

Main product characteristics

$I_{F(AV)}$	30 A
V_{RRM}	100 V
T_j (max)	150° C
V_F (typ)	0.385 V

Features and Benefits

- Avalanche rated
- Low V_F
- Good trade off between leakage current and forward voltage drop
- High frequency operation
- Avalanche capability specified

Description

Single Schottky rectifier, suited for high frequency switch mode power supply.

Packaged in TO-220AB, this device is intended to be used in notebook and game station adaptors, providing in these applications a good efficiency at both low and high load.

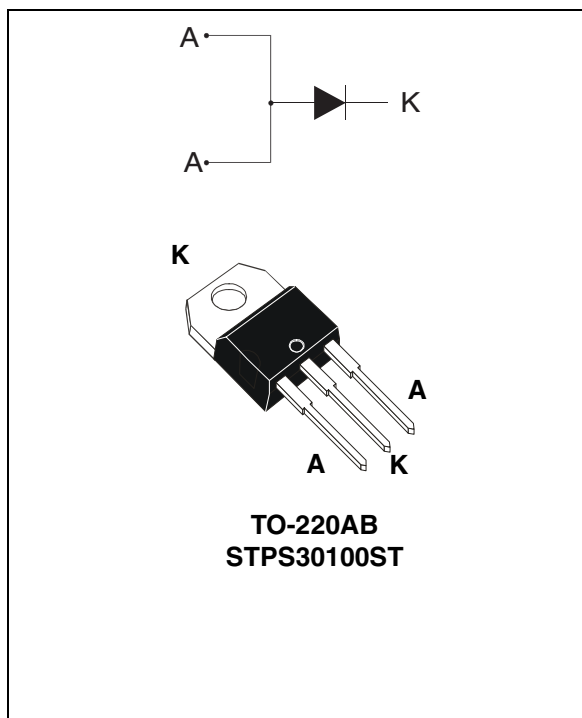


Table 1. Absolute Ratings (limiting values)

Symbol	Parameter	Value	Unit
V_{RRM}	Repetitive peak reverse voltage	100	V
$I_{F(RMS)}$	RMS forward current	60	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 125^\circ \text{C}$ 30	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms sinusoidal}$ 300	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1 \mu\text{s}$ $T_j = 25^\circ \text{C}$ 26400	W
T_{stg}	Storage temperature range	-65 to + 175	°C
T_j	Maximum operating junction temperature ⁽¹⁾	150	°C

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

1 Characteristics

Table 2. Thermal resistance

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

Table 3. Static electrical characteristics (per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ \text{C}$	$V_R = V_{RRM}$			175	μA
		$T_j = 125^\circ \text{C}$			20	50	mA
		$T_j = 25^\circ \text{C}$	$V_R = 70 \text{ V}$			60	μA
		$T_j = 125^\circ \text{C}$			10	20	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ \text{C}$	$I_F = 5 \text{ A}$		0.475		V
		$T_j = 125^\circ \text{C}$			0.385		
		$T_j = 25^\circ \text{C}$	$I_F = 10 \text{ A}$		0.555		
		$T_j = 125^\circ \text{C}$			0.475		
		$T_j = 25^\circ \text{C}$	$I_F = 15 \text{ A}$		0.620	0.660	
		$T_j = 125^\circ \text{C}$			0.525	0.565	
		$T_j = 25^\circ \text{C}$	$I_F = 30 \text{ A}$		0.740	0.800	
		$T_j = 125^\circ \text{C}$			0.605	0.655	

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

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

To evaluate the conduction losses use the following equation:

$$P = 0.475 \times I_{F(AV)} + 0.006 \times I_F^2_{(RMS)}$$

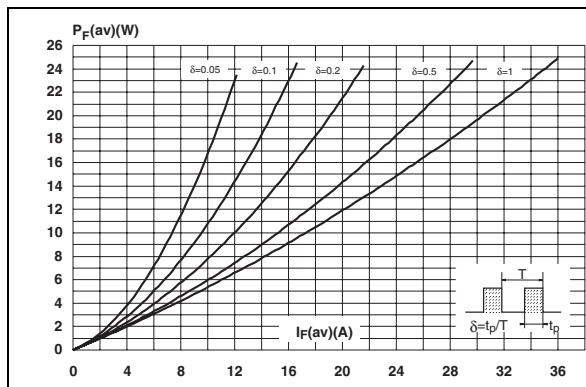
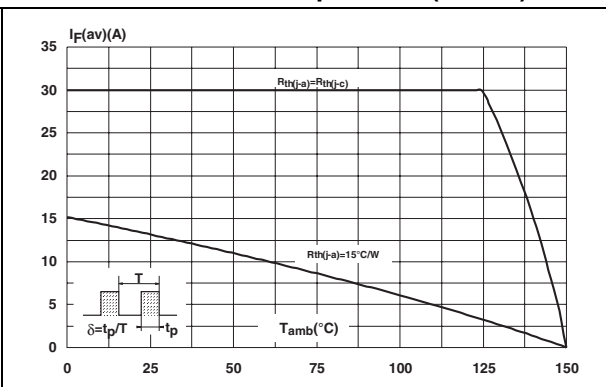
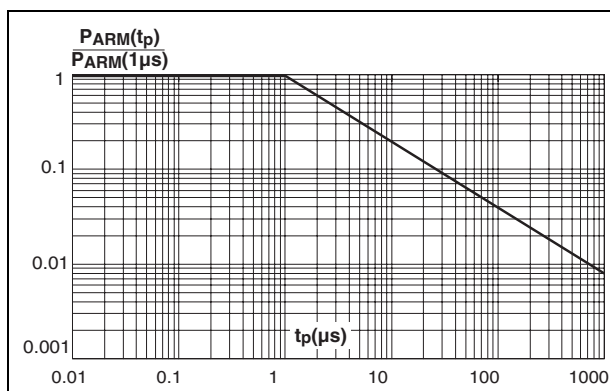
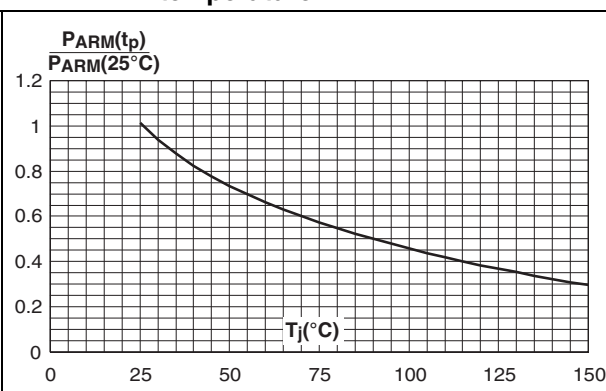
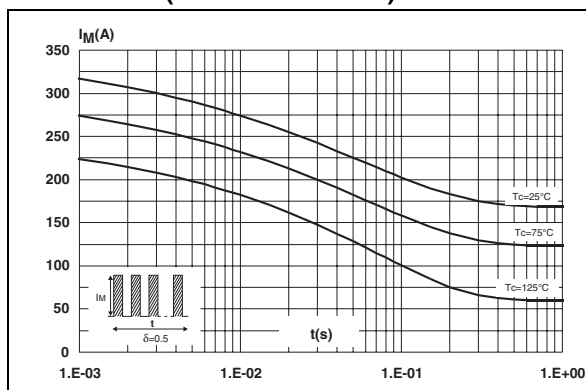
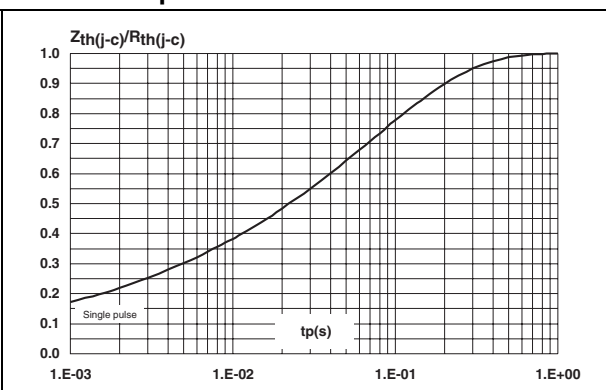
Figure 1. Conduction losses versus average current**Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)****Figure 3. Normalized avalanche power derating versus pulse duration****Figure 4. Normalized avalanche power derating versus junction temperature****Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)****Figure 6. Relative variation of thermal impedance junction to case versus pulse duration**

Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

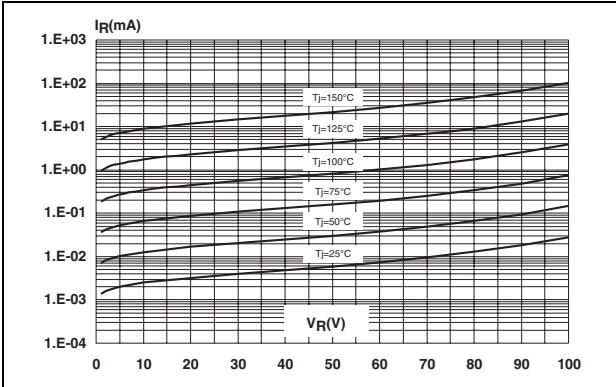


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

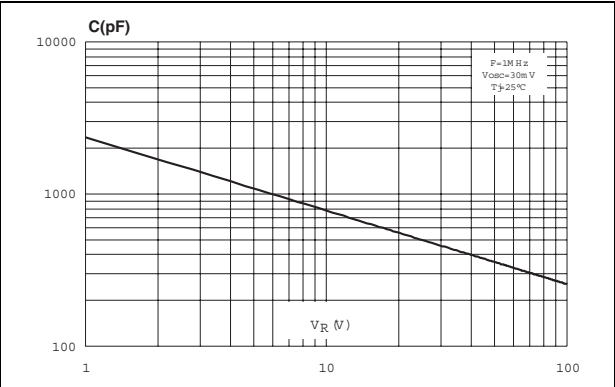


Figure 9. Forward voltage drop versus forward current (high level)

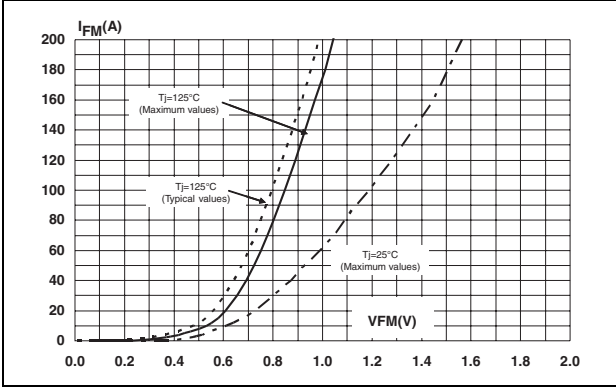
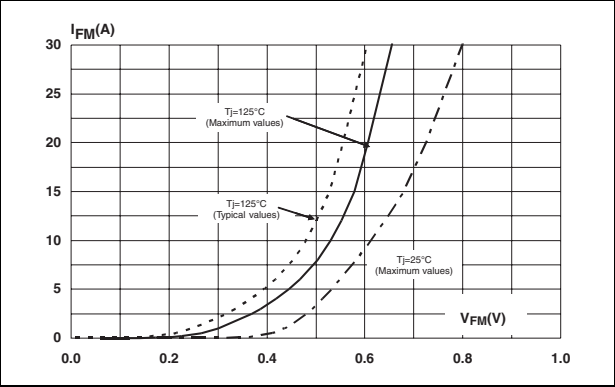


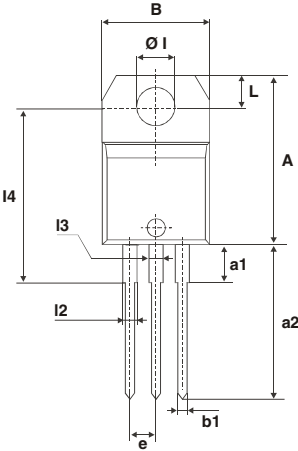
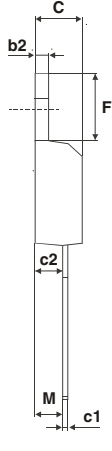
Figure 10. Forward voltage drop versus forward current (low level)



2 Package Information

Epoxy meets UL94,V0

Table 4. TO-220AB dimensions

	Ref.	Dimensions					
		Millimeters			Inches		
		Min.	Typ.	Max.	Min.	Typ.	Max.
	A	15.20		15.90	0.598		0.625
	a1		3.75			0.147	
	a2	13.00		14.00	0.511		0.551
	B	10.00		10.40	0.393		0.409
	b1	0.61		0.88	0.024		0.034
	b2	1.23		1.32	0.048		0.051
	C	4.40		4.60	0.173		0.181
	c1	0.49		0.70	0.019		0.027
	c2	2.40		2.72	0.094		0.107
	e	2.40		2.70	0.094		0.106
	F	6.20		6.60	0.244		0.259
	ØI	3.75		3.85	0.147		0.151
	I4	15.80	16.40	16.80	0.622	0.646	0.661
	L	2.65		2.95	0.104		0.116
	I2	1.14		1.70	0.044		0.066
	I3	1.14		1.70	0.044		0.066
	M		2.60			0.102	

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3 Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS30100ST	STPS30100ST	TO-220AB	2.23 g	50	Tube

4 Revision History

Date	Revision	Changes
24-Oct-2006	1	First issue

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