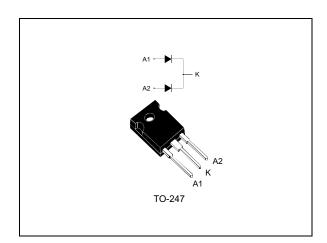




Power Schottky Rectifier

Datasheet - production data



Features

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

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

Characteristics STPS6045C

Characteristics

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

Symbol	Para	Value	Unit	
V_{RRM}	Repetitive peak reverse volt	age	45	V
I _{F(RMS)}	RMS forward current		60	Α
I _{F(AV)}	Average forward current $\delta = 0.5$ Tc = 150 °C per diode		30	Α
I _{FSM}	Surge non repetitive forward current tp = 10 ms sinusoidal		400	Α
I _{RRM}	Repetive peak reverse tp = 2 µs square F = 1 kHz		1	Α
I _{RSM}	Non repetitive peak reverse current tp = 100 μs square		3	Α
P _{ARM}	Repetitive peak avalanche power $tp = 1 \mu s$ $T_j = 25 °C$		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.} $\frac{dPtot}{dT_j} < \frac{1}{Rth(j-a)}$ 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 Total	0.95 0.55	°C/W
R _{th(c)}		Coupling	0.15	

When the diodes 1 and 2 are simultaneously:

 $\Delta \, T_j(\text{diode 1}) = P(\text{diode1}) \, x \, R_{th(j-c)} \, (\text{Per diode}) + P(\text{diode 2}) \, x \, R_{th(c)}$

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Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _R ⁽¹⁾ Reverse leakage current	T _j = 25 °C	$V_R = V_{RRM}$	-		500	μΑ	
	T _j = 125 °C		-	20	80	mA	
VF ⁽¹⁾ Forward voltage drop	T _j = 125 °C	IF = 30 A	-	0.53	0.63		
	T _j = 25 °C	IF = 60 A	-		0.84	V	
		T _j = 125 °C	IF = 60 A	-	0.68	0.78	

Table 4. Static electrical characteristics (per diode)

To evaluate the conduction losses use the following equation:

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

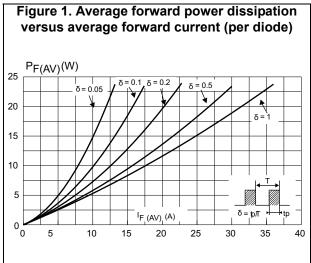
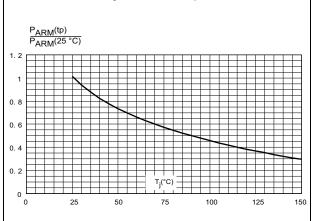


Figure 2. Average current versus ambient temperature (δ = 0.5, per diode) $I_{F(AV)}(A)$ 35 $R_{th(j-a)} = R_{th(j-c)}$ 30 25 20 $R_{th(j-a)} = 10 \, ^{\circ}C/W$ 15 10 5 T_{amb}(°C) 0 25 125 75 100 150

Figure 3. Normalized avalanche power derating | Figure 4. Normalized avalanche power derating versus pulse duration P_{ARM} (tp) P_{ARM}(1 µs) 0.01 tp(µs) 0. 001 0. 1 10 100



versus junction temperature

^{1.} Pulse test: tp = 380 μ s, δ < 2%

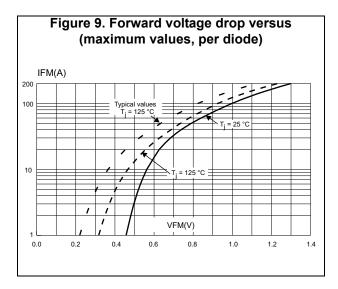
Characteristics STPS6045C

Figure 5. Non-repetitive surge peak forward Figure 6. Relative variation of thermal transient current versus overload duration (maximum impedance junction to case versus pulse values, per diode) duration $Z_{th(j-c)}/R_{th(j-c)}$ IM(A) 350 300 0.8 250 0.6 200 150 0.4 100 0.2 50 $\delta = tp/T$ tp(s) 0.0 1E-3 1E-2 1E-1 1E+0 1E-2 1E-4 1E-3 1E-1 1E+0

Figure 7. Reverse leakage current versus Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode) reverse voltage applied (typical values, per diode) C(nF) IR(µA) 5. 0 1E+5 F = 1 MHz T_i = 25 °C T_i = 125 °C 1E+4 1. 0 1E+3 T_i = 75 °C 1E+2 T; = 25 °C VR(V) VR(V) 0. 1 1E+0 50 2 5 20 45

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Package information STPS6045C

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

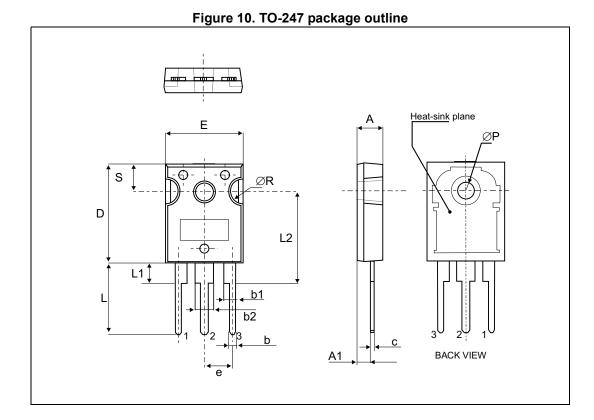


Table 5. TO-247 package mechanical data

	Dimensions					
Ref.		Millimeters		Inches ⁽¹⁾		
	Тур.	Min.	Max.	Тур.	Min.	Max.
Α		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
С		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
е	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.



Ordering information STPS6045C

2 Ordering information

Table 6. Ordering information

Туре	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 <i>Table 2</i> and <i>Table 3</i> and <i>Table 5</i> . Update of <i>Figure 2</i> . Remove of figure 5.2.

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