

STARING ARRAY INFRARED DETECTOR

## LYNRED Staring Array

# IRS

160 x 160 – 90µm pitch / 480 x 480 – 30µm pitch  
MCT – MWIR to VLWIR



IRS is a **space qualified detector** well-suited for sounding applications in MWIR to VLWIR spectral range.

Based on LYNRED space proven MCT, this detector developed in the frame of MTG mission offers the **highest level of performance** for space sounding applications (high operability and SNR for example).

## THE LARGE IR DETECTOR FOR FTS SPACE SOUNDING APPLICATIONS



**SPECIFICALLY DESIGNED FOR FOURIER TRANSFORM SPECTROMETRY (FTS) SOUNDING APPLICATIONS**



**SPACE QUALIFIED**



**LARGE DYNAMIC RANGE WELL SUITED FOR MWIR – VLWIR SPECTRAL RANGE**



**PROVEN TECHNOLOGY FOR OUTSTANDING OPERABILITY REQUIREMENTS UP TO 15µm**

SPACE



PRODUCT NUMBER: IRS

# THE LARGE IR DETECTOR FOR FTS SPACE SOUNDING APPLICATIONS



**HIGH OPERABILITY & HIGH SNR**



**LARGE DYNAMIC RANGE**



**SPACE QUALIFIED**



**ON BOARD MTG MISSION**

## ARRAY FEATURES

Spectral range	Nominal configuration	On demand
	<ul style="list-style-type: none"> <li>4 – 6.25 <math>\mu\text{m}</math> (MWIR)</li> <li>8–14.5 <math>\mu\text{m}</math> (LWIR-LWIR)</li> </ul>	<ul style="list-style-type: none"> <li>Adjustment available from MWIR up to VLWIR</li> </ul>
Format & Pixel pitch	<ul style="list-style-type: none"> <li>Normal Mode: 160 x 160 super-pixels, 90 <math>\mu\text{m}</math> pitch</li> <li>Imager Mode: 480 x 480 sub-pixels, 30 <math>\mu\text{m}</math> pitch</li> </ul>	
Operating temperature	Nominal configuration	On demand
	<ul style="list-style-type: none"> <li>55 K</li> </ul>	<ul style="list-style-type: none"> <li>Adjustment from 50 K up to 90 K depending on SNR mission needs</li> </ul>

## ROIC (READ-OUT INTEGRATED CIRCUIT)

ROIC main characteristics	<ul style="list-style-type: none"> <li>Snapshot integration type (IWR &amp; ITR mode)</li> <li>2 available gains G1 &amp; G2</li> <li>16 Analog outputs (Pseudo-differential mode, 2.1V (G1) / 3 V(G2) maximum output voltage swing)</li> </ul>
ROIC main functionalities	<ul style="list-style-type: none"> <li>Sub-pixel deselection among super-pixel</li> <li>2 operating modes (Normal Mode &amp; Imager Mode)</li> <li>Skimming</li> </ul>
Operating characteristics	<ul style="list-style-type: none"> <li>Normal Mode Frame rate: 2.4 kHz @4 MHz (Available operation up to 4.2 kHz @7 MHz)</li> <li>Integration time: From 15 <math>\mu\text{s}</math> up to (Frame time – 15 <math>\mu\text{s}</math>)</li> </ul>
Charge Handling Capacity	<ul style="list-style-type: none"> <li>2 available values: 37.5 Me- (G1) &amp; 523 Me- (G2)</li> </ul>

## TYPICAL PERFORMANCES (NOMINAL CONFIGURATION)

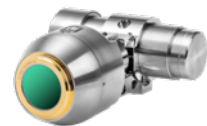
Detection Efficiency Plateau (=QE*Fill Factor)	<ul style="list-style-type: none"> <li>75% (MWIR) 65% (LWIR-VLWIR)</li> </ul>
PRNU	<ul style="list-style-type: none"> <li>&lt; 2%</li> </ul>
Dark Current Density @55 K	<ul style="list-style-type: none"> <li>Negligible for MWIR &amp; 5 000 fA/<math>\mu\text{m}^2</math> for LWIR-VLWIR</li> </ul>
MTF @Nyquist	<ul style="list-style-type: none"> <li>&gt; 0.6</li> </ul>
Readout Noise @55 K	<ul style="list-style-type: none"> <li>1875e- for G1</li> <li>16875e- for G2</li> </ul>
Operability	<ul style="list-style-type: none"> <li>&gt; 99.5% (MWIR) and &gt;98% (LWIR-VLWIR)</li> </ul>
Power Dissipation	<ul style="list-style-type: none"> <li>110 mW @4 MHz</li> </ul>
Radiation hardness	<ul style="list-style-type: none"> <li>TID: up to 28 krad</li> <li>TNID: up to 5,2.10<sup>10</sup> protons/cm<sup>2</sup> @ 41.6 MeV</li> <li>SEE robustness: SEL free / Low SEU &amp; SEFI rate</li> </ul>

## DETECTOR CONFIGURATIONS\*

Passive configuration (without cryocooler)

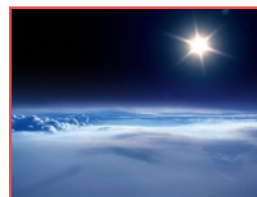


Active configuration (with high reliability cryocooler > 60 000 h)



*In collaboration with Absolut System*

\* Detailed technical information available on request



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