DAIWON

DAIWON OPTICAL CO., LTD

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DAIWON

DAIWON HISTORY

Established in 1988, DAIWON OPTICAL CO., LTD. has been a leading manufacturer specializing in a wide range of cutting edge lenses optimally designed for Security, Automotive, Home Automation and Machine Vision Cameras. Our accumulated know-how with continual, technical enhancement, top-quality oriented management and proactive sales development has rewarded DAIWON OPTICAL as a globally outstanding company that has increased our strong reputation in terms of precision optical expertise. Experienced in operating a global standard of excellence in these quickly paced industries. We have facilitated innovative and customer satisfied quality lenses starting from construction to counseling up to actual production. Qualified with ISO 9001:14001, IATF16949 our rapid responding service and technology are striving with more than decade-experienced engineering workmanship. DAIWON OPTICAL CO., LTD. is continuously striving to become the most trusted company and to lead the technology for the industry with the best service.

Milestones

2018 – 2020

· Developed DSM Lens
· Developed RGBIR Lens
· Approved Lens vender of LG Electronic
· Approved Lens vender of Mitsubishi Electronic
· Operated New Factory in Vietnam
· New building in Incheon 2020

2014 – 2017

· Released 16 Megapixel Fixed Board Mount for Sports Camera
· Released 3 Megapixel Pinhole Lens
· Released 2 Megapixel Doorbell Lens
· Released Automotive Surround View Lens
· Acquired ISO TS 16949

2010 – 2013

· Released Board Mount Vari-focal Motorized Zoom Lens(x8.3)
· Developed 5 Megapixel Fixed C mount Lens(f 50mm)
· Released 3 Mega-pixel CS Mount Vari-focal Lens and P-Iris Vari-Focal Lens
· Released 3 Mega-pixel Board Mount Vari-focal Lens
· Acquired ISO TS 14001

2006 – 2009

· Released Mega-pixel CS Mount Vari-focal Lens
· Released Easy-focus Lens and Mega-pixel Board Mount Vari-focal Lens
· Released Mega-pixel Board Lens
· Released Vari-focal IR Lens
· Awarded '10 Million USD Export Prize', Korea Intenational Trade Association

2000 – 2005

· Released IR Lenses
· Released New Vari-focal Lenses
· Produced and Exported High Definition Digital Camera Lenses
· Acquired ISO 9001
· Awarded '5 Million USD Export Prize', Korea Intenational Trade Association

1988 – 1999

· DAIWON OPTICAL COMPANY established
· Started Optical manufacturing business in Camera Lenses and Lenses for Binoculars
· Produced and Exported PC and Digital Camera Lenses
· Obtained a Patent in field of 'Optical System of the Pinhole Camera Lenses'
· Awarded '1 Million USD Export Prize', Korea Intenational Trade Association
· Released and Exported Vari-focal Lens and Aspherical Hybrid Lens

OVERVIEW

Daiwon Value

People   Speed   Integrity   Excellence   Zero Defect

Business Scope

Business Scope

- Automotive 40%
- Security 30%
- MV/Home Automation 20%
- Others 10%
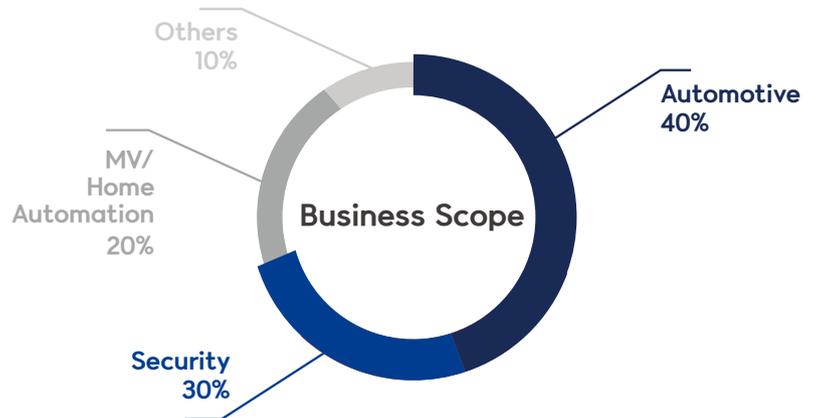
Foundation : Since1988, 32 years

Total Assets : $20M

Employees : 140, [75(Head quarter), 65(Vietnam)]

Capacity : 8M pcs / Y, 700K pcs / M (Max)

Product Portfolio : Security, Automotive, Machine Vision Camera Lens, Fixed Lens for Home Automation, Drone, Iris Recognition etc

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Qualifications : Certificate IATF16949, ISO9001, ISO14001

GLOBAL NETWORK

● Main Market
● Headquarters – INCHEON CITY, SOUTH KOREA
  Factory – HOCHIMINH CITY, VIETNAM

EUROPE
FRANCE
RUSSIA
KOREA INCHEON
CHINA
TAIWAN
VIETNAM HO CHI MINH
SINGAPORE
USA

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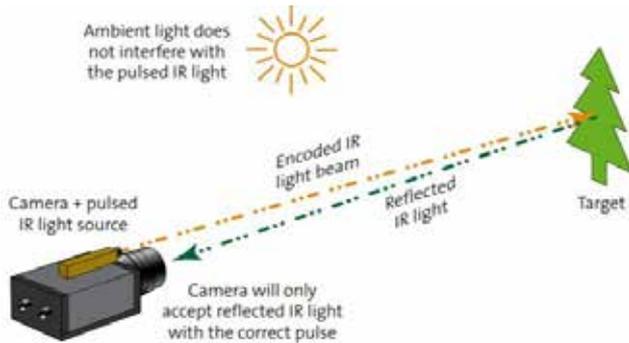E : emmanuel@visielec.fr

📍 US (California)

LEGEND TECHNOLOGIES UNLIMITED
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TOF(Time of Flight)

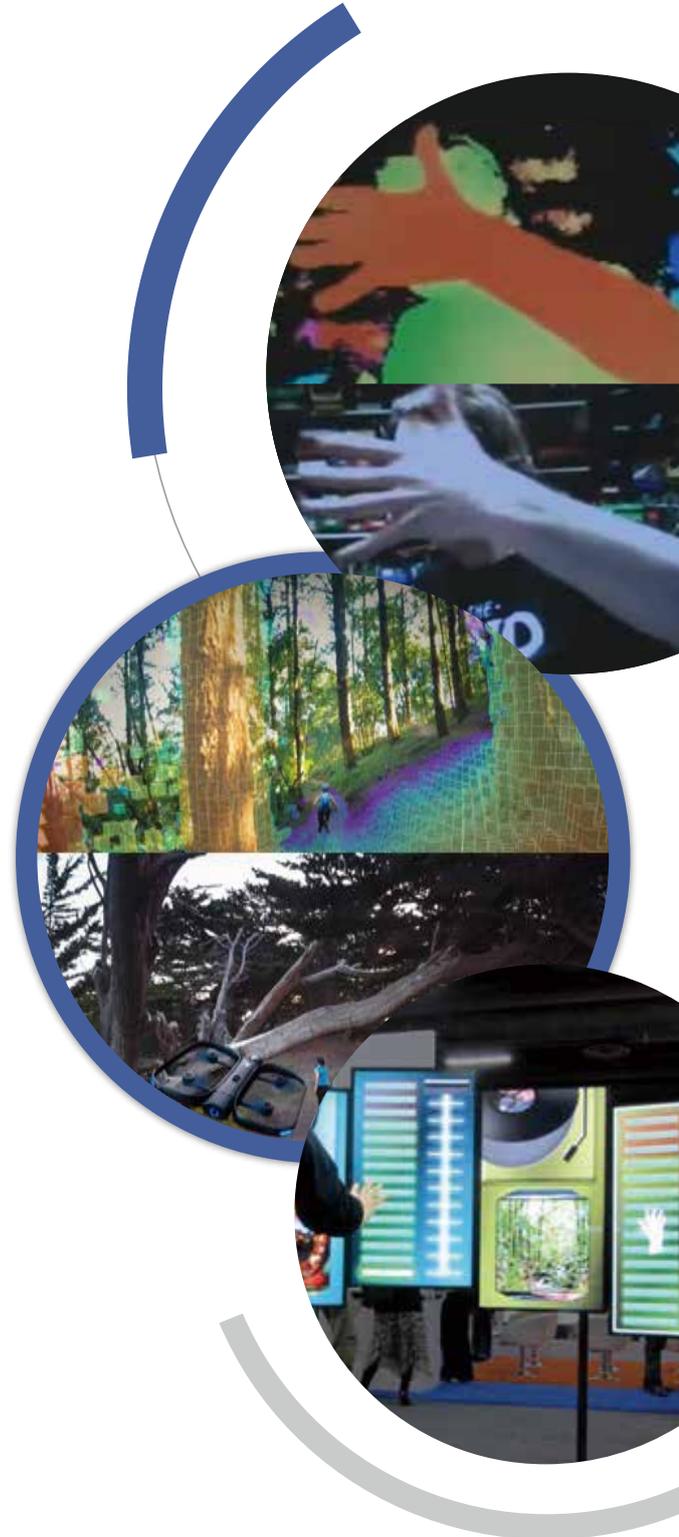## What is a ToF(Time of Flight) Camera?

- 📷 Emits an infrared light signal
- 📷 Measures how long the signal takes to return
- 📷 Determines depth based on extracted data

A ToF camera uses infrared light (lasers invisible to human eyes) to determine depth information – a bit like how a bat senses it surroundings. The sensor emits a light signal, which hits the subject and returns to the sensor. The time it takes to bounce back is then measured and provides depth-mapping capabilities. This provides a huge advantage over other technologies, as it can accurately measure distances in a complete scene with a single laser pulse.

Ambient light does not interfere with the pulsed IR light

Encoded IR light beam

Reflected IR light

Camera + pulsed IR light source

Target

Camera will only accept reflected IR light with the correct pulse

Security

- 📷 Abnormal approach detection
- 📷 Intelligent camera
- 📷 Access control
- 📷 Security control
- 📷 Low light night detection

SECURITY LOG

LOGIN: 1
ACCESS: 2
ACTION: SECURITY CHECK

SUM: 341

Anti-Tailgating Security System

Product Features

· Compact Size (Dia. 13.4mm TTL 13mm)
· Low Aperture F1.0, F1.3 (Brightness Lens)
· High Resolution (1280 x 720P)
· Minimized Focus shift at Thermal Shock (Temp. −40°C~105°C)
· No Thermal Shift of 940nm Band pass   filter (Temp. −40°C~105°C)
· Minimized Veiling Glare, Ghost, Flare
· Low Cost (Plastic+Glass Lens)
· The Plastic lenses meet reliability requirements

The Product of Other Companies

	25°C	40°C	55°C	70°C	85°C	100°C	115°C
Average trasmission is over 50%	87.1%	87.1%	85.1%	85.1%	84.9%	84.9%	85.0%
Peak penetration ratio	95.4%	95.5%	93.2%	93.2%	92.9%	92.8%	92.6%

The Product of Daiwon

	25°C	40°C	55°C	70°C	85°C	100°C	115°C
Average trasmission is over 50%	93.0%	93.5%	93.5%	93.6%	93.6%	93.6%	93.6%
Peak penetration ratio	97.8%	97.9%	97.9%	98.0%	98.0%	98.0%	98.0%

Ambient Temp	−40°C			+20°C			+40°C			+85°C			+105°C		
Field of image	0F	0.8F	1.0F	0F	0.8F	1.0F	0F	0.8F	1.0F	0F	0.8F	1.0F	0F	0.8F	1.0F
�⌿BFL[um]	−4.66			−1.12			0.0			2.46			3.53		
MTF [%] @ NY/2	89.7	S70.2T8 3.6	S65.2T7 8.8	84.4	S70.4T8 1.2	S60.1T8 0.0	82.1	S69.6T7 9.1	S57.5T7 9.9	76.7	S66.7T7 3.6	S51.1T7 8.4	74.2	S64.9T7 0.5	S47.6T7 7.4
MTF image															

Products Specifications

| MODEL	18513AS	19609AS
Focal Length	1.8mm	1.9mm
Back Focal Length	3.1mm	3.9mm
Flange Back Length	2.0mm	1.8mm
F No.	F1.3	F0.9
Total Track Length	13.0mm	25.0mm
Resolution	VGA	VGA
Diameter	13.4mm	18.0mm
Format Size	1/4"	1/4"
Angle of View (H*V)	(H)110.0 (V)84.5	(H)110.0 (V)82.8
Image Circle (Max.)	Ø4.48	Ø4.48
Mount Type	M12	M12

RGB+IR

What is RGB+IR?

The Technology is similar to standard RGB color sensors in that it is a mask that is applied to a monochrome sensor. What is different is that one of the two green replaced pixels with an infrared(IR)pixel. This IR pixel contains Red, Green and Blue filter materials, effectively absorbing all of the visible spectrum. IR light with longer wavelengths will pass through this filter with minimal loss.

What is the Difference about Daiwon's RGB+IR?

Daiwon can only use RGB+IR with the lens without IR Cut Filter for the ICR Camera.
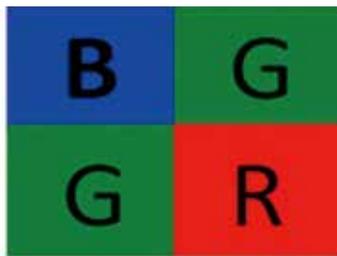
Standard RGB Format
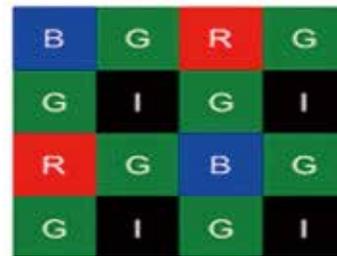
RGB+IR Format

📷 Comparison of Standard RGB vs RGB + IR Format

~500 lux, IR OFF

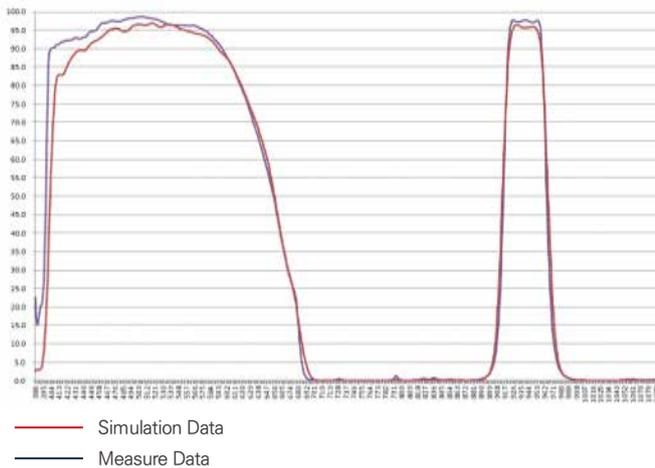~14 lux, IR OFF

~0.5 lux, IR OFF

0 lux, IR ON

📷 Comparison images according to Lux

Comparison of RGB+IR Dual Band Pass Filter

The IR area can be applied at the same level as the existing 850nm / 940nm Band pass filter.

— Simulation Data
— Measure Data

▲ Before Ghost Problem Improvements
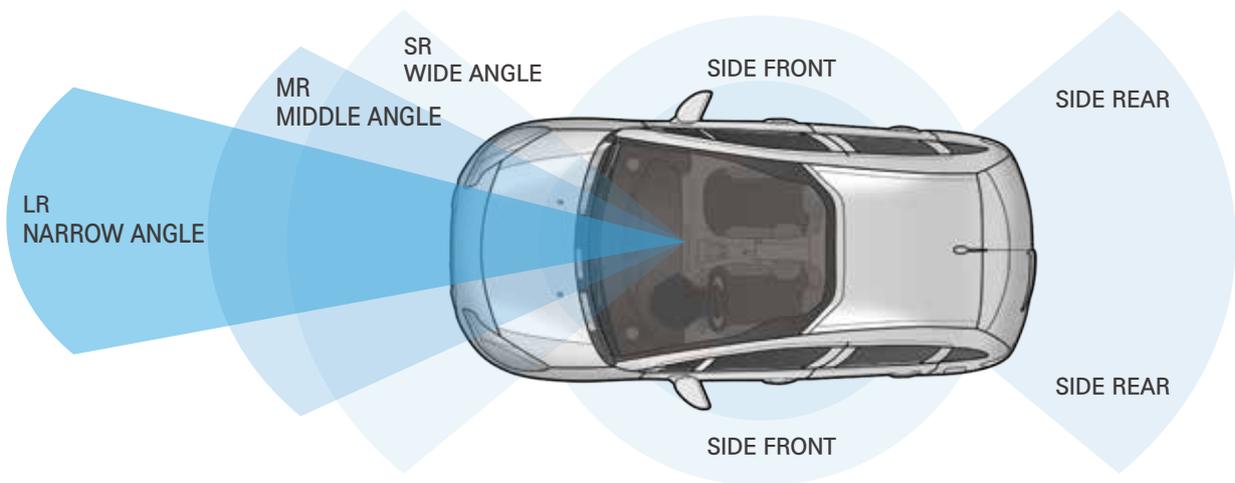
▲ After Ghost Problem Improvements

Product Features

· In the case of the lens using the Band Pass Filter, the color of the tree or indigo blue color appears pink (or purple) in the image due to the natural light, but there is no such phenomenon when using the lens of our RGB+IR.
· Satisfies the vehicle reliability standard specification.
· Minimized Veiling Glare, Ghost, Flare

Products Specifications

MODEL	17620–2MAS	24620–3MAS	29620–3M	VIR60620–3M
Focal Length	1.7mm	2.4mm	2.9mm	6.0mm
Back Focal Length	3.4mm	5.1mm	6.3mm	7.0mm
Flange Back Length	1.5mm	4.4mm	6.4mm	5.4mm
F No.	F2.0	F2.0	F2.0	F2.0
Total Track Length	16.0mm	22.8mm	21.5mm	21.2mm
Resolution	2MP	3MP	3MP	3MP
Diameter	17.8mm	17.8mm	14.0mm	14.0mm
Format Size	1/2.8"	1/3"	1/2.7"	1/2.7"
Angle of View (H*V)	(H)188.6 (V)102.8	(H)122.2 (V)69.6	(H)119.8 (V)65.1	(H)55.8 (V)31.0
Image Circle (Max.)	Ø5.6	Ø6.1	Ø6.61	Ø6.61
Mount Type	M12	M12	M12	M12

AUTONOMOUS

LR
NARROW ANGLE

MR
MIDDLE ANGLE

SR
WIDE ANGLE

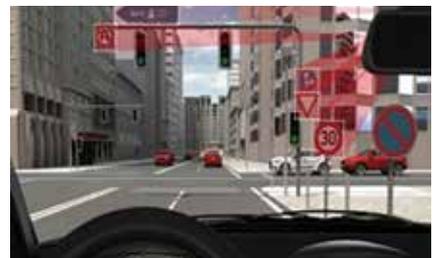SIDE FRONT

SIDE REAR

SIDE REAR

SIDE FRONT

System Approach

AVM

LDWS

Traffic Sign Recognition

Camera Lenses For Auto Vision

Daiwon Optical is one of the leading automotive lenses developer and manufacturer in the filed of automotive vision systems for advanced safety applications.

The core technology of Daiwon Optical is with its own patented lens designs. These sophisticated lens designs are used in its market−leading surround view system(SVS) and for the development of the advanced driver assistance systems(ADAS). At the center of its competitive edge is also the capacity of developing automotive lenses that would satisfy even the stringent requirements from OEMs.

Daiwon is expanding its range from narrow angle to wide angle and ultra small to provide more suitable products for advanced driver assistance systems (ADAS).

Driver Status Monitoring

E−Mirror

Interior (ToF Gesture / Cabin Camera)

AUTONOMOUS

LDWS / DSM / E-Mirror Lens

MODEL	32520MAS	VIR60620-3M	39720-2M
Focal Length	3.2mm	6.0mm	3.9mm
Back Focal Length	2.7mm	7.0mm	5.5mm
Flange Back Length	1.0mm	5.4mm	4.91mm
F No.	F2.0	F2.0	F2.0
Total Track Length	9.0mm	21.2mm	23.0mm
Resolution	1.3MP	3MP	2MP
Diameter	9.2mm	14.0mm	15.0mm
Format Size	1/4"	1/2.7"	1/2.5"
Angle of View (H*V)	(H)66.1 (V)41.6	(H)55.8 (V)31.0	(H)90.7 (V)56.6
Image Circle (Max.)	Ø4.5	Ø6.61	Ø7.4
Mount Type	M10	M12	M12

Interior / Black Box Lens

MODEL	18513AS	29620-3M	17620-2MAS	DW178720
Focal Length	1.8mm	2.9mm	1.7mm	1.78mm
Back Focal Length	3.1mm	6.3mm	3.4mm	4.2mm
Flange Back Length	2.0mm	6.4mm	1.5mm	2.7mm
F No.	F1.3	F2.0	F2.0	F2.0
Total Track Length	13.0mm	21.5mm	16.0mm	21.2mm
Resolution	VGA	3MP	2MP	VGA
Diameter	13.4mm	14.0mm	17.8mm	14.8mm
Format Size	1/4"	1/2.7"	1/2.8"	1/4"
Angle of View (H*V)	(H)110.0 (V)84.5	(H)119.8 (V)65.1	(H)188.6 (V)102.8	(H)118.8 (V)88.1
Image Circle (Max.)	Ø4.48	Ø6.61	Ø5.6	Ø4.48
Mount Type	M12	M12	M12	M12

Stereo Camera / Front view / Rear view Lens

MODEL	15422AS	18524MAS	47616G-5MAS	VIR43618-3M
Focal Length	1.5mm	1.8mm	4.7mm	4.3mm
Back Focal Length	2.4mm	2.5mm	5.3mm	8.0mm
Flange Back Length	1.2mm	1.3mm	4.1mm	6.6mm
F No.	F2.2	F2.4	F1.6	F2.5
Total Track Length	12.0mm	14.0mm	23.4mm	23.9mm
Resolution	VGA	1.3MP	5MP	3MP
Diameter	16.8mm	18.8mm	14.0mm	14.0mm
Format Size	1/4"	1/3"	1/1.7"	1/2.7"
Angle of View (H*V)	(H)140.0 (V)103.0	(H)154.2 (V)86.7	(H)112.1 (V)56.9	(H)84.3 (V)44.0
Image Circle (Max.)	Ø4.48	Ø5.5	Ø9.25	Ø6.61
Mount Type	M10	M10,M12	M12	M12

MODEL	10620MAS	11620MAS	12624MAS	17620-2MAS
Focal Length	0.9mm	1.1mm	1.2mm	1.7mm
Back Focal Length	2.2mm	2.0mm	2.0mm	3.4mm
Flange Back Length	1.0mm	1.0mm	1.0mm	1.5mm
F No.	F2.0	F2.0	F2.4	F2.0
Total Track Length	16.2mm	14.8mm	14.0mm	16.0mm
Resolution	1.3MP	1.3MP	1.3MP	2MP
Diameter	18.4mm	21.9mm	18.8mm	17.8mm
Format Size	1/4"	1/4"	1/3"	1/2.8"
Angle of View (H*V)	(H)190.6 (V)150.8	(H)190.5 (V)114.9	(H)192.8 (V)122.8	(H)188.6 (V)102.8
Image Circle (Max.)	Ø3.7	Ø4.0	Ø5.5	Ø5.6
Mount Type	M10,M12	M10	M10,M12	M12

BIOMETRIC RECOGNITION

What is Biometric Recognition?

Biometrics is the measurement and statistical analysis of people's unique physical and behavioral characteristics. The technology is mainly used for identification and access control, or for identifying individuals who are under surveillance.

Daiwon can suggest lenses that can be applied to biometric systems such as face, iris and fingerprint recognition.

Fingerprint Recognition

Face ID

Iris Recognition

Fingerprint Recognition

Fingerprint recognition refers to the automated method of identifying or confirming the identity of an individual.

Fingerprint recognition is one of the most well known biometrics, and it is by far the most used biometric solution for authentication on computerized systems.

Product Features

· Fingerprint Recognition Lens
· Focal Length 2.2mm
· F2.4
· (H) 86.5 (V) 83.0

Products Specifications

| MODEL	VIR43618-3M	120320-2MAS	DW10353
Focal Length	4.3mm	12.0mm	10.3mm
Back Focal Length	7.8mm	4.65mm	8.7mm
Flange Back Length	6.6mm	4.1mm	7.4mm
F No.	F2.5	F2.8	F3.0
Total Track Length	23.8mm	12.3mm	17.6mm
Resolution	3MP	2MP	VGA
Diameter	14.0mm	8.4mm	14.0mm
Format Size	1/2.7"	1/4"	1/2"
Angle of View (H*V)	(H)84.3 (V)44.0	(H)17.2 (V)13.0	(H)34.9 (V)26.5
Image Circle (Max.)	Ø6.61	Ø4.35	Ø10.3
Mount Type	M12	M6.5	M12

IOT HOME SECURITY

What is IoT Home security?

IoT security is the technology area concerned with safeguarding connected devices and networks in the internet of things.

IoT involves adding internet connectivity to a system of interrelated computing devices, mechanical and digital machines, objects, animals and/or people. Each "think" is provided a unique identifier and the ability to automatically transfer data over a network. Allowing devices to connect to the internet opens them up to a number of serious vulnerabilities if they are not properly protected.

IoT security has become the subject of scrutiny after a number of high-profile incidents where a common IoT device was used to infiltrate and attack the larger network. Implementing security measures is critical to ensuring the safety of networks with IoT devices connected to them.

Door Bell

Door Rock

Home / Pet Cam
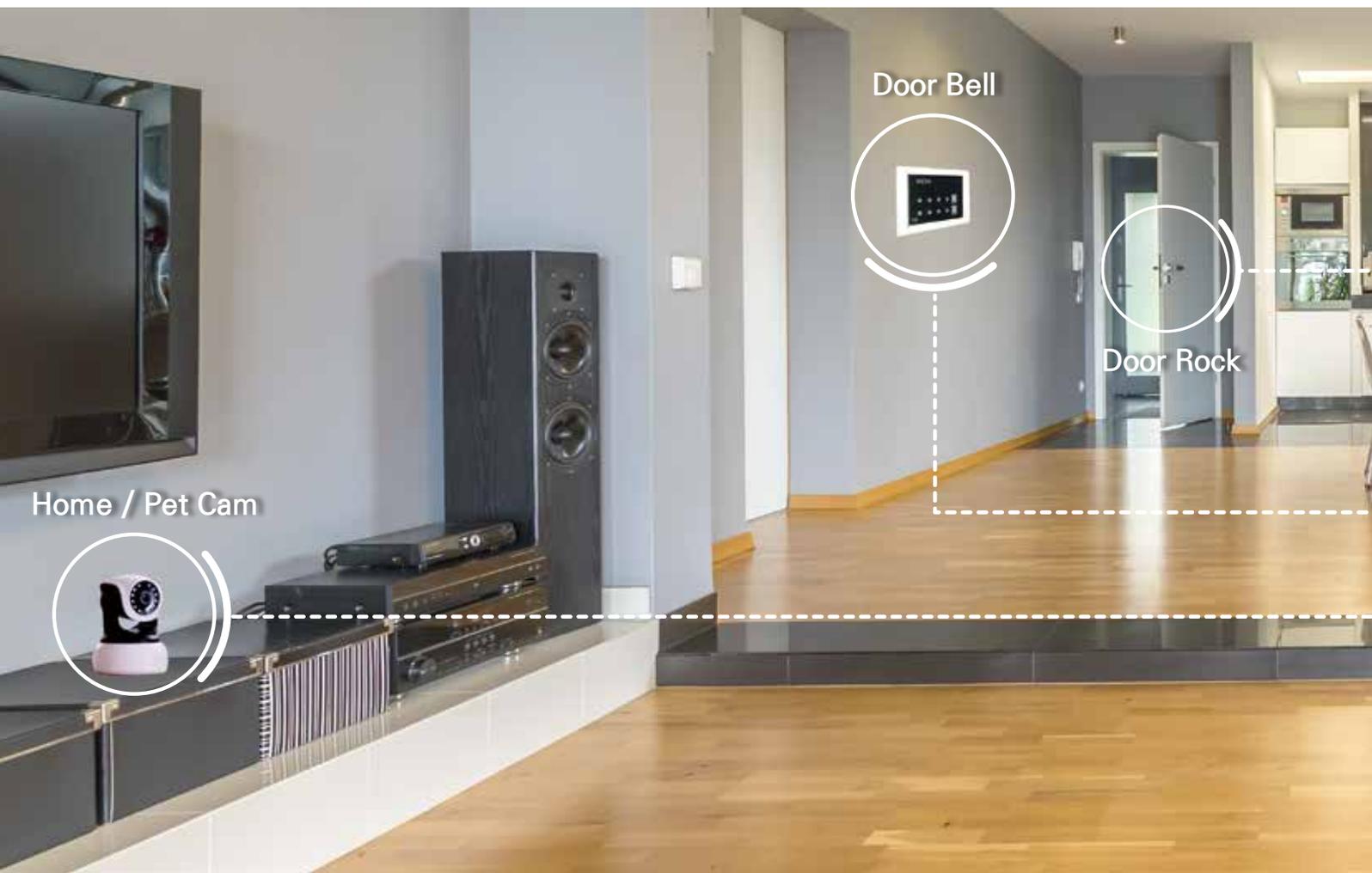
MODEL	12624MAS	17620-2MAS	19620-3MAS	24620-3MAS
Focal Length	1.2mm	1.7mm	1.9mm	2.4mm
Back Focal Length	2.0mm	3.4mm	6.0mm	5.1mm
Flange Back Length	1.0mm	1.5mm	6.2mm	4.4mm
F No.	F2.4	F2.0	F2.0	F2.0
Total Track Length	14.0mm	16.0mm	25.0mm	22.8mm
Resolution	1.3MP	2MP	3MP	3MP
Diameter	18.8mm	17.8mm	18.7mm	17.8mm
Format Size	1/3"	1/2.8"	1/3"	1/3"
Angle of View (H*V)	(H)192.8 (V)122.8	(H)188.6 (V)102.8	(H)132.0 (V)99.0	(H)122.2 (V)69.6
Image Circle (Max.)	Ø5.5	Ø5.6	Ø5.6	Ø6.1
Mount Type	M10,M12	M12	M12	M12
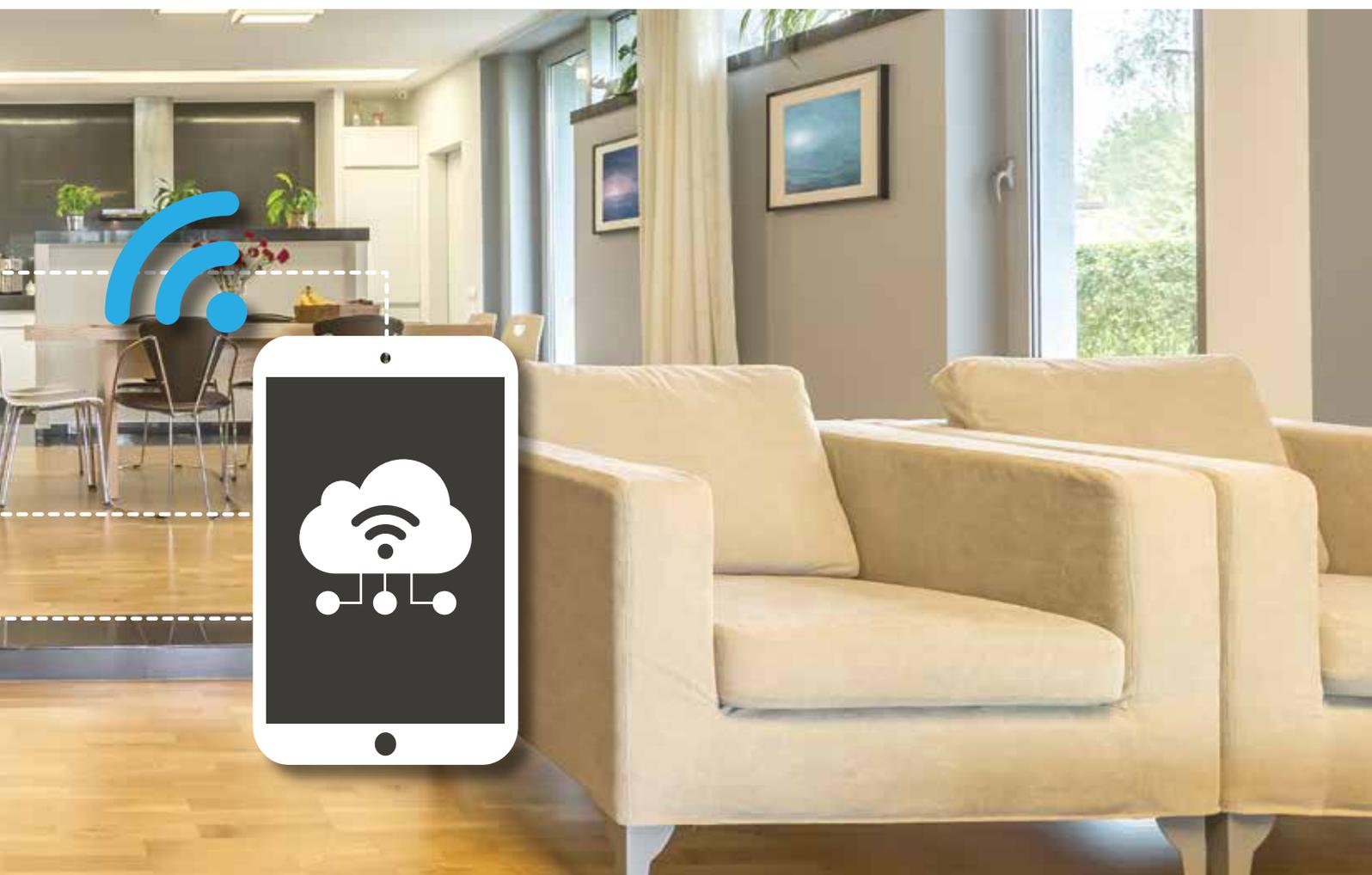
MACHINE VISION

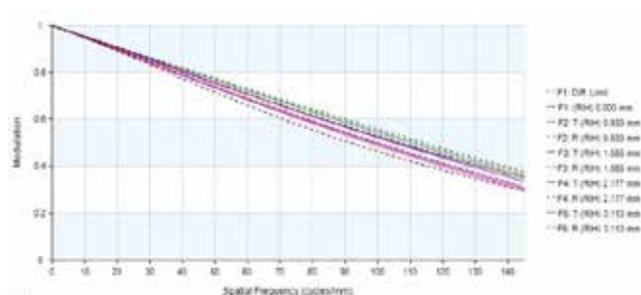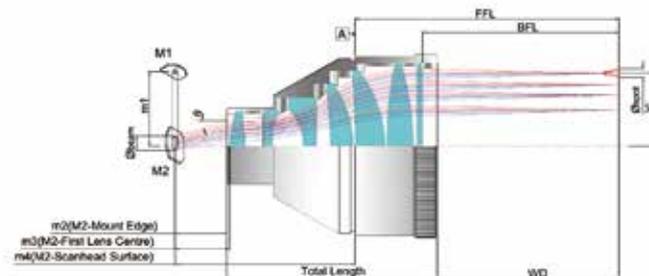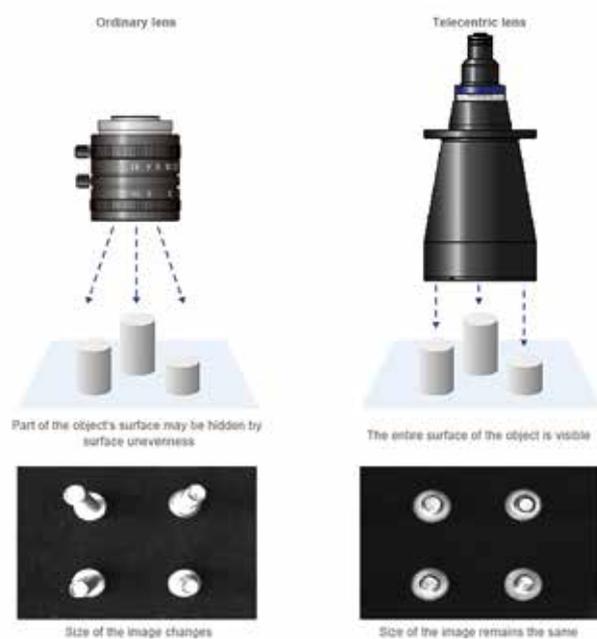

76560M | 7.6mm 1/2.8" 1.3MP Miniature Telecentric Lens

⚙ Designed to position principal ray parallel to lens optical axis at both object side and image side by controlling viewing angle as "near–zero"

⚙ Maintaining image side magnification regardless of how close/far the object is located, providing an ideal solution for dimension measurement

⚙ Highly accurate measurement can be achieved even for the object position with angle or different height.

⚙ Incident angle to the sensor is constant generating less shading and resulting in an image with very uniform brightness.

⚙ Stable, repeatable measurement is possible in addition to reducing the effect of object position offset even if camera or sensor installation is not securely fixed along the optical axis.

Product Features

· 1.3MP Resolution, High relative Illumination 87% CRA 7.9° M.O.D. 82m
· Compact Size TTL 10.9mm, Dia.12mm (Optional 8mm)
· Ultra low Distortion Lens
· Minimized Veiling Glare, Ghost, Flare
· Minimized Focus Shift at Thermal Shock Testing (−40℃ ~120℃)

Ordinary lens

Telecentric lens

Part of the object's surface may be hidden by surface unevenness

The entire surface of the object is visible

Size of the image changes

Size of the image remains the same

Products Features

MODEL	157460M	DW62428	DW10353
Focal Length	15.7mm	6.2mm	10.3mm
Back Focal Length	13.2mm	4.5mm	8.7mm
Flange Back Length	8.4mm	3.0mm	6.74(CM)
F No.	F6.0	F2.8	F3.0
Total Track Length	22.9mm	11.5mm	17.6mm
Resolution	1MP	VGA	VGA
Diameter	7.0mm	14.0mm	14.0mm
Format Size	1/3"	1/3"	1/2"
Angle of View (H*V)	(H)16.8 (V)12.8	(H)43.0 (V)32.8	(H)34.9 (V)26.5
Image Circle (Max.)	Ø6.0	Ø6.0	Ø10.3
Mount Type	M12	M12	M12

SECURITY

60500-3MASDNZ

3MP 6.0-50.0mm Varifocal Motorized Lens

Daiwon's varifocal lenses offer the Ultra flexibility when the installation setting requires a wide range of focal lengths. The focal length can be adjusted easily on all lenses and comes with either manual iris, for installations with constant light conditions, also with auto-iris for settings with changing illuminate conditions. And it provides a clear image without color smear by minimizing chromatic aberration.

Product Features

· X8.3 Zoom Lens
· F 1.6 (~1.8 : TELE) ~ 360
· Suitable for 3.0MP 1/2.7", 1/3", 1/4" CMOS sensors,
· IRIS function : Manual, Manual + ICR, DC, DC+ICR, P-IRIS
· Included 2 Aspherical lens

ANPR

Automatic number plate recognition is a technology that uses optical character recognition on images to read vehicle registration plates.

CCTV

It allows you to adjust the aperture on the fly. This leaves less room for error and would also allow you to make changes to the view at a later date. Varifocal lenses come in various apertures

Intelligent Transportation System(ITS)

An intelligent transportation system (ITS) is an advanced application which aims to provide innovative services relating to different modes of transport and traffic management and enable users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks.

Casino CCTV

Video surveillance plays a pivotal role within the gaming industry. In casinos, where the threat of criminal activity is as high as the stakes at the card table, it's important that facilities are properly monitored. Prevent theft by utilizing high surveillance in areas where large amounts of currency are exchanged or stored.

Other Applications

ATM Camera

9803-3MASK and DW33524K are designed for the hidden camera which would mostly be built in the ATM machine.

It is completely inconspicuous in size and are best at identifying potential hackers and thieves vividly who try to break into the ATM machine or try to force others into giving them their money using the ATM machine.

Wearable Camera

17620-2MAS is used for wearable camera. body-worn video camera purpose. Wearable camera comfortably goes around your neck and effortlessly captures full evidence in 360°. It can be used security, police, maintenance and military.
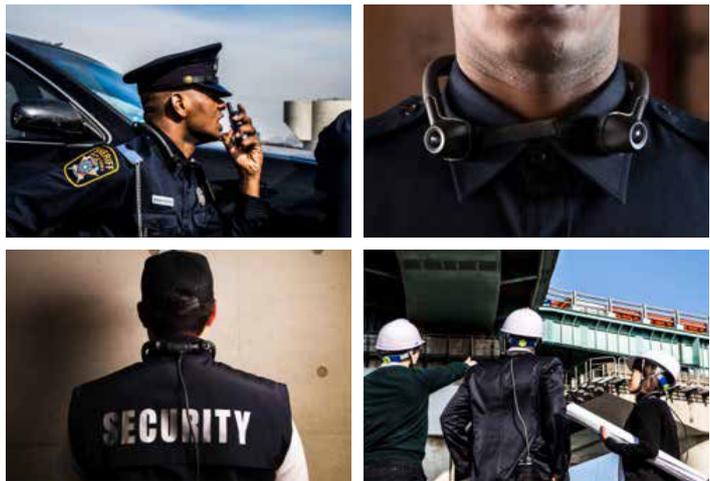
People Counting Camera

Accurately Daiwon offers a lens for People Counting camera to help business owners and managers improve operational efficiency and increase profitability. It supports specialized people counting function, support separate counting of people entering, exiting, and passing by.

SECURITY

MODEL	28110R-2MDNZ	60500-3MASDNZ
Focal Length	2.8~11.0mm	6.0~50.0mm
Back Focal Length	4.2~11.1mm	5.8~5.9mm
Flange Back Length	13.8mm	13.9mm
F No.	1.6~360	1.6~360
Total Track Length	50.2mm	54.4mm
Resolution	2MP	3MP
Diameter	28.5mm	29.0mm
Format Size	1/2.7"	1/2.7"
Angle of View (H*V)	(H)103.3~36.2 (V)55.6~20.4	(H)55.7~6.9 (V)30.0~3.9
Image Circle (Max.)	Ø6.61	Ø6.61
Mount Type	Ø14.0	Ø14.0

MODEL	17620-2MAS	19620-3MAS	DW2162
Focal Length	1.7mm	1.9mm	2.1mm
Back Focal Length	3.4mm	6.0mm	5.7mm
Flange Back Length	1.5mm	6.2mm	4.8mm
F No.	F2.0	F2.0	F2.0
Total Track Length	16.0mm	25.0mm	24.4mm
Resolution	2MP	3MP	VGA
Diameter	17.8mm	18.7mm	17.0mm
Format Size	1/2.8"	1/3"	1/3"
Angle of View (H*V)	(H)188.6 (V)102.8	(H)132.0 (V)99.0	(H)117.0 (V)77.0
Image Circle (Max.)	Ø5.6	Ø5.6	Ø5.2
Mount Type	M12	M12	M12

MODEL	24620-3MAS	DW2425F-CM	DW245625	25620-3M
Focal Length	2.4mm	2.4mm	2.45mm	2.5mm
Back Focal Length	5.1mm	4.7mm	5.4mm	5.5mm
Flange Back Length	4.4mm	3.8mm	4.2mm	5.2mm
F No.	F2.0	F2.5	F2.5	F2.0
Total Track Length	22.8mm	18.1mm	20.9mm	22.0mm
Resolution	3MP	VGA	VGA	3MP
Diameter	17.8mm	14.0mm	14.0mm	17.8mm
Format Size	1/3"	1/3"	1/3"	1/2.7"
Angle of View (H*V)	(H)122.2 (V)69.6	(H)106.3 (V)68.4	(H)115.7 (V)85.6	(H)136.5 (V)73.2
Image Circle (Max.)	Ø6.1	Ø5.2	Ø6.0	Ø6.61
Mount Type	M12	M12	M12	M12

MODEL	27629-16MAS	29620-3M	31420-2M	36420-3M
Focal Length	2.7mm	2.9mm	3.1mm	3.6mm
Back Focal Length	6.7mm	6.3mm	6.2mm	6.6mm
Flange Back Length	2.9mm	6.4mm	6.2mm	6.2mm
F No.	F2.9	F2.0	F2.0	F2.0
Total Track Length	24.1mm	21.5mm	22.0mm	22.1mm
Resolution	16MP	3MP	2MP	3MP
Diameter	18.0mm	14.0mm	14.8mm	14.0mm
Format Size	1/2.3"	1/2.7"	1/3"	1/2.7"
Angle of View (H*V)	(H)120.4 (V)93.5	(H)119.8 (V)65.1	(H)100.0 (V)70.5	(H)97.8 (V)51.1
Image Circle (Max.)	Ø7.8	Ø6.61	Ø6.0	Ø6.61
Mount Type	M12	M12	M12	M12

MODEL	VIR37618-3M	VIR43618-3M	VIR60620-3M	VIR80620-3M
Focal Length	3.7mm	4.3mm	6.0mm	8.0mm
Back Focal Length	6.9mm	8.0mm	7.0mm	6.3mm
Flange Back Length	5.6mm	6.6mm	5.4mm	4.0mm
F No.	F2.5	F2.5	F2.0	F2.0
Total Track Length	22.4mm	23.9mm	21.2mm	23.2mm
Resolution	3MP	3MP	3MP	3MP
Diameter	14.0mm	14.0mm	14.0mm	14.0mm
Format Size	1/2.7"	1/2.7"	1/2.7"	1/2.7"
Angle of View (H*V)	(H)97.7 (V)51.0	(H)84.3 (V)44.0	(H)55.8 (V)31.0	(H)40.6 (V)23.2
Image Circle (Max.)	Ø6.61	Ø6.61	Ø6.61	Ø6.61
Mount Type	M12	M12	M12	M12

SECURITY

MODEL	DW9607	DW9610	DW9611	DW9711
Focal Length	6.0mm	8.0mm	12.0mm	16.0mm
Back Focal Length	6.5mm	8.6mm	9.9mm	11.8mm
Flange Back Length	5.9mm	6.4mm	6.7mm	8.4mm
F No.	F2.0	F2.0	F2.2	F2.5
Total Track Length	15.4mm	20.0mm	18.4mm	22.4mm
Resolution	VGA	VGA	VGA	VGA
Diameter	14.0mm	14.0mm	14.0mm	14.0mm
Format Size	1/3"	1/3"	1/3"	1/3"
Angle of View (H*V)	(H)39.9 (V)30.3	(H)31.4 (V)23.7	(H)21.2 (V)15.8	(H)17.0 (V)12.8
Image Circle (Max.)	Ø6.0	Ø6.0	Ø6.0	Ø6.0
Mount Type	M12	M12	M12	M12

MODEL	DW25425	DW350420	DW500425
Focal Length	25.0mm	35.0mm	50.0mm
Back Focal Length	12.2mm	19.3mm	33.8mm
Flange Back Length	8.1mm	15.8mm	4.0mm
F No.	F2.5	F2.0	F2.5
Total Track Length	29.4mm	39.0mm	56.8mm
Resolution	VGA	VGA	VGA
Diameter	25.0mm	25.0mm	27.0mm
Format Size	2/3"	2/3"	1/2"
Angle of View (H*V)	(H)20.2 (V)15.2	(H)14.4 (V)10.8	(H)7.3 (V)5.5
Image Circle (Max.)	Ø11.0	Ø11.0	Ø10.3
Mount Type	M12	M12	M12

MODEL	DW33524 A/B/K	37624A-2M	9803-3MASK	Accessory
Focal Length	3.3mm	3.7mm	4.3mm	· ICR Holder
Back Focal Length	3.4mm	3.2mm	3.8mm	· C/CS Mount
Flange Back Length	3.5mm	1.5mm	3.1mm	· Holder
F No.	F2.4	F2.4	F2.0	· Barrel Holder
Total Track Length	A/B : 11.8mm, K : 12.2mm	13.4mm	12.0mm	· M12 Adaptor Ring
Resolution	VGA	2MP	3MP	
Diameter	A : 5.4mm / K : 2.5mm	6.4mm	2.8mm	
Format Size	1/3"	1/2.7"	1/2.7"	
Angle of View (H*V)	(H)83.0 (V)57.1	(H)100.0 (V)49.9	(H)74.5 (V)39.9	
Image Circle (Max.)	Ø6.0	Ø6.61	Ø6.61	
Mount Type	M12	M12	M12	

PRODUCT LIST

★ : PP stage ■ : RGBIR

Type	Model	Application					Focal Length	Resolution	Format Size	Angle of View
		Automotive	Security	ToF	M/V	Biometrics				
BOARD	10620MAS	●					0.9mm	1.3MP	1/4"	(H)190.6
	11620MAS	●					1.1mm	1.3MP	1/4"	(H)190.5
	12624MAS	●	●				1.2mm	1.3MP	1/3"	(H)192.8
	15422AS	●					1.5mm	VGA	1/4"	(H)140.0
	DW178720	●	●				1.78mm	VGA	1/4"	(H)118.8
	17620-2MAS	●	●	●			1.7mm	2MP	1/2.8"	(H)188.6
	★18513AS	●		●			1.8mm	VGA	1/4"	(H)110.0
	18524MAS	●	●	●			1.8mm	1.3MP	1/3"	(H)154.2
	★19609AS	●		●			1.9mm	VGA	1/4"	(H)110.0
	★19620-3MAS		●	●			1.9mm	3MP	1/3"	(H)132.0
	DW2162		●				2.1mm	VGA	1/3"	(H)117.3
	DW2425	●	●				2.4mm	VGA	1/3"	(H)120.5
	24620-3MAS		●	●			2.4mm	3MP	1/3"	(H)122.2
	DW245625	●	●				2.45mm	VGA	1/3"	(H)115.8
	25620-3M		●	●			2.5mm	3MP	1/2.7"	(H)136.5
	27629-16MAS		●				2.7mm	16MP	1/2.3"	(H)120.4
	29620-3M	●	●	●			2.9mm	3MP	1/2.7"	(H)119.8
	★29720-2M	●	●				2.9mm	2MP	1/2.5"	(H)129.0
	31420-2M		●				3.1mm	2MP	1/3"	(H)100.0
	★32520MAS	●	●	●			3.2mm	1.3MP	1/4"	(H)66.1
	36420-3M		●				3.6mm	3MP	1/2.7"	(H)97.8
	VIR37618-3M		●				3.7mm	3MP	1/2.7"	(H)97.7
	★39720-2M	●					3.9mm	2MP	1/2.5"	(H)90.7
	VIR43618-3M	●	●	●		●	4.3mm	3MP	1/2.7"	(H)84.3
	★47616G-5MAS	●					4.7mm	5MP	1/1.7"	(H)112.1
	DW9607		●				6.0mm	VGA	1/3"	(H)39.9
	VIR60620-3M	●	●	●			6.0mm	3MP	1/2.7"	(H)55.8
	DW62428				●		6.2mm	VGA	1/3"	(H)43.0
	★76560M				●		7.6mm	1.3MP	1/2.8"	(H)40.0
	DW9610		●				8.0mm	VGA	1/3"	(H)31.4
	★VIR80620-3M		●				8.0mm	3MP	1/2.7"	(H)40.6
	DW10353				●	●	10.3mm	VGA	1/2"	(H)34.9
	DW9611		●				12.0mm	VGA	1/3"	(H)21.2
	★120320-2MAS			●		●	12.0mm	2MP	1/4"	(H)17.7
	★157460M				●		15.7mm	1MP	1/3"	(H)16.8
	DW9711		●				16.0mm	VGA	1/3"	(H)17.0
	★240523-2M			●		●	24.3mm	2MP	1/4"	(H)10.5
	DW25425		●				25.0mm	VGA	2/3"	(H)20.1
	DW350420		●				35.0mm	VGA	2/3"	(H)14.4
	DW500425		●				50.0mm	VGA	1/2"	(H)7.3
PIN HOLE	DW33524		●				3.3mm	VGA	1/3"	(H)83.0
	DW9802		●				3.7mm	VGA	1/3"	(H)73.8
	★37624A-2M		●				3.7mm	2MP	1/2.7"	(H)100.0
	DW9803		●				4.3mm	VGA	1/3"	(H)69.5
	9803-3MAS		●	●			4.3mm	3MP	1/2.7"	(H)74.5
VARI FOCAL	28110R-2M		●				2.8~11.0mm	2MP	1/2.7"	(H)103.3~36.2
	35160-3MAS		●				3.5~16.0mm	3MP	1/2.7"	(H)91.6~24.5
	60500-3MAS		●				6.0~50.0mm	3MP	1/2.7"	(H)55.7~6.9

TEST EQUIPMENTS AND MEASUREMENTS

Automatic Assembling

Advanced Inspection Equipments
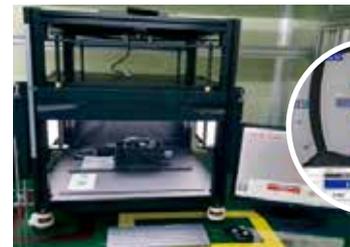

Thermal Shock Tester

Image Master HR

PRO10

Other Equipments

SFR Inspection Tester

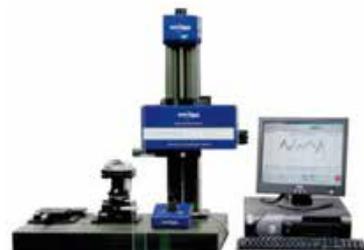Inspection up to 940 mm wavelength

Wide angle inspection equipment over 190°

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