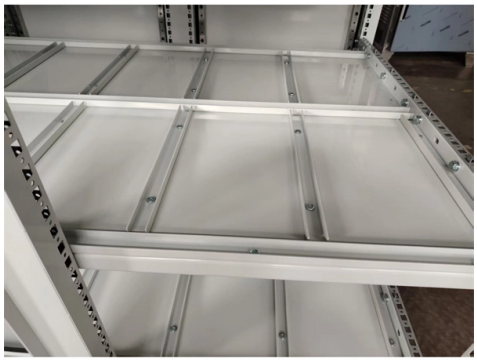
How to replace the ceramic core in an optocoupler



Overview

To compare TI digital isolators to optocouplers in standard interface circuits, see How to Replace Optocouplers with Digital Isolators in Standard Interface Circuits.

Key Takeaways

Directly replacing the ceramic core inside an optocoupler is not feasible; the recommended approach is to replace the entire optocoupler or use a compatible digital isolator. Why Direct Replacement is ImpracticalOptocouplers are sealed semiconductor devices that contain a light-emitting diode (LED) and a photodetector, often mounted on a ceramic or plastic substrate for insulation and thermal stability. The ceramic core is integral to the device's structure, providing electrical isolation and mechanical support.

Attempting to remove or replace it would destroy the internal alignment of the LED and photodetector, compromise insulation, and likely render the device nonfunctional.

Recommended Replacement Methods

Replace the Entire OptocouplerDisconnect the circuit from power and discharge all components. Desolder the existing optocoupler carefully using a soldering station and desoldering pump or wick. Insert a new optocoupler in the correct orientation and solder it in place.

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Clean the board with isopropyl alcohol to remove flux residue and reassemble the device. Use a Digital Isolator as a Drop-In ReplacementModern digital isolators, such as the Si87xx series, can replace traditional optocouplers without PCB modifications. These devices emulate the LED-photodetector behavior and maintain pin compatibility, timing, and logic behavior, while offering improved reliability and faster response.

When using a digital isolator, you may need to adjust the input resistor to match the original optocoupler's current requirements.

Safety Considerations

Always disconnect power before working on the circuit. Avoid applying excessive heat to surrounding components during desoldering. Ensure the replacement device meets the voltage isolation and safety ratings of the original optocoupler.

Conclusion

Instead of attempting to replace the ceramic core, which is not serviceable, the practical solution is to replace the entire optocoupler or upgrade to a compatible digital isolator. This approach preserves circuit functionality, maintains electrical isolation, and ensures long-term reliability.

Article Content

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A: Most simulation software provide within their standard library a basic set of optocoupler PSpice models. These generic type of models are mostly made for ambient temperatures of 25 °C and serve

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For example, the Si87xx digital isolators from Skyworks directly replace 6- and 8-pin optocouplers and are suitable for both optocoupler retrofit and new system designs. They directly connect to existing

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