

# Mosaic Core

**HIGH VERSATILITY & PERFORMANCE,  
LOW COST THERMAL IMAGING CORES  
WITH 200 X 150 & 320 X 240  
SENSOR RESOLUTION**

## KEY CAMERA SPECS

- 200 x 150 & 320 x 240 Sensor Resolution
- 15° to 105° Field of View Options
- 40C to 330C (-40F to 626F) Detection
- Size (LxWxH) 10x20x21mm to 23x20x21mm
- Dual-Gain Smart Pixels
- Up to 32Hz and < 9Hz Frame Rate

**seek**  
thermal  
thermal.com



Designed for performance and versatility, Mosaic Core is available in 200 x 150 and 320 x 240 resolution with several configuration options to match your application and meet your program needs. Implementing high-end thermal technology has never been this simple and affordable.

**Designed and Manufactured in Santa Barbara, California with Global Components.**

## KEY FEATURES

### High-Resolution Thermal Sensors

Choose a core with 30,000 or 76,800 temperature pixels with excellent image clarity and sensitivity

### Dual-Gain Smart Pixels

Each pixel automatically adjusts gain states to maximize resolution contrast when viewing hot and cold objects in the same scene

### 12 Micron Pixels

More resolution and temperature data packed into a physically tiny array enables small form factor applications and lower cost

### Options For <9Hz or Fast Frame

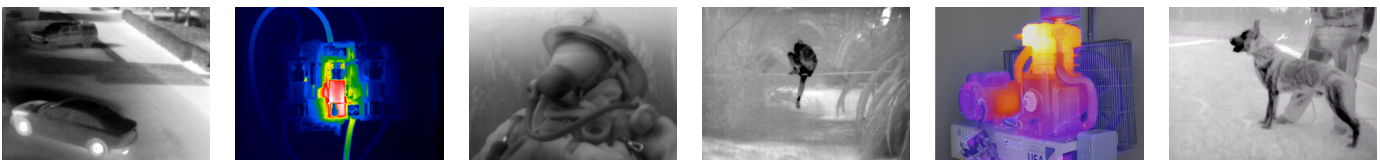
Perfect for regions where <9Hz is required and available up to 32Hz Fast Frame where higher frame rates are preferred and permitted

### Customizable To Meet Your Design Goals

Select the ideal thermal core for your project with options for resolution, field of view, frame rate and more

### Add a Visible Light Camera

SDK support available for integrating a visible light camera to fuse thermal and visible images together for additional context



## DEVELOPER PORTAL ACCESS

Get access to SDKs, APIs, support documentation and other important tools to ensure your project is a success. SDKs available for Linux, Android and Windows.

**Please contact your sales representative for access to the Seek Developer Portal.**

## TECHNICAL SUMMARY

## 200 x 150 RESOLUTION

Specifications		Description			
Microbolometer	Uncooled Vanadium Oxide				
Pixel Pitch	12 Microns				
Spectral Response	7.8 - 14 Microns				
Sensor Resolution (Array Format)	200 (h) x 150 (v); 30,000 pixels				
Frame Rate	<9Hz or up to 32Hz				
Scene Dynamic Range <sup>1</sup>	-40°C to 330°C Contact your sales rep for higher temperature applications				
Sensor Sensitivity	65 mK (typical), <100 mK (max) @ 25°C				
Non-Uniformity Correction (NUC)	Automatic NUC (with shutter)				
Video Output Interfaces <sup>2</sup>	USB				
Supply Voltage	3.3V to 5.5V				
Power: Core Only	<50mW				
Power: Core + Interface Board	300mW				
Output Formats (user selectable)	Linux / Windows SDK		Android SDK		
	16-bit filtered pre AGC. 32-bit ARGB post colorization. 32-bit floating point or 16-bit fixed point thermography data.		16-bit filtered pre AGC. 32-bit ARGB post colorization in the bitmap image. 16-bit fixed point thermography data.		
Optics & Mechanical					
Focal Length	2.2mm	4.0mm	6.6mm	9.1mm	
F-number (focal length/aperture)	f/1.05	f/1.00	f/1.26	f/1.00	
Spatial Resolution (IFOV, center)	5.23	3.00	1.82	1.32	
HFOV	61°	35°	21°	15°	
VFOV	45°	26°	15°	12°	
Detection Range <sup>3</sup>	186m	333m	543m	758m	
Recognition Range <sup>3</sup>	46m	83m	136m	190m	
Identification Range <sup>3</sup>	27m	48m	78m	108m	
Distance to Spot Ratio	31:1	56:1	91:1	126:1	
Ingress Protection	N/A	IP67	IP67	IP67	
Core Dimensions Without Cushion (L x W x H)	10 x 20 x 21mm	20 x 20 x 21mm	23 x 20 x 21mm	20 x 20 x 21mm	
Core Weight	8 g	12 g	12 g	12 g	
Focus	Fixed				
Lens Material	Chalcogenide				
Thermography					
Temperature Calibration	Calibrated Output in °C, °F, K				
Temperature Accuracy <sup>1,4</sup>	The greater of ±5°C or 5% between 5°C to 140°C scene temperatures Typical performance of ±10% between 140°C to 330°C scene temperatures Contact your sales rep for higher temperature accuracy up to 330°C and beyond				
Environmental					
Operating Temperature Range	-10°C to 60°C Contact your sales rep for higher operating temperature ranges				
Storage Temperature Range	-40°C to 80°C				
Solar Protection	Yes				
Humidity	10%~95%RH, non-condensing				
Regulatory	ROHS, WEEE, REACH				
Documentation and Tools					
Starter Kit	Available				
Data Sheet	Available				
Accessories	Interface Board and Flexes				

- Specified at nominal 25°C ambient operating temperature and nominal measurement distance of 12 inches. Temperature reported is Center Spot temperature, which is an average of the center 36 pixels. Contact Seek Thermal for performance at other nominal operating temperatures and measurement distances.
- SPI option available. Contact Seek Thermal for further details.
- Based on Johnson Criteria.
- Factory default emissivity is set to 0.97. Emissivity is adjustable using the SDK. See data sheet for more information.

Specifications and undocumented specifications are subject to change without notice.  
For the most up-to-date specifications, visit [thermal.com/oem](http://thermal.com/oem)

## TECHNICAL SUMMARY

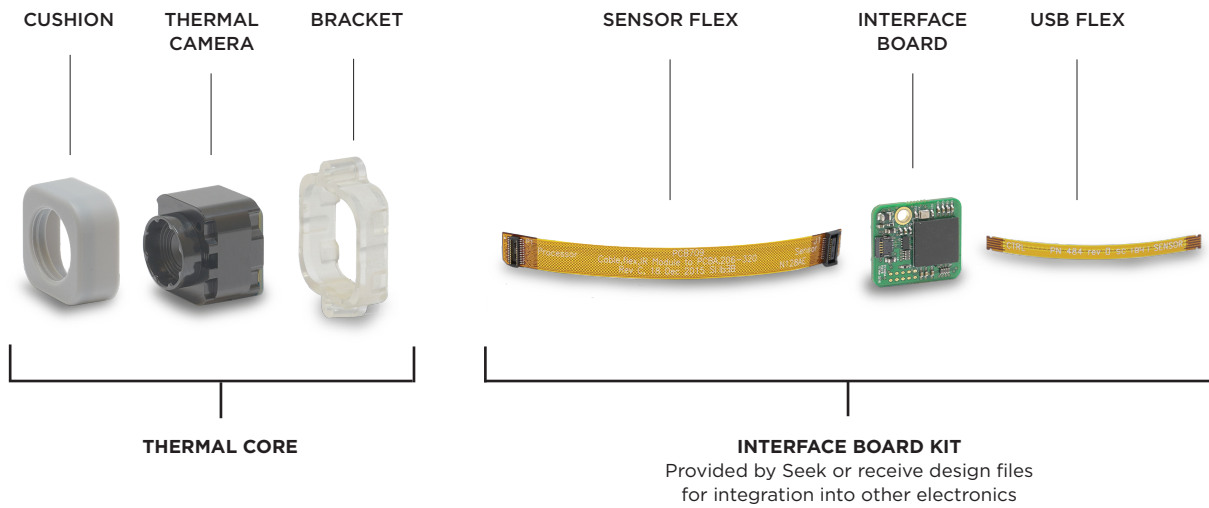
## 320 x 240 RESOLUTION

Specifications		Description			
Microbolometer	Uncooled Vanadium Oxide				
Pixel Pitch	12 Microns				
Spectral Response	7.8 - 14 Microns				
Sensor Resolution (Array Format)	320 (h) x 240 (v); 76,800 pixels				
Frame Rate	<9Hz or up to 27Hz				
Scene Dynamic Range <sup>1</sup>	-40°C to 330°C Contact your sales rep for higher temperature applications				
Sensor Sensitivity	65 mK (typical), <100 mK (max) @ 25°C				
Non-Uniformity Correction (NUC)	Automatic NUC (with shutter)				
Video Output Interfaces <sup>2</sup>	USB				
Supply Voltage	3.3V to 5.5V				
Power: Core Only	<50mW				
Power: Core + Interface Board	300mW				
Output Formats (user selectable)	Linux / Windows SDK		Android SDK		
	16-bit filtered pre AGC. 32-bit ARGB post colorization. 32-bit floating point or 16-bit fixed point thermography data.		16-bit filtered pre AGC. 32-bit ARGB post colorization in the bitmap image. 16-bit fixed point thermography data.		
Optics & Mechanical					
Focal Length	2.2mm	4.0mm	6.6mm	9.1mm	
F-number (focal length/aperture)	f/1.05	f/1.00	f/1.26	f/1.00	
Spatial Resolution (IFOV, center)	5.23	3.00	1.82	1.32	
HFOV <sup>5</sup>	105°	56°	34°	24°	
VFOV <sup>5</sup>	75°	42°	25°	18°	
Detection Range <sup>3</sup>	186m	333m	543m	758m	
Recognition Range <sup>3</sup>	46m	83m	136m	190m	
Identification Range <sup>3</sup>	27m	48m	78m	108m	
Distance to Spot Ratio	31:1	56:1	91:1	126:1	
Ingress Protection	N/A	IP67	IP67	IP67	
Core Dimensions Without Cushion (L x W x H)	10 x 20 x 21mm	20 x 20 x 21mm	23 x 20 x 21mm	20 x 20 x 21mm	
Core Weight	8 g	12 g	12 g	12 g	
Focus	Fixed				
Lens Material	Chalcogenide				
Thermography					
Temperature Calibration	Calibrated Output in °C, °F, K				
Temperature Accuracy <sup>1,4</sup>	The greater of ±5°C or 5% between 5°C to 140°C scene temperatures Typical performance of ±10% between 140°C to 330°C scene temperatures Contact your sales rep for higher temperature accuracy up to 330°C and beyond				
Environmental					
Operating Temperature Range	-10°C to 60°C Contact your sales rep for higher operating temperature ranges				
Storage Temperature Range	-40°C to 80°C				
Solar Protection	Yes				
Humidity	10%~95%RH, non-condensing				
Regulatory	ROHS, WEEE, REACH				
Documentation and Tools					
Starter Kit	Available				
Data Sheet	Available				
Accessories	Interface Board and Flexes				

- Specified at nominal 25°C ambient operating temperature and nominal measurement distance of 12 inches.  
Temperature reported is Center Spot temperature, which is an average of the center 36 pixels.  
Contact Seek Thermal for performance at other nominal operating temperatures and measurement distances.
- SPI option available. Contact Seek Thermal for further details.
- Based on Johnson Criteria.
- Factory default emissivity is set to 0.97. Emissivity is adjustable using the SDK. See data sheet for more information.
- Actual usable FOV on 2.2mm lens may be less due to vignetting at the edges and corners.

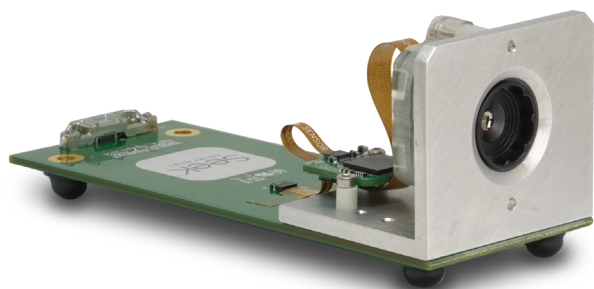
Specifications and undocumented specifications are subject to change without notice.  
For the most up-to-date specifications, visit [thermal.com/oem](http://thermal.com/oem)

## REQUIRED ELEMENTS



Ask your sales representative about timing and availability of the following configurations.

Resolution	Lens	HFOV	Interface Board Kit	Frame Rate	Part Number	
200 x 150	2.2mm f/1.05	61°	Provided by Seek	< 9Hz	C202SP	
			Customer Integrated	Fast Frame	C212SPX	
			Provided by Seek	< 9Hz	C202S	
			Customer Integrated	Fast Frame	C212SX	
			Provided by Seek	< 9Hz	C204SP	
			Customer Integrated	Fast Frame	C214SPX	
	4.0mm f/1.00	35°	Provided by Seek	< 9Hz	C204S	
			Customer Integrated	Fast Frame	C214SX	
			Provided by Seek	< 9Hz	C206SP	
			Customer Integrated	Fast Frame	C216SPX	
			Provided by Seek	< 9Hz	C206S	
			Customer Integrated	Fast Frame	C216SX	
6.6mm f/1.26	21°	Provided by Seek	< 9Hz	C209SP		
		Customer Integrated	Fast Frame	C219SPX		
		Provided by Seek	< 9Hz	C209S		
		Customer Integrated	Fast Frame	C219SX		
		9.1mm f/1.00	15°	Provided by Seek	< 9Hz	C302SP
				Customer Integrated	Fast Frame	C312SPX
Provided by Seek	< 9Hz			C302S		
Customer Integrated	Fast Frame			C312SX		
4.0mm f/1.00	56°			Provided by Seek	< 9Hz	C304SP
				Customer Integrated	Fast Frame	C314SPX
		Provided by Seek	< 9Hz	C304S		
		Customer Integrated	Fast Frame	C314SX		
		6.6mm f/1.26	34°	Provided by Seek	< 9Hz	C306SP
				Customer Integrated	Fast Frame	C316SPX
Provided by Seek	< 9Hz			C306S		
Customer Integrated	Fast Frame			C316SX		
9.1mm f/1.00	24°			Provided by Seek	< 9Hz	C309SP
				Customer Integrated	Fast Frame	C319SPX
		Provided by Seek	< 9Hz	C309S		
		Customer Integrated	Fast Frame	C319SX		

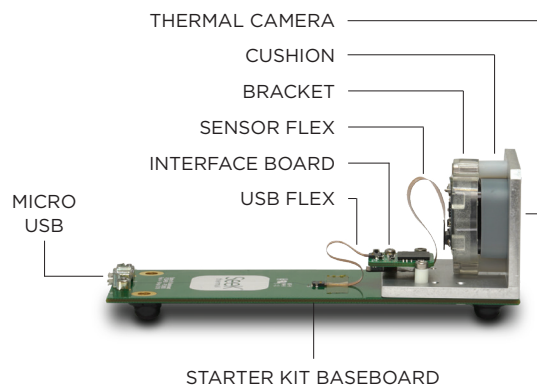


## Everything you need to get started with thermal imaging.

Starter Kits enable your project team to begin development with a Mosaic Core quickly and easily. To start your evaluation, download the Sample Viewer and connect the Starter Kit for simple, plug-and-play thermal imaging. Get access to the Developer Portal with SDKs, APIs, and other important documentation to ensure your project is a success.

### INCLUDED IN A STARTER KIT

- **Thermal Core:** Thermal camera, cushion and bracket.
- **Interface Board Kit:** Sensor flex, interface board and USB flex.
- **Starter Kit Baseboard:** Development board with MicroUSB port. Holds Thermal Core and Interface Board.
- **Cable:** MicroUSB to USB cable.
- **Developer Portal Access:** Get access to SDKs, APIs, a Sample Viewer and other support tools.



### STARTER KITS

Resolution	Lens	HFOV	Interface Board Kit	Frame Rate	Part Number
200 x 150	4.0mm f/1.00	35°	Provided by Seek	< 9Hz	S204SP
320 x 240	4.0mm f/1.00	56°	Provided by Seek	< 9Hz	S304SP

**Please contact your sales rep for more information on Starter Kits.**

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Seek Thermal engineers and manufactures low-cost, high-resolution thermal imaging cameras and OEM thermal cores. Founded by industry pioneers who spent 40 years advancing the state of military and professional-grade thermal technologies, Seek Thermal has developed a breakthrough line of products at competitive price points making this technology more accessible to manufacturers and end users. The company's products serve the firefighting, law enforcement and commercial markets, among others, under its own brand and OEM offerings.