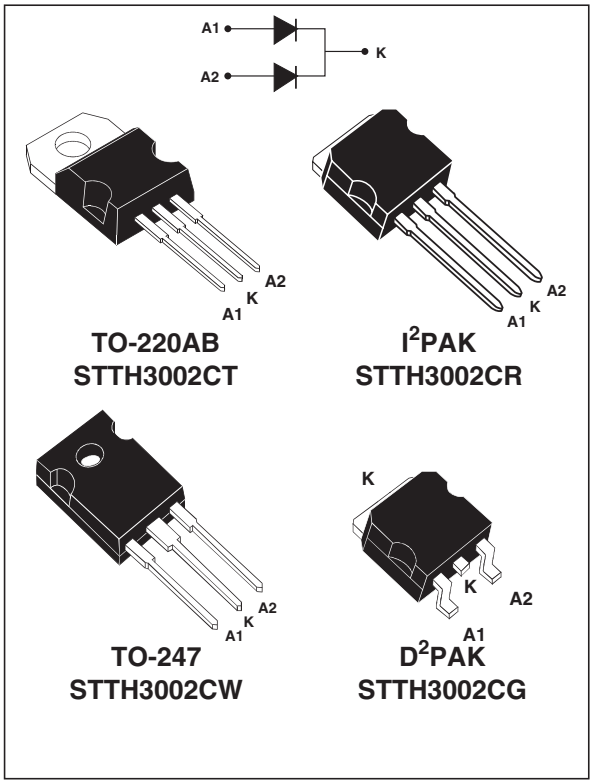
STTH3002C

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 15A
V_{RRM}	200 V
Tj (max)	175 °C
V_F (typ)	0.75 V
t_{rr} (typ)	17 ns



TO-220AB
STTH3002CT

I^2PAK
STTH3002CR

TO-247
STTH3002CW

D^2PAK
STTH3002CG

FEATURES AND BENEFITS

- Suited for SMPS
- Low losses
- Low forward and reverse recovery times
- High surge current capability
- High junction temperature
- Low leakage current

DESCRIPTION

Dual center tap rectifier suited for Switch Mode Power Supplies and High frequency DC to DC converters.
Packaged in TO-220AB, D^2PAK, TO-247 and I^2PAK, 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			50	A
$I_{F(AV)}$	Average forward current δ =0.5	Tc = 155°C	Per diode	15	A
		Tc = 145°C	Per device	30	
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal		180	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	Per diode	1.5	°C/W
		Per device	1.0	
$R_{th\ (j-c)}$	Coupling		0.5	°C/W

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	$V_R = V_{RRM}$			20	µA
		Tj = 125°C			10	125	
V_F**	Forward voltage drop	Tj = 25°C	I_F = 15 A			1.05	V
		Tj = 25°C	I_F = 30 A			1.18	
		Tj = 150°C	I_F = 15 A		0.75	0.84	
		Tj = 150°C	I_F = 30 A			0.99	

Pulse test: * tp = 5ms, δ < 2%

** tp = 380µs, δ < 2%

To evaluate the maximum conduction losses use the following equation :
$P = 0.69 \times I_{F(AV)} + 0.01\ I_{F}^{2}{}_{(RMS)}$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	Tj = 25°C	I_F = 1 A V_R = 30V dI_F/dt = 200 A/µs		17	22	ns
I_{RM}	Reverse recovery current	Tj = 125°C	I_F = 15 A V_R = 160V dI_F/dt = 200 A/µs		6.0	7.8	A
t_{fr}	Forward recovery time	Tj = 25°C	I_F = 15 A dI_F/dt = 200 A/µs V_{FR} = 1.1 x $V_F$max			110	ns
V_{FP}	Forward recovery voltage	Tj = 25°C	I_F = 15 A dI_F/dt = 200 A/µs		2.5		V

Fig. 1: Peak current versus duty cycle (per diode).

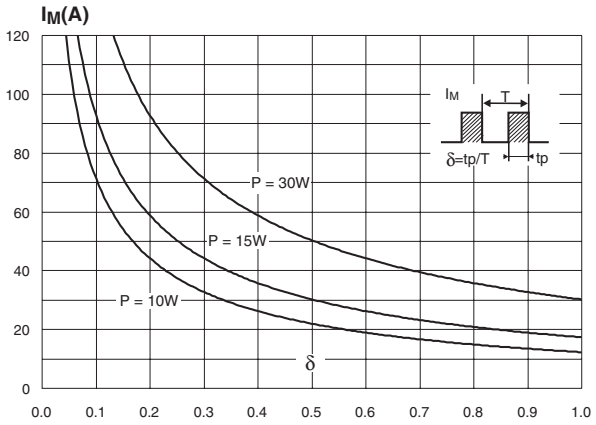


Fig. 2-1: Forward voltage drop versus forward current (typical values, per diode).

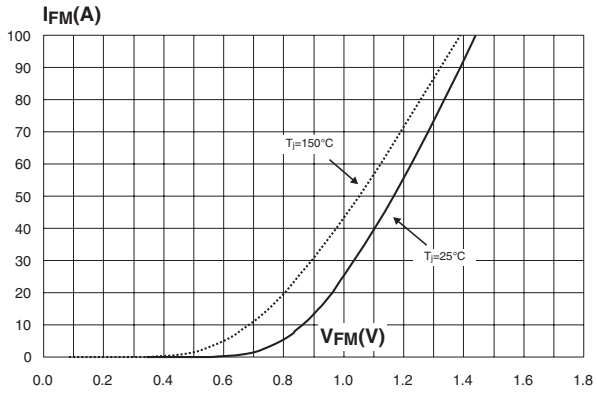


Fig. 2-2: Forward voltage drop versus forward current (maximum values, per diode).

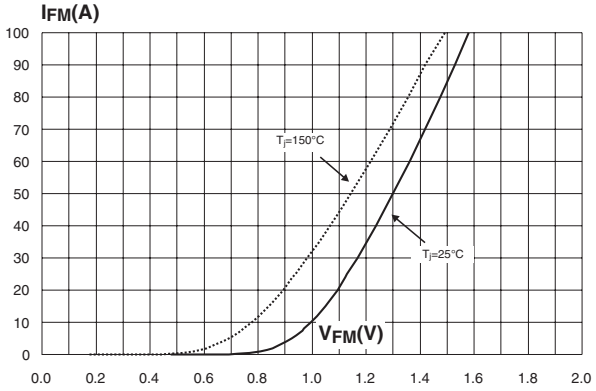


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

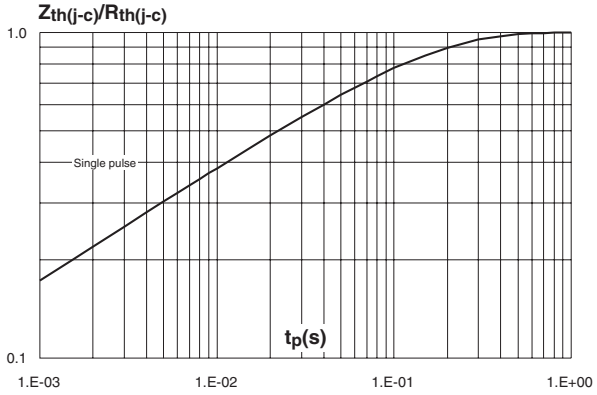


Fig. 4: Junction capacitance versus reverse voltage applied (typical values, per diode).

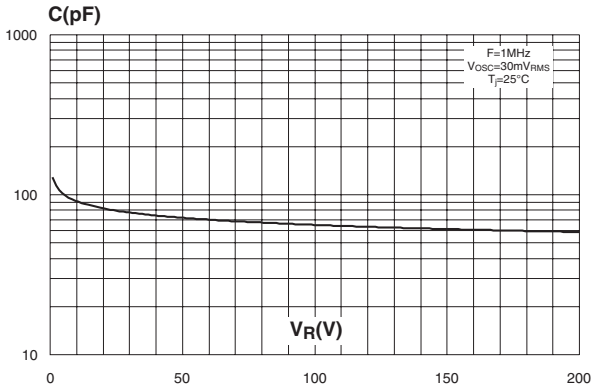


Fig. 5: Reverse recovery charges versus dI_F/dt (typical values, per diode).

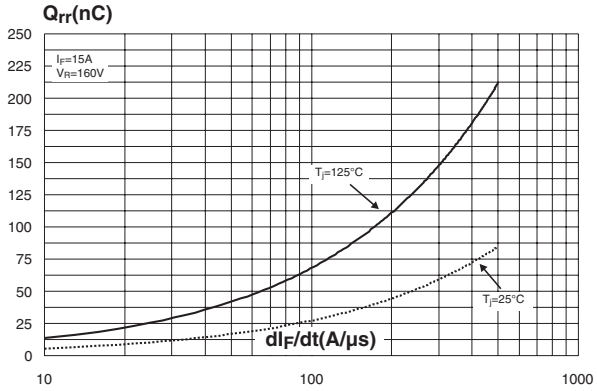


Fig. 6: Reverse recovery time versus dI_F/dt (typical values, per diode).

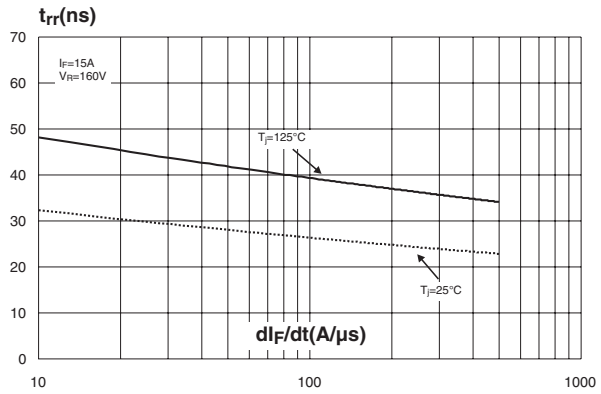


Fig. 7: Peak reverse recovery current versus dI_F/dt (typical values, per diode).

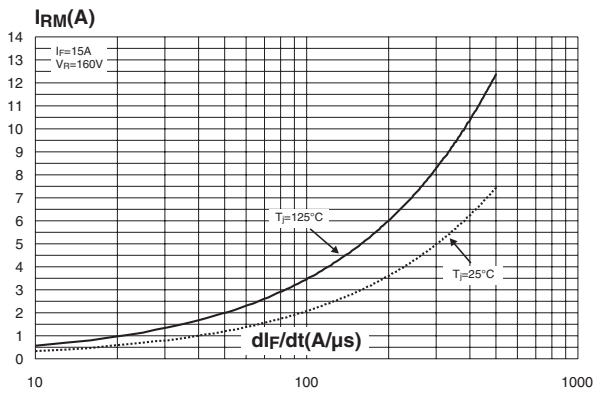


Fig. 8: Dynamic parameters versus junction temperature.

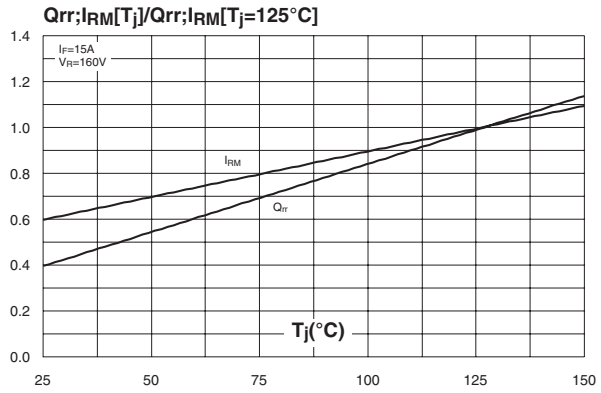
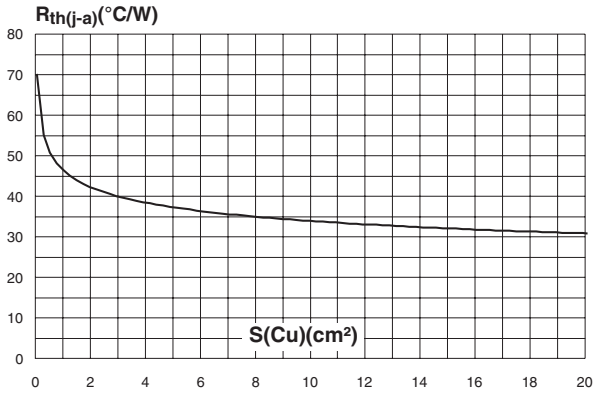


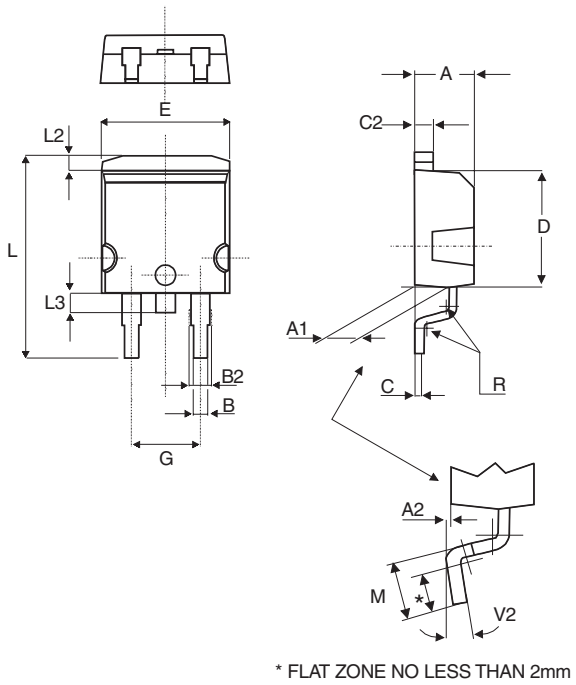
Fig. 9: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, e_{CU}: 35µm) for D^2PAK.



Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH3002CT	STTH3002CT	TO-220AB	2.23 g	50	Tube
STTH3002CG	STTH3002CG	D^2PAK	1.48 g	50	Tube
STTH3002CG-TR	STTH3002CG	D^2PAK	1.48 g	1000	Tape & reel
STTH3002CR	STTH3002CR	I^2PAK	1.49 g	50	Tube
STTH3002CW	STTH3002CW	TO-247	4.46 g	50	Tube

PACKAGE MECHANICAL DATA

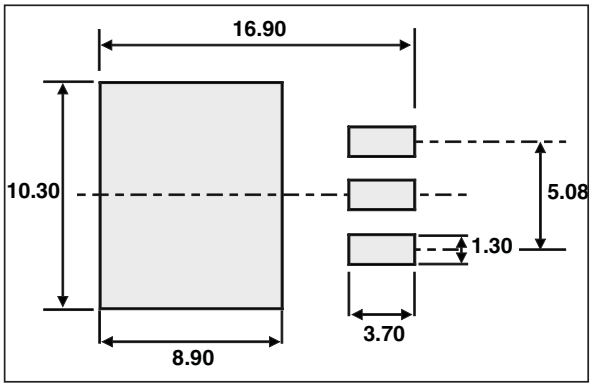
D^2PAK



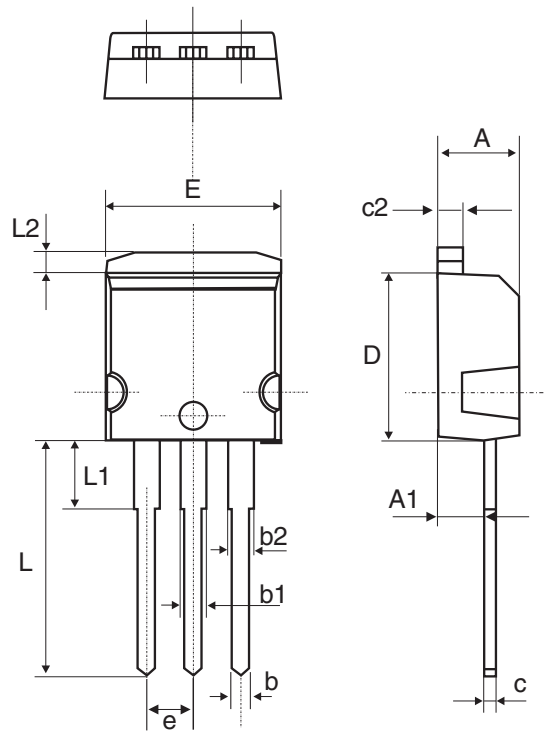
* FLAT ZONE NO LESS THAN 2mm

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°

FOOTPRINT DIMENSIONS (in millimeters)

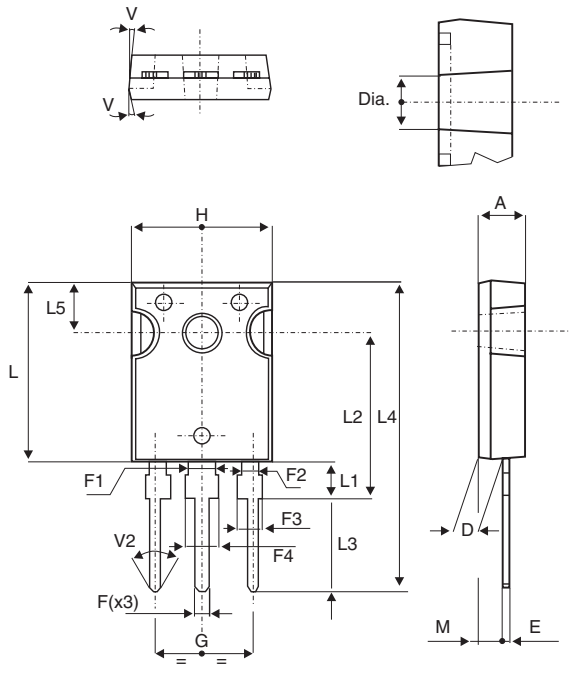


PACKAGE MECHANICAL DATA
I^2PAK



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
b	0.70	0.93	0.028	0.037
b1	1.14	1.17	0.044	0.046
b2	1.14	1.17	0.044	0.046
c	0.45	0.60	0.018	0.024
c2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
e	2.40	2.70	0.094	0.106
E	10.0	10.4	0.394	0.409
L	13.1	13.6	0.516	0.535
L1	3.48	3.78	0.137	0.149
L2	1.27	1.40	0.050	0.055

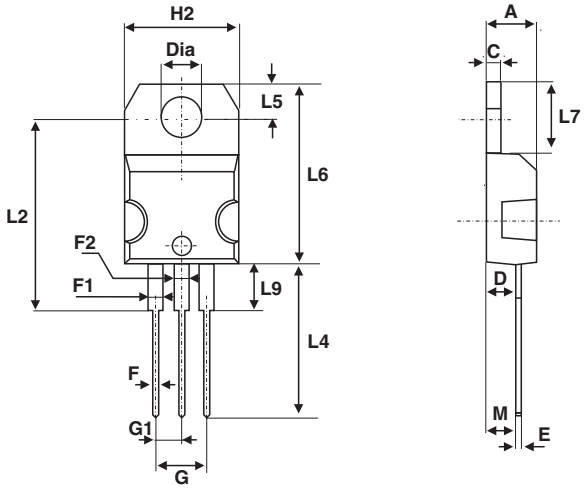
PACKAGE MECHANICAL DATA
TO-247



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

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

- Epoxy meets UL94,V0
- Cooling method: by conduction (method C)
- Recommended torque value (TO-220AB): 0.8 N.m.
- Maximum torque value (TO-220AB): 1.0 N.m.