STTH5L06

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

MAIN PRODUCT CHARACTERISTICS

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

DO-201AD
STTH5L06

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	Tl = 50°C δ =0.5	5	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal	110	A
T_{stg}	Storage temperature range		- 65 + 175	°C
Tj	Maximum operating junction temperature		+ 175	°C

THERMAL PARAMETERS

Symbol	Parameter		Maximum	Unit
$R_{th\ (j-l)}$	Junction to lead	L = 10mm	20	°C/W
$R_{th\ (j-a)}$	Junction to ambient (note 1)	L = 10mm	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	Tj = 25°C			5	µA
			Tj = 150°C		25	150	
V_F	Forward voltage drop	I_F = 5 A	Tj = 25°C			1.3	V
			Tj = 150°C		0.85	1.05	

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

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
trr	Reverse recovery time	I_F = 1 A dI_F/dt = - 50 A/µs V_R = 30V	Tj = 25°C		65	95	ns
tfr	Forward recovery time	I_F = 5 A dI_F/dt = 100 A/µs V_{FR} = 1.1 x $V_F$max	Tj = 25°C			150	ns
V_{FP}	Forward recovery time	I_F = 5 A dI_F/dt = 100 A/µs	Tj = 25°C			7	V

Fig. 1: Conduction losses versus average current.

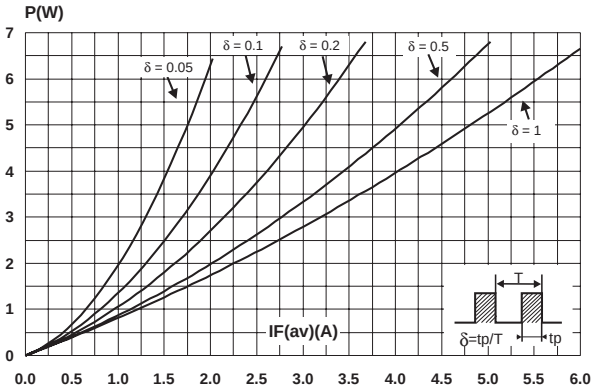


Fig. 2: Forward voltage drop versus forward current.

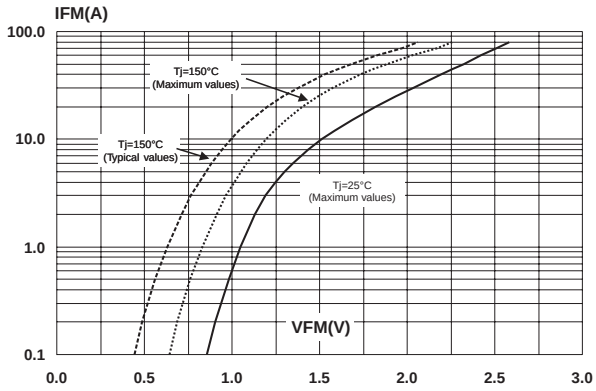


Fig. 3: Relative variation of thermal impedance junction ambient versus pulse duration (DO-201AD, epoxy FR4, Lleads = 10mm).)

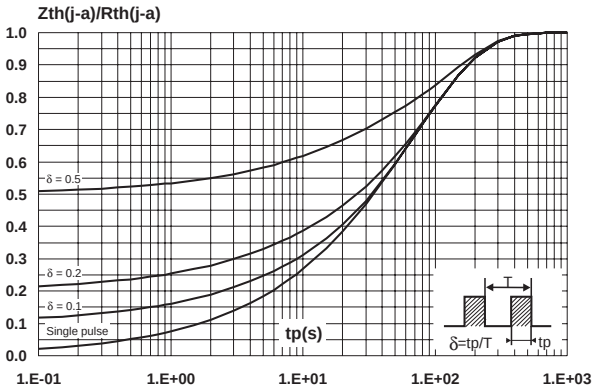


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence).

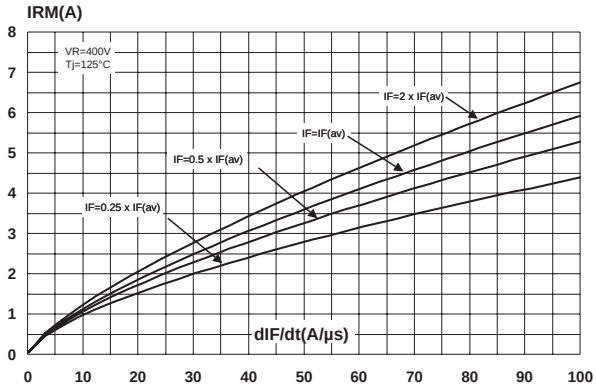


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence).

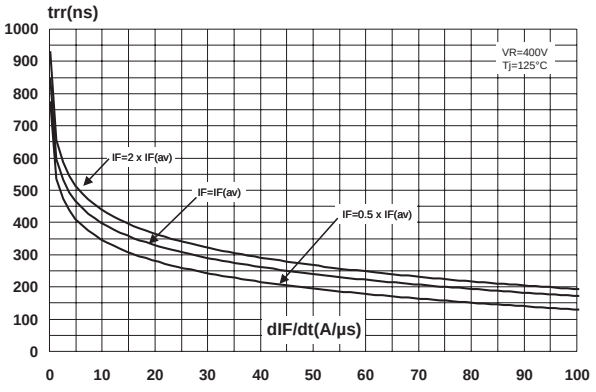


Fig. 6: Reverse recovery charges versus dI_F/dt (90% confidence).

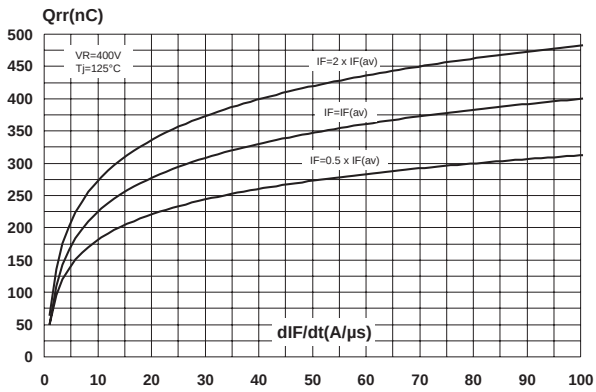


Fig. 7: Softness factor versus dI_F/dt (typical values).

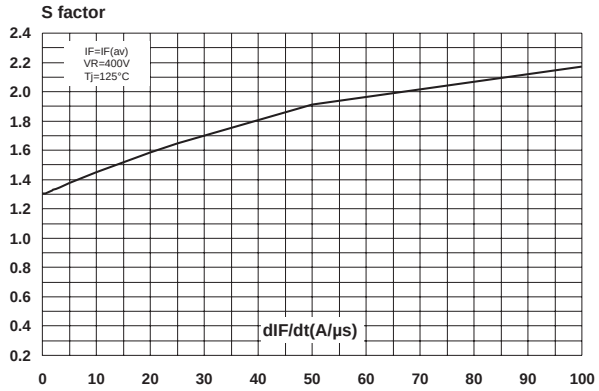


Fig. 8: Relative variations of dynamic parameters versus junction temperature.

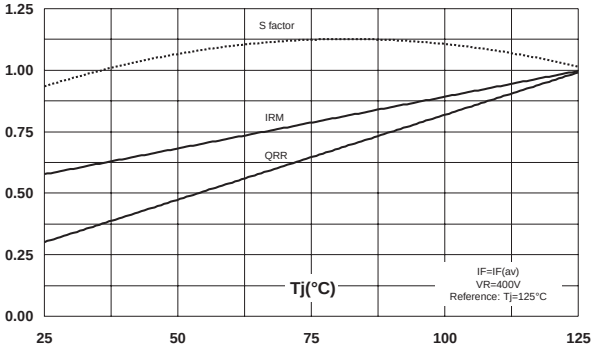


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

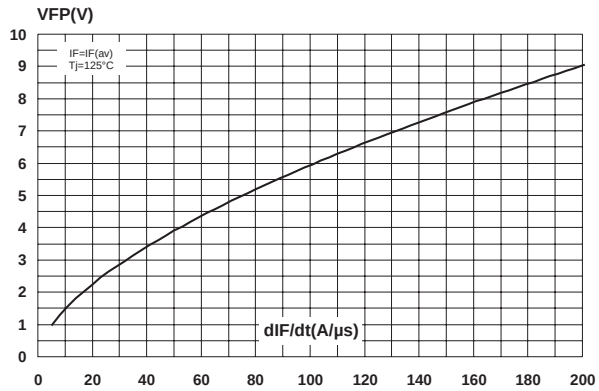


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

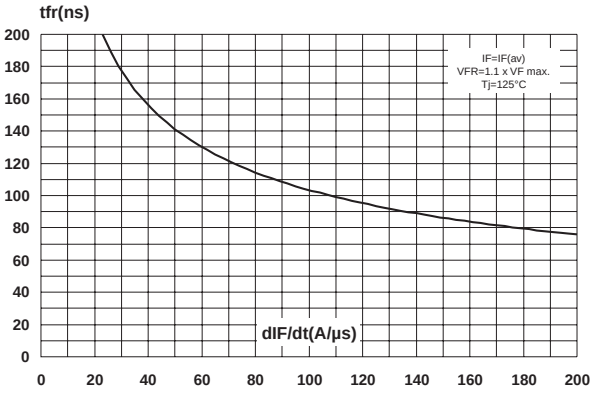


Fig. 11: Junction capacitance versus reverse voltage applied (typical values).

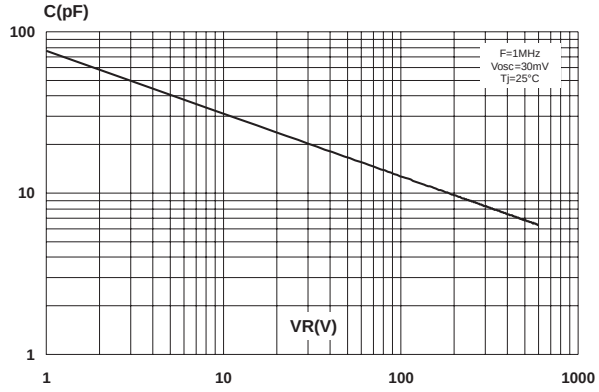
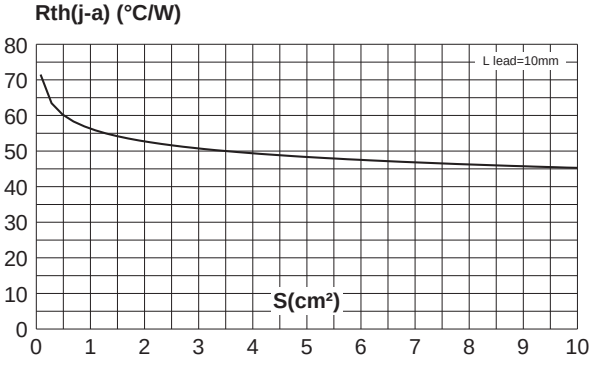
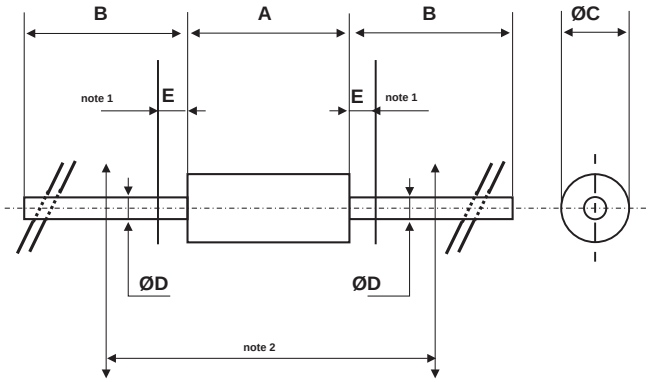


Fig. 12: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm)



PACKAGE MECHANICAL DATA

DO-201AD



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