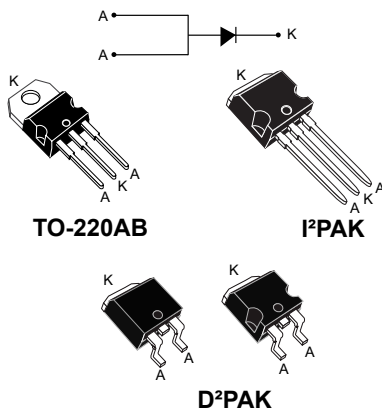


100 V, 30 A power Schottky rectifier



Features

- High current capability
- Avalanche rated
- Low forward voltage drop
- High frequency operation
- **ECOPACK®2** compliant components (for D²PAK on demand)

Applications

- Switching diode
- SMPS
- DC/DC converter
- LED lighting
- Desktop power supply

Description

This single Schottky rectifier is suited for high frequency switch mode power supply.

Packaged in TO-220AB, D²PAK and I²PAK, the **STPS30SM100S** is optimized for use in notebook and game station adapters, providing in these applications a good efficiency at both low and high load.

Product status link

[STPS30SM100S](#)

Product summary

$I_{F(AV)}$	30 A
V_{RRM}	100 V
T_j (max.)	150 °C
V_F (typ.)	0.63 V

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Characteristics

Table 1. Absolute ratings (limiting values, with terminals 1 and 3 short circuited, at 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		100	V
$I_{F(RMS)}$	Forward rms current		60	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$, square wave	$T_c = 125\text{ °C}$	30	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	400	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 10\text{ }\mu\text{s}$, $T_j = 125\text{ °C}$	1545	W
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Maximum operating junction temperature ⁽¹⁾		150	°C

1. $(dP_{tot}/dT_j) < (1/R_{th(j-a)})$ condition to avoid thermal runaway for a diode on its own heatsink.

Table 2. Thermal resistance parameter

Symbol	Parameter	Max. value	Unit
$R_{th(j-c)}$	Junction to case	1	°C/W

For more information, please refer to the following application note:

- AN5088: Rectifiers thermal management, handling and mounting recommendations

Table 3. Static electrical characteristics (with terminals 1 and 3 short circuited)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R ⁽¹⁾	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		45	μA
		$T_j = 125\text{ °C}$		-	15	45	mA
V_F ⁽²⁾	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 5\text{ A}$	-	500		mV
		$T_j = 125\text{ °C}$		-	420		
		$T_j = 25\text{ °C}$	$I_F = 10\text{ A}$	-	600	670	
		$T_j = 125\text{ °C}$		-	505	560	
		$T_j = 25\text{ °C}$	$I_F = 30\text{ A}$	-	780	870	
		$T_j = 125\text{ °C}$		-	630	690	

1. Pulse test: $t_p = 5\text{ ms}$, $\delta < 2\%$

2. Pulse test: $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses, use the following equation:

$$P = 0.580 \times I_{F(AV)} + 0.0033 \times I_F^2 (RMS)$$

For more information, please refer to the following application notes related to the power losses:

- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current (terminals 1 and 3 short circuited)

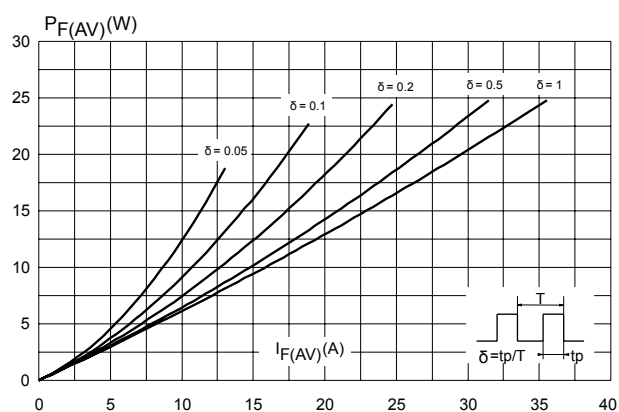


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$, terminals 1 and 3 short circuited)

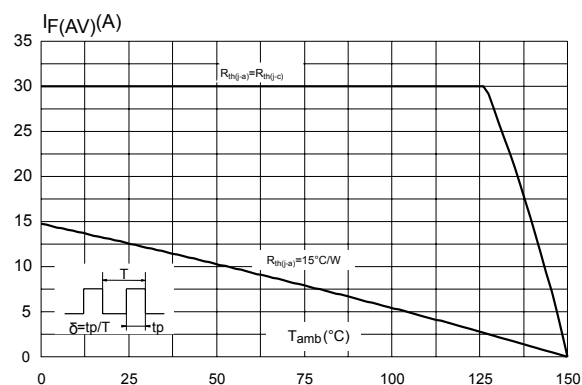


Figure 3. Normalized avalanche power derating versus pulse duration ($T_j = 125^\circ\text{C}$)

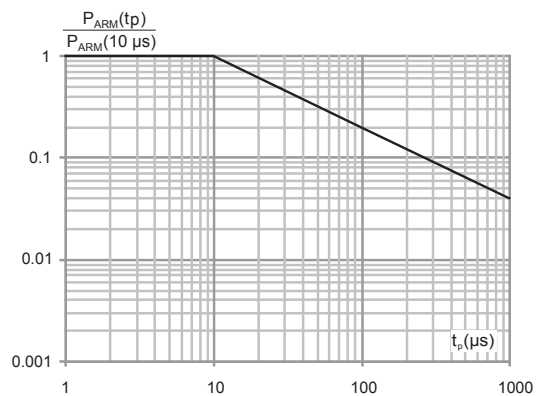
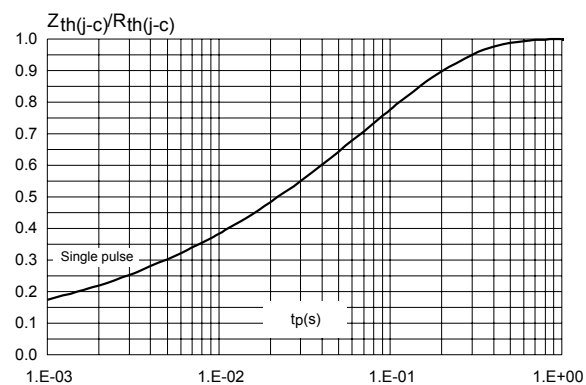


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration



3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS30SM100ST	PS30SM100ST	TO-220AB	1.95 g	50	Tube
STPS30SM100SR	PS30SM100SR	I ² PAK	1.50 g	50	Tube
STPS30SM100SG-TR	PS30SM100SG	D ² PAK	1.48 g	1000	Tape and reel