



DIONICS INC.

65 RUSHMORE STREET, WESTBURY, NEW YORK 11590
(516) 997-7474 TWX 510-222-0974

POWER MOSFET SOLID STATE AC/DC RELAY SPST/NO DIH-121 DIH-122*

Features

- Low level logic compatibility
- Optical Isolation, to 1000V (DC)
- Low on resistance
- Low off-set voltage
- Low off-state leakage current
- High speed switching response
- Ability to switch AC or DC, up to 400V
- No false turn-on
- High transient immunity
- Current limiting protection
- Hermetically sealed
- Designed to meet Mil-R-28750

Description

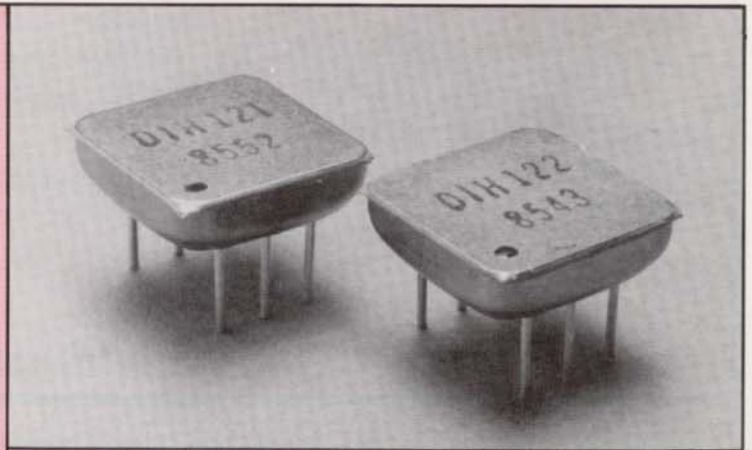
The DIH-121 and -122 are State-of-the-Art AC/DC solid state relays incorporating an infrared LED input, a photovoltaic diode array connected to the gates of a pair of high voltage MOSFETs as output, and including a unique turn-off circuit. The photovoltaic diode array is a series-connected group of photo sensitive diodes which are electrically isolated from, but optically coupled to, the input LED. Input/Output isolation is rated at 1000 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 will provide complete immunity from false turn-on, and feature low off-set voltage, current limiting protection and thermal stability.

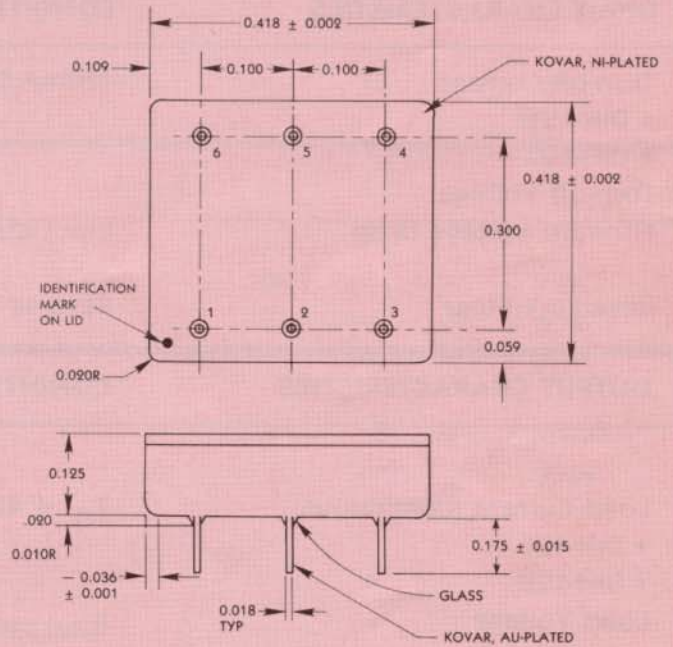
Applications

- Replacement of electromechanical relays
- Telecommunications
- Data Acquisition
- Automatic testing equipment
- Instrumentation

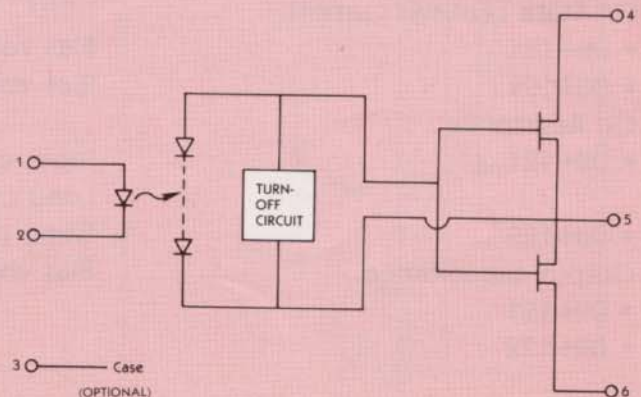
*DIH-121M and DIH-122M for military versions.



Package (Bottom View)



Equivalent Circuit



DIH-121, DIH-122

ABSOLUTE MAXIMUM RATINGS:

(25°C Ambient unless otherwise specified)

ENVIRONMENTAL RATINGS

Input Current (continuous)	50 mA	Operating Temp.	-55 to 125°C (Mil.)
Load Current (continuous)			-20 to 85°C (Comm.)
• DIH-121	0.75A	Storage Temp.	-55 to 125°C (Mil.)
• DIH-122	0.30A		-20 to 85°C (Comm.)
Load Current (10ms pulse, 20% duty)		Shock	50G, MIL-202 (Mil.)
• DIH-121	2.0A	Hermeticity	Fine Leak (Mil.)
• DIH-122	0.65A		5 x 10 ⁻⁸ cc/sec.
Load Voltage			Gross Leak (Comm.)
• DIH-121	200V		10 ⁻⁵ cc/sec.
• DIH-122	400V	Vibration	20G, 10 to 2000 Hz (Mil.)
		Acceleration	100 G (Mil.)

ELECTRICAL SPECIFICATIONS (25°C Unless Otherwise Specified)

INPUT CHARACTERISTICS	CONDITION	MIN	TYP	MAX	UNITS
Turn-on Current	100mA Load				
• DIH-121		—	5	10	mA
• DIH-122		—	5	10	mA
Turn-off Voltage		1.2	—	—	V
Forward Voltage Drop	Input current = 10mA	—	2.2	2.6	V
	= 25mA	—	2.6	3.0	V
Reverse Voltage	Reverse current = 10 μ A	10	—	—	V

OUTPUT CHARACTERISTICS	CONDITION	MIN	TYP	MAX	UNITS
Load Current (continuous)	T _A = 40°C				
• DIH-121		—	—	0.70	A
• DIH-122		—	—	0.28	A
Load Voltage	I _{Leakage} = 100 μ A				
• DIH-121		—	—	200	V
• DIH-122		—	—	400	V
Off-State Leakage Current					
• DIH-121	Bias voltage = 180V	—	0.20	1.0	μ A
• DIH-122	Bias voltage = 350V	—	0.05	1.0	μ A
On Resistance					
• DIH-121	Input current = 25mA	—	—	0.80	ohm
	Load current = 40mA				
• DIH-122	Same conditions as above	—	—	8.0	ohm
Output capacitance	Bias voltage = 50V				
• DIH-121		—	80	—	pf
• DIH-122		—	25	—	pf

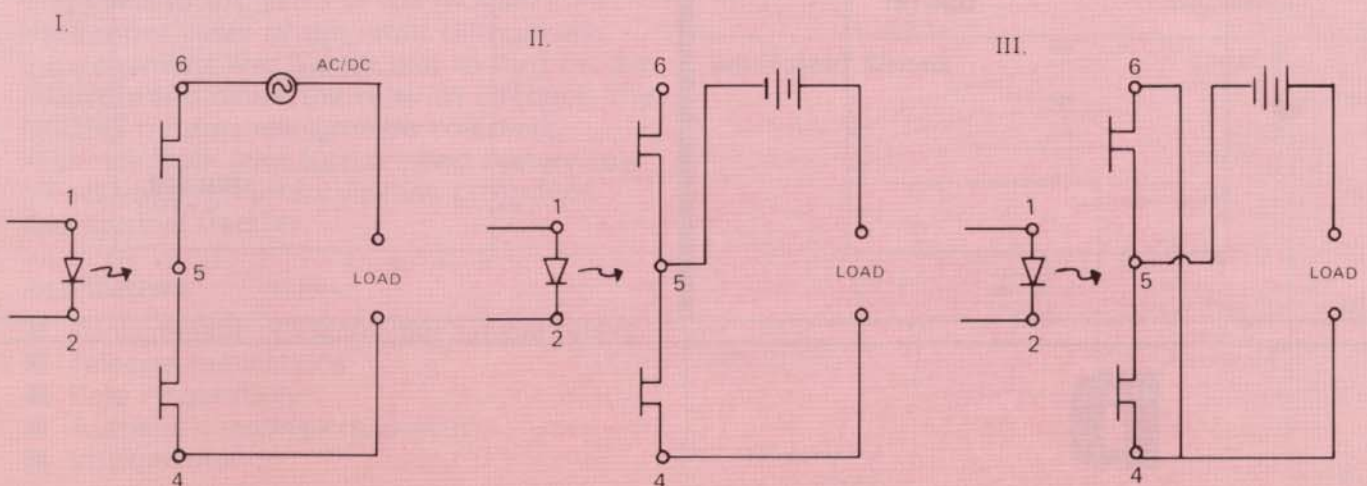
DIH-121, DIH-122

COUPLED CHARACTERISTICS	CONDITION	MIN	TYP	MAX	UNITS
Turn-on					
Delay Time					
• DIH-121	Input current = 25mA Load current = 500mA	—	270	—	μS
• DIH-122	Input current = 25mA Load current = 100mA	—	50	—	μS
Rise Time					
• DIH-121	Same Conditions	—	250	—	μS
• DIH-122	As Above	—	50	—	μS
Turn-off					
Storage Time					
• DIH-121	Same Conditions	—	180	—	μS
• DIH-122	As Above	—	150	—	μS
Fall Time					
• DIH-121	Same Conditions	—	5	—	μS
• DIH-122	As Above	—	5	—	μS
Off-set Voltage					
	Input current = 25mA	—	15	—	μV

GENERAL CHARACTERISTICS

Input/Output Isolation	1000	—	—	V DC
Input/Output Resistance	10^9	—	—	ohm
Input/Output Capacitance	—	10	—	pf
Thermal Resistance				
• Junction to Ambient	—	8	—	$\text{mW}/^\circ\text{C}$
Transient Protection Capability (dv/dt)	—	200	—	$\text{V}/\mu\text{s}$

WIRING DIAGRAMS

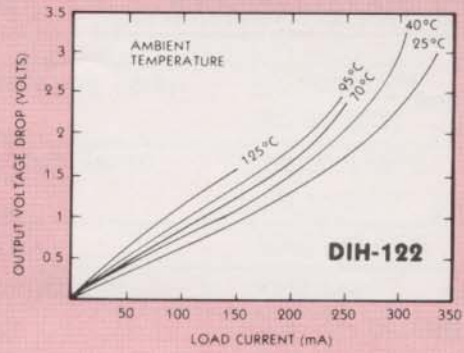
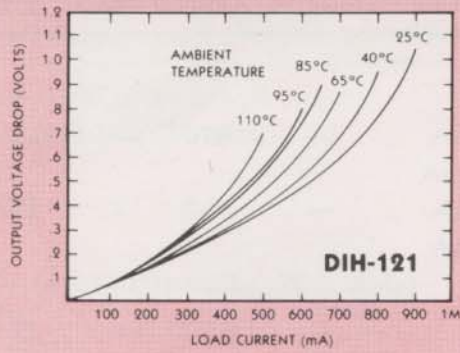


DIH-121

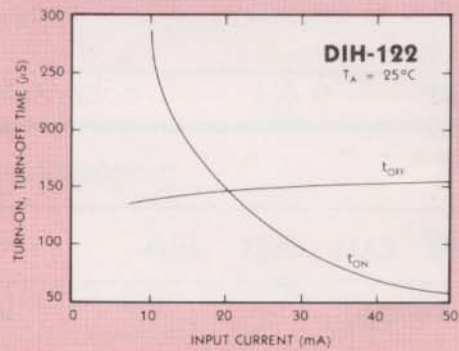
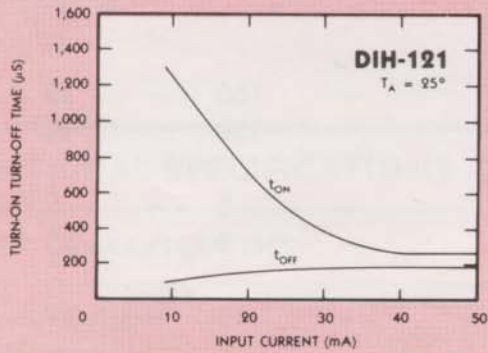
Characteristic Curves

DIH-122

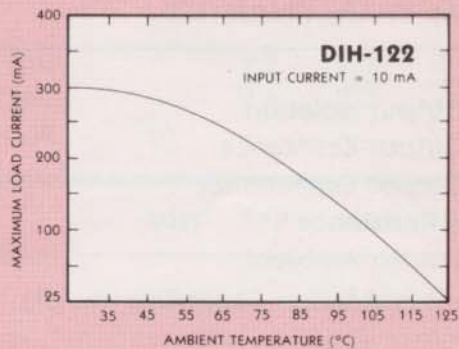
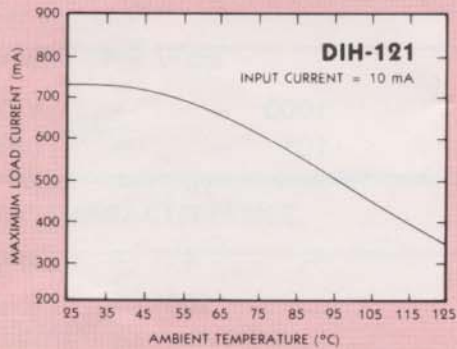
TYPICAL LOAD CURRENT vs. OUTPUT VOLTAGE DROP



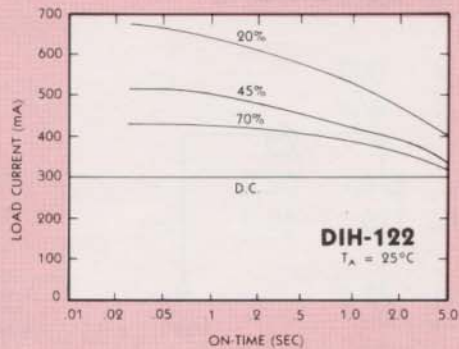
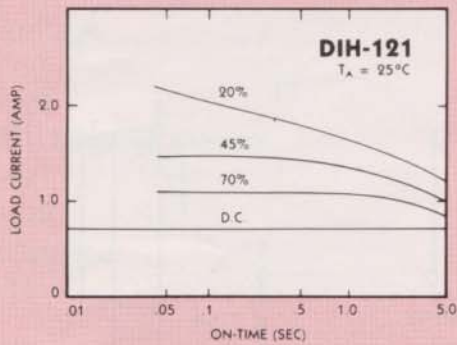
TYPICAL SWITCHING CHARACTERISTICS



THERMAL DERATING CURVE



TYPICAL DUTY CYCLE RATING CURVES



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