

1 Characteristics

Table 1. Absolute ratings (limiting values at $T_j = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			200	V
I _{F(RMS)}	RMS forward current			16	A
I _{F(AV)}	Average forward current, δ = 0.5	TO-220A, DPAK, D ² PAK	T _c = 145° C	8	A
		TO-220FPAC	T _c = 125° C		
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms Sinusoidal		100	A
T _{stg}	Storage temperature range			-65 to + 175	° C
T _j	Maximum operating junction temperature			175	° C

Table 2. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC, DPAK, D ² PAK	3.2	$^\circ\text{C/W}$
		TO-220FPAC	5.5	

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			6	μA
		$T_j = 125^\circ\text{C}$			6	60	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 8\text{ A}$		0.95	1.05	V
		$T_j = 150^\circ\text{C}$			0.8	0.90	

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

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

To evaluate the conduction losses use the following equation:

$$P = 0.73 \times I_{F(AV)} + 0.021 I_{F(RMS)}^2$$

Table 4. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	$I_F = 1\text{ A}$, $dI_F/dt = -50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $T_j = 25\text{ }^\circ\text{C}$		25	30	ns
		$I_F = 1\text{ A}$, $dI_F/dt = -100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $T_j = 25\text{ }^\circ\text{C}$		17	22	
I_{RM}	Reverse recovery current	$I_F = 8\text{ A}$, $dI_F/dt = -200\text{ A}/\mu\text{s}$, $V_R = 160\text{ V}$, $T_j = 125\text{ }^\circ\text{C}$		5.5	7	A
t_{fr}	Forward recovery time	$I_F = 8\text{ A}$, $dI_F/dt = 50\text{ A}/\mu\text{s}$, $V_{FR} = 1.1 \times V_{Fmax}$, $T_j = 25\text{ }^\circ\text{C}$		150		ns
V_{FP}	Forward recovery voltage	$I_F = 8\text{ A}$, $dI_F/dt = 50\text{ A}/\mu\text{s}$, $T_j = 25\text{ }^\circ\text{C}$		1.5		V

Figure 1. Peak current versus duty cycle

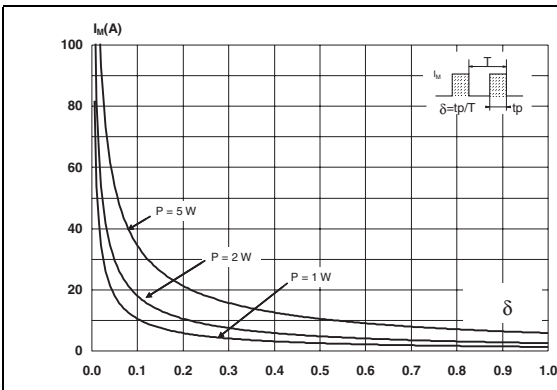


Figure 2. Forward voltage drop versus forward current (typical values)

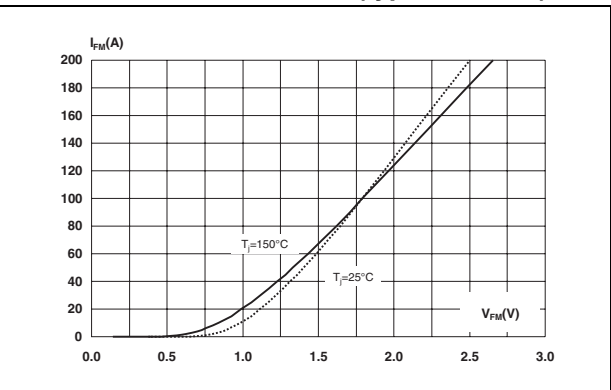


Figure 3. Forward voltage drop versus forward current (maximum values)

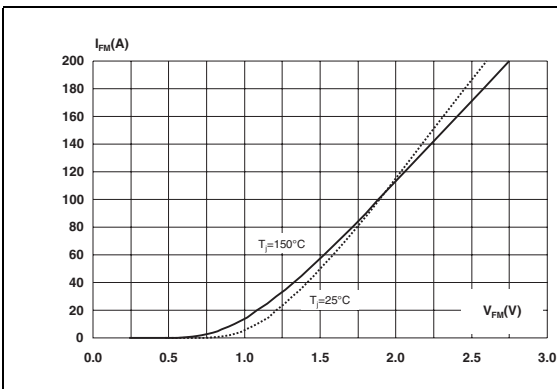


Figure 4. Relative variation of thermal impedance, junction to case, versus pulse duration (TO-220AC, DPAK, D²PAK)

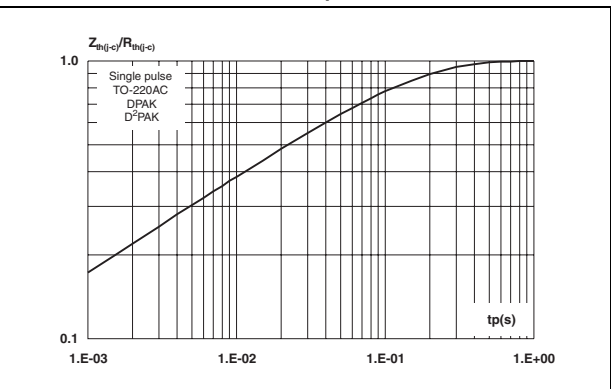


Figure 5. Relative variation of thermal impedance, junction to case, versus pulse duration (TO-220FPAC)

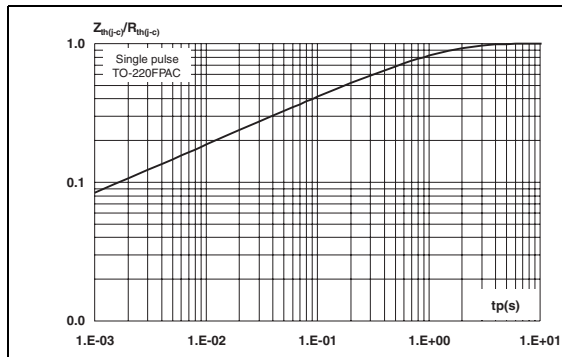


Figure 6. Junction capacitance versus reverse applied voltage (typical values)

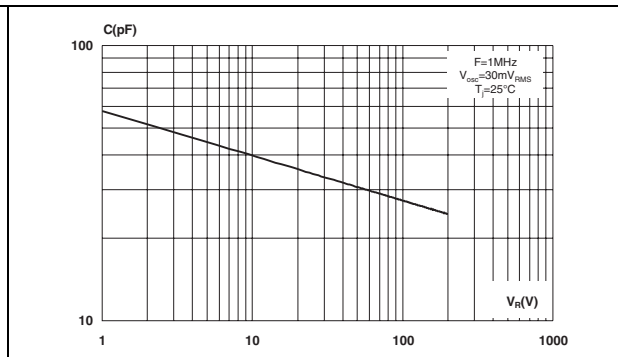


Figure 7. Reverse recovery charges versus dl_F/dt (typical values)

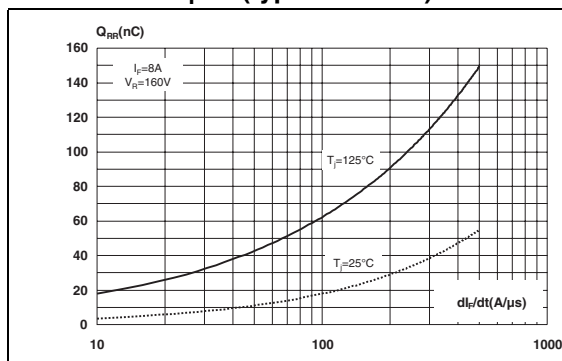


Figure 8. Reverse recovery time versus dl_F/dt (typical values)

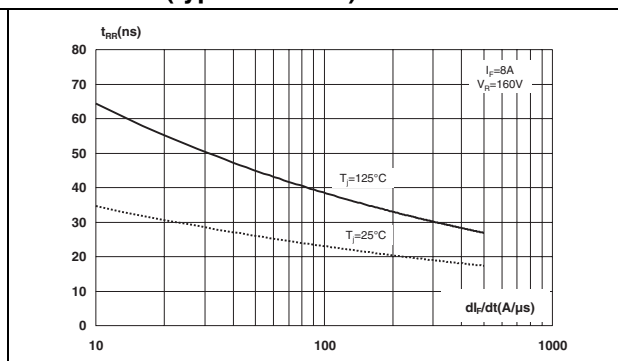


Figure 9. Peak reverse recovery current versus dl_F/dt (typical values)

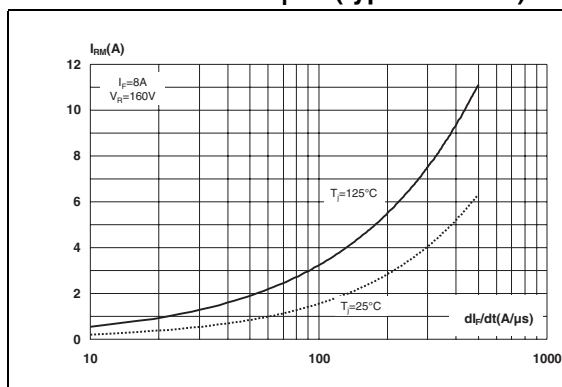


Figure 10. Dynamic parameters versus junction temperature

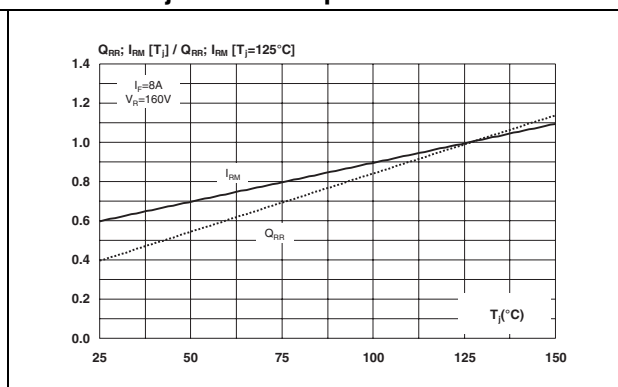


Figure 11. Thermal resistance, junction to ambient, versus copper surface under tab - Epoxy printed circuit board FR4, $e_{CU} = 35 \mu m$ (D²PAK)

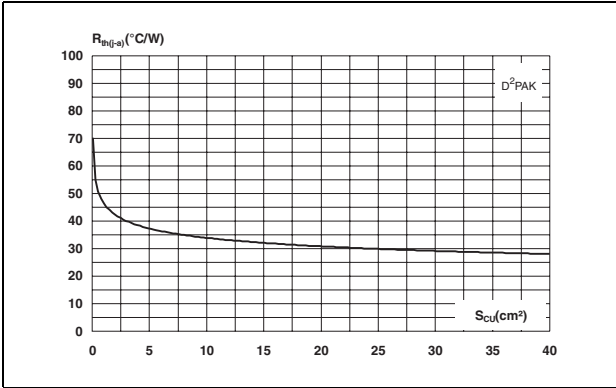
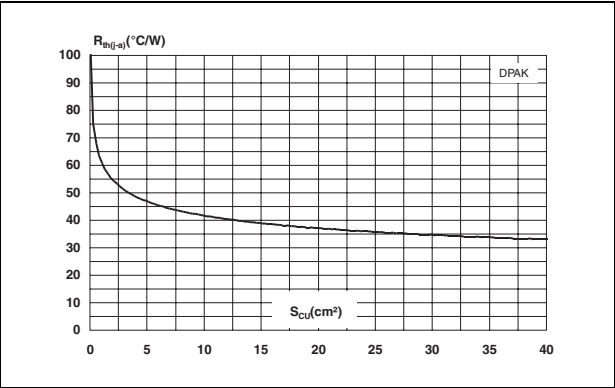
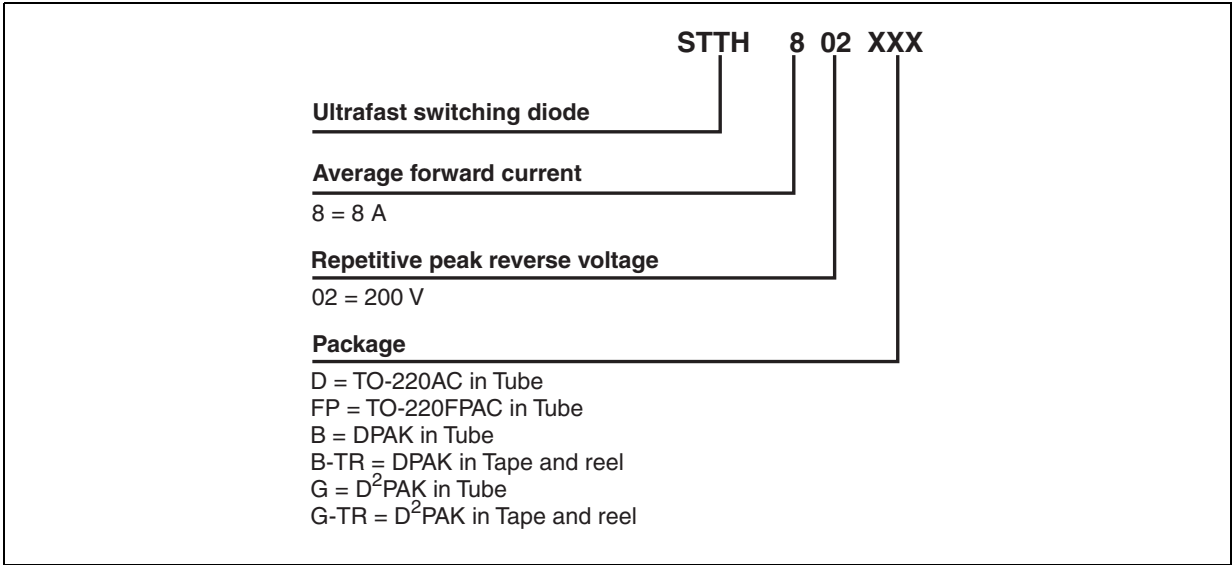


Figure 12. Thermal resistance, junction to ambient, versus copper surface under tab - Epoxy printed circuit board FR4, $e_{CU} = 35 \mu m$ (DPAK)



2 Ordering information scheme



3 Package information

Epoxy meets UL94, V0
 Cooling method: by conduction (C)
 Recommended torque value: 0.8 Nm
 Maximum torque value: 1.0 Nm

Table 5. T0-220AC dimensions

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

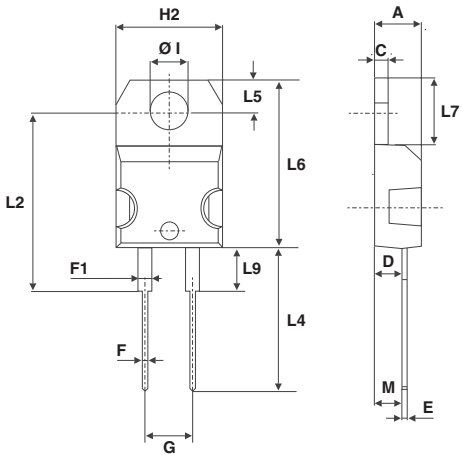
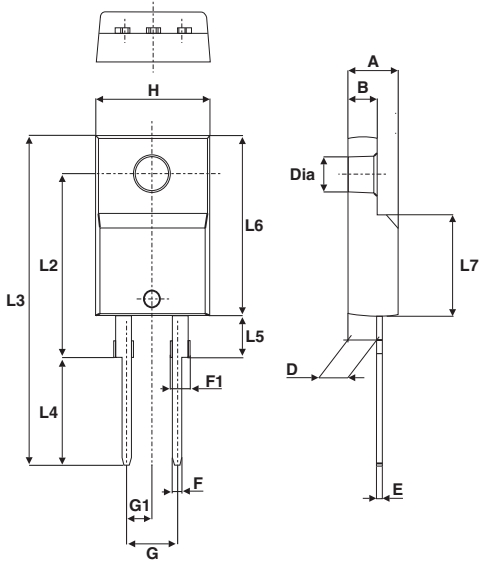


Table 6. T0-220FPAC dimensions

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

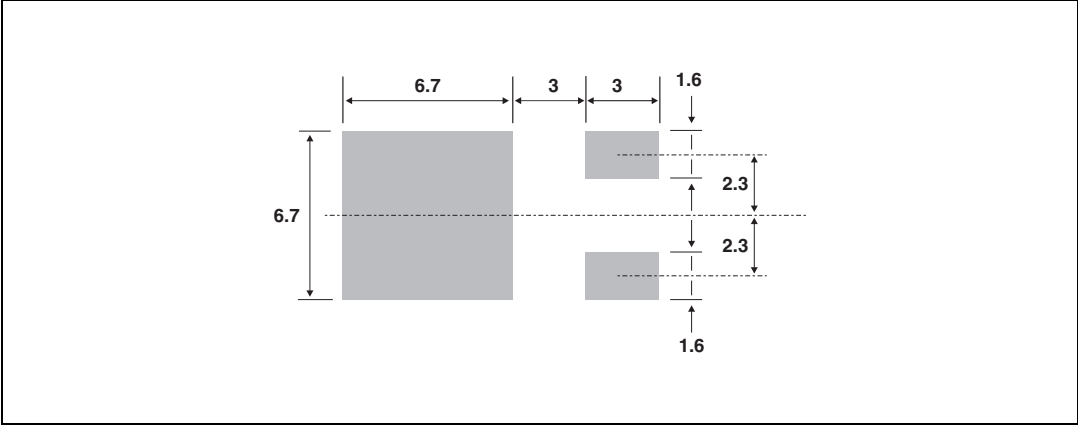


The technical drawing shows two views of the T0-220FPAC package. The top view shows a rectangular package with a central circular feature. Dimensions A, B, D, and Dia. are indicated. The side view shows the package's profile with dimensions L2, L3, L4, L5, L6, L7, F, F1, G, and G1. The package has a central circular feature and a rectangular base.

Table 7. 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 13. DPAK footprint (dimensions in mm)



Technical drawing of a 1/2 inch NPT female plug. The drawing includes a top view, a side view, and a detail view of the thread. Dimensions are labeled as follows:

- Top View:** L2 (width of the top flange), L (total height), L3 (height of the body), E (width of the body), B2 (width of the base), B (width of the base), G (width of the base).
- Side View:** A (height of the top flange), C2 (height of the top flange), D (height of the body), A1 (height of the body), C (height of the body), R (height of the body).
- Detail View:** A2 (height of the thread), M (height of the thread), V2 (height of the thread).

* FLAT ZONE NO LESS THAN 2mm

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°

Technical drawing of a mechanical part showing front and side views with dimensions.

Front View (Left):

- Overall width: 16.90
- Overall height: 10.30
- Bottom width: 8.90

Side View (Right):

- Overall width: 3.70
- Overall height: 5.08
- Distance from bottom to the center of the middle hole: 1.30

4 Ordering information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STTH802D	STTH802	TO-220AC	1.86 g	50	Tube
STTH802FP	STTH802	TO-220FPAC	2.2 g	50	Tube
STTH802B	STTH802	DPAK	0.3 g	75	Tube
STTH802B-TR	STTH802	DPAK	0.3 g	2500	Tape and reel
STTH802G	STTH802	D ² PAK	1.48 g	50	Tube
STTH802G-TR	STTH802	D ² PAK	1.48 g	1000	Tape and reel

5 Revision history

Date	Revision	Description of Changes
03-May-2006	1	First issue
22-Sep-2006	2	Added D ² PAK package

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