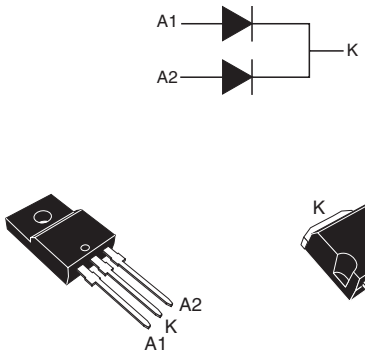
STPS10L60C

Power Schottky rectifier

Main product characteristics

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



TO-220FPAB
STPS10L60CFP

D²PAK
STPS10L60CG

Features and benefits

- Low forward voltage drop
- Negligible switching losses
- Insulated package: TO-220FPAB
  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 and D²PAK, this device is intended for use in high frequency inverters.

1 Characteristics

Symbol	Parameter				Value	Unit
V_{RRM}	Repetitive peak reverse voltage				60	V
$I_{F(RMS)}$	RMS forward current				30	A
$I_{F(AV)}$	Average forward current	TO220FPAB	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. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ thermal runaway condition for a diode on its own heatsink

Table 1. Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th\ (j-c)}$	Junction to case TO-220FPAB	Per diode Total	4.5 3.5	° C/W
$R_{th\ (c)}$		Coupling	2.5	° C/W

When the diodes 1 and 2 are used simultaneously :
ΔTj(diode 1) = P(diode1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

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

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

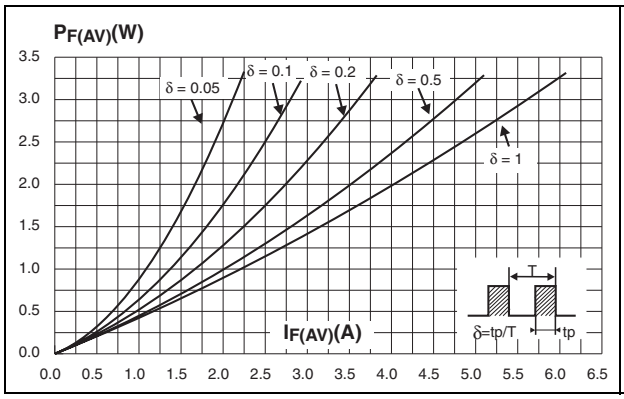


Figure 2. Average forward current versus ambient temperature (δ = 0.5) (per diode)

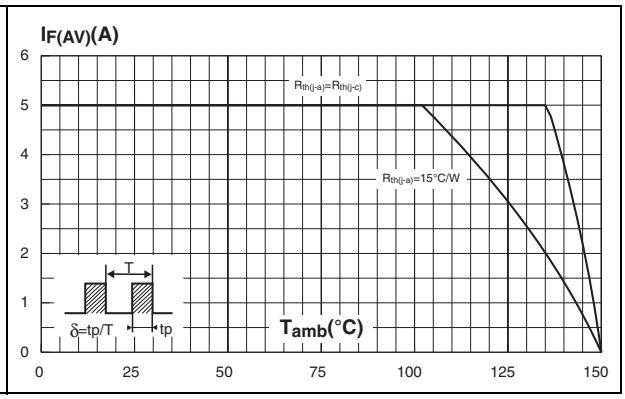


Figure 3. Normalized avalanche power derating versus pulse duration

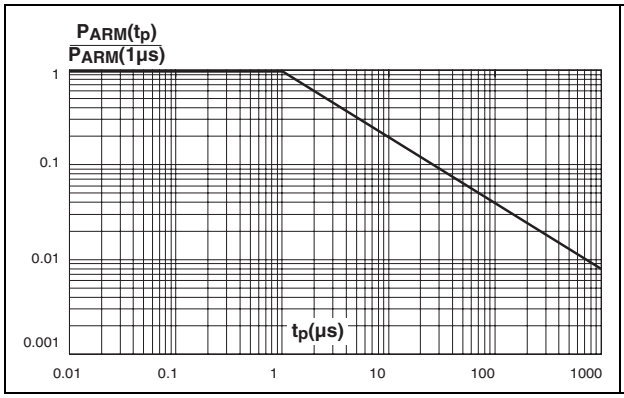


Figure 4. Normalized avalanche power derating versus junction temperature

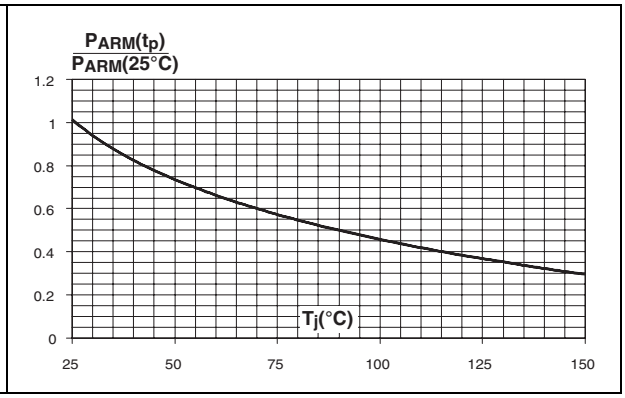


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220FPAB)

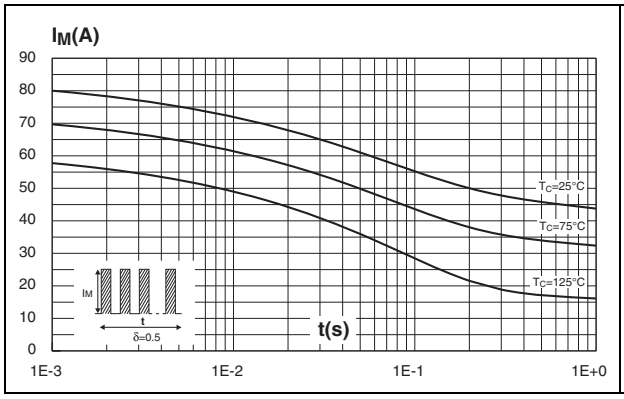


Figure 6. Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220FPAB)

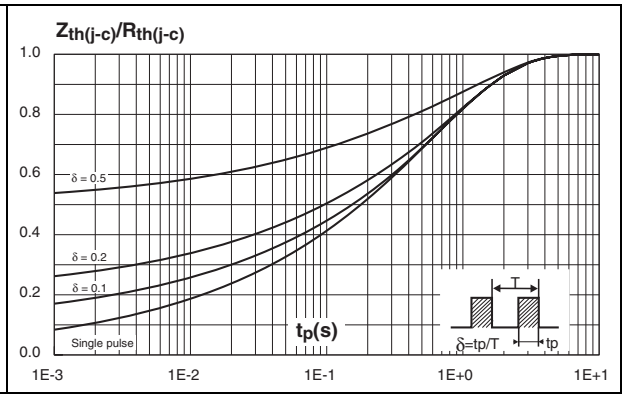


Figure 7. Relative variation of thermal transient impedance junction to case versus pulse duration (D^2PAK)

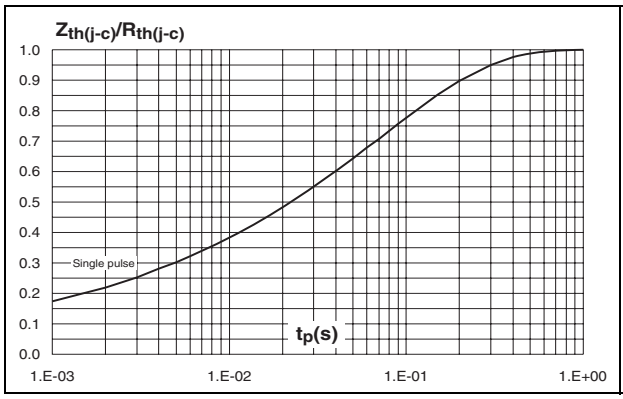


Figure 8. Reverse leakage current versus reverse voltage applied (typical values, per diode)

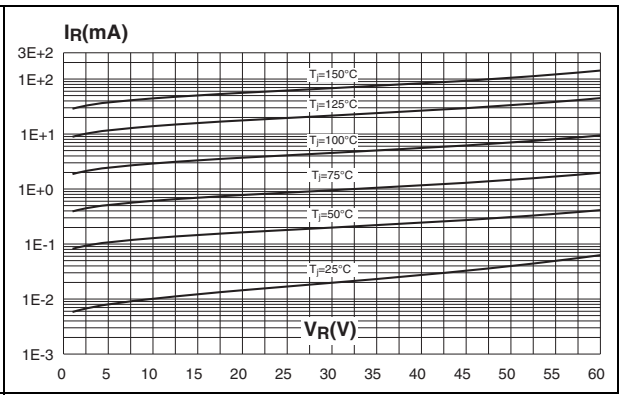


Figure 9. Junction capacitance versus reverse voltage applied (typical values, per diode)

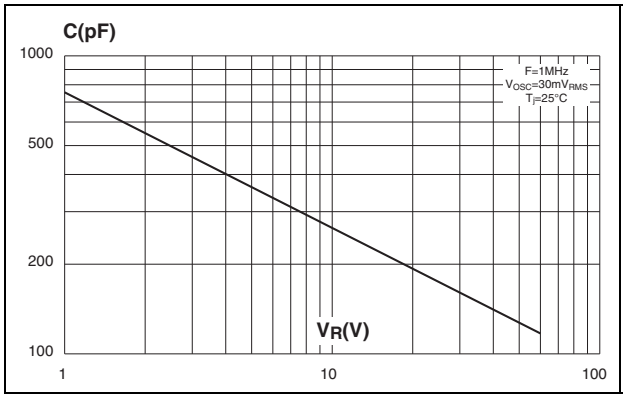


Figure 10. Forward voltage drop versus forward current (maximum values, per diode)

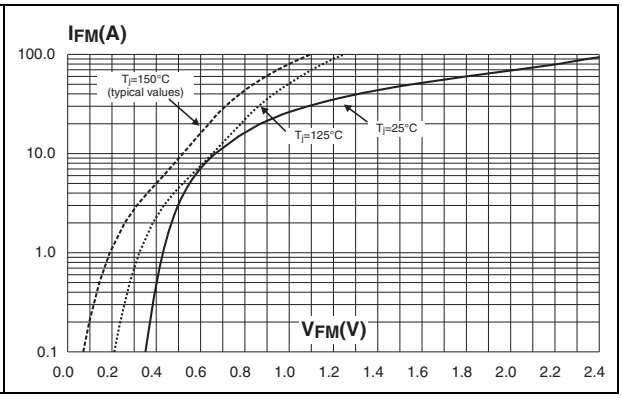
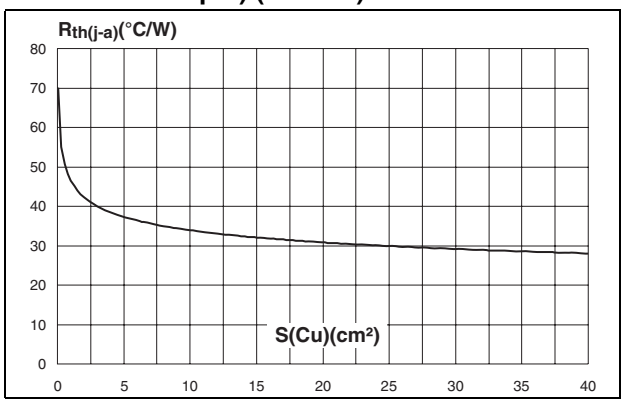


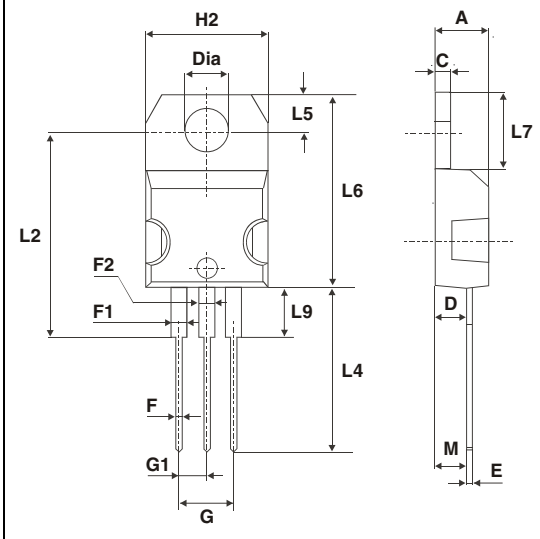
Figure 11. Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35 µm) (D^2PAK)



2 Package information

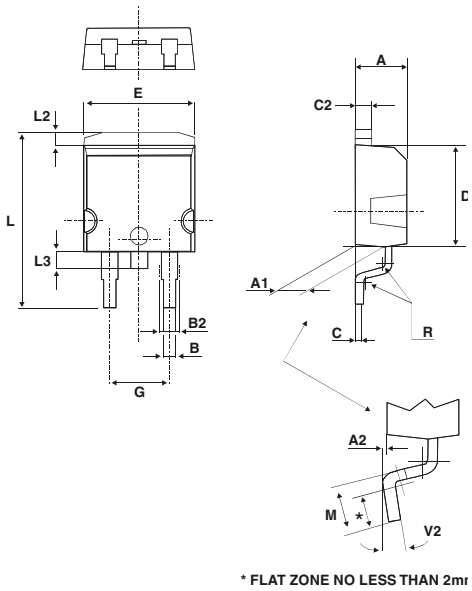
- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.55 Nm
- Maximum torque value: 0.70 Nm

Table 3. TO-220FPAB dimensions



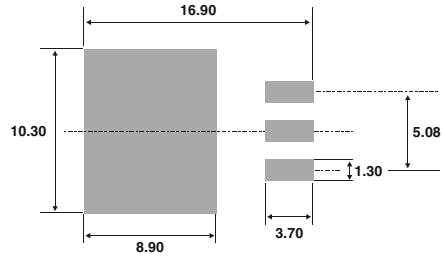
REF.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	2.50	2.70	0.098	0.106
D	2.50	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1.00	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.40	2.70	0.094	0.106
H	10.00	10.40	0.393	0.409
L2	16.00 Typ.		0.630 Typ.	
L3	28.60	30.60	1.126	1.205
L4	9.80	10.60	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Diam	3.00	3.20	0.118	0.126

Table 4. D²PAK dimensions



Ref	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

Figure 12. Footprint (dimensions in millimeters)



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3 Ordering information

Type	Marking	Package	Weight	Base qty	Delivery mode
STPS10L60CFP	STPS10L60CFP	TO-220FPAB	2 g	50	Tube
STPS10L60CG	STPS10L60CG	D^2PAK	1.48 g	50	Tube
STPS10L60CG-TR	STPS10L60CG	D^2PAK	1.48 g	1000	Tape and reel

4 Revision history

Date	Revision	Description of Changes
Jul-2003	3C	Last release.
26-Mar-2007	4	Removed ISOWATT package. Added D^2PAK package.

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