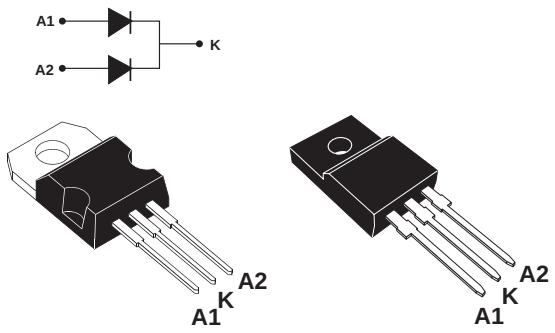
STTH802CT/CB/CFP

HIGH EFFICIENCY ULTRAFAST DIODE

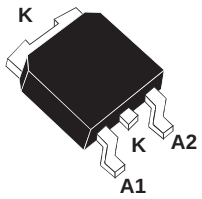
MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 4A
V_{RRM}	200 V
Tj (max)	175 °C
V_F (max)	0.95 V
trr (max)	20 ns



TO-220AB
STTH802CT

TO-220FPAB
STTH802CFP



DPAK
STTH802CB

FEATURES AND BENEFITS

- Suited for SMPS
- Low losses
- Low forward and reverse recovery times
- High surge current capability
- High junction temperature
- Insulated package: TO-220FPAB

DESCRIPTION

Dual center tap rectifier suited for Switch Mode Power Supplies and High frequency DC to DC converters.
Packaged in DPAK, TO-220AB or TO-220FPAB. This device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter				Value	Unit
V_{RRM}	Repetitive peak reverse voltage				200	V
$I_{F(RMS)}$	RMS forward current	TO-220AB / TO-220FPAB / DPAK			10	A
$I_{F(AV)}$	Average forward current δ =0.5	TO-220AB / DPAK	Tc = 155°C	Per diode	4	A
		TO-220FPAB	Tc = 145°C			
		TO-220AB / DPAK	Tc = 150°C	Per device	8	A
		TO-220FPAB	Tc = 130°C			
I_{FSM}	Surge non repetitive forward current		tp = 10 ms Sinusoidal		50	A
T_{stg}	Storage temperature range				- 65 + 175	°C
Tj	Maximum operating junction temperature				175	°C

THERMAL PARAMETERS

Symbol	Parameter			Maximum	Unit
$R_{th\ (j-c)}$	Junction to case	TO-220AB / DPAK	Per diode	4.0	°C/W
		TO-220FPAB		6.5	
		TO-220AB / DPAK	Total	2.5	
		TO-220FPAB		5	
$R_{th\ (j-c)}$	Coupling	TO-220AB / DPAK		1	°C/W
		TO-220FPAB		3.5	

When the diodes 1 and 2 are used simultaneously:
Δ Tj (diode1) = P(diode1) x $R_{th(j-c)}$ (per diode) + P(diode2) x $R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R*	Reverse leakage current	Tj = 25°C	$V_R = V_{RRM}$			4	µA
		Tj = 125°C			2	40	
V_F**	Forward voltage drop	Tj = 25°C	I_F = 4 A			1.1	V
		Tj = 125°C	I_F = 4 A		0.81	0.95	
		Tj = 25°C	I_F = 8 A			1.25	
		Tj = 125°C	I_F = 8 A		0.95	1.1	

Pulse test: * tp = 5ms, δ < 2%

** tp = 380µs, δ < 2%

To evaluate the maximum conduction losses use the following equation :
$P = 0.80 \times I_{F(AV)} + 0.037\ I_F{}^2{}_{(RMS)}$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
trr	Reverse recovery time	Tj = 25°C	I_F = 0.5 A Irr = 0.25 A I_R = 1A		13	20	ns
tfr	Forward recovery time	Tj = 25°C	I_F = 4 A dI_F/dt = 100 A/µs V_{FR} = 1.1 x $V_F$max		50		ns
V_{FP}	Forward recovery voltage	Tj = 25°C	I_F = 4 A dI_F/dt = 100 A/µs		2.4		V

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

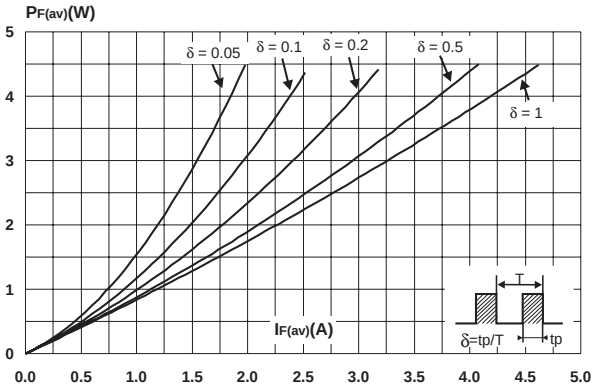


Fig. 2: Peak current versus form factor (per diode).

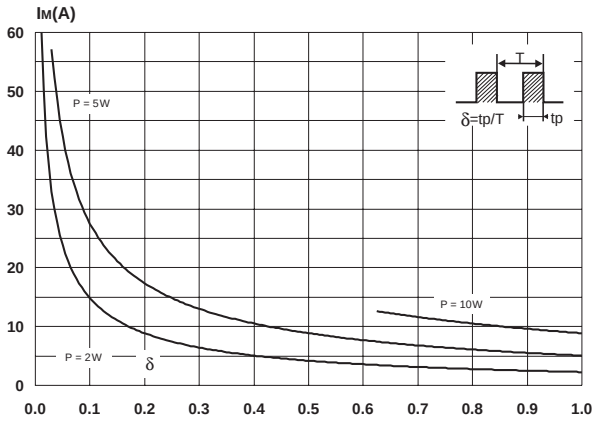


Fig. 3: Forward voltage drop versus forward current (per diode).

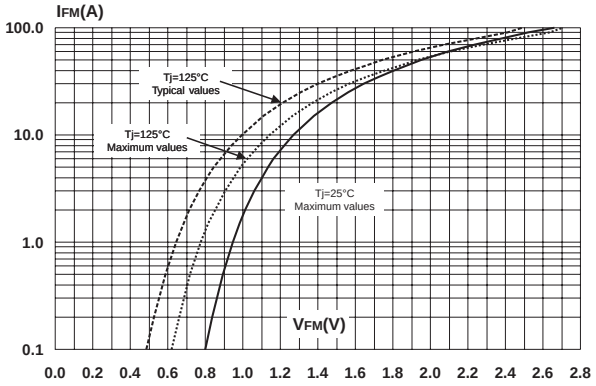


Fig. 4-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB, DPAK).

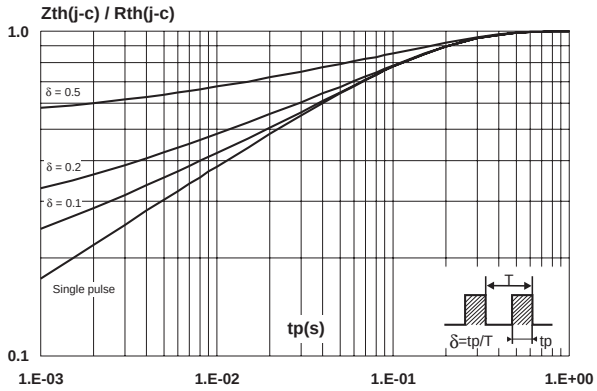


Fig. 4-2: Relative variation of thermal impedance junction to case versus duration (TO-220FPAB).

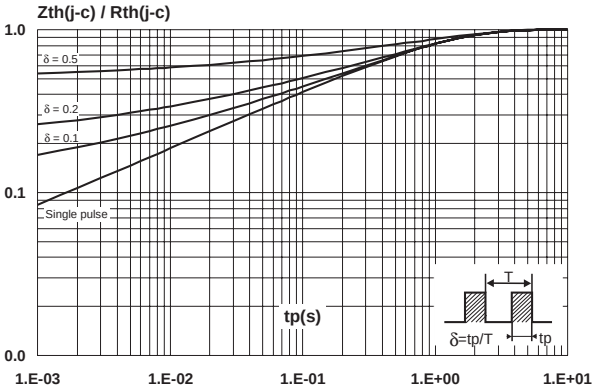


Fig. 5-1: Non repetitive surge peak forward current versus overload duration per diode (TO-220AB, DPAK).

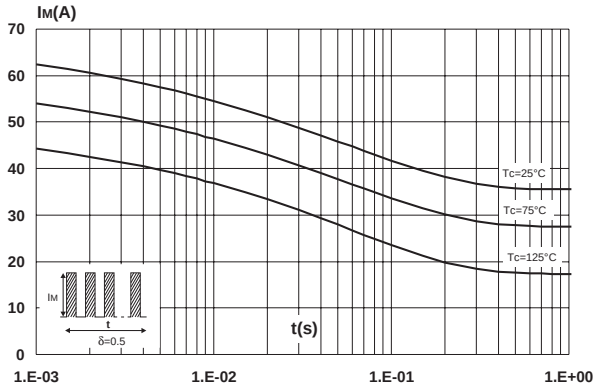


Fig. 5-2: Non repetitive surge peak forward current versus overload duration per diode (TO-220FPAB).

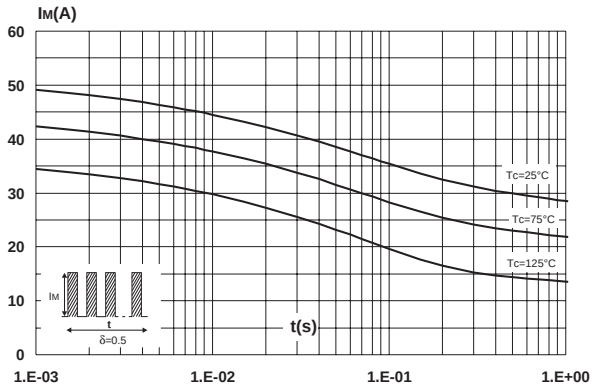


Fig. 6: Average forward current versus ambient temperature (δ = 0.5, per diode).

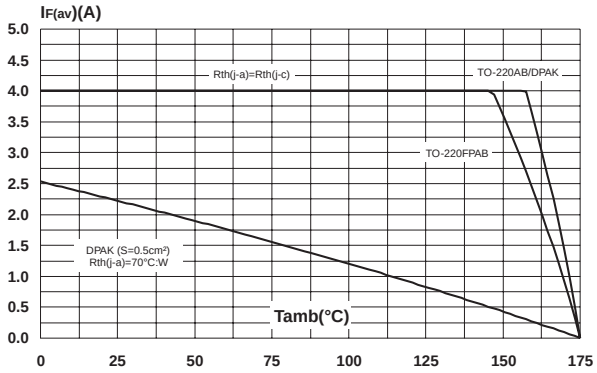


Fig. 7: Junction capacitance versus reverse voltage applied (typical values, per diode).

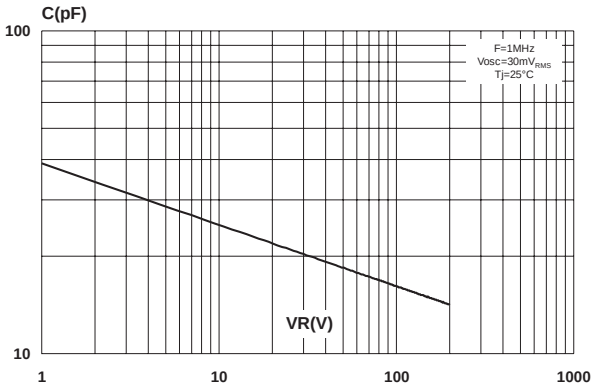


Fig. 8: Reverse recovery charges versus dIF/dt (90% confidence, per diode).

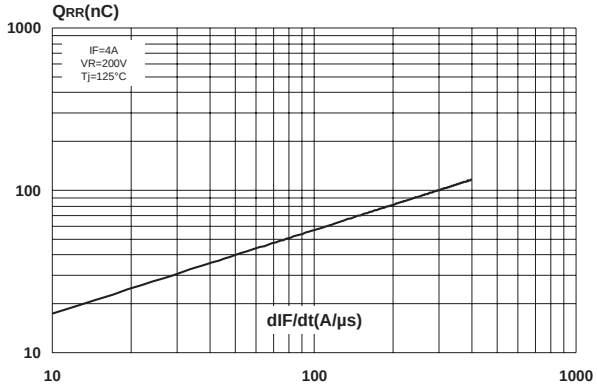


Fig. 9: Peak reverse recovery current versus dIF/dt (90% confidence, per diode).

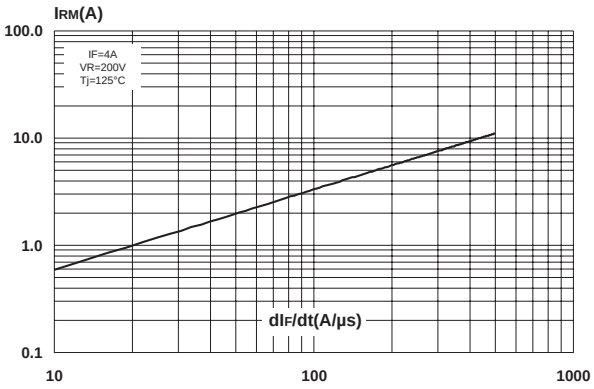


Fig. 10: Dynamic parameters versus junction temperature.

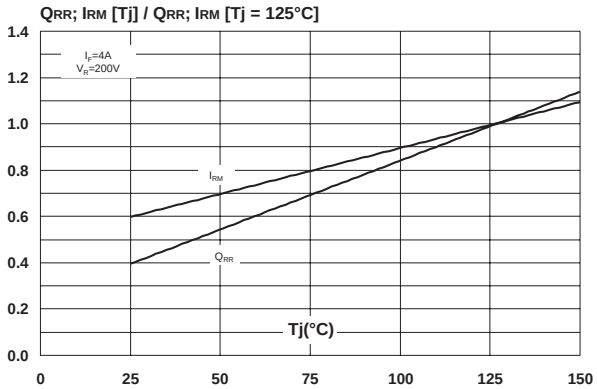
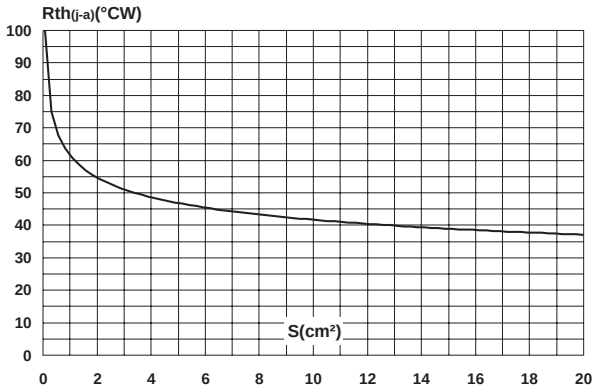
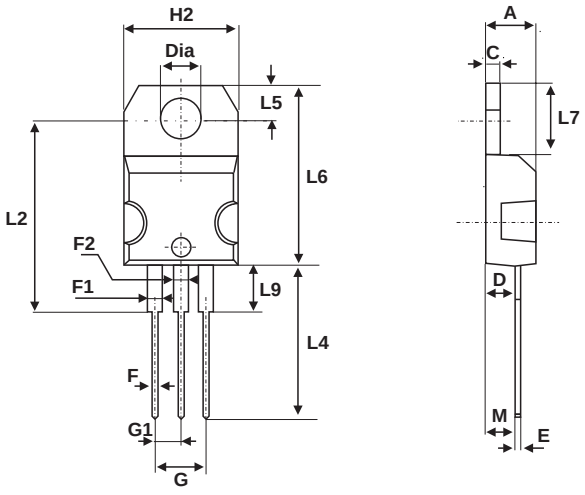


Fig. 11: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm) for DPAK.



PACKAGE MECHANICAL DATA

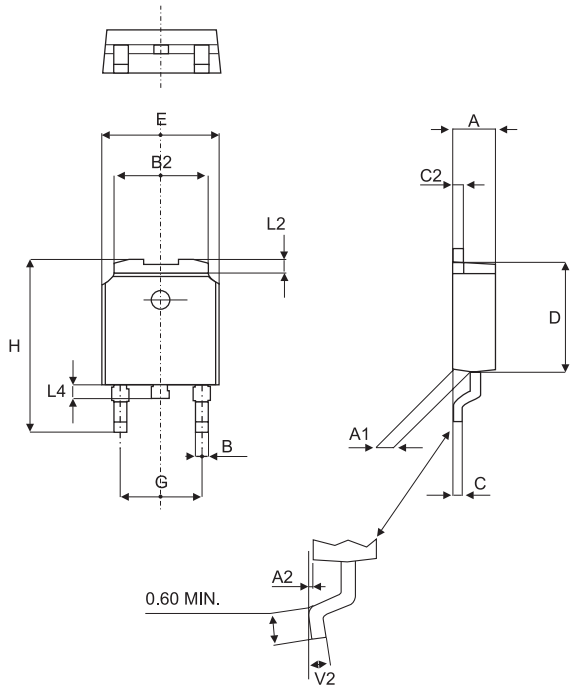
TO-220AB



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
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
L2	16.4 typ.		0.645 typ.	
L4	13	14	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.	3.75	3.85	0.147	0.151

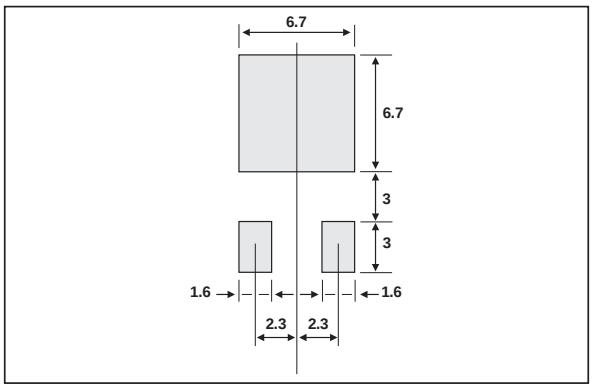
PACKAGE MECHANICAL DATA

DPAK



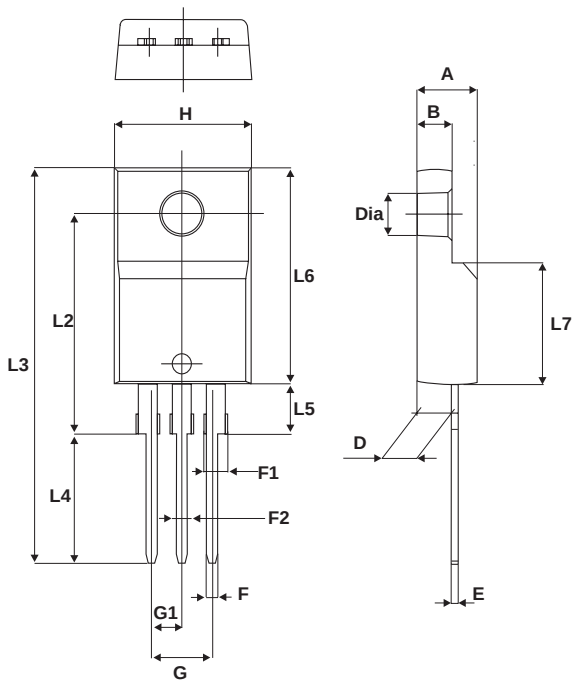
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
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°

FOOTPRINT



PACKAGE MECHANICAL DATA

TO-220FPAB



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

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH802CT	STTH802CT	TO-220AB	2.23 g	50	Tube
STTH802CB	STTH802CB	DPAK	0.3 g	75	Tube
STTH802CB-TR	STTH802CB	DPAK	0.3 g	2500	Tape & reel
STTH802CFP	STTH802CFP	TO-220FPAB	2.0 g	50	Tube

- Cooling method: by conduction (method C)
- Recommended torque value (TO-220AB): 0.8 N.m
- Maximum torque value (TO-220AB): 1.0 N.m
- Recommended torque value (TO-220FPAB): 0.55 N.m
- Maximum torque value (TO-220FPAB): 0.7 N.m
- Epoxy meets UL 94,V0