

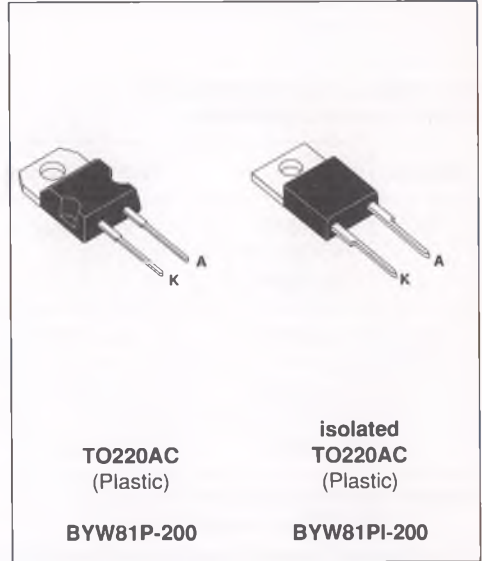
## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- INSULATED VERSION :  
Insulating voltage = 2500 V<sub>RMS</sub>  
Capacitance = 7 pF

### DESCRIPTION

Single chip rectifier suited for switchmode power supply and high frequency DC to DC converters. Packaged in TO220AC 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		35	A	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	BYW81P	$T_c = 115^\circ\text{C}$	15	A
		BYW81PI	$T_c = 90^\circ\text{C}$	15	
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10\text{ms}$ sinusoidal	200	A
$T_{stg}$ $T_j$	Storage and junction temperature range		- 40 to + 150 - 40 to + 150	$^\circ\text{C}$ $^\circ\text{C}$	

Symbol	Parameter	BYW81P-/PI-				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	BYW81P	2.0	°C/W
		BYW81PI	3.5	

**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>			20	μA
	T <sub>j</sub> = 100°C				1.5	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 12 A			0.85	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 25 A			1.05	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 25 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 :

$$P = 0.65 \times I_{F(AV)} + 0.016 \times I_{F(RMS)}^2$$

**RECOVERY CHARACTERISTICS**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A      I <sub>rr</sub> = 0.25A I <sub>R</sub> = 1A			25	ns
		I <sub>F</sub> = 1A      dI <sub>F</sub> /dt = -50A/μs V <sub>R</sub> = 30V			40	
tfr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A      tr = 10 ns 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      tr = 10 ns		2		V

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

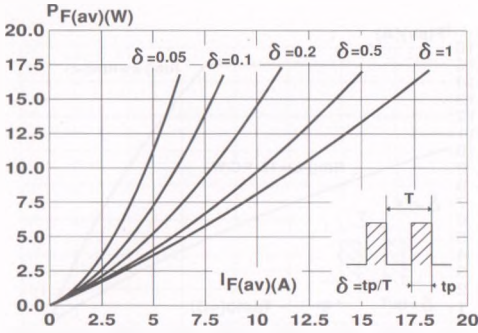


Fig.2 : Peak current versus form factor.

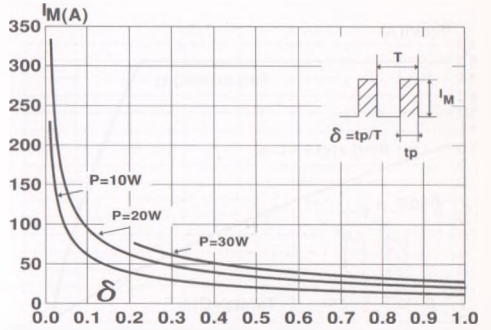


Fig.3 : Forward voltage drop versus forward current (maximum values).

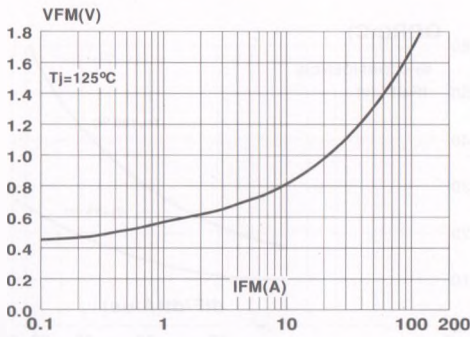


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

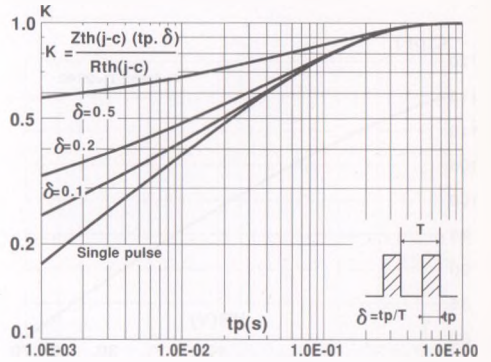


Fig.5 : Non repetitive surge peak forward current versus overload duration. (BYW81P)

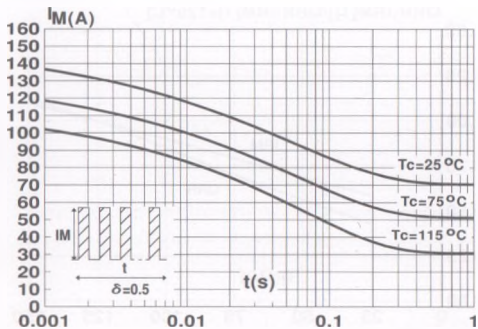


Fig.6 : Non repetitive surge peak forward current versus overload duration. (BYW81PI)

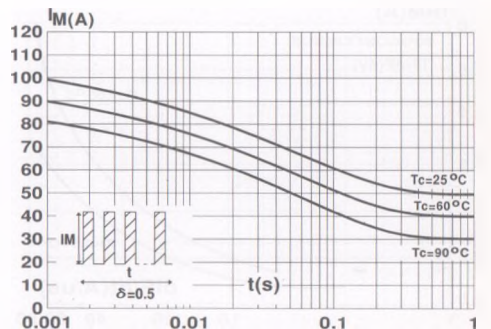


Fig.7 : Average current versus ambient temperature.  
(duty cycle : 0.5) (BYW81P)

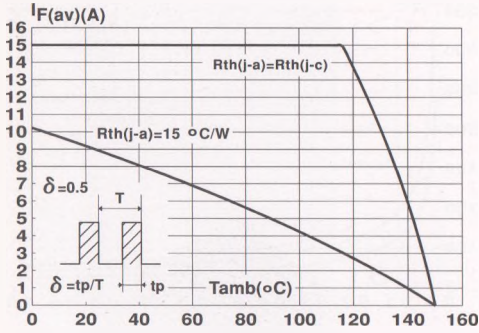


Fig.8 : Average current versus ambient temperature.  
(duty cycle : 0.5) (BYW81PI)

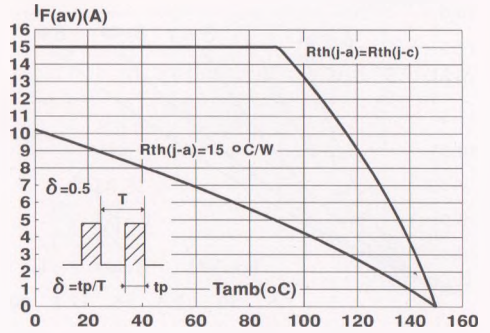


Fig.9 : Junction capacitance versus reverse voltage applied (Typical values).

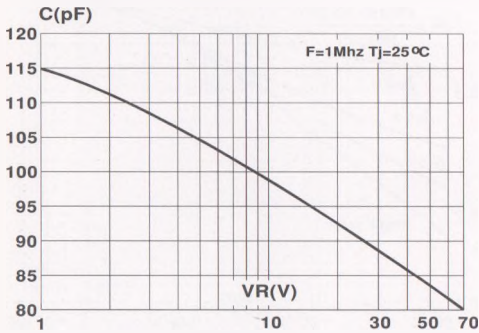


Fig.10 : Recovery charges versus diF/dt.

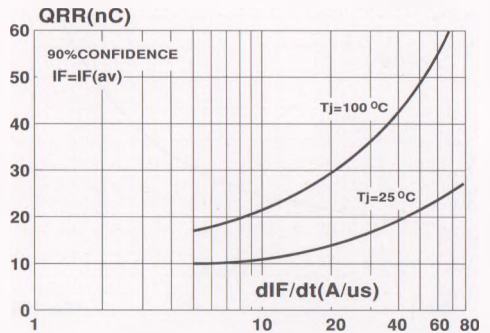


Fig.11 : Peak reverse current versus diF/dt.

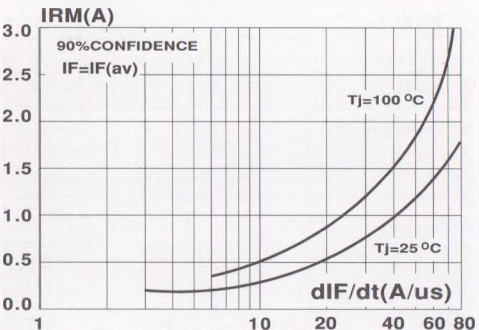


Fig.12 : Dynamic parameters versus junction temperature.

