

Soldering and Cleaning Guidelines for TDK Innoveta Power Modules

Handling

TDK Innoveta power modules should be stored in their shipping boxes as they are received until time of assembly. This will protect them from mechanical and ESD damage. Full ESD procedures should be followed when handling TDK Innoveta products.

TDK Innoveta products are susceptible to physical damage from rough or careless handling, as are all open frame modules. The modules should not be subjected to mechanical shock, twisting or bending. This can result in damaged or broken components, and/or bent pins.

TDK Innoveta power modules should not be stacked on top of one another. TDK Innoveta modules should be handled by the sides or edges; do not touch the active components on the underside of the modules.

Soldering – Through-Hole Modules

TDK Innoveta through-hole power modules may be either hand soldered or wave soldered. TDK Innoveta recommends that, in either case, the power module be kept below its reflow temperature of 183°C. In the case of wave soldering,

TDK Innoveta also recommends that the solder wave temperature be, at most, 250°C, with maximum dwell time of 6 to 7 seconds. Wave side preheat temperature is recommended to be 135°C +/- 10°C, with a maximum ramp rate of 4°C/sec. The top side preheat temperature should be kept below the wave side temperature to prevent reflow.

Reflow Soldering – Surface Mount Modules

TDK Innoveta surface mountable power modules may be reflow soldered to the receiving board using standard reflow mounting techniques. Innoveta recommends the following mounting topology and reflow profile.

Land Pad Geometry	0.140" x 0.120" (3.56 mm x 3.05 mm) <i>(Long axis of land pad parallel to long axis of connector)</i>
Solder Paste Composition	Either 63 Sn/37 Pb or 62 Sn/36 Pb/2 Ag
Solder Paste Stencil Thickness	8 mils (0.2 mm) recommended, 6 mils (0.15 mm) minimum
Solder Paste Coverage	75% minimum @ 8 mil (0.20 mm) stencil 100% @ 6 mil (0.15 mm) stencil

Reflow Profile

In order to reflow TDK Innoveta power modules onto a main panel, it is completely acceptable to use the solder paste manufacturer's 63Sn/37Pb eutectic solder profile. Be aware, however, that TDK Innoveta modules tend to be densely populated, and therefore contain a fair amount of thermal mass. The customer's normal oven profile may need to be slightly adjusted to make sure that the TDK Innoveta power module does in fact reflow onto the receiving board. TDK Innoveta recommends that the oven profile be set up with at least one thermocouple monitoring the temperature of the module connector solder joint.

Cleaning

TDK Innoveta power modules are fabricated with a no-clean process, and, as such, do not require any cleaning themselves. TDK Innoveta recommends the use of either no-clean flux or water-soluble flux for wave soldering applications, and no-clean solder paste for surface mount applications. If cleaning is required, TDK Innoveta power modules are compatible with the following cleaning process:

DI water wash 140°F – 160°F, 50psi – 60psi
(If DI water is not sufficient, an alkaline saponifier may be added to the wash, in a concentration not to exceed 6% by volume.)

Rinse 120°F to 140°F, 50psi – 60psi
(As in all cleaning operations, good rinsing is critical. This is especially true when the wash solution contains dissolved or solvated cleaning agents, such as saponifiers, detergents, or emulsifiers. Inadequate rinsing may leave ionic residues on the board or power module surfaces, providing current leakage paths between adjacent conductors. To confirm sufficient rinsing, a conductivity meter can be used to monitor the rinse effluent. Resistivities of 1 to 2 MΩ-cm are usually enough to guarantee good rinsing.)

Oven Dry 30 minutes to 1 hr @ 105°C, 750cfm minimum airflow
(Shorter drying times may be acceptable for the smaller modules.)

TDK Innoveta does not recommend solvent cleaning of the power modules.