Product Overview

Isolating and Detecting AC/DC Voltage in EV Charging

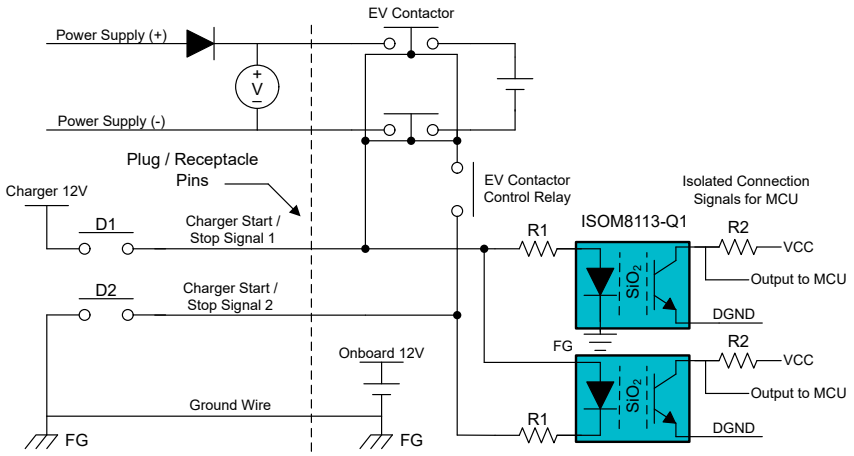

Figure 1. Example Circuit to Use ISOM8113-Q1 to Detect Charging Connections

Design Considerations

- [FAQ] What is an Opto-emulator? | [FAQ] Opto-Emulator FAQ's | [FAQ] What are the benefits?
- Low-cost, Automotive-qualified isolation for charging standards (CHAdeMO, GB/T, COMBO1, COMBO2)
- Drop-in replacement for transistor output opto-emulators
- 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
- Upgrade photoMOS, SSR and Push-Pull, Totem-Pole, or Transistor Output Optocouplers With Opto-emulators
- Taking charge of electric vehicles – both in the vehicle and on the grid
- TIDA-010939: Electric Vehicle Supply Equipment Front-End Controller Reference Design

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

Recommended Parts

Transistor Output Opto-Emulators

Catalog Part Number	Automotive Part Number	Input Type	Output Type	V_F (MAX)	I_F(MIN)	CTR
ISOM8113	ISOM8113-Q1	DC Input	Open-collector / transistor output	1.4V	700µA	375% to 560%
ISOM8118	ISOM8118-Q1	AC Input		1.5V	700µA	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 input of the opto-emulator. For best results, the high-level input current can be I_F = 1mA to allow for margin over the I_F(MIN) = 700µA. Therefore, R1 must be selected to satisfy:

$$R_1 < (V_{IN} - V_F) \div I_{Fmin} \quad (1)$$

The pull-up resistor R2 is selected to make sure that ISOM8113-Q1 outputs a low level after input the goes high. Select an R2 to limit the collector current below to the desired output current. For best switching performance, R2 is normally between 1kΩ to 25kΩ to operate the device in saturation mode. For more details on the application and design considerations, see [FAQ] ISOM8110: How do I design ISOM8110 to have the best timing performance for switching applications?

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