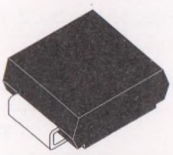
SGS-THOMSON MICROELECTRONICS

SMBYT03

FAST RECOVERY RECTIFIER DIODES

FEATURES

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- SURFACE MOUNT DEVICE



SOD15
(Plastic)

DESCRIPTION

Single high voltage rectifier ranging from 200V to 400 V suited for Switch Mode Power Supplies and other power converters.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
$I_{F(RMS)}$	RMS forward current		10	A
$I_{F(AV)}$	Average forward current	Tl=55°C δ = 0.5	3	A
I_{FSM}	Non repetitive surge peak forward current	tp=10ms sinusoidal	60	A
Tstg Tj	Storage and junction temperature range		- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	SMBYT03-			Unit
		200	300	400	
V_{RRM}	Repetitive peak reverse voltage	200	300	400	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 = 3 A			1.5	V
	T_j = 100°C				1.4	
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 = 0.5A Irr = 0.25A I_R = 1A			25	ns
		I_F = 1A dI_F/dt = -15A/µs V_R = 30V			60	

TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{IRM}	V_{CC} = 200V	I_F = 3A Lp ≤ 0.05µH		35	50	ns
I_{RM}	T_j = 100°C	dI_F/dt = -50A/µs		1.5	2	A

To evaluate the conduction losses use the following equation :
$P = 1.1 \times I_{F(AV)} + 0.08 \times I_F{}^2{}_{(RMS)}$

Voltage (V)	200	300	400
Marking	C2	C3	C4

Laser marking
Logo indicates cathode

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

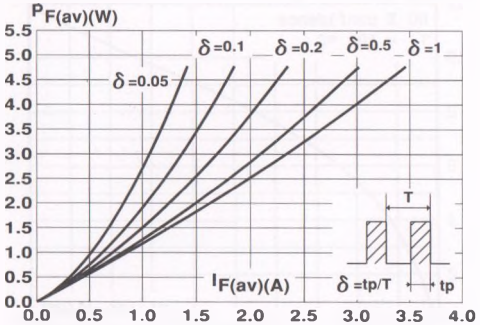


Fig.2 : Peak current versus form factor.

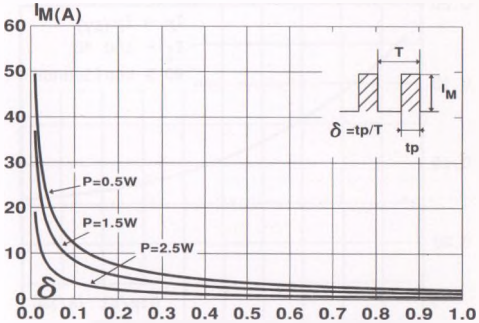


Fig.3 : Non repetitive surge peak forward current versus overload duration.

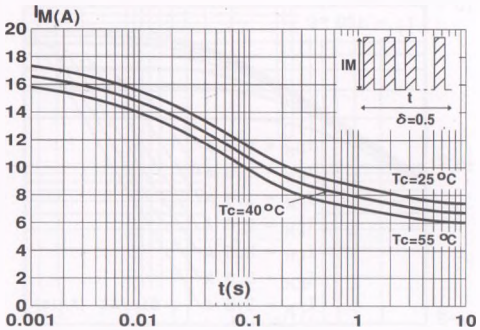


Fig.4 : Relative variation of thermal impedance junction to lead versus pulse duration.

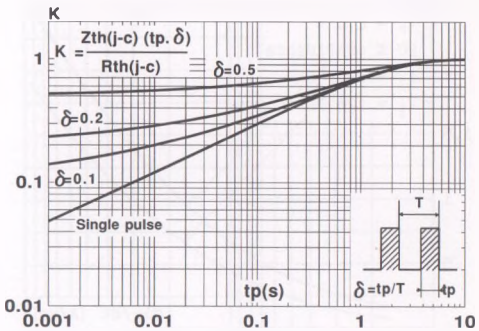


Fig.5 : Voltage drop versus forward current. (Maximum values)

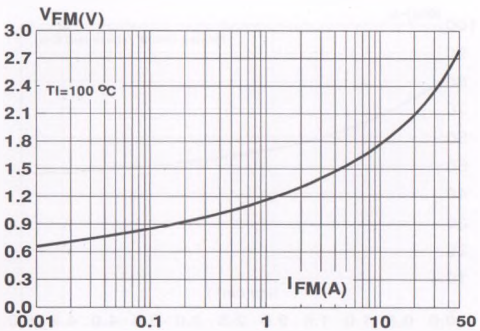


Fig.6 : Average current versus ambient temperature. (duty cycle : 0.5)

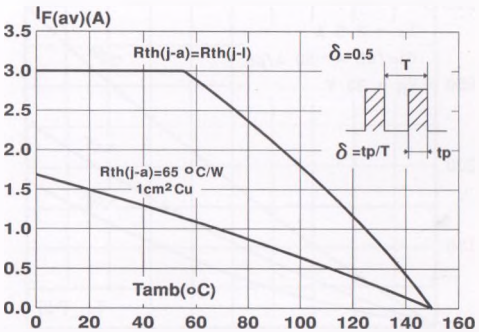


Fig.7 : Recovery time versus dI_F/dt.

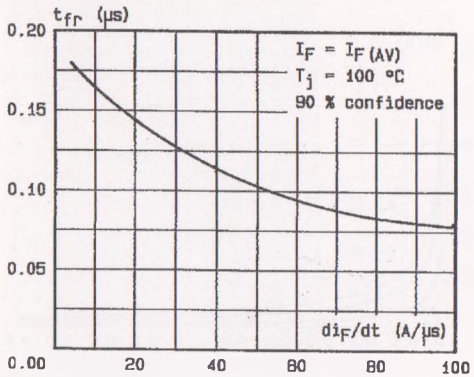


Fig.8 : Peak forward voltage versus dI_F/dt.

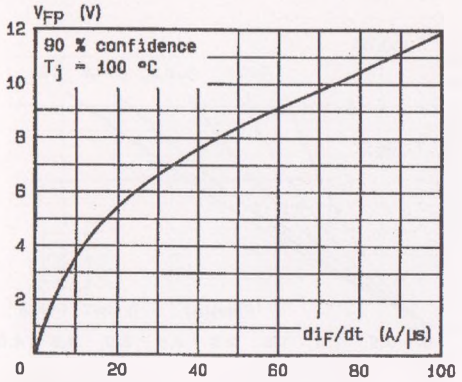


Fig.9 : Peak reverse current versus dIF/dt.

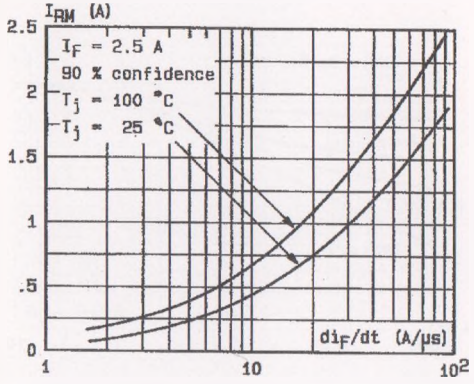


Fig.10 : Recovery charge versus dIF/dt. (typical values)

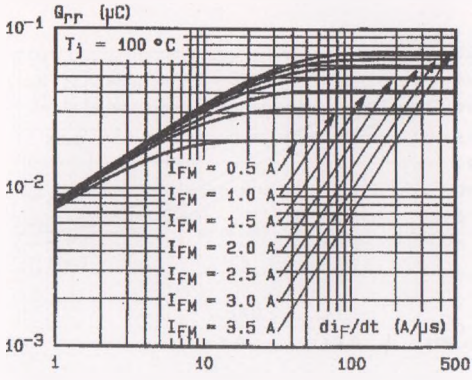


Fig.11 : Dynamic parameters versus junction temperature.

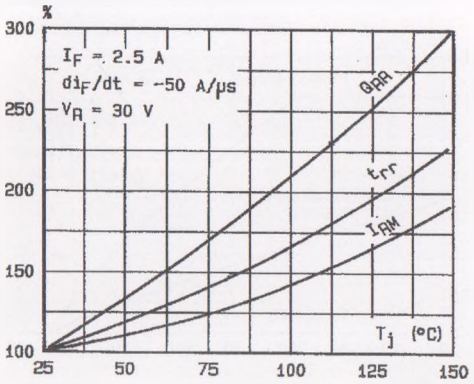


Fig.12 : Thermal resistance junction to ambient versus copper surface under each lead.