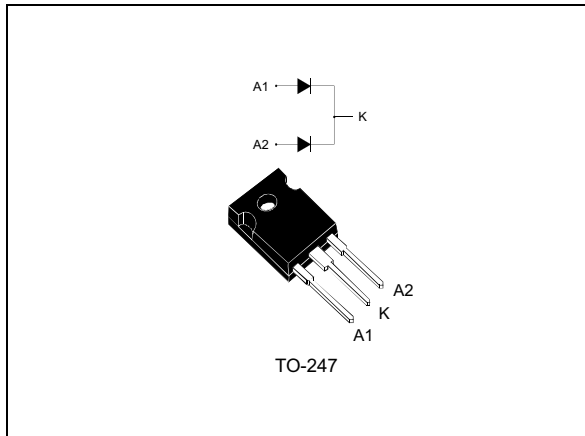


## Power Schottky Rectifier

Datasheet - production data



### Description

Dual center tap Schottky rectifier suited for switch mode power supply and high frequency DC to DC converters. Packaged in TO-247, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

**Table 1. Device summary**

Symbol	Value
$I_F(AV)$	2 x 30 A
$V_{RRM}$	45 V
$T_j(max.)$	175 °C
$V_F(max.)$	0.63 V

### Features

- Very small conduction losses
- Negligible switching losses
- Extreme fast switching
- Low thermal resistance
- Avalanche capability specified

# Characteristics

**Table 2. Absolute ratings (limiting values, per diode)**

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		45	V
$I_{F(RMS)}$	RMS forward current		60	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 150\text{ }^\circ\text{C}$ per diode	30	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	400	A
$I_{RRM}$	Repetive peak reverse current	$t_p = 2\text{ }\mu\text{s}$ square $F = 1\text{ kHz}$	1	A
$I_{RSM}$	Non repetitive peak reverse current	$t_p = 100\text{ }\mu\text{s}$ square	3	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1\text{ }\mu\text{s}$ $T_j = 25\text{ }^\circ\text{C}$	10600	W
$T_{stg}$	Storage temperature range		- 65 to + 175	$^\circ\text{C}$
$T_j$	Maximum operating junction temperature <sup>(1)</sup>		175	$^\circ\text{C}$
dV/dt	Critical rate of rise or reverse voltage		10000	V/ $\mu\text{s}$

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

**Table 3. thermal resistances**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	0.95	$^\circ\text{C/W}$
		Total	0.55	
$R_{th(c)}$		Coupling	0.15	

When the diodes 1 and 2 are simultaneously:

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

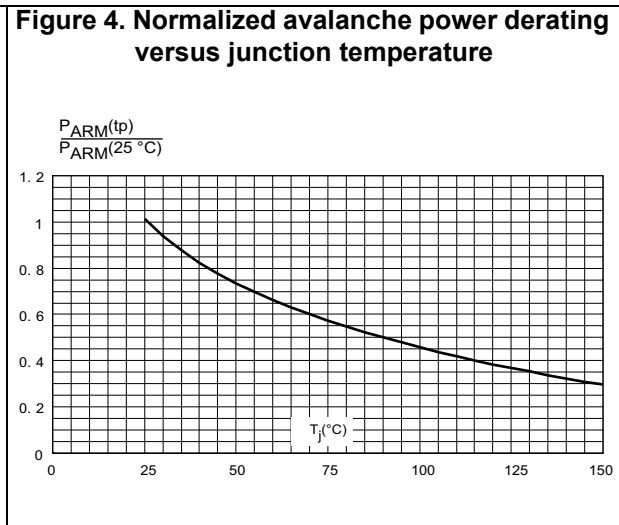
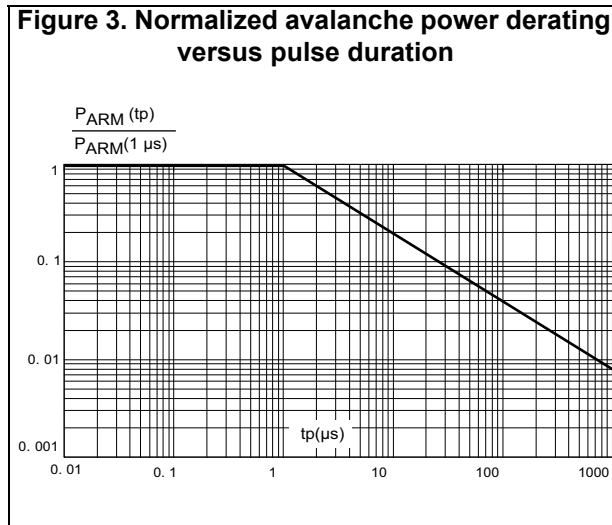
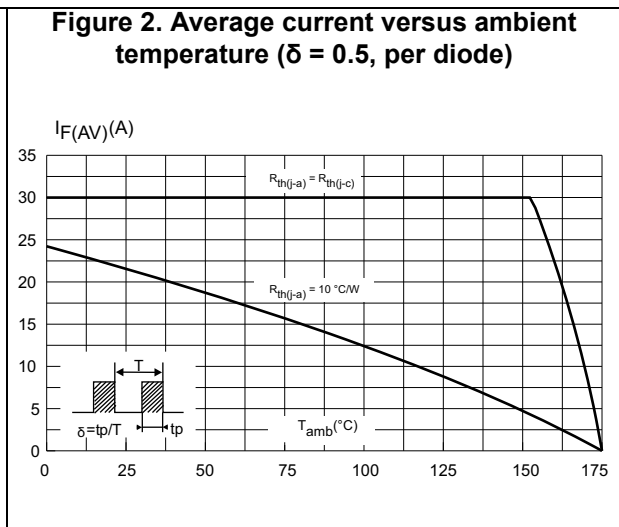
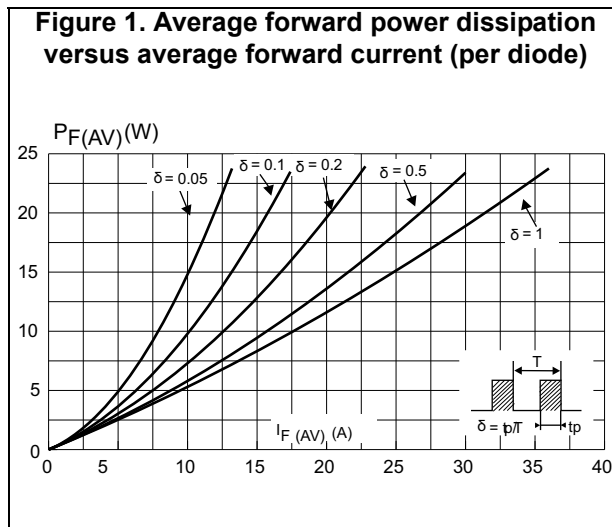
Table 4. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ }^\circ\text{C}$	$V_R = V_{RRM}$	-		500	$\mu\text{A}$
		$T_j = 125\text{ }^\circ\text{C}$		-	20	80	$\text{mA}$
$V_F^{(1)}$	Forward voltage drop	$T_j = 125\text{ }^\circ\text{C}$	$I_F = 30\text{ A}$	-	0.53	0.63	V
		$T_j = 25\text{ }^\circ\text{C}$	$I_F = 60\text{ A}$	-		0.84	
		$T_j = 125\text{ }^\circ\text{C}$	$I_F = 60\text{ A}$	-	0.68	0.78	

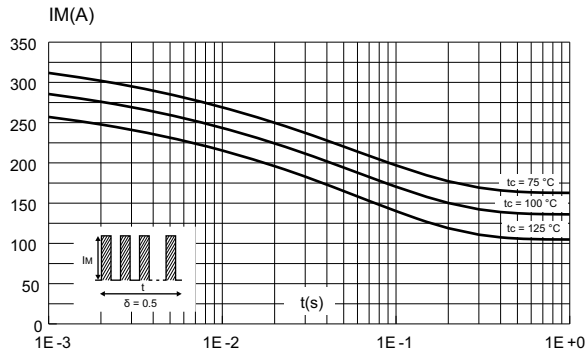
1. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation:

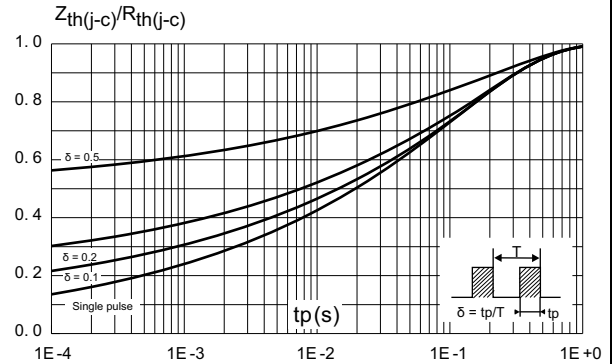
$$P + 0.48 \times I_{F(AV)} + 0.005 I_{F(RMS)}^2$$



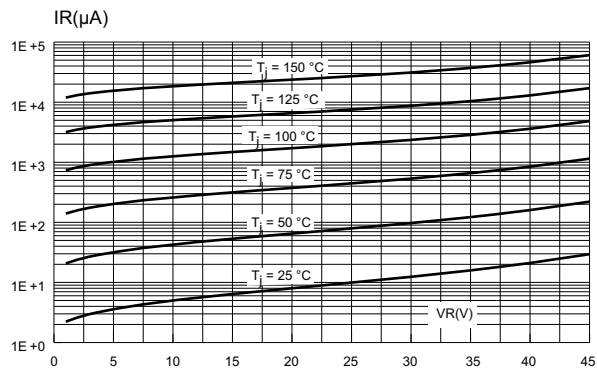
**Figure 5. Non-repetitive surge peak forward current versus overload duration (maximum values, per diode)**



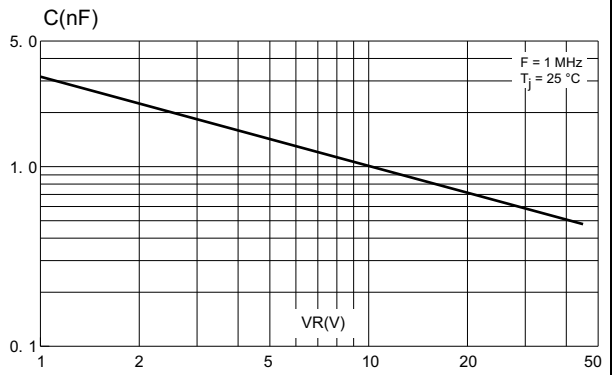
**Figure 6. Relative variation of thermal transient impedance junction to case versus pulse duration**

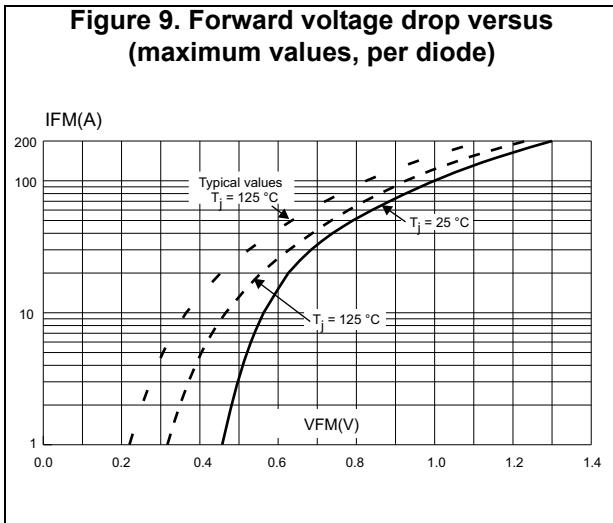


**Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



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





# 1 Package information

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

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.

## 1.1 TO-247 package information

Figure 10. TO-247 package outline

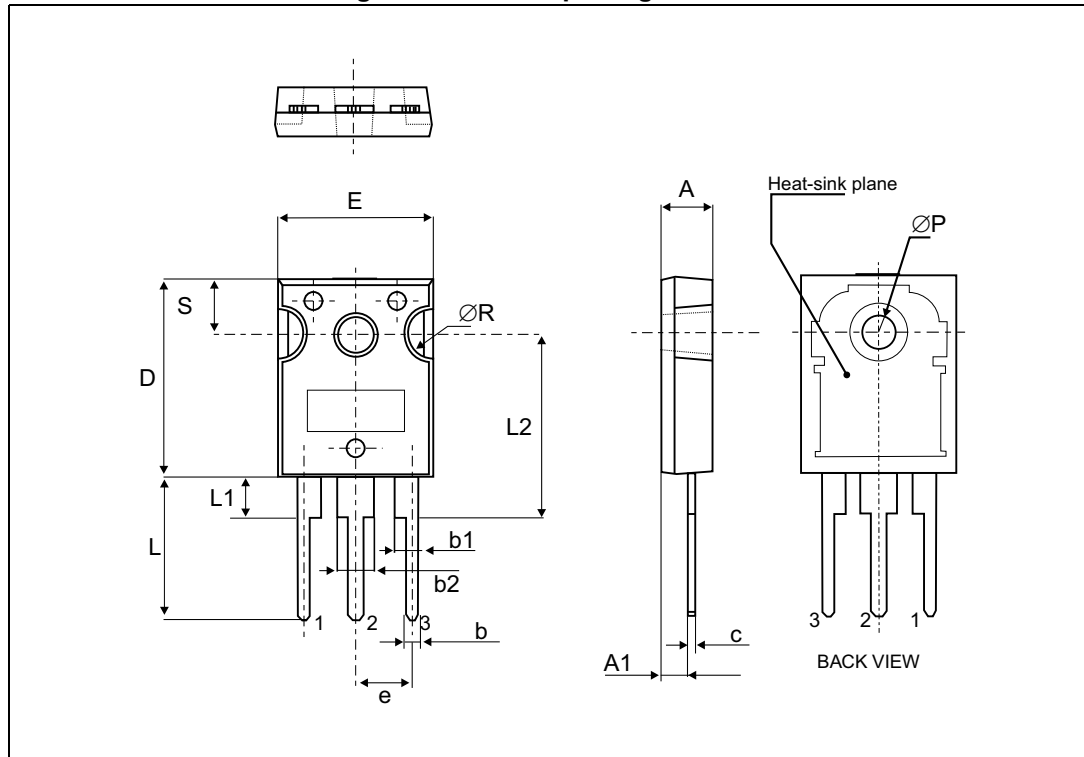


Table 5. TO-247 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches <sup>(1)</sup>		
	Typ.	Min.	Max.	Typ.	Min.	Max.
A		4.85	5.15		0.191	0.203
A1		2.20	2.60		0.086	0.102
b		1.0	1.40		0.039	0.055
b1		2.0	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		19.85	20.15		0.781	0.793
E		15.45	15.75		0.608	0.620
e	5.50	5.30	5.60		0.209	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	5.50	5.30	5.70		0.209	0.224

1. Values in inches are converted from mm and rounded to 4 decimal digits.

## 2 Ordering information

Table 6. Ordering information

Type	Marking	Package	Weight	Base qty.	Delivery mode
STPS6045CW	STPS6045CW	TO-247	4.36 g.	30	Tube

## 3 Revision history

Table 7. Document revision history

Date	Revision	Changes
24-Jul-2012	7	
11-Dec-2015	8	Format updated to current standard. Update of <a href="#">Table 2</a> and <a href="#">Table 3</a> and <a href="#">Table 5</a> . Update of <a href="#">Figure 2</a> . Remove of figure 5.2.



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