

IR OPTICS OPTIMIZED FOR 10-12 μ m PIXEL PITCH UNCOOLED DETECTORS



CUTTING EDGE TECHNOLOGIES, MEETING THE NEEDS OF NEXT GENERATION DETECTORS

Key benefits

- Meeting SWaP constraints
- Optimized for 10-12 μm detectors
- Addresses the next generation of detector and camera form factors, for both size and weight
- Suitable for multiple applications: Air, sea, and land
- Cost effective design
- Full athermalization

As these detectors enter the market, older 17 μm detectors will become obsolete. Ahead of the game, we've been refining our designs for the last two years, working with major detector manufacturers, to provide an optimized optics design that matches the needs of the new 10-12 μm detectors.

Thanks to superior engineering capabilities, Ophir has a reputation as the producer of diffraction limit products—maximizing optical performance through innovative lens designs. Now, you can maintain this level of optical performance for 10-12 μm detectors, utilizing Ophir's latest collection of 10-12 μm IR thermal lens assemblies.

Overview

Ophir are always on the mark, ready to provide the ideal optical solutions for new, cutting edge technologies. This time, we're addressing the new market shift in the direction of 10-12 μm detectors. These new detectors meet superior SWaP standards, enabling a reduction in the size of the optical system, while also providing a shorter focal length and a longer detection range.

Ophir's lens assemblies are designed for a wide range of air, marine, and land applications—including homeland and perimeter security, surveillance, maritime applications, aircraft vision systems, and more.

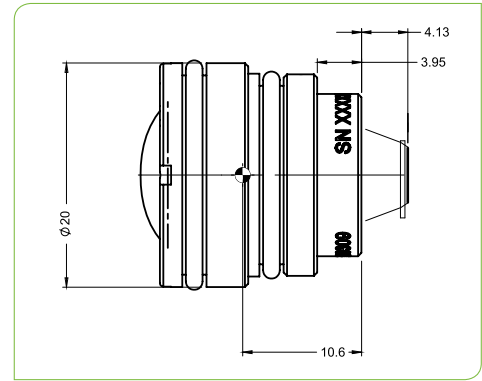
Lenses HFOV's [deg] for 10 & 12 μm pitch uncooled detectors

| |  2.4mm f/1.0 680309 | |  4.5mm f/1.1 680284 | |  8.7mm f/1.2 680310 | |  9.2mm f/1.0 680407 | |
|-----------|--|----------|--|----------|--|----------|--|----------|
| FORMAT | 10 μ | 12 μ | 10 μ | 12 μ | 10 μ | 12 μ | 10 μ | 12 μ |
| 320 X 240 | 76.2° | 91.9° | 40.3° | 48.5° | 20.8° | 13.2° | 20.1° | 24.2° |
| 640 X 480 | | | | | 41.6° | 26.4° | 41.0° | 50.0° |
| 672 X 544 | | | | | 43.7° | 52.6° | 43.2° | 52.8° |

| |  13.6mm f/1.0 680412 | |  19.8mm f/1.2 680312 | |  24mm f/1.0 680360 | |  55mm f/1.0 680372 | |
|-------------|---|----------|---|----------|---|----------|---|----------|
| FORMAT | 10 μ | 12 μ | 10 μ | 12 μ | 10 μ | 12 μ | 10 μ | 12 μ |
| 320 X 240 | 13.5° | 16.2° | 9.2° | 11.0° | 7.5° | 9.0° | 3.3° | 4.0° |
| 640 X 480 | 29.8° | 32.0° | 18.2° | 21.7° | 15.0° | 18.0° | 6.4° | 8.0° |
| 672 X 544 | | | 19.1° | 22.8° | 15.8° | 18.9° | 7.0° | 8.2° |
| 1280 X 1024 | | | | | 30.2° | | 13.2° | |

| |  73.1mm f/1.05 680311 | |  15-75mm f/1.0 Continuous Zoom 680386 | | | |
|-------------|--|----------|--|----------|----------|----------|
| | 10 μ | 12 μ | WFOV | | NFOV | |
| FORMAT | 10 μ | 12 μ | 10 μ | 12 μ | 10 μ | 12 μ |
| 320 X 240 | 2.5° | 3.0° | 12.3° | 14.7° | 2.4° | 2.9° |
| 640 X 480 | 5.0° | 6.0° | 24.8° | 29.9° | 4.9° | 5.8° |
| 672 X 544 | 5.3° | 6.3° | | | | |
| 1024 X 768 | 8.0° | 9.6° | 40.6° | 49.7° | 7.7° | 9.2° |
| 1280 X 1024 | 9.9° | 11.9° | 52.0° | 64.4° | 9.6° | 11.4° |
| 1312 X 1056 | 10.2° | 12.2° | | | | |

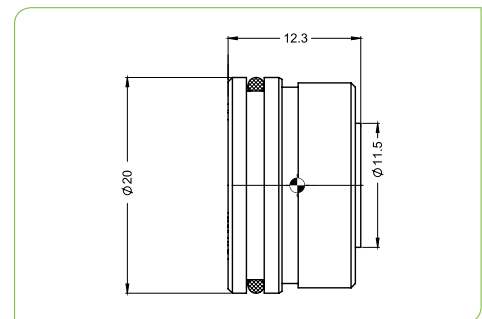
SupIR 2.4mm f/1.0 Athermalized Fixed Focus 680309



| HFOV[deg] | 160x120 | 320x240 |
|-----------|---------|---------|
| 25 μ | 96.1° | |
| 17 μ | 64.8° | |
| 12 μ | 45.8° | 91.9° |
| 10 μ | | 76.2° |

| Property | Value |
|-------------------------------|---------------|
| Optical | |
| Average Transmission (8-12um) | 84% (HC) |
| Back Focal Length | 5.23mm in air |
| Mechanical | |
| Max. Dimensions | Ø20 X 19.74mm |
| Weight | 13.2g |

SupIR 4.5mm f/1.1 Athermalized Fixed Focus 680284



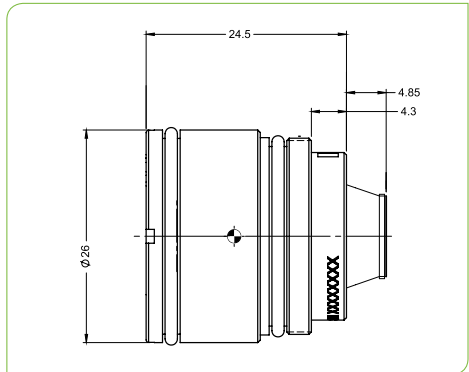
| HFOV[deg] | 160x120 | 320x240 |
|-----------|---------|---------|
| 25 μ | 50.7° | |
| 17 μ | 34.1° | |
| 12 μ | 24.0° | 48.5° |
| 10 μ | | 40.3° |

| Property | Value |
|-------------------------------|--------------|
| Optical | |
| Average Transmission (8-12um) | 89% (HC) |
| Back Focal Length | 6.3mm in air |
| Mechanical | |
| Max. Dimensions | Ø20 X 12.3mm |
| Weight | 8gr |

SupIR 8.7mm f/1.0 Athermalized Fixed Focus 680310



HD
FORMAT



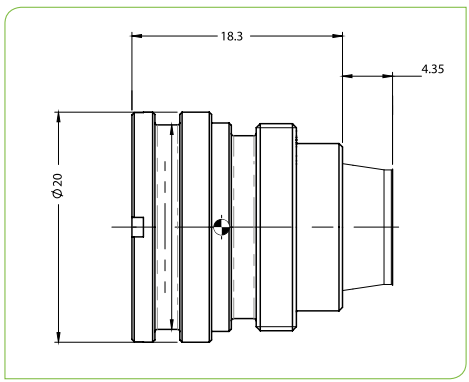
| HFOV[deg] | 160x120 | 320x240 | 384x288 | 640x480 | 1024x768 |
|-----------|---------|---------|---------|---------|----------|
| 25μ | 26.0° | 52.2° | 63.0° | | |
| 17μ | 17.7° | 24.9° | 29.9° | 50.1° | |
| 12μ | 12.6° | 13.2° | 15.8° | 26.4° | 42.5° |
| 10μ | 10.5° | 20.8° | 24.9° | 41.6° | 67.4° |

| Property | Value |
|-------------------------------|---------------|
| Optical | |
| Average Transmission (8-12μm) | 87% |
| Back Focal Length | 7.39mm in air |
| Mechanical | |
| Max. Dimensions | Ø26 X 24.5mm |
| Weight | 28.5g |

SupIR 9.2mm f/1.0 Athermalized Fixed Focus 680407



HD
FORMAT

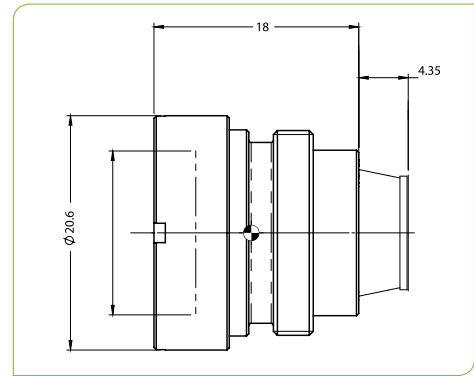


| HFOV[deg] | 160x120 | 320x240 | 384x288 | 640x480 | 672x544 | 1024x768 |
|-----------|---------|---------|---------|---------|---------|----------|
| 25μ | 25.2° | 52.3° | 65.1° | | | |
| 17μ | 17.0° | 34.6° | 41.9° | 77.9° | 84.8° | |
| 12μ | 12.0° | 24.2° | 29.1° | 50.0° | 52.8° | |
| 10μ | 10.0° | 20.1° | 24.2° | 41.0° | 43.2° | 71.1° |

| Property | Value |
|-------------------------------|--------------------|
| Optical | |
| Average Transmission (8-12μm) | 87% (HD); 84% (HC) |
| Back Focal Length | 6.85mm in air |
| Mechanical | |
| Max. Dimensions | Ø20 X 18.3mm |
| Weight | 13g |

SupIR 13.6mm f/1.0 Athermalized Fixed Focus 680412

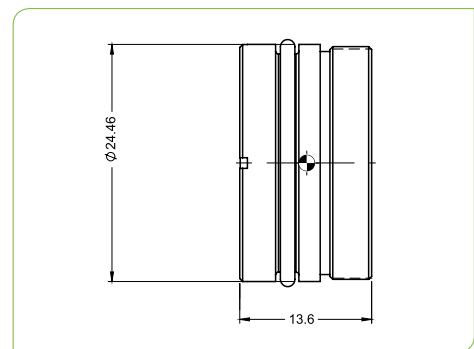
NEW



| HFOV[deg] | 160x120 | 320x240 | 384x288 | 640x480 |
|-----------|---------|---------|---------|---------|
| 25 μ | 16.8° | 33.3° | 40.0° | |
| 17 μ | 11.5° | 22.8° | 27.3° | |
| 12 μ | 8.1° | 16.2° | 19.3° | 32.0° |
| 10 μ | 6.8° | 13.5° | 16.2° | 29.8° |

| Property | Value |
|-------------------------------------|----------------------|
| Optical | |
| Average Transmission (8-12 μ m) | 86% (HD); 84.5% (HC) |
| Back Focal Length | 4.8mm in air |
| Mechanical | |
| Max. Dimensions | Ø34 X 29.45mm |
| Weight | 12.5g |

SupIR 19.8mm f/1.2 Athermalized Fixed Focus 680312



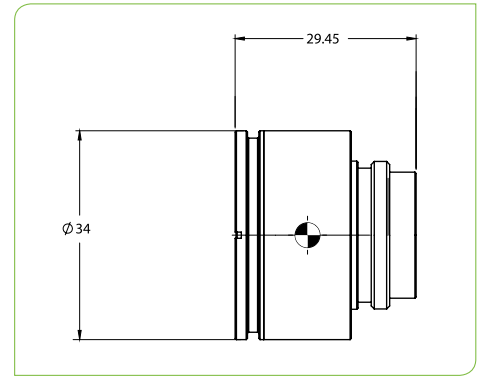
| HFOV[deg] | 160x120 | 320x240 | 384x288 | 640x480 |
|-----------|---------|---------|---------|---------|
| 25 μ | 11.5° | 22.6° | | |
| 17 μ | 7.8° | 15.5° | 18.6° | |
| 12 μ | 5.5° | 11.0° | 13.2° | 21.7° |
| 10 μ | | 9.2° | | 18.2° |

| Property | Value |
|-------------------------------------|-----------------|
| Optical | |
| Average Transmission (8-12 μ m) | 87% (HC) |
| Back Focal Length | 13.45mm in air |
| Mechanical | |
| Max. Dimensions | Ø24.46 X 13.6mm |
| Weight | 14.9g |

SupIR 24mm f/1.0 Athermalized Fixed Focus 680360



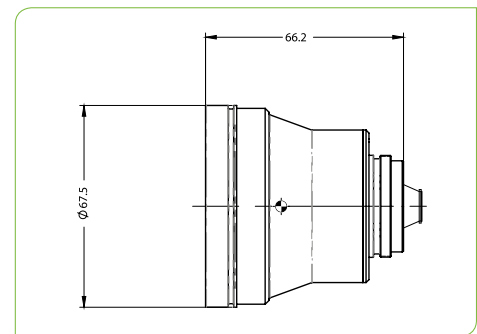
HD
FORMAT



| HFOV[deg] | 320x256 | 640x512 | 672x544 | 1280x1024 |
|-----------|---------|---------|---------|-----------|
| 25 μ | 18.7° | | | |
| 17 μ | 12.8° | 25.5° | 26.8° | |
| 12 μ | 9.0° | 18.0° | 18.9° | |
| 10 μ | 7.5° | 15.0° | 15.8° | 30.2° |

| Property | Value |
|-------------------------------------|---------------------|
| Optical | |
| Average Transmission (8-12 μ m) | 87% (HC) / 92% (HD) |
| Back Focal Length | 8.97mm in air |
| Mechanical | |
| Max. Dimensions | Ø34 X 29.45mm |
| Weight | 37g |

SupIR 55mm f/1.0 Athermalized Fixed Focus 680372



| HFOV[deg] | 160x120 | 320x240 | 384x288 | 640x480 |
|-----------|---------|---------|---------|---------|
| 25 μ | 4.2° | 8.3° | 10.0° | |
| 17 μ | 2.8° | 5.7° | 6.8° | |
| 12 μ | 2.0° | 4.0° | 4.8° | 8.0° |
| 10 μ | 1.7° | 3.3° | 4.0° | 6.4° |

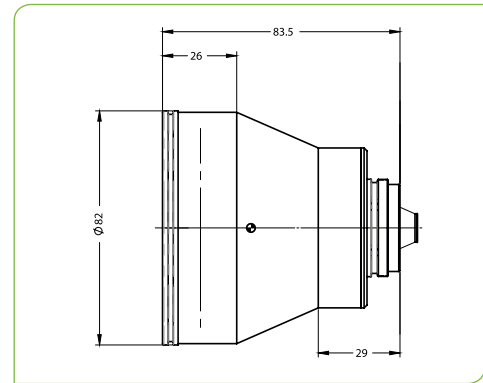
| Property | Value |
|-------------------------------------|----------------|
| Optical | |
| Average Transmission (8-12 μ m) | 85% (HC) |
| Back Focal Length | 12.03mm in air |
| Mechanical | |
| Max. Dimensions | Ø67.5 X 66.2mm |
| Weight | 177g |

SupIR 73.1mm f/1.05

Athermalized, Fixed Focus 680311



HD
FORMAT



| HFOV[deg] | 160x120 | 320x240 | 384x288 | 640x480 | 1024x768 |
|-----------|---------|---------|---------|---------|----------|
| 25μ | 3.1° | 6.2° | 7.5° | | |
| 17μ | 2.1° | 4.3° | 5.0° | 8.5° | |
| 12μ | 1.5° | 3.0° | 3.6° | 6.0° | 9.55° |
| 10μ | | 2.5° | | 5.0° | 7.98° |

| Property | Value |
|-------------------------------|---------------------|
| Optical | |
| Average transmission (8-12μm) | 87% (HC) / 91% (HD) |
| Back Focal Length | 24.68mm in air |
| Mechanical | |
| Max. Dimensions | Ø82mm X 83.5mm |
| Weight | 380g |

LightIR 15-75mm f/1.2

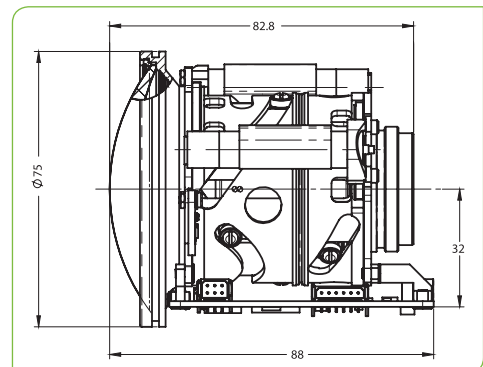
Motorized Continuous Zoom 680386

Designed and optimized for 10-12μm

NEW



HD
FORMAT



WFOV(15mm)

| HFOV[deg] | 320x256 | 480x384 | 640x512 | 1024x768 | 1280x1024 |
|-----------|---------|---------|---------|----------|-----------|
| 25μ | 31.2° | 48.4° | | | |
| 20μ | 24.8° | 38.0° | 52.0° | | |
| 17μ | 20.9° | 31.9° | 43.4° | | |
| 12μ | 14.7° | 22.2° | 29.9° | 49.7° | 64.4° |
| 10μ | | | 24.8° | 40.6° | 52.0° |

NFOV(75mm)

| HFOV[deg] | 320x256 | 480x384 | 640x512 | 1024x768 | 1280x1024 |
|-----------|---------|---------|---------|----------|-----------|
| 25μ | 6.0° | 9.0° | | | |
| 20μ | 4.9° | 7.2° | 9.6° | | |
| 17μ | 4.1° | 6.2° | 8.2° | | |
| 12μ | 2.9° | 4.4° | 5.8° | 9.2° | 11.4° |
| 10μ | | | 4.9° | 7.7° | 9.6° |

| Property | Value |
|-------------------------------|---------------------------|
| Optical | WFOV |
| Average transmission (8-12μm) | 85.5% (HD); 79.4% (HC) |
| Back focal length | 20.76mm in air |
| Mechanical | |
| Max. Dimensions | Ø75 X 88mm |
| Weight | 320g |
| Electrical | |
| Drive voltage | 6-12VDC |
| Current consumption | <0.15A average, 0.3A peak |
| Communication interface | RS 485, RS 422, RS 232 |



About Ophir IR Optics

With decades worth of knowledge and experience, Ophir Optronics Solutions LTD., Infrared Optics, an MKS Company (NASDAQ: MKSI), is a world-leading designer and manufacturer of high performance IR thermal lenses and optical elements for SWIR, MWIR & LWIR imaging. Using advanced technologies, innovative engineering, and design configurations, Ophir provides a global solution for homeland security, surveillance, automotive, commercial, and defense applications: IR Components and complex lens assemblies with fixed or motorized focus and zoom lenses.

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