

# Product Document



## Application Note

AN000325

# AS62xx

## Thermal Design Guideline for PCB Reference Design

v4-00 • 2020-Nov-23

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# Content Guide

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# 1 Introduction

The AS62xx device family is a digital temperature sensor family for applications that require small form factors, ultra-low power consumption and high accuracy.

Temperature monitoring could be challenging and with this document, some design guidelines are listed to support you in your product design.

## 1.1 Ordering Information

Ordering Code	Package	Marking	Delivery Form	Delivery Quantity
AS6221-AWLT-S	WLCSP	AS6221	Tape & Reel	500 pcs/reel
AS6221-AWLT-L	WLCSP	AS6221	Tape & Reel	5000 pcs/reel
AS6212-AWLT-S	WLCSP	AS6212	Tape & Reel	500 pcs/reel
AS6212-AWLT-L	WLCSP	AS6212	Tape & Reel	5000 pcs/reel
AS6214-AWLT-S	WLCSP	AS6214	Tape & Reel	500 pcs/reel
AS6214-AWLT-L	WLCSP	AS6214	Tape & Reel	5000 pcs/reel
AS6218-AWLT-S	WLCSP	AS6218	Tape & Reel	500 pcs/reel
AS6218-AWLT-L	WLCSP	AS6218	Tape & Reel	5000 pcs/reel
AS6204-AWLM-S	WLCSP	AS6204	Tape & Reel	500 pcs/reel
AS6204-AWLT-L	WLCSP	AS6204	Tape & Reel	5000 pcs/reel
AS6200C-AWLM-S	WLCSP	AS6MCC	Tape & Reel	500 pcs/reel
AS6200C-AWLT-L	WLCSP	AS6MCC	Tape & Reel	5000 pcs/reel
AS6200-AWLT-S	WLCSP	AS6200	Tape & Reel	500 pcs/reel
AS6200-AWLT-L	WLCSP	AS6200	Tape & Reel	5000 pcs/reel

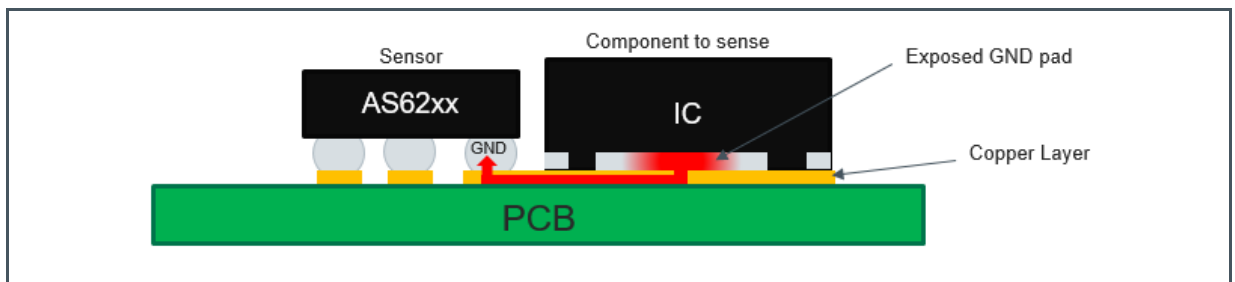
## 2 Temperature Sensing of Components on PCB

### 2.1 Temperature Sensing on Same PCB Layer Side

In order to get a good sensing results the AS62xx 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.

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

**Figure 1:**  
Copper Connection on Same Layer for Heat Transfer

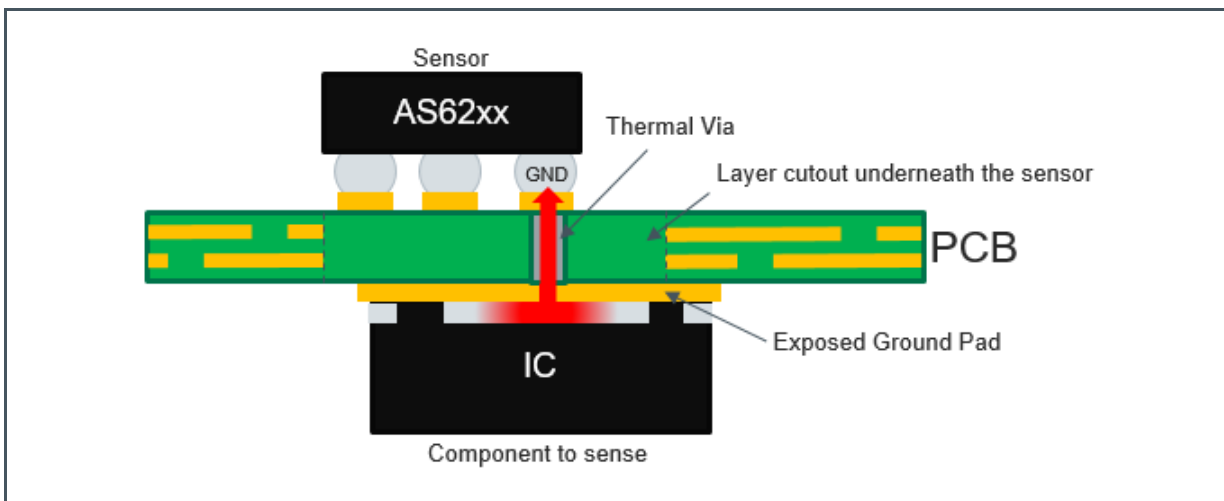


The advantage of same side measuring is that to keep influence of other heat sources of the bottom side away from the sensor.

### 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. 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



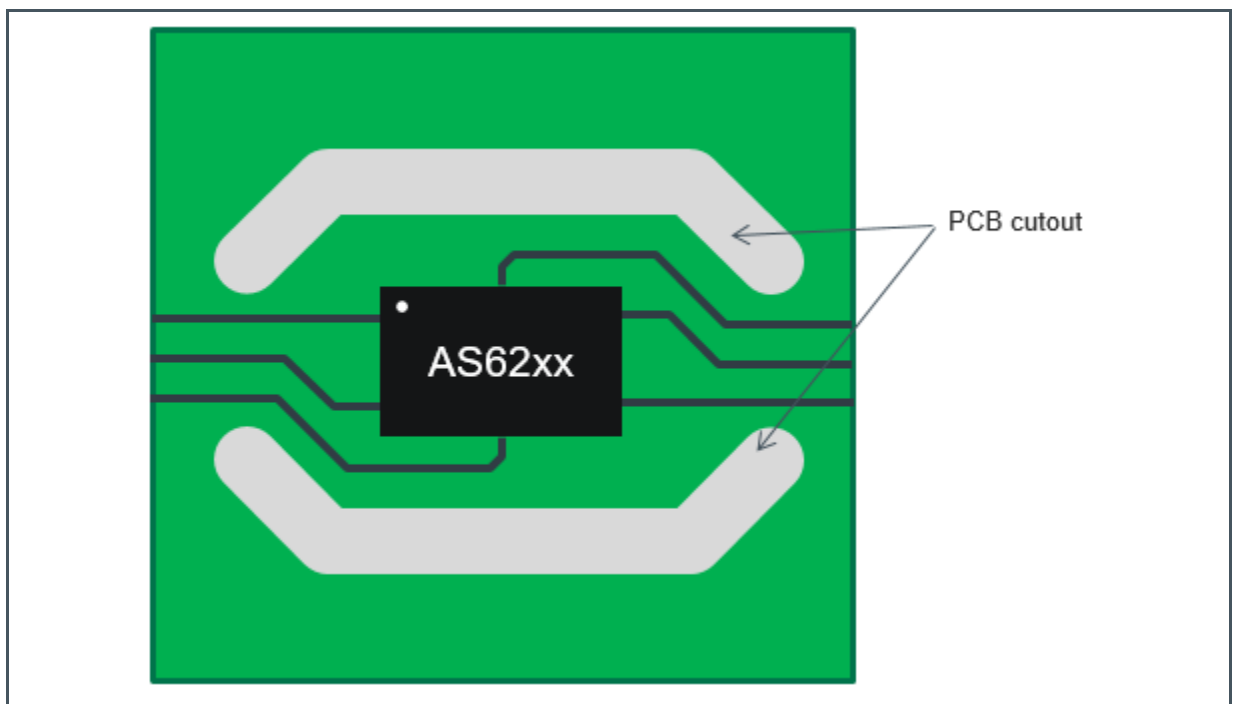
### 3 Thermal Load vs. Temperature Response Time

#### 3.1 Reduce Thermal Load with PCB Cut

##### 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 should be applied.

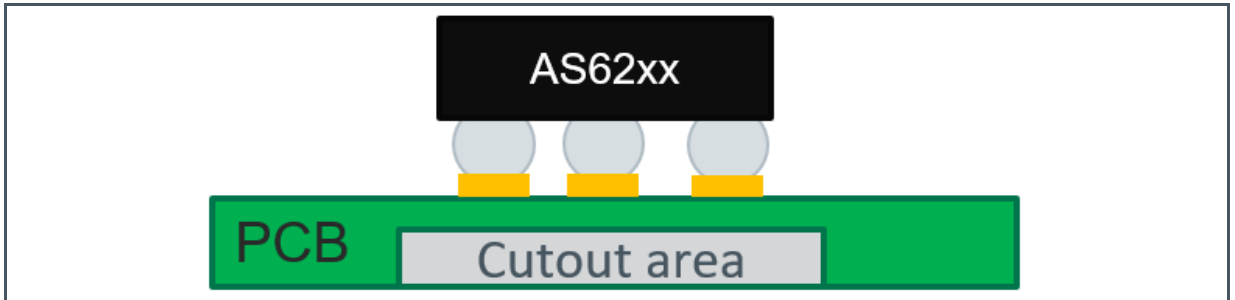
**Figure 3:**  
PCB Cutout



##### 3.1.2 PCB Cutout Area

In addition, to reduce thermal load of the PCB the bottom side can be cut out as shown in Figure 4

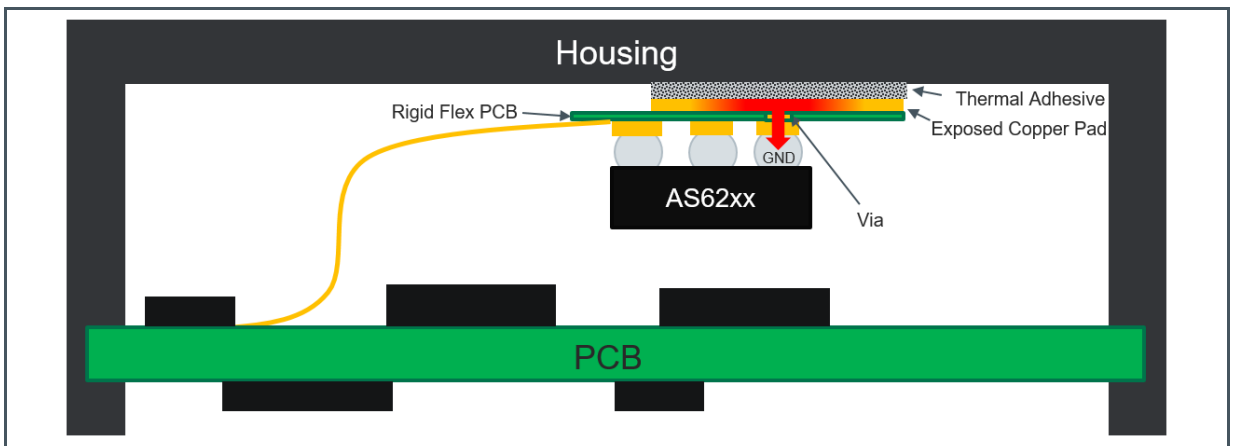
Figure 4:  
PCB Cutout Bottom Side



### 3.2 Flex PCB

Another possibility to reduce thermal load is the use of a rigid flex PCB. In the Figure 5 an application example shows 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





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## 4 Revision Information

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Changes from previous version to current revision v4-00	Page
Updated Ordering Information table with AS6221	3

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- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
- Correction of typographical errors is not explicitly mentioned.

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