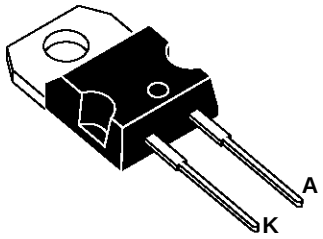
SGS-THOMSON MICROELECTRONICS

# BYT 08PI-1000

## FAST RECOVERY RECTIFIER DIODE

- VERY HIGH REVERSE VOLTAGE CAPABILITY
- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED: Capacitance 7pF

Insulting voltage 500 $V_{RMS}$




**Isolated**
**TO220AC**
(Plastic)

### SUITABLE APPLICATIONS

- FREE WHEELING DIODE IN CONVERTERS AND MOTOR CONTROL CIRCUITS
- RECTIFIER IN S.M.P.S.

### ABSOLUTE MAXIMUM RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{RRM}$ | Repetitive Peak Reverse Voltage | | 1000 | V |
| $V_{RSM}$ | Non Repetitive Peak Reverse Voltage | | 1000 | V |
| $I_{FRM}$ | Repetitive Peak Forward Current | $t_p \leq 10\mu s$ | 100 | A |
| $I_{F\ (RMS)}$ | RMS Forward Current | | 16 | A |
| $I_{F\ (AV)}$ | Average Forward Current | $T_c = 80°C$<br>$\delta = 0.5$ | 8 | A |
| $I_{FSM}$ | Surge Non Repetitive Forward Current | $t_p = 10ms$<br>Sinusoidal | 50 | A |
| P | Power Dissipation | $T_c = 80°C$ | 17 | W |
| $T_{stg}$<br>$T_j$ | Storage and Junction Temperature Range | | - 40 to + 150<br>- 40 to + 150 | °C |

### THERMAL RESISTANCE

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th\ (j-c)}$ | Junction-case | 4 | °C/W |

## ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

| Symbol | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_R$ | $T_j$ = 25°C | $V_R = V_{RRM}$ | | | 35 | µA |
| | $T_j$ = 100°C | | | | 2 | mA |
| $V_F$ | $T_j$ = 25°C | $I_F$ = 8A | | | 1.9 | V |
| | $T_j$ = 100°C | | | | 1.8 | |

RECOVERY CHARACTERISTICS

| Symbol | Test Conditions | | | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|
| $t_{rr}$ | $T_j$ = 25°C | $I_F$ = 1A | $dI_F/dt$ = - 15A/µs | $V_R$ = 30V | | | 155 | ns |
| | | $I_F$ = 0.5A | $I_R$ = 1A | $I_{rr}$ = 0.25A | | | 65 | |

TURN-OFF SWITCHING CHARACTERISTICS (Without Series Inductance)

| Symbol | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $t_{IRM}$ | $dI_F/dt$ = - 32A/µs | $V_{CC}$ = 200 V $I_F$ = 8A<br>$L_p \leq 0.05\mu H$ $T_j$ = 100°C<br>See Figure 1 | | | 200 | ns |
| | $dI_F/dt$ = - 64A/µs | | | 120 | | |
| $I_{RM}$ | $dI_F/dt$ = - 32A/µs | | | | 5.5 | A |
| | $dI_F/dt$ = - 64A/µs | | | 6 | | |

TURN-OFF OVERVOLTAGE COEFFICIENT (With Series Inductance)

| Symbol | Test Conditions | | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $C = \frac{V_{RP}}{V_{CC}}$ | $T_j$ = 100°C<br>$dI_F/dt$ = - 8A/µs | $V_{CC}$ = 200V<br>$L_p$ = 2µH | $I_F = I_{F\ (AV)}$<br>See figure 2 | | | 4.5 | |

To evaluate the conduction losses use the following equation:

$V_F = 1.47 + 0.04\ I_F$ $\quad P = 1.47 \times I_{F(AV)} + 0.04\ I_F{}^2{}_{(RMS)}$

**Figure 1. Turn-off switching characteristics (without series inductance).**

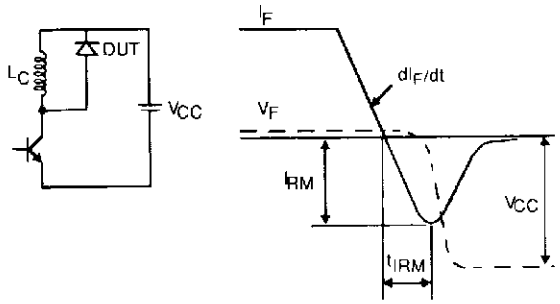
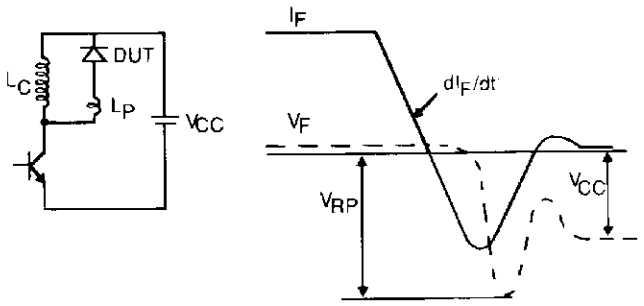
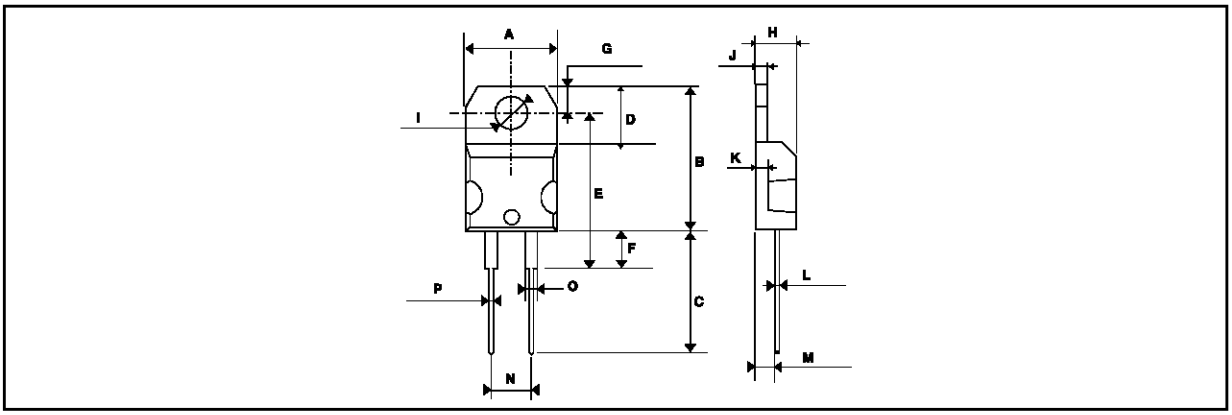



**Figure 2. Turn-off switching characteristics (with series inductance).**



**PACKAGE MECHANICAL DATA :** TO220AC Plastic




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 10.0 | 10.4 | 0.393 | 0.409 |
| B | 15.2 | 15.9 | 0.598 | 0.626 |
| C | 13 | 14 | 0.511 | 0.551 |
| D | 6.2 | 6.6 | 0.244 | 0.260 |
| E | 16.4 typ. | | 0.645 typ. | |
| F | 3.5 | 4.2 | 0.137 | 0.165 |
| G | 2.65 | 2.95 | 0.104 | 0.116 |
| H | 4.4 | 4.6 | 0.173 | 0.181 |
| I | 3.75 | 3.85 | 0.147 | 0.151 |
| J | 1.23 | 1.32 | 0.048 | 0.051 |
| K | 1.27 typ. | | 0.050 typ. | |
| L | 0.49 | 0.70 | 0.019 | 0.027 |
| M | 2.4 | 2.72 | 0.094 | 0.107 |
| N | 4.95 | 5.15 | 0.194 | 0.203 |
| O | 1.14 | 1.70 | 0.044 | 0.067 |
| P | 0.61 | 0.88 | 0.024 | 0.034 |

Cooling method: by conduction (method C)
Marking: type number
Weight: 2.1g
Recommended torque value: 80cm. N
Maximum torque value: 100cm. N