

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	3 A
V_{RRM}	600 V
$I_R (max)$	100 μA
$T_j (max)$	175 °C
$V_F (max)$	1.05 V
$t_{rr} (max)$	85 ns

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)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	RMS forward current		20	A
$I_{F(AV)}$	Average forward current	$T_I = 100^{\circ}\text{C} \quad \delta = 0.5$	3	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms} \quad \text{Sinusoidal}$	80	A
T_{stg}	Storage temperature range		- 65 + 175	°C
T_j	Maximum operating junction temperature		+ 175	°C

STTH3L06

THERMAL PARAMETERS

Symbol	Parameter		Maximum	Unit
$R_{th(j-l)}$	Junction to lead	$L = 10\text{ mm}$	20	$^{\circ}\text{C/W}$
$R_{th(j-a)}$	Junction to ambient (note 1)	$L = 10\text{ mm}$	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	$V_R = 600\text{V}$	$T_j = 25^{\circ}\text{C}$			3	μA
			$T_j = 150^{\circ}\text{C}$		15	100	
V_F	Forward voltage drop	$I_F = 3\text{ A}$	$T_j = 25^{\circ}\text{C}$			1.3	V
			$T_j = 150^{\circ}\text{C}$		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	$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{V}$	$T_j = 25^{\circ}\text{C}$		60	85	ns
t_{fr}	Forward recovery time	$I_F = 3\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$	$T_j = 25^{\circ}\text{C}$			100	ns
V_{FP}	Forward recovery time	$I_F = 3\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$	$T_j = 25^{\circ}\text{C}$			7.5	V

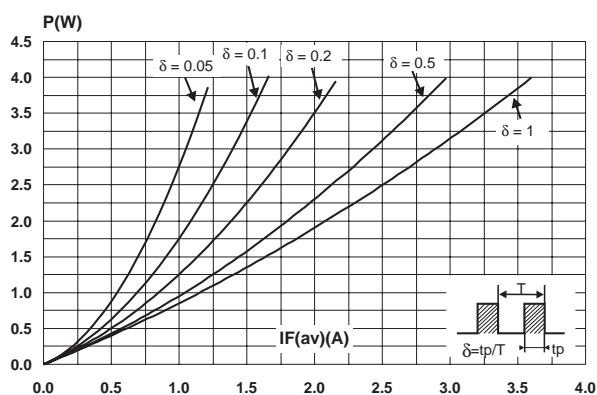
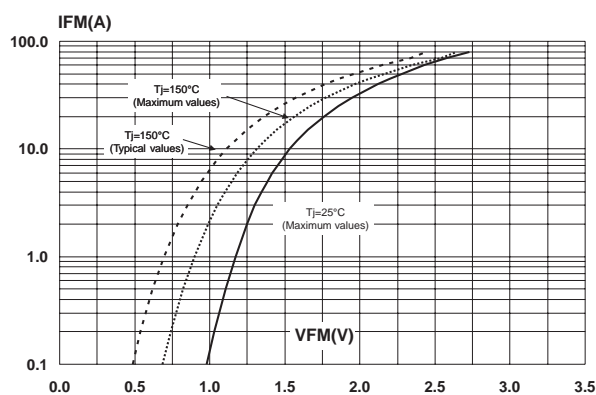
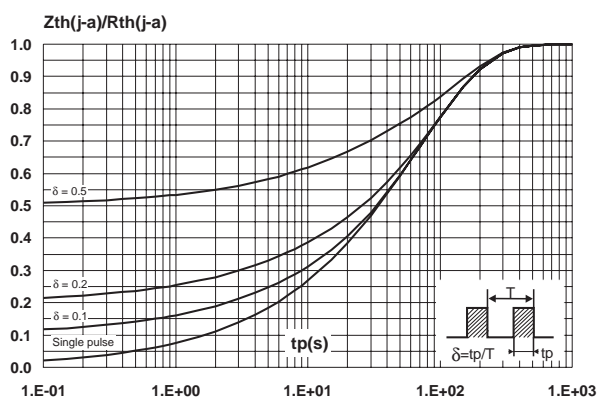
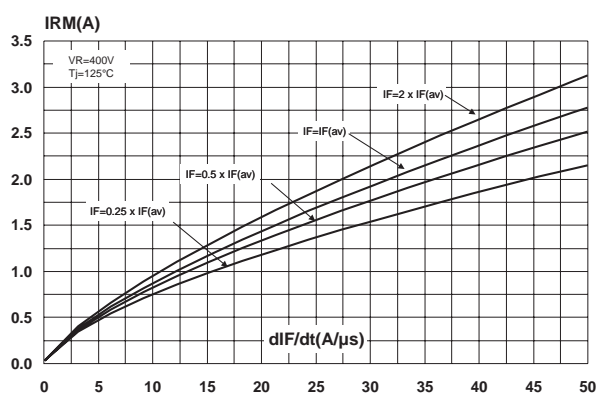
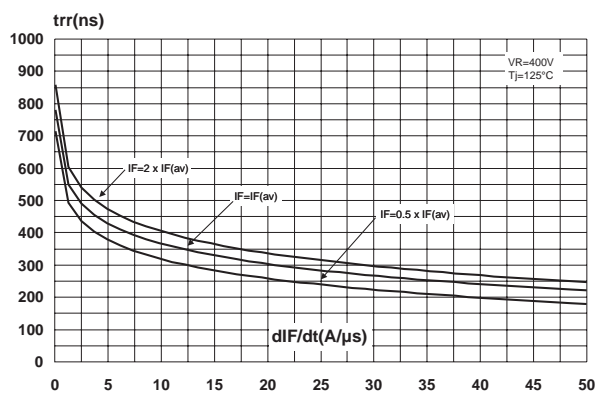
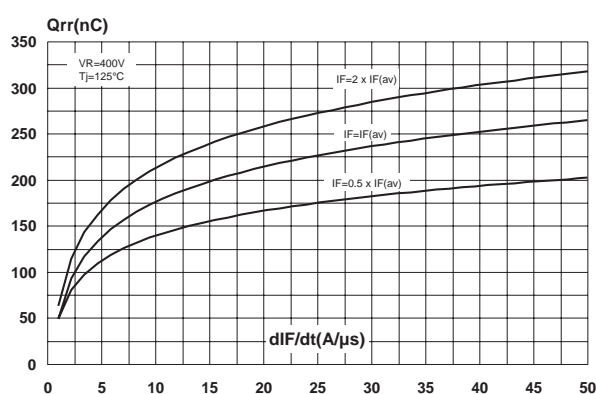
Fig. 1: Conduction losses versus average current.**Fig. 2:** Forward voltage drop versus forward current.**Fig. 3:** Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, Leads = 10mm)**Fig. 4:** Peak reverse recovery current versus dI_F/dt (90% confidence).**Fig. 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).

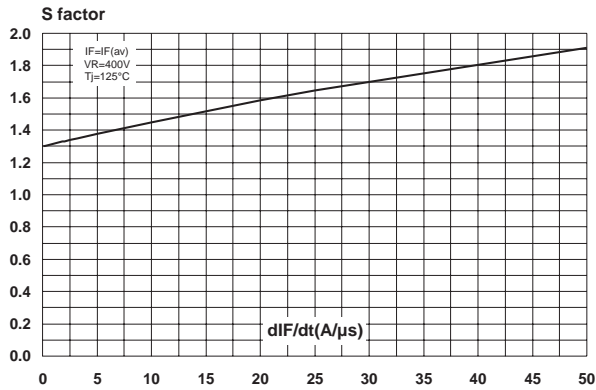


Fig. 8: Relative variations of dynamic parameters versus junction temperature.

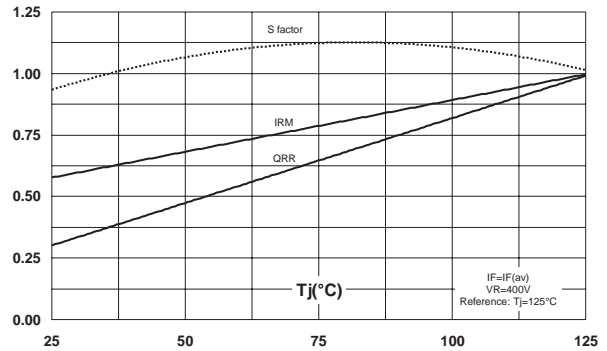


Fig. 9: Transient peak forward voltage versus di_F/dt (90% confidence).

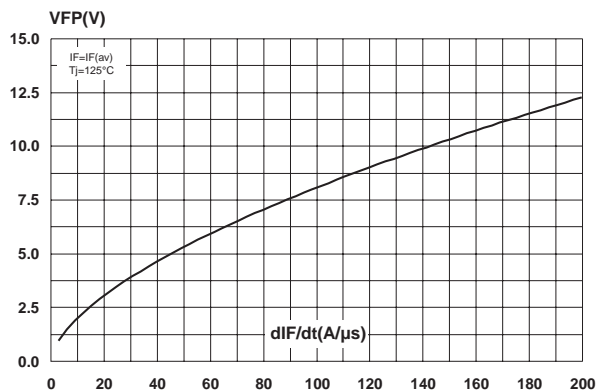


Fig. 10: Forward recovery time versus di_F/dt (90% confidence).

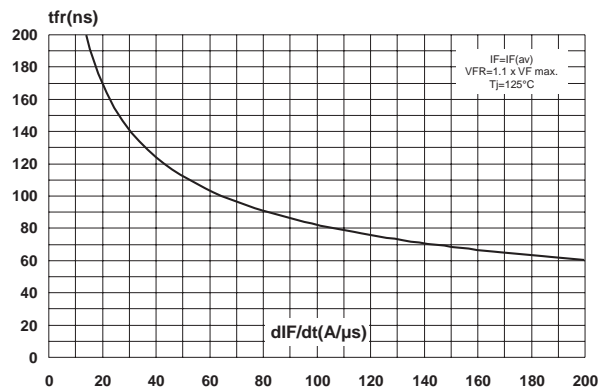


Fig. 11: Junction capacitance versus reverse voltage applied (typical values).

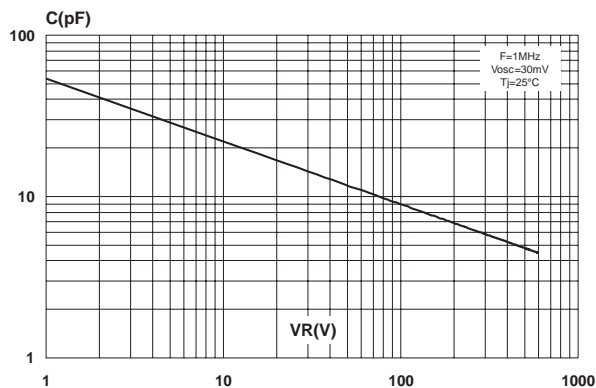
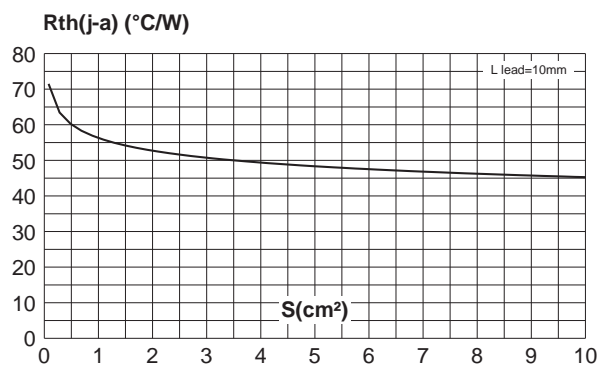
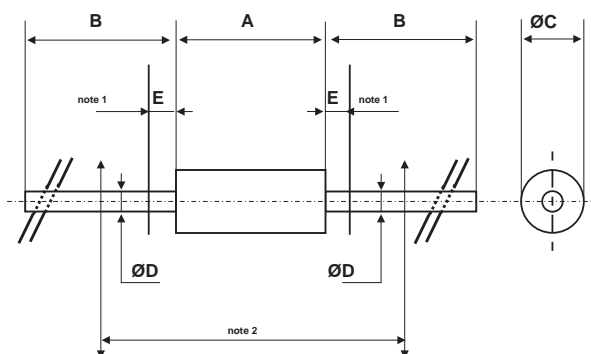


Fig. 12: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35 μ m).



PACKAGE MECHANICAL DATA

DO-201AD



REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A		9.50		0.374	1 - The lead diameter Ø 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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