

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

MAIN PRODUCT CHARACTERISTICS

I_{F(AV)}	5 A
V_{RRM}	600 V
I_R (max)	150 µA
T_j (max)	175 °C
V_F (max)	1.05 V
t_{rr} (max)	95 ns

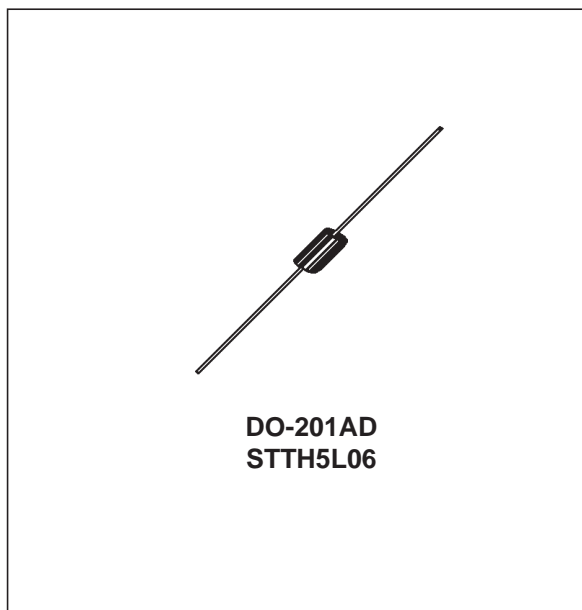
FEATURES AND BENEFITS

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

DESCRIPTION

The STTH5L06, 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 = 50°C δ = 0.5	5	A
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms Sinusoidal	110	A
T _{stg}	Storage temperature range		- 65 + 175	°C
T _j	Maximum operating junction temperature		+ 175	°C

STTH5L06

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	$V_R = 600\text{V}$	$T_j = 25^{\circ}\text{C}$			5	μA
			$T_j = 150^{\circ}\text{C}$		25	150	
V_F	Forward voltage drop	$I_F = 5\text{ A}$	$T_j = 25^{\circ}\text{C}$			1.3	V
			$T_j = 150^{\circ}\text{C}$		0.85	1.05	

To evaluate the maximum conduction losses use the following equation :
 $P = 0.89 \times I_{F(AV)} + 0.033 I_{F(RMS)}^2$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{V}$	$T_j = 25^{\circ}\text{C}$		65	95	ns
t_{fr}	Forward recovery time	$I_F = 5\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$	$T_j = 25^{\circ}\text{C}$			150	ns
V_{FP}	Forward recovery time	$I_F = 5\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$	$T_j = 25^{\circ}\text{C}$			7	V

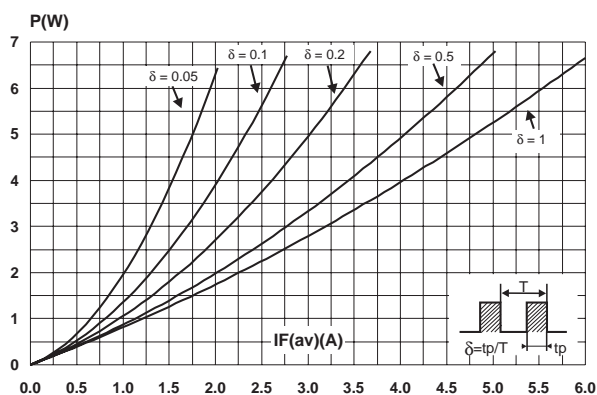
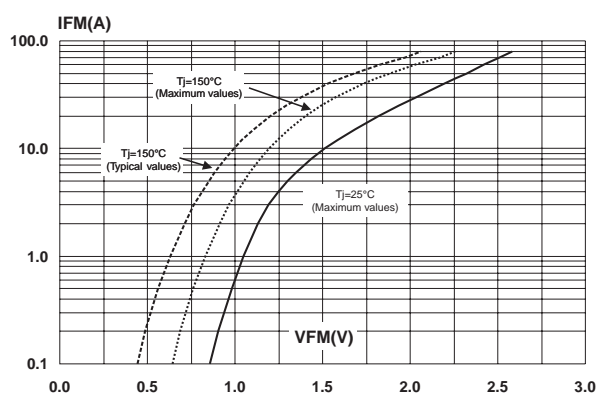
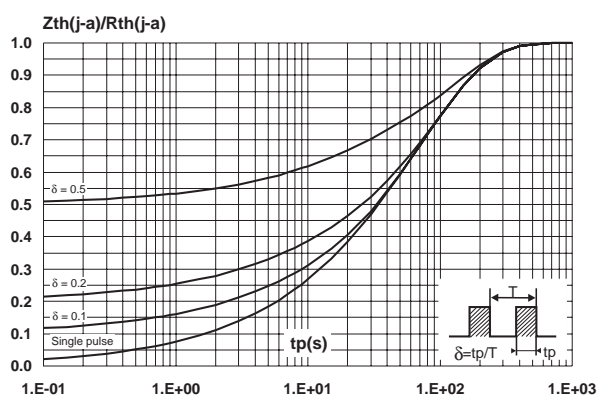
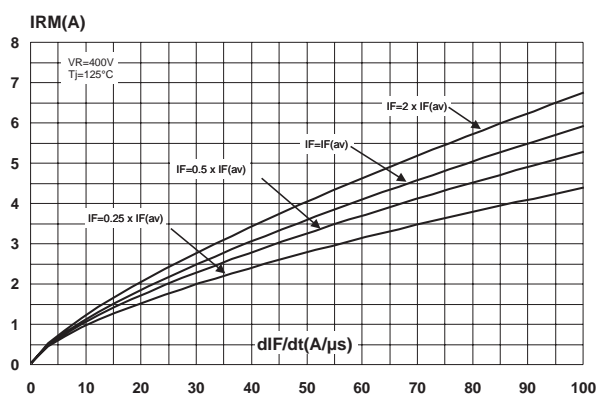
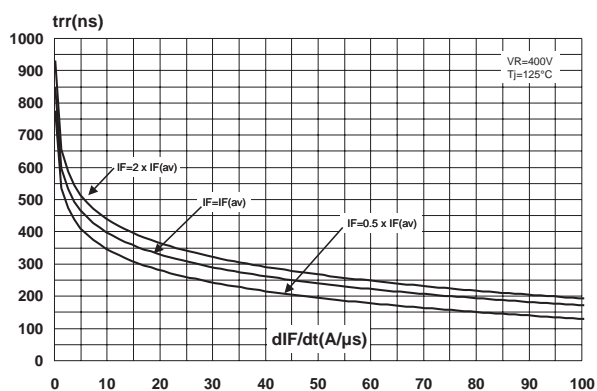
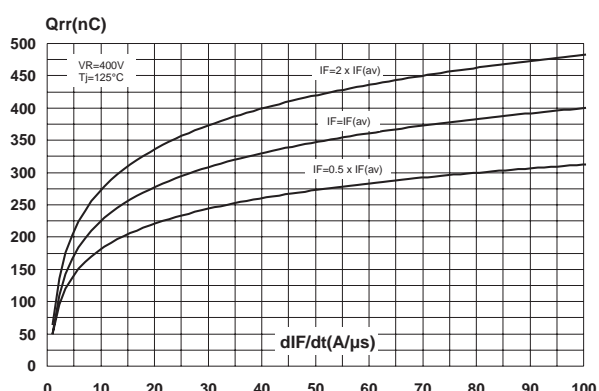
Fig. 1: Conduction losses versus average current.**Fig. 2:** Forward voltage drop versus forward current.**Fig. 3:** Relative variation of thermal impedance junction ambient versus pulse duration (DO-201AD, epoxy FR4, Leads = 10mm).**Fig. 4:** Peak reverse recovery current versus dI_F/dt (90% confidence).**Fig. 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 dl_F/dt (typical values).

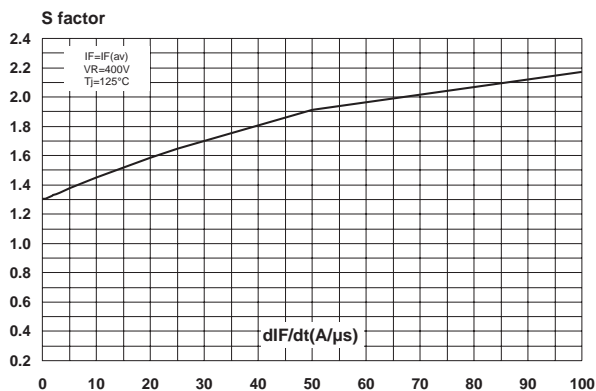


Fig. 8: Relative variations of dynamic parameters versus junction temperature.

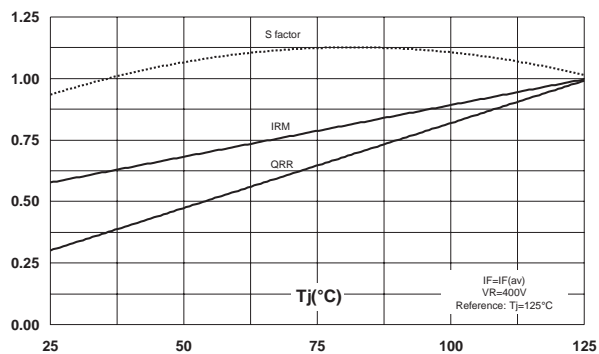


Fig. 9: Transient peak forward voltage versus dl_F/dt (90% confidence).

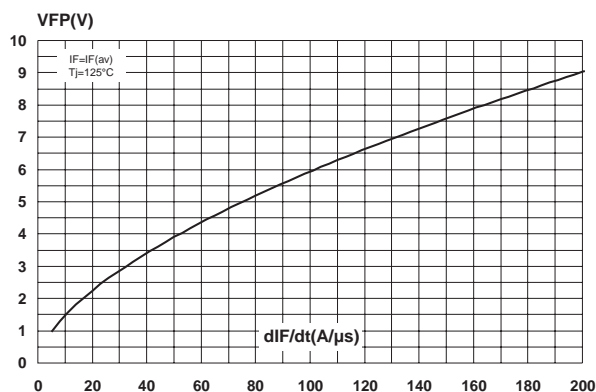


Fig. 10: Forward recovery time versus dl_F/dt (90% confidence).

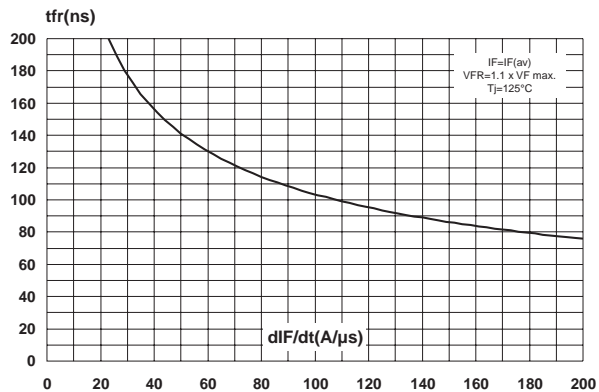


Fig. 11: Junction capacitance versus reverse voltage applied (typical values).

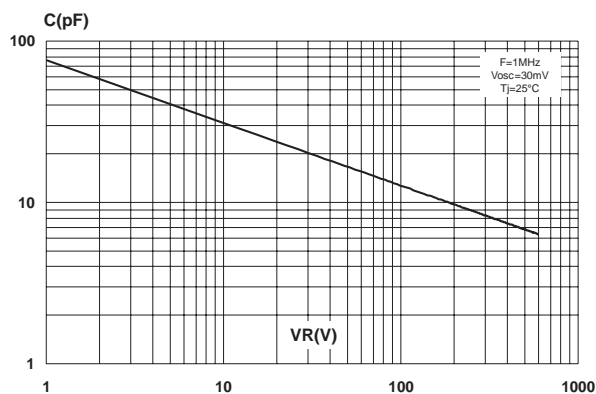
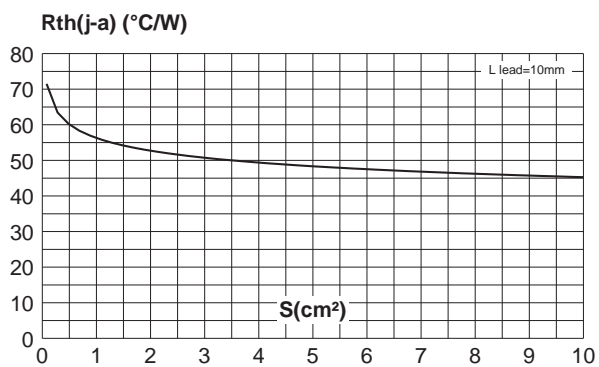
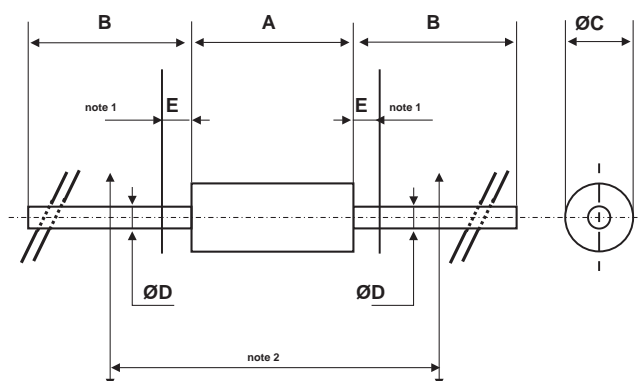


Fig. 12: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35 μ m).



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
STTH5L06	STTH5L06	DO-201AD		600	Ammopack
STTH5L06RL	STTH5L06	DO-201AD		1900	Tape & reel

- Epoxy meets UL 94,V0
- Lead bending and cutting: refer to ST application note AN1471

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