

Guidelines for Returns

Introduction

Mtron strives to provide quality products and is continuously improving products, processes and services.

To enable an efficient and effective quality review process, and to avoid unnecessary false failures, it is critical that Mtron understand the customer's alleged issue with a suspect Mtron part, and separate it from any application issue that the customer may be experiencing. It is equally crucial that the suspect Mtron part not incur damage during removal, handling, or shipping.

In this document, Mtron has combined established guidelines and best practices describing verification and handling processes targeted to achieve this objective.

Nothing in these guidelines gives rise to any obligation on the part of Mtron to conduct verification or analysis.

Handling Overview

These following guidelines must be followed when suspect parts are being returned to Mtron:

- *Verify and confirm the issue*
- *Carefully de-solder the part from the PCB/board*
- *Return parts free of mechanical damage and in a testable condition*
- *Ensure that there is no obvious electrical overstress (EOS) damage*
- *Affix and return the part in a proper container*
- *Pack the part in a shielding (S) bag or container for return shipment*
- *Include a detailed description of the alleged issue with the Mtron part*

Failure to observe these guidelines may cause technical issues and and/or render a proper quality review impossible. Mtron reserves the right to reject requests for review, verification, or analysis if a customer is unable to demonstrate compliance with these guidelines.

Handling Process Requirements

- *Verify and confirm the issue*

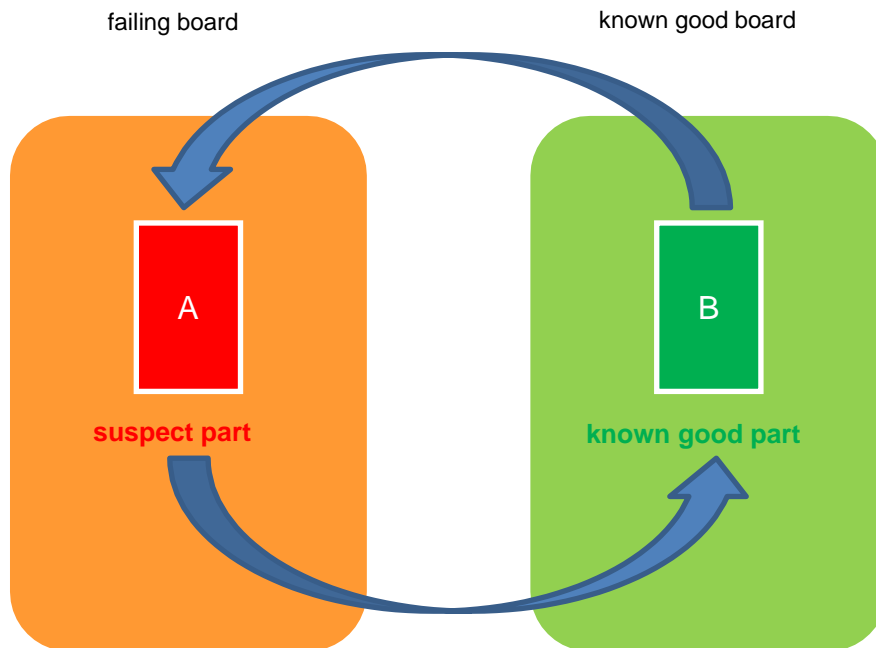
Only return suspect Mtron parts that have been tested through by A-B-A swap cross check to confirm the observed issue is not system related.

A-B-A Swap Method:

To perform the A-B-A swap:

- (A) Remove the suspect Mtron part (A) from the original failing board.
- (B) Replace the suspect Mtron part (A) with a known good Mtron part (B) and check if the original failing board is now working correctly.
- (A) Mount the suspect Mtron part (A) to a known good board and see if the observed issue continues to occur.

The last step is critical to exclude the possibility that the issue is caused by an interaction with another part on the board.



- *Carefully de-solder the part from the PCB/board*

All suspect Mtron parts returned for Mtron verification and analysis must be carefully removed from the customer printed circuit board (PCB) prior to shipping.

Mtron will advise customers in advance in rare cases where a complete PCB with the Mtron part(s) mounted is required.

De-Soldering:

Manual de-soldering of any electronic part is not recommended. Instead, use a rework station allowing control of the soldering temperature according to the JEDEC soldering profile. Uncontrolled de-soldering may damage the part.

Do not cut off the pins / leads from the Mtron part, as that will prevent any further electrical testing.

Fresh / Virgin Parts:

Do not return fresh/virgin Mtron parts unless explicitly requested to do so by Mtron. There might be special cases when Mtron would like to get back fresh/virgin Mtron parts, such as:

- solderability issues
- generic tape & reel, tray or tube related issues
- reel cover tape issues

- *Return parts free of mechanical damage and in a testable condition*

Suspect parts must be carefully removed and appropriately handled to allow for a proper root cause analysis.

Unacceptable / untestable conditions such as:

- mechanical damages to the part package,
- remainder of coating material,
- cut-off / broken or bent leads / pins, or
- excessive solder residues in-between the leads / pins

are in most cases a result of inappropriate part handling. Mtron may reject the analysis of such parts and label them as “**Non-actionable cases.**”

To improve the effective quality analysis, Mtron focuses on verification / analysis of returns that can give value to our customers.

- *Ensure that there is no obvious electrical overstress (EOS) damage*

In cases where the issue seems to be induced by electrical overstress (EOS) with visible signs of damages, a Mtron failure analysis will have a limited chance to find the true root cause.

Heavy EOS damage masks the issue. Mtron is not in a position to know the customer's operating, environmental and temperature conditions at the time of the issue to determine what may have caused the EOS damage. There is no useful action Mtron can take in such cases.

- *Affix and return the part in a proper container*

When returning a suspect Mtron part for analysis, always:

- Select a suitable shielding (**S**) shipping container, and
- Fix parts properly to prevent them from moving around or touching one another.

- *Pack the part in a shielding (S) bag or container for return shipment*

Electronic parts must be handled, packed and shipped appropriately. Shipments might go through rough uncontrolled areas and might be exposed to high electrical fields, for example, when a shipment is inspected by customs or when the shipment is exposed to high electrical fields from conveyor belt motor drives in logistic centers.

Consequently, electronic parts that are not packed in shielding (**S**) bags / containers can be easily damaged directly (direct discharge) or indirectly (electromagnetic pulse) by external electro static discharge (ESD) during shipment.

ESD-safe Packaging for Shipments:

Always use packing material that provides shielding (**S**) protection as illustrated below.

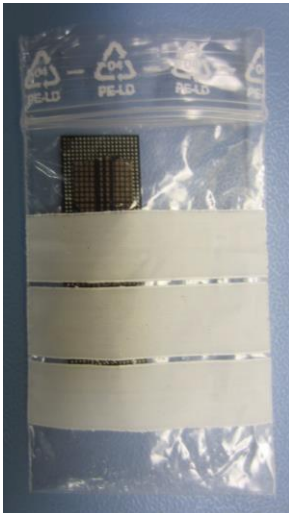


various examples of shielding bags and boxes

Although dissipative (**D**) “pink / green / blue” or conductive (**C**) “black” bags or containers provide protection against tribocharging, they do not protect against electric fields. These bags (examples illustrated above) can only be used within an ESD protected area (EPA*)!

Do not use standard plastic (PE-LD) bags or containers for shipments as these bags may charge up the parts inside.

Improper Packaging for Shipments:



plastic (PE-LD) bag⁴⁾



dissipative (**D**) “pink / green / blue” or conductive (**C**) “black” bags



If these types of packaging are used, the original issue may be masked by external ESD damage. Failure analysis of such a part might therefore give misleading results.

In summary, it is crucial to protect against external ESD during shipment. Mtron will only accept returned parts that are packed such that later damage can be ruled out. The interior of shielded bags / containers may be regarded as a “mobile EPA*”.

- *Include a detailed description of the alleged issue with the Mtron part*

To streamline analysis, Mtron requests that the following information be provided with any returns:

- Full orderable Mtron part number and customer part number;
- Customer reference number;
- A clear and detailed description of the alleged issue at the Mtron part level including, set-up and use conditions for stimulation of the alleged issue;
- Quantity, frequency and clustering, related volumes and observed potential failure rate of suspect Mtron parts;
- Photos of the suspect Mtron parts' top and bottom marking;
- Photos of the Mtron labels attached to the original shipping carton/boxes/bags or reels; and
- If possible, the schematic drawing of the application circuitry including set-up, voltage and current conditions of the suspect Mtron part in the customer application.

Failure to include the required information could jeopardize an efficient and successful analysis.

Summary

These guidelines are meant to enable an efficient and effective issue-solving process. Thank you for your careful attention to, and compliance with, these guidelines.