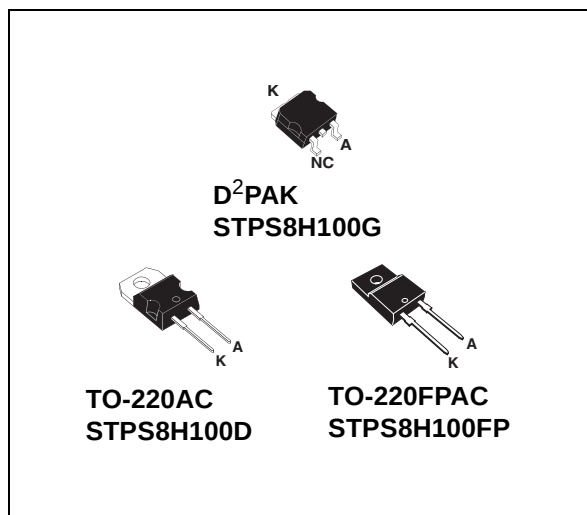


High voltage power Schottky rectifier

Datasheet - production data



Description

Schottky barrier rectifier designed for high frequency compact switched mode power supplies such as adaptators and on board DC/DC converters.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	8 A
V_{RRM}	100 V
T_j (max)	175° C
V_F (max)	0.58 V

Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade off between leakage current and forward voltage drop
- Insulated package:
 - TO-220FPAC
Insulating voltage = 2000 V AC
Typical package capacitance = 12 pF
- Avalanche capability specified

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			100	V
$I_{F(RMS)}$	RMS forward current			30	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AC, D ² PAK	$T_C = 165^\circ \text{C}$	8	A
		TO-220FPAC	$T_C = 150^\circ \text{C}$		
I_{FSM}	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ sinusoidal	250	A
P_{ARM}	Repetitive peak avalanche power		$t_p = 10 \mu\text{s}$ $T_j = 125^\circ \text{C}$	750	W
T_{stg}	Storage temperature range			-65 to + 175	$^\circ \text{C}$
T_j	Maximum operating junction temperature			175	$^\circ \text{C}$

Table 3. Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC, D ² PAK	1.6	$^\circ \text{C/W}$
		TO-220FPAC	4	

Table 4. Static electrical characteristics (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ \text{C}$	$V_R = V_{RRM}$			4.5	μA
		$T_j = 125^\circ \text{C}$			2	6.0	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ \text{C}$	$I_F = 8 \text{ A}$			0.71	V
		$T_j = 125^\circ \text{C}$			0.56	0.58	
		$T_j = 25^\circ \text{C}$	$I_F = 10 \text{ A}$			0.77	
		$T_j = 125^\circ \text{C}$			0.59	0.64	
		$T_j = 25^\circ \text{C}$	$I_F = 16 \text{ A}$			0.81	
		$T_j = 125^\circ \text{C}$			0.65	0.68	

1. $t_p = 5 \text{ ms}$, $\delta < 2\%$

2. $t_p = 380 \mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

$$P = 0.48 \times I_{F(AV)} + 0.0125 I_{F(RMS)}^2$$

Figure 1. Average forward power dissipation versus average forward current

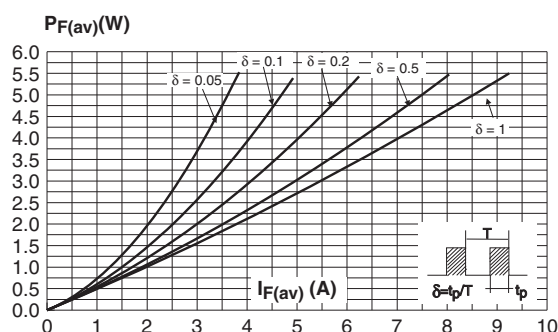


Figure 2. Normalized avalanche power derating versus pulse duration

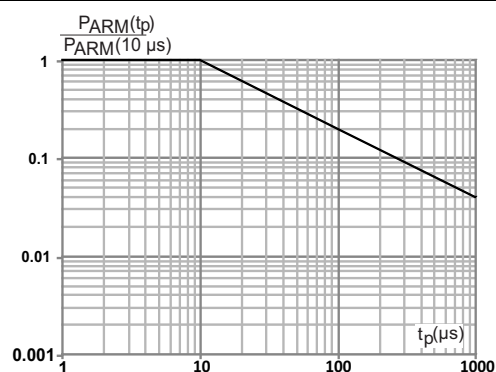


Figure 3. Average forward current versus ambient temperature, $\delta = 0.5$, (TO-220AC, D²PAK)

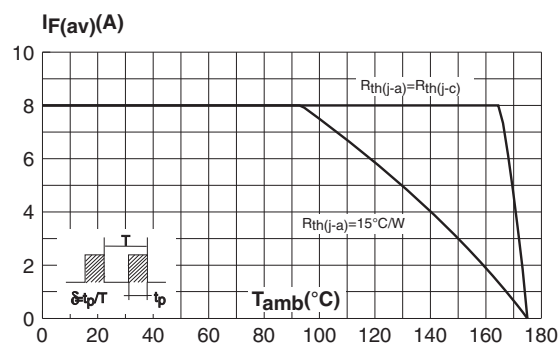


Figure 4. Average forward current versus ambient temperature, $\delta = 0.5$, (TO-220FPAC)

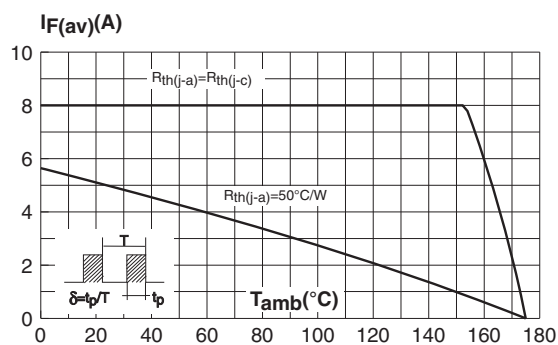


Figure 5. Non repetitive surge peak forward current versus overload duration - maximum values, per diode (TO-220AC, D²PAK)

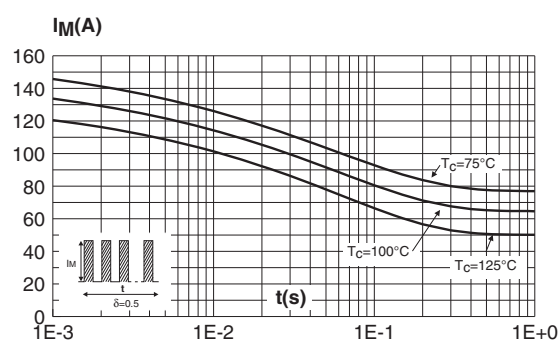


Figure 6. Non repetitive surge peak forward current versus overload duration - maximum values (TO-220FPAC)

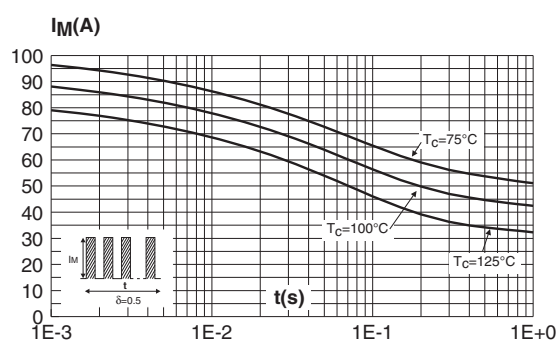


Figure 7. Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, D²PAK)

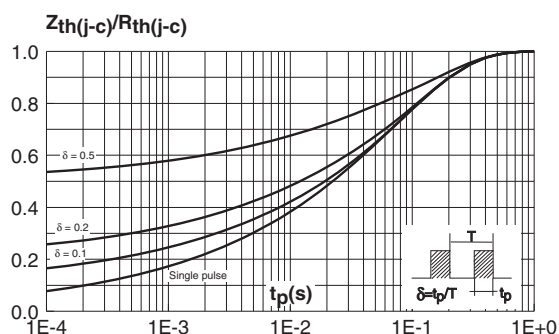


Figure 8. Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC)

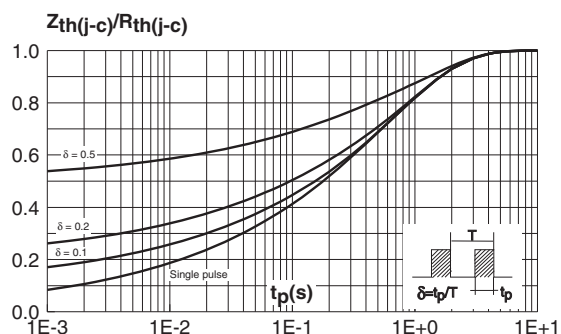


Figure 9. Reverse leakage current versus reverse voltage applied (typical values)

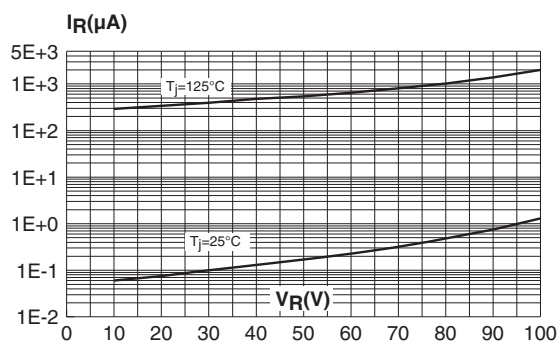


Figure 10. Junction capacitance versus reverse voltage applied (typical values)

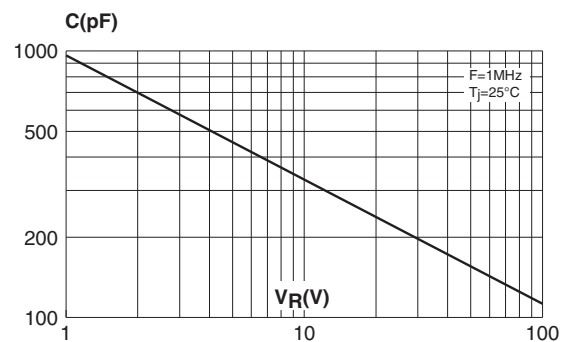


Figure 11. Forward voltage drop versus forward current (maximum values)

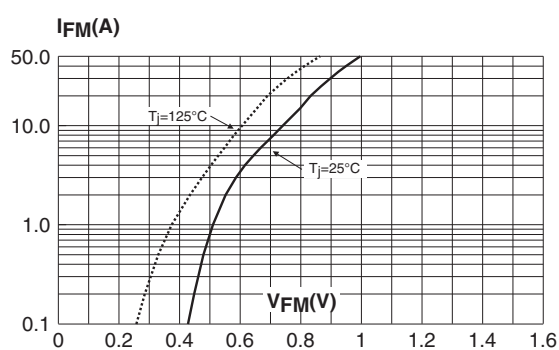
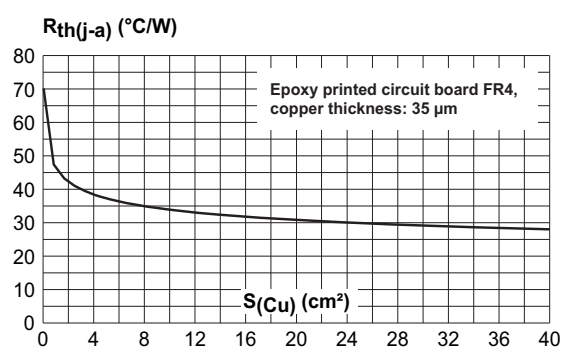


Figure 12. Thermal resistance junction to ambient versus copper surface under tab (D²PAK)



2 Package Information

- Epoxy meets UL94,V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.4 to 0.6 N·m (TO-220AC)

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Figure 13. D²PAK dimension definitions

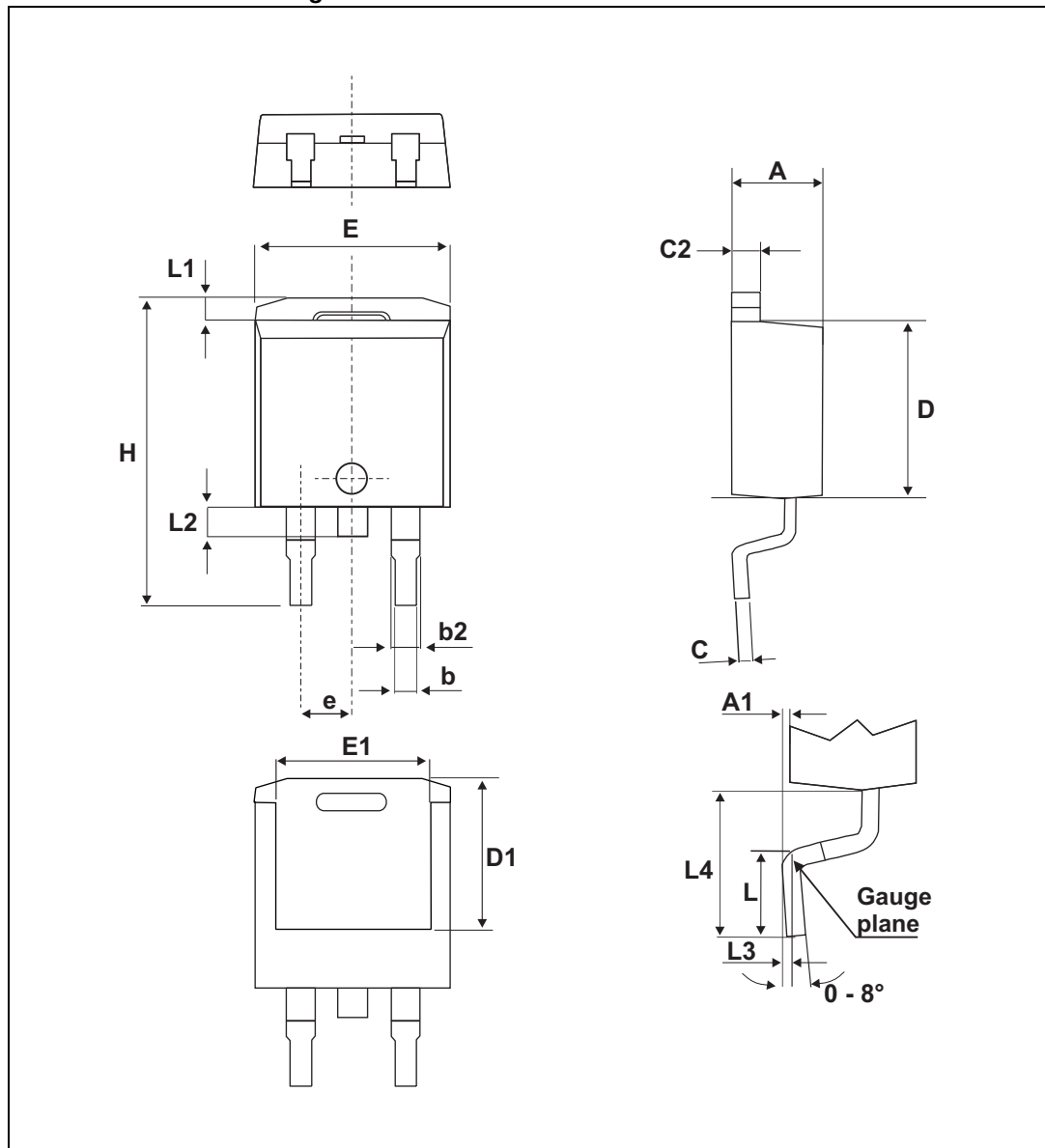


Table 5. D²PAK dimension values

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.36	4.60	0.172	0.181
A1	0.00	0.25	0.000	0.010
b	0.70	0.93	0.028	0.037
b2	1.14	1.70	0.045	0.067
c	0.38	0.694	0.015	0.027
c1	0.38	0.534	0.015	0.021
c2	1.19	1.36	0.047	0.053
D	8.60	9.35	0.339	0.368
D1	6.90	-	0.272	-
E	10.00	10.55	0.394	0.415
E1	8.10	-	0.319	-
e	2.54 typ.		0.100 typ.	
H	15.00	15.85	0.591	0.624
L	1.90	2.79	0.075	0.110
L1	-	1.65	-	0.065
L2	-	1.78	-	0.070
L3	0.25 typ.		0.010 typ.	
L4	4.78	5.28	0.188	0.208

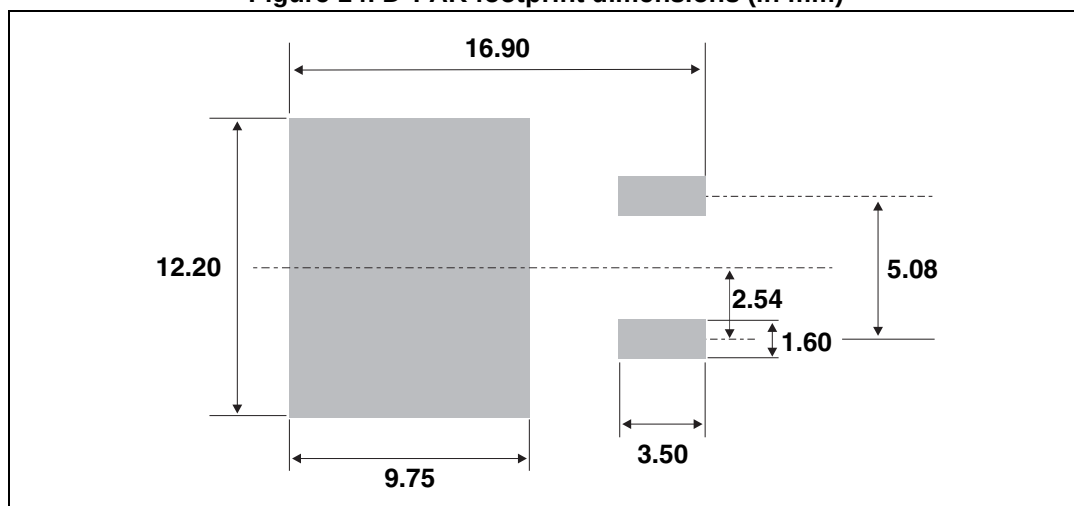
Figure 14. D²PAK footprint dimensions (in mm)

Figure 15. TO-220AC dimension definitions

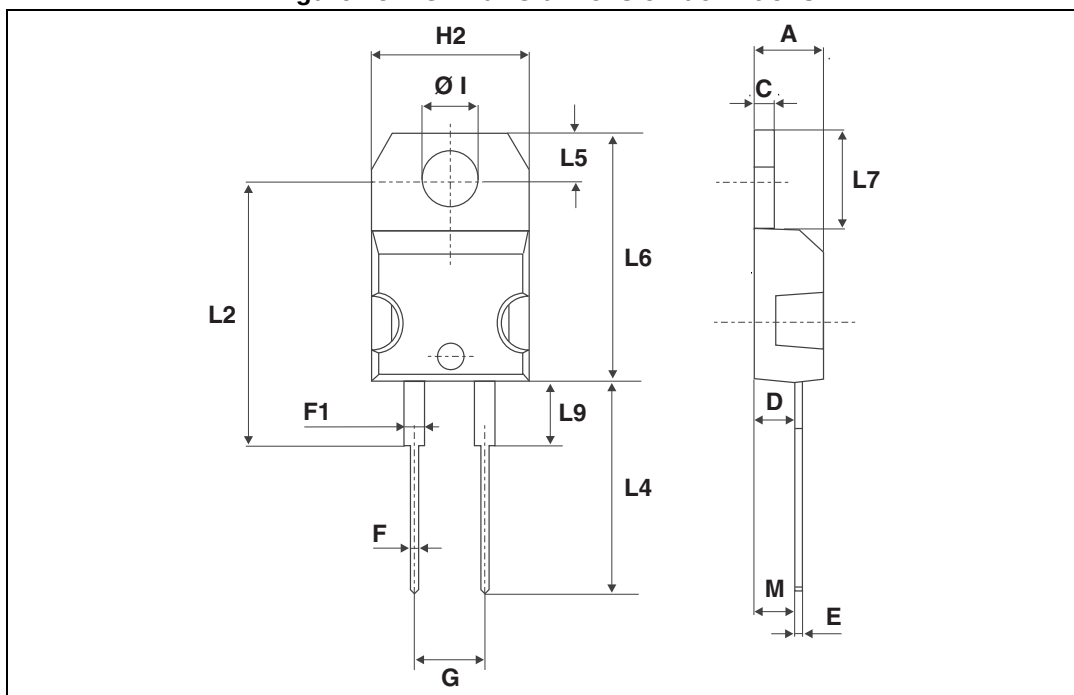


Table 6. TO-220AC dimension values

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
H2	10.00	10.40	0.393	0.409
L2	16.40 typ.		0.645 typ.	
L4	13.00	14.00	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam. I	3.75	3.85	0.147	0.151

Figure 16. TO-220FPAC dimension definitions

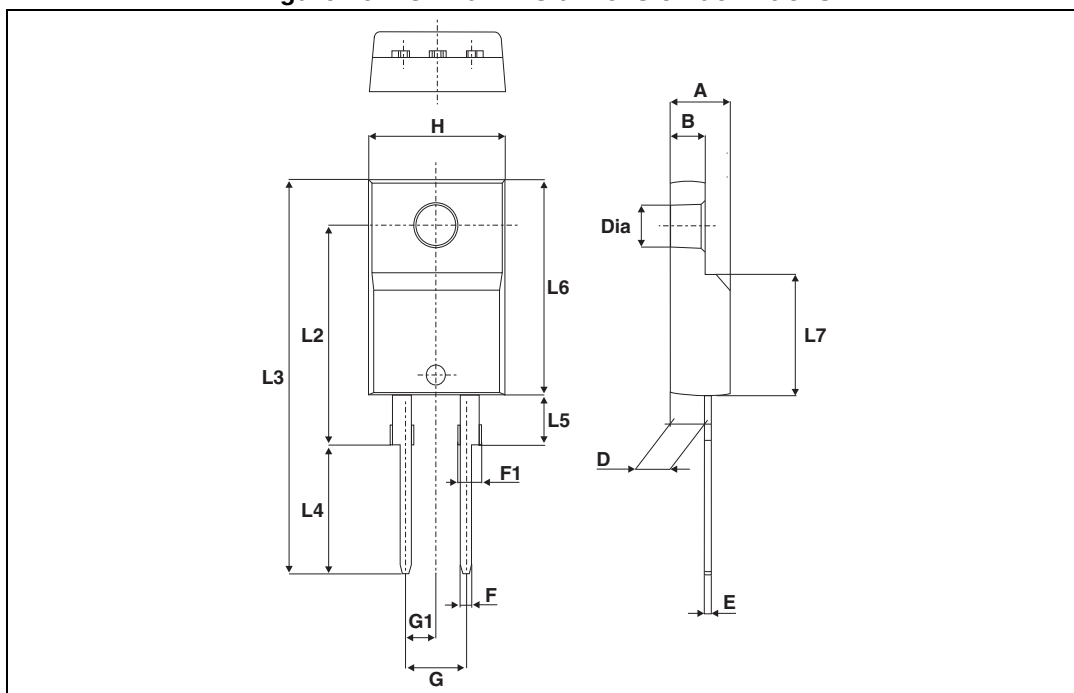


Table 7. TO-220FPAC dimension values

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 8. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS8H100D	STPS8H100D	TO-220AC	1.86 g	50	Tube
STPS8H100FP	STPS8H100FP	TO-220FPAC	1.9 g	50	Tube
STPS8H100G	STPS8H100G	D ² PAK	1.48 g	50	Tube
STPS8H100G-TR	STPS8H100G	D ² PAK	1.48 g	500	Tape and reel

4 Revision history

Table 9. Document revision history

Date	Revision	Description of Changes
Jul-2003	6D	Last update.
1-June-2006	10	Reformatted to current standard. Added ECOPACK statement. Changed nF to pF in Figure 11. Revision number set to 10 to align with on-line versioning.
08-Apr-2014	11	Updated D ² PAK package information and Figure 2 .

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