

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

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

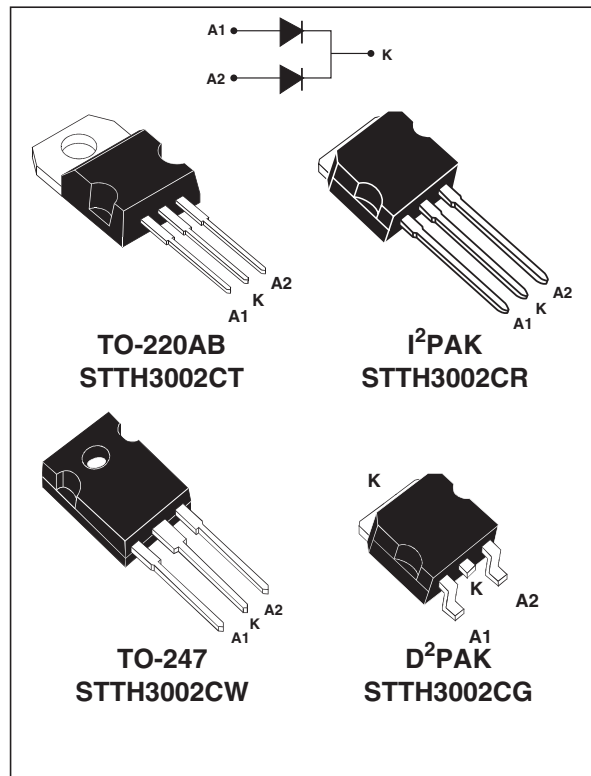
FEATURES AND BENEFITS

- 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, D²PAK, TO-247 and I²PAK, 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 $\delta = 0.5$	$T_c = 155^\circ\text{C}$ Per diode	15	A
		$T_c = 145^\circ\text{C}$ Per device	30	
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms Sinusoidal	180	A
T_{stg}	Storage temperature range		- 65 + 175	°C
T_j	Maximum operating junction temperature		175	°C

STTH3002C

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:

$$\Delta T_j (\text{diode1}) = P(\text{diode1}) \times R_{th(j-c)} (\text{per diode}) + P(\text{diode2}) \times R_{th(c)}$$

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I _R *	Reverse leakage current	T _j = 25°C	V _R = V _{RRM}			20	μA
		T _j = 125°C			10	125	
V _F **	Forward voltage drop	T _j = 25°C	I _F = 15 A			1.05	V
		T _j = 25°C	I _F = 30 A			1.18	
		T _j = 150°C	I _F = 15 A		0.75	0.84	
		T _j = 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 :

$$P = 0.69 \times I_{F(AV)} + 0.01 I_{F(RMS)}^2$$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t _{rr}	Reverse recovery time	T _j = 25°C	I _F = 1 A V _R = 30V dI _F /dt = 200 A/μs		17	22	ns
I _{RM}	Reverse recovery current	T _j = 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	T _j = 25°C	I _F = 15 A dI _F /dt = 200 A/μs V _{FR} = 1.1 x V _{Fmax}			110	ns
V _{FP}	Forward recovery voltage	T _j = 25°C	I _F = 15 A dI _F /dt = 200 A/μs		2.5		V

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

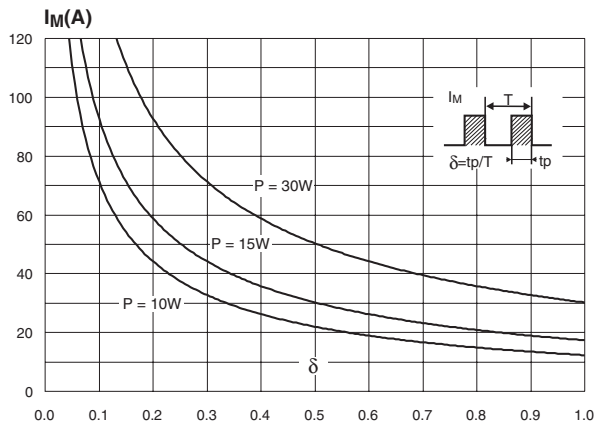


Fig. 2-1: Forward voltage drop versus forward current (typical values, per diode).

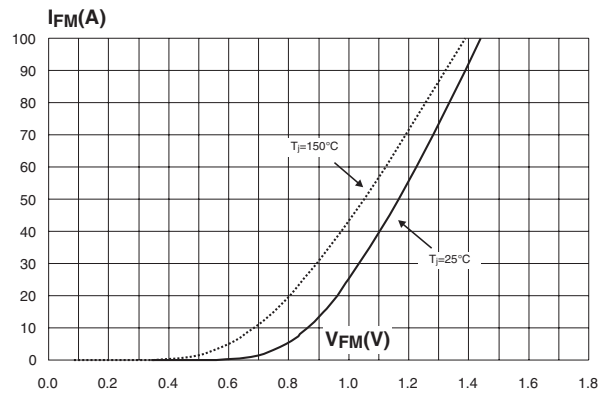


Fig. 2-2: Forward voltage drop versus forward current (maximum values, per diode).

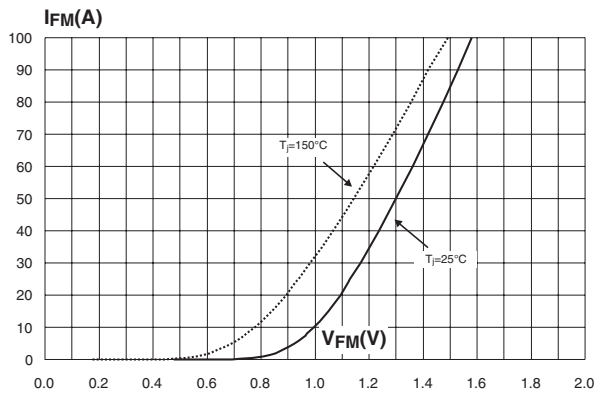


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

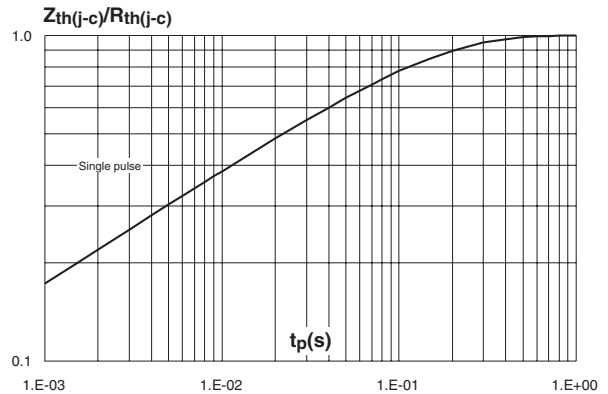


Fig. 4: Junction capacitance versus reverse voltage applied (typical values, per diode).

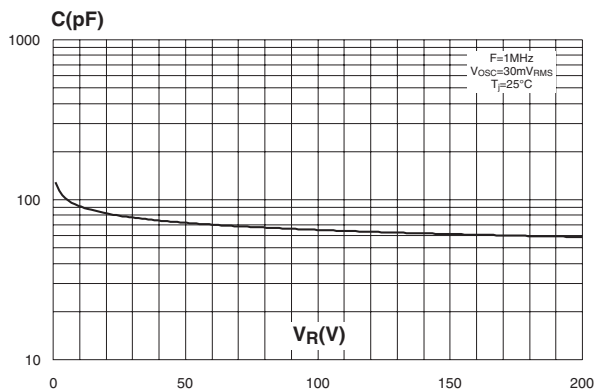


Fig. 5: Reverse recovery charges versus di_F/dt (typical values, per diode).

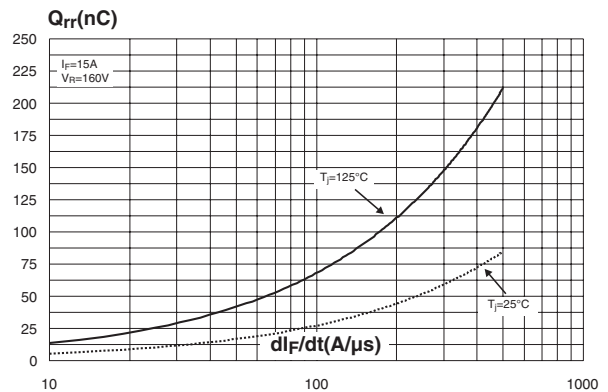


Fig. 6: Reverse recovery time versus di_F/dt (typical values, per diode).

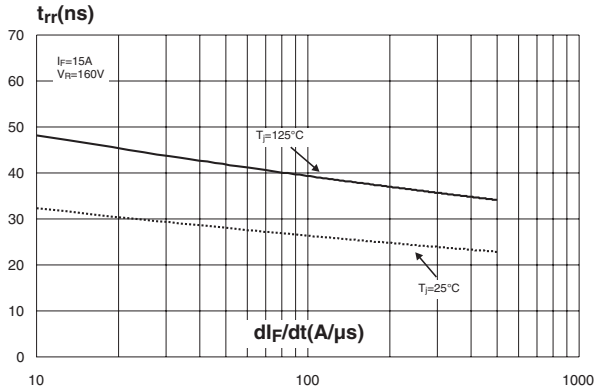


Fig. 7: Peak reverse recovery current versus di_F/dt (typical values, per diode).

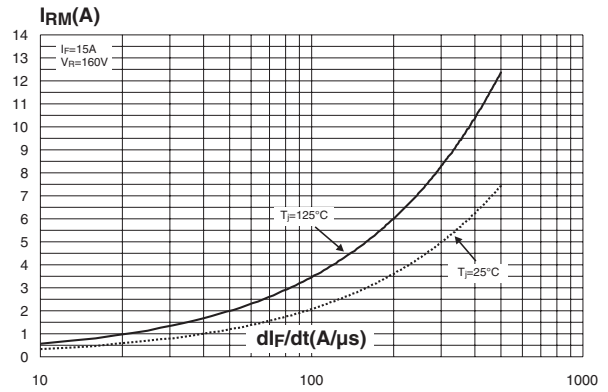


Fig. 8: Dynamic parameters versus junction temperature.

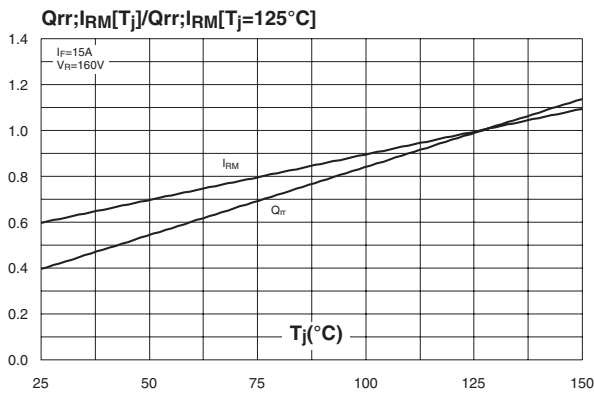
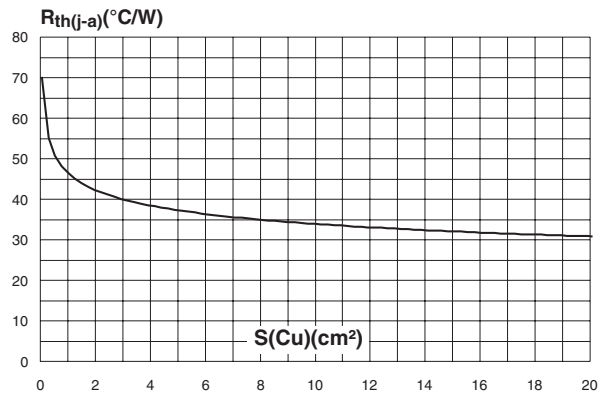


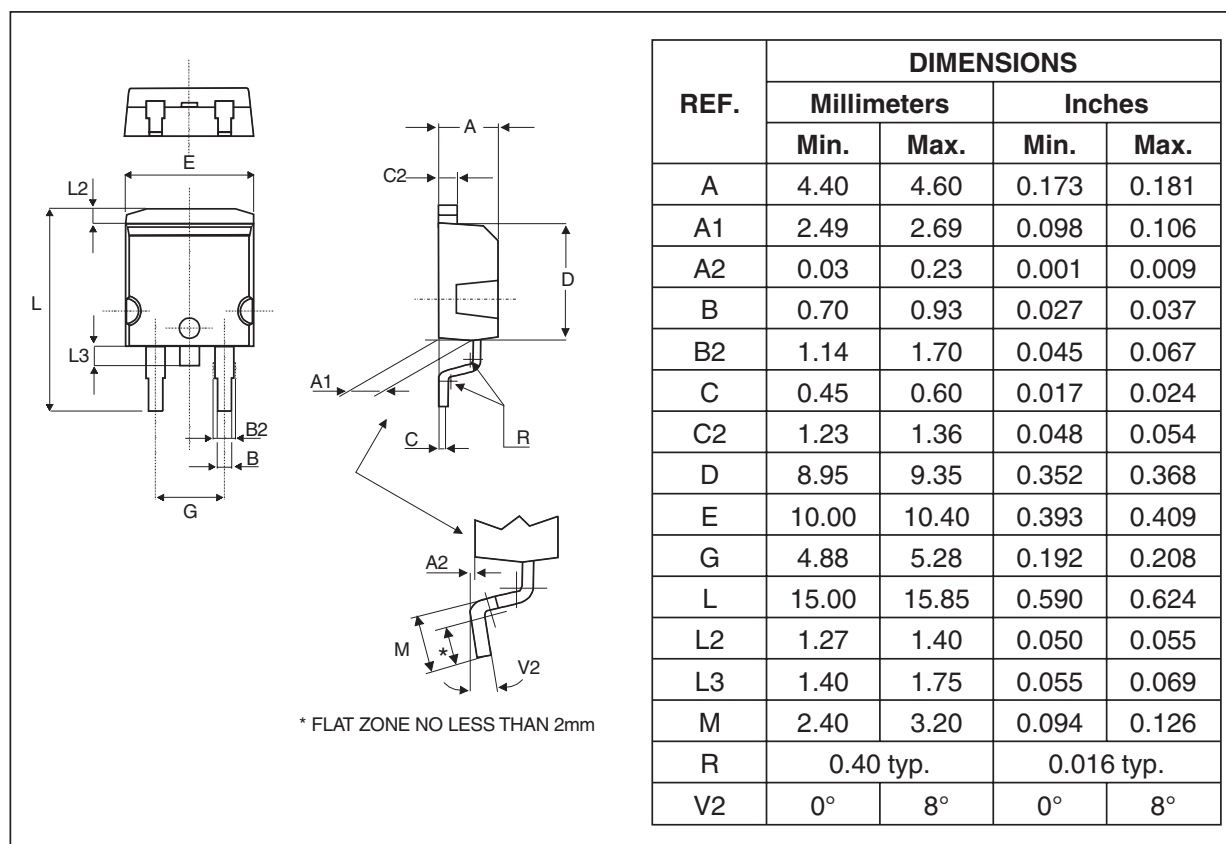
Fig. 9: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, e_{Cu} : 35 μ m) for D²PAK.



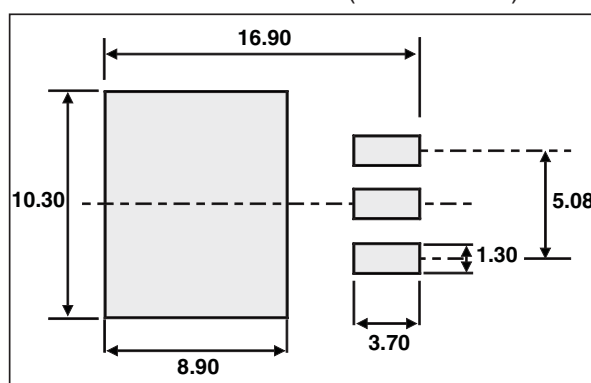
Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH3002CT	STTH3002CT	TO-220AB	2.23 g	50	Tube
STTH3002CG	STTH3002CG	D ² PAK	1.48 g	50	Tube
STTH3002CG-TR	STTH3002CG	D ² PAK	1.48 g	1000	Tape & reel
STTH3002CR	STTH3002CR	I ² PAK	1.49 g	50	Tube
STTH3002CW	STTH3002CW	TO-247	4.46 g	50	Tube

PACKAGE MECHANICAL DATA

D²PAK

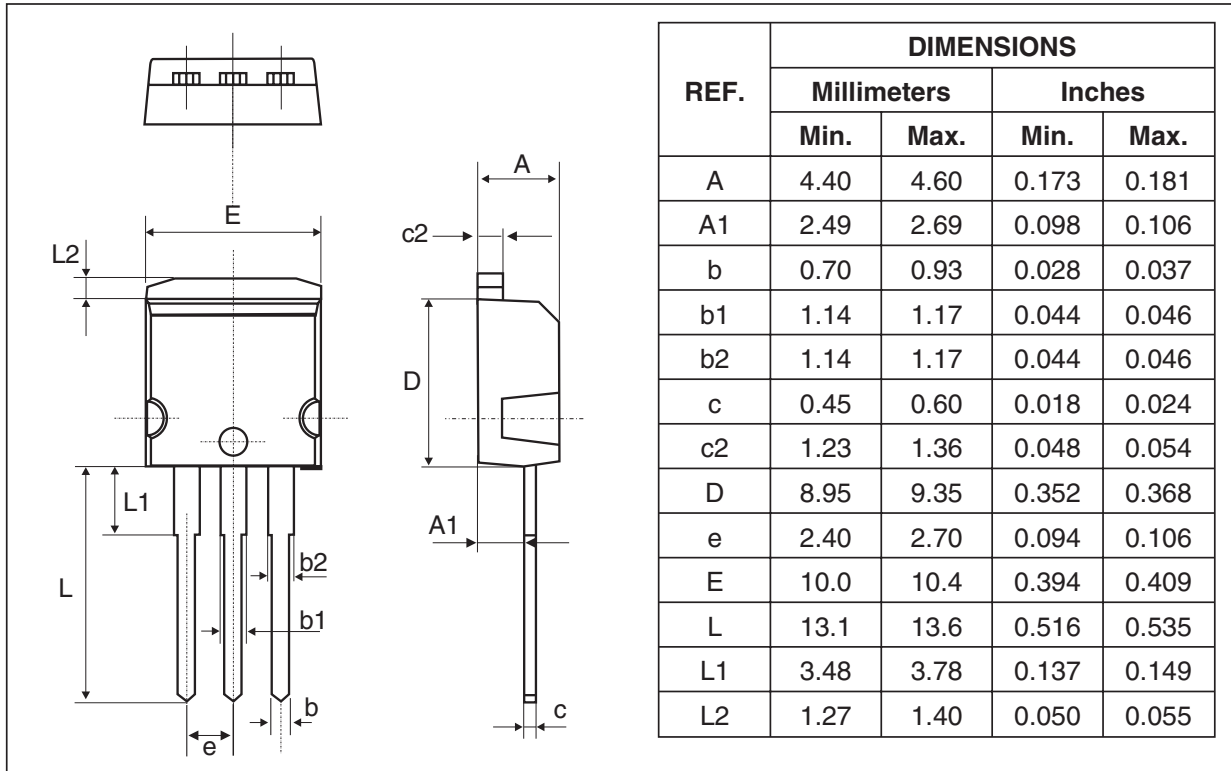


FOOTPRINT DIMENSIONS (in millimeters)

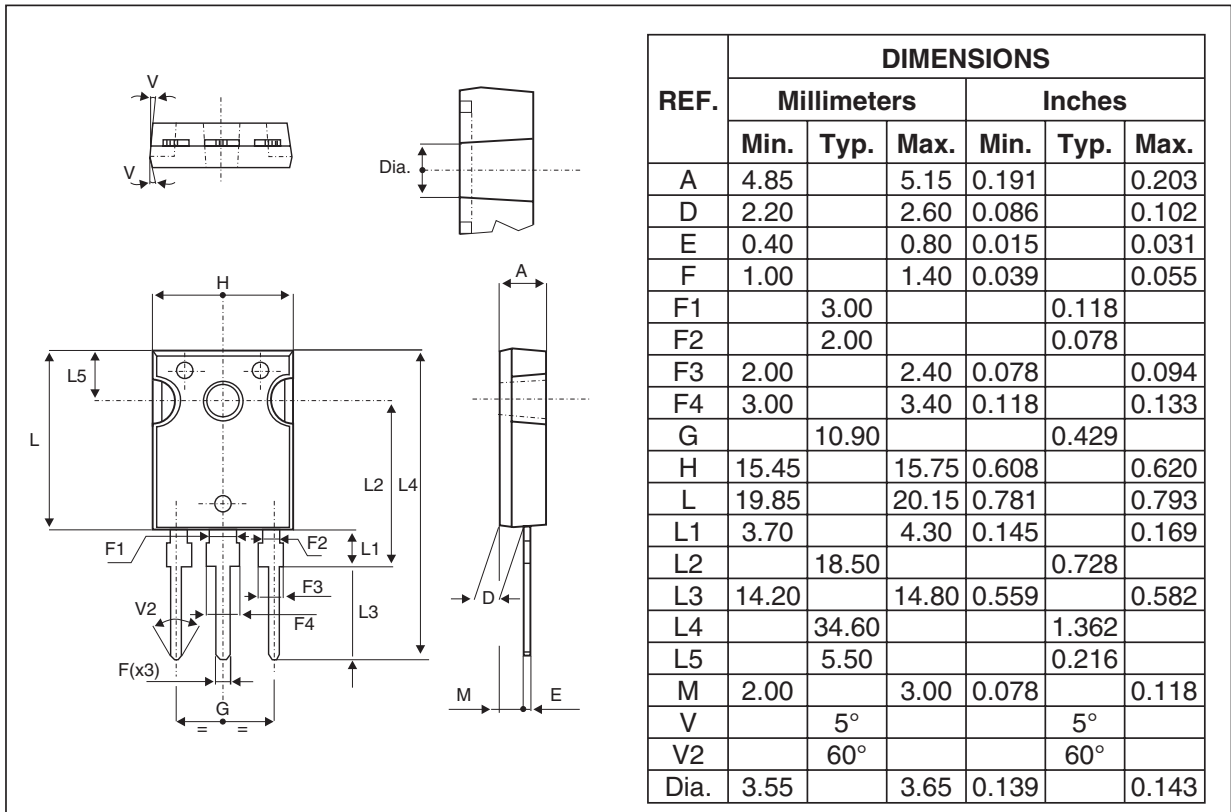


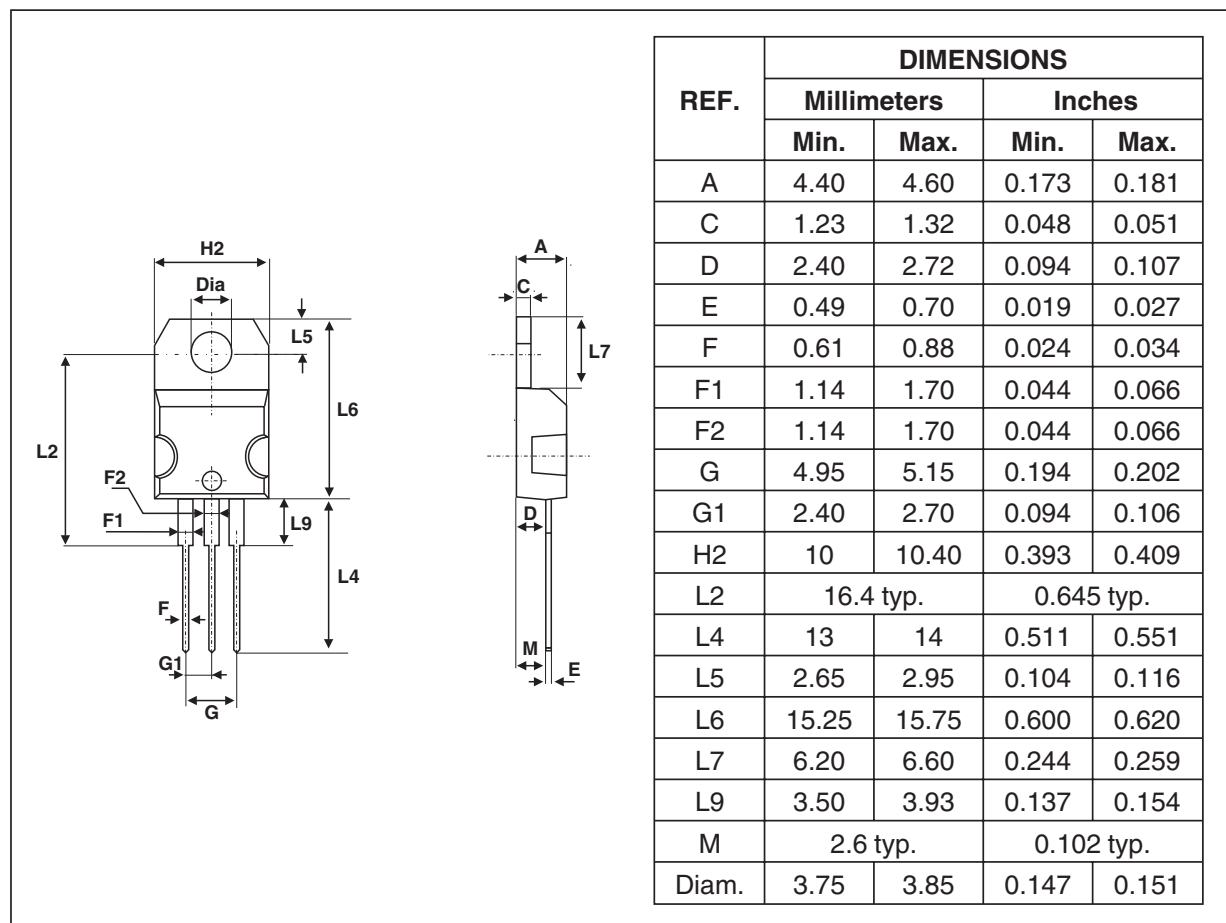
STTH3002C

PACKAGE MECHANICAL DATA
I²PAK



PACKAGE MECHANICAL DATA
TO-247



PACKAGE MECHANICAL DATA
TO-220AB


- 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.

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