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DIH-128 Power MOSFET N/O SPST Photovoltaic AC-DC Relay

Features:

- Low Level Logic Compatibility
- Optical Isolation to 400VDC
- Low On Resistance, Low Offset Voltage
- Low Off-State Leakage Current.
- High Speed Switching Response.
- High Transient Immunity, No False Turn on
- Hermetically Sealed 6-Pin Mini DIP Foot Print
- Designed To Meet MIL-R-28750
- Y-Level MIL-Screening Available (**DIH-128Y**)

Applications:

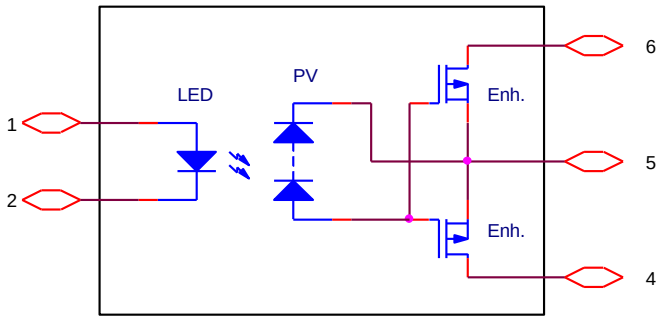
- Replacement of Mechanical Relays
- Motor Control & Power Control
- Aircraft Flight Control Systems
- A.T.E. (Automatic Test Equipment)
- Load Control From Processor I/O Ports
- High-side DC Power Switching
- Power Supply Circuits
- Medical Electronics

Description:

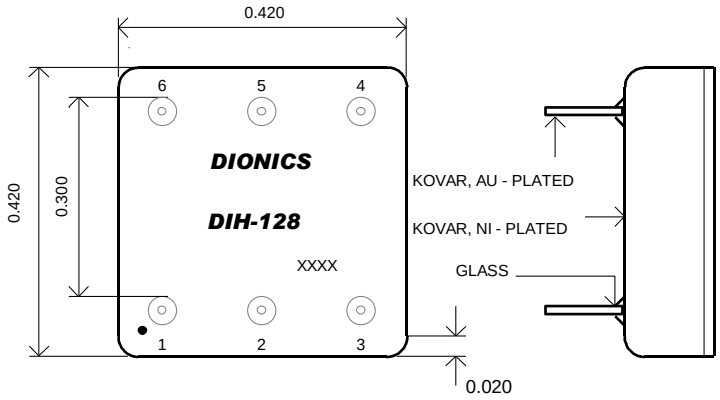
The DIH-128 is a State-of-the-Art Photovoltaic Solid State Relay designed for A.T.E. applications where speed, on-resistance and leakage current are critical. These photovoltaic relays incorporate an infrared LED input, a photovoltaic (PV) diode array including a unique turn-off circuit connected to the gates of a pair of high voltage MOSFETs as output. The photovoltaic diode array is a series-connected group of photosensitive diodes, which are electrically isolated from, but optically coupled to, the input LED. Input/Output isolation is rated at 400 VDC.

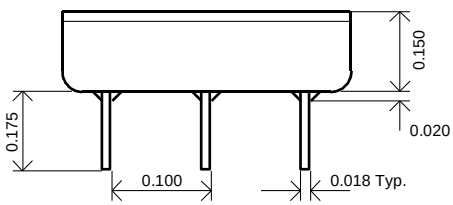
When activated, the LED emits infrared light toward the photovoltaic diode array, which then responds with a self-generated open circuit voltage, V_{oc}, proportional to the LED input current. This V_{oc} , which is floating and completely isolated from any power supply, is applied to the Gates of the MOSFETs. At the proper value of the input LED current, the generated V_{oc} is sufficient to turn on the MOSFETs and cause the relay to conduct. The MOSFET outputs provide thermal stability, immunity from false turn-on, and low offset voltage.

* DIH-128 Schematic



* Package Lay out:





❖ Pin Designation	
Pin number	***Function***
1	Input +
2	Input -
3	Case
4	Output Drain
5	Output Common Source
6	Output Drain

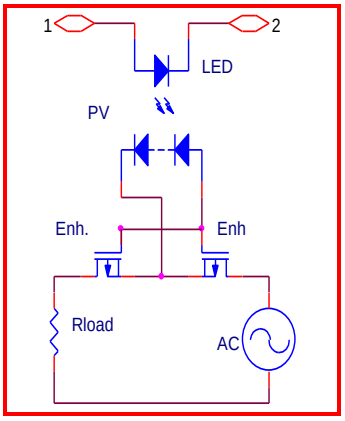
09/2012

DIH-128: Power MOSFET N/O SPST Photovoltaic AC-DC Relay

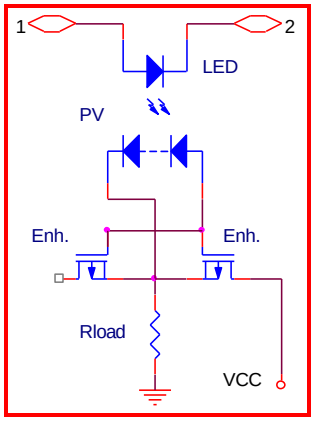
Electrical Characteristics (@ 25 ^{0} C unless otherwise specified):

Wiring Configuration:

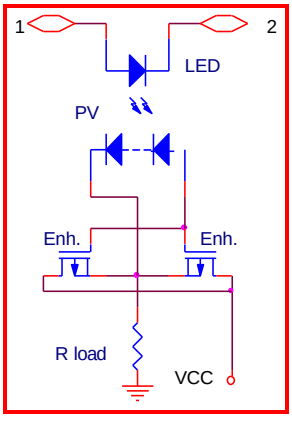
AC-DC Wiring Config. (1)



DC Wiring Config. (2)
Single MOSFET



DC Wiring Config. (3)
Parallel MOSFETs



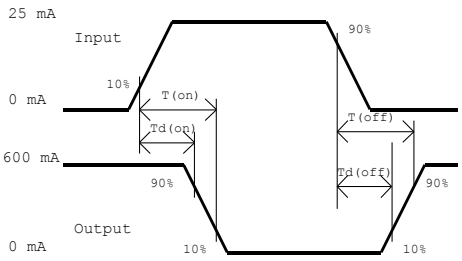
❖ ***Input Characteristics***	*Condition*	*Min.*	*Typ.*	*Max*	*Units*
Turn-On Current	100 mA load	–	5	10	mA
Turn-Off Current		1.2	–	–	V
Forward Voltage Drop	Input Current = 10mA	–	2.2	2.7	V
	Input Current = 25mA	–	2.6	2.9	V
Reverse Voltage	Reverse Current = 10µA	10	–	–	V

❖ ***Output Characteristics***	*AC-DC Wiring Config. (1)*	*DC Wiring Config. (2)*	*DC Wiring Config. (3)*	*Unit*
Load Current (Continuous in Free Air)	600	600	1200	mA
On Resistance (I_{in} = 15mA, V_{op} = 30V)	1.0	0.5	0.25	Ohm
Typical Output Capacitance (Bias Voltage= 50V)	80	160	320	pF
Off-State Leakage @ 250V	10	10	20	µA
Output Offset Voltage (I_{in} = 15mA)	250	250	250	µV
Turn-On Time*	500	500	500	µs
Turn-Off Time*	70	70	70	µs
Load Voltage (I_l = 10mA)	250	250	250	V

**** I_{led} = 25 mA; f = 100 Hz; Pulse Width = 100 µs; I_{load} = 600 mA***

❖ *Environmental Conditions:*

Operating Temp. :	-20 to 85 ^{0}C (Comm.)
(Y-Level Mil.)	-55 to 125 ^{0}C
Storage Temp. :	-20 to 85 ^{0}C (Comm.)
(Y-Level Mil.)	-55 to 125 ^{0}C
Shock: (Y-Level Mil.)	50 G, MIL-STD-202 Method 202
Hermeticity:	Gross Leak (Comm.) 10^{-5} atm cc/sec
(Y-Level Mil.)	Fine Leak 5x10 $^{-8}$ atm cc/sec
Vibration: (Y-Level Mil.)	20G, 10 to 2000 Hz
Acceleration: (Y-Level Mil.)	100 G
Weight:	1.5 Grams



❖ General Characteristics:

Minimum Input/Output Isolation:	400 VDC
Minimum Input/Output Resistance:	10 ^{8} Ohms
Typical Input/Output capacitance:	10pF
Typical Thermal Resistance:	15mW/^{0}C
Min. Transient Protection Capability (dv /dt):	100V/µs
Maximum Power Dissipation @ 25 ^{0}C:	1W