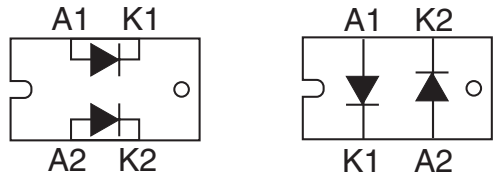
STTH60L06TV

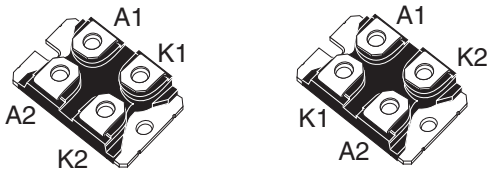
Turbo 2 ultrafast high voltage rectifier

Main product characteristics

$I_{F(AV)}$	2 x 40 A
V_{RRM}	600 V
T_j	150° C
V_F (typ)	1.30 V
t_{rr} (typ)	50 ns



STTH60L06TV1 **STTH60L06TV2**



ISOTOP

Features and benefits

- Ultrafast switching
- Low reverse current
- Low thermal resistance
- Reduces switching & conduction losses
- Insulated package:
  Electrical insulation = 2500 V_{RMS}
  Capacitance = 45 pF

Description

The STTH60L06TV, which is using ST Turbo 2 600V technology, is specially suited for use in switching power supplies, and industrial applications (such as welding), as rectification diode.

Order codes

Part Number	Marking
STTH60L06TV1	STTH60L06TV1
STTH60L06TV2	STTH60L06TV2

Table 1. Absolute ratings (limiting values per diode at 25° C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	RMS forward current		100	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	T_c = 75° C per diode	30	A
		T_c = 70° C per diode	40	
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms Sinusoidal	210	A
T_{stg}	Storage temperature range		-55 to + 150	° C
T_j	Maximum operating junction temperature		150	° C

1 Characteristics

Table 2. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.60	°C/W
		Total	0.85	
$R_{th(c)}$	Coupling thermal resistance		0.1	

When the diodes are used simultaneously:
$\Delta T_{j(diode1)} = P_{(diode1)} \times R_{th(j-c)}$ (per diode) + $P_{(diode2)} \times R_{th(c)}$

Table 3. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 25° C	$V_R = V_{RRM}$			25	µA
		T_j = 125° C			25	250	
V_F (2)	Forward voltage drop	T_j = 25° C	I_F = 60 A			1.55	V
		T_j = 150° C			1.0	1.25	

1. Pulse test: t_p = 5 ms, δ < 2 %
2. Pulse test: t_p = 380 µs, δ < 2 %

To evaluate the conduction losses use the following equation:
$P = 0.95 \times I_{F(AV)} + 0.010\ I_F{}^2{}_{(RMS)}$

Table 4. Dynamic characteristics (per diode)

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	I_F = 0.5 A, I_{rr} = 0.25 A I_R = 1 A, T_j = 25° C			65	ns
		I_F = 1 A, dI_F/dt = 50 A/µs, V_R = 30 V, T_j = 25° C		65	90	
I_{RM}	Reverse recovery current	I_F = 30 A, dI_F/dt = 100 A/µs, V_R = 400 V, T_j = 125° C		11.5	16	A
t_{fr}	Forward recovery time	I_F = 30 A dI_F/dt = 100 A/µs $V_{FR} = 1.1 \times V_{Fmax}$, T_j = 25° C			500	ns
V_{FP}	Forward recovery voltage	I_F = 30 A, dI_F/dt = 100 A/µs, $V_{FR} = 1.1 \times V_{Fmax}$, T_j = 25° C		2.5		V

Figure 1. Conduction losses versus average current (per diode)

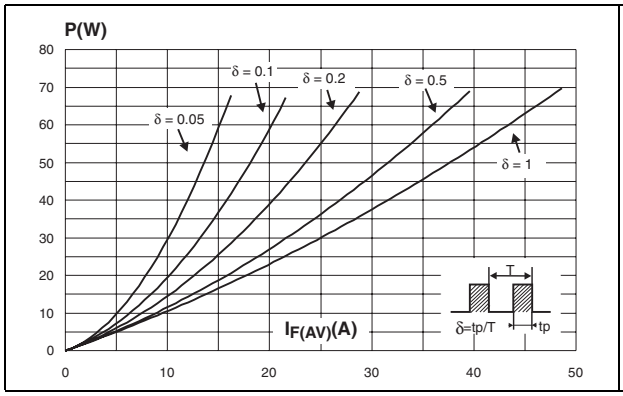


Figure 2. Forward voltage drop versus forward current (per diode)

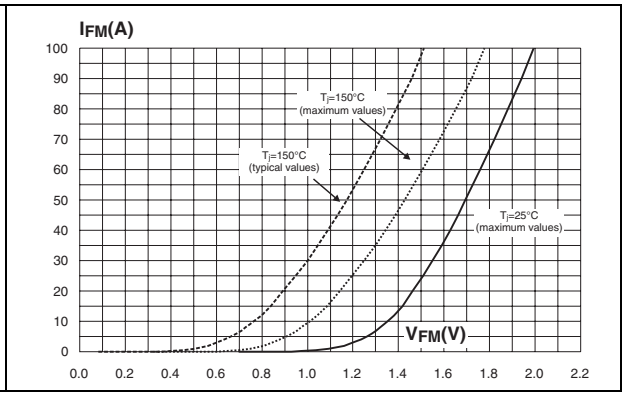


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

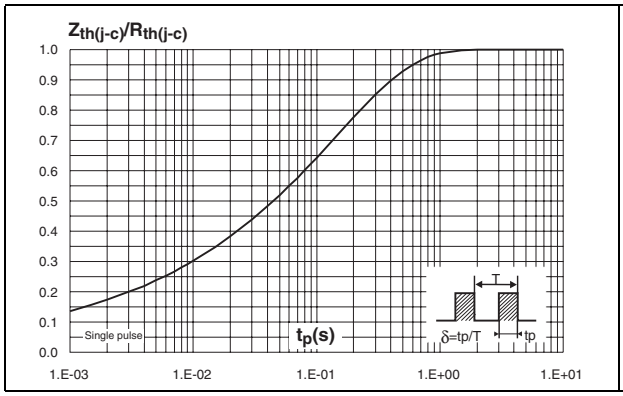


Figure 4. Peak reverse recovery current versus dI_F/dt (typical values, per diode)

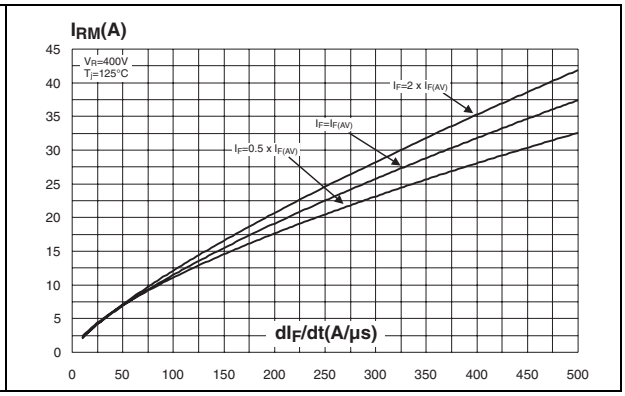


Figure 5. Reverse recovery time versus dI_F/dt (typical values, per diode)

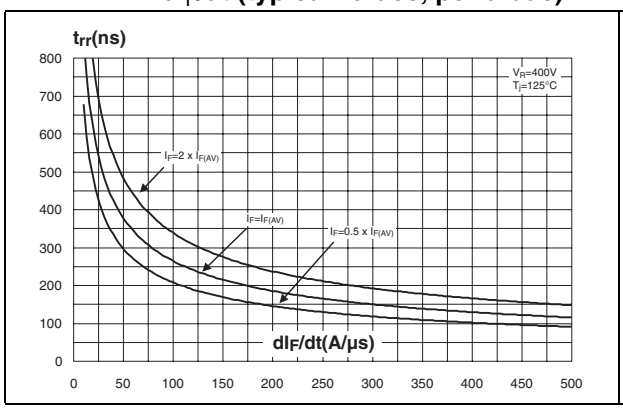


Figure 6. Reverse recovery charges versus dI_F/dt (typical values, per diode)

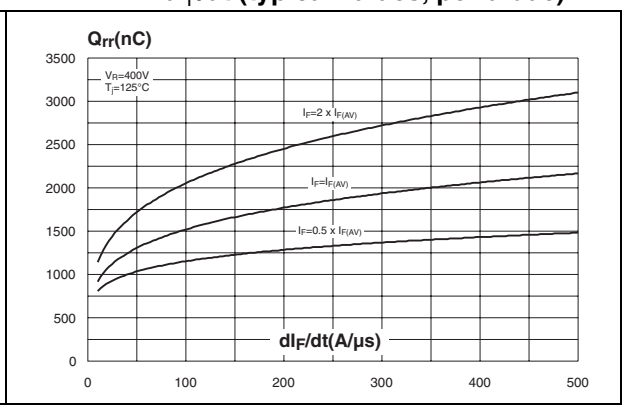


Figure 7. Reverse recovery softness factor versus dI_F/dt (typical values, per diode)

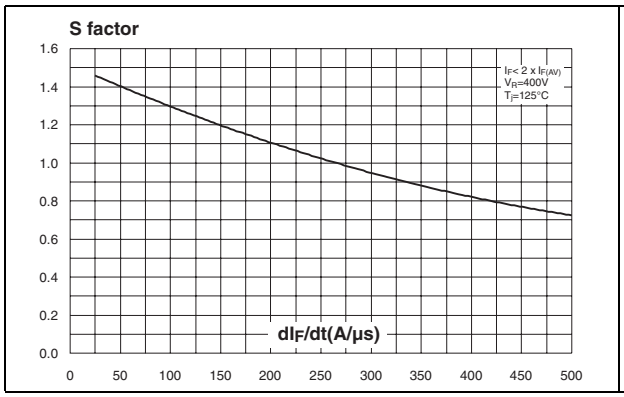


Figure 8. Relative variations of dynamic parameters versus junction temperature

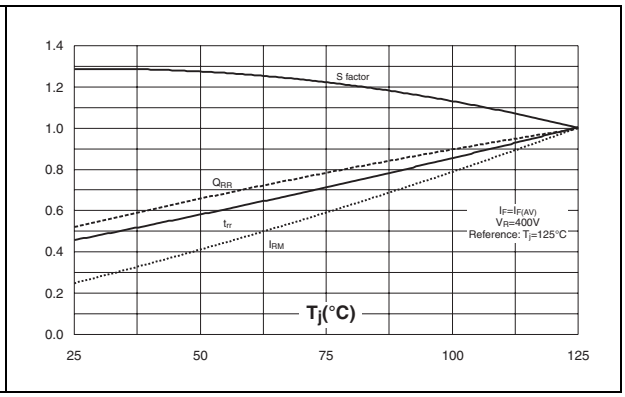


Figure 9. Transient peak forward voltage versus dI_F/dt (typical values, per diode)

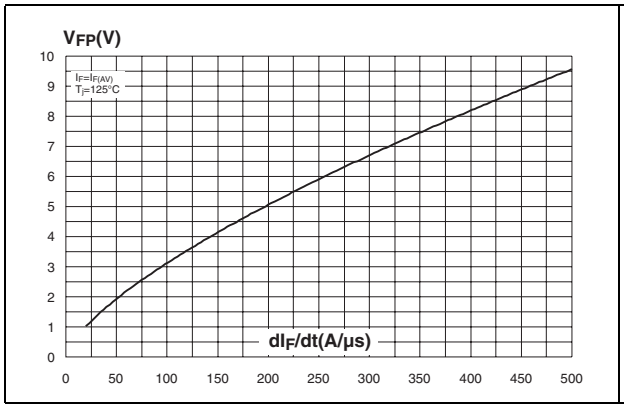


Figure 10. Forward recovery time versus dI_F/dt (typical values, per diode)

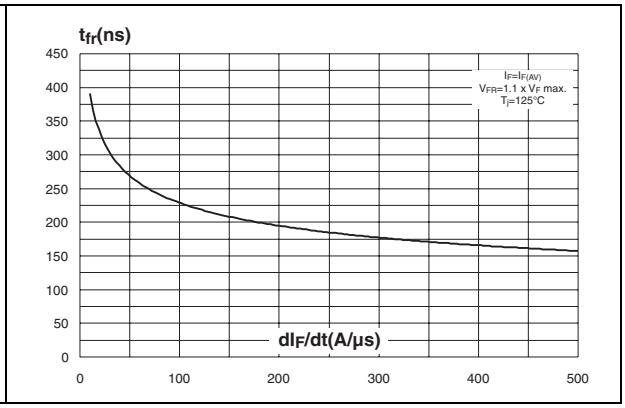
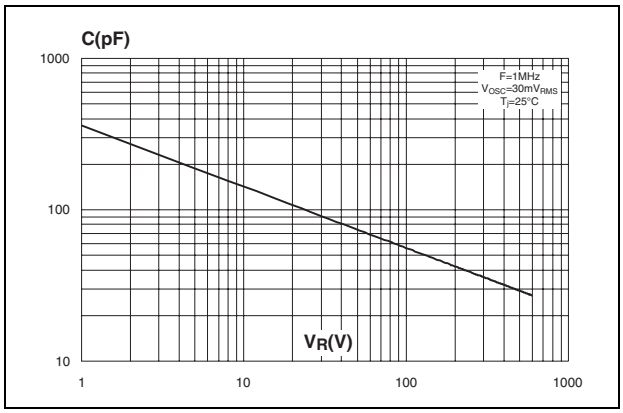


Figure 11. Junction capacitance versus reverse voltage applied (typical values, per diode)

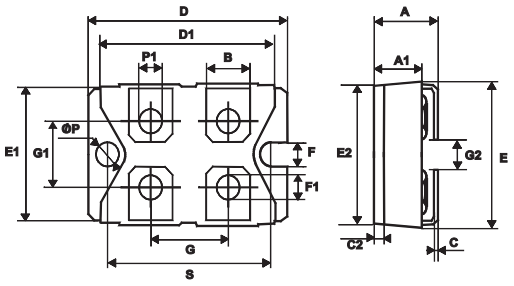


2 Package mechanical data

Epoxy meets UL94, V0

Cooling method: by conduction (C)

Table 5. ISOTOP dimensions



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	11.80	12.20	0.465	0.480
A1	8.90	9.10	0.350	0.358
B	7.8	8.20	0.307	0.323
C	0.75	0.85	0.030	0.033
C2	1.95	2.05	0.077	0.081
D	37.80	38.20	1.488	1.504
D1	31.50	31.70	1.240	1.248
E	25.15	25.50	0.990	1.004
E1	23.85	24.15	0.939	0.951
E2	24.80 typ.		0.976 typ.	
G	14.90	15.10	0.587	0.594
G1	12.60	12.80	0.496	0.504
G2	3.50	4.30	0.138	0.169
F	4.10	4.30	0.161	0.169
F1	4.60	5.00	0.181	0.197
P	4.00	4.30	0.157	0.69
P1	4.00	4.40	0.157	0.173
S	30.10	30.30	1.185	1.193

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

3 Ordering information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STTH60L06TV1	STTH60L06TV1	ISOTOP	27 g (without screws)	10 (with screws)	Tube
STTH60L06TV2	STTH60L06TV2	ISOTOP	27 g (without screws)	10 (with screws)	Tube

4 Revision history

Date	Revision	Description of Changes
07-Sep-2004	1	First issue
10-Sep-2004	2	Average forward current (page 1) and Junction to case (page 2) values changed
13-Oct-2006	3	Reformatted to current standard. Added part number STTH60L06TV2.

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