

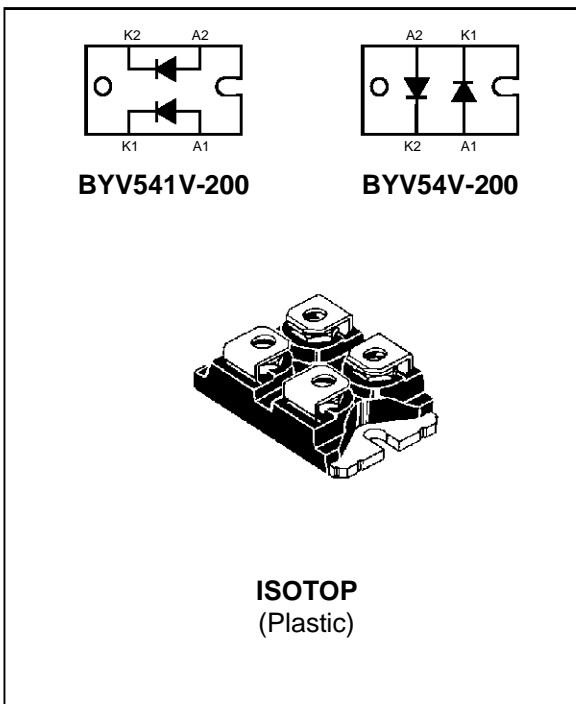
## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### 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 = 45 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		100	A
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$	T <sub>c</sub> =90°C	50	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> =10ms sinusoidal	1000	A
T <sub>stg</sub> T <sub>j</sub>	Storage and junction temperature range		- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	BYV54V / BYV541V				Unit
		50	100	150	200	
V <sub>RRM</sub>	Repetitive peak reverse voltage	50	100	150	200	V

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## BYV54V / BYV541V

### THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction to case	Per diode	1.2	°C/W
		Total	0.85	
Rth (c)	Coupling		0.1	°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
$I_R^*$	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			50	$\mu\text{A}$
	$T_j = 100^\circ\text{C}$				5	mA
$V_F^{**}$	$T_j = 125^\circ\text{C}$	$I_F = 50\text{ A}$			0.85	V
	$T_j = 125^\circ\text{C}$	$I_F = 100\text{ A}$			1.00	
	$T_j = 25^\circ\text{C}$	$I_F = 100\text{ A}$			1.15	

Pulse test : \*  $t_p = 5\text{ ms}$ , duty cycle < 2 %

\*\*  $t_p = 380\ \mu\text{s}$ , duty cycle < 2 %

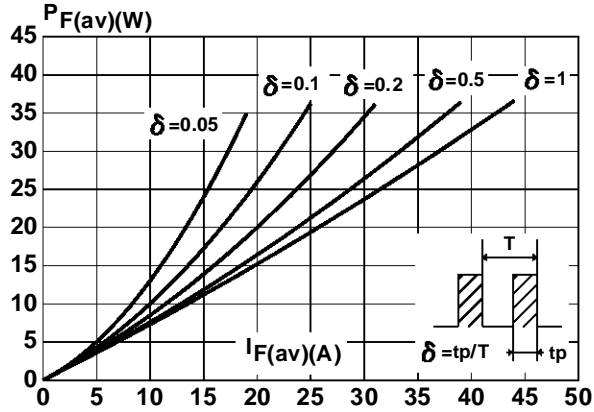
To evaluate the conduction losses use the following equation :

$$P = 0.7 \times I_{F(AV)} + 0.003 \times I_{F(RMS)}^2$$

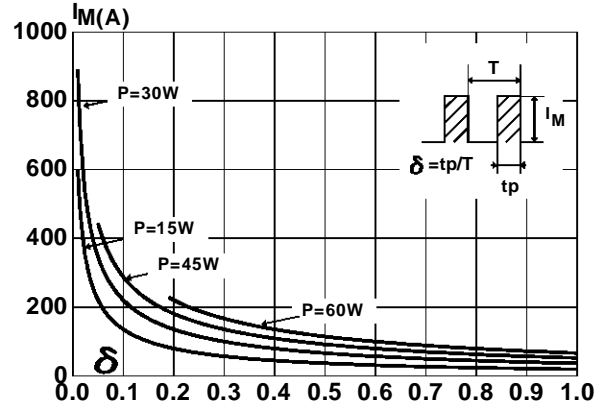
### RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$			40	ns
		$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$			60	
tfr	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $tr = 5\text{ ns}$ $V_{FR} = 1.1 \times V_F$		10		ns
$V_{FP}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $tr = 5\text{ ns}$		1.5		V

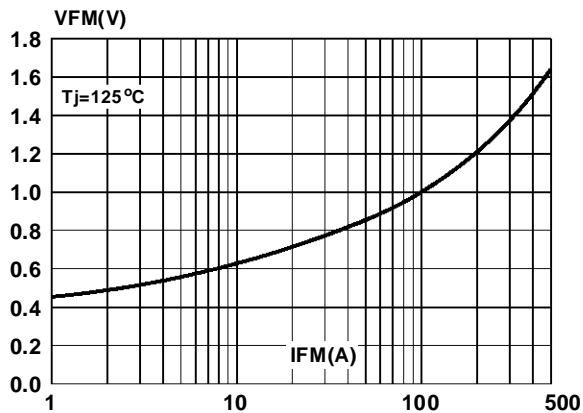
**Fig.1 :** Average forward power dissipation versus average forward current.



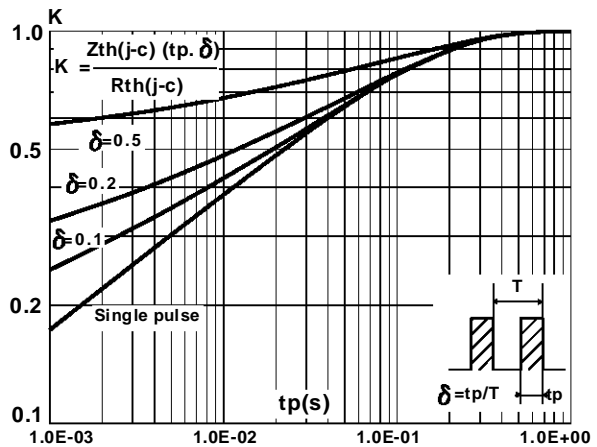
**Fig.2 :** Peak current versus form factor.



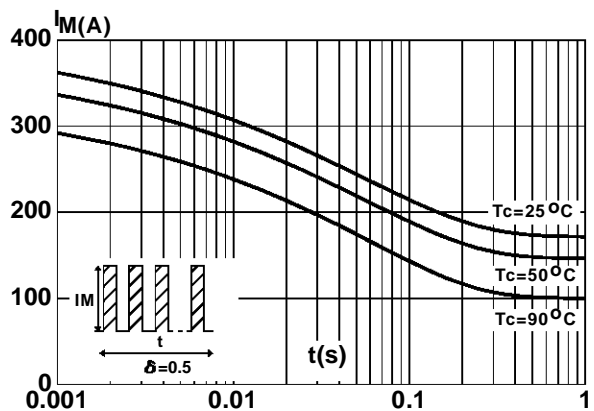
**Fig.3 :** Forward voltage drop versus forward current (maximum values).



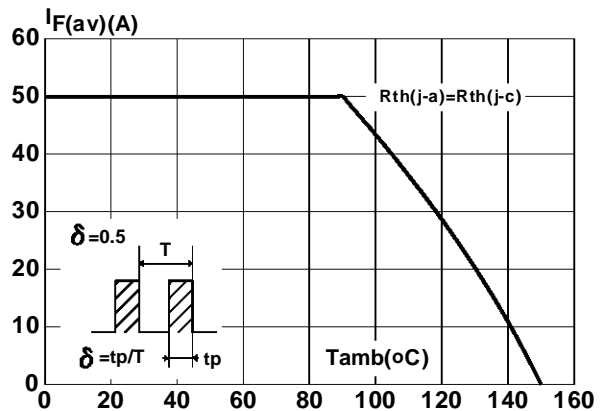
**Fig.4 :** Relative variation of thermal impedance junction to case versus pulse duration.



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

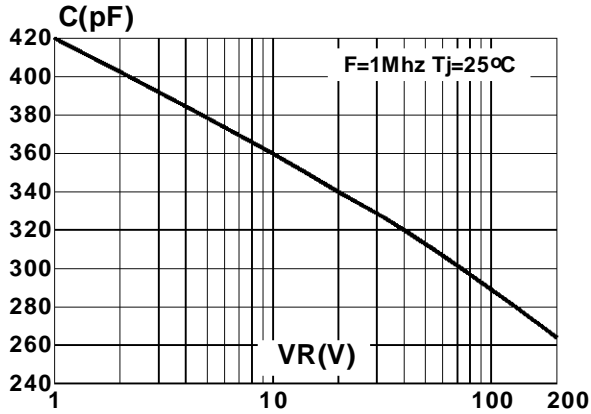


**Fig.6 :** Average current versus ambient temperature. (duty cycle : 0.5)

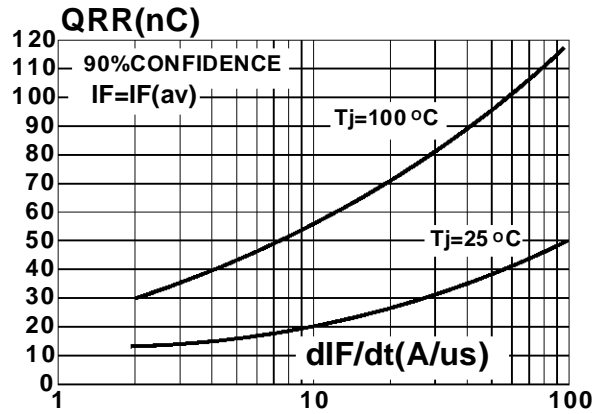


**BYV54V / BYV541V**

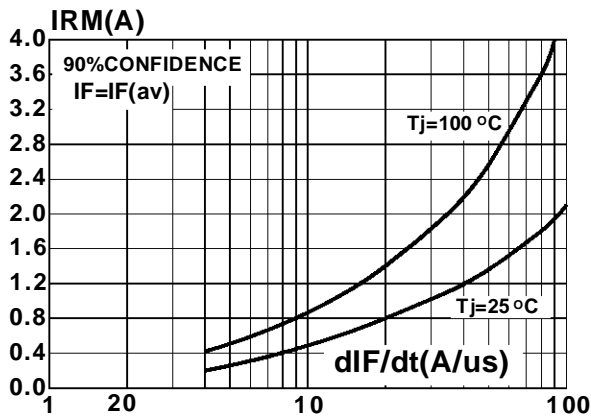
**Fig.7 :** Junction capacitance versus reverse voltage applied (Typical values).



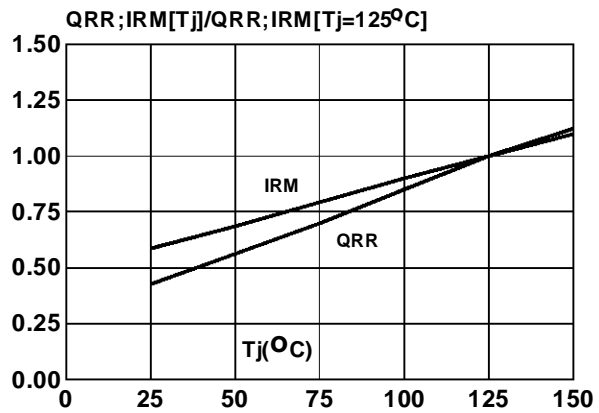
**Fig.8 :** Recovery charges versus  $dI_F/dt$ .



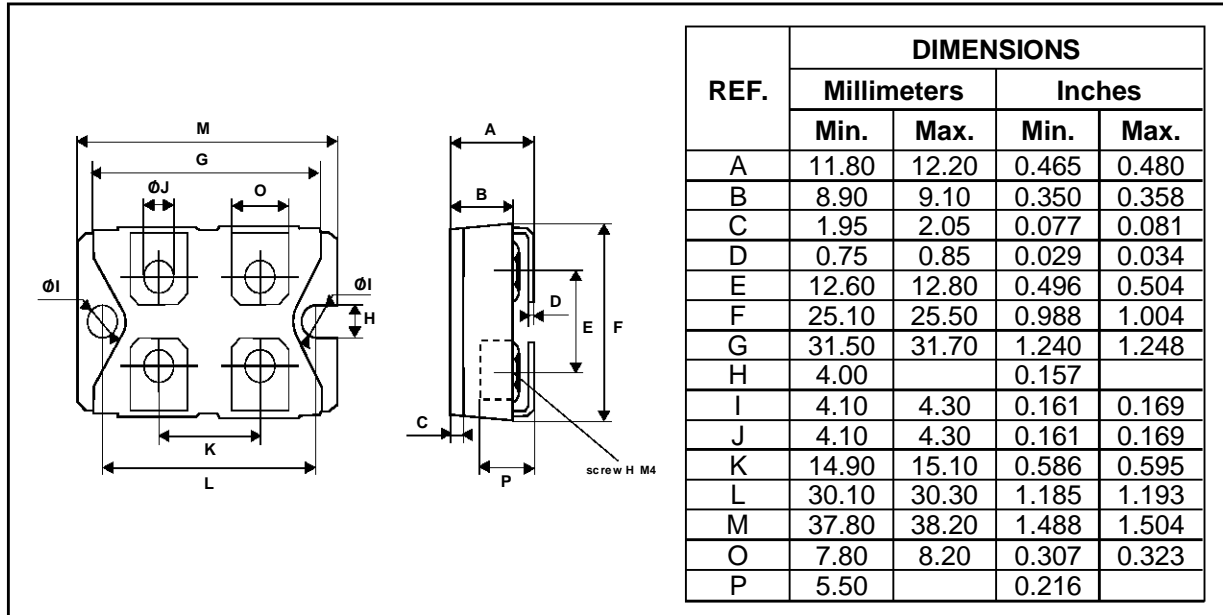
**Fig.9 :** Peak reverse current versus  $dI_F/dt$ .



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



**PACKAGE MECHANICAL DATA**  
ISOTOP



Cooling method : C  
Marking : Type number  
Weight : 28 g

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