

**TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER**
**MAIN PRODUCT CHARACTERISTICS**

<b>I<sub>F(AV)</sub></b>	<b>3 A</b>
<b>V<sub>RRM</sub></b>	<b>600 V</b>
<b>I<sub>R</sub> (max)</b>	<b>100 μA</b>
<b>T<sub>j</sub> (max)</b>	<b>175 °C</b>
<b>V<sub>F</sub> (max)</b>	<b>1.05 V</b>
<b>t<sub>rr</sub> (max)</b>	<b>85 ns</b>

**FEATURES AND BENEFITS**

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

**DESCRIPTION**

The STTH3L06, which is using ST Turbo 2 600V technology, is specially suited as boost diode in discontinuous or critical mode power factor corrections.

The device is also intended for use as a free wheeling diode in power supplies and other power switching applications.


**ABSOLUTE RATINGS** (limiting values)

<b>Symbol</b>	<b>Parameter</b>		<b>Value</b>	<b>Unit</b>
V <sub>RRM</sub>	Repetitive peak reverse voltage		600	V
I <sub>F(RMS)</sub>	RMS forward current		20	A
I <sub>F(AV)</sub>	Average forward current	T <sub>I</sub> = 100°C    δ = 0.5	3	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms    Sinusoidal	80	A
T <sub>stg</sub>	Storage temperature range		- 65 + 175	°C
T <sub>j</sub>	Maximum operating junction temperature		+ 175	°C

## STTH3L06

### THERMAL PARAMETERS

Symbol	Parameter		Maximum	Unit
$R_{th(j-l)}$	Junction to lead	L = 10 mm	20	°C/W
$R_{th(j-a)}$	Junction to ambient (note 1)	L = 10 mm	75	

**Note 1:** With recommended pad layout (see Fig 12)

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R$	Reverse leakage current	$V_R = 600V$	$T_j = 25^\circ C$			3	$\mu A$
			$T_j = 150^\circ C$		15	100	
$V_F$	Forward voltage drop	$I_F = 3 A$	$T_j = 25^\circ C$			1.3	V
			$T_j = 150^\circ C$		0.85	1.05	

To evaluate the maximum conduction losses use the following equation :

$$P = 0.89 \times I_{F(AV)} + 0.055 I_{F(RMS)}^2$$

### DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$I_F = 1 A$ $di_F/dt = - 50 A/\mu s$ $V_R = 30V$	$T_j = 25^\circ C$		60	85	ns
$t_{fr}$	Forward recovery time	$I_F = 3 A$ $di_F/dt = 100 A/\mu s$ $V_{FR} = 1.1 \times V_{Fmax}$	$T_j = 25^\circ C$			100	ns
$V_{FP}$	Forward recovery time	$I_F = 3 A$ $di_F/dt = 100 A/\mu s$	$T_j = 25^\circ C$			7.5	V

Fig. 1: Conduction losses versus average current.

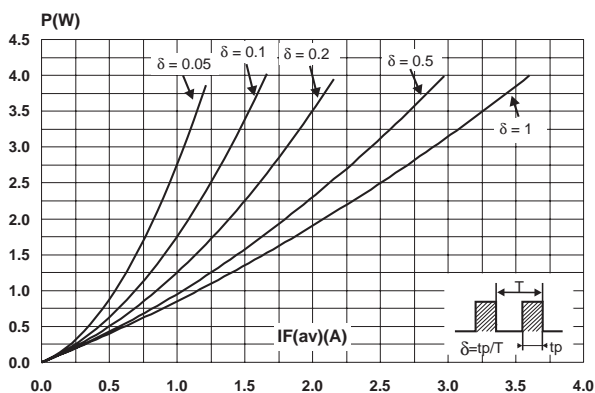


Fig. 2: Forward voltage drop versus forward current.

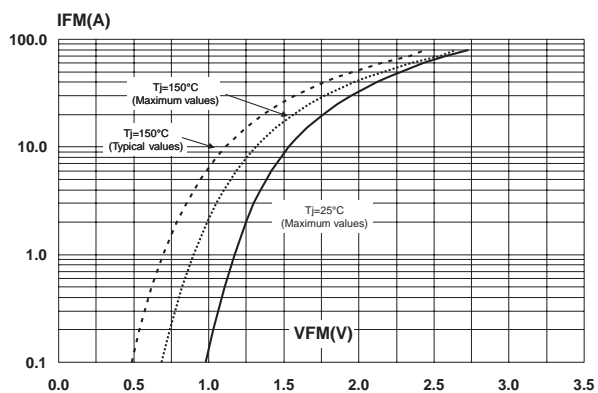


Fig. 3: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, Leads = 10mm)

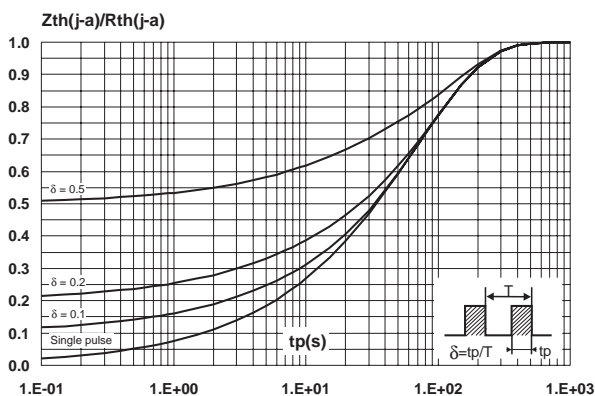


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence).

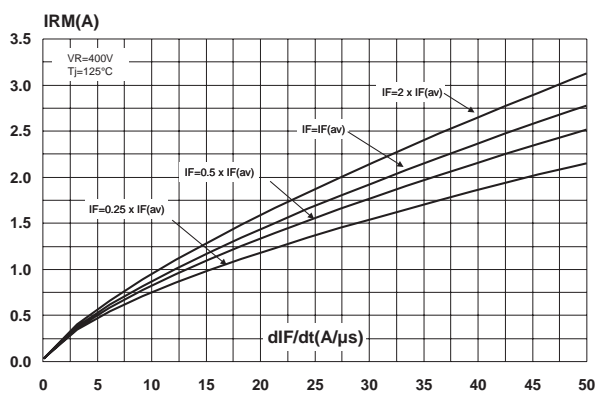


Fig. 5: Reverse recovery time versus dIF/dt (90% confidence).

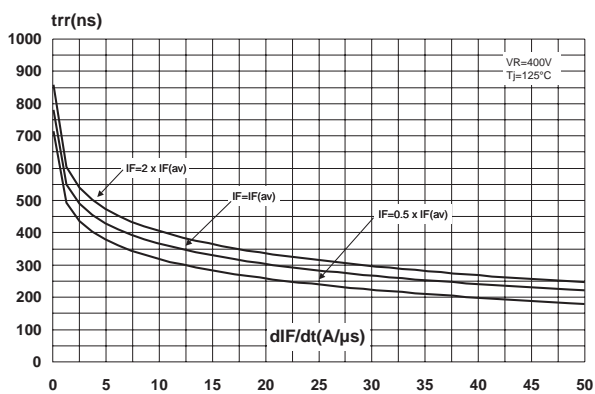
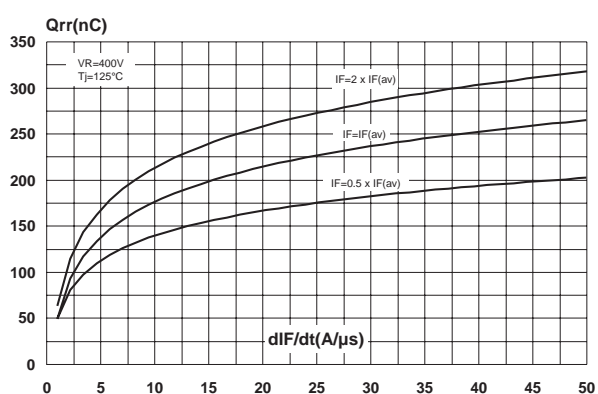
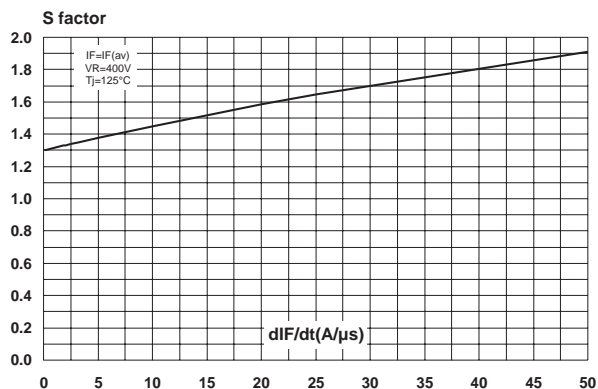


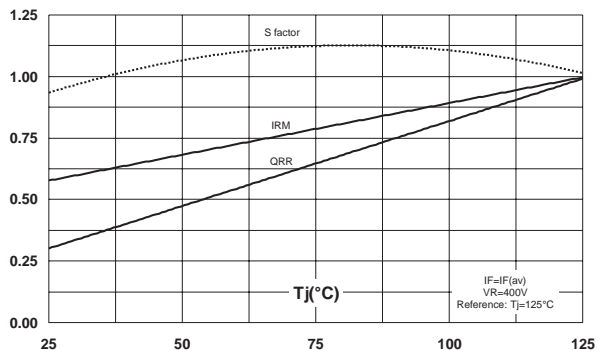
Fig. 6: Reverse recovery charges versus dIF/dt (90% confidence).



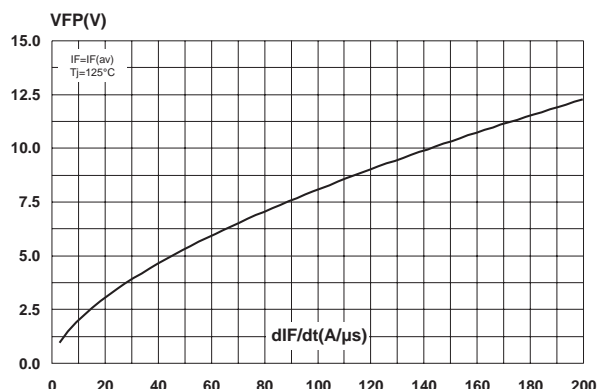
**Fig. 7:** Softness factor versus  $dI_F/dt$  (typical values).



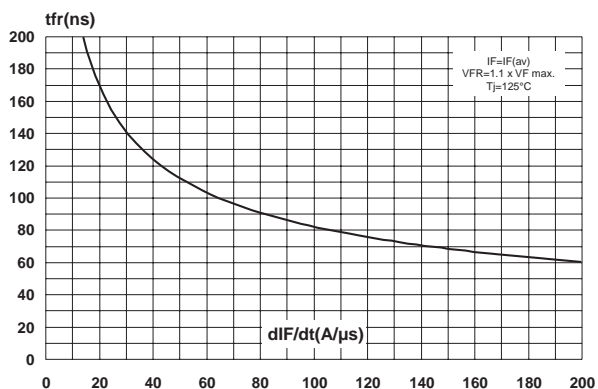
**Fig. 8:** Relative variations of dynamic parameters versus junction temperature.



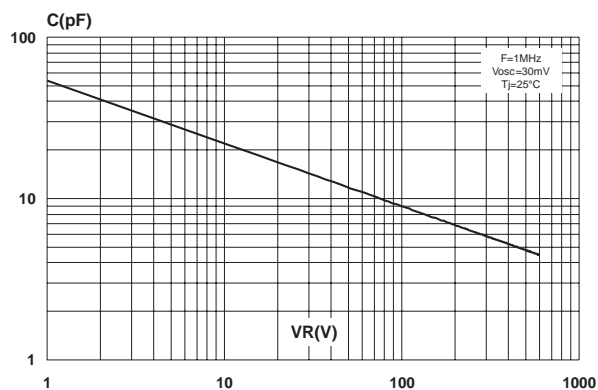
**Fig. 9:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



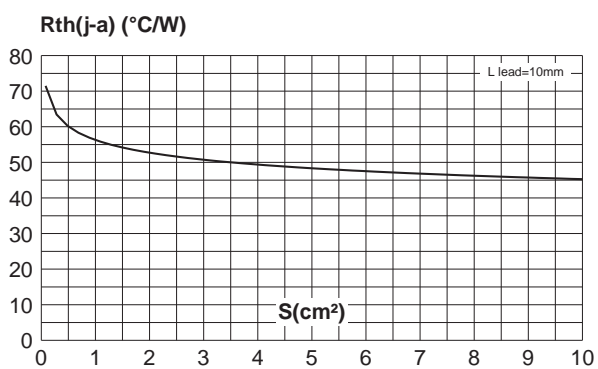
**Fig. 10:** Forward recovery time versus  $dI_F/dt$  (90% confidence).

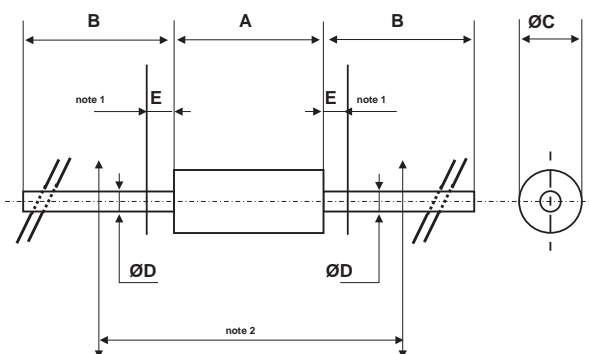


**Fig. 11:** Junction capacitance versus reverse voltage applied (typical values).



**Fig. 12:** Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35μm)



**PACKAGE MECHANICAL DATA**  
 DO-201AD


REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A		9.50		0.374	1 - The lead diameter $\varnothing D$ is not controlled over zone E  2 - The minimum length which must stay straight between the right angles after bending is 0.59" (15 mm)
B	25.40		1.000		
C		5.30		0.209	
D		1.30		0.051	
E		1.25		0.049	

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH3L06	STTH3L06	DO-201AD	1.12 g	600	Ammopack
STTH3L06RL	STTH3L06	DO-201AD	1.12 g	1900	Tape & reel

- Epoxy meets UL 94,V0
- Band indicated cathode
- Bending method: Application note AN1471

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