



DIH-1378 Power MOSFET SPDT Photovoltaic AC-DC Relay

Features:

- Two AC-DC Relays; One N/C, One N/O
- Easily Connected as Single AC-DC, SPDT Relay
- Fast Switching Speeds, 60 μ s Max.
- Low Level Logic Compatibility
- Immune to False Triggering
- Small size, Hermetic 8-pin SIP Package
- High Isolation Voltage
- Designed to Meet MIL-R28750

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
- High-side DC Power Switching
- Power Supply Circuits
- Medical Electronics

Description:

The DIH-1378 is a State-of-the-Art Photovoltaic Solid State Relay designed for special AC-DC switching power applications where package space efficiency and high reliability are critical.

Each package contains two independent relays. One is normally closed (N/C) and the other is normally opened (N/O). Both relays are built with separate input LEDs and optically isolated power MOSFET outputs. The N/C and N/O outputs are able to operate either AC or DC. Connecting the two inputs either in series or parallel (depending on available power supply) will convert the (N/C), (N/O) of DIH-1378 from 2 single SPST relays into a single SPDT configuration.

Each relay, A or B, is capable of carrying 150mA AC or DC continuous current and 250mA 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-1378 is also available screened to military specifications, as required.

Truth Table

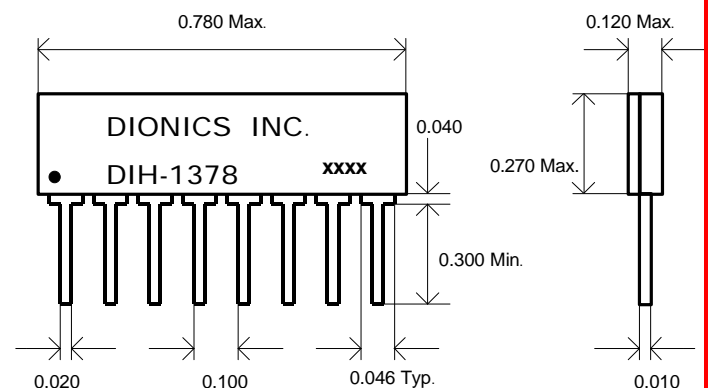
Relay	Input	Output
A Pins 1-4	Low	Close
	High	Open
B Pins 5-8	Low	Open
	High	Close

Pin Designations

Pin number	Function	Relay	Status
1	Input +	A (N/C)	Normally Close
2	Input -		
3	Output		
4	Output		
5	Input +	B (N/O)	Normally Open
6	Input -		
7	Output		
8	Output		

* Package Layout:

Weight 1.5 Grams

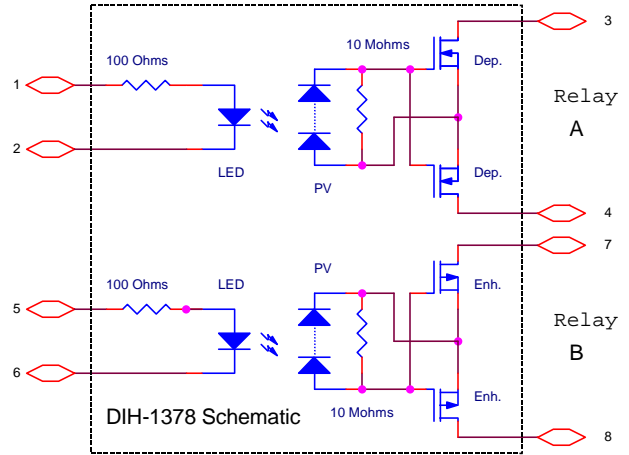


DIH-1378: Power MOSFET SPDT Photovoltaic AC-DC Relay

Electrical Characteristics (@ 25 °C unless otherwise specified):

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

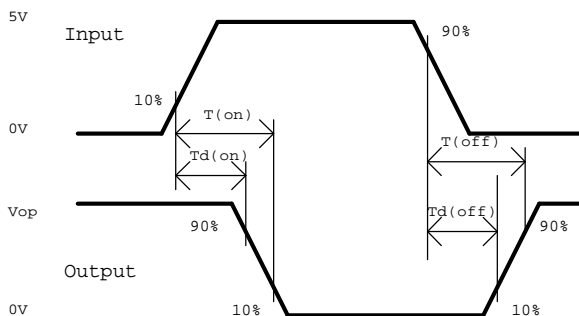
❖ Input Characteristics (Per Relay)					
Symbol	Parameter	Min.	Typ.	Max.	Unit
I_{in}	Input Current	5.0	20.0	30.0	mA
V_{in}	Input Voltage Drop	1.3	—	1.5	V
$V_{rev.}$	Reverse Voltage	—	—	10.0	V
V_{on}	On State Voltage (A)	—	—	1.2	V
	On State Voltage (B)	3.5	—	—	V
V_{off}	OFF State Voltage (A)	3.5	—	—	V
	OFF State Voltage (B)	—	—	1.2	V



❖ Output Characteristics						
Symbol	Parameter	Relay	Typ.	Max.	Unit	Condition
I_{load}	Load Current	A	—	150 / 250	mA	Continuous / Peak
R_{on}	On Resistance	A	8	20	W	$I_{in}=20$ (mA); $V_{op}=80$ (V)
		B	8	20	W	$I_{in}=20$ (mA); $V_{op}=80$ (V)
V_{op}	Operating Voltage	A or B	30	80	V	AC or DC
BV	Breakdown Voltage	A or B	—	100	V	DC
T_{on}	Turn-On Time	A	15	60	ms	$V_{in}=3.5V$, P.W* = 100 μ s; $V_{op}=30V$
		B	15	60	ms	$V_{in}=3.5V$, P.W = 100 μ s; $V_{op}=30V$
T_{off}	Turn-Off Time	A	40	60	ms	$V_{in}=3.5V$, P.W = 100 μ s; $V_{op}=30V$
		B	40	60	ms	$V_{in}=3.5V$, P.W = 100 μ s; $V_{op}=30V$
V_{iso}	Input-Output Isolation	A or B	—	400	VDC	
P	Maximum Power Dissipation	A or B	—	400	mW	

PW*: Pulse Width.

❖ Timing Diagram



❖ Environmental Ratings:

- Storage Temperature: -25°C to +125°C
- Constant Acceleration: 5000G
- Hermeticity: + Gross 1×10^{-5} atm cc/sec
+ Fine 5×10^{-8} atm cc/s **

** When screened to MIL-Specs.