


## SOT-227 Silicon Carbide Schottky Barrier Diode, 1200 V, 120 A



SOT-227

| PRIMARY CHARACTERISTICS                                     |                                       |
|---|---------------------------------------|
| $V_R$   | 1200 V                                |
| $V_F$ (typical) at 60 A, per diode                          | 1.42 V                                |
| $Q_C$ (typical), per diode                                  | 332.5 nC                              |
| $I_{F(DC)}$ per module at $T_C = 136\text{ }^\circ\text{C}$ | 120 A                                 |
| Type  | Modules - diode, SiC Schottky         |
| Package   | SOT-227                               |
| Circuit configuration                                       | Two separate diodes, parallel pin-out |

### FEATURES

- Virtually no recovery tail and no switching losses
- Majority carrier diode using Schottky technology on SiC wide band gap material
- Improved  $V_F$  and efficiency by thin wafer technology
- High speed switching, low switching losses
- Positive temperature coefficient, for easy paralleling
- Electrically isolated base plate
- Large creepage distance between terminal
- Simplified mechanical designs, rapid assembly
- Designed and qualified for industrial level
- UL approved file E78996 
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS  
COMPLIANT**

### DESCRIPTION / APPLICATIONS

Wide band gap SiC based 1200 V Schottky diode, designed for high performance and ruggedness.

Optimum choice for high speed hard switching and efficient operation over a wide temperature range, it is also recommended for all applications suffering from Silicon ultrafast recovery behavior.

Typical applications include AC/DC PFC and DC/DC ultra high frequency output rectification in FBPS and LLC converters

| ABSOLUTE MAXIMUM RATINGS                         |                |  |             |                  |
|--|----------------|--|-------------|------------------|
| PARAMETER  | SYMBOL         | TEST CONDITIONS                                      | MAX.        | UNITS            |
| Cathode to anode voltage                         | $V_R$          |  | 1200        | V                |
| Continuous forward current per diode             | $I_F$          | $T_C = 136\text{ }^\circ\text{C}$                    | 60          | A                |
| Single pulse forward current per diode           | $I_{FSM}$      | $T_J = 25\text{ }^\circ\text{C}$ , 6 ms square pulse | 385         |                  |
| Maximum power dissipation per module             | $P_D$          | $T_C = 136\text{ }^\circ\text{C}$                    | 243         | W                |
| RMS isolation voltage                            | $V_{ISOL}$     | Any terminal to case, $t = 1\text{ min}$             | 2500        | V                |
| Operating junction and storage temperature range | $T_J, T_{Stg}$ |  | -55 to +175 | $^\circ\text{C}$ |

| ELECTRICAL SPECIFICATIONS ( $T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified) |          |   |      |      |      |               |
|--|----------|---|------|------|------|---------------|
| PARAMETER  | SYMBOL   | TEST CONDITIONS   | MIN. | TYP. | MAX. | UNITS         |
| Cathode to anode breakdown voltage   | $V_{BR}$ | $I_R = 100\text{ }\mu\text{A}$                            | 1200 | -    | -    | V             |
| Forward voltage  | $V_{FM}$ | $I_F = 60\text{ A}$                                       | -    | 1.42 | 1.59 |               |
|  |          | $I_F = 60\text{ A}$ , $T_J = 150\text{ }^\circ\text{C}$   | -    | 1.86 | -    |               |
| Reverse leakage current  | $I_{RM}$ | $V_R = 1200\text{ V}$                                     | -    | 4.9  | 180  | $\mu\text{A}$ |
|  |          | $T_J = 125\text{ }^\circ\text{C}$ , $V_R = 1200\text{ V}$ | -    | 15.1 | -    |               |
|  |          | $T_J = 150\text{ }^\circ\text{C}$ , $V_R = 1200\text{ V}$ | -    | 22   | -    |               |
| Junction capacitance   | $C_T$    | $V_R = 1200\text{ V}$ , $f = 1\text{ MHz}$                | -    | 206  | -    | pF            |



| DYNAMIC RECOVERY CHARACTERISTICS (T <sub>J</sub> = 25 °C unless otherwise specified) |                |                        |      |       |      |       |
|--|----------------|------------------------|------|-------|------|-------|
| PARAMETER  | SYMBOL         | TEST CONDITIONS        | MIN. | TYP.  | MAX. | UNITS |
| Total capacitive charge  | Q <sub>C</sub> | V <sub>R</sub> = 800 V | -    | 332.5 | -    | nC    |

| THERMAL - MECHANICAL SPECIFICATIONS             |                   |                       |         |      |            |             |
|---|-------------------|-----------------------|---------|------|------------|-------------|
| PARAMETER                                       | SYMBOL            | TEST CONDITIONS       | MIN.    | TYP. | MAX.       | UNITS       |
| Thermal resistance junction to case, per diode  | R <sub>thJC</sub> |                       | -       | -    | 0.31       | °C/W        |
| Thermal resistance junction to case, per module |                   |                       | -       | -    | 0.16       |             |
| Thermal resistance case to heatsink, per module | R <sub>thCS</sub> | Flat, greased surface | -       | 0.05 | -          |             |
| Weight  |                   |                       | -       | 30   | -          | g           |
| Mounting torque                                 |                   | Torque per diode      | -       | -    | 1.1 (9.7)  | Nm (lbf.in) |
|   |                   | Torque to heatsink    | -       | -    | 1.8 (15.9) | Nm (lbf.in) |
| Case style                                      |                   |                       | SOT-227 |      |            |             |

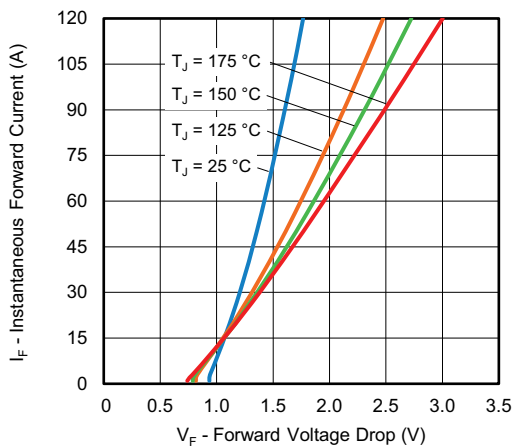


Fig. 1 - Typical Forward Voltage Drop Characteristics

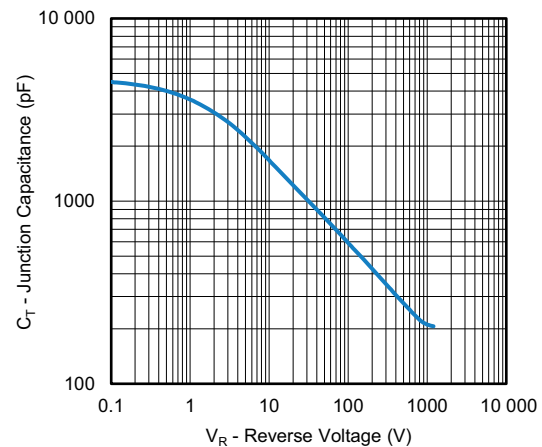


Fig. 3 - Junction Capacitance vs. Reverse Voltage

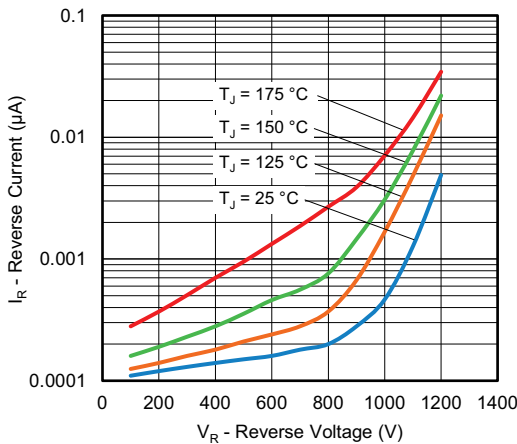


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

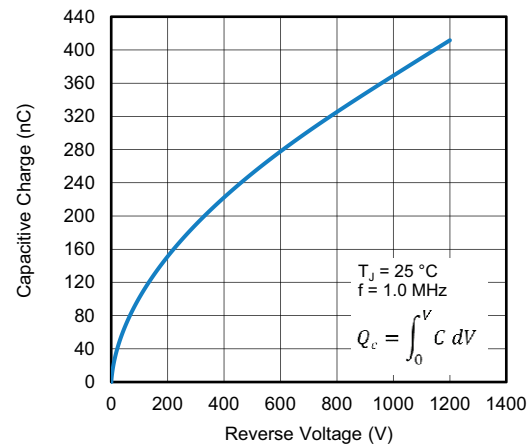


Fig. 4 - Typical Capacitive Charge vs. Reverse Voltage

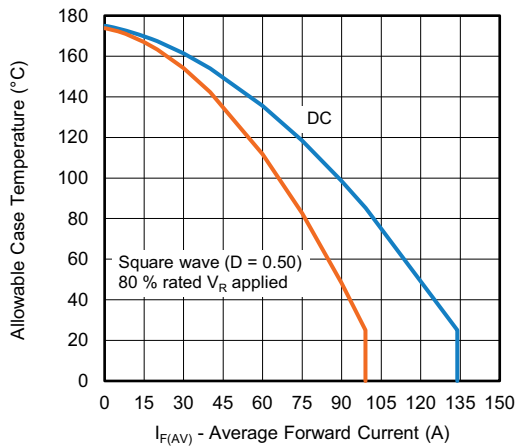


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

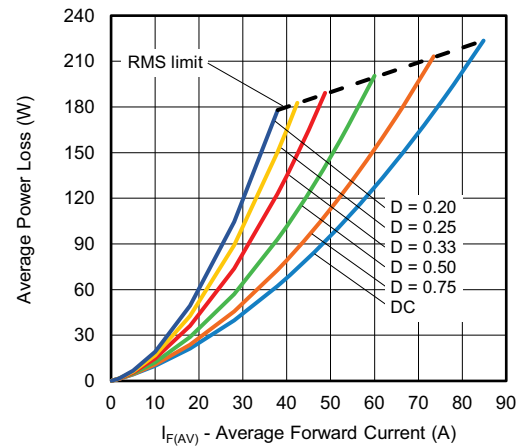


Fig. 6 - Forward Power Loss Characteristics

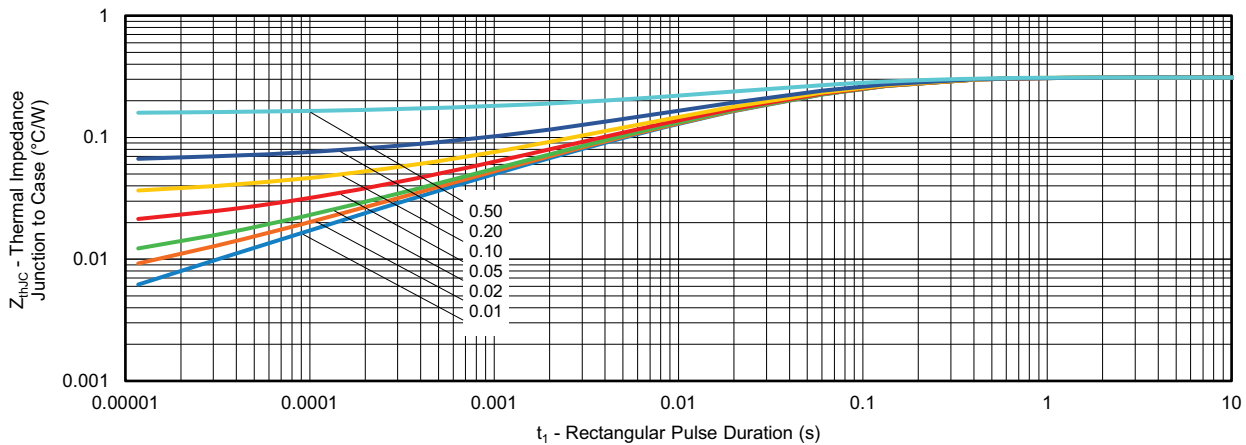


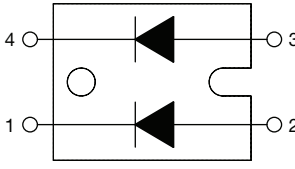
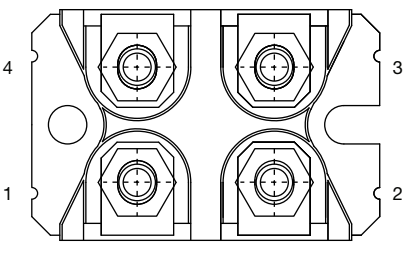
Fig. 7 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

**ORDERING INFORMATION TABLE**

|             |            |           |            |          |          |            |
|-------------|------------|-----------|------------|----------|----------|------------|
| Device code | <b>VS-</b> | <b>SC</b> | <b>120</b> | <b>F</b> | <b>A</b> | <b>120</b> |
|             | ①          | ②         | ③          | ④        | ⑤        | ⑥          |

- 1** - Vishay Semiconductors product
- 2** - SC = SiC Schottky Barrier Diode
- 3** - Current rating per module (120 = 120 A)
- 4** - F = circuit configuration (two separate diodes, parallel pin-out)
- 5** - Package indicator (SOT-227 standard insulated base)
- 6** - Voltage rating (120 = 1200 V)



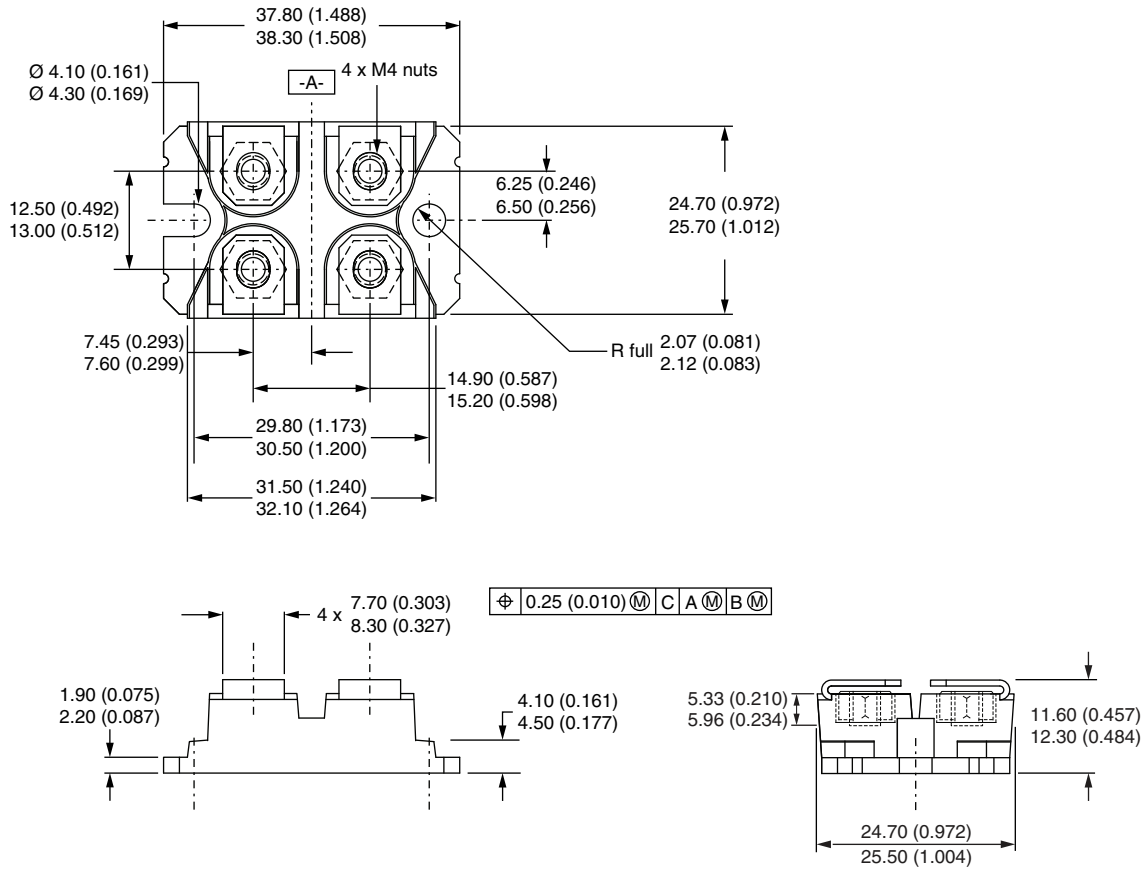
| CIRCUIT CONFIGURATION                 |                            |   |
|---------------------------------------|----------------------------|---|
| CIRCUIT                               | CIRCUIT CONFIGURATION CODE | CIRCUIT DRAWING   |
| Two separate diodes, parallel pin-out | F                          |   |

| LINKS TO RELATED DOCUMENTS |  |
|----------------------------|--|
| Dimensions                 | <a href="http://www.vishay.com/doc?95423">www.vishay.com/doc?95423</a> |
| Packaging information      | <a href="http://www.vishay.com/doc?95425">www.vishay.com/doc?95425</a> |



## SOT-227 Generation 2

**DIMENSIONS** in millimeters (inches)



**Note**

- Controlling dimension: millimeter



## Disclaimer

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