

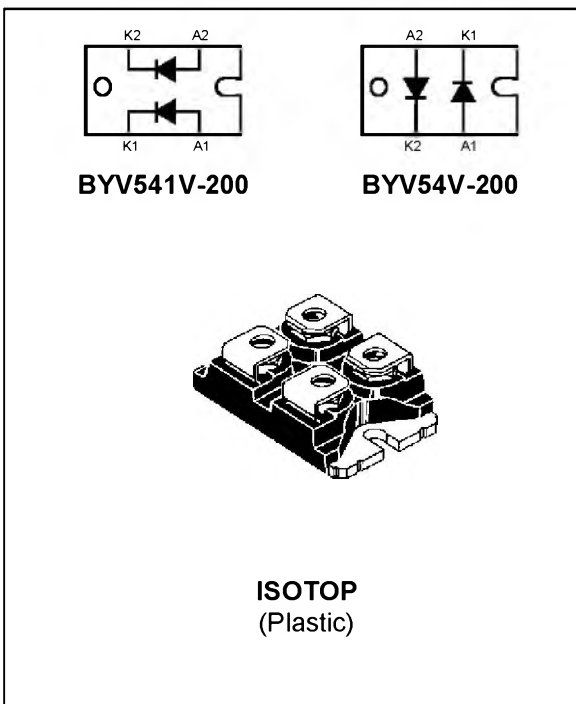
HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- INSULATED :
Insulating voltage = 2500 V_{RMS}
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		100	A
I _{F(AV)}	Average forward current $\delta = 0.5$	T _c =90°C	50	A
I _{FSM}	Surge non repetitive forward current	t _p =10ms sinusoidal	1000	A
T _{stg} T _j	Storage and junction temperature range		- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	BYV54V / BYV541V				Unit
		50	100	150	200	
V _{RRM}	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	μA
	$T_j = 100^\circ\text{C}$				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.

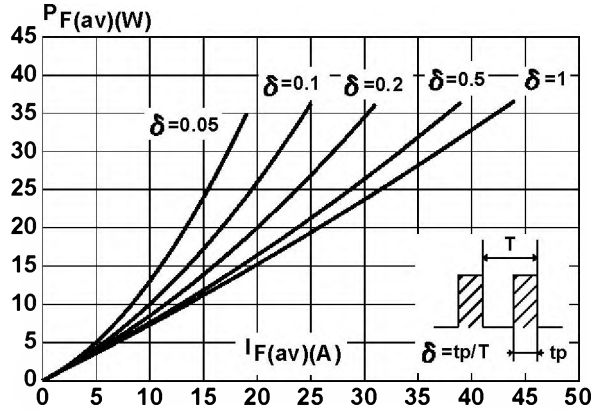


Fig.2 : Peak current versus form factor.

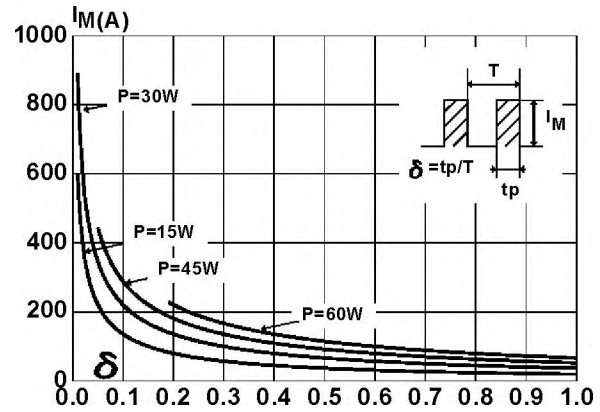


Fig.3 : Forward voltage drop versus forward current (maximum values).

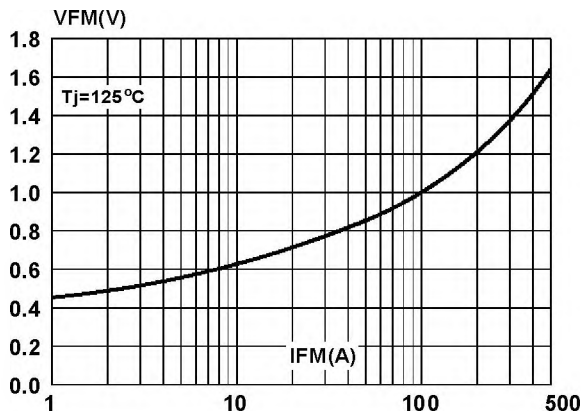


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

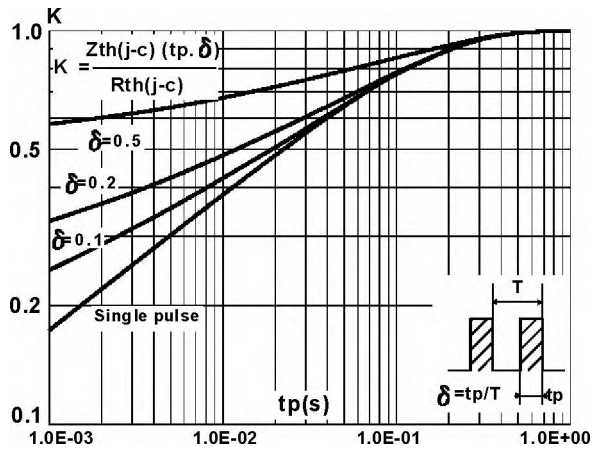


Fig.5 : Non repetitive surge peak forward current versus overload duration.

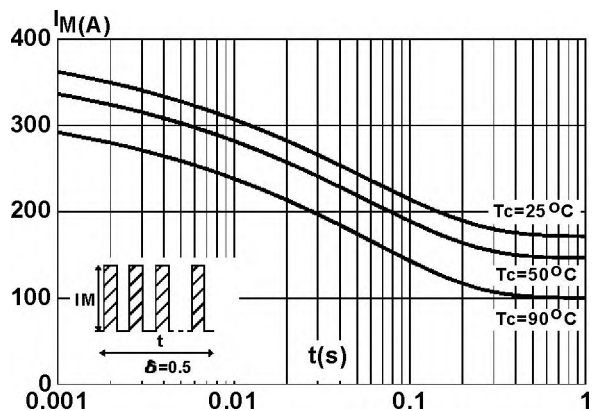
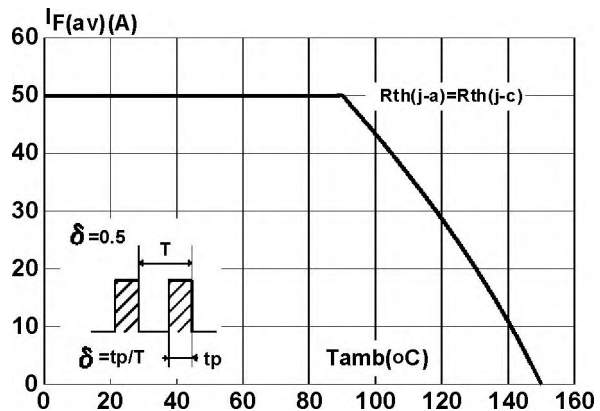


Fig.6 : Average current versus ambient temperature. (duty cycle : 0.5)



BYV54V / BYV541V

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

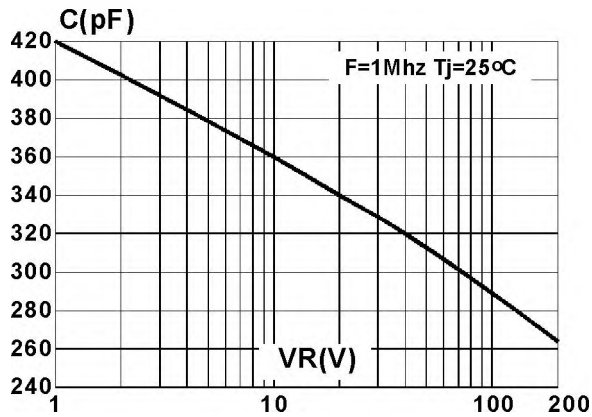


Fig.8 : Recovery charges versus dI_F/dt .

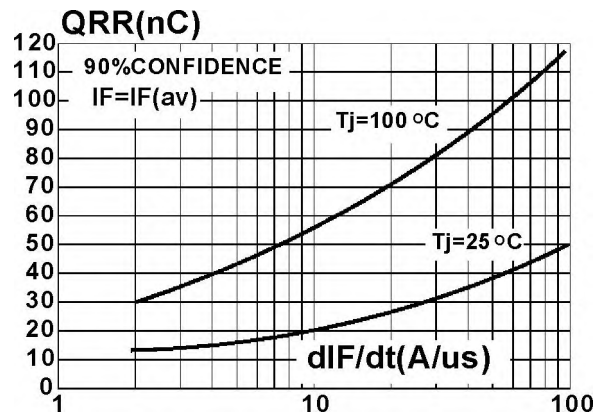


Fig.9 : Peak reverse current versus dI_F/dt .

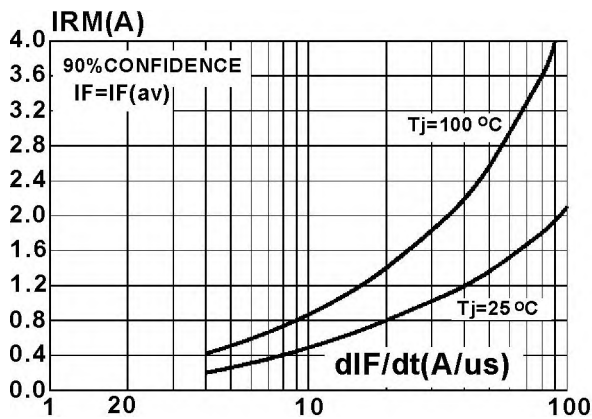
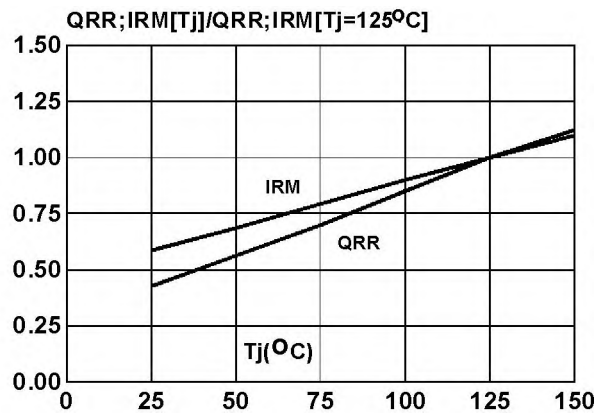
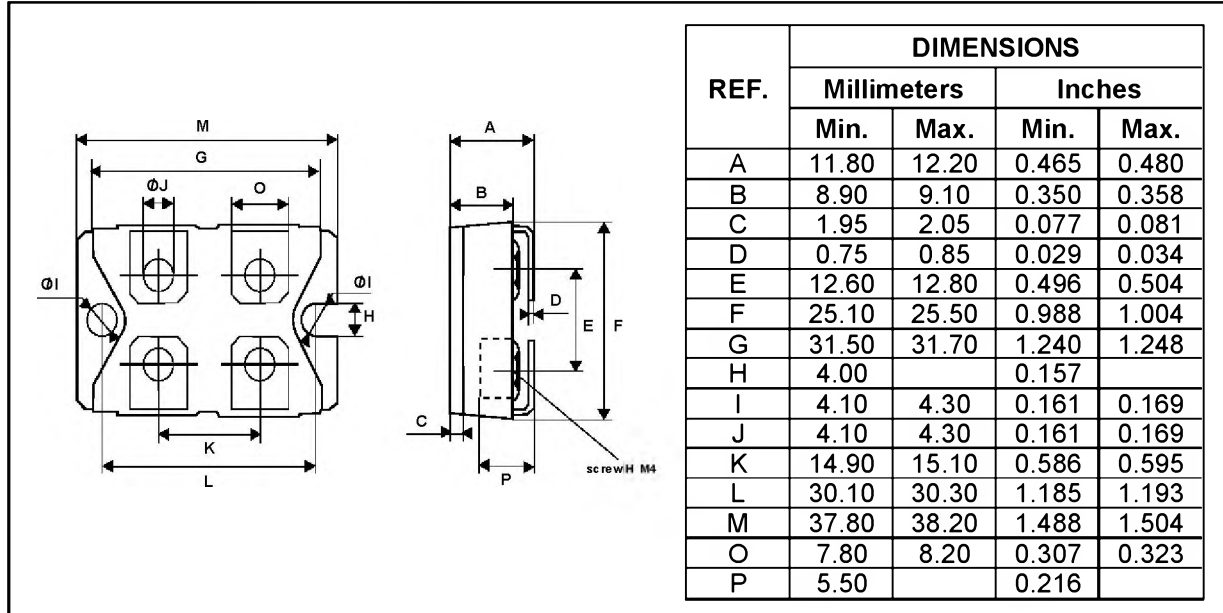


Fig.10 : Dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA
ISOTOP



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

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