

STTB206S

PRELIMINARY DATASHEET

TURBOSWITCH™"B". ULTRA-FAST HIGH VOLTAGE DIODE

MAIN PRODUCTS CHARACTERISTICS

I _{F(AV)}	2A		
V _{RRM}	600V		
t _{rr} (typ)	45ns		
V _F (max)	1.3V		

FEATURES AND BENEFITS

- SPECIFIC TO THE FOLLOWING OPERATIONS: SNUBBING OR CLAMPING, DEMAGNETIZATION AND RECTIFICATION
- ULTRA-FAST, VERY SOFT AND FREE-NOISE RECOVERY
- VERY LOW OVERALL POWER LOSSES AND PARTICULARY LOW FORWARD VOLTAGE
- DESIGNED FOR HIGH PULSED CURRENT OPERATIONS
- SURFACE MOUNT DEVICE

SOD15 (Plastic)

DESCRIPTION

The TURBOSWITCH is a very high performance series of ultra-fast high voltage power diodes from 600V to 1200V.

TURBOSWITCH "B" family drastically cuts losses in all high voltage operations which require extremely fast, soft and noise-free power diodes. They are particularly suitable in the primary circuit

of an SMPS as snubber, clamping or demagnetizer diodes, and also in most power converters as high performance Rectifier diodes.

Packaged in SOD15 surface mount envelope, these 600V devices are particularly intended for use on 240V domestic mains.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	600	V
V_{RSM}	Non Repetitive Peak Reverse Voltage	600	V
I _{F(RMS)}	RMS Forward Current	8	Α
I _{FRM}	Repetitive Peak Forward Current (tp = 5 μs, f = 1kHz)	110	Α
Tj	Max. Operating Junction Temperature	125	°C
T _{stg}	Storage Temperature range	- 65 to + 150	°C

TM: TURBOSWITCH is a trademark of SGS-THOMSON Microelectronics

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THERMAL AND POWER DATA

Symbol	Parameter Conditions		Value	Unit
R _{th(j-l)}	Junction to Lead Thermal Resistar	21	°C/W	
P ₁	Conduction Power Dissipation (see fig. 5)	$I_{F(AV)} = 1.5A$ $\delta = 0.5$ Tlead= 81°C	2.1	W
P _{max}	Total Power Dissipation Pmax = P1 + P3 (P3 = 10% P1)	Tlead= 76°C (Square waveform)	2.4	W

STATIC ELECTRICAL CHARACTERISTICS (see Fig. 5)

Symbol	Parameter	Test Conditions		Min	Тур	Max	Unit
V _F *	Forward Voltage Drop	I _F = 2A	Tj = 25°C Tj = 125°C		0.9	1.35 1.2	V
I _R **	Reverse Leakage Current	V _R = 0.8 x V _{RRM}	Tj = 25°C Tj = 125°C		150	20 500	μА

Test pulses widths : $\,^*$ tp = 380 $\mu s,\,duty\,\,cycle$ < 2% $\,^{**}$ tp = 5 ms $\,$, duty $\,cycle$ < 2%

DYNAMIC ELECTRICAL CHARACTERISTICS

TURN-OFF SWITCHING (see Fig. 6)

Symbol	Parameter	Test Conditions	Min	Тур	Max	Unit
t _{rr}	Reverse Recovery Time	Tj = 25°C $I_F = 0.5$ A $I_R = 1$ A $Irr = 0.25$ A $I_F = 1$ A $dI_F/dt = -50$ A/ μ s $V_R = 30$ V		45	95	ns
I _{RM}	Maximum Recovery Current	$Tj = 125$ °C $VR = 400V$ $I_F = 2A$ $dI_F/dt = -16$ $A/\mu s$ $dI_F/dt = -50$ $A/\mu s$		3.6	2.4	А
S factor	Softness factor	$Tj = 125$ °C $V_R = 400V$ $I_F = 2A$ $dI_F/dt = -50$ $A/\mu s$		TBD		/

TURN-ON SWITCHING (see Fig. 7)

Symbol	Parameter	Test Conditions	Min	Тур	Max	Unit
t _{fr}	Forward Recovery Time	Tj = 25°C $I_F = 2$ A $dI_F/dt = 16$ A/ μ s measured at : 1.1 × V_F max			500	ns
V _{Fp}	Peak Forward Voltage	Tj = 25°C I _F = 2 A dI _F /dt = 16 A/μs			8	V
		Tj = 25°C IF = 5 A dIF/dt = 50 A/μs		6		



APPLICATION DATA

The TURBOSWITCHTM "B" is especially designed to provide the lowest overall power losses in any application such as snubbing, clamping, demagnetization and rectification.

In such applications (fig. 1 to 4), the way of calculating the power losses is given below:

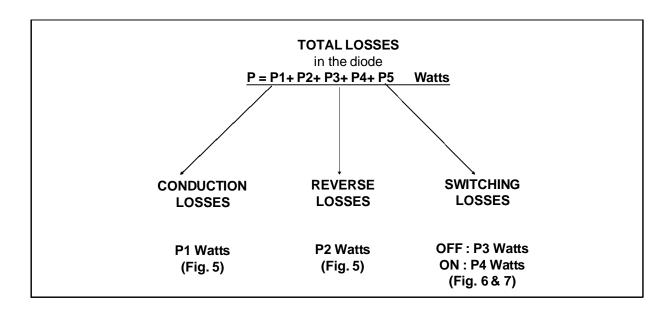


Fig. 1: SNUBBER DIODE.

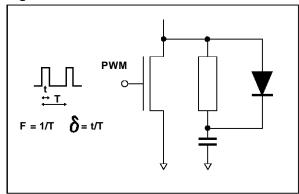


Fig. 2: CLAMPING DIODE.

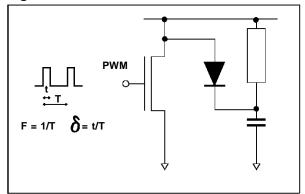


Fig. 3: DEMAGNETIZING DIODE.

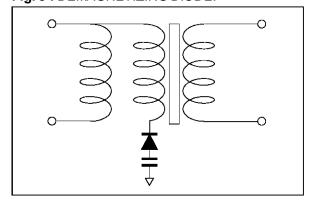
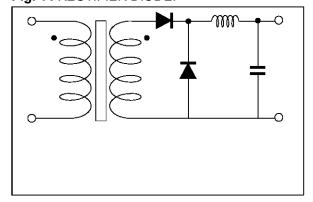


Fig. 4: RECTIFIER DIODE.



APPLICATION DATA (Cont'd)

Fig. 5: STATIC CHARACTERISTICS

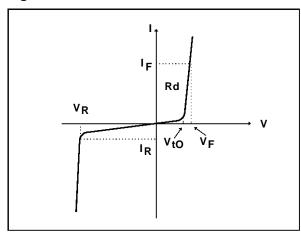
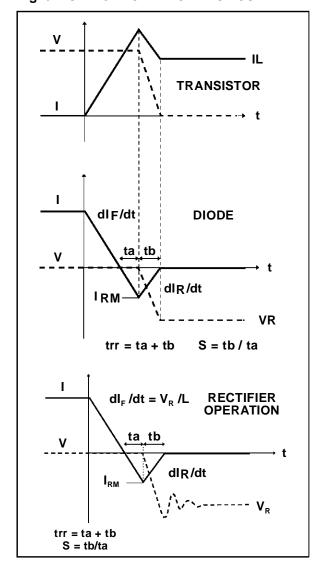


Fig. 6: TURN-OFF CHARACTERISTICS



Conduction losses:

 $P1 = V_{t0} \times I_{F(AV)} + R_d \times I_{F^2(RMS)}$

with

 $V_{t0} = 1.05 \text{ V}$ $R_d = 0.125 \text{ Ohm}$ (Max values at 125°C)

Reverse losses:

 $P2 = V_R \times I_R \times (1 - \delta)$

Turn-off losses:

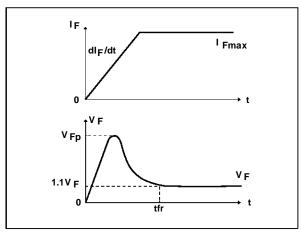
$$P3 = \frac{V_R \times I_{RM}^2 \times S \times F}{6 \times dI_F/dt}$$

Turn-off losses: with non negligible serial inductance

P3' =
$$\frac{V_R \times I_{RM}^2 \times S \times F}{6 \times dI_F/dt} + \frac{L \times I_{RM}^2 \times F}{2}$$

APPLICATION DATA (Cont'd)

Fig. 7: TURN-ON CHARACTERISTICS



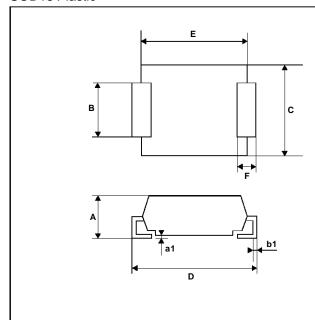
Ratings and characteristics curves are ON GOING.

Turn-on losses:

 $P4 = 0.4 (V_{FP} - V_F) \times I_{Fmax} \times t_{fr} \times F$

PACKAGE MECHANICAL DATA

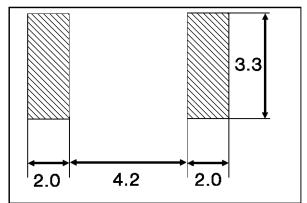
SOD15 Plastic



	DIMENSIONS			
REF.	Millimeters		Inches	
	Min. Max.		Min.	Max.
Α	2.50	3.10	0.098	0.122
a1	0.05	0.20	0.002	0.008
В	2.90	3.10	0.114	0.122
b1	0.29	0.32	0.011	0.012
С	4.80	5.20	0.189	0.204
D	7.60	8.00	0.299	0.315
E	6.30	6.60	0.225	0.259
F	1.30	1.70	0.051	0.056

FOOTPRINT DIMENSIONS

SOD15 Plastic



Marking: T61
Laser marking
Logo indicates cathode

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