Mounting Improves Heat-Sink Contact with Beryllia Washer

The problem:
Conducting heat away from electrical components that must be electrically insulated from a metal heat sink. Beryllia (beryllium oxide) washers, which have been used as heat-sink spacers because they combine high thermal conductivity with high electrical resistivity, must be properly mounted to ensure an effective thermal path between the electrical component and the heat sink.

The solution:
Place a metal washer and a coil spring between one end of the electrical component and the beryllia washer mounted on the heat sink.

How it's done:
The beryllia washer containing a metallized cavity (for soldering to the lower component lead) is seated on the heat sink. The lower lead of the electrical component is passed through a snug-fitting hole in a metal washer, and the exposed face of the washer is then placed on a coil spring which has been positioned on the beryllia washer. In mounting the electrical component on the spring sufficient pressure is applied to bring the spring coils into contact when the upper lead is soldered or welded to an electrical connector. The assembly is completed by soldering the lower lead to the cavity in the beryllia washer and to a second ele-
trical connector. Heat transfer to the heat sink is
effected through the paths formed by the lower com-
ponent lead, the base of the component, the metal
washer, the compressed spring, and the beryllia
washer.

Notes:
1. This method of employing a beryllia washer for
heat sinking would be particularly applicable to en-
capsulated components (e.g., resistors and capaci-
tors) with electrical leads protruding from two
ends.
2. The use of indium foil in conjunction with beryl-
lia washers for heat sinking of power transistors
is described in NASA Tech Brief B63-10033, April,
1964.
3. Inquiries concerning this innovation may be di-
rected to:
   Technology Utilization Officer
   Manned Spacecraft Center
   Houston, Texas, 77001
   Reference: B66-10144

Patent status:
No patent action is contemplated by NASA.
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