Some things are even better when cooled

Thermal management for ICS series electronics housings

PHOENIX CONTACT

INSPIRING INNOVATIONS

Our ICS housings service

ICS electronics housings

- Modularity and flexibility in connection technology
- Customized design

Web code: #1826

Thermal simulation

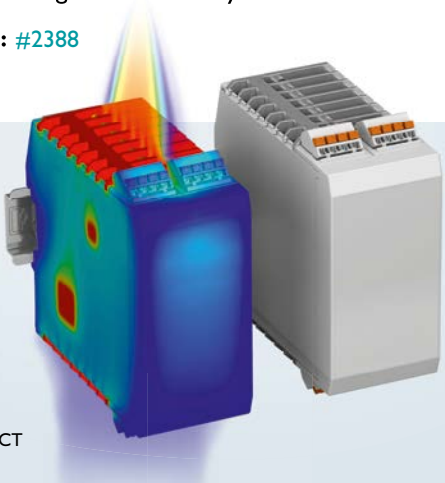
- Automated online tool
- Professional application-specific consultation

Web code: #2388

Customer-specific ICE heatsinks

- Tailored processing
- Coordinated housing and heatsink system

Web code: #2388

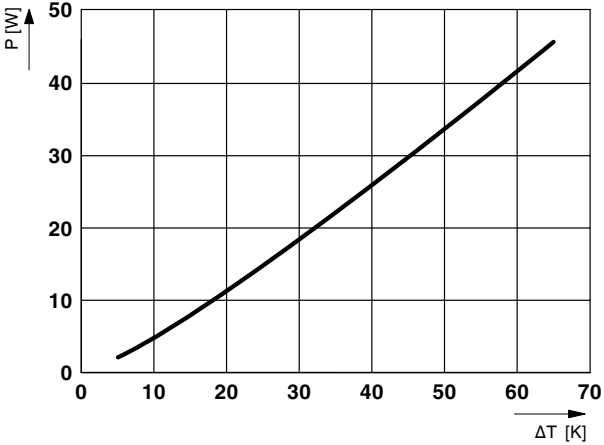


1. ICS modular housing system

ICS electronics housings – your advantages

- ☑ Flexible use, thanks to a modular system and unique modularity in connection technology
- ☑ Standardized connections such as RJ45, USB, D-SUB, and antenna jacks as components that can be integrated
- ☑ Optimal space utilization, as well as flexibility of design, colors, and printing
- ☑ 8-pos. DIN rail connectors with parallel and serial contacts for easy module-to-module communication
- ☑ Individual design of the upper housing part possible
- ☑ Passive heatsinks for reliable heat dissipation

Thermal resistance R_{th}
This value describes the thermal properties and the thermal behavior of a heatsink.



R_{th} diagram of the ICE 122 mm heatsink

Targeted thermal management

The power density of electronic systems increases more and more as size decreases. This trend makes it a challenge to dissipate the lost heat in a targeted manner into the environment.

To describe the thermal conduction in electronic components, the thermal resistance R_{th} in K/W is used. This value describes the maximum thermal conduction P [W] that can be dissipated with a specified temperature difference of ΔT [K], and serves as an indicator of the efficiency of a heatsink.

Heat can be transferred through thermal conduction, convection, and heat radiation. When developing a cooling strategy, analyzing the heat paths and higher-level transport mechanisms is particularly challenging.

Through a targeted optimization of the heat transport mechanisms, the dissipation performance is increased and, at the same time, the service life of the electronic components is extended.

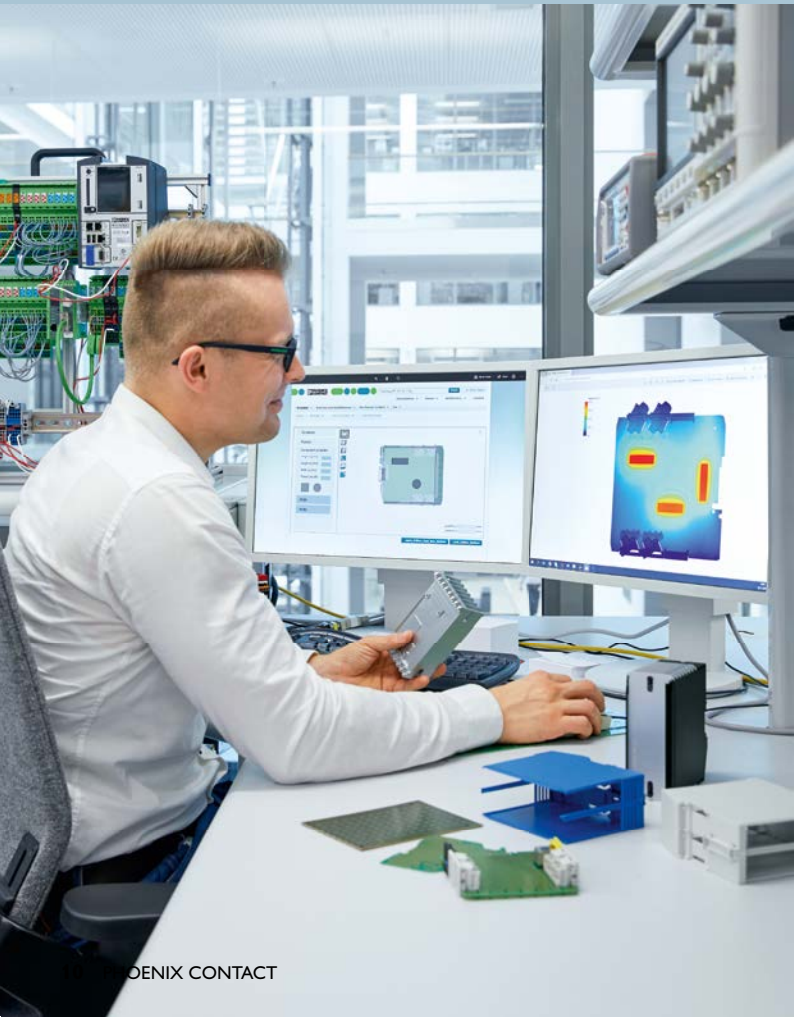
3. Thermal management: tips and tricks

The thermal optimization of electronic devices always depends on the application

These tips can help:

- Use of fillers with ventilation slots instead of closed fillers
- In general, hot spots (heat-critical components) should be placed near the lower ventilation slots so that they can have cool fresh air flow over them
- At the same time, however, further thermally sensitive components should never be negatively influenced by the positioning of the hot spots
- Use of a passive customer-specific heatsink

4. Automated thermal simulation



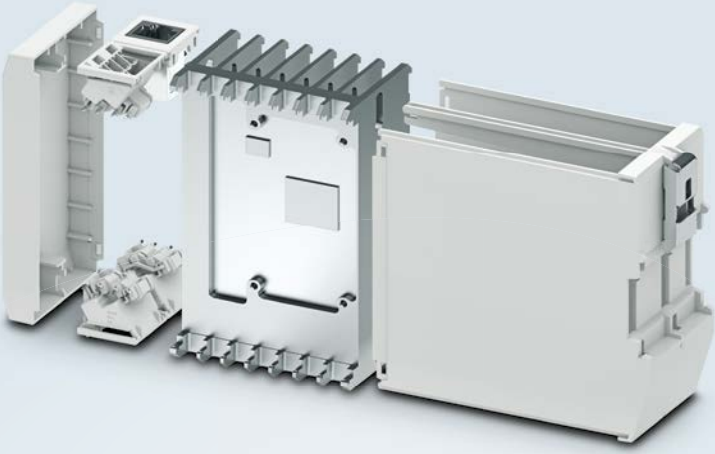
Use our easy to operate online simulation tool to thermally analyze your application

1. Assemble your housing in a way that is suitable for your application online using our electronic housing configurator

   Web code: #0512

2. Position hot spots on your PCB and define the thermal boundary conditions of your application
3. Receive your application-specific results in the form of a 3D PDF by email
4. If needed, take advantage of our offer of an individual consultation or the customer-specific heatsink service from Phoenix Contact

5. Function and customization of the heatsink



Customer-specific consultation on the heatsink

- Extruded heatsink made of aluminum corresponding to the ICS housing geometry for simple slide-in assembly
- Custom milling of the standard heatsink depending on customer application
- Hot spots are connected to the heatsink using thermal interface materials (TIMs)
- Heat-dissipating surface of the hot spot is enlarged by the heatsink
- The heatsink ensures that the heat loss of the component is spread through thermal conduction and dissipates this radiation and convection into the environment

6. Your complete solution from PHOENIX CONTACT

Benefit from the services and product solutions from PHOENIX CONTACT

- ICS housing system with comprehensive module selection and variable connection technology

  Web code: #1826

- Individual cover with the digital ICS Cover Designer

  Web code: #0685

- Heatsinks that can be individually machined for the ICS housing series

  Web code: #2388

- ICS mounting device for quick and easy final assembly
- Online tool for thermal simulations
- Color versions, mechanical processing, and tool modifications for your customer-specific design
- Professional support in the development process through application-specific simulations and recommendations on optimum housing selection and heatsink design

Find out more with the web code

For detailed information, use the web codes provided in this brochure. Simply enter the # and the four-digit number in the search field on our website.

Web code: #1234 (example)

Or use the direct link:
phoenixcontact.net/webcode/#1234

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MNR 1197999/2020-04-01/00

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