

# MarsMW

## High Performance IR Detectors for Mid Wave Infrared Imaging 320x256 HgCdTe MWIR (30µm pitch)

- 320Hz Operation
- Low Power
- High Sensitivity
- Lightweight
- 30 micron Pixel Technology



The Sofradir staring snapshot 320x256 Mid Wave Infrared (MWIR) focal plane assemblies are offered to answer the military and commercial systems requirement for 3-5µm detection. These detectors take advantage of the Sofradir optimized high performance, stable, low defect density photo-voltaic HgCdTe staring array technology. Hybridized on a Sofradir state-of-the-art CMOS Read-Out Integrated Circuit (ROIC), these detectors are offered in various long vacuum-life dewar and cooler configurations, in order to meet the mechanical and cooling needs for different applications.

**STANDARD CONFIGURATIONS:**

- Detector Dewar Assembly (IDDCA) with or without Joule-Thomson cooler (pressurized gas cooling).
- Integrated Detector Dewar Cooler Assembly (IDDCA) with miniature Stirling-cycle rotary cooler for compact, low power configuration

**ON-REQUEST CONFIGURATION:**

- IDDCA with split Stirling-cycle linear cooler, for expanded lifetime and system integration facilitation.



Security



Defense



Soldier Systems

**ROIC FEATURES**

Selection	Parallel or serial electrical interface
Modes	Snapshot operation, direct injection input circuit, integrate-then-read mode, programmable integration time ( $\geq 3 \mu s$ ), anti-blooming
Window Modes	Fixed (320x256, 320x240, 256x256) or programmable (any size down to 64x1 anywhere in the 320x256 array)
Charge Handling Capacity	$> 12 \times 10^6 e^-$ or $37 \times 10^6 e^-$ (for 100% well fill)
Electric Dynamic Range	$> 80 \text{ dB}$
Readout Noise	$1000 e^-$ (for highest gain)
Signal Outputs	1 or 4
Pixel Output Rate	up to 6.6MHz per output
Frame Rate	up to 320Hz full frame rate (320x256, 4 outputs)
Electrical Interface	14 inputs/outputs (default mode: 4 outputs, gain 1, 320x256) + 2 pins for regulation

**ARRAY FEATURES**

Pixel Pitch	30µm x 30µm
Detector Spectral Response	3.7µm - 4.8µm (with cold filter)
FPA Operating Temperature	Up to 110K (Stirling cycle coolers); 80K or 90K (Joule-Thomson cooler)

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Technical characteristics described in this data sheet are for information only and are not contractual. Because of ongoing product enhancements, specifications are subject to change without notice. Export of these products from the United States is controlled by the US Government. Prior authorization is required for re-export or transfer.

## TYPICAL PERFORMANCE

Non-Uniformity	< 5% RMS ( $\sigma$ /mean, 300K uncorrected performance)
Array Operability	> 99.5% typical (NETD < 2xNETD <sub>average</sub> )
Pixel NETD (average)	≤ 10mK typical (f/2, 37x10 <sup>6</sup> e <sup>-</sup> , 300K, 50% well fill, 90Hz) ≤ 16mK typical (f/4, 12x10 <sup>6</sup> e <sup>-</sup> , 300K, 50% well fill, 90Hz)
Residual Fixed Pattern Noise	low and stable (< NETD)
MTF	maximized

## OPTIONS

MW Engine	Proximity Driving Electronics (including ADC)
Complete MW Camera	Cold Filters and Cold Shield Aperture

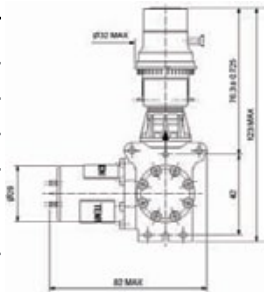
## STANDARD CONFIGURATIONS

### Mars MW RM2

#### RM2-7i Micro Cooler



FOV: f/4 Weight: < 0.45kg (0.99 lb)  
 Operating Temperature: -40°C / +71°C  
 Power Supply: 32V  
 Typical Characteristics at 20°C, 90K:  
 Cooldown input power: 12.5 W<sub>AC</sub> (\*) Regulated input power: 6.5 W<sub>AC</sub>  
 Cooldown time: < 6 min., 30 sec.  
 (\*) W<sub>AC</sub> - at cooler pins AC input

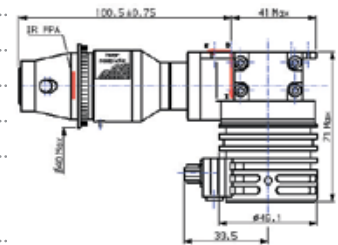


### Mars MW K508

#### K508 Micro Cooler



Integrated cooler driving electronics  
 FOV: f/2 or f/4 Weight: < 0.6 kg (1.32 lb)  
 Operating Temperature: -40°C / +71°C  
 Power Supply: 24V  
 Typical Characteristics at 20°C, 90K:  
 Cooldown input power: 10.5 W<sub>DC</sub> (\*) Regulated input power: 5.7 W<sub>DC</sub>  
 Cooldown time: 6 min., 30 sec.  
 (\*) W<sub>DC</sub> - at cooler C&C DC input

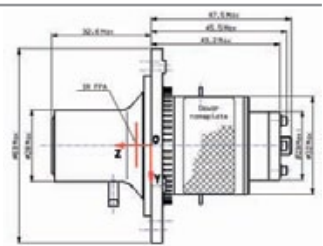


### Mars MW JT

#### 11 mm Joule-Thomson Cooler



FOV: f/2 Weight: < 0.15 kg (0.33 lb)  
 Operating Temperature: -40°C / +71°C  
 Argon gas  
 Typical Characteristics at 20°C, 90K (310bar argon gas):  
 Cooldown time: 1 min., 30 sec. Maximum Gas Consumption: 30NI/min.  
 Regulated Gas Consumption: 10NI/min.



### Mars MW LS5

#### LS5-7i Split Cooler



Weight: < 1.50 kg (3.3 lb)  
 Operating Temperature: -40°C / +71°C  
 Power Supply: 11V  
 Typical Characteristics at 20°C, 77K:  
 Cooldown input power: 35W<sub>AC</sub> (\*) Regulated input power: 16 W<sub>AC</sub> Cooldown time: 5 min.  
 (\*) W<sub>AC</sub> - at cooler pins AC input