

# STTA506B(-TR)

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

## MAIN PRODUCT CHARACTERISTICS

I <sub>F(AV)</sub>	5 A
V <sub>RRM</sub>	600 V
V <sub>F</sub> (max)	1.5 V
t <sub>rr</sub> (typ)	20 ns

#### **FEATURES AND BENEFITS**

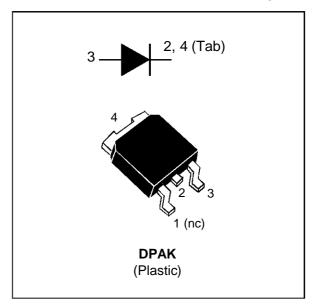
- SPECIFIC TO THE FOLLOWING OPERATIONS: SNUBBING OR CLAMPING, DEMAGNETIZA-TION AND RECTIFICATION, FREEWHEEL OR BOOSTER DIODE
- ULTRA-FAST RECOVERY
- VERY LOW OVERALL POWER LOSSES IN BOTH THE DIODE AND THE COMPANION TRANSISTOR
- DESIGNED FOR HIGH PULSED CURRENT OP-ERATIONS
- SURFACE MOUNT DEVICE
- TAPE AND REEL OPTION: -TR

## **DESCRIPTION**

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

TURBOSWITCH "A" family drastically cuts losses in both the diode and the associated switching IGBT or MOSFET in all "Freewheel Mode" operations and is particulary suitable and efficient in Mo-

#### PRELIMINARY DATASHEET



tor Control Freewhell applications and in Booster diode applications in Power Factor Control circuitries.

Packaged in DPAK Surface Mount enveloppe, these 600V devices are particulary intended for use on 240V domestic mains.

### **ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit	
$V_{RRM}$	Repetitive Peak Reverse Voltage		600	V
V <sub>RSM</sub>	Non Repetitive Surge Reverse Voltage	600	V	
I <sub>F(RMS)</sub>	RMS Forward Current		8	Α
I <sub>FRM</sub>	Repetitive Peak Forward Current	65	А	
T <sub>stg</sub>	Storage Temperature Range	- 65 to + 150	°C	
Tj	Max. Junction Temperature		150	°C

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

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# THERMAL AND POWER DATA

Symbol	Parameter	Conditions	Value	Unit
R <sub>th (j-c)</sub>	Junction to Case Thermal Resistance		TBD	°C/W
P <sub>1</sub>	Conduction Power Dissipation	$I_{F(AV)} = 1.5A, \delta = 0.5$ $T_L = {}^{\circ}C$	TBD	W
P <sub>max</sub>	Total Power Dissipation $P_{max} = P_1 + P_3$ $(P_3 = 10\% P_1)$	T <sub>L</sub> = 76°C	TBD	°C/W

# STATIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions	Tests	Min.	Тур.	Max.	Unit	
I <sub>R</sub> *	Reverse leakage	Tj = 25°C	$V_R = 0.8 \times V_{RRM}$			100	μΑ
	Current	Tj = 125°C				2	mA
V <sub>F</sub> **	Forward Voltage	Tj = 25°C	I <sub>F</sub> = 5 A			1.75	V
	drop	Tj = 125°C	I <sub>F</sub> = 5 A			1.5	

# **DYNAMIC ELECTRICAL CHARACTERISTICS**

# **TURN-OFF SWITCHING**

Symbol	Parameter		<b>Test Conditions</b>	Min.	Тур.	Max.	Unit
t <sub>rr</sub>		Tj = 25°C	$I_F=0.5A$ $I_R=1A$ $I_{rr}=0.25A$ $I_F=1A$ $dI_F/dt=A/\mu s$ $V_R=30V$		20	50	ns
t <sub>fr</sub>	Maximum Reverse Recovery Current	Tj = 125°C	$I_F=2A$ $V_R=400V$ $dI_F/dt = -16A/\mu s$ $dI_F/dt = -500A/\mu s$		11	3.0	А
S factor	Softness Factor	Tj = 125°C	V <sub>R</sub> =400V I <sub>F</sub> =2A dI <sub>F</sub> /dt = -50A/μs		0.6		/

# **TURN-ON SWITCHING**

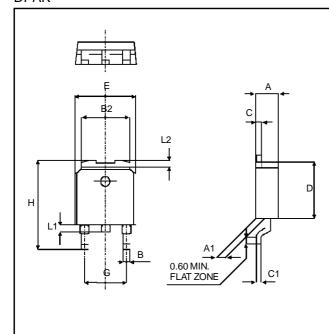
Symbol	Parameter	Test Conditions			Тур.	Max.	Unit
t <sub>rr</sub>	Forward Recovery Time	Tj = 25°C	I <sub>F</sub> =2A dI <sub>F</sub> /dt = 16A/μs Measured at 1.1 x V <sub>Fmax</sub>			500	ns
V <sub>PF</sub>	Peak Forward Voltage	Tj = 25°C	I <sub>F</sub> =5A dI <sub>F</sub> /dt = 40A/μs			10	V



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

<sup>\*\*</sup> tp =  $380 \,\mu s$ , duty cycle < 2%

### PACKAGE MECHANICAL DATA DPAK



	DIMENSIONS							
REF.	Millimeters			Inches				
	Min.	Тур.	Max	Min.	Тур.	Max.		
Α	2.20		2.40	0.086		0.094		
A1	0.90		1.10	0.035		0.043		
В	0.64		0.90	0.025		0.035		
B2	5.20		5.40	0.204		0.212		
С	0.45		0.60	0.017		0.023		
C1	0.48		0.60	0.018		0.023		
D	6.00		6.20	0.236		0.244		
Е	6.40		6.60	0.251		0.259		
G	4.40		4.60	0.173		0.181		
Н	9.35		10.10	0.368		0.397		
L1	0.60		1.00	0.023		0.039		
L2		0.80			0.031			

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