

STPS1045

Power Schottky rectifier

Main product characteristics

I _{F(AV)}	10 A
V _{RRM}	45 V
V _F	0.57 V

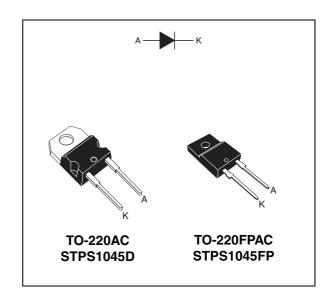
Features and Benefits

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop
- Insulated package: TO-220FPAC
 Insulating voltage = 2000V DC
 Capacitance = 12 pF
- Avalanche capability specified

Description

Single chip Schottky rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters.

This device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



Characteristics STPS1045

Characteristics 1

Table 1. **Absolute Ratings (limiting values)**

Symbol		Value	Unit		
V _{RRM}	Repetitive peak revers	Repetitive peak reverse voltage			V
I _{F(RMS)}	RMS forward voltage			30	Α
	Average forward	TO-220AC	T _c = 150° C	40	А
I _{F(AV)}	$I_{F(AV)}$ current $\delta = 0.5$	TO-220FPAC	T _c = 145° C	10	
I _{FSM}	Surge non repetitive for	orward current	t _p = 10 ms sinusoidal	180	Α
	Repetitive peak revers	t _p = 2 μs F = 1 kHz	1	Α	
P _{ARM}	Repetitive peak avalanche power $t_p = 1 \mu s Tj = 25^{\circ}$ C			4000	W
T _{stg}	Storage temperature range			-65 to + 175	°C
T _j	Maximum junction temperature			175	°C
dV/dt	Critical rate of rise of reverse voltage			10000	V/µs

Table 2. Thermal resistances

Symbol	Parameter		Value	Unit
В	lunction to case	TO-220AC	2.2	°C/W
R _{th(j-c)}	c) Junction to case	TO-220FPAC	4.5	C/VV

Table 3. Static electrical characteristics

Symbol	Parameter	Test Conditions		Min.	Тур.	Max.	Unit
I _B ⁽¹⁾	Povorco logicado gurront	T _j = 25° C	$V_R = V_{RRM}$			100	μΑ
'R`	I _R ⁽¹⁾ Reverse leakage current	T _j = 125° C				15	mA
		T _j = 25° C	I _F = 20 A			0.84	
V _F ⁽²⁾	V _F ⁽²⁾ Forward voltage drop	T _j = 125° C	I _F = 20 A			0.72	V
		T _j = 125° C	I _F = 10 A			0.60	

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

To evaluate the conduction losses use the following equation: P = 0.42 x $I_{F(AV)}$ + 0.015 $I_{F}^{2}_{(RMS)}$

$$P = 0.42 \text{ x I}_{F(AV)} + 0.015 \text{ I}_{F}^{2}_{(RMS)}$$

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

STPS1045 Characteristics

Figure 1. Average forward power dissipation Figure 2. Average forward current versus versus average forward current ambient temperature (δ = 0.5)

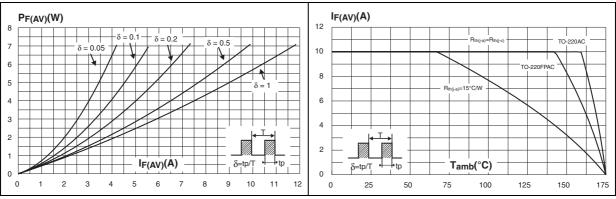


Figure 3. Normalized avalanche power derating versus pulse duration

Figure 4. Normalized avalanche power derating versus junction temperature

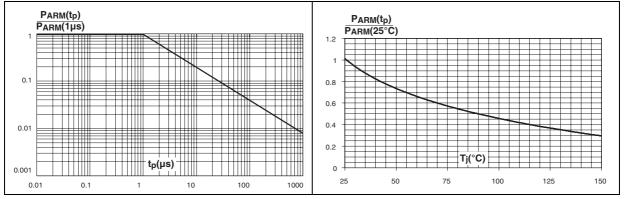
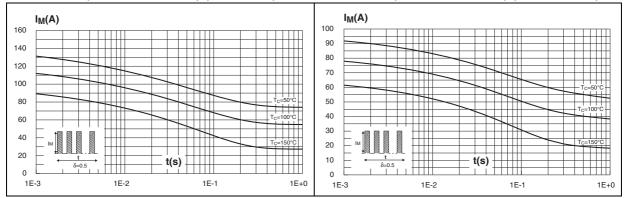


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AC)

Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220FPAC)



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Characteristics STPS1045

Figure 7. Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AC)

Figure 8. Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220FPAC)

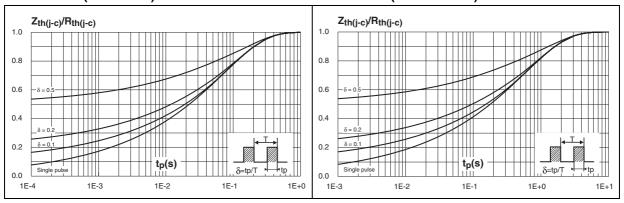


Figure 9. Reverse leakage current versus reverse voltage applied (typical values)

Figure 10. Reverse leakage current versus reverse voltage applied (typical values)

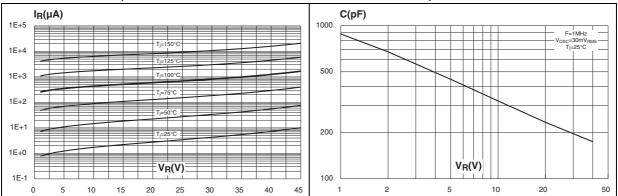
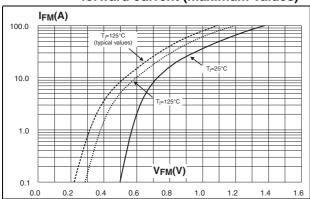


Figure 11. Forward voltage drop versus forward current (maximum values)



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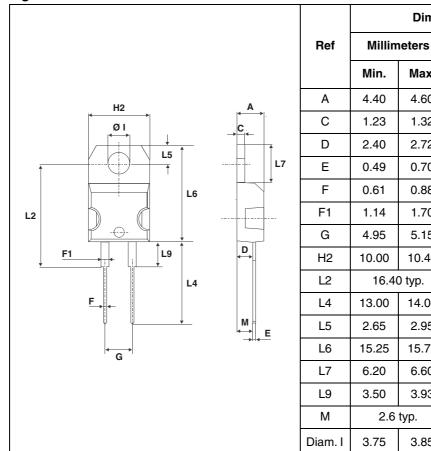
STPS1045 **Package Information**

Package Information 2

Epoxy meets UL94, V0

Cooling method: by conduction (C) Recommended torque value: 0.55 Nm Maximum torque value: 0.70 Nm

Figure 12. TO-220AC dimensions



Dimensions

Max.

4.60

1.32

2.72

0.70

0.88

1.70

5.15

10.40

14.00

2.95

15.75

6.60

3.93

3.85

Inches

Max.

0.181

0.051

0.107

0.027

0.034

0.066

0.202

0.409

0.551

0.116

0.620

0.259

0.154

0.151

Min.

0.173

0.048

0.094

0.019

0.024

0.044

0.194

0.393

0.511

0.104

0.600

0.244

0.137

0.147

0.645 typ.

0.102 typ.

Package Information STPS1045

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Figure 13. TO-220FPAC dimensions

	Dimensions			
Ref	Millimeters		Inc	hes
	Min.	Max.	Min.	Max.
Α	4.4	4.6	0.173	0.181
В	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
Е	0.45	0.70	0.018	0.027
F	0.75	1	0.030	0.039
F1	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.4	2.7	0.094	0.106
Н	10	10.4	0.393	0.409
L2	16 Typ.		0.63	Тур.
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

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3 Ordering Information

STPS1045

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS1045D	STPS1045D	TO-220AC	1.86 g	50	Tube
STPS1045FP	STPS1045FP	TO-220FPAC	1.9 g	50	Tube

4 Revision history

Date	Revision	Description of Changes
Jul-2003	5D	Last release.
22-Mar-2007	6	Removed ISOWATT package.

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