



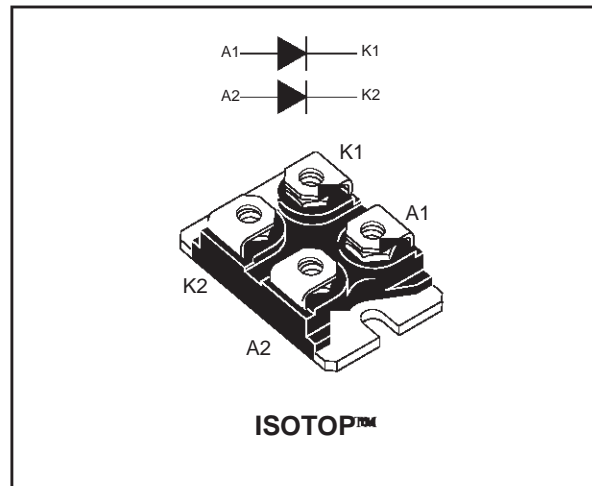
HIGH FREQUENCY SECONDARY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 80 A
V_{RRM}	300 V
$T_j(\text{max})$	150 °C
$V_F(\text{max})$	0.95 V
$t_{rr}(\text{max})$	80 ns

FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY FOR LOW SIDE EFFECTS
- ISOLATED PACKAGE: ISOTOP
Insulated voltage: 2500 V_{RMS}
Capacitance: < 45 pF
- LOW INDUCTANCE AND LOW CAPACITANCE ALLOW SIMPLIFIED LAYOUT



DESCRIPTION

Dual rectifiers suited for Switch Mode Power Supply and high frequency DC to DC converters.

Packaged in ISOTOP™, this device is intended for use in low voltage, high frequency inverters, free wheeling operation, welding equipments and telecom power supplies.

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		300	V
$I_{F(RMS)}$	RMS forward current		180	A
$I_{F(AV)}$	Average forward current	$T_c = 80^\circ\text{C}$ $\delta = 0.5$	Per diode 80 Per device 160	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ sinusoidal	800	A
I_{RSM}	Non repetitive peak reverse current	$t_p = 100 \mu\text{s}$ square	5	A
T_{stg}	Storage temperature range		- 55 to + 150	°C
T_j	Maximum operating junction temperature		150	°C

ISOTOP is a registered trademark of STMicroelectronics

STTH16003TV

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	0.7	$^{\circ}\text{C/W}$
		Total	0.4	
$R_{th(c)}$		Coupling	0.1	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode 1}) = P (\text{diode 1}) \times R_{th(j-c)} (\text{per diode}) + P (\text{diode 2}) \times R_{th(c)}$$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$V_R = 300\text{ V}$	$T_j = 25^{\circ}\text{C}$			200	μA
			$T_j = 125^{\circ}\text{C}$		0.2	2	mA
V_F^{**}	Forward voltage drop	$I_F = 80\text{ A}$	$T_j = 25^{\circ}\text{C}$			1.2	V
			$T_j = 125^{\circ}\text{C}$		0.8	0.95	

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

** $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation:

$$P = 0.75 \times I_{F(AV)} + 0.0025 \times I_F^2 (RMS)$$

RECOVERY CHARACTERISTICS

Symbol	Tests conditions			Min.	Typ.	Max.	Unit
trr	$I_F = 0.5\text{ A}$	$I_{rr} = 0.25\text{ A}$	$I_R = 1\text{ A}$	$T_j = 25^{\circ}\text{C}$		60	ns
	$I_F = 1\text{ A}$	$di_F/dt = -50\text{ A}/\mu\text{s}$	$V_R = 30\text{ V}$			80	
tfr	$I_F = 80\text{ A}$	$di_F/dt = 200\text{ A}/\mu\text{s}$		$T_j = 25^{\circ}\text{C}$		1000	ns
V_{FP}	$V_{FR} = 1.1 \times V_F \text{ max.}$					5	V
S_{factor}	$V_{CC} = 200\text{ V}$	$I_F = 80\text{ A}$		$T_j = 125^{\circ}\text{C}$	0.3		-
I_{RM}	$di_F/dt = 200\text{ A}/\mu\text{s}$					16	A

Fig. 1: Conduction losses versus average current (per diode).

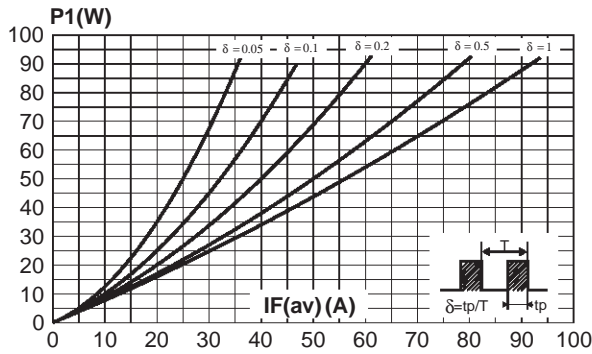


Fig. 2: Forward voltage drop versus forward current (Maximum values, per diode).

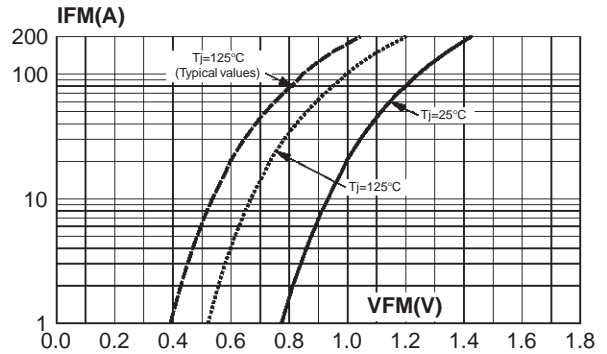


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

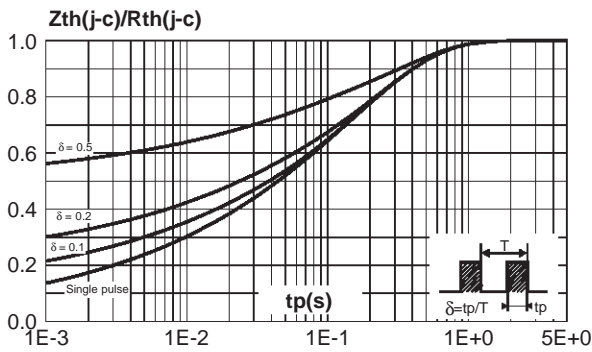


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence, per diode).

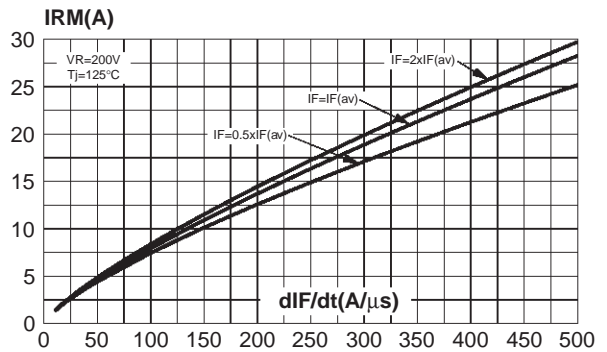


Fig. 5: Reverse recovery time versus dIF/dt (90% confidence, per diode).

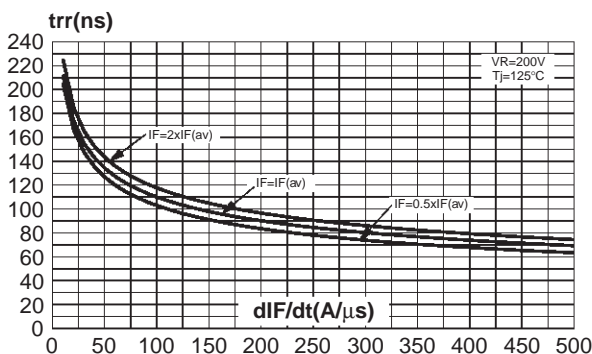


Fig. 6: Softness factor (tb/ta) versus dIF/dt (typical values, per diode).

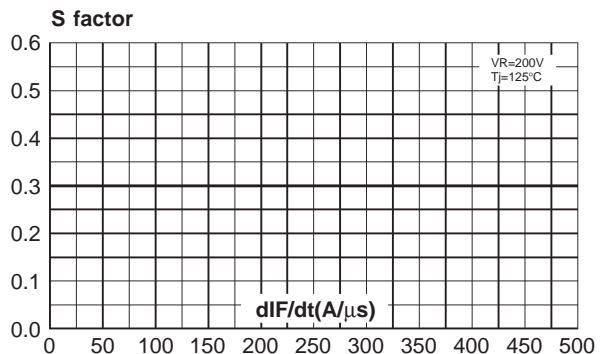


Fig. 7: Relative variation of dynamic parameters versus junction temperature (Reference: $T_j=125^\circ\text{C}$).

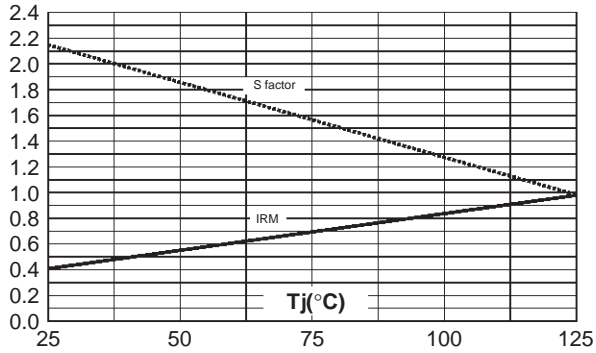


Fig. 8: Transient peak forward voltage versus dI_F/dt (90% confidence, per diode).

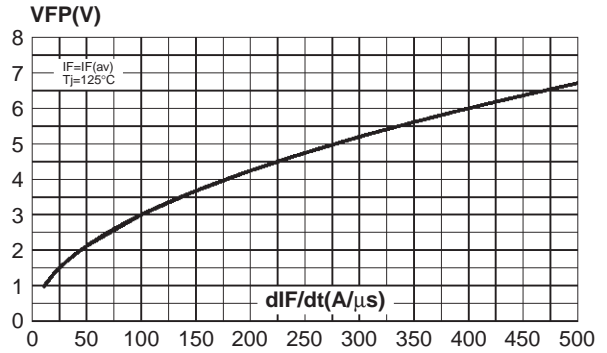
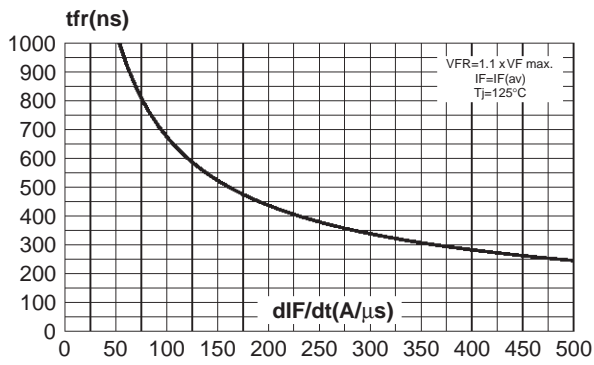
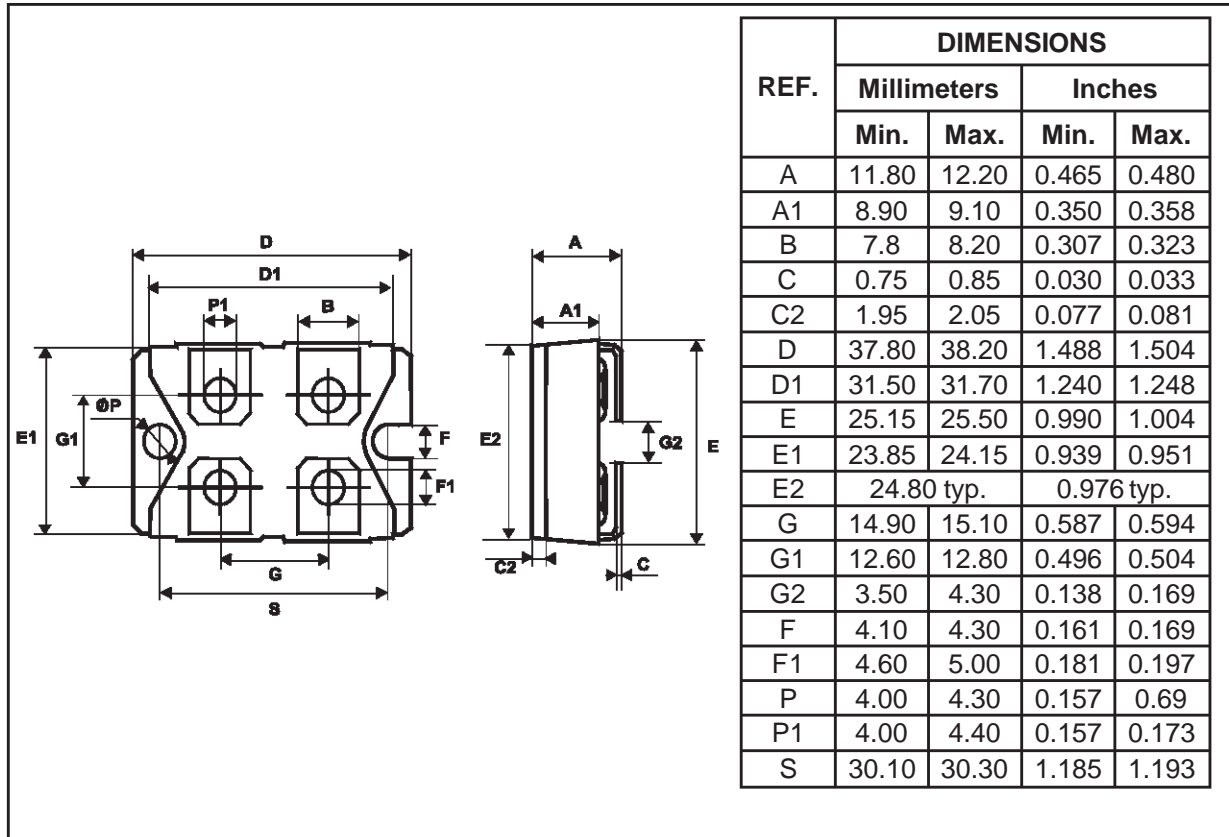


Fig.9: Forward recovery time versus dI_F/dt (90% confidence, per diode).



PACKAGE MECHANICAL DATA
 ISOTOP


Type	Marking	Package	Weight	Base qty	Delivery mode
STTH16003TV1	STTH16003TV	ISOTOP	27 g. without screws	10 with screws	Tube

- Cooling method: by conduction (C)
- Recommended torque value: 1.3 N.m.
- Maximum torque value: 1.5 N.m.
- Epoxy meets UL 94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 1999 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco -
The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

<http://www.st.com>