



STTH30L06

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

Table 1: Main Product Characteristics

$I_{F(AV)}$	30 A
V_{RRM}	600 V
T_j	175°C
V_F (typ)	1.0 V
t_{rr} (max)	65 ns

FEATURES AND BENEFITS

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

DESCRIPTION

The STTH30L06, which is using ST Turbo 2 600V technology, is specially suited for use in switching power supplies, and industrial applications, as rectification and discontinuous mode PFC boost diode.

Table 2: Order Codes

Part Number	Marking
STTH30L06D	STTH30L06D
STTH30L06G	STTH30L06G
STTH30L06G-TR	STTH30L06G
STTH30L06W	STTH30L06W
STTH30L06P	STTH30L06P
STTH30L06PI	STTH30L06PI

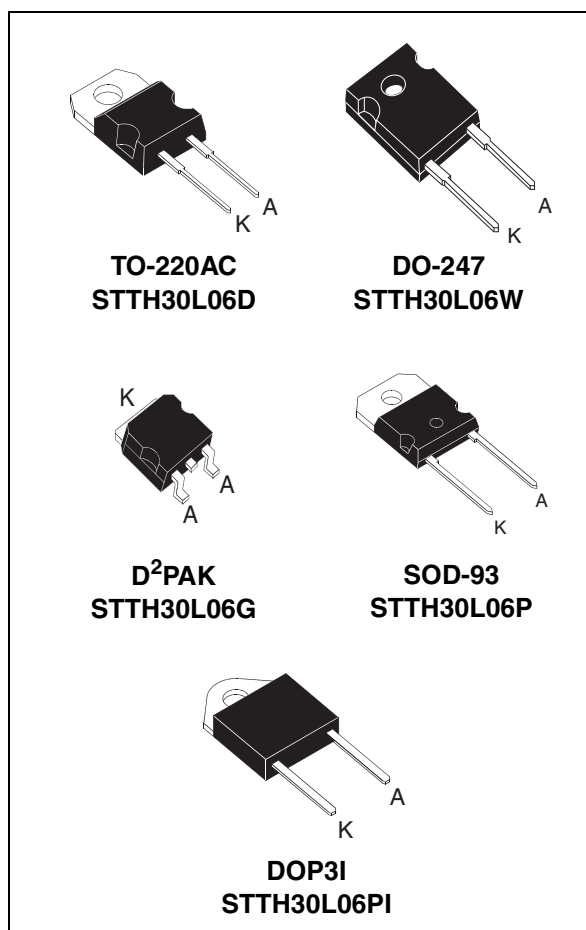


Table 3: Absolute Ratings (limiting values)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			600	V
I _{F(RMS)}	RMS forward voltage			50	A
I _{F(AV)}	Average forward current	TO-220AC / TO-247 / D ² PAK / SOT-93	T _c = 125°C δ = 0.5	30	A
		DOP3I	T _c = 95°C δ = 0.5		
I _{FSM}	Surge non repetitive forward current		t _p = 10ms sinusoidal	160	A
T _{stg}	Storage temperature range			-65 to + 175	°C
T _j	Maximum operating junction temperature			175	°C

Table 4: Thermal Resistance

Symbol	Parameter		Value (max).	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC / TO-247 / D ² PAK / SOT-93	1.1	$^{\circ}\text{C/W}$
		DOP3I	1.7	

Table 5: Static Electrical Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			25	μA
		$T_j = 150^{\circ}\text{C}$			80	800	
V_F^{**}	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 30\text{A}$			1.55	V
		$T_j = 150^{\circ}\text{C}$			1.0	1.25	

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

** $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation: $P = 0.95 \times I_{F(AV)} + 0.010 I_F^2(RMS)$

Table 6: Dynamic Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25^{\circ}\text{C}$	$I_F = 0.5\text{A} \quad I_{rr} = 0.25\text{A} \quad I_R = 1\text{A}$			65	ns
			$I_F = 1\text{A} \quad dI_F/dt = 50\text{ A}/\mu\text{s} \quad V_R = 30\text{V}$		65	90	
I_{RM}	Reverse recovery current	$T_j = 125^{\circ}\text{C}$	$I_F = 30\text{A} \quad V_R = 400\text{V}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$		11.5	16	A
t_{fr}	Forward recovery time	$T_j = 25^{\circ}\text{C}$	$I_F = 30\text{A} \quad dI_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$			500	ns
V_{FP}	Forward recovery voltage	$T_j = 25^{\circ}\text{C}$	$I_F = 30\text{A} \quad dI_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$		2.5		V

Figure 1: Conduction losses versus average forward current

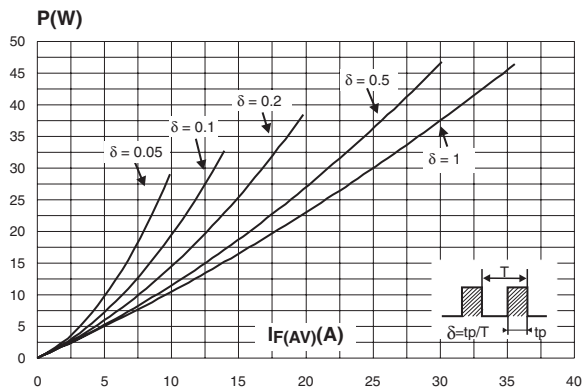


Figure 2: Forward voltage drop versus forward current

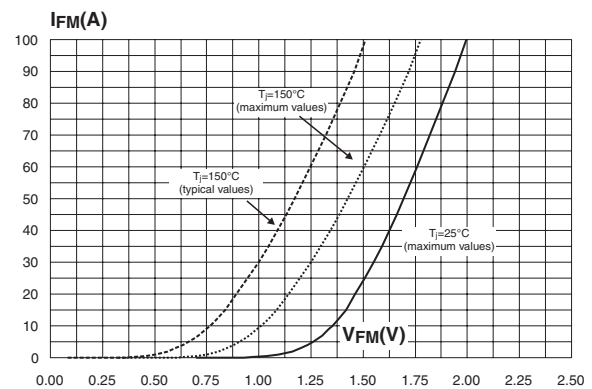


Figure 3: Relative variation of thermal impedance junction to case versus pulse duration

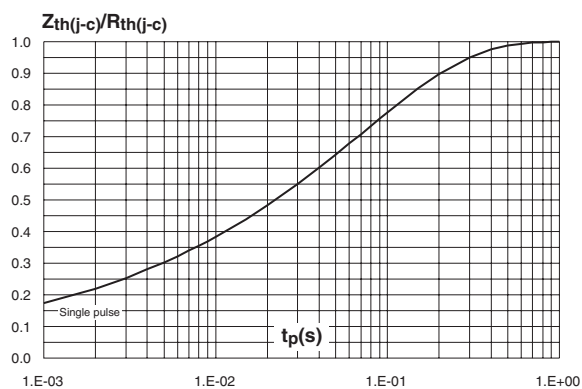


Figure 4: Peak reverse recovery current versus di_F/dt (typical values)

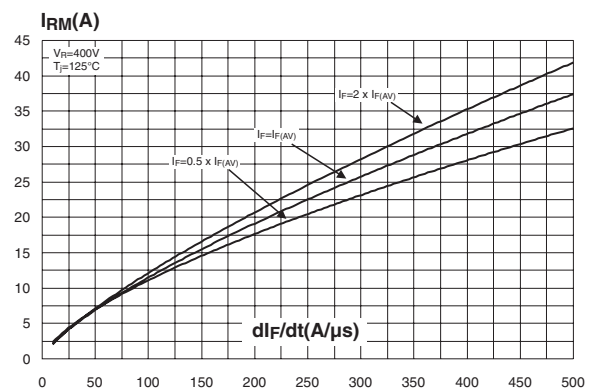


Figure 5: Reverse recovery time versus di_F/dt (typical values)

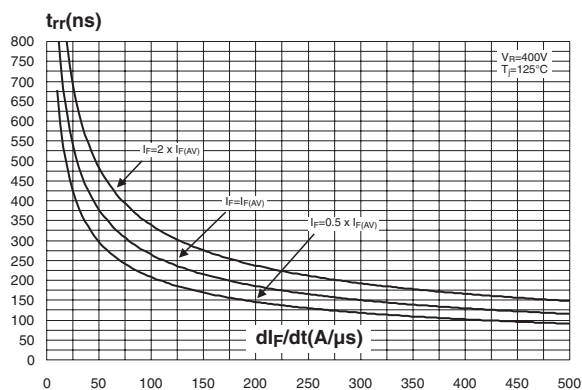


Figure 6: Reverse recovery charges versus di_F/dt (typical values)

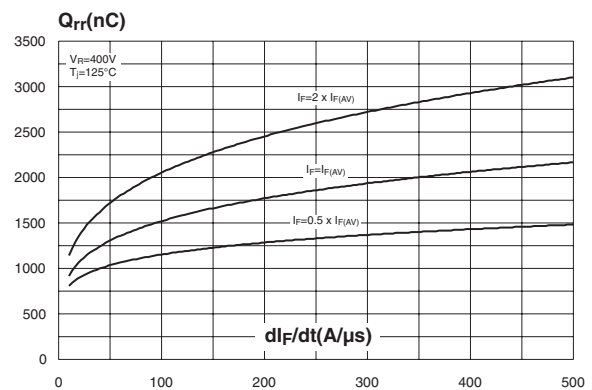


Figure 7: Reverse recovery softness factor versus dl_F/dt (typical values)

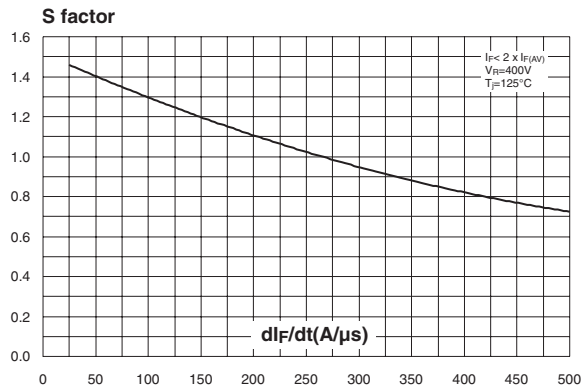


Figure 8: Relative variations of dynamic parameters versus junction temperature

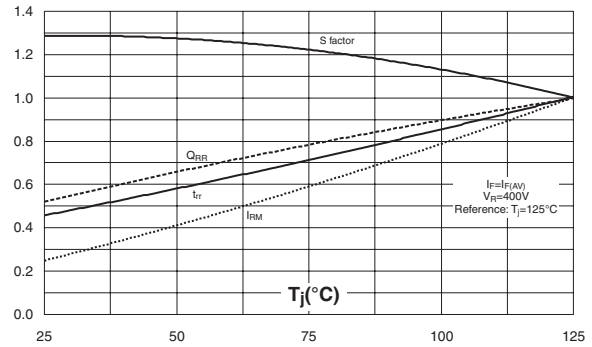


Figure 9: Transient peak forward voltage versus dl_F/dt (typical values)

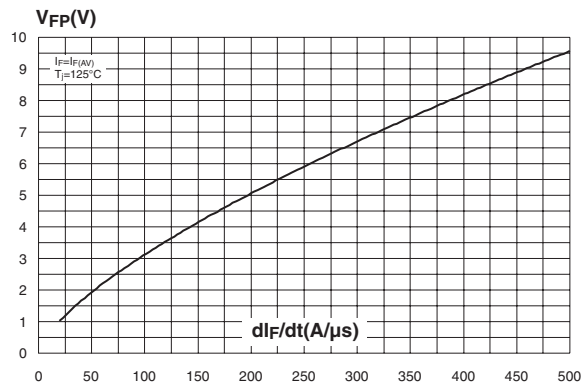


Figure 10: Forward recovery time versus dl_F/dt (typical values)

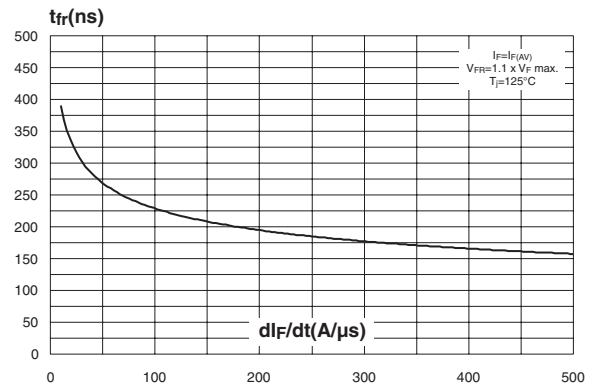


Figure 11: Junction capacitance versus reverse voltage applied (typical values)

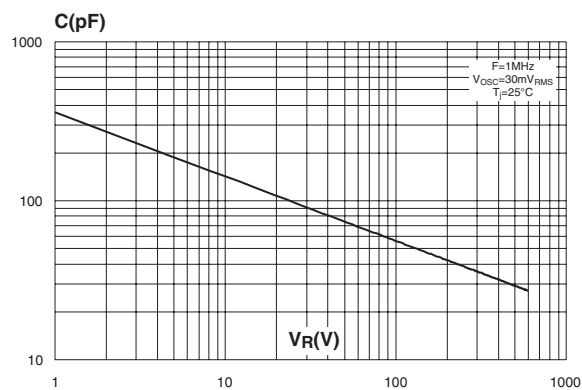


Figure 12: Thermal resistance junction to ambient versus copper surface under tab (epoxy FR4, $e_{CU}=35\mu m$) (D²PAK)

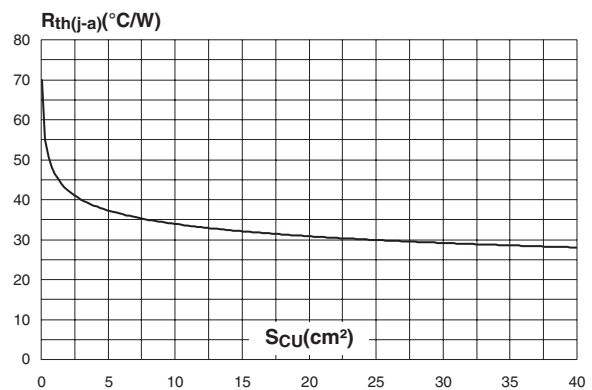


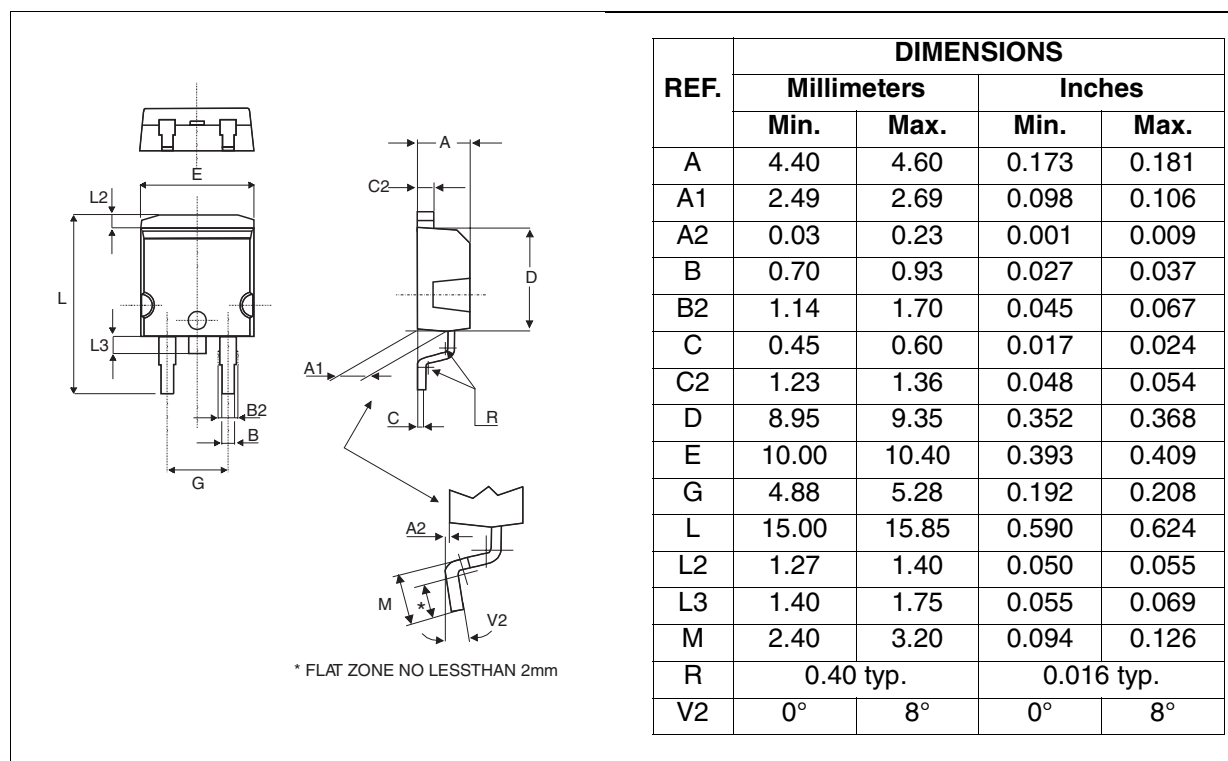
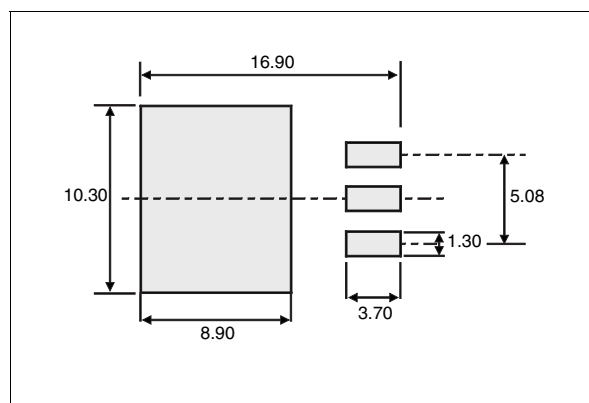
Figure 13: D²PAK Package Mechanical DataFigure 14: D²PAK Foot Print Dimensions
(in millimeters)

Figure 15: DO-247 Package Mechanical Data

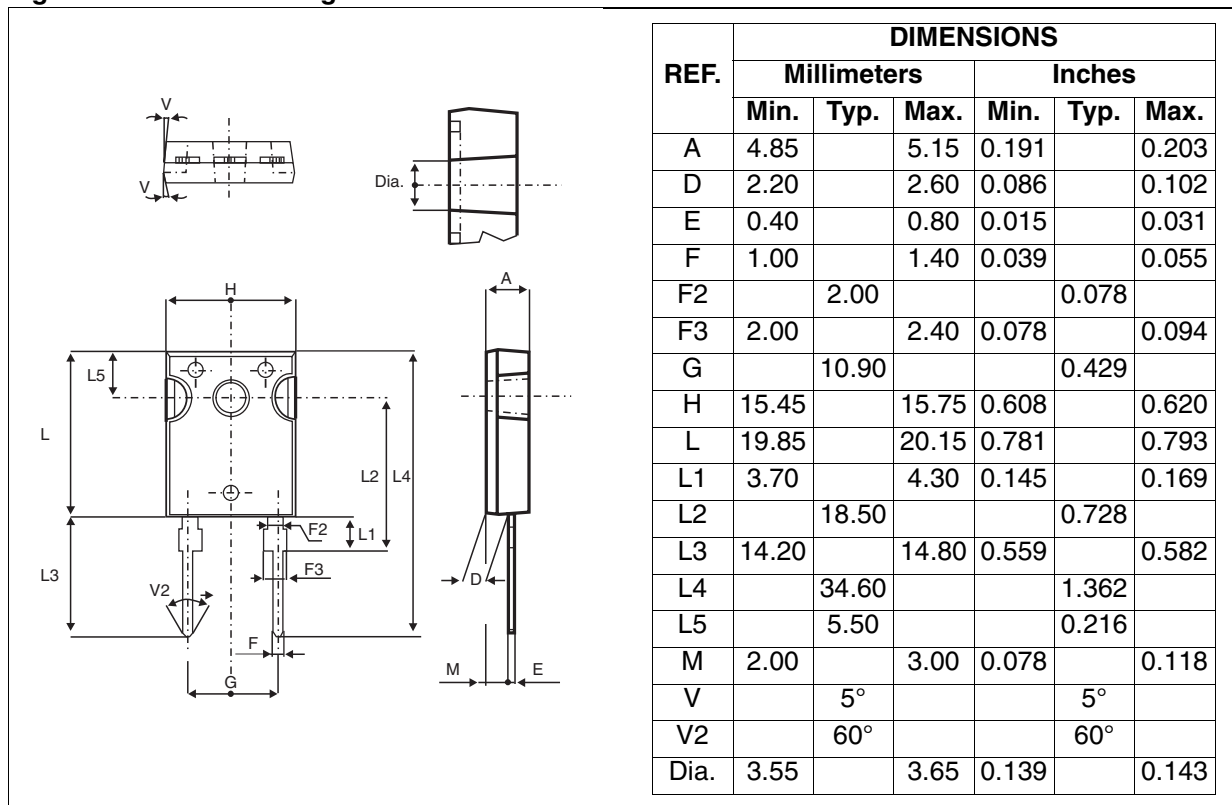


Figure 16: SOD-93 Package Mechanical Data

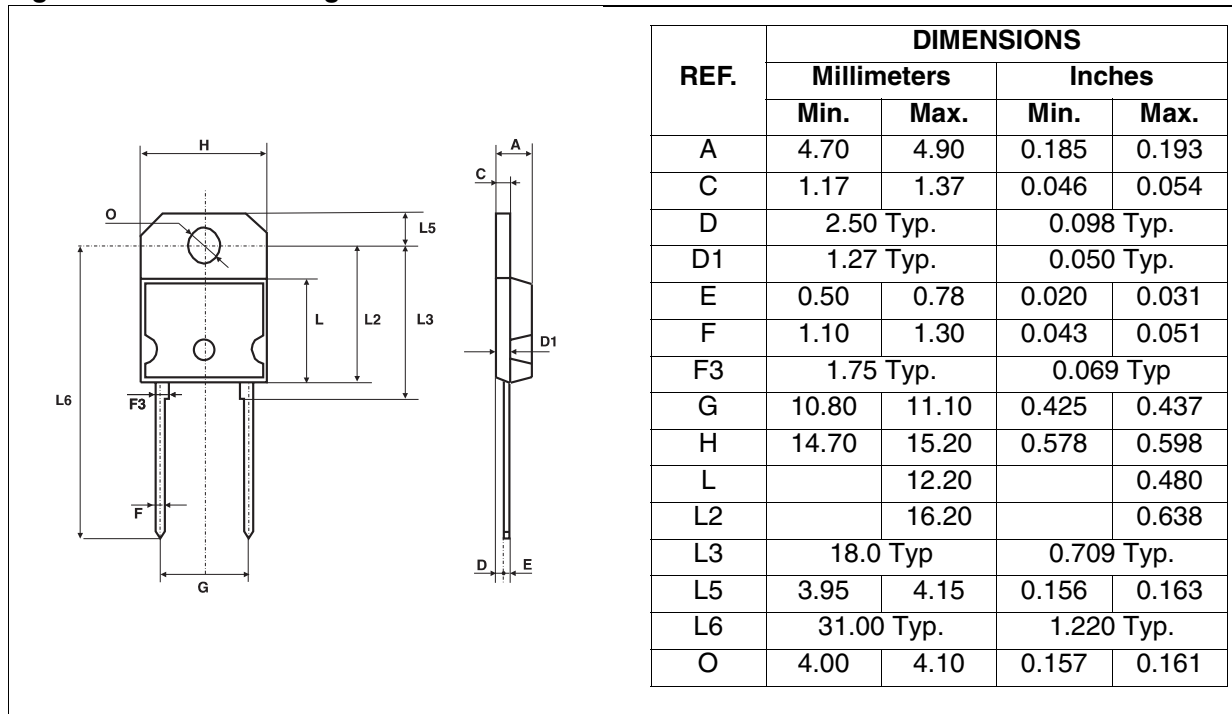


Figure 17: SOD-93 Package Mechanical Data

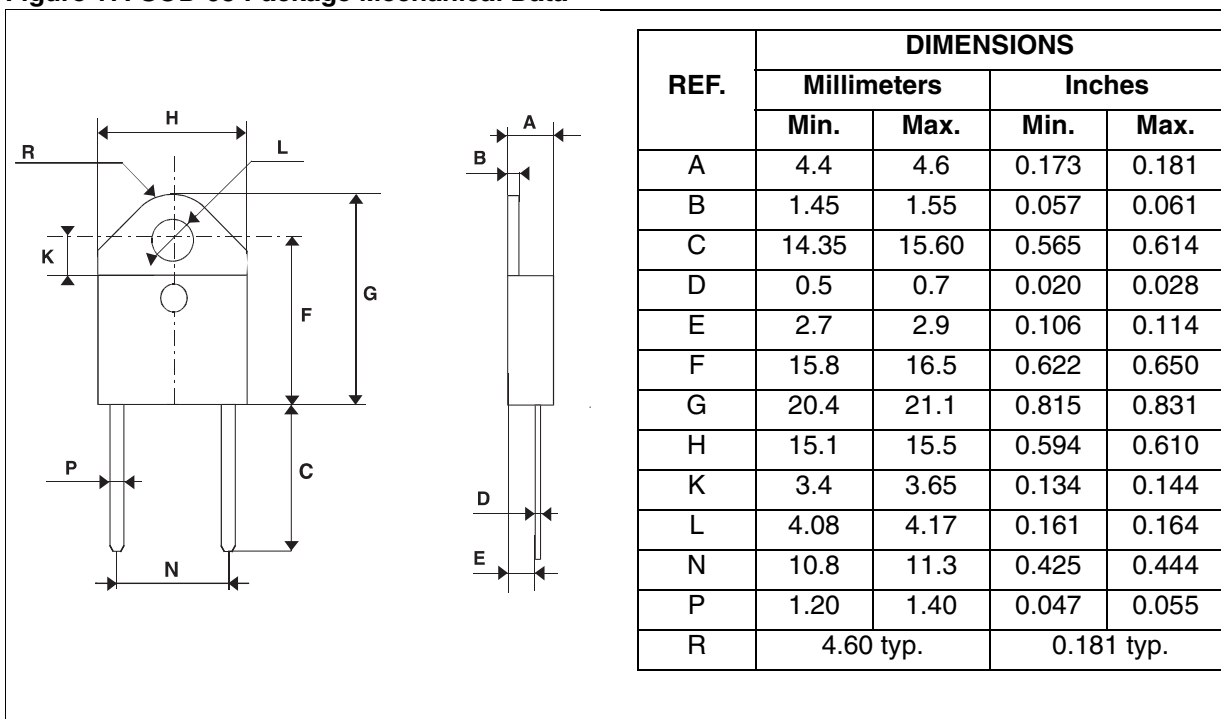


Figure 18: TO-220AC Package Mechanical Data

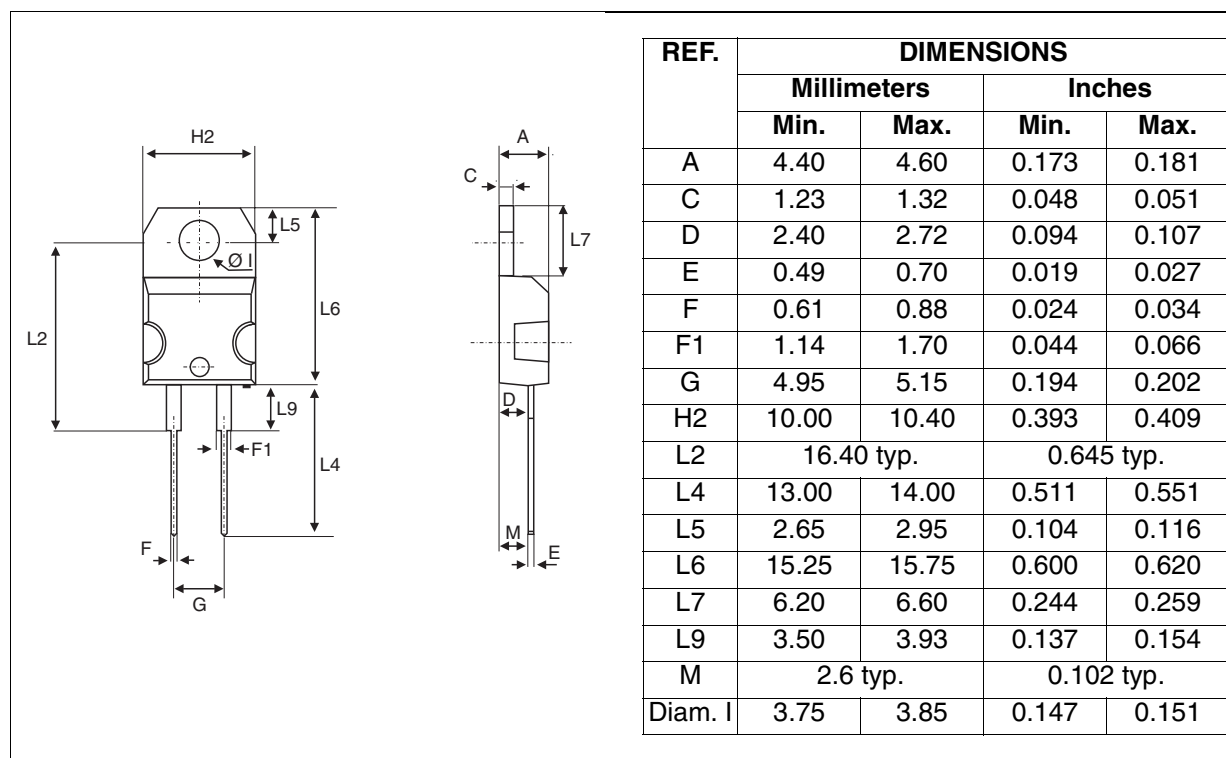


Table 7: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STTH30L06D	STTH30L06D	TO-220AC	1.90 g	50	Tube
STTH30L06G	STTH30L06G	D ² PAK	1.48 g	50	Tube
STTH30L06G-TR	STTH30L06G	D ² PAK	1.48 g	1000	Tape & reel
STTH30L06W	STTH30L06W	DO-247	4.40 g	30	Tube
STTH30L06P	STTH30L06P	SOD-93	3.79 g	30	Tube
STTH30L06P	STTH30L06P	DOP3I	4.46 g	30	Tube

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 m.N. (TO-220FPAC) / 0.55 m.N. (TO-220AC)
- Maximum torque value: 1.0 m.N. (TO-220FPAC) / 0.70 m.N. (TO-220AC)

Table 8: Revision History

Date	Revision	Description of Changes
07-Sep-2004	1	First issue.
21-Oct-2004	2	DOP3I package added.
11-Jan-06	3	Table 3 on page 2: · I _{F(RMS)} corrected from 30A to 50A · I _{F(AV)} corrected from 50A to 30A

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