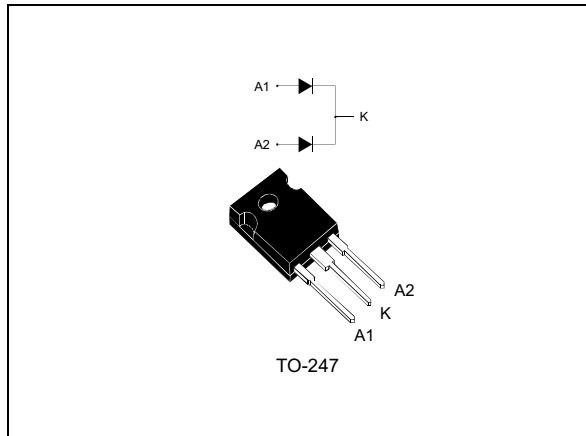


Power Schottky Rectifier

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 δ = 0.5	T _c = 150 °C per diode	30	A
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms sinusoidal	400	A
I _{RRM}	Repetive peak reverse current	t _p = 2 μs square F = 1 kHz	1	A
I _{RSM}	Non repetitive peak reverse current	t _p = 100 μs square	3	A
P _{ARM}	Repetitive peak avalanche power	t _p = 1 μs T _j = 25 °C	10600	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 or 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

Table 3. thermal resistances

Symbol	Parameter		Value	Unit
R _{th(j-c)}	Junction to case	Per diode	0.95	°C/W
		Total	0.55	
R _{th(c)}		Coupling	0.15	

When the diodes 1 and 2 are simultaneously:

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

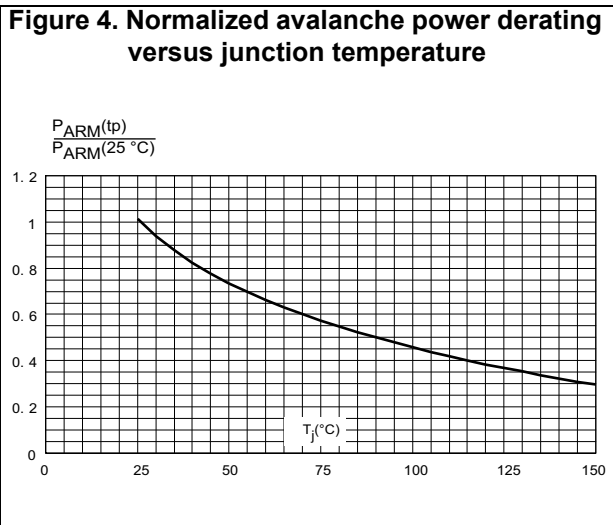
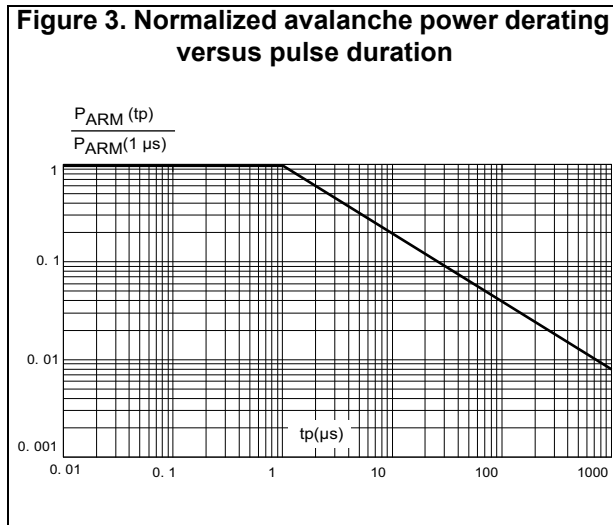
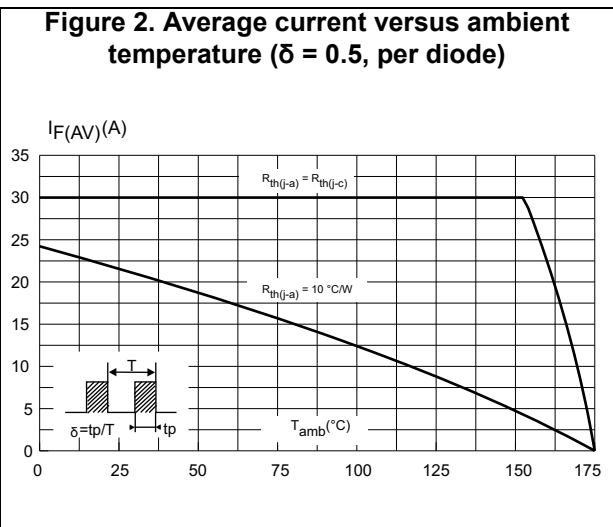
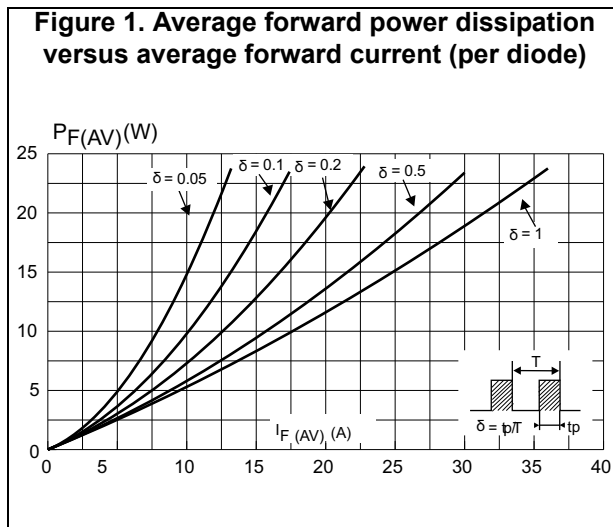
Table 4. Static electrical characteristics (per diode)

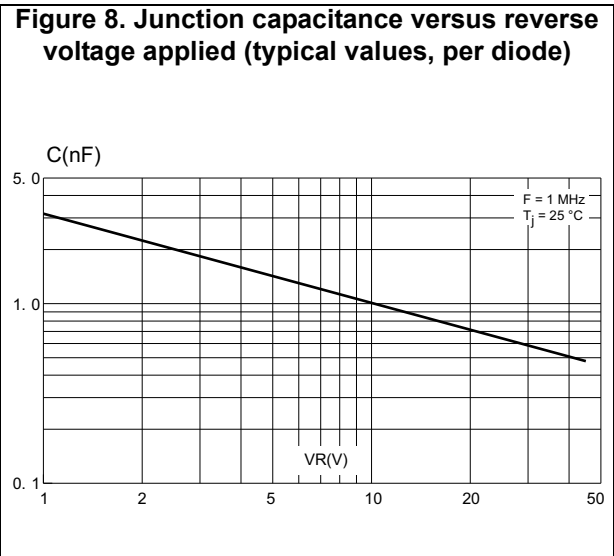
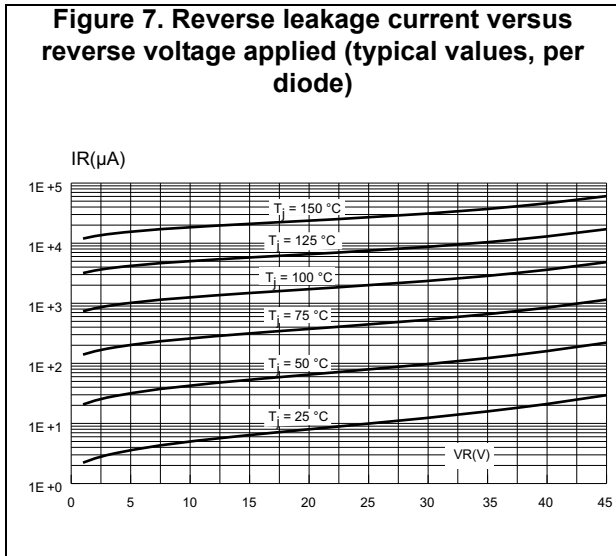
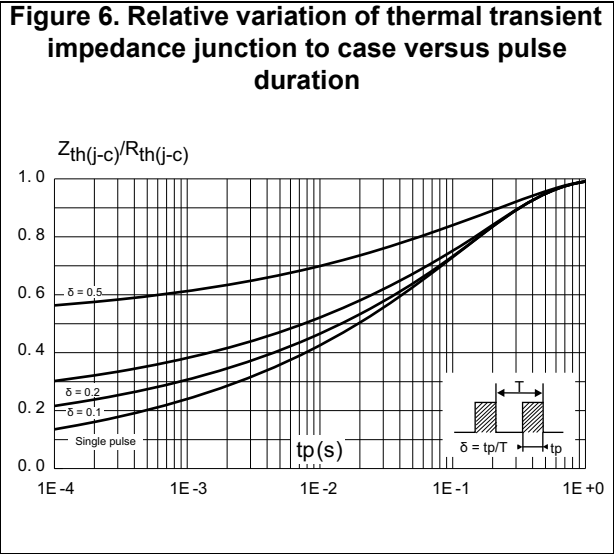
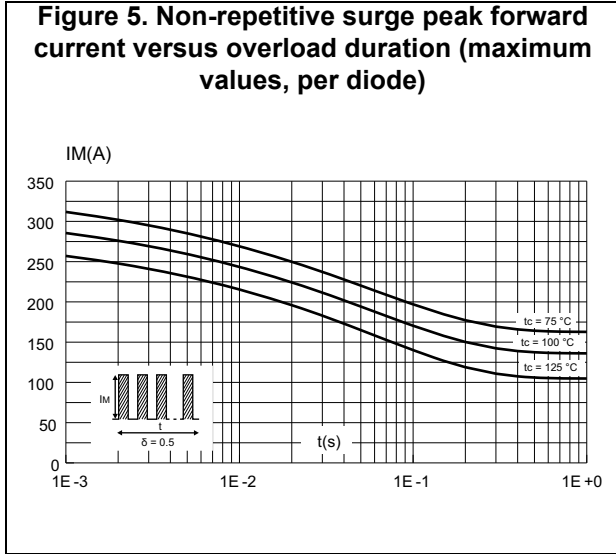
Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ }^\circ\text{C}$	$V_R = V_{RRM}$	-		500	μA
		$T_j = 125\text{ }^\circ\text{C}$		-	20	80	mA
$V_F^{(1)}$	Forward voltage drop	$T_j = 125\text{ }^\circ\text{C}$	$I_F = 30\text{ A}$	-	0.53	0.63	V
		$T_j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

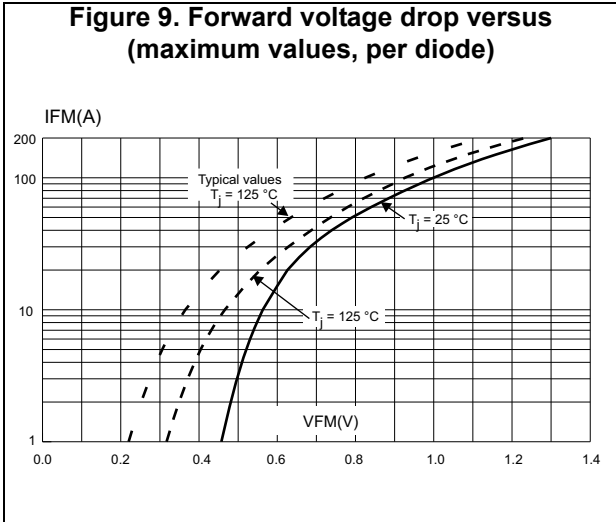
1. Pulse test: $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

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







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. ECOPACK® is an ST trademark.

1.1 TO-247 package information

Figure 10. TO-247 package outline

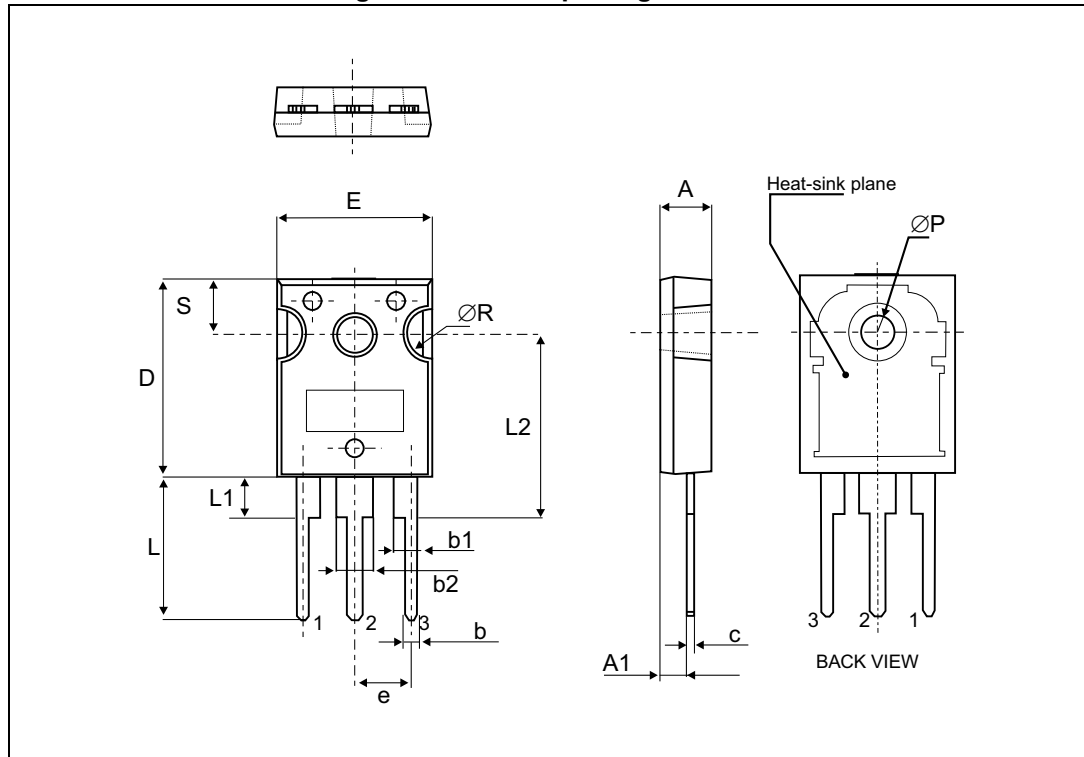


Table 5. TO-247 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches ⁽¹⁾		
	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 Table 2 and Table 3 and Table 5 . Update of Figure 2 . Remove of figure 5.2.

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