



# STTH803D/G

## HIGH FREQUENCY SECONDARY RECTIFIER

### MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	8 A
$V_{RRM}$	300 V
$T_j(\text{max})$	175 °C
$V_F(\text{max})$	1 V
$t_{rr}(\text{max})$	35 ns

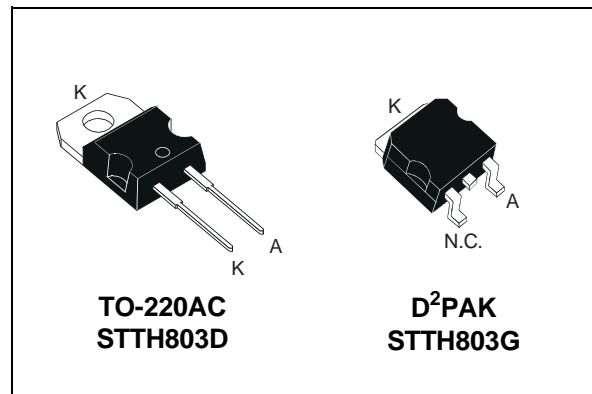
### FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND REVERSE VOLTAGE PERFORMANCE
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY

### DESCRIPTION

Single Fast Recovery Epitaxial Diode suited for Switch Mode Power Supply and high frequency DC/DC converters.

Packaged in TO-220AC or D<sup>2</sup>PAK this device is especially intended for secondary rectification.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		300	V
$I_{F(RMS)}$	RMS forward current		20	A
$I_{F(AV)}$	Average forward current	$T_c = 150^\circ\text{C} \quad \delta = 0.5$	8	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ sinusoidal	100	A
$I_{RSM}$	Non repetitive avalanche current	$t_p = 20 \mu\text{s}$ square	4	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	2.5	°C/W

### STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$V_R = 300\text{ V}$	$T_j = 25^\circ\text{C}$			20	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$		20	200	
$V_F^{**}$	Forward voltage drop	$I_F = 8\text{ A}$	$T_j = 25^\circ\text{C}$			1.25	V
		$I_F = 8\text{ A}$	$T_j = 125^\circ\text{C}$		0.85	1	

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

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

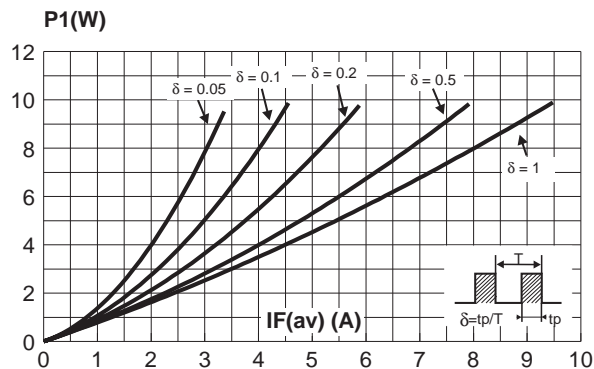
To evaluate the maximum conduction losses use the following equation :

$$P = 0.75 \times I_{F(AV)} + 0.031 I_{F(RMS)}^2$$

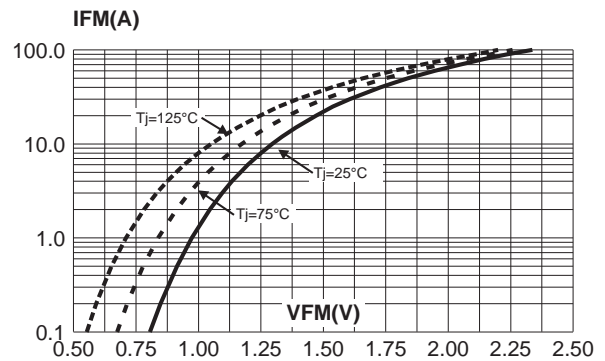
### RECOVERY CHARACTERISTICS

Symbol	Tests conditions			Min.	Typ.	Max.	Unit
trr	$I_F = 0.5\text{ A}$	$I_{rr} = 0.25\text{ A}$	$I_R = 1\text{ A}$	$T_j = 25^\circ\text{C}$		25	ns
	$I_F = 1\text{ A}$	$di_F/dt = -50\text{ A}/\mu\text{s}$	$V_R = 30\text{ V}$				
tfr	$I_F = 8\text{ A}$	$di_F/dt = 100\text{ A}/\mu\text{s}$		$T_j = 25^\circ\text{C}$		200	ns
$V_{FP}$	$V_{FR} = 1.1 \times V_F \text{ max.}$			$T_j = 25^\circ\text{C}$		3.5	V
$S_{factor}$	$V_{CC} = 200\text{ V}$	$I_F = 8\text{ A}$		$T_j = 125^\circ\text{C}$	0.3	8	-
$I_{RM}$	$di_F/dt = 200\text{ A}/\mu\text{s}$						

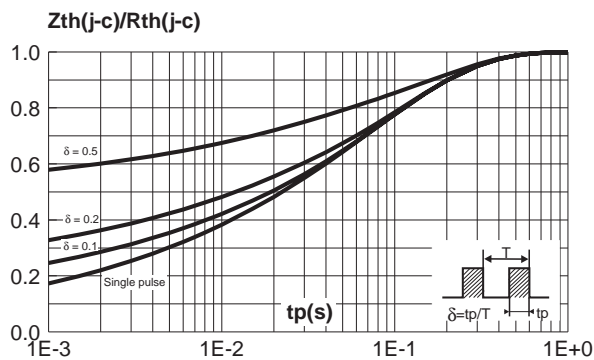
**Fig. 1:** Conduction losses versus average current.



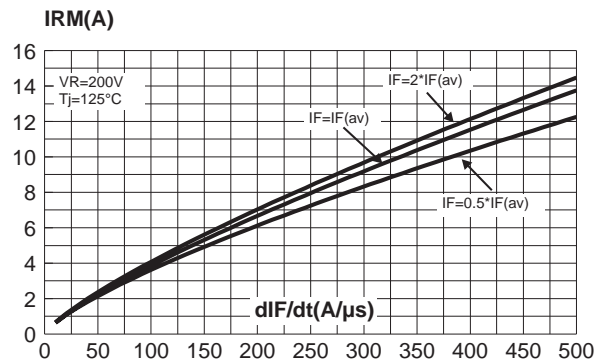
**Fig. 2:** Forward voltage drop versus forward current (maximum values).



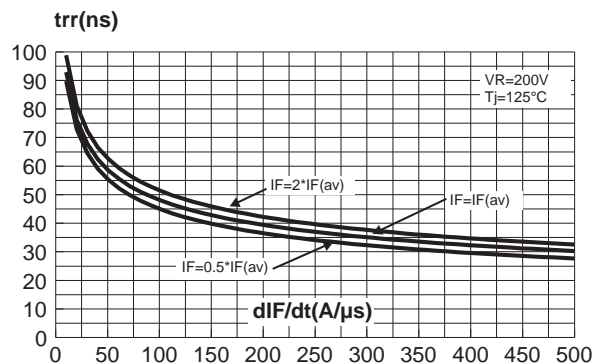
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



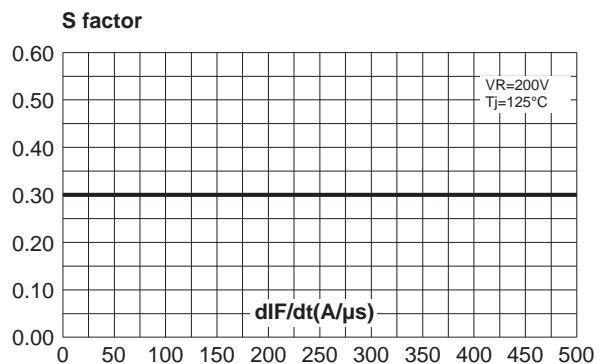
**Fig. 4:** Peak reverse recovery current versus  $dI_F/dt$  (90% confidence).



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

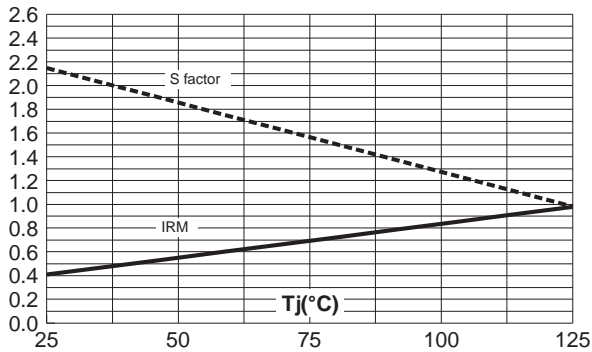


**Fig. 6:** Softness factor versus  $dI_F/dt$  (typical values).

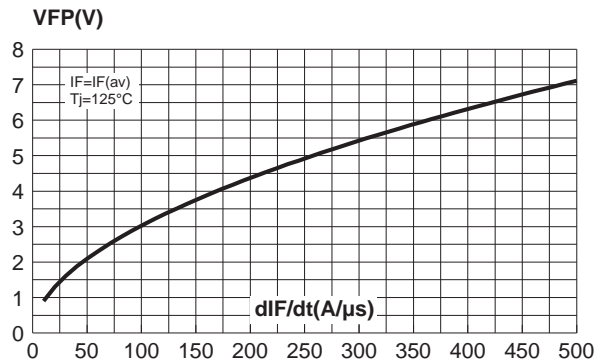


## STTH803D/G

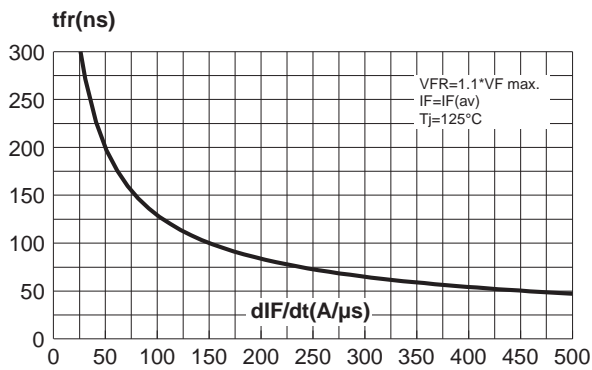
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (reference:  $T_j = 125^\circ\text{C}$ ).



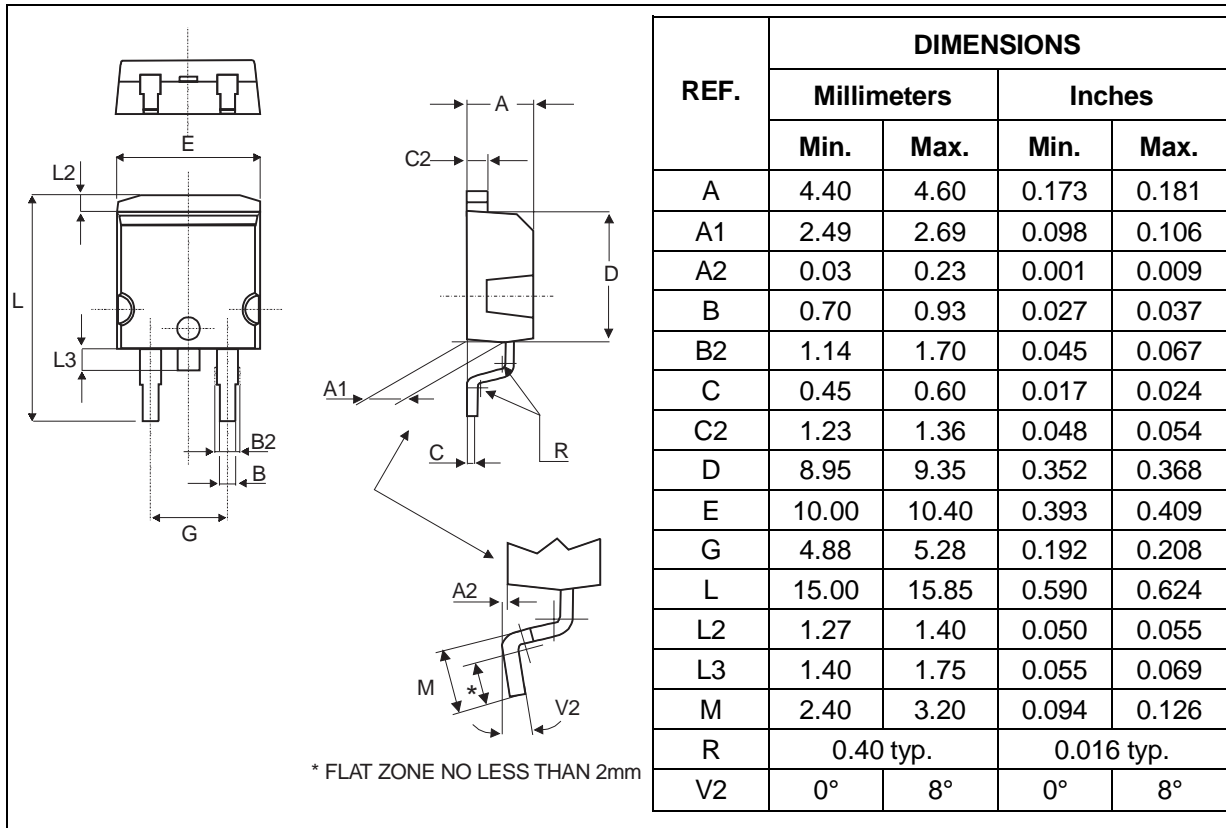
**Fig. 8:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



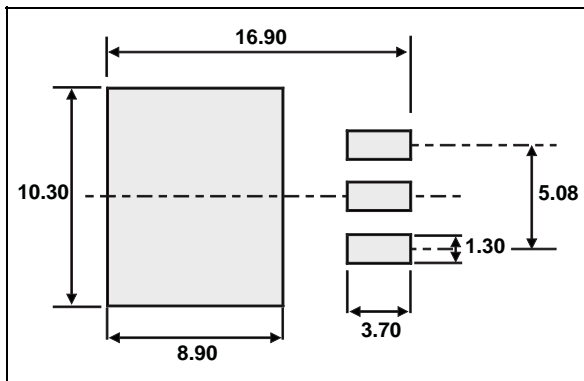
**Fig. 9:** Forward recovery time versus  $dI_F/dt$  (90% confidence).



**PACKAGE MECHANICAL DATA**  
D<sup>2</sup>PAK

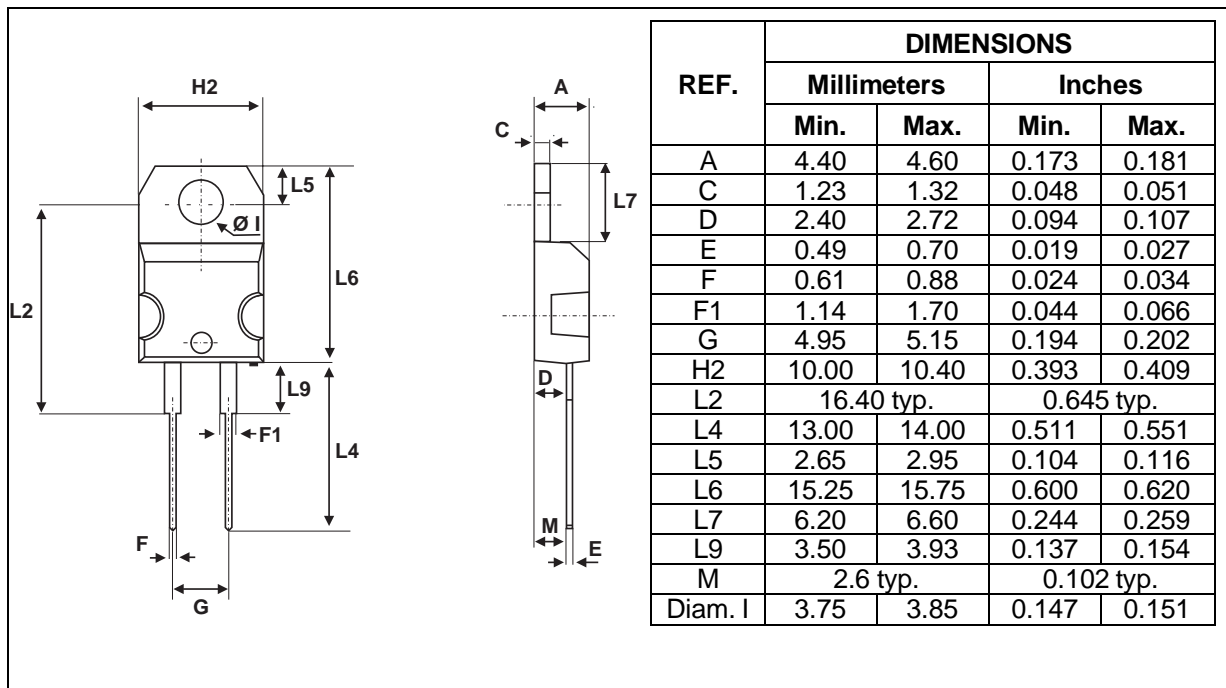


**FOOT PRINT DIMENSIONS (in millimeters)**  
D<sup>2</sup>PAK



# STTH803D/G

## PACKAGE MECHANICAL DATA TO-220AC



Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH803D	STTH803D	TO-220AC	1.86g	50	Tube
STTH803G	STTH803G	D <sup>2</sup> PAK	1.48g	50	Tube

- Cooling method: by conduction (C)
- Recommended torque value (TO-220AC): 0.55 N.m.
- Maximum torque value (TO-220AC): 0.70 N.m.
- Epoxy meets UL 94,V0

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