



# BYT16P-400

## FAST RECOVERY RECTIFIER DIODES

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	16 A
$V_{RRM}$	400 V
$V_F(\max)$	1.4 V
$t_{rr}(\max)$	35 ns

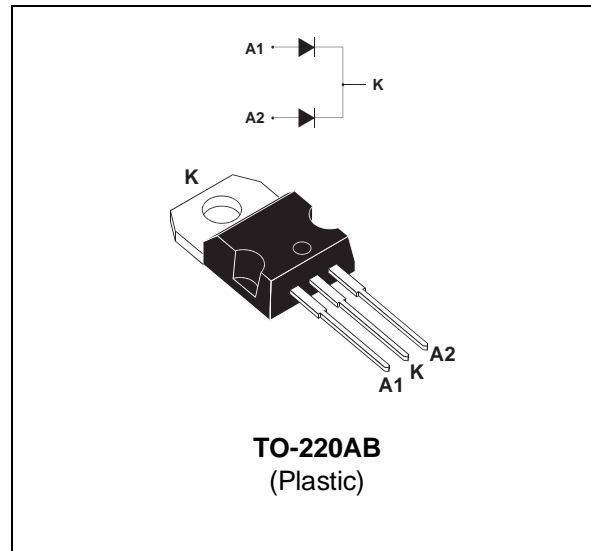
### FEATURES AND BENEFITS

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

### DESCRIPTION

This double 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, per diode)

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	400	V
$I_{FRM}$	Repetitive peak forward current	$t_p=5\ \mu s$ $F=1kHz$	A
$I_{F(RMS)}$	RMS forward current	30	A
$I_{F(AV)}$	Average forward current	$T_c = 100^\circ C$ $\delta = 0.5$	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\ ms$ Sinusoidal	A
$T_{stg}$	Storage temperature range	- 40 to + 150	$^\circ C$
$T_j$	Maximum operating junction temperature	150	$^\circ C$

## BYT16P-400

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	3.75	°C/W
		Total	2	
R <sub>th(c)</sub>		Coupling	0.25	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_{j(\text{diode } 1)} = P(\text{diode } 1) \times R_{th(j-c)} (\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$$

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 8 A			1.5	V
		T <sub>j</sub> = 100°C				1.4	
I <sub>R</sub> **	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			15	μA
		T <sub>j</sub> = 100°C				2.5	mA

Pulse test : \* t<sub>p</sub> = 380 μs, δ < 2%

\*\* t<sub>p</sub> = 5 ms, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 1.1 \times I_{F(AV)} + 0.024 I_{F(RMS)}^2$$

### RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A V <sub>R</sub> = 30V dI <sub>F</sub> /dt = - 15A/μs			75	ns
		I <sub>F</sub> = 0.5A I <sub>R</sub> = 1A I <sub>rr</sub> = 0.25A			35	

### TURN-OFF SWITCHING CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>IRM</sub>	Maximum reverse recovery time	dI <sub>F</sub> /dt = - 32 A/μs	V <sub>CC</sub> = 200 V			75	ns
		dI <sub>F</sub> /dt = - 64 A/μs		I <sub>F</sub> = 8 A		50	
I <sub>RM</sub>	Maximum reverse recovery current	dI <sub>F</sub> /dt = - 32 A/μs	L <sub>p</sub> ≤ 0.05 μH			2.2	A
		dI <sub>F</sub> /dt = - 64 A/μs		T <sub>j</sub> = 100°C		2.8	
C = $\frac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	T <sub>j</sub> = 100°C	V <sub>CC</sub> = 120V	I <sub>F</sub> = I <sub>F(AV)</sub>		3.3	/
		dI <sub>F</sub> /dt = - 8A/μs	L <sub>p</sub> = 9μH	(see fig. 12)			

Fig. 1: Low frequency power losses versus average current.

Fig. 2: Peak current versus form factor.

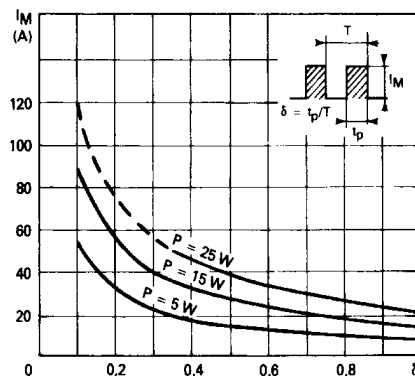
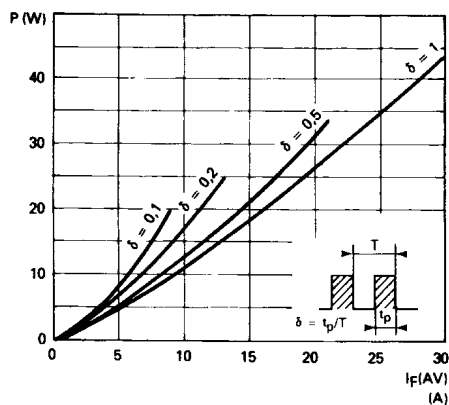


Fig. 3: Non repetitive peak surge current versus overload duration.

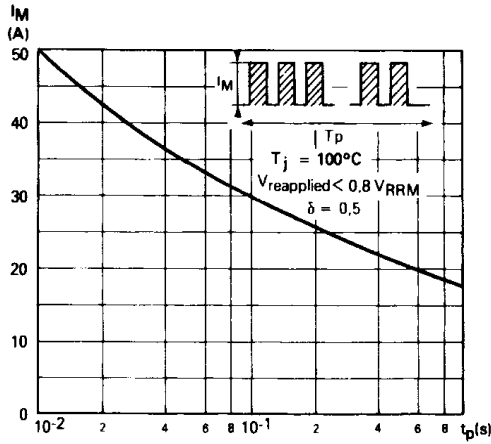


Fig. 4: Thermal impedance versus pulse width.

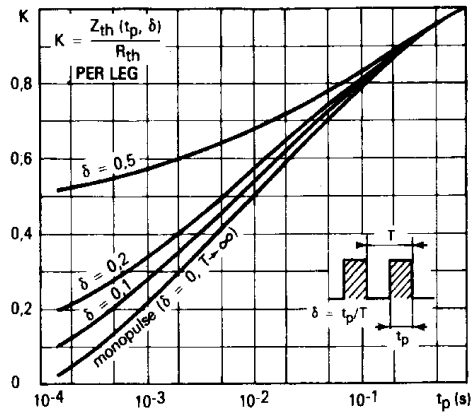


Fig. 5: Voltage drop versus forward current.

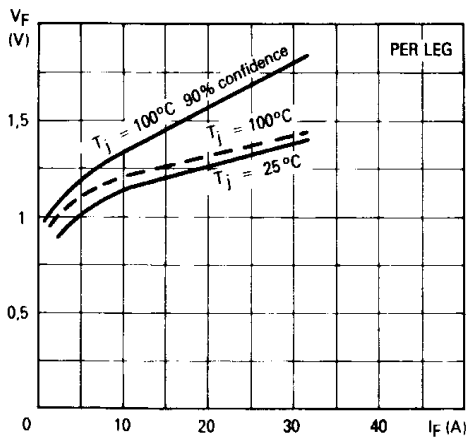


Fig. 6: Recovery charge versus di\_F/dt.

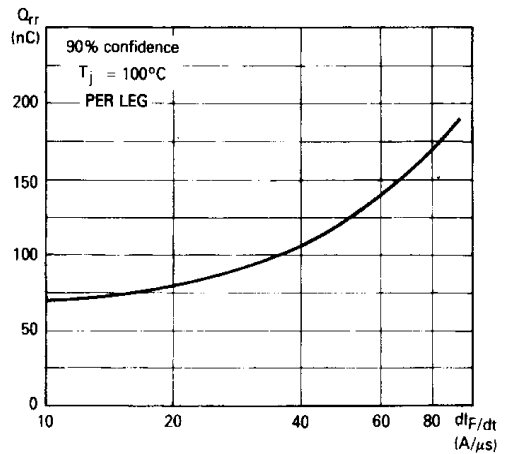


Fig. 7: Recovery time versus di\_F/dt.

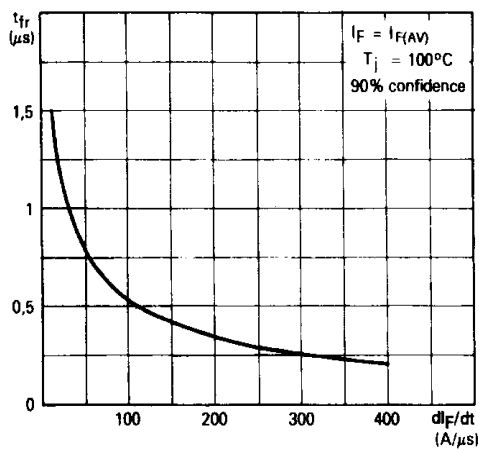


Fig. 8: Peak reverse current versus di\_F/dt.

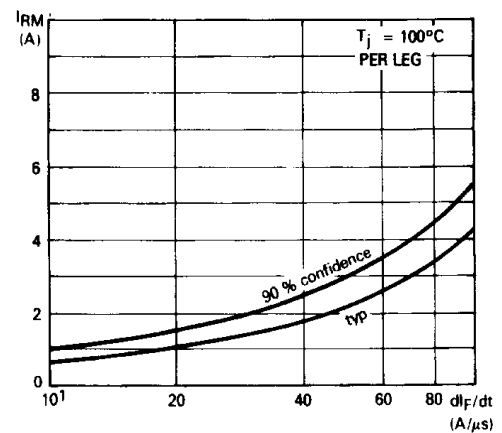


Fig. 9: Peak forward voltage versus  $di_F/dt$ .

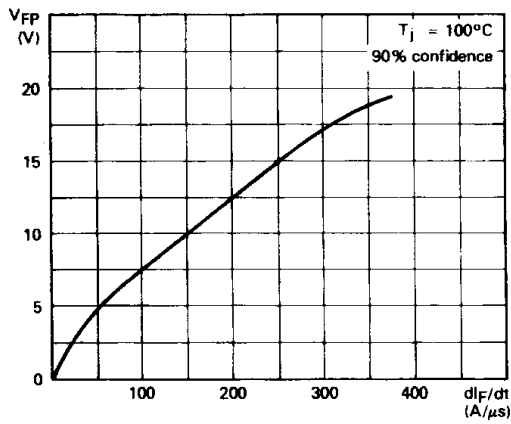


Fig. 10: Dynamic parameters versus junction temperature.

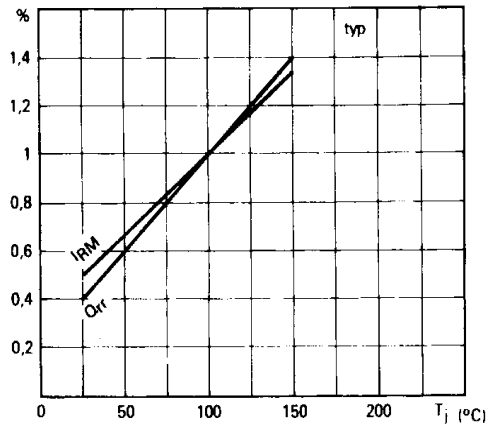


Fig. 11: Turn-off switching characteristics (without series inductance).

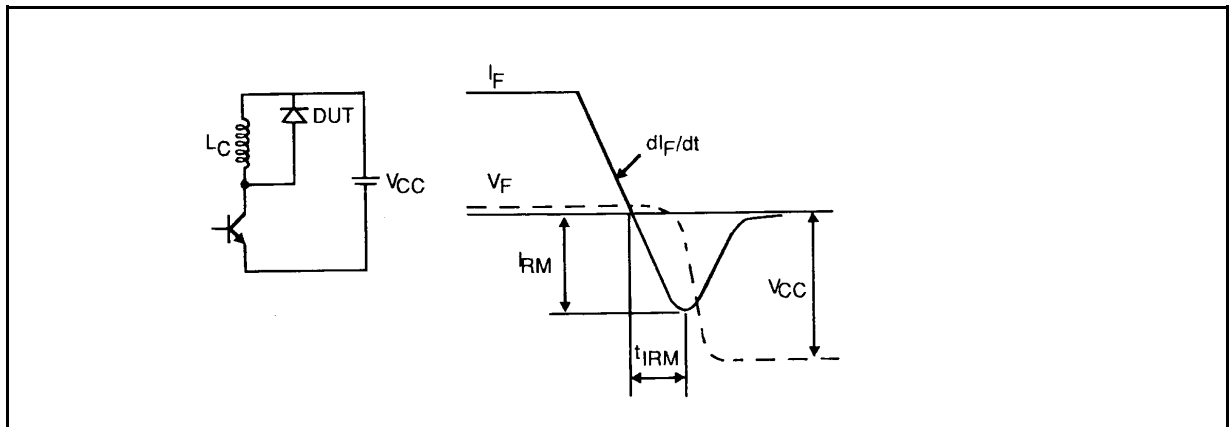
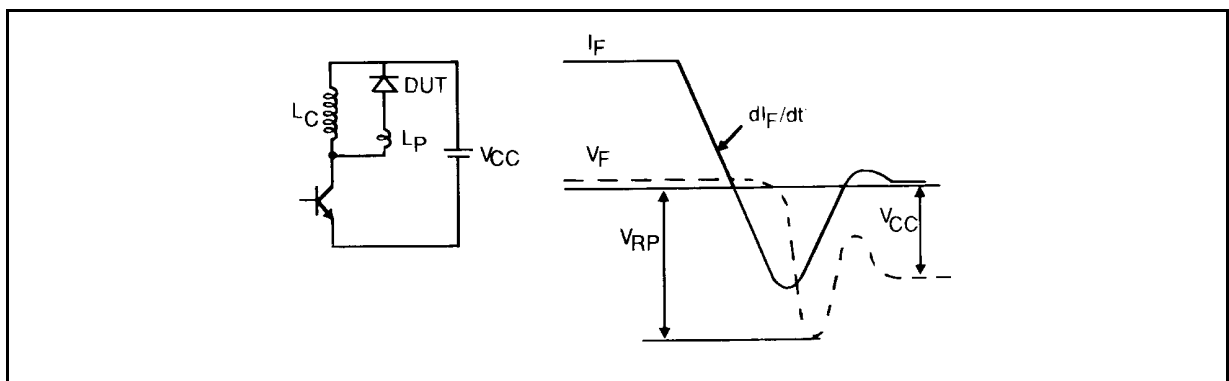
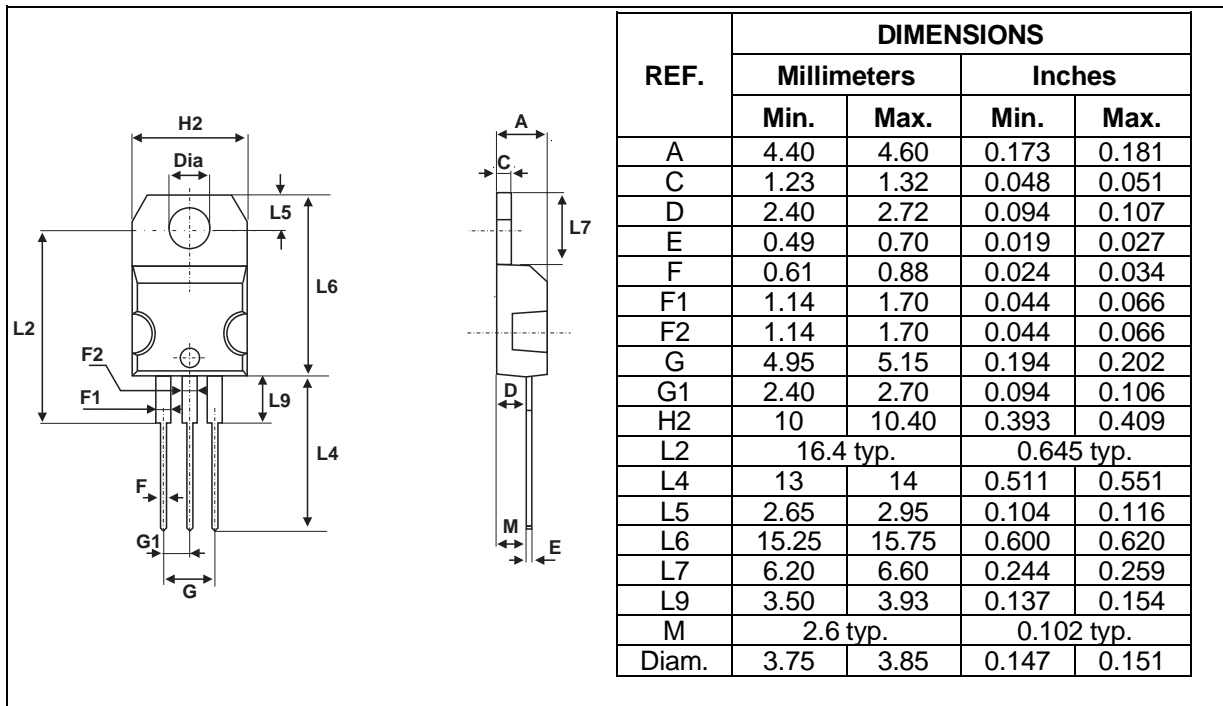


Fig. 12: Turn-off switching characteristics (with series inductance).



**PACKAGE MECHANICAL DATA**  
 TO-220AB


Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BYT16P-400	BYT16P-400	TO-220AB	2.03 g.	30	Tube

- Cooling method: by conduction (C)
- Recommended torque value: 0.08 N.m.
- Maximum torque value: 0.10 N.m.
- Epoxy meets UL94,V0

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