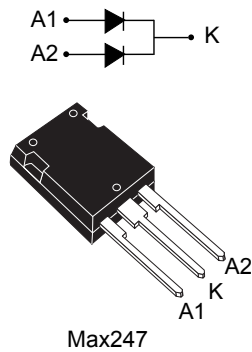


## 100 V power Schottky rectifier



### Features

- High reverse voltage
- Negligible switching losses
- Low forward voltage drop
- Low leakage current
- High temperature
- Low thermal resistance
- Avalanche capability specified
- ECOPACK<sup>®</sup>2 compliant

### Applications

- Switching diode
- SMPS
- DC/DC converter
- LED lighting
- Desktop power supply

### Description

This dual diode common cathode Schottky rectifier is suited for switched mode power supplies and high frequency DC to DC converters.

Packaged in Max247, the **STPS80H100C** is optimized for use in high frequency computer and telecom converters.

Product status	
STPS80H100C	
Product summary	
$I_{F(AV)}$	2 x 40 A
$V_{RRM}$	100 V
$T_{j(max.)}$	175 °C
$V_{F(typ.)}$	0.65 V

# 1 Characteristics

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

Symbol	Parameter	Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage	100	V	
$I_{F(RMS)}$	Forward rms current	50	A	
$I_{F(AV)}$	Average forward current, $\delta = 0.5$ , square wave	$T_C = 150\text{ °C}$ Per diode	40	A
		$T_C = 140\text{ °C}$ Per device	80	
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	400	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 10\text{ }\mu\text{s}$ , $T_j = 125\text{ °C}$	2822	W
$T_{stg}$	Storage temperature range	-65 to +175	°C	
$T_j$	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 parameters**

Symbol	Parameter	Max. value	Unit	
$R_{th(j-c)}$	Junction to case	Per diode	0.7	°C/W
		Total	0.5	
$R_{th(c)}$	Coupling	0.3	°C/W	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode1}) = P_{(\text{diode1})} \times R_{th(j-c)} (\text{per diode}) + P_{(\text{diode2})} \times R_{th(c)}$$

For more information, please refer to the following application note:

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

**Table 3. Static electrical characteristics (per diode)**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit	
$I_R$ <sup>(1)</sup>	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		20	$\mu\text{A}$
		$T_j = 125\text{ °C}$		-	7	20	mA
$V_F$ <sup>(2)</sup>	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 40\text{ A}$	-		0.80	V
		$T_j = 125\text{ °C}$		-	0.65	0.70	
		$T_j = 25\text{ °C}$	$I_F = 80\text{ A}$	-		0.94	
		$T_j = 125\text{ °C}$		-	0.79	0.84	

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

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

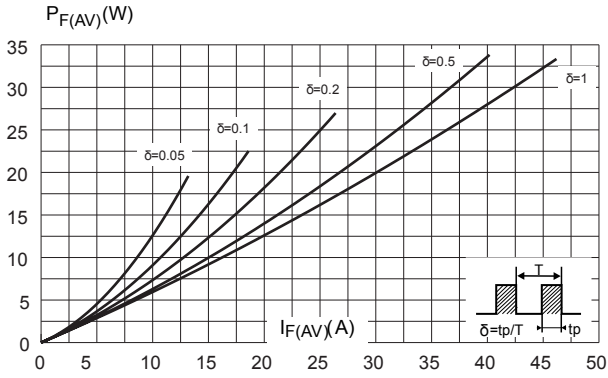
To evaluate the conduction losses, use the following equation:  $P = 0.56 \times I_{F(AV)} + 0.0035 \times I_F^2 (RMS)$

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

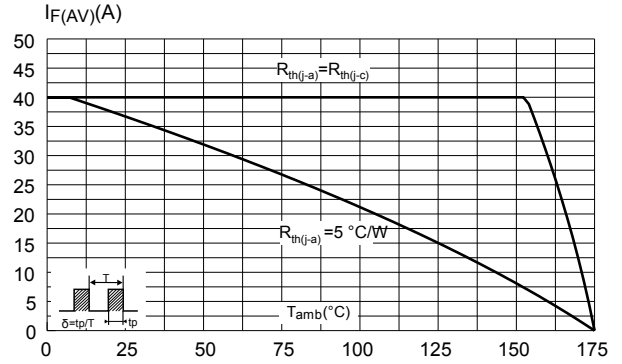
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

### 1.1 Characteristics (curves)

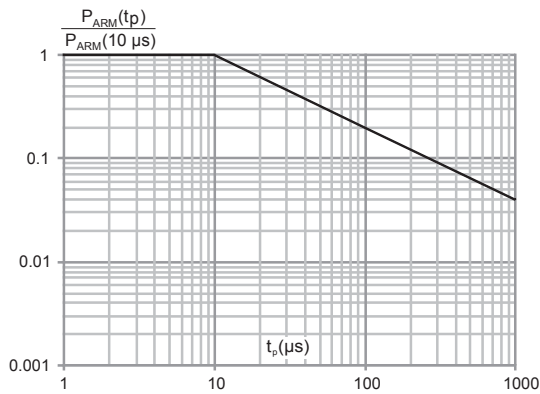
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



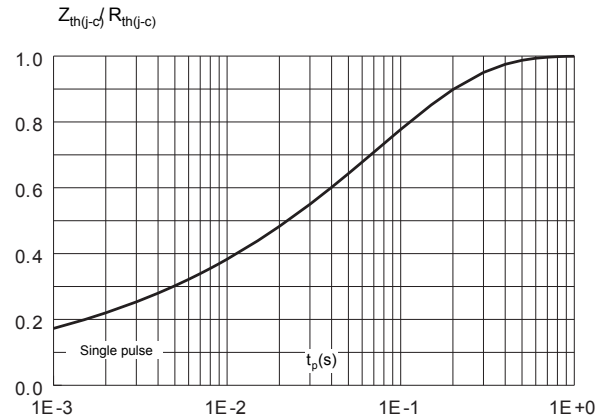
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode)**



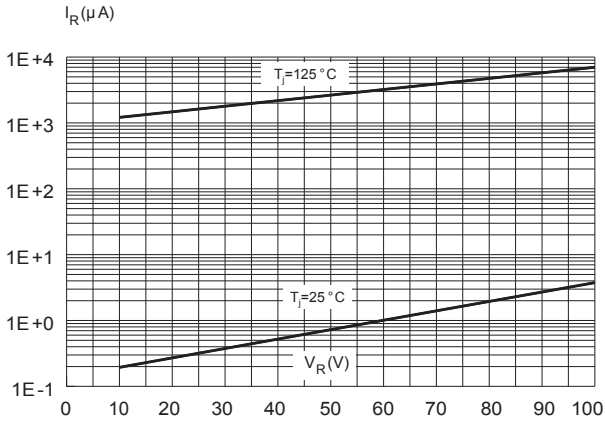
**Figure 3. Normalized avalanche power derating versus pulse duration ( $T_j = 125$  °C)**



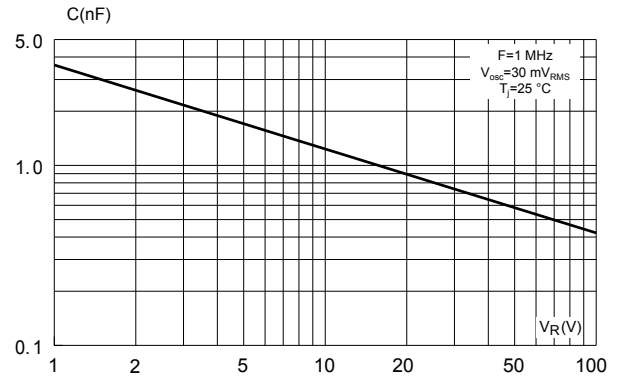
**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**



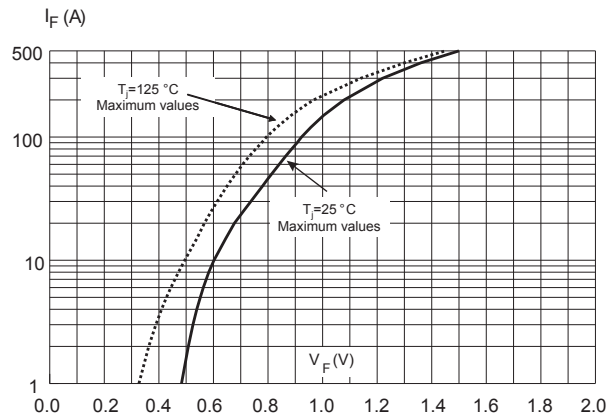
**Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



**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

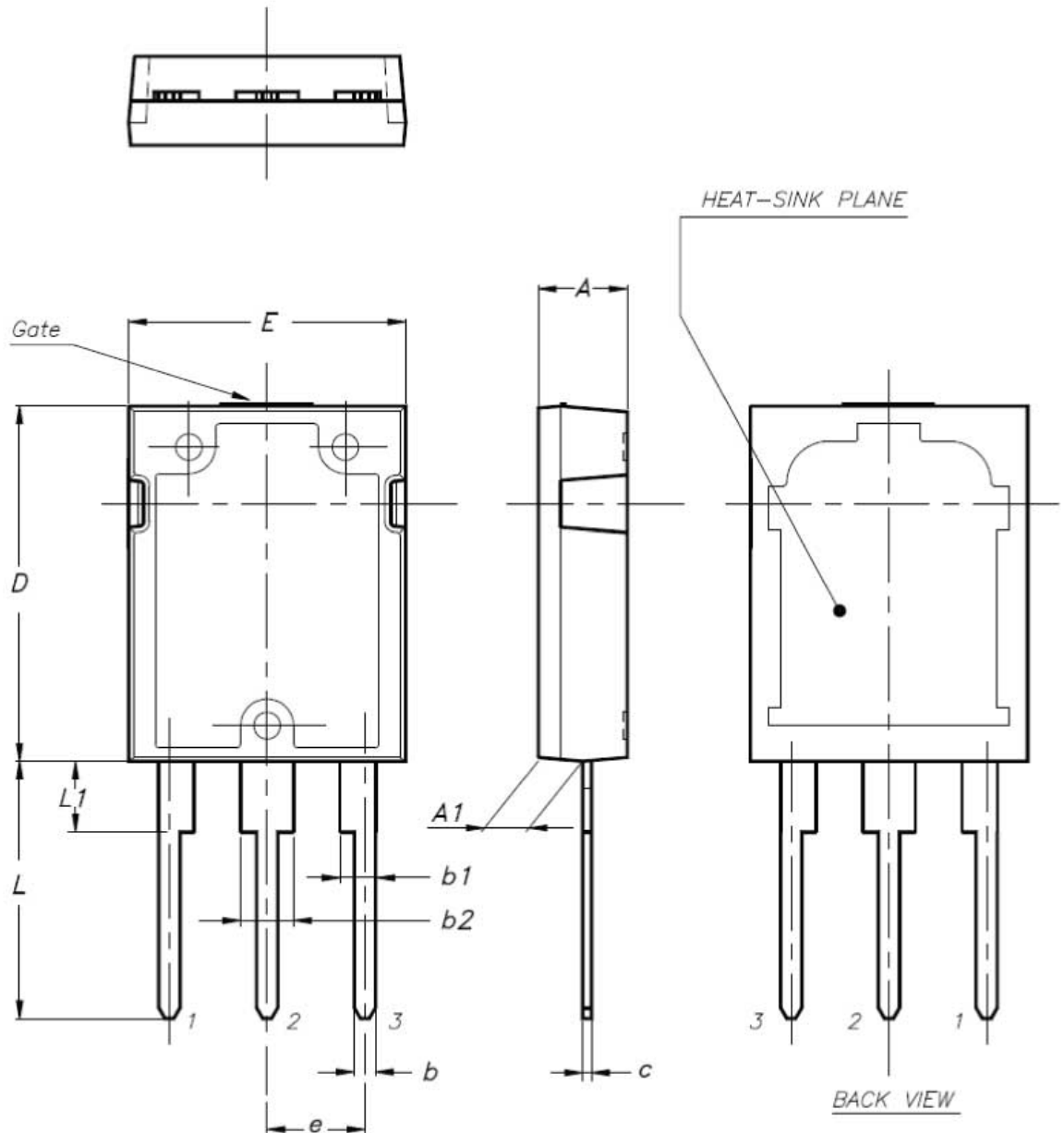
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In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com).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

## 2.1 Max247 package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

Figure 8. Max247 package outline



**Table 4. Max247 package mechanical data**

Ref.	Dimensions			
	Millimeters		Inches (for reference only)	
	Min.	Max.	Min.	Max.
A	4.70	5.30	0.185	0.208
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	3.0	3.40	0.118	0.133
c	0.40	0.80	0.015	0.031
D	19.70	20.30	0.775	0.800
E	15.30	15.90	0.602	0.626
e	5.35	5.55	0.210	0.218
L	14.20	15.20	0.559	0.598
L1	3.70	4.30	0.145	0.169

### 3 Ordering information

**Table 5. Order code**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS80H100CY	STPS80H100CY	Max247	4.90 g	30	Tube



## Revision history

**Table 6. Document revision history**

Date	Revision	Changes
July-2003	2B	Last release.
21-Jun-2010	3	Updated package illustration on page 1 and Section 2: Package information on page 5.
02-Jul-2018	4	Updated <a href="#">Figure 3</a> . Normalized avalanche power derating versus pulse duration ( $T_j = 125\text{ °C}$ ) and <a href="#">Table 1</a> . Absolute ratings (limiting values, per diode at $25\text{ °C}$ , unless otherwise specified).

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