STPS3045FP

Power Schottky rectifier

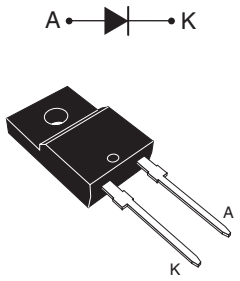
Features

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

Description

Schottky rectifier suited for switch mode power supply and high frequency DC to DC converters.

Packaged in TO-220 full pack, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



TO-220FPAC
STPS3045FP

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	30 A
V_{RRM}	45 V
$T_{j\ (max)}$	175 °C
$V_{F\ (max)}$	0.51 V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		45	V
$I_{F(RMS)}$	Forward rms current		45	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 85$ °C	30	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal, $T_c = 25$ °C	300	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1$ µs, $T_j = 25$ °C	12500	W
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature(1)		+ 175	°C

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

Table 3. Thermal resistance parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	4.0	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	$T_j = 25$ °C	$V_R = V_{RRM}$			300	µA
		$T_j = 125$ °C			20	60	mA
V_F (1)	Forward voltage drop	$T_j = 25$ °C	$I_F = 30$ A			0.62	V
		$T_j = 125$ °C			0.51	0.57	
		$T_j = 25$ °C	$I_F = 60$ A			0.79	
		$T_j = 125$ °C			0.65	0.72	

1. Pulse test: $t_p = 380$ µs, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

$P = 0.42 \times I_{F(AV)} + 0.0050 \times I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

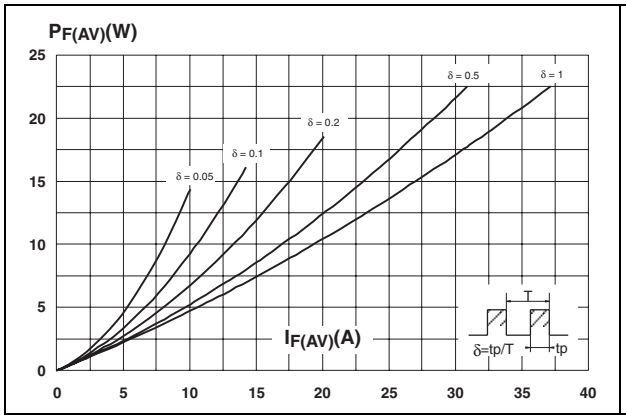


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

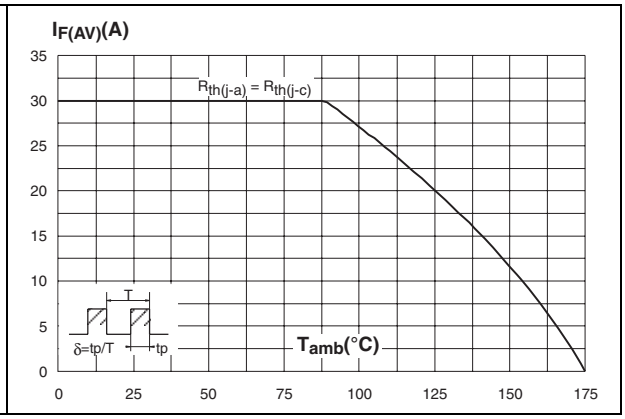


Figure 3. Normalized avalanche power derating versus pulse duration

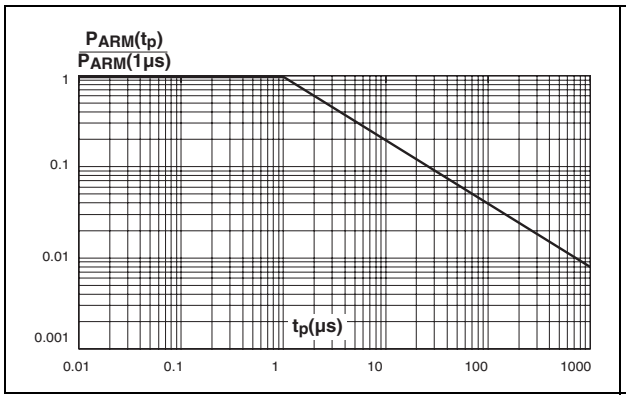


Figure 4. Normalized avalanche power derating versus junction temperature

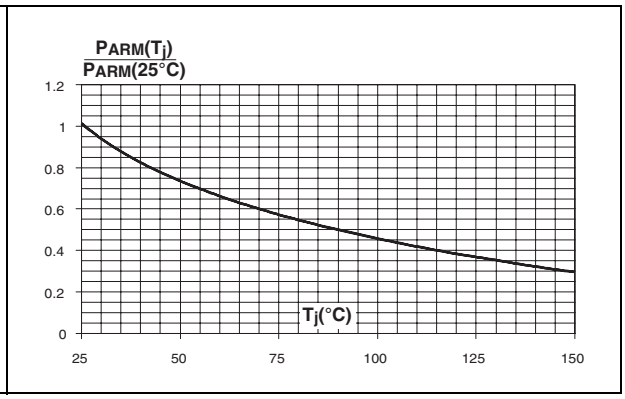


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

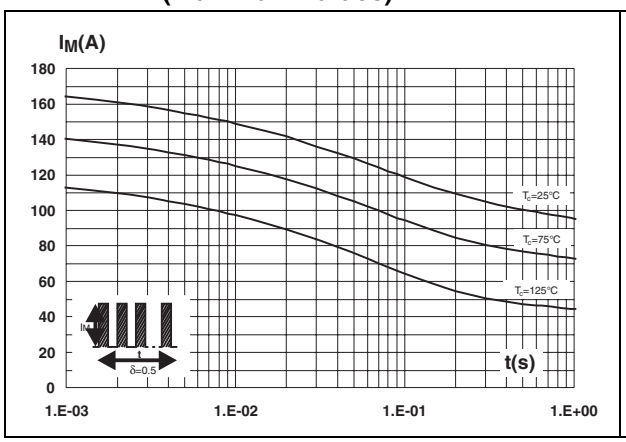


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

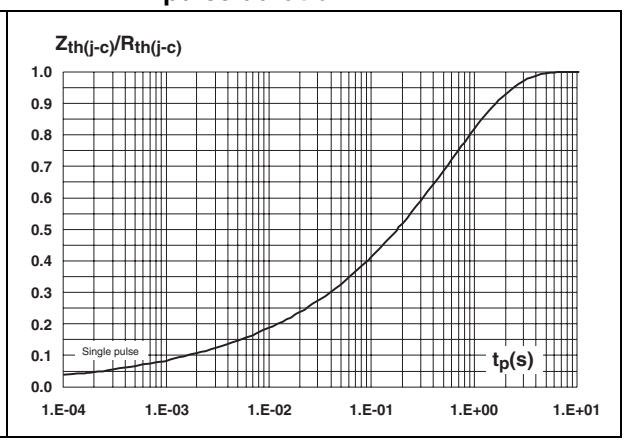


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

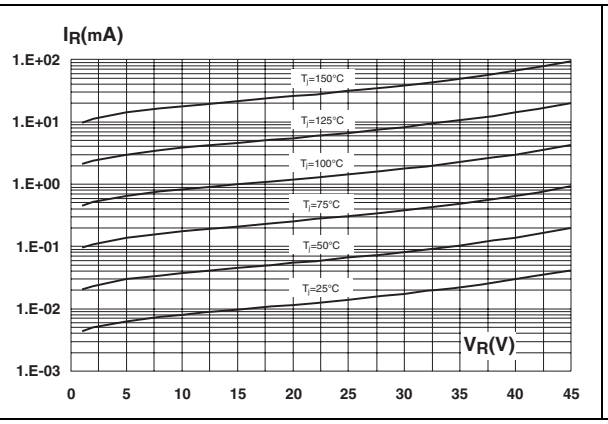


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

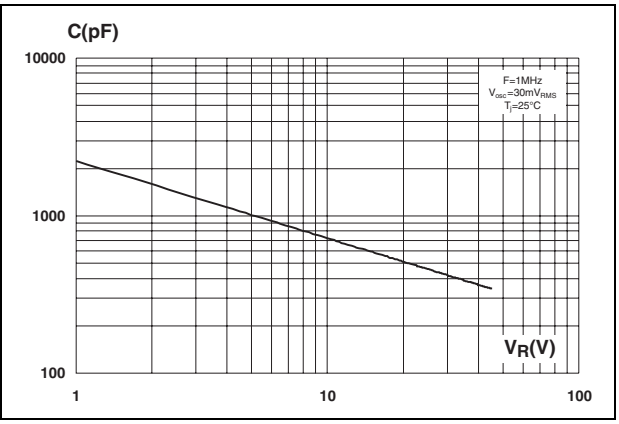
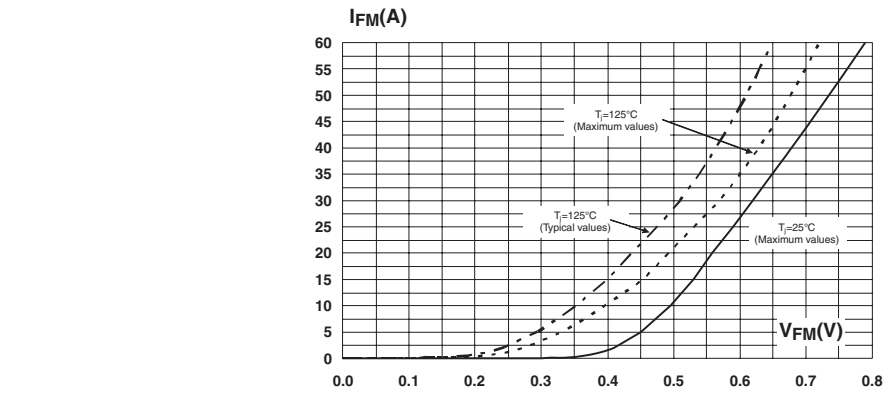


Figure 9. Forward voltage drop versus forward current

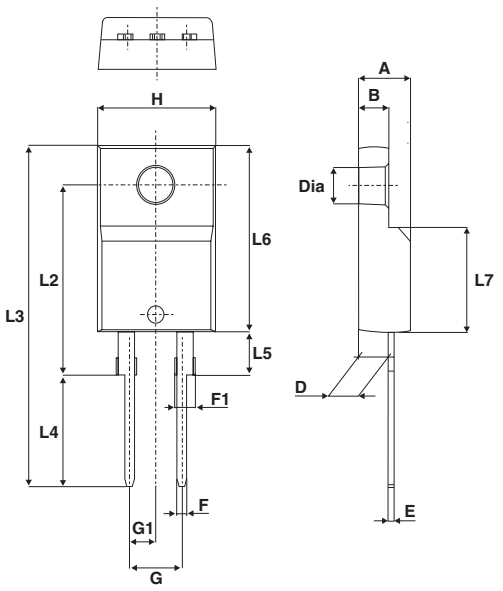


2 Package information

- Epoxy meets UL94,V0
- Lead-free package

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.

Table 5. TO-220FPAC dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	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
H	10	10.4	0.393	0.409
L2	16 Typ.		0.63 Typ.	
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

3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS3045FP	STPS3045FP	TO-220FPAC	2.2 g	50	Tube

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
30-Mar-2011	1	Initial issue

AMEYA360
Components Supply Platform

Authorized Distribution Brand :

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