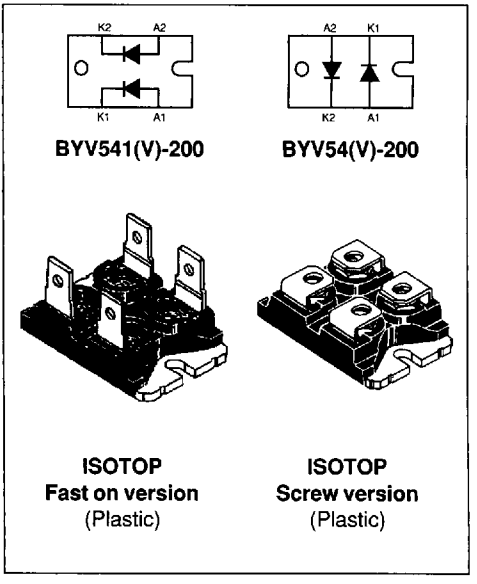
SGS-THOMSON MICROELECTRONICS

BYV54(V)
BYV541(V)

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 $\delta = 0.5$	Tc=90°C	Per diode	50	A
I_{FSM}	Surge non repetitive forward current	tp=10ms sinusoidal	Per diode	1000	A
Tstg Tj	Storage and junction temperature range			- 40 to + 150 - 40 to + 150	°C °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 :
Tj-Tc (diode 1) = P(diode 1) x Rth(j-c)(Per diode) + P(diode 2) x Rth(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 :
$P = 0.7 \times I_{F(AV)} + 0.003 \times I_F{}^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
trr	T_j = 25°C	I_F = 0.5A I_R = 1A	Irr = 0.25A			40	ns
		I_F = 1A V_R = 30V	dI_F/dt = -50A/µs			60	
tfr	T_j = 25°C	I_F = 1A $V_{FR} = 1.1 \times V_F$	tr = 5 ns		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.

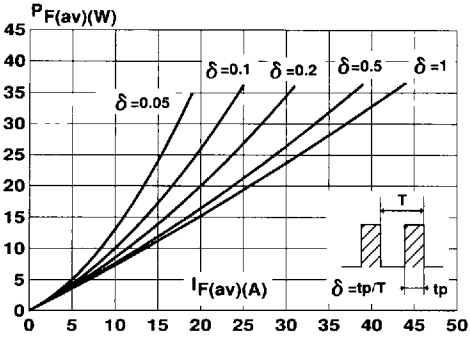


Fig.2 : Peak current versus form factor.

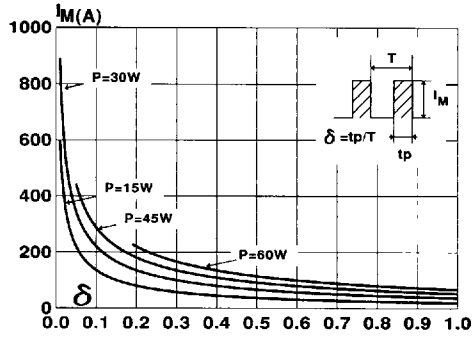


Fig.3 : Forward voltage drop versus forward current (maximum values).

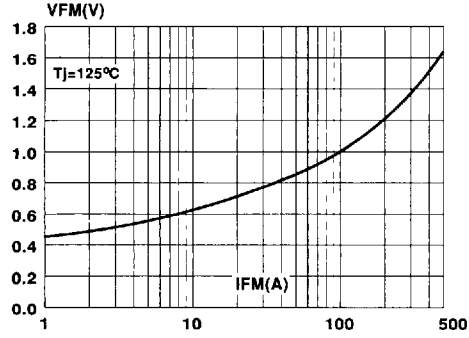


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

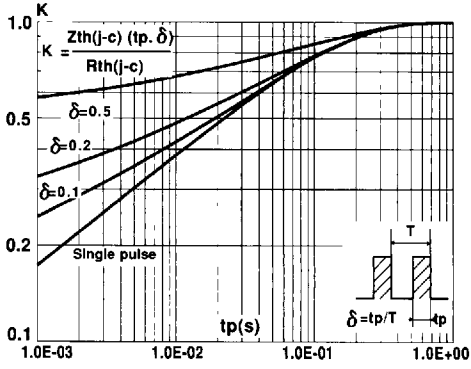


Fig.5 : Non repetitive surge peak forward current versus overload duration.

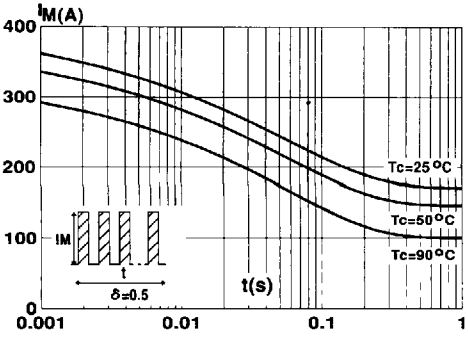


Fig.6 : Average current versus ambient temperature. (duty cycle : 0.5)

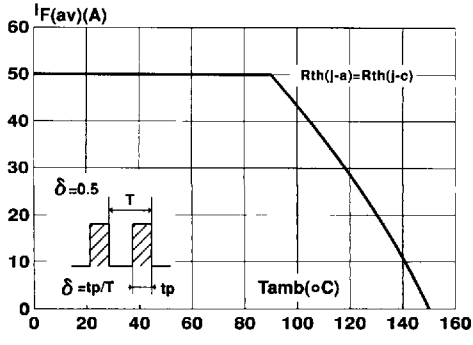


Fig.7 : Junction capacitance versus reverse voltage applied (Typical values).

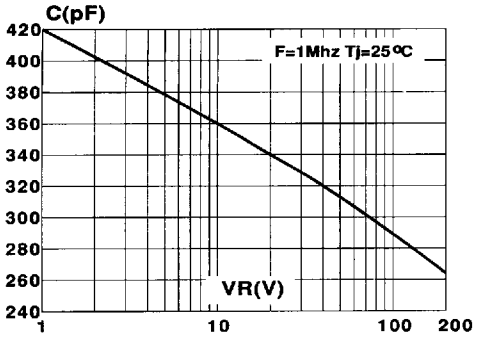


Fig.8 : Recovery charges versus dI_F/dt.

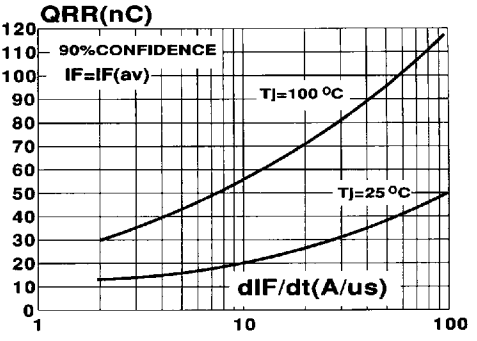


Fig.9 : Peak reverse current versus dIF/dt.

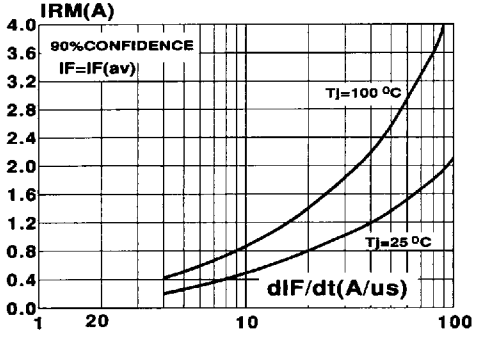


Fig.10 : Dynamic parameters versus junction temperature.