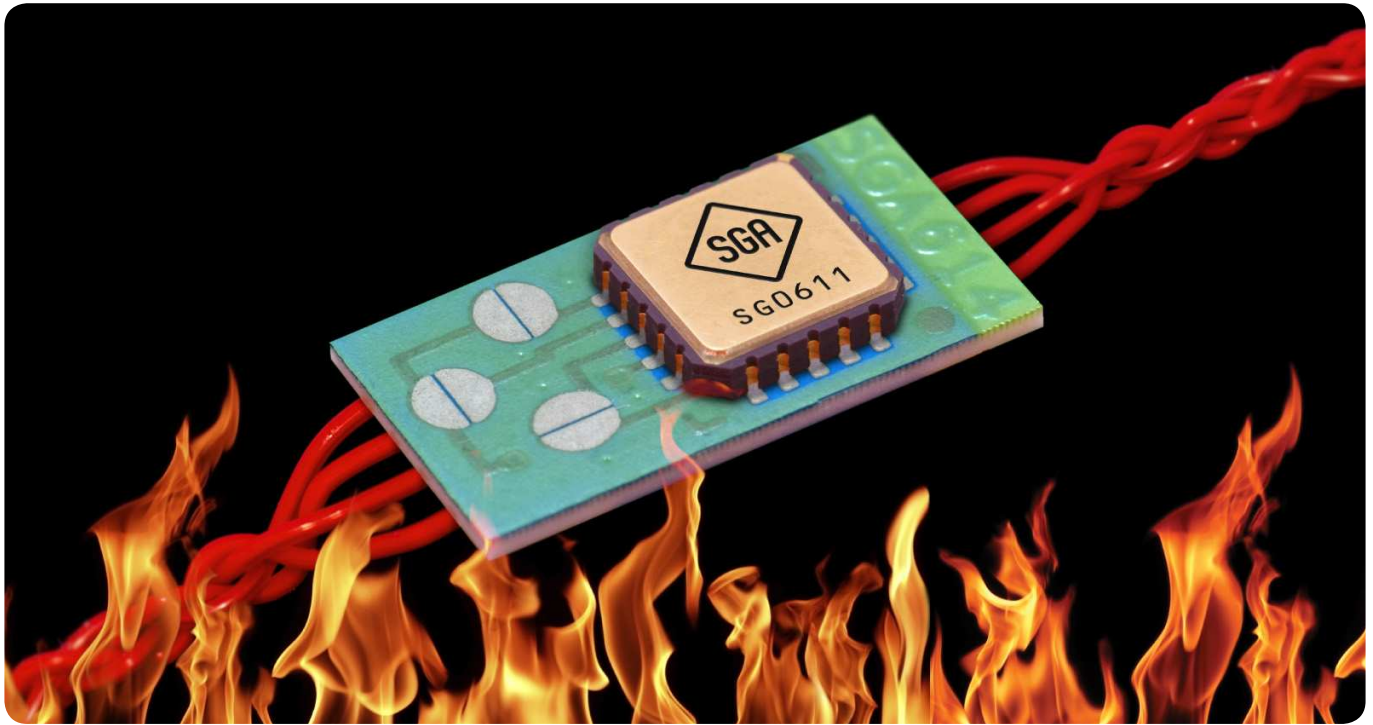




High Temperature **Sensor Amplifier Module**



Designing a high temperature system is not only a matter of finding the right integrated circuit. Assembly, substrate, passives and connections must all be suitable for use in high temperature. Overall size is also important in many applications.

SGA presents a demonstrator that realises a miniature sensor amplifier system for high temperature use that will fit inside an 8mm wide housing.

SGA designs and produces integrated circuits for high temperature conditions. Silicon On Insulator (SOI) technology together with a high temperature metal system create real high temperature Specific Components specified for use at +225°C.

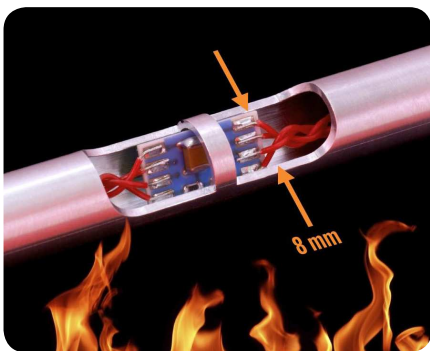
One target application is instrumentation amplifiers for bridge style sensors. It is in this case an obvious advantage to mount the instrumentation amplifier within the sensor housing. This means that physical size of the amplifier system is important.

The SG0614 demonstrator presents both a solution for miniature assembly of a high temperature component as well as a system

approach that creates a very small instrumentation amplifier system that fits inside an 8mm wide housing.

The Package

First step in creating a miniature high temperature sensor amplifier system is to use a very small package for the integrated instrumentation amplifier. SGA has developed a special ceramic package for this purpose.



Our CQFN-20 is a leadless ceramic carrier with 20 connections and only a 6x6 mm footprint. Small package dimensions are essential in creating a miniature system. The new package is designed to be hermetically sealed and to be surface mounted on a ceramic substrate.

The instrumentation amplifier SG0611 from SGA is available assembled in CQFN-20. This package is also available for use in other SGA products like for example all types of High Temperature ASIC:s.

The Demonstrator

The SG0614 demonstrator is an example of a complete instrumentation amplifier system for a high temperature pressure sensor. A system like this highlights several important features:

- Miniature hermetic assembly
- Trimming in production
- High temperature passives
- Easy connection of sensor element
- Miniature surface mount substrate
- “Inside a tube” design

The SG0611 assembled in CQFN-20 is a central part of the demonstrator. This small footprint package is an ideal choice for a miniature high temperature application.

Gain in SG0611 can be adjusted with external connections or jumpers. This feature is used together with split pads on the substrate to illustrate in-production trimming.

High temperature passive components are included in the demonstrator. Resistors and capacitors are surface mounted on the substrate.

Wires from the sensor element are connected to solder pads on the substrate. Power to and signals from the demonstrator are connected in the same way.

The demonstrator is realised on a ceramic thick film substrate. Substrate width is only 7.5 mm to fit for example inside an 8mm tube. The SG0611 and the split pads are placed on one side of the substrate and the passives and the connections on the other side.

The demonstrator illustrates how a miniature high temperature system can be designed. This approach is valid for many applications, not only for pressure sensors. The technology shown is available for custom design both concerning high temperature integrated circuits and concerning assembly of high temperature systems.

**Contact SGA for
High Temperature solutions**