

International
IR Rectifier

STPS1L30UPbF

SCHOTTKY RECTIFIER

1 Amp

$$I_{F(AV)} = 1.0 \text{ Amp}$$

$$V_R = 30V$$

Major Ratings and Characteristics

| Characteristics | Value | Units |
|---|-------------|------------------|
| $I_{F(AV)}$ Rectangular waveform | 1.0 | A |
| V_{RRM} | 30 | V |
| I_{FSM} @ $t_p = 5 \text{ ms}$ sine | 360 | A |
| V_F @ 1.0 Apk , $T_J = 125^\circ\text{C}$ | 0.30 | V |
| T_J range | - 55 to 150 | $^\circ\text{C}$ |

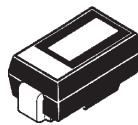
Description/ Features

The STPS1L30UPbF surface-mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC boards. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- Small foot print, surface mountable
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

Case Styles

STPS1L30UPbF



SMB



Voltage Ratings

| Part number | STPS1L30UTRPbF |
|---|----------------|
| V_R Max. DC Reverse Voltage (V) | 30 |
| V_{RWM} Max. Working Peak Reverse Voltage (V) | |

Absolute Maximum Ratings

| Parameters | Value | Units | Conditions |
|--|-------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current | 1.0 | A | 50% duty cycle @ $T_L = 106^\circ\text{C}$, rectangular wave form |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current | 360 | A | 5 μs Sine or 3 μs Rect. pulse |
| | 75 | | 10ms Sine or 6ms Rect. pulse |
| E_{AS} Non-Repetitive Avalanche Energy | 3.0 | mJ | $T_J = 25^\circ\text{C}$, $I_{AS} = 1\text{A}$, $L = 6\text{mH}$ |
| I_{AR} Repetitive Avalanche Current | 1.0 | A | Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_a = 1.5 \times V_r$ typical |

Electrical Specifications

| Parameters | Value | Units | Conditions |
|---|-------|------------------|---|
| V_{FM} Max. Forward Voltage Drop (1) | 0.420 | V | @ 1A |
| | 0.470 | V | @ 2A |
| | 0.300 | V | @ 1A |
| | 0.375 | V | @ 2A |
| I_{RM} Max. Reverse Leakage Current (1) | 0.2 | mA | $T_J = 25^\circ\text{C}$ |
| | 5.0 | mA | $T_J = 100^\circ\text{C}$ |
| | 15 | mA | $T_J = 125^\circ\text{C}$ |
| C_T Max. Junction Capacitance | 200 | pF | $V_R = 5V_{DC}$, (test signal range 100KHz to 1Mhz) 25°C |
| L_S Typical Series Inductance | 2.0 | nH | Measured lead to lead 5mm from package body |
| dv/dt Max. Voltage Rate of Change (Rated V_R) | 10000 | V/ μs | |

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

| Parameters | Value | Units | Conditions |
|---|-------------|---------------------------|---------------------|
| T_J Max. Junction Temperature Range (*) | -55 to 150 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ | |
| R_{thJL} Max. Thermal Resistance Junction to Lead (**) | 25 | $^\circ\text{C}/\text{W}$ | DC operation |
| R_{thJA} Max. Thermal Resistance Junction to Ambient | 80 | $^\circ\text{C}/\text{W}$ | DC operation |
| wt Approximate Weight | 0.10(0.003) | g (oz.) | |
| Case Style | SMB | | Similar to DO-214AA |
| Device Marking | IR13L | | |

(*) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

(**) Mounted 1 inch square PCB

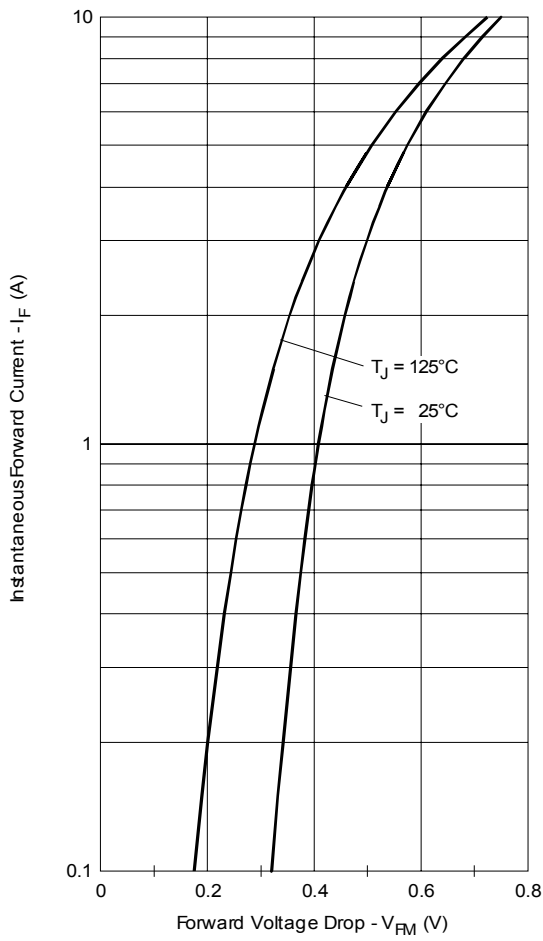


Fig. 1 - Maximum Forward Voltage Drop Characteristics

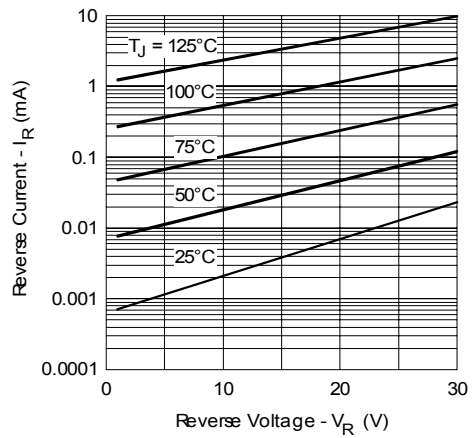


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

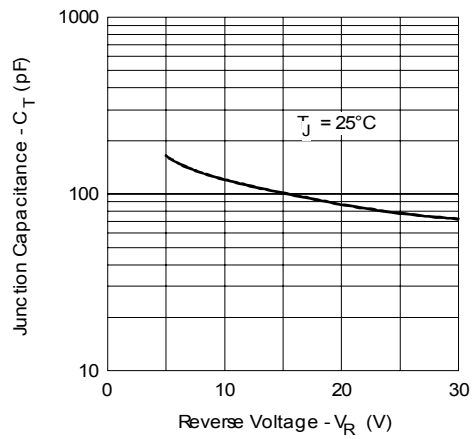


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

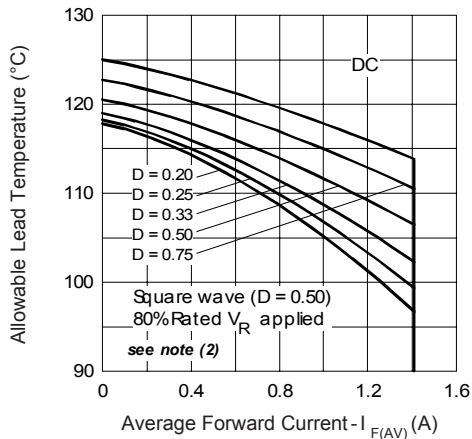


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

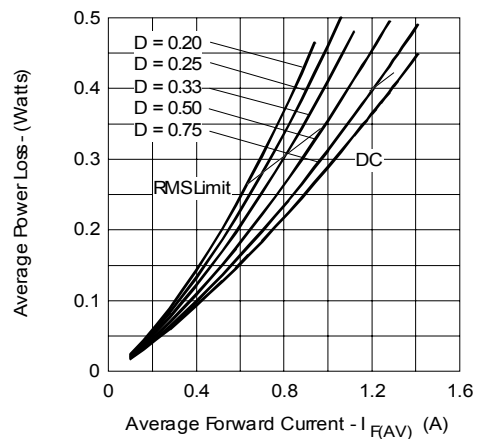


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

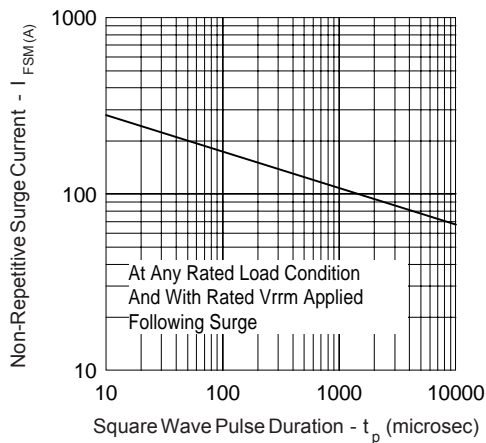


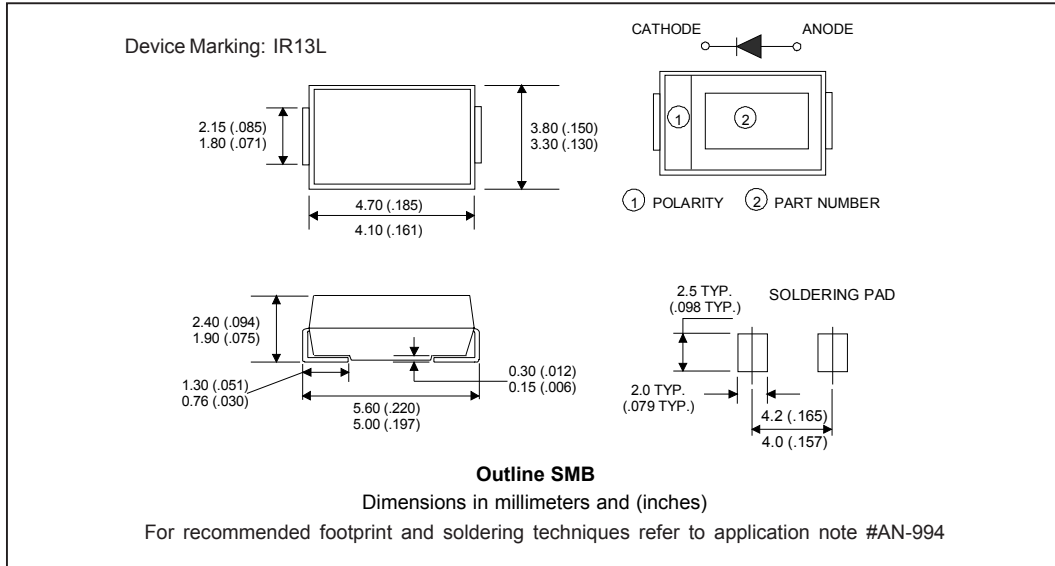
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;

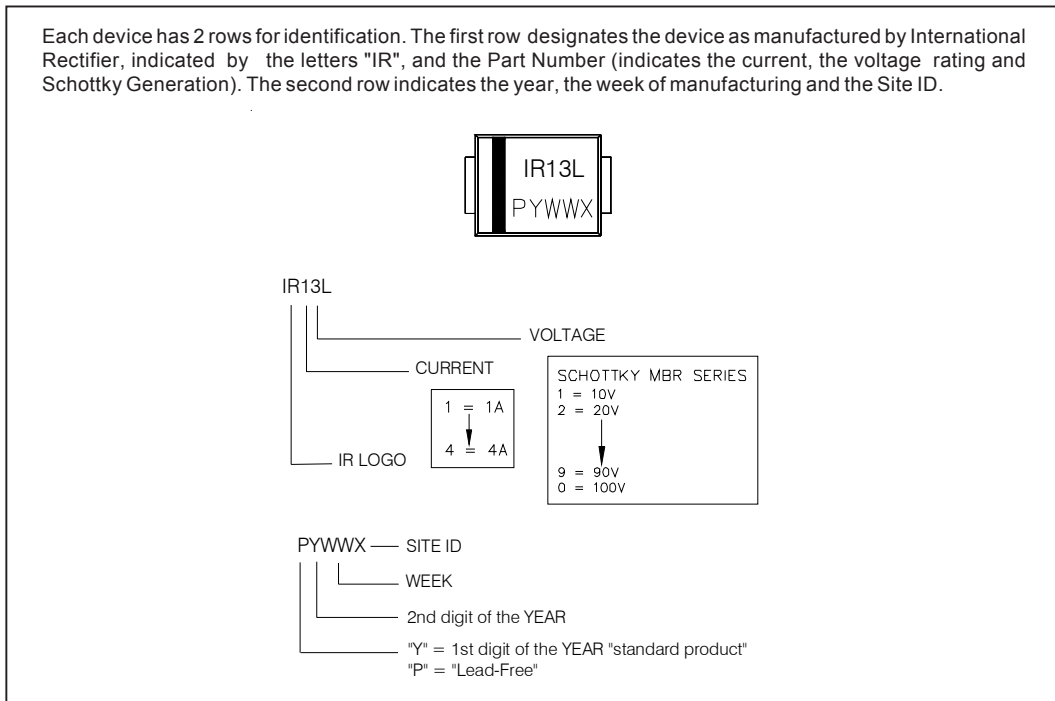
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ rated V_R

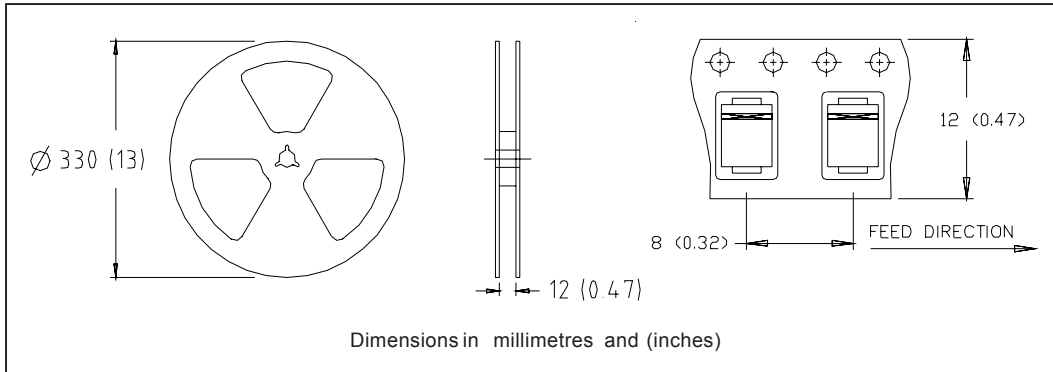
Outline Table



Marking & Identification



Tape & Reel Information



Ordering Information Table

| Device Code | STPS | 1 | L | 30 | U | PbF |
|-------------|------|--------------------------------|---|---------------------------|-----------------------------|-----------|
| | ① | ② | ③ | ④ | ⑤ | ⑥ |
| | | 1 | 2 | 3 | 4 | 5 |
| | | - Schottky STP Series | - Current Rating (1 = 1 A) | - L = Low Forward Voltage | - Voltage Rating (30 = 30V) | - U = SMB |
| | | 6 | <ul style="list-style-type: none"> • none = Standard Production • PbF = Lead-Free | | | |
| | | Tape & Reel only (3000 pieces) | | | | |

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on IR's Web site.