# POWER-GATE<sup>™</sup> Solid-State Devices OR'ing (programmable) Specification Sheet Generation 3.0

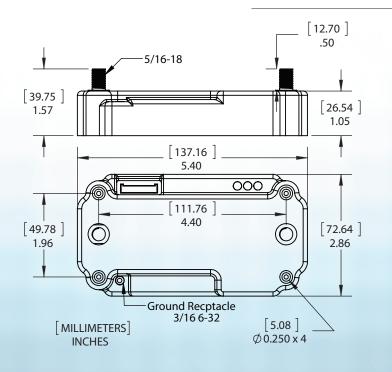


The POWER-GATE Programmable OR'ing functionality is achieved using two, bi-directional solid state relays (RB devices). For Absolute Maximum Ratings, Recommended Operating Conditions, and Electrical Specifications, please view the specification sheet for the POWER-GATE Bi-Directional Relays located on our website. The information herein relates to OR'ing performance when deployed as an RB assembly programmed to behave as a smart OR'ing device.



# MECHANICAL SPECIFICATIONS

Two devices per assembly



#### ADDITIONAL INFORMATION

Electronic assembly inserted into ABS encapsulation shell then backfilled with black, flame retardent, filled epoxy specifically developed for the potting of electronic modules.

Four integrated mounting holes pre-drilled to .250"

Mouting posts, 5/16-18 x .50" with provided brass washers and nylon insert 5/16-18 nuts. Mounting torque not to exceed 75 inch-pounds or 8.5 newtonmeters.

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#### SWITCHING SPECIFICATIONS All devices, $T_a = 25 \pm 3$ °C, relays operated within recommended operating conditions, all voltages referenced to relay ground, unless otherwise specified.

Symbol	Parameter	Min.	Тур.	Max.	Units	Conditions
t <sub>sw</sub>	Switching delay when primary source falls below programmed under-voltage threshold	-	5.6	-		$V_{\text{P}}:~28$ to $18$ V, $V_{\text{S}}$ = 24 V, Primary under-voltage trip threshold = 25 V
t <sub>DT,P2S</sub>	Load deadtime when switching sources, after primary source falls below programmed under- voltage trip threshold	-	0.76	-	ms	$V_{\text{P}}:~28$ to $18$ V, $V_{\text{S}}$ = 24 V, Primary under-voltage trip threshold = 25 V
t <sub>dt,s2p</sub>	Load deadtime when switching sources, after primary source rises above programmed under- voltage reset threshold	-	4.0	-		$V_{P^{\rm c}}$ 18 to 28 V, $V_{S}$ = 24 V, Primary under-voltage reset threshold = 26.5 V

**TYPICAL PERFORMANCE** 

## NOTES:

- V<sub>p</sub> = Primary Source Voltage, V<sub>c</sub> = Secondary Source Voltage, VL = Load Voltage 1)
- 2) Operating current for both relays drawn from primary source when  $V_p > V_c - 3.6 V$ , from secondary source otherwise.
- Switching delay defined as difference between time when V, falls below under-voltage trip threshold and time when, after secondary relay 3) turns on,  $V_1 = V_s$ .
- 4) Load deadtime defined as difference between time when V, falls below 5 V (when primary relay is turning off), and the time when V, rises above 5 V (when secondary relay is turning on).

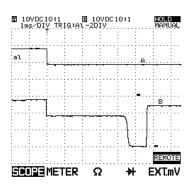


Figure 1: Switching delay when primary source falls below programmed under-voltage threshold. Top Trace: V Bottom Trace: V  $V_{p}$ : 28 to 18 V,  $V_{s} = 24$  V Primary source under-voltage trip threshold = 25 V

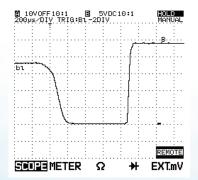


Figure 3: Load deadtime when switching sources, after primary source falls below programmed under-voltage trip threshold. Trace: V

 $V_{p}$ : 28 to 18 V,  $V_{s} = 24 V$ 

Primary source under-voltage trip threshold = 25 V

# 10VDC10:1 10VDC10:1 1ms/DIV\_TRIG:AL-2DIV HOLD MANUAL - **T** в REMOTE SCOPE METER EXT.mV

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Figure 2: Switching delay when primary source fails shorted to ground. Top Trace: V<sub>p</sub> Bottom Trace: V,

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 $V_{p}$ : 28 to 0 V,  $V_{s} = 24 V$ 

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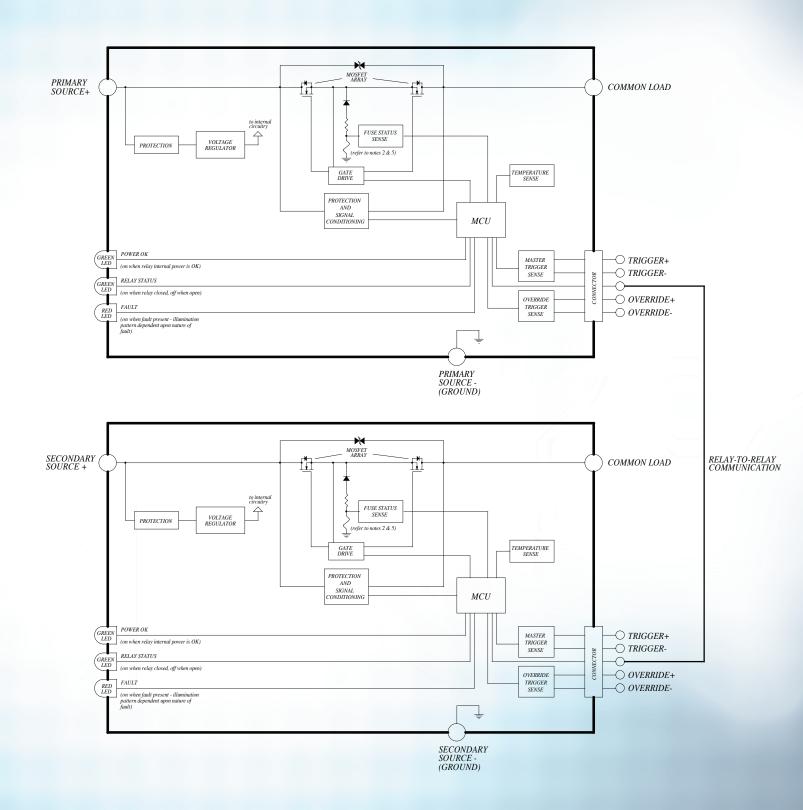
Figure 4: Load deadtime when switching sources, after primary source rises above programmed under-voltage reset threshold. Trace:  $V_{L}$ 

 $V_{p}$ : 18 to 28 V,  $V_{s} = 24 V$ 

Primary source under-voltage reset threshold = 26.5 V

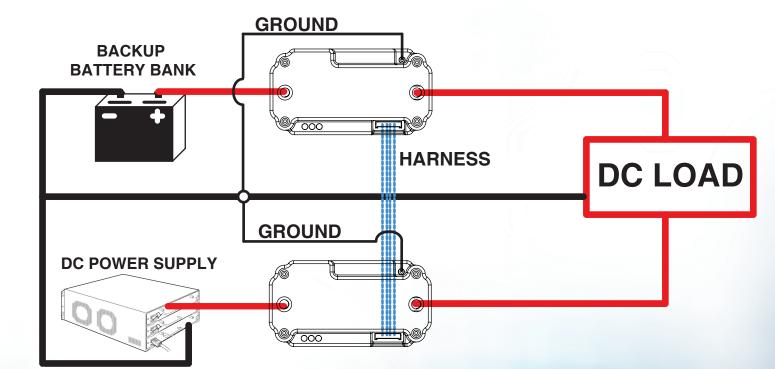
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#### Diagram 1



POWER-GATE programmable OR'ing configuration is designed to selectively connect one of two sources to a common load. As opposed to the non-programmable OR'ing diodes, which connect the higher of two sources to the common load, regardless of the source's absolute voltages, the programmable OR'ing configuration allows the user to choose any switching voltage threshold and delay. For example, a common configuration (shown below) is to OR a primary power supply and a backup battery. When the primary source voltage falls and stays below the user-defined under-voltage trip threshold for the user-defined delay, its corresponding relay will automatically disconnect the primary source from the load and command the load to be connected to the backup battery. When the primary source voltage then rises and stays above the userdefined under-voltage reset threshold for the user-defined delay, the load will automatically be disconnected from the backup battery and reconnected to the primary source.

The relays are configured standard as break-before-make, resulting in a short dead-time (refer to switching specifications) where the load is connected to neither source. This prevents cross-conduction between the sources, which is especially important if one source becomes shorted to ground.



### **REVISION HISTORY**

REV	DATE	DESCRIPTION	PAGE NUMBER (S)
0	02/28/14	Original Release	
1	12/03/14	Comprehensive Revise	

Á	DANGER / PE	ELIGRO / DANG	ER /GEFAHR / P	ERICOLO / PERI	GO
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH. • Disconnect all power before installing or working with this equipment. • Verify all connections and replace all covers before turning on power. Failure to follow these instructions will result in death or serious injury.	RIESGO DE DESCARGA ELECTRICA O EXPLOSION. • Desconectar todos los suministros de energia a este equipo antes de trabajar con este equipo. • Verificar todas las conexiones y colocar todas las tapas antes de energizer el equipo. El incumplimiento de estas instrucciones puede provocar la muerte o lesiones serias.	RISQUE DE DESCHARGE ELECTRIQUE OU EXPLOSION • Eteindre toutes les sources d'énergie de cet appareil avant de travailler dessus de cet appareil • Vérifier tous connections, et remettre tous couverts en olace avant de mettre sous De non-suivi de ces instructions provoquera la mort ou des lésions sérieuses sérieuses.	GEFAHR EINES ELEKTRISCHE N SCHLAGES ODER EINER EXPLOSION. • Stellen Sie jeglichen Strom ab, der dieses Gerät versorgt, bevor Sie an dem Gerät Arbeiten durchführen • Vor der Inbetriebnahme alle Anschlüsse überprüfen und alle Gehäuseteile montieren. Unterlassung dieser Anweisungen können zum Tode oder zu schweren Verletzungen führen.	RISCHIO DI SCOSSA ELETTRICA O DELL'ESPLOSI ONE. • Spenga tutta l'alimentazion e che fornisce questa apparecchiatu ra prima del lavorare a questa apparecchiatu ra • Verificare tutti i collegamenti e sostituire tutte le coperture prima della rotazione sull'alimentazi one L'omissione di seguire queste istruz ioni provocherà la morte o di lesioni serie	RISCO DE DESCARGA ELÉTTRICA OU EXPLOSÃO • Desconectar o equipamento de toda á energia antes de instalar ou trabalhar com este equipamen to • Verificar todas as conexões e recolocar todas as tampas antes de religar o equipamento O não cumprimento destas instruções pode levar á morte ou lesões sérias.