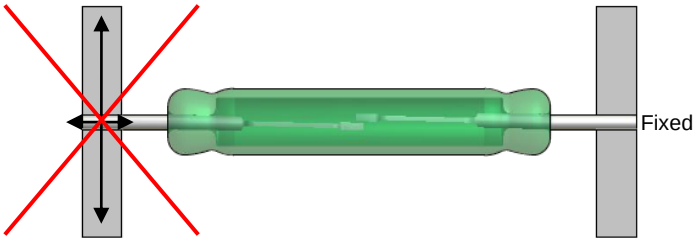
Introduction

A dry-reed switch can be defined as an assembly that contains two ferromagnetic NiFe contact blades, hermetically sealed in a glass envelope and filled with an inert gas. The inert gas atmosphere protects the contact resistance of the reed switch, which is one of its most important electrical performance characteristics. The inert atmosphere is maintained by the integrity of the critical glass-to-metal seal of the switch. This seal is defined as a "residual stress seal," which means that the seal is sensitive to handling. When properly made, this seal with maintain the inert gas atmosphere of the reed switch for a minimum of thirty (30) years. However, improper handling of the switch and the application of excessive mechanical force of the switch leads (for example) during assembly on prints may result in a loss of the seal hermeticity. If damage is caused, it might be immediately visible as a glass crack in the seal area with or without the evidence of chipped glass particles. Or a latent defect may be created that will deteriorate the seal hermeticity over time due to the residual stress of the seal being altered through the improper application of a mechanical force. Once the seal integrity is compromised, atmospheric oxygen and other contaminants will degrade the contact resistance and the life expectancy of the switch will be severely impacted.

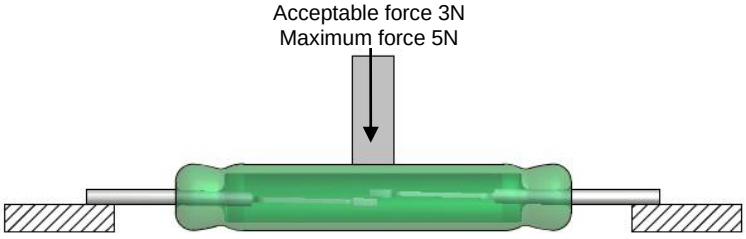
Switch Lead Handling Recommendations

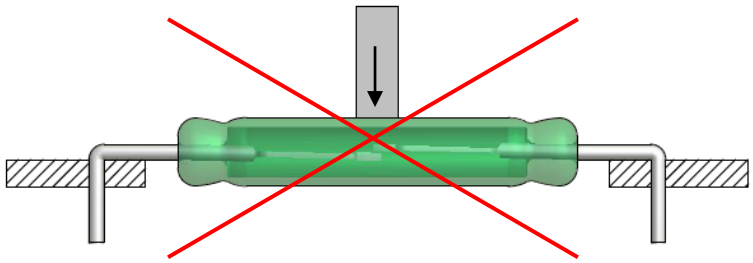
The glass seal has a very high resistance to pressure, but a low resistance to pull forces. The ability of the seal to properly withstand a switch lead handling is dependent on several factors: the relation of the wire-to-glass dimensions, the length of the seal, the pull force or type of handling to be performed, and the distance and direction of the mechanical force in relation to the seal itself.
Therefore, the proper support and clamping of the leads is necessary to avoid damage to the seal. Even then, the plastic deformation strain of the NiFe lead wires can be transmitted through the clamping area and into the seal. Depending on the combination of the force and the distance of the clamping area to the seal, damage may still result.

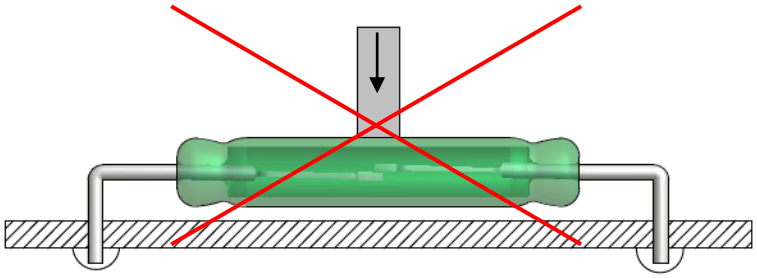
In the following figures, handling examples are given that are unacceptable.

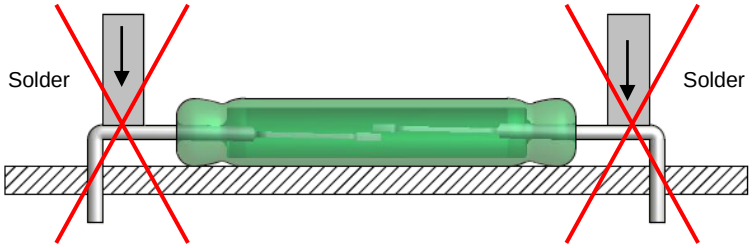


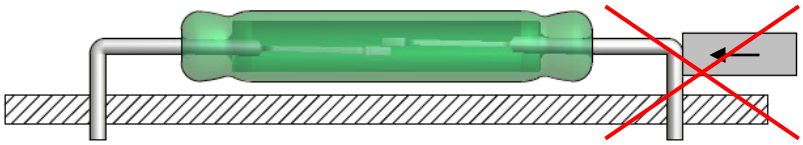
When possible don't add pressure on the glass on placing the reed switch on a pcb or device.
However when handling with a Pick and Place machine the acceptable force on the reed switch is 3N with a maximum of 5N

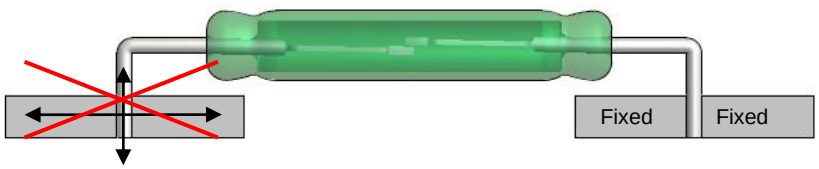




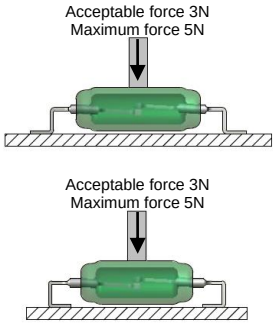



Solder
Solder

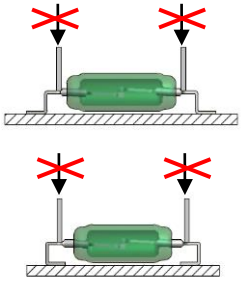



Fixed
Fixed

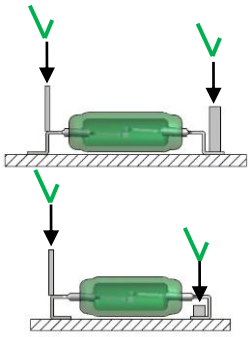
The handling of SMD switches are similar to the normal switches, but some bended SMD types needs to be handled different as the examples shown below.



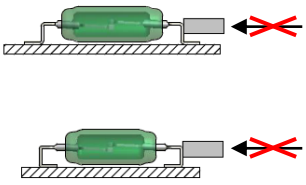
When possible don't add pressure on the glass on placing the SMD switch on a pcb or device.
This could result into glass cracks. However when handling with a Pick and Place machine the acceptable force on the reed switch is 3N with a maximum of 5N



Don't ad pressure on the leads, directly beside the glass-metal connection.
This could result into glass cracks.



Pressure can be applied directly on the horizontal bended SMD-pad
or straight on the vertical bended SMD-pad.



After soldering, don't apply pressure on the SMD-switch, for instance sideways.
This could result in bend SMD-pads, bend wire and glass cracks.

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