Sofradir’s Mars Very Long Wave Infrared (VLWIR) Integrated Detector Dewar Cooler Assembly (IDDCA) focal plane array features a staring, snapshot 320x256 Mercury Cadmium Telluride (HgCdTe or MCT) focal plane array in a compact dewar for long-wave (8-12 µm) infrared imaging. The Mars VLW is ideal for use in military and commercial systems having an 8-12 µm detection requirement. These detectors take advantage of Sofradir’s process to optimize performance of photovoltaic HgCdTe technology, delivering stable, low defect density staring arrays with material bandgap adapted for VLW applications.

The Sofradir IRFPAs are hybridized on a state-of-the-art CMOS Read-Out Integrated Circuit (ROIC), and mounted in a long vacuum-life dewar and cooler configurations that meet various different mechanical and cooling requirements of the systems for which they are intended.

The Mars VLW IDDCA is available with separate proxy electronics (including A/D, drive and cooler control electronics), as a cooled infrared engine and as a calibrated, cooled infrared scientific camera.

STANDARD CONFIGURATION:
• 11.0µm IRFPA at 70K into IDDCA with 1W split Stirling-cycle linear cooler

ON-REQUEST CONFIGURATIONS:
• Custom dewar, cold filter, and cooler configurations

Surveillance Systems
Security
Soldier Systems

### ROIC FEATURES

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection</td>
<td>Parallel or serial electrical interface</td>
</tr>
<tr>
<td>Modes</td>
<td>Snapshot operation, direct injection input circuit, integrate-then-read mode, programmable integration time (≥ 3µs), anti-blooming</td>
</tr>
<tr>
<td>Window Modes</td>
<td>Fixed (320x256, 320x240, 256x256) or programmable (any size down to 64x1 anywhere in the 320x256 array)</td>
</tr>
<tr>
<td>Charge Handling Capacity</td>
<td>12x10⁶ or 37x10⁶ e⁻ (for 100% well fill)</td>
</tr>
<tr>
<td>Electrical Dynamic Range</td>
<td>&gt; 80dB</td>
</tr>
<tr>
<td>Readout Noise</td>
<td>1000 e⁻ (for highest gain)</td>
</tr>
<tr>
<td>Signal Outputs</td>
<td>1 or 4</td>
</tr>
<tr>
<td>Pixel Output Rate</td>
<td>up to 6.6MHz per output</td>
</tr>
<tr>
<td>Frame Rate</td>
<td>up to 320Hz full frame rate (320x256, 4 outputs)</td>
</tr>
<tr>
<td>Electrical Interface</td>
<td>14 inputs/outputs (default mode: 4 outputs, gain 1, 320x256) + 2 pins for regulation</td>
</tr>
</tbody>
</table>

### ARRAY FEATURES

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pixel Pitch</td>
<td>30µm x 30µm</td>
</tr>
<tr>
<td>Detector Spectral Response</td>
<td>7.7µm - 11.5μm up to material cut-off (high pass cold filter)</td>
</tr>
<tr>
<td>FPA Operating Temperature</td>
<td>70K</td>
</tr>
</tbody>
</table>
TYPICAL PERFORMANCE

Non Uniformity: < 5% RMS (σ/mean, 300K uncorrected performance)
Array Operability: > 99% typical (NETD < 2xNETD_average)
Pixel NETD (average): ≤ 25mK (11.0μm, 37x10^6 e-, 300K, 50% well fill, 200Hz)
Residual Fixed Pattern Noise: low and stable (< NETD)
MTF: maximized

OPTIONS

VLW Engine
Proximity Driving Electronics (including ADC)
Complete VLW Camera

ORDERING INFORMATION

Mars VLW LS5-7i 914961

STANDARD CONFIGURATION

Mars VLW LS5-7i 1W LS5-7i/09 Split Cooler

Weight: < 2.1kg (4.63 lb)
Operating Temperature: -40°C / +71°C
Power Supply: 13.5 V

Typical Characteristics at 20°C, 70 K
Cooldown Input Power: 60 W_{AC} (*)
Regulated Input Power: 40 W_{AC}
Cooldown Time: < 9 min.

(*) W_{AC} – at cooler cable AC input

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.

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