AN1617

Mounting Recommendations for Copper Tungsten Flanged Transistors

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INTRODUCTION

Because of mechanical constraints caused by the hardness of the flange material, Power RF transistors with a Copper Tungsten (CuW) flange require special care when mounted. The purpose of this application note is to describe the care to be taken for those devices with emphasis on the flatness and torque required.

PACKAGES AFFECTED

All Copper Tungsten flanged transistors like those shown in Figure 1 (Case 395B, Case 395C, Case 398, Case 360B, Case 375B, and Case 375A).

This list is not exhaustive. In particular, all new high power discretes packages are likely to have a Copper Tungsten flange and thus follow the mounting requirements described in this note.

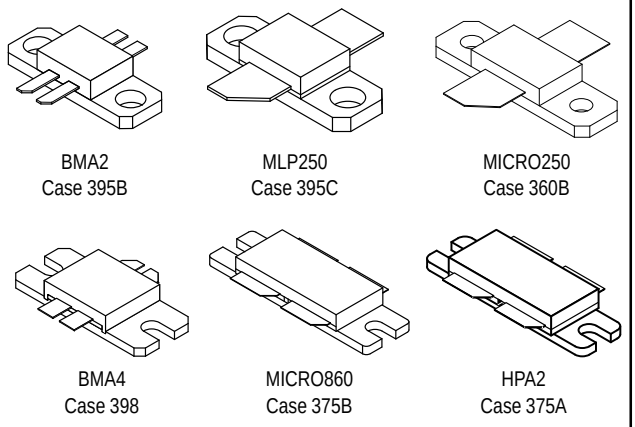
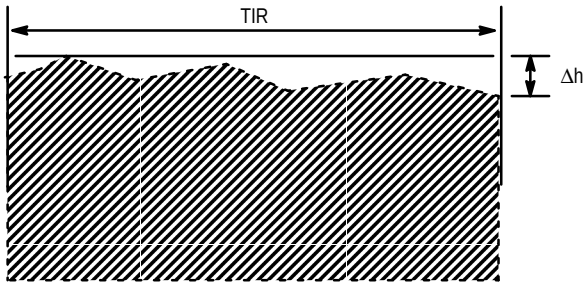


Figure 1. Example of CuW Packages



The mounting surface flatness is defined by the varaiance in height (Δh) divided by Total Indicator Reading (TIR)

Figure 2. Mounting Surface Flatness

The surface flatness required for CuW flanged transistors is: Δh/TIR = 10 microns/inch (0.4 mils/inch)

This is to be reached by milling the aluminium heatsink (nearly perfect flatness).

MOUNTING SURFACE FINISH

Surface finish is the average of deviation below and above the mean value of surface height.

A finish roughness (Ra) in the order of 0.8 μm or 0,03 mils is required (met with milled aluminium).

THERMAL COMPOUND

The use of thermal compound is recommended provided it is applied carefully:

–Apply a thin layer of thermal compound.
–Spread the compound evenly.

Too much grease is worse than using none.

TORQUE

Torque has to be applied in 2 steps.

–First step torque: fingertight (0.5 Kg.cm or 0.4 inch.pounds) on each side
–Second step: controlled torque (with a controlled torque screwdriver: 6 Kg.cm (± 1 Kg.cm) or 5.2 inch.pounds (± 0.8 inch.pounds) on each side.

Excessive torque may damage the device.

The use of washers is recommended to control the torque.

MOUNTING PROCEDURE SUMMARY

1. Control the flatness of the heatsink.
2. Control the perfect cleanliness of both the heatsink and the back of the flange.
3. Make sure the device mounting holes are deburred.
4. Apply the absolute minimum of thermal coumpound to the flange and spread evenly.

Too much compound is worse than using none.

5. Place the flange in the recess.
6. Screw the flange in two steps using washers:
   1rst step torque: 0.5 kg.cm on each side
   2nd step controlled torque: 6 kg.cm (± 1 kg.cm) on each side

Excessive torque may damage the device.

7. Solder the leads.

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