

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

### MAIN PRODUCT CHARACTERISTICS

|               |              |
|---------------|--------------|
| $I_F(AV)$     | <b>5 A</b>   |
| $V_{RRM}$     | <b>600 V</b> |
| $V_F(max)$    | <b>1.3 V</b> |
| $t_{rr}(typ)$ | <b>45 ns</b> |

### PRELIMINARY DATASHEET

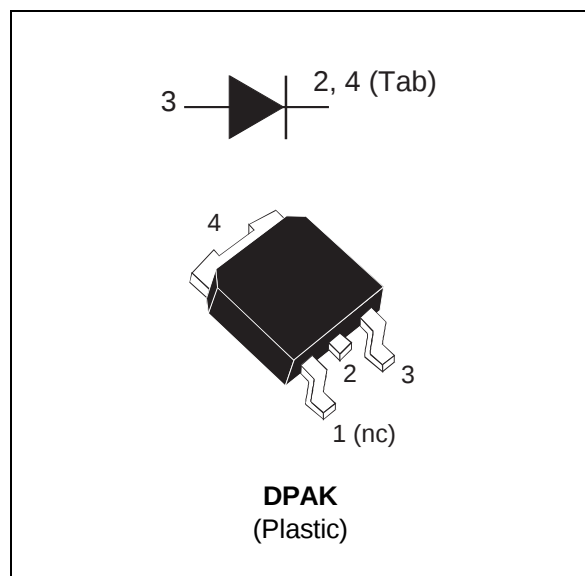
### FEATURES AND BENEFITS

- SPECIFIC TO THE FOLLOWING OPERATIONS :  
 SNUBBING OR CLAMPING, DEMAGNETIZATION 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 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 "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 DPAK 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 Surge Reverse Voltage |                                | 600           | V    |
| $I_{F(RMS)}$ | RMS Forward Current                  |                                | 8             | A    |
| $I_{FRM}$    | Repetitive Peak Forward Current      | $t_p = 5 \mu s$<br>$F = 5 KHz$ | 65            | A    |
| $T_{stg}$    | Storage Temperature Range            |                                | - 65 to + 150 | °C   |
| $T_j$        | Max. Junction Temperature            |                                | 150           | °C   |

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

## STTB506B(-TR)

### THERMAL AND POWER DATA

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

### STATIC ELECTRICAL CHARACTERISTICS

| Symbol     | Tests Conditions        | Tests Conditions    |                            | Min. | Typ. | Max. | Unit    |
|------------|-------------------------|---------------------|----------------------------|------|------|------|---------|
| $I_R^*$    | Reverse leakage Current | $T_j = 25^\circ C$  | $V_R = 0.8 \times V_{RRM}$ |      |      | 100  | $\mu A$ |
|            |                         | $T_j = 125^\circ C$ |                            |      |      | 0.75 | mA      |
| $V_F^{**}$ | Forward Voltage drop    | $T_j = 25^\circ C$  | $I_F = 5A$                 |      |      | 1.4  | V       |
|            |                         | $T_j = 125^\circ C$ | $I_F = 5A$                 |      |      | 1.3  |         |

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

\*\*  $t_p = 380\mu s$ , duty cycle  $< 2\%$

### DYNAMIC ELECTRICAL CHARACTERISTICS

#### TURN-OFF SWITCHING

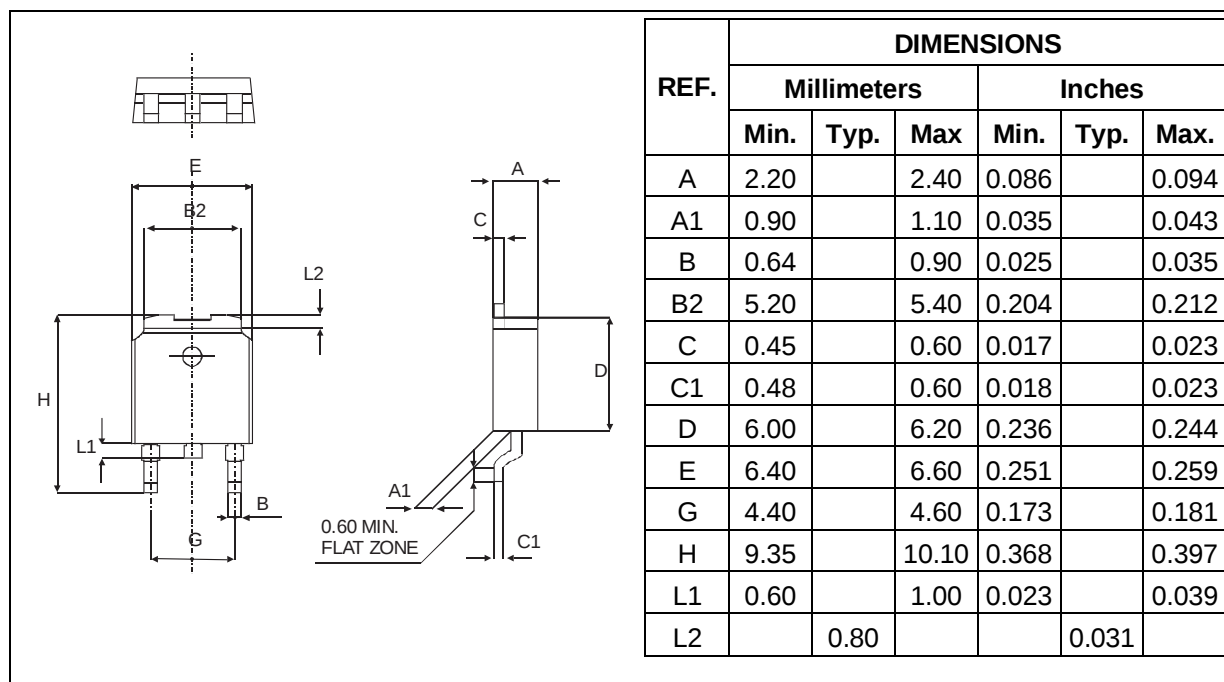
| Symbol   | Parameter                        | Test Conditions     |                                                                               | Min. | Typ. | Max. | Unit |
|----------|----------------------------------|---------------------|-------------------------------------------------------------------------------|------|------|------|------|
| $t_{rr}$ | Reverse Recovery Time            | $T_j = 25^\circ C$  | $I_F=0.5A$ $I_R=1A$ $I_{rr}=0.25A$<br>$I_F=1A$ $dI_F/dt=-50A/\mu s$ $V_R=30V$ |      | 45   | 95   | ns   |
| $t_{fr}$ | Maximum Reverse Recovery Current | $T_j = 125^\circ C$ | $I_F=5A$ $V_R=400V$<br>$dI_F/dt = -40A/\mu s$<br>$dI_F/dt = -500A/\mu s$      |      | 20   | 7.5  | A    |
| S factor | Softness Factor                  | $T_j = 125^\circ C$ | $V_R=400V$ $I_F=5A$<br>$dI_F/dt = -500A/\mu s$                                |      | 1    |      | /    |

#### TURN-ON SWITCHING

| Symbol   | Parameter             | Test Conditions    |                                                                     | Min. | Typ. | Max. | Unit |
|----------|-----------------------|--------------------|---------------------------------------------------------------------|------|------|------|------|
| $t_{rr}$ | Forward Recovery Time | $T_j = 25^\circ C$ | $I_F=5A$ $dI_F/dt = 40A/\mu s$<br>Measured at $1.1 \times V_{Fmax}$ |      |      | 500  | ns   |
| $V_{PF}$ | Peak Forward Voltage  | $T_j = 25^\circ C$ | $I_F=5A$ $dI_F/dt = 40A/\mu s$<br>$I_F=25A$ $dI_F/dt=500A/\mu s$    |      | 10   | 8    | V    |

## PACKAGE MECHANICAL DATA

DPAK



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