

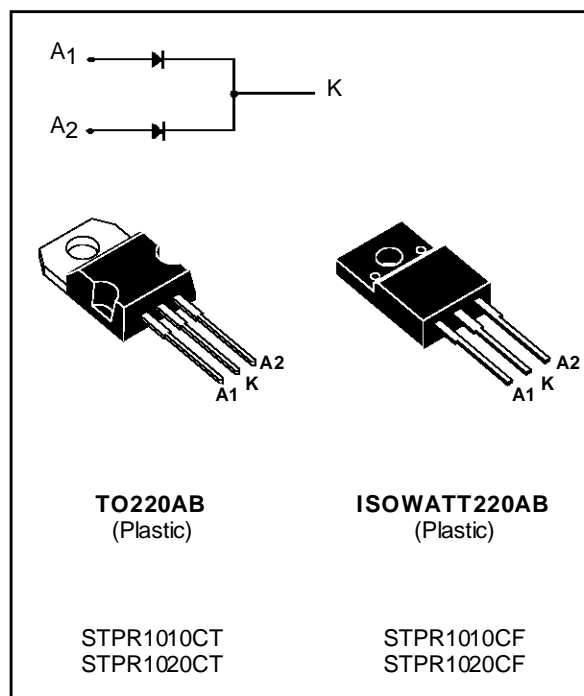
## ULTRA FAST RECOVERY RECTIFIER DIODES

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

### DESCRIPTION

Low cost dual center tap rectifier suited for switch-mode power supply and high frequency DC to DC converters.

Packaged in TO220AB and ISOWATT220AB, 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 <sub>F(RMS)</sub>	RMS Forward Current			10	A	
I <sub>F(AV)</sub>	Average Forward Current $\delta = 0.5$	TO220AB	T <sub>c</sub> = 125°C	Per diode	5	A
		ISOWATT220AB	T <sub>c</sub> = 115°C	Per device	10	
I <sub>FSM</sub>	Surge Non Repetitive Forward Current		T <sub>p</sub> = 10 ms Sinusoidal	Per diode	50	A
T <sub>stg</sub> T <sub>j</sub>	Storage and Junction Temperature Range			- 65 to + 150 - 65 to + 150	°C	

Symbol	Parameter	STPR		Unit
		1010CT 1010CF	1020CT 1020CF	
V <sub>RRM</sub>	Repetitive Peak Reverse Voltage	100	200	V

# STPR1010CT/CF / STPR1020CT/CF

## THERMAL RESISTANCE

Symbol	Parameter		Value	Unit	
Rth (j-c)	Junction-case	TO220AB	Per diode total	4.0	°C/W
		ISOWATT220AB	Per diode total	6.0	
Rth (c)	Coupling			°C/W	

When the diodes 1 and 2 are used simultaneously :  
 $\Delta T_{j(\text{diode } 1)} = P(\text{diode } 1) \times R_{th}(\text{Per diode}) + P(\text{diode } 2) \times R_{th}(c)$

## 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				0.5	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 5 A			0.99	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 10 A			1.20	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 10 A			1.25	

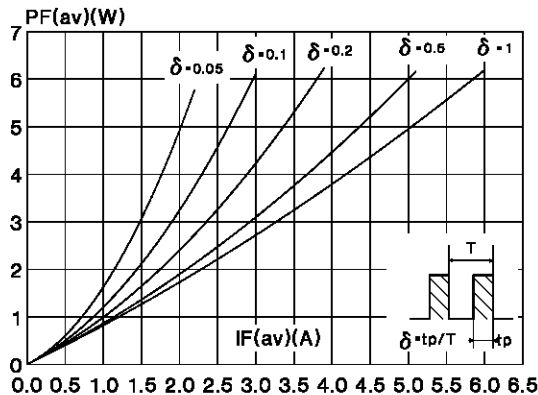
Pulse test : \* tp = 5 ms, duty cycle < 2 %  
 \*\* tp = 380 μs, duty cycle < 2%

### RECOVERY CHARACTERISTICS

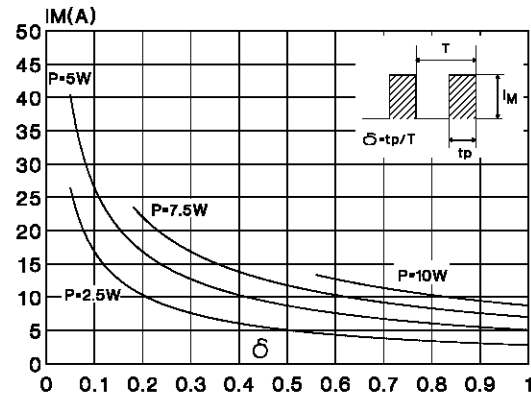
Symbol	Tests Conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5 A I <sub>R</sub> = 1A I <sub>rr</sub> = 0.25 A			30	ns
t <sub>fr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1 A tr = 10 ns V <sub>FR</sub> = 1.1 x V <sub>F</sub>		20		ns
V <sub>FP</sub>	T <sub>j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

To evaluate the conduction losses use the following equation :  
 $P = 0.78 \times I_F(\text{AV}) + 0.042 I_F^2(\text{RMS})$

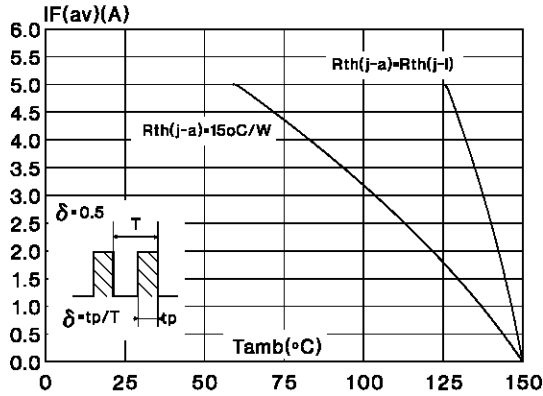
**Fig.1 :** Average forward power dissipation versus average forward current. (Per diode)



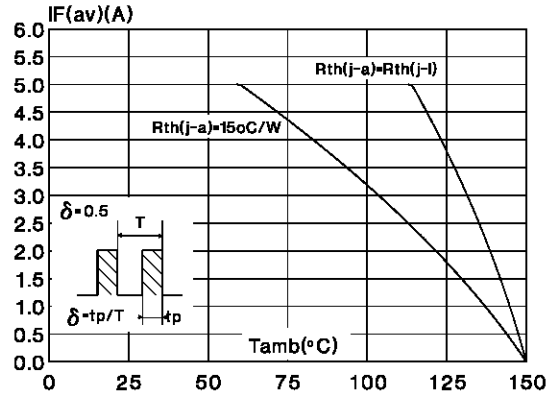
**Fig.2 :** Peak current versus form factor. (Per diode)



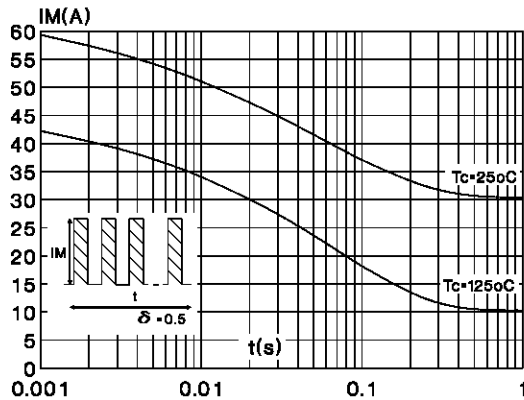
**Fig.3 :** Average current versus ambient temperature.  
(duty cycle : 0.5) (TO220AB)



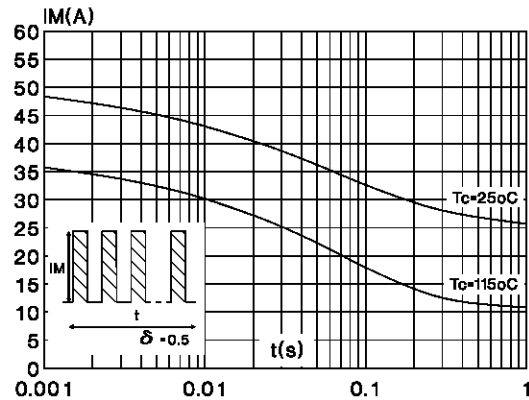
**Fig.4 :** Average current versus ambient temperature.  
(duty cycle : 0.5) (ISOWATT220AB)



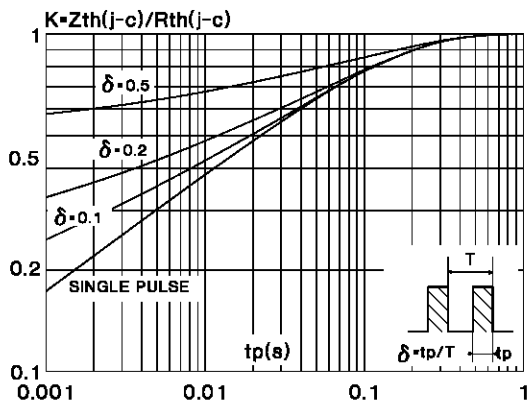
**Fig.5 :** Non repetitive surge peak forward current versus overload duration.  
(Maximum values) (TO220AB) (Per diode)



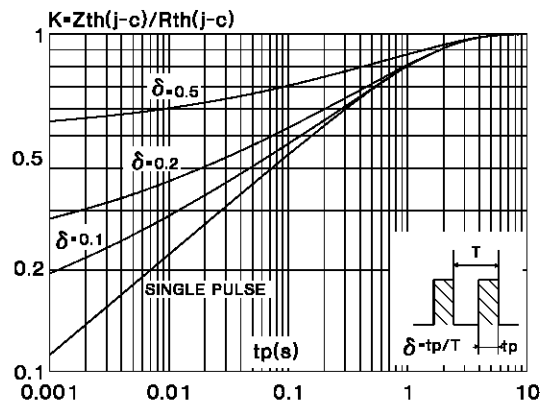
**Fig.6 :** Non repetitive surge peak forward current versus overload duration.  
(Maximum values) (ISOWATT220AB) (Per diode)



**Fig.7 :** Relative variation of thermal transient impedance junction to case versus pulse duration.  
(TO220AB) (Per diode)

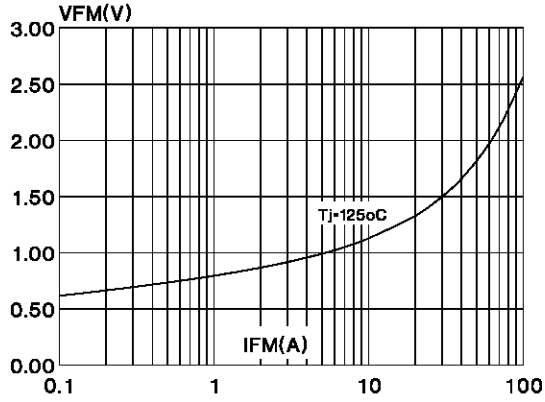


**Fig.8 :** Relative variation of thermal transient impedance junction to case versus pulse duration.  
(ISOWATT220AB) (Per diode)

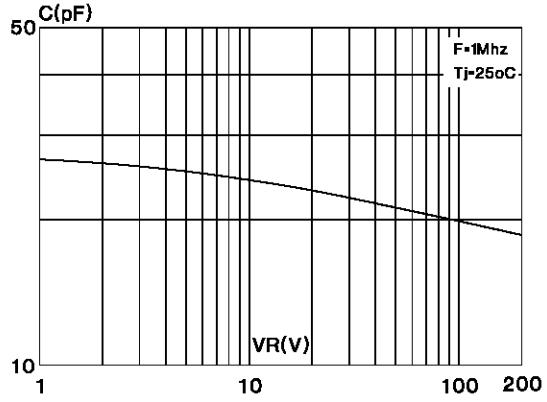


# STPR1010CT/CF / STPR1020CT/CF

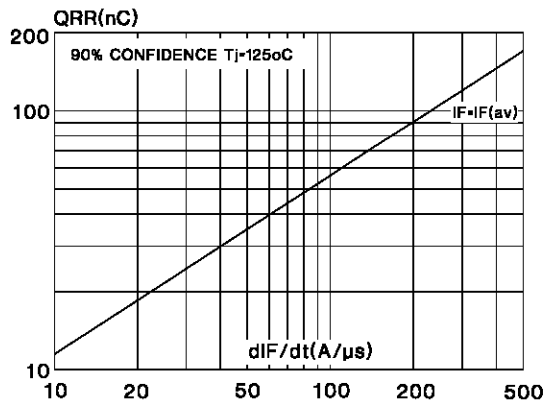
**Fig.9 :** Forward voltage drop versus forward current. (Maximum values) (Per diode)



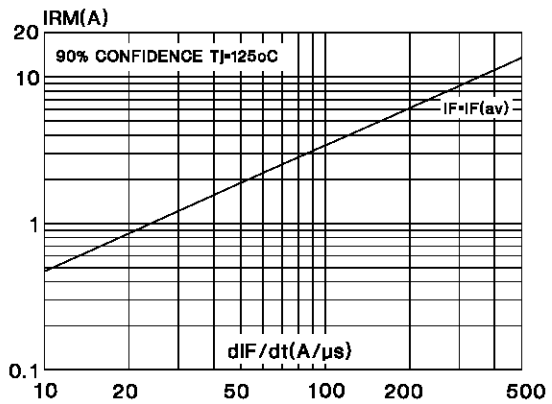
**Fig.10 :** Junction capacitance versus reverse voltage applied. (Typical values) (Per diode)



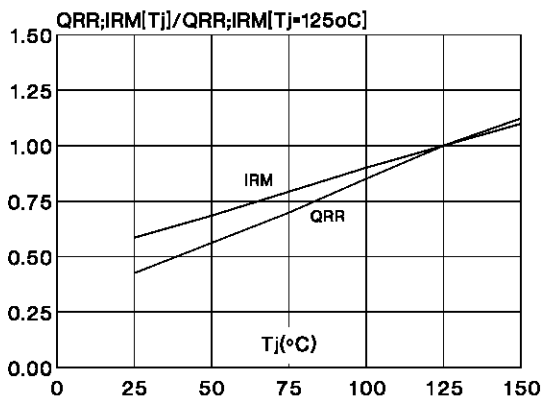
**Fig.11 :** Recovery charge versus  $dI_F/dt$ . (Per diode)



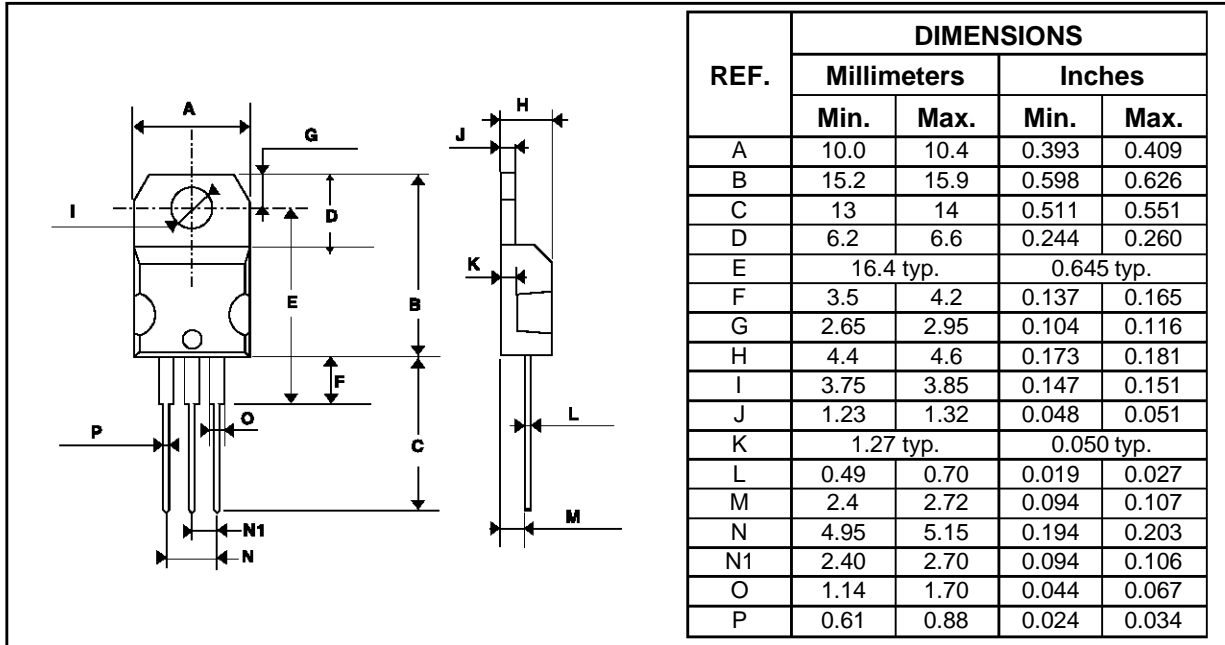
**Fig.12 :** Peak reverse current versus  $dI_F/dt$ . (Per diode)



**Fig.13 :** Dynamic parameters versus junction temperature. (Per diode)

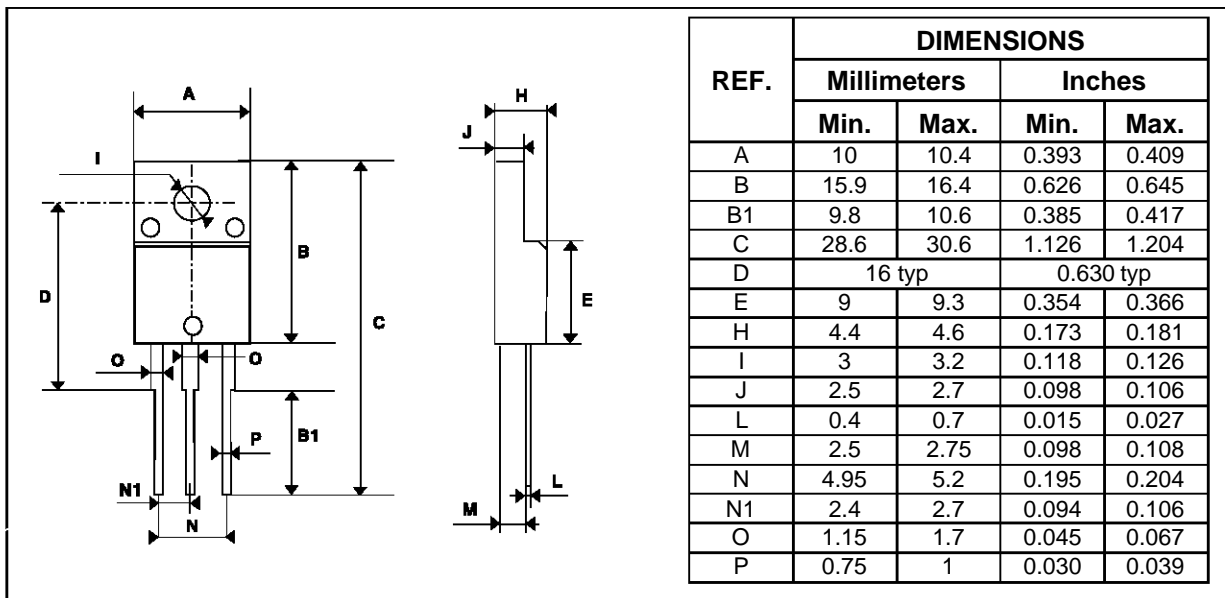


**PACKAGE MECHANICAL DATA**  
TO220AB (JEDEC outline)



Cooling method : C  
 Marking : Type number  
 Weight : 2 g  
 Recommended torque value : 0.55m.N  
 Maximum torque value : 0.7m.N

**PACKAGE MECHANICAL DATA**  
ISOWATT220AB (JEDEC outline)



Cooling method : C  
 Marking : Type number  
 Weight : 2.1 g  
 Recommended torque value : 0.55m.N  
 Maximum torque value : 0.70m.N  
 Electrical isolation : 2000V DC  
 Capacitance : 12pF

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