

## Three Phase Bridge Rectifier, 25 A, 35 A


**D-63**

### FEATURES

- Universal, 3 way terminals: push-on, wrap around or solder
- High thermal conductivity package, electrically insulated case
- Center hole fixing
- Excellent power/volume ratio
- UL E300359 approved 
- Nickel plated terminals solderable using lead (Pb)-free solder; solder alloy Sn/Ag/Cu (SAC305); solder temperature 260 °C to 275 °C
- Designed and qualified for industrial and consumer level
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### DESCRIPTION

A range of extremely compact, encapsulated three phase bridge rectifiers offering efficient and reliable operation. They are intended for use in general purpose and instrumentation applications.

### PRIMARY CHARACTERISTICS

|                       |                    |
|-----------------------|--------------------|
| $I_O$                 | 25 A, 35 A         |
| $V_{RRM}$             | 50 V to 1600 V     |
| Package               | D-63               |
| Circuit configuration | Three phase bridge |

### MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL    | CHARACTERISTICS | VALUES<br>26MT.. | VALUES<br>36MT.. | UNITS            |
|-----------|-----------------|------------------|------------------|------------------|
| $I_O$     |                 | 25               | 35               | A                |
|           | $T_C$           | 70               | 60               | °C               |
| $I_{FSM}$ | 50 Hz           | 360              | 475              | A                |
|           | 60 Hz           | 375              | 500              |                  |
| $I^2t$    | 50 Hz           | 635              | 1130             | A <sup>2</sup> s |
|           | 60 Hz           | 580              | 1030             |                  |
| $V_{RRM}$ |                 | 50 to 1600       |                  | V                |
| $T_J$     |                 | -55 to +150      |                  | °C               |

### ELECTRICAL SPECIFICATIONS

#### VOLTAGE RATINGS

| TYPE NUMBER            | VOLTAGE CODE | $V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE<br>V | $I_{RRM}$ MAXIMUM AT $T_J$ MAXIMUM<br>mA |
|------------------------|--------------|----------------------------------------------------------|--------------------------------------------------------------|------------------------------------------|
| VS-26MT..<br>VS-36MT.. | 05           | 50                                                       | 75                                                           | 2                                        |
|                        | 10           | 100                                                      | 150                                                          |                                          |
|                        | 20           | 200                                                      | 275                                                          |                                          |
|                        | 40           | 400                                                      | 500                                                          |                                          |
|                        | 60           | 600                                                      | 725                                                          |                                          |
|                        | 80           | 800                                                      | 900                                                          |                                          |
|                        | 100          | 1000                                                     | 1100                                                         |                                          |
|                        | 120          | 1200                                                     | 1300                                                         |                                          |
|                        | 140          | 1400                                                     | 1500                                                         |                                          |
|                        | 160          | 1600                                                     | 1700                                                         |                                          |

**FORWARD CONDUCTION**

| PARAMETER                                              | SYMBOL        | TEST CONDITIONS                                                                                                   | VALUES<br>26MT..                                  | VALUES<br>36MT..                      | UNITS             |
|--------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------|-------------------|
| Maximum DC output current at $T_C$                     | $I_O$         | 120° rect. conduction angle                                                                                       | 25<br>70                                          | 35<br>60                              | A<br>°C           |
| Maximum peak, one-cycle non-repetitive forward current | $I_{FSM}$     | $t = 10\text{ ms}$<br>$t = 8.3\text{ ms}$<br>$t = 10\text{ ms}$<br>$t = 8.3\text{ ms}$                            | No voltage reapplied<br>100 % $V_{RRM}$ reapplied | Initial<br>$T_J = T_J\text{ maximum}$ | A                 |
| Maximum $I^2t$ for fusing                              | $I^2t$        | $t = 10\text{ ms}$<br>$t = 8.3\text{ ms}$<br>$t = 10\text{ ms}$<br>$t = 8.3\text{ ms}$                            | No voltage reapplied<br>100 % $V_{RRM}$ reapplied | Initial<br>$T_J = T_J\text{ maximum}$ | A <sup>2</sup> s  |
| Maximum $I^2\sqrt{t}$ for fusing                       | $I^2\sqrt{t}$ | $I^2t$ for time $t_x = I^2\sqrt{t} \times \sqrt{t_x}$ ; $0.1 \leq t_x \leq 10\text{ ms}$ , $V_{RRM} = 0\text{ V}$ | 6360                                              | 11 300                                | A <sup>2</sup> √s |
| Low level of threshold voltage                         | $V_{F(TO)1}$  | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J\text{ maximum}$                          | 0.88                                              | 0.86                                  | V                 |
| High level of threshold voltage                        | $V_{F(TO)2}$  | $(I > \pi \times I_{F(AV)})$ , $T_J\text{ maximum}$                                                               | 1.13                                              | 1.03                                  | V                 |
| Low level forward slope resistance                     | $r_{t1}$      | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J\text{ maximum}$                          | 7.9                                               | 6.3                                   | mΩ                |
| High level forward slope resistance                    | $r_{t2}$      | $(I > \pi \times I_{F(AV)})$ , $T_J\text{ maximum}$                                                               | 5.2                                               | 5.0                                   | mΩ                |
| Maximum forward voltage drop                           | $V_{FM}$      | $T_J = 25\text{ °C}$ , $I_{FM} = 40\text{ A}_{pk}$ - per single junction                                          | 1.26                                              | 1.19                                  | V                 |
| Maximum DC reverse current                             | $I_{RRM}$     | $T_J = 25\text{ °C}$ , per junction at rated $V_{RRM}$                                                            | 100                                               |                                       | μA                |
| RMS isolation voltage                                  | $V_{INS}$     | $T_J = 25\text{ °C}$ , all terminal shorted; $f = 50\text{ Hz}$ , $t = 1\text{ s}$                                | 2700                                              |                                       | V                 |

**THERMAL - MECHANICAL SPECIFICATIONS**

| PARAMETER                                      | SYMBOL         | TEST CONDITIONS                                               | VALUES<br>26MT | VALUES<br>36MT | UNITS |
|------------------------------------------------|----------------|---------------------------------------------------------------|----------------|----------------|-------|
| Maximum junction and storage temperature range | $T_J, T_{Stg}$ |                                                               | -55 to +150    |                | °C    |
| Maximum thermal resistance, junction to case   | $R_{thJC}$     | DC operation per bridge (based on total power loss of bridge) | 1.42           | 1.35           | K/W   |
| Maximum thermal resistance, case to heatsink   | $R_{thCS}$     | Mounting surface, smooth, flat and greased                    | 0.2            | 0.2            |       |
| Approximate weight                             |                |                                                               | 20             |                | g     |
| Mounting torque $\pm 10\%$                     |                | Bridge to heatsink with screw M4                              | 2.0            |                | Nm    |

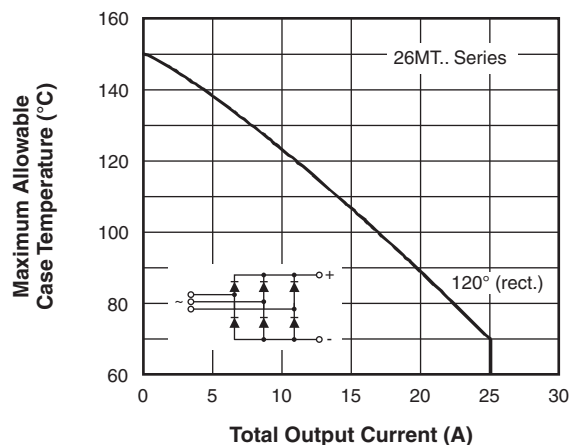


Fig. 1 - Current Ratings Characteristics

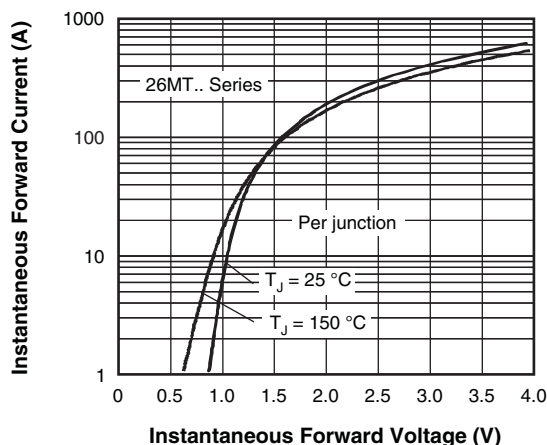


Fig. 2 - Forward Voltage Drop Characteristics

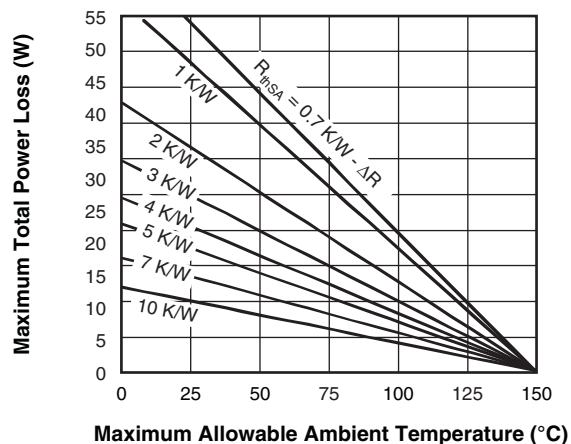
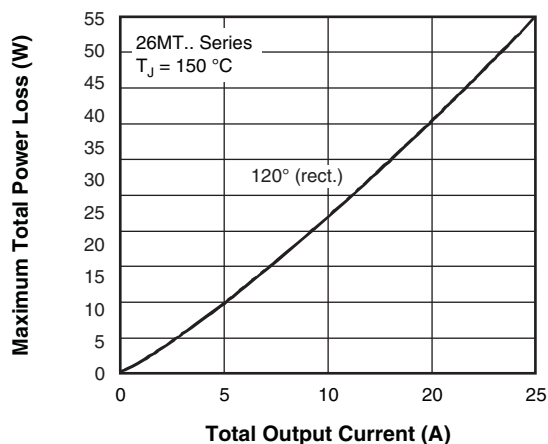


Fig. 3 - Total Power Loss Characteristics

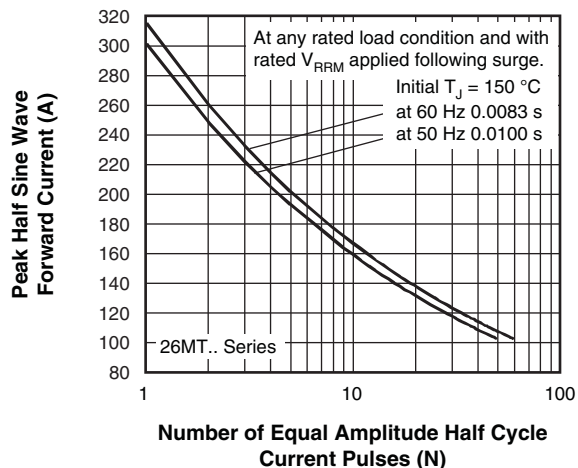


Fig. 4 - Maximum Non-Repetitive Surge Current

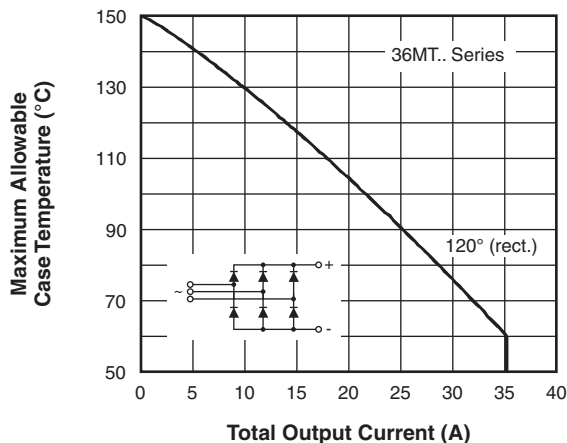


Fig. 6 - Current Ratings Characteristics

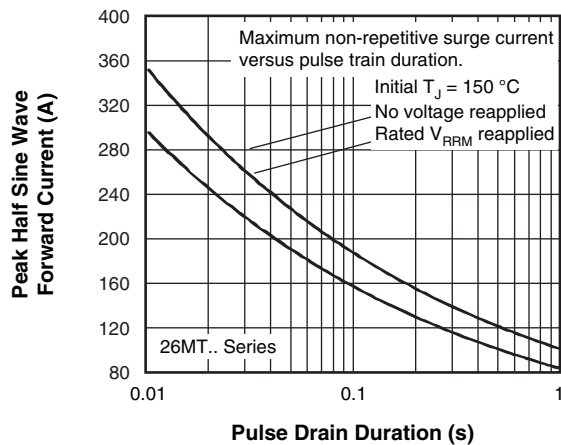


Fig. 5 - Maximum Non-Repetitive Surge Current

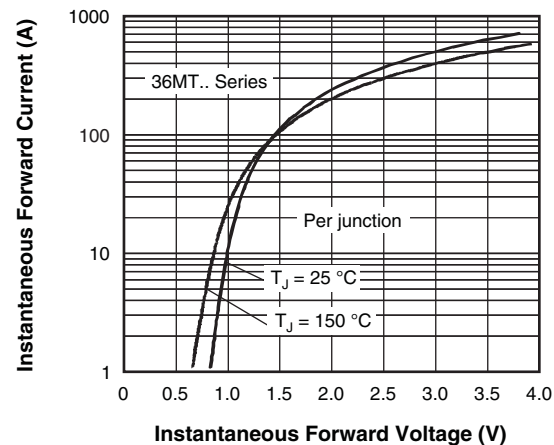


Fig. 7 - Forward Voltage Drop Characteristics

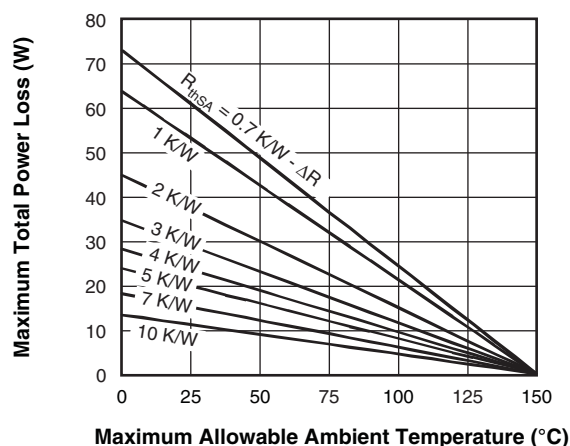
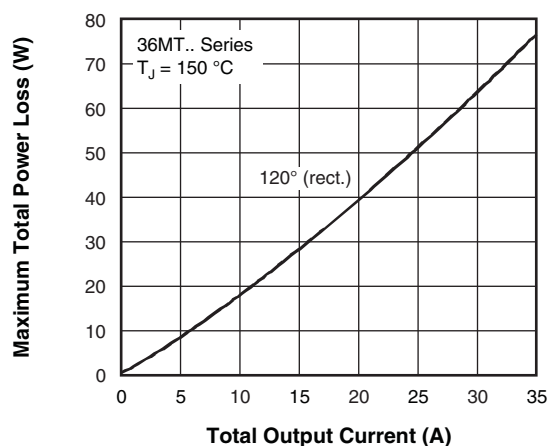


Fig. 8 - Total Power Loss Characteristics

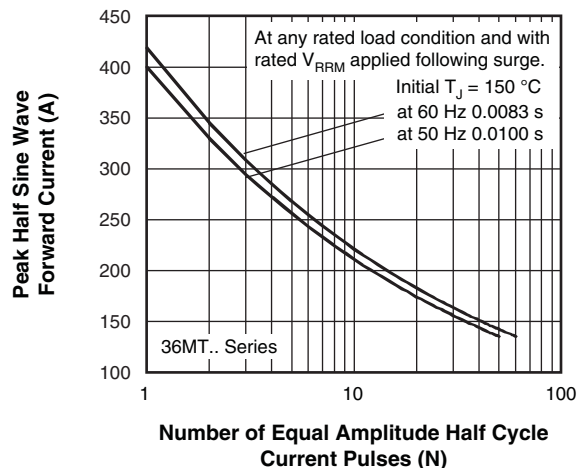


Fig. 9 - Maximum Non-Repetitive Surge Current

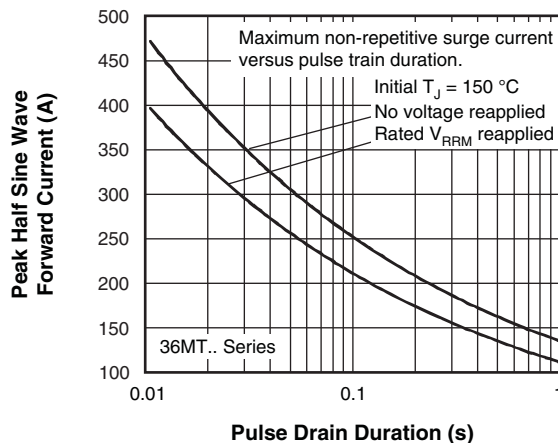
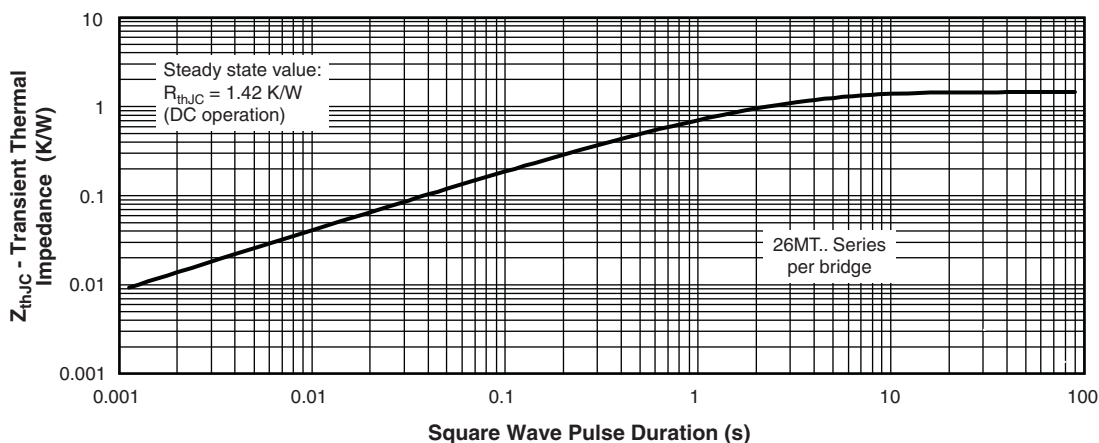
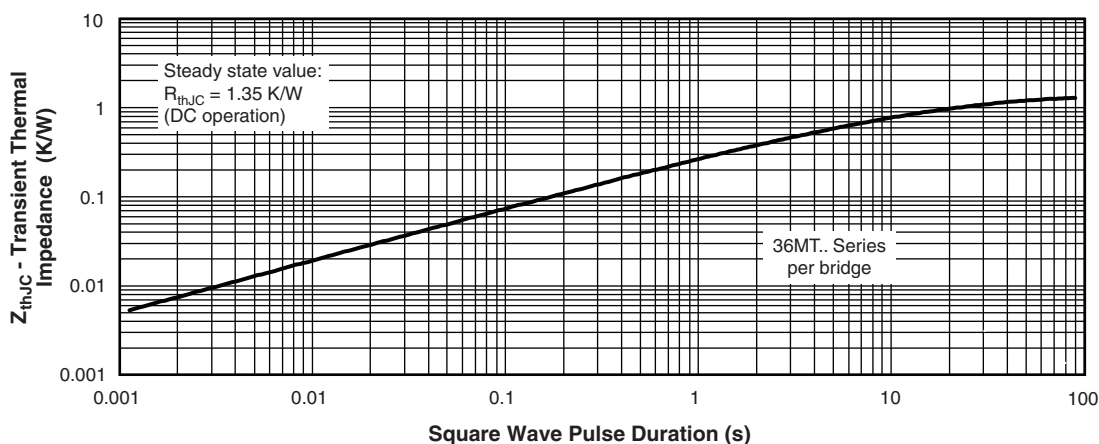


Fig. 10 - Maximum Non-Repetitive Surge Current


Fig. 11 - Thermal Impedance  $Z_{thJC}$  Characteristics

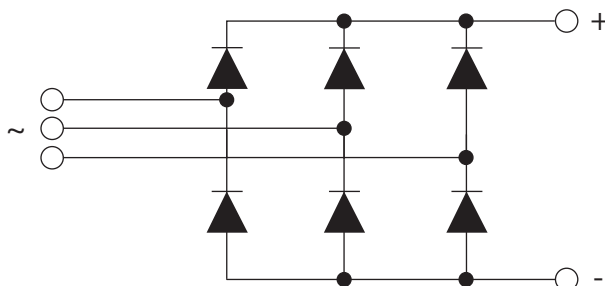

Fig. 12 - Thermal Impedance  $Z_{thJC}$  Characteristics

## ORDERING INFORMATION TABLE

| Device code | VS-                             | 36 | MT | 160 |
|-------------|---------------------------------|----|----|-----|
|             | ①                               | ②  | ③  | ④   |
| ①           | - Vishay Semiconductors product |    |    |     |
| ②           | - Current rating code           |    |    |     |
| ③           | - Basic part number             |    |    |     |
| ④           | - Voltage code x 10 = $V_{RRM}$ |    |    |     |

26 = 25 A (average)  
 36 = 35 A (average)

## CIRCUIT CONFIGURATION

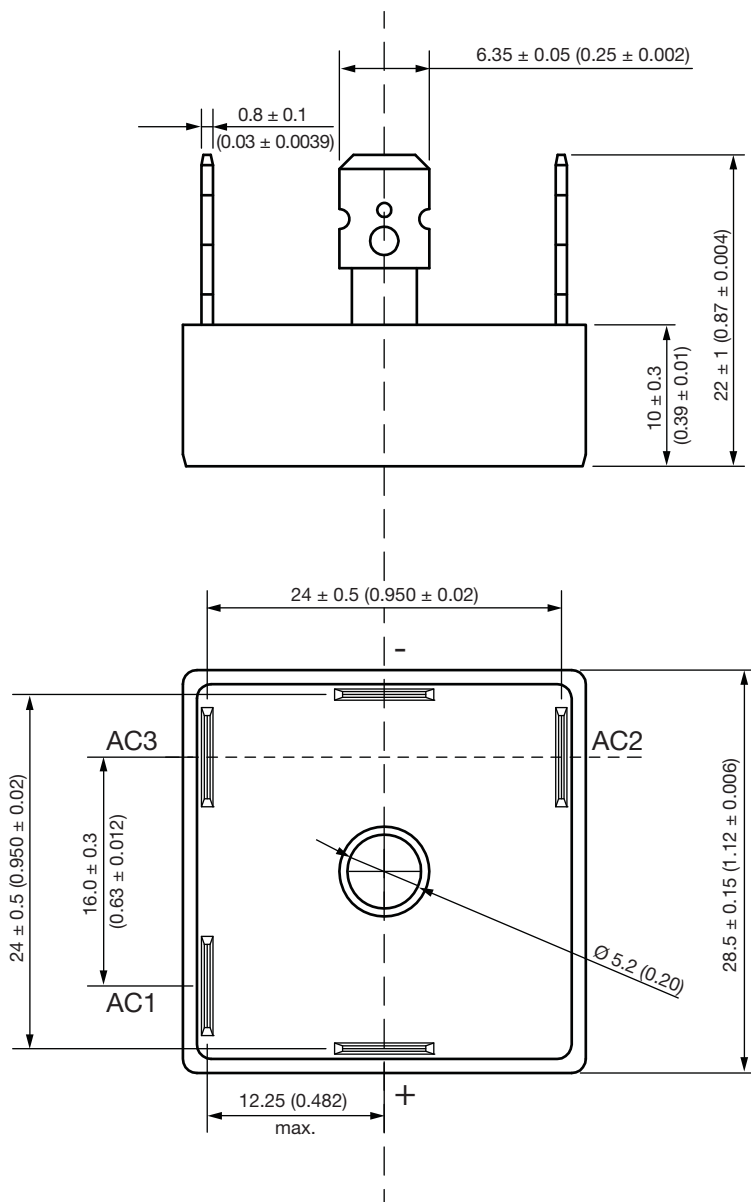


| LINKS TO RELATED DOCUMENTS |                                                                        |
|----------------------------|------------------------------------------------------------------------|
| Dimensions                 | <a href="http://www.vishay.com/doc?95251">www.vishay.com/doc?95251</a> |



## D-63

**DIMENSIONS** in millimeters (inches)



Not to scale



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