

UL TEST REPORT AND PROCEDURE

Standard:	UL 62368-1, 3rd Ed, 2021-10-22 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1:19, 3rd Ed, 2021-10-22 (Audio/video, information and communication technology equipment Part 1: Safety requirements)
Certification Type:	Listing
CCN:	AZOT, AZOT7 (Audio/video, Information and Communication Technology Equipment)
Complementary CCN:	N/A
Product:	NETWORK CAMERA
Model:	TNO-A45080R, TNO-A45090R
Rating:	PoE (55 Vdc), 0.72 A or 12Vdc, 3.11 A (for model TNO-A45080R) PoE (55 Vdc), 0.72 A or 12Vdc, 3.11 A (for model TNO-A45090R)
Applicant Name and Address:	HANWHA VISION 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.

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Prepared By: SeoHwan Kim / Project Handler Reviewed By: SeungTae Kim / Reviewer

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 55 °C (Min -40 °C)
- 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 : No direct connection
- The class of laser product is : Class 1 (I)
- The Risk Group of a lamp or lamp system (including LEDs) is : RG 2
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual
- The outdoor equipment was evaluated for use in an ambient range of: -40 °C to 55 °C

Additional Information

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- Maximum Normal Load: Continuous operation. Operate the camera through networked equipment with LED(3ea), IR LED(3ea) ON, fan operate, recording through SD memory card(2ea), optical module recording and heater on.

Additional Standards

The product fulfills the requirements of: N/A

Markings and Instructions

Clause Title	Marking or Instruction Details
Optical radiation from lamps – IR Radiation Symbol	IR radiation symbol  (60417-6151) for cornea/lens infrared hazard and retinal thermal hazard, weak visual stimulus Symbol on equipment is black on a yellow background. Reproduction in user manual is not required to be in color.
Optical radiation from lamps - Hazard-related risk group marking of equipment:	"CAUTION - IR emitted from this product" for Risk Group 2. "ATTENTION - IR émis par ce produit" for Risk Group 2.
Cornea/lens infrared hazard 780-3000 nm	Text on equipment is black on a yellow background. Reproduction in user manual is not required to be in color.

Optical radiation from lamps - Explanation of marking information and guidance on control measures: Cornea/lens infrared hazard 780-3000 nm	"Avoid eye exposure. Use appropriate shielding or eye protection." for Risk Group 2 "Éviter d'exposer les yeux. Utiliser un écran approprié ou une protection oculaire." for Risk Group 2
Equipment identification marking – Manufacturer identification	Listee's or Recognized Company's name, Trade Name, File Number
Equipment identification marking – model identification	Model Number
Equipment rating marking – ratings	Input Ratings (voltage, current)
Outdoor enclosure type	"Rainproof", IP67, IP66
Equipment for use in location where children are not likely to be present	"This equipment is not suitable for use in locations where children are likely to be present" (Instruction) or equivalent
Hard Copy	A. IMPORTANT or ATTENTION or similar wording B. Please check 'Manuals' from our website, before connecting to the supply. C. Company website URL (https://www.~~) or QR code.
(Website) Manual - 1	This product is intended to be supplied by a UL Listed Power Supply Unit marked "Class 2" or "LPS" or "PS2".
(Website) Manual - 2	The wired LAN hub providing power over the Ethernet (PoE) in accordance with IEEE 802.3bt/802.3at 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.
SCC requirement	If the signal words DANGER, WARNING, and CAUTION are included, a French manual is provided.
Special Instructions to UL Representative N/A	

BD1.0	TABLE: Production-Line Testing Requirements					
BD1.1	Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information.					
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
BD1.2	Earthing Continuity Test Exemptions – This test is not required for the following models:					
	All models					
BD1.3	Electric Strength Test Exemptions – This test is not required for the following models:					
	All models					
BD1.4	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.					
	All models					

BE1.0	Sample and Test Specifics for Follow-Up Tests at UL				
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 Window (Glass)	Interchangeable	Interchangeable	Glass, Min. 2.0 mm thickness, See enclosure for dimension.	-	Tested in equipment	
WINDOW-IR LED Cover (Plastic) (Part 1)	SABIC INNOVATIVE PLASTICS B V	EXL1434T(f1)(GG)(N1)(BK47)(EXL1434 T(f1))	Min.2.0 mm thickness, rated Min. PC, HB, RTI min. 120 deg. C.	QMFZ2	UL (E45329)	
WINDOW-IR LED Cover (Plastic) (Part 2)	LOTTE CHEMICAL CORPORATION	HN-1068(f1)	Min.1.5 mm thickness, rated Min PC, V-0, RTI min. 130 deg. C.	QMFZ2	UL (E115797)	
Enclosure – TOP body side (Metal)	Interchangeable	Interchangeable	Aluminum, Min. 1.5 mm thickness, see enclosure for dimension.	-	Tested in equipment	
Enclosure – Arm Side (Metal)	Interchangeable	Interchangeable	Aluminium, Min. 1.5 mm thickness, see enclosure for dimension.	-	Tested in equipment	
Enclosure – Top Back Box (Metal)	Interchangeable	Interchangeable	Aluminium, Min. 1.5 mm thickness, see enclosure for dimension.	-	Tested in equipment	
Enclosure – Bottom Back Box (Metal)	Interchangeable	Interchangeable	Aluminium, Min. 1.5 mm thickness, see enclosure for dimension.	-	Tested in equipment	
Enclosure – Bracket (Metal)	Interchangeable	Interchangeable	Aluminium, Min. 2.3 mm thickness, see enclosure for dimension.	-	Tested in equipment	

Internal Plastic Part Materials	LOTTE CHEMICAL CORPORATION	HN-1068(f1)	Min.1.5 mm thickness, rated Min PC, V-0, RTI min. 130 deg. C.	QMFZ2	UL (E115797)	
Internal Metal part materials	Interchangeable	Interchangeable	Aluminium, Min. 1.5 mm thickness, see enclosure for dimension.	-	Tested in equipment	
FUSE (F1)	LITTELFUSE INC	454*	75V, 7A	JDYX2	UL (E10480)	
Lens module (For model TNO-A45080R)	UNION OPTECH CO., LTD	T5931-A1	Rated 5.0 V±0.3 V	-	Tested in equipment	
Lens module (For model TNO-A45090R)	UNION OPTECH CO., LTD	T5932-A1	Rated 5.0 V±0.3 V	-	Tested in equipment	
Opto-coupler (LS1)	LITE-ON Technology Corporation	LTV-217 (Type: LTV-217-C-G)	Isolation Voltage: 3750, Max. operation Temperature: 110 deg. C	FPQU2	UL (E113898)	
Transformer (T2)	SHENZHEN GROUP-TEK ELECTRONICS TECHNOLOGY CO., LTD	PDT25268SR	100.0 uH, 130 deg . C. See enclosure for more detail.	-	-	
Line Filter (L5)	TNC CO., LTD	CV320070SB	7.0 mH, 105 deg . C. See enclosure for more detail.	-	-	
Laser Module (SFP Module) (optional)	Interchangeable	Interchangeable	Laser Class 1	AZOT2	UL	
DC Fan	SUNONWEALTH ELECTRIC MACHINE INDUSTRY CO LTD	HA30101V3-1(Y) (type: HA30101V3-1000U-A99)	12 Vdc, 0.025 A, 7000 RPM (N/15000+K/2400 = 0.48467 < 1, N=7000, K=52.23)	GPWV2	UL (E77551)	
Rechargeable battery (BAT1)	SEIKO INSTRUMENTS	ML414H	Lithium, Rechargeable, Max Charging Voltage:	BBCV2	UL (MH15628)	

	INC MICRO-ENERGY DIV		3.4 Vdc, Max Charging current: 300 mA			
Lithium Battery Protection Circuit (BAT1)	Interchangeable	Interchangeable	Diode (D2, 80 V, 250 mA) and Resistor (R65, 3.3 Kohm) in series	-	Tested in equipment	
Thermal pad	KOMOTECH	KGP-1(a)	Min. 0.2 mm thickness, rated V-0, 150 deg. C	QMFZ2	UL (E245303)	
GASKET- Between Front Body plastic Side and Body Metal side	NAMYANG	O-VMQ-50-BK	Gasket Test was conducted under E158873-A6034	-	Tested in equipment	
GASKET -Between Rear Body Metal side and Body Metal side	NAMYANG	O-VMQ-50-GR	Gasket Test was conducted under E158873-A6034	-	Tested in equipment	
GASKET- Tube cable Between Rear Body Metal side and Back-Box Top Metal side	NAMYANG	C-VMQ-30-BK	Gasket Test was conducted under E158873-A6034	-	Tested in equipment	
GASKET- Between Back-Box Top Metal side and Back-Box Bottom Metal side	NAMYANG	O-VMQ-50-GR	Gasket Test was conducted under E158873-A6034	-	Tested in equipment	
GASKET- Between Back-Box Top Metal side and Cover Door Metal side	NAMYANG	O-VMQ-50-GR	Gasket Test was conducted under E158873-A6034	-	Tested in equipment	
PWB	HANNSTAR BOARD CORP	MV-4	Min. V-0, 130 deg. C	ZPMV2	UL (E89382)	
PWB – Alternate	Interchangeable	Interchangeable	Min. V-0, 130 deg. C	ZPMV2	UL	
PWB – IR LED	KIJOO Industrial Co., LTD.	KJ13-01	Min. V-0, 150 deg. C	ZPMV2	UL (E111636)	
PWB – IR LED	Interchangeable	Interchangeable	Min. V-0, 150 deg. C	ZPMV2	UL	

Alternate						
Outdoor Label	Interchangeable	Interchangeable	Suitable for use on each type of surface to which applied, rated for maximum and minimum surface temperature specified, or Min. - 40 deg. C to Max. 55 deg. C if not specified.	PGDQ2 or PGJI2 and PGAA	UL	
IR LED (LD1, LD2, LD3, LD4, LD5, LD6)	OSRAM Opto Semiconductors. GmbH	SFH4715AS	VF=Max. 3.5 V, IF=Max. 1.5 A	-	Tested in equipment	

Enclosures

Type	Supplement Id	Description
Photographs	03-01	External View - 1
Photographs	03-02	External View - 2
Photographs	03-04	Internal View
Photographs	03-05	Power board
Photographs	03-06	Main board
Photographs	03-07	Lens module
Photographs	03-08	Driver board
Photographs	03-09	Heater board
Photographs	03-10	Sensor board
Diagrams	04-01	Enclosure Diagram
Manuals	06-01	Manual
Miscellaneous	07-01	Transformer (T1) Specification
Miscellaneous	07-02	Label