



STTH5R06D/FP/B/G

TURBO 2 ULTRAFast HIGH VOLTAGE RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	5 A
V_{RRM}	600 V
$I_{RM} (typ.)$	5 A
$T_j (max)$	175 °C
$V_F (max)$	1.8 V
$t_{rr} (max)$	40 ns

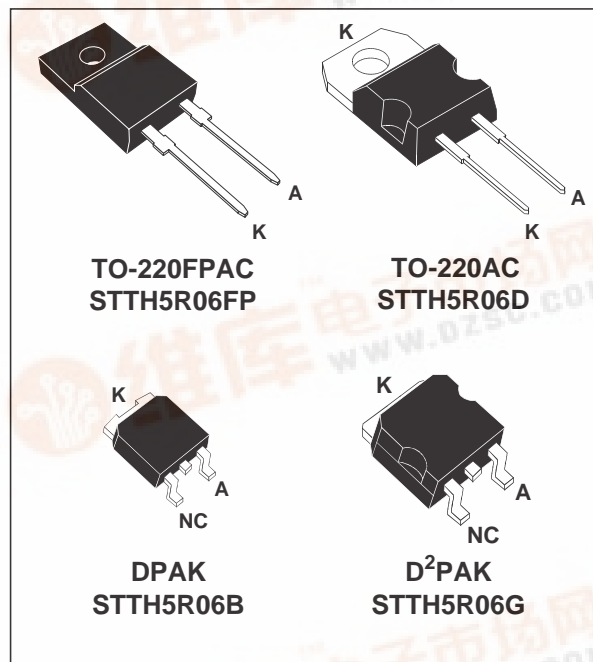
FEATURES AND BENEFITS

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

DESCRIPTION

The STTH5R06D/FP/B/G, which is using ST Turbo 2 600V technology, is specially suited as boost diode in continuous mode power factor corrections and hard switching conditions.

The device (available in TO-220AC, TO-220FPAC, D²PAK 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 / D ² PAK	20	A
		DPAK	10	A
$I_{F(AV)}$	Average forward current	TO-220AC TO-220FPAC DPAK / D ² PAK	5	A
		$T_c = 105^\circ\text{C} \quad \delta = 0.5$		
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms Sinusoidal}$	50	A
T_{stg}	Storage temperature range		- 65 + 175	°C
T_j	Maximum operating junction temperature		175	°C

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THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R _{th(j-c)}	Junction to case	TO-220AC / DPAK / D ² PAK	3.0	°C/W
		TO-220FPAC	5.5	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I _R	Reverse leakage current	V _R = 600V	T _j = 25°C			20	μA
			T _j = 125°C		25	250	
V _F	Forward voltage drop	I _F = 5 A	T _j = 25°C			2.9	V
			T _j = 125°C		1.4	1.8	

To evaluate the maximum conduction losses use the following equation :
 $P = 1.16 \times I_{F(AV)} + 0.128 I_{F(RMS)}^2$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Tests conditions		Min.	Typ.	Max.	Unit
trr	I _F = 0.5 A I _{rr} = 0.25 A I _R = 1A	T _j = 25°C			25	ns
	I _F = 1 A dI _F /dt = - 50 A/μs V _R = 30V				40	
I _{RM}	V _R = 400 V I _F = 5A dI _F /dt = - 200A/μs	T _j = 125°C		5.0	6.0	A
S factor				0.35		
Q _{rr}				110		nC
t _{fr}	I _F = 5 A dI _F /dt = 40 A/μs V _{FR} = 1.1 x V _{Fmax}	T _j = 25°C			150	ns
V _{FP}					4.5	V

Fig. 1: Conduction losses versus average current.

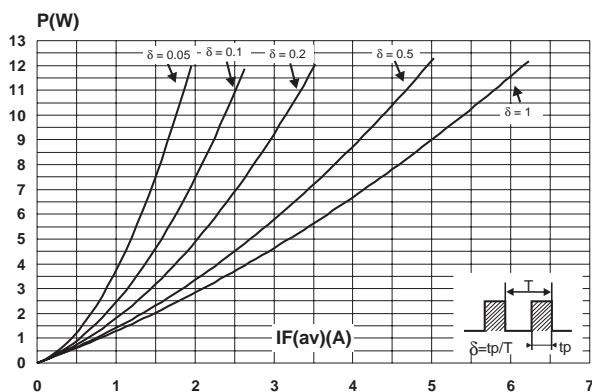


Fig. 2: Forward voltage drop versus forward current.

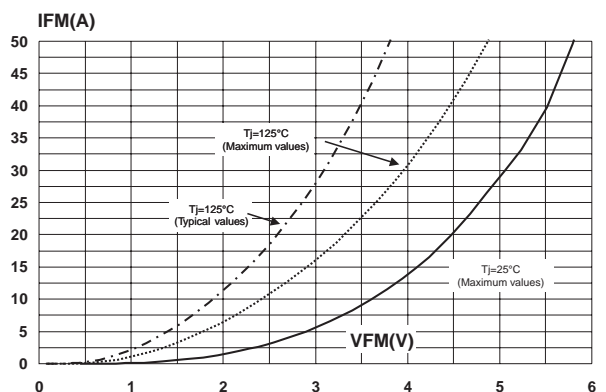


Fig. 3-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, DPAK, D²PAK).

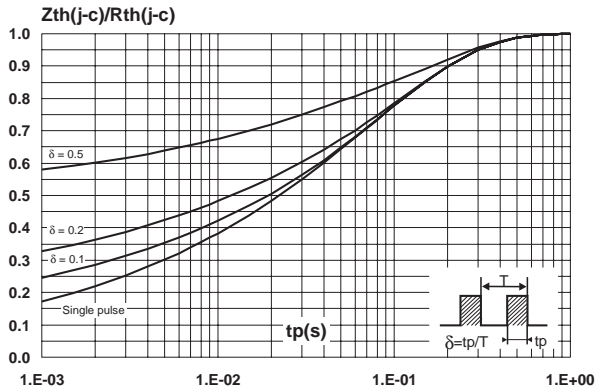


Fig. 3-2: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC).

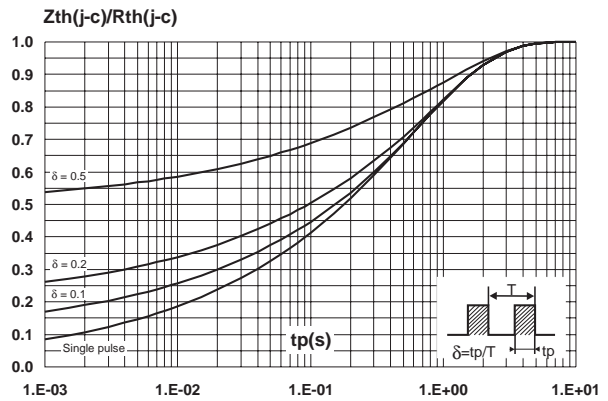


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence).

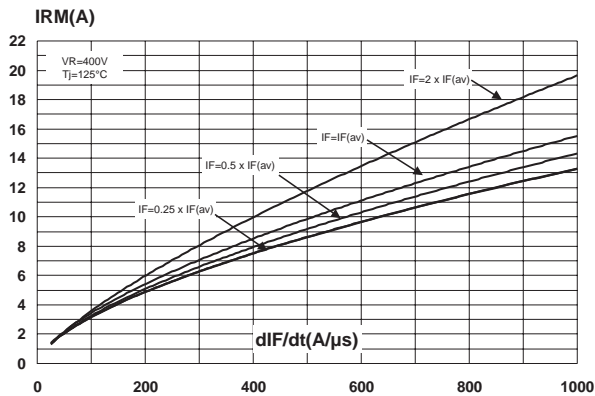


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence).

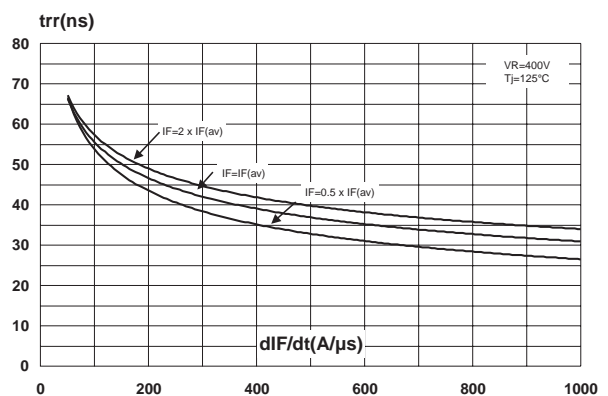


Fig. 6: Reverse recovery charges versus dI_F/dt (90% confidence).

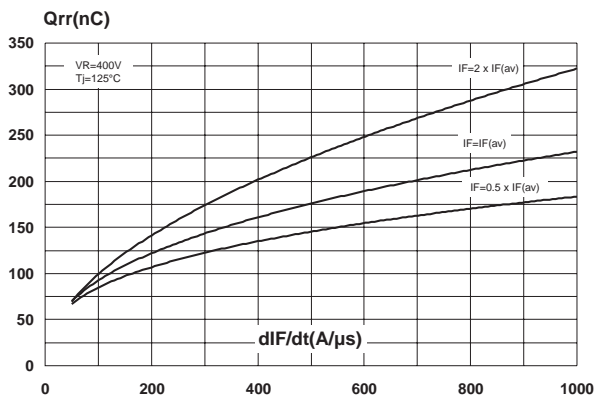


Fig. 7: Softness factor versus dI_F/dt (typical values).

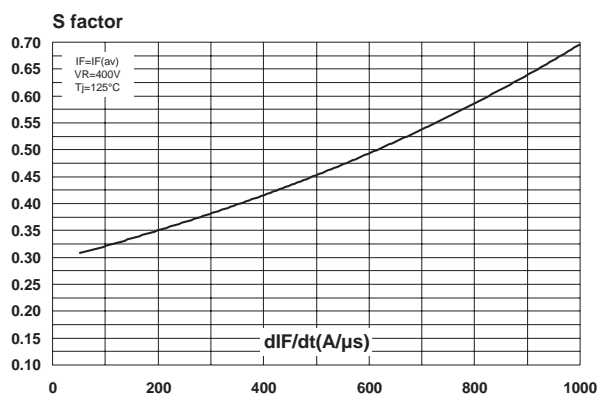


Fig. 8: Relative variation of dynamic parameters versus junction temperature.

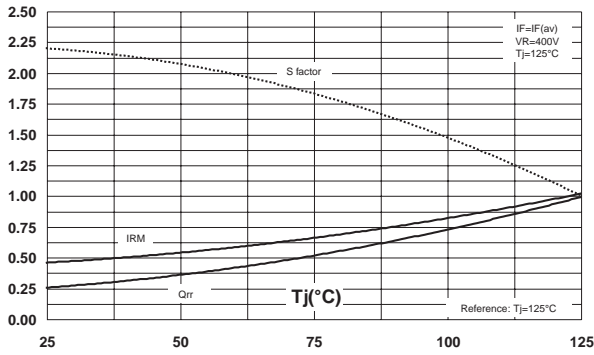


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

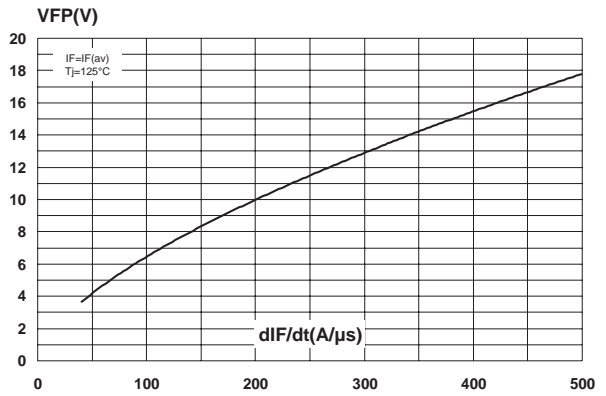


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

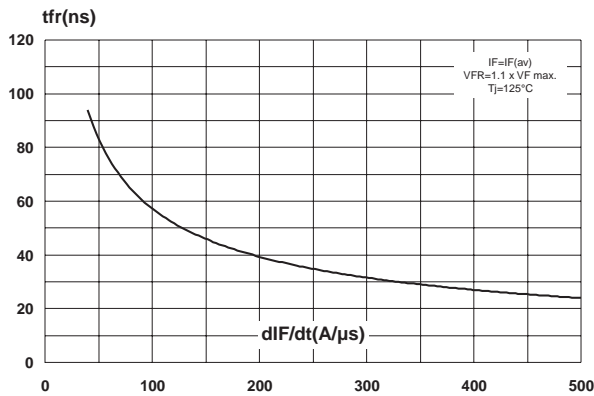


Fig. 11: Junction capacitance versus reverse voltage applied (typical values).

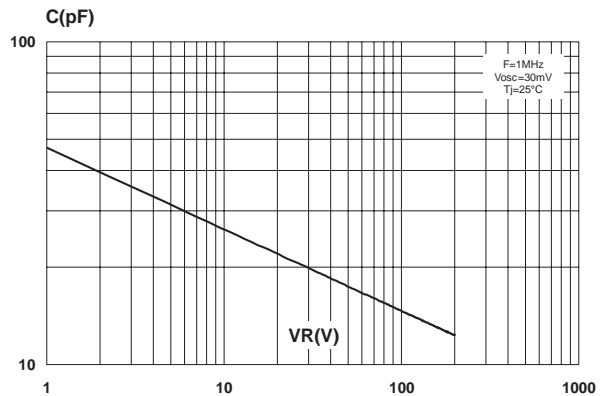
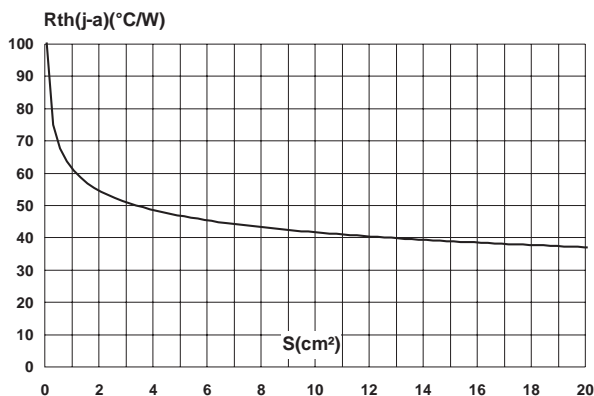
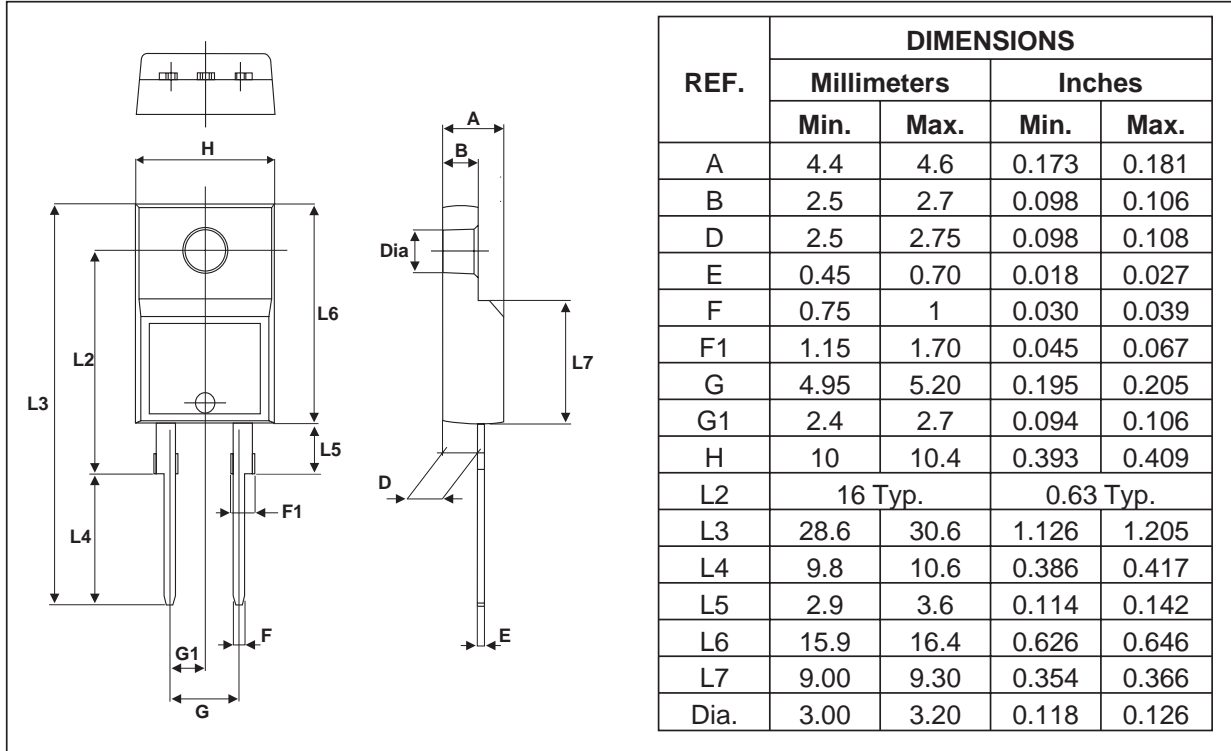


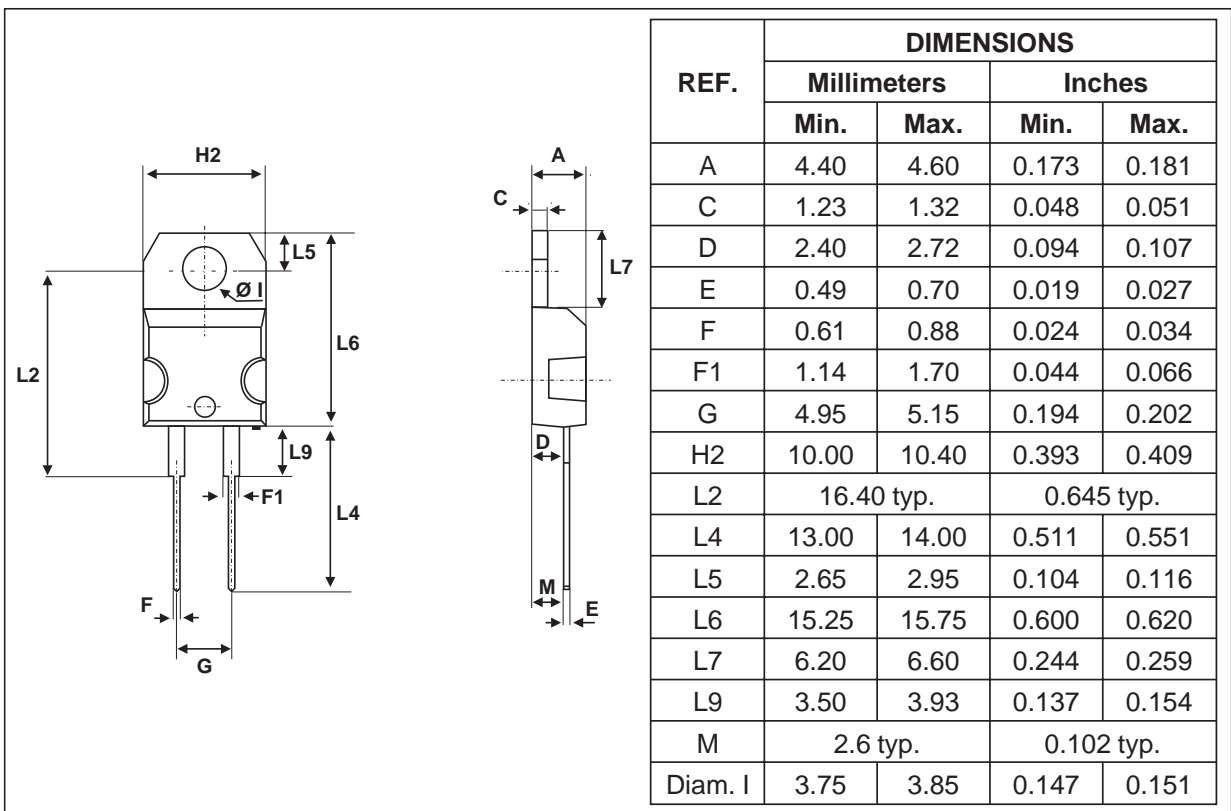
Fig. 12: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board FR4, Cu=35 μm) (DPAK and D²PAK).



PACKAGE MECHANICAL DATA
TO-220FPAC

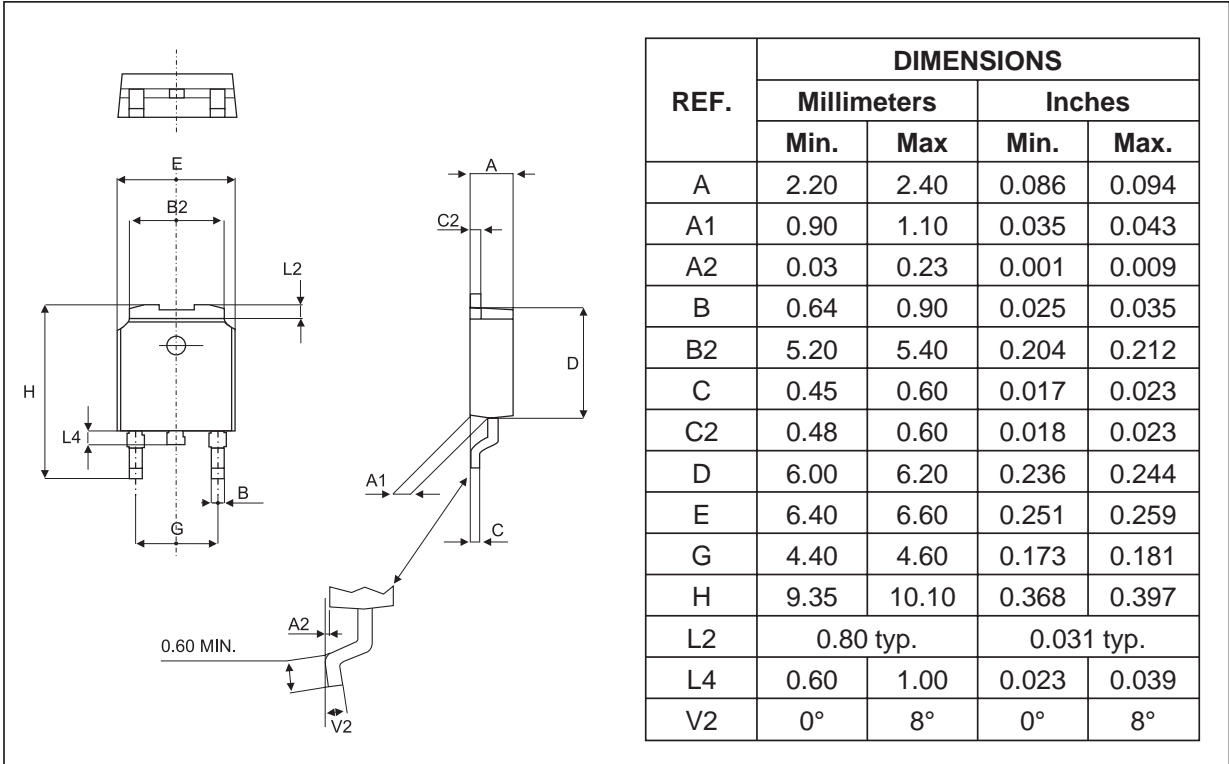


PACKAGE MECHANICAL DATA
TO-220AC

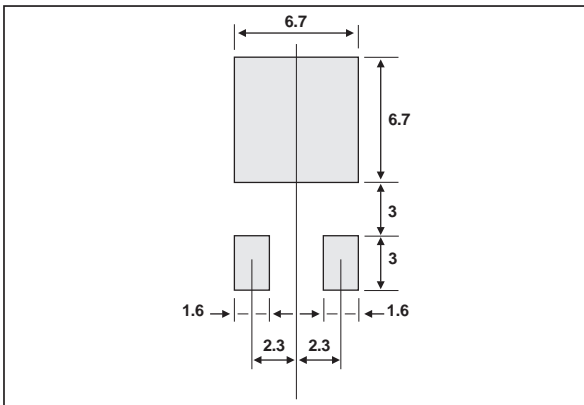


STTH5R06D/FP/B/G

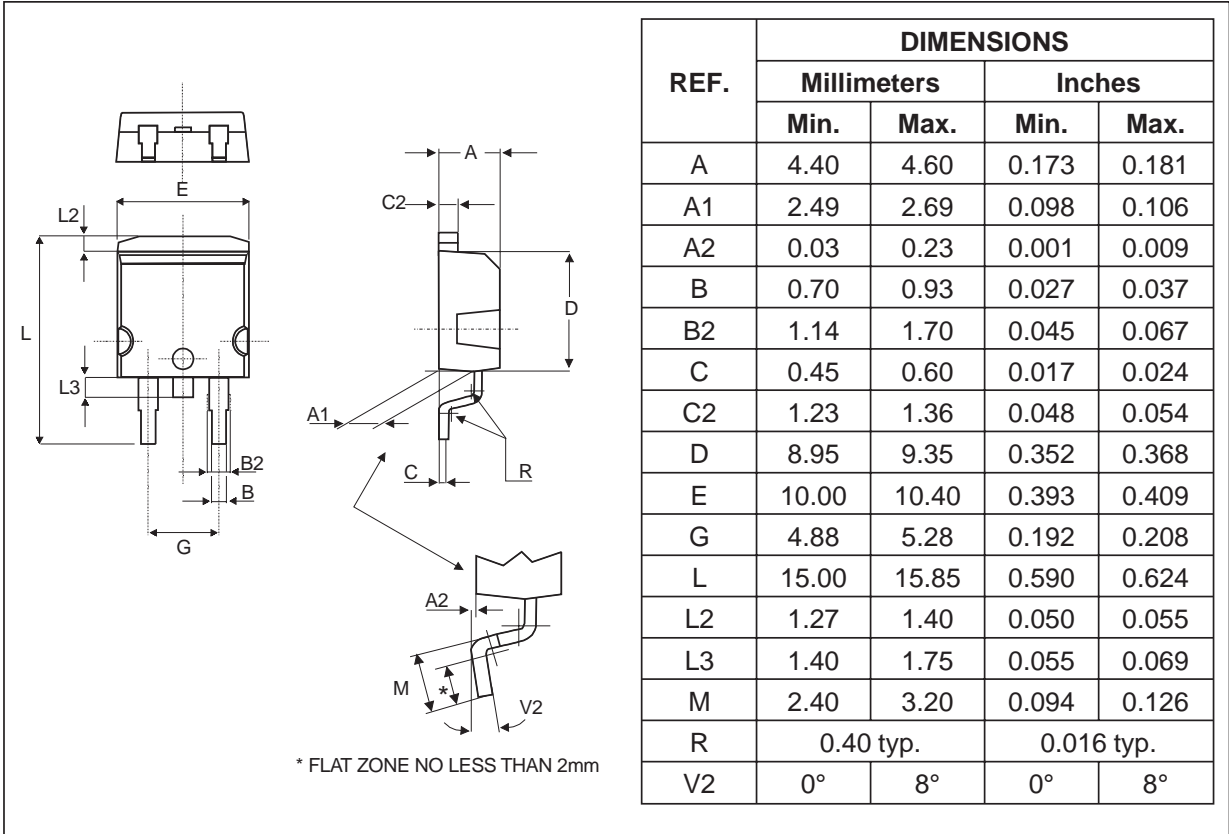
PACKAGE MECHANICAL DATA
DPAK



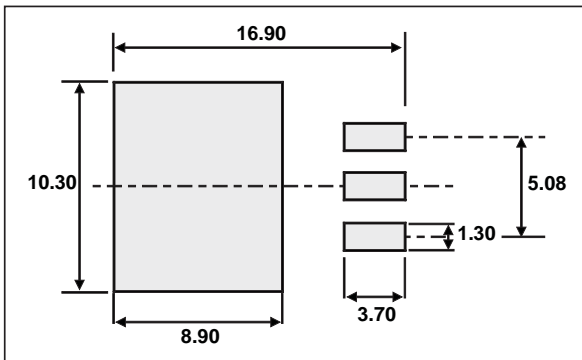
FOOT PRINT DIMENSIONS (in millimeters)
DPAK



PACKAGE MECHANICAL DATA
D²PAK



FOOT PRINT DIMENSIONS (in millimeters)



STTH5R06D/FP/B/G

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH5R06D	STTH5R06D	TO-220AC	1.9 g	50	Tube
STTH5R06FP	STTH5R06FP	TO-220FPAC	1.7 g	50	Tube
STTH5R06B	STTH5R06B	DPAK	0.3 g	75	Tube
STTH5R06B-TR	STTH5R06B	DPAK	0.3 g	2500	Tape & reel
STTH5R06G	STTH5R06G	D ² PAK	1.48 g	50	Tube
STTH5R06G-TR	STTH5R06G	D ² PAK	1.48 g	1000	Tape & reel

- 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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