

FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCT CHARACTERISTICS

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

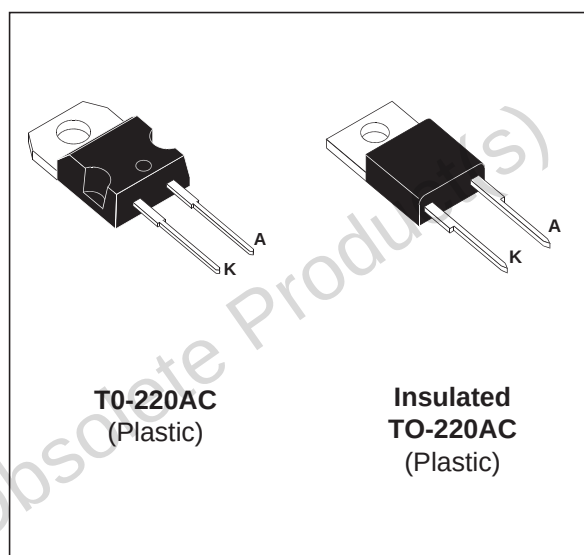
FEATURES AND BENEFITS

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED PACKAGE: TO-220AC
Insulation voltage: 2500 V_{RMS}
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	tp=5 μs F=5kHz		200	A
I _{F(RMS)}	RMS forward current			16	A
I _{F(AV)}	Average forward current	TO-220AC	Tc = 120°C δ = 0.5	8	A
		Insulated TO-220AC	Tc = 105°C		
I _{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal		100	A
T _{stg}	Storage temperature range			- 40 to + 150	°C
T _j	Maximum operating junction temperature			150	°C

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC Ins. TO-220AC	2.5 3.5	°C/W

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

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

To evaluate the conduction losses use the following equation:

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

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	$dI_F/dt = -32\text{ A}/\mu\text{s}$	$V_{CC} = 200\text{ V}$ $I_F = 8\text{ A}$ $L_p \text{ @ } 0.05\text{ }\mu\text{H}$ $T_j = 100^\circ\text{C}$ (see fig. 13)			75	ns
I_{RM}	Maximum reverse recovery current	$dI_F/dt = -32\text{ A}/\mu\text{s}$			50		
		$dI_F/dt = -64\text{ A}/\mu\text{s}$				2.2	A
$C = \frac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	$T_j = 100^\circ\text{C}$ $V_{CC} = 60\text{ V}$ $I_F = I_{F(AV)}$ $dI_F/dt = -30\text{ A}/\mu\text{s}$ $L_p = 1\text{ }\mu\text{H}$			3.3		/

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

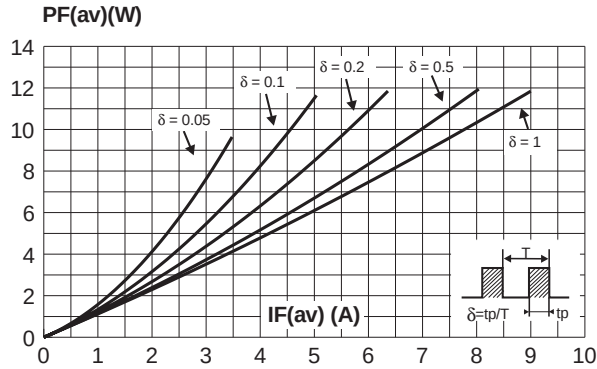


Fig. 2: Peak current versus form factor.

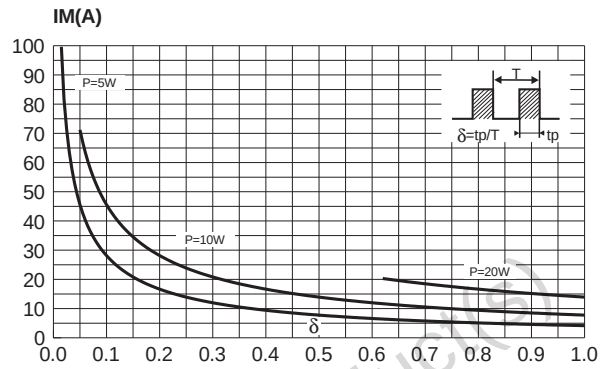


Fig. 3: Average forward current versus ambient temperature ($\delta=0.5$).

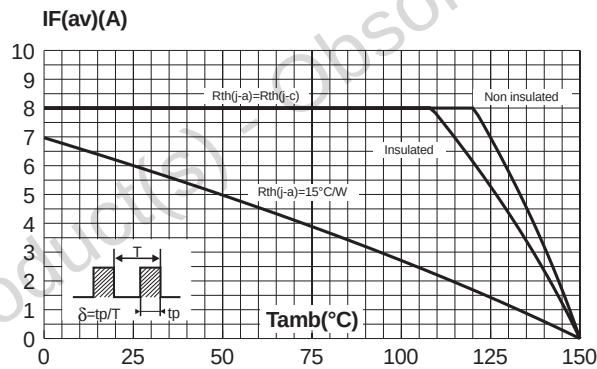


Fig. 4-1: Non repetitive surge peak forward current versus overload duration (TO-220AC).

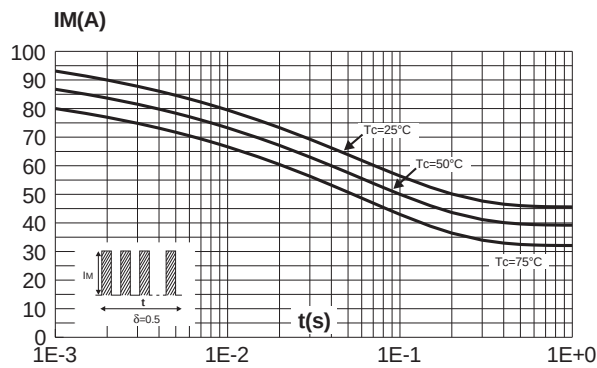


Fig. 4-2: Non repetitive surge peak forward current versus overload duration (insulated TO-220AC).

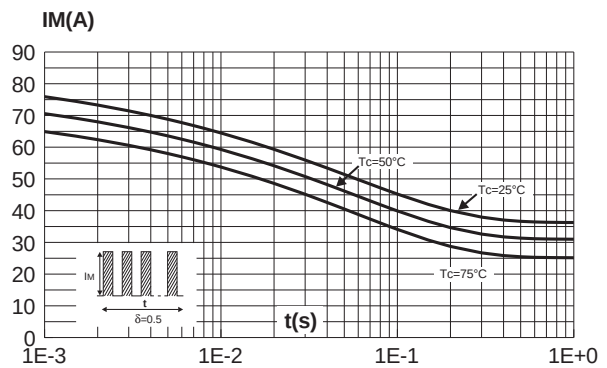


Fig. 5: Relative variation of thermal impedance junction to case versus pulse duration.

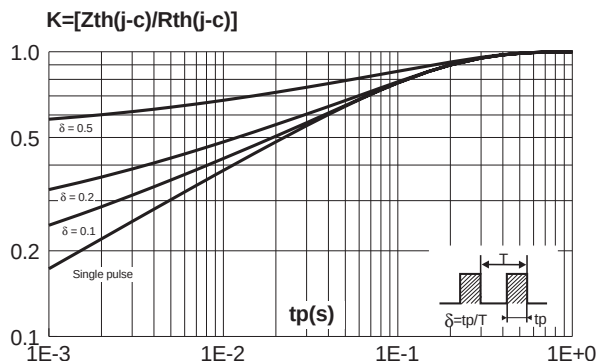


Fig. 6: Forward voltage drop versus forward current (maximum values, per diode).

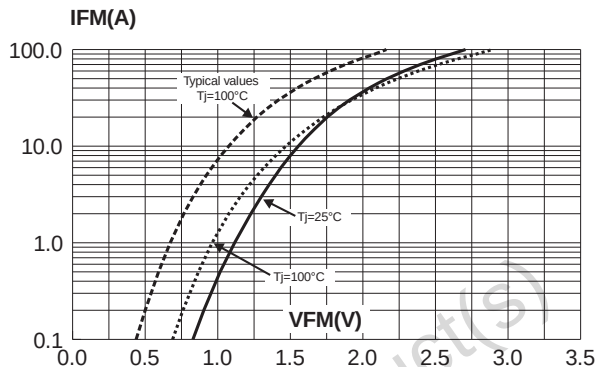


Fig. 7: Junction capacitance versus reverse voltage applied (typical values, per diode).

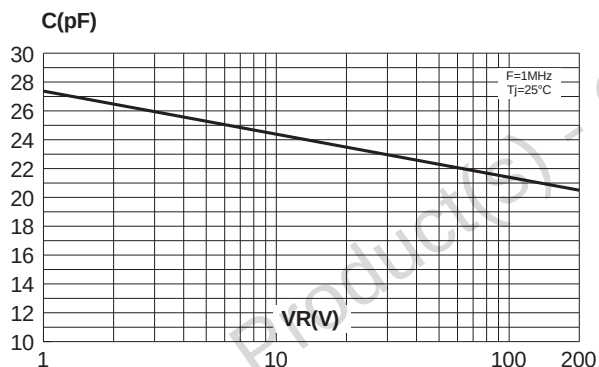


Fig. 8: Recovery charges versus dI_F/dt (per diode).

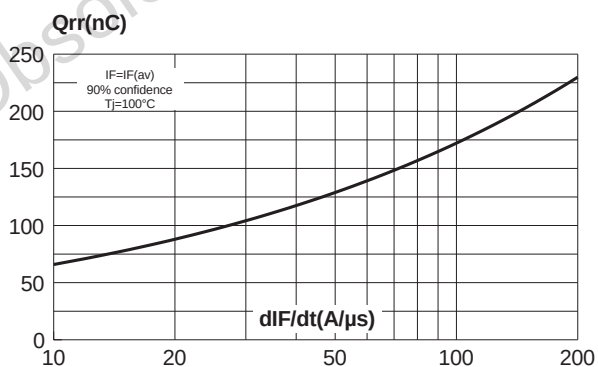


Fig. 9: Recovery current versus dI_F/dt (per diode).

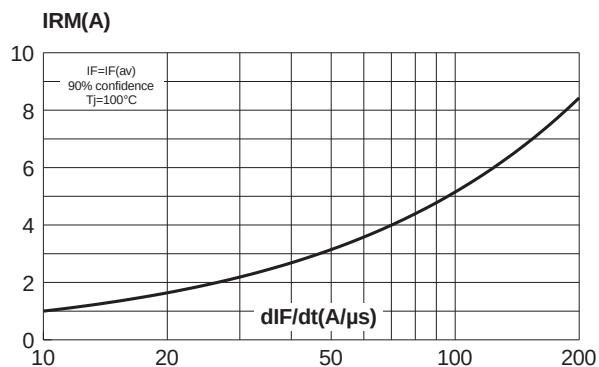


Fig. 10: Transient peak forward voltage versus dI_F/dt (per diode)

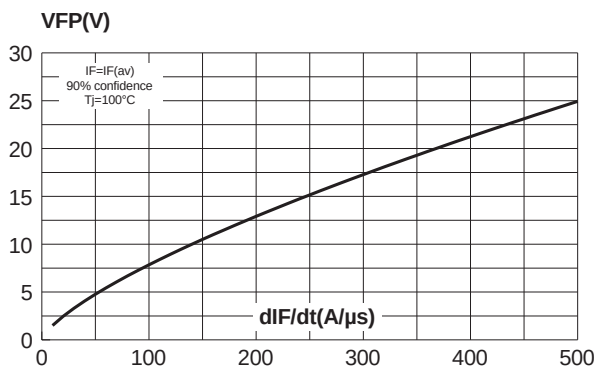


Fig. 11: Forward recovery time versus di_F/dt (per diode)

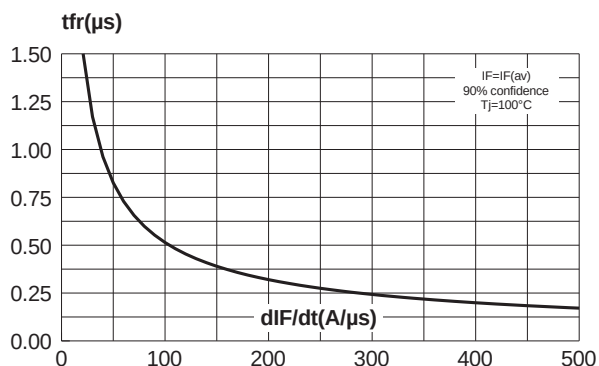


Fig. 12: Dynamic parameters versus junction temperature.

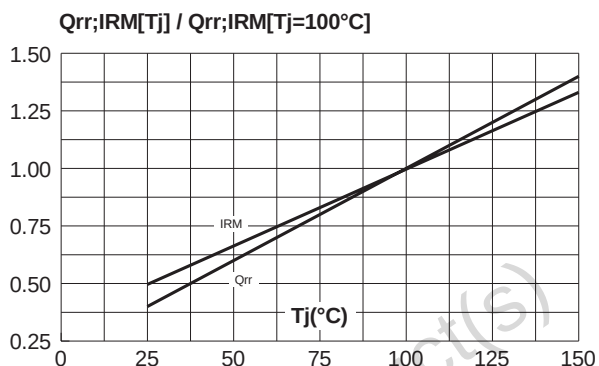


Fig. 13: Turn-off switching characteristics (without series inductance).

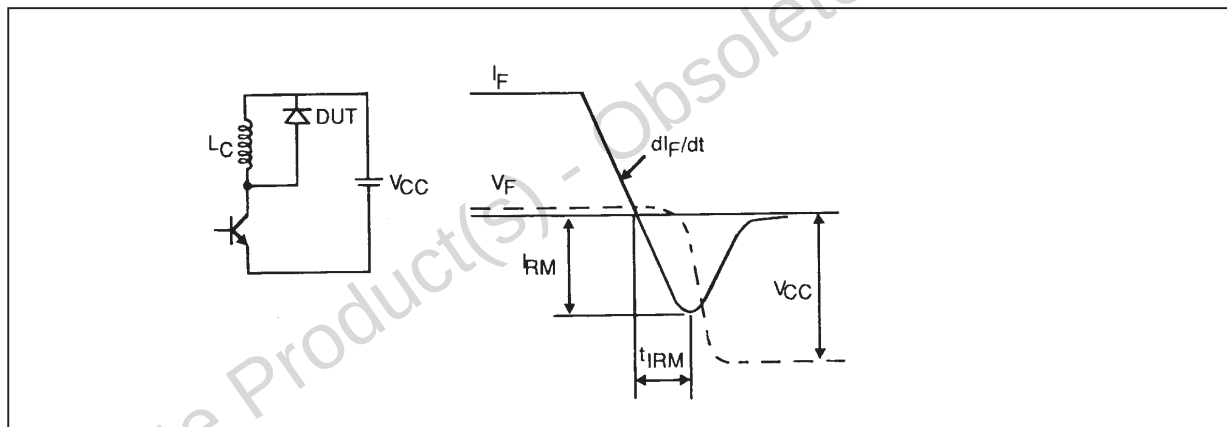
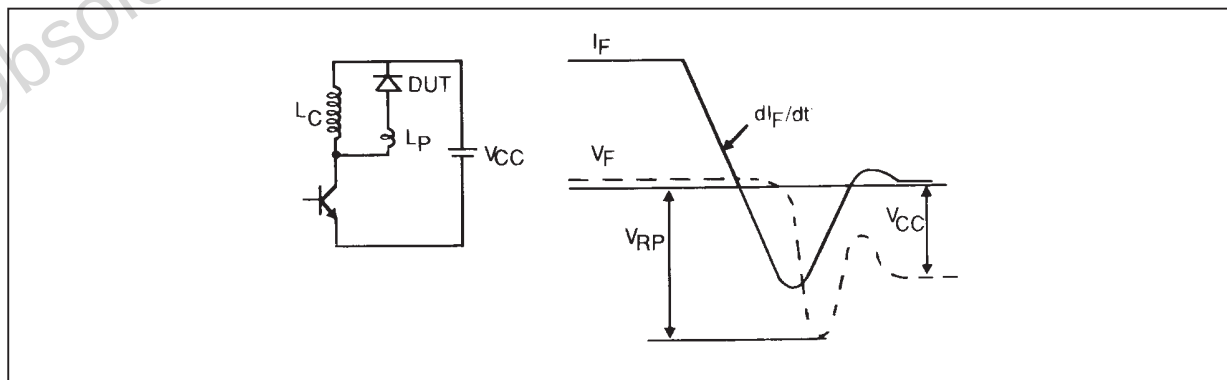
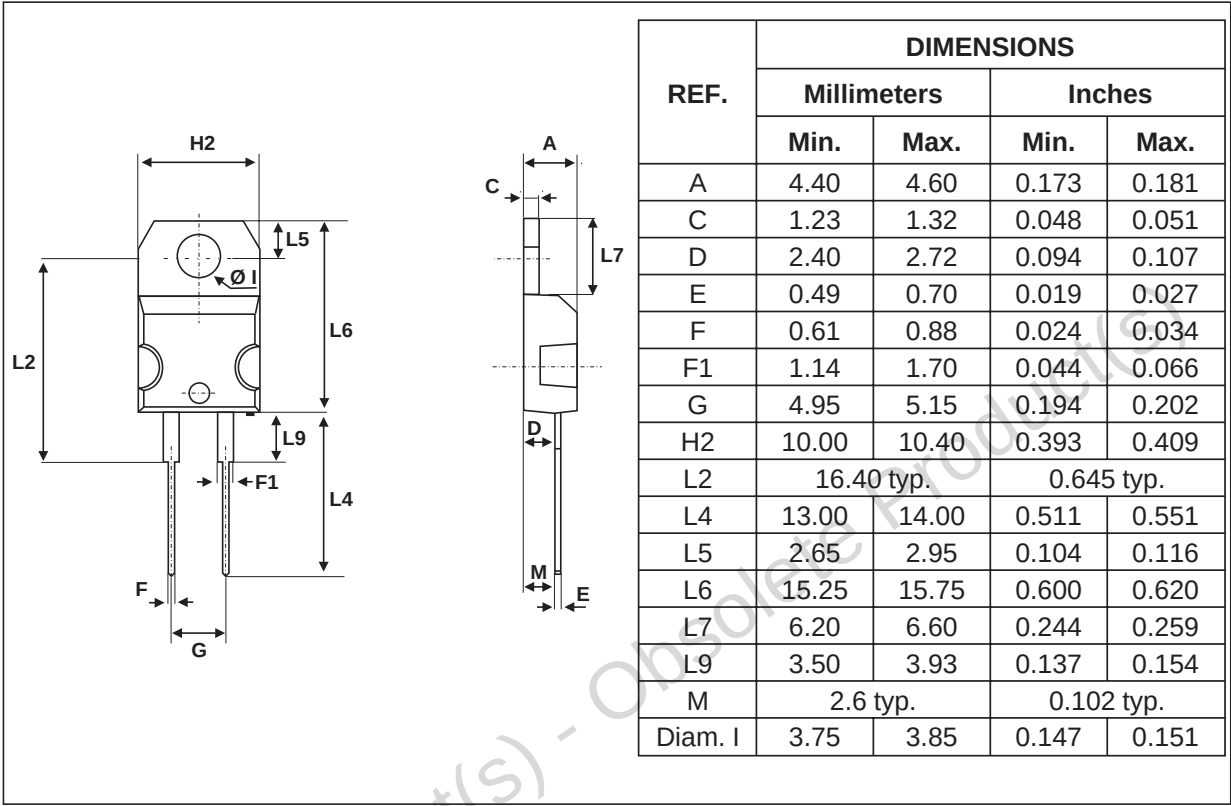
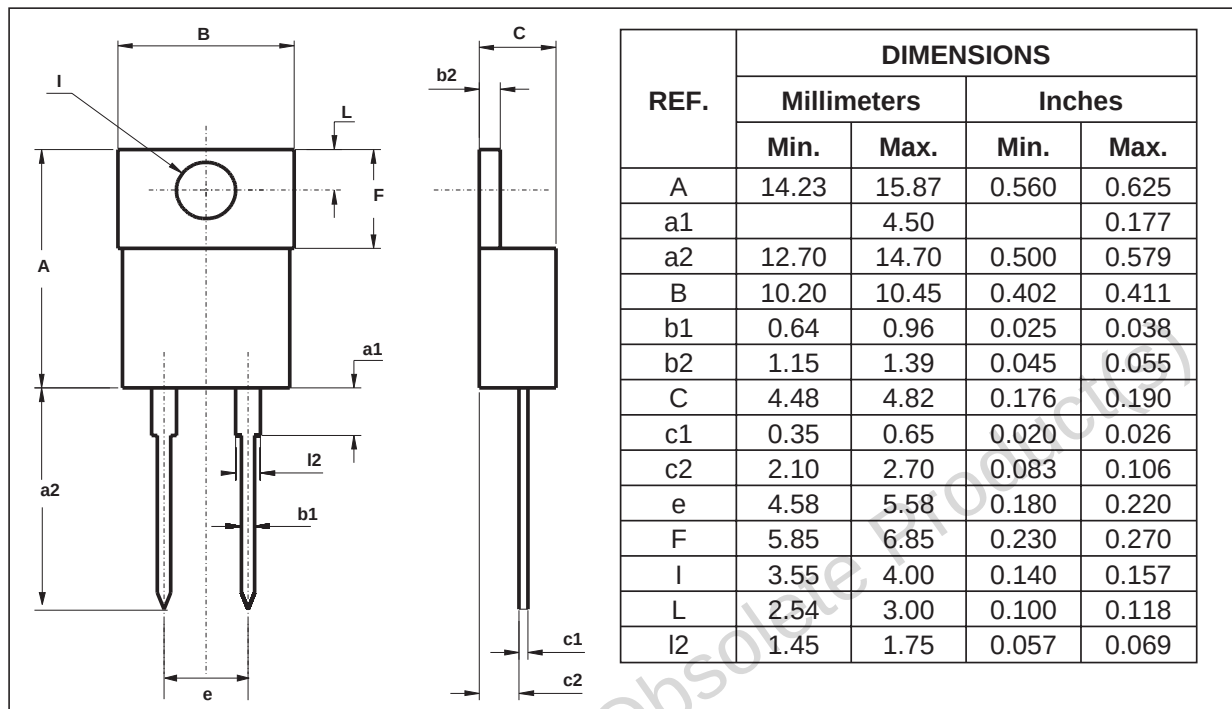


Fig. 14: Turn-off switching characteristics (with series inductance).



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.	250	Bulk

- 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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