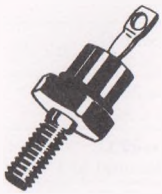
SGS-THOMSON MICROELECTRONICS

BYW 77-50 → 200

HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

- VERY LOW CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIMES
- HIGH SURGE CURRENT AND AVALANCHE CAPABILITY
- THE SPECIFICATIONS AND CURVES ENABLE THE DETERMINATION OF t_{rr} AND I_{RM} AT 100°C UNDER USERS CONDITIONS



DO 4
(Metal)

DESCRIPTION

Low voltage drop rectifiers suited for switching mode power supply.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
I_{FRM}	Repetitive Peak Forward Current	$t_p \leq 20\mu s$	500	A
$I_{F(RMS)}$	RMS Forward Current		50	A
$I_{F(AV)}$	Average Forward Current	$T_C = 115°C$ $\delta = 0.5$	25	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	500	A
P_{tot}	Power Dissipation	$T_C = 100°C$	33	W
T_{stg} T_j	Storage and Junction Temperature Range		− 40 to 150	°C

Symbol	Parameter	BYW 77-				Unit
		50	100	150	200	
V_{RRM}	Repetitive Peak Reverse Voltage	50	100	150	200	V
V_{RSM}	Non Repetitive Peak Reverse Voltage	55	110	165	220	V

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-case	1.5	°C/W

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I_R	T_j = 25°C	$V_R = V_{RRM}$			25	µA
	T_j = 100°C				2.5	mA
V_F	T_j = 25°C	I_F = 63A			1.1	V
	T_j = 100°C	I_F = 20A			0.85	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
t_{rr}	T_j = 25°C V_R = 30V	I_F = 1A see figure 12	di_F/dt = – 50A/µs			50	ns
Q_{rr}	T_j = 25°C $V_R \leq$ 30V	I_F = 2A	di_F/dt = – 20A/µs			20	nC
t_{fr}	T_j = 25°C Measured at 1.1 x V_F	I_F = 1A	t_r = 5ns		10		ns
V_{FP}	T_j = 25°C	I_F = 1A	t_r = 5ns		1.5		V

To evaluate the conduction losses use the following equations :

$V_F = 0.66 + 0.0047\ I_F$ $\qquad$ $P = 0.66 \times I_{F(AV)} + 0.0047 I_F{}^2{}_{(RMS)}$

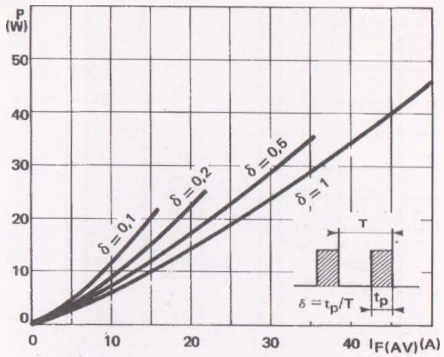


FIGURE 1 : Power losses versus average current

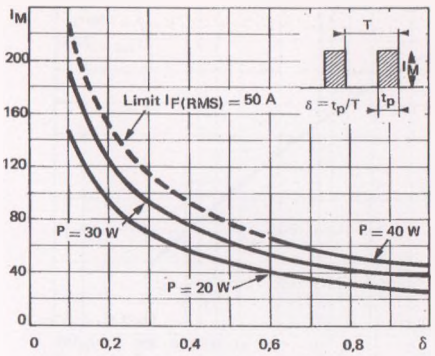


FIGURE 2 : Peak current versus form factor

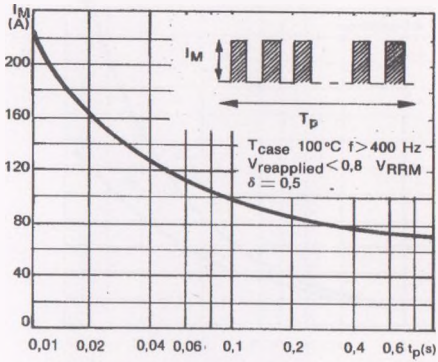


FIGURE 3 : Non repetitive peak surge current versus duration

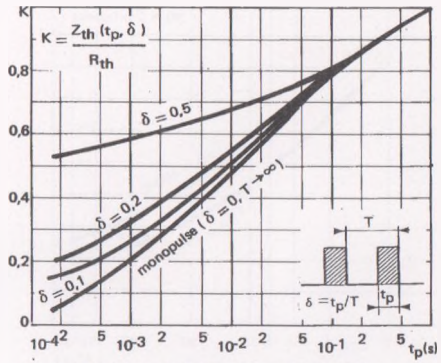


FIGURE 4 : Thermal impedance versus pulse width

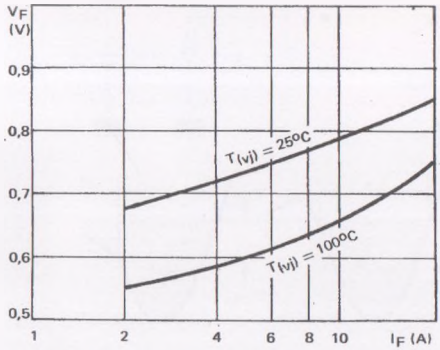


FIGURE 5 : Voltage drop and dispersion versus forward current

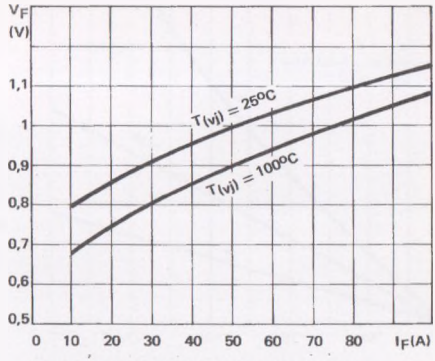


FIGURE 6 : Voltage drop versus forward current

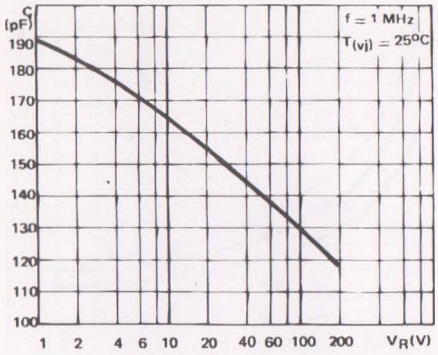


FIGURE 7 : Capacitance versus reverse voltage applied

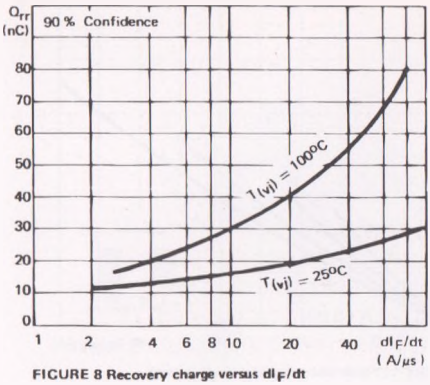


FIGURE 8 Recovery charge versus dI_F/dt

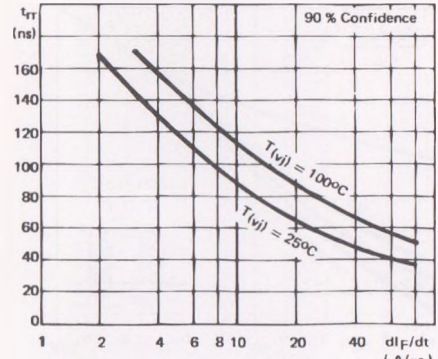


FIGURE 9 : Recovery time versus dI_F/dt

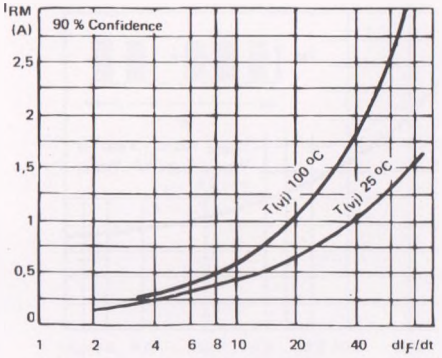


FIGURE 10 : Peak reverse current versus dI_F/dt

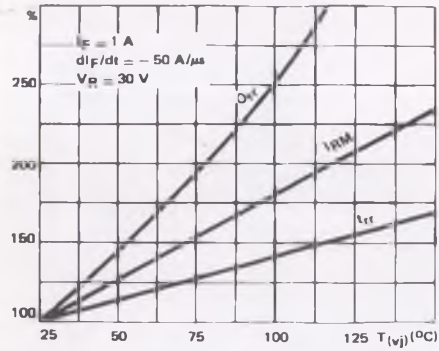


FIGURE 11 : Dynamic parameters versus junction temperature

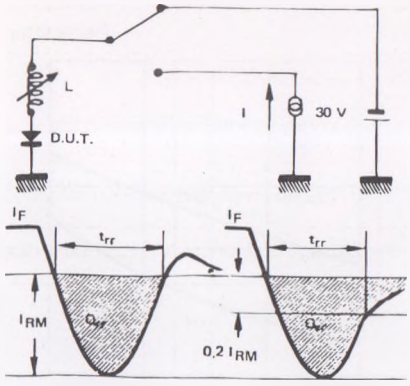


FIGURE 12 : Measurement of t_{rr} (fig. 9) and I_{RM} (fig. 10)