

**53252**

**90V - 0.8A DUAL POWER  
MOSFET OPTOCOUPERS  
DSCC DWG #5962-03247**



**Features:**

- 8-Pin Dual-In-Line Hermetic Package
- Performance over  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Compact Isolation Solid State Switches
- Continuous Output Current: 0.8 A <sup>(1)</sup>
- 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 <sup>(1)</sup>
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 ≤ T <sub>A</sub> ≤ +125°C unless otherwise specified.	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Output Withstand Voltage	V <sub>O(OFF)</sub>	V <sub>FOFF</sub> = 0.6 V, I <sub>O</sub> = 10 μA	1, 2, 3	All	90		V
Output On-Resistance 2/	R <sub>(ON)</sub>	I <sub>FON</sub> = 10 mA, I <sub>O</sub> = 800 mA, pulse duration ≤ 30 ms, duty cycles < 10%	1, 2, 3	All		1.2	Ω
Output Leakage Current	I <sub>O(OFF)</sub>	V <sub>FOFF</sub> = 0.6 V, V <sub>O</sub> = 90 V	1, 2, 3	All		10	μA
Input Forward Voltage	V <sub>FOFF</sub>	I <sub>FON</sub> = 10 mA	1, 2, 3	All	1.0	1.7	V
Input Reverse Breakdown Voltage	V <sub>R</sub>	I <sub>R</sub> = 10 μA	1, 2, 3	All	5.0		V
Input-Output Isolation Current 3/	I <sub>I-O</sub>	V <sub>I-O</sub> = 1000 V dc, t = 5 s, RH ≤ 45%, T <sub>A</sub> = +25°C	1, 2, 3	All		1.0	μA
Channel-Channel Isolation Current 3/	I <sub>ISO</sub>	V <sub>ISO</sub> = 1000 V dc, t = 5 s, RH ≤ 45%, T <sub>A</sub> = +25°C	1, 2, 3	All		1.0	μA
Turn-On Time 2/	t <sub>ON</sub>	I <sub>FON</sub> = 10 mA, I <sub>O</sub> = 800 mA, Pulse duration ≤ 30 ms, duty cycles < 10%	1, 2, 3	All		6.0	ms
Turn-Off time 2/	t <sub>OFF</sub>	I <sub>FON</sub> = 10 mA, I <sub>O</sub> = 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<sub>C</sub>) is maintained below 120°C.
2. During the pulsed R<sub>ON</sub> measurement (I<sub>O</sub> duration < 30 ms), ambient (T<sub>A</sub>) and case temperature (T<sub>C</sub>) are equal.
3. This is a momentary withstand test, not a continuous operating condition.
4. Typical junction to case thermal resistance (θ<sub>JC</sub>) for the device is 15°C/W, where case temperature (T<sub>C</sub>) 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

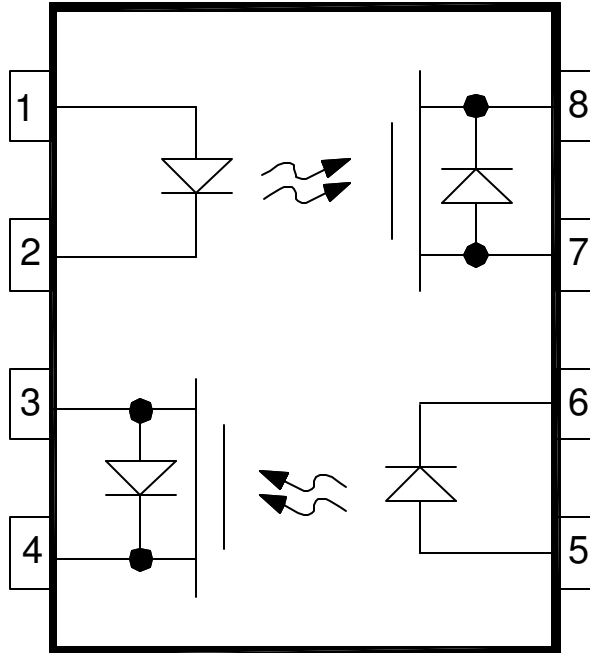


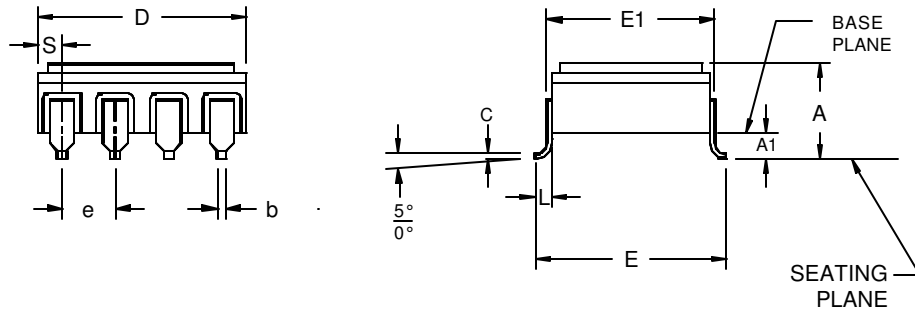
FIGURE 2. Terminal connections.

Input	Output
OFF	OFF
ON	ON

FIGURE 3. Truth table(s).

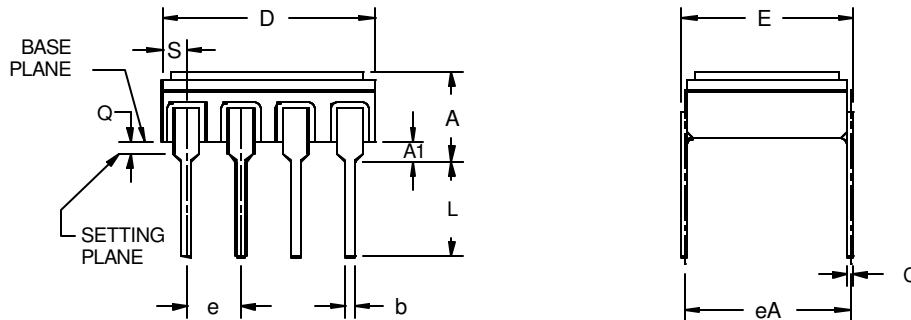
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Case outline X



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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