STPS30M120S

Power Schottky rectifier

Datasheet — production data

Features

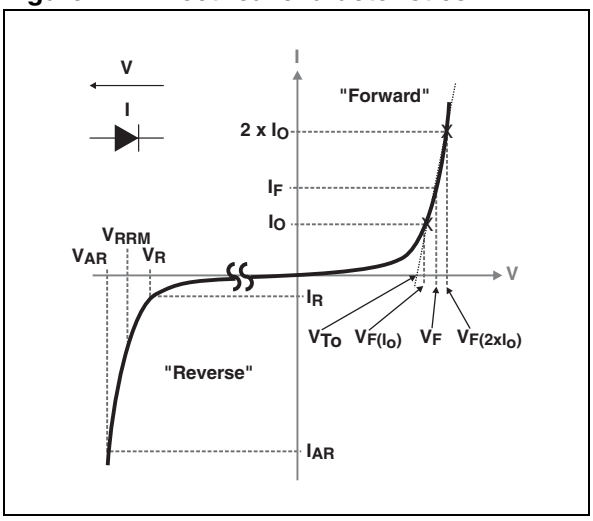
- High current capability
- Avalanche rated
- Low forward voltage drop
- High frequency operation

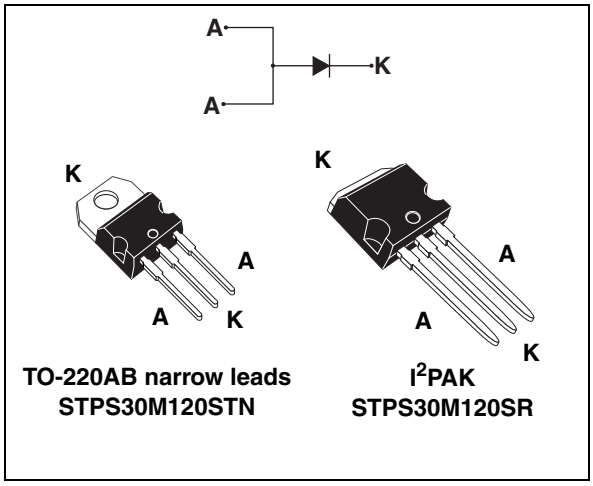
Description

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

Packaged in TO-220AB narrow leads and I^2PAK, this device is intended to be used in notebook, game station and desktop adapters, providing in these applications a good efficiency at both low and high load.

Figure 1. Electrical characteristics[(a)]





TO-220AB narrow leads
STPS30M120STN

I^2PAK
STPS30M120SR

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	30 A
V_{RRM}	120 V
V_F (typ)	0.45 V
T_j (max)	150 °C

1 Characteristics

Table 2. Absolute ratings (limiting values with terminals 1 and 3 short circuited at T_{amb} = 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		120	V
$I_{F(RMS)}$	Forward rms current		50	A
$I_{F(AV)}$	Average forward current, δ = 0.5	T_c = 110 °C	30	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sine-wave	260	A
P_{ARM}(1)	Repetitive peak avalanche power	T_j = 125 °C, t_p = 10 µs	1450	W
V_{ARM}(2)	Maximum repetitive peak avalanche voltage	t_p < 10 µs, T_j < 125 °C, I_{AR} < 9.7 A	150	V
V_{ASM}(2)	Maximum single-pulse peak avalanche voltage	t_p < 10 µs, T_j < 125 °C, I_{AR} < 9.7 A	150	V
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Maximum operating junction temperature(3)		150	°C

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	1.3	°C/W

Table 4. Static electrical characteristics (terminals 1 and 3 short circuited)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RM}$	-	70	345	µA
		T_j = 125 °C		-	25	65	mA
V_F(2)	Forward voltage drop	T_j = 125 °C	I_F = 5 A	-	0.45	0.50	V
		T_j = 125 °C	I_F = 10 A	-	0.52	0.57	
		T_j = 25 °C	I_F = 15 A	-		0.75	
		T_j = 125 °C		-	0.57	0.62	
		T_j = 25 °C	I_F = 30 A	-		0.90	
		T_j = 125 °C		-	0.66	0.73	

1. Pulse test: t_p = 5 ms, δ < 2%
2. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.53 \times I_{F(AV)} + 0.0067 \times I_F^2{}_{(RMS)}$

Figure 2. Average forward power dissipation versus average forward current

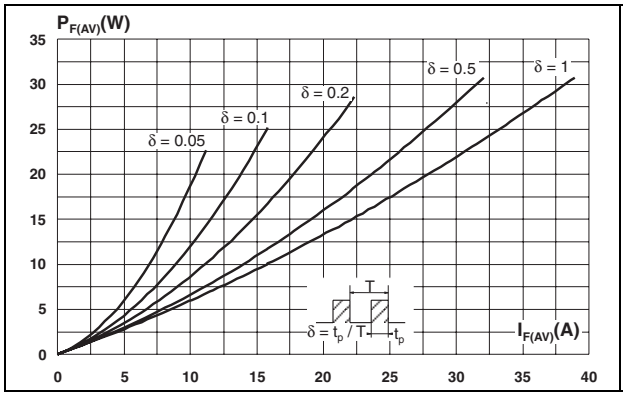


Figure 3. Average forward current versus ambient temperature (δ = 0.5)

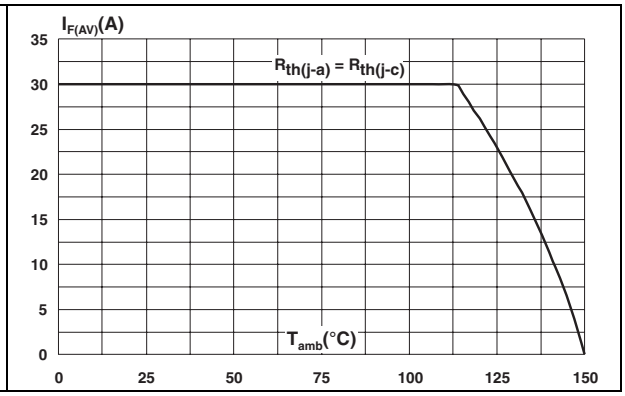


Figure 4. Normalized avalanche power derating versus pulse duration

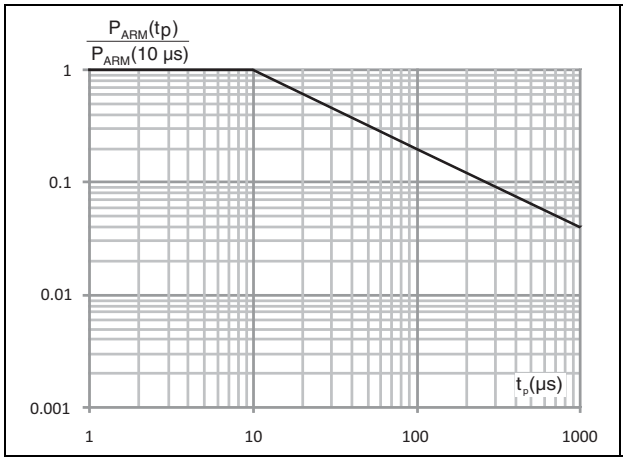


Figure 5. Relative variation of thermal impedance junction to case versus pulse duration

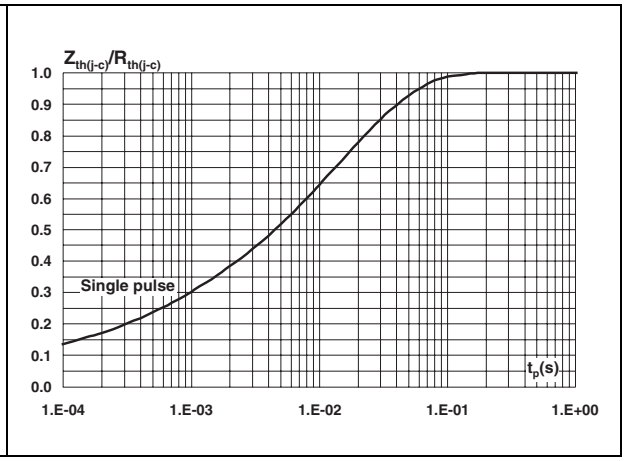


Figure 6. Reverse leakage current versus reverse voltage applied (typical values)

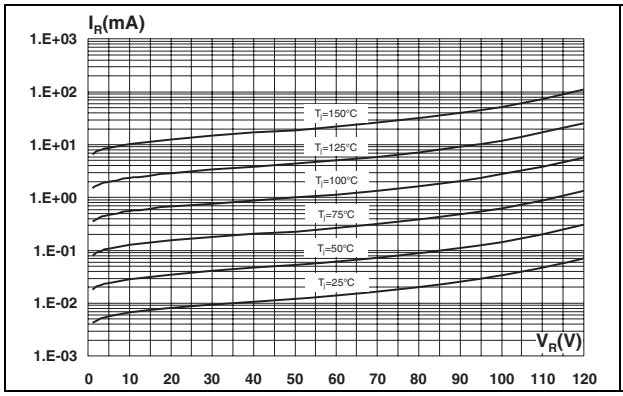
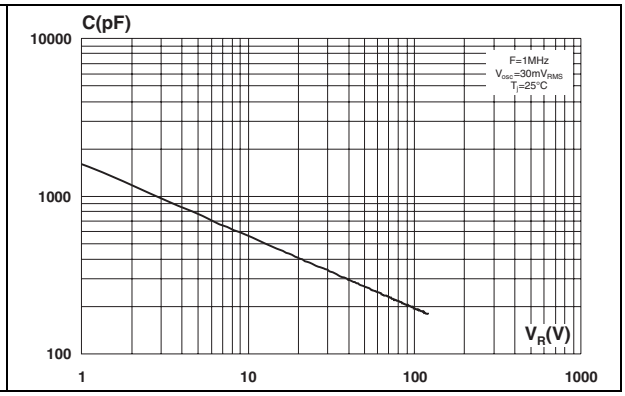


Figure 7. Junction capacitance versus reverse voltage applied (typical values)



3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS30M120SR	PS30M120SR	I^2PAK	1.49 g	50	Tube
STPS30M120STN	PS30M120STN	TO-220AB narrow leads	1.9 g	50	Tube

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
02-Apr-2012	1	First issue.