SGS-THOMSON MICROELECTRONICS

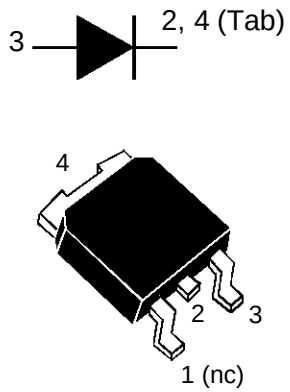
STTA312B(-TR)

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

MAIN PRODUCT CHARACTERISTICS

PRELIMINARY DATASHEET

$I_{F(AV)}$	**3 A**
V_{RRM}	**1200 V**
V_F (max)	**1.7 V**
t_{rr} (typ)	**65 ns**



DPAK
(Plastic)

FEATURES AND BENEFITS

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

DESCRIPTION

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

TURBOSWITCH 1200V drastically cuts losses in all high voltage operations which require extremely fast, soft and noise-free power diodes.

Due to their optimized switching performances they also highly decrease power losses in any associated switching IGBT or MOSFET in all "Free-wheel Mode" operations.
They are particularly suitable in Motor Control circuitries, or in primary of SMPS as snubber, clamping or demagnetizing diodes, and also in at the secondary of SMPS as high voltage rectifier diodes.

Packaged in DPAK Surface Mount enveloppe, these 1200V devices are particulary intended for use on triphase 400V industrial mains.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		1200	V
V_{RSM}	Non Repetitive Surge Reverse Voltage		1200	V
$I_{F(RMS)}$	RMS Forward Current		8	A
I_{FRM}	Repetitive Peak Forward Current	tp = 5 µs F = 1 KHz	110	A
T_{stg}	Storage Temperature Range		- 65 to + 150	°C
Tj	Max. Junction Temperature		125	°C

TM : TURBOSWITCH is a trademark from SGS-THOMSON Microelectronics.

THERMAL AND POWER DATA

Symbol	Parameter	Conditions	Value	Unit
$R_{th\ (j-c)}$	Junction to Case Thermal Resistance		6.5	°C/W
P_1	Conduction Power Dissipation	$I_{F(AV)}$ = 1.5A, δ = 0.5 T_L = 80°C	6.7	W
P_{max}	Total Power Dissipation $P_{max} = P_1 + P_3$ (P_3 = 10% P_1)	T_L = 76°C	7.5	°C/W

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions	Tests Conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage Current	Tj = 25°C	V_R = 0.8 X V_{RRM}		2	20	µA
		Tj = 125°C			150	400	µA
V_F **	Forward Voltage drop	Tj = 25°C	I_F = 3 A		1.25	1.8	V
		Tj = 125°C	I_F = 3 A		1.15	1.7	

Pulse test : * tp = 5 ms, duty cycle < 2 %
** tp = 380 µs, duty cycle < 2%

DYNAMIC ELECTRICAL CHARACTERISTICS

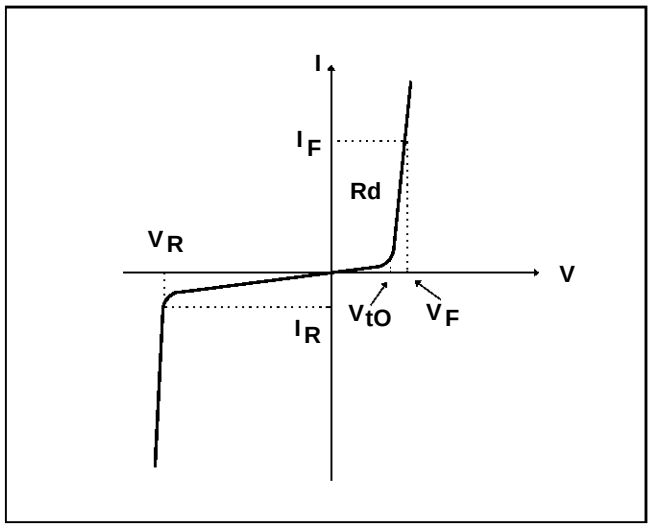
TURN-OFF SWITCHING

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t_{rr}		Tj = 25°C	I_F=0.5A I_R=1A I_{rr}=0.25A I_F=1A dI_F/dt=A/µs V_R=30V		65	115	ns
t_{fr}	Maximum Reverse Recovery Current	Tj = 125°C	I_F=2A V_R=400V dI_F/dt = -16A/µs dI_F/dt = -50A/µs			3.6	A
S factor	Softness Factor	Tj = 125°C	V_R=400V I_F=2A dI_F/dt = -50A/µs		TBD		/

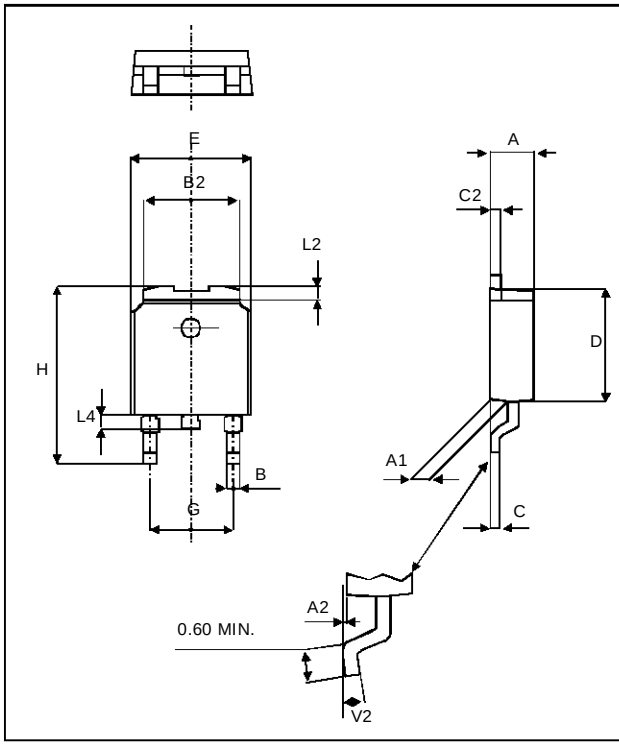
TURN-ON SWITCHING

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t_{rr}	Forward Recovery Time	Tj = 25°C	I_F=2A dI_F/dt = 16A/µs Measured at 1.1 x V_{Fmax}			900	ns
V_{PF}	Peak Forward Voltage	Tj = 25°C	I_F=2A dI_F/dt = 16A/µs			30	V
		T j= 25°C	I_F=5A dI_F/dt = 50A/µs			30	

Fig. 1 : STATIC CHARACTERISTICS :
V_{TO} = 1.15V R_D = 185mΩ



PACKAGE MECHANICAL DATA
DPAK



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.212
C	0.45		0.60	0.017		0.023
C2	0.48		0.60	0.018		0.023
D	6.00		6.20	0.236		0.244
E	6.40		6.60	0.251		0.259
G	4.40		4.60	0.173		0.181
H	9.35		10.10	0.368		0.397
L2		0.80			0.031	
L4	0.60		1.00	0.023		0.039
V2	0°		8°	0°		8°

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