



STTH12R06D/FP

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	12 A
V_{RRM}	600 V
I_{RM} (typ.)	7 A
T_j (max)	175 °C
V_F (max)	1.8 V
t_{rr} (max)	45 ns

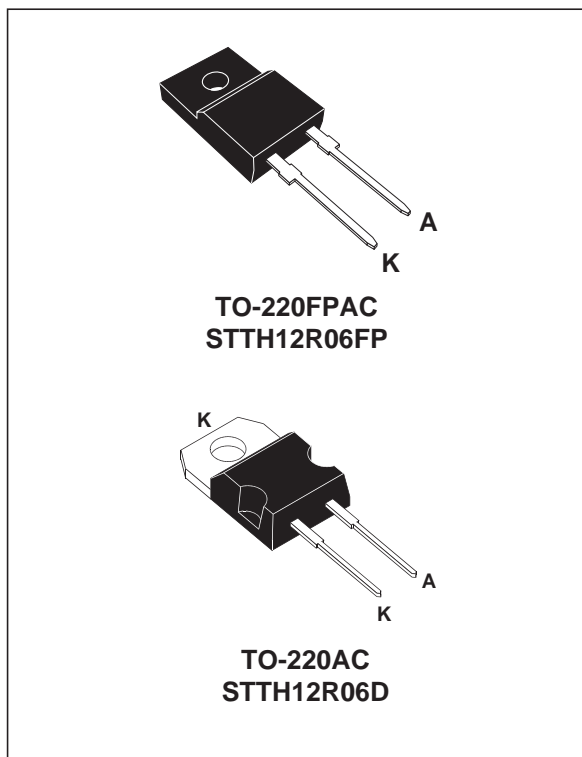
FEATURES AND BENEFITS

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

DESCRIPTION

The STTH12R06D/FP, 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 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		12	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms Sinusoidal	100	A
T_{stg}	Storage temperature range		- 65 + 175	°C
T_j	Maximum operating junction temperature		+ 175	°C

STTH12R06D/FP

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R _{th(j-c)}	Junction to case	TO-220AC	1.7	°C/W
		TO-220FPAC	4.4	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I _R	Reverse leakage current	V _R = 600V	T _j = 25°C			45	μA
			T _j = 125°C		50	600	
V _F	Forward voltage drop	I _F = 12 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 :
 $P = 1.16 \times I_{F(AV)} + 0.053 I_{F(RMS)}^2$

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					45	
I _{RM}	V _R = 400 V I _F = 12A dI _F /dt = - 200A/μs		T _j = 125°C		7.0	8.4	A
S factor					0.2		
Qrr					180		nC
tfr	I _F = 12 A dI _F /dt = 96 A/μs		T _j = 25°C			200	ns
V _{FP}	V _{FR} = 1.1 x V _{Fmax}					5.5	V

Fig. 1: Conduction losses versus average current.

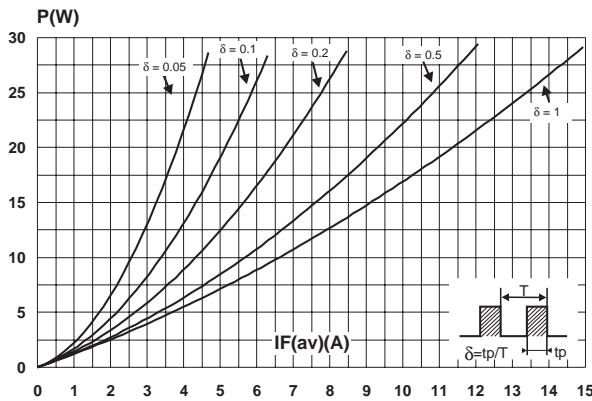


Fig. 2: Forward voltage drop versus forward current.

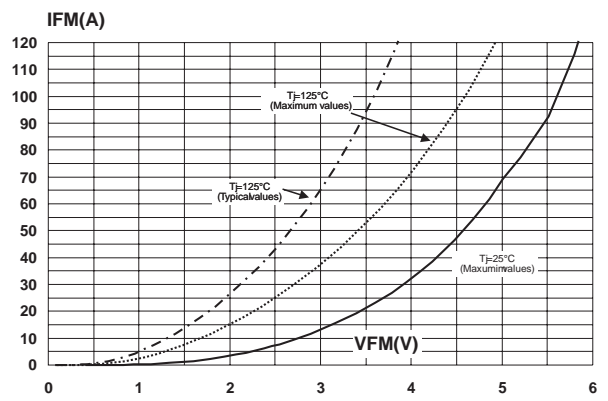


Fig. 3-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC).

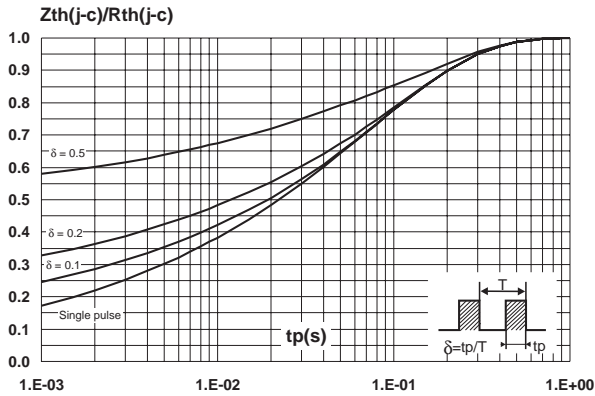


Fig. 3-2: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC).

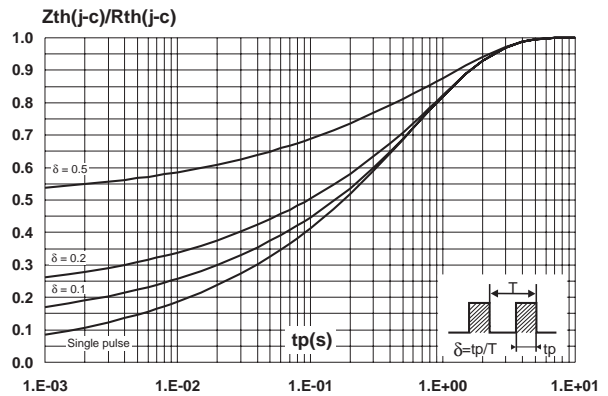


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence).

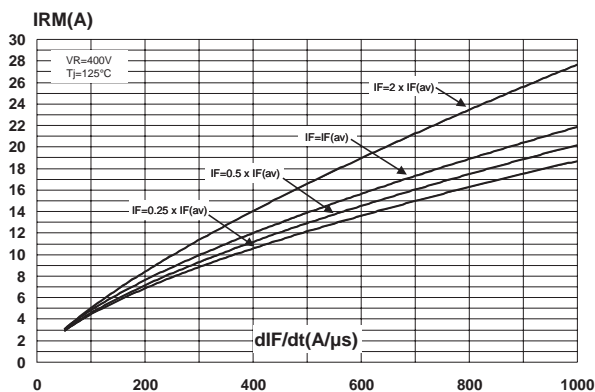


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence).

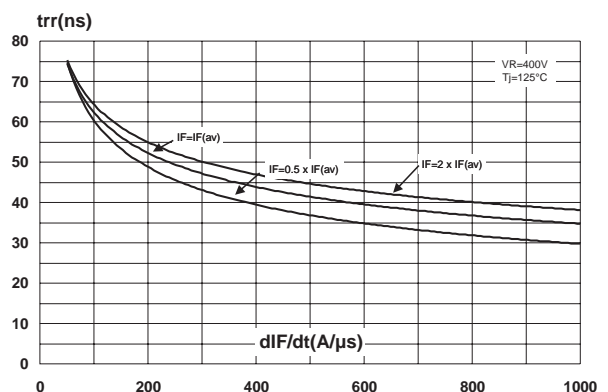


Fig. 6: Reverse recovery charges versus dI_F/dt (90% confidence).

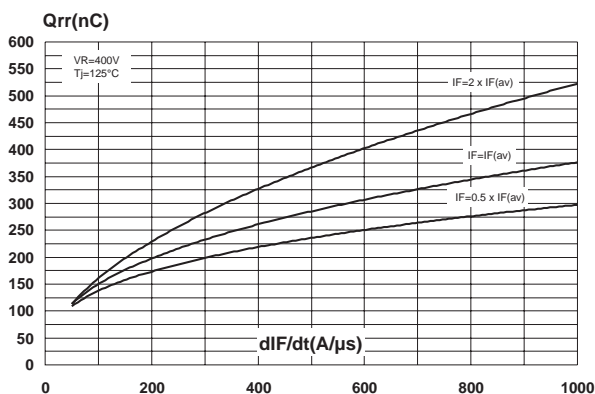


Fig. 7: Softness factor versus dI_F/dt (typical values).

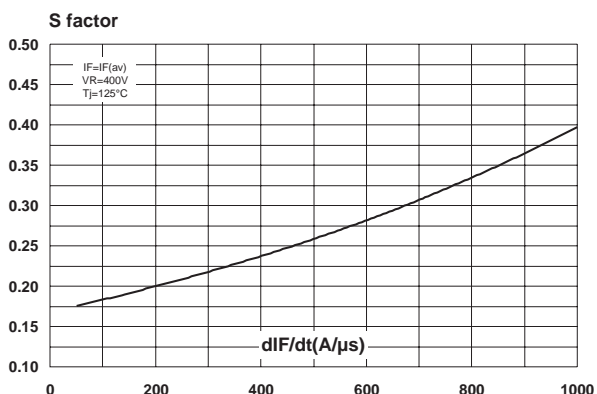


Fig. 8: Relative variation of dynamic parameters versus junction temperature.

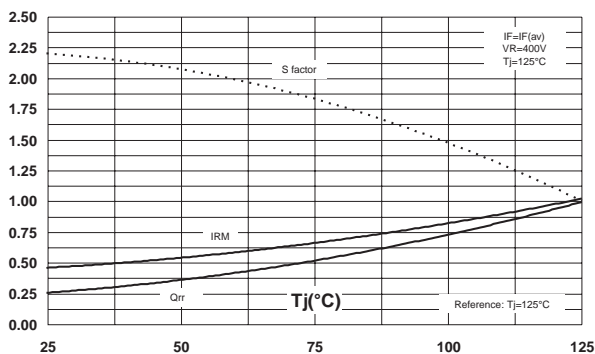


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

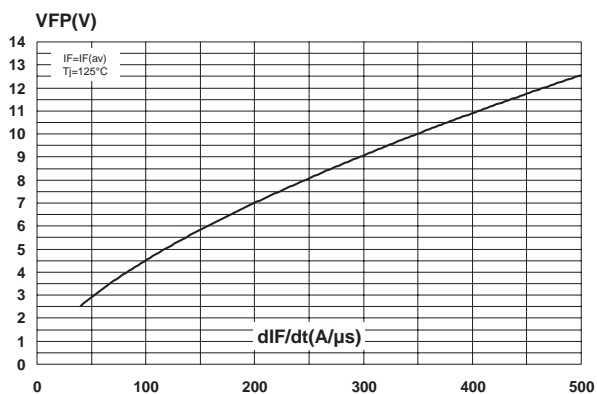


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

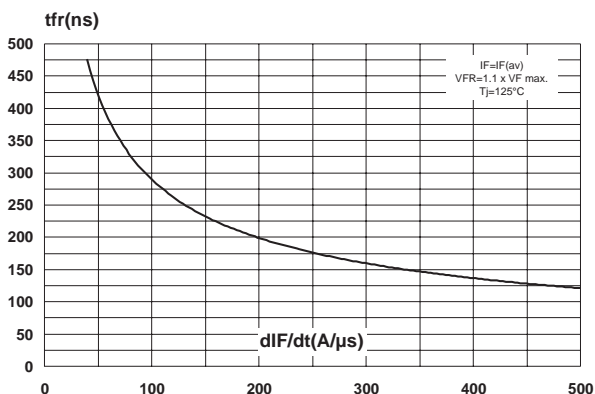
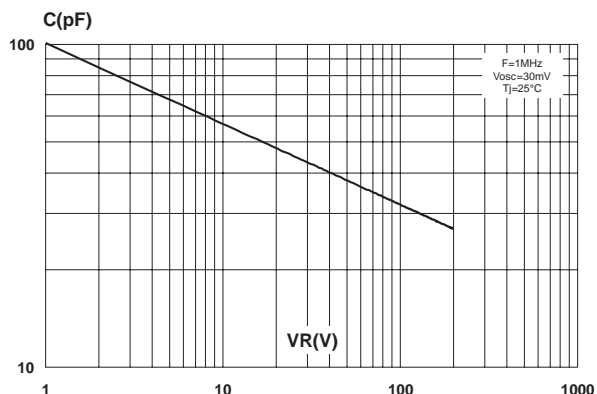
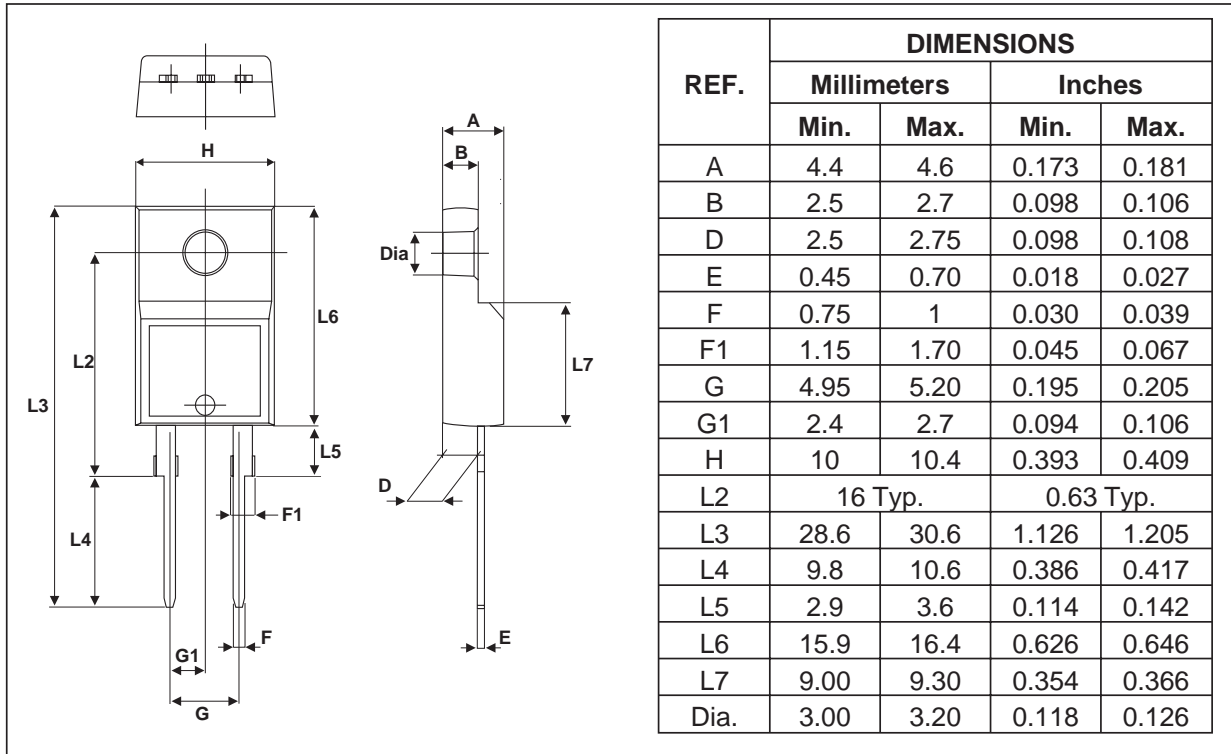


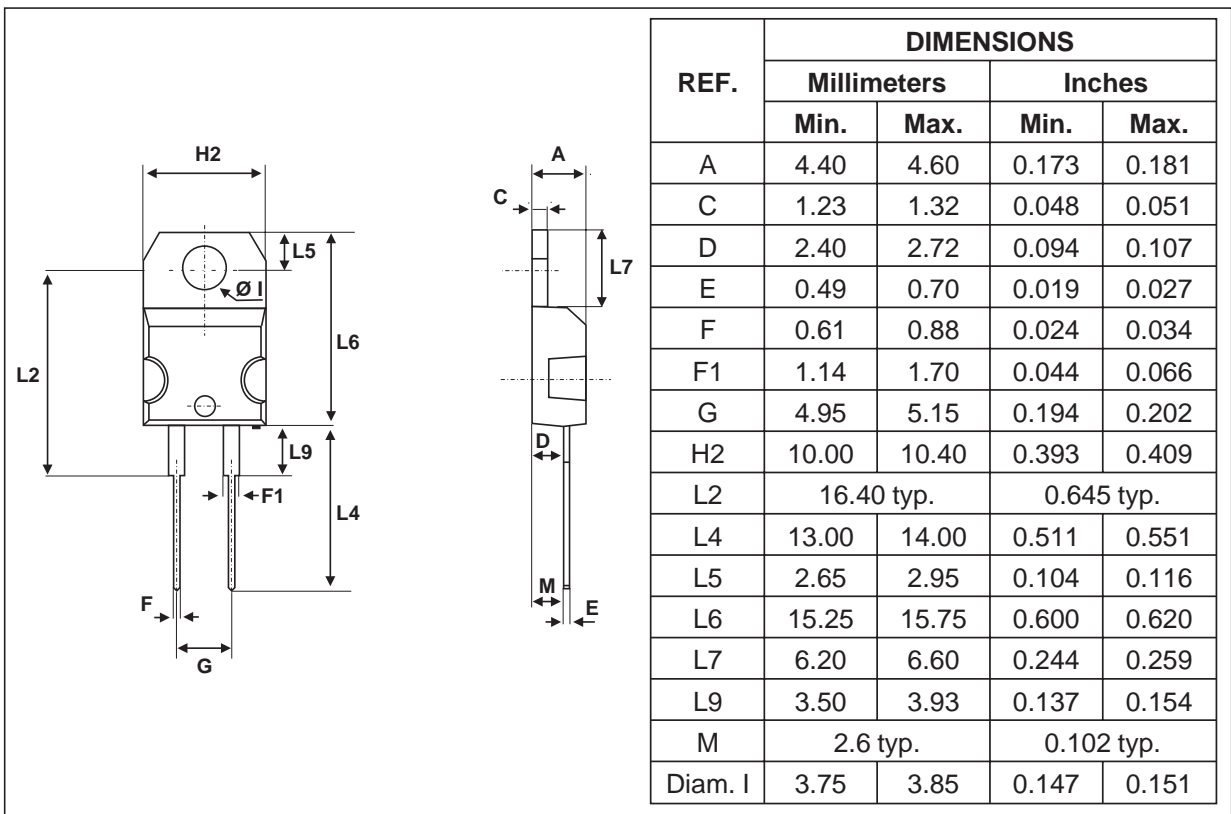
Fig. 11: Junction capacitance versus reverse voltage applied (typical values).



PACKAGE MECHANICAL DATA
TO-220FPAC



PACKAGE MECHANICAL DATA
TO-220AC



STTH12R06D/FP

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH12R06D	STTH12R06D	TO-220AC	1.9 g	50	Tube
STTH12R06FP	STTH12R06FP	TO-220FPAC	1.7 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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