

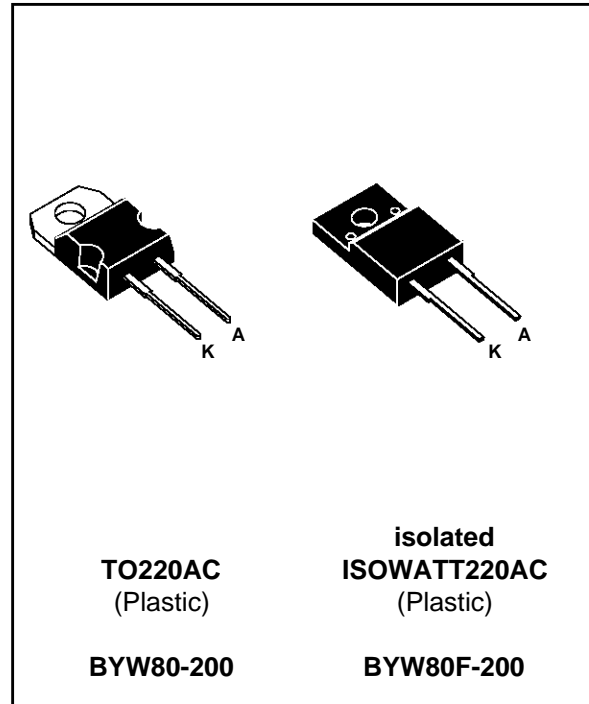
## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- INSULATED VERSION (ISOWATT220AC):  
Insulating voltage = 2000 V DC  
Capacitance = 12 pF

### DESCRIPTION

Single chip rectifier suited for switchmode power supply and high frequency DC to DC converters. Packaged in TO220AC, or ISOWATT220AC this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit	
$I_{F(RMS)}$	RMS forward current		20	A	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO220AC	$T_c=120^\circ\text{C}$	10	A
		ISOWATT220AC	$T_c=95^\circ\text{C}$	10	
$I_{FSM}$	Surge non repetitive forward current		$t_p=10\text{ms}$ sinusoidal	100	A
$T_{stg}$ $T_j$	Storage and junction temperature range		- 65 to + 150 - 65 to + 150	$^\circ\text{C}$ $^\circ\text{C}$	

Symbol	Parameter	BYW80-(F)				Unit
		50	100	150	200	
$V_{RRM}$	Repetitive peak reverse voltage	50	100	150	200	V

## BYW80(F)

### THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction to case	TO220AC	2.5	°C/W
		ISOWATT220AC	4.7	

### 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>			10	μA
	T <sub>j</sub> = 100°C				1	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 7 A			0.85	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 15 A			1.05	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 15 A			1.15	

Pulse test : \* tp = 5 ms, duty cycle < 2 %

\*\* tp = 380 μs, duty cycle < 2 %

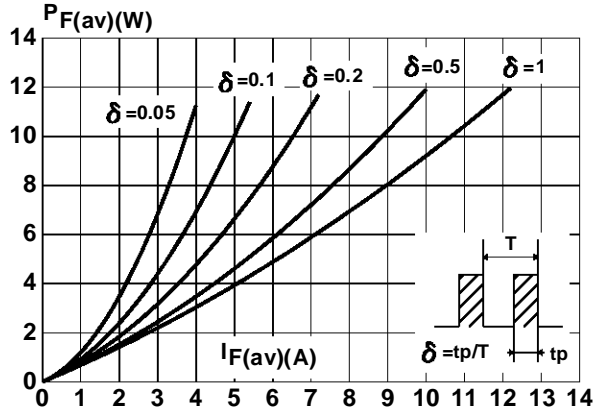
To evaluate the conduction losses use the following equation :

$$P = 0.65 \times I_{F(AV)} + 0.027 \times I_{F(RMS)}^2$$

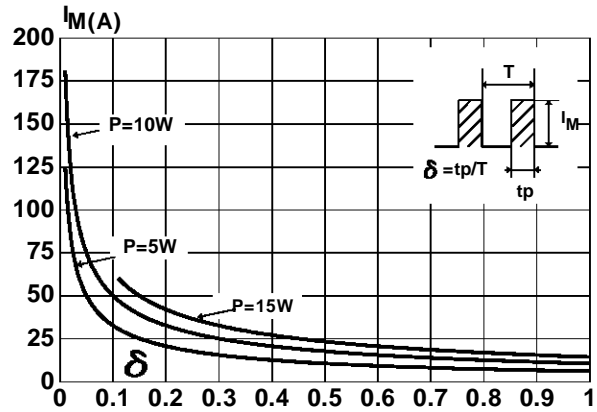
### RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A I <sub>R</sub> = 1A			25	ns
		I <sub>F</sub> = 1A V <sub>R</sub> = 30V			35	
tfr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A V <sub>FR</sub> = 1.1 x V <sub>F</sub>		15		ns
V <sub>FP</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A		2		V

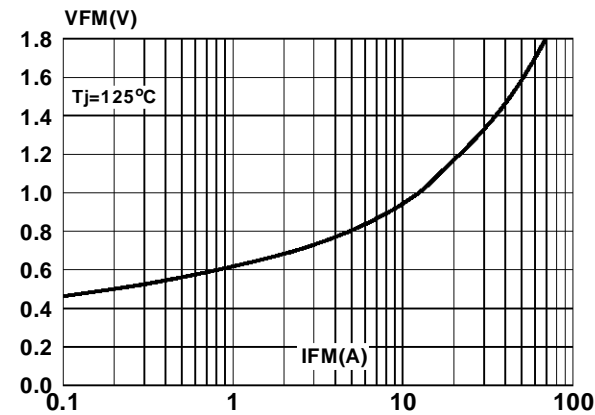
**Fig.1 :** Average forward power dissipation versus average forward current.



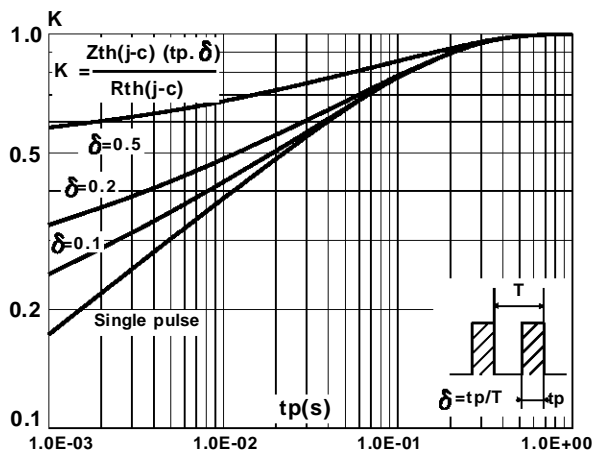
**Fig.2 :** Peak current versus form factor.



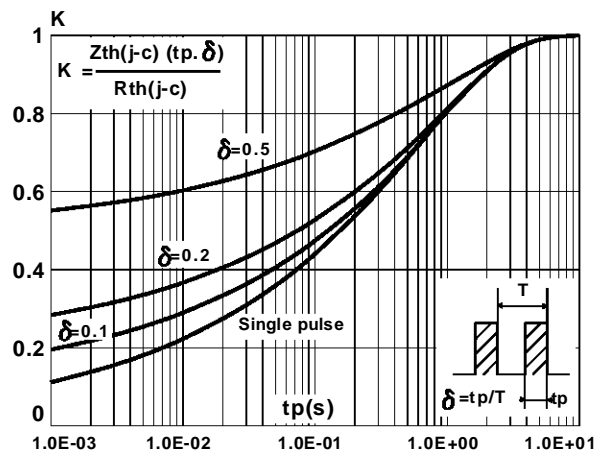
**Fig.3 :** Forward voltage drop versus forward current (maximum values).



**Fig.4 :** Relative variation of thermal impedance junction to case versus pulse duration. (TO220AC)

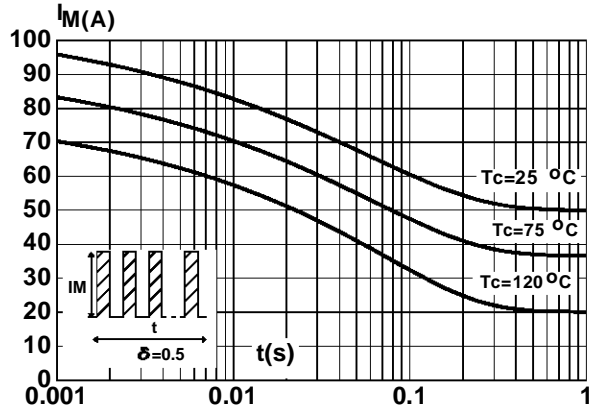


**Fig.5 :** Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AC)

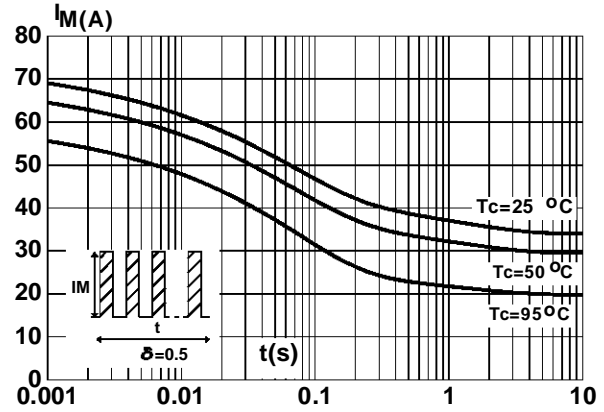


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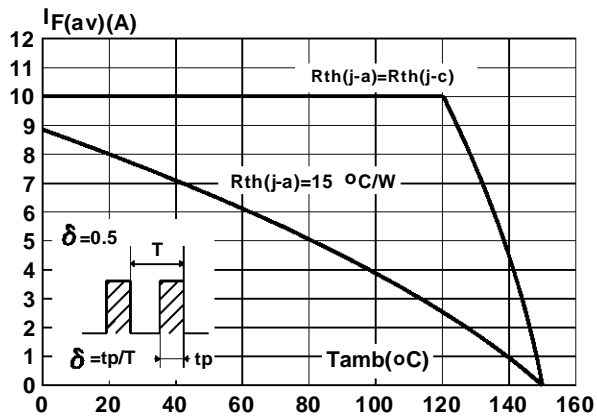
**Fig.6 :** Non repetitive surge peak forward current versus overload duration. (TO220AC)



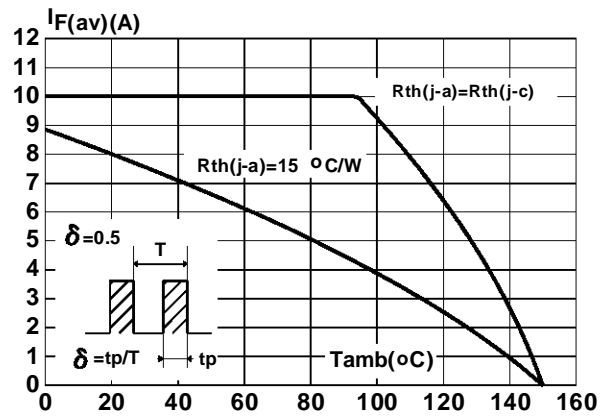
**Fig.7 :** Non repetitive surge peak forward current versus overload duration. (ISOWATT220AC)



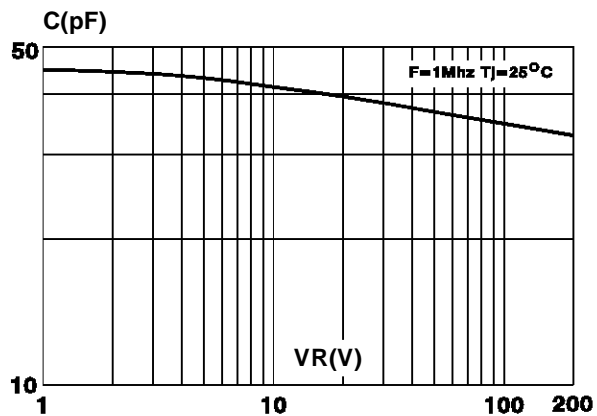
**Fig.8 :** Average current versus ambient temperature. (duty cycle : 0.5) (TO220AC)



**Fig.9 :** Average current versus ambient temperature. (duty cycle : 0.5) (ISOWATT220AC)



**Fig.10 :** Junction capacitance versus reverse voltage applied (Typical values).



**Fig.11 :** Recovery charges versus  $dI_F/dt$ .

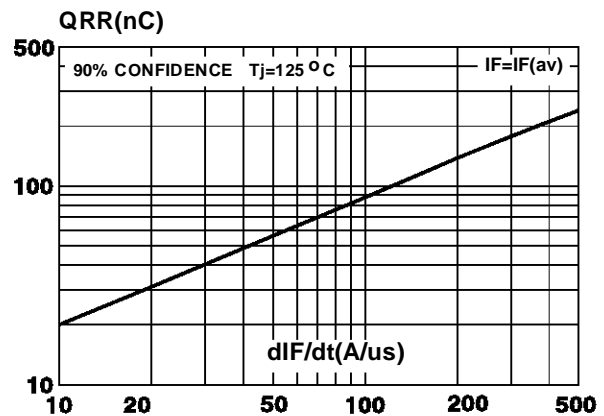


Fig.12 : Peak reverse current versus dIF/dt.

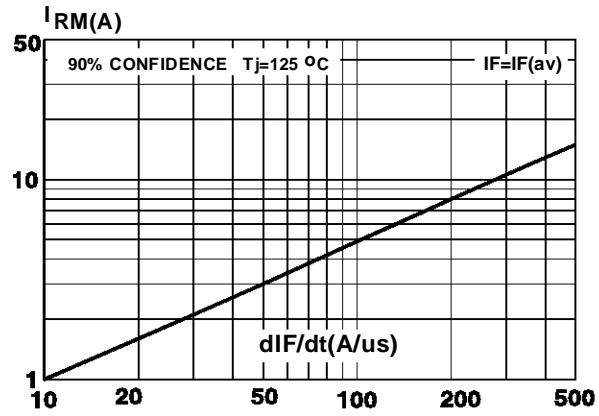
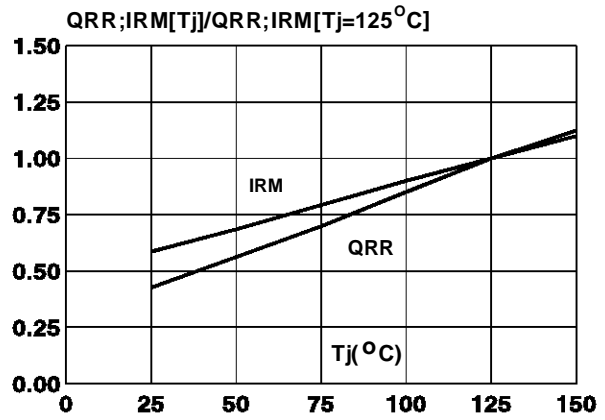
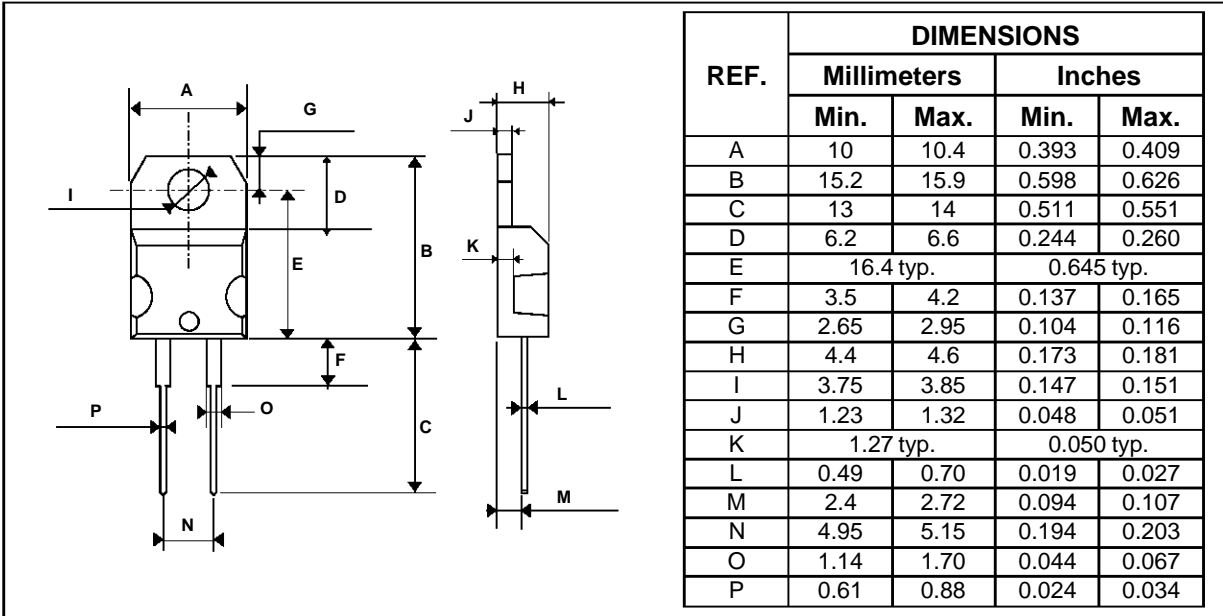


Fig.13 : Dynamic parameters versus junction temperature.



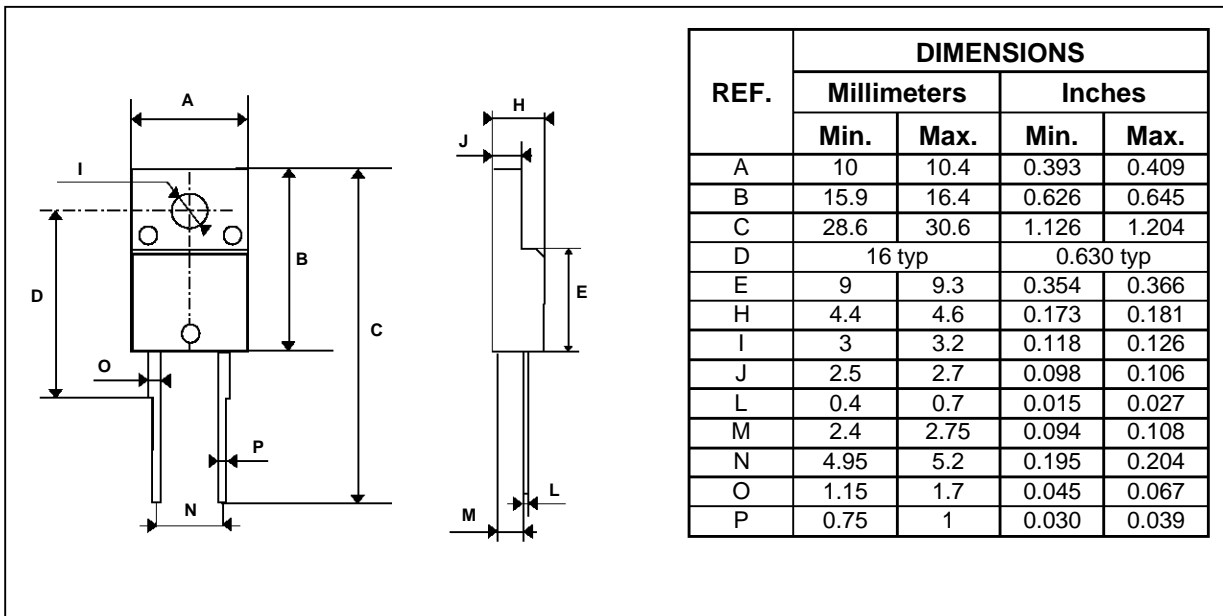
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### PACKAGE MECHANICAL DATA TO220AC (JEDEC outline)



Cooling method : C  
 Marking : Type number  
 Weight : 1.9 g  
 Recommended torque value : 0.8m.N  
 Maximum torque value : 1.0m.N

### PACKAGE MECHANICAL DATA ISOWATT220AC (JEDEC outline)



Cooling method : C  
 Marking : Type number  
 Weight : 2 g  
 Recommended torque value : 0.55m.N  
 Maximum torque value : 0.70m.N

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