

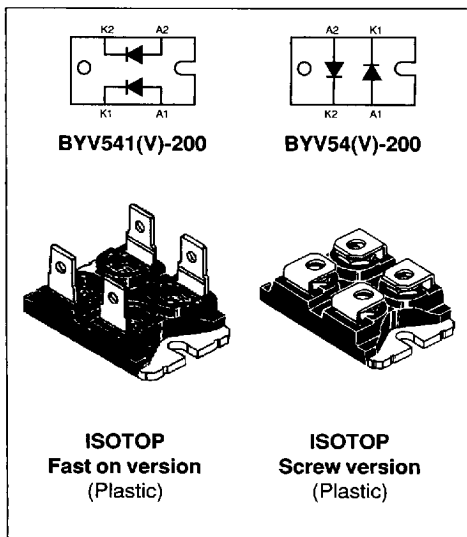
HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

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		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	BYV54(V) / BYV541(V)				Unit
		50	100	150	200	
V_{RRM}	Repetitive peak reverse voltage	50	100	150	200	V

TM : ISOTOP is a trademark of SGS-THOMSON Microelectronics.

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°C	V _R = V _{RRM}			50	μA
	T _j = 100°C				5	mA
V _F **	T _j = 125°C	I _F = 50 A			0.85	V
	T _j = 125°C	I _F = 100 A			1.00	
	T _j = 25°C	I _F = 100 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 :

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

RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	T _j = 25°C	I _F = 0.5A I _{RR} = 0.25A I _R = 1A			40	ns
		I _F = 1A V _R = 30V dI _F /dt = -50A/μs			60	
tfr	T _j = 25°C	I _F = 1A V _{FR} = 1.1 x V _F		10		ns
V _{FP}	T _j = 25°C	I _F = 1A tr = 5 ns		1.5		V

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

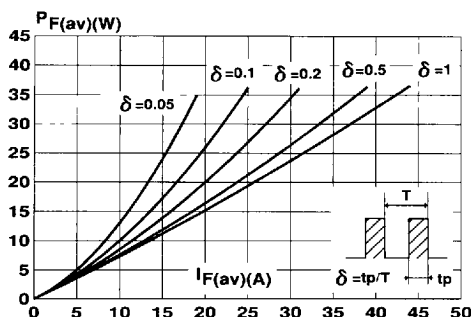


Fig.2 : Peak current versus form factor.

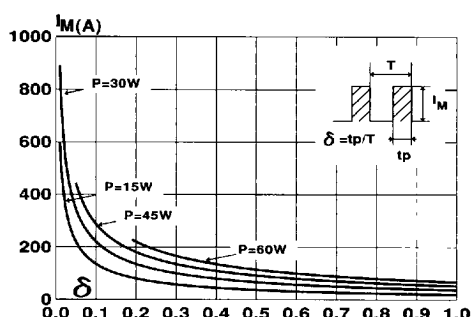


Fig.3 : Forward voltage drop versus forward current (maximum values).

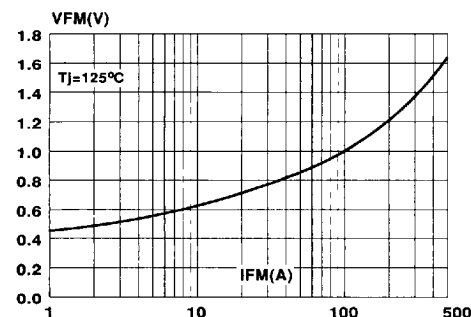


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

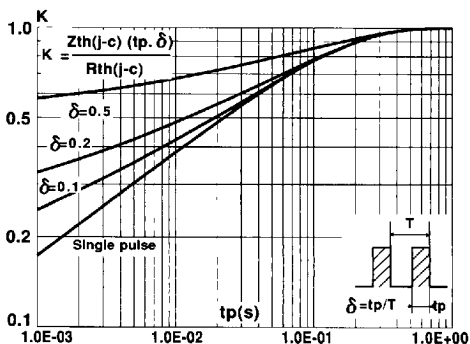


Fig.5 : Non repetitive surge peak forward current versus overload duration.

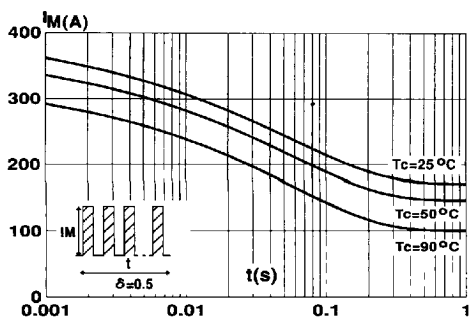


Fig.6 : Average current versus ambient temperature. (duty cycle : 0.5)

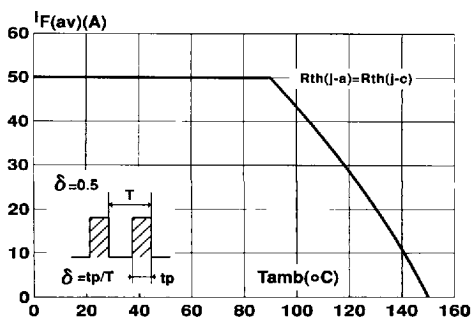


Fig.7 : Junction capacitance versus reverse voltage applied (Typical values).

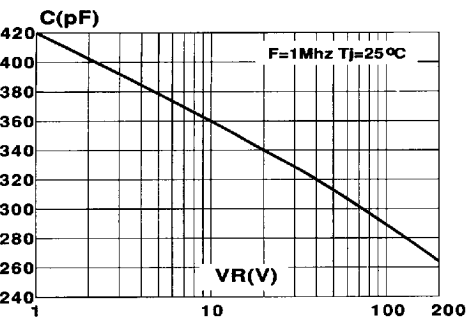


Fig.9 : Peak reverse current versus dI_F/dt .

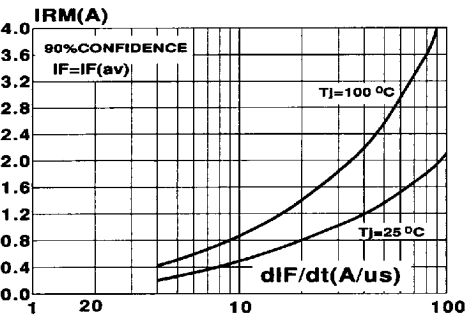


Fig.8 : Recovery charges versus dI_F/dt .

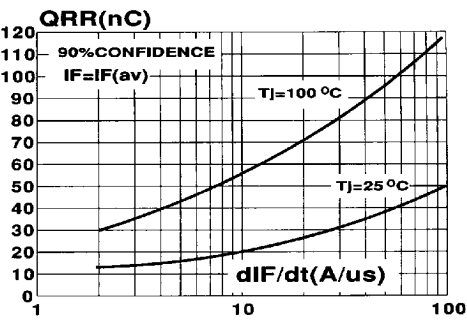


Fig.10 : Dynamic parameters versus junction temperature.

