

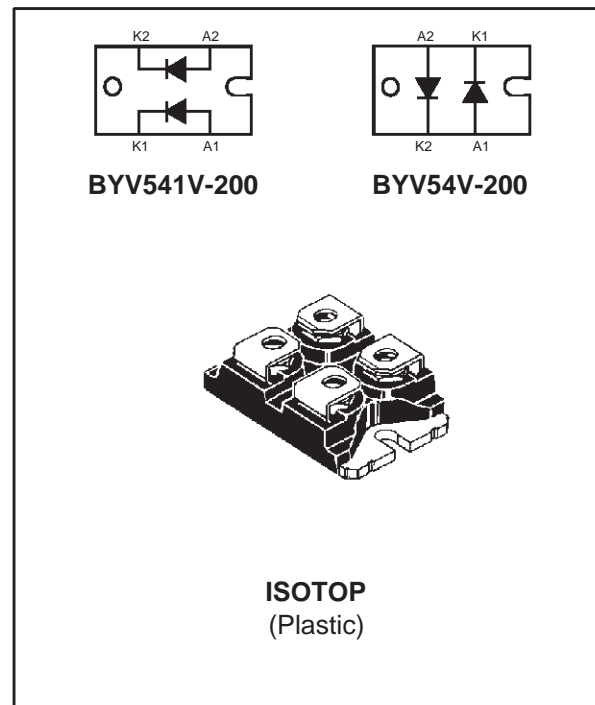
## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### 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
$I_{F(RMS)}$	RMS forward current		Per diode	100	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 90^\circ\text{C}$	Per diode	50	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ms}$ sinusoidal	Per diode	1000	A
$T_{stg}$ $T_j$	Storage and junction temperature range			- 40 to + 150 - 40 to + 150	$^\circ\text{C}$ $^\circ\text{C}$

Symbol	Parameter	BYV54V / BYV541V	Unit
$V_{RRM}$	Repetitive peak reverse voltage	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 <sub>R</sub> *	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			50	μA
	T <sub>j</sub> = 100°C				5	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 50 A			0.85	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 100 A			1.00	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 100 A			1.15	

Pulse test :

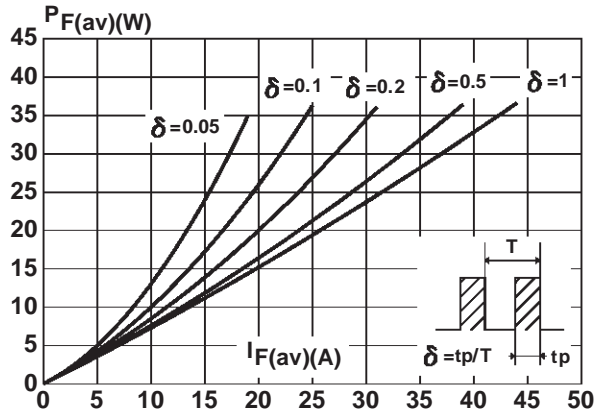
\* t<sub>p</sub> = 5 ms, duty cycle < 2 %

\*\* t<sub>p</sub> = 380 μs, duty cycle < 2 %

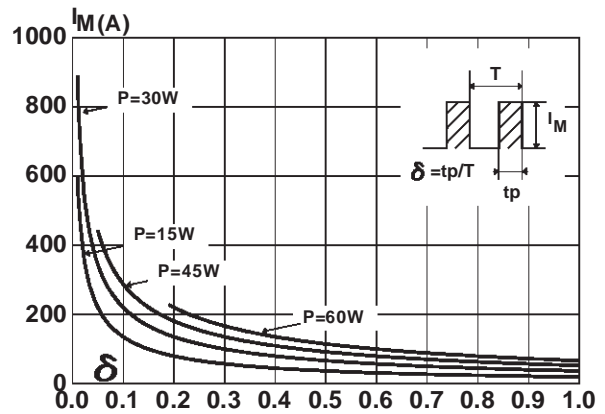
**RECOVERY CHARACTERISTICS**

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			40	ns
		I <sub>F</sub> = 1A V <sub>R</sub> = 30V	dI <sub>F</sub> /dt = -50A/μs			60	
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

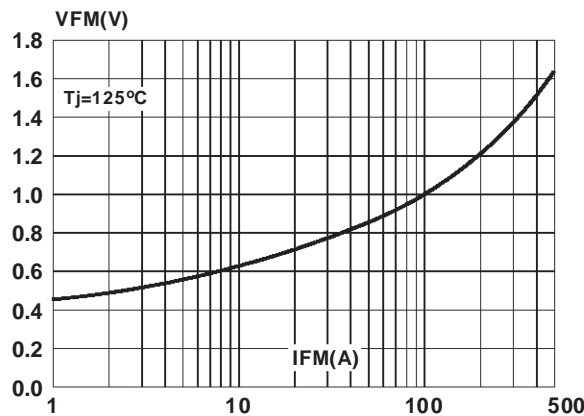
**Fig.1** : Average forward power dissipation versus average forward current.



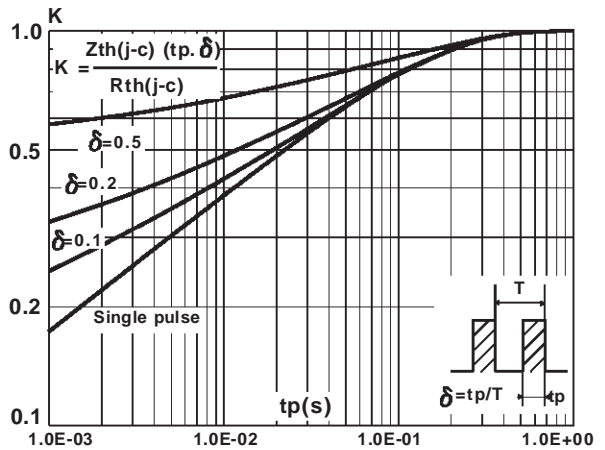
**Fig.2** : Peak current versus form factor.



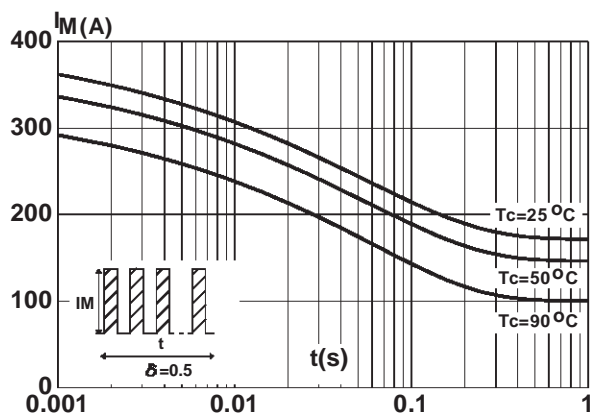
**Fig.3** : Forward voltage drop versus forward current (maximum values).



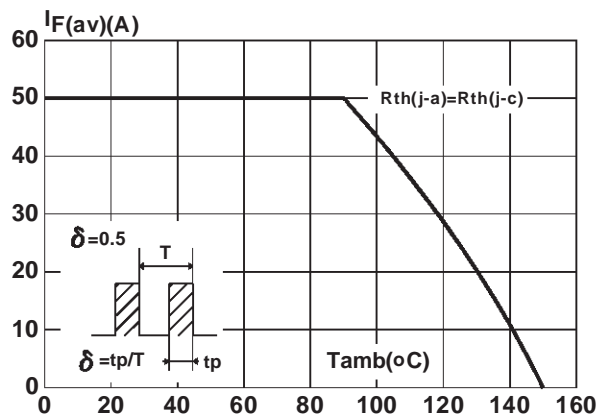
**Fig.4** : Relative variation of thermal impedance junction to case versus pulse duration.



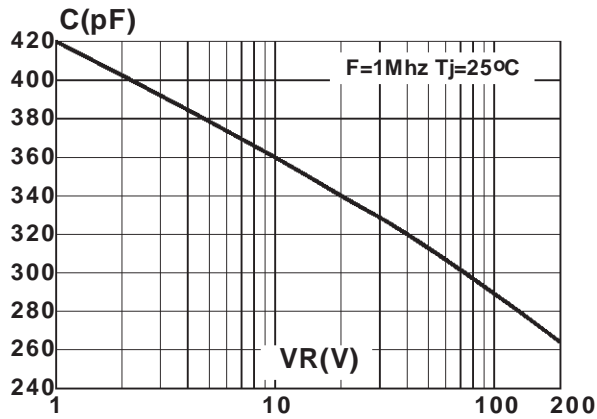
**Fig.5** : Non repetitive surge peak forward current versus overload duration.



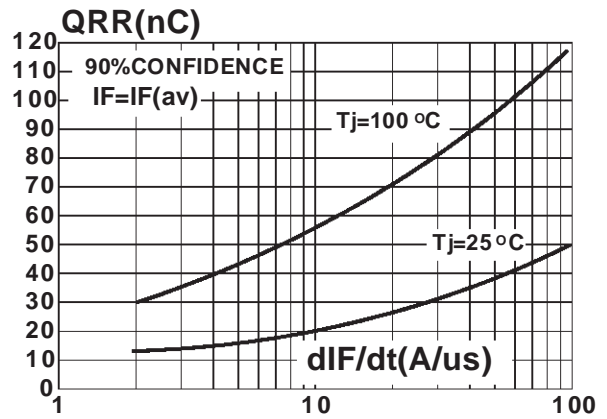
**Fig.6** : Average current versus ambient temperature. (duty cycle : 0.5)



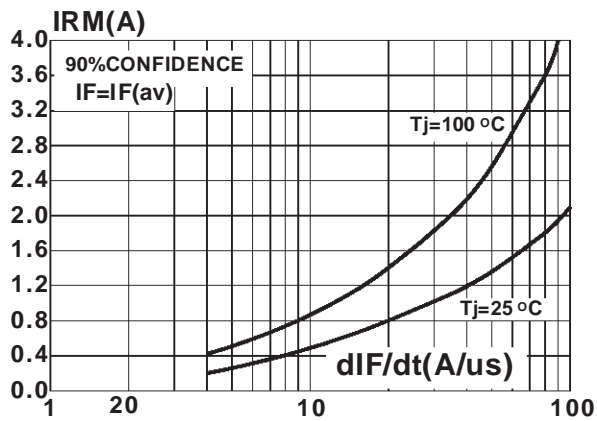
**Fig.7** : Junction capacitance versus reverse voltage applied (Typical values).



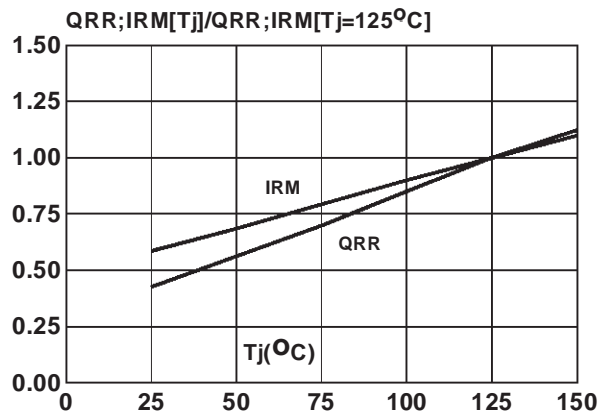
**Fig.8** : Recovery charges versus  $dI_F/dt$ .



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



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



# **PACKAGE MECHANICAL DATA** **ISOTOP**

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	11.80	12.20	0.465	0.480
A1	8.90	9.10	0.350	0.358
B	7.8	8.20	0.307	0.323
C	0.75	0.85	0.030	0.033
C2	1.95	2.05	0.077	0.081
D	37.80	38.20	1.488	1.504
D1	31.50	31.70	1.240	1.248
E	25.15	25.50	0.990	1.004
E1	23.85	24.15	0.939	0.951
E2	24.80 typ.		0.976 typ.	
G	14.90	15.10	0.587	0.594
G1	12.60	12.80	0.496	0.504
G2	3.50	4.30	0.138	0.169
F	4.10	4.30	0.161	0.169
F1	4.60	5.00	0.181	0.197
P	4.00	4.30	0.157	0.69
P1	4.00	4.40	0.157	0.173
S	30.10	30.30	1.185	1.193

- **Marking** : Type number
- Cooling method : C
- Weight : 27 g
- Epoxy meets UL94, V0

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