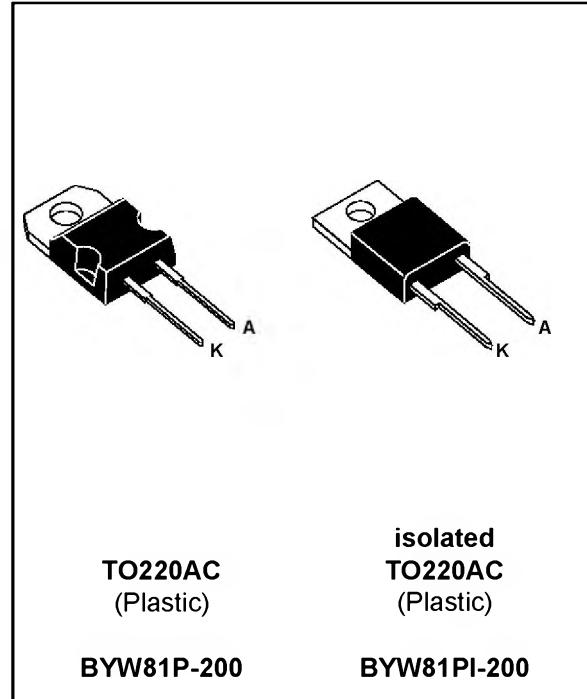


HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

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_{RMS}
 - 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 δ = 0.5	BYW81P	T _c =115°C	15	A
		BYW81PI	T _c =90°C	15	
I _{FSM}	Surge non repetitive forward current		tp=10ms sinusoidal	200	A
T _{stg} T _j	Storage and junction temperature range			- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	BYW81P-/PI-				Unit
		50	100	150	200	
V _{RRM}	Repetitive peak reverse voltage	50	100	150	200	V

BYW81P/PI

THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
R _{th} (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 _R *	T _j = 25°C	V _R = V _{RRM}			20	μA
	T _j = 100°C				1.5	mA
V _F **	T _j = 125°C	I _F = 12 A			0.85	V
	T _j = 125°C	I _F = 25 A			1.05	
	T _j = 25°C	I _F = 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 :

$$P = 0.65 \times I_F(AV) + 0.016 \times I_F^2(RMS)$$

RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
tr	T _j = 25°C	I _F = 0.5A	I _{rr} = 0.25A		25	ns
		I _R = 1A				
tfr	T _j = 25°C	I _F = 1A	dI _F /dt = -50A/μs		40	
		V _{FR} = 1.1 x V _F				
V _{FP}	T _j = 25°C	I _F = 1A	tr = 10 ns	15		ns
				2		V

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

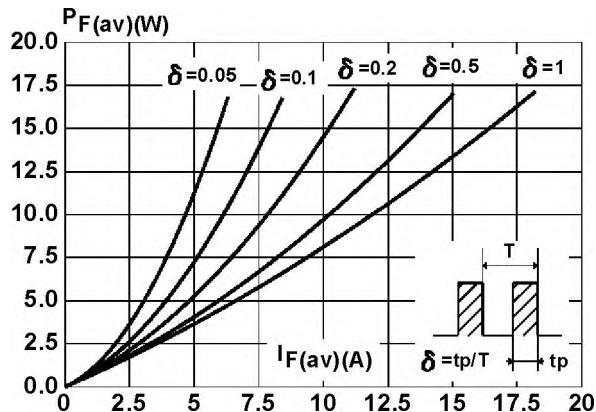


Fig.3 : Forward voltage drop versus forward current (maximum values).

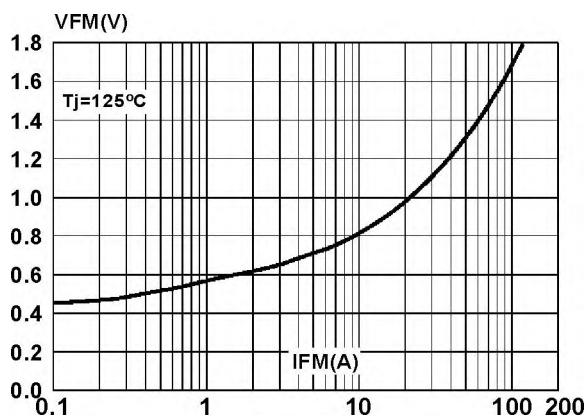


Fig.5 : Non repetitive surge peak forward current versus overload duration.
(BYW81P)

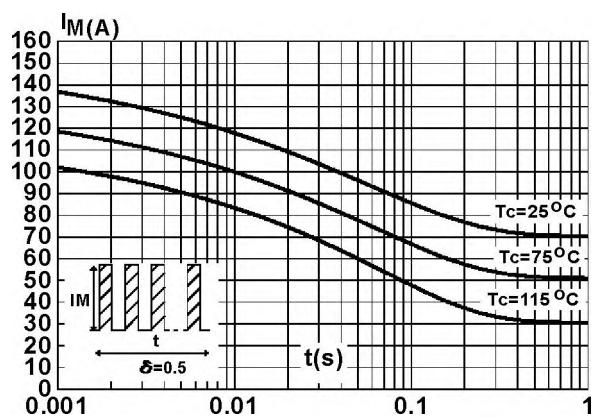


Fig.2 : Peak current versus form factor.

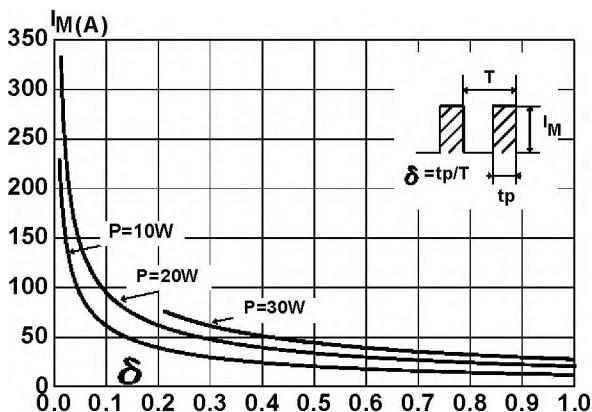


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

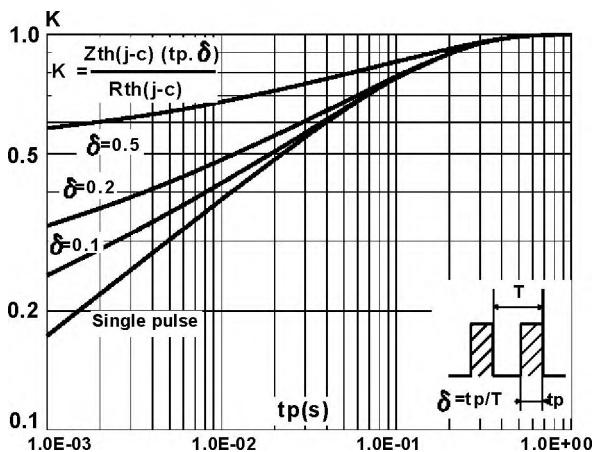
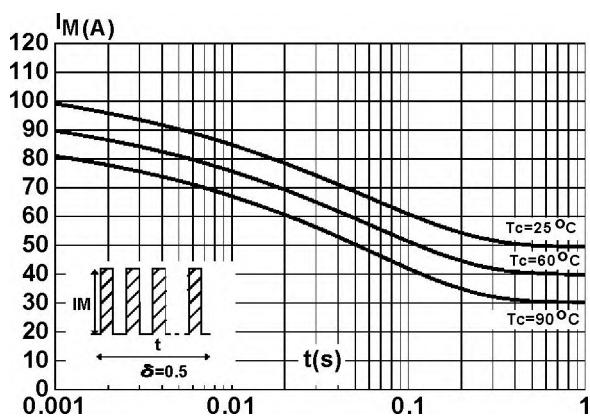


Fig.6 : Non repetitive surge peak forward current versus overload duration.
(BYW81P)



BYW81P/PI

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

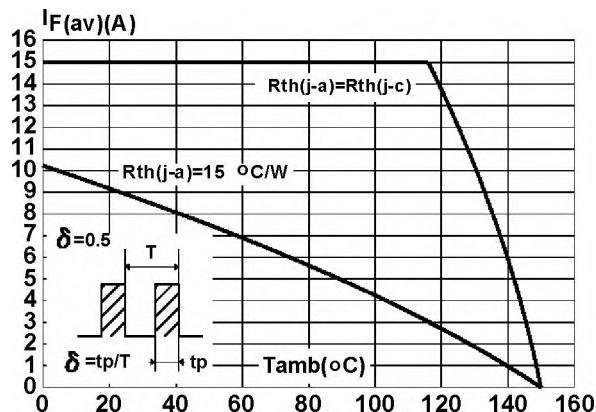


Fig.9 : Junction capacitance versus reverse voltage applied (Typical values).

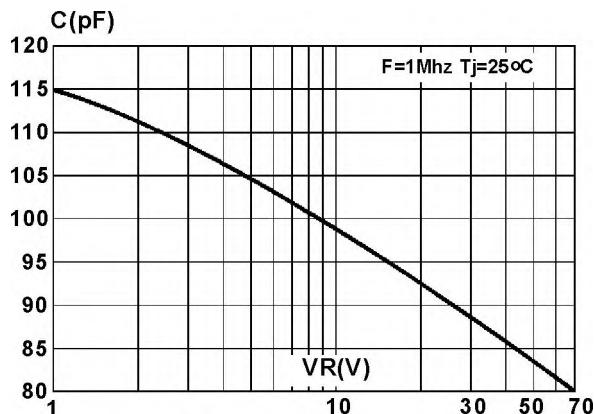


Fig.11 : Peak reverse current versus $dI/F/dt$.

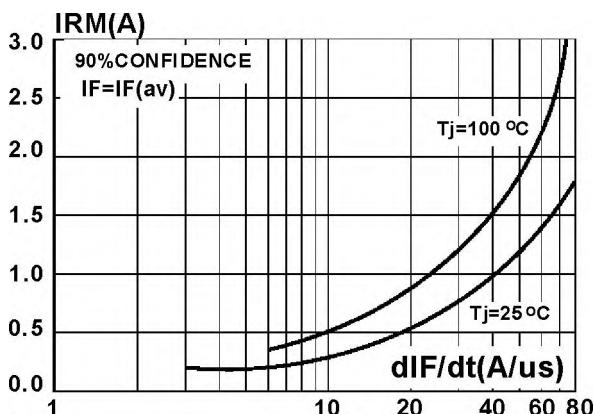


Fig.8 : Average current versus ambient temperature.
(duty cycle : 0.5) (BYW81PI)

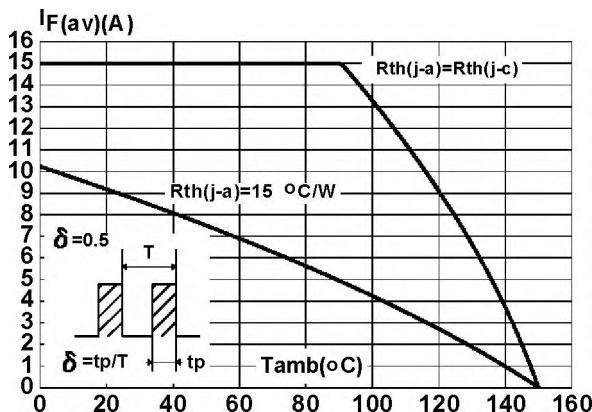


Fig.10 : Recovery charges versus $dI/F/dt$.

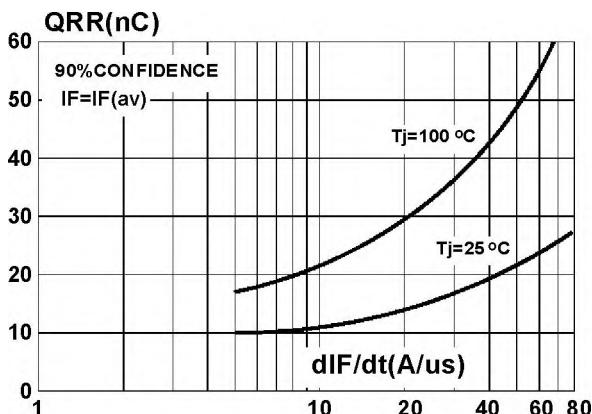
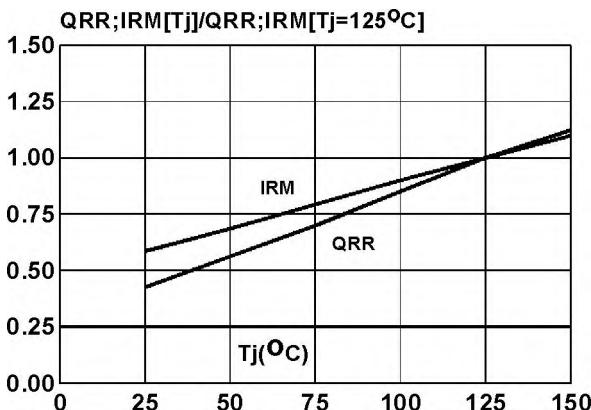
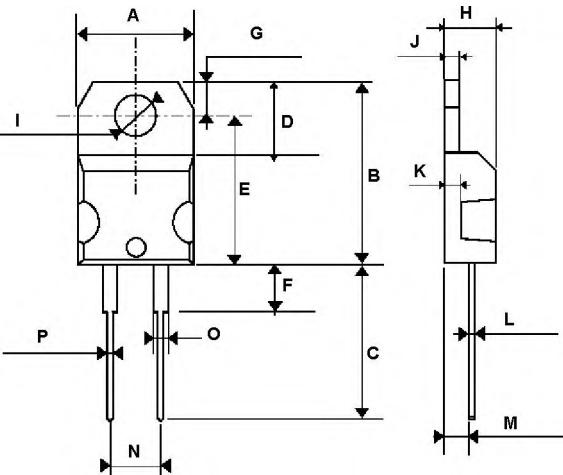


Fig.12 : Dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA
TO220AC (JEDEC outline)



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10	10.4	0.393	0.409
B	15.2	15.9	0.598	0.626
C	13	14	0.511	0.551
D	6.2	6.6	0.244	0.260
E	16.4 typ.		0.645 typ.	
F	3.5	4.2	0.137	0.165
G	2.65	2.95	0.104	0.116
H	4.4	4.6	0.173	0.181
I	3.75	3.85	0.147	0.151
J	1.23	1.32	0.048	0.051
K	1.27 typ.		0.050 typ.	
L	0.49	0.70	0.019	0.027
M	2.4	2.72	0.094	0.107
N	4.95	5.15	0.194	0.203
O	1.14	1.70	0.044	0.067
P	0.61	0.88	0.024	0.034

Cooling method : C

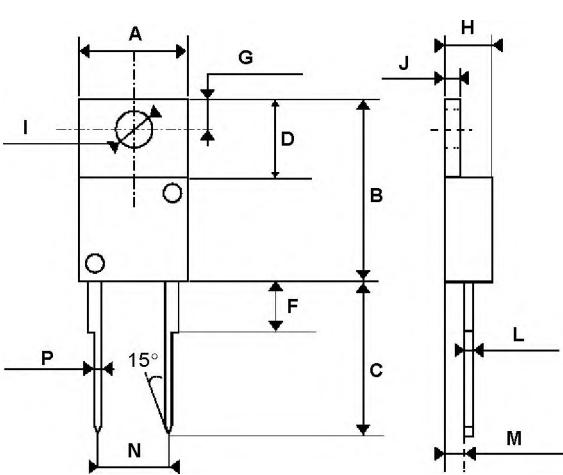
Marking : Type number

Weight : 1.9 g

Recommended torque value : 0.8m.N

Maximum torque value : 1.0m.N

PACKAGE MECHANICAL DATA
TO220AC (isolated)



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10.20	10.40	0.401	0.401
B	14.23	15.87	0.560	0.625
C	12.70	14.70	0.500	0.579
D	5.85	6.85	0.230	0.270
F		4.50		0.178
G	2.54	3.00	0.100	0.119
H	4.48	4.82	0.176	0.190
I	3.55	4.00	0.139	0.158
J	1.15	1.39	0.045	0.055
L	0.35	0.65	0.013	0.026
M	2.10	2.70	0.082	0.107
N	4.58	5.58	0.18	0.22
P	0.64	0.96	0.025	0.038

Cooling method : C

Marking : Type number

Weight : 2.2 g

Recommended torque value : 0.8m.N

Maximum torque value : 1.0m.N

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

Purchase of I²C Components by SGS-THOMSON Microelectronics, conveys a licence under the Philips I²C Patent. Rights to use these components in an I²C system, is granted provided that the system conforms to the I²C Standard Specification as defined by Philips.

SGS-THOMSON Microelectronics GROUP OF COMPANIES
Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A