Isolated Relay Weld Detection in Onboard Chargers



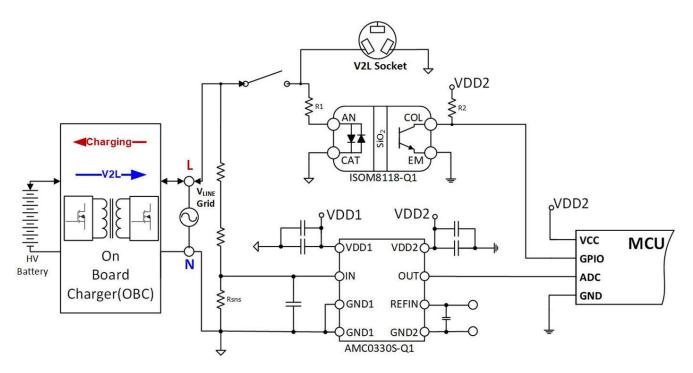


Figure 1. Circuit for Relay Weld Detection Based on ISOM8118-Q1

Design Considerations

- Relay Weld Detection for OBCs in V2L With Opto-emulators
- [FAQ] What is an Opto-emulator? | [FAQ] Opto-Emulator FAQ's | [FAQ] What are the benefits?
- Allows for low-cost, isolated, relay weld detection OBC systems
- Performance upgrade from traditional optocouplers; allows tight CTR performance with no LED aging.
- Introduction to Opto-Emulators
- · Opto-emulators explained: Why you should upgrade your optocoupler technology

Need additional assistance? Ask our engineers a question on the *TI E2E™ Isolation Support Forum*.

Recommended Parts

Analog Output Opto-Emulators

Catalog Part Number	Automotive Part Number	Input Type	Output Type	V _F (MAX)	CTR
ISOM8115	ISOM8115-Q1	- AC Input	Open-collector / transistor output	1.5V	100% to 155%
ISOM8116	ISOM8116-Q1			1.5V	150% to 230%
ISOM8117	ISOM8117-Q1			1.5V	255% to 380%
ISOM8118	ISOM8118-Q1			1.5V	375% to 560%

To find a pin-to-pin alternative to the optocouplers in your design, search TI's *cross reference tool*. For more opto-emulators, browse through the *online parametric tool*.



Resistor selection

R1 is used to limit the amount of current flowing into the AN pin and output a low-level logic when the AC discharge port reaches the threshold V_{TH} . Therefore, R1 needs to satisfy:

$$R_1 < (V_{TH} - V_F) \div I_{Fmin} \tag{1}$$

R2 is selected to make sure that ISOM8118-Q1 outputs a low level after the input drops below the threshold at the minimum CTR, and avoid an over-current at the ISOM8118-Q1 output. Therefore R2 resistance must satisfy:

$$(V_{DD2} - V_{CE(SAT)}) \div I_{CMAX} < R_2 < (V_{DD2} - V_{CE(SAT)}) \div (I_{Fmin} \times CTR_{MIN})$$

$$(2)$$

For more details on the application and design considerations please see Relay Weld Detection for OBCs in V2L With Opto-emulators

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Last updated 10/2025