STPS30L120C

Power Schottky rectifier

Features

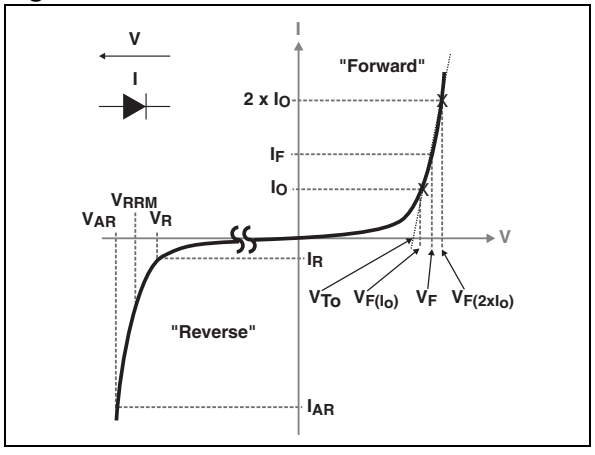
- High junction temperature capability
- Avalanche capability specified
- Low forward voltage drop current
- High frequency operation
- Insulated package: TO-220FPAB
  - Insulating voltage = 1500 V rms
  - Typical package capacitance 12 pF

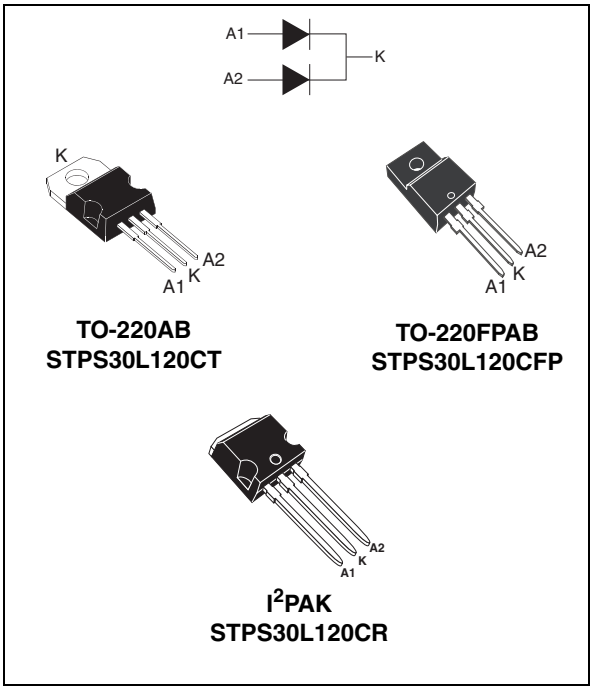
Description

This dual center tap Schottky rectifier is suited for high frequency switch mode power supplies.

Packaged in TO-220AB, I^2PAK and TO-220FPAB, this device provides adaptor designers with an optimized price-performance ratio.

Figure 1. Electrical characteristics [a]





TO-220AB
STPS30L120CT

TO-220FPAB
STPS30L120CFP

I^2PAK
STPS30L120CR

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 15 A
V_{RRM}	120 V
$T_{j(max)}$	150 °C
$V_{F(typ)}$	0.51 V

a. V_{ARM} and I_{ARM} must respect the reverse safe operating area defined in *Figure 13*. V_{AR} and I_{AR} are pulse measurements (t_p < 1 µs). V_R, I_R, V_{RRM} and V_F, are static characteristics.

1 Characteristics

Table 2. Absolute ratings (limiting values, per diode)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		120	V
$I_{F(RMS)}$	Forward rms current		30	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	Total package	30	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	220	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs, T_j = 25 °C	11500	W
V_{ARM}(1)	Maximum repetitive peak avalanche voltage	t_p = 1 µs, T_j < 150 °C, I_{AR} < 23 A	150	V
V_{ASM}(1)	Maximum single pulse peak avalanche voltage	t_p = 1 µs, T_j < 150 °C, I_{AR} < 23 A	150	V
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature(2)		150	°C

1. Refer to *Figure 13*
2. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

Table 3. Thermal parameters

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB, I^2PAK	Per diode Total	1.3 0.7	°C/W
		TO-220FPAB	Per diode Total	4.5 3.8	
$R_{th(c)}$	Coupling	TO-220AB, I^2PAK	Total	0.1	
		TO-220FPAB		3	

When the diodes 1 and 2 are used simultaneously :
T_j(diode 1) = P(diode 1) x $R_{th(j-c)}$(per diode) + P(diode 2) x $R_{th(c)}$

Table 4. Static electrical characteristics (per diode)

Symbol	Test conditions			Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-	-	200	µA
		T_j = 125 °C		-	12	35	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 5 A	-	-	0.675	V
		T_j = 125 °C		-	0.51	0.57	
		T_j = 25 °C	I_F = 15 A	-	-	0.88	
		T_j = 125 °C		-	0.65	0.71	
		T_j = 25 °C	I_F = 30 A	-	-	1.08	
		T_j = 125 °C		-	0.755	0.84	

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

To evaluate the maximum conduction losses use the following equation :
$P = 0.58 \times I_{F(AV)} + 0.0087\ I_F^2{}_{(RMS)}$

Figure 2. Average forward power dissipation versus average forward current (per diode)

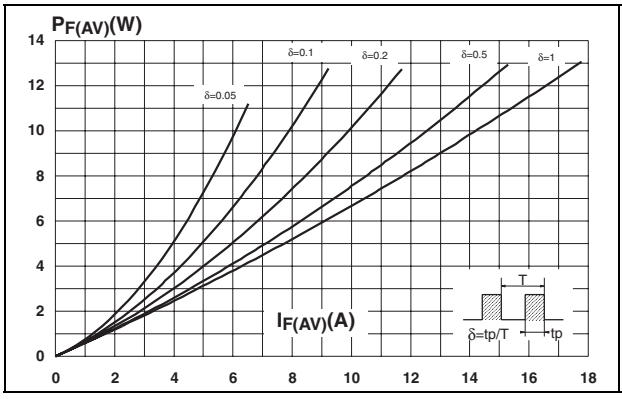


Figure 3. Average forward current versus ambient temperature (δ = 0.5, per diode)

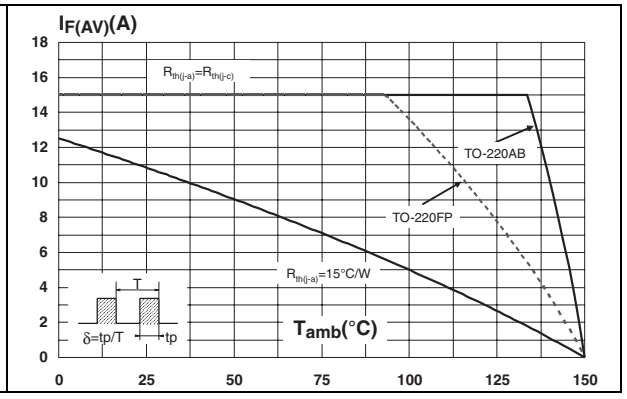


Figure 4. Normalized avalanche power derating versus pulse duration

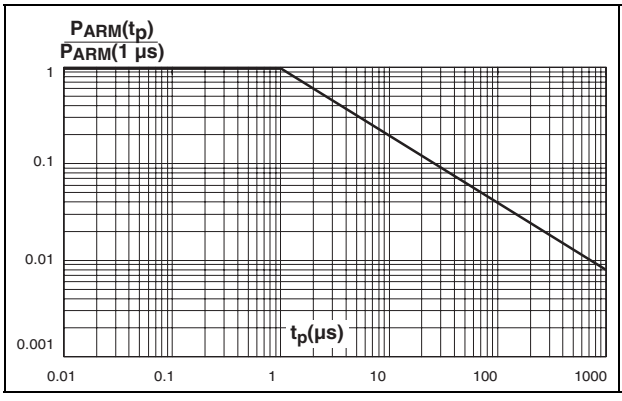
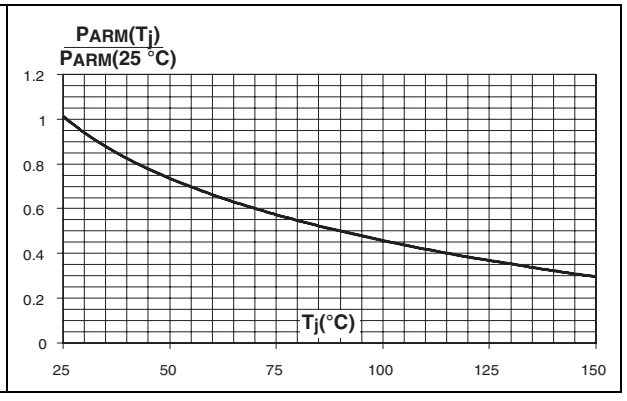


Figure 5. Normalized avalanche power derating versus junction temperature



3 Ordering information

Table 8. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS30L120CT	STPS30L120CT	TO-220AB	2.2 g	50	Tube
STPS30L120CFP	STPS30L120CFP	TO-220FPAB	2.0 g	50	Tube
STPS30L120CR	STPS30L120CR	I^2PAK	1.49 g	50	Tube