

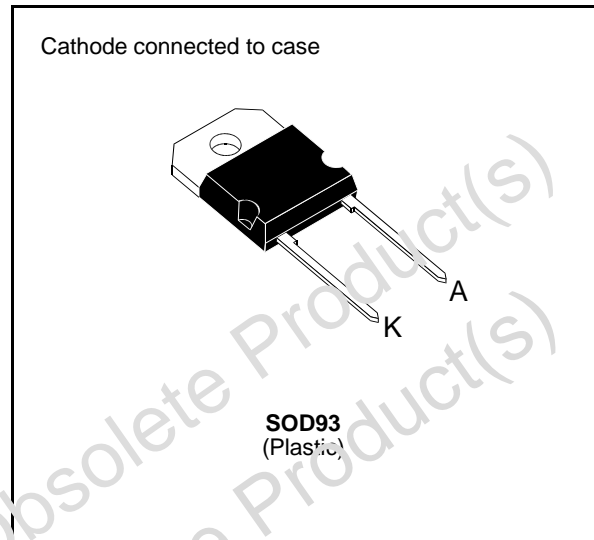


# THE DATASHEET OF BYT30P-400



## FAST RECOVERY RECTIFIER DIODES

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING



### SUITABLE APPLICATIONS

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

### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter	Value	Unit
$I_{FRM}$	Repetitive Peak Forward Current $t_p \leq 10\mu s$	500	A
$I_F (RMS)$	RMS Forward Current	50	A
$I_F (AV)$	Average Forward Current $T_c = 100^\circ C$ $\delta = 0.5$	30	A
$I_{FSM}$	Surge non Repetitive Forward Current $t_p = 10ms$ Sinusoidal	350	A
$P$	Power Dissipation $T_c = 100^\circ C$	50	W
$T_{stg}$ $T_j$	Storage and Junction Temperature Range	- 40 to + 150 - 40 to + 150	$^\circ C$

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage	400	V
$V_{RSM}$	Non Repetitive Peak Reverse Voltage	440	V

### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-case	1	$^\circ C/W$

**ELECTRICAL CHARACTERISTICS**

STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub>	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			35	μA
	T <sub>j</sub> = 100°C				6	mA
V <sub>F</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 30A			1.5	V
	T <sub>j</sub> = 100°C				1.4	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
t <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A	di <sub>F</sub> /dt = - 15A/μs	V <sub>R</sub> = 30V		100	ns
		I <sub>F</sub> = 0.5A	I <sub>R</sub> = 1A		I <sub>rr</sub> = 0.25A		

TURN-OFF SWITCHING CHARACTERISTICS (Without Series Inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>IRM</sub>	di <sub>F</sub> /dt = - 120A/μs	V <sub>CC</sub> = 200 V I <sub>F</sub> = 30A L <sub>p</sub> ≤ 0.05μH T <sub>j</sub> = 100°C See figure 11			75	ns
	di <sub>F</sub> /dt = - 240A/μs			50		
I <sub>RM</sub>	di <sub>F</sub> /dt = - 120A/μs				9	A
	di <sub>F</sub> /dt = - 240A/μs			12		

TURN-OFF OVERVOLTAGE COEFFICIENT (With Series Inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	T <sub>j</sub> = 100°C	V <sub>CC</sub> = 60V I <sub>F</sub> = I <sub>F(AV)</sub> di <sub>F</sub> /dt = - 30A/μs L <sub>p</sub> = 1μH See figure 12		3.3		

To evaluate the conduction losses use the following equations:

$$V_F = 1.1 + 0.0025 I_F \quad P = 1.1 \times I_{F(AV)} + 0.0095 I_{F(RMS)}^2$$

Figure 1. Low frequency power losses versus average current

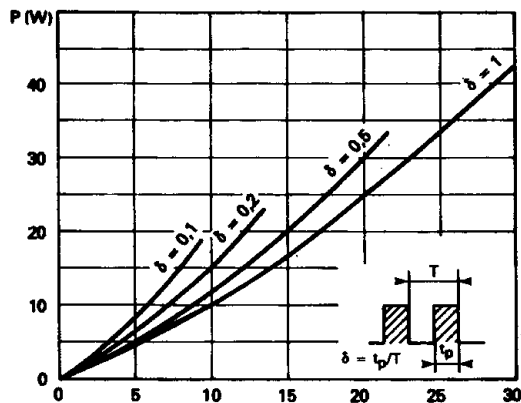


Figure 2. Peak current versus form factor

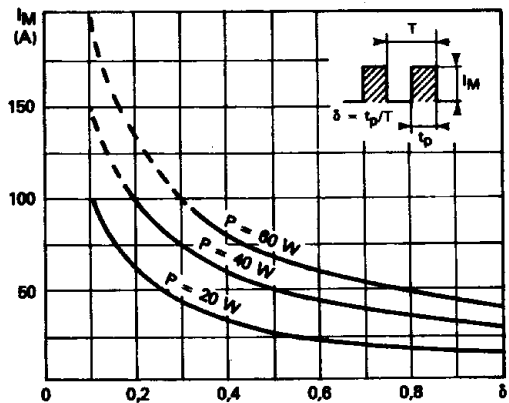


Figure 3. Non repetitive peak surge current versus overload duration

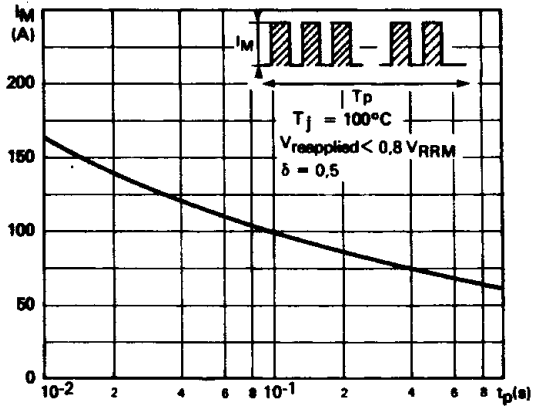


Figure 4. Thermal impedance versus pulse width

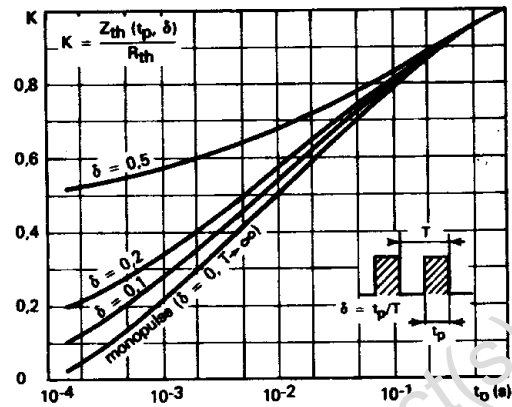


Figure 5. Voltage drop versus forward current

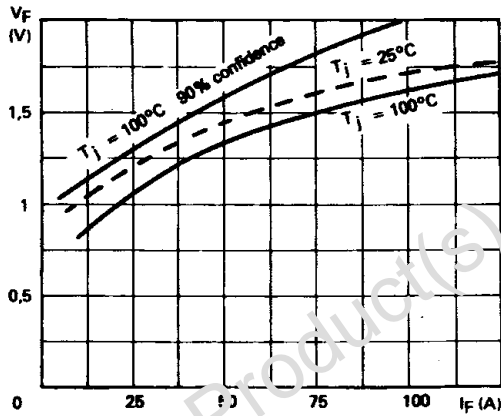


Figure 6. Recovery charge versus di\_F/dt

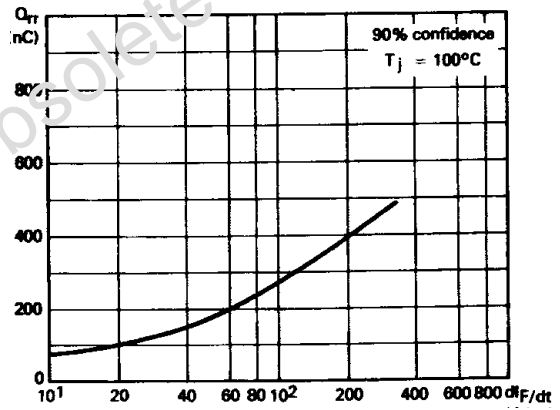


Figure 7. Recovery time versus di\_F/dt

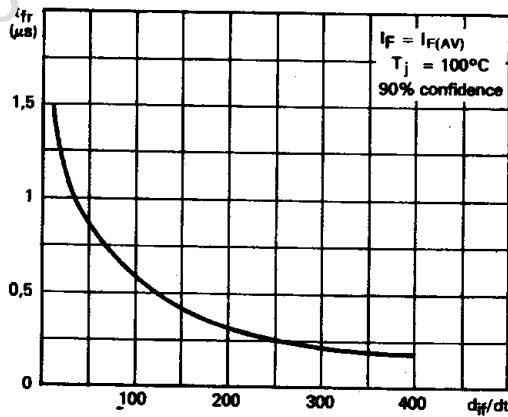


Figure 8. Peak reverse current versus di\_F/dt

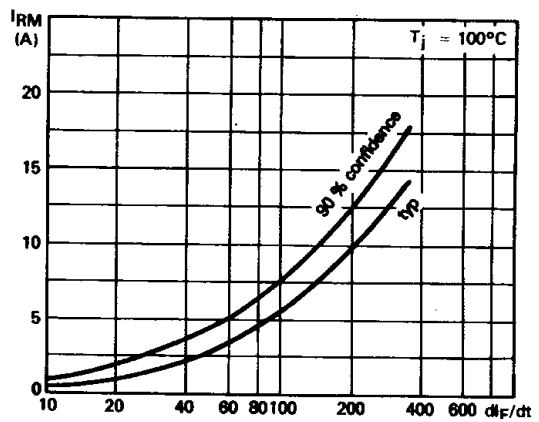


Figure 9. Peak forward voltage versus  $di_F/dt$ .

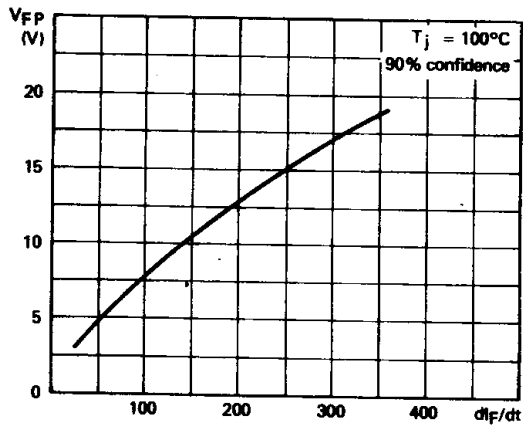


Figure 10. Dynamic parameters versus junction temperature.

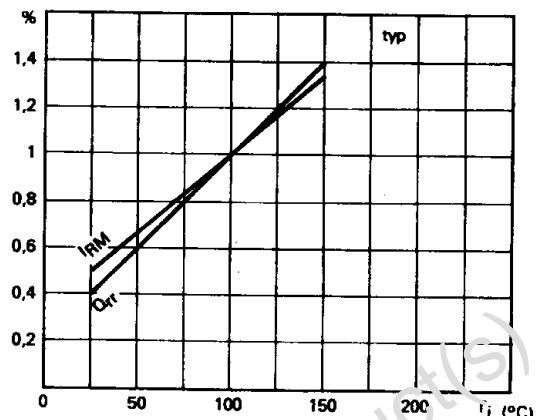


Figure 11. Turn-off switching characteristics (without series inductance).

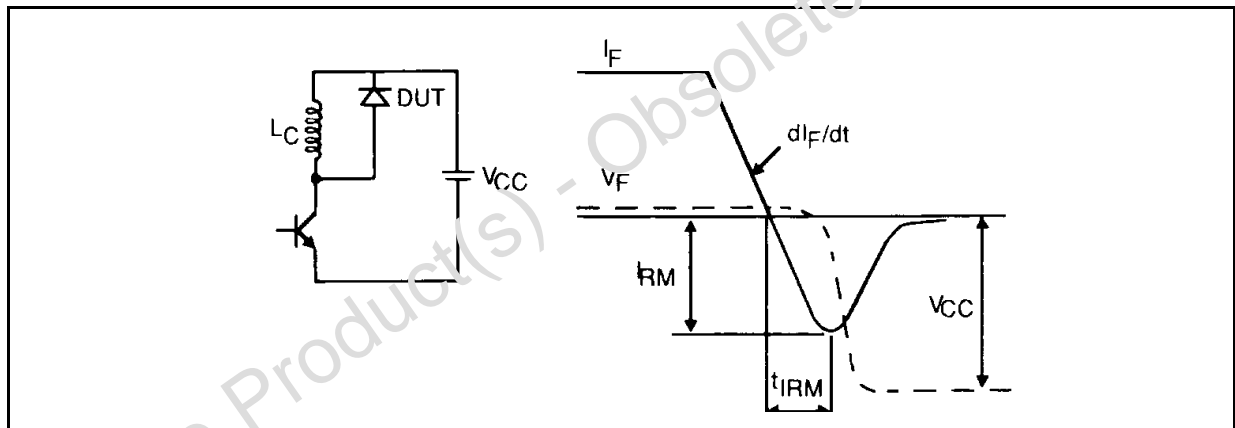
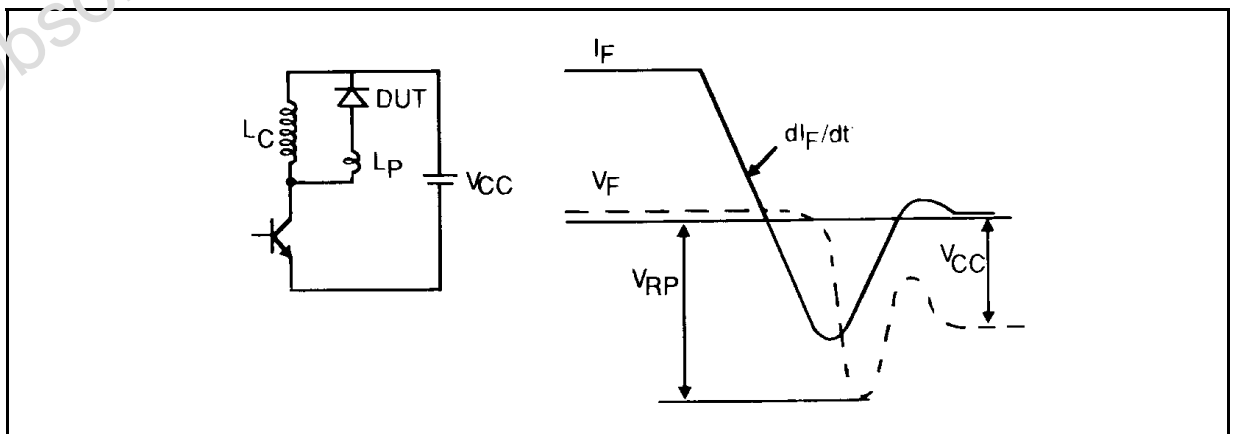
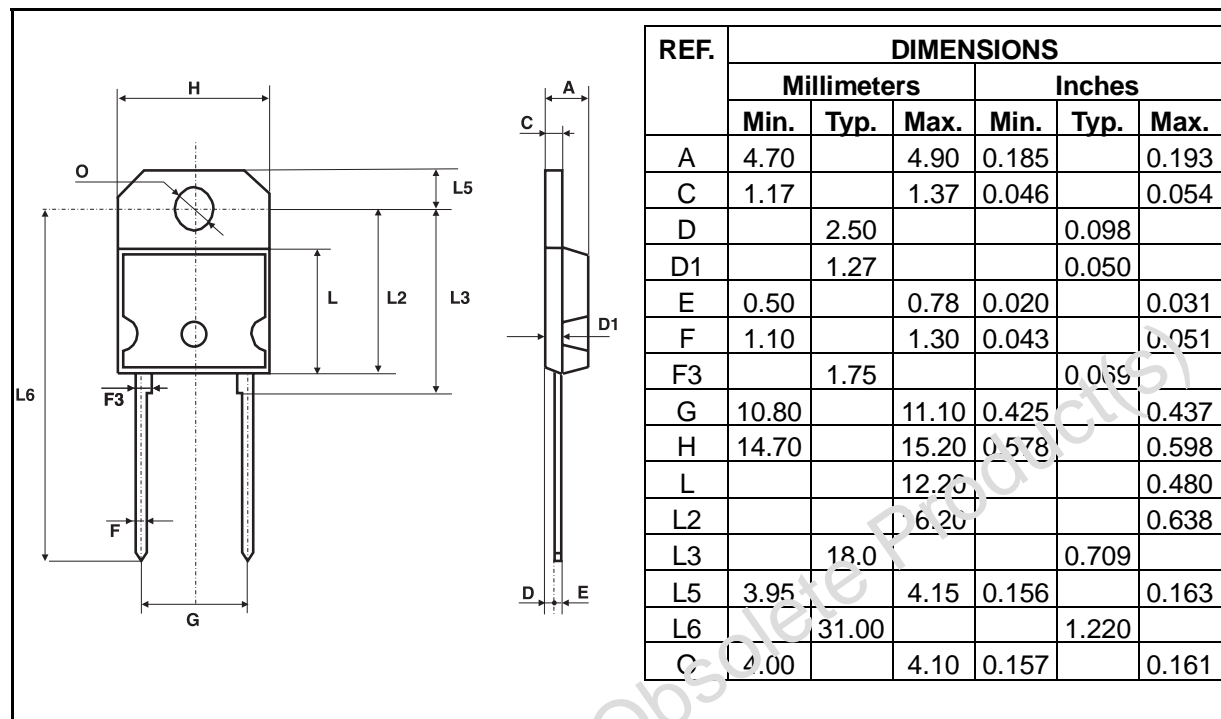


Figure 12. Turn-off switching characteristics (with series inductance)



**PACKAGE MECHANICAL DATA :**  
SOD93 Plastic



- **Marking:** type number
- **Cooling method:** by conduction (method C)
- **Weight:** 3.79g
- **Recommended torque value:** 80cm. N
- **Maximum torque value:** 100cm. N

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