

POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

$I_{F(AV)}$	2 x 30 A
V_{RRM}	150 V
T_j	175°C
$V_F(max)$	0.76 V

FEATURES AND BENEFITS

- High junction temperature capability
- Low leakage current
- Low thermal resistance
- High frequency operation
- Avalanche specification

DESCRIPTION

Dual center tab Schottky rectifier suited for High Frequency server and telecom base station SMPS. Packaged in TO-220AB, this device combines high current rating and low volume to enhance both reliability and power density of the application.

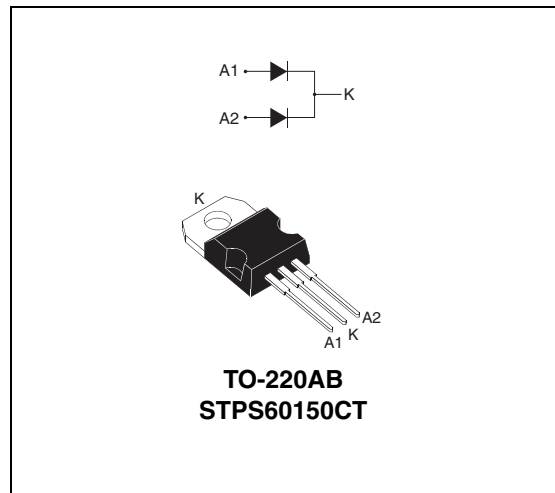


Table 2: Order Codes

Part Number	Marking
STPS60150CT	STPS60150CT

Table 3: Absolute Ratings (limiting values, per diode)

Symbol	Parameter		Value	Unit	
V_{RRM}	Repetitive peak reverse voltage		150	V	
$I_{F(RMS)}$	RMS forward current		60	A	
$I_{F(AV)}$	Average forward current	$T_c = 150^\circ\text{C}$	Per diode	30	A
		$\delta = 0.5$	Per device	60	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ms}$ sinusoidal	270	A	
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s}$ $T_j = 25^\circ\text{C}$	17300	W	
T_{stg}	Storage temperature range		-65 to + 175	°C	
T_j	Maximum operating junction temperature *		175	°C	
dV/dt	Critical rate of rise of reverse voltage		10000	V/ μs	

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

STPS60150C

Table 4: Thermal Parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.0	°C/W
		Total	0.7	
$R_{th(c)}$	Coupling		0.4	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_{j(\text{diode } 1)} = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$$

Table 5: Static Electrical Characteristics (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		3	15	μA
		$T_j = 125^\circ\text{C}$			3	10	mA
V_F^{**}	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 30\text{A}$			0.94	V
		$T_j = 125^\circ\text{C}$	$I_F = 30\text{A}$		0.72	0.76	
		$T_j = 25^\circ\text{C}$	$I_F = 60\text{A}$		0.97	1.05	
		$T_j = 125^\circ\text{C}$	$I_F = 60\text{A}$		0.86	0.92	

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

** $t_p = 380 \mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation: $P = 0.6 \times I_{F(AV)} + 0.0053 I_F^2(\text{RMS})$

Figure 1: Average forward power dissipation versus average forward current (per diode)

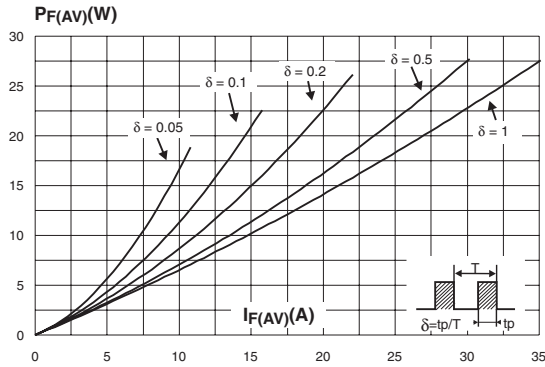


Figure 2: Average forward current versus ambient temperature ($\delta = 0.5$, per diode)

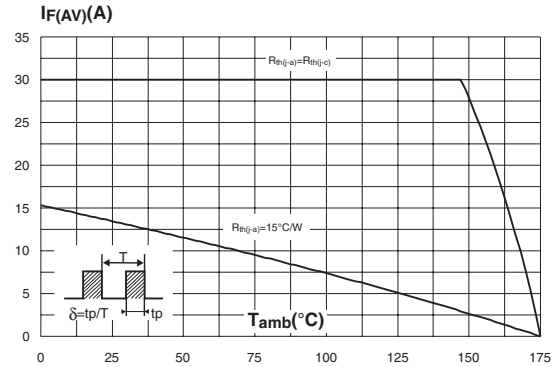


Figure 3: Normalized avalanche power derating versus pulse duration

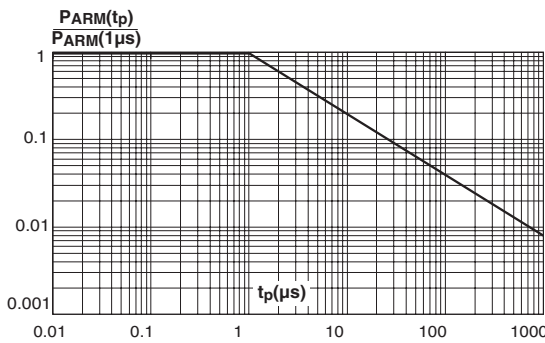


Figure 4: Normalized avalanche power derating versus junction temperature

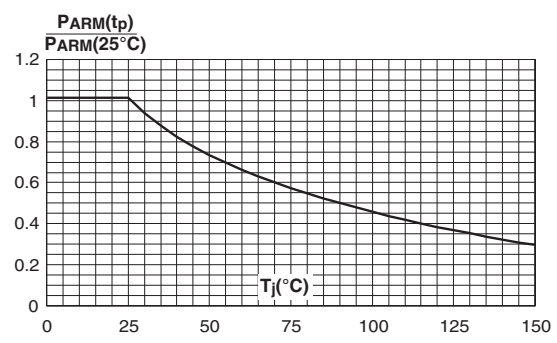


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

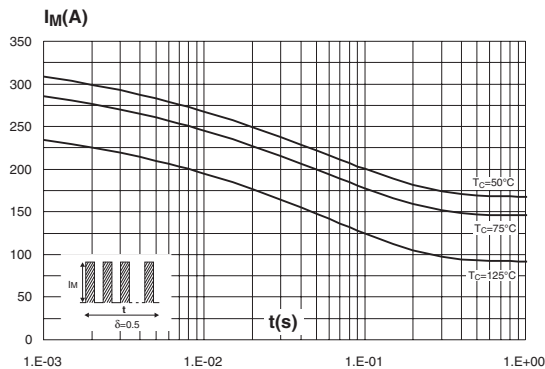


Figure 6: Relative variation of thermal impedance to case versus pulse duration (per diode)

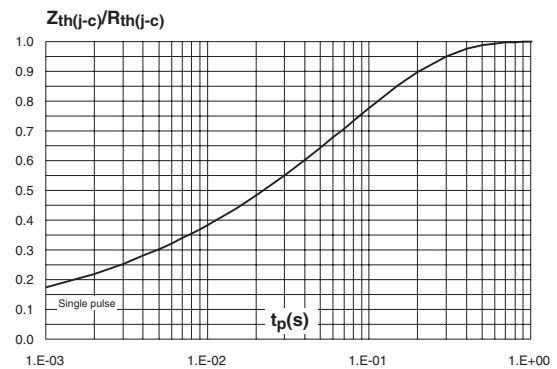


Figure 7: Reverse leakage current versus reverse voltage applied (typical values, per diode)

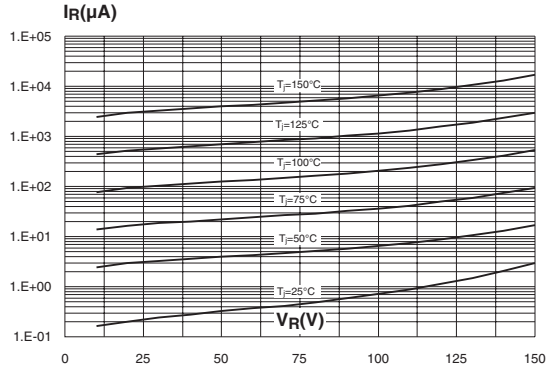


Figure 8: Junction capacitance versus reverse voltage applied (typical values, per diode)

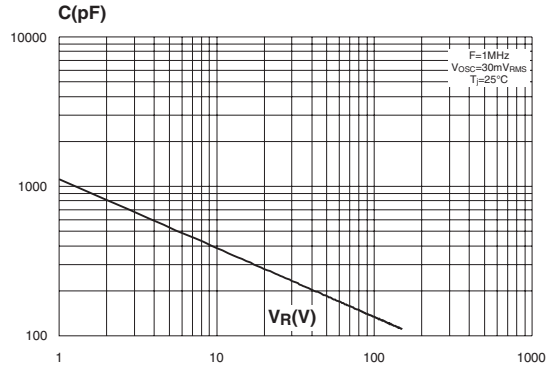


Figure 9: Forward voltage drop versus forward current (per diode)

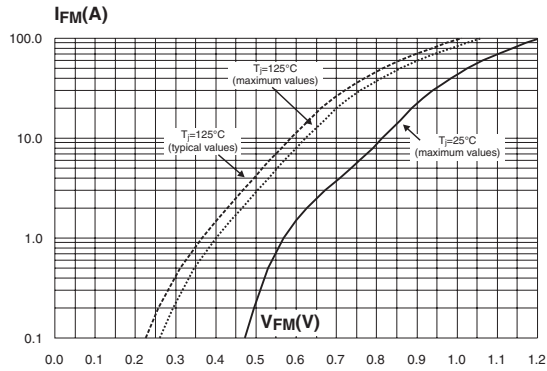


Figure 10: TO-220AB Package Mechanical Data

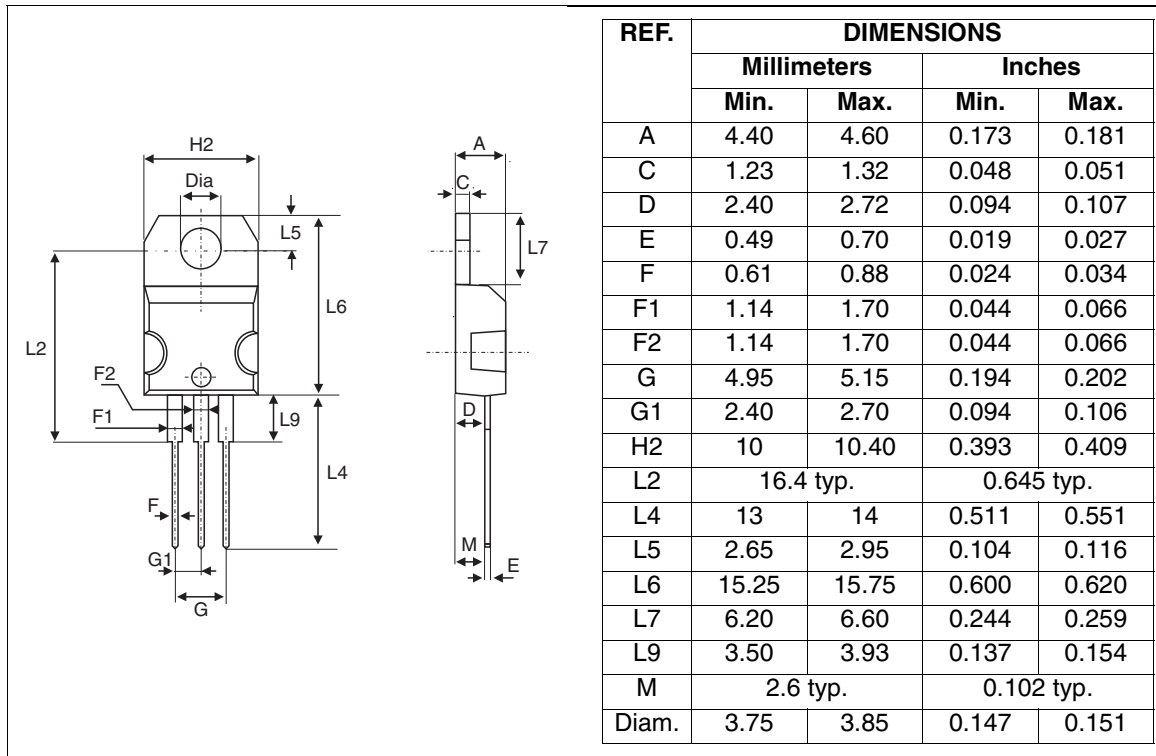


Table 6: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS60150CT	STPS60150CT	TO-220AB	2.20 g	50	Tube

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1.0 m.N.

Table 7: Revision History

Date	Revision	Description of Changes
19-Oct-2004	1	First issue.

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