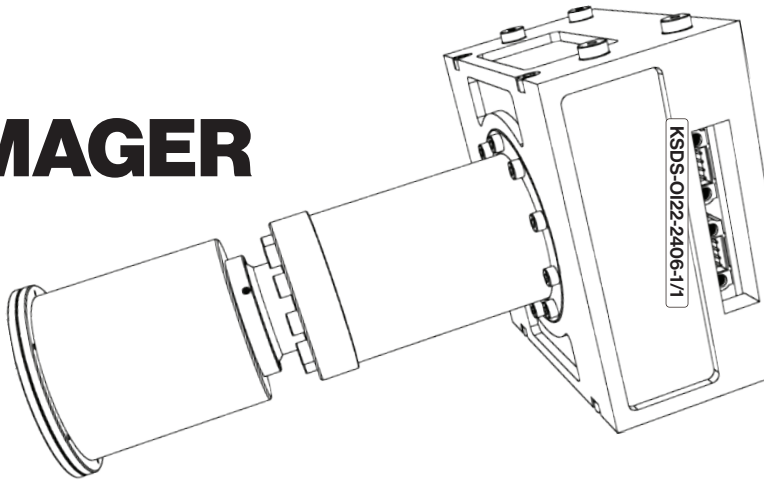
KSOI-22 OPTICAL IMAGER

DATASHEET



KSOI-22 optical imager utilizes space qualified optics, which was initially developed for a lunar orbiter and has successfully performed the mission. It features wide operating temperature, high-performance and passive self-focusing, ideal for solving agriculture, civilian and scientific tasks of remote sensing. This camera has the possibility to work with stable MTF in range of temperature from -55°C to +60°C. The payload has 3 different options for sensors. The main difference between sensors is the resolution. They are 1.5, 2 and 5 MP (Megapixels), please refer to the specifications for details.

Specifications

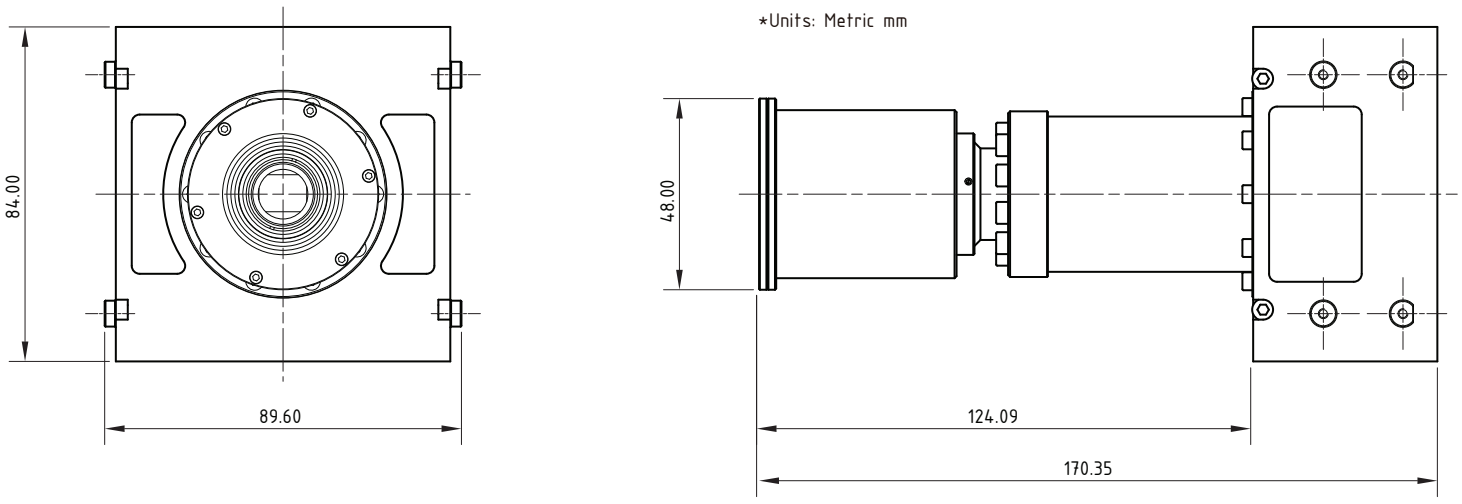
		5MP	2MP	1.5MP
GSD @600km, Panchromatic		30 m	25 m	30 m
Swath width @600km		73 km	48 km	43 km
Swath length @600km		61 km	27 km	32 km
Storage capacity		128 Gigabyte EDAC protected NAND Flash		
Image processing		Binning, Thumbnails		
Image compression		No image compression		
Mass		850 g ±(10%)		
Dimensions		170.3 x 89.6 x 84.0 (±1) mm		
Power supply		5V DC ± 150 mV		
Power consumption		Idle: 1 W, operation: 1.5 W, Peak: 3 W		
Data interface		UART (default) / CAN / RS422 / RS232		
Data rate		CAN: 250 kbit/s (2 Mbit/s optional)		
		UART/RS422/RS232: 19.2 kbit/s		
		(250 kbit/s optional)		
Data format	5MP, 2MP	mono 8/10/12 bit		
	1.5MP	mono 8/10 bit		
Control interface		UART (default) / CAN/ RS422 / RS232		
Nominal pointing direction		Earth / Space		
Operating temperature		-55 °C ~ +60 °C , vacuum		
Surviving temperature		-55 °C ~ +125 °C		
Sun facing duration		Sun can be within FoV for up to 3 minutes		
Radiation (TID)		Tested beyond 25 kRad, without shielding, using a 60Co source		
Design life		2 years in LEO		
Heritage / TRL		TRL 9		
ITAR restriction / Export control		None		

Optics

Aperture diameter	14 mm
Focal length	76.5 mm
F number	f / 5.46
Field of View (horizontal x vertical)	12°
Optical transmission and vignetting	> 94 %

Detector

		5MP	2MP	1.5MP
Type of detector		CMOS matrix		
Shutter mode		Global	Rolling	Global
Lower/upper wavelength		400 - 900 nm (PAN)		
Resolution (horizontal x vertical)	5MP	2464 (H) x 2056 (V) pixels		
	2MP	1920 (H) x 1080 (V) pixels		
	1.5MP	1456 (H) x 1088 (V) pixels		
Pixel size		3.45 µm	2.9 µm	3.45 µm
Maximum pixel depth		12 bit	12 bit	10bit
Spectral bands		PAN (default, no filter)		
	5MP	Up to 6 bands (RGB, Red Edge, NIR)		
	2MP, 1.5MP	Up to 3 bands (RGB, Red Edge, NIR)		
Gain	5MP, 1.5MP	Analog: 0 dB to 24 dB, (0.1 dB step) Digital: 24 dB to 48 dB, Analog +0.1 d step		
	2MP	Analog: 0 dB to 29.4 dB, (0.3 dB step) Digital: 29.7dB to 71.4dB, Analog +0.3 d step		
SNR		> 100	> 85	> 100
Instantaneous FoV (for a pixel), arcsec		9.4 x 9.4	7.8 x 7.8	9.4 x 9.4
Min/Max exposure time		Min 9 µs / Max 30 s		
Quamtum efficiency, QE @ 600nm		> 99 %	> 60 %	> 90 %
Ensquared energy		96 %	86 %	86 %
Full well capacity		5760 e-	2760 e-	3760 e-
Read-out noise electrons		3.5 e-	23.2 e-	30.5 e-
Dark current @20C (e-/s)		< 10	< 23	< 10
Accuracy of time tagging per picture		400 ns		



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