

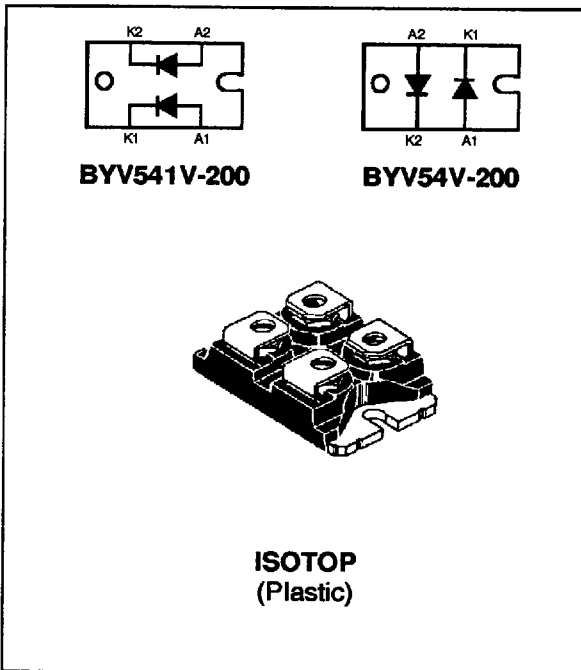
HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

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	BYV54V / BYV541V				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.

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	$T_j = 25^\circ\text{C}$	$I_F = 0.5 \text{ A}$ $I_R = 1 \text{ A}$			40	ns
		$I_F = 1 \text{ A}$ $V_R = 30 \text{ V}$			60	
tfr	$T_j = 25^\circ\text{C}$	$I_F = 1 \text{ A}$ $V_{FR} = 1.1 \times V_F$		10		ns
V_{FP}	$T_j = 25^\circ\text{C}$	$I_F = 1 \text{ A}$ $t_r = 5 \text{ ns}$		1.5		V

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

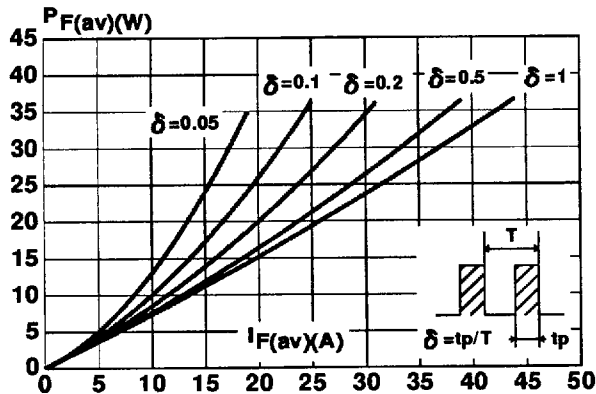


Fig.2 : Peak current versus form factor.

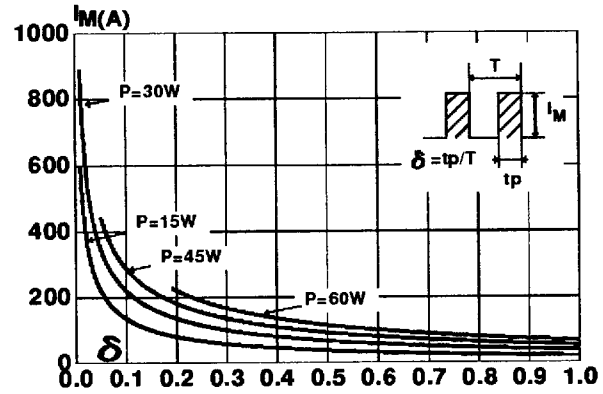


Fig.3 : Forward voltage drop versus forward current (maximum values).

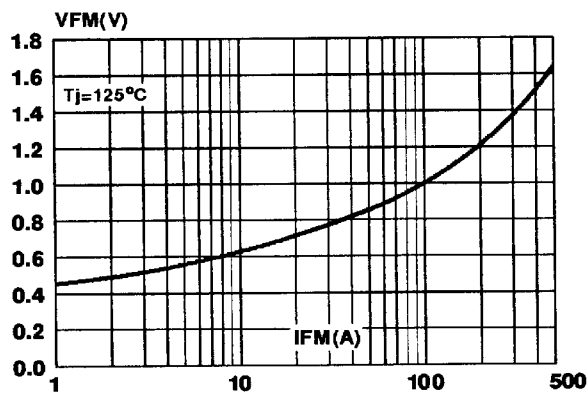


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

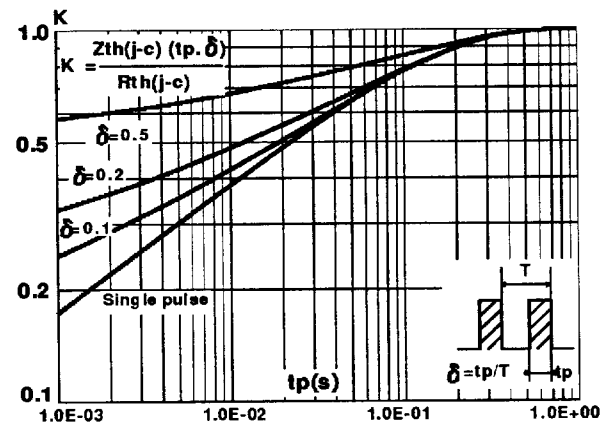


Fig.5 : Non repetitive surge peak forward current versus overload duration.

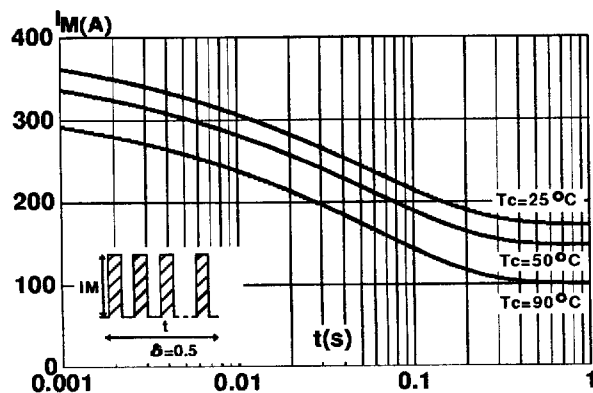


Fig.6 : Average current versus ambient temperature. (duty cycle : 0.5)

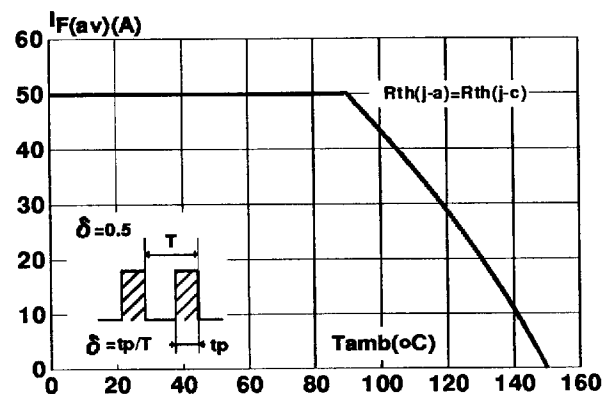


Fig.7 : Junction capacitance versus reverse voltage applied (Typical values).

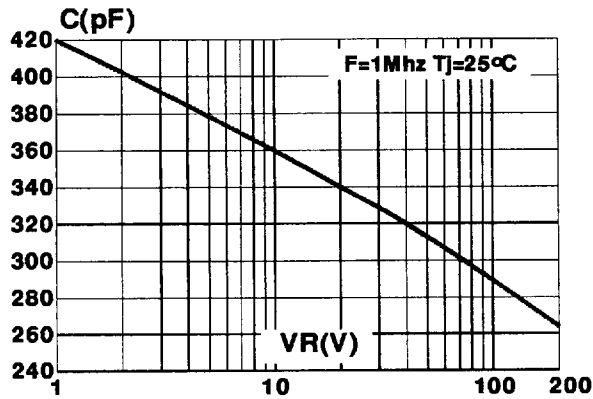


Fig.8 : Recovery charges versus dI_F/dt .

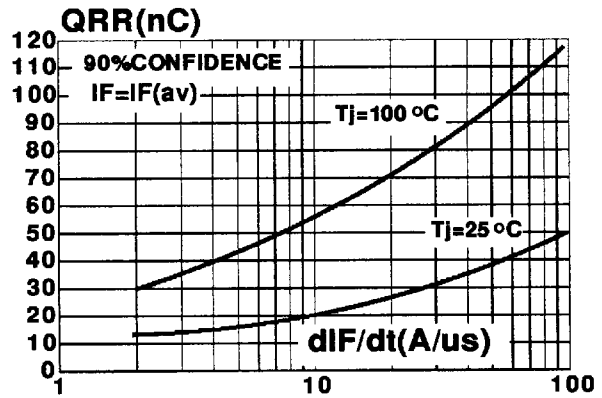


Fig.9 : Peak reverse current versus dI_F/dt .

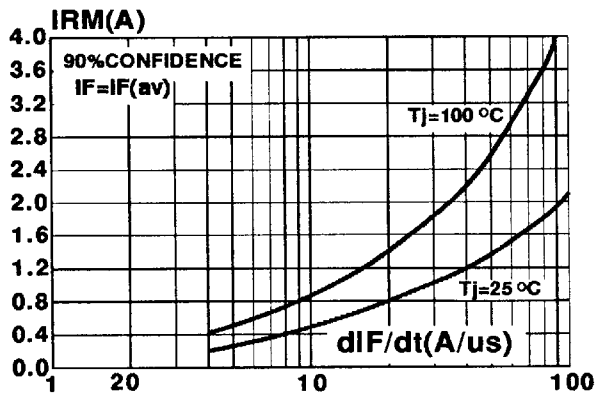
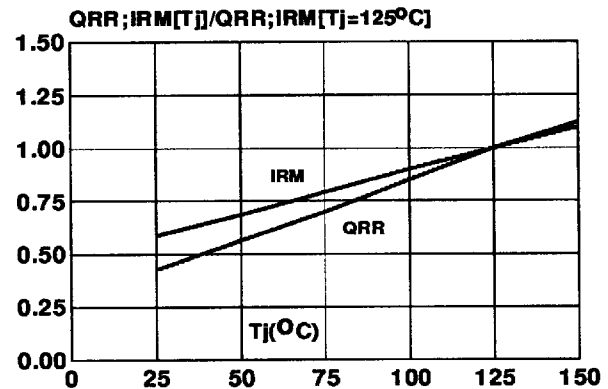
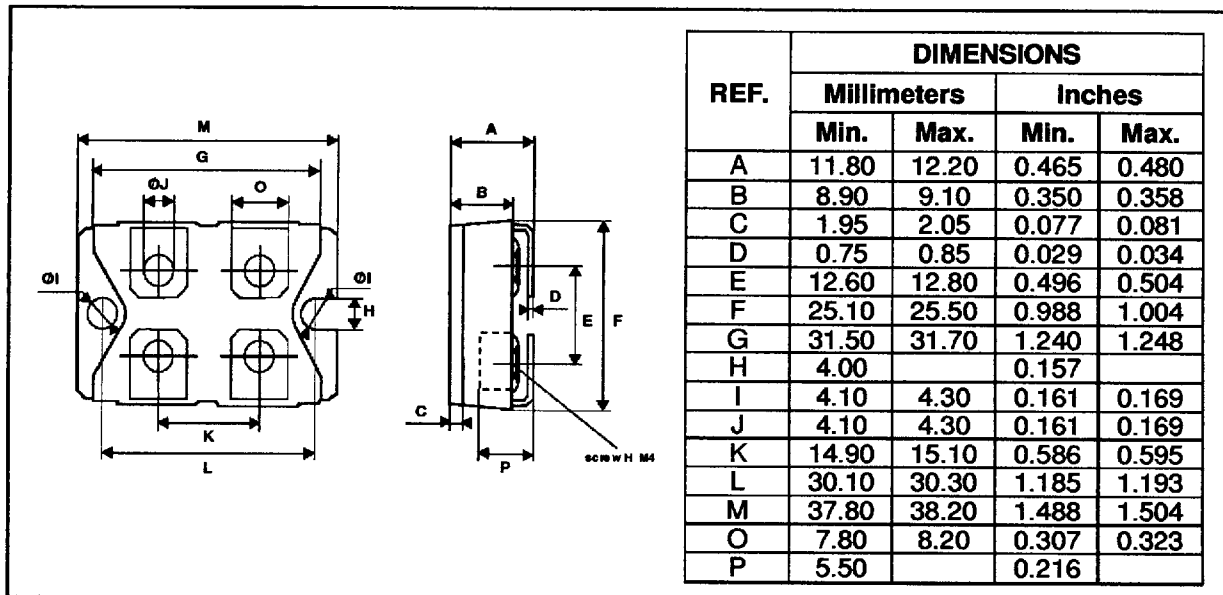


Fig.10 : Dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA
ISOTOP


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

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1995 SGS-THOMSON Microelectronics - Printed in Italy - All rights reserved.

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.