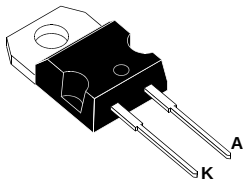
# BYT08P-400
# BYT08PI-400

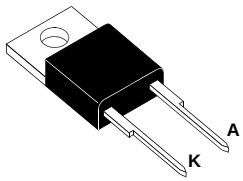
## FAST RECOVERY RECTIFIER DIODES

### MAIN PRODUCT CHARACTERISTICS

| | |
|---|---|
| $I_{F(AV)}$ | 8 A |
| $V_{RRM}$ | 400 V |
| $V_F$ (max) | 1.4 V |
| trr (max) | 35 ns |




**T0-220AC**
(Plastic)




**Insulated**
**TO-220AC**
(Plastic)

### FEATURES AND BENEFITS

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED PACKAGE: TO-220AC
  Insulation voltage: 2500 $V_{RMS}$
  Capacitance = 7 pF

### DESCRIPTION

This single rectifier is suited for Switch Mode Power Supplies and other power converters.

This device is intended to free-wheeling function in converters and motor control circuits.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | | 400 | V |
| $I_{FRM}$ | Repetitive peak forward current | tp=5 µs F=5kHz | | 200 | A |
| $I_{F(RMS)}$ | RMS forward current | | | 16 | A |
| $I_{F(AV)}$ | Average forward current | TO-220AC | Tc = 120°C<br>δ = 0.5 | 8 | A |
| | | Insulated TO-220AC | Tc = 105°C | | |
| $I_{FSM}$ | Surge non repetitive forward current | tp = 10 ms Sinusoidal | | 100 | A |
| $T_{stg}$ | Storage temperature range | | | - 40 to + 150 | °C |
| Tj | Maximum operating junction temperature | | | 150 | °C |

## THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{th\ (j-c)}$ | Junction to case | TO-220AC<br>Ins. TO-220AC | 2.5<br>3.5 | °C/W |

## STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_F$ * | Forward voltage drop | Tj = 25°C | $I_F$ = 8 A | | | 1.5 | V |
| | | Tj = 100°C | | | | 1.4 | |
| $I_R$ ** | Reverse leakage current | Tj = 25°C | $V_R = V_{RRM}$ | | | 15 | µA |
| | | Tj = 100°C | | | | 2.5 | mA |

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

To evaluate the conduction losses use the following equation:
$P = 1.1 \times I_{F(AV)} + 0.024\ I_F{}^2{}_{(RMS)}$

## RECOVERY CHARACTERISTICS

| Symbol | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $t_{rr}$ | Tj = 25°C | $I_F$ = 1A $V_R$ = 30V $dI_F/dt$ = - 15A/µs | | | 75 | ns |
| | | $I_F$ = 0.5A $I_R$ = 1A $I_{rr}$ = 0.25A | | | 35 | |

## TURN-OFF SWITCHING CHARACTERISTICS

| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $t_{IRM}$ | Maximum reverse recovery time | $dI_F/dt$ = - 32 A/µs | $V_{CC}$ = 200 V<br>$I_F$ = 8 A<br>$L_p \leq 0.05$ µH<br>Tj = 100°C<br>(see fig. 13) | | | 75 | ns |
| | | $dI_F/dt$ = - 64 A/µs | | | 50 | | |
| $I_{RM}$ | Maximum reverse recovery current | $dI_F/dt$ = - 32 A/µs | | | | 2.2 | A |
| | | $dI_F/dt$ = - 64 A/µs | | | 2.8 | | |
| $C = \frac{V_{RP}}{V_{CC}}$ | Turn-off overvoltage coefficient | Tj = 100°C $V_{CC}$ = 60V $I_F = I_{F(AV)}$<br>$dI_F/dt$ = - 30A/µs $L_p$ = 1µH | | | 3.3 | | / |

**Fig. 1:** Average forward power dissipation versus average forward current .

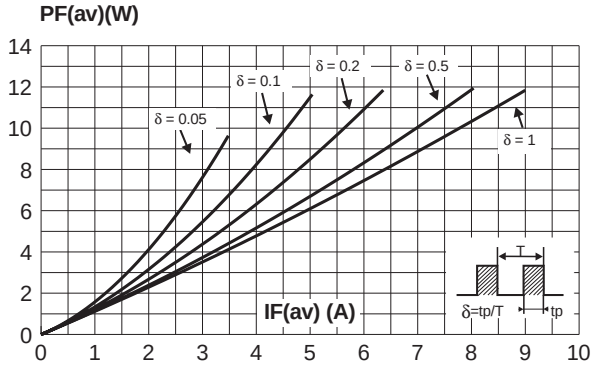



**Fig. 2:** Peak current versus form factor.

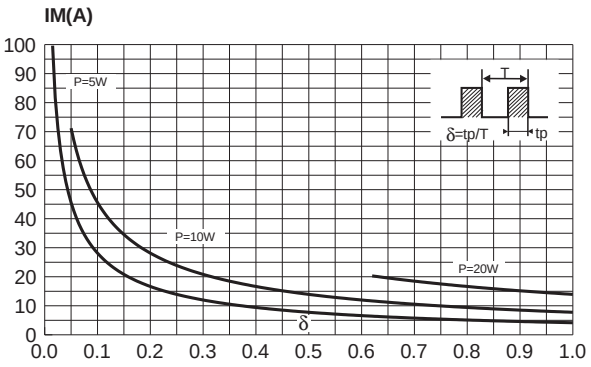



**Fig. 3:** Average forward current versus ambient temperature (δ=0.5).

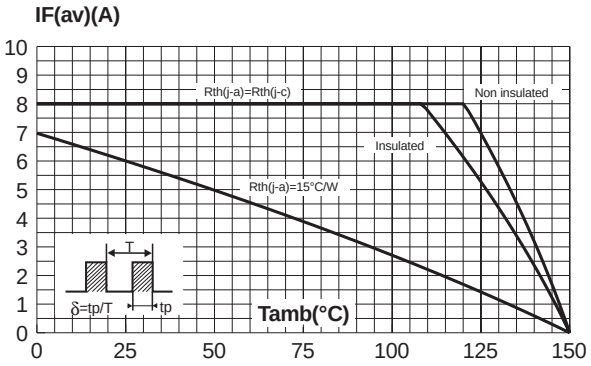



**Fig. 4-1:** Non repetitive surge peak forward current versus overload duration (TO-220AC).

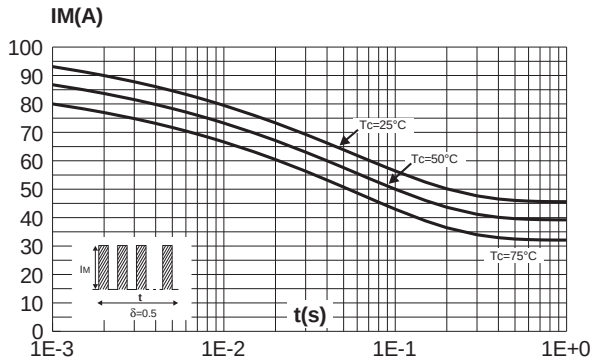



**Fig. 4-2:** Non repetitive surge peak forward current versus overload duration (insulated TO-220AC).

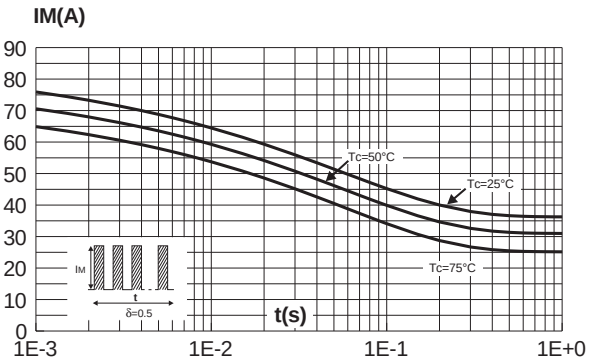


**Fig. 5:** Relative variation of thermal impedance junction to case versus pulse duration.

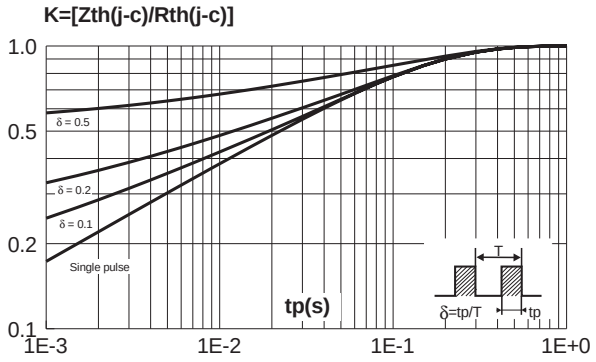



**Fig. 6:** Forward voltage drop versus forward current (maximum values, per diode)**.**

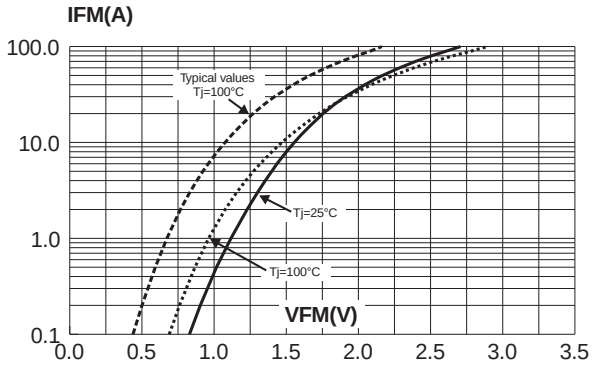



**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values, per diode).

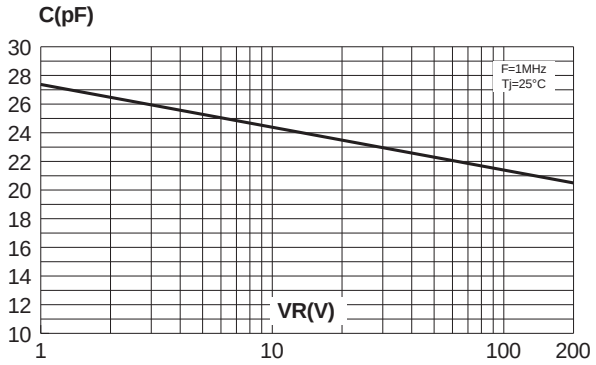



**Fig. 8:** Recovery charges versus $dI_F/dt$ (per diode).

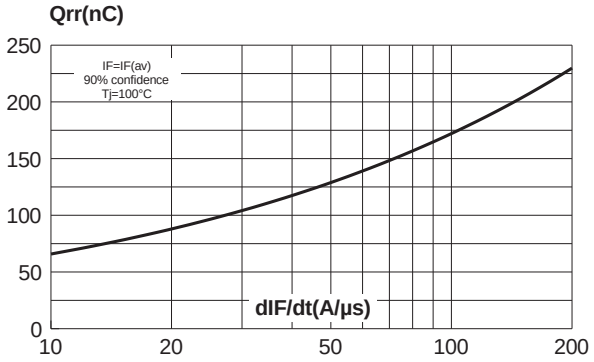



**Fig. 9:** Recovery current versus $dI_F/dt$ (per diode).

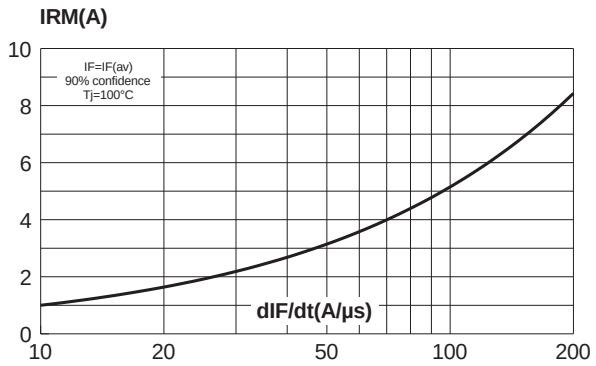



**Fig. 10:** Transient peak forward voltage versus $dI_F/dt$ (per diode)

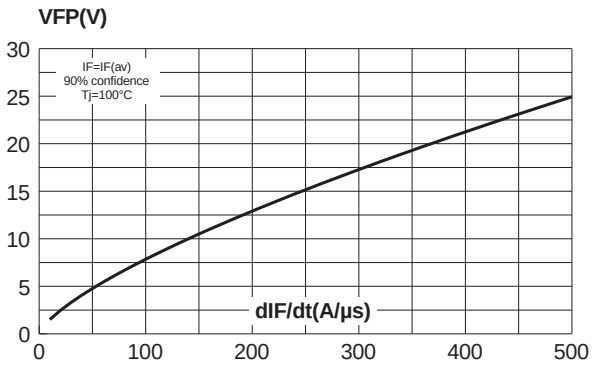


**Fig. 11:** Forward recovery time versus $dI_F/dt$ (per diode)

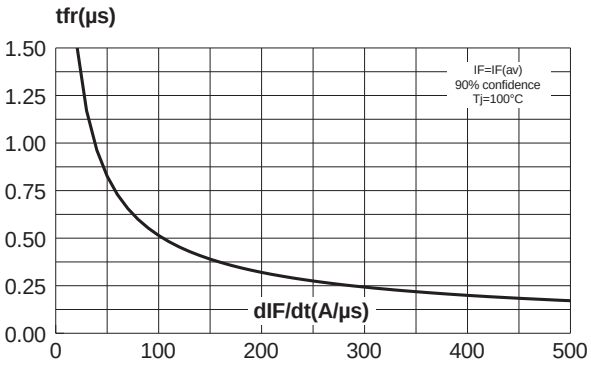



**Fig. 12:** Dynamic parameters versus junction temperature.

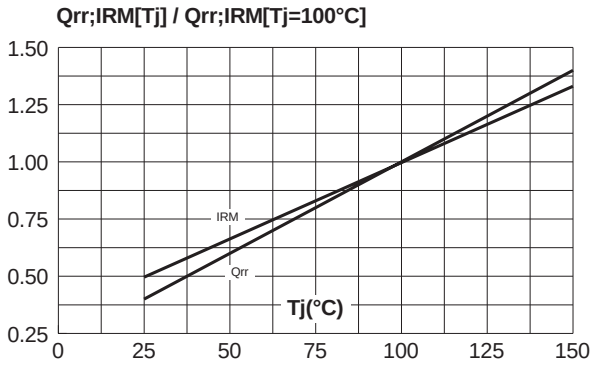



**Fig. 13:** Turn-off switching characteristics (without series inductance).

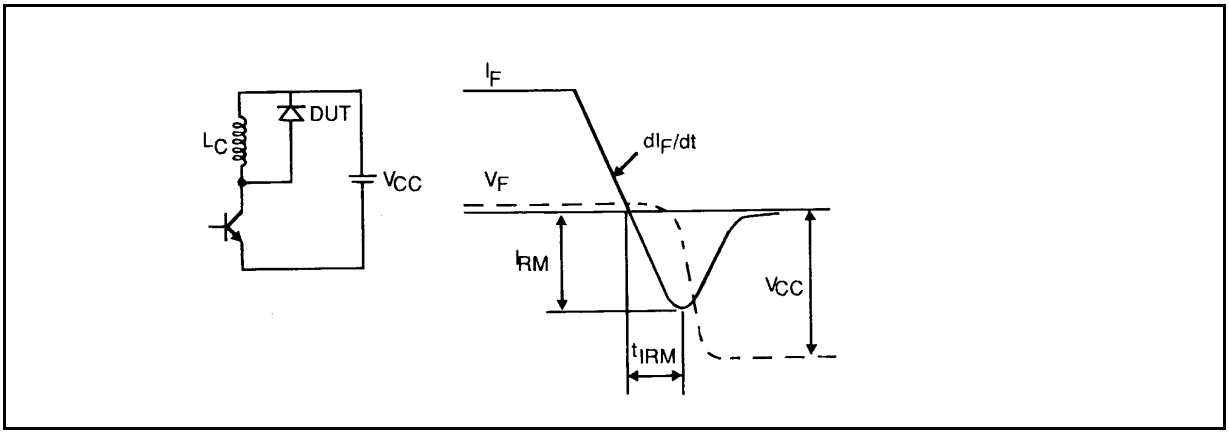
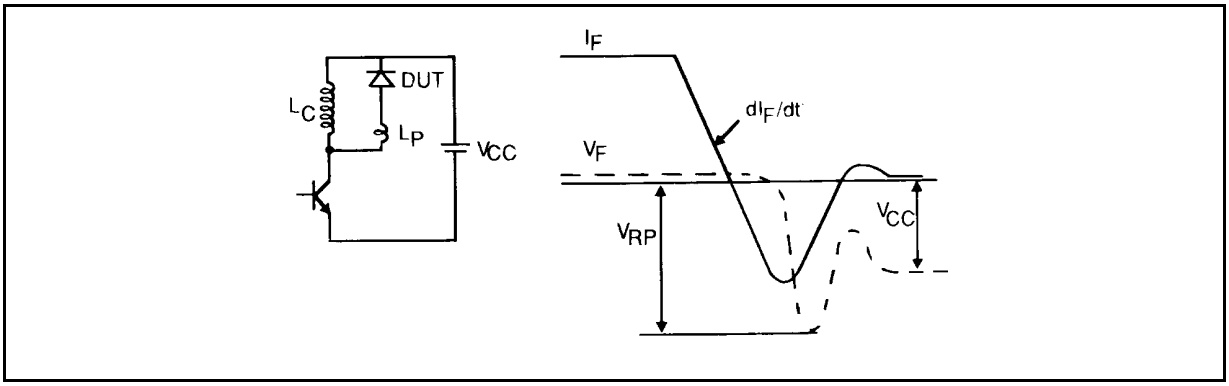
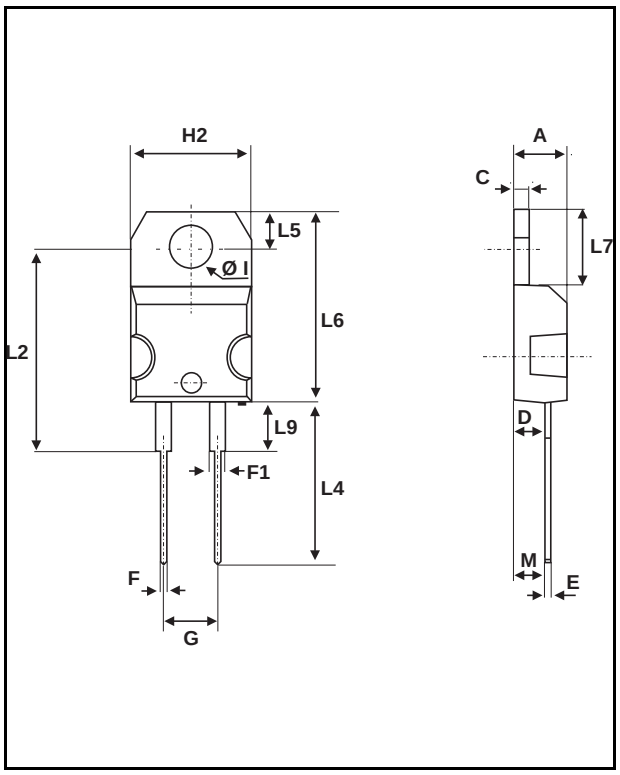



**Fig. 14:** Turn-off switching characteristics (with series inductance).



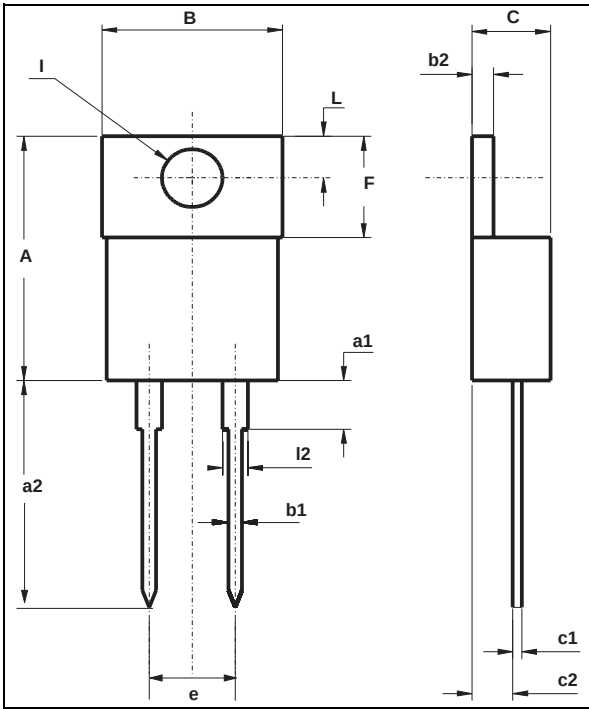
## PACKAGE MECHANICAL DATA

TO-220AC




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.40 | 4.60 | 0.173 | 0.181 |
| C | 1.23 | 1.32 | 0.048 | 0.051 |
| D | 2.40 | 2.72 | 0.094 | 0.107 |
| E | 0.49 | 0.70 | 0.019 | 0.027 |
| F | 0.61 | 0.88 | 0.024 | 0.034 |
| F1 | 1.14 | 1.70 | 0.044 | 0.066 |
| G | 4.95 | 5.15 | 0.194 | 0.202 |
| H2 | 10.00 | 10.40 | 0.393 | 0.409 |
| L2 | 16.40 typ. | | 0.645 typ. | |
| L4 | 13.00 | 14.00 | 0.511 | 0.551 |
| L5 | 2.65 | 2.95 | 0.104 | 0.116 |
| L6 | 15.25 | 15.75 | 0.600 | 0.620 |
| L7 | 6.20 | 6.60 | 0.244 | 0.259 |
| L9 | 3.50 | 3.93 | 0.137 | 0.154 |
| M | 2.6 typ. | | 0.102 typ. | |
| Diam. I | 3.75 | 3.85 | 0.147 | 0.151 |

**PACKAGE MECHANICAL DATA**
TO-220AC Insulated




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 14.23 | 15.87 | 0.560 | 0.625 |
| a1 | | 4.50 | | 0.177 |
| a2 | 12.70 | 14.70 | 0.500 | 0.579 |
| B | 10.20 | 10.45 | 0.402 | 0.411 |
| b1 | 0.64 | 0.96 | 0.025 | 0.038 |
| b2 | 1.15 | 1.39 | 0.045 | 0.055 |
| C | 4.48 | 4.82 | 0.176 | 0.190 |
| c1 | 0.35 | 0.65 | 0.020 | 0.026 |
| c2 | 2.10 | 2.70 | 0.083 | 0.106 |
| e | 4.58 | 5.58 | 0.180 | 0.220 |
| F | 5.85 | 6.85 | 0.230 | 0.270 |
| I | 3.55 | 4.00 | 0.140 | 0.157 |
| L | 2.54 | 3.00 | 0.100 | 0.118 |
| l2 | 1.45 | 1.75 | 0.057 | 0.069 |

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| BYT08P-400 | BYT08P-400 | TO-220AC | 1.86 g. | 50 | Tube |
| BYT08PI-400 | BYT08PI-400 | Insulated TO-220AC | 1.86 g. | 50 | Tube |

- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1.0 N.m.
- Epoxy meets UL94,V0

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