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DIG-1612-DD MOSFET Driver With Dynamic Discharge*

*US Patent 4,931,656

Features:

- Fast Turn Off, Active Gate Discharge
- 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

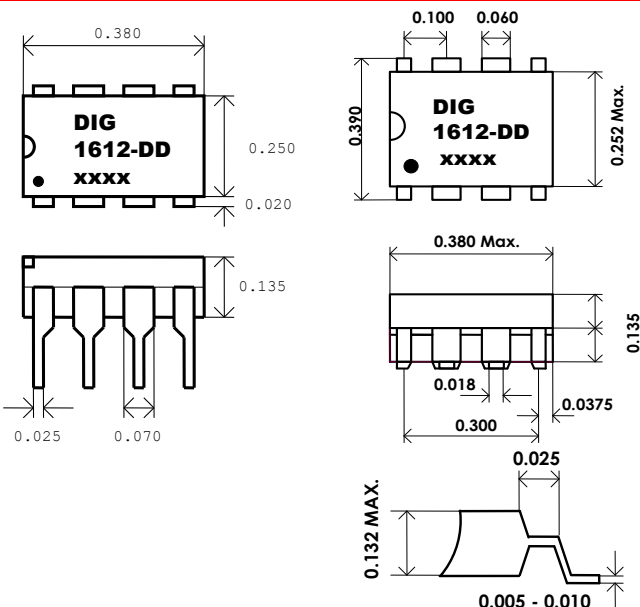
Applications:

- 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:

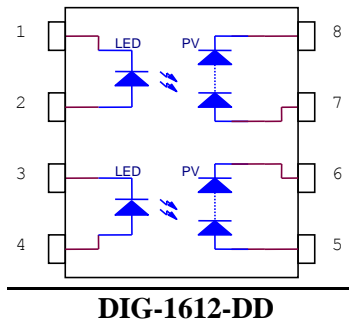
The photovoltaic MOSFET driver is a State-of-the-Art, optically coupled floating power source used primarily to control MOSFETs when electrical isolation between input and output is required. The ISO-GATE™ is a state-of-the-art opto-isolator incorporating DIONICS' photovoltaic (PV) diode arrays and an 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 SiO₂ 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. This part is available in a plastic mini-dip or surface mount gull wing package.



Pin Designation	
Pin Number	DIG-1612-DD
1	Input 1-
2	Input 1+
3	Input 2-
4	Input 2+
5	Output 2+
6	Output 2-
7	Output 1+
8	Output 1-

DIG-1612-DD MOSFET Driver With Active Dynamic Discharge



❖ Absolute Maximum Ratings (T_a = 25 °C)		
LED Forward Current	Steady State	100 mA
LED Forward Current	Peak 10% Duty Cycle	150 mA
LED Reverse Voltage		10V
Output Discharge Current		15mA
Operating Temperature Range		-20 to 100 °C
Storage Temperature		-50 to 125 °C
Power Dissipation		100 mW

❖ **Individual Channel Electrical Characteristics (T_a =25 °C)**

<i>Model Number</i>		<i>DIG-1612-DD</i>			<i>Unit</i>
Parameter & Test Condition	Symbol	Min.	Typ.	Max.	
Open Circuit Voltage					
I _{led} = 10mA	V_{oc}	13.0	14.0		V
I _{led} = 30mA		14.5	14.8		V
Short Circuit Current					
I _{led} = 10mA	I_{sc}	2.0			μA
I _{led} = 30 mA		6.0			μA
LED Forward Voltage	V_r				
I _f = 20mA		-	1.3	1.7	V
LED Reverse Current	I_r				
V _r = 5V		0.1	10.0		μA
Off State Voltage	V_{off}				
I _{off} = 10μA; I _{led} = 0mA		-	0.65	1.00	V
Isolation Voltage	V_{iso}	2500	-	-	VDC
Temperature Coefficients	θ V	-	60	-	mV / °C
I _{led} = 10mA	θ I	-	0.5	-	%I / °C
Turn-On Time	T_{on}				
I _{led} = 30 mA		-	100	-	μs
C = 1500pF; V _{oc} to 10%					
Turn-Off Time	T_{off}				
I _{led} = 30 mA C=1500pF; V _{oc} to 50%		-	3.0	6.0	μs