

1. Introduction

This application note gives guidelines for the assembly of the BXB FxT DC/DC converters, with or without heatsink, onto a printed circuit board.

2. Physical Assembly

Attaching the converter to the board:

The BXB FxT DC/DC converters are typically mounted by the input and output pins. In cases where there is extreme shock, or when a large heat sink is attached, the converter may also be screwed on to the board. This requires four metric size M3 screws, which may be either steel or nylon. The screws should be inserted from the top of the converter, screwed down through the board, and secured to the bottom of the board by using a nut and a washer. To do the opposite (inserting screws from the bottom of the board and into the converter) can cause the converter's threaded inserts to break loose with minimal torque thus damaging the converter. When applying screws, a torque-limiting driver should be used. The recommended torque when inserting the screws from the top is 0.35-0.55 N-m (3-5 in-lb).

Another alternative to the nut and washer method describe above is the use of four short retaining screws that act as retainers for the inserts. These short screws can be inserted on the baseplate side of the converter leaving enough space to insert other screws into the converter from the bottom side of the board. Maximum recommended torque for this method is 3 in lbs."

If the converter is screwed to the circuit board, the converter must be screwed to the board before being soldered. Attaching the converter with screws after soldering may damage the converter by applying excessive pressure to the input and output pins. Converters damaged in this way will not be replaced under warranty.

Attaching a heatsink to the converter:

Heat sinks are attached using four metric size M3 screws. Steel is the recommended material for the screws. They should be installed using a torque-limiting driver. The recommended torque is about 0.11 N.m (1 lb.in).

It is recommended that a thermally conductive pad, such as the Grafoil® pads, available from Thermalloy, Inc., be used when attaching heat sinks.

Heatsinks may be attached before or after the converter is attached to the circuit board.

3. Wave Soldering

Solder type:

Only a 63/37 or 60/40 tin/lead solder should be used to solder the converter to the board.

Pre-heat:

The converters should be pre-heated before being passed over a solder wave. During the pre-heat, the maximum rate of change of the temperature of the top side of the circuit board is not to exceed 6 °C per second.

Solder wave:

When converters are passing over a solder wave:

- The maximum difference between the pre-heated temperature and the temperature of the wave should not exceed 135 °C.
- The maximum peak temperature of the solder should not exceed 260 °C, and
- The maximum immersion time in the wave is 4 seconds.

4. Water Washing

Where possible, a no-clean flux should be used for solder attaching the BXB FxT converters onto application boards. Even though the BXB FxT converters are encapsulated, they are not recommended for aqueous washing applications because there are areas where water and residues could be trapped long term. If aqueous washing is employed the converters should be baked at 100°C, non-operating for one (1) hour to remove the moisture content. Never power the converters unless they are fully dried.