

Product Document



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Application note for CMV/CHR

Sensor cooling techniques

Change record

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1 INTRODUCTION

This document will describe some possible techniques that could be used to cool or keep the sensor temperature stable. Not all sensors are suitable for all techniques as for smaller sensor, less free (read no pins) ceramic is available to use for cooling.

2 FORCED AIR

The easiest technique is probably just forcing air flow over the mounted sensor to extract heat from the sensor and or the whole camera system.

Some sensors have stand-off pins, which will also allow for airflow underneath the sensor package.

Otherwise a socket (with or without window) can be used to lift the sensor off the PCB, allowing for better airflow around the sensor.

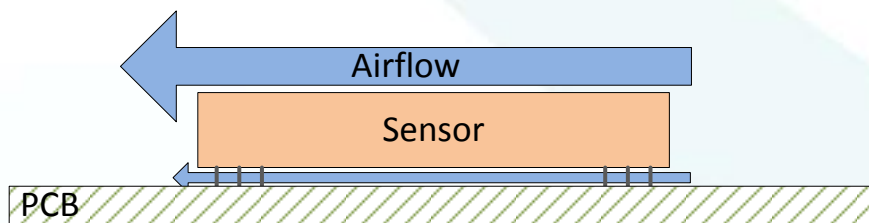


FIGURE 1: FORCED AIR COOLING

3 PCB THERMAL PAD

Underneath the sensor a copper thermal pad can be applied on the PCB. The bottom of the ceramic package should then be mounted to this pad. For better heat transfer a thermal compound or adhesive pad can be used. This thermal pad can then either be connected to a thermal pad on the bottom of the PCB with thermal vias. If this is not possible, you can choose to expand the top PCB copper pad over the sides of the sensor package.

The thermal pad (either the one on the bottom side of the PCB or on the sides of the sensor) can then be cooled further by mounting a heat sink, forcing airflow, using a TEC (thermo-electric cooler) or a combination of those.

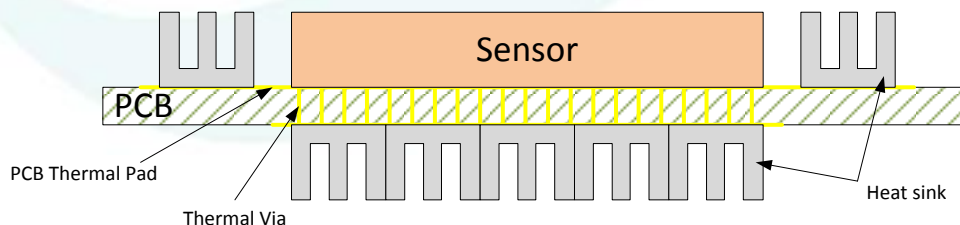


FIGURE 2: PCB THERMAL PAD

4 PCB WINDOW

A window (hole) in the PCB can be foreseen underneath the sensor, so access to the bottom of the ceramic package is available. Some sockets also come with an (optional) window. With this access you can again choose to attach a heat sink, forcing airflow to it, using a TEC (thermo-electric cooler) or a combination of those.

This solution will give the best results as the cooling is closest to the die itself.

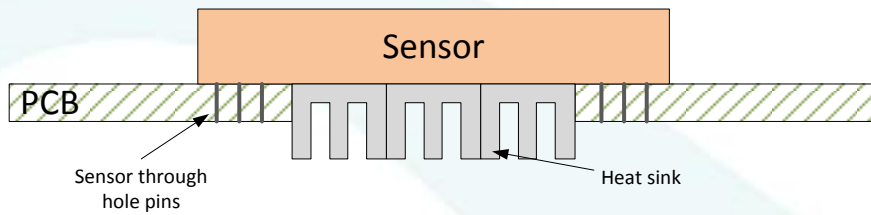


FIGURE 3: WINDOW IN PCB WITH HEATSINK

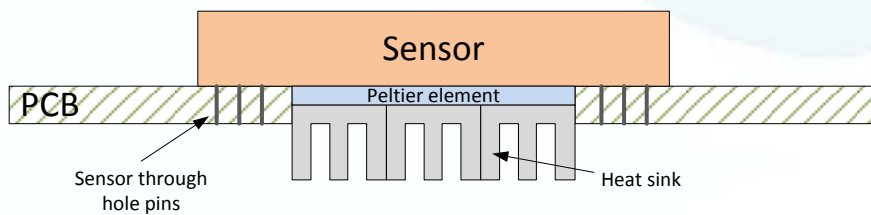


FIGURE 4: WINDOW IN PCB WITH PELTIER ELEMENT