



# *High Temperature Specific Components*



**SGA designs and manufactures integrated circuits for high temperature conditions. We realise components that are specified for use at +225°C.**

**The target applications contain analog functions placed in a hot environment.**

**Silicon on Insulator (SOI) technology together with a high temperature metal system create real High Temperature Specific Components.**

An average electronic design may never come close to what can be called high temperature conditions. There are however several examples where it is an advantage to place components in a high temperature environment.

SGA offers a special process qualified to be used when designing components for very high temperature. We design both ASIC and standard components for use far above the normal temperature range. This is what we call High Temperature Specific Components.

## **Applications**

Components that can withstand high temperature conditions may be placed close to a heat source. This makes it possible to distribute electronic functions into a rough environment.

One example of an application where this is an advantage is a sensor placed at a high temperature location. This could for example be a bridge style pressure sensor placed on an engine.

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It is in this case an advantage to have signal conditioning functions close to the sensor element. This is particularly true when the electrical environment is rough and the sensor signal is weak. Signal conditioning close to the sensor will significantly improve signal integrity as there is then no need to carry small signals in long wires to a location far from the heat source.

This approach is certainly supported by the design of a High Temperature Specific Component that can be placed together with the sensor element.

#### **The Solution**

The design of high temperature integrated circuits requires a special manufacturing process that is suitable for use in the intended temperature range. SGA offers a CMOS, Silicon On Insulator (SOI), process for manufacturing of analog and mixed signal components. This process is characterised for use up to +225°C.

Individual components within an integrated circuit, like transistors of different types, are in an SOI-process separated from each other by an insulator. Parasitic leakage currents between individual components as well as from components to ground are then dramatically reduced compared to

a standard process that relies on junction isolation.

Leakage current in a semiconductor junction is heavily dependent on temperature. This means that isolation will be lost at high temperature in a junction isolated process while an SOI-process is still operational.

Elevated temperature also accelerates ageing effects in an integrated circuit. One example is migration in metal connections. High current and temperature would over time, for a standard metal, cause an increased resistance and finally a failure. Our SOI-process has a special metal system that is characterised for use up to +225°C.

The conclusion is that several effects join together in creating obstacles to use a standard process at high temperature. SGA provides a proven solution for High Temperature Specific Components specified for use at +225°C.

#### **Contact SGA for High Temperature solutions**

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