

Malin Space Science Systems

Exploration Through Imaging

ECAM-IR3S

LWIR (8-14 μ m) Uncooled Microbolometer, 640x480, 17 μ m pitch, Shuttered for Non-Uniformity Correction

Electro-Optical

Band	LWIR
Wavelength Range	8-14 μ m
Electronic Shutter Modes	Rolling
Pixels	0.3 Mpixel
Horizontal Resolution	640 pixels
Vertical Resolution	480 pixels
Pixel Pitch	17 μ m
Array Diagonal	13.6 mm
Conversion Bit Depth	16 bits
NEDT	<500mK with F/2 lens and 300K target temperature
Frame Rate, Native Format	12 fps

Power

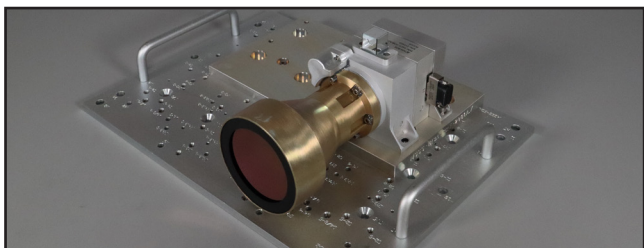
Supply Voltage	5V (4.5 to 5.35V)
Power, Idle	0.8 W
Power, Imaging	2 W

Thermal

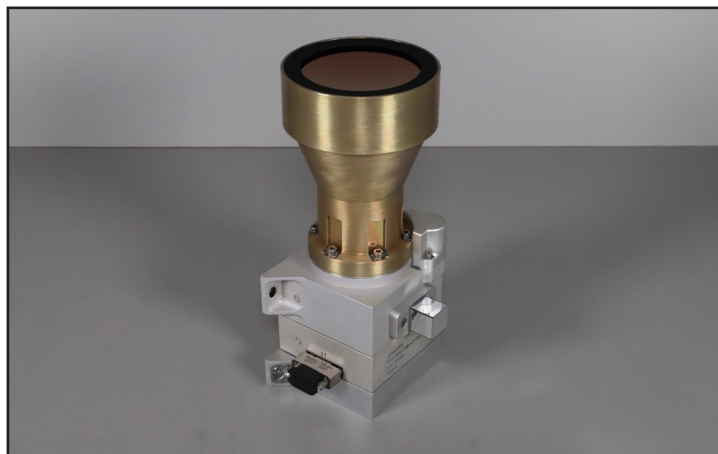
Operating Temperature	-30 to +40 °C
Protoflight Qualification	-40 to +55 °C
Non-Operating Temperature	-45 to +70 °C
Temperature Sensing	Internal ISL71590 available for readout on J1

Survivability

Radiation Design Environment	5 years GEO standard, up to 15 years GEO optional
Predicted MTTF	4.6 million hours
NASA TRL	8



ECAM-IR3S with VNFOV optics



ECAM-IR3S with VNFOV optics

Features

- Compact thermal-IR camera
- Mechanical shutter for non-uniformity correction
- 1-point non-uniformity correction can be performed in the DVR
- Standardized ECAM interface

Programmability

- Shutter Control
- Sensor Clock Rate
- Gain
- Integration
- Region of Interest
- Test Pattern

Applications

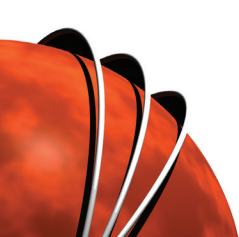
- Space situational awareness (SSA)
- Rendezvous and proximity operations (RPO)
- Mission extension and inspection services
- Planetary science

Optics

Effective Focal Length	F/#	FOV (V° x H°)	Bandpass
MFOV, 19.3 mm	F/1.5	25 x 32	8-12 μ m
NFOV, 39 mm	F/2.0	12 x 16	8-12 μ m
VNFOV, 102.8 mm	F/2.0	4.5 x 6	8-12 μ m

Digital

Internal Memory	64 byte SpW Rx FIFO 512 byte SpW Tx FIFO No Frame Buffer
Digital Processing	None
Data Interface	SpaceWire (Single Port)

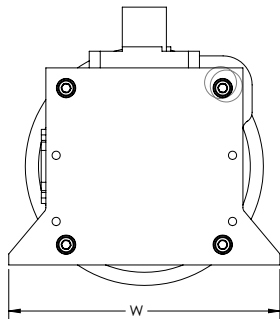
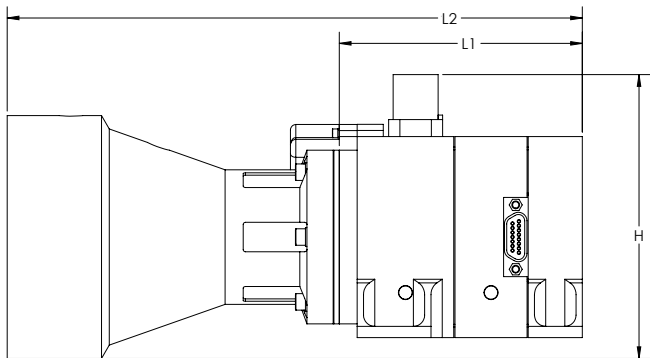


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Dimensional Envelope



Mechanical/Interfaces	
Mass w/VNFOV optics, no baffle	740 g
Dimensional Envelope w/VNFOV optics, no baffle	H: 81 mm W: 79 mm L1: 69 mm L2: 163 mm
Connectors	J1: Micro-D, 15-Socket ECAM Pinout
Mechanisms	Self-Restoring Shutter



Targets at approximately 1 km imaged from the Canyon View Cleanroom at MSSS with VNFOV optics. Image has been 1-point non-uniformity corrected using an image taken with the internal shutter actuated. Image Credit: MSSS

Quality: AS9100D:2016 Compliant
DUNS Number: 62-680-9032
CAGE Code: 0R9V5
NAICS Codes: 334511, 336419, 541690, 541715

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