

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

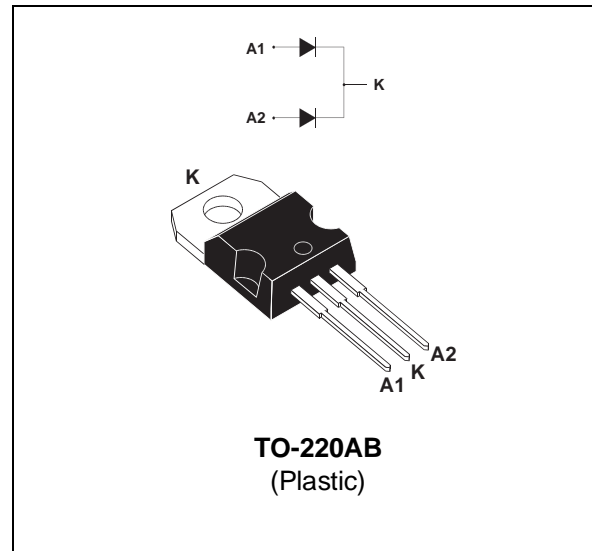
FEATURES AND BENEFITS

- 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	$t_p=5 \mu s$ $F=1kHz$	300	A
$I_{F(RMS)}$	RMS forward current		30	A
$I_{F(AV)}$	Average forward current	$T_c = 100^\circ C$ $\delta = 0.5$	16	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 ms$ Sinusoidal	100	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
$R_{th(j-c)}$	Junction to case	Per diode	3.75	°C/W
		Total	2	
$R_{th(c)}$		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_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 8\text{ A}$			1.5	V
		$T_j = 100^\circ\text{C}$				1.4	
I_R^{**}	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			15	μA
		$T_j = 100^\circ\text{C}$				2.5	mA

Pulse test : * $t_p = 380\ \mu\text{s}$, $\delta < 2\%$

** $t_p = 5\ \text{ms}$, $\delta < 2\%$

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_{rr}	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $V_R = 30\text{ V}$ $dI_F/dt = -15\text{ A}/\mu\text{s}$			75	ns
		$I_F = 0.5\text{ A}$ $I_R = 1\text{ A}$ $I_{rr} = 0.25\text{ A}$			35	

TURN-OFF SWITCHING CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t_{IRM}	Maximum reverse recovery time	$dI_F/dt = -32\text{ A}/\mu\text{s}$	$V_{CC} = 200\text{ V}$ $I_F = 8\text{ A}$ $L_p \leq 0.05\ \mu\text{H}$ $T_j = 100^\circ\text{C}$ (see fig. 11)			75	ns
		$dI_F/dt = -64\text{ A}/\mu\text{s}$				50	
I_{RM}	Maximum reverse recovery current	$dI_F/dt = -32\text{ A}/\mu\text{s}$	$V_{CC} = 200\text{ V}$ $I_F = 8\text{ A}$ $L_p \leq 0.05\ \mu\text{H}$ $T_j = 100^\circ\text{C}$ (see fig. 11)			2.2	A
		$dI_F/dt = -64\text{ A}/\mu\text{s}$				2.8	
$C = \frac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	$T_j = 100^\circ\text{C}$ $V_{CC} = 120\text{ V}$ $I_F = I_{F(AV)}$ $dI_F/dt = -8\text{ A}/\mu\text{s}$ $L_p = 9\ \mu\text{H}$ (see fig. 12)			3.3		/

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

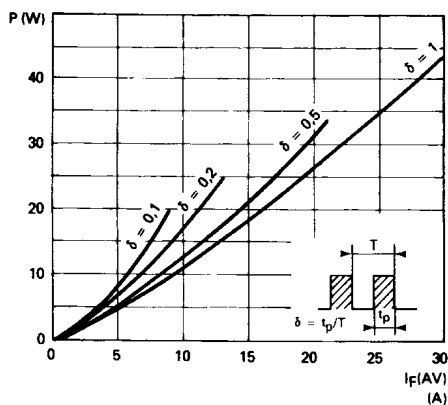


Fig. 2: Peak current versus form factor.

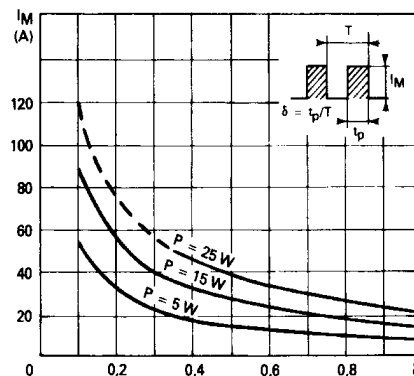


Fig. 3: Non repetitive peak surge current versus overload duration.

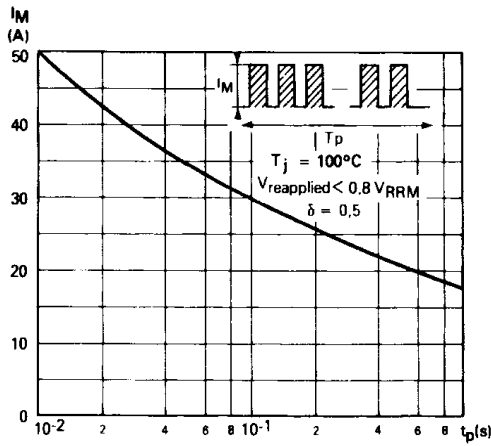


Fig. 4: Thermal impedance versus pulse width.

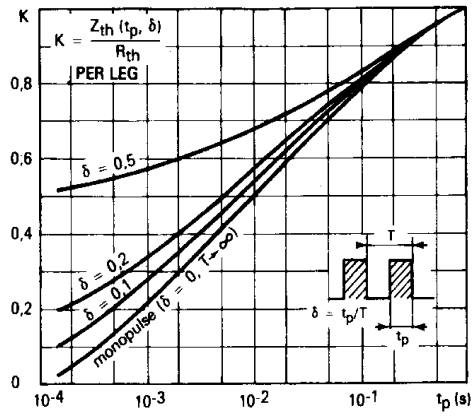


Fig. 5: Voltage drop versus forward current.

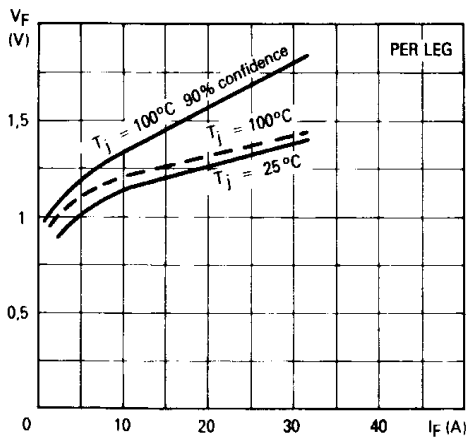


Fig. 6: Recovery charge versus di_F/dt.

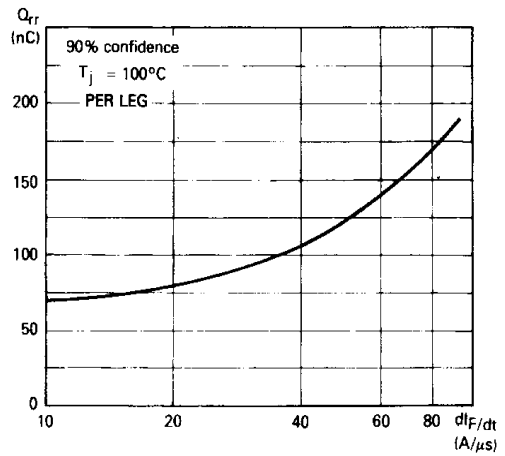


Fig. 7: Recovery time versus di_F/dt.

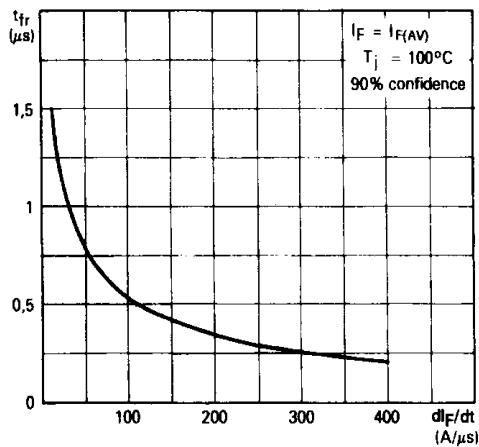


Fig. 8: Peak reverse current versus di_F/dt.

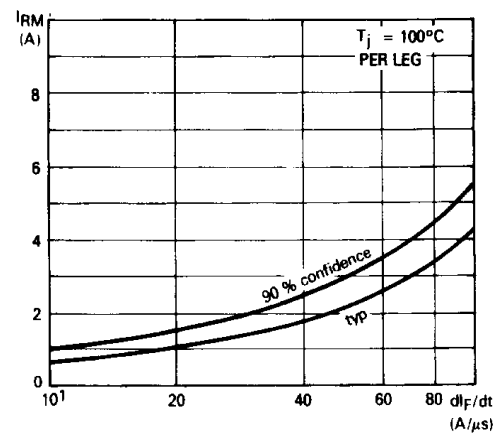


Fig. 9: Peak forward voltage versus di_F/dt .

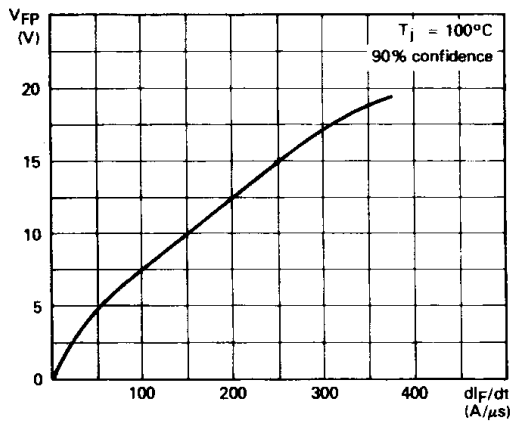


Fig. 10: Dynamic parameters versus junction temperature.

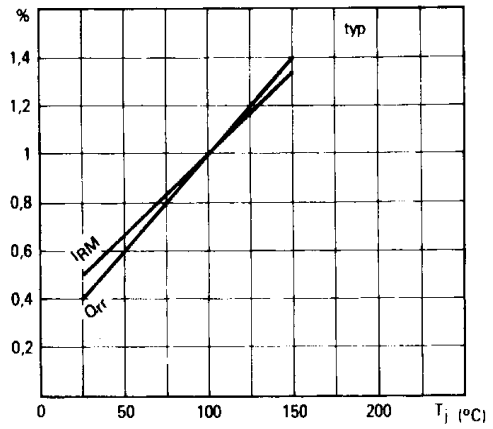


Fig. 11: Turn-off switching characteristics (without series inductance).

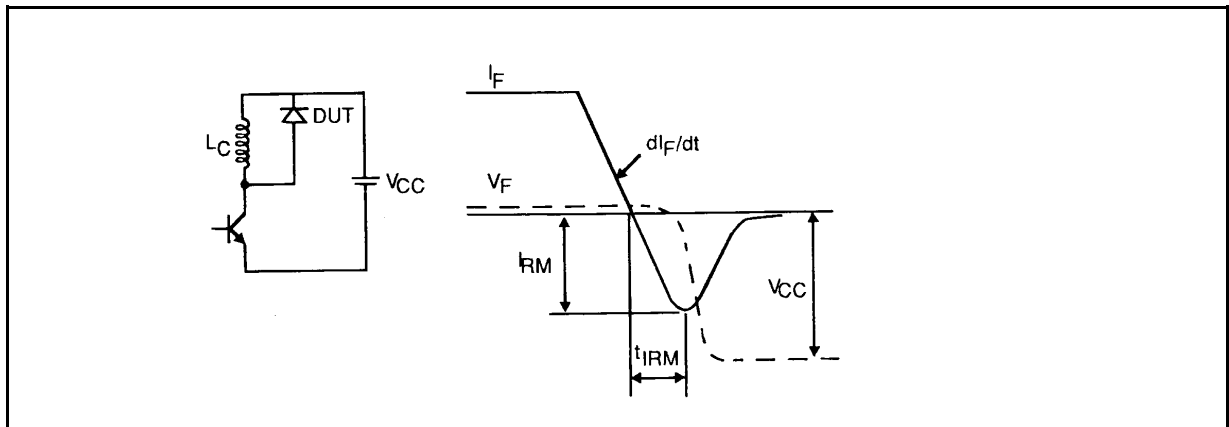
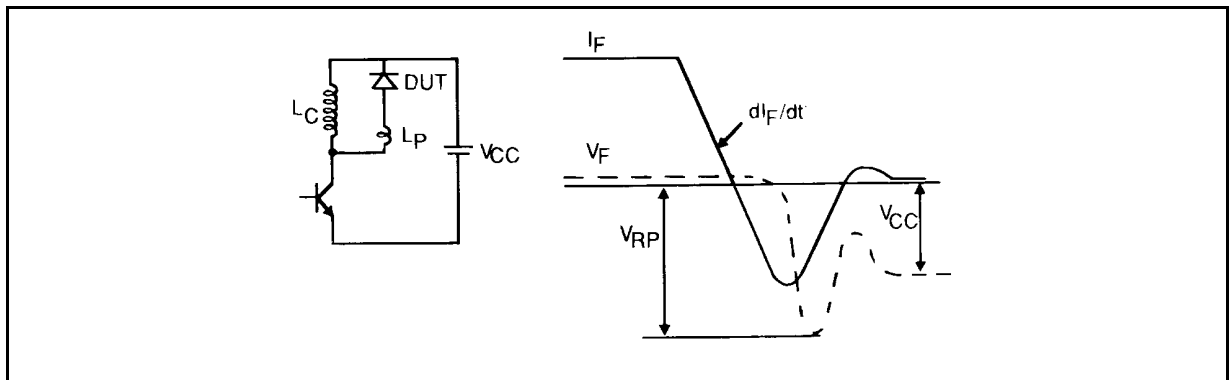
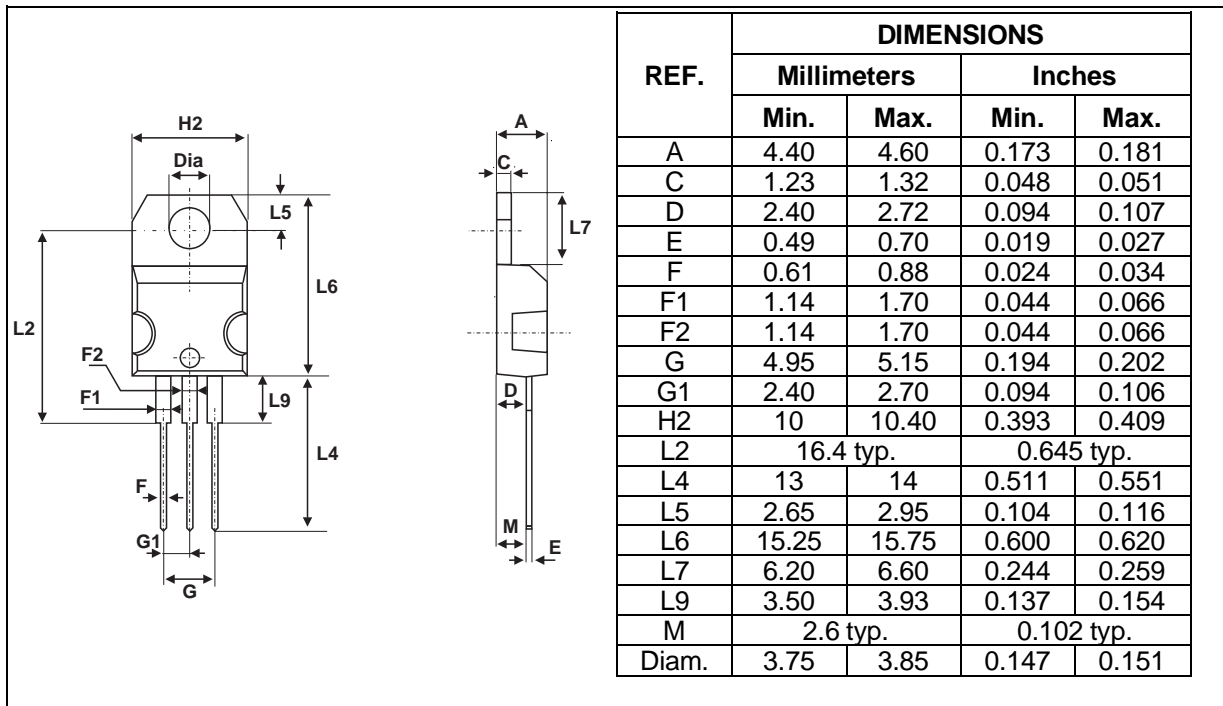


Fig. 12: Turn-off switching characteristics (with series inductance).



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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