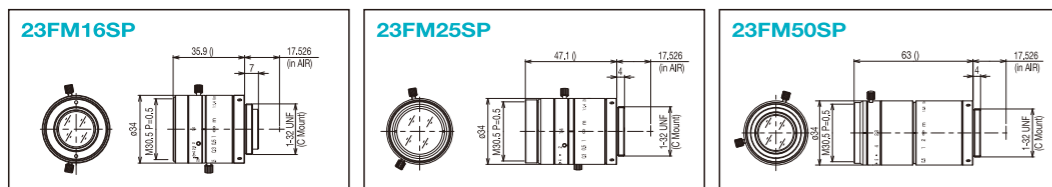
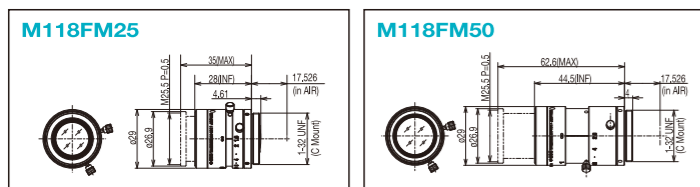
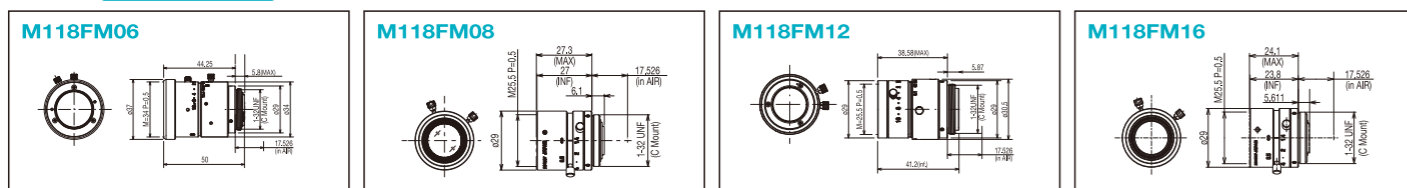


**DIMENSIONS**

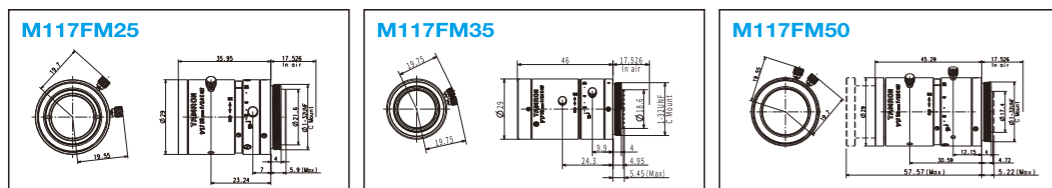
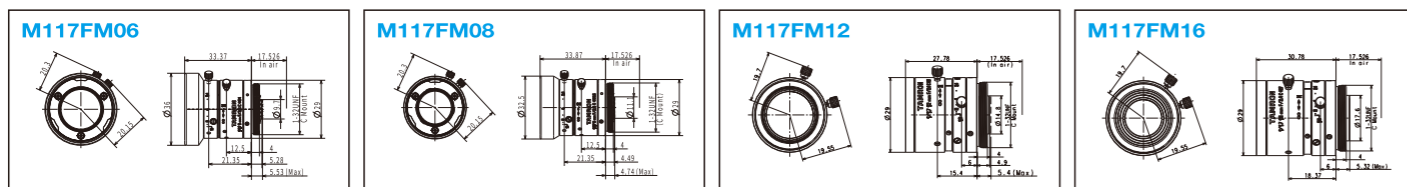
2/3" 4.0µm pixel pitch



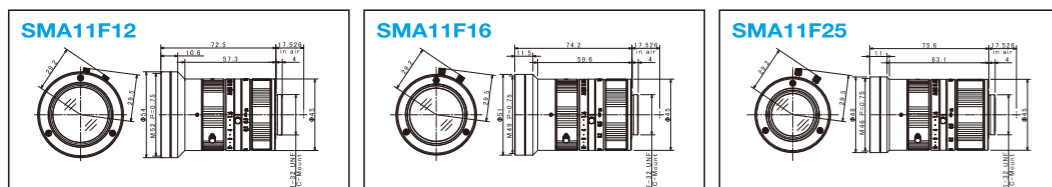
1/1.8" 4.0µm pixel pitch



1/1.7" 2.4µm pixel pitch



SWIR"



# Mega-Pixel Machine Vision Lens Series

## Fixed-Focal Machine Vision Lens Series



**Caution:** Please read the instruction manual carefully before using the lens.

**TAMRON**

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specifications subject to change without notice 2023.12

FAG-EN-2312-0000

These Ultra-High-Resolution Lenses deliver outstanding optical quality with enhanced performance from center to periphery of the image. The best choice for Machine Vision and FA (Factory Automation) applications.

High-Performance / Minimized Distortion / Enhanced Performance in the Close-Focus Range

# Fixed-Focal Machine Vision Lens Series

Machine vision lenses featuring superior optical technology

Tamron's Mega-Pixel Machine Vision Lens Series provides outstanding optical quality and enhanced performance in close-focus situations and meets the needs of diverse image processing applications

## 1.1" Ultra-High-Performance Machine Vision Fixed-Focal Lenses

Compatible with MP camera

2.5µm pixel pitch

# 2.5µm

1.1" cameras

1" cameras

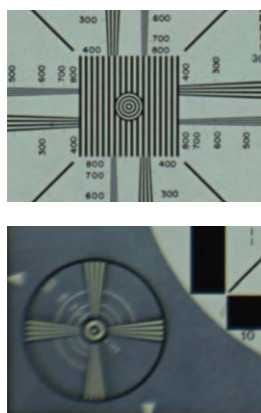
1/1.2" cameras

2/3" cameras

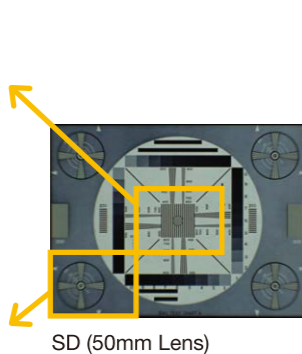
1/1.8" cameras

### Industry-Leading High Contrast and Resolution

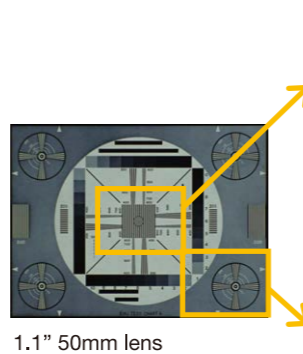
The lenses are optimized for 2.5µm-pixel-pitch imagers, equivalent to 1.1" 24 mega-pixels. Offer resolution and contrast outperforming other 24-mega pixel lenses. (resolution at the center)  
Tamron's machine vision fixed-focal lens line-up also opens gates to other areas of applications including traffic monitoring, notably for ITS (Intelligent Transport Systems).



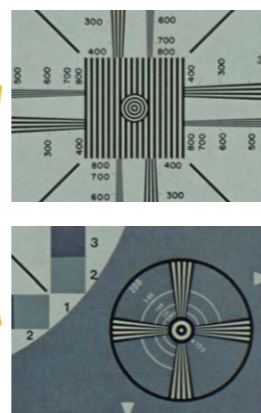
5MP Camera + SD Lens  
= Not Enough Resolution



SD (50mm Lens)



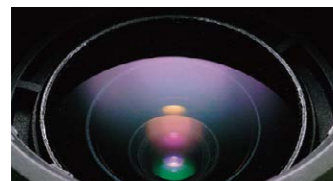
1.1" 50mm lens



12MP Camera + Ultra High Resolution Lens  
= Resolution is Clear to the Corner

### Rugged Mechanical Design for Anti-Vibration and Shock

Newly designed mechanism improves anti-vibration and shock performance compared with previous models. Even under a severe machine-vision setup with as much as max 10G vibrations and shocks, the new mechanism limits optical (image) de flection within 10µm. \*Vibration frequency 10-60Hz (amplitude 0.75mm), vibration frequency 60-200Hz (acceleration 100m/s<sup>2</sup>), and number of cycles: 50 cycles.



### Enhanced Functionality and Utility

Well-tuned rotation torque of both focus and iris control rings facilitates smooth adjustments of focusing and aperture. For ease of installation, the rings are also equipped with a lock mechanism, similar to Tamron's other current machine vision fixed-focal lens models; the rings can be locked at a choice of three lock screw positions.

### Uncompromised Image Quality at Close Distances

High image-fidelity is maintained at frequently-used close distances.

### Covering from the Visible-Light to the NIR Band

Focus-shift associated with the wide spectrum of 400nm to 850nm is reduced to an absolute minimum, which makes the new lenses an optimum choice for cameras compatible with the visible-light and the NIR band.



Model	MA111F16VIR	MA111F25VIR	MA111F35VIR	MA111F50VIR
Imager Size	1.1/1			
Mount	C			
Focal Length	16mm	25mm	35mm	50mm
Aperture Range	F/2.8 - F/16			
Field of View Angle (Horizontal x Vertical)	1.1/1 47.7° x 36.8°	31.7° x 23.9°	22.8° x 17.2°	16.0° x 12.0°
TV Distortion	0.2%	-0.3%	0.3%	0.1%
Focus Range	0.1m - ∞		0.2m - ∞	
Operation	Manual w/Lock			
Filter Size	M40.5 P=0.5mm			
Weight	178g	196g	179g	181g
Operating Temperature	-20°C - +60°C			

## 1/1.2", 2/3" Ultra-High-Performance Machine Vision Fixed-Focal Lenses (ø29mm)

Compatible with MP camera

5.86µm pixel pitch

3.45µm pixel pitch

# 5.86µm

1/1.2" cameras

2/3" cameras

1/1.2" cameras

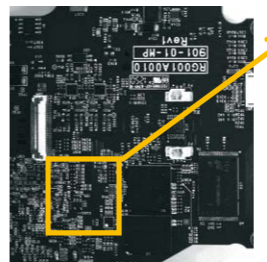
2/3" cameras

1/1.8" cameras

### Industry-Leading High Contrast and Resolution at Compact Size

Compatible with both 5.86µm pixel-pitch 1/1.2" imagers and 3.45µm pixel-pitch 2/3" imagers. Equivalent resolution of full 5-mega-pixels. Industry-leading resolution and contrast in ø29mm machine-vision lenses. First-class performance in all different focal lengths of the models.

1/1.2" Camera  
Shot at the Corner



5.86µm-Pixel-Pitch  
Sensor (16mm Lens)



2.4MP Camera + High Resolution Lens  
= Resolution is Clear to the Corner

<Image Size Example>

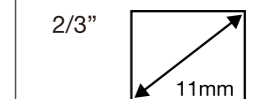


Image Circle  
diameter : 13.8mm

### High-Quality Imaging at Close-Shooting Distances

Lenses assure high-quality imaging at close-shooting distances often used.

### Functionality and Utility

Rotational torque is increased to improve maneuverability for focusing and iris adjustment. Lock-screw positions are now selectable from four locations, assisting easier installation for users.



Model	1/1.2									
Imager Size	C									
Mount	C									
Focal Length	6mm	8mm	12mm	16mm	25mm	35mm	50mm	75mm		
Aperture Range	F/2.8 - 16		F/2.4 - 16		F/2.0 - 16		F/1.8 - 16	F/2.1 - 16	F/2.8 - 16	F/3.5 - 16
Field of View Angle (Horizontal x Vertical)	1/1.2 (4:3)	87.7° x 70.1°	70.3° x 54.9°	49.2° x 37.6°	37.4° x 28.4°	24.1° x 18.2°	17.3° x 13.1°	12.2° x 9.2°	8.1° x 6.1°	
	1/1.2 (16:9)	93.1° x 59.0°	75.3° x 45.6°	53.2° x 30.6°	40.5° x 22.3°	26.2° x 15.0°	18.8° x 10.7°	13.2° x 7.5°	8.9° x 5.0°	
TV Distortion	2/3 (4:3)	75.5° x 59.2°	59.5° x 45.8°	40.9° x 31.1°	31.0° x 23.4°	19.9° x 15.0°	14.3° x 10.7°	10.0° x 7.5°	6.7° x 5.0°	
	2/3 (16:9)	80.8° x 49.3°	64.0° x 37.8°	44.4° x 25.5°	33.7° x 19.2°	21.7° x 12.3°	15.5° x 8.8°	10.9° x 6.16°	7.3° x 4.1°	
Focus Range	Less than -1.99%		Less than -1.47%		Less than -0.97%		Less than -0.56%		Less than -0.09%	
Operation	Manual w/Lock		Manual w/Lock		Manual w/Lock		Manual w/Lock		Manual w/Lock	
Filter Size	M58 P=0.75mm		M35.5 P=0.5mm		M27 P=0.5mm		M27 P=0.5mm		M27 P=0.5mm	
Weight	115g	86g	64g	51g	54g	57g	70g	81g		
Operating Temperature	-20°C - +60°C									

# Fixed-Focal Machine Vision Lens Series

## 2/3" Ultra-High-Resolution Fixed-Focal Lens Series

Compatible with MP camera

2.74µm pixel pitch

2/3" cameras

1/1.8" cameras

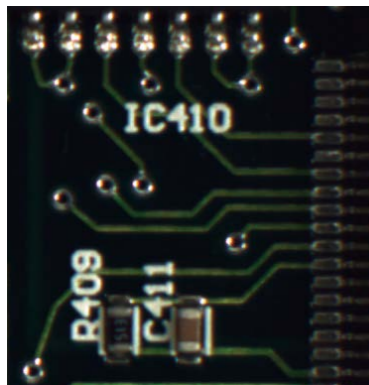
1/2" cameras

1/3" cameras

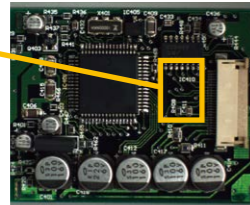
# 2.74µm

### 2.74µm Pixel-Pitch Sensor

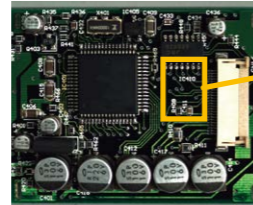
By supporting a 2.74µm-pixel-pitch, the lens maintains high-resolution from center to periphery. This lens series offers superior optical performance with resolution in the mega-pixel range even at the periphery of the image, and can be used for various applications such as inspection of small components, and inspection of detailed particles. In addition, each lens in the series provides high-quality images with minimized distortion.



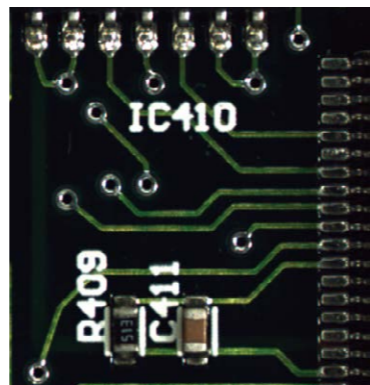
5MP Camera + SD Lens  
= Not Enough Resolution



SD (50mm Lens)



2/3 " 50mm lens



5MP Camera + Ultra-High-Resolution Lens  
= Resolution is Clear to the Corner

### Industry-Leading Low Distortion (TV Distortion)

Significantly reduce TV distortion compared with previous models.

MA23F08V: -0.6%, MA23F12V: 0.4%, MA23F16V: -0.05%, MA23F25V: -0.01%, MA23F35V: 0.04%, MA23F50V: 0.05%

### New Robust Mechanism for Anti-Vibration and Anti-Shock

A newly designed mechanism improves anti-vibration and anti-shock performance compared with previous models, limiting the optical(image) de cation to less than 10µm even for the severe impact of vibrations and shocks of max 10G of magnitude.

[Compliant with IEC 60068-2-6/JIS C 60068-2-6]

Vibration frequency 10-60Hz (amplitude 0.75mm), vibration frequency 60-500Hz (acceleration 100m/S<sup>2</sup>)



MA23F08V



MA23F12V



MA23F16V



MA23F25V



MA23F35V



MA23F50V

Model	MA23F08V	MA23F12V	MA23F16V	MA23F25V	MA23F35V	MA23F50V
Imager Size	2/3					
Mount	C					
Focal Length	8mm	12mm	16mm	25mm	35mm	50mm
Aperture Range	F/2.4 - F/16					
Field of View Angle (Horizontal x Vertical)	2/3(1:1) 53.1°x 53.1°	36.0°x 36.0°	27.0°x 27.0°	16.9°x 16.9°	11.1°x 11.1°	7.5°x 7.5°
TV Distortion	-0.6%	0.4%	-0.05%	-0.01%	0.04%	0.05%
Focus Range	0.1m - ∞					
Operation	Manual w/Lock					
Filter Size	M34 P=0.5mm					
Weight	84g	69g	59g	55g	58g	74g
Operating Temperature	-20°C - +60°C					

## 2/3" Mega-Pixel Machine Vision Lens Series

Compatible with MP camera

4.0µm pixel pitch

2/3" cameras

1/1.8" cameras

1/2" cameras

1/3" cameras

# 4.0µm

- Perfectly suited for use with high-end cameras with resolution in the mega-pixel range.
- Excellent not only in the close-focus range, but also throughout the entire focal length.
- Three lock screw positions are provided for ease of set up and effective space utilization. (Iris)
- All lenses in the series use the same filter diameter. (ø30.5 mm)



Model	23FM16SP	23FM25SP	23FM50SP
Imager Size	2/3		
Mount	C		
Focal Length	16mm	25mm	50mm
Aperture Range	F/1.4 - 22		
Field of View Angle (Horizontal x Vertical)	2/3 30.9°x23.4°	20.0°x15.1°	10.1°x7.6°
TV Distortion	Less than -0.1%	Less than -0.05%	Less than -0.01%
Focus Range	0.15m - ∞		
Operation	Manual w/Lock		
Filter Size	M30.5 P=0.5mm		
Weight	80g	103g	117g
Operating Temperature	-10°C - +60°C		

## 1/1.8" Mega-Pixel Machine Vision Lens Series

Compatible with MP camera

4.0µm pixel pitch

1/1.8" cameras

1/2" cameras

1/3" cameras

# 4.0µm

- Compact design, yet achieves mega-pixel performance.
- No more need for a close up ring, minimum focus distance has been minimized to useful distance. This not only improves the durability of imaging systems, but also helps to reduce overall costs.
- The core structural elements— the lens barrel and the lens fixing mechanism — have been strengthened, and vibration resistance has been enhanced.
- Three lock screw positions are provided for ease of set up and effective space utilization. (Both Iris and Focus)



Model	M118FM06	M118FM08	M118FM12	M118FM16	M118FM25	M118FM50
Imager Size	1/1.8					
Mount	C					
Focal Length	6mm	8mm	12mm	16mm	25mm	50mm
Aperture Range	F/1.4 - 16					
Field of View Angle (Horizontal x Vertical)	1/1.8 66.1°x50.8°	50.8°x38.6°	34.2°x25.8°	25.9°x19.5°	16.6°x12.5°	8.3°x6.2°
TV Distortion	Less than -3.0%	Less than -2.0%	Less than -1.2%	Less than -0.7%	Less than -0.2%	Less than -0.1%
Focus Range	0.1m - ∞					
Operation	Manual w/Lock					
Filter Size	M34 P=0.5mm					
Weight	86g	44g	57g	39g	39g	52g
Operating Temperature	-10°C - +60°C					

# Fixed-Focal Machine Vision Lens Series

## 1/1.7" Ultra-High-Performance Machine Vision Fixed-Focal Lenses

Compatible with MP camera

2.4μm Pixel-Pitch

1/1.7" camera

1/1.8" camera

1/1.7" camera

1/1.8" camera

# 2.4μm

### 2.4μm Pixel-Pitch Sensor

By supporting a 2.4μm-pixel-pitch, the lens maintains high-resolution from center to periphery. This lens series offers superior optical performance with resolution in the mega-pixel range even at the periphery of the image, and can be used for various applications such as inspection of small components, and inspection of detailed particles. In addition, each lens in the series provides high-quality images with minimized distortion.

### Industry-Leading Low Distortion (TV Distortion)

Significantly reduce TV distortion compared with previous models.  
 M117FM06: -1.02% M117FM08: -0.85% M117FM12: -0.42%  
 M117FM16: -0.1% M117FM25: -0.1% M117FM35: -0.06% M117FM50: -0.01%

### High-Quality Performance at Close-up distances

A new comprehensive lens design assures high contrast and resolution at commonly used close-up distances.

### New Robust Mechanism for Anti-Vibration and Anti-Shock

A newly designed mechanism improves anti-vibration and anti-shock performance compared with previous models, limiting the optical(image) de cation to less than 10μm even for the severe impact of vibrations and shocks of max 10G of magnitude  
 Vibration frequency 10-60Hz (amplitude 0.75mm), vibration frequency 60-200Hz (acceleration 100m/S<sup>2</sup>)



Model	M117FM06	M117FM08	M117FM12	M117FM16	M117FM25	M117FM35	M117F50
Imager Size	1/1.7						
Mount	C						
Focal Length	6mm	8mm	12mm	16mm	25mm	35mm	50mm
Aperture Range	F/2.4 - F/16						
Field of View Angle (Horizontal x Vertical)	1/1.7 65.0° x 50.5°	52.2° x 39.5°	34.3° x 25.9°	26.1° x 19.7°	17.4° x 13.1°	12.6° x 9.5°	F/2.8 - F/16 8.9° x 6.7°
TV Distortion	-1.02%	-0.85%	-0.42%	-0.1%	-0.1%	-0.06%	-0.01%
Focus Range	0.1m - ∞						
Operation	Manual w/Lock						
Filter Size	M34 P=0.5mm	M30.5 P=0.5mm	40g		M27 P=0.5mm		45g
Weight	50g	48g	40g		45g		60g
Operating Temperature	-20°C - +60°C						

## 2/3" High-Resolution Machine Vision Lens Series

\*For cameras with resolution in the mega-pixel range. Please use following lens series: 1.1", 1/1.2", 2/3", 1/1.7", 1/1.8" Mega-Pixel Machine Vision/FA Lens Series.



Model	219HB	25HA/HB	17HF	20HC	35HB	21HC	1A1HB
Imager Size	2/3						
Mount	C						
Focal Length	8mm	12mm	16mm	25mm	35mm	50mm	75mm
Aperture Range	F/1.4 - 16						
Field of View Angle (Horizontal x Vertical)	1.1/1 59.3° x 45.2°	40.9° x 30.9°	30.9° x 23.2°	20.0° x 15.0°	14.3° x 10.8°	10.0° x 7.5°	6.9° x 5.2°
TV Distortion	Less than -3.0%	Less than -1.6%	Less than -1.5%	Less than -0.5%	Less than +0.5%	Less than +0.5%	Less than +0.1%
Focus Range	0.26m - ∞						
Operation	Manual w/Lock						
Filter Size	M25.5 P=0.5mm						
Back Focus (in Air)	11.60mm	11.03mm	11.85mm	11.60mm	15.53mm	22.10mm	27.12mm
Weight	40g	40g	50g	37g	44g	50g	88g
Operating Temperature	-10°C - +45°C		-5°C - +45°C		-10°C - +45°C		-10°C - +70°C

## Industrial Lenses covering a Wide Spectral Band from Visible-Light to SWIR Band

Compatible with MP camera

1" cameras

1/1.8" camera



Model	SMA11F12	SMA11F16	SMA11F25
Imager Size	1		
Mount	C		
Focal Length	12mm	16mm	25mm
Aperture Range	F/1.6~F/22		
Field of View Angle (Horizontal x Vertical)	1 57.9° x 44.6°	44.1° x 33.7°	29.1° x 21.9°
Focus Range	0.2m~∞		
Operation	Manual w/Lock		
Filter Size	M52 P=0.75mm	M49 P=0.75mm	M46 P=0.75mm
Weight	260g		
Operating Temperature			

### Industry-Leading Spectrum Transmittance

Tamron's new proprietary lens coating technology assures an approx. 80% constant spectrum transmittance over the whole spectrum from the visible-light to the SWIR\* band.

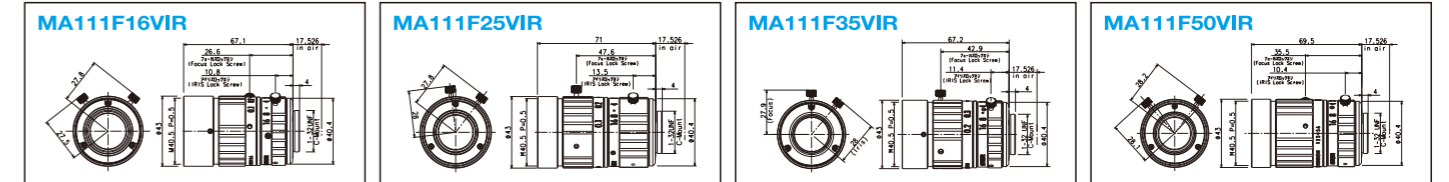
Band corresponding to the wavelength of 400 - 1700nm

### Significant Reduction of Focus-Shift in between the Visible-Light and the SWIR Bands

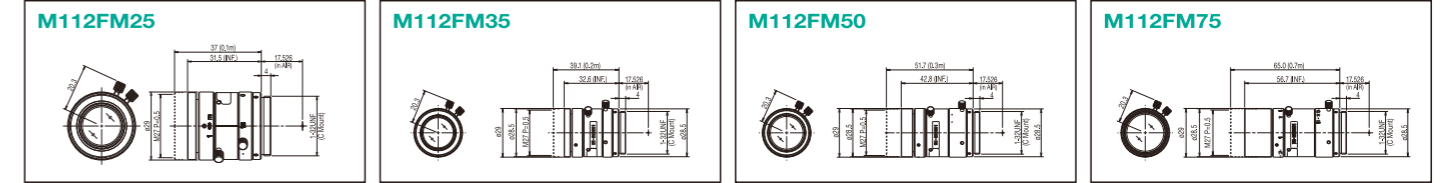
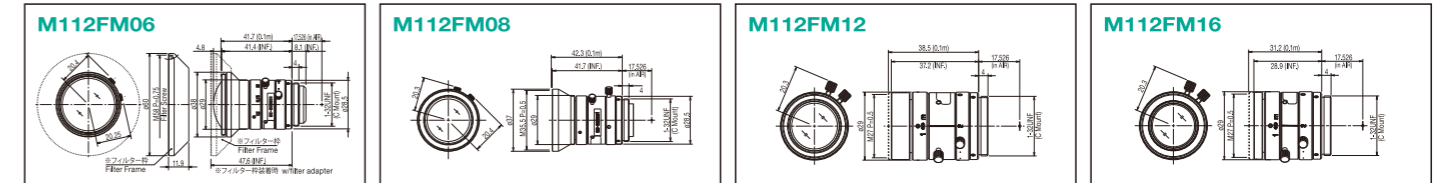
Focus-shift occurring in between different bands is effectively reduced over the whole spectrum corresponding to the wavelength of 400 nm to 1700 nm.

## DIMENSIONS

### 1.1" 2.5μm pixel pitch



### 1/1.2" 5.86μm pixel pitch 2/3" 3.45μm pixel pitch



### 2/3" 2.74μm pixel pitch

