



## DIG-12-08-045 OPTO-ISOLATED PHOTOVOLTAIC ISO-GATE™ MOSFET DRIVERS

**Features:**

- Completely Isolated Voltage Signal Generation
- Dielectrically Isolated
- Logic Circuit Compatibility
- High Open Circuit Voltage
- High Operating Temperature
- Fast Response Time
- High Isolation Resistance
- Excellent Input/Output Linearity
- Self Limiting Gate Voltage

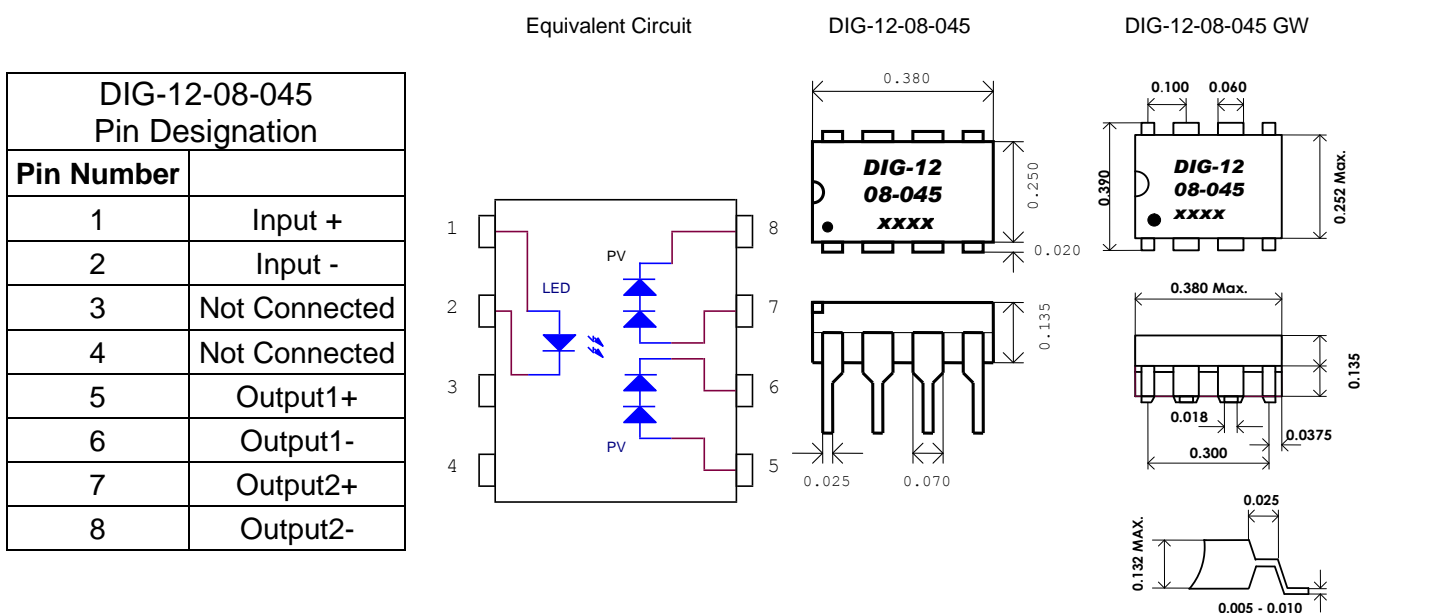
**Applications:**

- Gate Drive For MOS devices
- Gate Drive For SCR
- Solid-State Relays
- Interface Between Logic Circuits & External Loads
- A.T.E. (Automatic Test Equipment)
- Switching Equipment
- Isolation Amplifiers
- Load Control From Microprocessor I/O Ports
- Thermocouple Open Detectors

**Description:**

The photovoltaic MOSFET driver is a State-of-the-Art, optically coupled floating power source used primarily to control MOSFETs when electrical isolation between input and output is required. The ISO-GATE™ is a state-of-the-art opto-isolator incorporating DIONICS' photovoltaic (PV) diode arrays and an infrared LED. The diode array is a unique I.C. consisting of series-connected photovoltaic diodes. The diodes are completely isolated from each other and from their common substrate by means of SiO<sub>2</sub> Dielectric Isolation (DI). These photovoltaic output chips are electrically isolated but optically coupled to the LED.

The typical input circuit to the LED is a limiting resistor connected in series with the LED. When activated, the LED emits infrared light towards the photovoltaic diode array, which then responds by generating an open circuit voltage (Voc). This Voc is floating and is therefore completely isolated. The Voc value depends on the LED input drive and load impedance. DIONICS, Inc offers a wide variety of package styles including low-cost plastic Mini-DIP's, high reliability TO-5 metal cans, 8-pin ceramic side brazed DIP's and ceramic chip carriers for hybrid manufacturers. Other custom packages and custom designs are also available. Surface mount gull wing packages are also available.



DIG-12-08-045 Photovoltaic Mosfet Driver

❖ <b>Absolute Maximum Ratings (<math>T_a = 25^{\circ}\text{C}</math>)</b>		
LED Forward Current	Steady State	100 Ma
LED Forward Current	Peak 10% Duty Cycle	250 Ma
LED Forward Voltage	$I_f = 20\text{Ma}$	3.4V
LED Reverse Current	$V_r = 3\text{V}$	100 $\mu\text{A}$
LED Reverse Voltage		5V
Output Forward Voltage	$I_f = 10\mu\text{A}$	20V
Lead Soldering Time	At $260^{\circ}\text{C}$	10 sec
Storage Temperature		-50 to $125^{\circ}\text{C}$
Power Dissipation		150 Mw

❖ **Individual Channel Electrical Characteristics ( $T_a = 25^{\circ}\text{C}$ )**

Parameter	Symbol	Min.	Typ.	Unit
Open Circuit Voltage $I_{led} = 2\text{Ma}$	$V_{oc}$		8.0	V
$I_{led} = 10\text{Ma}$		8.5	9.0	V
$I_{led} = 30\text{Ma}$		9.5	10.0	V
Short Circuit Current $I_{led} = 2\text{Ma}$	$I_{sc}$		1.0	$\mu\text{A}$
$I_{led} = 10\text{Ma}$		4.0	8.0	$\mu\text{A}$
$I_{led} = 30\text{Ma}$		12.0	25.0	$\mu\text{A}$
Turn-On Time $I_f = 50\text{ Ma}; C = 10\text{Pf}$ $P.W = 100\mu\text{s};$ $f = 1\text{kHz}; R_s = 10\text{M}\Omega$	$T_{on}$	-	8.0	$\mu\text{s}$
Temp. Coefficient (Channels in Series)	$\Theta$	-	-100	$\text{Mv}/^{\circ}\text{C}$
Isolation Voltage $I_{iso} = 50\mu\text{A} @ 2\text{ sec}$	$V_{iso}$	2500		
Operating Temp. (Channels in Series)	$T_{op}$	-50 $^{\circ}\text{C}$ To +100 $^{\circ}\text{C}$		
Turn-Off Time $I_f = 50\text{ Ma}; C = 10\text{Pf}$ $P.W = 100\mu\text{s};$ $F = 1\text{kHz}; R_s = 10\text{M}\Omega$	$T_{off}$	The Photovoltaic array stops generating current within one microsecond of the trailing edge of LED current the discharge time is solely dependent upon discharge circuitry and capacitive load.		