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May 2015

FSV1045V

10 A, 45 V Ultra-Low VF Schottky Rectifier

Features

- Ultra-Low Forward Voltage Drop:
 - 0.41 V Typical at 10 A, $T_A = 25^\circ\text{C}$
 - 0.44 V Maximum at 10 A, $T_A = 25^\circ\text{C}$
- Low Thermal Resistance
- Very Low Profile: Typical Height of 1.1 mm
- RoHS Compliant
- Halogen Free
- Meets MSL 1 per JESD22-A111 Full-Body Solder Immersion

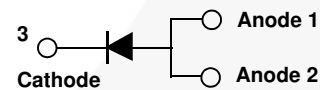
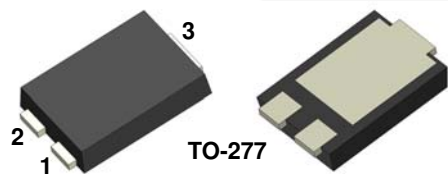
Applications

- Mobile Charger
- Solar Panel
- Reverse Polarity Protection

Description

The FSV1045V schottky rectifier offers break-through size and performance. The device is optimized for mobile charger applications. It sinks only 18 mA reverse current at high temperature and provides forward voltage drop of 0.18 V at 1 A operating current in a charger design.

All this capability is packed into a small, flat-lead, TO-277 package, optimized for space-constrained applications. The FSV1045V supports a typical Z height of 1.1 mm. It is RoHS compliant and halogen free. It is also qualified for a wave soldering process.



Ordering Information

| Part Number | Top Mark | Package | Packing Method |
|-------------|----------|-----------|----------------|
| FSV1045V | FSV1045V | TO-277 3L | Tape and Reel |

FSV1045V — 10 A, 45 V Ultra-Low VF Schottky Rectifier

Absolute Maximum Ratings⁽¹⁾

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | | Value | Unit |
|-----------|--|----------------------------------|-------------|------------------|
| V_{RRM} | Peak Repetitive Reverse Voltage | | 45 | V |
| V_{RWM} | Working Peak Reverse Voltage | | 45 | V |
| V_{RMS} | RMS Reverse Voltage | | 32 | V |
| V_R | DC Blocking Voltage | | 45 | V |
| I_O | Average Rectified Output Current ⁽²⁾ | $T_L = 105^\circ\text{C}$ | 10 | A |
| I_{FSM} | Non-Repetitive Peak Forward Surge Current ⁽³⁾ | | 300 | A |
| C_J | Typical Junction Capacitance | $V_R = 4\text{ V}, 1\text{ MHz}$ | 820 | pF |
| T_J | Operating Junction Temperature Range | | -55 to +150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | | -55 to +150 | $^\circ\text{C}$ |

Notes:

- All tests conducted at $T_A = T_J = 25^\circ\text{C}$ unless otherwise noted.
- Mounted on 30 mm x 30 mm FR4 PCB.
- Pulse condition: 8.3 ms single half-sine wave. Test method is compliant with MIL standard. (MIL-STD-750E)

Thermal Characteristics⁽⁴⁾

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Minimum Land Pattern | Maximum Land Pattern | Unit |
|-----------------|--|----------------------|----------------------|---------------------------|
| $R_{\theta JA}$ | Junction-to-Ambient Thermal Resistance | 100 | 40 | $^\circ\text{C}/\text{W}$ |
| ψ_{JL} | Junction-to-Lead Thermal Characteristics, Thermocouple Soldered to Anode | 15 | 12 | $^\circ\text{C}/\text{W}$ |
| | Junction-to-Lead Thermal Characteristics, Thermocouple Soldered to Cathode | 6 | 5 | |

Note:

- The thermal resistances ($R_{\theta JA}$ & ψ_{JL}) are characterized with device mounted on the following FR4 printed circuit boards, as shown in Figure 1 and Figure 2. PCB size: 76.2 x 114.3 mm. Minimum land pattern size: 4.9 x 4.8 mm (big pattern, x1), 1.4 x 1.52 mm (small pattern, x2). Maximum land pattern size: 30 x 30 mm (pattern, x2). Force line trace size = 55 mils, sense line trace size = 4 mils.



Figure 1. Minimum Land Pattern of 2 oz Copper

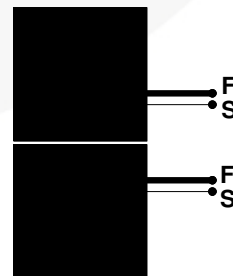


Figure 2. Maximum Land Pattern of 2 oz Copper

Electrical Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------|----------------------|-------------------------|---------------------------|-------|-------|------|
| V_{BR} | Breakdown Voltage | $I_T = 500 \mu\text{A}$ | 45 | | | V |
| V_F | Forward Voltage Drop | $I_F = 1 \text{ A}$ | $T_A = 25^\circ\text{C}$ | 0.28 | 0.44 | V |
| | | $I_F = 10 \text{ A}$ | | 0.41 | | |
| | | $I_F = 1 \text{ A}$ | $T_A = 125^\circ\text{C}$ | 0.18 | 0.39 | |
| | | $I_F = 10 \text{ A}$ | | 0.36 | | |
| I_R | Maximum Leakage | $V = V_{RWM}$ | $T_A = 25^\circ\text{C}$ | 0.065 | 0.220 | mA |
| | | | $T_A = 125^\circ\text{C}$ | 19 | 32 | |



Typical Performance Characteristics

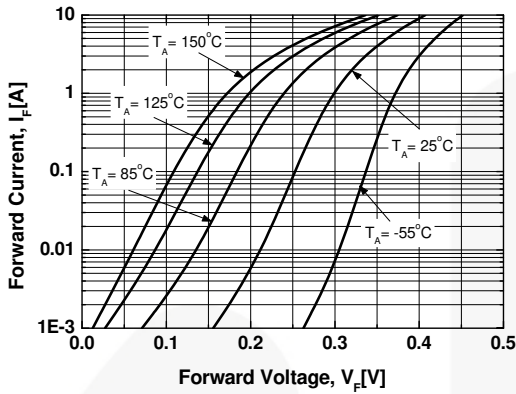


Figure 3. Forward Current Characteristics

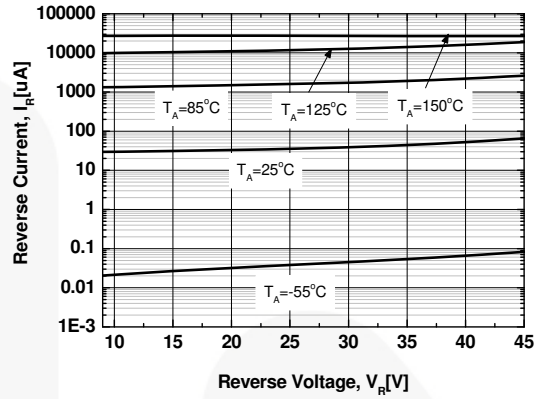


Figure 4. Typical Reverse Characteristics

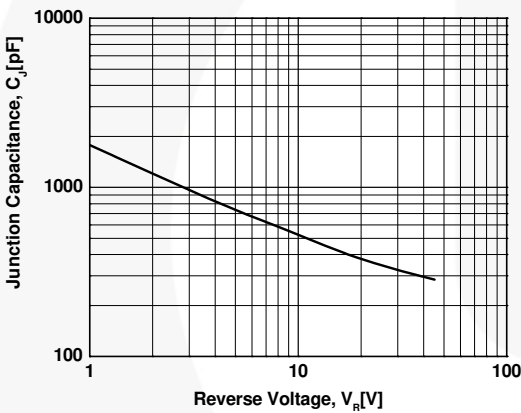


Figure 5. Typical Junction Capacitance

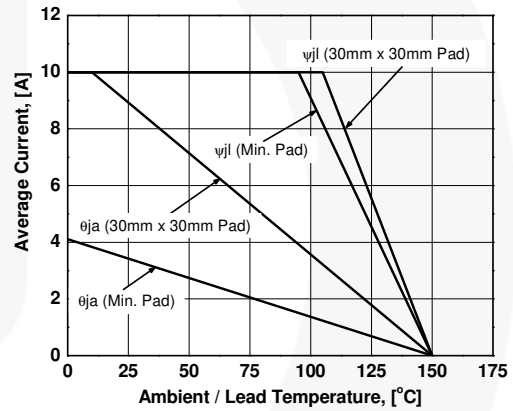


Figure 6. Forward Current Derating Curve

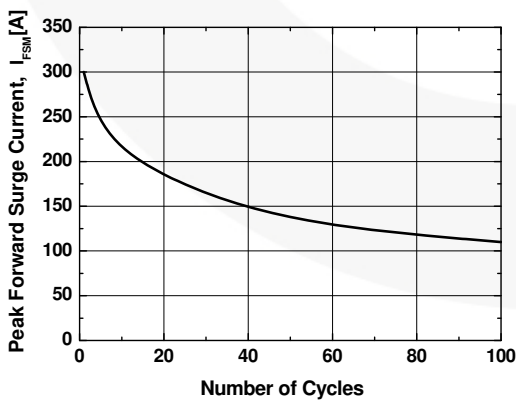
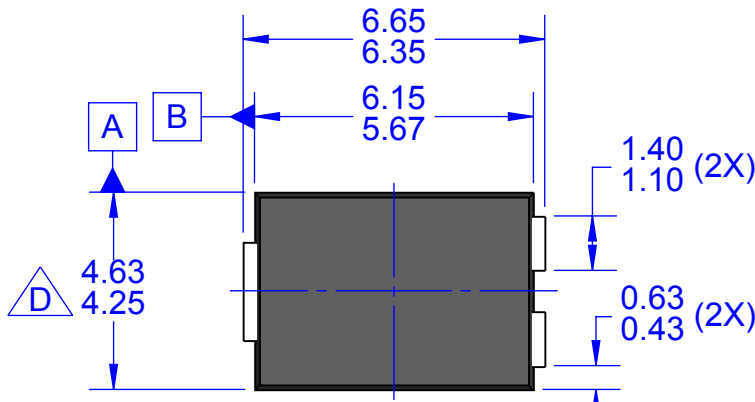
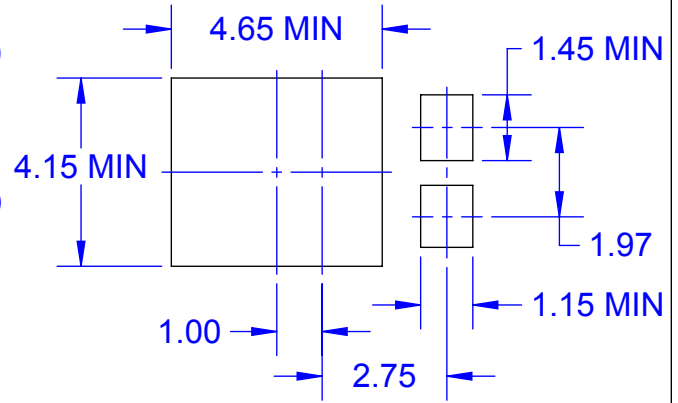


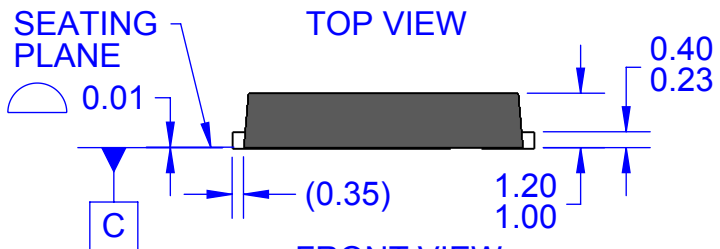
Figure 7. Surge Current Derating Curve



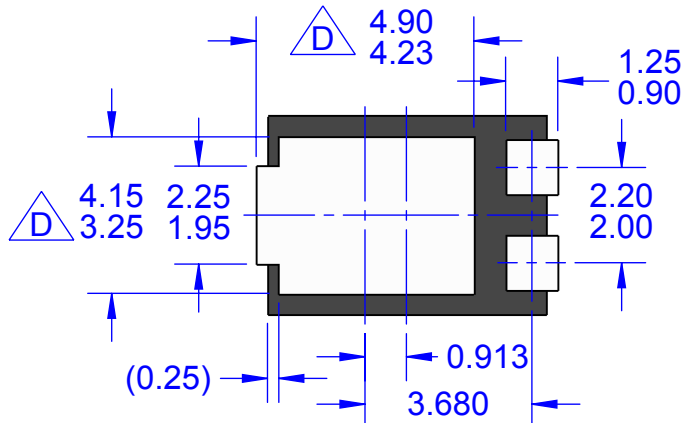
TOP VIEW



LAND PATTERN RECOMMENDATION



FRONT VIEW

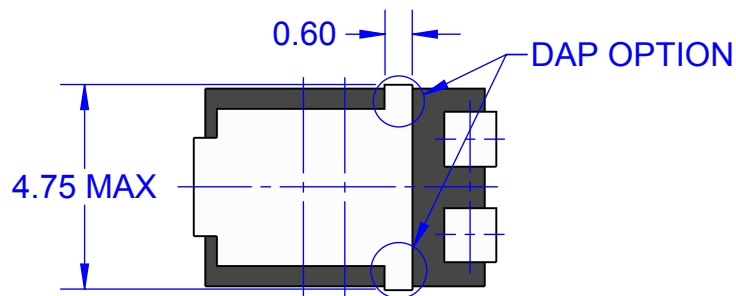


BOTTOM VIEW

NOTES: UNLESS OTHERWISE SPECIFIED

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- C. ALL DIMENSIONS ARE IN MILLIMETERS.

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- E. DRAWING FILENAME: MKT-TO277A03rev5



BOTTOM VIEW - DAP OPTION



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