

53225

SOLID-STATE POWER CONTROLLER (SSPC)

Mii

HYBRID MICROELECTRONICS
PRODUCTS DIVISION

Features:

- I²t output trip
- Output trip status
- 1000 VRMS Isolation
- Power FET Output
Low On-state Resistance
- Full Military compliance
- Low control power consumption (3 mA @ 5 V typical)
- 125°C screening available

Applications:

- Logic controlled circuit breakers
- Dynamic load switching
- Power distribution switch
- Supply source switching

DESCRIPTION

The 53225 is a military SPST solid-state relay. This light-weight device is mechanically resistant and electrically immune to contact-related problems inherent in mechanical relays.

An I²t current let-through curve assures power supply, relay, and load protection from thermal stress yet provides large momentary currents to charge capacitive loads or start inductive loads. Any current versus time above the I²t curve initiates a trip condition and a status output is generated.

Effective isolation of 1000 VRMS is provided from all inputs, case and outputs through magnetic coupling. Magnetic coupling contributes to very low control power, repeatable turn-on/turn-off times, and no output stage currents to provide status signals.

Micropac Industries cannot assume any responsibility for any circuits shown or represent that they are free from patent infringement.
Micropac reserves the right to make changes at any time in order to improve design and to supply the best product possible.

ELECTRICAL CHARACTERISTICS

($-55^{\circ}\text{C} \leq T_A \leq 85^{\circ}\text{C}$, $V_{\text{BIAS}} = 5\text{ V}$, $V_{\text{OUT}+} = 28\text{ V}$, $I_{\text{OUT}} = 1.5\text{ A}$ unless otherwise noted)

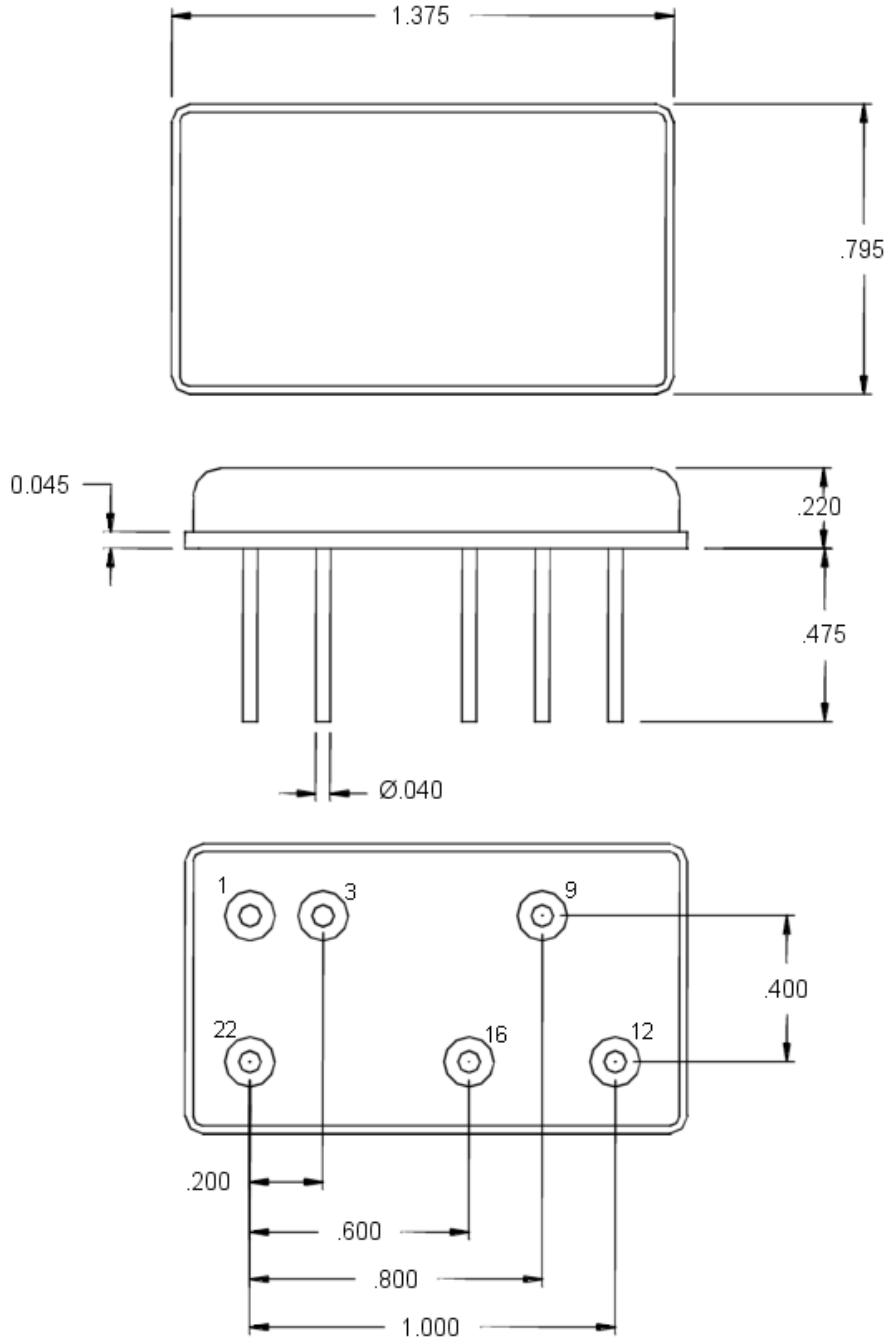
CHARACTERISTIC	CONDITION	MIN	MAX	UNITS
2 Terminal Configuration (see Fig. 2) Input Current			5	MADC
Turn off voltage (V_{IN})			1.5	VDC
Turn on voltage (V_{IN})		3.8		VDC
Bias supply voltage range		4	6	VDC
3 Terminal Configuration (see Fig. 1)				
Control input Current	$V_{\text{CONT}} = 5\text{ VDC}$		250	μADC
Control voltage range		0	6	VDC
Bias supply voltage range		0.5	6	VDC
Bias supply current			5	mADC
Turn off voltage (V_{CONTROL})		3.9		VDC
Turn on voltage (V_{CONTROL})			0.3	VDC
Noise Margin	$V_{\text{OFF}} - V_{\text{ON}}$	0.5		VDC
Continuous off leakage current (not tripped)	$V_{\text{OUT}+} = 60\text{ VDC}$ $V_{\text{OUT}-} = \text{Ground}$		150	μADC
Output on voltage drop	$I_L = 1.5\text{ A}$		0.45	VDC
Continuous operating load voltage			60	VDC
Transient blocking voltage	@ 1.0 mA		80	VDC
On resistance $R_{\text{DS (ON)}}$	$I_{\text{LOAD}} = 100\text{ mADC}$		0.30	OHMS
Turn on time			3.0	MS
Turn off time			1.0	MS
Operating frequency			20	HZ
DV/DT		100		V/ μM
Electrical system spike		± 600		Peak
Output Capacitance	25 VDC, 100 kHz		1000	PF
Input to output capacitance			15	PF
Dielectric strength	@ 1.0 mA maximum leakage	1000		VAC
Insulation resistance	@ 500 VDC, $T_A - 25^{\circ}\text{C}$	10^3		OHMS
Surge Current (see Fig. 4)	Guaranteed no trip @ 10 A surge		70 Typ.	MS
Trip Reset Time	Remove short / overload & Cycle input	50		Ms
Status Output Specification Status Supply Voltage (open Collector)		5.0	32	VDC
Status off leakage current	$V_S = 15\text{ VDC}$		4	μADC
Status on voltage	$I_{\text{STATUS}} = 5\text{ MA}$		0.4	VDC
High-To-Low Transition Time	$I_{\text{STATUS}} = 5\text{ MA}$		1.0	MS

Notes:

- Input transition should be \leq MSEC duration and input drive should be "bounceless contact" type.

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Package Dimensions



PIN	FUNCTION
1	Control
3	Ground
9	V _{OUT -}
12	V _{OUT +}
16	Status
22	V _{BIAS}

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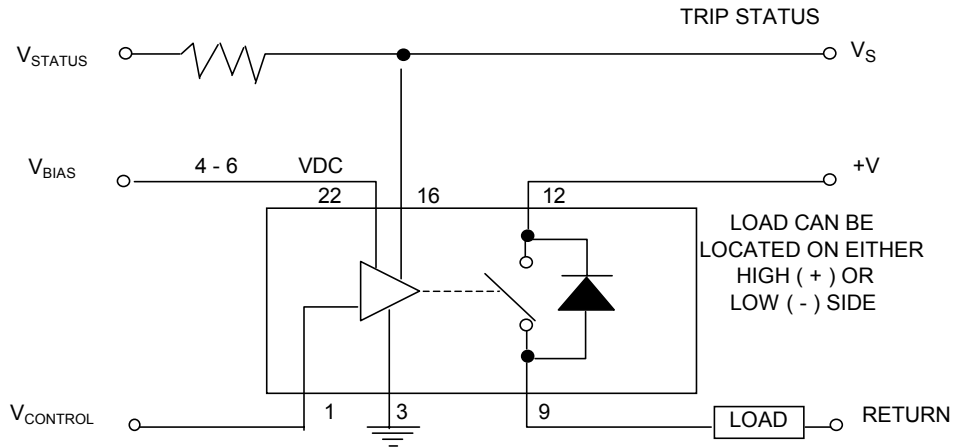


Figure 1
A - Three - Terminal Connection

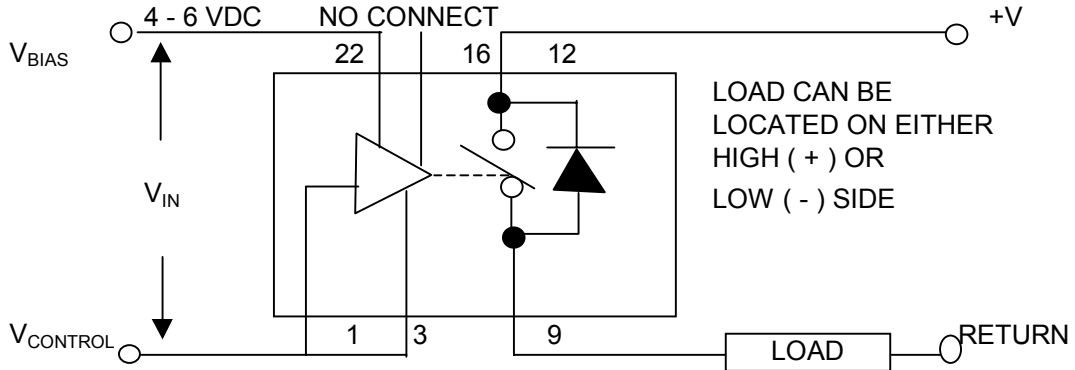


Figure 2
B - Two - Terminal Connection

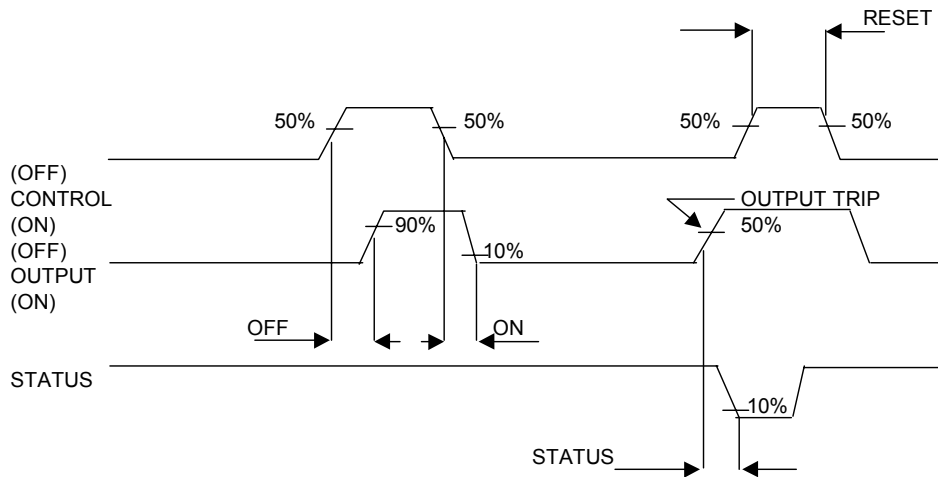
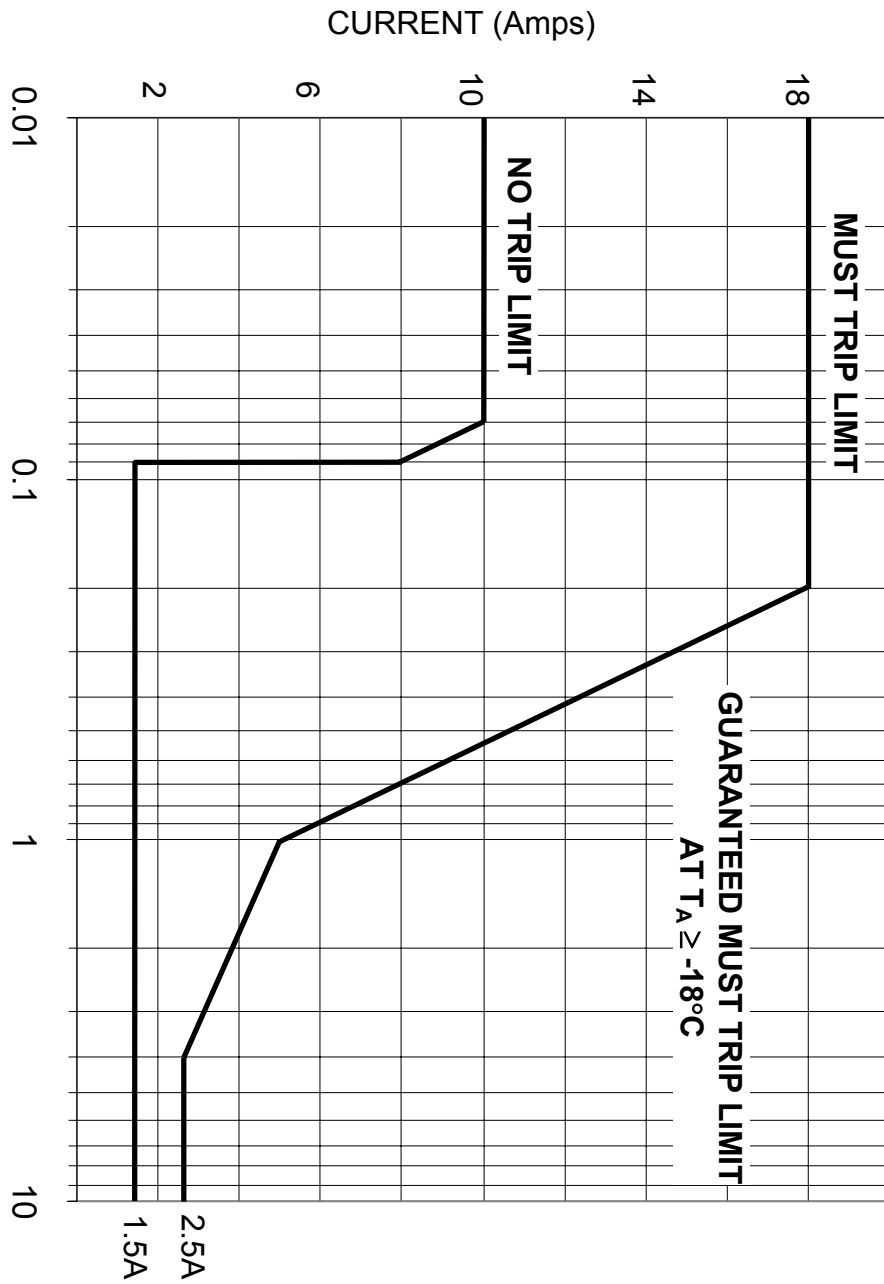


Figure 3
Timing Diagram (3 Terminal Connection)

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