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STPS60H100C

Power Schottky rectifier

Main product characteristics

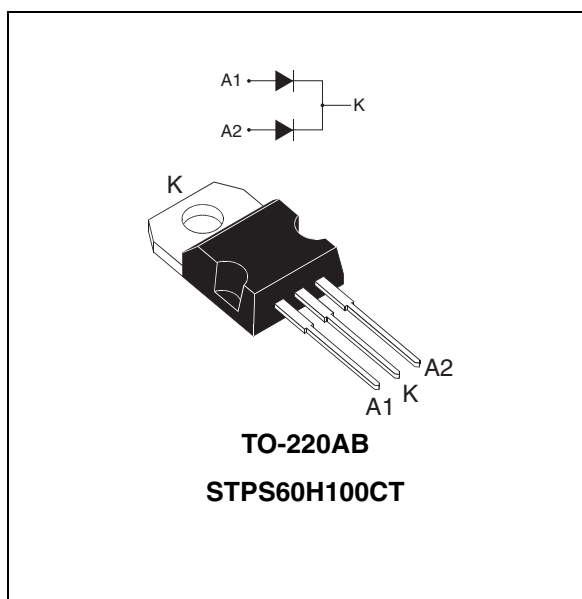
$I_{F(AV)}$	2 x 30 A
V_{RRM}	100 V
T_j	175° C
$V_{F(max)}$	0.72 V

Feature 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.



Order code

Part Number	Marking
STPS60H100CT	STPS60H100CT

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	$T_c = 150^\circ\text{C}$ $\delta = 0.5$	Per diode 30 Per device 60	A
I_{FSM}	Surge non repetitive forward current		$t_p = 10\text{ ms}$ Sinusoidal	300 A
P_{ARM}	Repetitive peak avalanche power		$t_p = 1\ \mu\text{s}$ $T_j = 25^\circ\text{C}$	18100 W
T_{stg}	Storage temperature range		-65 to + 175	° C
T_j	Maximum operating junction temperature ⁽¹⁾		175	° C
dV/dt	Critical rate of rise of reverse voltage		10000	V/μs

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 resistances

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 3. Static electrical characteristics (per diode)

Symbol	Test conditions			Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ \text{C}$	$V_R = V_{RRM}$		2	10	μA
		$T_j = 125^\circ \text{C}$			3	10	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ \text{C}$	$I_F = 30 \text{ A}$			0.84	V
		$T_j = 125^\circ \text{C}$	$I_F = 30 \text{ A}$		0.67	0.72	
		$T_j = 25^\circ \text{C}$	$I_F = 60 \text{ A}$		0.92	0.98	
		$T_j = 125^\circ \text{C}$	$I_F = 60 \text{ A}$		0.8	0.84	

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

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

To evaluate the maximum conduction losses use the following equation :

$$P = 0.6 \times I_{F(AV)} + 0.004 I_{F(RMS)}^2$$

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

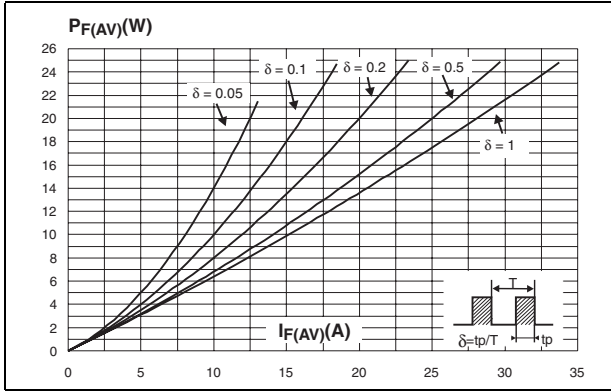


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$, per diode)

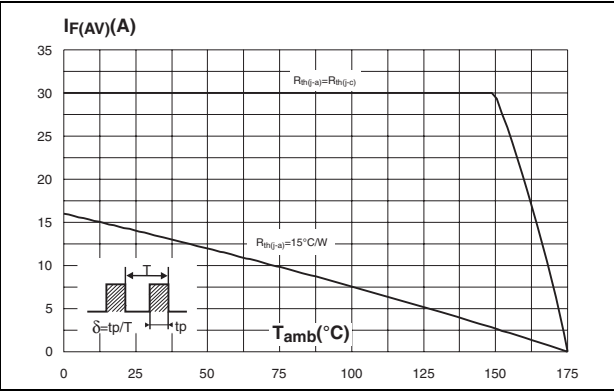


Figure 3. Normalized avalanche power derating versus pulse duration

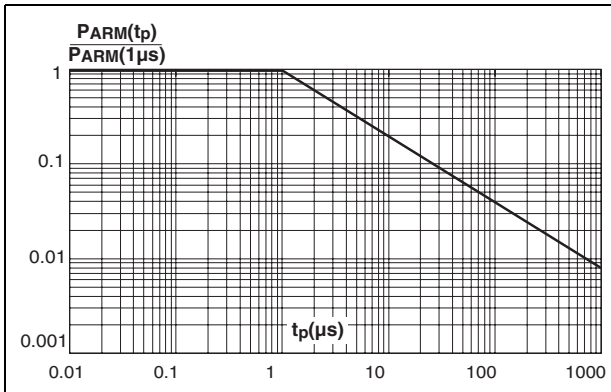


Figure 4. Normalized avalanche power derating versus junction temperature

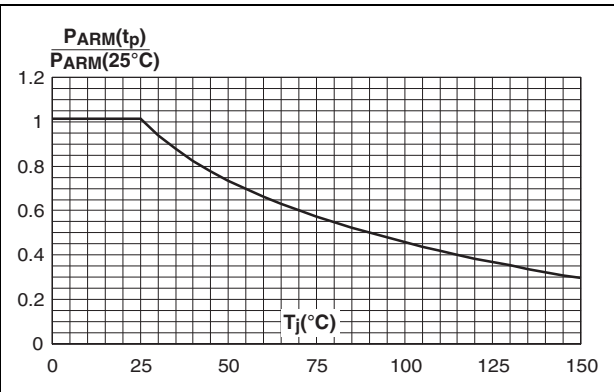


Figure 5. Non repetitive surge peak forward current versus overload duration

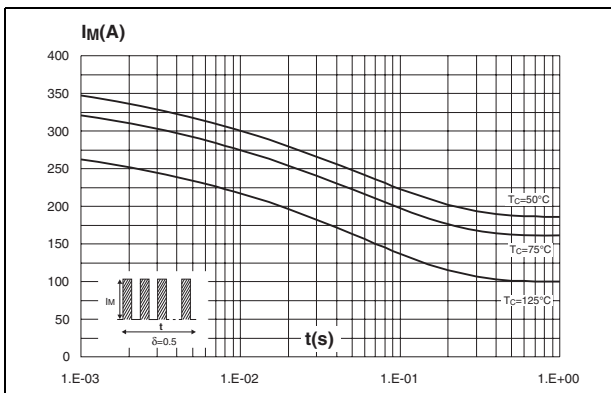
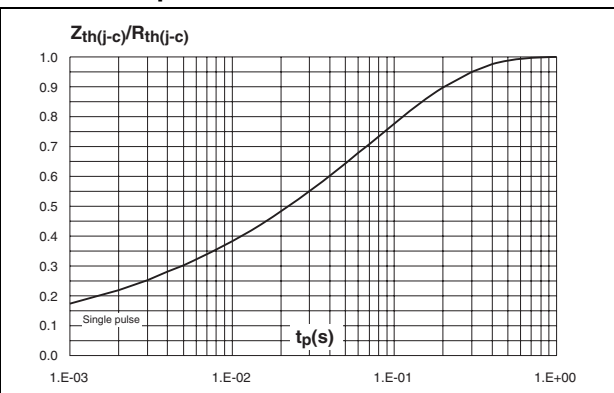


Figure 6. Relative variation of thermal impedance junction to case versus pulse



Characteristics

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

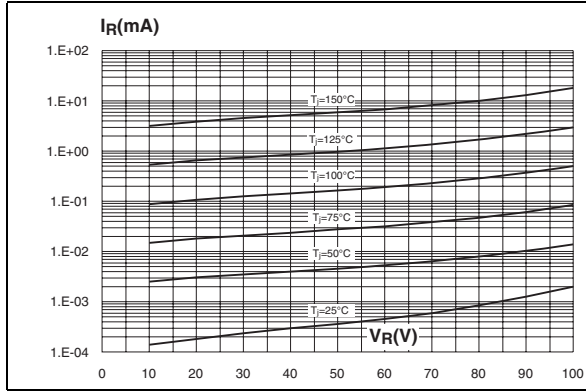


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

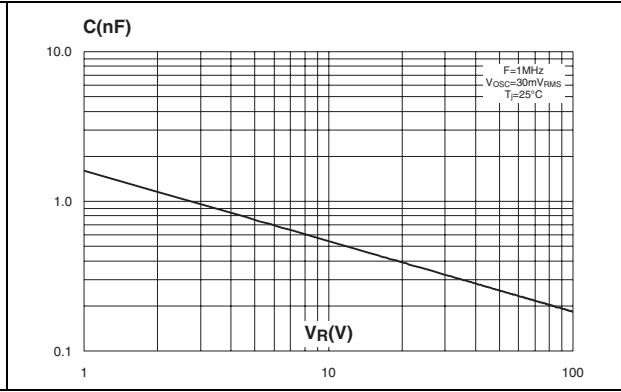
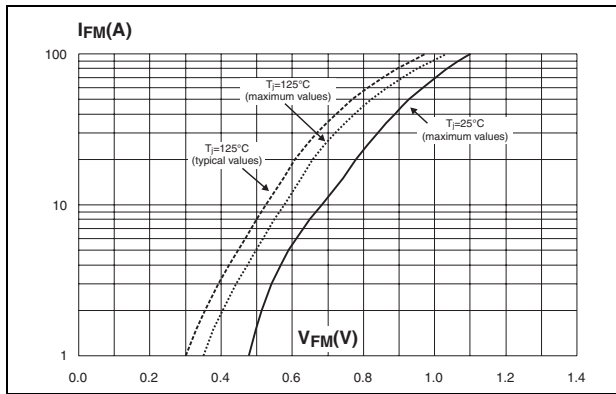


Figure 9. Forward voltage drop versus forward current



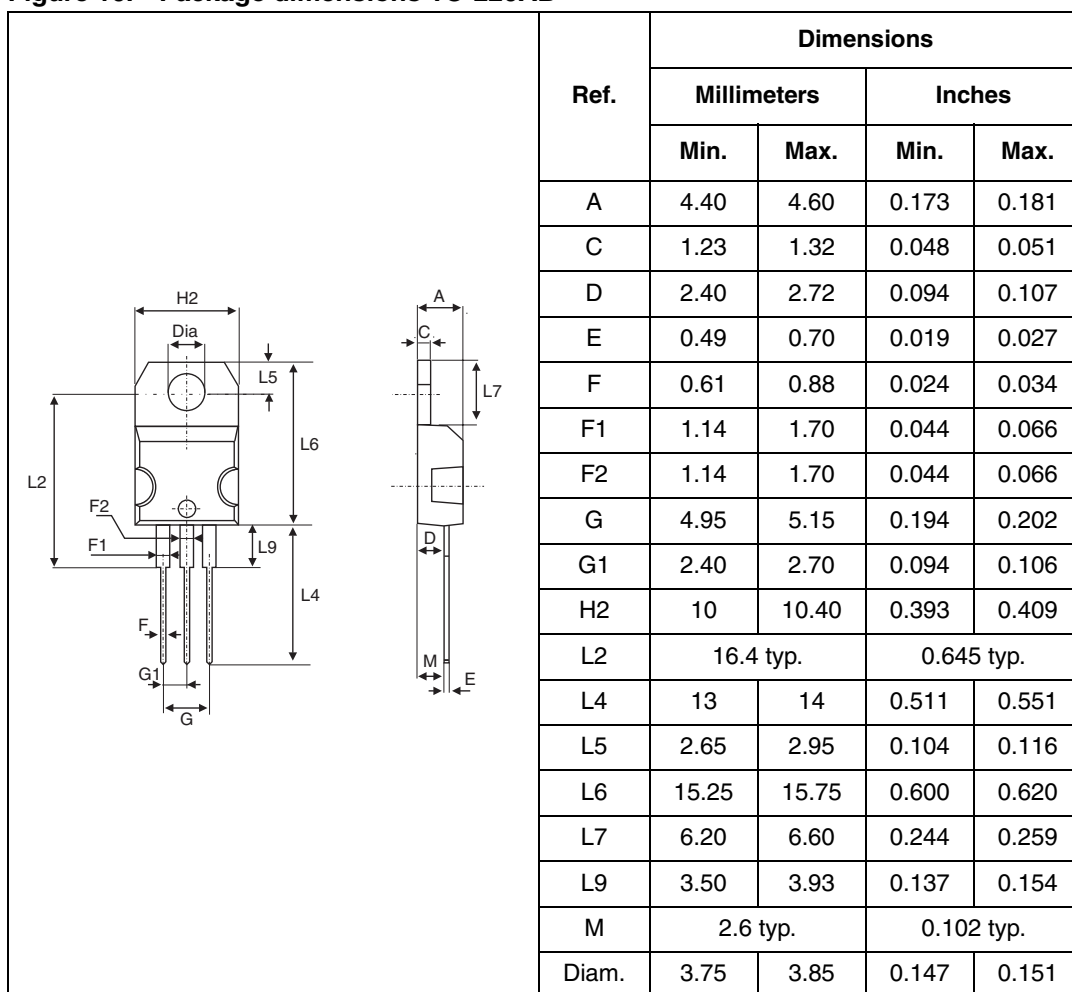
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Package information

2 Package information

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

Figure 10. Package dimensions TO-220AB



In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

Ordering information**STPS60H100C**

3 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS60H100CT	STPS60H100CT	TO-220AB	2.20 g	50	Tube

4 Revision history

Date	Revision	Description of Changes
02-Aug-2004	1	First issue
07-Feb-2007	2	Reformatted to current standards. Added ECOPACK statement on page 5. Corrected typographical errors on pages 1 and 3

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