Modules

Application Note AN-0802

Mounting Instructions for INT-A-PAK Modules

This application note introduces Vishay's INT-A-PAK (New INT-A-PAK) thyristor-rectifier-switch modules. It covers their key features and gives instructions for using heatsinks with the modules.

INT-A-PAK modules are designed to provide reliable performance in rugged 75 A to 230 A industrial applications. A single housing is used to integrate power components, providing higher power density. Various die selections are available in several configurations.

Fig. 1 - Example of INT-A-PAK module

INTRODUCTION

Vishay's INT-A-PAK modules are distinguished by these key features:

- Fully isolated from the metal base, allowing common heatsink and compact assemblies to be built
- Wire-bonded internal connections
- Screwable electrical terminals secured against axial pull-out. They are fixed to the module housing via a click-stop feature
- Low junction-to-case thermal resistance

Important factors in the assembly process are:

- Heatsink design
- Power leads size/area
- Distance from adjacent heating parts
- Solder paste choice
- Reflow profile
- Protection against electrostatic discharge (ESD)

Recommendations for each of these items and requirements for mounting INT-A-PAK modules to the heatsink are discussed in the following sections.

ESD PROTECTION

IGBT modules are sensitive to ESD. All INT-A-PAK modules are ESD-protected during shipment: all devices are separated in a carton box and protected by an antistatic sponge.

Anyone handling or working with the modules during the assembly process must wear a conductive grounded wristband.

HEATSINK SPECIFICATION

The contact surface of the heatsink must be flat, with a recommended tolerance of < 0.03 mm (< 1.18 mils) and a levelling depth 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

Coat uniformly the heatsink surface and the power module baseplate with a good quality thermal compound.

Apply uniform pressure on the package to force the compound to spread over the entire contact area.

The purpose of thermal grease is to fill gaps at baseplate-heatsink interface. The suggested thermal grease is Dow Corning 340.

Screen printing or rubber rolling are the preferred methods to apply the grease.

A final thickness of grease layer in the range of 80 µm to 100 µm is considered suitable for most of applications.

MODULE FASTENING

Bolt the module ot the heatsink using two M6 screws. The recommended torque is 4 N · m to 6 N · m (35 lbf · inch to 53 lbf · inch) ± 10 %.

An even amount of torque should be applied for each individual mounting screw.

A torque calibrate wrench, accurate in the specified range, must be used in mounting the module, in order to achieve optimum results. The mounting screw must be tightened in sequence.

After a period of about three hours, recheck the torque with a final tightening in opposite sequence to allow the spread of the compound.

APPLICATION NOTE