

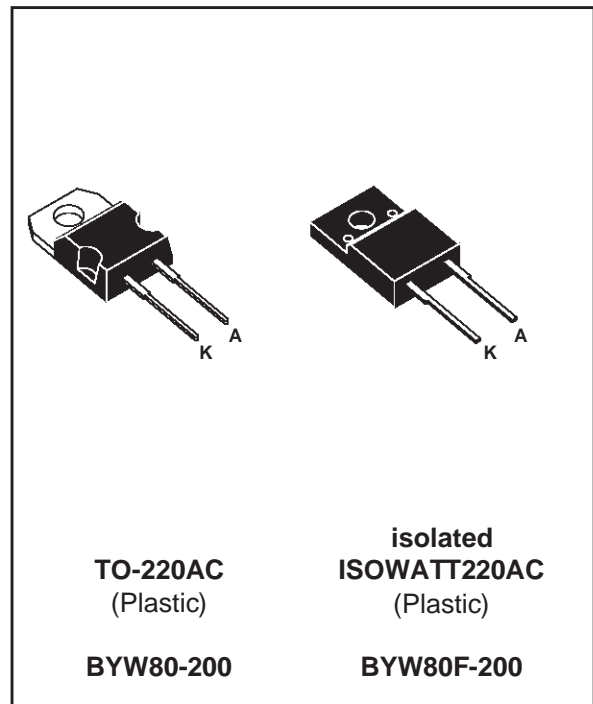
## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### 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 TO-220AC, 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 $\delta = 0.5$	TO-220AC	$T_c=120^\circ\text{C}$	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	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	200	V

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### THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction to case	TO-220AC	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 %

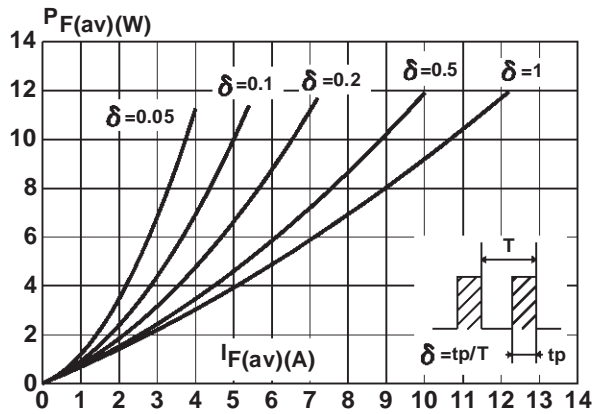
To evaluate the conduction losses use the following equation :

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

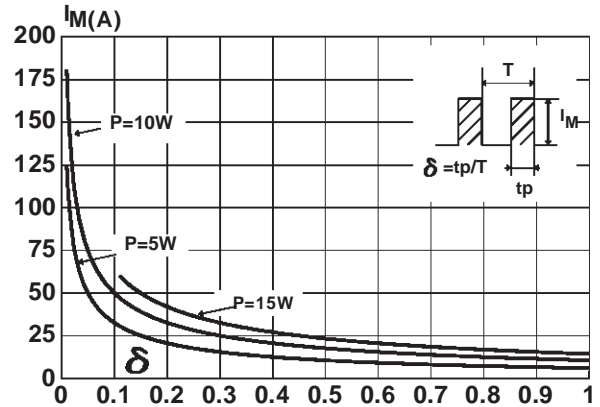
### RECOVERY CHARACTERISTICS

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

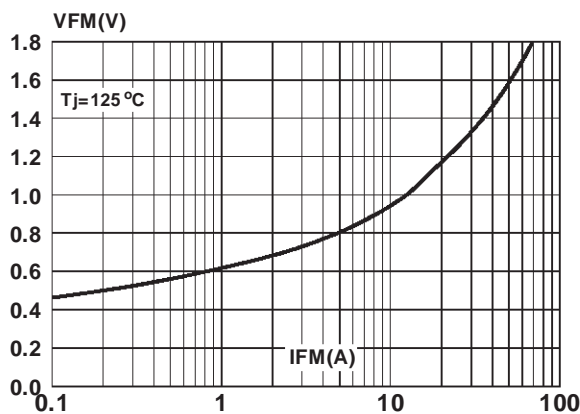
**Fig.1** : Average forward power dissipation versus average forward current.



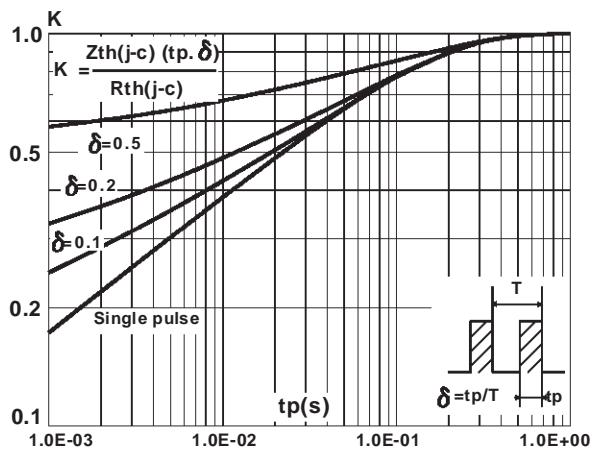
**Fig.2** : Peak current versus form factor.



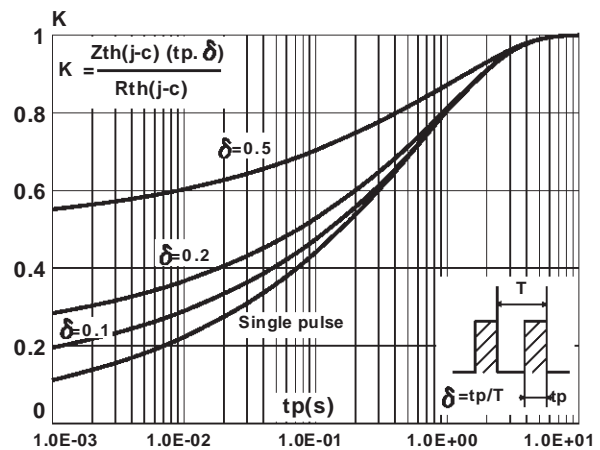
**Fig.3** : Forward voltage drop versus forward current (maximum values).



**Fig.4** : Relative variation of thermal impedance junction to case versus pulse duration. (TO-220AC)

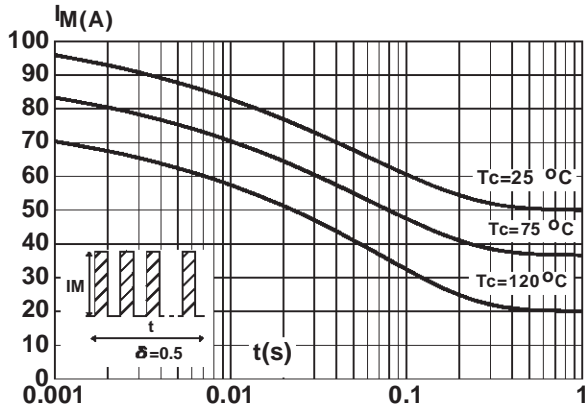


**Fig.5** : Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AC)

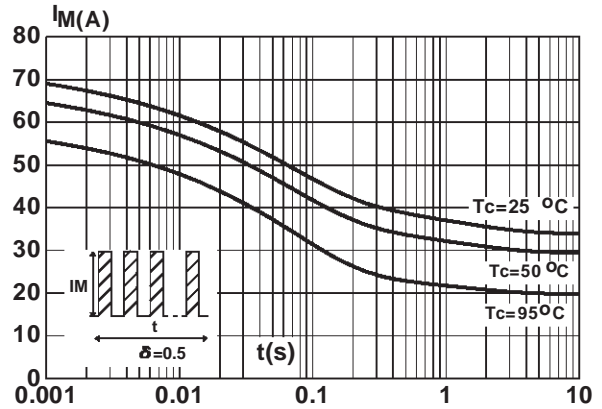


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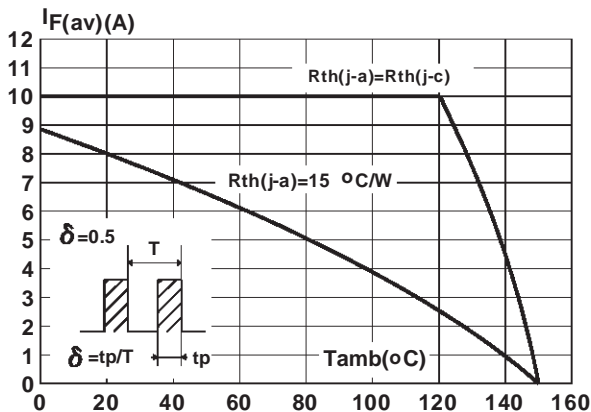
**Fig.6** : Non repetitive surge peak forward current versus overload duration. (TO-220AC)



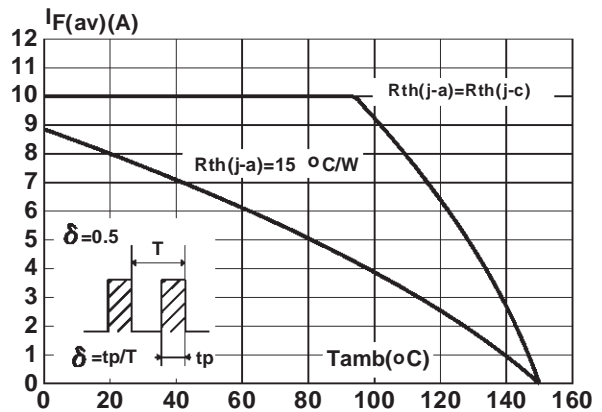
**Fig.7** : Non repetitive surge peak forward current versus overload duration. (ISOWATT220AC)



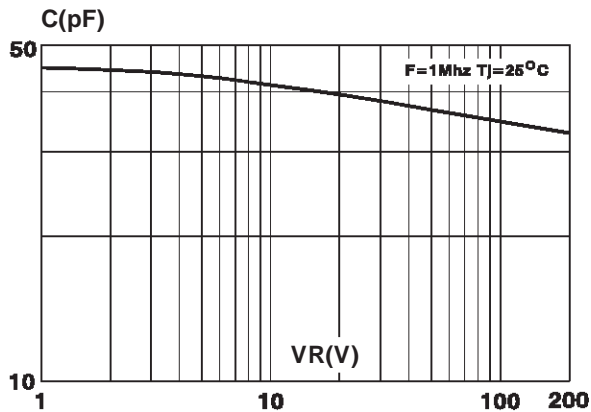
**Fig.8** : Average current versus ambient temperature. (duty cycle : 0.5) (TO-220AC)



**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  $dI_F/dt$ .

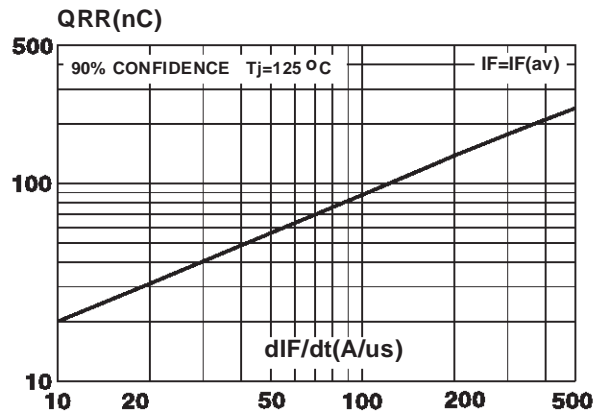


Fig.12 : Peak reverse current versus dIF/dt.

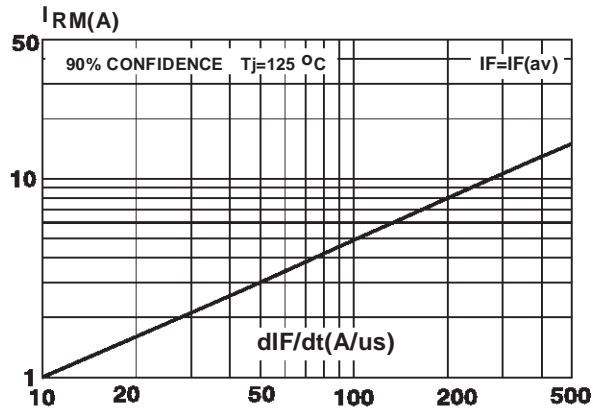
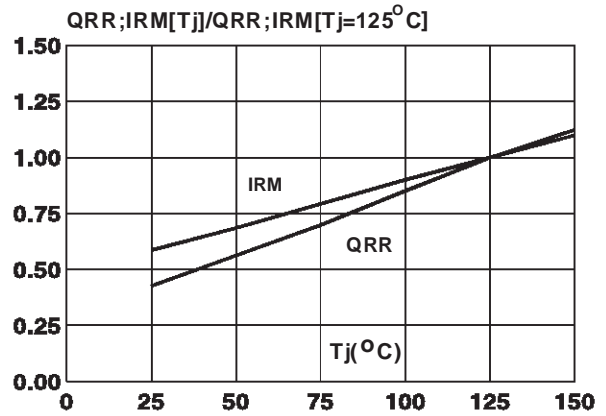
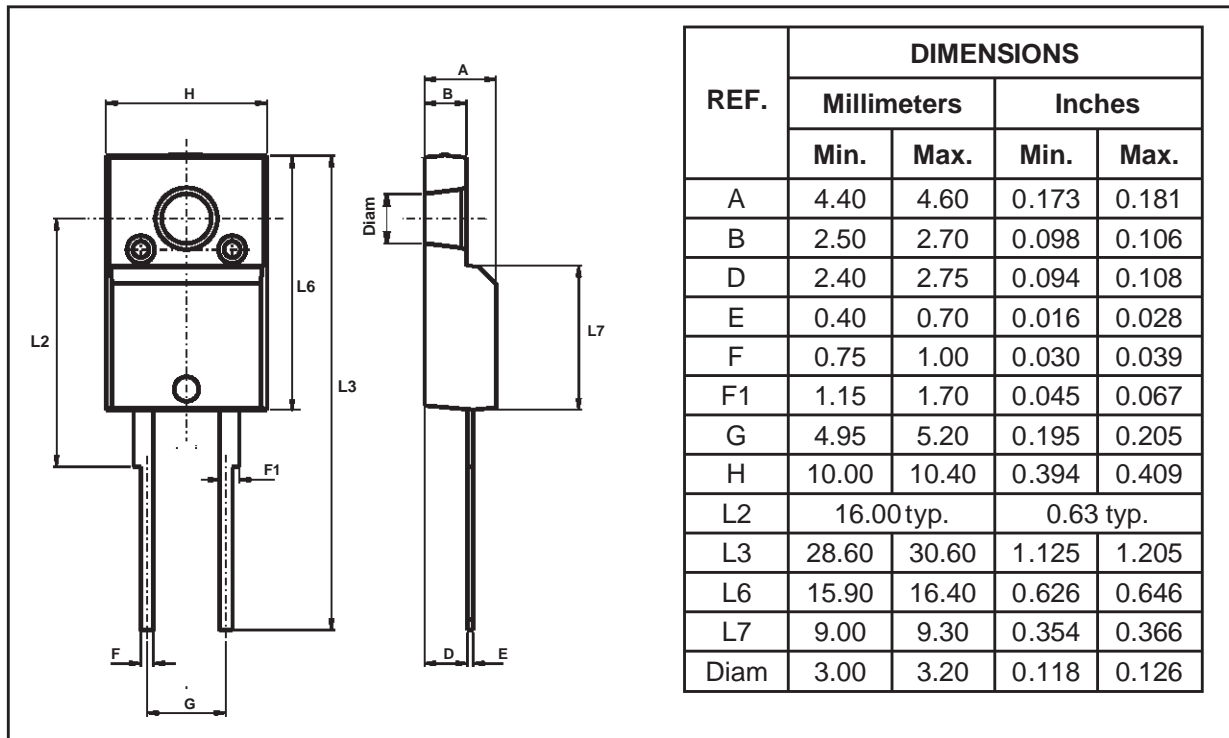


Fig.13 : Dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA

ISOWATT220AC (JEDEC outline)



Cooling method : C

Marking : Type number

Weight : 2 g

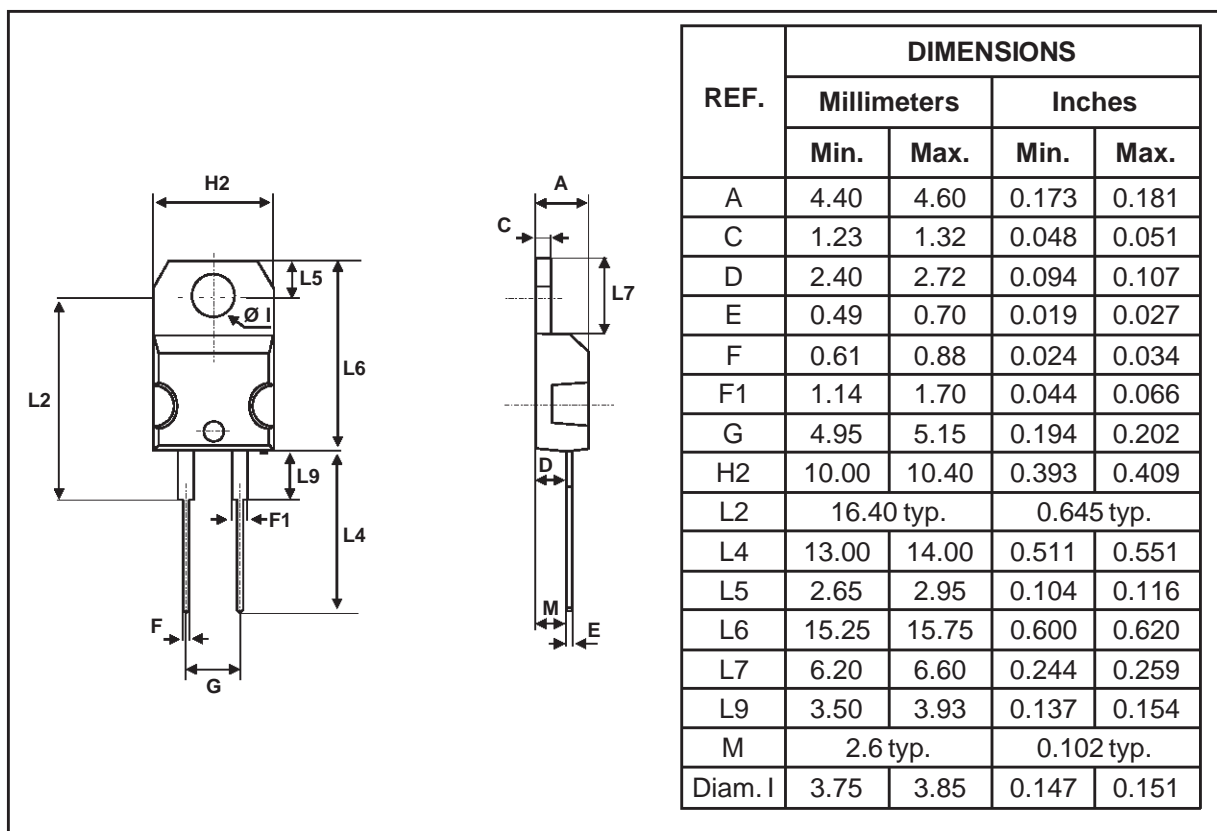
Recommended torque value : 0.55m.N

Maximum torque value : 0.70m.N

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### PACKAGE MECHANICAL DATA

TO-220AC (JEDEC outline)



Cooling method : C

Marking : Type number

Weight : 1.86 g

Recommended torque value : 0.8m.N

Maximum torque value : 1.0m.N

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