



Q: Can vibration isolators improve the MTBF of my electronic equipment?

A: Shock and vibration isolators, when designed and integrated correctly, can decrease the mechanical stress and strain placed upon all components of an electronic system caused by the dynamic environments to which the hardware is exposed. Typical benefits to electronic systems using isolators (increasing the MTBF*) are the following:

- 1) Decrease in board flexure resulting in lower inherent failures rates.
- 2) Decrease in lead cracking and solder joint failures (surface mount and thru hole).
- 3) Increased integrity of Board to motherboard connections.
- 4) Reduction in I/O connector unseating.
- 5) Reduction in RF board and component solder joint cracking.
- 6) Decrease in potential flexure for RF waveguide.
- 7) Reduced vibration and shock input sensitive system components requiring precise alignment.
- 8) Increased module I/O integrity.
- 9) Reduced wire chaffing caused by vibration.
- 10) Reduction in intermittent failures associated with connector pin contact integrity.
- 11) Reduction in the stress on mechanical assemblies, leading to potential weight/cost saving designs.

In summary, shock and vibration isolators when utilized appropriately, serve to increase MTBF and system reliability. They are a valuable tool in the mechanical system designer's kit to make systems meet the rigors of adverse environmental conditions.

*Mean time between failure (MTBF) serves as the basis for reliability studies and logistics support for electronic hardware in the defense industry as well as many others. Reliability studies determine component level failure rates which are statistically rolled up into sub assembly (board or module) failure rates which ultimately become the statistical determinant of unit level reliability. These values serve as the basis for spare parts fielding and logistics flow. They also serve as a determining factor for the intermediate and depot level support requirements in the defense logistics world. Intermediate level repair typically replaces modules which have gone bad. Depot level typically goes inside the module level to repair and re-field the module back to the intermediate level shops.