

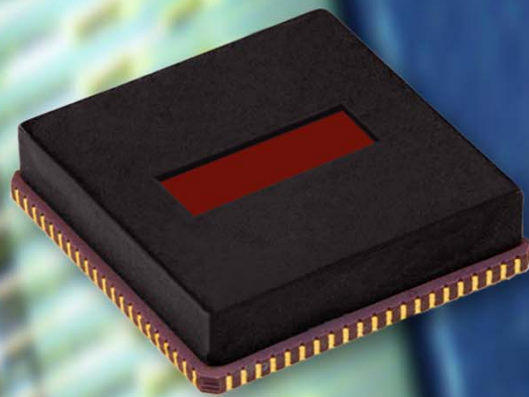


Infrared Materials

The Leader in High Performance IR Detectors

PbS

256 Pixel SWIR Linear Array
1.2 to 3.3 Microns



Integral TEC | -20°C Operation (45 Degrees DT)
256 Channel Multiplexer (MUX)

WWW.INFRARED MATERIALS.COM

707-620-0160

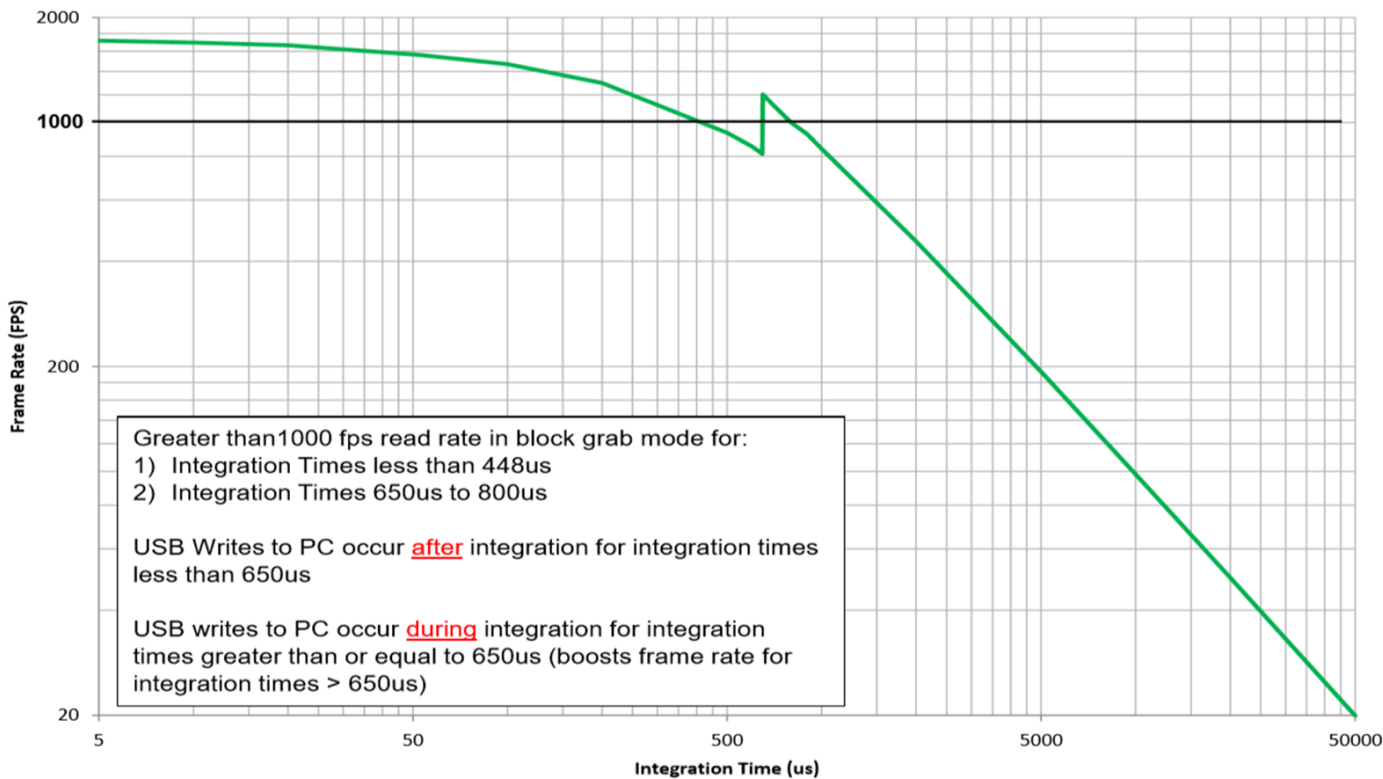


PbS SWIR PHOTOCONDUCTIVE IR ARRAYS | 1.2 - 3.3 MICRONS



Array Mechanical Characteristics				
	Optical Interface	84-pin Leadless Chip Carrier (LCC), 0.317" height, 1.150" Square		
	Window	0.50 mm Thick Silicon with Long Wave Pass (LWP) Anti-Reflective Coating		
	Array Type	PbS Quantum Photoconductor		
		*PbSe versions also available for spectral sensitivity from 1.2 - 5.5 Microns		
	Resolution	256 x 1	--	
	Pixel Size	0.040 x 0.450	--	mm
	Pixel Options	0.040 x 0.040	(Square Pixel)	mm
		0.040 x 4.50	(Long Pixel)	mm
	Array Length	12.85	--	mm
	Pixel Pitch	0.050	(On centers)	mm
	Pixel Operability	> 98%	--	
	Cooling Element	Thermoelectric Cooler (TEC)	1-Stage, 10 Watt, RoHS	5.0 VDC @ 2.0 Amps
	Field of View (FOV)	> 40	--	Degrees
Readout Electronics (ROIC)				
	ADIC PC06 R6 Array Controller	32 Bit microcontroller (80 MHz)	16 Bit A/D Converter	On Board EEPROM
	External Hardware Trigger Input	External Shutter Control	Auto Calibration Feature	Integrated TE Cooler Board
	Default Temp range -20 to +25°C	Control Stability to ± 5 mK	Array Software & SDK Available	
	Readout Method	Multiplexer, 256 Channel, DC Integrating w/ Global & 8 Bit Per Pixel Dark Current Correction		
	Readout Control / Windowing	Feature to readout all 256 pixels or a user defined value, e.g., 2, 8, 16, 32, 64, 128, etc.		
	Integration Time Range**	4 (Min.)	--	µs
		210 (Max.)	--	ms
		**Digitally selectable in 3.2 µs steps.		
	Frame Rate***	Sample rates up to 1700 frames per second, 1 to 64K block selectable		
		***Maximum frame rate achieved at the minimum integration time		

Frame Rate vs. Integration Time (Block Grab Mode)



PbS SWIR PHOTOCONDUCTIVE IR ARRAYS | 1.2 - 3.3 MICRONS



	Operating Modes	Integrate While Read (IWR)		
		Integrate Then Read (ITR)		
	Compatibility	Windows DLL Software Interface, Linux Compatible		
		Programming languages supported: Visual C#, Visual C++, and more.		
	Interface Protocol	USB 2.0 (Ethernet, SPI, RS485 Serial Communication Interfaces Under Development)		
	Power Requirement:			
	Data Acquisition / TEC Controller	15 VDC	1.6 A	--
Spectral Characteristics				
	Operating Range (λ)	1.2**	3.3	Microns
		**Cut-on wavelength is dependent upon the window material		
		Other window options are available for wavelength sensitivity at or below 1.0 Microns.		
	Wavelength Peak (λ_{pk})	≥ 2.4 (Min.)	≤ 2.5 (Max.)	Microns
Electrical Performance Characteristics				
	Pixel Resistance Range +25°C (Typ.)	10	11	MΩ
	-20°C (Typ.)	50	60	MΩ
	D* (D-Star) Detectivity +25°C	$\geq 1.0 \times 10^{11}$ (Min.)	No Upper Limit	$\text{cm Hz}^{1/2} \text{W}^{-1}$
	Responsivity	2.5×10^6 (min.)	5.0×10^6 (Typ.)	V/W
	Response Uniformity	± 15 of Mean	--	%
	Quantum Efficiency (QE)	2	--	%
	Time Constant (T_c)	250 @ +25°C (Typ.)	1600 @ -20°C (Max.)	uSec
	NEP	No Data	--	pW
General Specifications				
	Operating Temperature	-20	--	°C
	Operational Temperature Range	-50	+75	°C
	Maximum Incident Light	1×10^{-3}	--	W/cm ²
	Storage Temperature	-50 (Min.)	+75 (Max.)	°C
	Thermistor Resistance	$10 \pm 5\%$ @ +25°C	Not calibrated	KΩ

PbS ARRAY DEVELOPMENT SYSTEM (DS)

Development System Kit Includes:

256 Element PbS Array and Headboard
 USB Electronic Controller Board R6, Ribbon Cable, USB Cable
 Copper Mounting Block
 Copper Heatsink with Integrated Fan
 System Power Supply Module (12V @ 1A)
 Array Controller GUI Software & SDK Library
 Users Manual (Also available on website)

OPERATING MODES:
 Pixel Stream Output
 Spectrometer Mode
 Push Broom Imager

FEATURES:

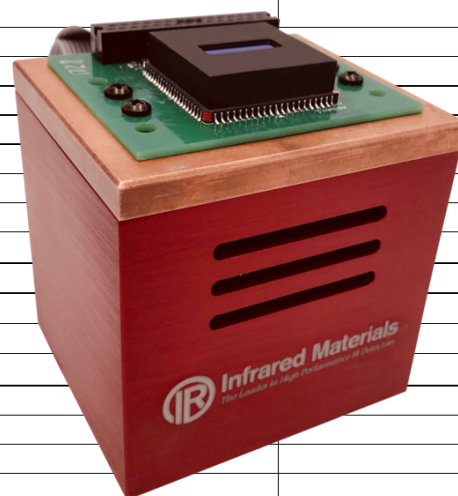
External Hardware Trigger Input
 External Shutter Control
 Auto Calibration Feature
 Integrated TE Cooler Board (Control Stability to ± 5 mK)
 32 Bit microcontroller (80 MHz)
 16 Bit A/D Converter

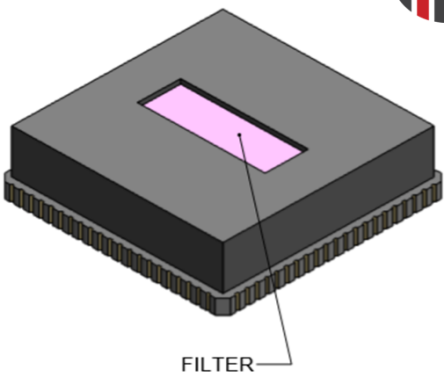
ADDITIONAL DEVELOPMENTS:

Linear Variable Filter (LVF) Integration of PbSe Versions for 2.5 - 5.5 Micron Operating Range
 Ethernet Communication Protocol Under Development

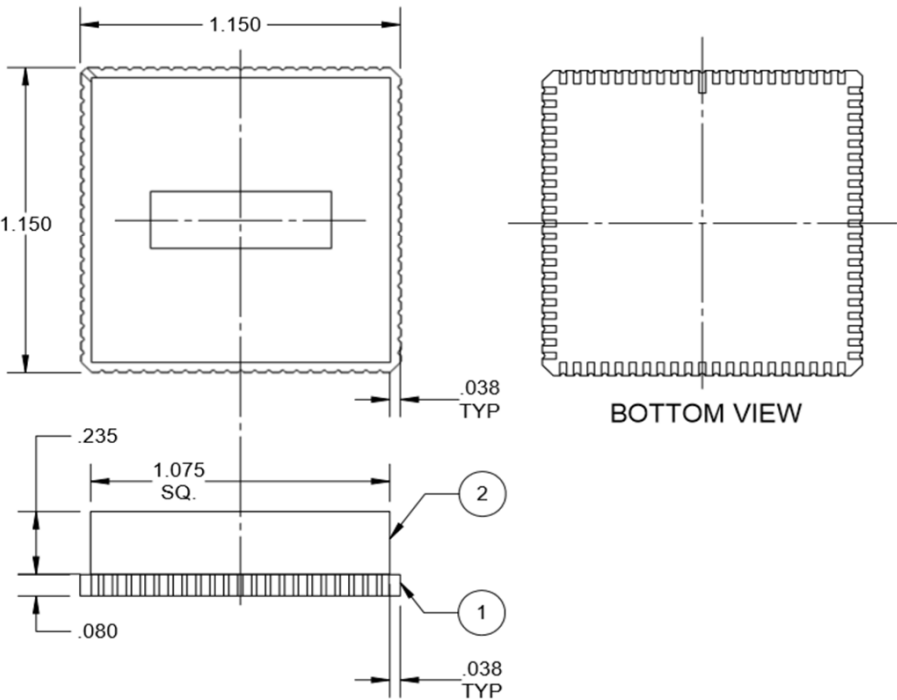
ADDITIONAL TOOLS:

3D Model Drawing Available Upon Request for Mechanical Design Considerations

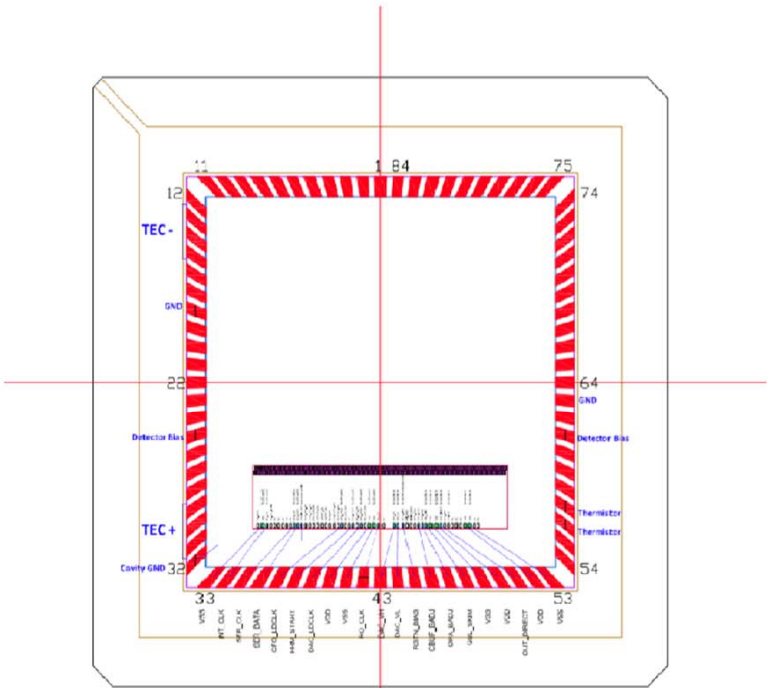




FILTER



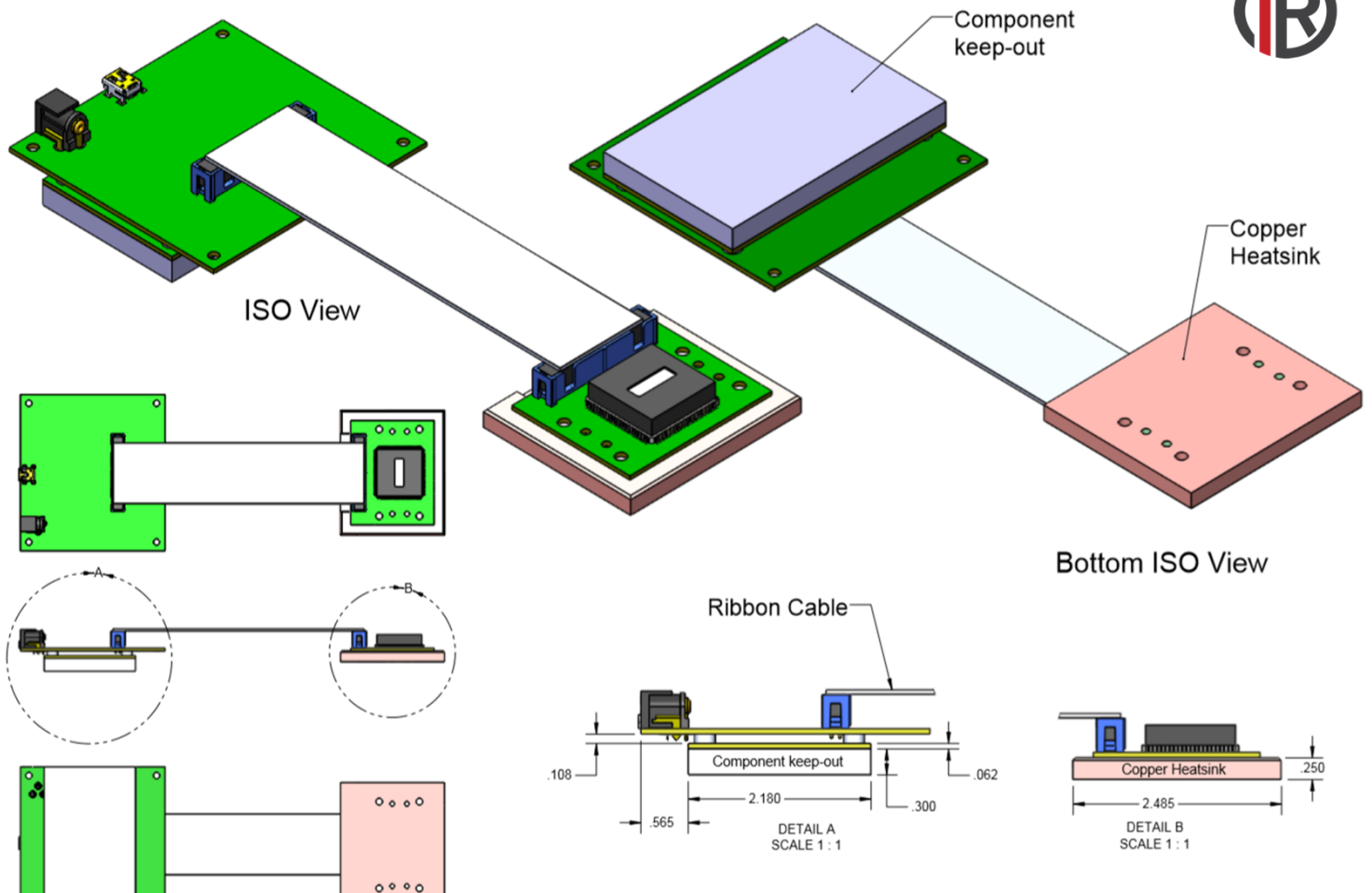
BOTTOM VIEW



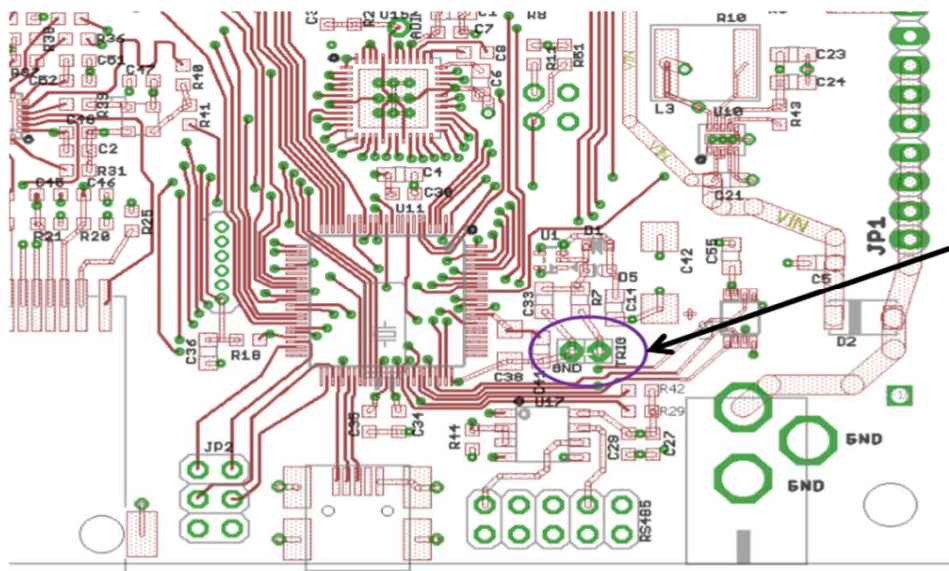
PAD LEGEND

- Power Pads - All are Required (VDD and VSS/GND)
- Required Signal Bonds that route to LCC pins
- Required Signal Bonds that stay internal to LCC
- LCC Bonding Lands
- Detector Bonds - Required
- No Bond Required

LCC Bondout June 18th, 2015



TRIGGER INPUT



Trigger input
pin and ground