

POWER-GATE™ Solid-State Devices Bi-Directional Relay



Made in U.S.A

APPLICATIONS:

An arrayed back-to-back MOSFET SSR designed to switch and control DC. Common uses include military, aeronautic, automotive, marine, industrial machinery, photovoltaic, fleet utility.

FEATURES and BENEFITS:

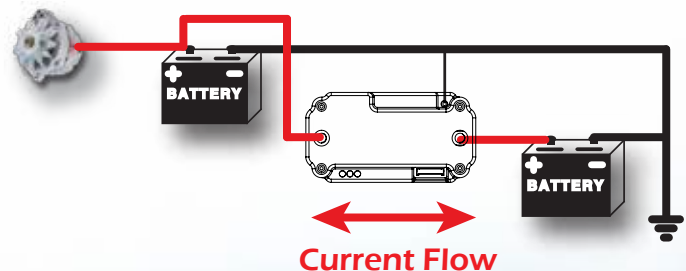
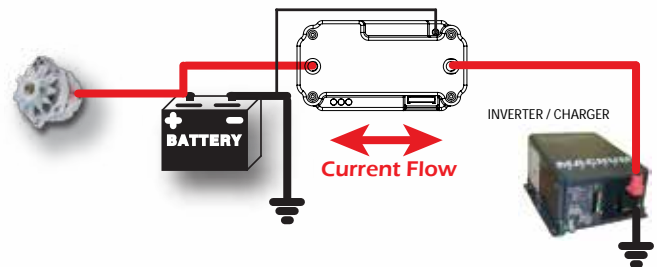
- Low voltage, high current capability
- Internationally patented arrayed MOSFET technology
- MIL-STD-461E Compliant
- Optional sleep mode for ultra-low current draw
- 99.9% efficiency at max. current
- Fully Encapsulated solid state design
- Light weight
- Dramatically smaller than conventional devices
- Market-leading, ultra-low on-state resistance
- No heat sinks or airflow required
- Quik-turn capability
- Recommended by top battery manufacturers



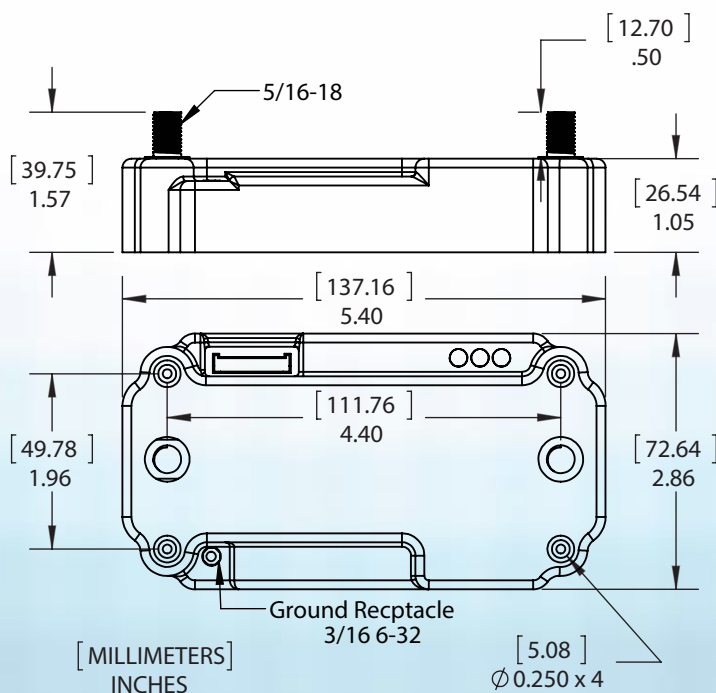
50 to 100 Amps
12 and 24 Volts

POWER-GATE solid state Bi-Directional relays are designed to switch DC current up to 100 amps, and allow current to flow bi-directionally. An integrated microprocessor provides smart control including traditional Low Voltage Disconnect functionality to safeguard batteries. The device can be customized for OEM's serving various internal and external battery management applications. Often used in fleet applications, the device can be placed between a starting and auxiliary battery allowing the onboard logic to decide when to separate the batteries to insure vehicle start-up. A manual override trigger can force the device to join batteries together for self-jumping applications.

Bi-Directional relays can behave in full automatic mode, respond to manual triggers, or both. Its on-board logic, low on-resistance, and high current switching make it a compelling choice for systems engineers and fleet operators alike.



MECHANICAL SPECIFICATIONS



A solid state Bi-Directional Relay can be used to switch power between two batteries. Current can flow in both directions much like a mechanical relay. Reprogrammable logic causes the device to respond to differing voltage and timing cues, safeguarding batteries from deep discharge, or monitoring voltage, current, and temperature for various internal or external battery management applications.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min.	Max.	Units
V_S	Supply Voltage	6.5	36	VDC
T_A	Ambient Temperature	-40	+105	°C
V_{TRIG}	Trigger Voltage	0	36	VDC

ELECTRICAL SPECIFICATIONS

($T_A = +25\text{ }^\circ\text{C}$, $6.5\text{ VDC} \leq V_S \leq 36\text{ VDC}$, all LEDs enabled unless otherwise specified):

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_{MAX}	Maximum Continuous Load Current	-	-	50	ADC	Model RB50B, $-40\text{ }^\circ\text{C} \leq T_A \leq +105\text{ }^\circ\text{C}$
		-	-	100		Model RB100B, $-40\text{ }^\circ\text{C} \leq T_A \leq +105\text{ }^\circ\text{C}$
V_{DROP}	Input-to-Output Voltage Drop	-	40	50	mVDC	Load Current = I_{MAX}
I_S	Operating Current	18	-	-	mADC	$V_S = 18\text{ VDC}$, $V_{TRIG} = 0\text{ VDC}$
		-	18.3	-		$V_S = 24\text{ VDC}$, $V_{TRIG} = 0\text{ VDC}$
		-	-	19		$V_S = 36\text{ VDC}$, $V_{TRIG} = 0\text{ VDC}$
		32	-	-		$V_S = 18\text{ VDC}$, $V_{TRIG} = 10\text{ VDC}$
		-	33.5	-		$V_S = 24\text{ VDC}$, $V_{TRIG} = 10\text{ VDC}$
		-	-	35		$V_S = 36\text{ VDC}$, $V_{TRIG} = 10\text{ VDC}$
$I_{S,LP}$	Low Power Mode Current	500	-	-	μADC	
I_{LEAK}	Relay Off Leakage Current	-	620	-	μADC	
		-	-	800	μADC	
I_{LEAK}	Relay Off Leakage Current	-	190	250	μADC	$V_S = 36\text{ VDC}$, Load = 0 VDC
$V_{TRIG,ON}$	Trigger On Voltage	3.3	-	-	VDC	
$V_{TRIG,OFF}$	Trigger Off Voltage	-	-	3	VDC	
I_{TRIG}	Trigger Current	-	2	-	mADC	$V_{TRIG} = 3.3\text{ VDC}$
		-	4.2	-		$V_{TRIG} = 24\text{ VDC}$
		-	5.4	-		$V_{TRIG} = 36\text{ VDC}$
I_{O11}	Overcurrent Threshold - Level 1	$1.05 \cdot I_{MAX}$	$1.2 \cdot I_{MAX}$	$1.35 \cdot I_{MAX}$	ADC	$-40\text{ }^\circ\text{C} \leq T_A \leq +105\text{ }^\circ\text{C}$
t_{O11}	Overcurrent Threshold Shutdown Delay - Level 1	-	5	-	s	$-40\text{ }^\circ\text{C} \leq T_A \leq +105\text{ }^\circ\text{C}$
I_{O12}	Overcurrent Threshold - Level 2	$1.85 \cdot I_{MAX}$	$2 \cdot I_{MAX}$	$2.35 \cdot I_{MAX}$	ADC	$-40\text{ }^\circ\text{C} \leq T_A \leq +105\text{ }^\circ\text{C}$
t_{O12}	Overcurrent Threshold Shutdown Delay - Level 2	-	2	-	s	$-40\text{ }^\circ\text{C} \leq T_A \leq +105\text{ }^\circ\text{C}$
I_{SC}	Short Circuit Threshold	$2.85 \cdot I_{MAX}$	$3 \cdot I_{MAX}$	$3.15 \cdot I_{MAX}$	ADC	$-40\text{ }^\circ\text{C} \leq T_A \leq +105\text{ }^\circ\text{C}$
t_{SC}	Short Circuit Threshold Shutdown Delay	-	500	-	μs	$-40\text{ }^\circ\text{C} \leq T_A \leq +105\text{ }^\circ\text{C}$
T_{OFF}	Internal Overtemp Shutdown	-	135	-	°C	
T_{RESET}	Internal Overtemp Reset	-	130	-	°C	

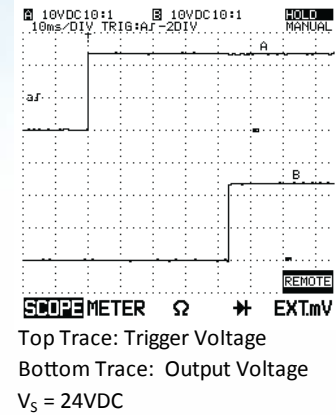
PACKAGE CHARACTERISTICS

- Vacuum-formed Acrylonitrile Butadiene Styrene (ABS)
- Black 2-part, flame retardant filled epoxy - electronics grade
- Three integrated LED's for visual status and diagnostics
- Four .250" integrated mounting holes
- 5/16-18 x .500" machined brass connection posts
- 6-32 brass ground post with provided ring terminal
- 10-pin Molex control harness
- Vinyl post insulators
- Weight : approximately 14 ounces (0.396kg)

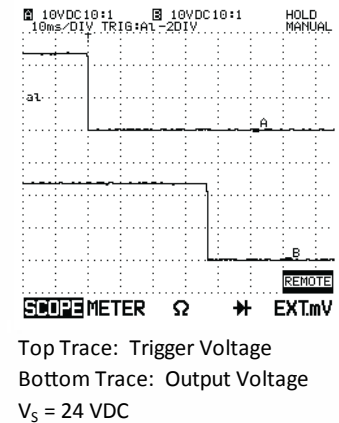


TYPICAL PERFORMANCE

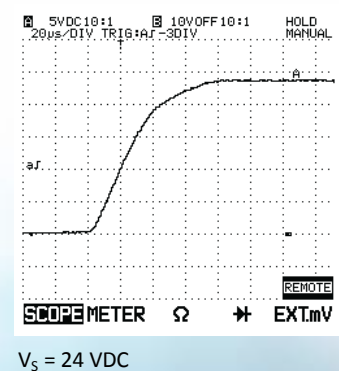
Turn-On Time



Turn-Off Time



Output Rise Time



Output Fall Time

