SF31 THRU SF38

Super Fast Rectifiers
Reverse Voltage - 50 to 600 V
Forward Current – 3 A

Features
• Low leakage
• Low forward voltage
• High current capability
• Easily cleaned with alcohol, isopropanol and similar solvents
• The plastic material carries U/L recognition 94V-0

Mechanical Data
• Case: JEDEC DO-201AD molded plastic body
• Terminals: Axial lead, solderable per MIL-STD-202, Method 208
• Polarity: Color band denotes cathode end
• Mounting Position: Any

Absolute Maximum Ratings and Characteristics
Rating at 25 °C ambient temperature unless otherwise specified. Single-phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SF31</th>
<th>SF32</th>
<th>SF33</th>
<th>SF34</th>
<th>SF35</th>
<th>SF36</th>
<th>SF37</th>
<th>SF38</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Recurrent Peak Reverse Voltage V_{RRM}</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td>600</td>
<td>V</td>
</tr>
<tr>
<td>Maximum RMS Voltage V_{RMS}</td>
<td>35</td>
<td>70</td>
<td>105</td>
<td>140</td>
<td>210</td>
<td>280</td>
<td>350</td>
<td>420</td>
<td>V</td>
</tr>
<tr>
<td>Maximum DC Blocking Voltage V_{DC}</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td>600</td>
<td>V</td>
</tr>
<tr>
<td>Maximum Average Forward Rectified Current 9.5 mm Lead Length at T_A = 75 °C I_{F(AV)}</td>
<td>3</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>A</td>
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<tr>
<td>Peak Forward Surge Current 8.3 ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) at T_J = 125 °C I_{FSM}</td>
<td>125 A</td>
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<tr>
<td>Maximum Instantaneous Forward Voltage at 3 A V_F</td>
<td>0.95</td>
<td>1.25</td>
<td>1.7</td>
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<td></td>
<td>V</td>
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<tr>
<td>Maximum Reverse Current at Rated DC Blocking Voltage T_A = 25 °C I_{R}</td>
<td>5</td>
<td>50</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>µA</td>
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<tr>
<td>Maximum Reverse Recovery Time 1) t_{rr}</td>
<td>35</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ns</td>
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<td>Typical Junction Capacitance 2) C_J</td>
<td>100</td>
<td>50</td>
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<td></td>
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<td></td>
<td></td>
<td>pF</td>
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<td>Typical Thermal Resistance 3) R_{JA}</td>
<td>20</td>
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<td></td>
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<td>°C/W</td>
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<td>Operating Junction Temperature Range T_J</td>
<td>- 55 to + 150</td>
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<td></td>
<td></td>
<td></td>
<td>°C</td>
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<tr>
<td>Storage Temperature Range T_{stg}</td>
<td>- 55 to + 150</td>
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<td></td>
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<td></td>
<td></td>
<td>°C</td>
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</table>

1) Reverse recovery test conditions: I_R = 0.5 A, I_{Rr} = 1 A, I_{Rrr} = 0.25 A.
2) Measured at 1 MHz and applied reverse voltage of 4 V.
3) Thermal resistance from junction to ambient at 0.375” (9.5 mm) lead length, P. C. B. Mounted.
FIG. 1 – TEST CIRCUIT DIAGRAM AND REVERSE RECOVERY TIME CHARACTERISTIC

NOTES: 1. RISE TIME = 7 ns  MAX. INPUT IMPEDANCE = 1 MΩ, 22 pF.
2. RISE TIME = 10 ns  MAX. SOURCE IMPEDANCE = 50 Ω.

SET TIME BASE FOR 10 ns/cm

FIG. 2 – TYPICAL FORWARD CHARACTERISTIC

INSTANTANEOUS FORWARD CURRENT

AMPERES

0.5 0.7 0.9 1.1 1.3 1.5 1.7 1.9

4.0 3.0 2.0 1.0

FIG. 3 – FORWARD DERATING CURVE

AVERAGE FORWARD CURRENT

AMPERES

0 25 50 75 100 125 150 175

6.0 4.0 2.0 1.0

Single Phase
Half Wave 60Hz
Repetitive
Inductive Load
0.375 Duty Cycle Length

FIG. 4 – TYPICAL JUNCTION CAPACITANCE

JUNCTION CAPACITANCE

μF

0.1 0.2 0.4 1 2 4 8 16 32 64

FIG. 5 – PEAK FORWARD SURGE CURRENT

PEAK FORWARD SURGE CURRENT

AMPERES

1 5 10 50 100 150 200

83ms Single Half
Sinusoidal

REVERSE VOLTAGE, VOLTS

NUMBER OF CYCLES AT 60 Hz