

## HIGH EFFICIENCY FAST RECOVERY DIODES

**MAIN PRODUCT CHARACTERISTICS**

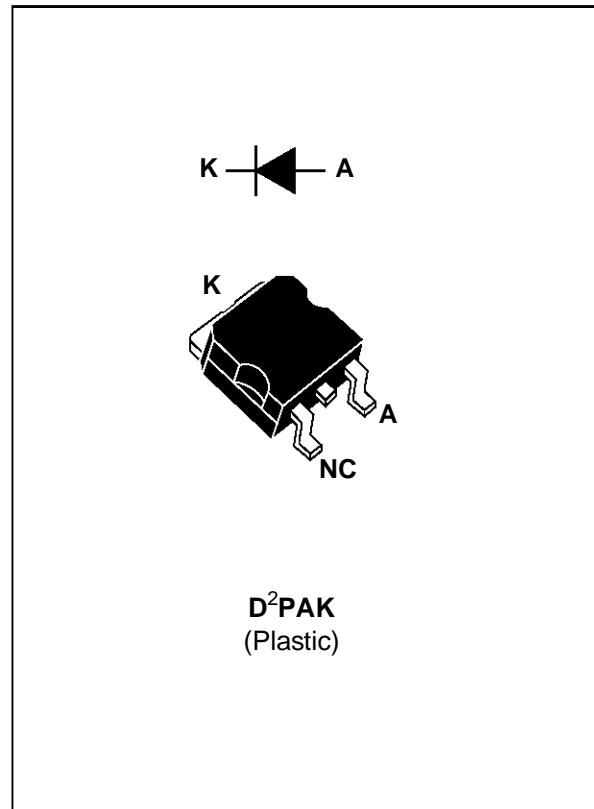
$I_{F(AV)}$	<b>25 A</b>
$V_{RRM}$	<b>200 V</b>
$t_{rr}$	<b>50 ns</b>
$V_F$	<b>0.85 V</b>

**FEATURES AND BENEFITS**

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY
- SMD PACKAGE

**DESCRIPTION**

Single rectifier suited for switchmode power supply and high frequency DC to DC converters. Packaged in D<sup>2</sup>PAK, this surface mount device is intended for use in high frequency inverters, free wheeling and polarity protection applications.


**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		200	V
$I_{F(RMS)}$	RMS forward current		50	A
$I_{F(AV)}$	Average forward current	$T_c=125^\circ\text{C}$ $\delta = 0.5$	25	A
$I_{FSM}$	Surge non repetitive forward current	$t_p=10\text{ms}$ sinusoidal	200	A
$I_{FRM}$	Repetitive peak forward current	$t_p = 5\mu\text{s}$ $f = 5\text{ kHz}$	310	A
$T_{stg}$ $T_j$	Storage and junction temperature range		- 40 to + 150	$^\circ\text{C}$

## BYW77G-200

### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
Rth (j-c)	Junction to case thermal resistance	1	°C/W

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	V <sub>R</sub> = V <sub>RRM</sub>	T <sub>j</sub> = 25°C			25	μA
			T <sub>j</sub> = 100°C			2.5	mA
V <sub>F</sub> **	Forward voltage drop	I <sub>F</sub> = 20 A	T <sub>j</sub> = 125°C			0.85	V
		I <sub>F</sub> = 40 A	T <sub>j</sub> = 125°C			1.00	
		I <sub>F</sub> = 40 A	T <sub>j</sub> = 25°C			1.15	

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

\*\* tp = 380 μs, duty cycle < 2 %

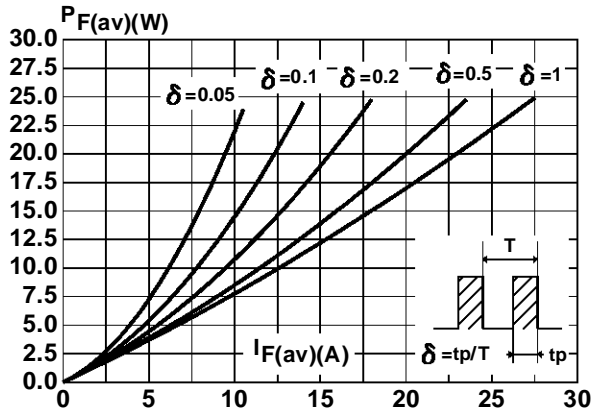
To evaluate the conduction losses use the following equation :

$$P = 0.65 \times I_{F(AV)} + 0.0075 I_{F(RMS)}^2$$

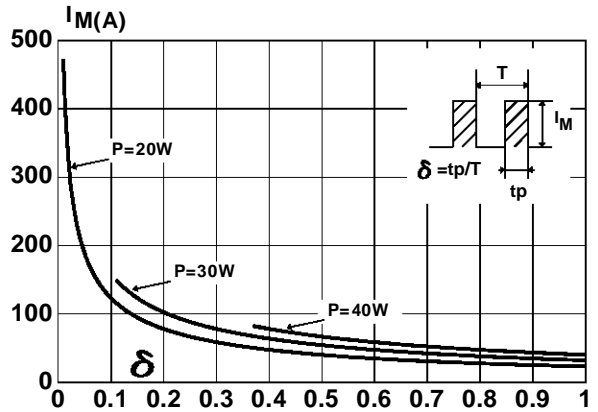
### RECOVERY CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	Reverse recovery time	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A			35	ns
		I <sub>rr</sub> = 0.25 A	I <sub>R</sub> = 1A				
		T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A			50	
		dI <sub>F</sub> /dt = -50A/μs					
			V <sub>R</sub> = 30V				
t <sub>fr</sub>	Forward recovery time	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A		10		ns
		dI <sub>F</sub> /dt = 100A/μs					
		V <sub>FR</sub> = 1.1 x V <sub>F</sub> max					
V <sub>FP</sub>	Peak forward voltage	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A		1.5		V
		dI <sub>F</sub> /dt = 100A/μs					

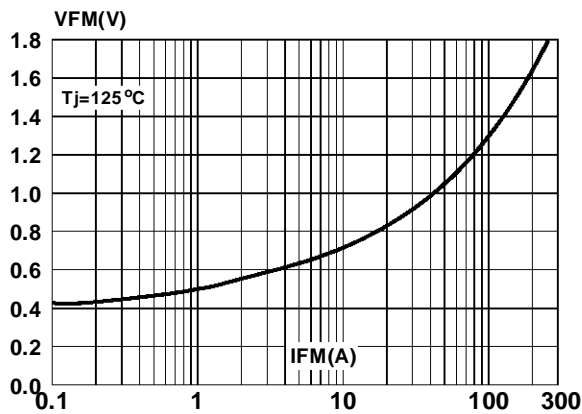
**Fig.1** : Average forward power dissipation versus average forward current.



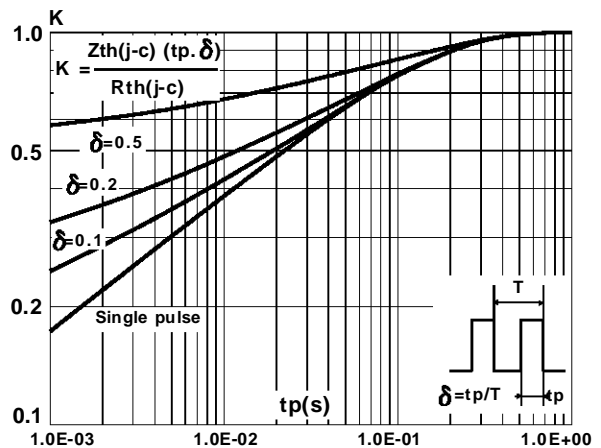
**Fig.2** : Peak current versus form factor.



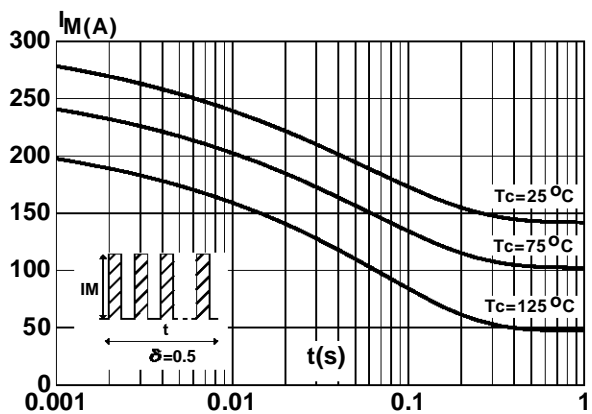
**Fig.3** : Forward voltage drop versus forward current (maximum values).



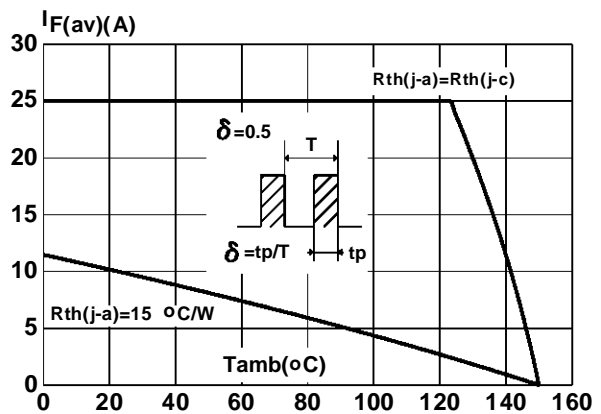
**Fig.4** : Relative variation of thermal impedance junction to case versus pulse duration.



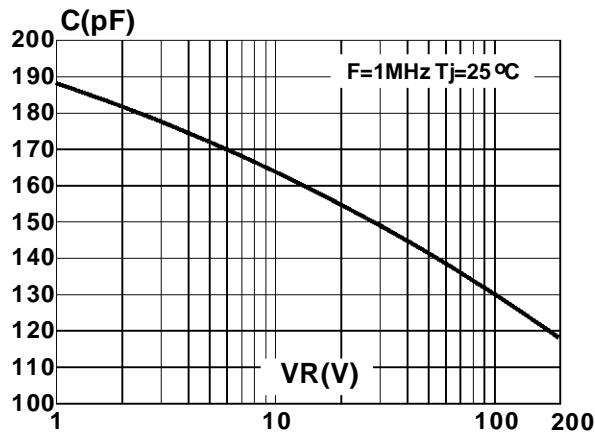
**Fig.5** : Non repetitive surge peak forward current versus overload duration.



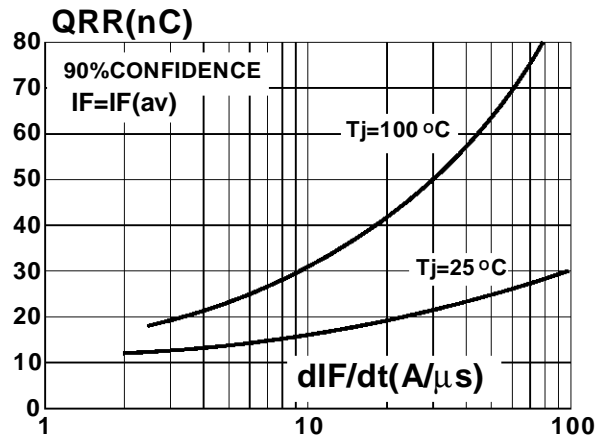
**Fig.6** : Average current versus ambient temperature. ( $\delta = 0.5$ )



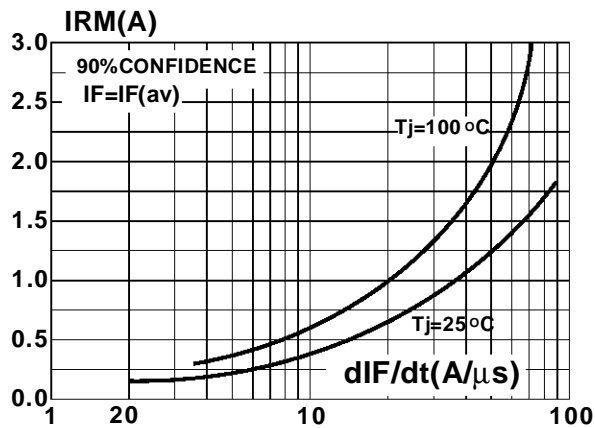
**Fig.7 :** Junction capacitance versus reverse voltage applied (Typical values).



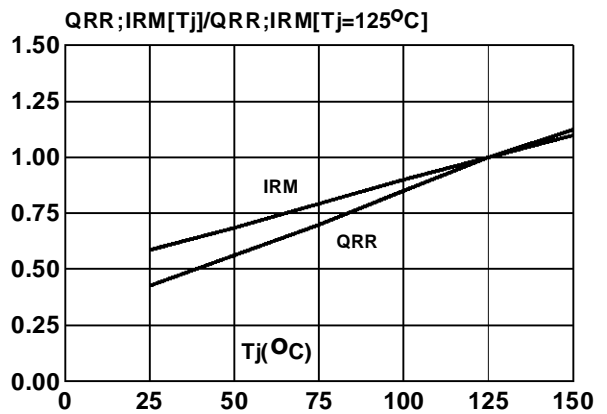
**Fig.8 :** Reverse recovery charges versus  $dI_F/dt$ .



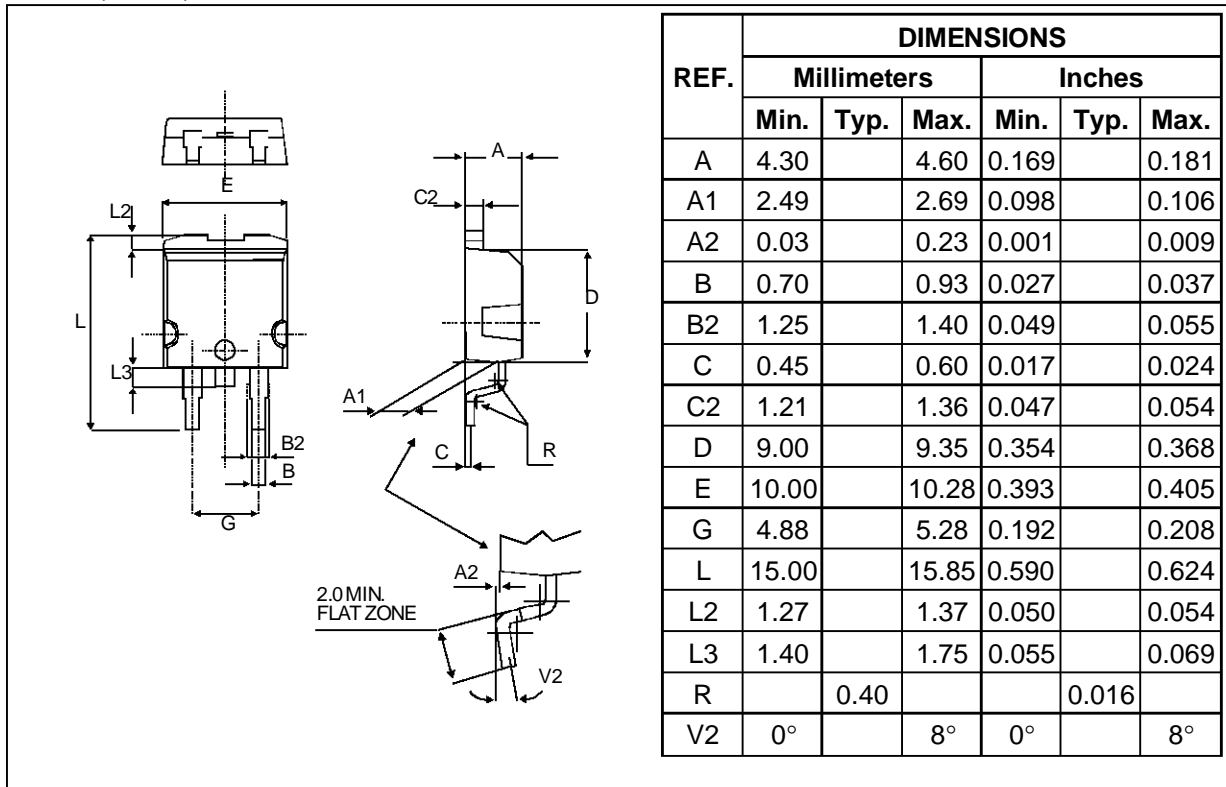
**Fig.9 :** Peak reverse current versus  $dI_F/dt$ .



**Fig.10 :** Dynamic parameters versus junction temperature.



**PACKAGE MECHANICAL DATA**  
D<sup>2</sup>PAK (Plastic)



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