



Mounting Instructions for DO-203AA / DO-203AB Diodes

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This application note introduces Vishay's DO-203AA (DO-4) and DO-203AB (DO-5) diodes and provides instructions for mounting them to a heat sink.

INTRODUCTION

Vishay's DO-203AA / DO-203AB diodes are distinguished by these key features:

- Stud cathode and stud anode
- Through-hole non isolated device, PWB or panel mounts
- High surge current capability and wide current range

Important factors in the assembly process are:

- Heat sink design
- Distance from adjacent heating parts

HEAT SINK SPECIFICATION

The contact surface of the heat sink must be flat, with a recommended tolerance of < 0.03 mm (< 1.18 mils) and a levelling depth (surface roughness) of < 0.02 mm (< 0.79 mils), according to DIN/ISO 1302. In general, a milled or machined surface is satisfactory if prepared with tools in good working condition. The heatsink mounting surface must be clean, with no dirt, corrosion, or surface oxides. It is very important to keep the mounting surface free from particles exceeding 0.05 mm (2 mils) in thickness.

THERMAL COMPOUND

Apply thermal joint compound on the hex side of the device surfaces prior to mounting. The use of the compound produces a low initial contact resistance that helps seal out air and moisture, which can in turn help to prevent oxidation or corrosion over the life of the stud. A silicone-based thermal joint compound or petroleum-based thermal joint compound such as Penetrox is the best choice for metal-to-metal joints.

MOUNTING TO HEAT SINK

These packages can be mounted as by attaching one surface of the semiconductor device to a heat dissipater, to achieve thermal management of the case temperature.

These packages may also be called a Screw Mount, Stud Mount, Bolt Mount, or Panel Mount. Place a suitable amount of thermal compound on the hex side of the device surfaces and spread it evenly with a spatula. Thermal grease contact and distribution will be improved during the first hours and after heating up the system for the first time.

All mounting holes of heat sink should be free of burrs. Bolt the stud with a nut and washer to the threaded heat sink hole. Be sure the stud is inserted straight into the threaded hole without forcing it. Mounting error with non-isolated stud mounted parts is generally confined to application of excessive torque or tapping the stud into a threaded heat sink hole. Both these practices may cause a warpage of the hex base which may crack the semiconductor die. The only recommended fastening method is to use a nut and washer.



Fig. 1 - Examples of DO-203AA (DO-4)



Fig. 2 - Examples of DO-203AB (DO-5)



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SOLDERING TECHNIQUE - HAND SOLDERING

Power, soldering iron tip size and working temperature of the soldering iron affect the soldering time. These parameters have to be adjusted in order to keep the maximum temperature within the specified limit.

Only thermostatically-controlled irons should be used for this operations. The maximum permitted temperature-time combination for this soldering process, 260 °C to 275 °C for 10 minutes in case of lead (Pb)-free solder, to solder flexible lead on diode eyelet.

Vishay semiconductor recommends that the soldering joints should be thoroughly checked to ensure a high quality soldering joint.

If necessary, different parameters should be adjusted in order to optimize the process.