

HiPIR-640 – MCT 640 x 512 15 μm PITCH IDCA

HIGH PERFORMANCE IR-MODULES (MWIR OR LWIR)



Focusing on excellent E/O performance with minimum size, weight and power, AIM manufactures full TV format HiPIR-640 modules with 15 μm pitch in the MWIR or LWIR with high full frame rates up to 100Hz. State of the art MCT technology allows series production of MWIR detectors operating at temperatures exceeding 120K without any need to sacrifice the 5 μm cut-off wavelength.

Depending on whether minimum vibration output and maximum lifetime are key requirements or compactness and low power consumption, the detectors are either available in configurations with AIM's new SX095 split linear cooler or with different integral rotary coolers.

A dedicated electronics card set provides digital output optionally including sophisticated scene based non-uniformity correction and is designed to withstand even harsh environments.

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IR-Sensor	MW	LW
Material	HgCdTe - Cadmium Mercury Telluride	
Format	640 x 512	
Pixel pitch	15μm x 15μm	
Material spectral response	0.8-5.2μm typ.	0.8-9.0μm typ.
Detector spectral response	3.4-5.2μm standard	7.6-9.0μm standard
FPA operating temperature	95K typ., up to 120K	67K typ., up to 80K

ROIC

Technology	Si - CMOS
Input	Direct charge injection
Operating mode	Snapshot
Read out modes	selectable IWR/ITR
Subarrays / Windows	Any size in steps of 4 horizontal and 1 vertical
Charge handling capacity	IWR: $5 \times 10^6 e^-$ ITR: $6 \times 10^6 e^-$
Dynamic range	> 80dB
Read out noise	< 400 e^-
Outputs	4
Max. output pixel rate	10MHz / output
Max. full frame rate	100Hz

IWR = Integrate While Read, ITR = Integrate Then Read

Dewar / Cooler

Type	Integrated Detector Cooler Module (IDCA)	
Cold shield	F/4.6	F/2.05
Cooler	Integral Rotary K508 (other coolers optionally available*)	
Cool down time	< 6min	< 7min
Lifetime	> 8,000h	> 6,000h

(*) AIM Split linear SX095 or SX040: high MTF (up to >20,000h), low noise and low vibration output

(*) Integral small Rotary K561: very compact dewar configuration with low power consumption for MWIR

Command / Control Electronics

Function / Interface ROIC	DC supply / Clocks / Serial data / 4 analog video
AD Converter / DMUX	4 x 14 bit
Output	14 bit serial / Frame Sync / Line Sync / Data Clock
Input	Ext. Frame in / RS232 serial data / 5V Power supply

Performance

NETD (300K half well)	17mK (F/4.6, $t_{int} \sim 5ms$)	30mK (F/2, $t_{int} \sim 0.2ms$)
IETD	< 0.5 x NETD typ.	< 1.0 x NETD typ.
Array operability	> 99.5%	> 99.0%

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