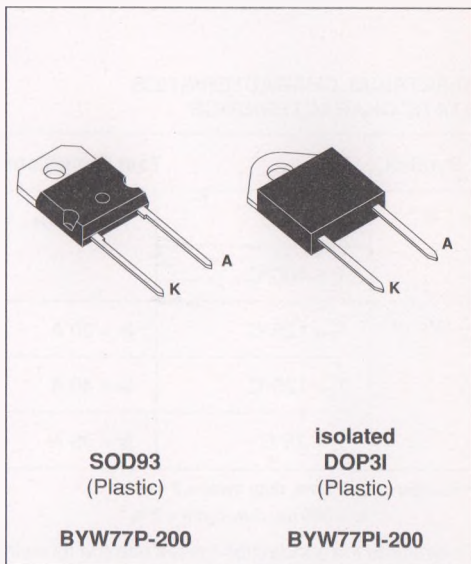


## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### 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 DC  
 Capacitance = 12 pF



### DESCRIPTION

Single chip rectifier suited for switchmode power supply and high frequency DC to DC converters. Packaged in SOD93, or DOP3I 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			50	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	SOD93	$T_c = 125^\circ\text{C}$	25	A
		TOP3I	$T_c = 100^\circ\text{C}$	25	
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10\text{ms}$ sinusoidal	500	A
$T_{stg}$ $T_j$	Storage and junction temperature range			- 40 to + 150 - 40 to + 150	$^\circ\text{C}$ $^\circ\text{C}$

Symbol	Parameter	BYW77P-/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	SOD93	1.0	°C/W
		DOP3I	1.8	

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>			25	μA
	T <sub>j</sub> = 100°C				2.5	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 20 A			0.85	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 40 A			1.00	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 40 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 :

$$P = 0.7 \times I_{F(AV)} + 0.0075 \times I_{F(RMS)}^2$$

## RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5 A I <sub>R</sub> = 1 A			35	ns
		I <sub>F</sub> = 1 A V <sub>R</sub> = 30V		dI <sub>F</sub> /dt = -50A/μs	50	
tfr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1 A V <sub>FR</sub> = 1.1 x V <sub>F</sub>		10		ns
V <sub>FP</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1 A		1.5		V

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

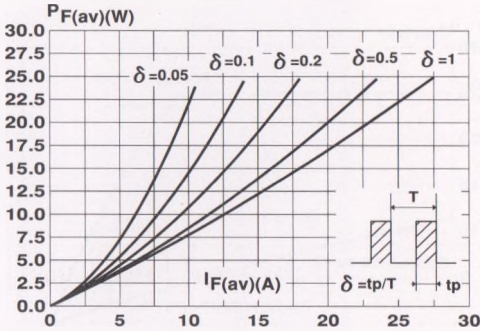


Fig.2 : Peak current versus form factor.

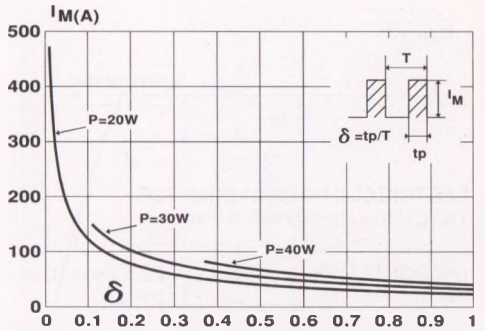


Fig.3 : Forward voltage drop versus forward current (maximum values).

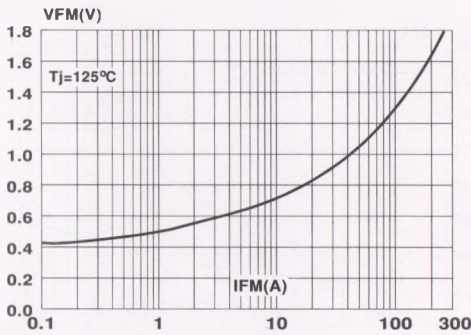


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

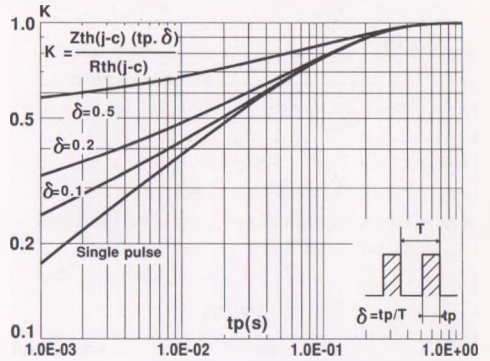


Fig.5 : Non repetitive surge peak forward current versus overload duration. (BYW81P)

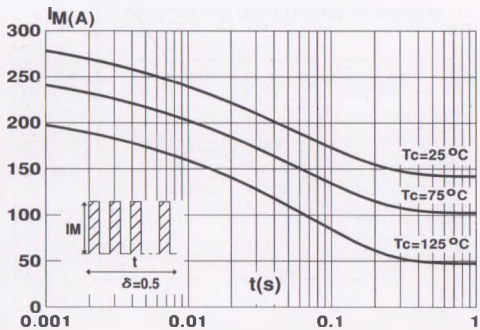
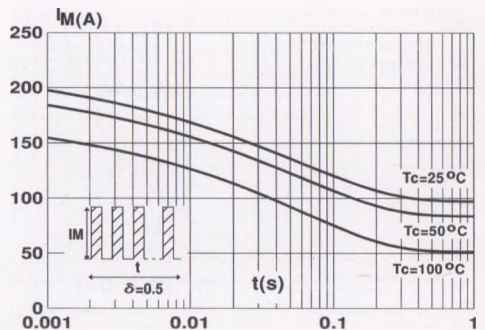
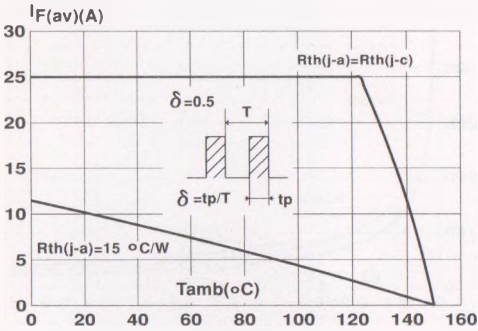


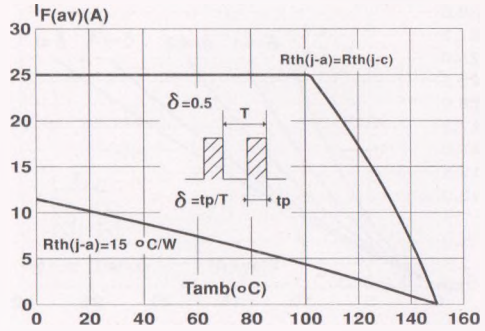
Fig.6 : Non repetitive surge peak forward current versus overload duration. (BYW81PI)



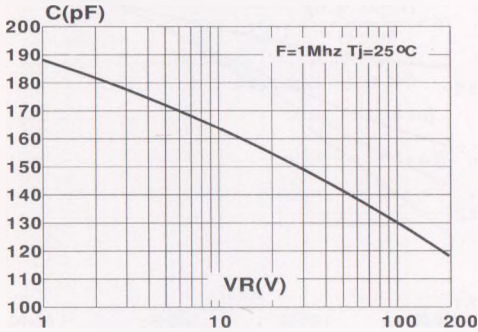
**Fig.7** : Average current versus ambient temperature.  
(duty cycle : 0.5) (SOD93)



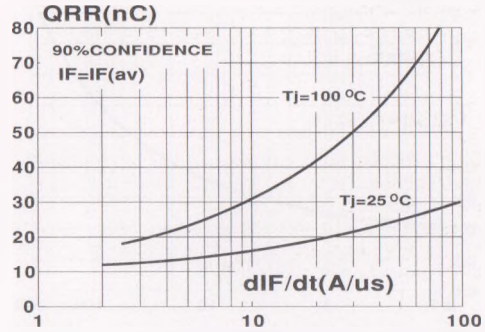
**Fig.8** : Average current versus ambient temperature.  
(duty cycle : 0.5) (DOP31)



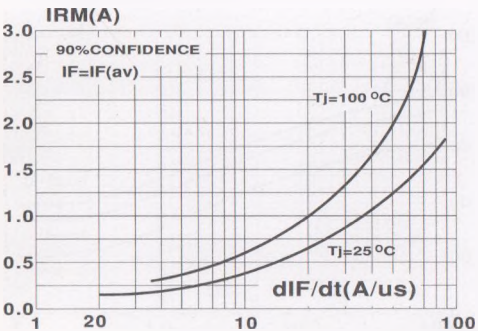
**Fig.9** : Junction capacitance versus reverse voltage applied (Typical values).



**Fig.10** : Recovery charges versus  $dI_F/dt$ .



**Fig.11** : Peak reverse current versus  $dI_F/dt$ .



**Fig.12** : Dynamic parameters versus junction temperature.

