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

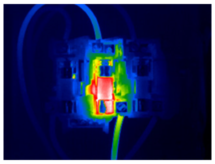
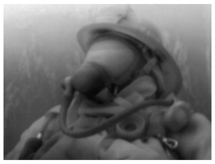
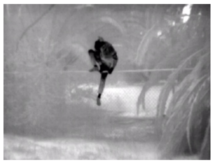
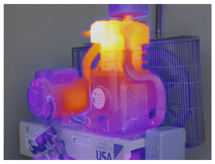
Dual-Gain Smart Pixels
Each pixel automatically adjusts gain states to maximize resolution contrast when viewing hot and cold objects in the same scene

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.

2020 V2

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 [1]	-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 [2]	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 [3]	186m	333m	543m	758m
Recognition Range [3]	46m	83m	136m	190m
Identification Range [3]	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 [1,4]	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			

1. **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.**
2. **SPI option available. Contact Seek Thermal for further details.**
3. **Based on Johnson Criteria.**
4. **Factory default emissivity is set to 0.97. Emissivity is adjustable using the SDK. See data sheet for more information.**

Mosaic Core C3 Series

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 [1]	-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 [2]	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 [5]	105°	56°	34°	24°
VFOV [5]	75°	42°	25°	18°
Detection Range [3]	186m	333m	543m	758m
Recognition Range [3]	46m	83m	136m	190m
Identification Range [3]	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 [1,4]	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			

1. **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.**
2. **SPI option available. Contact Seek Thermal for further details.**
3. **Based on Johnson Criteria.**
4. **Factory default emissivity is set to 0.97. Emissivity is adjustable using the SDK. See data sheet for more information.**
5. **Actual usable FOV on 2.2mm lens may be less due to vignetting at the edges and corners.**

Mosaic Core **Part Numbers**

REQUIRED ELEMENTS

CUSHION | THERMAL CAMERA | BRACKET | SENSOR FLEX | INTERFACE BOARD | USB FLEX

THERMAL CORE

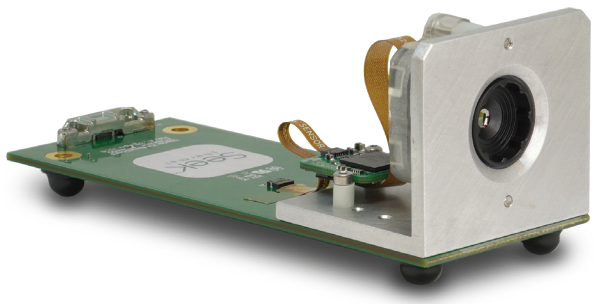
INTERFACE BOARD KIT
Provided by Seek or receive design files for integration into other electronics

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
				Fast Frame	C212SPX
			Customer Integrated	< 9Hz	C202S
				Fast Frame	C212SX
	4.0mm f/1.00	35°	Provided by Seek	< 9Hz	C204SP
				Fast Frame	C214SPX
			Customer Integrated	< 9Hz	C204S
				Fast Frame	C214SX
	6.6mm f/1.26	21°	Provided by Seek	< 9Hz	C206SP
				Fast Frame	C216SPX
			Customer Integrated	< 9Hz	C206S
				Fast Frame	C216SX
	9.1mm f/1.00	15°	Provided by Seek	< 9Hz	C209SP
				Fast Frame	C219SPX
			Customer Integrated	< 9Hz	C209S
				Fast Frame	C219SX
320 x 240	2.2mm f/1.05	105°	Provided by Seek	< 9Hz	C302SP
				Fast Frame	C312SPX
			Customer Integrated	< 9Hz	C302S
				Fast Frame	C312SX
	4.0mm f/1.00	56°	Provided by Seek	< 9Hz	C304SP
				Fast Frame	C314SPX
			Customer Integrated	< 9Hz	C304S
				Fast Frame	C314SX
	6.6mm f/1.26	34°	Provided by Seek	< 9Hz	C306SP
				Fast Frame	C316SPX
			Customer Integrated	< 9Hz	C306S
				Fast Frame	C316SX
	9.1mm f/1.00	24°	Provided by Seek	< 9Hz	C309SP
				Fast Frame	C319SPX
			Customer Integrated	< 9Hz	C309S
				Fast Frame	C319SX

Mosaic Core **Starter Kit**

Seek thermal

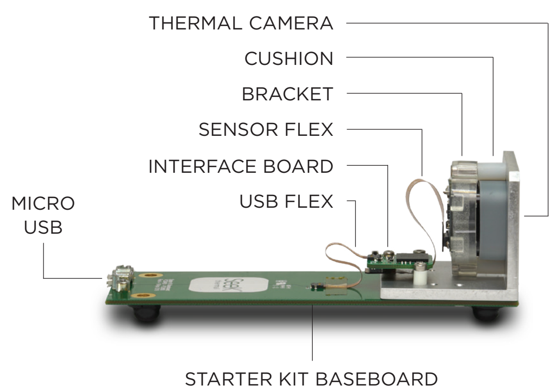


Everything you need to get started with thermal imaging.

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.

6300 HOLLISTER AVE, SANTA BARBARA, CA 93117 USA

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.