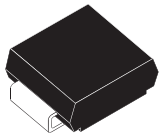
STTH1L06/U/A

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

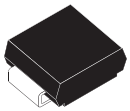
MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	1 A
V_{RRM}	600 V
I_R (max)	75 µA
Tj (max)	175 °C
V_F (max)	1.05 V
trr (max)	80 ns

DO-41
STTH1L06



SMB
STTH1L06U



SMA
STTH1L06A

FEATURES AND BENEFITS

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

DESCRIPTION

The STTH1L06/U/A, 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	DO-41 SMA / SMB	10 7	A
$I_{F(AV)}$	Average forward current	Tl = 120°C δ = 0.5 DO-41 Tl = 135°C δ = 0.5 SMA Tl = 145°C δ = 0.5 SMB	1 1 1	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal DO-41 tp = 10 ms Sinusoidal SMA / SMB	30 20	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 = 10 mm	DO-41	45	°C/W
			SMA	30	
			SMB	25	
$R_{th\ (j-a)}$	Junction to ambient (note 1)	L = 10 mm	DO-41	70	

Note 1: Rth(j-a) is measured with a copper area S = $5cm^2$ (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			1	µA
			Tj = 150°C		10	75	
V_F	Forward voltage drop	I_F = 1 A	Tj = 25°C			1.3	V
			Tj = 150°C		0.85	1.05	

To evaluate the maximum conduction losses use the following equation :
$P = 0.89 \times I_{F(AV)} + 0.165\ I_F{}^2{}_{(RMS)}$

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		55	80	ns
tfr	Forward recovery time	I_F = 1 A dI_F/dt = 100 A/µs V_{FR} = 3.5V	Tj = 25°C			50	ns
V_{FP}	Forward recovery voltage	IF = 1A dI_F/dt = 100 A/µs	Tj = 25°C			10	V

Fig. 1: Conduction losses versus average current.

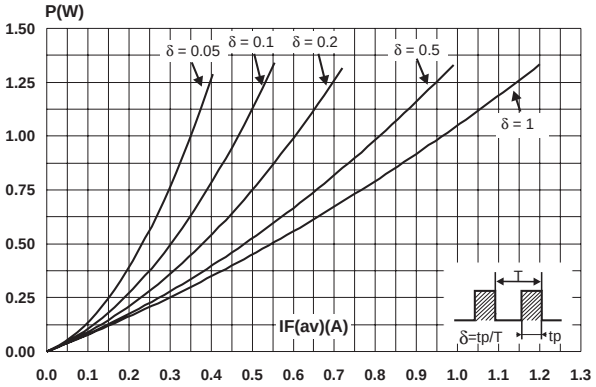


Fig. 2: Forward voltage drop versus forward current.

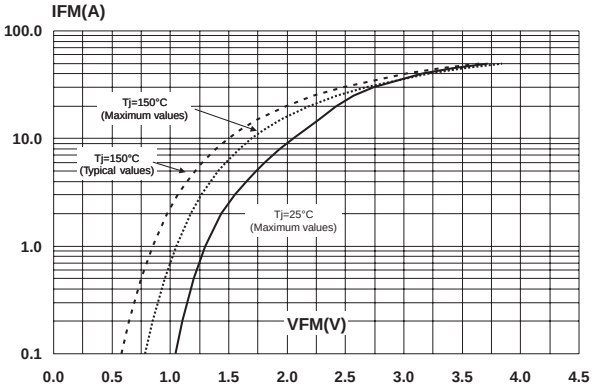


Fig. 3-1: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, Leads = 10mm)

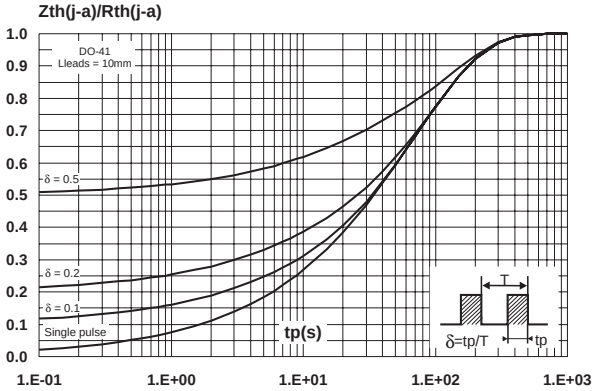


Fig. 3-2: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, S = 1cm²)

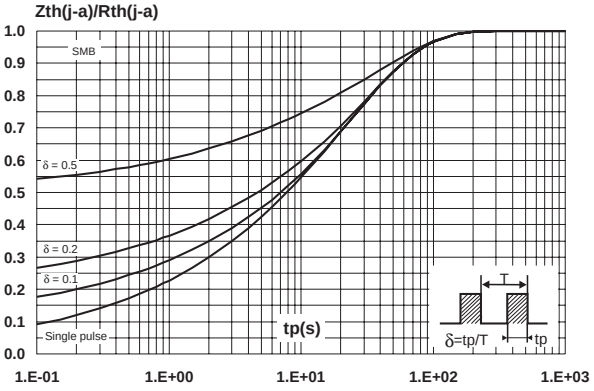


Fig. 3-3: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4)

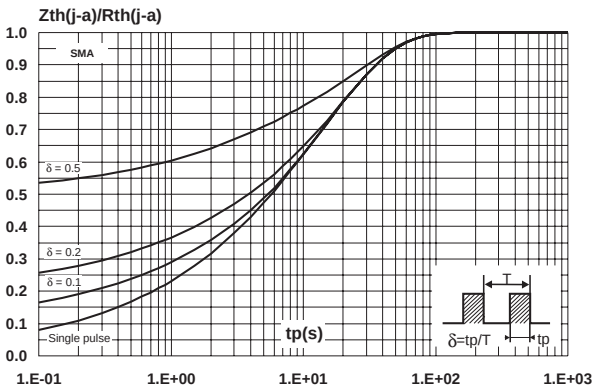


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence).

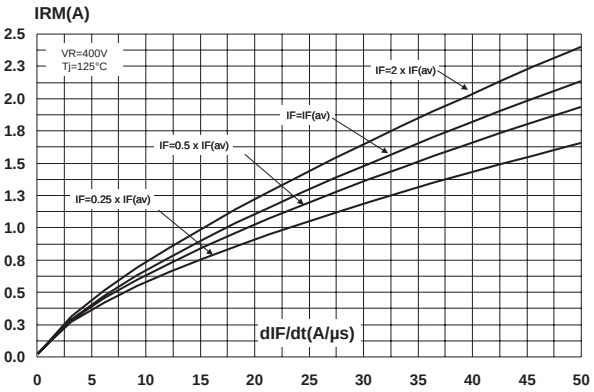


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence).

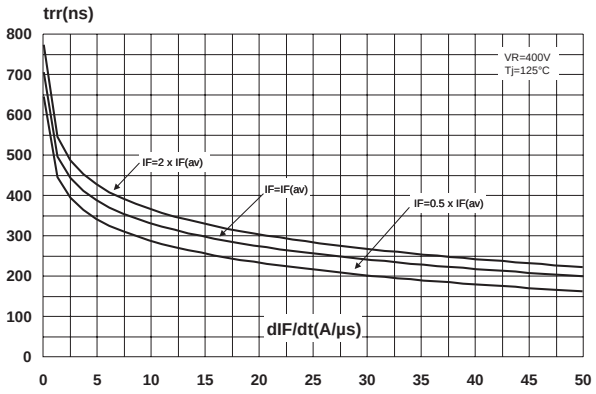


Fig. 6: Reverse recovery charges versus dI_F/dt (90% confidence).

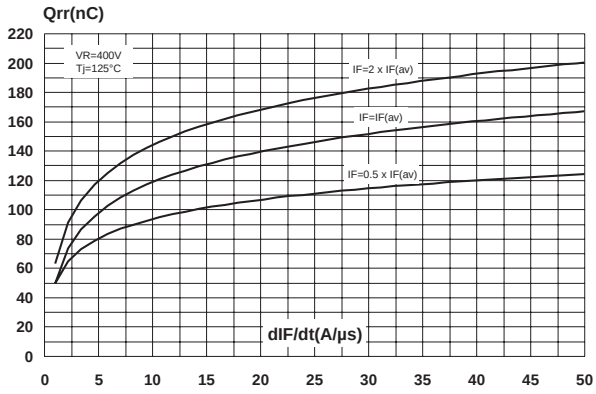


Fig. 7: Softness factor versus dI_F/dt (typical values).

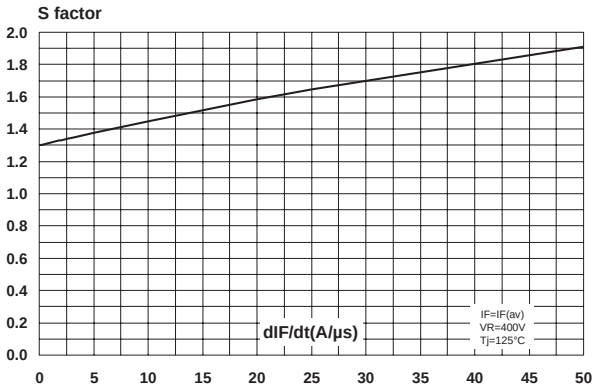


Fig. 8: Relative variations of dynamic parameters versus junction temperature.

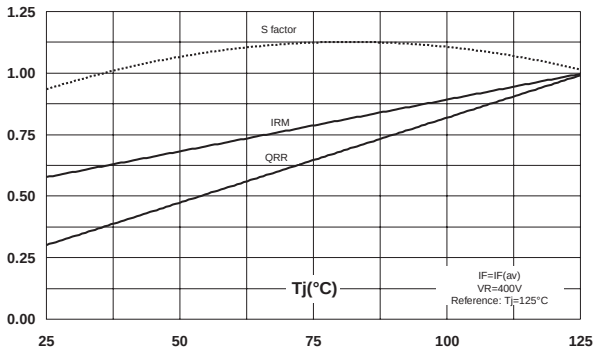


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

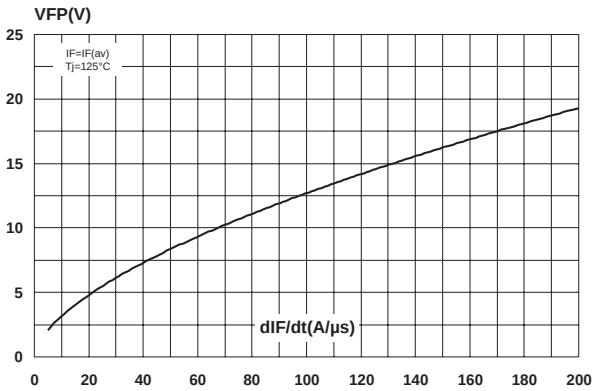


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

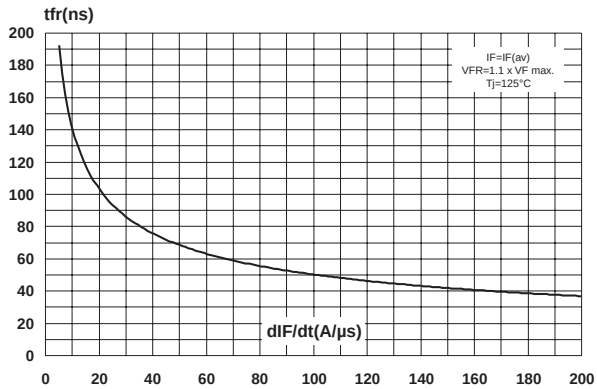


Fig. 11: Junction capacitance versus reverse voltage applied (typical values).

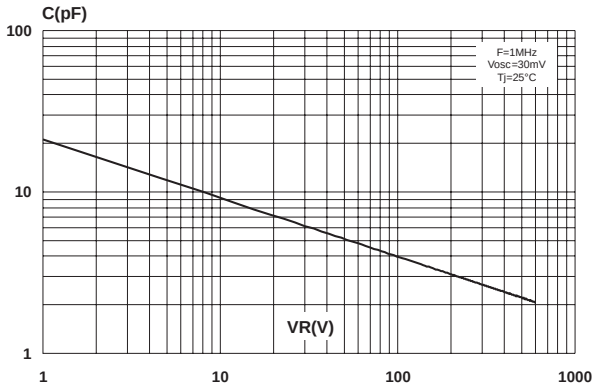


Fig. 12-1: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm).

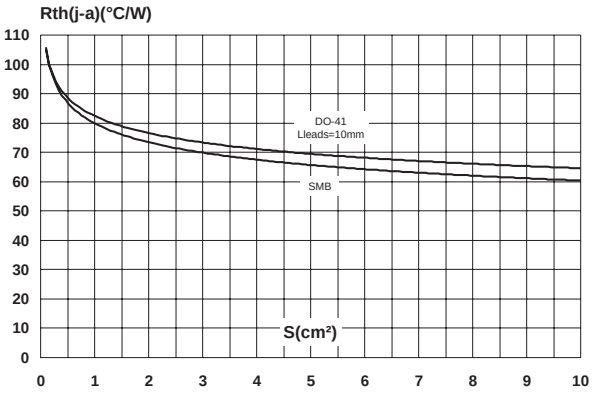
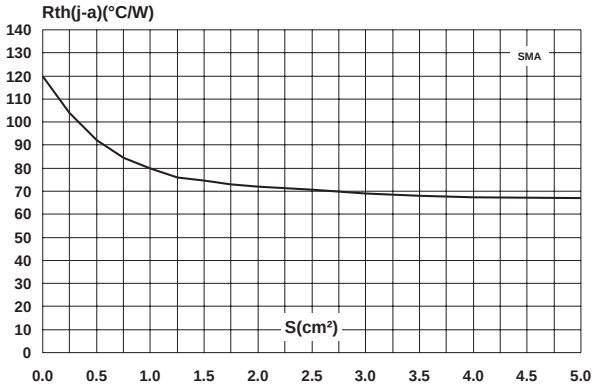
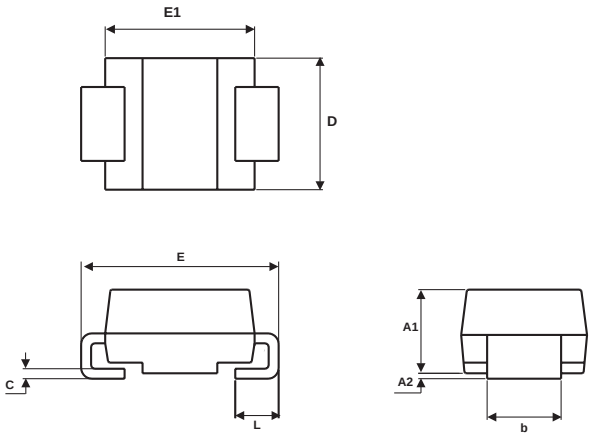


Fig. 12-2: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm).



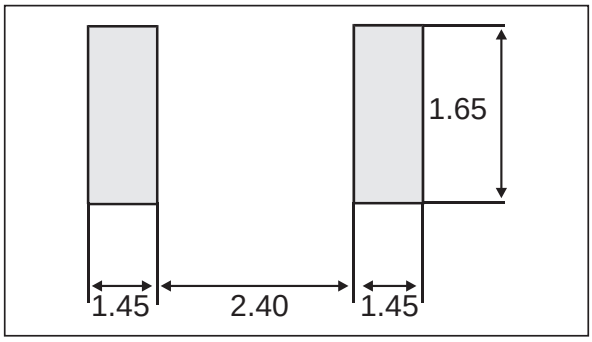
PACKAGE MECHANICAL DATA

SMA



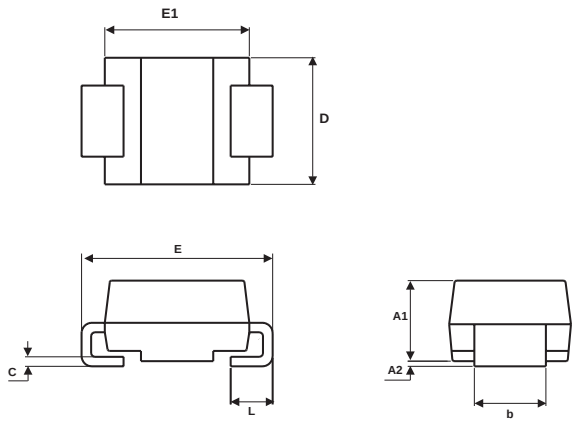
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.70	0.075	0.106
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

FOOTPRINT



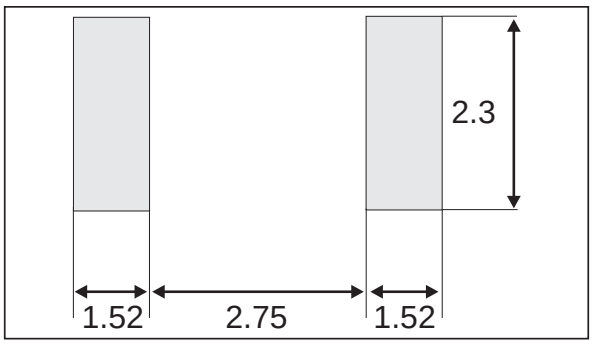
PACKAGE MECHANICAL DATA

SMB



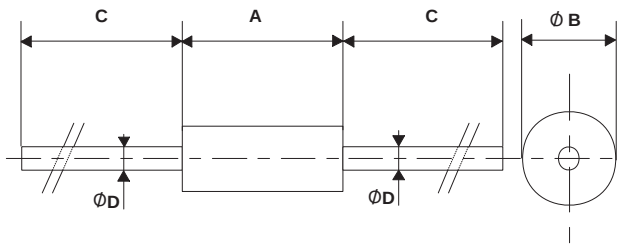
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.41	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.60	0.030	0.063

FOOTPRINT



PACKAGE MECHANICAL DATA

DO-41



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.07	5.20	0.160	0.205
B	2.04	2.71	0.080	0.107
C	28		1.102	
D	0.712	0.863	0.028	0.034

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH1L06	STTH1L06	DO-41	0.34 g	2000	Ammopack
STTH1L06RL	STTH1L06	DO-41	0.34 g	5000	Tape & reel
STTH1L06U	BL6	SMB	0.11 g	2500	Tape & reel
STTH1L06A	HL6	SMA	0.068 g	5000	Tape & reel

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