FLIR MUON™

Longwave Infrared Thermal Camera Module

Muon™ is a calibrated uncooled thermal camera subassembly developed for thermal product OEMs to integrate with their own image processing, packaging and optical solutions. A thermal camera "engine" with the perfectly optimized combination of size, weight and power (SWaP), Muon only requires standard imaging device power and communication protocols to generate corrected Parallel Interface video-out (CMOS). Because each Muon™ is calibrated by FLIR over temperature for TEC-less operation, OEMs no longer need to develop their own elaborate factory calibration equipment or processes, making production faster, easier, and less costly.

EASE OF INTEGRATION
Simplify Product Development & Manufacturing

- Industry standard interfaces provide for power in, corrected Parallel Interface video-out (CMOS)

- Precision aligned Mg mechanical assembly with Hirose connector

- I2C communication to abstracted layer

CALIBRATED THERMAL SUBASSEMBLY
Reduce Product Cost with a Pre-Calibrated Subassembly

- Calibrated using FLIR's industry-leading temperature stabilized process

- Only final assembly image optimization required

- Muon contains Known Good Die (KGD), increasing manufacturing first pass yield
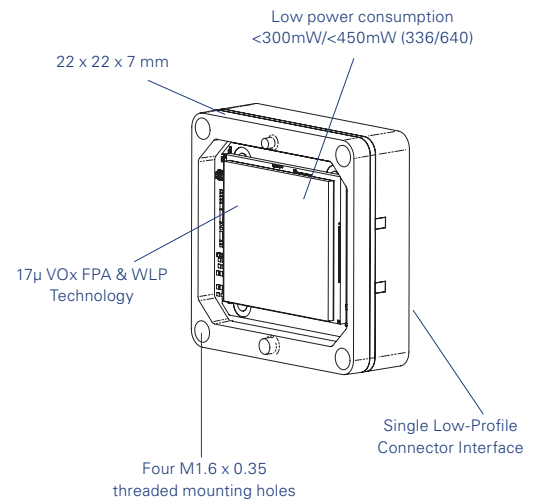
MARKET LEADING FEATURES
Technical Features & Performance

- 17µm VOx Focal Plane Array (FPA) technology - 640 x 512 and 336 x 256 resolutions (60 Hz and 9 Hz frame rates)

- SWaP optimized at 22 x 22 x 7 mm and under 5 grams

- <300 mW/<450mW power (336/640 resolution) and <0.5 second start up time

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Imaging Specifications

System Overview	MUON™ 336	MUON™ 640
System Type	336 x 256 VOx Microbolometer	640 x 512 VOx Microbolometer
Spectral Range	7.5 – 15.0 µm	
Pixel Size	17 µm	
Sensitivity*	<50 mK	< 60mK
Thermal Time Constant	≤15 msec (≤12 msec typical)	
Outputs		
Digital Video	16-bit temperature calibrated Parallel Interface video-out (CMOS)	
Frame Rate (Full Window)	60Hz, 50Hz and <9Hz	
Operations & Control		
Non-Uniformity Correction (NUC)	FLIR factory calibration ensures constant digital output level over operating temperature range (four tables). OEM to control one point NUC (shutter) and table switching	
Bad Pixel Replacement	Bad Pixel Replacement (BPR) data provided, user required to apply	
Camera Control	I2C communication, discrete control	
Signal Interface	60-pin Hirose connector: power, comm, digital data, external sync	
Telemetry Data	FPA temperature, FPA type, Frame Rate, Current NUC Table	
Physical Attributes		
Size/Weight	22 x 22 x 7 mm / <5 grams	
Mounting Interface	Four M1.6x0.35 threaded mounting holes	
Power		
Input Voltage	Imaging device standards: 3.3V, 2.5V, 1.8V, 1.2V	
Power Dissipation	<300mW (336), <450mW (640) at room temperture	
Time to Image	<500 msec	
Environmental		
Operating Temperature Range	-40°C to + 80°C external temp	
Storage Temperature Range	-55°C to + 105°C external temp	
Scene Temperature Range	50°C above and below ambient temperature	
Mechanical Shock	250g 1.0 msec half-sine and 500g 0.8 msec half-sine	
Vibration	4.3 g; 3 axes, 8 hours each	
Temperature Shock	5°C/min	
Humidity	5 - 95% non-condensing	
Operational Altitude	+40,000 feet	
ROHS, REACH and WEEE	Compliant	

* Measurement conditions/setups: 25°C ambient temperature, f/1 clear aperture and blackbodies temperature difference of 40°C

Low power consumption
<300mW/<450mW (336/640)

22 x 22 x 7 mm

17µ VOx FPA & WLP Technology

Single Low-Profile Connector Interface

Four M1.6 x 0.35 threaded mounting holes

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