

Trench Schottky Barrier Rectifier

Surface Mount

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RoHS
Compliant



Features

- The plastic package carries Underwriters Laboratory Flammability Classification 94V-0
- For surface mounted applications
- Built-in strain relief, ideal for automated placement
- Low forward voltage
- High forward surge current capability
- High temperature soldering guaranteed 250°C/10 seconds at terminals

Absolute Maximum Ratings (TA = 25°C Unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|-------------------|-------------|------|
| Maximum repetitive peak reverse voltage | V _{RRM} | 100 | V |
| Maximum RMS voltage | V _{RMS} | 70 | |
| Maximum DC blocking voltage | V _{DC} | 100 | |
| Maximum average forward rectified current at T _L =100°C | I _(AV) | 5 | A |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load | I _{FSM} | 120 | |
| Typical thermal resistance | R _{qJA} | 65 | °C/W |
| | R _{qJL} | 25 | |
| Operating Junction Temperature Range | T _J | -55 to +150 | °C |
| Storage Temperature Range | T _{STG} | -55 to +150 | |

Note:

1. Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.2" × 0.2" (5mm × 5mm) copper pad areas

Electrical Characteristics at (TA = 25°C Unless otherwise specified)

| Parameter | Symbol | TYP | MAX | Unit |
|---|----------------|------|------|------|
| Maximum instantaneous forward voltage at 5A | V _F | 0.58 | 0.65 | V |
| Maximum DC reverse current T _A =25°C | I _R | 20 | 100 | μA |
| at rated DC blocking voltage T _A =25°C | | 5 | 50 | mA |

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Recommended Reflow Solder Profiles

The recommended reflow solder profiles for Pb and Pb-free devices are shown below.

Figure 1 shows the recommended solder profile for devices that have Pb-free terminal plating, and where a Pb-free solder is used.

Figure 2 shows the recommended solder profile for devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with a leaded solder.

Figure 1

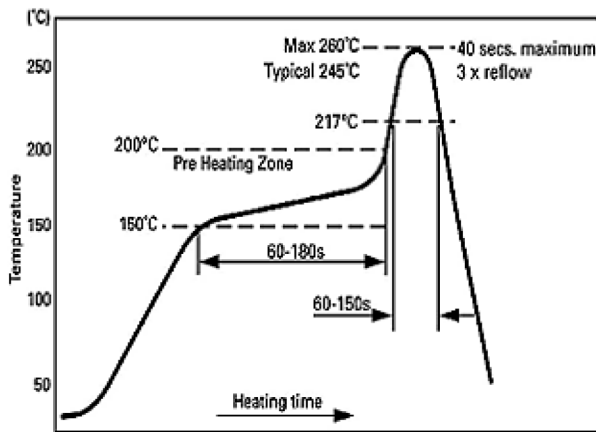
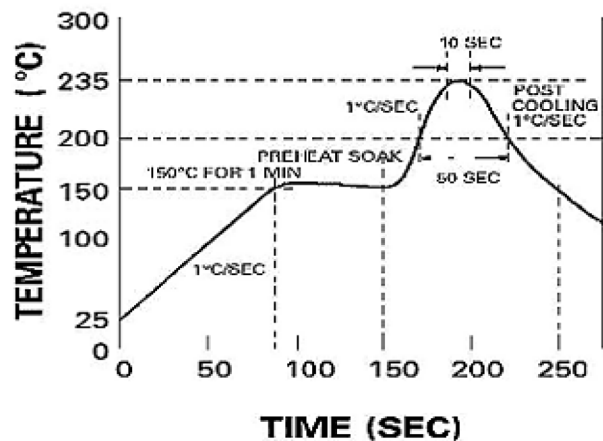


Figure 2



Reflow profiles in tabular form

| Profile Feature | Sn-Pb System | Pb-Free System |
|---|-----------------------------|-----------------------------|
| Average Ramp-Up Rate | ~3°C/second | ~3°C/second |
| Preheat – Temperature Range – Time | 150-170°C 60-180 seconds | 150-200°C 60-180 seconds |
| Time maintained above: – Temperature – Time | 200°C 30-50 seconds | 217°C 60-150 seconds |
| Peak Temperature | 235°C | 260°C max. |
| Time within +0 -5°C of actual Peak | 10 seconds | 40 seconds |
| Ramp-Down Rate | 3°C/second max. | 6°C/second max. |

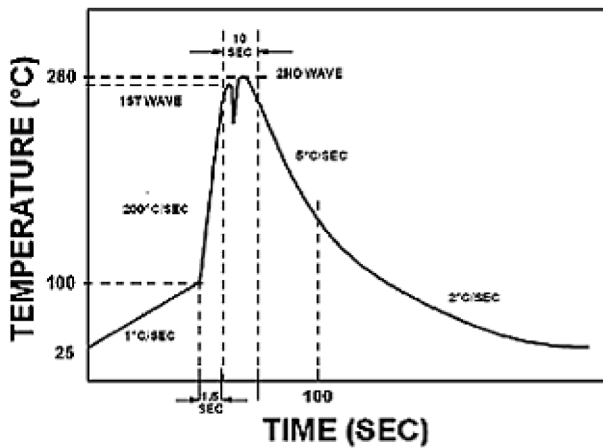


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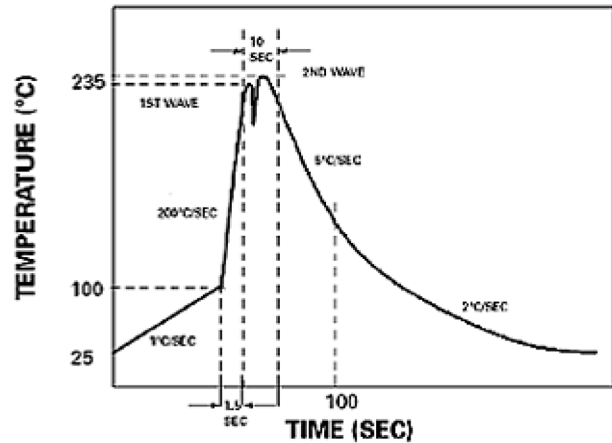


Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free terminal plating where a Pb-free solder is used



The Recommended solder Profile For Devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with leaded solder



Wave Profiles in Tabular Form

| Profile Feature | Sn-Pb System | Pb-Free System |
|------------------------------------|-----------------------------|-----------------------------|
| Average Ramp-Up Rate | ~200°C/second | ~200°C/second |
| Heating rate during preheat | Typical 1-2, Max 4°C/sec | Typical 1-2, Max 4°C/Sec |
| Final preheat Temperature | Within 125°C of Solder Temp | Within 125°C of Solder Temp |
| Peak Temperature | 235°C | 260°C max. |
| Time within +0 -5°C of actual Peak | 10 seconds | 10 seconds |
| Ramp-Down Rate | 3°C/second max. | 5°C/second max. |



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Typical Characteristic Curves

Fig 1: Derating Curve Output Rectified Current

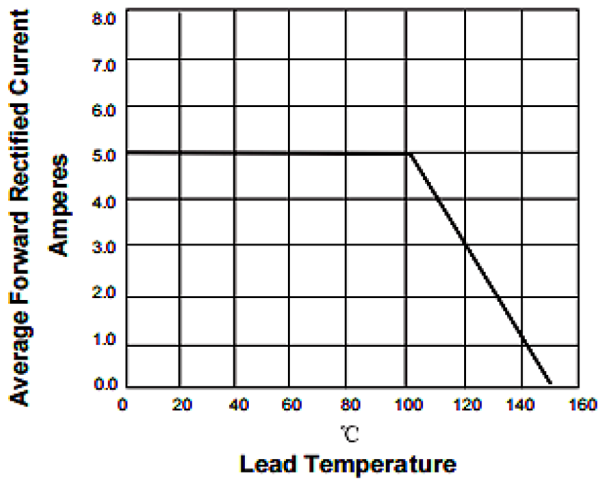


Fig 3: Maximum Non-Repetitive Peak Forward Surge Current Per leg

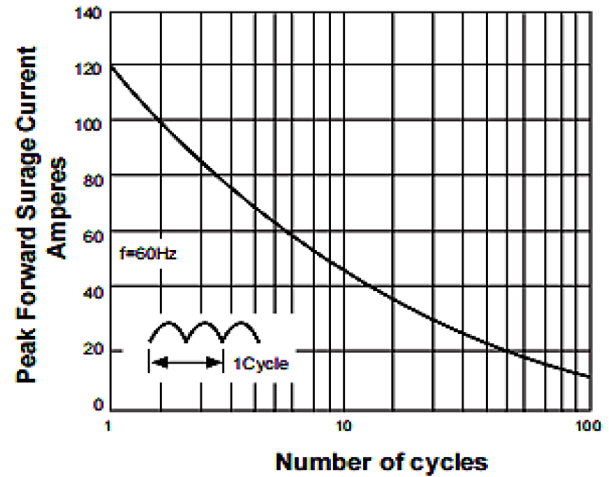


Fig 2: Typical Forward Voltage Characteristics

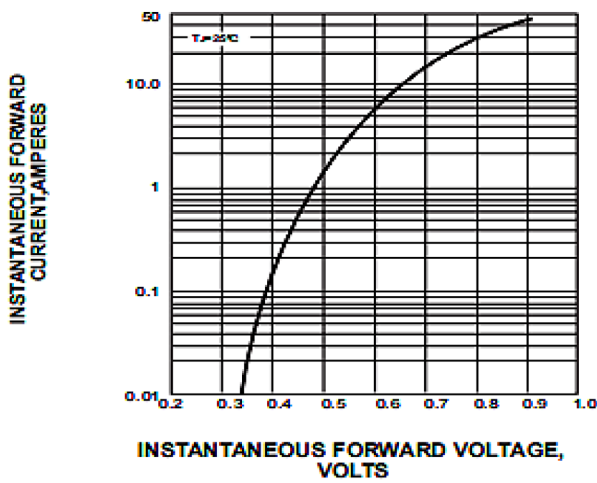
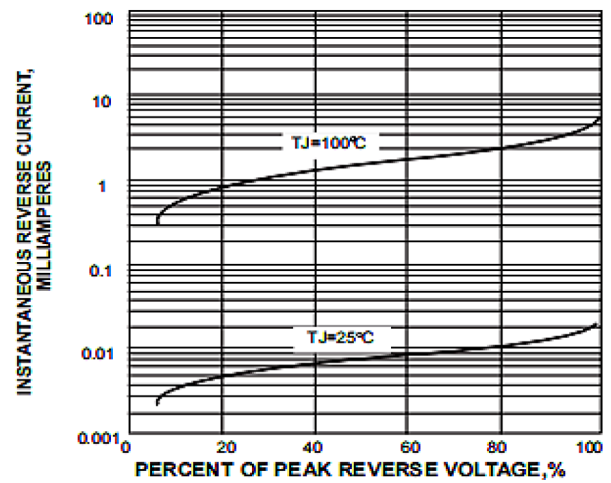


Fig 4: Typical Reverse Leakage Characteristics



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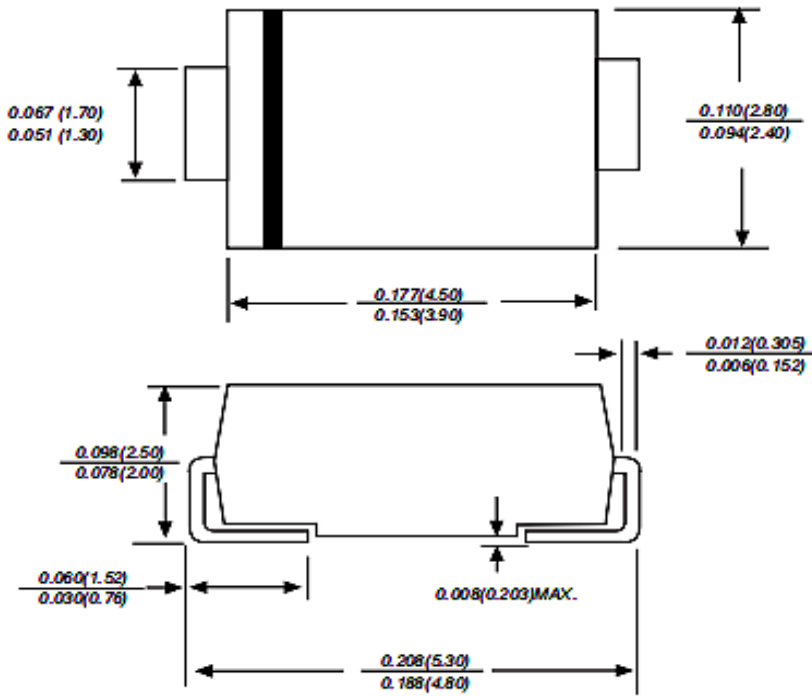
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Surface Mount



Diagram

TO-252 (DPAK)



Part Number Table

| Description | Part Number |
|--|-------------|
| Trench Schottky Barrier Rectifier, Surface Mount, 5A | ST510A |

Dimensions : Inches (Millimetres)

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