



APPLICATION NOTE

Lead Trimming for VPT DC-DC
Converters and Accessory Products

DC-DC CONVERTERS AND ACCESSORIES



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Introduction

VPT, Inc., a HEICO company, is dedicated to the highest level of quality. With expert, experienced personnel, state-of-the-art technology, and strict quality procedures, VPT produces reliable power supply products for the demanding environments of avionics, military, and space environments.

VPT's Hybrid Thick-film DC-DC Converters and Accessory Products are hermetically sealed to keep moisture and/or contaminants from entering the package cavity. Products of this type use a projection weld or seam weld process to create the hermetic seal between the lid and the package body. Depending on lead (pin) diameter/length and package configuration, products of this type will use either a matched or compression glass or brazed ceramic disc to create a hermetic seal between the lead and package body. This glass or ceramic seal also serves the dual purpose of electrically isolating the lead from the package body.

VPT Series Metal Packaged Hi-Rel COTS DC-DC Converters and Accessory Products are internally conformal coated and housed in a six-sided non-hermetic rugged metal enclosure to reduce moisture and contaminants from entering the package cavity. Products of this type use a non-electrically conductive isolator to create a seal between the lead and package body. This isolator also serves the dual purpose of electrically isolating the lead from the package body. These products should not be exposed to aqueous cleaning systems to avoid moisture ingress into the package that could potentially cause catastrophic failure.

VXR and VPT Series Fully Encapsulated Hi-Rel COTS DC-DC Converters and Accessory Products utilize VPT patented V-Shield® technique. This technique uses a hard epoxy fill that is more compatible with aqueous cleaning systems.

This document details the proper processes for trimming leads of products before integration into systems and applications while ensuring product safety and maintaining functional integrity. VPT welcomes customer inquiries into any areas not specifically covered in this document. Please contact your sales representative or the VPT Sales Department for more information.



Lead Trimming

VPT's products use uniform lead lengths across all standard product families. Customers may request a specific lead length as a paid custom modification. However, it is often more efficient to save cost and time by ordering a standard product and trimming the leads in-house. The lead trimming process, if not performed correctly, can either bend the leads at unacceptable angles or damage the seals. Leads trimmed by the customer should always be trimmed to length before insertion, attachment, or soldering into the application.

For hybrid products, seal damage can cause chip-out or micro-cracking, which can result in a loss of hermeticity. VPT performs 100% external visual inspection and leak testing after trimming leads for purchase order requirements to verify that the leads and seals have not been damaged as part of the trimming process. It is strongly suggested that customers do the same when performing these operations in-house. Micro-cracks are undetectable by the naked eye and require a visual test under high magnification. MIL-STD-883, Test Method 2009 and JEDEC JESD9 specify the proper visual inspection criteria to be used when determining acceptable bent lead angles or cracking, crazing, or chip-out of the glass or ceramic seals after trimming.

VPT recommends the following process when trimming leads:

1. Create a trimming fixture. One trimming block should be created for each type of VPT product used. It should be the same thickness as the desired final length of the lead and should be manufactured from aluminum or other similarly rigid, inexpensive, easily drilled and machined material. Holes should be drilled in the block in the locations for all pins of the product to be trimmed. These holes should be slightly larger than the pin diameter (approximately 0.010 to 0.020 inches) to guard against the scraping or bending of the leads during insertion and removal. The lead dimensions and locations are detailed in the product's corresponding datasheet located at www.vptpower.com/.
2. Insertion into the trimming fixture. The product should be inserted straight down over the holes until it sits flat on the trimming fixture, ensuring only the lead length to be trimmed, or waste area, is visible from the other side. See Figure 1.

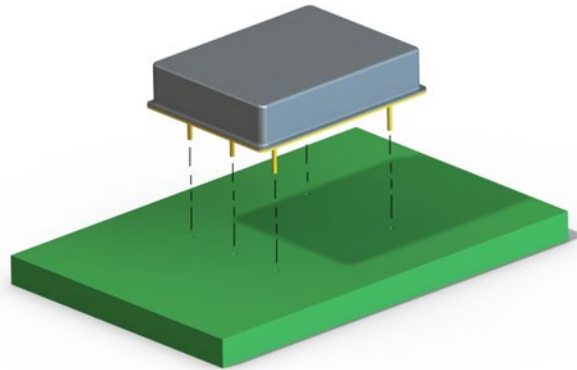


Figure 1

3. Position correctly. The trimming block and product should be placed upside down, with pins up, on a firm, ESD-safe surface that will keep the product and fixture from sliding. High quality flush cutters should be used to trim the leads even with the surface of the trimming block. See Figure 2.

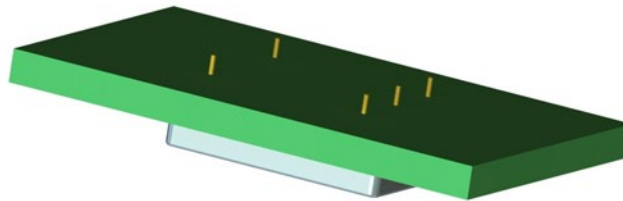


Figure 2

4. Test for success. After lead trimming is completed, VPT recommends that customers measure the final lead lengths with calipers. VPT also recommends a visual inspection and leak test to verify that the product remains undamaged after the trimming process.



Contact Information

For further information about any of VPT's products, policies, or programs contained herein, or to request a quotation or place orders please contact your sales representative or the VPT Inc. Sales Department at:

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