

## FAST RECOVERY RECTIFIER DIODES

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	<b>8 A</b>
$V_{RRM}$	<b>400 V</b>
$V_F(\max)$	<b>1.4 V</b>
$t_{rr}(\max)$	<b>35 ns</b>

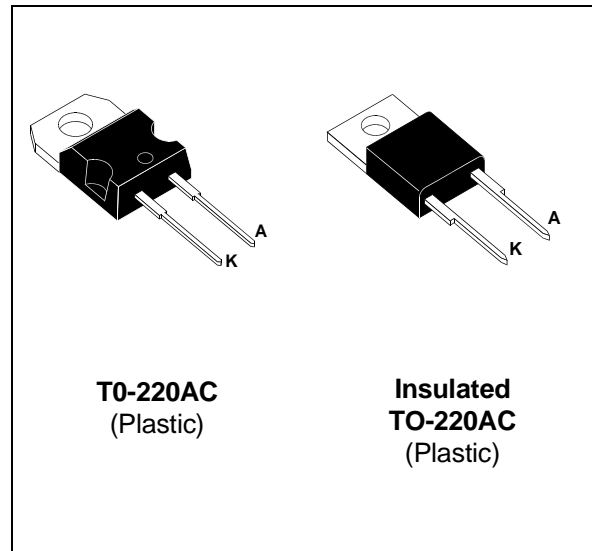
### FEATURES AND BENEFITS

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED PACKAGE: TO-220AC  
Insulation voltage: 2500 V<sub>RMS</sub>  
Capacitance = 7 pF

### DESCRIPTION

This single 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)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		400	V
$I_{FRM}$	Repetitive peak forward current	$t_p=5 \mu s$ $F=5kHz$	200	A
$I_{F(RMS)}$	RMS forward current		16	A
$I_{F(AV)}$	Average forward current	TO-220AC	8	A
		Insulated TO-220AC		
$I_{FSM}$	Surge non repetitive forward current	TO-220AC	100	A
		Insulated TO-220AC		
$T_{stg}$	Storage temperature range		- 40 to + 150	$^\circ C$
$T_j$	Maximum operating junction temperature		150	$^\circ C$

## BYT08P-400 / BYT08PI-400

### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case	TO-220AC	2.5
		Ins. TO-220AC	3.5

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 25°C			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 : \* tp = 380 μs, δ < 2%

\*\* tp = 5 ms, δ < 2%

To evaluate the conduction losses use the following equation:

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

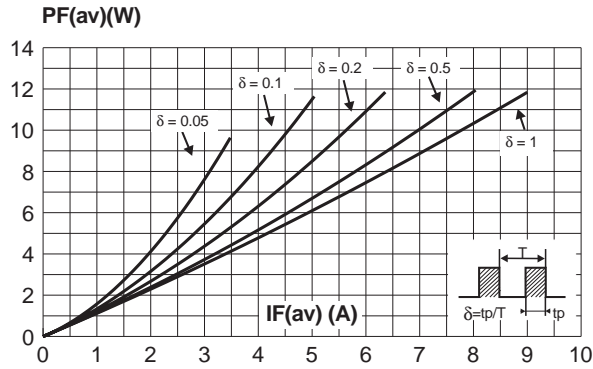
### RECOVERY CHARACTERISTICS

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

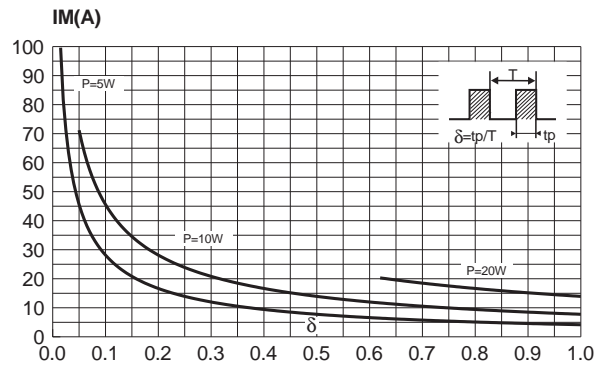
### TURN-OFF SWITCHING CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t <sub>IRM</sub>	Maximum reverse recovery time	dI <sub>F</sub> /dt = - 32 A/μs			75	ns
		dI <sub>F</sub> /dt = - 64 A/μs			50	
I <sub>RM</sub>	Maximum reverse recovery current	dI <sub>F</sub> /dt = - 32 A/μs	V <sub>CC</sub> = 200 V I <sub>F</sub> = 8 A L <sub>p</sub> ≤ 0.05 μH T <sub>j</sub> = 100°C (see fig. 13)		2.2	A
		dI <sub>F</sub> /dt = - 64 A/μs			2.8	
C = $\frac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	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			3.3	/

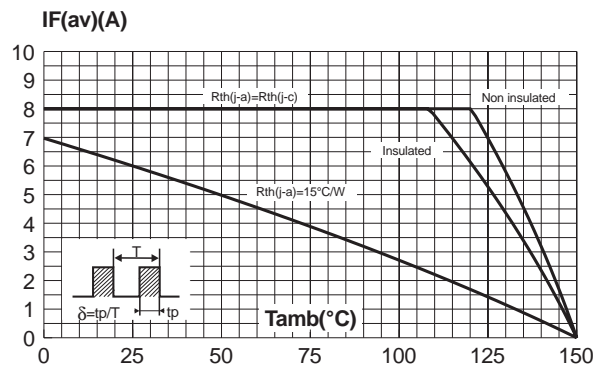
**Fig. 1:** Average forward power dissipation versus average forward current .



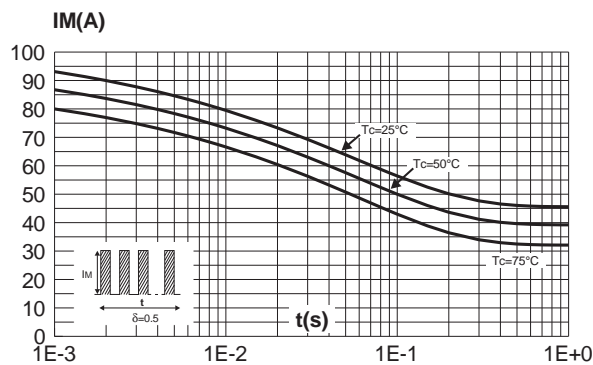
**Fig. 2:** Peak current versus form factor.



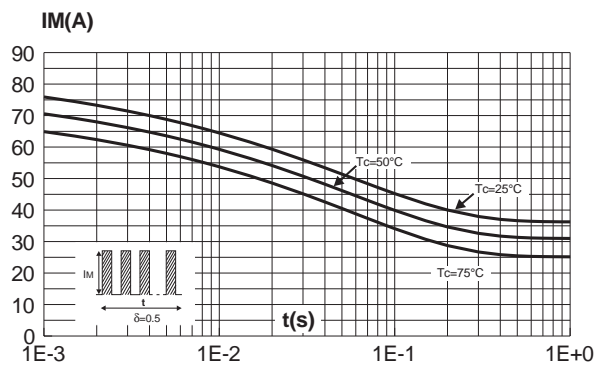
**Fig. 3:** Average forward current versus ambient temperature ( $\delta=0.5$ ).



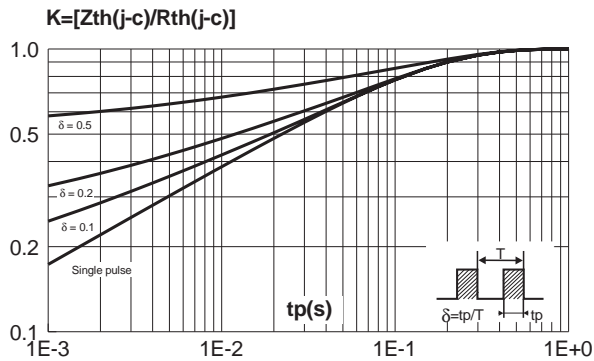
**Fig. 4-1:** Non repetitive surge peak forward current versus overload duration (TO-220AC).



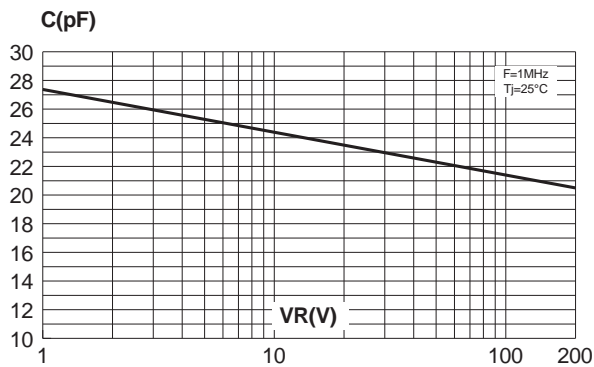
**Fig. 4-2:** Non repetitive surge peak forward current versus overload duration (insulated TO-220AC).



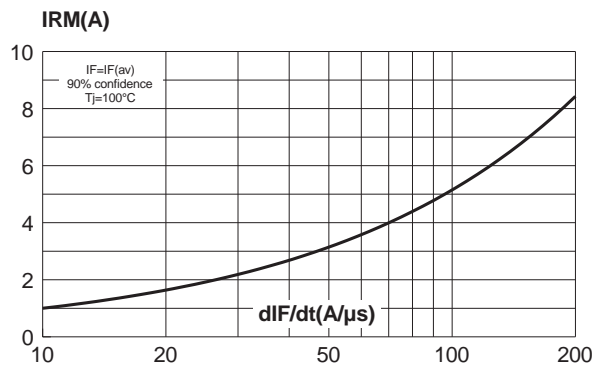
**Fig. 5:** Relative variation of thermal impedance junction to case versus pulse duration.



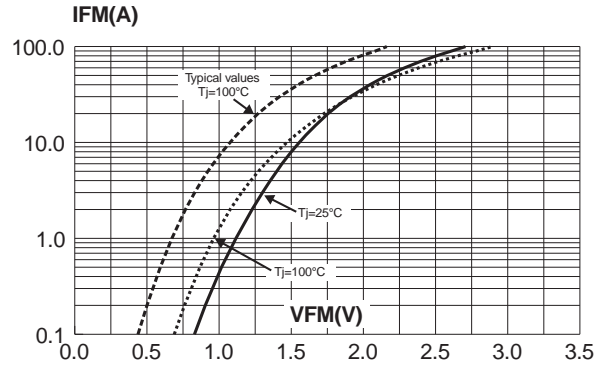
**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values, per diode).



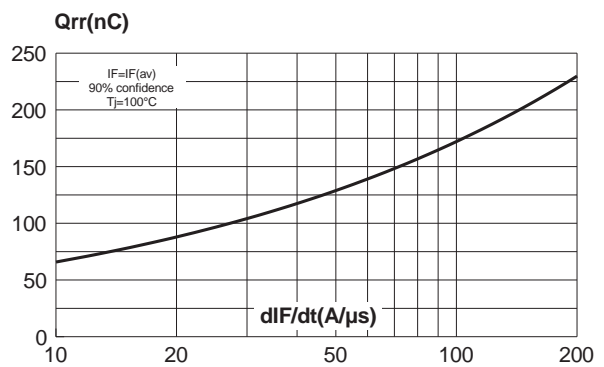
**Fig. 9:** Recovery current versus  $dI_F/dt$  (per diode).



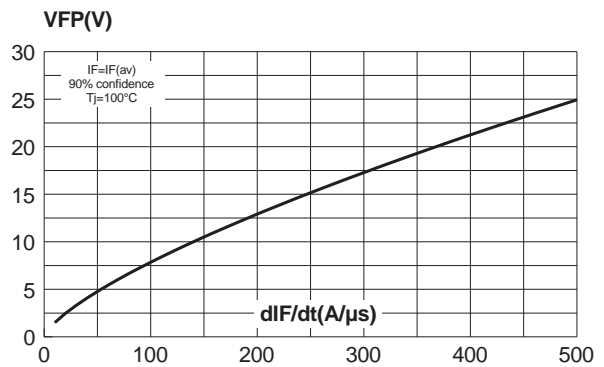
**Fig. 6:** Forward voltage drop versus forward current (maximum values, per diode).



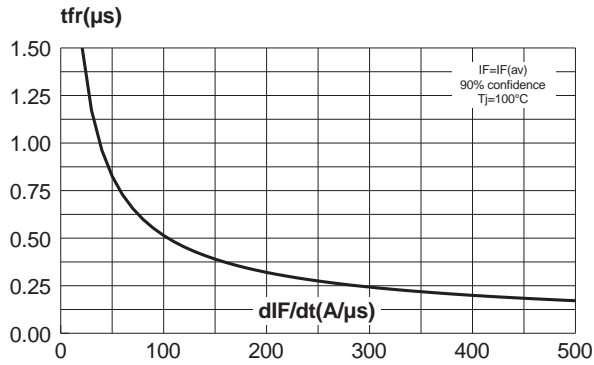
**Fig. 8:** Recovery charges versus  $dI_F/dt$  (per diode).



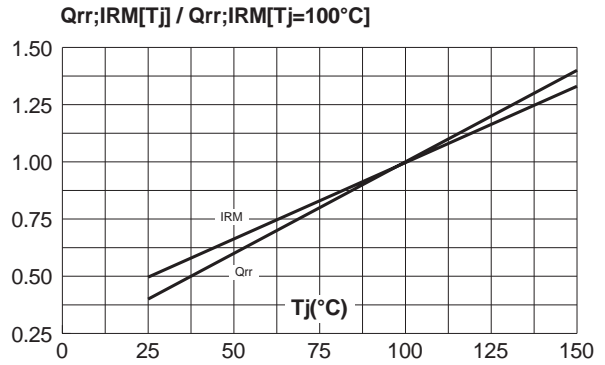
**Fig. 10:** Transient peak forward voltage versus  $dI_F/dt$  (per diode)



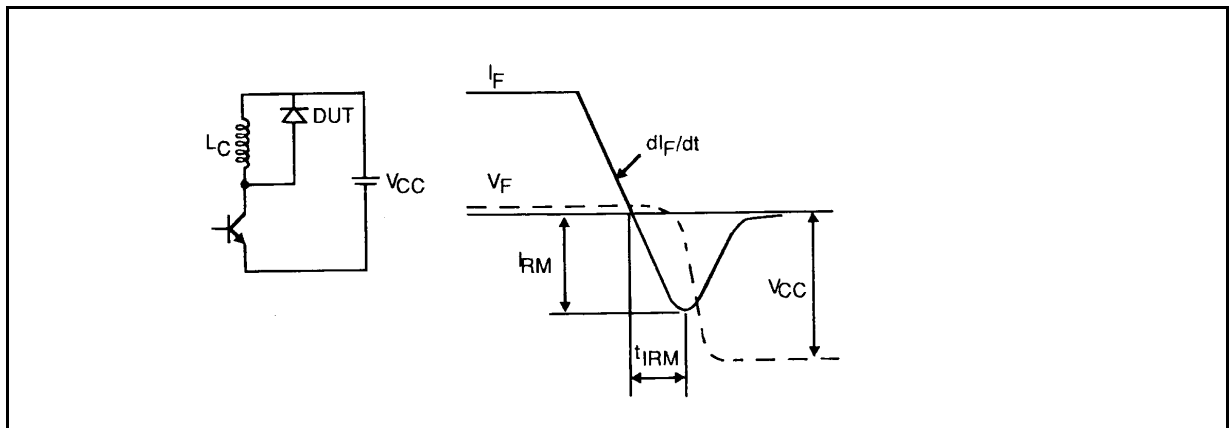
**Fig. 11:** Forward recovery time versus  $dI_F/dt$  (per diode)



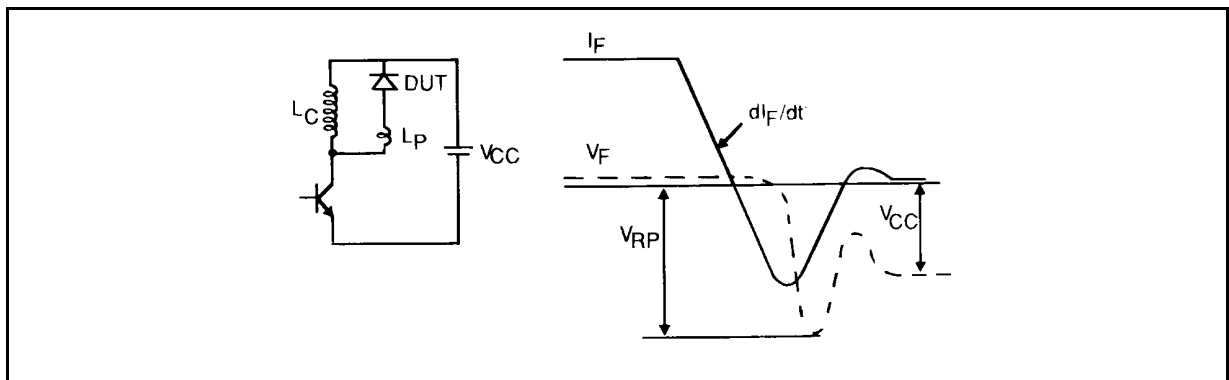
**Fig. 12:** Dynamic parameters versus junction temperature.



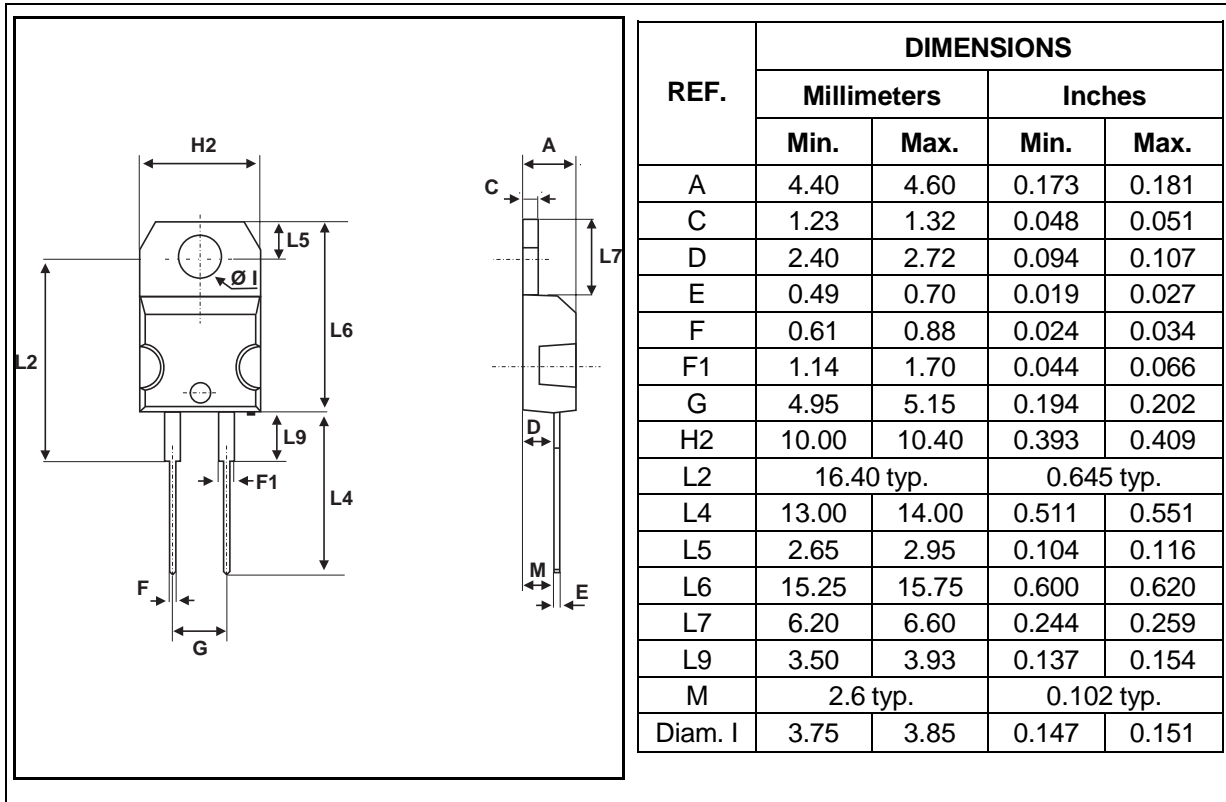
**Fig. 13:** Turn-off switching characteristics (without series inductance).



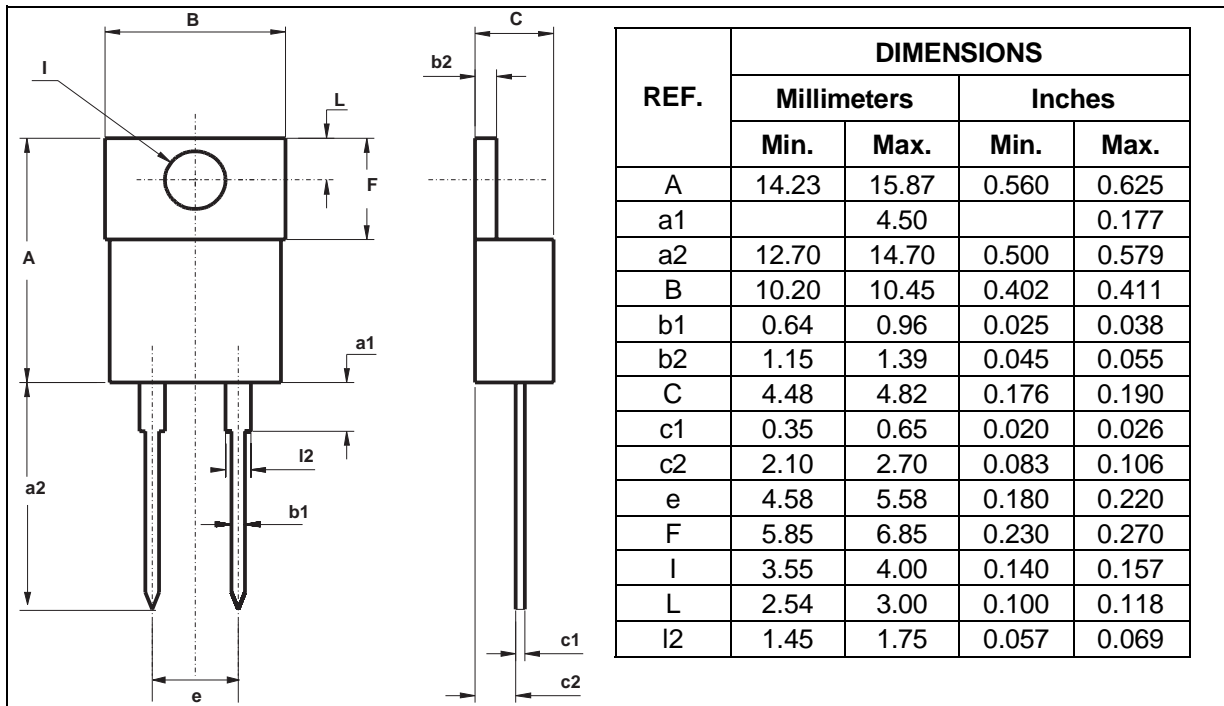
**Fig. 14:** Turn-off switching characteristics (with series inductance).



PACKAGE MECHANICAL DATA  
TO-220AC



**PACKAGE MECHANICAL DATA**  
TO-220AC Insulated



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BYT08P-400	BYT08P-400	TO-220AC	1.86 g.	50	Tube
BYT08PI-400	BYT08PI-400	Insulated TO-220AC	1.86 g.	50	Tube

- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1.0 N.m.
- Epoxy meets UL94,V0

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