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## DIH-134-SM Power MOSFET Dual N/O SPST Photovoltaic DC Relay

### Features:

- Package Contains Two N/O DC Relays
- Fast Switching Speeds
- Optically Isolated to 400V DC.
- Immune to False Triggering
- Hermetic Gull-Wing Surface Mount Package
- Y-Level MIL-Screening Available (**DIH-134-SMY**)
- Designed to Meet MIL-R28750 and 28V DC System Surge and Spike Requirement of MIL STD-704.
- Operation Temp.  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  @ 200mA Load (*Above  $85^{\circ}\text{C}$  Derate Load 5mA /  $^{\circ}\text{C}$* )

### Applications:

- Replacement of Mechanical Relays
- Motor Control & Power Control
- Aircraft Flight Control Systems
- A.T.E (Automatic Test Equipment)
- Load Control From Processor I/O Ports
- Power Supply Circuits
- Medical Electronics
- Tactical Aircraft

### Description:

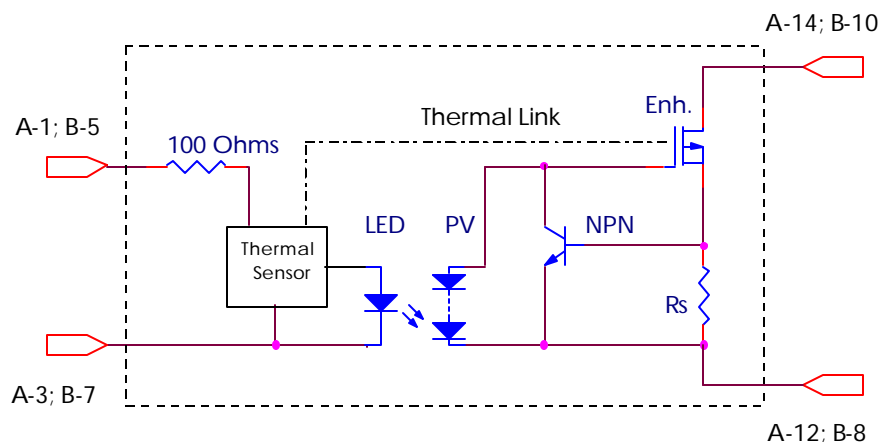
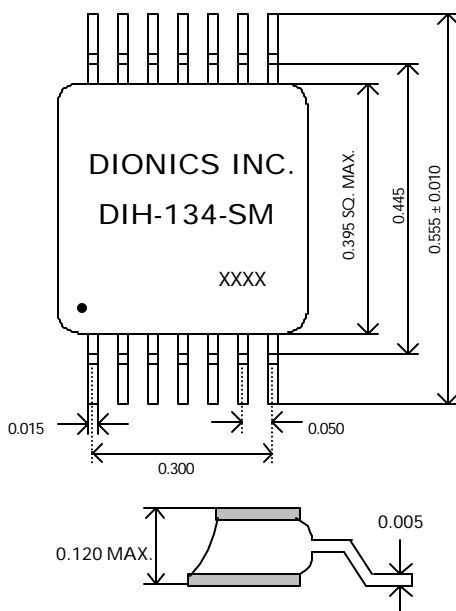
The DIH-134-SM is a State-of-the-Art Photovoltaic Solid State Relay designed for 28V DC Aircraft power applications where speed, current overload protection and immunity to transient voltages are critical.

The DIH-134-SM contains current limiting networks and thermally sensitive integrated circuits that disable the output, if the output MOSFETs approach an unsafe operating temperature. Because the thermally sensitive integrated circuits have built-in hysteresis, the output MOSFETs are automatically restarted when a safe temperature is reached. This auto restart feature eliminates the need for system restart signals. If the overload condition continues to exist, the cycle is repeated; if the overload condition is removed, the relay returns to normal operation.

The gull-wing surface mount package contains two independent N/O relays, with separate LED inputs and optically isolated power MOSFET outputs. Each relay, A or B, is capable of carrying 350mA DC continuous current and 500mA DC peak current. Each LED optically couples to a Photovoltaic (PV) IC chip which responds by generating a voltage. This voltage is internally connected to the Gate and Source terminals of the output MOSFETs, thus controlling their current. The DIH-134-SM is also available screened to military specifications, as required.

### Package Layout:

### DIH-134-SM Equivalent Circuit:



# DIH-134-SM: Power MOSFET Dual SPST Photovoltaic DC Relay

**Electrical Characteristics:** (Per Relay @ 25<sup>0</sup>C unless otherwise specified)

- ❖ Relay A: Normally Open (N/O)
- ❖ Relay B: Normally Open (N/O)

## ❖ Pin Designations

Relay	Pin Number	Inputs	Pin Number	Outputs
Relay A	1	A +	14	Drain A +
	3	A –	12	Source A –
Relay B	5	B +	10	Drain B +
	7	B –	8	Source B –
	2,4,6	NC	9,11,13	NC

## ❖ Input Characteristics

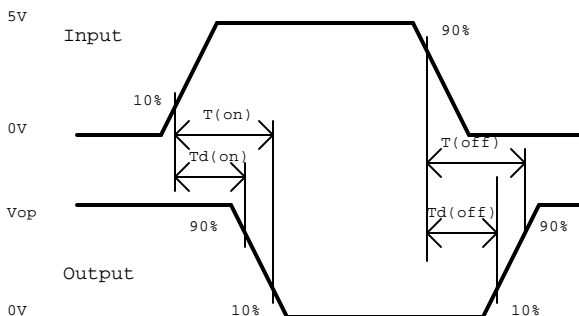
Symbol	Parameter	Min.	Typ.	Max.	Unit
<b>I<sub>in</sub></b>	Input Current	5.0	15.0	24.0	<b>mA</b>
<b>V<sub>in</sub></b>	Input Voltage Drop	1.3	—	1.5	<b>V</b>
<b>V<sub>rev.</sub></b>	Reverse Voltage	—	—	10.0	<b>V</b>
<b>V<sub>on</sub></b>	On State Voltage	3.5	—	—	<b>V</b>
<b>V<sub>off</sub></b>	Off State Voltage	—	—	1.5	<b>V</b>

## ❖ Output Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Conditions
<b>I<sub>load</sub></b>	Load Current	—	350 / 500	<b>mA</b>	Continuous / Peak
<b>R<sub>on</sub></b>	On Resistance @ T <sub>a</sub> = 85 °C	—	2	<b>W</b>	I <sub>in</sub> =18 (mA); I <sub>load</sub> = 100mA
		—	3	<b>W</b>	I <sub>in</sub> =18 (mA); I <sub>load</sub> = 100mA
<b>I<sub>leak</sub></b>	Leakage Current	—	10	<b>mA</b>	V <sub>op</sub> =90 (V)
<b>R<sub>iso</sub></b>	Input/Output Resistance	10 <sup>8</sup>	—	<b>W</b>	
<b>V<sub>op</sub></b>	Operating Voltage	28	60	<b>VDC</b>	Limited by Power Dissipation
<b>BV</b>	Breakdown Voltage	—	95	<b>VDC</b>	At 100 µA
<b>T<sub>on</sub></b>	Turn-On Time	150	300	<b>ms</b>	V <sub>in</sub> = 4.5V, P.W* = 100ms; V <sub>op</sub> = 30V
<b>T<sub>off</sub></b>	Turn-Off Time	20	40	<b>ms</b>	V <sub>in</sub> = 4.5V, P.W =100ms; V <sub>op</sub> = 30V
<b>V<sub>iso</sub></b>	Input-Output Isolation	—	400	<b>V</b>	DC
<b>P</b>	Maximum Power Dissipation	—	400	<b>mW</b>	In Free Air

PW\*: Pulse Width.

## ❖ Timing Diagram



## ❖ Environmental Ratings:

- Storage Temperature: -55<sup>0</sup>C to +125<sup>0</sup>C
- Constant Acceleration: 5000G
- Hermeticity: + Gross 1x10<sup>-5</sup> atm cc/sec  
+ Fine 5 x 10<sup>-8</sup> atm cc/s \*\*

\*\* When screened to MIL-Specs.