

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

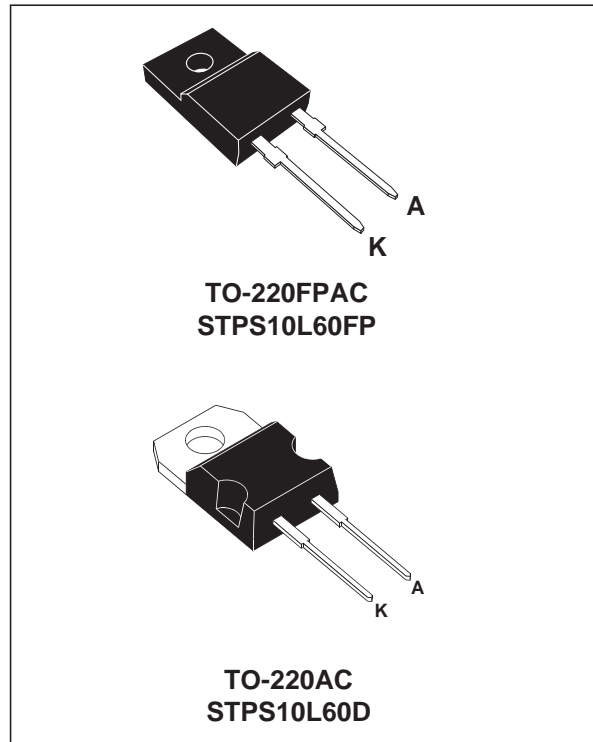
$I_{F(AV)}$	10 A
V_{RRM}	60 V
$T_j(\text{max})$	150°C
$V_F(\text{max})$	0.56 V

FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP
- NEGLIGIBLE SWITCHING LOSSES
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Schottky rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters. Packaged in TO-220AC, TO-220FPAC this device is intended for use in DC/DC chargers.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit	
V_{RRM}	Repetitive peak reverse voltage		60	V	
$I_{F(RMS)}$	RMS forward current		30	A	
$I_{F(AV)}$	Average forward current	TO-220AC	$T_c = 140^\circ\text{C} \quad \delta = 0.5$	10	A
		TO-220FPAC	$T_c = 120^\circ\text{C} \quad \delta = 0.5$		
I_{FSM}	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ Sinusoidal	220	A
I_{RRM}	Repetitive peak reverse current		$t_p = 2 \mu\text{s}$ square $F=1\text{kHz}$	1	A
P_{ARM}	Repetitive peak avalanche power		$t_p = 1 \mu\text{s} \quad T_j = 25^\circ\text{C}$	5800	W
T_{stg}	Storage temperature range		- 65 to + 175		°C
T_j	Maximum operating junction temperature *		150		°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

STPS10L60D/FP

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC	1.6
		TO-220FPAC	4

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions	Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		350	μA
		$T_j = 125^\circ\text{C}$		65	95	mA
V_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$		0.6	V
		$T_j = 125^\circ\text{C}$	$I_F = 10\text{ A}$	0.48	0.56	
		$T_j = 25^\circ\text{C}$	$I_F = 20\text{ A}$		0.74	
		$T_j = 125^\circ\text{C}$	$I_F = 20\text{ A}$	0.62	0.7	

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

To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.014 I_{F(RMS)}^2$$

Fig. 1: Average forward power dissipation versus average forward current.

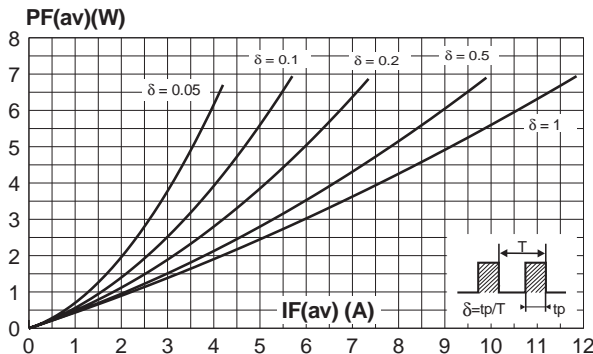


Fig. 3: Normalized avalanche power derating versus pulse duration.

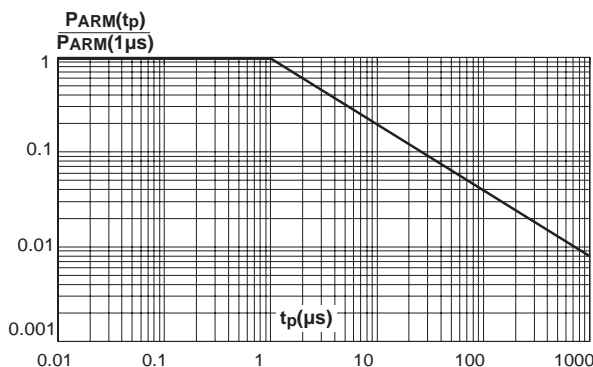


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

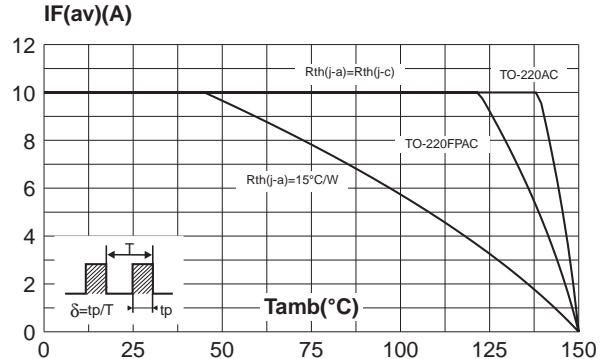


Fig. 4: Normalized avalanche power derating versus junction temperature.

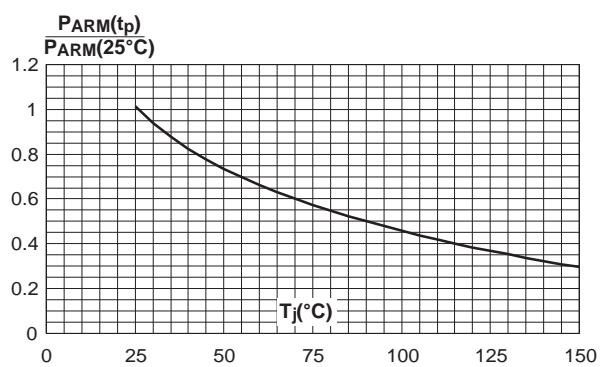


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AC).

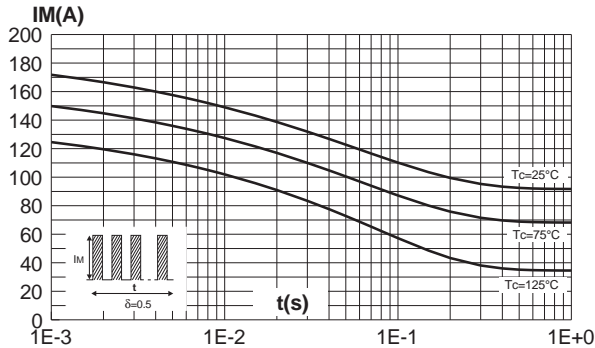


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220FPAC).

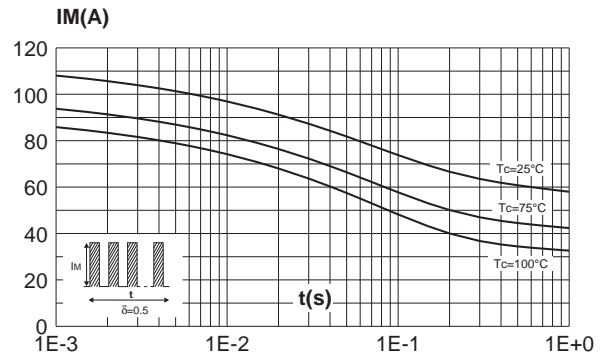


Fig. 6-1: Relative variation of thermal impedance junction to lead versus pulse duration (TO-220AC).

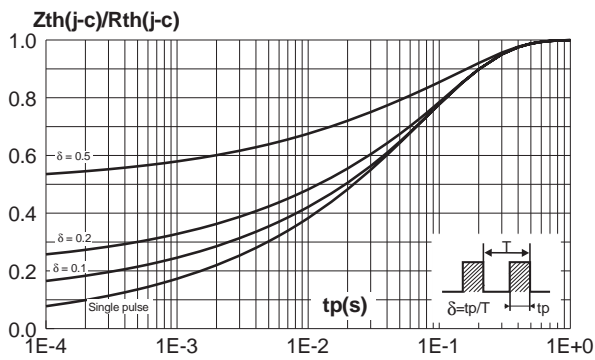


Fig. 6-2: Relative variation of thermal impedance junction to lead versus pulse duration (TO-220FPAC).

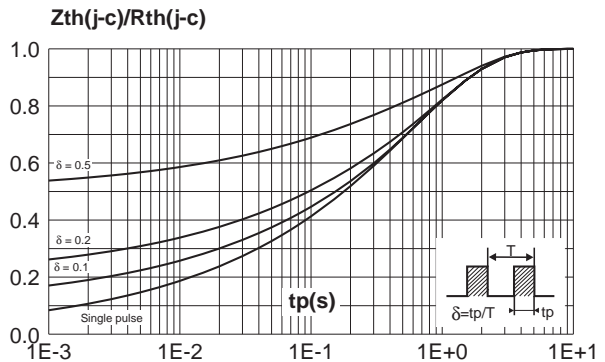


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

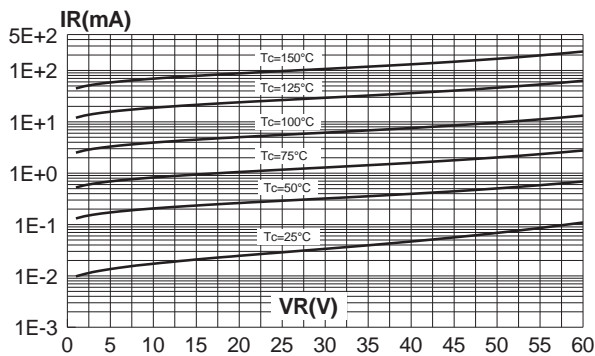


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

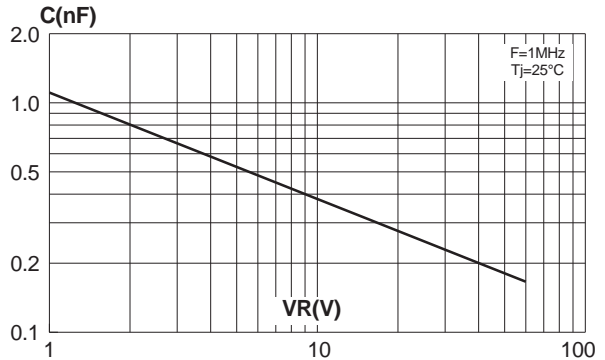
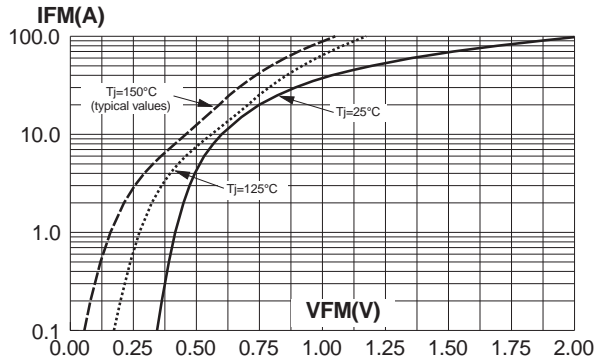
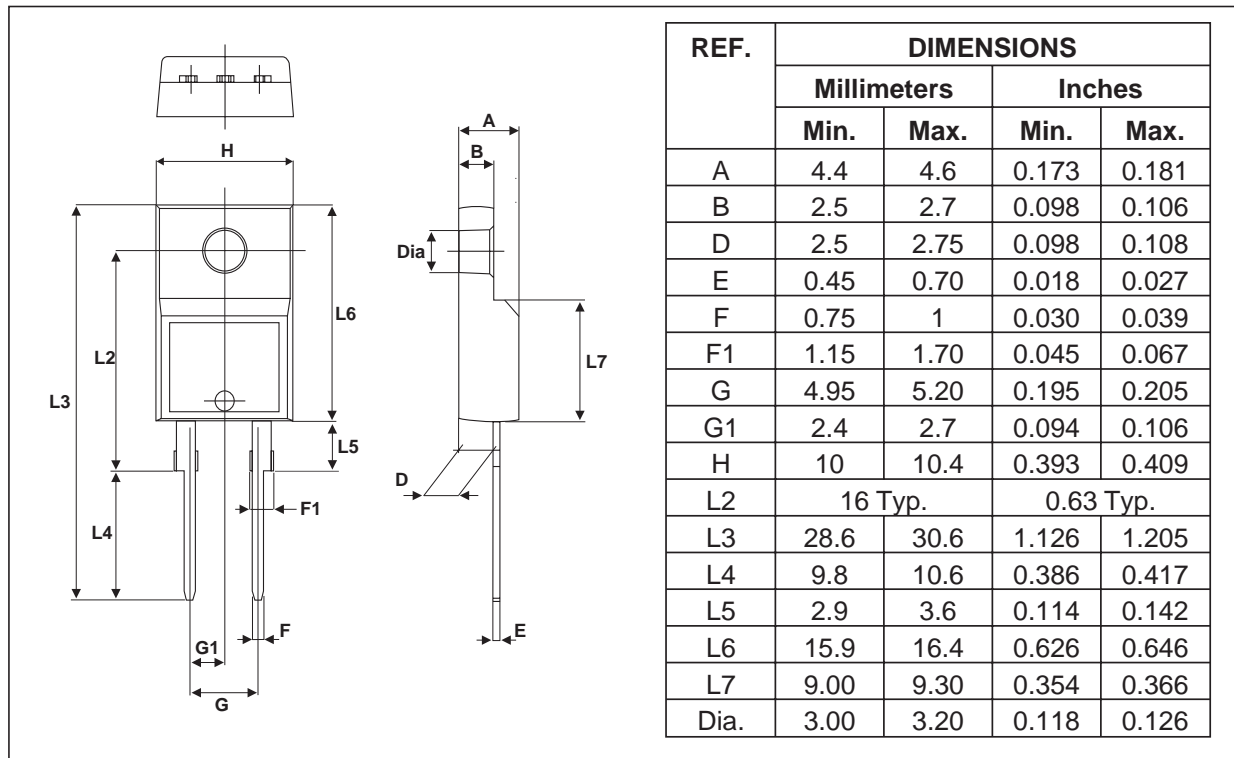


Fig. 9: Forward voltage drop versus forward current (low level, maximum values).

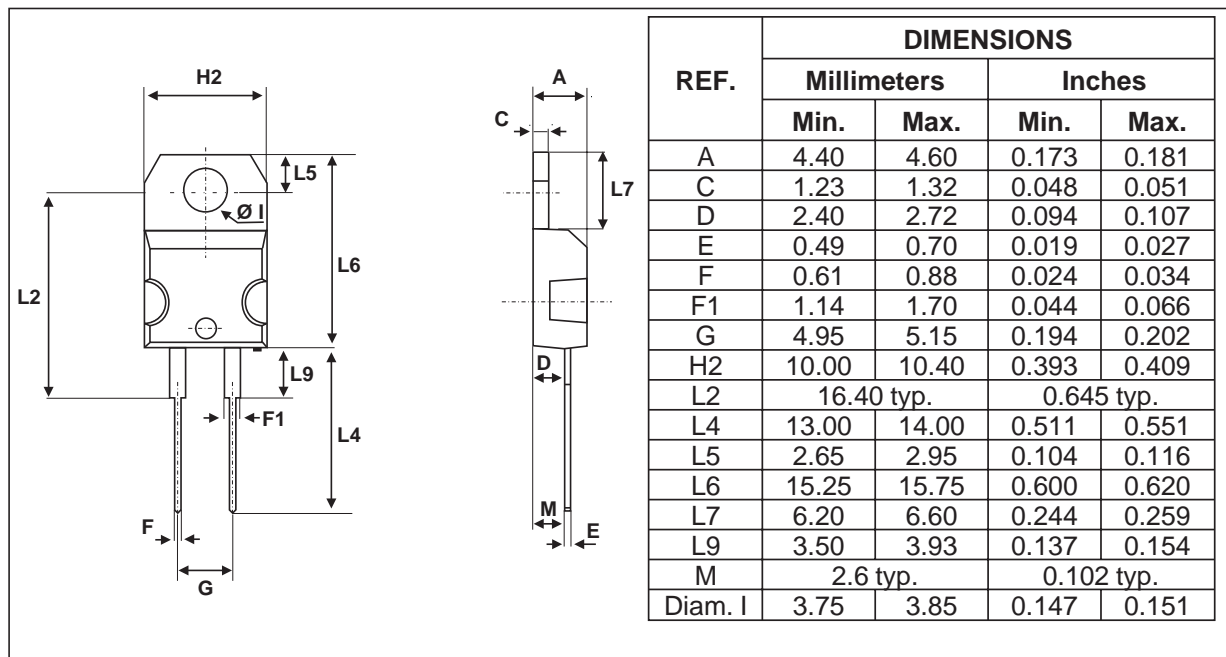


PACKAGE MECHANICAL DATA
TO-220FPAC



STPS10L60D/FP

PACKAGE MECHANICAL DATA TO-220AC



- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.8M.N
- MAXIMUM TORQUE VALUE : 1.0M.N

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS10L60D	STPS10L60D	TO-220AC	1.86g	50	Tube
STPS10L60FP	STPS10L60FP	TO-220FPAC	1.9g	50	Tube

- EPOXY MEETS UL94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics
 © 2003 STMicroelectronics - Printed in Italy - All rights reserved.
 STMicroelectronics GROUP OF COMPANIES
 Australia - Brazil - Canada - China - Finland - France - Germany
 Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore
 Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>

