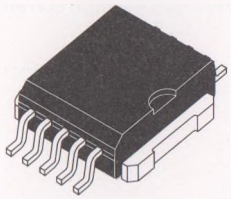
SGS-THOMSON MICROELECTRONICS

BYW51M-200

HIGH EFFICIENCY FAST RECOVERY DIODES

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 8 A
V_{RRM}	200 V
trr	35 ns
V_F	0.85 V



Power SO-10™
Plastic, non isolated SMD
with copper tab

FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIMES
- HIGH SURGE CURRENT
- HIGH DISSIPATION MINIATURE PACKAGE
- SURFACE MOUNT TECHNOLOGY COMPATIBLE

DESCRIPTION

Single rectifier suited for switchmode power supply and high frequency DC to DC converters.
Packaged in a high performance surface mount package PSO-10, this device is intended for use in high frequency inverters, free wheeling and polarity protection applications.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			200	V
$I_{F(RMS)}$	RMS forward current	All pins connected	Per diode	17	A
$I_{F(AV)}$	Average forward current	Tc=120°C δ = 0.5	Per diode	10	A
			Per device	20	
I_{FSM}	Surge non repetitive forward current	tp=10ms sinusoidal All pins connected	Per diode	100	A
I_{FRM}	Repetitive peak forward current	tp =5 µs f = 5 kHz	Per diode	100	A
Tstg Tj	Storage and junction temperature range			- 40 to + 150	°C

TM : PowerSO-10 is a trademark of SGS-THOMSON Microelectronics.

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction to case thermal resistances	Per diode	2.5	°C/W
		Total	1.4	
Rth (c)	Coupling thermal resistance		0.25	°C/W

STATIC ELECTRICAL CHARACTERISTICS (Per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	$V_R = V_{RRM}$	T_j = 25°C			15	µA
			T_j = 100°C			1	mA
V_F **	Forward voltage drop	I_F = 8 A	T_j = 125°C			0.9	V
		I_F = 16 A	T_j = 125°C			1.05	
		I_F = 16 A	T_j = 25°C			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 :
$P = 0.65 \times I_{F(AV)} + 0.025\ I_{F^2(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	T_j = 25°C I_F = 0.5A I_{rr} = 0.25 A I_R = 1A			25	ns
		T_j = 25°C I_F = 1A dI_F/dt = -50A/µs V_R = 30V			35	
t_{fr}	Forward recovery time	T_j = 25°C I_F = 1A dI_F/dt = 100A/µs V_{FR} = 1.1 x V_F max		15		ns
V_{FP}	Peak forward voltage	T_j = 25°C I_F = 1A dI_F/dt = 100A/µs		2		V

PIN OUT configuration in PowerSO-10 :

Anode 1 = pin 1 to 5
Anode 2 = pin 6 to 10
Cathodes = connected to base tab

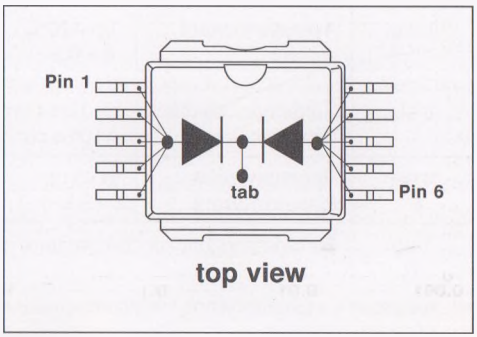


Fig.1 : Average forward power dissipation versus average forward current.

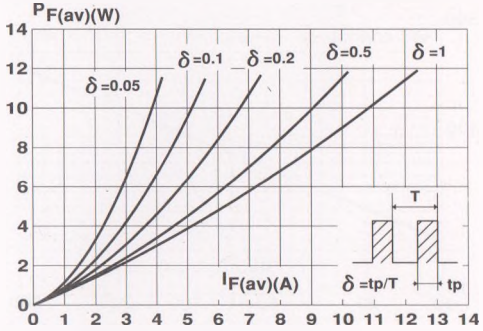


Fig.2 : Peak current versus form factor.

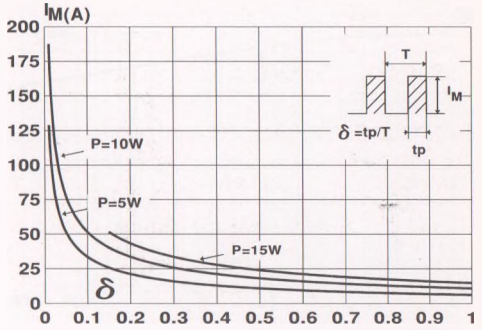


Fig.3 : Forward voltage drop versus forward current (maximum values).

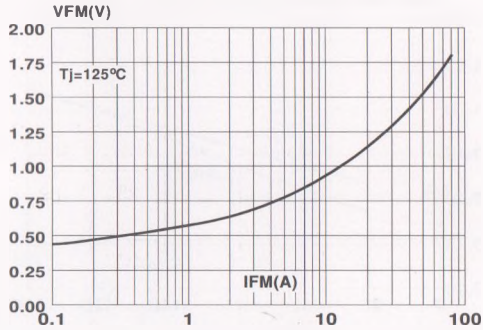


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

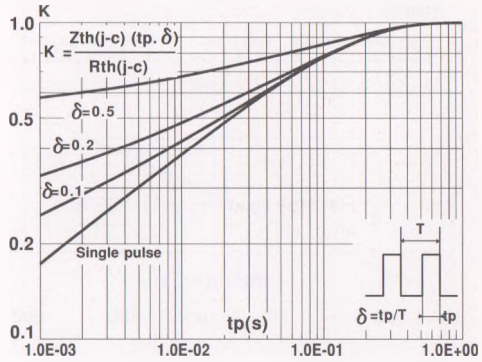


Fig.5 : Non repetitive surge peak forward current versus overload duration.

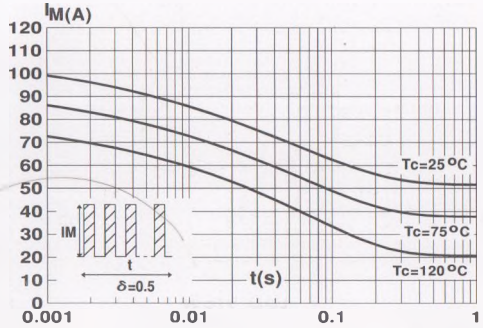


Fig.6 : Average current versus ambient temperature. (duty cycle : 0.5)

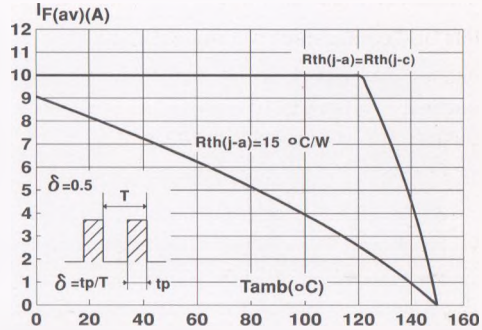


Fig.7 : Junction capacitance versus reverse voltage applied (Typical values).

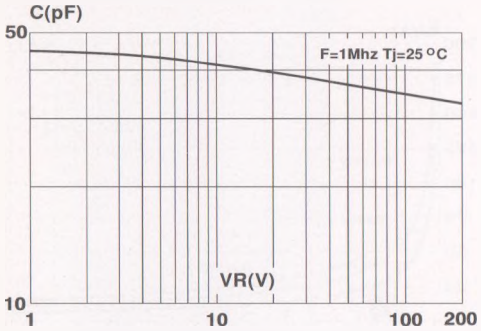


Fig.8 : Recovery charges versus dI_F/dt.

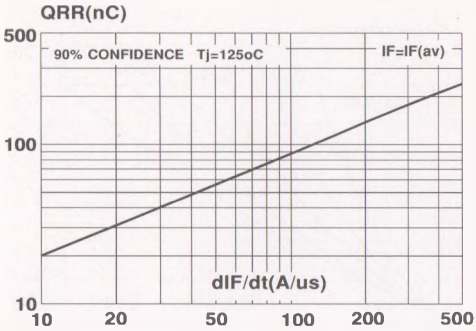


Fig.9 : Peak reverse current versus dIF/dt.

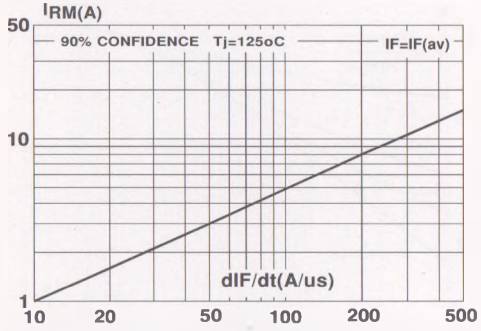


Fig.10 : Dynamic parameters versus junction temperature.