

# Post-assembly adjustable gas-gap heat switch

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A gas-gap heat switch is a device of which the thermal conductance is controlled by regulating the pressure of a working gas in a gap between warm and cold surfaces. The on-state conductance is largely determined by the gap distance, and as such minimization of the gap is often a design objective. By pumping out the gas or adsorbing it onto a getter, there is virtually no conductivity through the gas and, therefore, the off-state conductance is determined by the enclosing structure. This enclosing structure has to hermetically seal the gas space, and to mechanically support and separate the warm and cold sides of the switch.

In the process of assembly of the heat switch, twisting and tilting of the planes or the hermetic seal could bring the opposite surfaces in thermal contact, resulting in failure of the switch. This may be prevented by taking less risk in the design by increasing the gap, in turn reducing the on-state conductance and thus degrading the performance. We present a gas-gap heat switch design using bellows as the hermetic seal. The position of the planes can be adjusted using spacer rods after welding the switch shut. This avoids having to derisk in the design process, allowing for narrower gaps and a very high on-state performance.

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