

## 12A, 120V Trench Schottky Rectifier

### FEATURES

- Patented Trench Schottky technology
- Excellent high temperature stability
- Low forward voltage
- Low power loss/ high efficiency
- High forward surge capability
- Ideal for automated placement
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



TO-277A (SMPC)



### TYPICAL APPLICATIONS

Trench Schottky barrier rectifier is designed for high frequency miniature switched mode power supplies such as adapters, lighting and on-board DC/DC converters.

### MECHANICAL DATA

**Case:** TO-277A (SMPC)

Molding compound, UL flammability classification rating 94V-0

Moisture sensitivity level: level 1, per J-STD-020

Packing code with suffix "G" means green compound (halogen-free)

**Terminal:** Matte tin plated leads, solderable per JESD22-B102

Meet JESD 201 class 2 whisker test

**Polarity:** Indicated by cathode band

**Weight:** 0.095g (approximately)

| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T <sub>A</sub> =25°C unless otherwise noted) |                       |                        |                    |              |      |      |      |
|----------------------------------------------------------------------------------------------|-----------------------|------------------------|--------------------|--------------|------|------|------|
| PARAMETER                                                                                    |                       |                        | SYMBOL             | TSP12U120S   |      |      | UNIT |
| Marking code                                                                                 |                       |                        |                    | 12U120       |      |      |      |
| Maximum repetitive peak reverse voltage                                                      |                       |                        | V <sub>RRM</sub>   | 120          |      |      | V    |
| Maximum average forward rectified current                                                    |                       |                        | I <sub>F(AV)</sub> | 12           |      |      | A    |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load          |                       |                        | I <sub>FSM</sub>   | 150          |      |      | A    |
|                                                                                              |                       |                        | V <sub>F</sub>     | MIN          | TYP  | MAX  | V    |
| Maximum instantaneous forward voltage (Note 1)                                               | I <sub>F</sub> = 6 A  | T <sub>J</sub> = 25°C  |                    | -            | 0.56 | -    |      |
|                                                                                              | I <sub>F</sub> = 12 A |                        |                    | -            | 0.68 | 0.78 |      |
|                                                                                              | I <sub>F</sub> = 6 A  | T <sub>J</sub> = 125°C |                    | -            | 0.48 | -    |      |
|                                                                                              | I <sub>F</sub> = 12 A |                        |                    | -            | 0.58 | 0.68 |      |
| Maximum instantaneous reverse current at rated reverse voltage                               |                       | T <sub>J</sub> = 25°C  | I <sub>R</sub>     | -            | 3    | 500  | μA   |
|                                                                                              |                       | T <sub>J</sub> = 125°C |                    | -            | 3    | 50   | mA   |
| Typical thermal resistance                                                                   |                       |                        | R <sub>θJL</sub>   | 6            |      |      | °C/W |
| Operating temperature range                                                                  |                       |                        | T <sub>J</sub>     | - 55 to +150 |      |      | °C   |
| Storage temperature range                                                                    |                       |                        | T <sub>STG</sub>   | - 55 to +150 |      |      | °C   |

Note 1: Pulse Test with Pulse Width=300μs, 1% Duty Cycle

**ORDERING INFORMATION**

| PART NO.   | PACKING CODE | PACKING CODE SUFFIX | PACKAGE | PACKING                 |
|------------|--------------|---------------------|---------|-------------------------|
| TSP12U120S | S1           | G                   | SMPC    | 1,500/ 7" Plastic reel  |
|            | S2           |                     | SMPC    | 6,000/ 13" Plastic reel |

Note: Whole series with green compound

**EXAMPLE**

| PREFERRED PART NO. | PART NO.   | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION    |
|--------------------|------------|--------------|---------------------|----------------|
| TSP12U120S S1G     | TSP12U120S | S1           | G                   | Green compound |

**RATINGS AND CHARACTERISTICS CURVES**

( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

FIG.1 FORWARD CURRENT DERATING CURVE

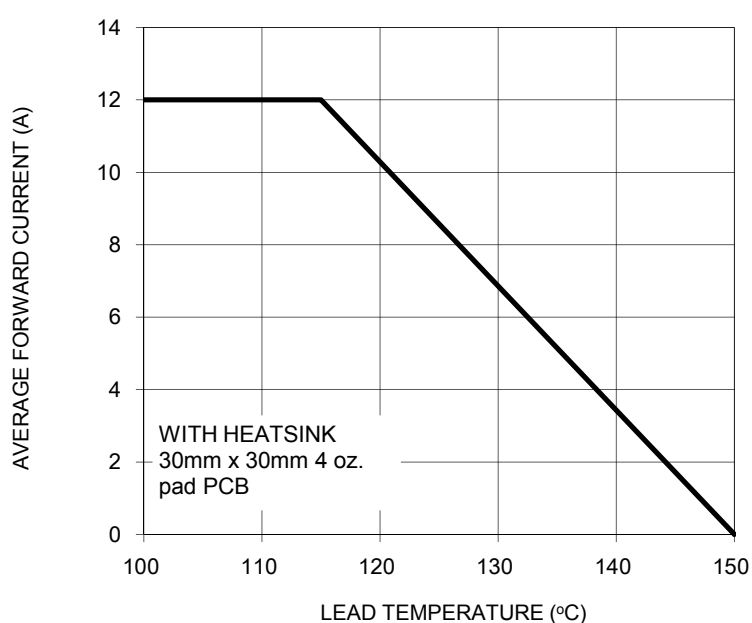


FIG. 2 TYPICAL FORWARD CHARACTERISTICS

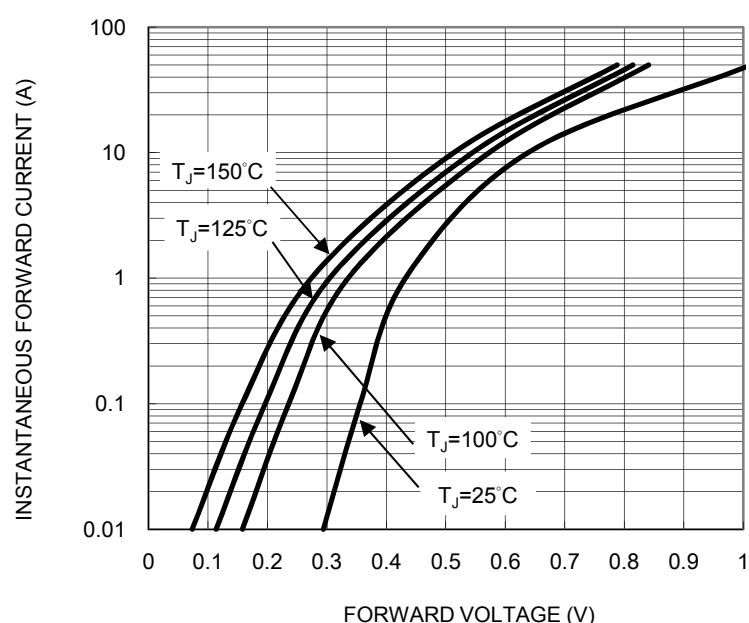


FIG. 3 TYPICAL REVERSE CHARACTERISTICS

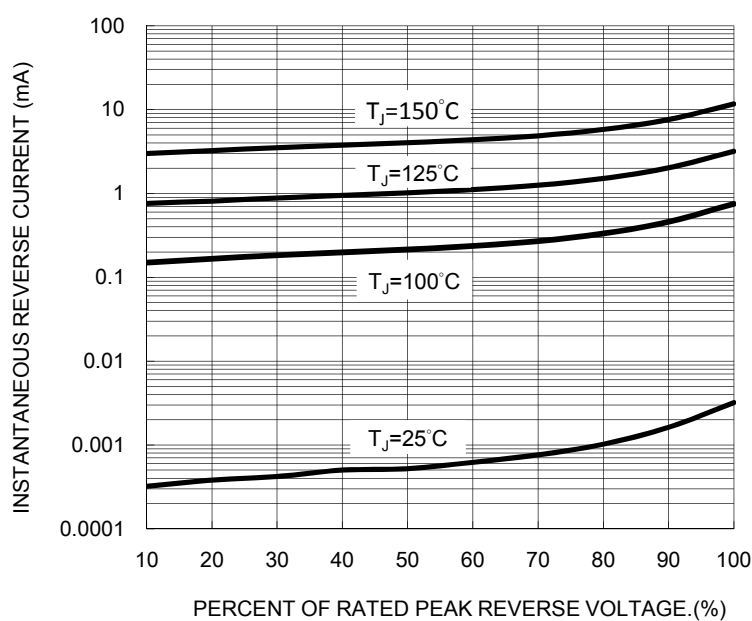


FIG. 4 TYPICAL JUNCTION CAPACITANCE

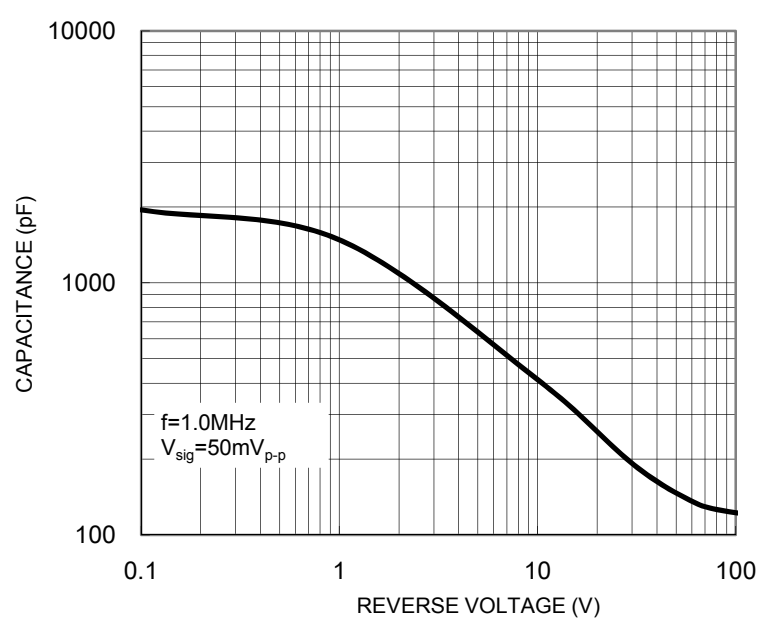
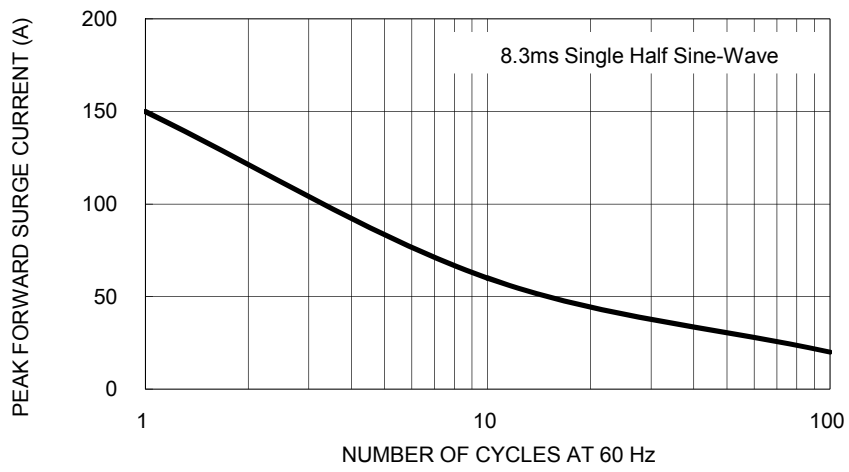
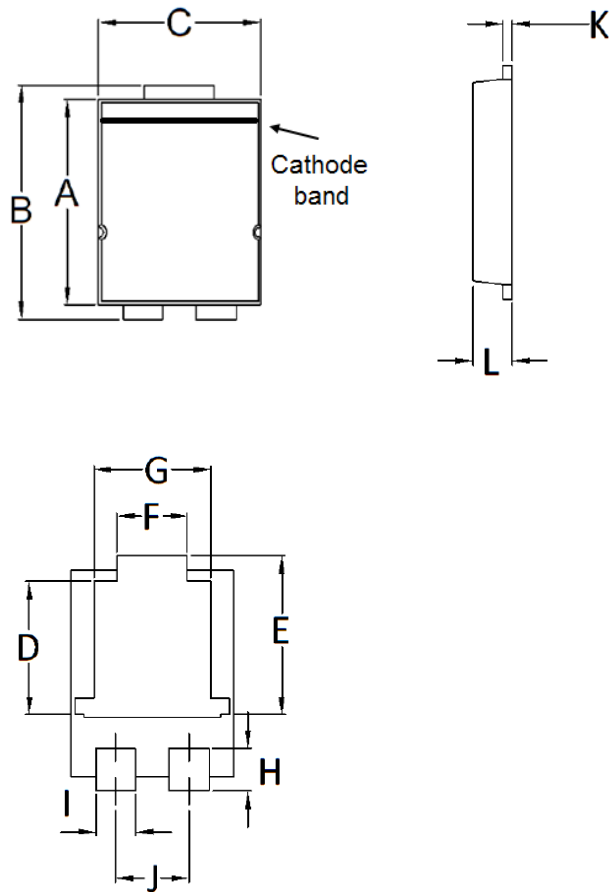


FIG. 5 MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

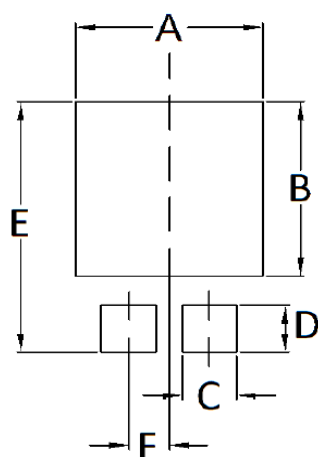


**PACKAGE OUTLINE DIMENSIONS**  
**TO-277A (SMPC)**



| DIM. | Unit (mm) |       | Unit (inch) |       |
|------|-----------|-------|-------------|-------|
|      | Min       | Max   | Min         | Max   |
| A    | 5.650     | 5.750 | 0.222       | 0.226 |
| B    | 6.350     | 6.650 | 0.250       | 0.262 |
| C    | 4.550     | 4.650 | 0.179       | 0.183 |
| D    | 3.540     | 3.840 | 0.139       | 0.151 |
| E    | 4.235     | 4.535 | 0.167       | 0.179 |
| F    | 1.850     | 2.150 | 0.073       | 0.085 |
| G    | 3.170     | 3.470 | 0.125       | 0.137 |
| H    | 1.043     | 1.343 | 0.041       | 0.053 |
| I    | 1.000     | 1.300 | 0.039       | 0.051 |
| J    | 1.930     | 2.230 | 0.076       | 0.088 |
| K    | 0.175     | 0.325 | 0.007       | 0.013 |
| L    | 1.000     | 1.200 | 0.039       | 0.047 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 4.80      | 0.189       |
| B      | 4.72      | 0.186       |
| C      | 1.40      | 0.055       |
| D      | 1.27      | 0.050       |
| E      | 6.80      | 0.268       |
| F      | 1.04      | 0.041       |

**MARKING DIAGRAM**



P/N = Marking Code  
YW = Date Code  
F = Factory Code

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