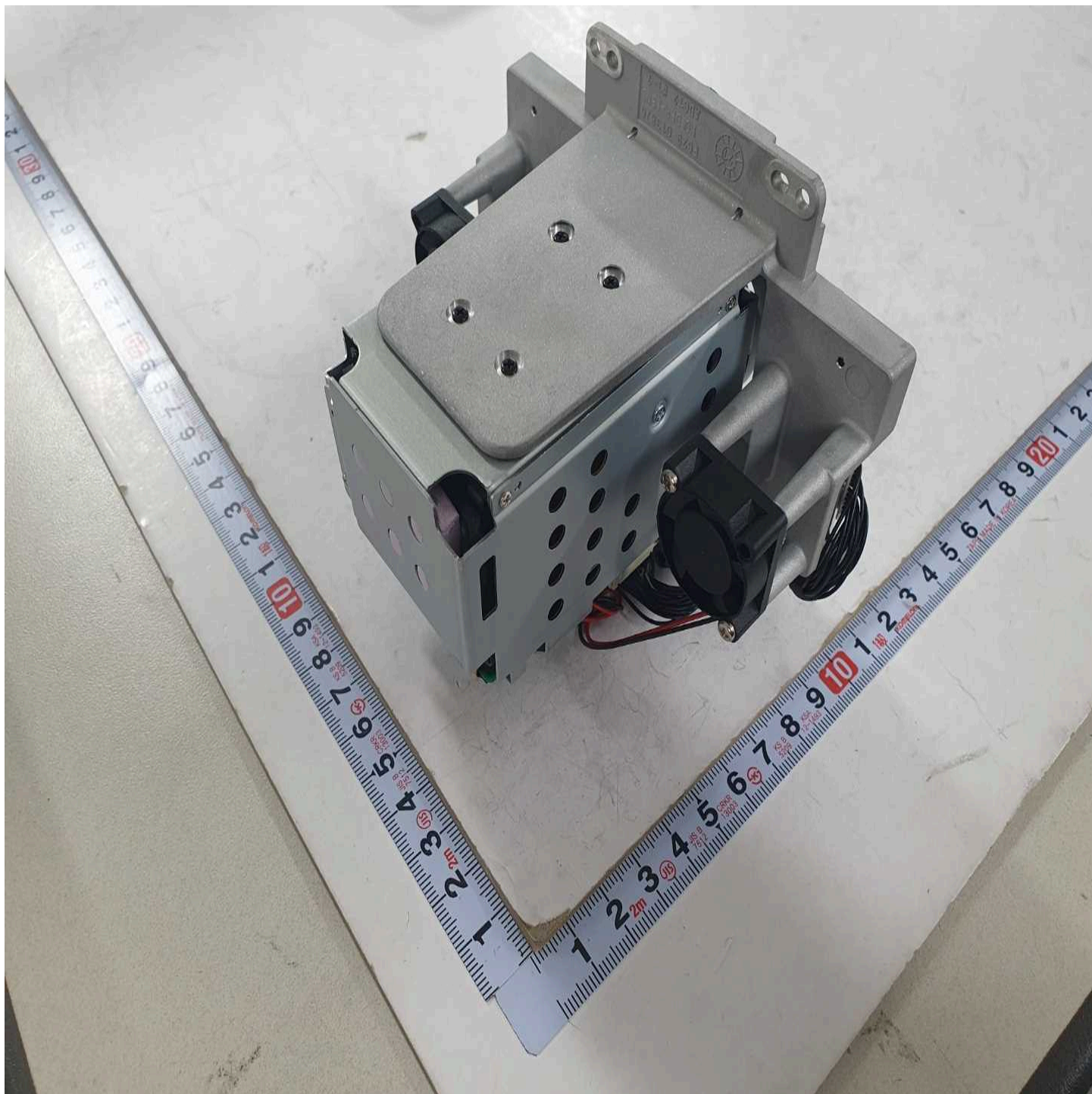






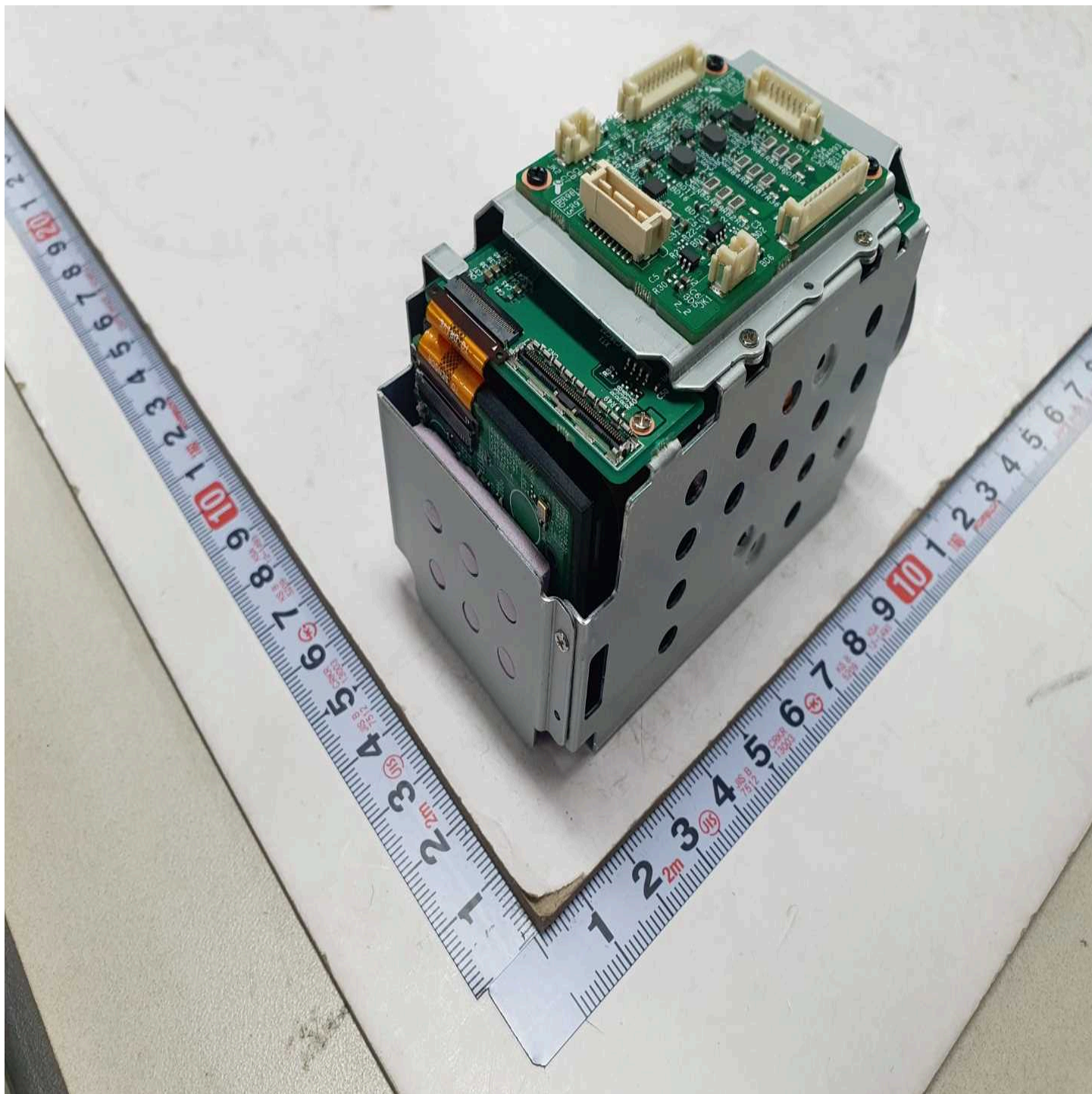






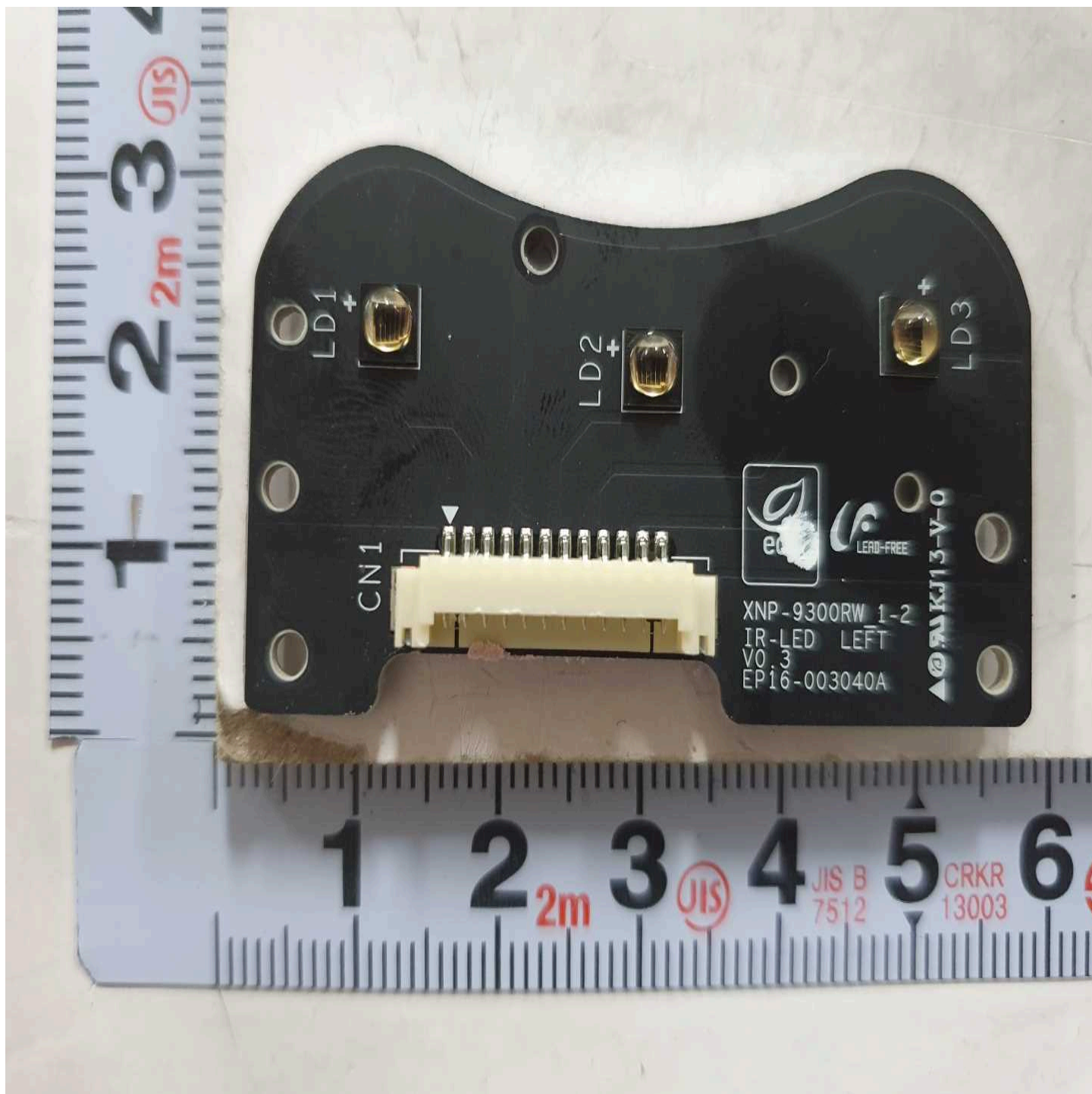




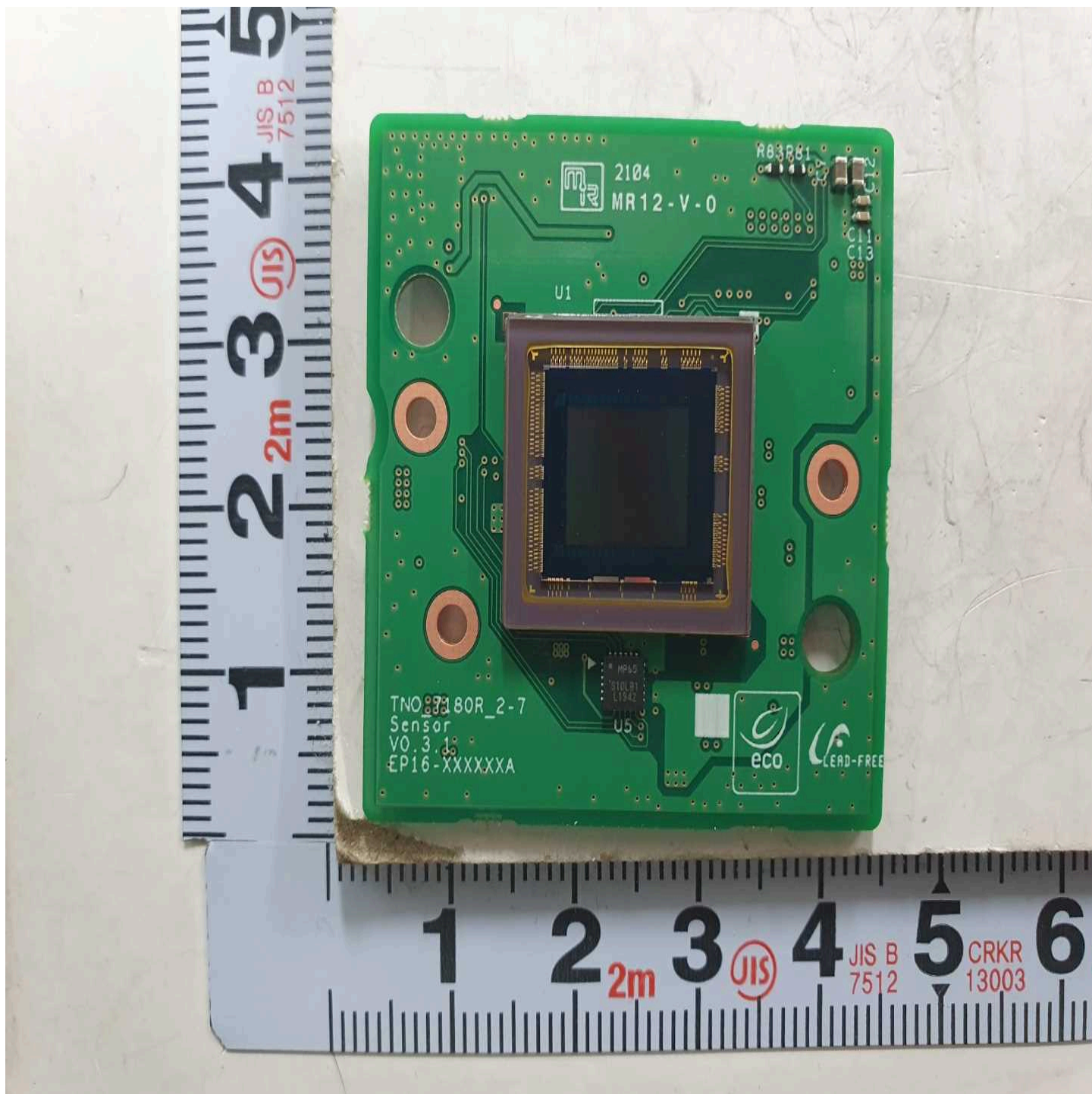




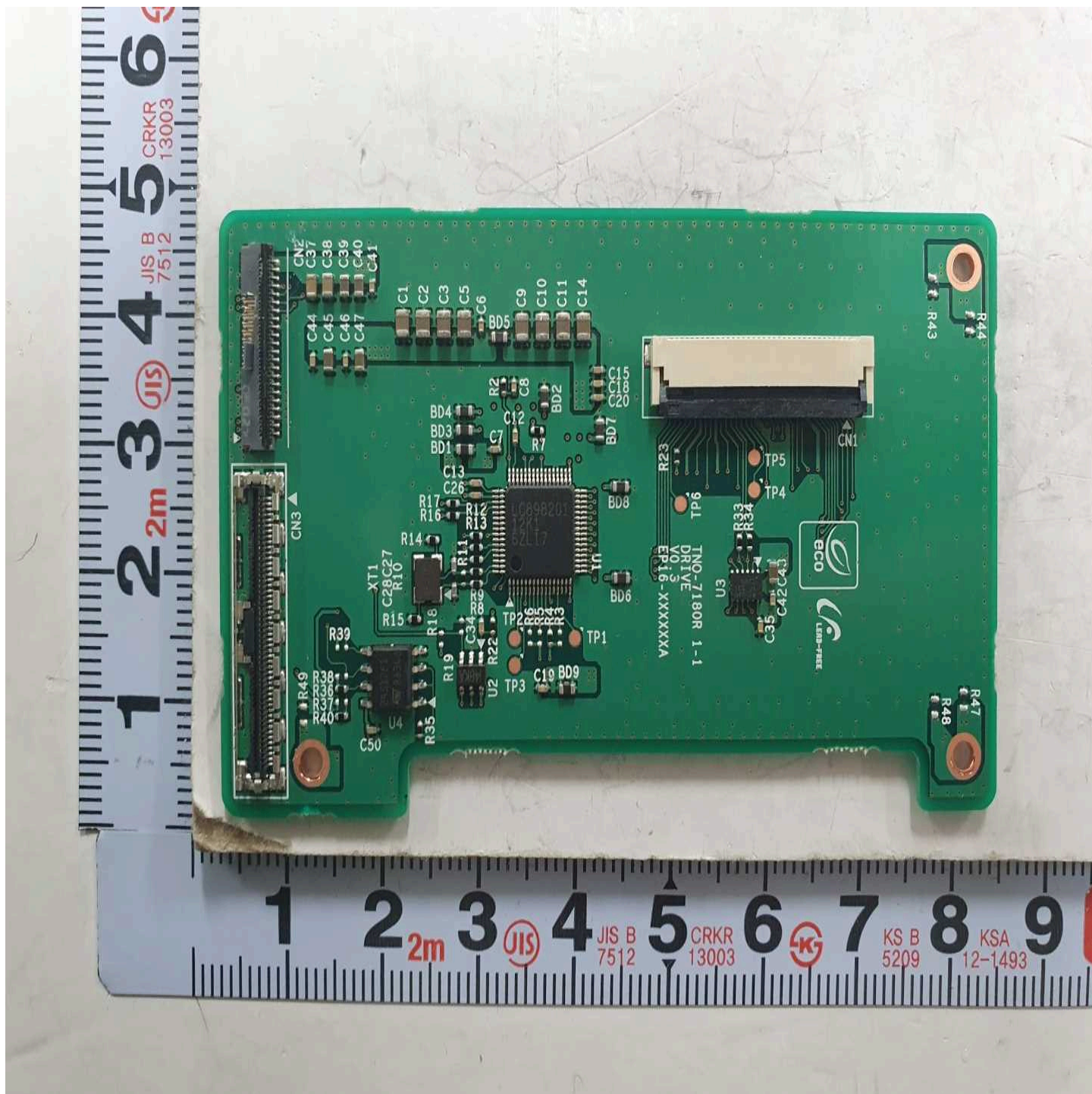


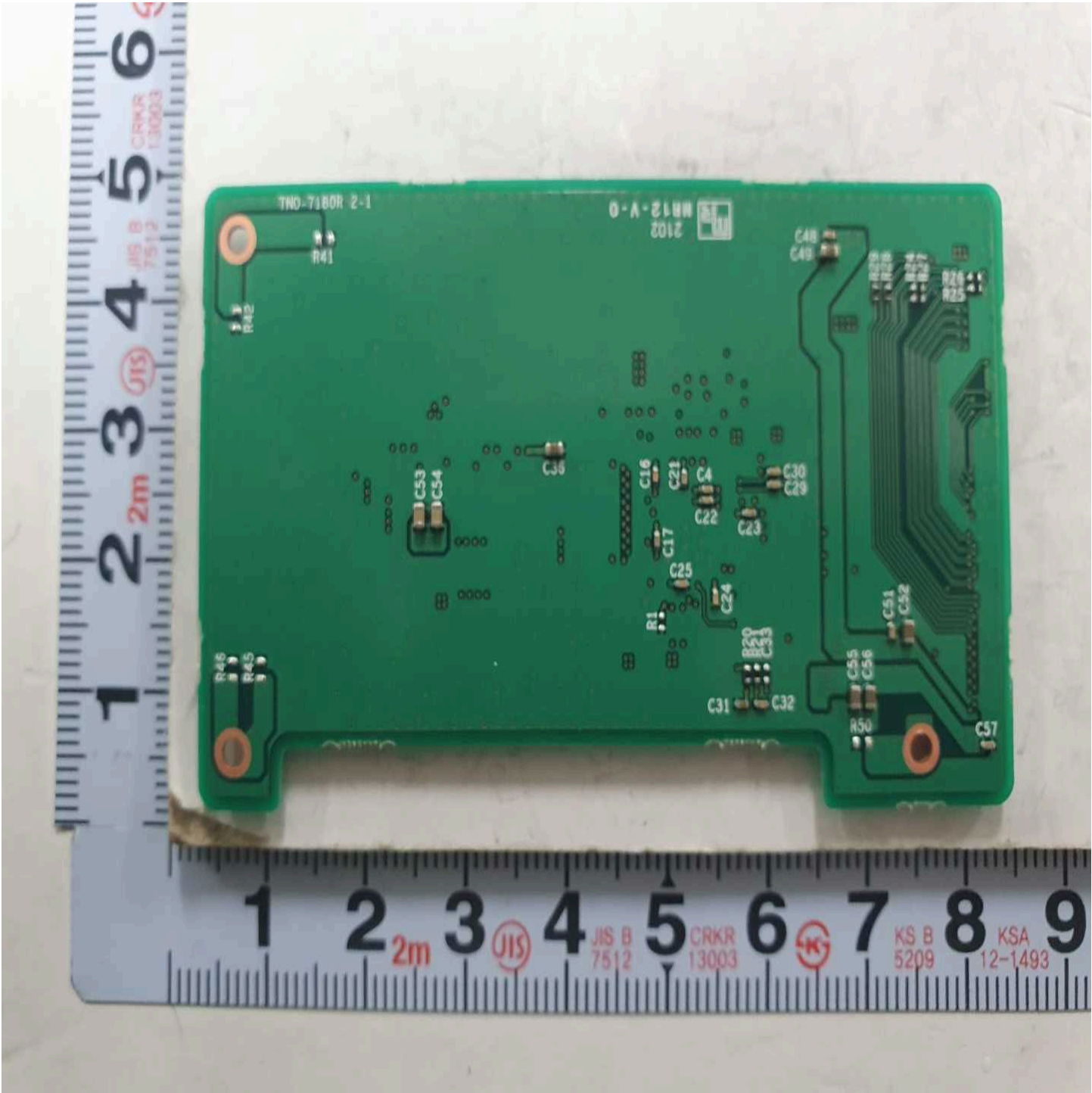


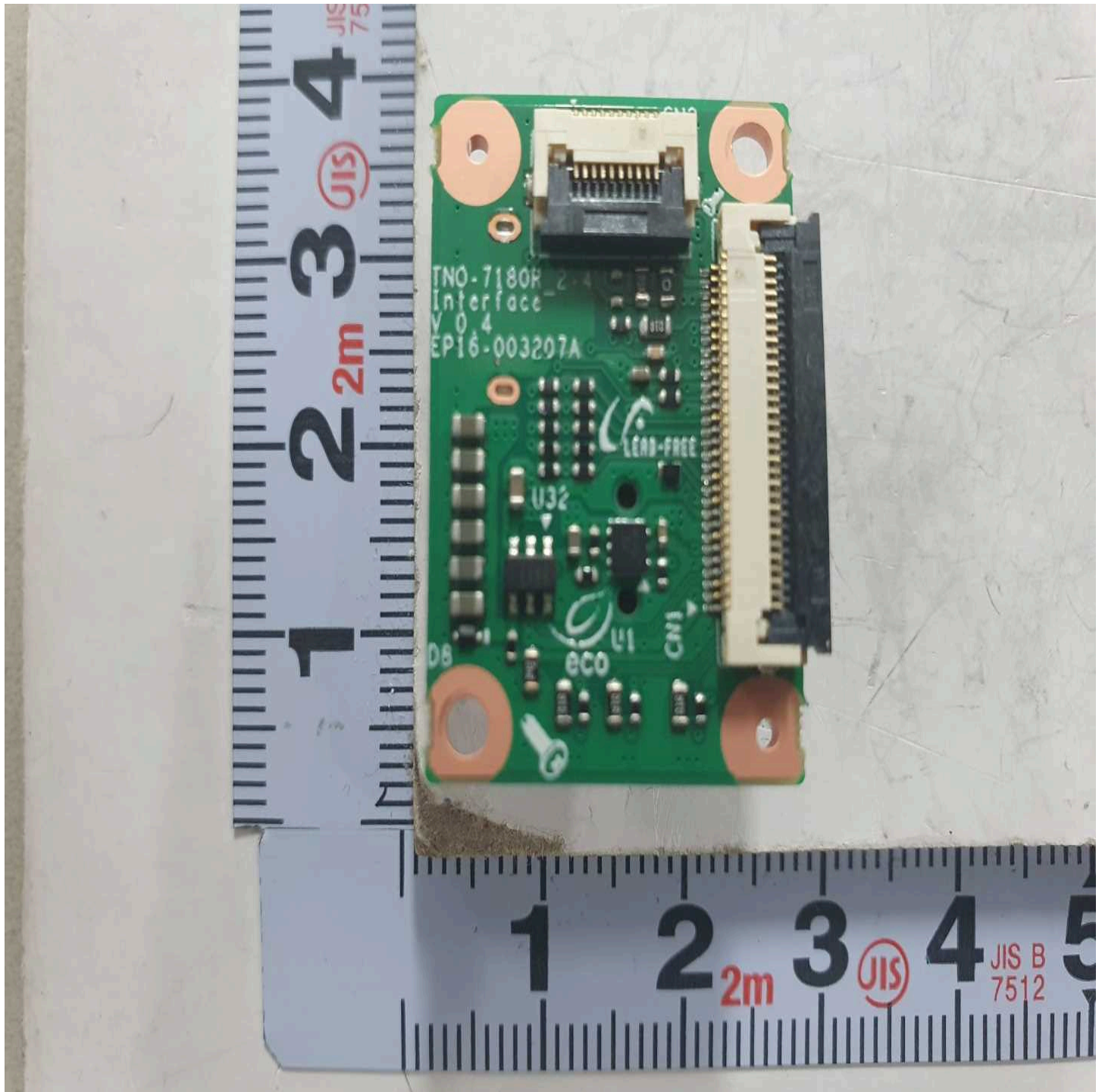


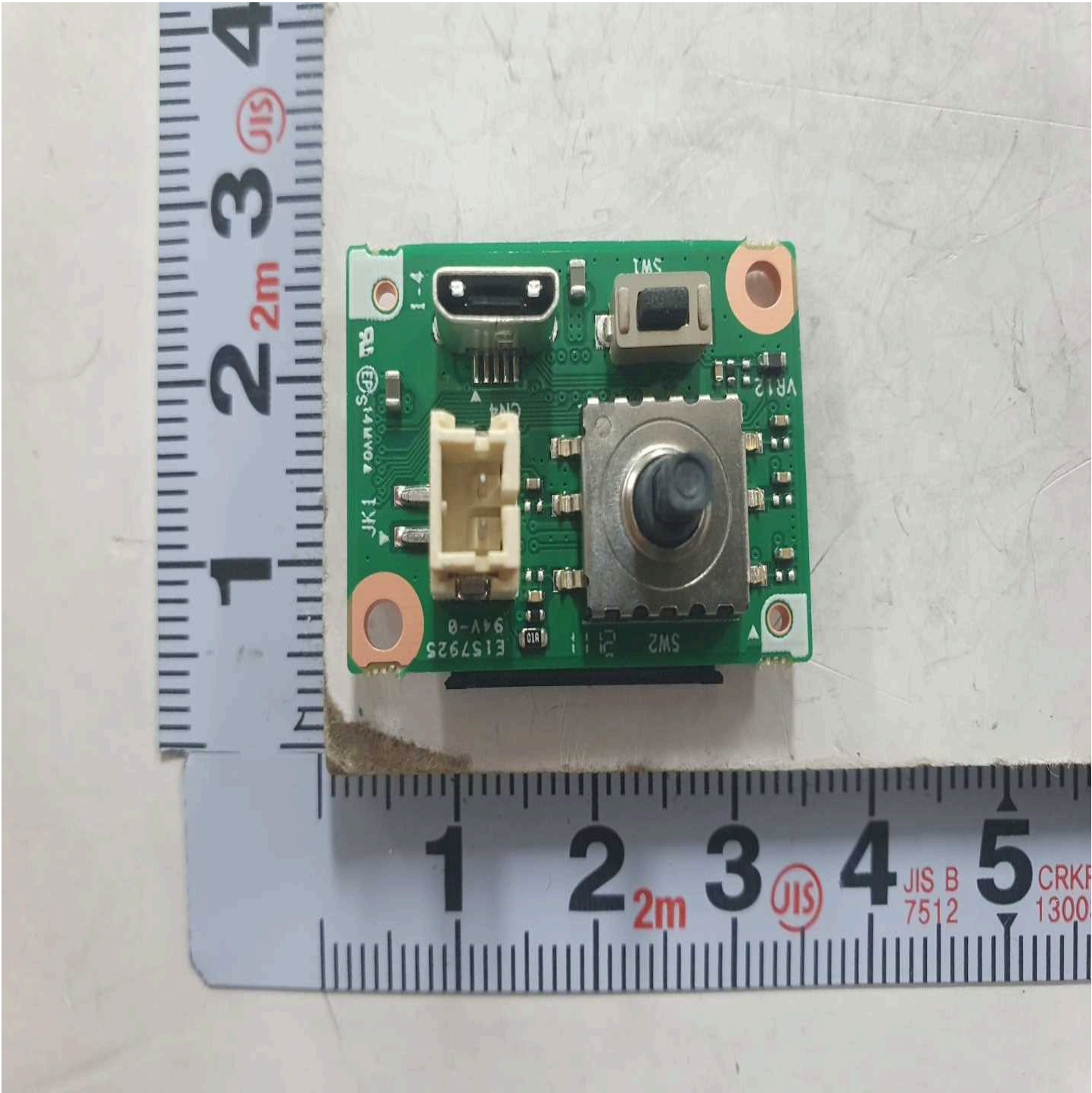






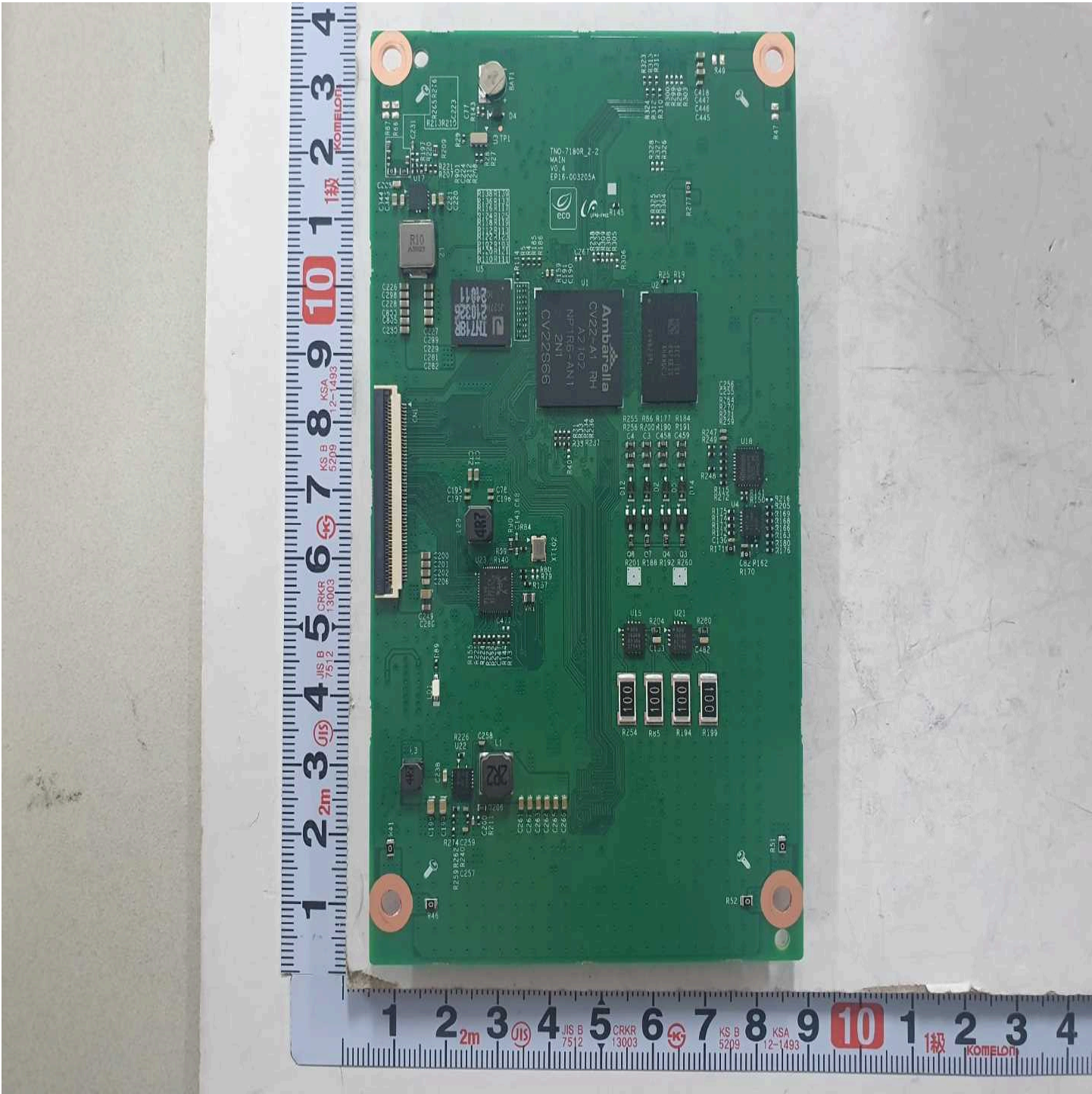


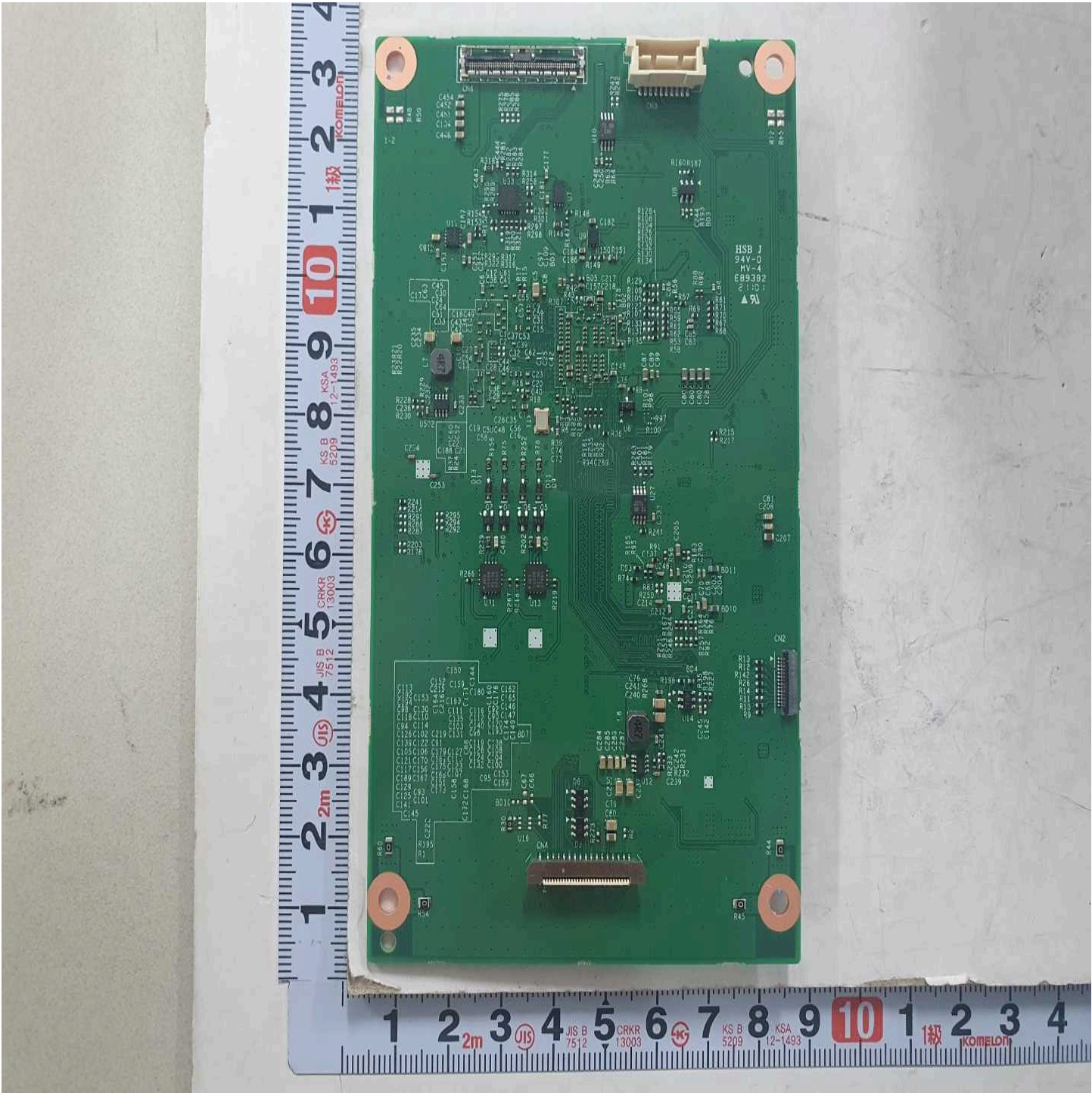


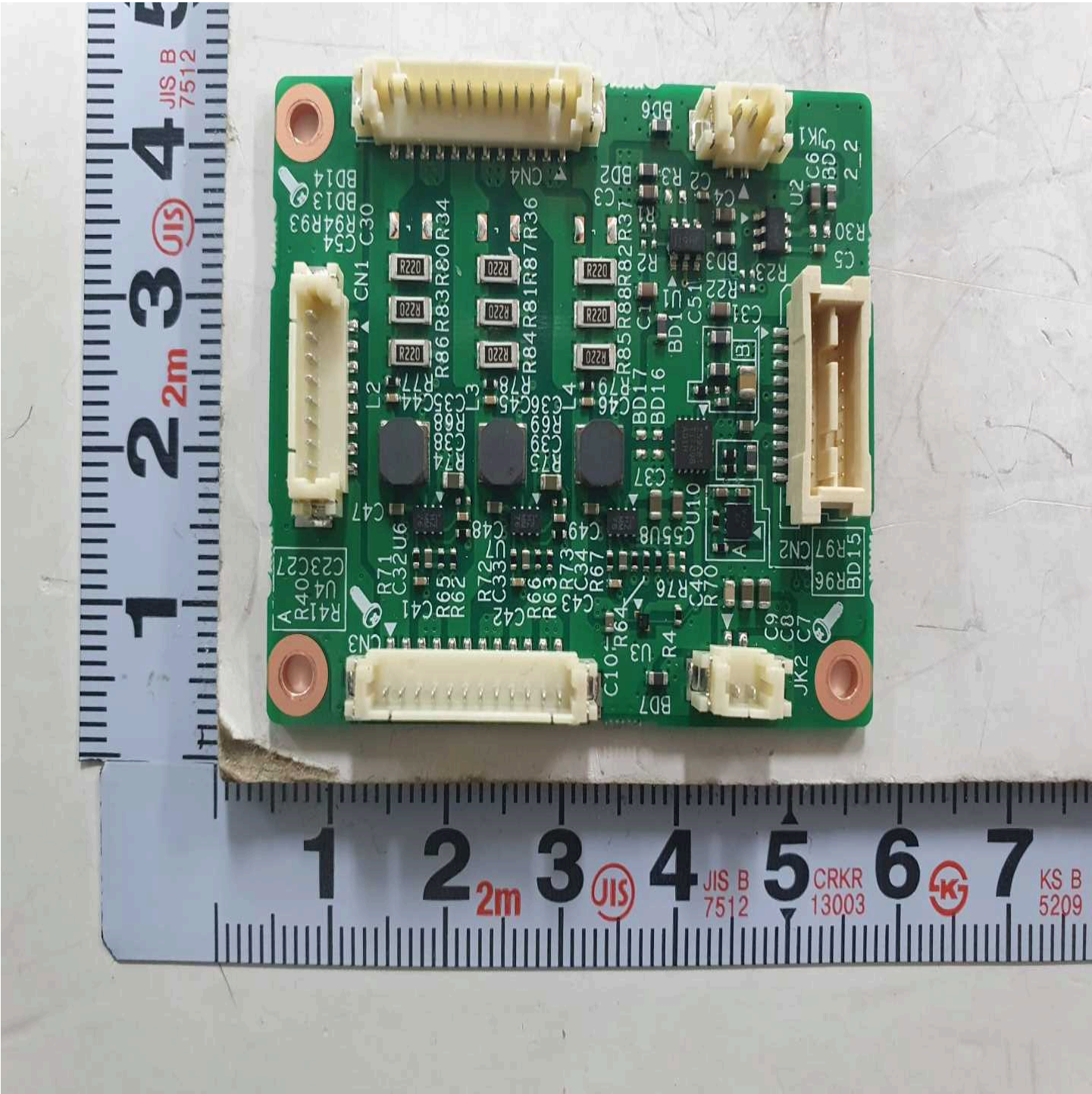


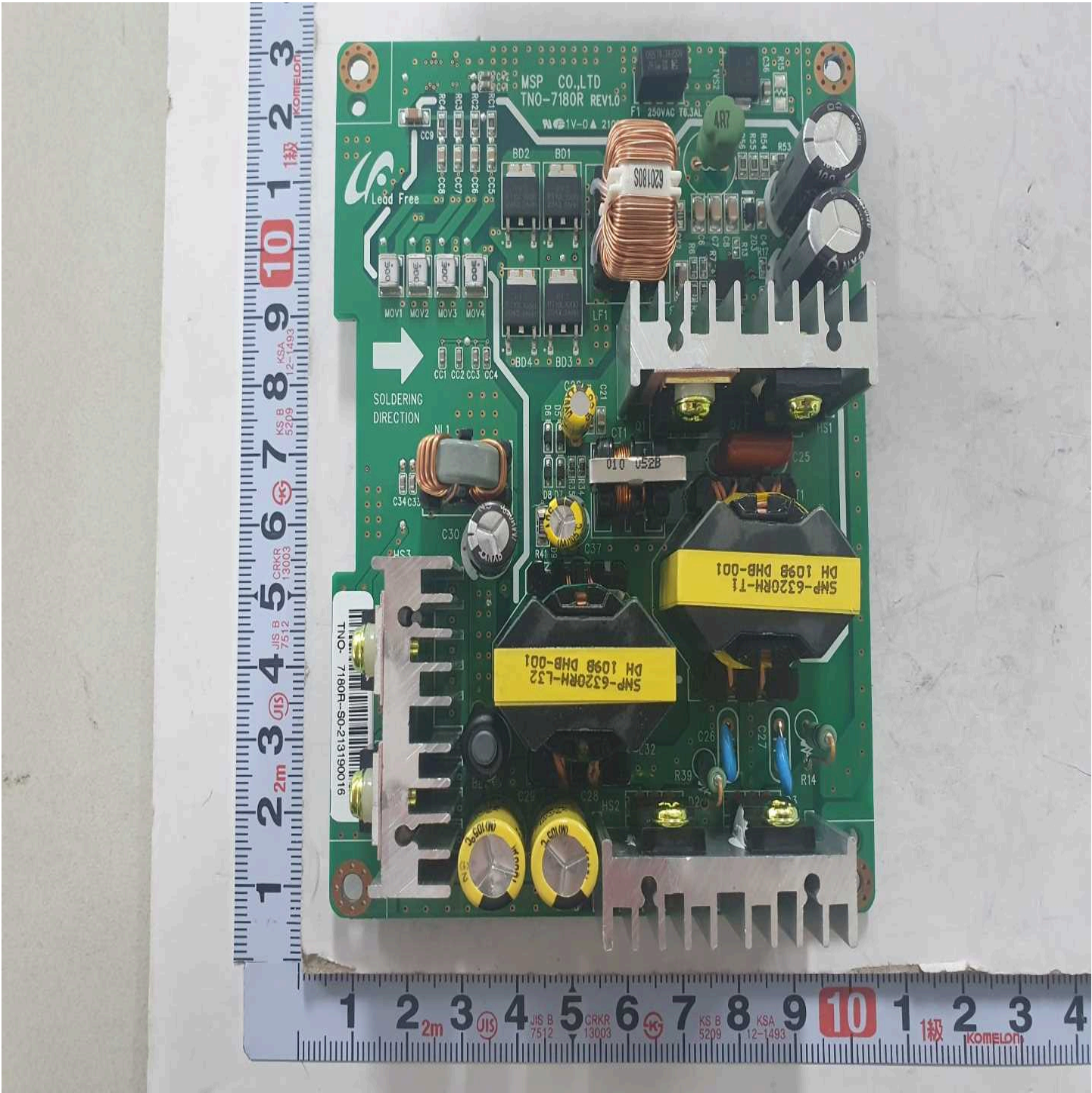




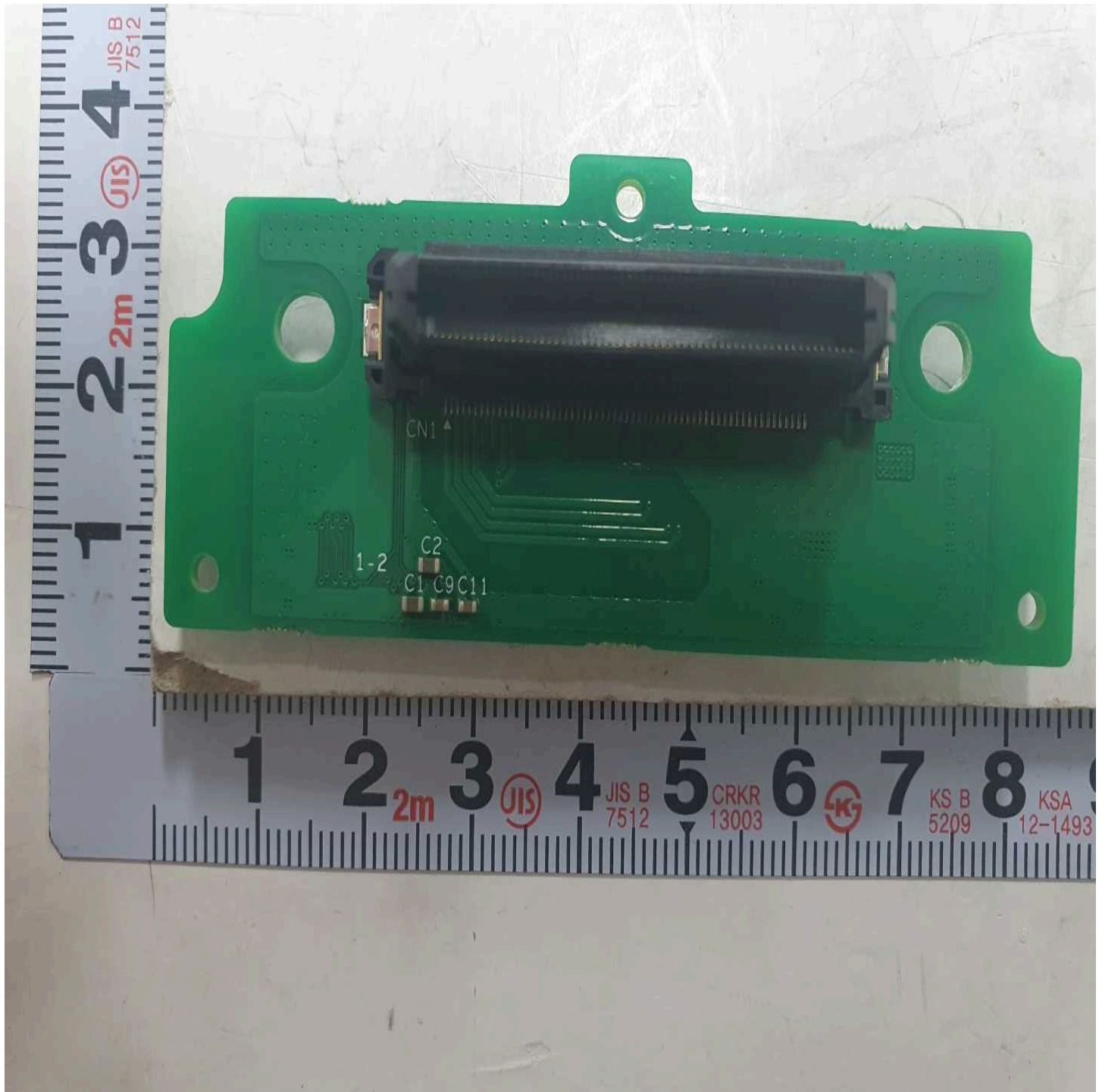


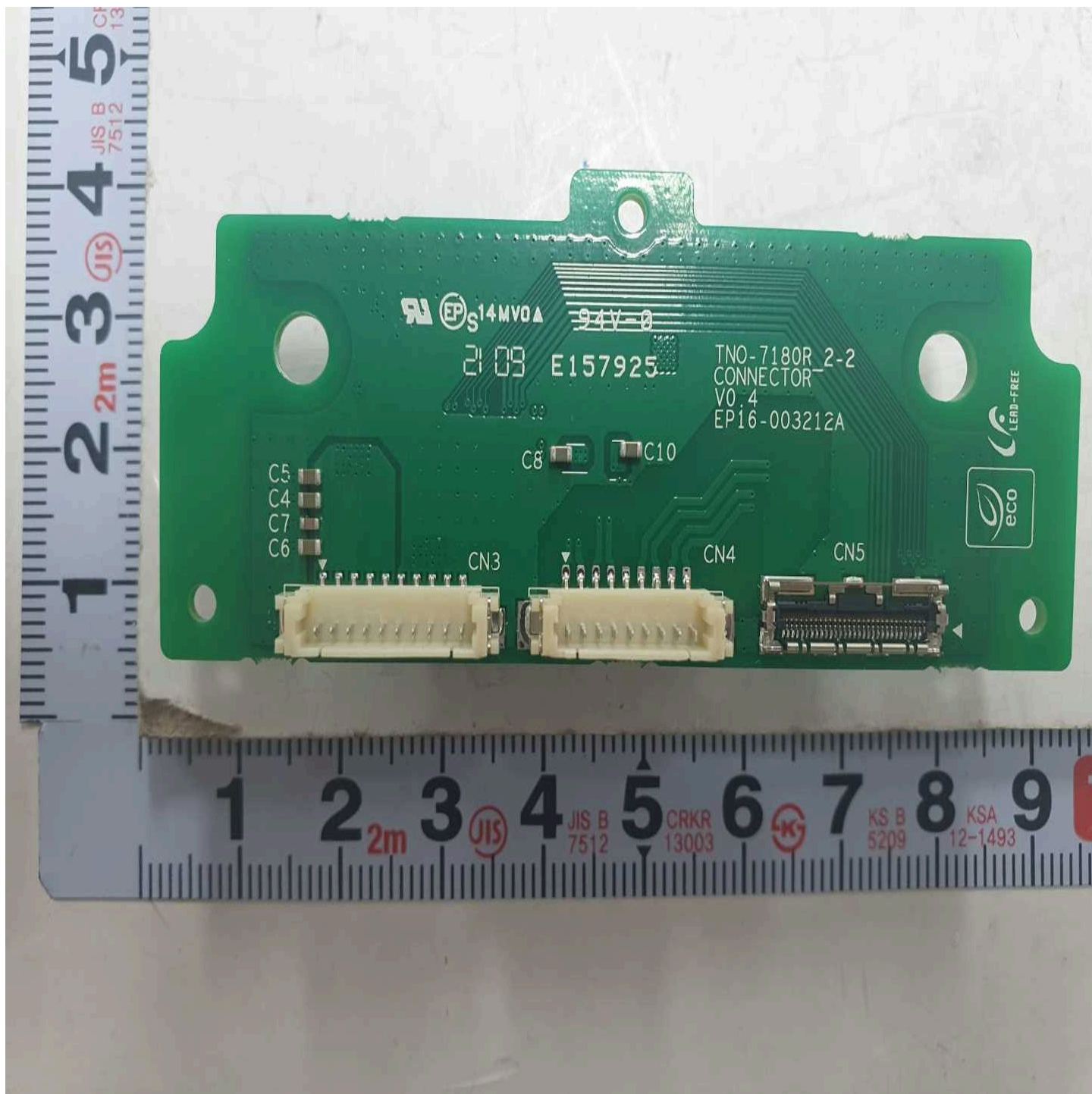












Revision Date: 2022-11-14

**Test Record No. 1**

1. Test result relate only to the items tested.
2. The manufacturer submitted representative production samples of NETWORK CAMERA, TNO-7180R.
3. Only the test listed were considered necessary.

The following tests were conducted:

<b>Tests performed (name of test and test clause):</b>	<b>Testing location:</b> CTK Co., Ltd., 386-1 Ho-dong Yongin-shi, Kyungki-do, 449-100, Korea
DETERMINATION OF WORKING VOLTAGE (5.4.1.8)	
WALL OR CEILING MOUNTING TESTS (8.7)	
INPUT TEST: SINGLE PHASE (B.2.5)	
SIMULATED ABNORMAL OPERATING CONDITIONS (B.3)	
SIMULATED SINGLE FAULT CONDITIONS (B.4)	
PROTECTION CIRCUITS FOR BATTERIES (M.3.2)	
MAXIMUM OPERATING TEMPERATURE FOR MATERIALS, COMPONENTS AND SYSTEMS (5.4.1.4, 6.2, 9.2.5 ANNEX B.2)	
<b>The following tests were waived:</b>	<b>Rationale for Waiving</b>

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 part of this Test Record. NOTE: These supplements are only available to the Applicant via the myUL™ Client Portal.

Type	Supplement Id	Description
Datasheet	02-01	Datasheet

Revision Date: 2022-11-14

**Test Record No. 2**

No test was considered necessary in order to add model name; TNO-7180RLP.

The following tests were conducted:

<b>Tests performed (name of test and test clause): None</b>	<b>Testing location: None</b>
<b>The following tests were waived: None</b>	<b>Rationale for Waiving</b>

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 part of this Test Record. NOTE: These supplements are only available to the Applicant via the myUL™ Client Portal.

Type	Supplement Id	Description