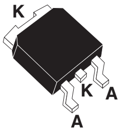
STPS1045B

Power Schottky rectifier

Features

- Negligible switching losses
- Low forward voltage drop
- Low capacitance
- High reverse avalanche surge capability
- Avalanche specification



DPAK

Description

High voltage dual Schottky rectifier suited for switch mode power supplies and other power converters.

Packaged in DPAK, this device is intended for use in high frequency circuitries where low switching losses are required.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	10 A
V_{RRM}	45 V
T_j	175 °C
V_F(max)	0.57 V

1 Characteristics

Table 2. **Absolute maximum ratings**

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		45	V
$I_{F(RMS)}$/ pin	Forward rms current		7	A
$I_{F(AV)}$	Average forward current	$T_c = 150$ °C $\delta = 0.5$	10	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal	75	A
I_{RRM}	Repetitive peak reverse current	$t_p = 2$ µs F= 1 kHz	1	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1$ µs $T_j = 25$ °C	4000	W
T_{stg}	Storage temperature range		- 65 to + 150	°C
T_j	Maximum operating junction temperature[1]		175	°C
dV/dt	Critical rate of rise of reverse voltage		10000	V/µs

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

Table 3. **Thermal parameters**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	3	°C/W

Table 4. **Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R[1]	Reverse leakage current	$T_j = 25$ °C	$V_R = V_{RRM}$			100	µA
		$T_j = 125$ °C			7	15	mA
V_F[2]	Forward voltage drop	$T_j = 25$ °C	$I_F = 10$ A			0.63	V
		$T_j = 125$ °C			0.50	0.57	
		$T_j = 25$ °C	$I_F = 20$ A			0.84	
		$T_j = 125$ °C			0.65	0.72	

1. Pulse test: tp = 5 ms, $\delta < 2\%$
2. Pulse test: tp = 380 µs, $\delta < 2\%$

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

Figure 1. Average forward power dissipation versus average forward current

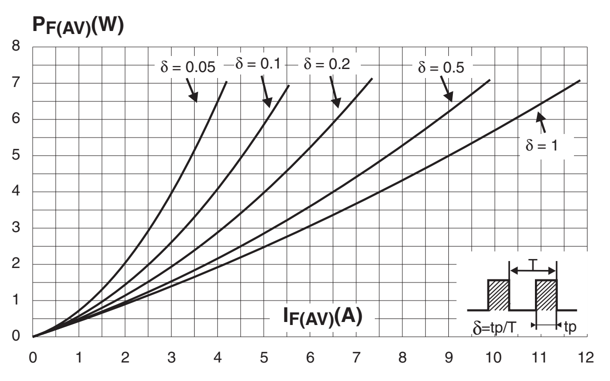


Figure 2. Average forward current versus ambient temperature (δ : 0.5)

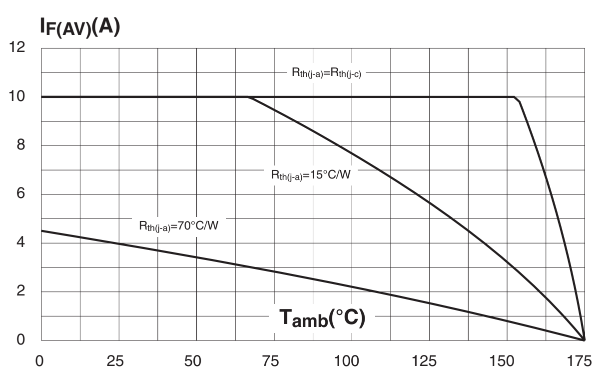


Figure 3. Normalized avalanche power derating versus pulse duration

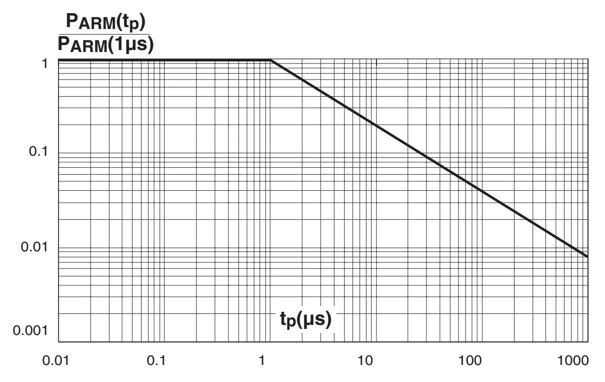


Figure 4. Normalized avalanche power derating versus junction temperature

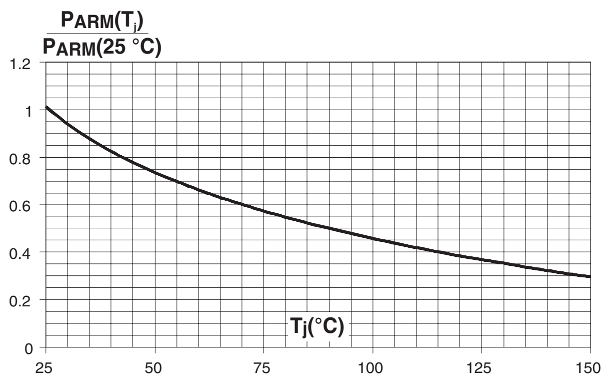


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

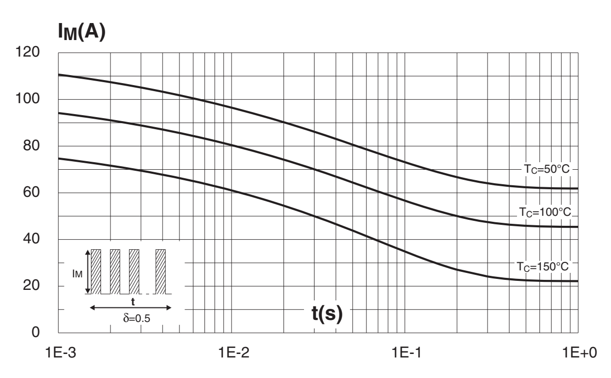


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

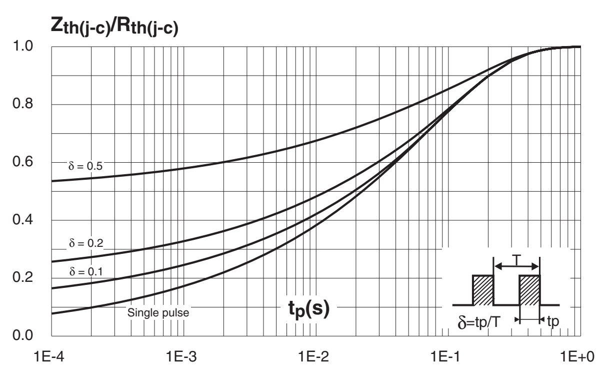


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

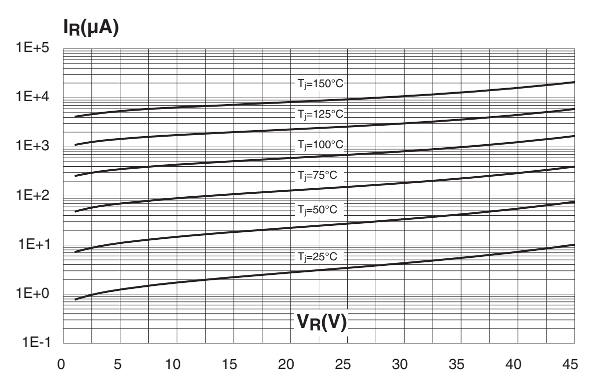


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

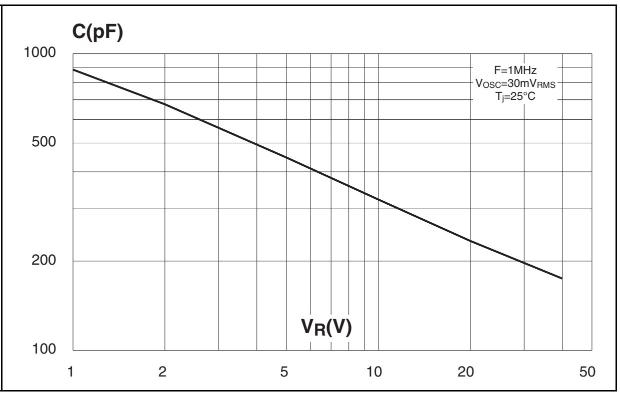


Figure 9. Forward voltage drop versus forward current

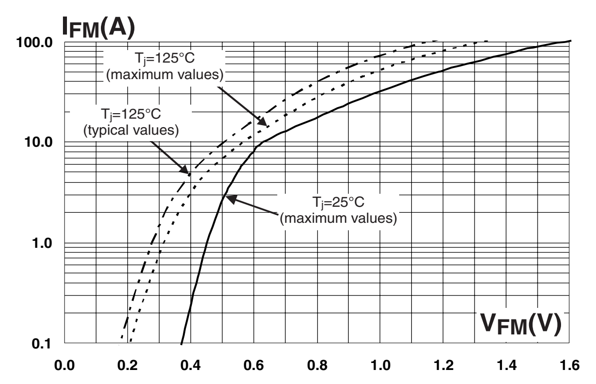
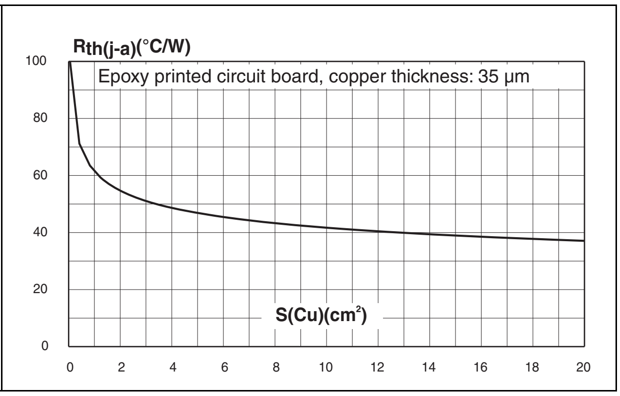


Figure 10. Thermal resistance junction to ambient versus copper surface under tab



2 Package information

- Epoxy meets UL94, V0.
- Lead-free packages

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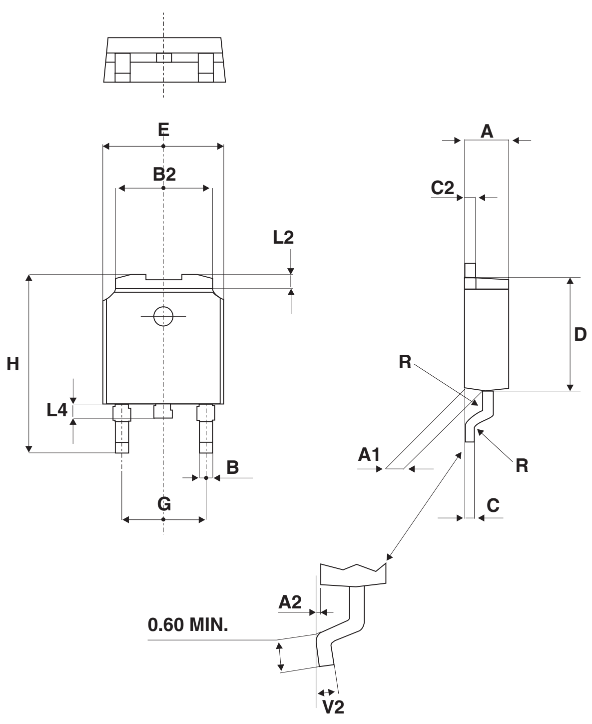
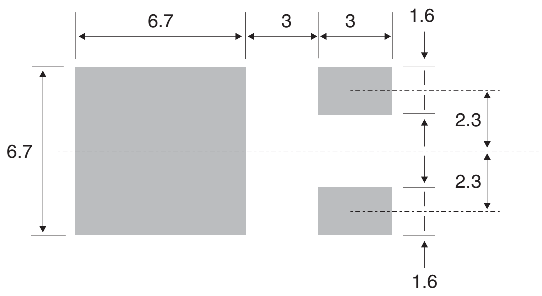
Table 5. DPAK dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
H	9.35	10.10	0.368	0.397
L2	0.80 typ.		0.031 typ.	
L4	0.60	1.00	0.023	0.039
V2	0°	8°	0°	8°

Figure 11. DPAK footprint (dimensions in mm)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS1045B	S1045	DPAK	0.30 g	75	Tube
STPS1045B-TR	S1045			2500	Tape and reel

Cooling method : by conduction (C)

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
Jul-2003	3B	Last issue
21-Apr-2005	4	IPAK package removed
03-Nov-2005	5	DPAK foot print dimensions updated.
01-Jul-2010	6	Updated *Figure 9.* Updated ECOPACK statement.

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