

HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

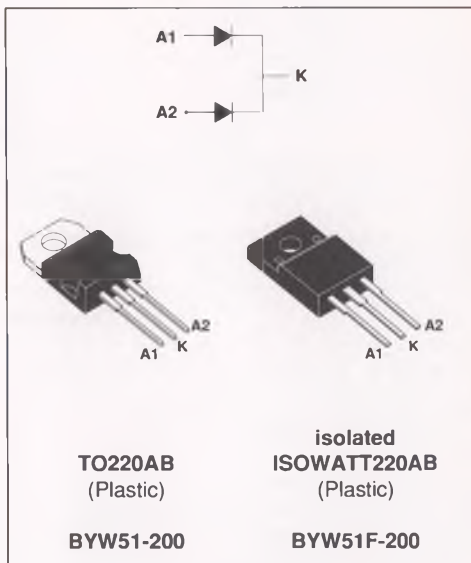
FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- INSULATED VERSION (ISOWATT220AB) :
Insulating voltage = 2000 V DC
Capacitance = 12 pF

DESCRIPTION

Dual center tap rectifier suited for switchmode power supply and high frequency DC to DC converters.

Packaged in TO220AB, or ISOWATT220AB 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 $\delta = 0.5$	TO220AB	$T_c = 120^\circ\text{C}$	Per diode	10	A
		ISOWATT220AB	$T_c = 95^\circ\text{C}$	Per diode	10	A
I_{FSM}	Surge non repetitive forward current		$t_p = 10\text{ms}$ sinusoidal	Per diode	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	BYW51-(F)				Unit
		50	100	150	200	
V_{RRM}	Repetitive peak reverse voltage	50	100	150	200	V

THERMAL RESISTANCE

Symbol	Parameter		Value	Unit	
Rth (j-c)	Junction to case	TO220AB	Per diode	2.5	°C/W
			Total	1.4	
		ISOWATT220AB	Per diode	5.1	
			Total	4.05	
Rth (c)	Coupling	TO220AB	0.25	°C/W	
		ISOWATT220AB	3.0		

When the diodes 1 and 2 are used simultaneously :

$$T_j - T_c (\text{diode } 1) = P(\text{diode } 1) \times R_{th}(j-c) (\text{Per diode}) + P(\text{diode } 2) \times R_{th}(c)$$

ELECTRICAL CHARACTERISTICS (Per diode)
STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I _R *	T _j = 25°C	V _R = V _{RRM}			15	μA
	T _j = 100°C				1	mA
V _F **	T _j = 125°C	I _F = 8 A			0.85	V
	T _j = 125°C	I _F = 16 A			1.05	
	T _j = 25°C	I _F = 16 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 :

$$P = 0.65 \times I_{F(AV)} + 0.025 \times I_{F(RMS)}^2$$

RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	T _j = 25°C	I _F = 0.5A I _{RR} = 0.25A I _R = 1A			25	ns
		I _F = 1A dI _F /dt = -50A/μs V _R = 30V			35	
tfr	T _j = 25°C	I _F = 1A tr = 10 ns V _{FR} = 1.1 x V _F		15		ns
V _{FP}	T _j = 25°C	I _F = 1A tr = 10 ns		2		V

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

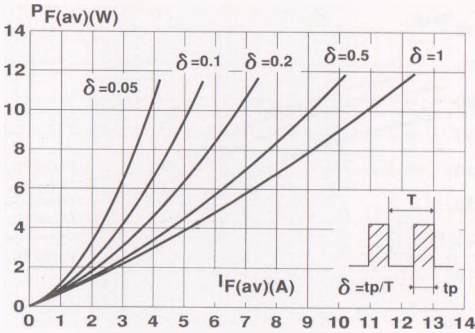


Fig.2 : Peak current versus form factor.

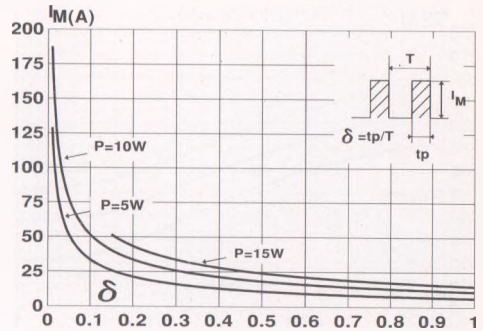


Fig.3 : Forward voltage drop versus forward current (maximum values).

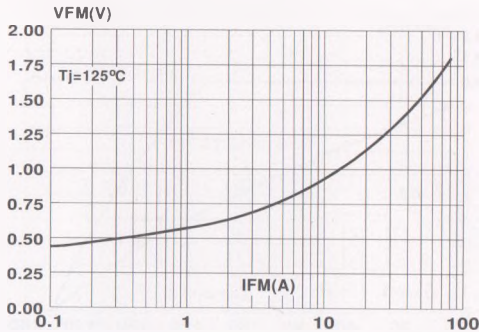


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration. (TO220AB)

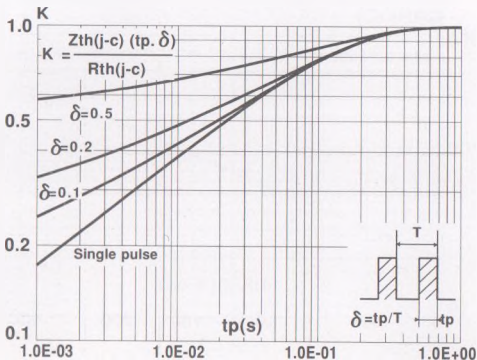


Fig.5 : Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AB)

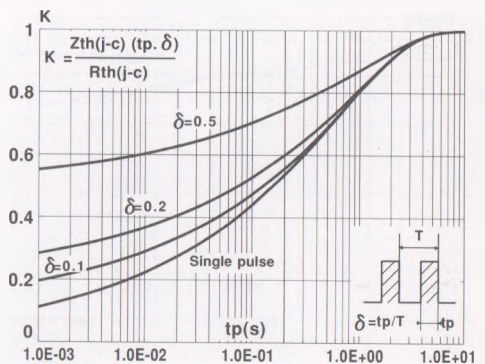


Fig.6 : Non repetitive surge peak forward current versus overload duration. (TO220AB)

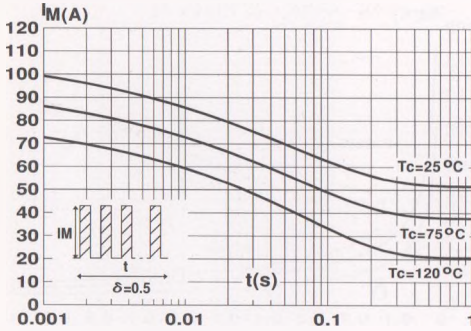


Fig.7 : Non repetitive surge peak forward current versus overload duration. (ISOWATT220AB)

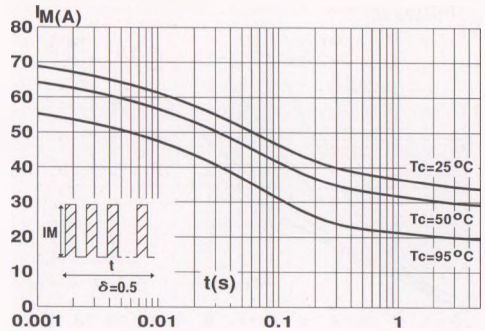


Fig.8 : Average current versus ambient temperature. (duty cycle : 0.5) (TO220AB)

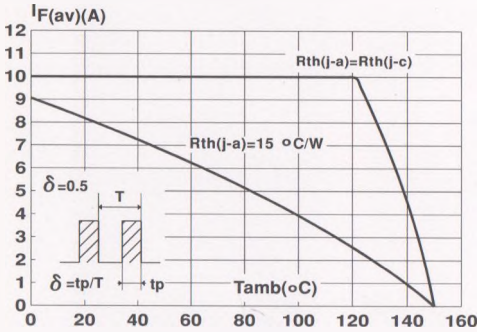


Fig.9 : Average current versus ambient temperature. (duty cycle : 0.5) (ISOWATT220AB)

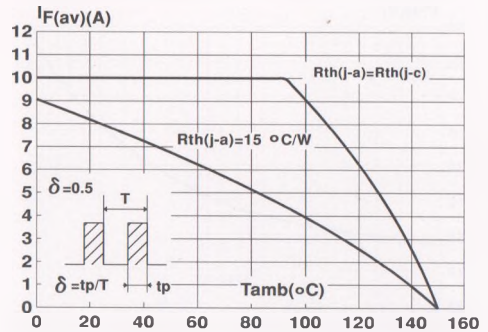


Fig.10 : Junction capacitance versus reverse voltage applied (Typical values).

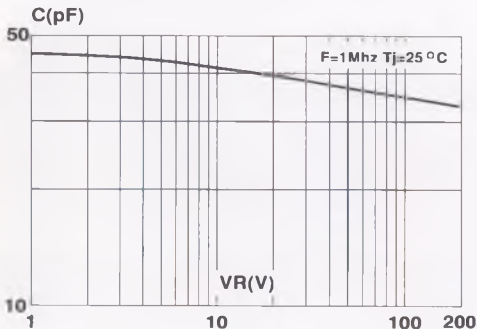


Fig.11 : Recovery charges versus dI_F/dt .

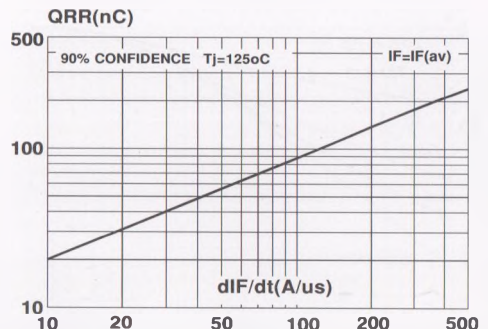


Fig.12 : Peak reverse current versus dIF/dt.

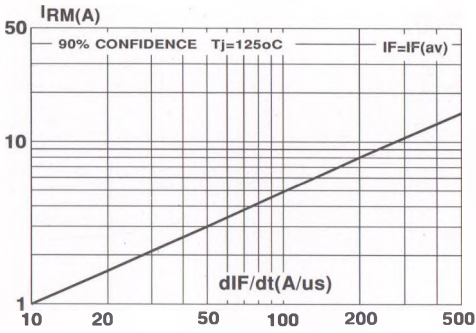


Fig.13 : Dynamic parameters versus junction temperature.

