

STTH10002

Ultrafast recovery diode

Main product characteristics

I _{F(AV)}	2 x 50 A
V _{RRM}	200 V
T _j (max)	150° C
V _F (typ)	0.72 V
t _{rr} (typ)	30 ns

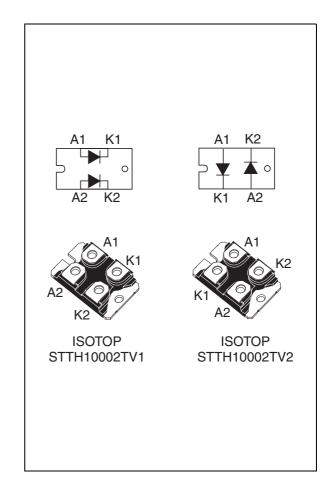
Features and benefits

- Very low forward losses
- Low recovery time
- High surge current capability
- Insulated
 - Insulating voltage = 2500 V_{rms}
 - Capacitance = 45 pF

Description

The STTH10002 is a dual rectifier suited for welding equipment, and high power industrial applications.

Packaged in ISOTOP, this device is intended for use in the secondary rectification of power converters.



Order codes

Part Number	Marking
STTH10002TV1	STTH10002TV1
STTH10002TV2	STTH10002TV2

1 Characteristics

Table 1. Absolute ratings (limiting values at $T_j = 25^{\circ}$ C, unless otherwise specified)

Symbol	Para	Value	Unit	
V _{RRM}	Repetitive peak reverse voltage	Repetitive peak reverse voltage		V
I _{F(RMS)}	RMS forward current Per diode		150	А
$I_{F(AV)}$ Average forward current, $\delta = 0.5$		Per diode $T_c = 100^{\circ} C$	50	А
		Per device $T_c = 95^{\circ} C$	- 50	A
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms Sinusoidal}$		750	А
T _{stg}	Storage temperature range	-55 to + 175	°C	
Т _ј	Maximum operating junction temperatu	150	°C	

Table 2.Thermal parameters

Symbol	Parameter		Value	Unit
Р	lunction to copp	Per diode	1	
Rth(j-c)	R _{th(j-c)} Junction to case	Total	0.55	° C/W
R _{th(c)}	Coupling		0.1	

When the two diodes 1 and 2 are used simultaneously:

 Δ Tj(diode 1) = P (diode 1) X R_{th(j-c)} (Per diode) + P (diode 2) x R_{th(c)}

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур	Max.	Unit
I _B ⁽¹⁾		$T_j = 25^\circ C$				50	
'R`´	Reverse leakage current	T _j = 125° C	V _R = V _{RRM}		50	500	μA
		T - 25° C	I _F = 50 A			1	
	V _F ⁽²⁾ Forward voltage drop	$T_j = 25^\circ C$	I _F = 100 A			1.15	
V _F ⁽²⁾		T _j = 125° C	I _F = 100 A		0.90	1.0	V
		T 1500 O	I _F = 50 A		0.72	0.80	
		T _j = 150° C	I _F = 100 A		0.86	0.97	

1. Pulse test: $t_p = 5 \text{ ms}, \delta < 2 \%$

2. Pulse test: t_p = 380 µs, δ < 2 %

To evaluate the conduction losses use the following equation: P = 0.63 x ${I_{F(AV)}}$ + 0.0034 ${I_{F}}^2_{(RMS)}$



Table 4.Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Тур	Max.	Unit
		$I_F = 1 \text{ A, } dI_F/dt = -50 \text{ A/}\mu\text{s},$ $V_R = 30 \text{ V, } T_j = 25 \text{ °C}$		53	65	ns
t _{rr} Reverse recovery time	$I_F = 1 \text{ A}, \text{ d}I_F/\text{d}t = -200 \text{ A}/\mu\text{s},$ $V_R = 30 \text{ V}, \text{ T}_j = 25 \ ^\circ\text{C}$		30	37		
I _{RM}	Reverse recovery current	$I_F = 50 \text{ A}, \text{ dI}_F/\text{dt} = 200 \text{ A}/\mu\text{s},$ $V_R = 160 \text{ V}, \text{ T}_j = 125 \ ^\circ\text{C}$		10	13	А
t _{fr}	Forward recovery time	$I_F = 50$ A, $dI_F/dt = 200$ A/µs $V_{FR} = 1.1$ x V_{Fmax} , $T_j = 25$ °C		180		ns
V_{FP}	Forward recovery voltage	$I_F = 50 \text{ A}, \text{ d}I_F/\text{d}t = 200 \text{ A}/\mu\text{s},$ $T_j = 25 \ ^\circ\text{C}$		1.6		V



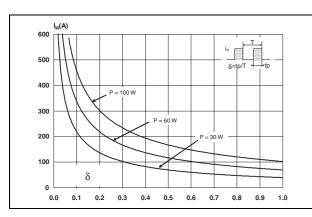
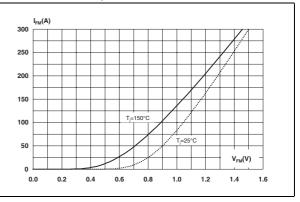
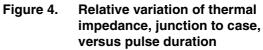
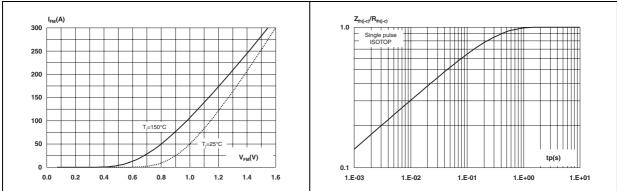


Figure 3. Forward voltage drop versus forward current (maximum values, per diode)

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

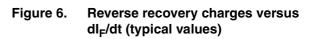


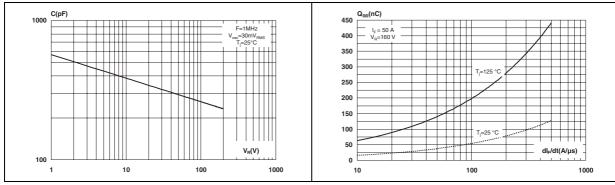


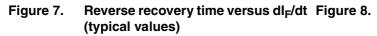


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Figure 5. Junction capacitance versus reverse applied voltage (typical values)







Peak reverse recovery current versus dl_F/dt (typical values)

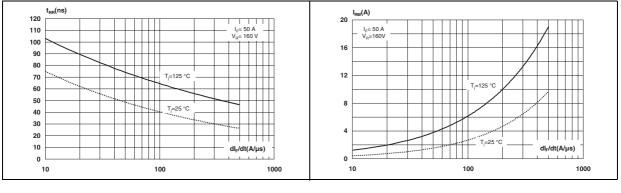
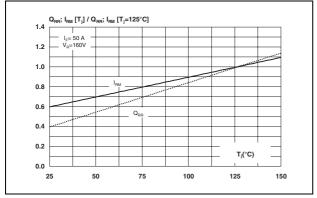
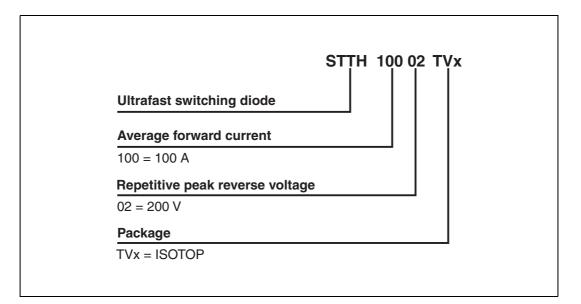


Figure 9. Dynamic parameters versus junction temperature



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2 Ordering information scheme





3 Package information

			DIMEN	SIONS	
	REF.	Millin	Millimeters		hes
		Min.	Max.	Min.	Max.
	Α	11.80	12.20	0.465	0.480
	A1	8.90	9.10	0.350	0.358
	В	7.8	8.20	0.307	0.323
E2	С	0.75	0.85	0.030	0.033
<mark>≠ 〒1</mark> 4 Ĕ→	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
P1	E	25.15	25.50	0.990	1.004
	E1	23.85	24.15	0.939	0.951
D S G D1	E2	24.8) typ.	0.97	6 typ.
в	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
ØP	F	4.10	4.30	0.161	0.169
G1	F1	4.60	5.00	0.181	0.197
←►E1	Р	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

Table 5.ISOTOP dimensions

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.



4 Ordering information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STTH10002TV1	STTH10002TV1	ISOTOP	27 g	10	Tube
STTH10002TV2	STTH10002TV2	ISOTOP	27 g	10	Tube

5 Revision history

Date	Revision	Description of Changes
05-Apr-2006	1	First issue



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