

APPLICATION NOTE

Optimum Heat Dissipation for Housed Alvium Cameras

V2.0.0
 2020-Jan-09

Scope

Cameras heat up during operation, which reduces image quality and increases power consumption. Excessive heat can even damage cameras. Heat dissipation reduces the camera temperature during operation. This document provides information for heat dissipation with Alvium housed cameras. For bare board cameras, please contact support@alliedvision.com.

Alvium temperature specifications

Specifications reflect the results from [Temperature tests](#):

Hardware option	Housing	Components in the cooling areas ¹	Mainboard ²
Open housing ³	+5 °C to +65 °C	+5 °C to +85 °C	See your camera's specifications.
Closed housing		Not applicable	

¹See [Mounting heat sinks](#) on page 4.

²Output by **DeviceTemperature** (Vimba Access) or by **Device Temperature** (Direct Register Access)

³Temperature values must be observed for the housing **and** for the cooling areas.

Table 1: Alvium temperature specifications

Temperature values apply to a relative humidity of 0 to 80 percent that is non-condensing.

If the mainboard temperature exceeds the specified maximum value for more than 2 seconds, the camera is powered off automatically. You can use this value to control cooling by software, for example, to control a fan.



Alvium camera documentation

For detailed information on Alvium cameras, see your camera's user guide at www.alliedvision.com/en/support/technical-documentation.

Temperature tests

Figure 1 shows how temperature was measured with an Alvium USB closed housing camera. CSI-2 cameras were tested the same way. Tests were performed in a climate chamber with no air flow. The cameras were heated up to 65 °C housing temperature.

The camera housing temperature is measured:

- At the hottest spot of the housing
- At the mainboard, using `DeviceTemperature` (Vimba Access) or using `Device Temperature` (Direct Register Access).

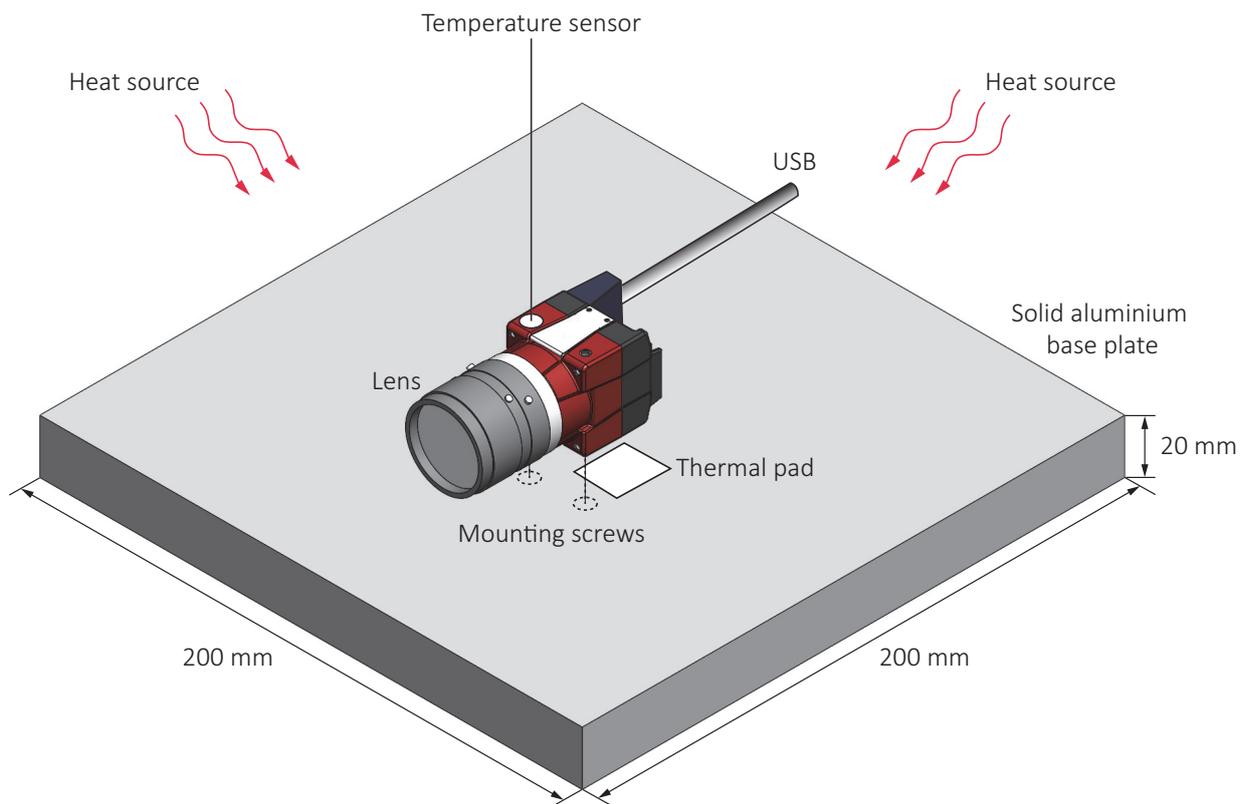


Figure 1: Testing temperature for closed housing Alvium cameras (schematic, non-isometric view)

Individual applications

Heat dissipative design is complex. Many factors have an impact that can often not be specified. In this case, calculations provide a rough estimation.

Best practice rules for heat dissipation

For your safety and to improve camera performance, operate the camera:

- Mounted to a base with a high thermal conductivity
- With a lens or other optical components mounted
- With a heat sink mounted that has large surface areas, see [Mounting heat sinks](#) on page 4
- Using conductive media for camera and heat sink mounting
- With active cooling of camera, mounting base, and heat sink, such as by ventilation
- Design open housing cameras into a heat dissipative housing with a high thermal conductivity. For closed housing cameras, encompassing heat dissipative housings can extend the supported temperature range.
- Keep the operating temperature in the specified range to enable best image quality and to enable a long camera life.

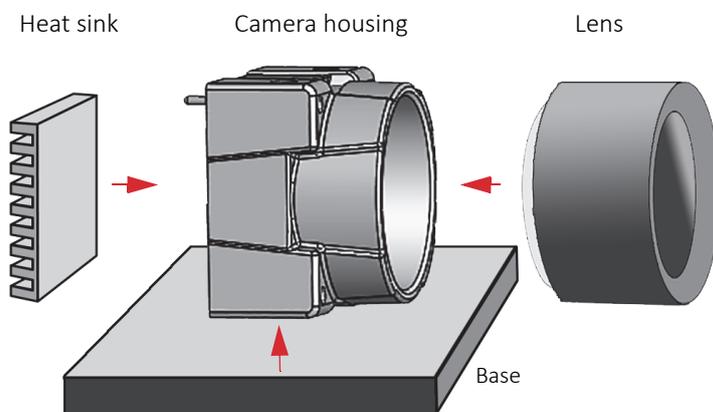


Figure 2: Camera setup for proper heat dissipation

Mounting heat sinks



NOTICE

Damage to the camera by heat sinks mounted improperly

- Allow mechanical contact only at the cooling areas.
- Avoid any mechanical stress to the sensor and electronics area.
- Avoid short circuits of the electronics components.



NOTICE

Damage to the sensor, filter, and lens by corrosive substances

Some conductive media for heat sinks contain corrosive substances that can damage optical surfaces of the sensor, filter, and lens.

- Cover the optical path of the camera when you apply heat sink compound or adhesive to prevent substances and fumes from damaging optical surfaces.
- Adhere to the instructions and safety notes provided by the manufacturer of the conductive media.



NOTICE

Damage to camera electronics

Heat sinks can cause short circuits if they are not electrically isolated.

Avoid electrical contact between electronic components by unsuitable heat sinks and thermal conductive media.

Connect components in the **cooling areas** (blue areas in [Figure 3](#)) to a heat sink, following the instructions of the manufacturer of the heat sink and the thermal conductive media.

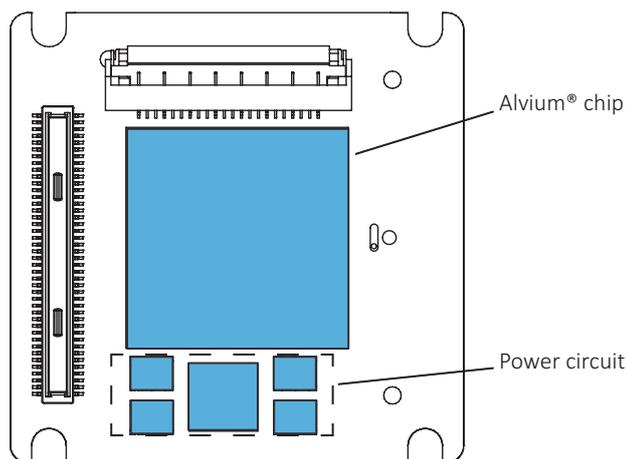


Figure 3: Cooling areas for Alvium cameras

Contact us

Website

General

www.alliedvision.com/en/contact

Distribution partners

www.alliedvision.com/en/about-us/where-we-are

Email

General

info@alliedvision.com

Support

support@alliedvision.com

Sales offices

Europe, Middle East, and Africa	T// +49 36428 677-230
North and South America	Toll-free: +1 877 USA 1394 T// +1 978 225 2030 California: +1 408 721 1965
Asia-Pacific	T// +65 6634 9027
China	T// +86 21 64861133

Headquarters

Allied Vision Technologies GmbH
Taschenweg 2a
07646 Stadtroda, Germany
T// +49 36428 677-0
F// +49 36428 677-28

Copyright and trademarks

All text, pictures, and graphics are protected by copyright and other laws protecting intellectual property. All content is subject to change without notice. All trademarks, logos, and brands cited in this document are property and/or copyright material of their respective owners. Use of these trademarks, logos, and brands does not imply endorsement.

Copyright © 2020 Allied Vision Technologies GmbH. All rights reserved.