



Application Note

AS62x0 - Thermal Design Guideline

For PCB Reference Design



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1 General Description

The AS62x0 Product Family is a digital temperature sensor family for applications that require small form factors, ultra low power consumption and high accuracy.

Apart from numerous other applications, wearables are a perfect fit for this sensor. Especially for wearable devices, designing a housing for a good skin and environmental temperature measurement could be challenging.

In this document some design guidelines are listed to support you in your product design.

2 Temperature Sensing of Components on PCB

2.1 Temperature Sensing on same PCB Layer Side

In order to get a good sensing results the AS62x0 should be placed as near as possible to the component you want to sense. Connect the common GND plane as close as possible together as shown in **Figure 1 Copper connection on same layer**.

Keep other copper layers and vias away from sensor to minimize the thermal load.

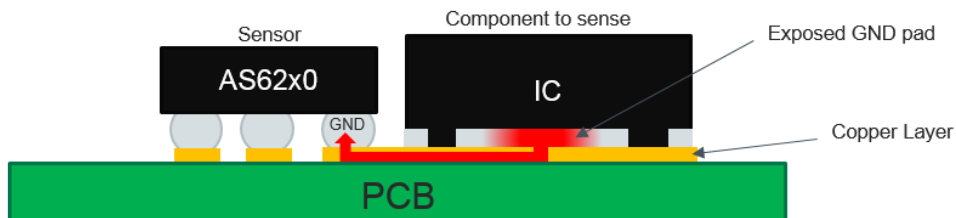


Figure 1 Copper connection on same layer for heat transfer

The advantage of same side measuring is that to keep influence of other heat sources of the bottom side away from the sensor.

2.2 Temperature Sensing on the opposite PCB Layer Side

Thermal vias can be used in case the sensing component is on the bottom side as shown in **Figure 2 Temperature Sensing over Thermal Via**. In order to reduce thermal load make sure there are no copper layers between sensor and the component you want to sense.

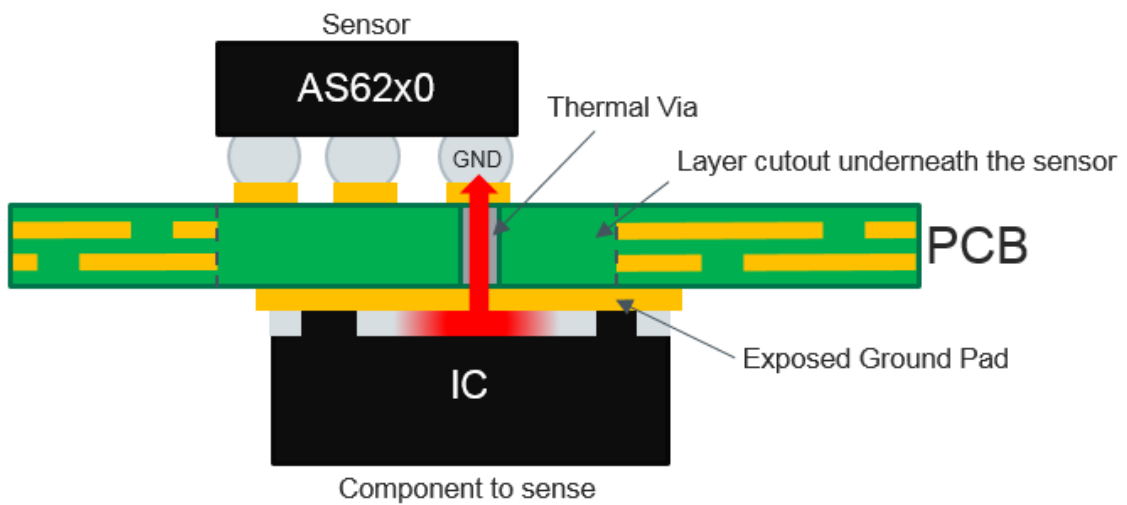


Figure 2 Temperature Sensing over Thermal Via

3 Thermal Load vs. Temperature Response Time

3.1 Reduce Thermal load with PCB Cutouts

3.1.1 Cutout through PCB

To further improve the response time of the sensor, it is recommended to reduce the thermal capacity of the PCB. One important measure is to keep the area around the sensor free of any copper planes. In addition to that, a cutout as can be seen in **Figure 3 PCB cutout** should be applied.

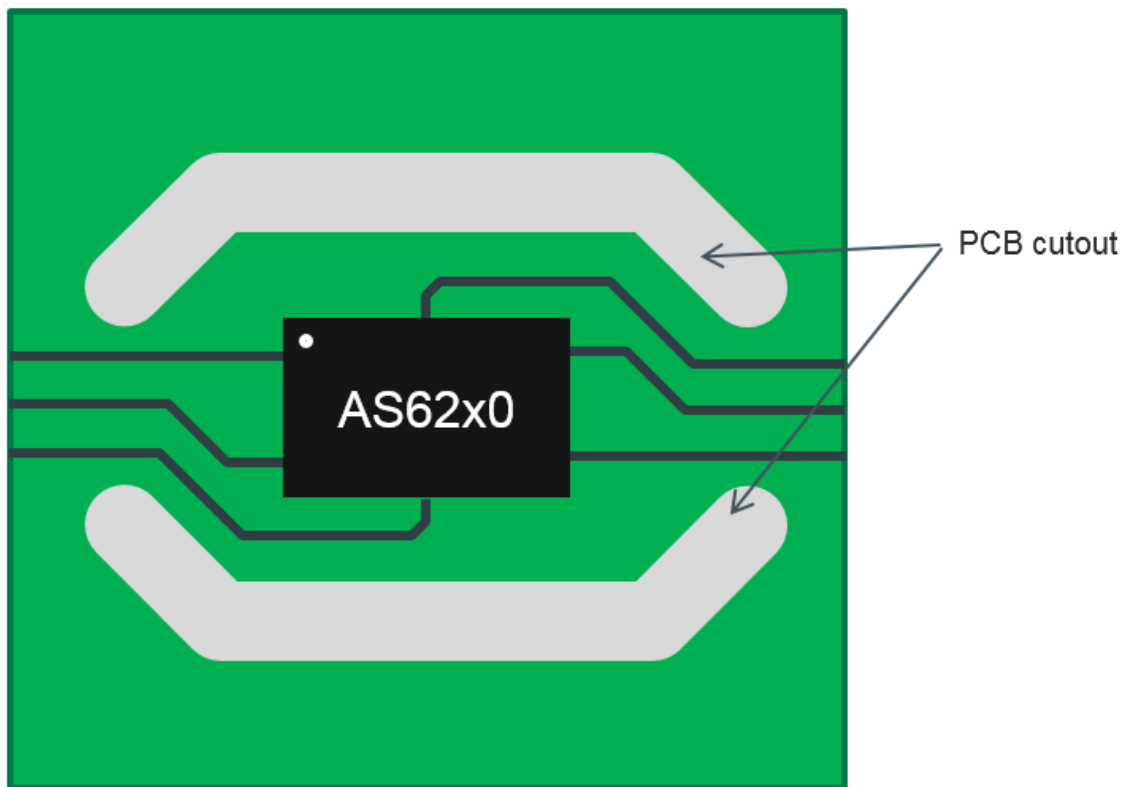


Figure 3 PCB cutout

3.1.2 PCB Cutout Area

In addition to reduce thermal load of the PCB the bottom side can be cutted out as shown in **Figure 4 PCB cutout bottom side**

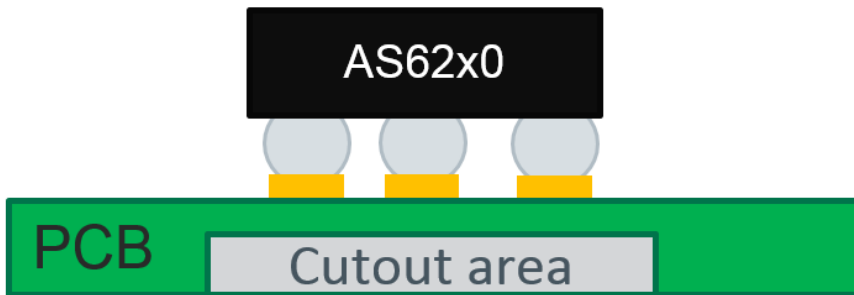


Figure 4 PCB cutout bottom side

3.2 Flex PCB

Another possibility to reduce thermal load is the use of a rigid flex PCB. In the **Figure 5 Sensor on Rigid Flex PCB** is an application example how it can be done to measure the housing temperature. A thermal tape or adhesive can be used to fix the rigid flex to the case. The exposed pad increases the thermal conduction. In best case use a thermal via to connect the sensor ground.

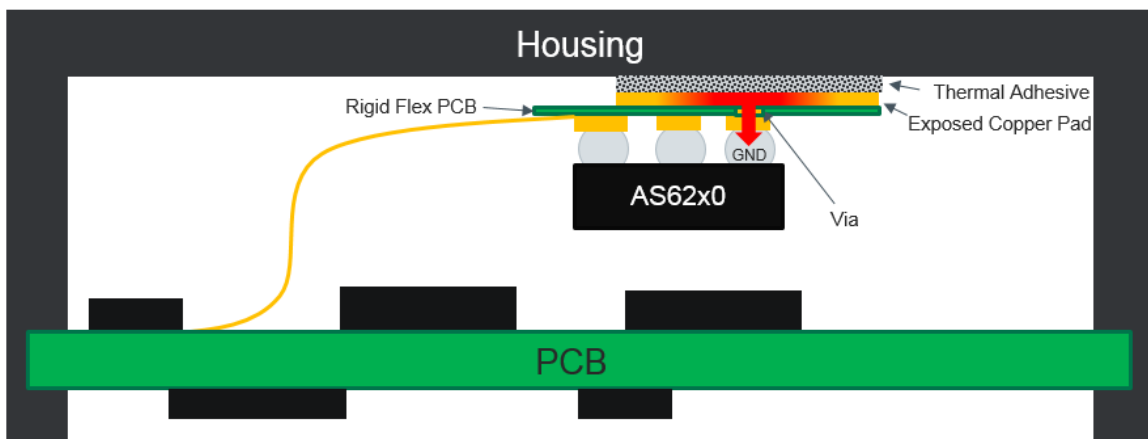


Figure 5 Sensor on Rigid Flex PCB

4 Contact Information

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6 Revision Information

Initial version 1-00

Note: Page numbers for the previous version may differ from page numbers in the current revision.



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