

GIGAFUSE: HIGH VOLTAGE BATTERY FAST DISCONNECT

A FAST AND PRECISE CIRCUIT PROTECTION SOLUTION FOR ADVANCED BATTERY SYSTEMS DURING SHORT CIRCUIT AND OVERCURRENT SITUATIONS

The high current levels and power densities in advanced battery systems demand equally high-performance safety components. Available in both passive and passive/active combinations, the GigaFuse from GIGAVAC, a brand of Sensata Technologies, is a fast-acting electromechanical device with low heat generation that allows for circuit trips at exact currents and features a design that easily pairs with contactors and eliminates thermal aging fatigue associated with typical DC fuses.



Features

- Functional Safety: Passive technology with electro-mechanical release mechanism
- Fast disconnect: <3ms clear time independent from current level
- System protection coordination: tunable trip current to easily pair with HV contactors
- Optional active control: to provide designers flexibility of active/passive protection methods
- 10MW max interrupt capacity at 850V, (4 μH)
- 400A continuous current carry (4/0 busbars); Consult engineering for higher current

Sensata's Value

- World-class automotive component supplier
- Application expertise, significant automotive knowledge base including quality and supply chain
- Global/Local approach, engineering, and commercial support
- Surety of supply: global manufacturing capability



SPECIFICATIONS

Specifications	Units	Data
Rated Voltage	V	1000
Continuous Current Rating²	A	400
Maximum Breaking Power³	MW	10
Fault Clear Time	ms	3
Contact Resistance, beginning of life	mΩ	< 0.15
Trip Tolerance	A	+0 / -400
Insulation Resistance After Interrupt (1000VDC)⁴	MΩ	≥0.5
Operating Temperature (Ambient)⁵	°C	-40 to +85
Allowed Terminal Temperature Maximum⁶	°C	150
Trip Sensitivity to Mechanical Shock⁷	25G, Half-sine, 6ms, 400A, +/-3 axes	
Vibration⁸	5G RMS Sinusoidal, 12hr/axis, 10-2000Hz, 400A continuous (See Note)	
Mass	g	750



DIMENSIONS

Dimensions are in [inches] millimeters
Tolerance is +/- 0.5mm for all dimensions, unless stated otherwise.

Mounting

M5 or No. 10 Screws
Torque 1.7 - 4 Nm [15-35in-lb]

Case Material

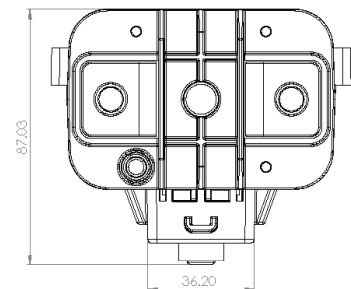
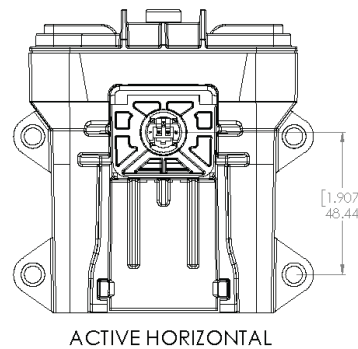
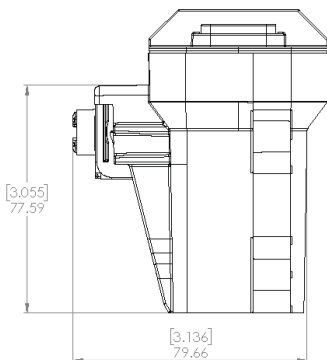
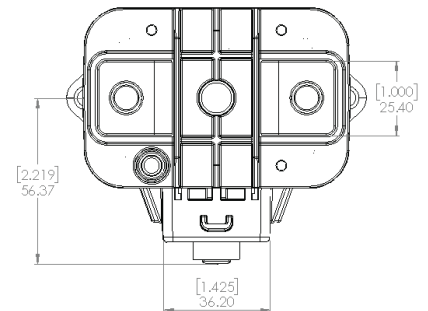
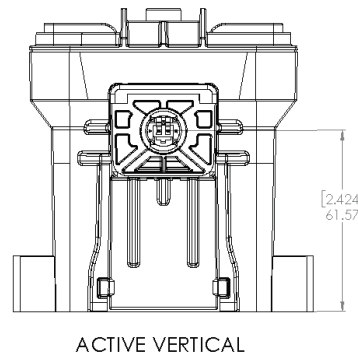
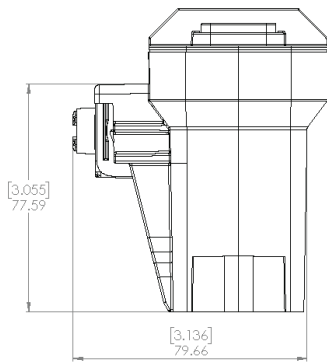
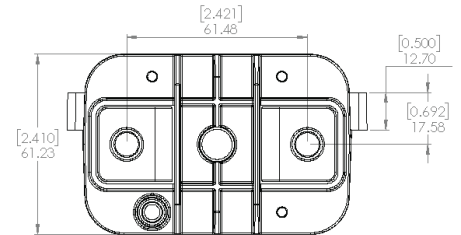
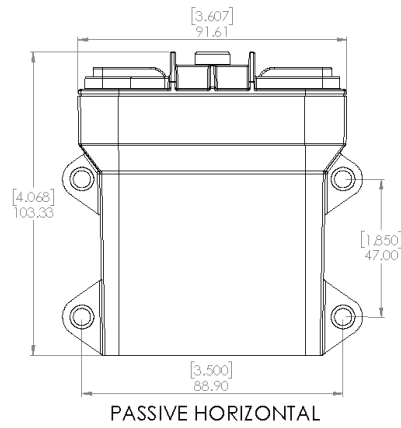
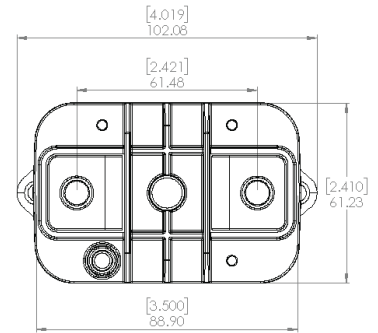
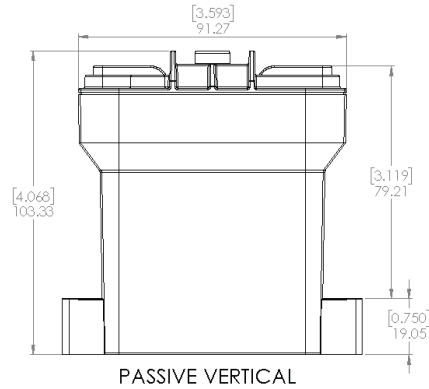
Thermoplastic Polyamide Resin

Power Connection

M8 x 1.25 Female
Torque 12-18 Nm [106-159 in-lb]

Pyro Connection

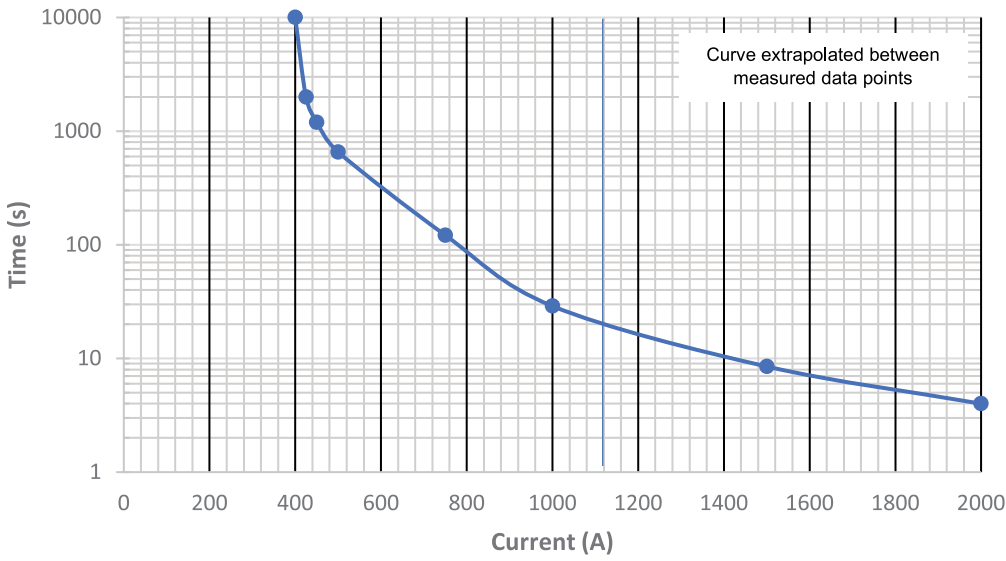
TE 411-78033
Qualified Acc. to LV 16 and USCAR
Initiator Resistance: $\geq 1.7\Omega$ and $\leq 2.5\Omega$
Triggering Pulse Current: $\geq 1.75A / 0.5ms$
 $\geq 1.2A / 2.0ms$
Diagnostic Current: $\leq 100mA$
No Trigger Current: $\leq 0.4A$ or $\leq 5.0A / 4\mu s$





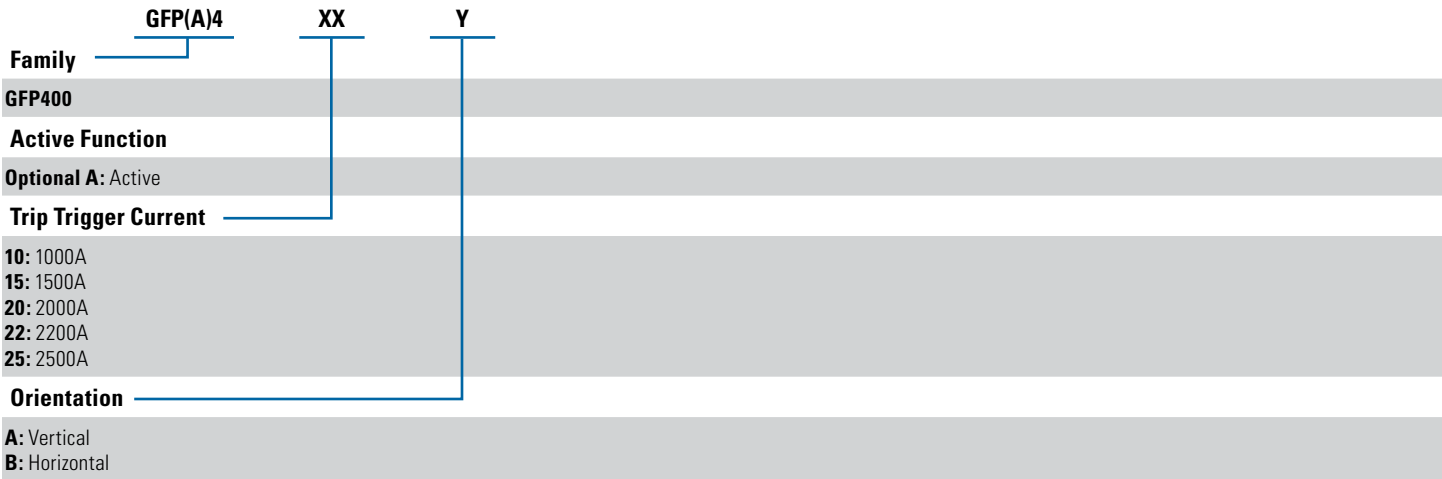
MOMENTARY CURRENT CURVE

Momentary Carry Current vs Time
(70C Ambient, 105mm²busbars)



ORDERING OPTIONS

Example: GFPA415B
(Passive/Active, 1500A Trip Current, Horizontal Mount Orientation)





GENERAL NOTES

1. For customers who can accommodate a vented device, contact Sensata Technologies for more information.
2. Current rating (both continuous and momentary) is dependent on bus bar size and customer specific application conditions. Consult with Sensata Technologies for specific details.
3. Performance in application will vary based on customer environment and system isolation requirements. Validated at following conditions: 650 V, 15.5kA, 12 µH system inductance. Up to 850 V, 12kA, with 4 µH system inductance.
4. Insulation resistance is dependent on power level of max interrupt load and IR increases with reduced power levels.
5. Device can operate in higher ambient temperatures with derated current carry while below maximum terminal temperature.
6. Measured on top of the bus bar at the bolted joint. Customer is responsible for ensuring this condition is met otherwise damage to device can occur.
7. Sensata Technologies recommends orienting Z axis orthogonal to any mechanical shock pulses to ensure robust performance under load. Sensitivity is dependent on trip setting, consult with Sensata Technologies for more details. See photo for axis orientation.
8. Performance depends on specific vibration profile and trip level, consult with Sensata Technologies for your specific requirements.
9. For Automotive Applications please request technical workshop with Sensata Technologies Application Engineering.



WARNINGS



RISK OF MATERIAL DAMAGE AND HOT ENCLOSURE

- The product's side panels may be hot, allow the product to cool before touching
- Follow proper mounting instructions including torque values
- Do not allow liquids or foreign objects to enter this product

Failure to follow these instructions can result in serious injury, or equipment damage.



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.

CONTACT US

Americas
+1 (805) 684-8401
gigavac@sensata.com

Sensata Technologies, Inc. ("Sensata") data sheets are solely intended to assist designers ("Buyers") who are developing systems that incorporate Sensata products (also referred to herein as "components"). Buyer understands and agrees that Buyer remains responsible for using its independent analysis, valuation, and judgment in designing Buyer's systems and products. Sensata data sheets have been created using standard laboratory conditions and engineering practices. Sensata has not conducted any testing other than that specifically described in the published documentation for a particular data sheet. Sensata may make corrections, enhancements, improvements, and other changes to its data sheets or components without notice.

Buyers are authorized to use Sensata data sheets with the Sensata component(s) identified in each particular data sheet. HOWEVER, NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OTHERWISE TO ANY OTHER SENSATA INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY THIRD PARTY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT, IS GRANTED HEREIN. SENSATA DATA SHEETS ARE PROVIDED "AS IS". SENSATA MAKES NO WARRANTIES OR REPRESENTATIONS WITH REGARD TO THE DATA SHEETS OR USE OF THE DATA SHEETS, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ACCURACY OR COMPLETENESS. SENSATA DISCLAIMS ANY WARRANTY OF TITLE AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, QUIET POSSESSION, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH REGARD TO SENSATA DATA SHEETS OR USE THEREOF.

All products are sold subject to Sensata's terms and conditions of sale supplied at www.sensata.com SENSATA ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR THE DESIGN OF BUYERS' PRODUCTS. BUYER ACKNOWLEDGES AND AGREES THAT IT IS SOLELY RESPONSIBLE FOR COMPLIANCE WITH ALL LEGAL, REGULATORY, AND SAFETY-RELATED REQUIREMENTS CONCERNING ITS PRODUCTS, AND ANY USE OF SENSATA COMPONENTS IN ITS APPLICATIONS, NOTWITHSTANDING ANY APPLICATIONS-RELATED INFORMATION OR SUPPORT THAT MAY BE PROVIDED BY SENSATA.

Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA