

TURBO 2 ULTRAFast HIGH VOLTAGE RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	5 A
V_{RRM}	600 V
I_R (max)	125 μ A
T_j (max)	175 °C
V_F (max)	1.05 V
t_{rr} (max)	95 ns

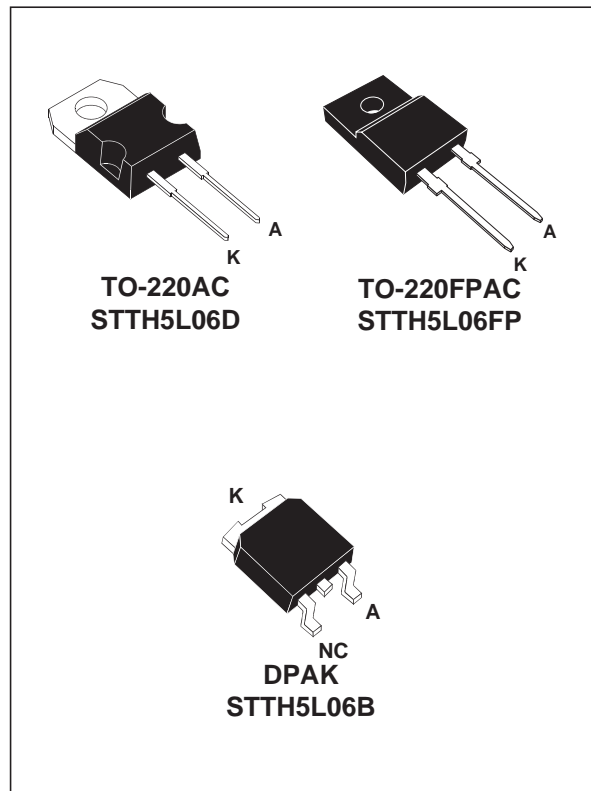
FEATURES AND BENEFITS

- Ultrafast switching
- Low reverse recovery current
- Reduces switching & conduction losses
- Low thermal resistance

DESCRIPTION

The STTH5L06D/B/FP, which is using ST Turbo 2 600V technology, is specially suited as boost diode in discontinuous or critical mode power factor corrections.

The device, available in TO-220AC, TO-220FPAC and DPAK, is also intended for use as a free wheeling diode in power supplies and other power switching applications.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit	
V_{RRM}	Repetitive peak reverse voltage		600	V	
$I_{F(RMS)}$	RMS forward current		TO-220AC/TO-220FPAC DPAK	20 10 A	
$I_{F(AV)}$	Average forward current	TO-220AC / DPAK	$T_c = 150^\circ\text{C}$ $\delta = 0.5$	5	A
		TO-220FPAC	$T_c = 135^\circ\text{C}$ $\delta = 0.5$		
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms Sinusoidal	TO-220AC/TO-220FPAC DPAK	90	A
		$t_p = 10$ ms Sinusoidal		60	
T_{stg}	Storage temperature range		- 65 + 175	°C	
T_j	Maximum operating junction temperature		+ 175	°C	

THERMAL PARAMETERS

Symbol	Parameter		Maximum	Unit
R _{th(j-c)}	Junction to case	TO-220AC / DPAK	3.5	°C/W
		TO-220FPAC	6.0	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I _R	Reverse leakage current	V _R = 600V	T _j = 25°C			5	μA
			T _j = 150°C		10	125	
V _F	Forward voltage drop	I _F = 5 A	T _j = 25°C			1.3	V
			T _j = 150°C		0.85	1.05	

To evaluate the maximum conduction losses use the following equation :
 $P = 0.89 \times I_{F(AV)} + 0.033 I_{F(RMS)}^2$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t _{rr}	Reverse recovery time	I _F = 1 A dI _F /dt = - 50 A/μs V _R = 30V	T _j = 25°C		65	95	ns
t _{fr}	Forward recovery time	I _F = 5 A dI _F /dt = 100 A/μs V _{FR} = 1.1 x V _{Fmax}	T _j = 25°C			150	ns
V _{FP}	Forward recovery time	I _F = 5 A dI _F /dt = 100 A/μs	T _j = 25°C			7	V

Fig. 1: Conduction losses versus average current.

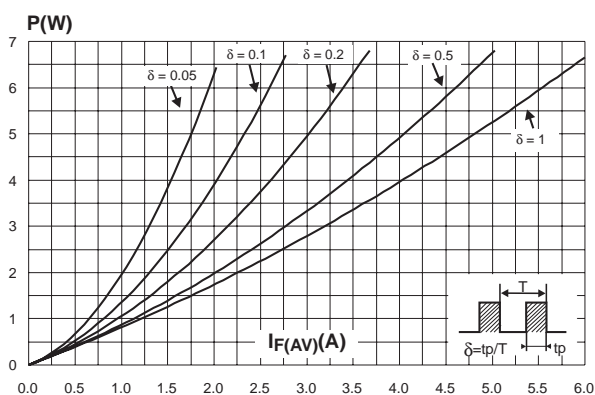


Fig. 2: Forward voltage drop versus forward current.

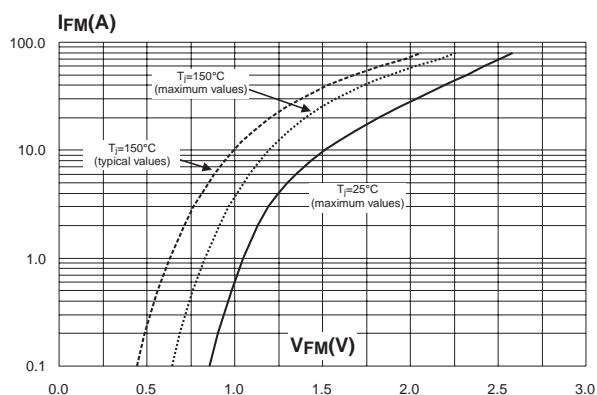


Fig. 3-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, DPAK).

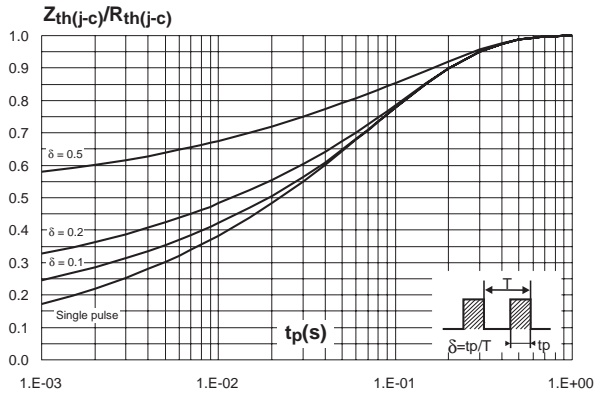


Fig. 3-2: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC).

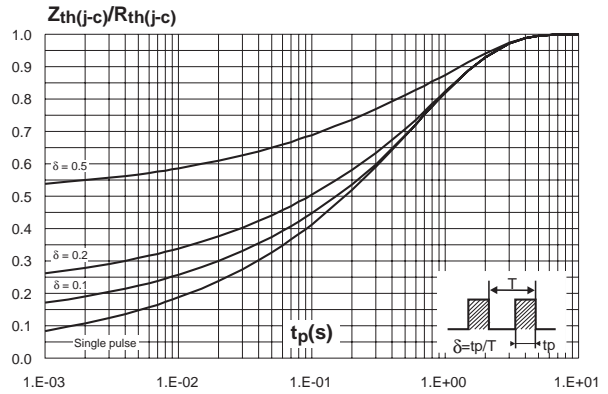


Fig. 4: Peak reverse recovery current versus di_F/dt (90% confidence).

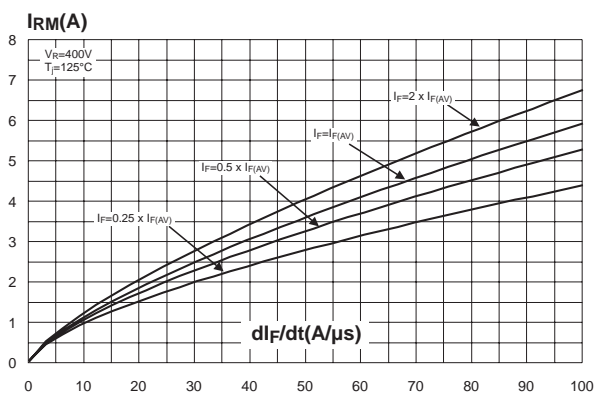


Fig. 5: Reverse recovery time versus di_F/dt (90% confidence).

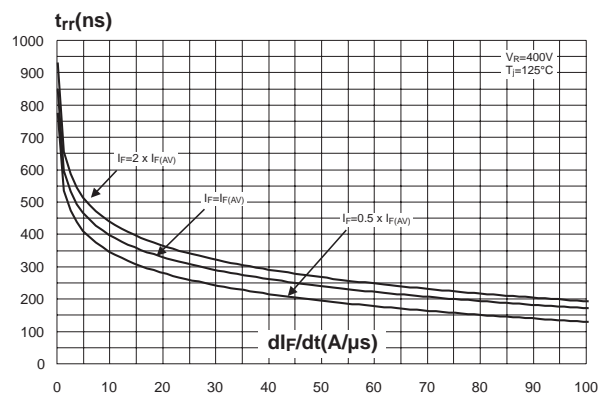


Fig. 6: Reverse recovery charges versus di_F/dt (90% confidence).

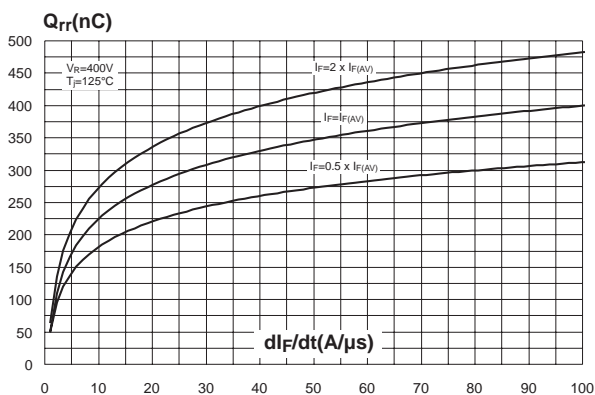


Fig. 7: Softness factor versus di_F/dt (typical values).

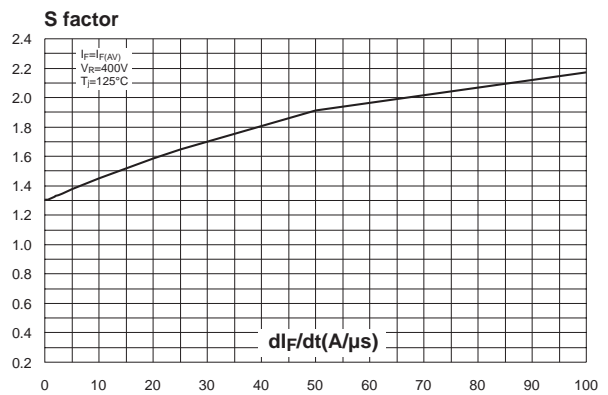


Fig. 8: Relative variations of dynamic parameters versus junction temperature.

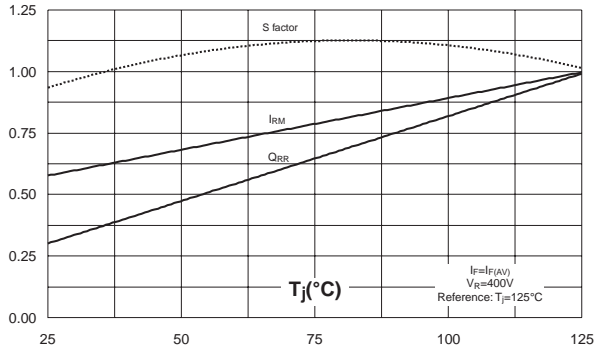


Fig. 9: Transient peak forward voltage versus di_F/dt (90% confidence).

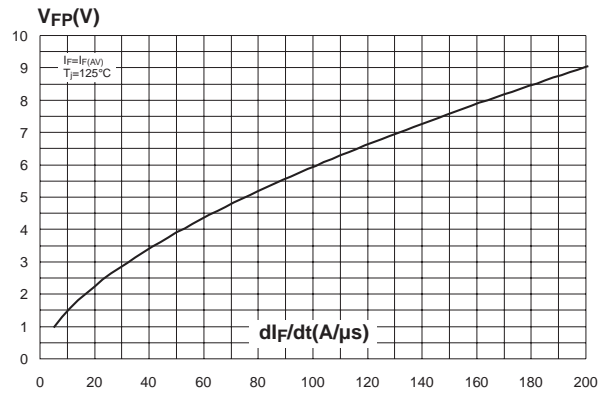


Fig. 10: Forward recovery time versus di_F/dt (90% confidence).

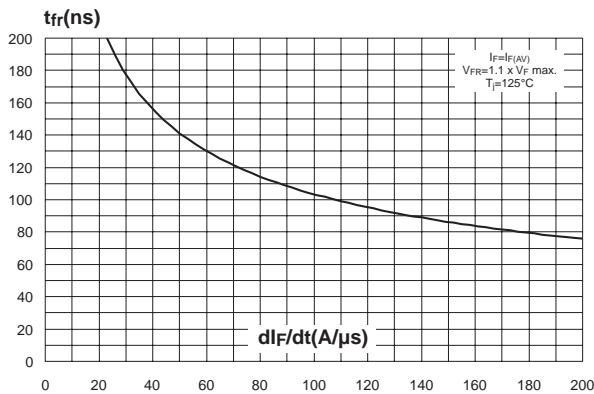


Fig. 11: Junction capacitance versus reverse voltage applied (typical values).

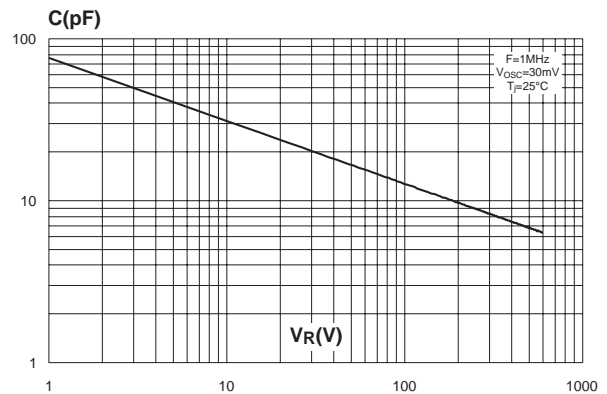
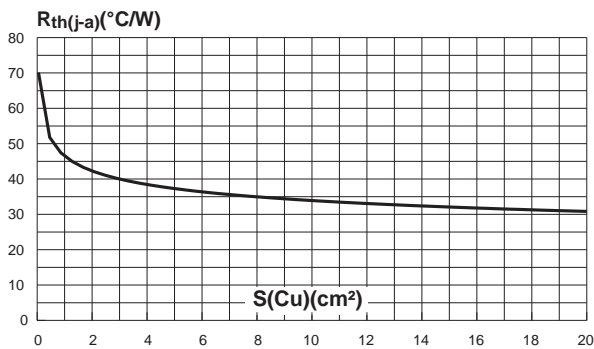
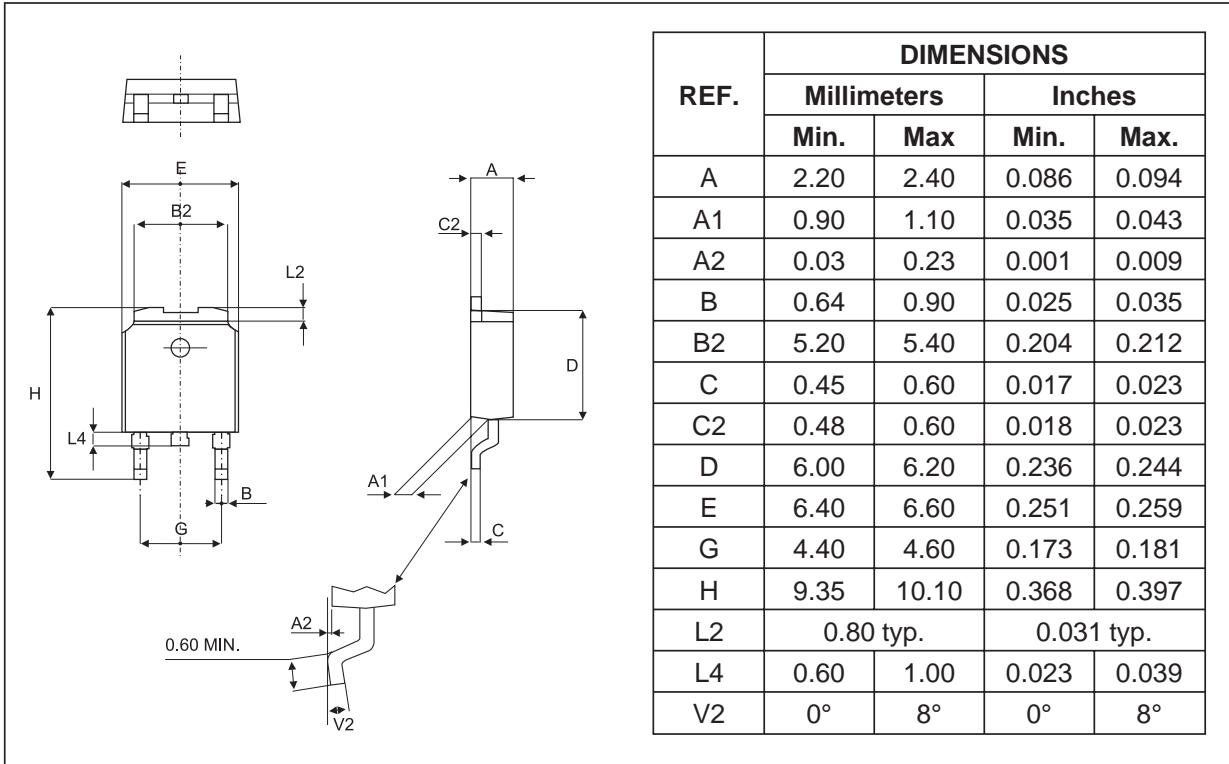


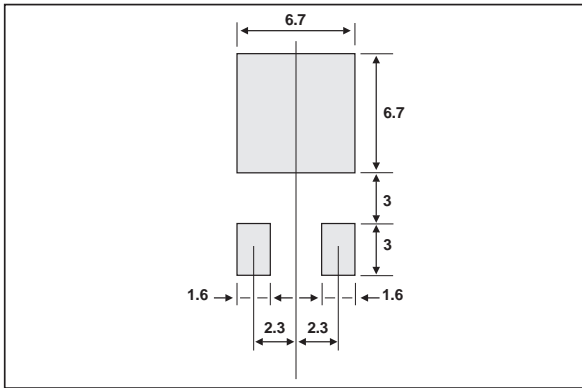
Fig. 12: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board FR4, copper thickness: 35μm) (DPAK).



PACKAGE MECHANICAL DATA
DPAK

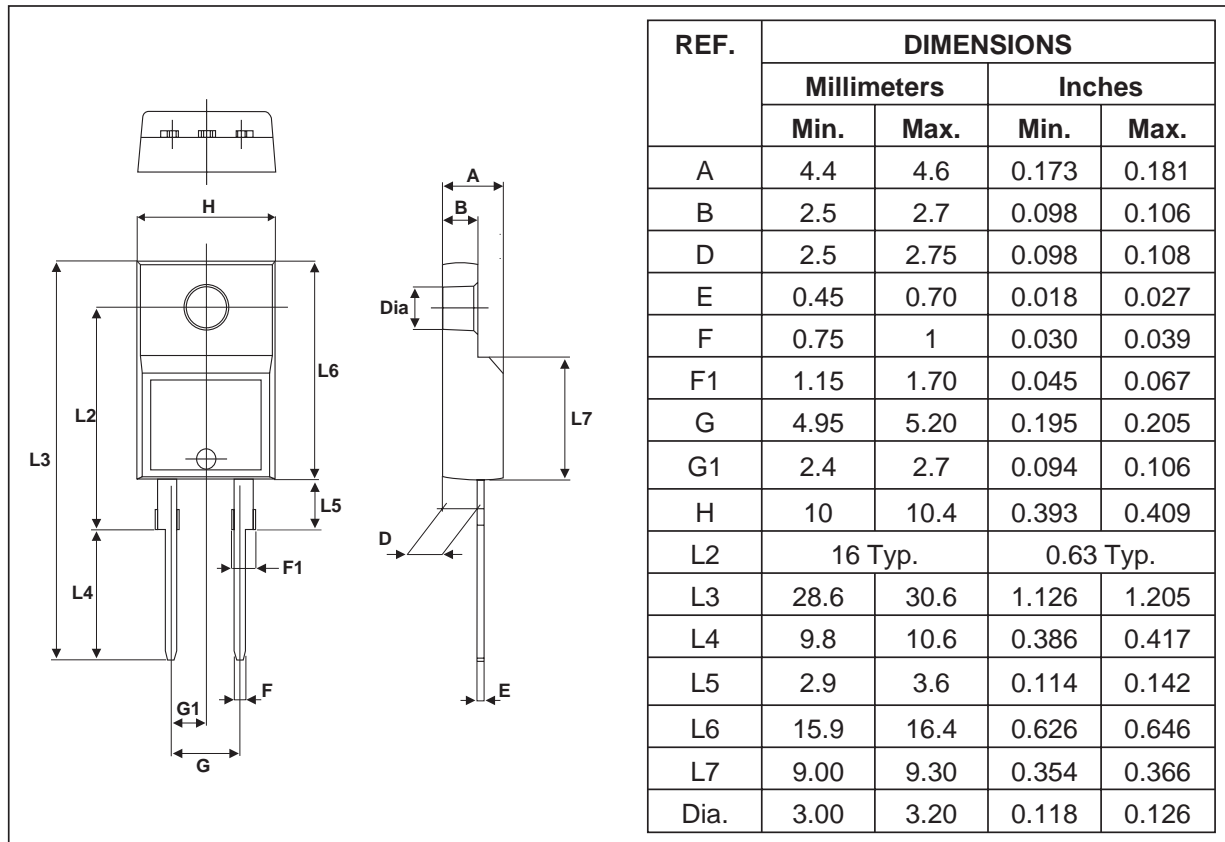


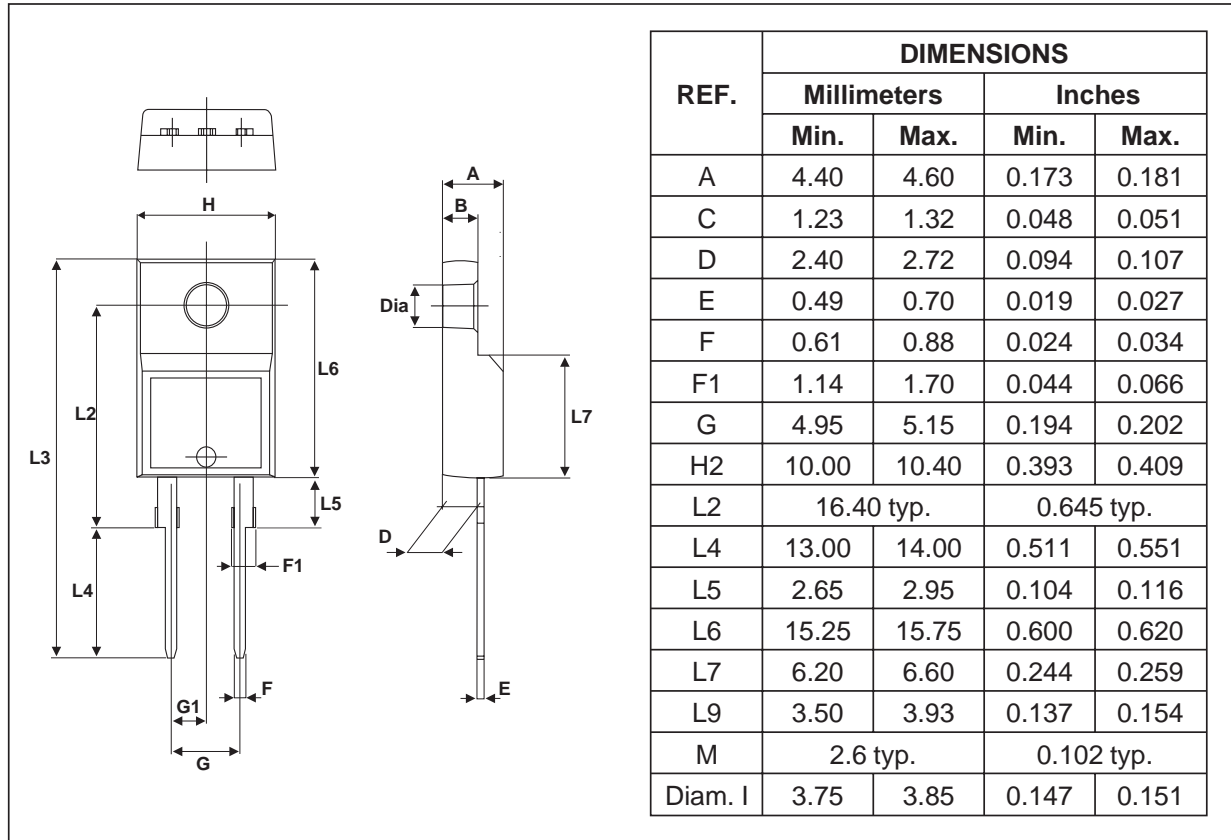
FOOTPRINT



STTH5L06D/B/FP

PACKAGE MECHANICAL DATA TO-220FPAC



PACKAGE MECHANICAL DATA
TO-220AC


Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH5L06D	STTH5L06D	TO-220AC	1.9 g	50	Tube
STTH5L06B	STTH5L06B	DPAK	0.3 g	75	Tube
STTH5L06B-TR	STTH5L06B	DPAK	0.3 g	2500	Tape & reel
STTH5L06FP	STTH5L06FP	TO-220PFAC	1.7 g	50	Tube

- Epoxy meets UL 94, V0
- Recommended torque value (TO-220AC): 0.55 Nm
- Maximum torque value (TO-220AC / TO-220FPAC): 0.7 Nm

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