



# STTH8R06D/FP/G/R

## TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	8 A
$V_{RRM}$	600 V
$I_{RM}(typ.)$	5.5A
$T_j(max)$	175 °C
$V_F(max)$	1.8 V
$t_{rr}(max)$	45 ns

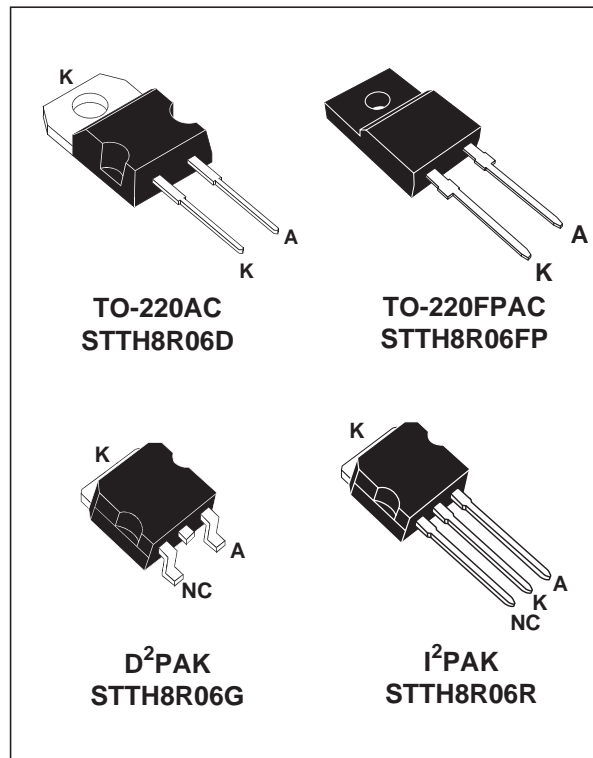
### FEATURES AND BENEFITS

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

### DESCRIPTION

The STTH8R06D/FP/G/R, which is using ST 600V technology, is specially suited as boost diode in continuous mode power factor corrections and hard switching conditions.

The device 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		30	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AC $T_c = 130^\circ\text{C}$ D <sup>2</sup> PAK / I <sup>2</sup> PAK $T_c = 130^\circ\text{C}$ TO-220FPAC $T_c = 85^\circ\text{C}$	8	A
$I_{FSM}$	Surge non repetitive forward current	tp = 10 ms Sinusoidal	80	A
$T_{stg}$	Storage temperature range		- 65 + 175	°C
$T_j$	Maximum operating junction temperature		+ 175	°C

## STTH8R06D/FP/G/R

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	TO-220AC / D <sup>2</sup> PAK / I <sup>2</sup> PAK	2.2	°C/W
		TO-220FPAC	4.6	

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub>	Reverse leakage current	V <sub>R</sub> = 600V	T <sub>j</sub> = 25°C			30	μA
			T <sub>j</sub> = 125°C		35	400	
V <sub>F</sub>	Forward voltage drop	I <sub>F</sub> = 8 A	T <sub>j</sub> = 25°C			2.9	V
			T <sub>j</sub> = 125°C		1.4	1.8	

To evaluate the maximum conduction losses use the following equation :  
 $P = 1.16 \times I_{F(AV)} + 0.08 I_{F(RMS)}^2$

### DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Tests conditions		Min.	Typ.	Max.	Unit
trr	I <sub>F</sub> = 0.5 A   I <sub>rr</sub> = 0.25 A   I <sub>R</sub> = 1A	T <sub>j</sub> = 25°C			25	ns
	I <sub>F</sub> = 1 A   dI <sub>F</sub> /dt = - 50 A/μs   V <sub>R</sub> = 30V				45	
I <sub>RM</sub>	V <sub>R</sub> = 400 V   I <sub>F</sub> = 8A   dI <sub>F</sub> /dt = - 200A/μs	T <sub>j</sub> = 125°C		5.5	7.2	A
S factor				0.3		
Qrr				150		
tfr	I <sub>F</sub> = 8 A   dI <sub>F</sub> /dt = 64 A/μs	T <sub>j</sub> = 25°C			150	ns
V <sub>FP</sub>	V <sub>FR</sub> = 1.1 x V <sub>Fmax</sub>				5	V

Fig. 1: Conduction losses versus average current.

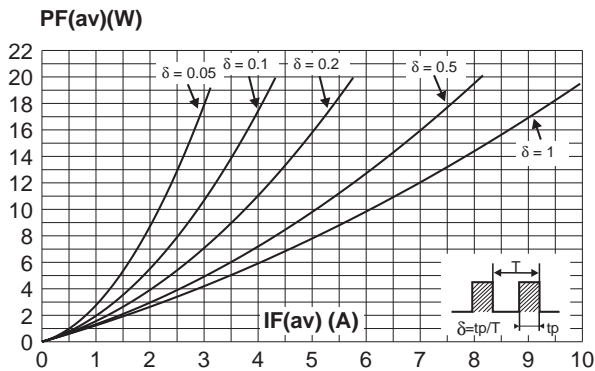


Fig. 2: Forward voltage drop versus forward current.

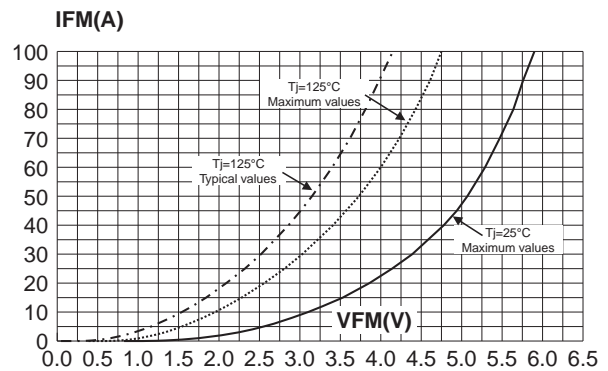


Fig. 3-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, I<sup>2</sup>PAK, D<sup>2</sup>PAK).

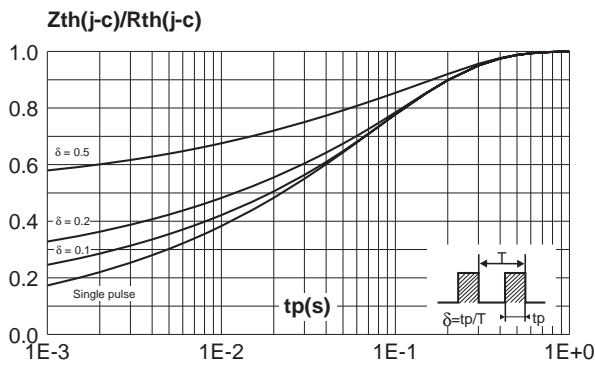


Fig. 3-2: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC).

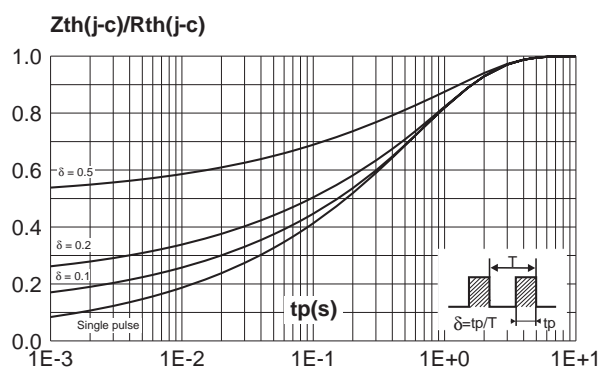


Fig. 4: Peak reverse recovery current versus  $dI_F/dt$  (90% confidence).

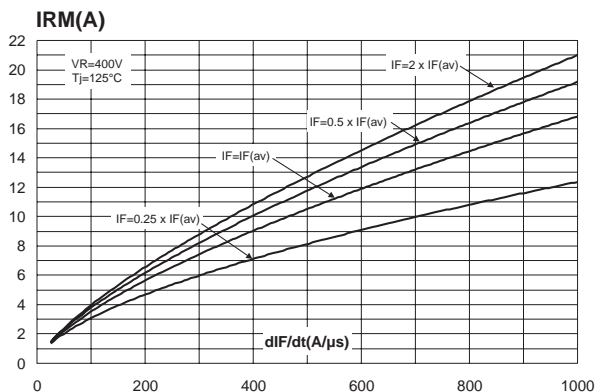
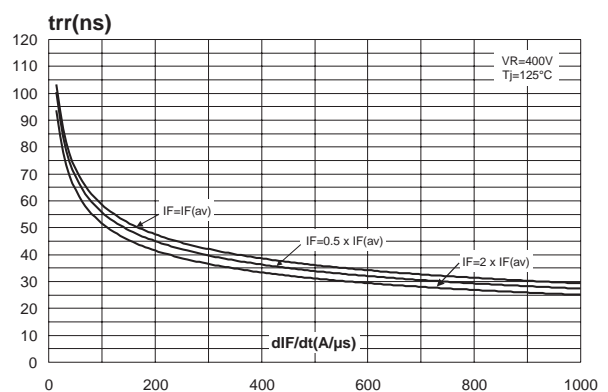
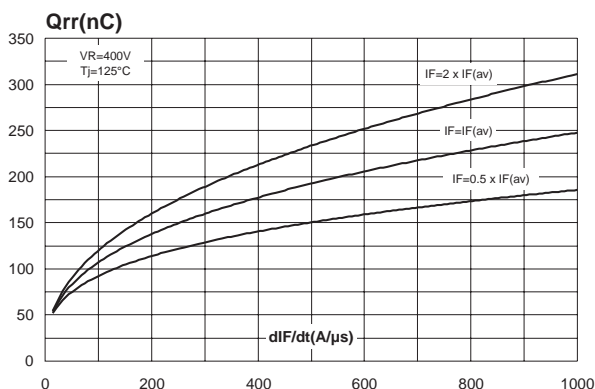


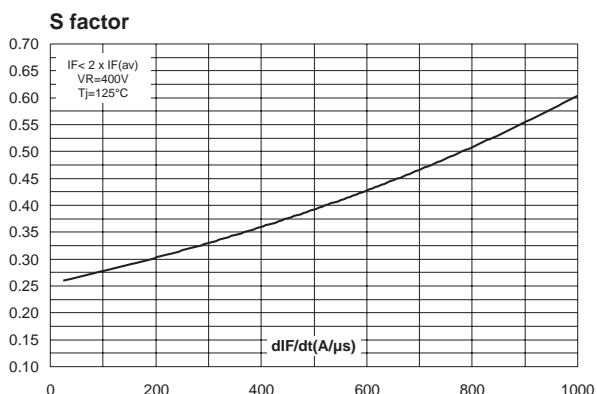
Fig. 5: Reverse recovery time versus  $dI_F/dt$  (90% confidence).



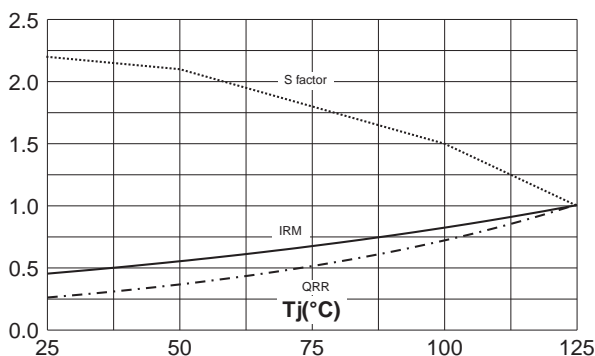
**Fig. 6:** Reverse recovery charges versus  $dI_F/dt$  (90% confidence).



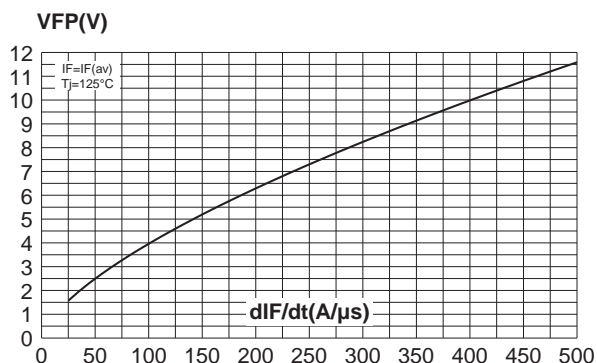
**Fig. 7:** Softness factor ( $t_b/t_a$ ) versus  $dI_F/dt$  (typical values).



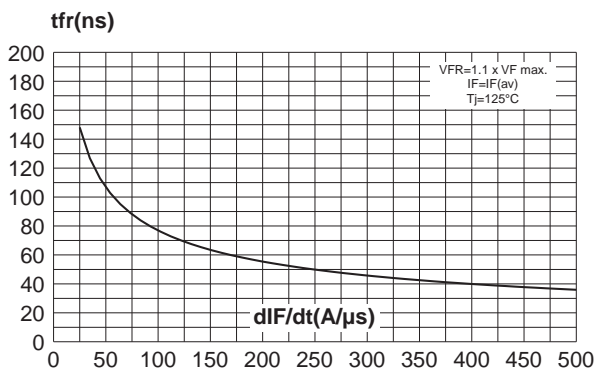
**Fig. 8:** Relative variation of dynamic parameters versus junction temperature (Reference:  $T_j = 125^\circ\text{C}$ ).



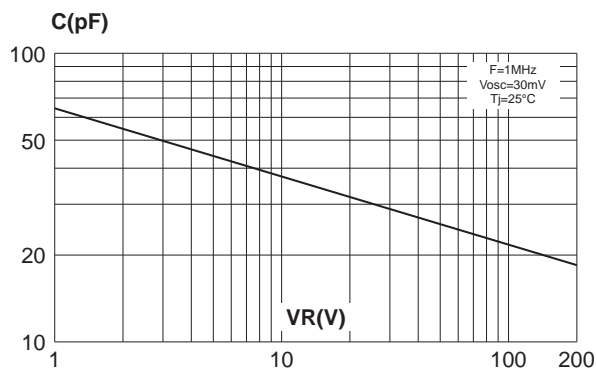
**Fig. 9:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



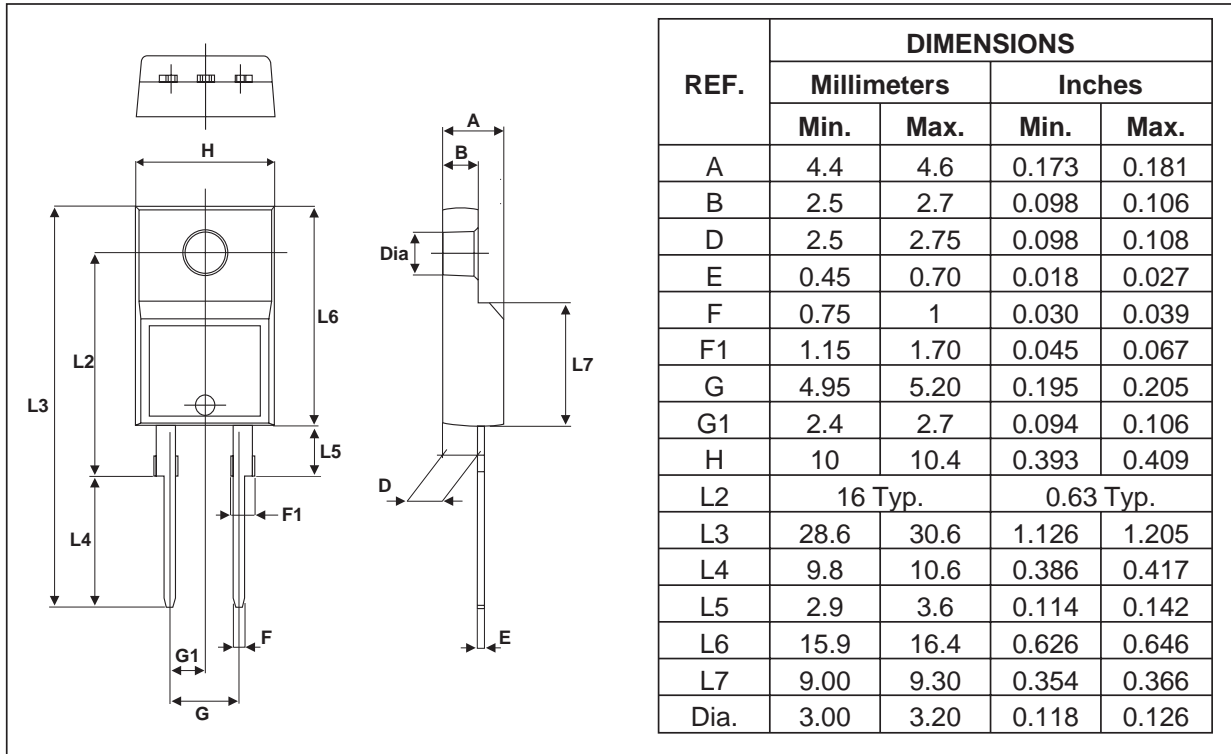
**Fig. 10:** Forward recovery time versus  $dI_F/dt$  (90% confidence).



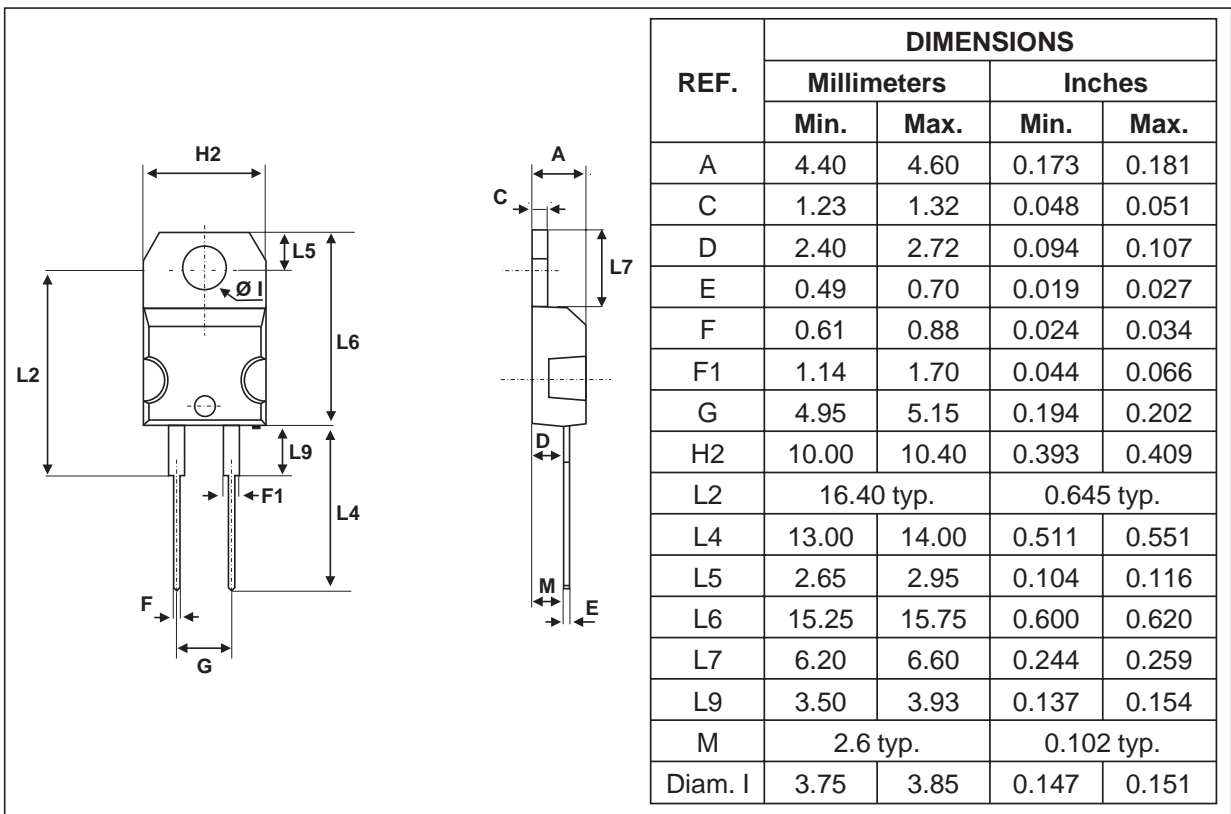
**Fig. 11:** Junction capacitance versus reverse voltage applied (typical values).



**PACKAGE MECHANICAL DATA**  
TO-220FPAC

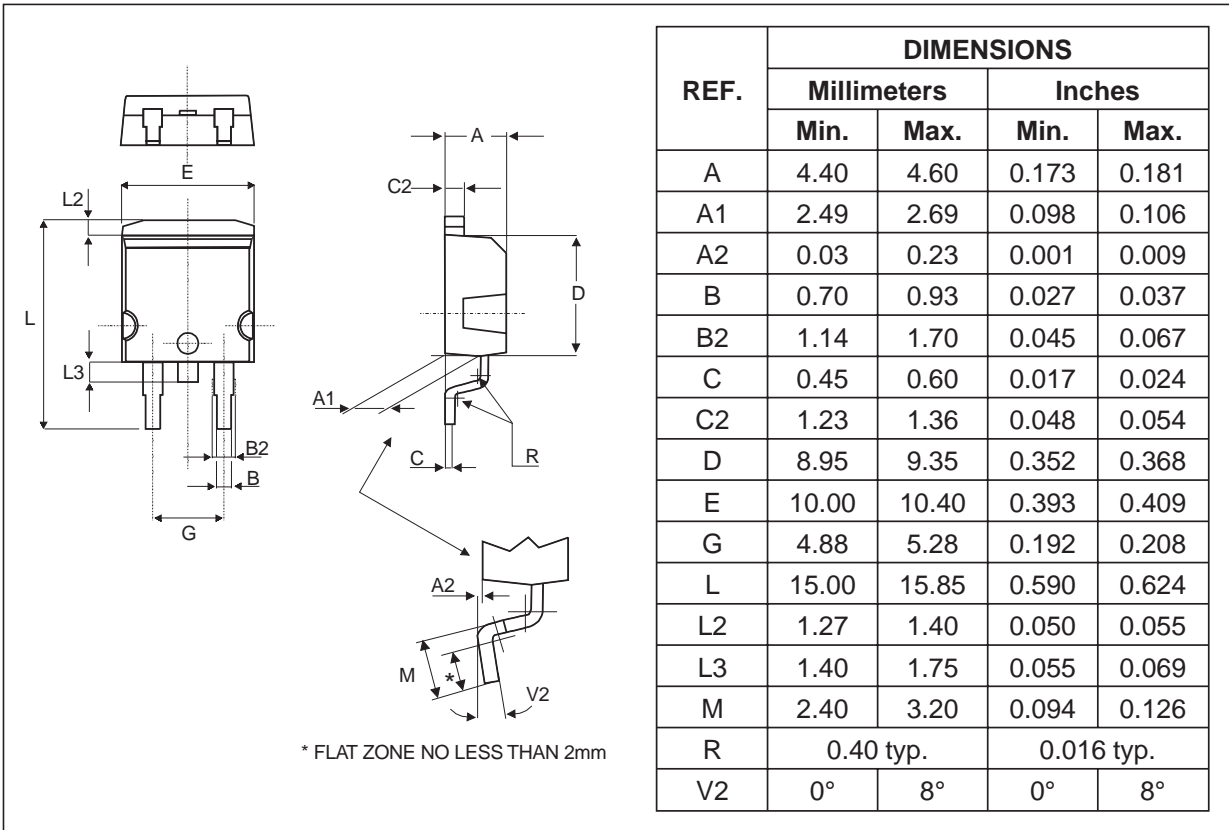


**PACKAGE MECHANICAL DATA**  
TO-220AC

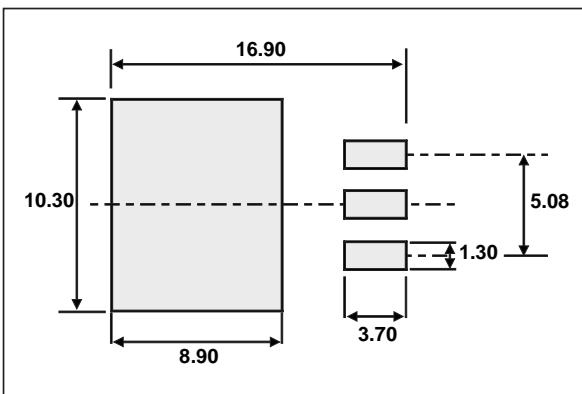


PACKAGE MECHANICAL DATA

D<sup>2</sup>PAK



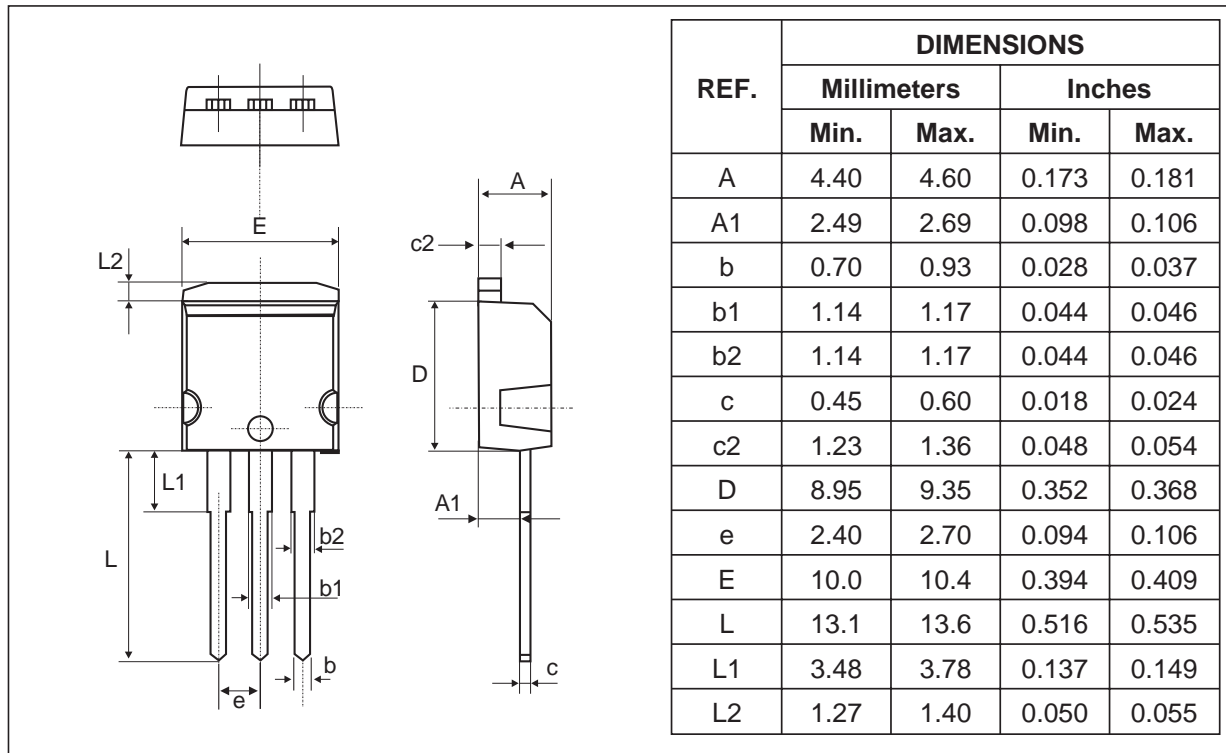
FOOTPRINT (in millimeters)



# STTH8R06D/FP/G/R

## PACKAGE MECHANICAL DATA

I<sup>2</sup>PAK



Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH8R06D	STTH8R06D	TO-220AC	1.9 g	50	Tube
STTH8R06FP	STTH8R06FP	TO-220FPAC	1.7 g	50	Tube
STTH8R06G	STTH8R06G	D <sup>2</sup> PAK	1.5 g	50	Tube
STTH8R06R	STTH8R06R	I <sup>2</sup> PAK	1.5 g	50	Tube

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

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