



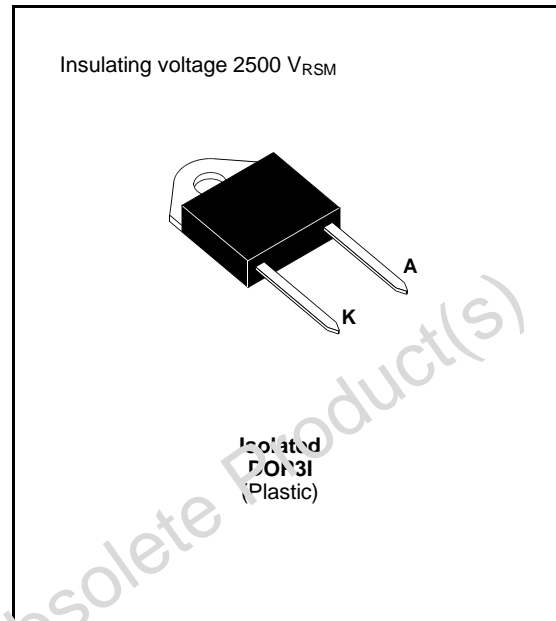
# BYT 30PI-1000

## 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 15pF

### 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	$t_p \leq 10\mu s$	A
$I_F (RMS)$	RMS Forward Current	70	A
$I_F (AV)$	Average Forward Current	$T_c = 50^\circ C$ $\delta = 0.5$	A
$I_{FSM}$	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	A
P	Power Dissipation	$T_c = 50^\circ C$	W
$T_{stg}$ $T_j$	Storage and Junction Temperature Range	- 40 to +150	$^\circ C$

### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-case	1.6	$^\circ C/W$

# BYT 30PI-1000

## ELECTRICAL CHARACTERISTICS

### STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$I_R$	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			100	$\mu\text{A}$
	$T_j = 100^\circ\text{C}$				5	$\text{mA}$
$V_F$	$T_j = 25^\circ\text{C}$	$I_F = 30\text{A}$			1.9	$\text{V}$
	$T_j = 100^\circ\text{C}$				1.8	

### RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
$t_{rr}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$	$di_F/dt = -15\text{A}/\mu\text{s}$	$V_R = 30\text{V}$		165	$\text{ns}$
		$I_F = 0.5\text{A}$	$I_R = 1\text{A}$	$I_{rr} = 0.25\text{A}$		70	

### TURN-OFF SWITCHING CHARACTERISTICS (Without Series Inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$t_{IRM}$	$di_F/dt = -120\text{A}/\mu\text{s}$	$V_{CC} = 200\text{V}$ $I_F = 30\text{A}$ $L_p \leq 0.05\mu\text{H}$ $T_j = 100^\circ\text{C}$ See figure 11			200	$\text{ns}$
	$di_F/dt = -240\text{A}/\mu\text{s}$			120		
$I_{RM}$	$di_F/dt = -120\text{A}/\mu\text{s}$				19.5	$\text{A}$
	$di_F/dt = -240\text{A}/\mu\text{s}$			22		

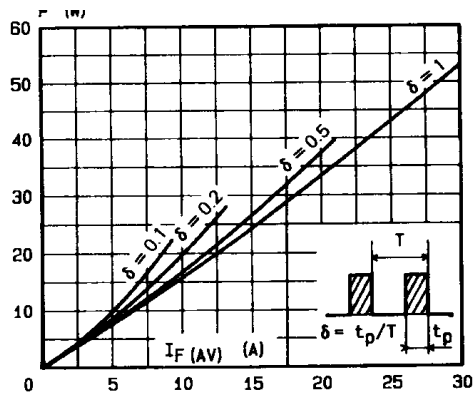
### TURN-OFF OVERVOLTAGE COEFFICIENT (With Series Inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	$T_j = 100^\circ\text{C}$ $di_F/dt = -30\text{A}/\mu\text{s}$	$V_{CC} = 200\text{V}$ $I_F = I_{F(AV)}$ $L_p = 5\mu\text{H}$ See figure 12			4.5	

To evaluate the conduction losses use the following equations:

$$V_F = 1.47 + 0.010 I_F \quad P = 1.47 \times I_{F(AV)} + 0.010 I_{F(RMS)}^2$$

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



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

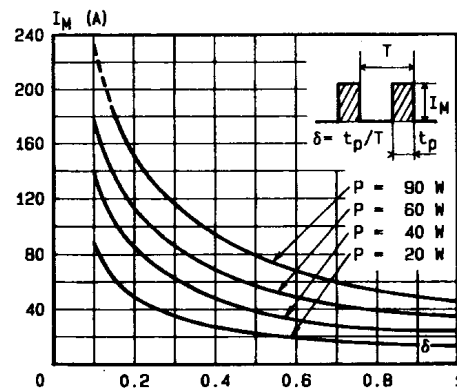


Figure 3. Non repetitive peak surge current versus overload duration

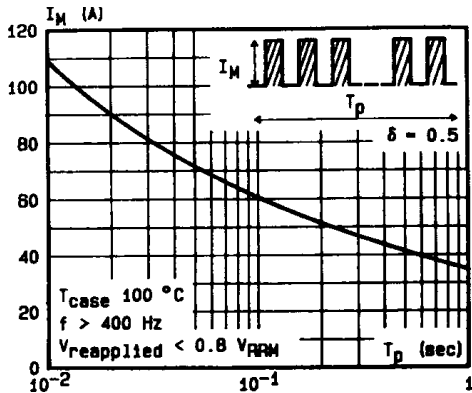


Figure 4. Thermal impedance versus pulse width

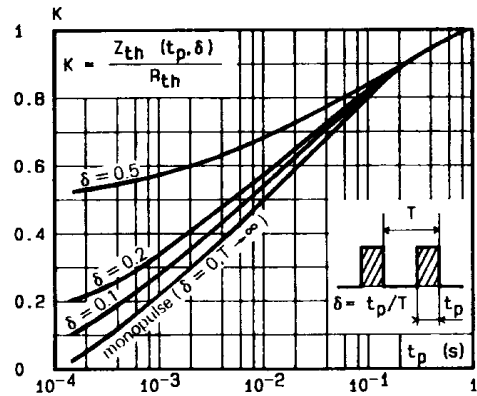


Figure 5. Voltage drop versus forward current

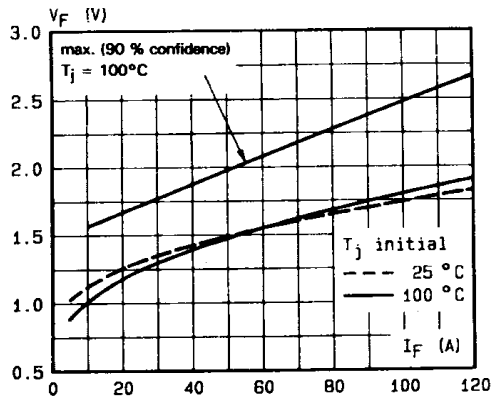


Figure 6. Recovery charge versus di\_F/dt

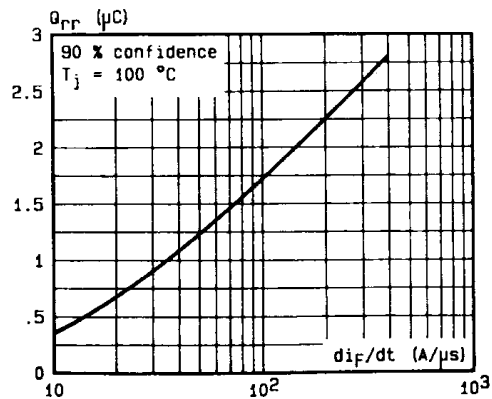


Figure 7. Recovery time versus di\_F/dt

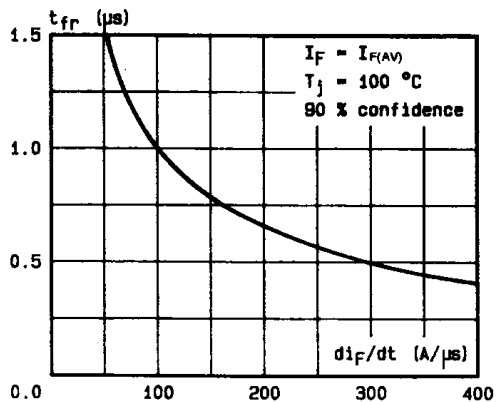


Figure 8. Peak reverse current versus di\_F/dt

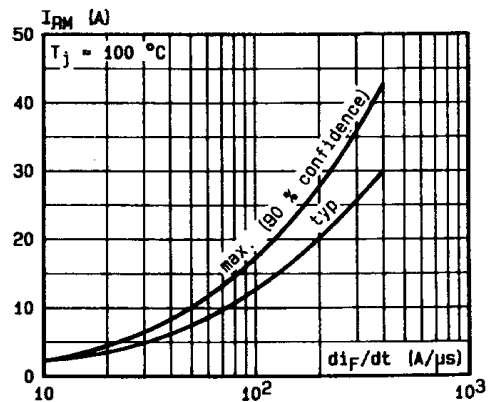


Figure 9. Peak forward voltage versus  $di_F/dt$ .

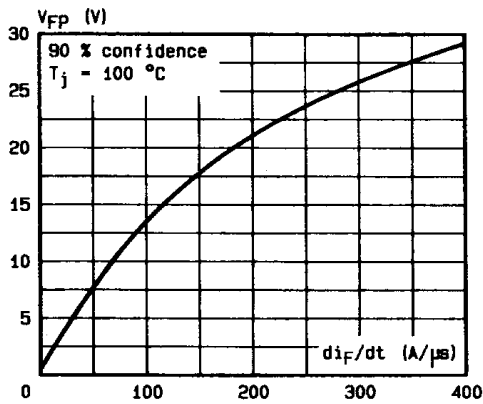


Figure 10. Dynamic parameters versus junction temperature.

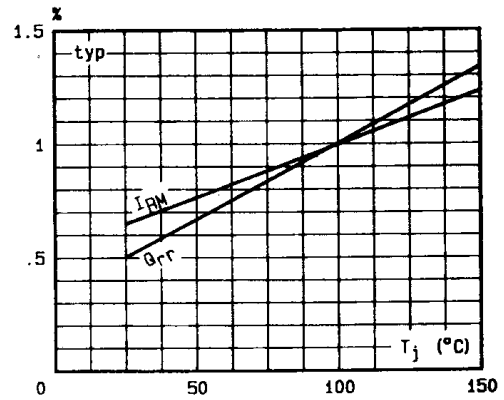


Figure 11. Turn-off switching characteristics (without series inductance).

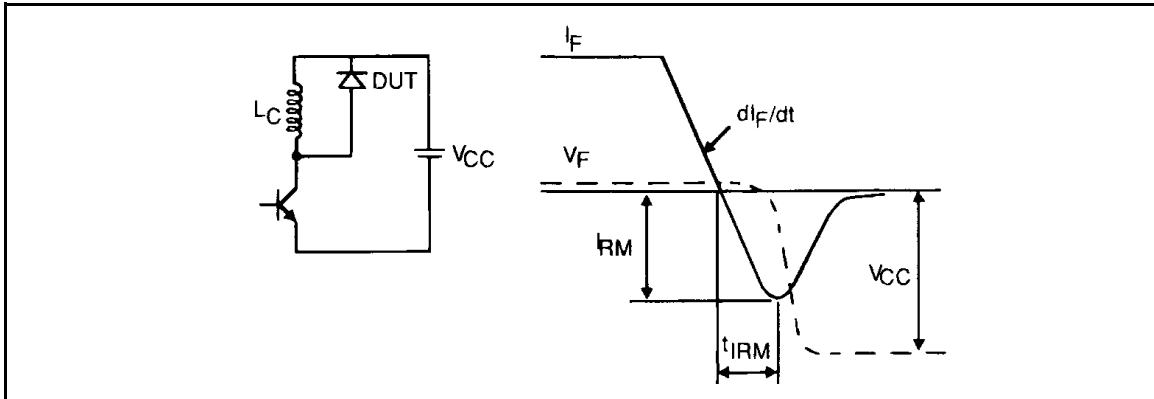
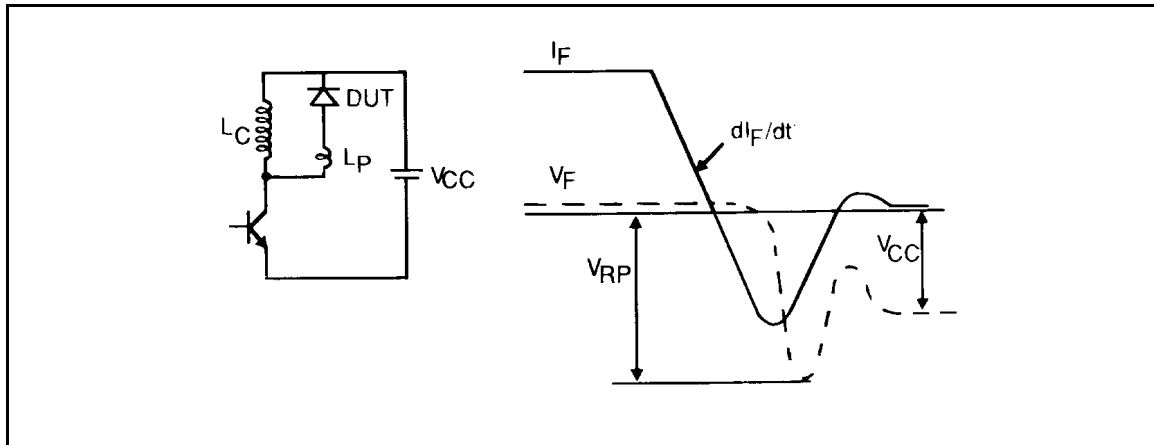
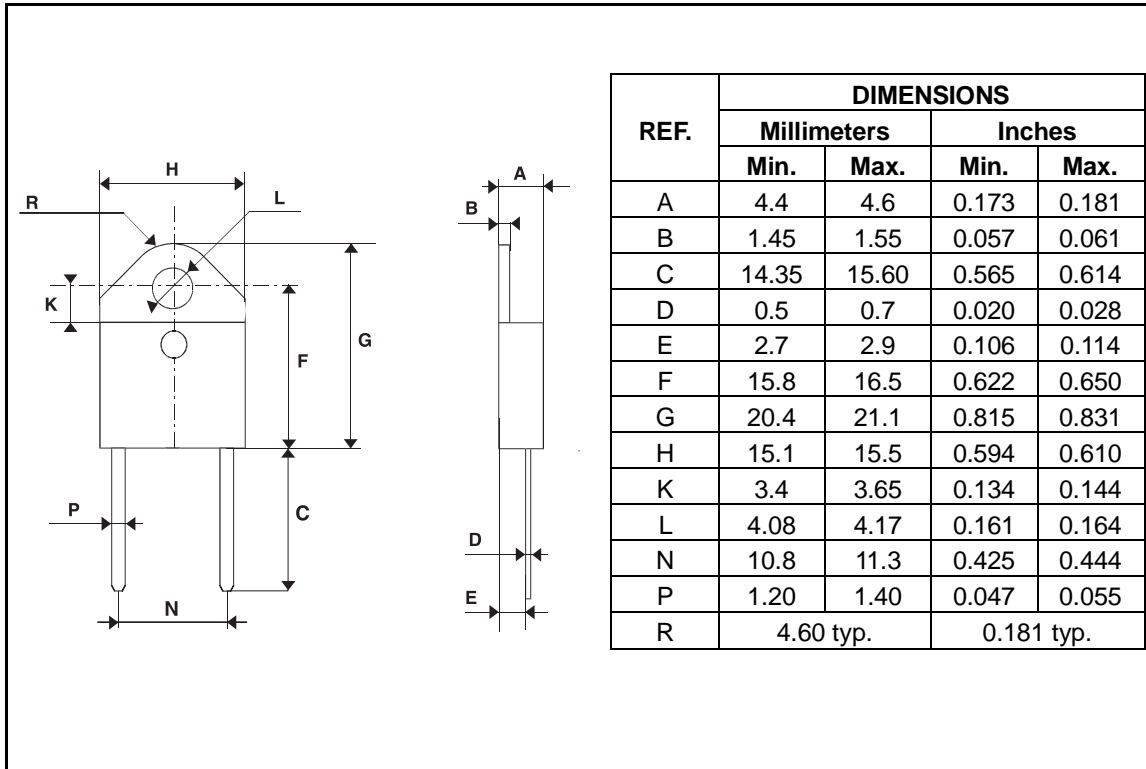


Figure 12. Turn-off switching characteristics (with series inductance)



PACKAGE MECHANICAL DATA : Isolated DOP3I Plastic



Cooling method: by conduction (method C)  
 Marking: type number  
 Weight: 18.84g  
 Recommended torque value: 250cm. N  
 Maximum torque value: 310cm. N

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