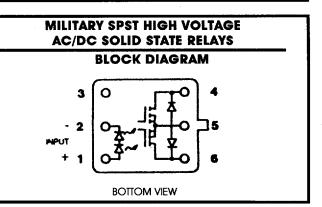




FEATURES

- SPST, Normally Open
- Up to 500V RMS Optical Isolation
- Power FET Output Low On-state Resistance
- Full Military Temperature Operation:
 - -55°Cto+120°C
 - Military Environmental Screening Available
- Improved Thermal Characteristics
- Built and tested per MIL-R-28750 utilizing the test methods of MIL-STD-883
- Built in accordance with 89116



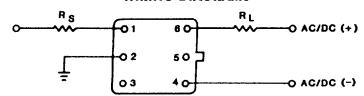
GENERAL DESCRIPTION

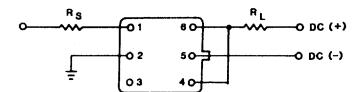
These solid state relays are military SPST Solid State Relays. These light-weight devices are resistant to damage from shock and vibration, and are immune to contact-related problems (contamination, arcing) associated with mechanical equivalents.

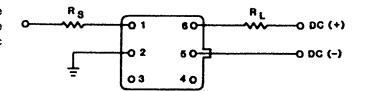
Optical coupling between the input and output stages provides effective isolation up to 500 volts AC RMS. Power FET outputs eliminate bipolar offset, and minimize output voltage drop.

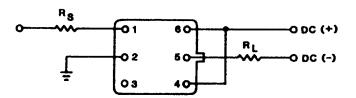
These solid-state relays are ideal for use in military systems, or wherever high reliability, low power actuation, low cost and light weight are design considerations. Applications include general purpose signal switching and electonic load control.

WIRING DIAGRAMS









GENERAL SPECIFICATIONS								
Part Number	Max. Operating Voltage	Max. Load (25°C)	Replaced Teledyne					
53119	±350 VDC	0.25A (see Figure 2)	FBOOKB					
53122	±80 VDC	1.0A (see Figure 1)	FB00CD					
53123	±180 VDC	0.50A (see Figure 3)	FB00FC					

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Micropac reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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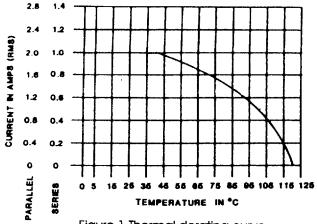


Figure 1 Thermal derating curve 53122

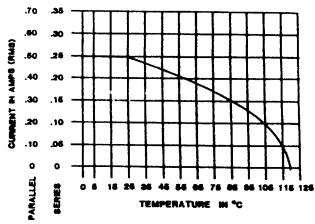


Figure 2 Thermal derating curve 53119

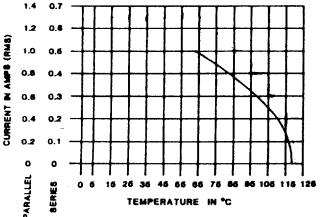


Figure 3 Thermal derating curve 53123

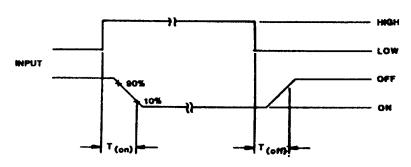
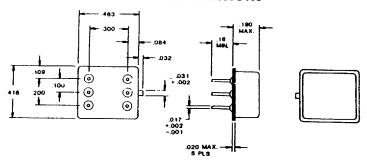


Figure 4 Turn-on/Turn-off timing

PACKAGE DIMENSIONS



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53119, 53122, 53123 \$P\$T 50HD-\$YATE RELAYS

ELECTRICAL CHARACTERISTICS* $T_A = -55^{\circ}$ C TO 120° C (unless otherwise noted)

+105 °C to +120 °C 10 25 mA d	INPUT CHARACTERISTICS		MIN	ТҮР	MAX	UNITS
+105 °C to +120 °C 10 25 mA d						
Rated Input Current 25	LED Input Current	-55 °C to +105 °C	10		50	mA dc
Turn-on Current (Assured) 10 mA d Turn-oft Current (Assured) 10 μA d Turn-oft Voltage (Assured) 1.5 Vd Input Voltage Drop at 25 mA 3.25 Vd Reverse Voltage Protection -5 Vd OUTPUT CHARACTERISTICS 53119 53122 53123 UNIT MIN MAX MIN MAX MIN MAX MIN MAX MIN MAX MIN MAX VD		+105 °C to +120 °C	10		25	mA dc
Turn-off Current (Assured) 10 μA d Turn-off Voltage (Assured) 1.5 Vd Input Voltage Drop at 25 mA 3.25 Vd Reverse Voltage Protection -5 Vd OUTPUT CHARACTERISTICS 53119 53122 53123 UNIT MIN MAX MIN MAX MIN MAX MIN MAX MIN MAX Output Voltage ±350 ±80 ±180 VD Output Load Current (See Figures 1,2.3) 0.25 1.0 0.50 Amp Output Voltage Drop Series 2.40 0.75 1.0 VD at 25 mA Parallel 1.80 0.40 0.50 Amp (25 °C to 120 °C) Vin = 1.5 VDC Parallel 40 40 40 40 Output Leakage (-55 °C to 25 °C) Series 200 200 200 VIn = 1.5 VDC Parallel 40 40 40 And	Rated Input Current			25		mA dc
Turn-off Voltage (Assured) 1.5 Vol Input Voltage Drop at 25 mA 3.25 Vol Reverse Voltage Protection -5 Vol OUTPUT CHARACTERISTICS 53119 53122 53123 UNIT MIN MAX MIN MAX MIN MAX MIN MAX MIN MAX MIN MAX VDI Output Voltage ±350 ±80 ±180 VDI	Turn-on Current (Assured)		10			mA dc
Input Voltage Drop at 25 mA 3.25 Voltage Reverse Voltage Protection 53119 53122 53123 UNIT	Turn-off Current (Assured)			10	μA dc	
Reverse Voltage Protection .5 Voltage	Turn-off Voltage (Assured)			1.5	Vdc	
OUTPUT CHARACTERISTICS 53119 53122 53123 UNIT MIN MAX MIN MAX MIN MAX MIN MAX MIN MAX Output Voltage ±350 ±80 ±180 VDI Output Load Current (See Figures 1,2,3) 0.25 1.0 0.50 Amp Output Voltage Drop Series 2.40 0.75 1.0 VDI at 25 mA Parallel 1.80 0.40 0.50 D Output Leakage Series 20 20 20 μ (25 °C to 120 °C) Vin = 1.5 VDC Parallel 40 40 40 40 Output Leakage (-55 °C to 25 °C) Series 200 200 200 20 vin = 1.5 VDC Parallel 400 400 400 n n n 0 n n 0 n n 0 n n 0 n n n 0 n n n n n n 0 n n n	Input Voltage Drop at 25 mA			3.25	Vdc	
Min Max Min Max Min Max Output Voltage ±350 ±80 ±180 VDr Output Load Current (See Figures 1,2,3) 0.25 1.0 0.50 Amp Output Voltage Drop Series 2.40 0.75 1.0 VDr at 25 mA Parallel 1.80 0.40 0.50 O.50 Output Leakage Series 20 20 20 μ (25 °C to 120 °C) Vin = 1.5 VDC Parallel 40 40 40 40 Output Leakage (-55 °C to 25 °C) Series 200 200 200 200 Vin = 1.5 VDC Parallel 400 400 400 n n On State Resistance Series 8.0 0.6 1.0 Ohm @ 25 mA (see Note 1) Parallel 2.0 .15 .25 Overload @ 25 °C I _N = 25 mA 3.5 x rated current Amp 10 cycles max. at a 1HZ, 10% max. duty cycle (on time) 500 800 800 <td>Reverse Voltage Protection</td> <td></td> <td></td> <td>-5</td> <td>Vdc</td>	Reverse Voltage Protection			-5	Vdc	
Output Voltage ±350 ±80 ±180 VD Output Load Current (See Figures 1,2,3) 0.25 1.0 0.50 Amp Output Voltage Drop Series 2.40 0.75 1.0 VD at 25 mA Parallel 1.80 0.40 0.50 D Output Leakage Series 20 20 20 μ (25 °C to 120 °C) Vin = 1.5 VDC Parallel 40 40 40 40 Output Leakage (-55 °C to 25 °C) Series 200 200 200 200 Vin = 1.5 VDC Parallel 400 400 400 n n Ohm	OUTPUT CHARACTERISTICS		53119	53122	53123	UNITS
Output Load Current (See Figures 1,2,3) 0.25 1.0 0.50 Amp Output Voltage Drop at 25 mA Series 2.40 0.75 1.0 VDropt Output Leakage at 25 mA Parallel 1.80 0.40 0.50 0.50 Output Leakage (25 °C to 120 °C) Vin = 1.5 VDC Parallel 40 40 40 40 Output Leakage (-55 °C to 25 °C) Series 200 200 200 200 200 Vin = 1.5 VDC Parallel 400 400 400 n n Ohm Ohm Ohm Ohm Ohm 0.6 1.0 Ohm 0.6 1.0 Ohm 0.0			MIN MAX	MIN MAX	MIN MAX	
Output Voltage Drop Series 2.40 0.75 1.0 VDrophy Voltage Drop at 25 mA Parallel 1.80 0.40 0.50 Output Leakage Series 20 20 20 μ (25 °C to 120 °C) Vin = 1.5 VDC Parallel 40 40 40 40 Output Leakage (-55 °C to 25 °C) Series 200 200 200 200 Vin = 1.5 VDC Parallel 400 400 400 400 n On State Resistance Series 8.0 0.6 1.0 Ohm @ 25 mA (see Note 1) Parallel 2.0 15 .25 Overload @ 25 °C I _{IN} = 25 mA 3.5 x rated current Amp 10 cycles max. at a 1HZ, 10% max. duty cycle (on time) 500 800 800 μ	Output Voltage		±350	±80	±180	VDC
at 25 mA Parallel 1.80 0.40 0.50 Output Leakage Series 20 20 20 μ (25 °C to 120 °C) Vin = 1.5 VDC Parallel 40 40 40 40 Output Leakage (-55 °C to 25 °C) Series 200 200 200 200 Vin = 1.5 VDC Parallel 400 400 400 n On State Resistance Series 8.0 0.6 1.0 Ohm @ 25 mA (see Note 1) Parallel 2.0 .15 .25 Amp Overload @ 25 °C I N = 25 mA 3.5 x rated current Amp 10 cycles max. at a 1HZ, 10% max. duty cycle (on time) 500 800 800 μ	Output Load Current (See Figures 1,2,3)		0.25	1.0	0.50	Amps
Output Leakage Series 20 20 20 μ (25 °C to 120 °C) Vin = 1.5 VDC Parallel 40 40 40 Output Leakage (-55 °C to 25 °C) Series 200 200 200 Vin = 1.5 VDC Parallel 400 400 400 n On State Resistance Series 8.0 0.6 1.0 Ohm @ 25 mA (see Note 1) Parallel 2.0 .15 .25 Overload @ 25 °C I N = 25 mA 3.5 x rafed current Amp 10 cycles max. at a 1Hz, 10% max. duty cycle (on time) 500 800 800 μ	Output Voltage Drop	Series	2.40	0.75	1.0	VDC
(25 °C to 120 °C) Vin = 1.5 VDC Parallel 40 40 40 Output Leakage (-55 °C to 25 °C) Series 200 200 200 Vin = 1.5 VDC Parallel 400 400 400 n On State Resistance Series 8.0 0.6 1.0 Ohm @ 25 mA (see Note 1) Parallel 2.0 .15 .25 Overload @ 25 °C I N = 25 mA 3.5 x rated current Amp 10 cycles max. at a 1HZ, 10% max. duty cycle (on time) 500 800 800 μ	at 25 mA	Parallel	1.80	0.40	0.50	
Output Leakage (-55 °C to 25 °C) Series 200 200 200 Vin = 1.5 VDC Parallel 400 400 400 n On State Resistance Series 8.0 0.6 1.0 Ohm @ 25 mA (see Note 1) Parallel 2.0 .15 .25 Overload @ 25 °C I N = 25 mA 3.5 x rated current Amp 10 cycles max. at a 1HZ, 10% max. duty cycle (on time) 500 800 800 μ	Output Leakage	Series	20	20	20	μА
Vin = 1.5 VDC Parallel 400 400 400 n On State Resistance Series 8.0 0.6 1.0 Ohm @ 25 mA (see Note 1) Parallel 2.0 .15 .25 Overload @ 25 °C I N = 25 mA 3.5 x rated current Amp 10 cycles max. at a 1HZ, 10% max. duty cycle (on time) Turn-on Time (Figure 4) (I _N = 25 mA) 500 800 800 μ	(25 °C to 120 °C) Vin = 1.5 VDC	Parallel	40	40	40	
On State Resistance Series 8.0 0.6 1.0 Ohm @ 25 mA (see Note 1) Parallel 2.0 .15 .25 Overload @ 25 °C I N = 25 mA 3.5 x rated current Amp 10 cycles max. at a 1HZ, 10% max. duty cycle (on time) 800 800 μ	Output Leakage (-55 °C to 25 °C)	Series	200	200	200	
@ 25 mA (see Note 1) Parallel 2.0 .15 .25 Overload @ 25 °C I _{IN} = 25 mA 3.5 x rated current Amp 10 cycles max. at a 1 HZ, 10% max. duty cycle (on time) Turn-on Time (Figure 4) (I _{IN} = 25 mA) 500 800 800 μ	Vin = 1.5 VDC	Parallel	400	400	400	nA
Overload @ $25 ^{\circ}\text{C I}_{\text{IN}} = 25 \text{mA}$ 3.5 x rated current Amplitude of the contraction of the c	On State Resistance	Series	8.0	0.6	1.0	Ohms
10 cycles max. at a 1HZ, 10% max. duty cycle (on time) Turn-on Time (Figure 4) (I _{IN} = 25 mA) 500 800 μ	@ 25 mA (see Note 1)	Parallel	2.0	.15	.25	
duty cycle (on time)	Overload @ 25 °C I _{IN} = 25 mA		3.5 x rated current			Amps
Turn-on Time (Figure 4) (I _{IN} = 25 mA) 500 800 μ	10 cycles max. at a 1HZ, 10% max.					
	duty cycle (on time)					
Turn-off Time (Figure 4) L = 25 mA) 500 500 500	Turn-on Time (Figure 4) (I _{IN} = 25 mA)	500	800	800	μs	
μ 200 μ 200 μ	Turn-off Time (Figure 4) I _N = 25 mA)	500	500	500	μs	
Transient Blocking Voltage (5 seconds max.) ±360 ±90 ±190 VDC	Transient Blocking Voltage (5 seconds max	±360	±90	±190	VDC	
dv/dt 100 100 100 V/μ	dv/dt	100	100	100	V/µs	
Dielectric Strength 500 500 VAC	Dielectric Strength		500	500	500	VAC
DC Offset Voltage 100 100 100 μ ¹	DC Offset Voltage		100	100	100	μ٧

Notes: 1. On-state resistance greater than 25°C

 $R_{\tau} = (4@ 25^{\circ}C) e^{X} \text{ where } X = .0065 (T_{J} - 25^{\circ}C)$

 $X = .0065 (T_J - 25^{\circ}C)$ $X = .0072 (T_J - 25^{\circ}C)$ for ±350 VDC

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