



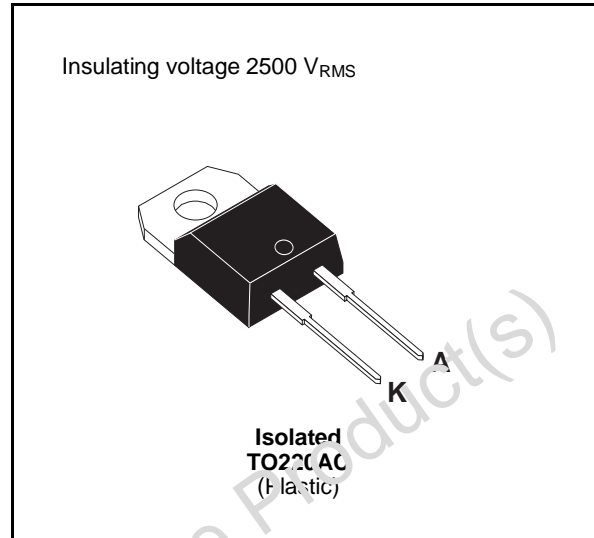
# BYT 12PI-1000

## 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

### SUITABLE APPLICATIONS

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



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V <sub>RRM</sub>	Repetitive Peak Reverse Voltage	1000	V
V <sub>RSM</sub>	Non Repetitive Peak Reverse Voltage	1000	V
I <sub>FRM</sub>	Repetitive Peak Forward Current	t <sub>p</sub> ≤ 10μs	A
I <sub>F (RMS)</sub>	RMS Forward Current	25	A
I <sub>F (AV)</sub>	Average Forward Current	T <sub>c</sub> = 50°C δ = 0.5	A
I <sub>FSM</sub>	Surge (non-Repetitive) Forward Current	t <sub>p</sub> = 10ms Sinusoidal	A
P	Power Dissipation	T <sub>c</sub> = 50°C	W
T <sub>stg</sub> T <sub>j</sub>	Storage and Junction Temperature Range	- 40 to + 150 - 40 to + 150	°C

### THERMAL RESISTANCE

Symbol	Test Conditions	Value	Unit
R <sub>th (j - c)</sub>	Junction-case	4	°C/W

**ELECTRICAL CHARACTERISTICS**

STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$I_R$	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			50	$\mu\text{A}$
	$T_j = 100^\circ\text{C}$				2.5	$\text{mA}$
$V_F$	$T_j = 25^\circ\text{C}$	$I_F = 12\text{A}$			1.9	$\text{V}$
	$T_j = 100^\circ\text{C}$				1.8	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
$t_{rr}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$	$di_F/dt = -15\text{A}/\mu\text{s}$			155	$\text{ns}$
		$I_F = 0.5\text{A}$	$I_R = 1\text{A}$			$I_{rr} = 0.25\text{A}$	

TURN-OFF SWITCHING CHARACTERISTICS (Without Series Inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$t_{IRM}$	$di_F/dt = -50\text{A}/\mu\text{s}$	$V_{CC} = 200\text{V}$ $I_F = 12\text{A}$ $L_p \leq 0.05\mu\text{H}$ $T_j = 100^\circ\text{C}$ See figure 11			200	$\text{ns}$
	$di_F/dt = -100\text{A}/\mu\text{s}$			120		
$I_{RM}$	$di_F/dt = -50\text{A}/\mu\text{s}$				7.8	$\text{A}$
	$di_F/dt = -100\text{A}/\mu\text{s}$			9		

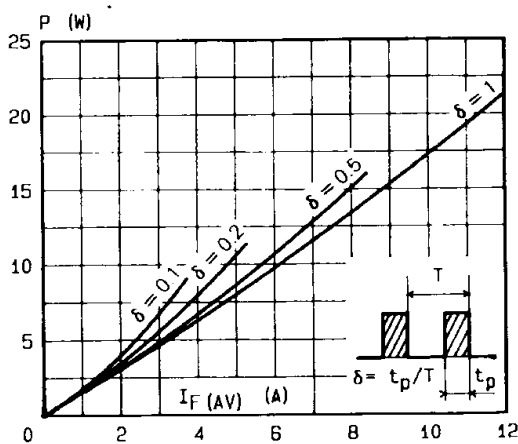
TURN-OFF OVERVOLTAGE COEFFICIENT (With Series Inductance)

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	$T_j = 100^\circ\text{C}$	$V_{CC} = 200\text{V}$	$I_F = I_{F(AV)}$			4.5	
	$di_F/dt = -12\text{A}/\mu\text{s}$	$L_p = 12\mu\text{H}$	See figure 12				

To evaluate the conduction losses use the following equations:

$$V_F = 1.47 + 0.026 I_F \quad P = 1.47 \times I_{F(AV)} + 0.026 I_{F(RMS)}^2$$

**Figure 1. Low frequency power losses versus average current**



**Figure 2. Peak current versus form factor**

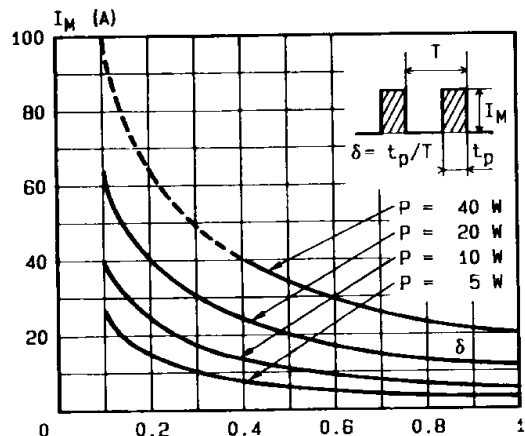


Figure 3. Non repetitive peak surge current versus overload duration

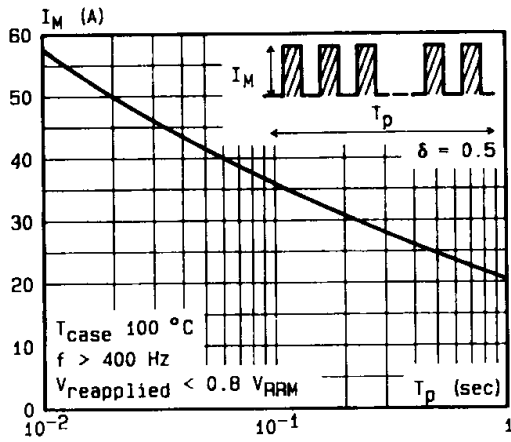


Figure 4. Thermal impedance versus pulse width

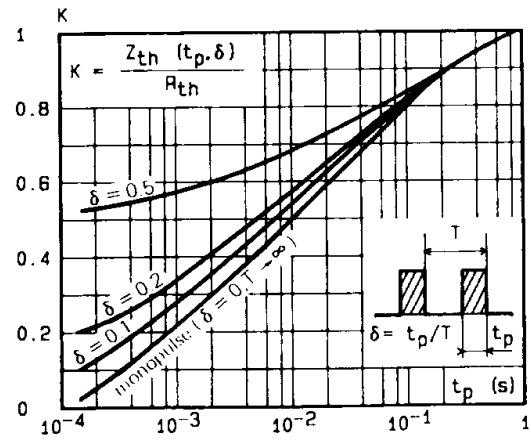


Figure 5. Voltage drop versus forward current

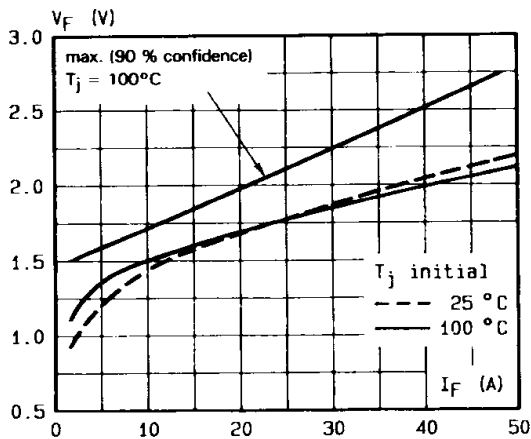


Figure 6. Recovery charge versus di\_F/dt.

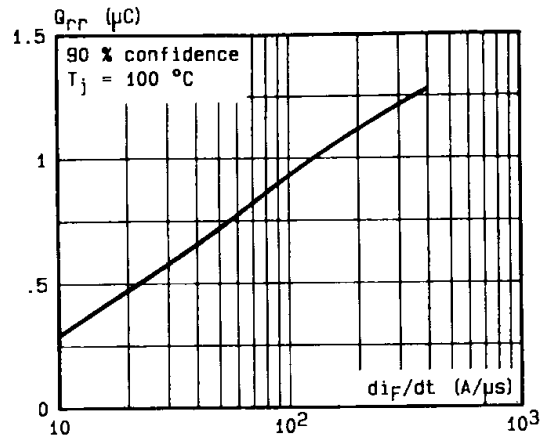


Figure 7. Recovery time versus di\_F/dt.

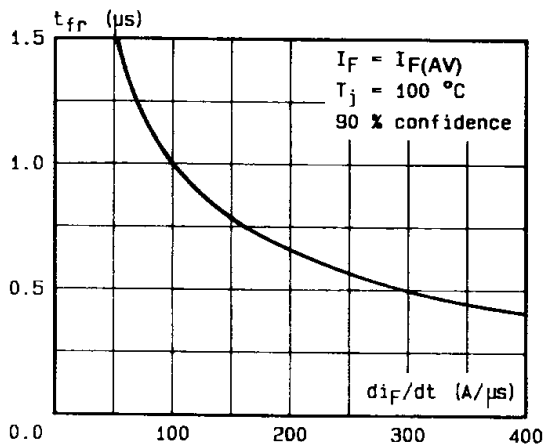


Figure 8. Peak reverse current versus di\_F/dt.

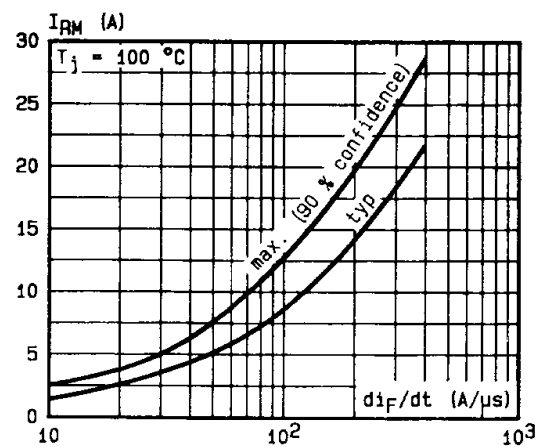


Figure 9. Peak forward voltage versus  $di_F/dt$ .

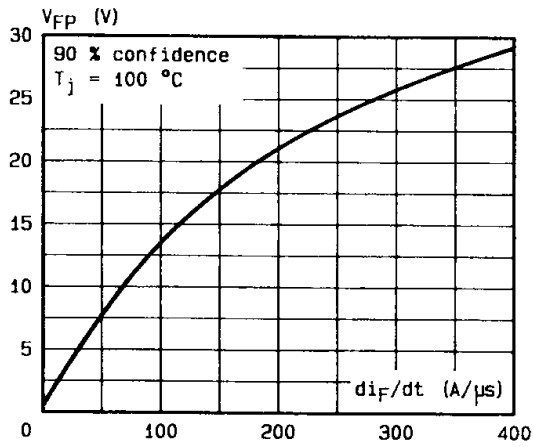


Figure 11. Turn-off switching characteristics (without series inductance).

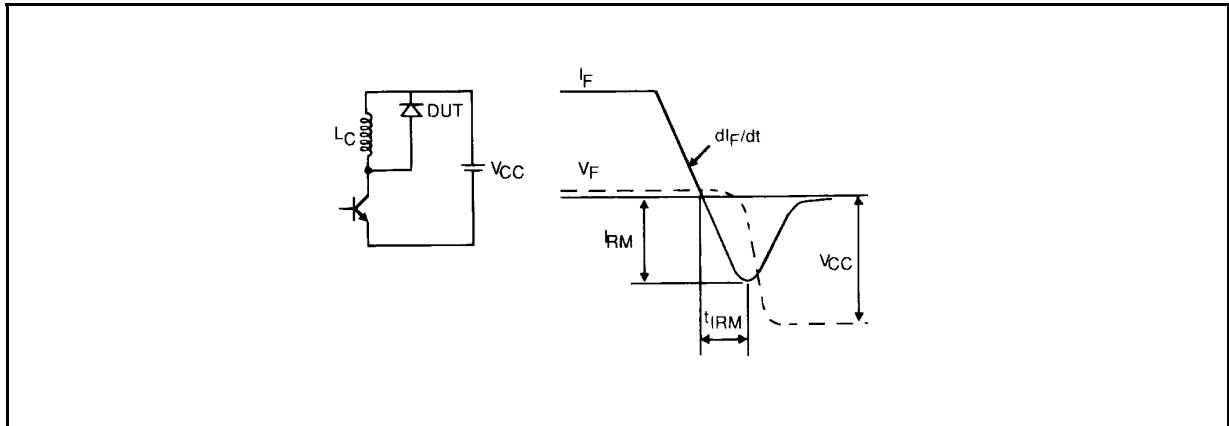
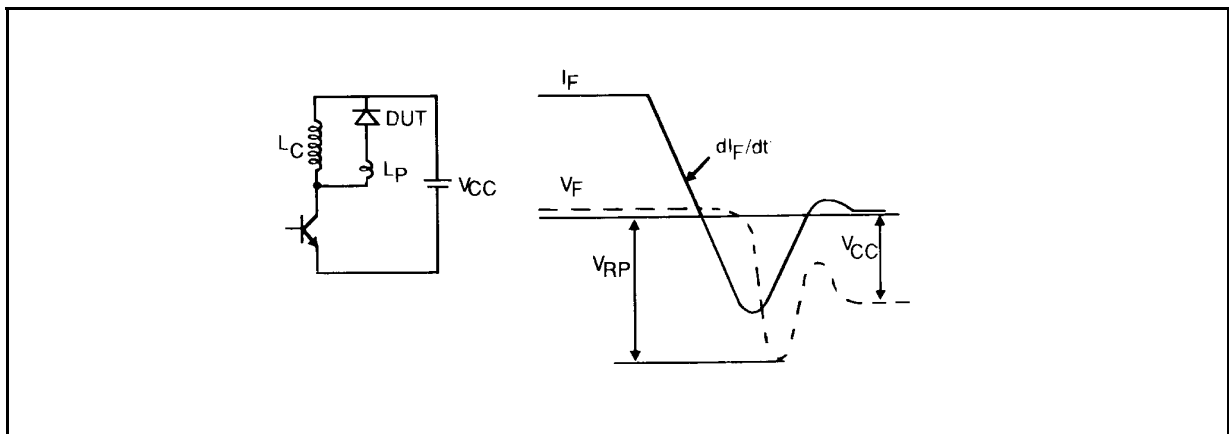
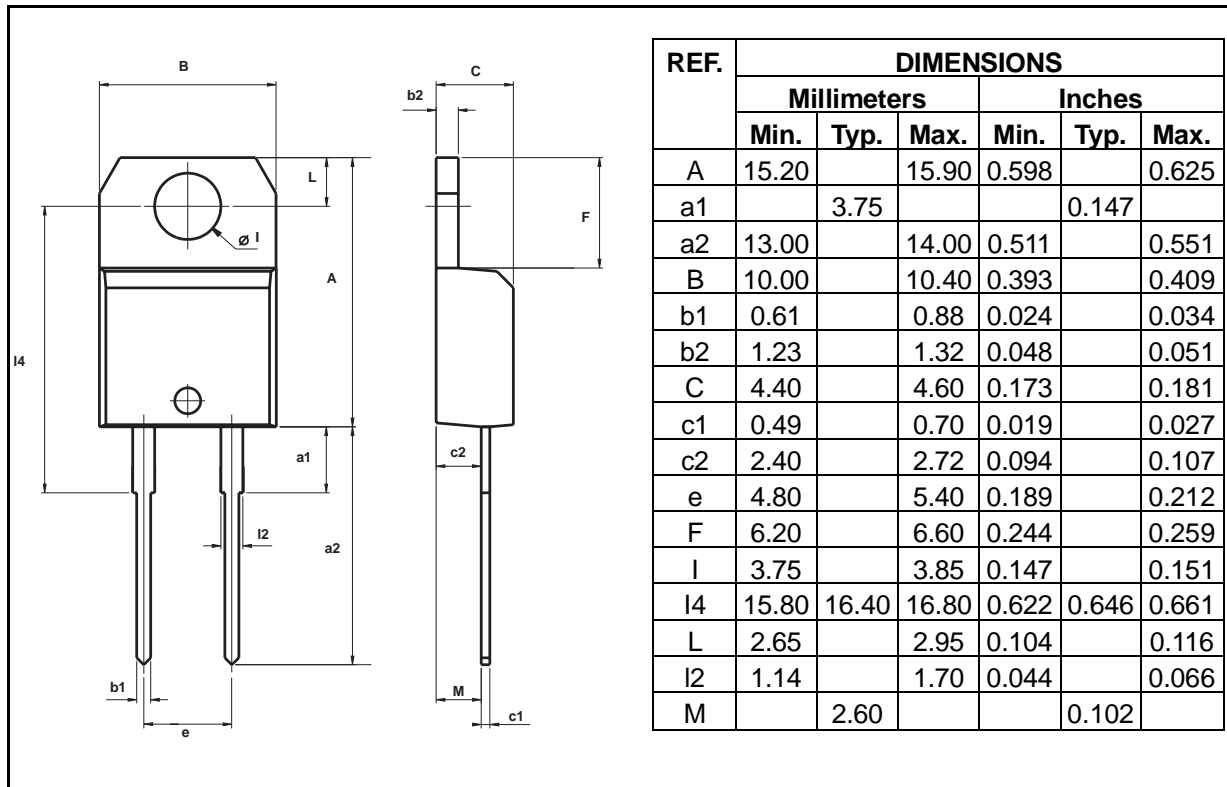


Figure 12. Turn-off switching characteristics (with series inductance)



**PACKAGE MECHANICAL DATA :**  
Isolated TO220AC Plastic



- **Marking:** type number
- **Cooling method:** by conduction (method C)
- **Weight :** 1.86g
- **Recommended torque value :** 80cm. N
- **Maximum torque value :** 100cm. N

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