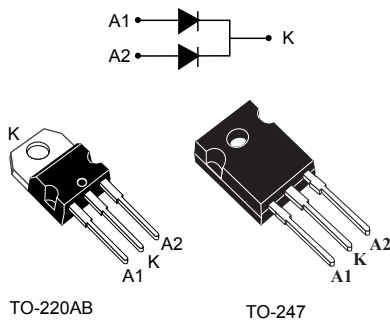


## 100 V power Schottky rectifier



### Features

- Negligible switching losses
- Low leakage current
- Good trade off between leakage current and forward voltage drop
- Avalanche rated
- ECOPACK<sup>®</sup>2 compliant

### Applications

- Switching diode
- SMPS
- DC/DC converter
- LED lighting

### Description

This dual Schottky rectifier is designed for high frequency miniature switch mode power supplies such as adaptors and on-board DC-DC converters.

Packaged in TO-200AB and TO-247, this **STPS30H100C** is optimized for use in high frequency inverters.

Product status link	
<a href="#">STPS30H100C</a>	
Product summary	
<b>I<sub>F(AV)</sub></b>	2 x 15 A
<b>V<sub>RRM</sub></b>	100 V
<b>T<sub>j</sub> (max)</b>	175 °C
<b>V<sub>F</sub> (typ)</b>	0.64 V

# 1 Characteristics

**Table 1. Absolute Ratings (limiting values at 25 °C, unless otherwise specified)**

Symbol	Parameter		Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage		100	V
I <sub>F(RMS)</sub>	Forward rms current		30	A
I <sub>F(AV)</sub>	Average forward current, δ = 0.5	T <sub>C</sub> = 155 °C Per diode	15	A
		T <sub>C</sub> = 150 °C Per device	30	
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal	250	A
P <sub>ARM</sub>	Repetitive peak avalanche power	t <sub>p</sub> = 10 μs, T <sub>j</sub> = 125 °C	778	W
T <sub>stg</sub>	Storage temperature range		-65 to +175	°C
T <sub>j</sub>	Maximum operating junction temperature <sup>(1)</sup>		+175	°C

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

**Table 2. Thermal resistance parameter**

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	1.6	°C/W
		Total	0.9	
R <sub>th(c)</sub>	Coupling		0.10	°C/W

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	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		5	$\mu\text{A}$
		$T_j = 125\text{ °C}$		-	2	6	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 15\text{ A}$	-		0.80	V
		$T_j = 125\text{ °C}$		-	0.64	0.67	
		$T_j = 25\text{ °C}$	$I_F = 30\text{ A}$	-		0.93	
		$T_j = 125\text{ °C}$		-	0.74	0.80	

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

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

To evaluate the conduction losses use the following equation:

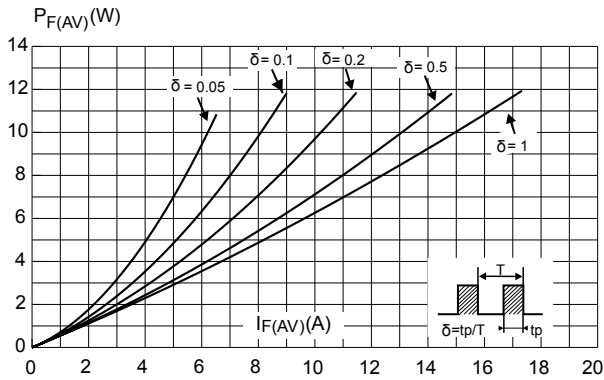
$$P = 0.54 \times I_{F(AV)} + 0.0086 I_{F(RMS)}^2$$

For more information, please refer to the following application notes related to the power losses :

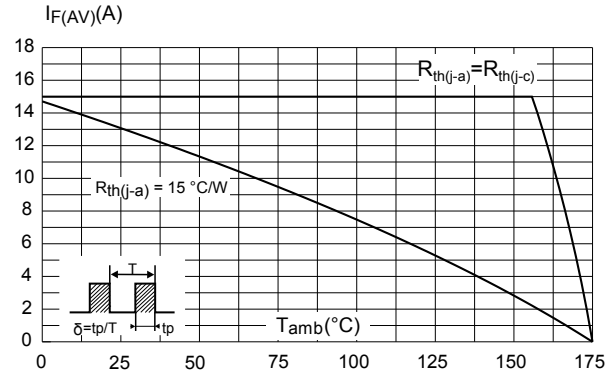
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

## 1.2 Characteristics (curves)

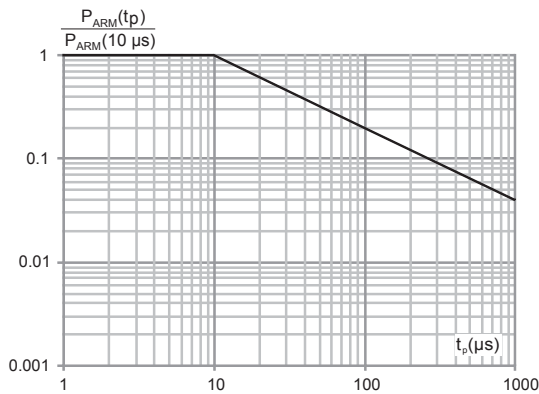
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



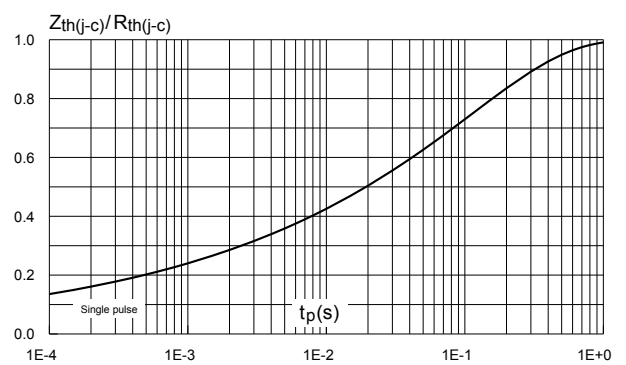
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode)**



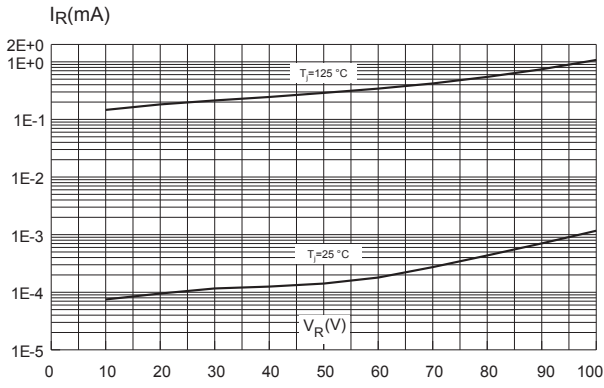
**Figure 3. Normalized avalanche power derating versus pulse duration ( $T_j = 125 \text{ }^\circ\text{C}$ )**



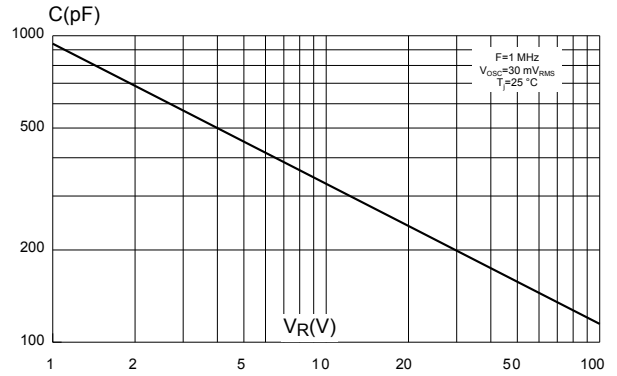
**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**



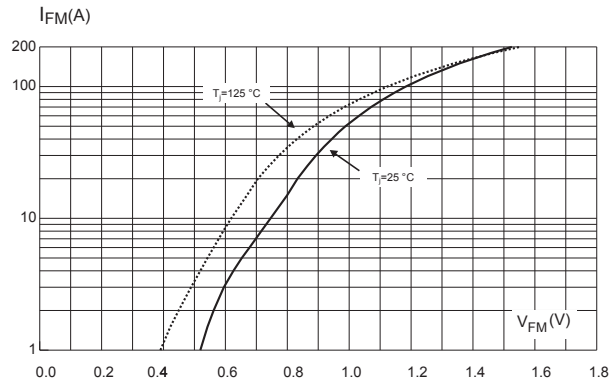
**Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



**Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)**



**Figure 7. Forward voltage drop versus forward current (maximum values, per diode)**



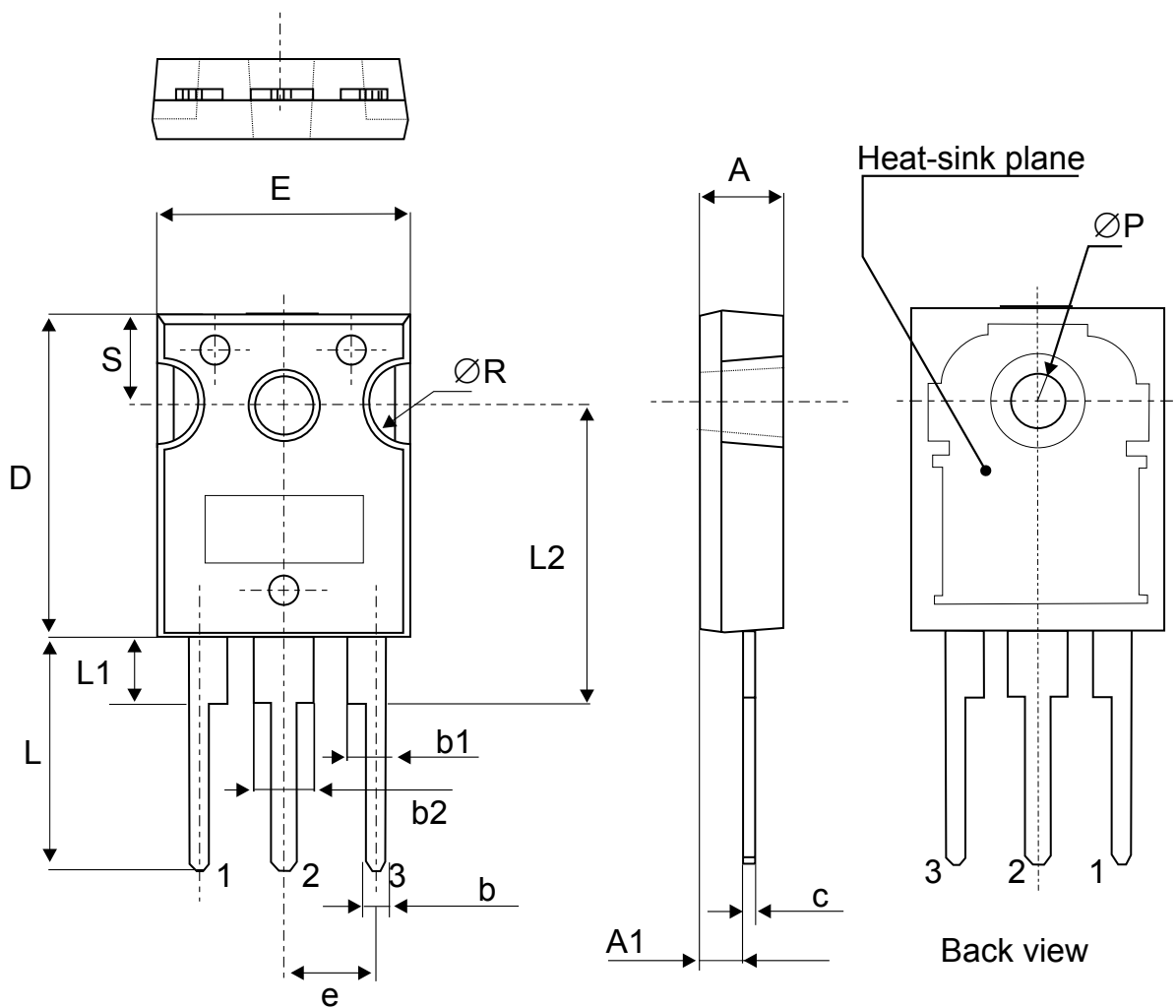
## 2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

### 2.1 TO-247 package information

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

Figure 8. TO-247 package outline



**Table 4. TO-247 package mechanical data**

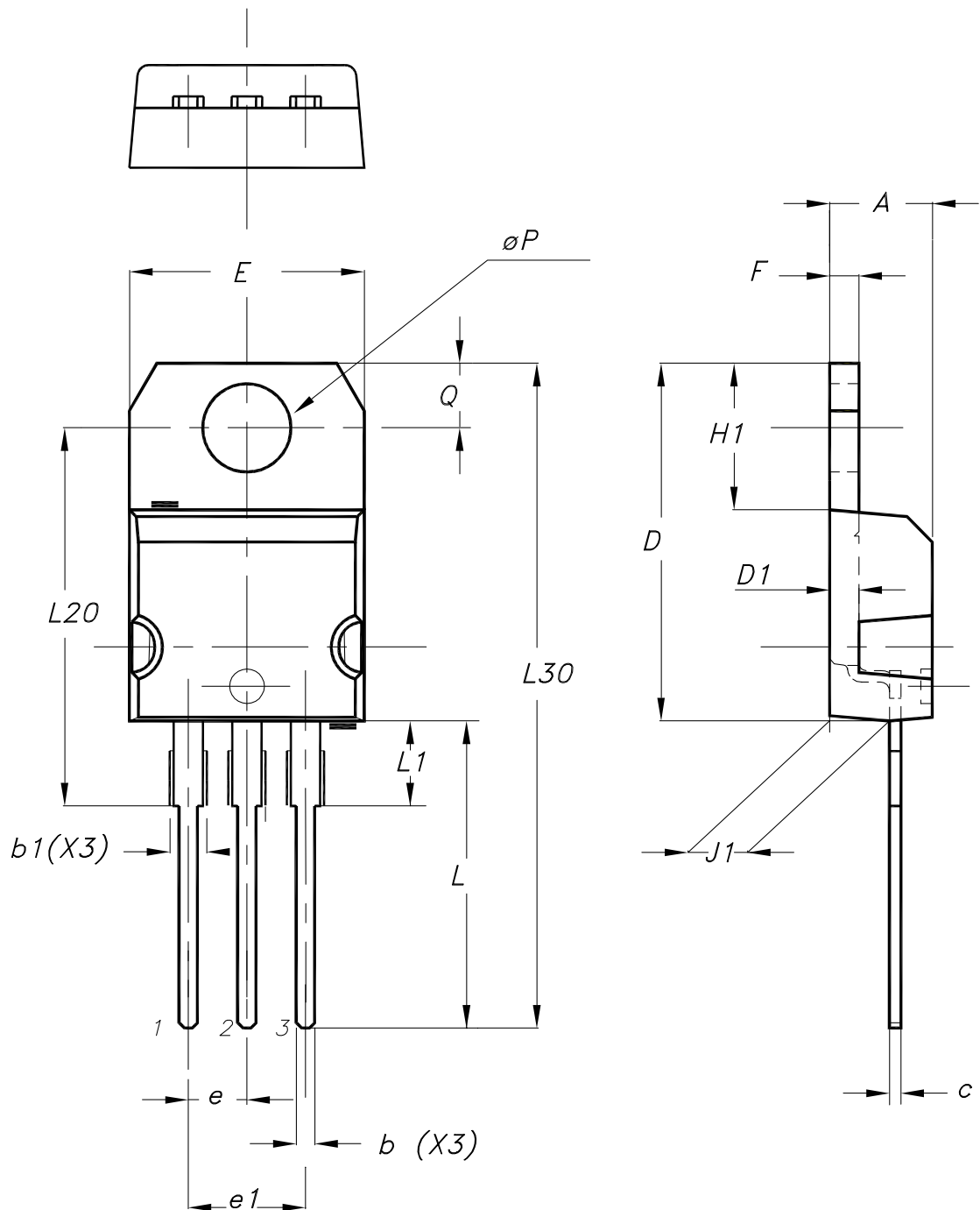
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
A1	2.20		2.60	0.086		0.102
b	1.00		1.40	0.039		0.055
b1	2.00		2.40	0.078		0.094
b2	3.00		3.40	0.118		0.133
c	0.40		0.80	0.015		0.031
D	19.85		20.15	0.781		0.793
E	15.45		15.75	0.608		0.620
e	5.30	5.45	5.60	0.209	0.215	0.220
L	14.20		14.80	0.559		0.582
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
ØP	3.55		3.65	0.139		0.143
ØR	4.50		5.50	0.177		0.217
S	5.30	5.50	5.70	0.209	0.216	0.224

1. Inches dimensions given for reference only

## 2.2 TO-220AB package information

- Cooling method: by conduction (C)
- Epoxy meets UL 94,V0
- Recommended torque value: 0.55 N·m
- Maximum torque value: 0.70 N·m

Figure 9. TO-220AB package outline





**Table 5. TO-220AB package mechanical data**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
b	0.61	0.88	0.240	0.035
b1	1.14	1.55	0.045	0.061
c	0.48	0.70	0.019	0.028
D	15.25	15.75	0.600	0.620
D1	1.27 typ.		0.050 typ.	
E	10.00	10.40	0.394	0.409
e	2.40	2.70	0.094	0.106
e1	4.95	5.15	0.195	0.203
F	1.23	1.32	0.048	0.052
H1	6.20	6.60	0.244	0.260
J1	2.40	2.72	0.094	0.107
L	13.00	14.00	0.512	0.551
L1	3.50	3.93	0.138	0.155
L20	16.40 typ.		0.646 typ.	
L30	28.90 typ.		1.138 typ.	
θP	3.75	3.85	0.148	0.152
Q	2.65	2.95	0.104	0.116

### 3 Ordering information

**Table 6. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS30H100CT	STPS30H100CT	TO-220AB	1.95 g	50	Tube
STPS30H100CW	STPS30H100CW	TO-247	4.36 g	30	Tube

## Revision history

**Table 7. Document revision history**

Date	Revision	Changes
Jul-2003	5E	Previous release
30-Mar-2011	6	Added I <sup>2</sup> PAK package.
15-Sep-2011	7	Added TO-220AB narrow leads package. Updated Table 5.
21-Jun-2012	8	Added minimum value for T <sub>j</sub> in Table 2.
01-Jun-2018	9	Updated P <sub>ARM</sub> value and removed "Normalized avalanche power derating" curves. Removed I <sup>2</sup> PAK package information.

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