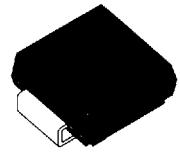
SGS-THOMSON MICROELECTRONICS

SMBYW04

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
- SURFACE MOUNT DEVICE



SOD15
(Plastic)

DESCRIPTION

Single chip rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters. Packaged in SOD15, this surface mount 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		10	A
$I_{F(AV)}$	Average forward current	Tl=70°C $\delta = 0.5$	4	A
I_{FSM}	Non repetitive surge peak forward current	tp=10ms sinusoidal	70	A
Tstg Tj	Storage and junction temperature range		- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	SMBYW04-				Unit
		50	100	150	200	
V_{RRM}	Repetitive peak reverse voltage	50	100	150	200	V

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
Rth (j-l)	Junction-leads	20	°C/W

ELECTRICAL CHARACTERISTICS
STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
V_F *	T_j = 25°C	I_F = 12 A			1.25	V
	T_j = 100°C	I_F = 4 A			0.85	
I_R **	T_j = 25°C	$V_R = V_{RRM}$			20	µA
	T_j = 100°C				0.5	mA

Pulse test : * tp = 380 µs, duty cycle < 2 %
** tp = 5 ms, duty cycle < 2 %

RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	T_j = 25°C	I_F = 1A dI_F/dt = -50A/µs V_R = 30V			35	ns
tfr	T_j = 25°C	I_F = 1A tr = 10 ns $V_{FR} = 1.1 \times V_F$		20		ns
V_{FP}	T_j = 25°C	I_F = 1A tr = 10 ns		5		V

To evaluate the conduction losses use the following equation :
$P = 0.7 \times I_{F(AV)} + 0.037 \times I_F{}^2{}_{(RMS)}$

Voltage (V)	50	100	150	200
Marking	D05	D10	D15	D20

Laser marking
Logo indicates cathode

Fig.1 : Low frequency power losses versus average current.

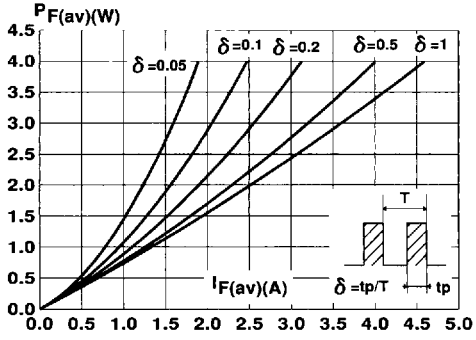


Fig.2 : Peak current versus form factor.

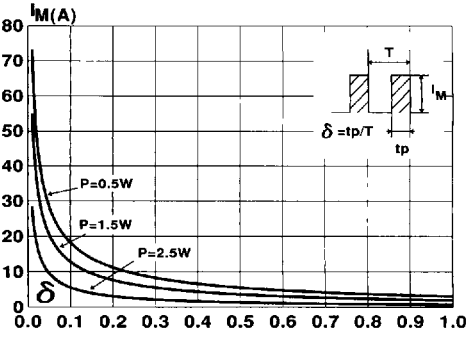


Fig.3 : Non repetitive surge peak forward current versus overload duration.

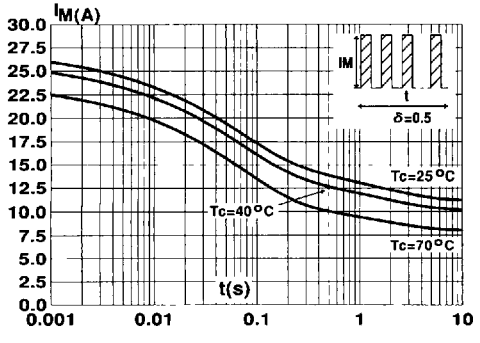


Fig.4 : Relative variation of thermal impedance junction to lead versus pulse duration.

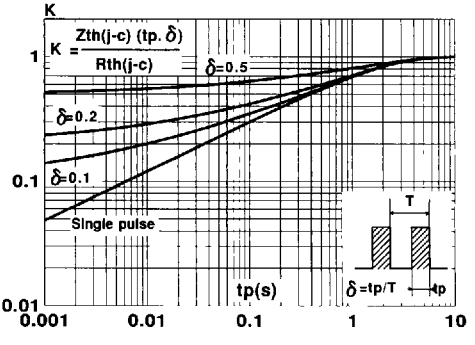


Fig.5 : Voltage drop versus forward current. (Maximum values)

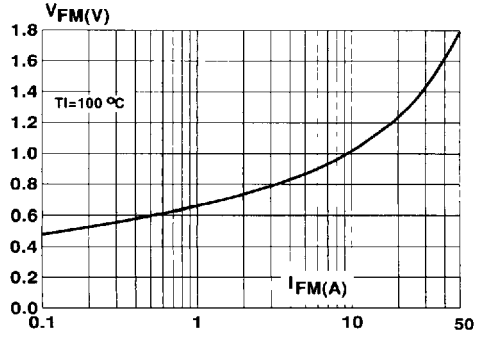


Fig.6 : Average current versus ambient temperature. (duty cycle : 0.5)

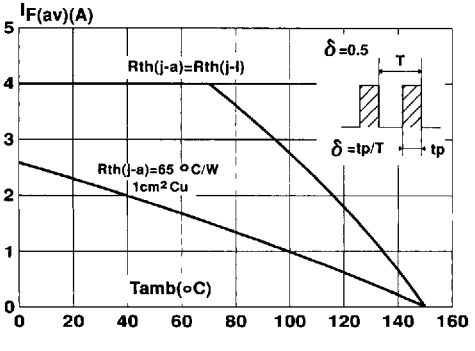


Fig.7 : Capacitance versus reverse voltage applied.

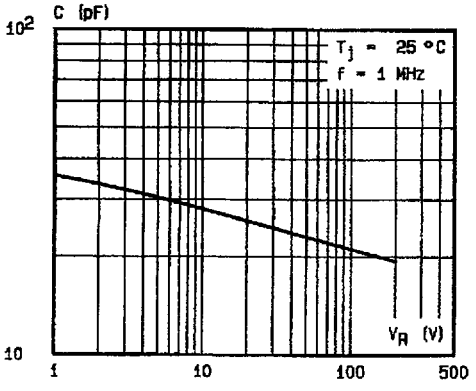


Fig.8 : Recovery time versus dIF/dt.

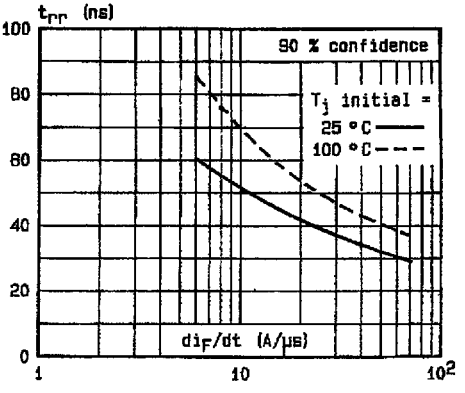


Fig.9 : Peak reverse current versus dIF/dt.

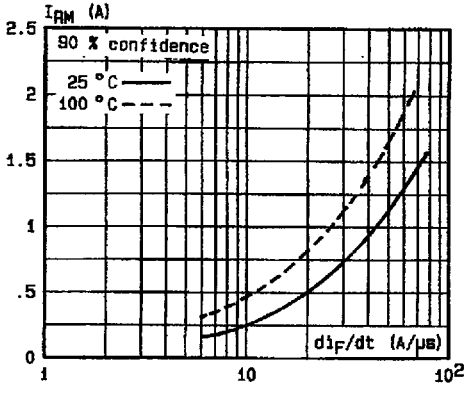


Fig.10 : Dynamic parameters versus junction temperature.

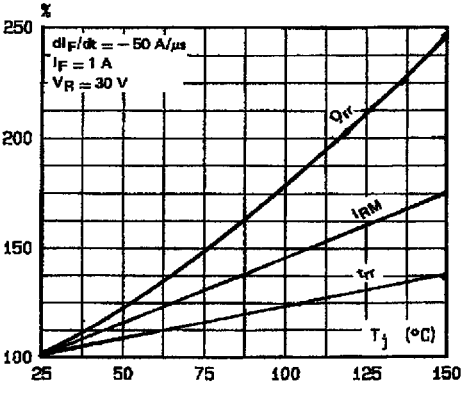


Fig.11 : Thermal resistance junction to ambient versus copper surface under each lead.