

## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

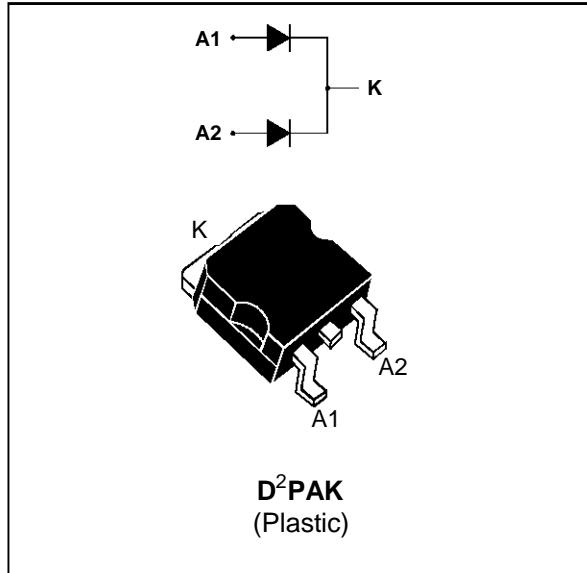
### FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- SMD PACKAGE

### DESCRIPTION

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

Packaged in D<sup>2</sup>PAK 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 <sub>F(RMS)</sub>	RMS forward current	Per diode	20	A
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$	T <sub>c</sub> =120°C Per diode	10	A
I <sub>FSM</sub>	Surge non repetitive forward current	tp=10ms sinusoidal	100	A
T <sub>stg</sub> T <sub>j</sub>	Storage and junction temperature range		- 65 to + 150 - 65 to + 150	°C °C

Symbol	Parameter	Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage	200	V

## BYW51G-200

### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
R <sub>th</sub> (j-c)	Junction to case	Per diode	2.5
		Total	1.4
R <sub>th</sub> (c)	Coupling	0.25	°C/W

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 <sub>R</sub> *	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			15	µA
	T <sub>j</sub> = 100°C				1	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 8 A			0.85	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 16 A			1.05	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 16 A			1.15	

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

\*\* tp = 380 µs, duty cycle < 2 %

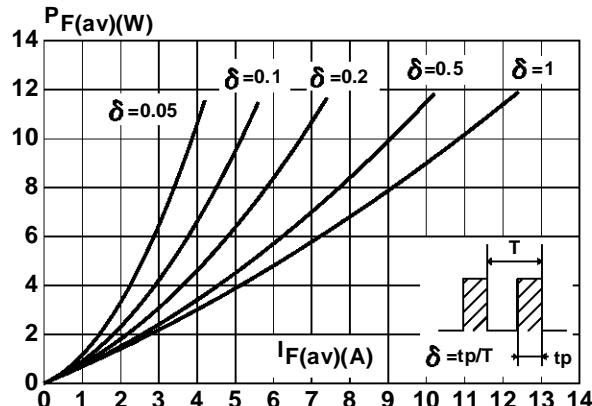
To evaluate the conduction losses use the following equation:

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

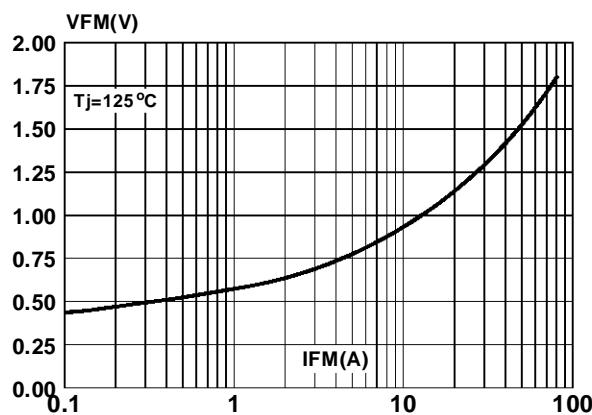
### RECOVERY CHARACTERISTICS

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		25	ns
		I <sub>R</sub> = 1A			35	
tfr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A	dI <sub>F</sub> /dt = -50A/µs			ns
		V <sub>FR</sub> = 30V				
V <sub>FP</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A	tr = 10 ns	15		V
		V <sub>FR</sub> = 1.1 x V <sub>F</sub>				
				2		

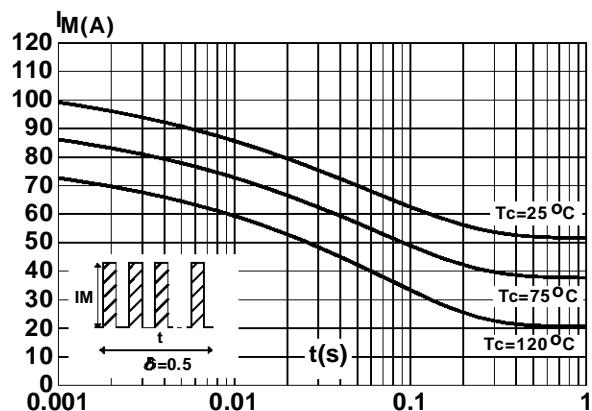
**Fig.1 :** Average forward power dissipation versus average forward current.



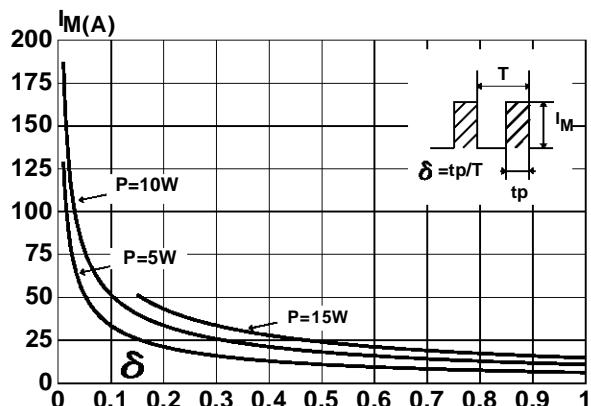
**Fig.3 :** Forward voltage drop versus forward current (maximum values).



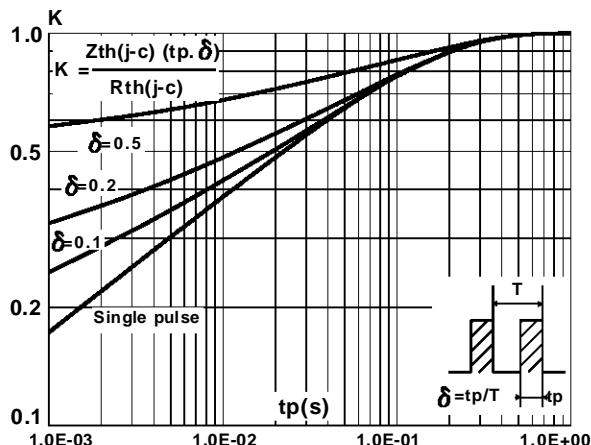
**Fig.5 :** Non repetitive surge peak forward current versus overload duration.



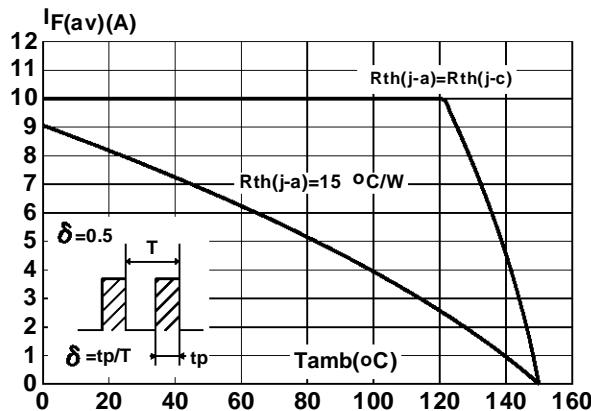
**Fig.2 :** Peak current versus form factor.



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



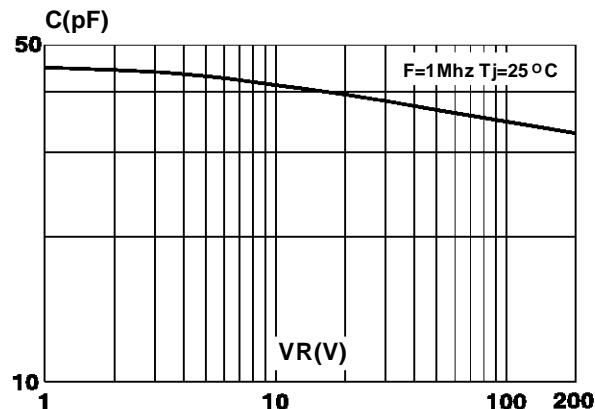
**Fig.6 :** Average current versus ambient temperature. (duty cycle : 0.5)



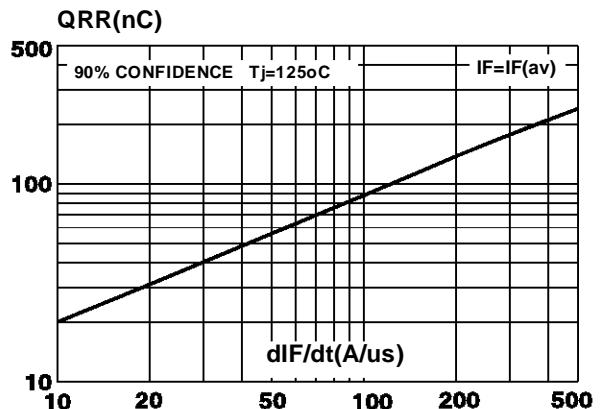
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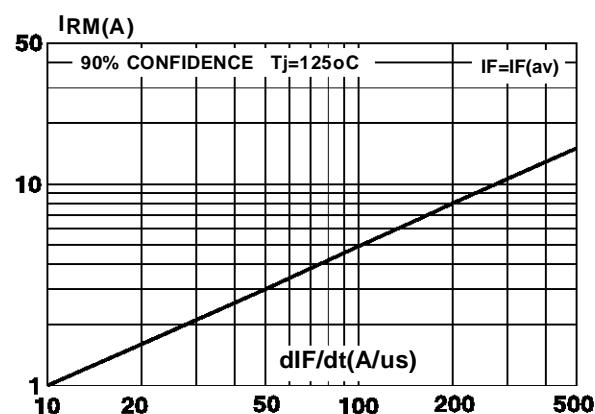
**Fig.7 :** Junction capacitance versus reverse voltage applied (Typical values).



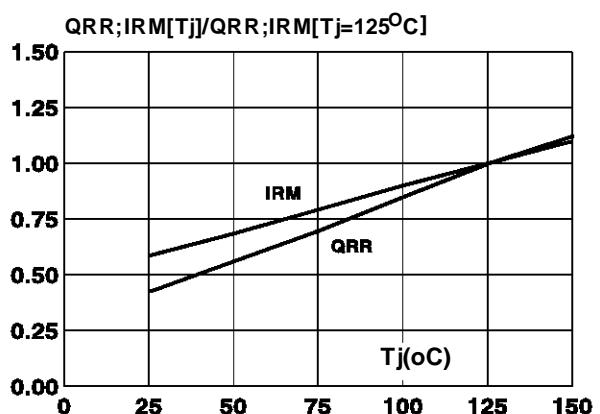
**Fig.8 :** Recovery charges versus  $dI_F/dt$ .



**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)**

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.169		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.037
B2	1.25		1.40	0.049		0.055
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	9.00		9.35	0.354		0.368
E	10.00		10.28	0.393		0.405
G	4.88		5.28	0.192		0.208
L	15.00		15.85	0.590		0.624
L2	1.27		1.37	0.050		0.054
L3	1.40		1.75	0.055		0.069

Cooling method : C

Marking : Type number

Weight: 1.8 g

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