



DIONICS-USA INCORPORATED

96-B Urban Avenue
Westbury, NY 11590

Phone: (516) 997-7474

Fax: (516) 997-7479

Website: www.dionics-usa.com

CR54SM

Surface Mount Photovoltaic MOSFET / IGBT Driver

Features:

- Optically Isolated; High Isolation Resistance
- Constructed For Surface Mount Assembly
- Suitable For Manual or Automatic Placement
- Sturdy Construction, Immune To Handling Damage
- Hermetic Construction
- Dielectrically Isolated PV IC Construction
- High Open Circuit Voltage Up To 19.5V
- Fast Turn On, Turn Off & Active Gate Discharge

Applications:

- MOSFET/IGBT Driver
- Medical Implant Application
- Aerospace/Aircraft Solid-State Relays
- A.T.E. (Automatic Test Equipment)
- Medical Test Equipment
- Isolation Amplifiers
- Load Control From Microprocessor I/O Ports
- Thermocouple Open Detectors

Description:

The surface mount CR54SM Photovoltaic (PV) is a State-of-the-Art, optically coupled floating power source used primarily to control MOSFET/IGBT's when electrical / optical isolation between input and output is required.

In addition to the infrared LED and PV diode array, each of the CR54SM devices contains circuitry that rapidly discharges the power MOSFET/IGBT gate when the LED is deactivated. The unique rapid discharge feature of the CR54SM makes it particularly useful for high side switching of MOSFET/IGBT's in DC motor control and switching regulator applications. The rugged design features a metal top and metal bottom. It is therefore ideal for manual or automatic vacuum-pencil assembly methods, with handling damage almost impossible. Construction of the CR54SM permits use of either standard solder assembly methods (and flux-removal cleaning) or conductive epoxy attachment to substrates. Footprint dimensions are only 0.360 with a height of 0.197 inches max.

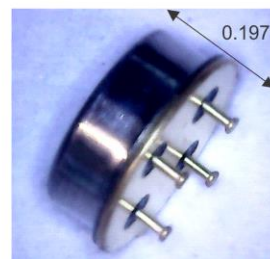
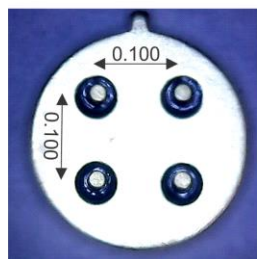
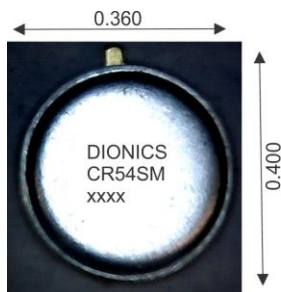
The typical input circuit to the LED is a limiting resistor connected in series with the LED. When activated, the LED emits infrared light towards the photovoltaic diode array, which then responds by generating an open circuit voltage (V_{oc}) and disabling the turn off circuitry. The self-limiting photovoltaic output of the diode array is floating and therefore, can be safely applied directly to the MOSFET/IGBT, regardless of the source potential of the MOSFET/IGBT. When the LED is deactivated, the active turn-off circuit discharges the capacitive input of the MOSFET/IGBT. The active turn-off circuitry is designed such that the turn-off time of the MOSFET/IGBT is relatively independent of the input capacitance over a range of 300 to 15000 pF.

CR54SM Layout and Configuration

0.360x0.400x0.197h

0.100 spacing

0.197 total height
Posts are 0.03 wide
Posts are 0.65 long



Lead Number	Function
1	+ Input
2	- Input
3	+ V_o
4	- V_o

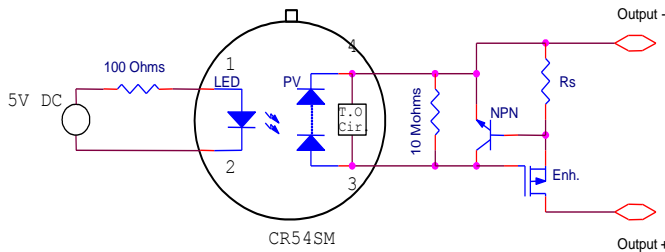
CR54SM Photovoltaic MOSFET/IGBT Driver

❖ Absolute Maximum Ratings (T_a = 25°C)		
LED Forward Current	Steady State Peak 10% Duty Cycle	100 mA
LED Forward Current		150 mA
LED Reverse Voltage		10V
Output Discharge Current		15mA
Operating Temperature Range		-55°C to 125 °C
Storage Temperature		-55°C to 150 °C

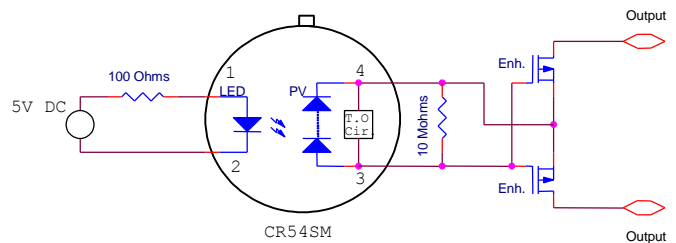
Electrical Characteristics (T_a = 25°C Unless otherwise specified)

<i>Model Number</i>	<i>CR54SM</i>				<i>Unit</i>
Parameter & Test Condition	Symbol	Min.	Typ.	Max.	
Open Circuit Voltage					
I _{led} = 10mA	V_{oc}	14.0	15.0	18.0	V
I _{led} = 30 mA; 50% Duty Cycle		15.0	16.0	19.5	V
Short Circuit Current					
I _{led} = 10mA	I_{sc}	-	6.0	-	μA
I _{led} = 30 mA; 50% Duty Cycle		15.0	20.0	-	μA
LED Forward Voltage					
I _f = 20mA	V_f	-	1.3	1.7	V
LED Reverse Current					
V _r = 5V	I_r	0.1	10.0	-	μA
Off State Voltage					
I _{off} = 10μA; I _{led} = 0mA	V_{off}	-	0.65	0.75	V
Isolation Voltage	V_{iso}	1000	-	-	VDC
Temp. Coefficients	⊖ V	-	60	-	mV / °C
I _{led} = 10mA	⊖ I	-	0.5	-	%I / °C
Turn-On Time					
I _{led} = 30 mA C=1500pF; V _{oc} to 50%	T_{on}	-	100	-	μs
Turn-Off Time					
I _{led} = 30 mA C=1500pF; V _{oc} to 50%	T_{off}	-	3.0	6.0	μs

Typical Applications



*Power MOSFET Photovoltaic N/O Relays
With Short Circuit Protection*



*Power MOSFET Photovoltaic
SPST N/O AC-DC Relays*