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Power Schottky rectifier

Features

- Low forward voltage drop
- Negligible switching losses
- Insulated package:
 - Insulating voltage = 2000 V DC
 - Capacitance = 12 pF
- Avalanche capability specified

Description

Dual center tap Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in TO-220FPAB, this device is intended for use in high frequency inverters.

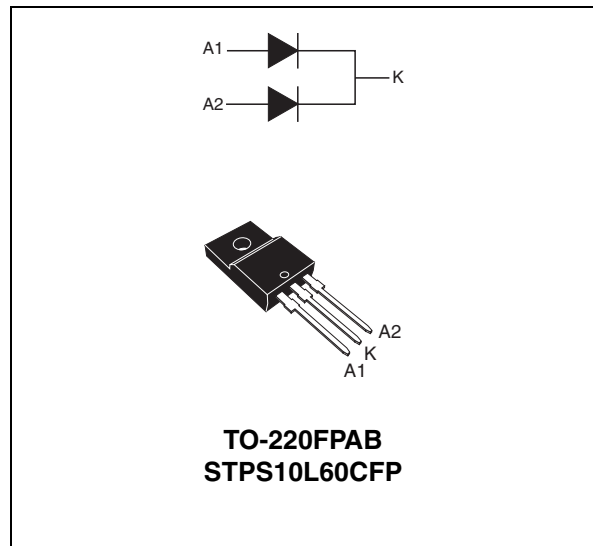


Table 1. Device summary

$I_{F(AV)}$	2 x 5 A
V_{RRM}	60 V
$T_j(max)$	150 °C
$V_F(max)$	0.52 V

1 Characteristics

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

Symbol	Parameter		Value	Unit	
V _{RRM}	Repetitive peak reverse voltage		60	V	
I _{F(RMS)}	Forward rms current		30	A	
I _{F(AV)}	Average forward current	T _C = 130 °C δ = 0.5	Per diode Per device	5 10	A
I _{FSM}	Surge non repetitive forward current	tp = 10 ms	Sinusoidal	180	A
I _{RRM}	Repetitive peak reverse current	tp = 2 μs	square F=1 kHz	1	A
P _{ARM}	Repetitive peak avalanche power	tp = 1 μs	T _j = 25 °C	4000	W
T _{stg}	Storage temperature range		-65 to +175	°C	
T _j	Maximum operating junction temperature ⁽¹⁾		150	°C	
dV/dt	Critical rate of rise reverse voltage		10000	V/μs	

1. $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

Table 3. Thermal resistance

Symbol	Parameter		Value	Unit
R _{th(j-c)}	Junction to case	Per diode	4.5	°C/W
		Total	3.5	
R _{th(c)}	Coupling		2.5	°C/W

When the diodes 1 and 2 are used simultaneously :

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

Table 4. Static electrical characteristics (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I _R ⁽¹⁾	Reverse leakage current	T _j = 25 °C	V _R = V _{RRM}			220	μA
		T _j = 125 °C			45	60	mA
V _F ⁽¹⁾	Forward voltage drop	T _j = 25 °C	I _F = 5 A			0.55	V
		T _j = 125 °C	I _F = 5 A		0.43	0.52	
		T _j = 25 °C	I _F = 10 A			0.67	
		T _j = 125 °C	I _F = 10 A		0.55	0.64	

1. Pulse test : tp = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.44 \times I_{F(AV)} + 0.0091 \times I_{F(RMS)}^2$$

Figure 1. Average forward power dissipation versus average forward current (per diode)

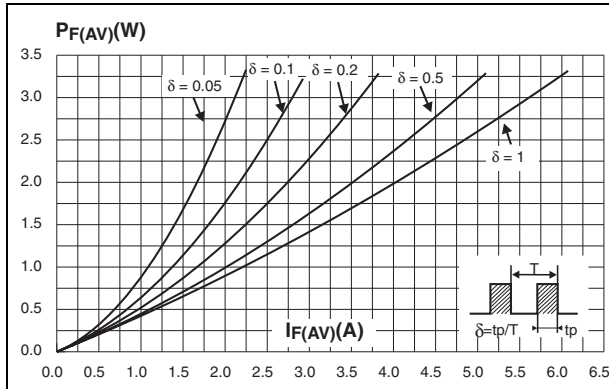


Figure 2. Average forward current versus ambient temperature (delta = 0.5) (per diode)

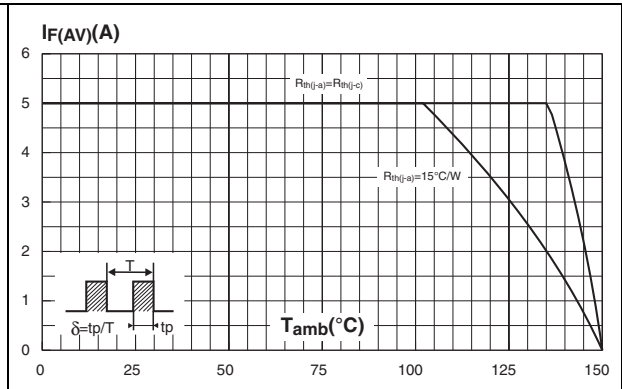


Figure 3. Normalized avalanche power derating versus pulse duration

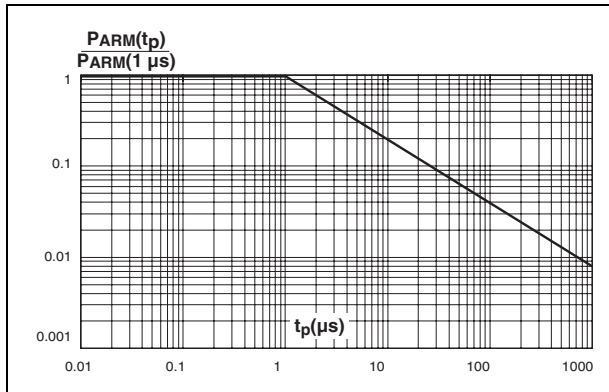


Figure 4. Normalized avalanche power derating versus junction temperature

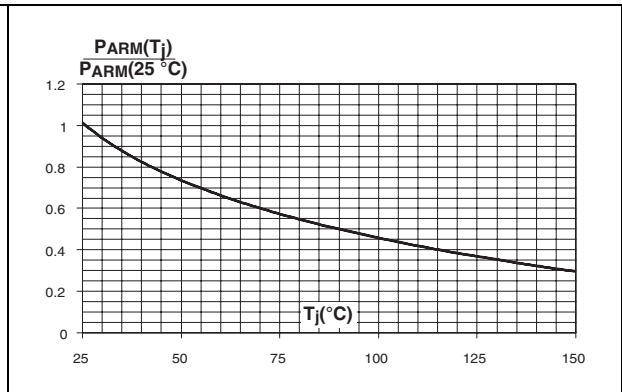


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

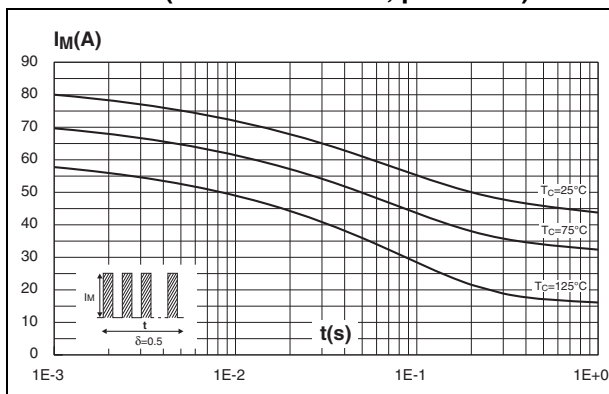


Figure 6. Relative variation of thermal transient impedance junction to case versus pulse duration

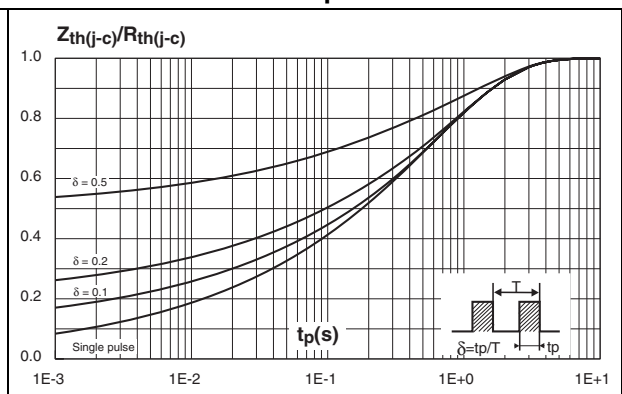


Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)

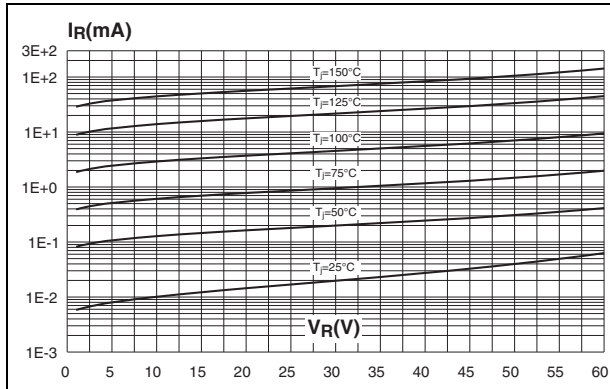


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

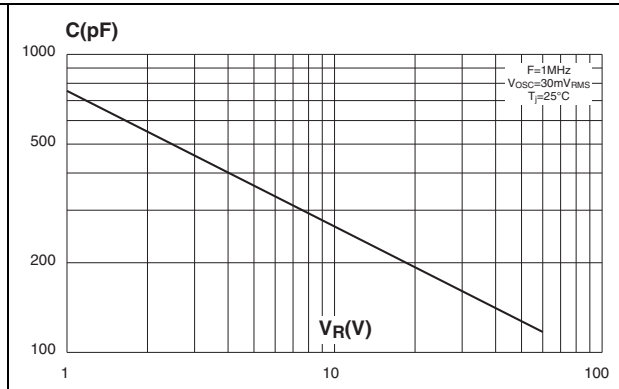
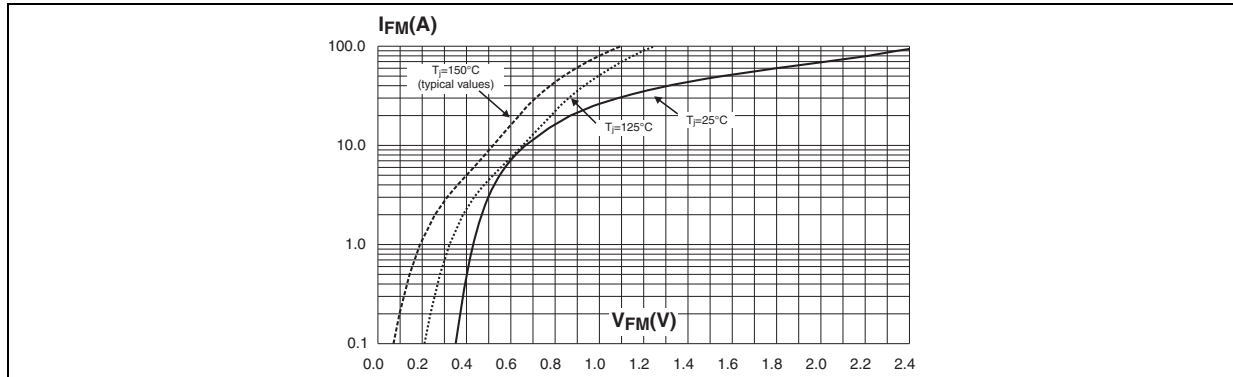


Figure 9. Forward voltage drop versus forward current (maximum values, per diode)



2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.4 to 0.6 N·m

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Table 5. TO-220FPAB 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
F2	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
STPS10L60CFP	STPS10L60CFP	TO-220FPAB	2 g	50	Tube

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
Jul-2003	3C	Last release.
26-Mar-2007	4	Removed ISOWATT package. Added D ² PAK package.
04-May-2011	5	Removed D ² PAK package and updated graphic in Table 5 .

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