

## ULTRA FAST RECOVERY RECTIFIER DIODES

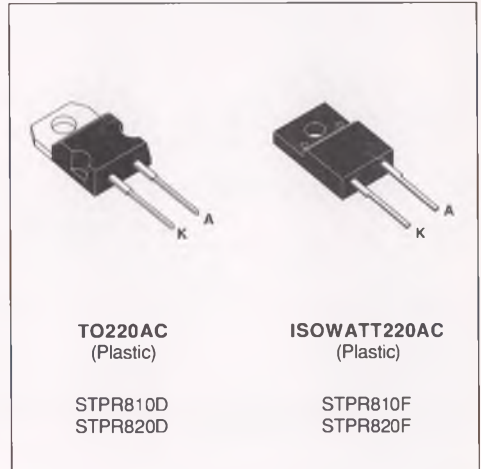
### FEATURES

- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY

### DESCRIPTION

Low cost single chip rectifier suited for switchmode power supply and high frequency DC to DC converters.

Packaged in TO220AC and ISOWATT220AC, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{F(RMS)}$	RMS Forward Current		20	A
$I_F(AV)$	Average Forward Current $\delta = 0.5$	TO220AC	8	A
		ISOWATT220AC		
$I_{FSM}$	Surge Non Repetitive Forward Current		80	A
$T_{stg}$ $T_j$	Storage and Junction Temperature Range		- 65 to + 150 - 65 to + 150	$^\circ\text{C}$

Symbol	Parameter	STPR		Unit
		810D 810F	820D 820F	
$V_{RRM}$	Repetitive Peak Reverse Voltage	100	200	V

### THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction-case	TO220AC	3.0	$^\circ\text{C/W}$
		ISOWATT220AC	5.5	

**ELECTRICAL CHARACTERISTICS**

**STATIC CHARACTERISTICS**

Symbol	Tests Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			50	μA
	T <sub>j</sub> = 100°C				0.6	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 8 A			0.99	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 16 A			1.20	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 16 A			1.25	

Pulse test : \* t<sub>p</sub> = 5 ms, duty cycle < 2 %  
 \*\* t<sub>p</sub> = 380 μs, duty cycle < 2%

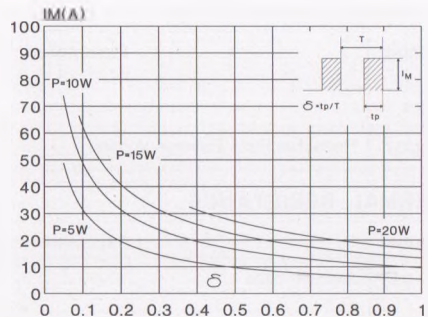
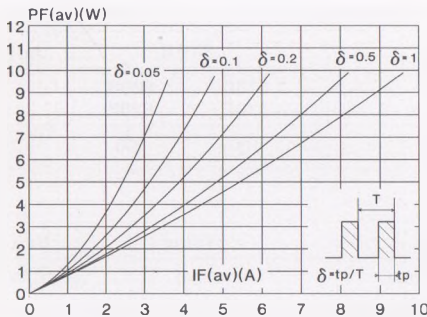
**RECOVERY CHARACTERISTICS**

Symbol	Tests Conditions			Min.	Typ.	Max.	Unit
t <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5 A	I <sub>R</sub> = 1A	I <sub>rr</sub> = 0.25 A		30	ns
t <sub>fr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1 A	t <sub>r</sub> = 10 ns	V <sub>FR</sub> = 1.1 x V <sub>F</sub>	20		ns
V <sub>FP</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1 A	t <sub>r</sub> = 10 ns		3		V

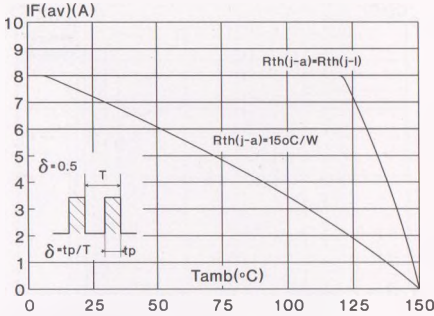
To evaluate the conduction losses use the following equation :  
 $P = 0.78 \times I_F(\text{AV}) + 0.026 I_F^2(\text{RMS})$

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

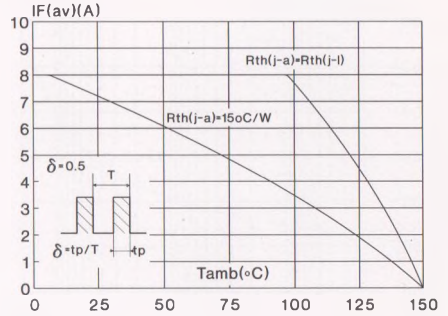
**Fig.2** : Peak current versus form factor.



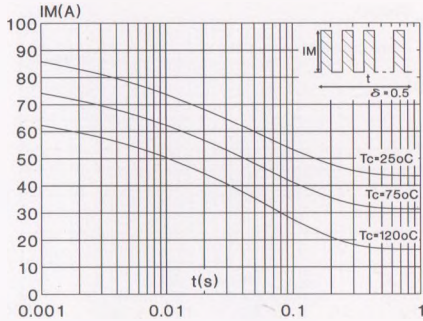
**Fig.3** : Average current versus ambient temperature.  
(duty cycle : 0.5) (TO220AC)



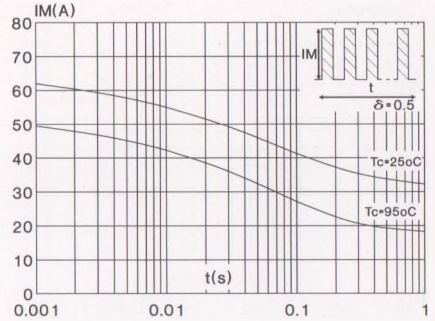
**Fig.4** : Average current versus ambient temperature.  
(duty cycle : 0.5) (ISOWATT220AC)



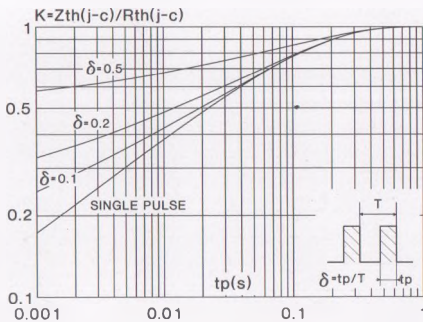
**Fig.5** : Non repetitive surge peak forward current versus overload duration.  
(Maximum values) (TO220AC)



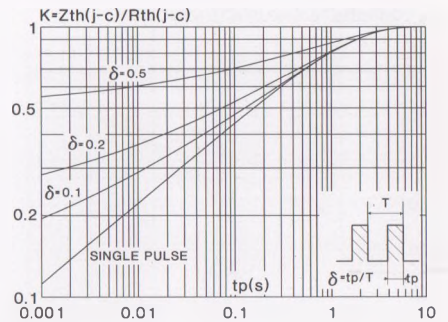
**Fig.6** : Non repetitive surge peak forward current versus overload duration.  
(Maximum values) (ISOWATT220AC)



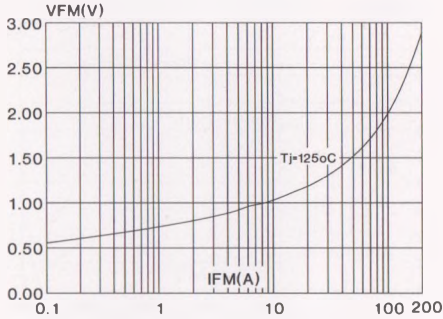
**Fig.7** : Relative variation of thermal transient impedance junction to case versus pulse duration.  
(TO220AC)



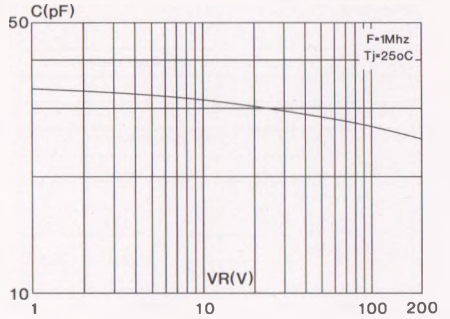
**Fig.8** : Relative variation of thermal transient impedance junction to case versus pulse duration.  
(ISOWATT220AC)



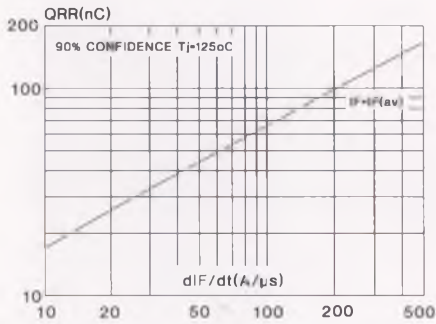
**Fig.9 :** Forward voltage drop versus forward current.  
(Maximum values)



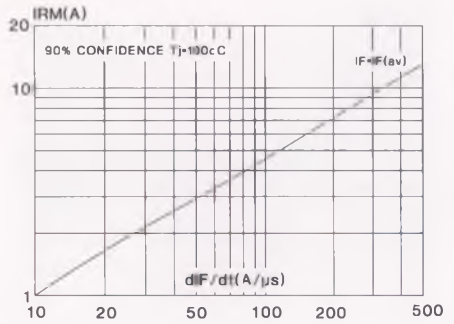
**Fig.10 :** Junction capacitance versus reverse voltage applied.  
(Typical values)



**Fig.11 :** Recovery charge versus dIF/dt.



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



**Fig.13 :** Dynamic parameters versus junction temperature.

