53252	90V - 0.8A DUAL POWER MOSFET OPTOCOUPLERS DSCC DWG #5962-03247	Mii MICROCIRCUITS DIVISION

Features:

- 8-Pin Dual-In-Line Hermetic Package
- Performance over –55°C to +125°C
- Compact Isolation Solid State Switches
- Continuous Output Current: 0.8 A (1)
- Optically Coupled between Input and Output
- Isolation Tested to 1000 VDC
- High Level of Transient Immunity
- 3 A Output Surge Current
- Shock and Vibration Resistant
- MIL-PRF-38534 screening optional

Applications:

- Military/High Reliability Systems
- Standard 28 VDC and 48 VDC Load Driver
- Aircraft Controls
- Electromechanical and Solid State Relay Replacement
- I/O Modules
- Switching Heaters

DESCRIPTION

The 53252 is two power MOSFET optocouplers in a single 8-pin dual-in-line package suitable for applications where two independent switches are required. The popular hermetic eight-pin dual-in-line ceramic package combined with 1000 VDC isolation between input and output and between two isolated relays, makes this device ideal for solid-state relay applications. Performance is specified over the full military temperature range. This device is available in a variety of quality levels from COTS to class H including any custom screening requirements. Gold plated leads are standard, but other lead finishes per MIL-PRF-38534 are also available.

Functionally, the device operates as two SPST, normally open (2 Form “A”) solid-state relays. Each relay is actuated by an input current, which can be driven from a standard TTL device. The input current biases a light emitting diode that is optically coupled to an integrated photovoltaic diode array. The photovoltaic diode array energizes control circuitry that operates the output MOSFET.

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ABSOLUTE MAXIMUM RATINGS:
(Per relay unless otherwise noted)

Storage Temperature Range ..... -65°C to +150°C
Operating Ambient Temperature - T_A ..... -55°C to +125°C
Junction Temperature - T_J ..... +150°C
Lead Solder Temperature for 10 seconds ..... +260°C
(1.6 mm below seating plane)
Average Input Current - I_F ..... 20 mA
Peak Repetitive Input Current - I_{Fpk} ..... 40 mA
(pulse width < 100 ms; duty cycle < 50%)
Peak Surge Input Current - I_{Fpk} surge ..... 100 mA
(pulse width < 0.2 ms; duty cycle < 0.1%)
Continuous Output Current per relay - I_O ..... 0.8 A (1)
Single Shot Output Current per relay- I_{Opk} surge (pulse width < 10 ms) ..... 3 A
Output Voltage - V_O ..... 90 VDC

RECOMMENDED OPERATING CONDITIONS:

Parameter	Symbol	Min.	Max.	Units
Input Current (ON)	$I_{F\ (ON)}$	10	20	mA
Input Voltage (OFF)	$V_{F\ (OFF)}$	0	0.6	VDC
Operating Temperature	T_A	-55	+125	°C

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ELECTRICAL SPECIFICATIONS

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified.	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Output Withstand Voltage	$V_{O(OFF)}$	V_{FOFF} = 0.6 V, I_O = 10 µA	1, 2, 3	All	90		V
Output On-Resistance 2/	$R_{(ON)}$	I_{FON} = 10 mA, I_O = 800 mA, pulse duration ≤ 30 ms, duty cycles < 10%	1, 2, 3	All		1.2	Ω
Output Leakage Current	$I_{O\ (OFF)}$	V_{FOFF} = 0.6 V, V_O = 90 V	1, 2, 3	All		10	µA
Input Forward Voltage	V_{FOFF}	I_{FON} = 10 mA	1, 2, 3	All	1.0	1.7	V
Input Reverse Breakdown Voltage	V_R	I_R = 10 µA	1, 2, 3	All	5.0		V
Input-Output Isolation Current 3/	I_{I-O}	V_{I-O} = 1000 V dc, t = 5 s, RH ≤ 45%, T_A = +25°C	1, 2, 3	All		1.0	µA
Channel-Channel Isolation Current 3/	I_{ISO}	V_{ISO} = 1000 V dc, t = 5 s, RH ≤ 45%, T_A = +25°C	1, 2, 3	All		1.0	µA
Turn-On Time 2/	t_{ON}	I_{FON} = 10 mA, I_O = 800 mA, Pulse duration ≤ 30 ms, duty cycles < 10%	1, 2, 3	All		6.0	ms
Turn-Off time 2/	t_{OFF}	I_{FON} = 10 mA, I_O = 800 mA, pulse duration ≤ 30 ms, duty cycles < 10%	1, 2, 3	All		2.0	ms

Notes:

1. Maximum average current rating where the case temperature (T_C) is maintained below 120°C.
2. During the pulsed R_{ON} measurement (I_O duration < 30 ms), ambient (T_A) and case temperature (T_C) are equal.
3. This is a momentary withstand test, not a continuous operating condition.
4. Typical junction to case thermal resistance (θ_{JC}) for the device is 15°C/W, where case temperature (T_C) is measured at the center of the package bottom.

CAUTION:
Care should be taken not to exceed the maximum output power dissipation, maximum case temperature, and maximum junction temperature when repetitively switching loads.

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Case outlines	X, Y
Terminal number	**Terminal symbol**
1	+ IN 1
2	- IN 1
3	- OUT 2
4	+ OUT 2
5	+ IN 2
6	- IN 2
7	- OUT 1
8	+ OUT 1

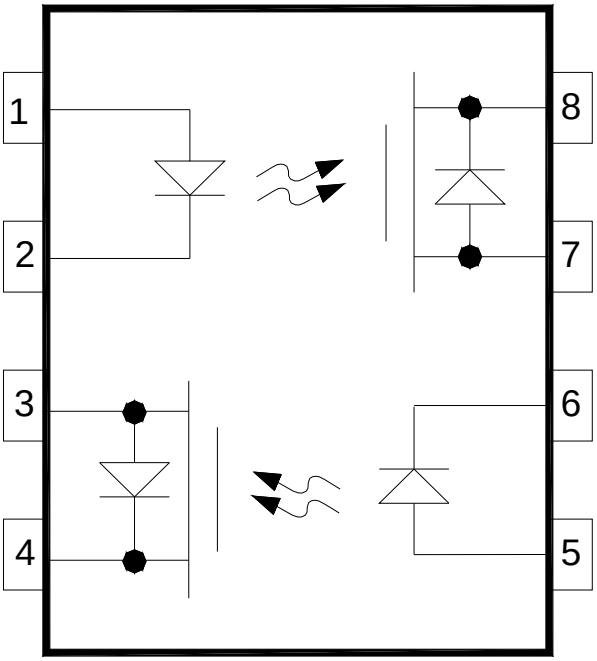


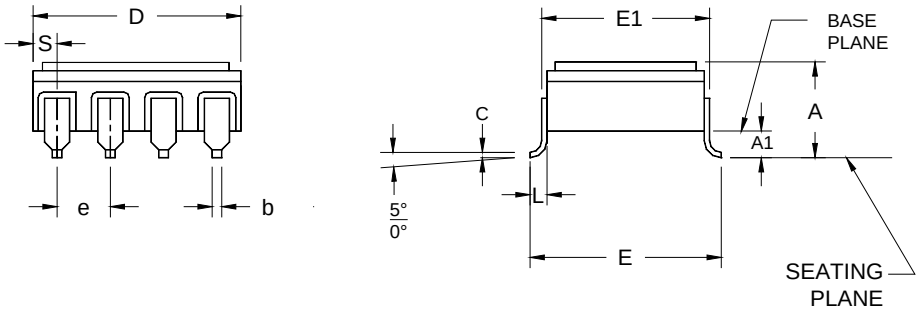
FIGURE 2. Terminal connections.

Input	Output
OFF	OFF
ON	ON

FIGURE 3. Truth table(s).

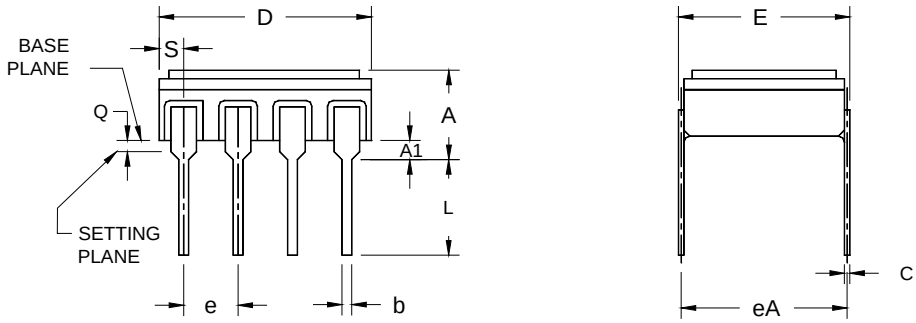
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Case outline X



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		6.99		.275
A1	1.40	1.65	.055	.065
b	0.41	0.53	.016	.021
c	0.18	0.33	.007	.013
D	9.40	9.91	.370	.390
e	2.29	2.79	.090	.110
E	9.65	9.91	.380	.390
E1		8.13		.320
L	1.07	1.32	.042	.052
S	0.89	1.27	.035	.050

Case outline Y



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		6.60		.260
A1	0.76	1.27	.030	.050
b	0.41	0.53	.016	.021
c	0.18	0.33	.007	.013
D	9.40	9.91	.370	.390
e	2.29	2.79	.090	.110
E		8.13		.320
eA	7.37	7.87	.290	.310
L		12.70		.500
Q	0.51		.020	
S	0.89	1.27	.035	.050

NOTES:
1. The U.S. government preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and in-pound units, the inch-pound units shall rule.

2. Pin 1 is indicated by the ESD triangle(s) marked on top of the package.

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The following chart explains the ordering procedure for Micropac Part Numbers.
Please contact Micropac for other desired options.

Mii DASH NO.	CASE OUTLINE	LEAD FINISH	SCREENING LEVEL PER MIL-PRF-38534
53252-101	Y	SOLDER DIP	NO SCREENING
53252-102	Y	GOLD PLATE	NO SCREENING
53252-103	Y	SOLDER DIP	SCREENING PER TABLE C1X H LEVEL
53252-104	Y	GOLD PLATE	SCREENING PER TABLE C1X H LEVEL
53252-105	Y	SOLDER DIP	SCREENING PER TABLE C1X K LEVEL
53252-106	Y	GOLD PLATE	SCREENING PER TABLE C1X K LEVEL
53252-107	Y	SOLDER DIP	COMPLIANT TO H LEVEL
53252-108	Y	GOLD PLATE	COMPLIANT TO H LEVEL
53252-111	X	SOLDER DIP	SCREENING PER TABLE C1X H LEVEL
53252-112	X	GOLD PLATE	SCREENING PER TABLE C1X H LEVEL
53252-113	X	SOLDER DIP	SCREENING PER TABLE C1X K LEVEL
53252-114	X	GOLD PLATE	SCREENING PER TABLE C1X K LEVEL
53252-115	X	SOLDER DIP	NO SCREENING
53252-116	X	GOLD PLATE	NO SCREENING
53252-117	X	SOLDER DIP	COMPLIANT TO H LEVEL
53252-118	X	GOLD PLATE	COMPLIANT TO H LEVEL

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