

**TECHNICAL DATA,**  
**DATA SHEET 5053 REV. A.1**

**HERMETIC SILICON CARBIDE RECTIFIER**

**DESCRIPTION:** A 1200-VOLT, 10 AMP POWER SILICON CARBIDE RECTIFIER IN A CERAMIC HERMETIC SMD-1 PACKAGE

**FEATURES:**

- NO RECOVERY TIME OR REVERSE RECOVERY LOSSES
- NO TEMPERATURE INFLUENCE ON SWITCHING BEHAVIOR
- SCREENED VERSIONS ARE AVAILABLE

**MAXIMUM RATINGS**

ALL RATINGS ARE @  $T_C = 25^\circ\text{C}$  UNLESS OTHERWISE SPECIFIED.

| RATING  | SYMBOL          | MAX.        | UNITS              |
|---|-----------------|-------------|--------------------|
| PEAK INVERSE VOLTAGE  | PIV             | 1200        | Volts              |
| MAXIMUM DC OUTPUT CURRENT (With Cathode Maintained @ $T_C = 65^\circ\text{C}$ )                                 | $I_O$           | 10          | Amps               |
| MAXIMUM DC OUTPUT CURRENT (With Cathode Maintained @ $T_C = 65^\circ\text{C}$ , for Single Package)             | $I_O$           | 5           | Amps               |
| MAXIMUM REPETITIVE FORWARD SURGE CURRENT PER LEG<br>( $t = 8.3\text{ms}$ , Sine) $T_C = 25^\circ\text{C}$       | $I_{FRM}$       | 30          | Amps               |
| MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT PER LEG<br>( $t = 10\mu\text{s}$ , pulse) $T_C = 25^\circ\text{C}$ | $I_{FSM}$       | 100         | Amps               |
|   |                 |             |                    |
| MAXIMUM POWER DISSIPATION, $T_C = 25^\circ\text{C}$   | $P_d$           | 15          | W                  |
| MAXIMUM THERMAL RESISTANCE, Junction to Case (per dual package)   | $R_{\theta JC}$ | 1.30        | $^\circ\text{C/W}$ |
| MAXIMUM OPERATING TEMPERATURE RANGE*  | Top & Tstg      | -55 to +200 | $^\circ\text{C}$   |

\* Note: SiC semiconductors will handle at or above this operating and storage temperature. However, extended operational use of the packaged device above 175C may reduce its future performance. All qualification testing and screening per MIL-PRF-19500 will only be performed to 175C.

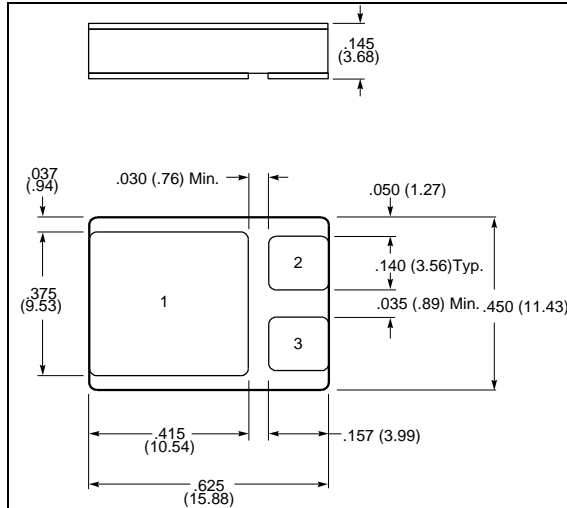
**ELECTRICAL CHARACTERISTICS**

| CHARACTERISTIC   | TYP   | MAX.         | UNITS               |
|--|---|--------------|---------------------|
| MAXIMUM FORWARD VOLTAGE DROP ( $I_f = 5\text{ A}$ per leg) $V_f$   | $T_J = 25^\circ\text{C}$<br>$T_J = 150^\circ\text{C}$ | 1.6<br>2.6   | 1.8<br>3.0<br>Volts |
| MAXIMUM REVERSE CURRENT (1200V PIV per leg) $I_r$  | $T_J = 25^\circ\text{C}$<br>$T_J = 150^\circ\text{C}$ | 0.05<br>0.10 | 0.20<br>1.00<br>mA  |
| TOTAL CAPACITIVE CHARGE ( $V_R = 1200\text{V}$ $I_F = 5\text{A}$ $di/dt = 500\text{A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$ ) $Q_C$<br>per leg |   | 28           | N/A<br>nC           |
| MAXIMUM JUNCTION CAPACITANCE ( $V_f = 5\text{V}$ ) PER LEG   | $C_T$   | 450          | PF                  |

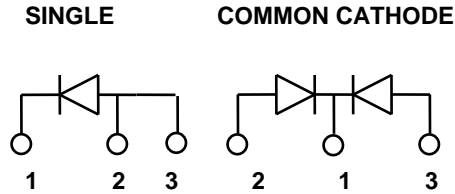
Application Note: Customers should be aware that at the current stage of technical development of SiC, the reverse avalanche capabilities of the device are limited. Customer designs will need to accommodate these limitations and avoid exposure of the device to this and other potentially damaging conditions in their applications.

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**MECHANICAL DIMENSIONS: IN Inches / mm**



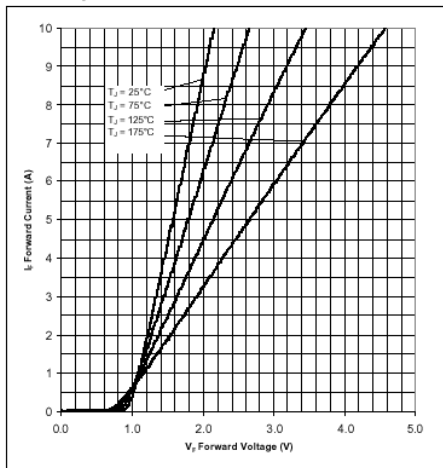
**SMD-1**



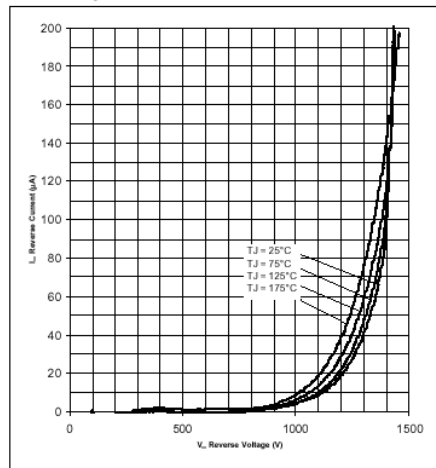
**NOUT TABLE**

| DEVICE TYPE                | PIN 1          | PIN 2   | PIN 3   |
|----------------------------|----------------|---------|---------|
| SHD619052 SINGLE RECTIFIER | CATHODE        | ANODE   | ANODE   |
| SHD619052P COMMON CATHODE  | COMMON CATHODE | ANODE 1 | ANODE 2 |

**Figure 1. Forward Characteristics**



**Figure 2. Reverse Characteristics**



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