

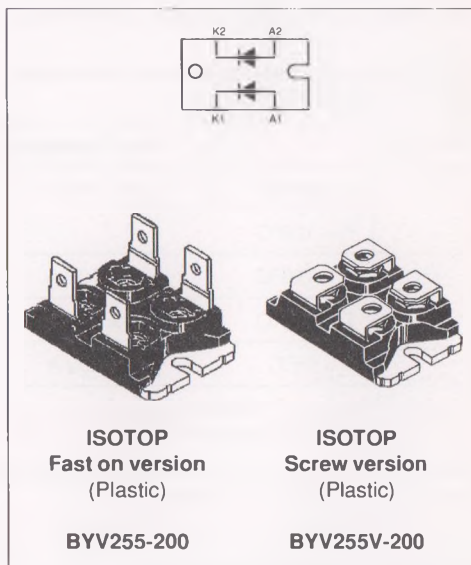
## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- INSULATED :  
 Insulating voltage = 2500 V<sub>RMS</sub>  
 Capacitance = 55 pF

### DESCRIPTION

Dual rectifier suited for switchmode power supply and high frequency DC to DC converters. Packaged in ISOTOP™ 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		150	A
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$	T <sub>C</sub> =110°C	100	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> =10ms sinusoidal	1600	A
T <sub>stg</sub> T <sub>j</sub>	Storage and junction temperature range		- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	BYV255-(V)				Unit
		50	100	150	200	
V <sub>RRM</sub>	Repetitive peak reverse voltage	50	100	150	200	V

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**THERMAL RESISTANCE**

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction to case	Per diode	0.4	°C/W
		Total	0.25	
Rth (c)	Coupling		0.1	°C/W

When the diodes 1 and 2 are used simultaneously :  
 $T_j - T_c$  (diode 1) = P(diode 1) x Rth(j-c)(Per diode) + P(diode 2) x Rth(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>			100	μA
	T <sub>j</sub> = 100°C				10	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 100 A			0.85	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 200 A			1.00	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 200 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 :

$$P = 0.7 \times I_{F(AV)} + 0.0015 \times I_{F(RMS)}^2$$

**RECOVERY CHARACTERISTICS**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit	
trr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A I <sub>R</sub> = 1A	I <sub>rr</sub> = 0.25A			55	ns
		I <sub>F</sub> = 1A V <sub>R</sub> = 30V	dI <sub>F</sub> /dt = -50A/μs			80	
tfr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A V <sub>FR</sub> = 1.1 x V <sub>F</sub>	tr = 5 ns		10	ns	
V <sub>FP</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A	tr = 5 ns		1.5	V	

**TURN-OFF SWITCHING CHARACTERISTICS**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit	
I <sub>RM</sub>	T <sub>j</sub> = 100°C	I <sub>F</sub> = 100A L <sub>p</sub> ≤ 0.05μH V <sub>CC</sub> ≤ 0.6 V <sub>RRM</sub>	dI <sub>F</sub> /dt = -200A/μs			16	A
			dI <sub>F</sub> /dt = -400A/μs		24		

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

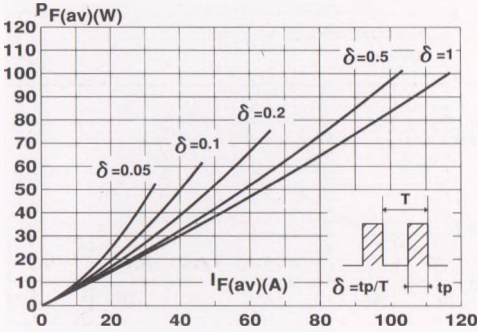


Fig.2 : Peak current versus form factor.

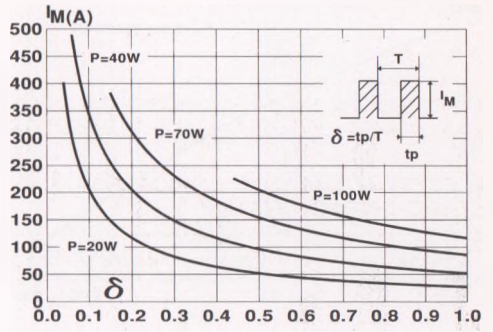


Fig.3 : Forward voltage drop versus forward current (maximum values).

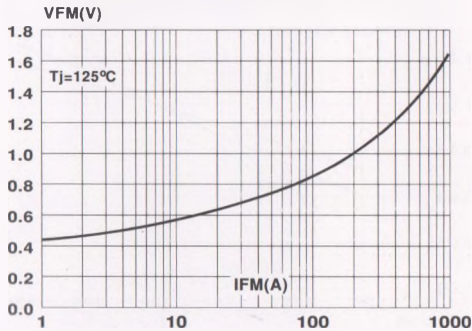


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

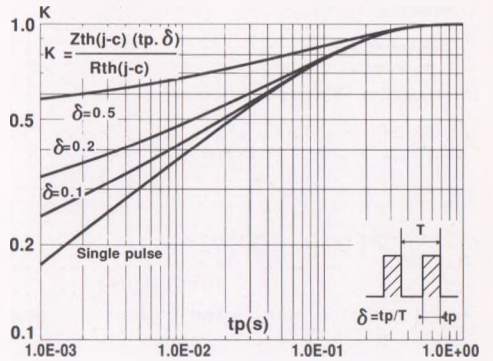


Fig.5 : Non repetitive surge peak forward current versus overload duration.

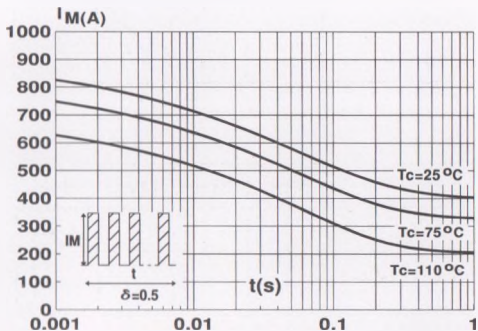


Fig.6 : Average current versus ambient temperature. (duty cycle : 0.5)

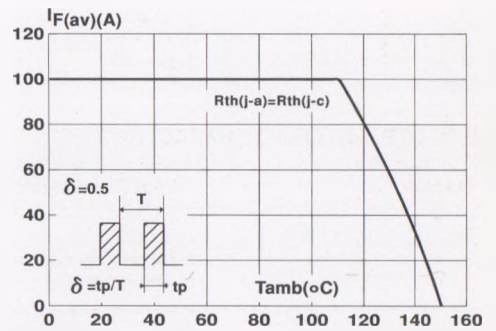


Fig.7 : Junction capacitance versus reverse voltage applied (Typical values).

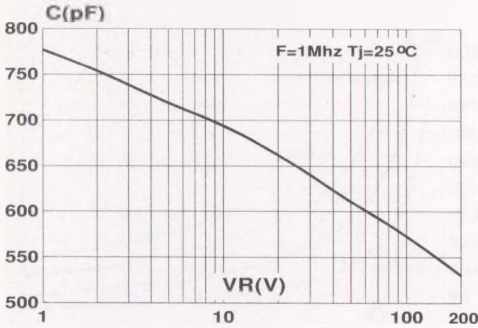


Fig.8 : Recovery charges versus  $dI_F/dt$ .

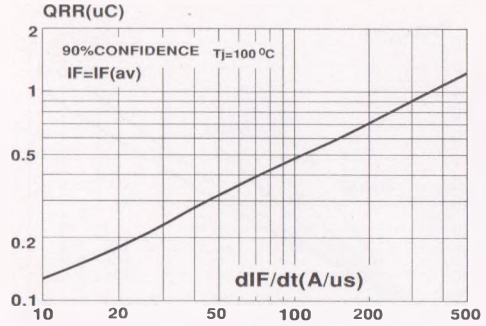


Fig.9 : Peak reverse current versus  $dI_F/dt$ .

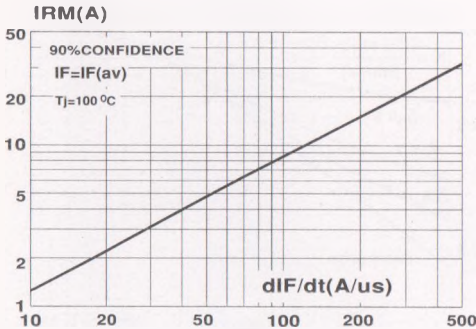


Fig.10 : Dynamic parameters versus junction temperature.

