

Passive Gas-Gap Heat Switch for Adiabatic Demagnetization Refrigerator

Case Number: GSC- 14525-1
Patent Number: 6,959,554
Patent Exp. Date: 7/10/2022

DESCRIPTION

This passive gas-gap heat switch for adiabatic demagnetization refrigerator has adsorption unit within containment tube which continuously varies on/off temperature of heat switch over range of temperatures. First and second sets of fins are connected with first and second copper conductors respectively. A containment tube physically supports the first and second conductors. An adsorption unit within the containment tube continuously varies on/off temperature of the heat switch over a range of temperatures.

FEATURES AND BENEFITS

- The technology cools adiabatic demagnetization refrigerator below room temperature.
- The switch conducts heat at temperatures ranging from 0.25 degree Kelvin to 1 degree Kelvin and does not require a long turn-off time.
- This has very low thermal conductance when turned off and can automatically thermally isolate adiabatic demagnetization refrigerator once it is cooled down to liquid helium temperature.

APPLICATIONS

- Spacecraft Instruments
- Detection and Analysis of Nanoscale Particle Contaminates
- Cryogenics
- Large-Molecule (DNA) Spectrometry
- Radiation Detectors

FOR MORE INFORMATION

If you are interested in more information or want to pursue transfer of this technology, GSC-14525-1, please contact:

Darryl Mitchell
Technology Manager
NASA Goddard Space Flight Center
Innovative Partnerships Program Office
darryl.r.mitchell@nasa.gov
301-286-5169