POWER-GATE™ Solid-State Devices
Single Rectifier
Specification Sheet
Generation 4.0

Made in U.S.A

ABSOLUTE MAXIMUM RATINGS[1]

All devices ("x" = don't care) , all amperages DC, all voltages DC and referenced to device ground, unless otherwise specified.

Symbol	Parameter	Min.	Max.	Units
V_A	Anode Voltage, Models SRS40A-xxx	-0.3[2]	19[3]	V
	Anode Voltage, Models SRS40B-xxx		37[4]	
V_K	Cathode Voltage (anode voltage at min), Models SRS40A-xxx	-0.6[2]	19[3]	V
	Cathode Voltage (anode voltage at min), Models SRS40B-xxx		37[4]	
$V_{R,gndfloat}$[5]	Reverse Voltage (ground floating), Models SRS40A-xxx	-	19	V
	Reverse Voltage (ground floating), Models SRS40B-xxx	-	37	
$I_{F,gndfloat}$[5]	Forward Current (ground floating), SRS40x-050	-	5	A
	Forward Current (ground floating), SRS40x-100	-	10	
	Forward Current (ground floating), SRS40x-150	-	15	
	Forward Current (ground floating), SRS40x-200	-	20	
	Forward Current (ground floating), SRS40x-250	-	25	
	Forward Current (ground floating), SRS40x-300	-	30	
T_A	Ambient Temperature	-45	+110	°C
V_{IGN}	Ignition Alternator Excitation Trigger Voltage	-37[6]	37[4]	V
$V_{STARTER}$	Starter Alternator Excitation Trigger Voltage			
$V_{ALTREEXC}$	Alternator Re-Excitation Trigger Voltage			
$V_{COMBINE+}$	COMBINE+ Trigger Voltage			
$V_{COMBINE-}$	COMBINE- Trigger Voltage[7]	-5.7	5.7	
I_{LED}	Remote LED Current	-	30	mA
$V_{LED(OFF)}$	Remote LED Voltage (LED Off)	-60	60	V

RECOMMENDED OPERATING CONDITIONS

All devices ("x" = don't care), all voltages DC and referenced to device ground, unless otherwise specificied.

Symbol	Parameter	Min.	Max.	Units
V_A	Anode Voltage, Model SRS40A-xxx	5.6	18	V
	Anode Voltage, Model SRS40B-xxx		36	
V_K	Cathode Voltage (anode voltage at min), Model SRS40A-xxx	5.5	18	V
	Cathode Voltage (anode voltage at min), Model SRS40B-xxx		36	
T_A	Ambient Temperature	-40	+105	°C
V_{IGN}	Ignition Alternator Excitation Trigger Voltage	0	36	V
$V_{STARTER}$	Starter Alternator Excitation Trigger Voltage			
$V_{ALTREEXC}$	Alternator Re-Excitation Trigger Voltage			
$V_{COMBINE+}$	COMBINE+ Trigger Voltage			

ELECTRICAL SPECIFICATIONS

All devices ("x" = don't care), all amperages DC, all voltages DC and referenced to ground,
T_A = +25 ± 3 °C, 5.6 V ≤ V_A (SRS40A-xxx) ≤ 18 V, 5.6 V ≤ V_A (SRS40B-xxx) ≤ 36 V,
all LEDs enabled, V_{IGN} = $V_{STARTER}$ = $V_{ALTREEXC}$ = 0 V , combine trigger active-low type, combine feature not active, unless otherwise specified.

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_{FET,MAX}$	Maximum MOSFET Array Continuous Current	-	-	50	A	Models SRS40x-050, -40°C ≤ T_A ≤ +105 °C
		-	-	100		Models SRS40x-100, -40°C ≤ T_A ≤ +105 °C
		-	-	150		Models SRS40x-150, -40°C ≤ T_A ≤ +105 °C
		-	-	200		Models SRS40x-200, -40°C ≤ T_A ≤ +105 °C
		-	-	250		Models SRS40x-250, -40 °C ≤ T_A ≤ +105 °C
		-	-	300		Models SRS40x-300, -40 °C ≤ T_A ≤ +105 °C
$I_{SURGE,MAX}$	Maximum MOSFET Array Surge Current	-	-	2.5 x $I_{FET,MAX}$		Pulse width = 60 s, -40 °C ≤ T_A ≤ +105 °C
		-	-	3 x $I_{FET,MAX}$		Pulse width = 10 s, -40 °C ≤ T_A ≤ +105 °C
		-	-	4 x $I_{FET,MAX}$		Pulse width = 1 s, -40 °C ≤ T_A ≤ +105 °C
		-	-	5 x $I_{FET,MAX}$		Pulse width = 20 ms, -40 °C ≤ T_A ≤ +105 °C
		-	-	6 x $I_{FET,MAX}$		Pulse width = 4 ms, -40 °C ≤ T_A ≤ +105 °C
		-	-	7 x $I_{FET,MAX}$		Pulse width = 2 ms, -40 °C ≤ T_A ≤ +105 °C
		-	-	9 x $I_{FET,MAX}$		Pulse width ≤ 1 ms, -40 °C ≤ T_A ≤ +105 °C
$I_{INT,MAX}$	Maximum Reverse Interrupt Current	-	-	-	-	See "Maximum Interrupting Current" section (coming soon)
V_{FET}	MOSFET Array Voltage Drop[8]	-	15	17	mV	SRS40A-050, Forward Current = $I_{FET,MAX}$
		-	15	18		SRS40A-050, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	18	25		SRS40A-100, Forward Current = $I_{FET,MAX}$
		-	23	32		SRS40A-100, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	24	33		SRS40A-150, Forward Current = $I_{FET,MAX}$
		-	30	42		SRS40A-150, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	28	39		SRS40A-200, Forward Current = $I_{FET,MAX}$
		-	36	49		SRS40A-200, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	32	44		SRS40A-250, Forward Current = $I_{FET,MAX}$
		-	40	56		SRS40A-250, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	36	49		SRS40A-300, Forward Current = $I_{FET,MAX}$
		-	46	62		SRS40A-300, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	16	19		SRS40B-050, Forward Current = $I_{FET,MAX}$
		-	24	33		SRS40B-050, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	28	39		SRS40B-100, Forward Current = $I_{FET,MAX}$
		-	40	56		SRS40B-100, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	30	41		SRS40B-150, Forward Current = $I_{FET,MAX}$
		-	42	58		SRS40B-150, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	34	45		SRS40B-200, Forward Current = $I_{FET,MAX}$
		-	47	64		SRS40B-200, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	39	52		SRS40B-250, Forward Current = $I_{FET,MAX}$
		-	55	75		SRS40B-250, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
		-	43	57		SRS40B-300, Forward Current = $I_{FET,MAX}$
		-	61	83		SRS40B-300, Forward Current = $I_{FET,MAX}$, T_A = +105 °C
$I_{over,trip}$	Forward Over-current Indicator Trip	1.5 x $I_{FET,MAX}$	2 x $I_{FET,MAX}$	2.5 x $I_{FET,MAX}$	A	-40 °C ≤ T_A ≤ +105 °C
$I_{over,reset}$	Forward Over-current Indicator Reset	-	$I_{over,trip}$ - 10	-		-40 °C ≤ T_A ≤ +105 °C
I_S	Operating Current[9]	0.78	0.82	0.86		V_K = 5.5 V, Anode floating, Device in low-power mode[11]
		0.81	0.88	0.94		V_K = 12.0 V, Anode floating, Device in low-power mode[11]
		0.81	1.01	1.38		Models SRS40A-xxx, V_K = 18.0 V, Anode floating, Device in low-power mode[11]
		0.88	0.92	0.96		Models SRS40B-xxx, V_K = 18.0 V, Anode floating, Device in low-power mode[11]
		0.93	0.97	1		Models SRS40B-xxx, V_K = 24.0 V, Anode floating, Device in low-power mode[11]
		1.01	1.1	1.13		Models SRS40B-xxx, V_K = 36.0 V, Anode floating, Device in low-power mode[11]
		19.4	20.4	21.5	mA	V_A = 5.5 V, Cathode floating
		20.3	21.4	22.4		V_A = 12.0 V, Cathode floating
		21.7	22.4	23		Models SRS40A-xxx, V_A = 18.0 V, Cathode floating
		21.1	22.1	23.1		Models SRS40B-xxx, V_A = 18.0 V, Cathode floating
		21.5	23.0	24.5		Models SRS40B-xxx, V_A = 24.0 V, Cathode floating
		22.2	24.8	27.4		Models SRS40B-xxx, V_A = 36.0 V, Cathode floating
		25.8	26.2	26.5		Models SRS40A-xxx, V_K = 12.0 V, Anode floating, Combine active (COMBINE+ and COMBINE- shorted)
		26.4	27.9	29.4		Models SRS40B-xxx, V_K = 24.0 V, Anode floating, Combine active (COMBINE+ and COMBINE- shorted)

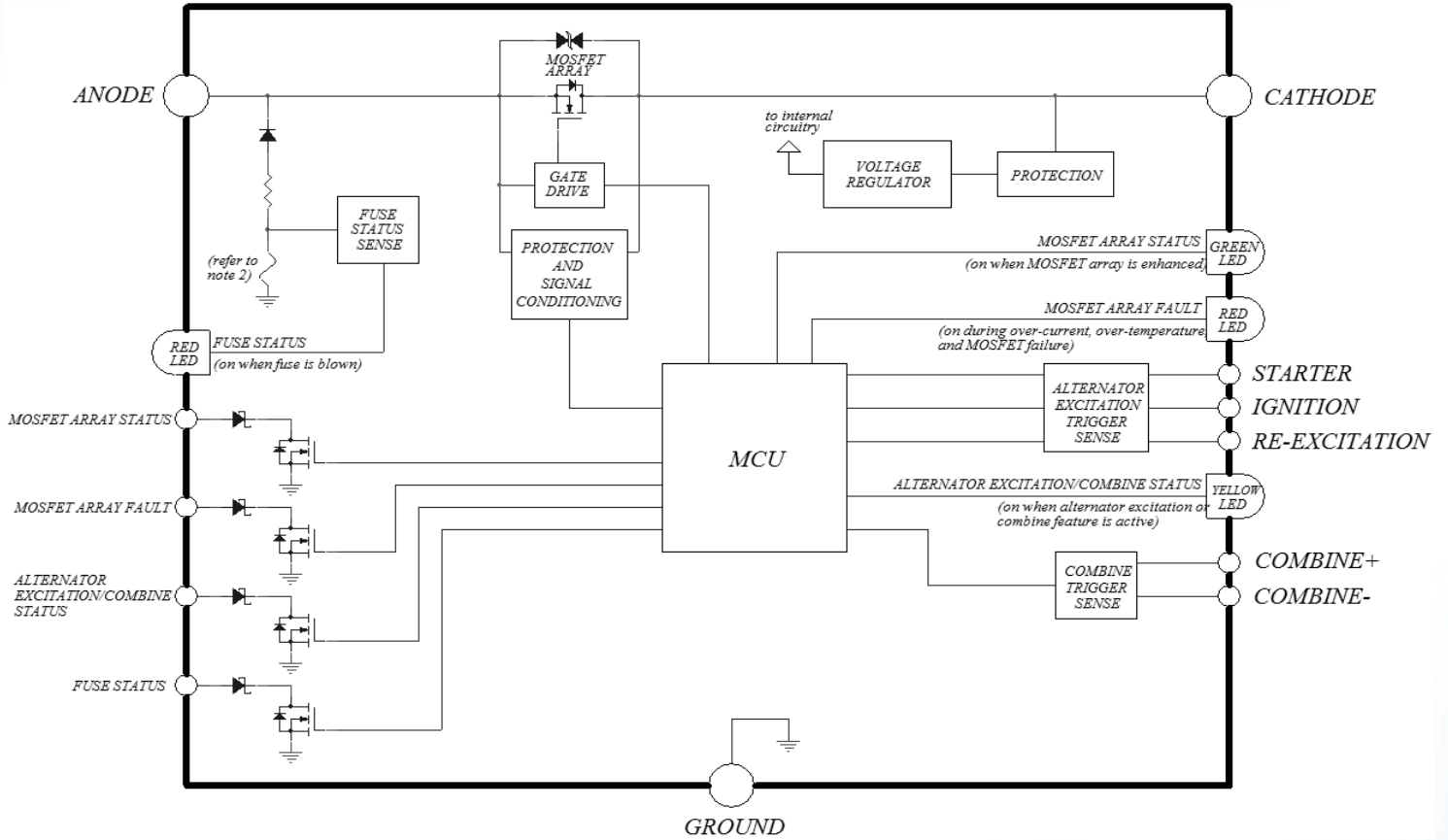# Continued on next page...

ELECTRICAL SPECIFICATIONS (continued)

All devices ("x" = don't care), all amperages DC, all voltages DC and referenced to ground,
T_A = +25 ± 3 °C, 5.6 V ≤ V_A (SRS40A-xxx) ≤ 18 V, 5.6 V ≤ V_A (SRS40B-xxx) ≤ 36 V,
all LEDs enabled, V_{IGN} = $V_{STARTER}$ = $V_{ALTREEXC}$ = 0 V, combine trigger active-low type, combine feature not active, unless otherwise specified.
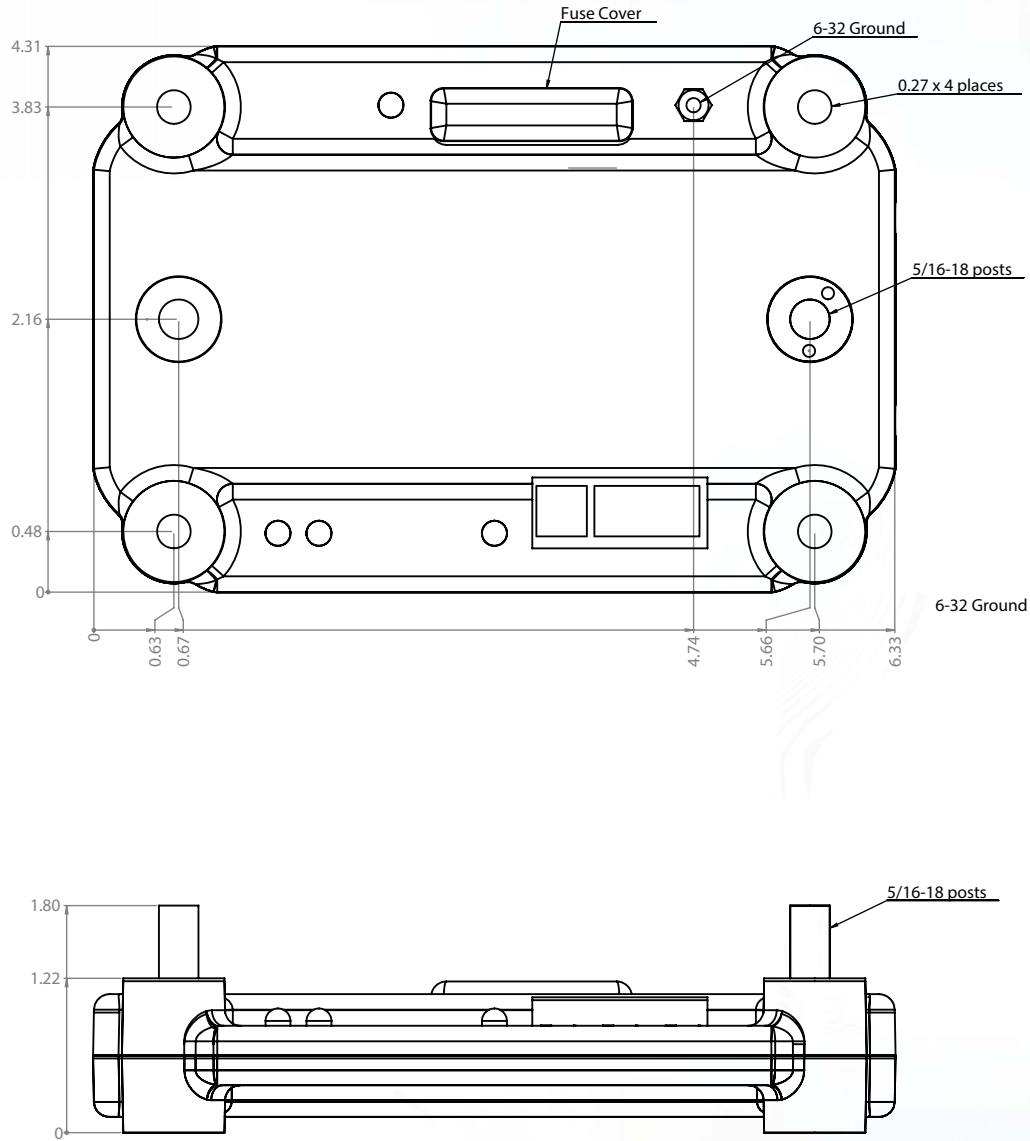
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_R	Reverse Leakage Current[10]	-	9	210	µA	Model SRS40A-050, Anode shorted to device ground, Typical value: V_K = 12.0 V, Maximum value: V_K = 18.0 V
		-	6	30		Model SRS40A-100, Anode shorted to device ground, Typical value: V_K = 12.0 V, Maximum value: V_K = 18.0 V
		-	10	210		Model SRS40A-150, Anode shorted to device ground, Typical value: V_K = 12.0 V, Maximum value: V_K = 18.0 V
		-	18	720		Model SRS40A-200, Anode shorted to device ground, Typical value: V_K = 12.0 V, Maximum value: V_K = 18.0 V
		-	35	1300		Model SRS40A-250, Anode shorted to device ground, Typical value: V_K = 12.0 V, Maximum value: V_K = 18.0 V
		-	40	1600		Model SRS40A-300, Anode shorted to device ground, Typical value: V_K = 12.0 V, Maximum value: V_K = 18.0 V
		-	6	10		Model SRS40B-050, Anode shorted to device ground, Typical value: V_K = 24.0 V, Maximum value: V_K = 36.0 V
		-	6	10		Model SRS40B-100, Anode shorted to device ground, Typical value: V_K = 24.0 V, Maximum value: V_K = 36.0 V
		-	6	10		Model SRS40B-150, Anode shorted to device ground, Typical value: V_K = 24.0 V, Maximum value: V_K = 36.0 V
		-	6	15		Model SRS40B-200, Anode shorted to device ground, Typical value: V_K = 24.0 V, Maximum value: V_K = 36.0 V
		-	6	25		Model SRS40B-250, Anode shorted to device ground, Typical value: V_K = 24.0 V, Maximum value: V_K = 36.0 V
		-	6	70		Model SRS40B-300, Anode shorted to device ground, Typical value: V_K = 24.0 V, Maximum value: V_K = 36.0 V
t_{FP2LP}	Full-Power Mode to Low-Power Mode Delay Time[11]	-	60	-	s	
$V_{IGN,ON}$	Ignition Alternator Excitation Trigger On Voltage[12,20]	-	0.9	-	V	
$V_{IGN,OFF}$	Ignition Alternator Excitation Trigger Off Voltage[13,20]	-	$V_{IGN,ON}$ - 0.025	-		
$V_{STARTER,TRIP}$	Starter Alternator Excitation Trigger Trip Voltage[14,20]	-	0.9	-		
$V_{STARTER,GO}$	Starter Alternator Excitation Trigger Go Voltage[14,20]	-	$V_{STARTER,GO}$ - 0.025	-		
$V_{ALTREEXC,ON}$	Alternator Re-Excitation Trigger On Voltage[15,20]	-	0.9	-		
$V_{ALTREEXC,OFF}$	Alternator Re-Excitation Trigger Off Voltage[16,20]	-	$V_{ALTREEXC,ON}$ - 0.025	-		
I_{IGN}	Ignition Alternator Excitation Trigger Current	-	49	-	µA	V_{IGN} = 5.0 V
		-	170	-		V_{IGN} = 12.0 V
		-	290	-		V_{IGN} = 18.0 V
		-	410	-		V_{IGN} = 24.0 V
		-	650	-		V_{IGN} = 36.0 V
$I_{STARTER}$	Starter Alternator Excitation Trigger Current	-	99	-	µA	$V_{STARTER}$ = 5.0 V
		-	340	-		$V_{STARTER}$ = 12.0 V
		-	580	-		$V_{STARTER}$ = 18.0 V
		-	820	-		$V_{STARTER}$ = 24.0 V
		-	1300	-		$V_{STARTER}$ = 36.0 V
$I_{ALTREEXC}$	Alternator Re-Excitation Trigger Current	-	51	-		$V_{ALTREEXC}$ = 5.0 V
		-	175	-		$V_{ALTREEXC}$ = 12.0 V
		-	295	-		$V_{ALTREEXC}$ = 18.0 V
		-	415	-		$V_{ALTREEXC}$ = 24.0 V
		-	655	-		$V_{ALTREEXC}$ = 36.0 V
$t_{TRIG,HOLD}$	Trigger Hold Time[17,18]	45	-	-	ms	
$t_{ALTEXC,DELAY}$	Alternator Excitation Delay Time[20]	-	4	-	s	
$t_{ALTEXC,PULSEON}$	Alternator Excitation Pulse On Time[20]	-	0.5	-		
$t_{ALTEXC,PULSEOFF}$	Alternator Excitation Pulse Off Time[20]	-	0.5	-		
$t_{ALTEXC,PULSENUM}$	Number of Alternator Excitation Pulses[20]	-	-	60		
$I_{COMBINE}$	Combine Trigger Current	-	34	-	µA	COMBINE+ and COMBINE- shorted together
$V_{COMBINE+}$	COMBINE+ Floating Voltage[19]	-	3.3	-	V	
t_{RR}	Rectifier Reverse Recovery Time[21]	-	-	400	µs	
$t_{FET,START}$	MOSFET Start-up Time[22]	-	45	50	ms	Models SRS40A-xxx: V_A = 0 to 12 V, Cathode floating Models SRS40B-xxx: V_A = 0 to 24 V, Cathode floating
		-	3	3.5		Models SRS40A-xxx: V_K = 18 V to floating, V_A = 12 V, Device in full-power mode Models SRS40B-xxx: V_K = 36 V to floating, V_A = 24 V, Device in full-power mode

Notes continued on next page...

NOTES

1.   Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. Exposure to any absolute maximum rating condition for extended periods may affect device reliability and lifetime.

2.   Larger negative voltages will blow internal fuse. If fuse blows, as long as V_A is not more negative than -18/-36 V for model SRS40A-xxx/SRS40B-xxx, respectively, and is less than V_K, no damage to device will occur. Only use manufacturer-specified fuse for replacement.

3.   Transient-protected to 40 V. Additional external protection may be required in some applications.

4.   Transient-protected to 60 V. Additional external protection may be required in some applications.

5.   Using the rectifier with the device ground disconnected is not recommended. Exceeding any of these ratings will cause excessive heat buildup, leading to MOSFET failure.

6.   Transient-protected to -60 V. Additional external protection may be required in some applications.

7.   COMBINE- trigger is not used with an active-high type. When trigger is configured as active-low type, COMBINE- trigger is usually connected to a mechanical switch which shorts it to COMBINE+ to activate the combine feature.

8.   Voltage drop tested under pulsed conditions with pulse length ≤ 2 s.

9. I_S sourced from cathode (anode), when $V_A < V_K$ ($V_A > V_K$).

10. I_R is defined as the current exiting the anode terminal and is measured when the device is in its low-power state; see application sheet AS0504 for additional information.

11.   Full-power mode to low-power mode delay time is defined as the length of time between when a reverse voltage appears across the MOSFET array and the device enters its low-power mode (only applicable when neither the alternator excitation/re-excitation nor the combine processes are active).

12.   Ignition alternator excitation trigger on voltage defined as the ignition line voltage at which the alternator excitation process begins. Voltage must stay above this value during entire excitation process.

13.   Ignition alternator excitation trigger off voltage defined as the ignition line voltage at which the alternator excitation process is terminated and reset; voltage must rise above the ignition alternator trigger on voltage to restart the alternator excitation process.

14.   Starter alternator excitation trigger trip voltage is defined as the rising starter line voltage at which the device detects a start event. Starter alternator excitation trigger go voltage is defined as the falling starter line voltage at which the alternator excitation process begins (after the voltage has first risen above $V_{STARTER,TRIP}$). If at any time during the alternator excitation process the starter line voltage rises above $V_{STARTER,TRIP}$, the alternator excitation process will be terminated and the device will wait for the voltage to fall below $V_{STARTER,GO}$ before initiating a new alternator excitation process.

15.   Alternator re-excitation trigger on voltage defined as the trigger line voltage at which the alternator re-excitation process begins. Voltage must stay above this value during entire excitation process.

16.   Alternator re-excitation trigger off voltage defined as the line voltage at which the alternator re-excitation process is terminated and reset; voltage must rise above the alternator re-excitation trigger on voltage to enable the alternator re-excitation feature.

17.   Applies to all triggers.

18.   Trigger hold time is defined as the length of time that a trigger voltage must be held above or below a threshold voltage in order to yield a valid state change.

19.   100 kΩ (typical) between COMBINE+ and internal +3.3 V.

20.   See application sheet AS0504 for more information on the alternator excitation process.

21.   Reverse recovery time measured from the time V_A - V_K goes from positive to negative until the MOSFET array turns completely off. Reverse current may continue to flow through the MOSFET transient voltage supression diodes or the inductive load diode depending on the inductance in the system.

22.   MOSFET start-up time is defined as the time from when V_A - V_K becomes positive to when the MOSFETs enter their low-resistance state. During this time, current will flow from the anode to the cathode through the MOSFET array body diodes, ensuring there is always a path for current to flow as long as a positive forward voltage (V_A - V_K) is present.

ANODE

CATHODE

MOSFET
ARRAY

to internal
circuitry

VOLTAGE
REGULATOR

PROTECTION

GATE
DRIVE

FUSE
STATUS
SENSE

(refer to
note 2)

PROTECTION
AND
SIGNAL
CONDITIONING

MOSFET ARRAY STATUS
(on when MOSFET array is enhanced)

GREEN
LED

MOSFET ARRAY FAULT
(on during over-current, over-temperature
and MOSFET failure)

RED
LED

RED
LED

FUSE STATUS
(on when fuse is blown)

STARTER

ALTERNATOR
EXCITATION
TRIGGER
SENSE

IGNITION

MOSFET ARRAY STATUS

RE-EXCITATION

MCU

MOSFET ARRAY FAULT

ALTERNATOR EXCITATION/COMBINE STATUS
(on when alternator excitation or
combine feature is active)

YELLOW
LED

ALTERNATOR
EXCITATION/COMBINE
STATUS

COMBINE+

COMBINE
TRIGGER
SENSE

COMBINE-

FUSE STATUS

GROUND

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Specifications subject to change without notice.

Specification Sheet-Single Rectifier, GEN4.0.ai 08/19

Perfect Switch, LLC
(858) 720-1339
(858) 530-8656 fax
www.perfectswitch.com

Fuse Cover

6-32 Ground

0.27 x 4 places

5/16-18 posts

6-32 Ground

5/16-18 posts

Electronic assembly inserted into Polycarbonate enclosure and fully encapsulated with silicone elastomer specifically developed for potting electronic modules.

Four intgrated mounting points for user supplied 5/16″ mounting hardware of suitable length.

Brass mounting posts, 5/16-18 x .60″ with provided brass washers and nylon insert nuts. Mounting torque not to exceed 15 newton-meters.

Molex top-mounted control harness and expansion port for remote monitoring display.

Typical weight post encapsulation including provided hardware is 23.5 ounces (+ /- 10%)

The manufacturer strongly recommends the use of remote-mounted visual indicators (LED or lamp) and/or audible indicators (alarm or buzzer) informing the user of either normal operation or a fault condition. Should a fault condition occur, it is necessary to remove the Single Rectifier from the electrical circuit and contact the manufacturer for diagnostic support or replacement.

Customer should match the LED / Lamp and/or alarm(s) to the voltage rating of the native electrical system. For example, a 12 volt vehicle will use a 12 volt Single Rectifier with 12 volt LEDS and alarms. A 24 volt vehicle will use a 24 volt Single Rectifier with 24 volt LEDS and alarms.

Current draw not to exceed 60mA

Wires coming from the connector are switched to ground when active, so the cathode of the LED should connect to the harness wire, and the anode should connect to the positive source voltage.

position #2

position #1
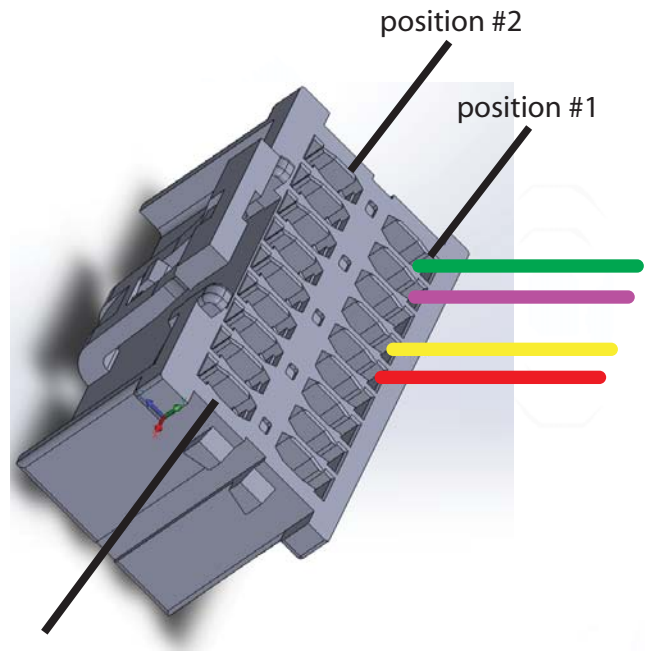
SR Accessory Harness 6055

Connector housing Molex 51353-1800
Terminals Molex 56134-9000
**Control harness, 1 meter, 24 AWG wires, -40 to +105 C min temp rating**

position #18

|		
1	**Array Status**	**Green**
2	**Empty**	
3	**Alternator Excite / Combine Active**	**Violet**
4	**Empty**	
5	**Empty**	
6	**Empty**	
7	**Fuse Blown**	**Yellow**
8	**Empty**	
9	**Array Fault**	**Red**
10	**Empty**	
11	**Empty**	
12	**Empty**	
13	**Empty**	
14	**Empty**	
15	**Empty**	
16	**Empty**	
17	**Empty**	
18	**Empty**	

SAMPLE APPLICATIONS
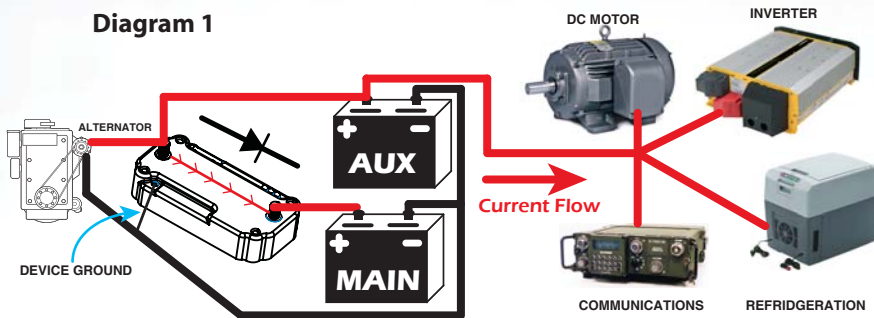
Diagram 1

POWER-GATE Single Rectifier Isolator allows all batteries in the network to be charged. In Diagram 1, the alternator is charging the AUX battery which is common on the device input post, and current is flowing through the MOSFET array to the MAIN battery. All loads applied to both batteries are being powered. See Diagram 2 to see what happens when the AUX battery is discharged.

Diagram 2
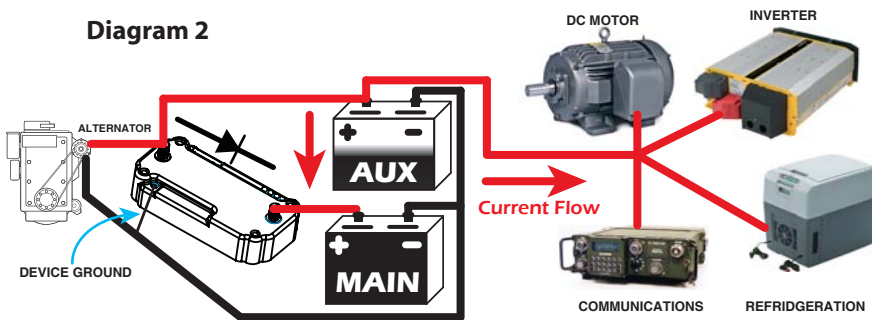
When the vehicle is off and load(s) are applied to the AUX battery, the AUX battery will discharge independent of the MAIN battery. Note the orientation of the diode symbol. The POWER-GATE's MOSFET array behaves like an "ideal" diode in that reverse current cannot flow from MAIN to AUX while forward current enjoys an absolute minimum voltage drop as denoted in Diagram 1.

Diagram 3
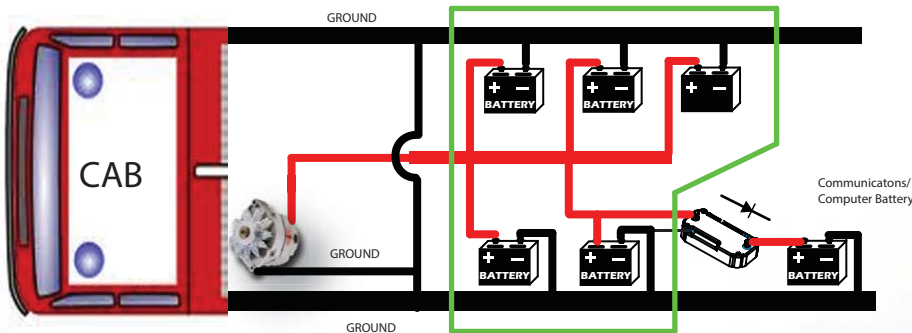
POWER-GATE Single Rectifier Isolator can be installed as an ideal diode. In Diagram 3, the Communications/Computer battery is isolated from the rest of the battery network. When the vehicle engine is cranked, the resulting dip in system voltage can cause the Communications and Computer equipment to reset. However, with the Comms/Computer battery isolated on its own dedicated cathode, when the system voltage dips, the Comm/Computer battery is automatically isolated alleviating wait-time needed for systems to reboot.

Under normal charging conditions either provided by the alternator or shore-power, all batteries charge as normal.

Specifications subject to change without notice.

Specification Sheet-Dual Rectifier, HC GEN4.0.ai 10/15

REVISION HISTORY

REV	DATE	DESCRIPTION	PAGE NUMBER (S)
0	08.29.19	Original Release	

⚠ DANGER / PELIGRO / DANGER /GEFAHR / PERICOLO / PERIGO

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