Silicon Carbide Power
Schottky Diode

Features
- 3300 V Schottky rectifier
- 175 °C maximum operating temperature
- Electrically isolated base-plate
- Positive temperature coefficient of V_F
- Fast switching speeds
- Superior figure of merit Q_C/IF

Package
- RoHS Compliant

TO – 220FP (Isolated Base-plate Package)

Advantages
- Improved circuit efficiency (Lower overall cost)
- Significantly reduced switching losses compare to Si PIN diodes
- Ease of paralleling devices without thermal runaway
- Smaller heat sink requirements
- Low reverse recovery current
- Low device capacitance

Applications
- Down Hole Oil Drilling, Geothermal Instrumentation
- High Voltage Multipliers
- Military Power Supplies

Maximum Ratings at Tj = 175 °C, unless otherwise specified

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Values</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitive peak reverse voltage</td>
<td>V_RRM</td>
<td></td>
<td>3300 V</td>
<td>V</td>
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<tr>
<td>Continuous forward current</td>
<td>I_F</td>
<td>T_C ≤ 125 °C</td>
<td>0.3 A</td>
<td>A</td>
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<tr>
<td>RMS forward current</td>
<td>I_F(RMS)</td>
<td>T_C ≤ 125 °C</td>
<td>0.35 A</td>
<td>A</td>
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<tr>
<td>Surge non-repetitive forward current, Half Sine Wave</td>
<td>I_F,SM</td>
<td>T_C = 25 °C, t_R = 10 ms</td>
<td>tbd</td>
<td>A</td>
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<tr>
<td>Non-repetitive peak forward current</td>
<td>I_F,MAX</td>
<td>T_C = 25 °C, t_R = 10 µs</td>
<td>tbd</td>
<td>A</td>
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<tr>
<td>F’t value</td>
<td>J^2 dt</td>
<td>T_C = 25 °C, t_R = 10 ms</td>
<td>tbd</td>
<td>A^S</td>
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<tr>
<td>Power dissipation</td>
<td>P_d</td>
<td>T_C = 25 °C</td>
<td>25 W</td>
<td>W</td>
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<tr>
<td>Operating and storage temperature</td>
<td>T_j , T_stg</td>
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<td>-55 to 175 °C</td>
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Electrical Characteristics at Tj = 175 °C, unless otherwise specified

<table>
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<tr>
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<th>Symbol</th>
<th>Conditions</th>
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<tbody>
<tr>
<td>Diode forward voltage</td>
<td>V_F</td>
<td>I_R = 0.3 A, T_j = 25 °C</td>
<td>1.7</td>
<td>V</td>
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<tr>
<td>Reverse current</td>
<td>I_R</td>
<td>V_R = 3300 V, T_j = 25 °C</td>
<td>1.3</td>
<td>µA</td>
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<tr>
<td>Total capacitive charge</td>
<td>Q_C</td>
<td>I_R ≥ I_R,MAX dI/dt = 35 A/µs, T_j = 175 °C</td>
<td>52 nC</td>
<td>nC</td>
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<tr>
<td>Switching time</td>
<td>t_s</td>
<td>V_R = 1500 V</td>
<td>&lt; 60 ns</td>
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<tr>
<td>Total capacitance</td>
<td>C</td>
<td>V_R = 1 V, f = 1 MHz, T_j = 25 °C</td>
<td>42 pF</td>
<td>pF</td>
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Thermal Characteristics
- Thermal resistance, junction – Cu lead frame R_RJC | 1.42 °C/W

Mechanical Properties
- Mounting torque, M3 screw M | 0.6 Nm
Figure 1: Typical Forward Characteristics

Figure 2: Typical Reverse Characteristics

Figure 3: Power Derating Curve

Figure 4: Current Derating Curves ($D = \frac{I}{T}$, $t_p = 400 \mu s$) (Considering worst case $Zth$ conditions)

Figure 5: Typical Junction Capacitance vs Reverse Voltage Characteristics

Figure 6: Typical Switching Energy vs Reverse Voltage Characteristics
Figure 7: Current vs Pulse Duration Curves at $T_c = 150 \, ^\circ C$

Figure 8: Transient Thermal Impedance

Package Dimensions:

**TO-220FP**

**PACKAGE OUTLINE**

**NOTE**

1. CONTROLLED DIMENSION IS INCH. DIMENSION IN BRACKET IS MILLIMETER.
2. DIMENSIONS DO NOT INCLUDE END FLASH, MOLD FLASH, MATERIAL PROTRUSIONS
3. CONTROLLED LEAD COPLANARITY <D> 0.004 INCH MAXIMUM

<table>
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<th>Revision</th>
<th>Comments</th>
<th>Supersedes</th>
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