

**LIGHTWEIGHT, COMPACT, HIGH-PERFORMANCE
SWIR, MWIR & LWIR OPTICS
FOR UNMANNED AERIAL SYSTEMS**



WHATEVER YOUR NEEDS, WE'VE GOT THE LENS

MKS Ophir® products are designed and produced for the most advanced aerial optical systems, meeting the challenging requirements for small form factor, lightweight designs and low power consumption, all to enhance flight time and visibility even under extreme conditions.

Our product portfolio offers a wide range of IR complex lens assemblies with fixed, motorized focus and zoom lenses, providing a global solution for infrared imaging systems in UAS emerging applications.

Our in-house R&D team works in collaboration with customers to develop and design products meeting the Size Weight and Power (SWaP) constraints of UAS, with an unparalleled optical performance, for which we are known worldwide.

Key features

- High MTF performance
- Lightweight, compact, continuous zoom and fixed focus lenses
- Folded optic design for min volume utilization
- Low power consumption
- Suitable for a wide range of reduced SWaP applications
- Available coatings: High durability (HD), hard carbon (HC) and low-reflection hard carbon (LRHC)
- Fast FOV change
- Continuous zoom, with fixed F# and zoom maintained through the full zoom range
- Accurate thru-zoom bore sight
- Compatible with major SWIR, MWIR & LWIR detectors
- Diffraction-limited optical designs
- Athermal compensation
- CPU controlled via RS 485 or RS 232

Continuous Zoom Lenses Detection, Recognition, Identification (DRI) Performance

LightIR 15-75mm f/1.2

12µm pixel size uncooled detectors



FoldIR 30-450mm f/3.4

10µm pixel size cooled detectors



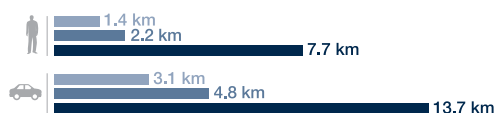
LightIR 10-135mm f/3.6

10µm pixel size cooled detectors



LightIR 16-180mm f/3.6

10µm pixel size cooled detectors



LightIR 18-225mm f/3.6

10µm pixel size cooled detectors



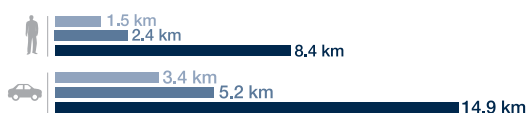
LightIR 18-225mm f/4

10µm pixel size cooled detectors



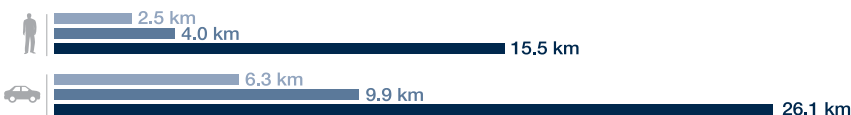
LightIR 20-275mm f/5.5

15µm pixel size cooled detectors



SWIR & NIR 25-250mm f/5.5 (NFOV) f/4.0 (WFOV)

10µm pixel size SWIR detectors



■ Identification
■ Recognition
■ Detection

 Vehicle size 2.3m x 2.3m

 Human size 1.7m X 0.5m

Note: Calculations used are based on "Johnson Criteria" | Real world performance may vary depending on the weather conditions

* Assumptions: 23mK NETD for f/4.0, 10µm and f/5.5, 15µm cooled detectors | 35.5mK NETD (f/3.4) for 10µm cooled detectors | 32mK NETD (f/3.6) for 10µm cooled detectors | 30Hz frame rate | 50% detection probability | 0.2km⁻¹ atmospheric attenuation coefficient | human ΔT = 5°C | vehicle ΔT = 2°C

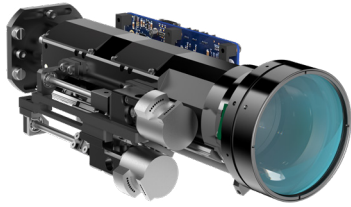
** SWIR assumptions: 10µm pixel size SWIR 1280 detectors | TRM4 model | Day mode | 0.7µm to 1.7µm spectral range | 25Hz frame rate | Overcast daylight irradiance | 0.2 path radiance factor | 0.2km⁻¹ atmospheric attenuation coefficient | 50% detection probability | Human and vehicle target 50% reflectivity | 15% background reflectivity

Low-SWaP SWIR, MWIR & LWIR Solutions WHERE MINIMAL IS CRITICAL



SWIR & NIR 25-250mm f/5.5 (NFOV) f/4.0 (WFOV) Cont. Zoom 680471

SWIR & NIR



NEW

HD
FORMAT

WFOV (25mm)

HFOV	640x512	1280x1024
15μ	21.7°	
10μ	14.6°	28.7°
5μ	7.3°	14.6°

NFOV (250mm)

HFOV	640x512	1280x1024
15μ	2.2°	
10μ	1.5°	2.9°
5μ	0.7°	1.5°

Property	Value	
Optical	WFOV	NFOV
Focal Length	25mm	250mm
F#	4.0	5.5
Back Focal Length	34.47mm in air (±0.1)	
Minimum Focusing Range	2m	20m
Mechanical		
Max. Dimensions	Ø65mm x 224.1mm	
Weight	840gr	
Electrical		
Supply Voltage	12V	
Current Consumption	<0.5A (max)	
Communication Protocol	RS422, RS232	

FoldIR 30-450mm f/3.4 Motorized Continuous Zoom 680465

Cooled MWIR



NEW

HD
FORMAT

WFOV (30mm)

HFOV[deg]	640x480	1280x1024
15μ	19.3°	
10μ	12.5°	26.9°

NFOV (450mm)

HFOV[deg]	640x480	1280x1024
15μ	1.3°	
10μ	0.8°	1.7°

Property	Value	
Optical	WFOV	NFOV
Focal Length	30mm	450mm
F#	3.4	
Cold stop to FPA Distance	19.4mm	
Minimum Focusing Range	20m	50m
Mechanical		
Max. Dimensions	Ø146mm x 247mm	
Weight	2kg	
Electrical		
Supply Voltage	12V	
Current Consumption	<0.5A average, 1.0A peak	
Communication Protocol	RS422, RS232	

LightIR 10-135mm f/3.6, Motorized Continuous Zoom 680451

Cooled MWIR



WFOV (10mm)

HFOV	640x512
10μ	37.0°

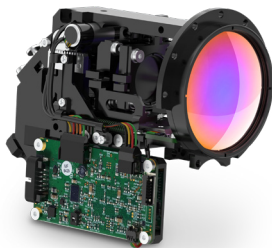
NFOV (135mm)

HFOV	640x512
10μ	2.67°

Property	Value	
Optical	WFOV	NFOV
Focal Length	10mm	135mm
F#	3.6	
Cold stop to FPA Distance	12mm	
Back Focal Length	≥17mm in air	
Minimum Focusing Range	5m	50m
Mechanical		
Max. Dimensions	Ø46mm x 86.4mm	
Weight	250gr	
Electrical		
Supply Voltage	12V	
Current Consumption	< 0.5A average, 1.0A peak	
Communication Protocol	RS422	

LightIR 16-180mm f/3.6, Motorized Continuous Zoom 680389

Cooled MWIR



WFOV (16mm)

HFOV	640x480
10μ	22.6°

NFOV (180mm)

HFOV	640x480
10μ	2°

Property	Value	
Optical	WFOV	NFOV
Focal Length	16mm	180mm
F#	3.6	
Cold stop to FPA Distance	12mm	
Back Focal Length	23.08mm in air	
Minimum Focusing Range	5m	50m
Mechanical		
Max. Dimensions	Length 121mm; Width 70mm; height 102mm	
Weight	460gr	
Electrical		
Supply Voltage	12V	
Current Consumption	< 0.5A average, 1.0A peak	
Communication Protocol	RS232, RS422	

LightIR 18-225mm f/3.6, Motorized Continuous Zoom 680442

Cooled MWIR



NEW

WFOV (18mm)

HFOV[deg]	640x512
10μ	20°

NFOV (225mm)

HFOV[deg]	640x512
10μ	1.6°

Property	Value	
Optical	WFOV	NFOV
Focal Length	18mm	225mm
F#	3.6	
Cold stop to FPA Distance	12mm	
Back Focal Length	18.5mm in air	
Minimum Focusing Range	5m	50m
Mechanical		
Max. Dimensions	Ø63mm x 84.6mm	
Weight	<300gr	
Electrical		
Drive Voltage	12V	
Current Consumption	< 0.5A average, 1.0A peak	
Communication Protocol	RS422	

LightIR 18-225mm f/4, Motorized Continuous Zoom 680473

Cooled MWIR



NEW

HD
FORMAT

WFOV (18mm)

HFOV	640x512	1280x1024
15μ	29.9°	
10μ	20.2°	39.1°

NFOV (225mm)

HFOV	640x512	1280x1024
15μ	2.4°	
10μ	1.6°	3.3°

Property	Value	
Optical	WFOV	NFOV
Focal Length	18mm	225mm
F#	4.0	
Cold stop to FPA Distance	19.4-20.5mm	
Back Focal Length	26.9mm in air (with 1+0.5mm Ge windows)	
Minimum Focusing Range	5m	50m
Mechanical		
Max. Dimensions	Ø61.4mm x 84mm	
Weight	326gr	
Electrical		
Supply Voltage	12V	
Current Consumption	< 0.5A average, 1.0A peak	
Communication Protocol	RS422	

LightIR 20-275mm f/5.5, Motorized Continuous Zoom 680314

Cooled MWIR



WFOV (EFL 20mm)

HFOV[deg]	640x512
20μ	
15μ	28.0°

NFOV (EFL 275mm)

HFOV[deg]	640x512
20μ	
15μ	1.9°

Property	Value	
Optical	WFOV	NFOV
Focal Length	20mm	275mm
F#	5.5	
Back Focal Length	23.52mm in air	
Cold stop to FPA distance	19.7mm	
Minimum Focusing Range	5m	50m
Mechanical		
Max. Dimensions	Ø58mm x 67.1mm	
Weight	264 gr	
Electrical		
Supply Voltage	12V	
Current Consumption	0.2A average, 1.0A peak	
Communication Interface	RS485, RS422	

LightIR 15-60mm f/1.4, Motorized Continuous Zoom 680164

Uncooled LWIR



WFOV (15mm)

HFOV[deg]	320x240	640x480
25μ	31.5°	
17μ	21.1°	44.2°
12μ	14.8°	30.2°

NFOV (60mm)

HFOV[deg]	320x240	640x480
25μ	7.6°	
17μ	5.2°	10.4°
12μ	3.7°	7.3°

Property	Value	
Optical	WFOV	NFOV
Focal Length	15mm	60mm
F#	1.4	
Minimum Focus Range	1m	2m
Back Focal Length	≥25mm in air	
Mechanical		
Max. Dimensions	Ø62mm x 83.5mm	
Weight	500gr	
Electrical		
Supply Voltage	12V	
Current Consumption	0.2A average, 0.5A peak	
Communication Interface	RS 422	

LightIR 15-75mm f/1.2, Motorized Continuous Zoom 680386

Uncooled LWIR



WFOV(15mm)

HFOV[deg]	320x240	640x480
25μ	31.2°	
17μ	20.9°	43.4°
12μ	14.7°	29.9°
10μ		24.8°

NFOV(75mm)

HFOV[deg]	320x240	640x480
25μ	6.0°	
17μ	4.1°	8.2°
12μ	2.9°	5.8°
10μ		4.9°

Property	Value	
Optical	WFOV	NFOV
Focal Length	15mm	75mm
F/#	1.2	
Minimum Focus Range	7m	18m
Back Focal Length	20.76mm in air	24.28mm in air
Mechanical		
Max. Dimensions	Ø75mm x 79.1mm	
Weight	328gr	
Electrical		
Supply Voltage	12V	
Current Consumption	<0.15A average, 0.3A peak	
Communication Interface	RS 485, RS 422, RS 232	

SupIR 7.5mm f/1.2, Fixed Athermalized 680331

Uncooled LWIR



HD
FORMAT

HFOV[deg]	320x240	384x288	640x480	1024x768
25μ	63.9°	78.3°		
17μ	42.5°	51.4°	90.9°	
12μ	29.7°	35.8°	61.1°	106.5°

Property	Value
Optical	
Focal Length	7.5mm
F/#	1.2
Back focal length	11.99mm in air
Mechanical	
Max. Dimensions	Ø25.12mm x 18.8mm
Weight	24.5gr

SuplR 13.6mm f/1.0, Fixed Athermalized 680412

Uncooled LWIR



HFOV[deg]	320x240	384x288	640x480
25μ	33.3°	40.0°	
17μ	22.8°	27.3°	
12μ	16.2°	19.3°	32.0°
10μ	13.5°	16.2°	29.8°

Property	Value
Optical	
Focal Length	13.6mm
F/#	1.0
Back focal length	4.8mm in air
Mechanical	
Max. Dimensions	Ø20.6mm x 18mm
Weight	12.5gr

SuplR 16.7mm f/1.25, Fixed Athermalized 680186

Uncooled LWIR



**HD
FORMAT**

HFOV[deg]	320x240	384x288	640x480	1024x768
25μ	27.5°	33.0°		
17μ	18.7°	22.4°	37.5°	
12μ	13.2°	15.8°	26.4°	42.5°

Property	Value
Optical	
Focal Length	16.7mm
F/#	1.25
Back focal length	11.41mm in air
Mechanical	
Max. Dimensions	Ø34.9mm x 16.4mm
Weight	25.5gr

SuplR 19mm f/1.1, Fixed Athermalized 65221

Uncooled LWIR



HD
FORMAT

HFOV[deg]	320x240	384x288	640x480	1024x768
25 μ	23.6°	28.3°		
17 μ	16.1°	19.3°	32.1°	
12 μ	11.4°	13.7°	22.7°	36.3°

	Property	Value
Optical	Focal Length	19mm
	F/#	1.1
	Back focal length	11.51mm in air
Mechanical	Max. Dimensions	Ø28.5mm x 18.1mm
	Weight	20gr

SuplR 25mm f/1.2, Fixed Athermalized 680108

Uncooled LWIR



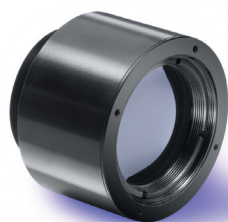
HD
FORMAT

HFOV[deg]	320x240	384x288	640x480	1024x768
25 μ	18.2°	21.8°	36.4°	
17 μ	12.4°	14.9°	24.8°	
12 μ	8.7°	10.5°	17.5°	27.9°

	Property	Value
Optical	Focal Length	25mm
	F/#	1.2
	Back focal length	17.99mm in air
Mechanical	Max. Dimensions	Ø34.9mm x 29mm
	Weight	57gr

SuplR 35mm f/1.2, Fixed Athermalized 680111

Uncooled LWIR



HD
FORMAT

HFOV[deg]	320x240	384x288	640x480	1024x768
25 μ	13.0°	15.5°		
17 μ	8.9°	10.6°	17.6°	
12 μ	6.3°	7.5°	12.5°	19.7°

	Property	Value
Optical	Focal Length	35mm
	F/#	1.2
	Back focal length	22.62mm in air
Mechanical	Max. Dimensions	Ø53.5mm x 45.2mm
	Weight	108gr



About Ophir Infrared Optics

With decades worth of knowledge and experience, Ophir Optronics Solutions LTD., Infrared Optics, an MKS Brand (NASDAQ: MKSI), is a world-leading designer and manufacturer of high-performance IR thermal imaging 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, defense and commercial applications: IR components and complex lens assemblies with fixed or motorized focus and zoom lenses.

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