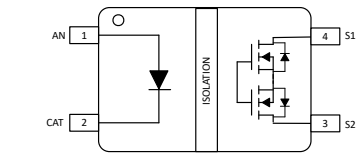
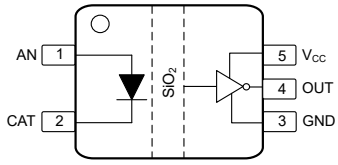
Product Overview

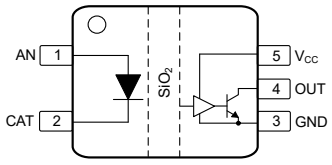
Upgrade photoMOS, SSR and Push-Pull, Totem-Pole, or Transistor Output Optocouplers With Opto-emulators



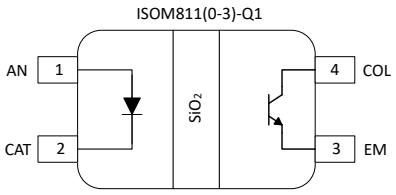
PhotoMOS, Photorelay, Solid State Relay (SSR)



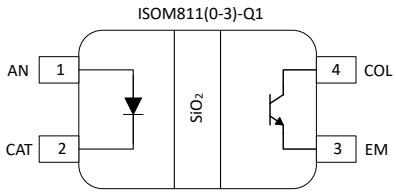
Push-Pull or Totem-Pole Output



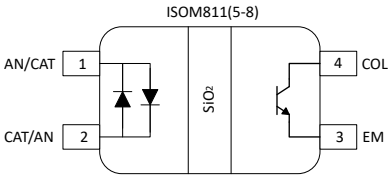
Open-Collector Output



DC Input; Transistor Output



Automotive AEC-Q100 Transistor Output



AC Input; Transistor Output

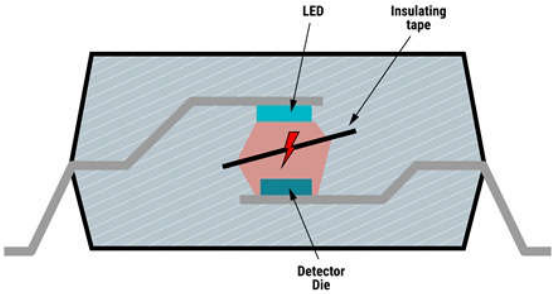


Figure 1. Construction of Typical Light-Based Isolated Optocoupler

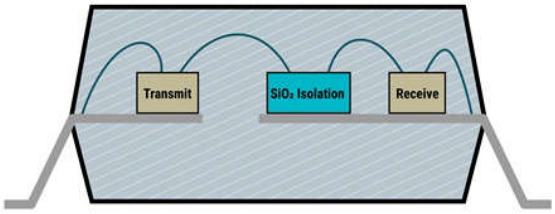
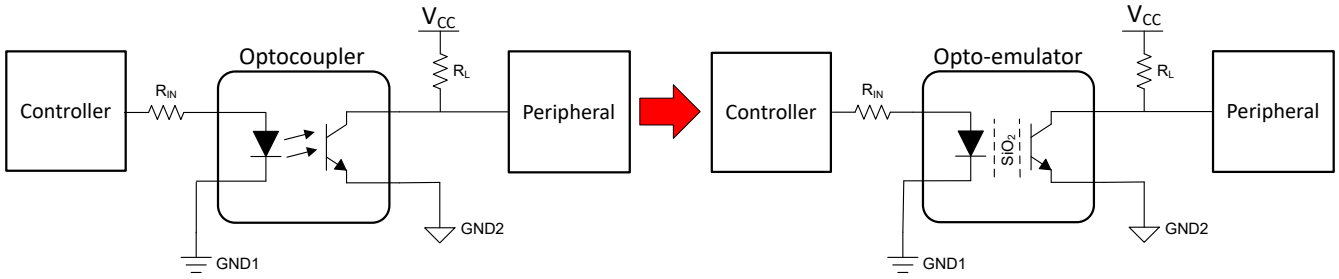


Figure 2. Construction of a TI Silicon Dioxide Isolated Opto-emulator



Light-based Optocoupler Function is the Same as Using Silicon Dioxide Opto-emulator

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Design Considerations

- TI offers opto-emulators with different output types: High-speed logic output, push-pull or totem-pole, open-collector output, transistor output, and MOSFET or switch output
- Automotive AEC-Q100 optocoupler functionality in more reliable silicon based technology enabling new, lower cost architectures, such as secondary side regulation in DC/DC converters.
- Opto-emulators are pin-to-pin drop-in replacements for logic output and transistor output optocouplers, photoMOS, and low power solid state relays (SSR)
- Opto-emulators have the same functionality of a current driven input and light (LED) based isolation optocoupler but TI's opto-emulators use a more reliable silicon dioxide isolation technology.
- Protects low-voltage system components from high-voltage circuits
- Allows signal transfer between controller devices and peripheral ICs

Additional Resources

- [FAQ] What are the benefits of Opto-emulators vs. Optocouplers?
- [FAQ] Opto-emulators - Top Questions, Answered
- Demystifying Isolation Certification Standards: Optocouplers vs Opto-emulators
- Opto-emulators explained: Why you should upgrade your optocoupler technology
- Opto-emulators | TI.com

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

Recommended Parts

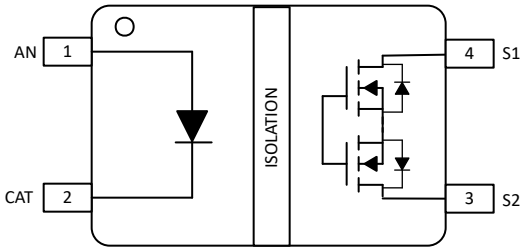

Figure 3. PhotoMOS, Photorelay, Solid State Relay (SSR)

Part Number	Output Type	Output Blocking Voltage	Output Current	Isolation rating	Pin-to-Pin photoMOS
ISOM8610	MOSFET / switch	80V	150mA	V_{ISO} = 3750V_{RMS} V_{IOWM} = 500V_{RMS}	CPC1017N VO1400AEF TLP175A AQY221N2VY APY212S TLP3441 ASSR-1218-003E and more
ISOM8600				V_{IOWM} = 500V_{RMS}	

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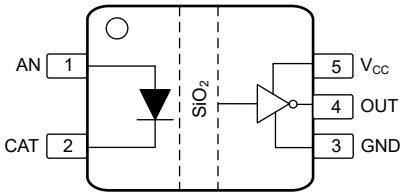

Figure 4. Push/Pull or Totem-Pole Output

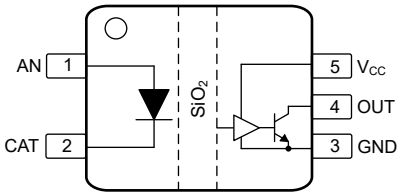

Figure 5. Open-Collector Output

Table 1. High-Speed Logic Output Optocouplers

Part Number	Output Type	V_{CC}	Data Rate	Pin-to-Pin High-Speed Logic output Optocouplers
ISOM8710	Push/Pull Totem-pole	2.7V to 5.5V	25Mbps	ACPL-M21L ACPL-M75L TLP2366 LTV-M601 and more
ISOM8711	Open Collector			ACPL-M62L-000E TLP2719 HCPL-M600 and more

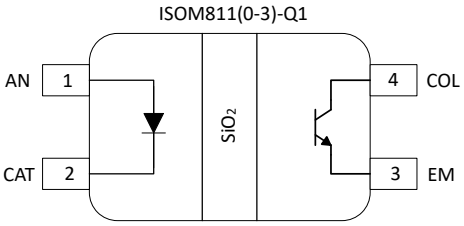

Figure 6. DC Input; Transistor Output

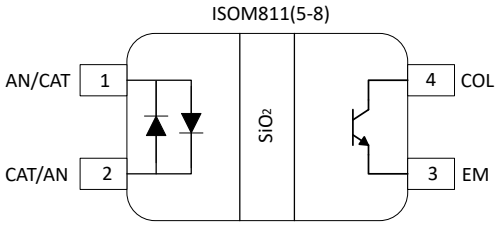

Figure 7. AC Input; Transistor Output

Table 2. Transistor Output Optocouplers

Catalog Part Number	Automotive Part Number	Input Type	Output Type	V_F (MAX)	CTR	Pin-to-Pin Transistor Output Optocouplers
ISOM8110	ISOM8110-Q1	DC Input	Transistor output / Open Collector	1.4V	100% to 155%	HCPL-181 ACPL-217 LTV356T LTV357T TLP185 TLP181 PS2701A PS2811-1 EL816 EL3H7 and more
ISOM8111	ISOM8111-Q1			1.4V	150% to 230%	
ISOM8112	ISOM8112-Q1			1.4V	255% to 380%	
ISOM8113	ISOM8113-Q1			1.4V	375% to 560%	
ISOM8115	ISOM8115-Q1	Bidirectional AC Input		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*.

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