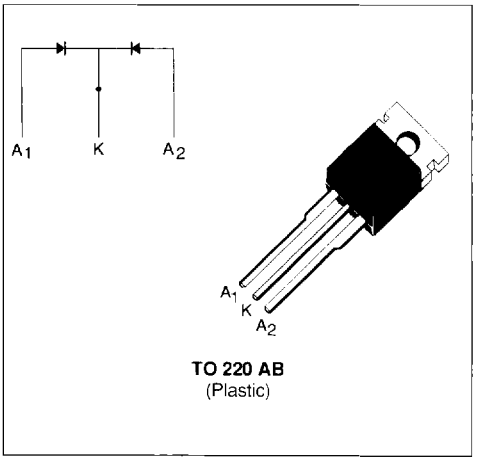
SGS-THOMSON MICROELECTRONICS

BYW 51-50 A → 200 A

HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIMES
- THE SPECIFICATIONS AND CURVES ENABLE THE DETERMINATION OF t_{rr} AND I_{RM} AT 100°C UNDER USERS CONDITIONS
- LOW THERMAL RESISTANCE



TO 220 AB
(Plastic)

DESCRIPTION

Low voltage drop double rectifiers center tap suited for switching mode power supply.

SUITABLE APPLICATIONS

The BYW 51 can be used :

2 X 10A 20A

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
I_{FRM}	Repetitive Peak Forward Current	$t_p \leq 20\mu s$	100	A
$I_{F(RMS)}$	RMS Forward Current		20 total	A
$I_{F(AV)}$	Average Forward Current	$T_C = 125°C$ $\delta = 0.5$	20 total	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	100	A
P_{tot}	Power Dissipation	$T_C = 125°C$	20 total	W
T_{stg} T_j	Storage and Junction Temperature Range		– 40 to 150	°C

Symbol	Parameter	BYW 51–				Unit
		50A	100A	150A	200A	
V_{RRM}	Repetitive Peak Reverse Voltage	50	100	150	200	V
V_{RSM}	Non Repetitive Peak Reverse Voltage	55	110	165	220	V

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-case	2.5 per leg 1.3 total	°C/W
$R_{th(c)}$	Coupling	0.1	°C/W

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Symbol		Test Conditions	Min.	Typ.	Max.	Unit
I_R	T_j = 25°C	$V_R = V_{RRM}$			15	µA
	T_j = 100°C				1	mA
V_F	T_j = 25°C	I_F = 8A			0.97	V
	T_j = 100°C				0.89	

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			35	ns
Q_{rr}	T_j = 25°C $V_R \leq$ 30V	I_F = 2A	dI_F/dt = – 20A/µs			15	nC
t_{fr}	T_j = 25°C Measured at 1.1 x V_F	I_F = 1A	t_r = 5ns		15		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 :

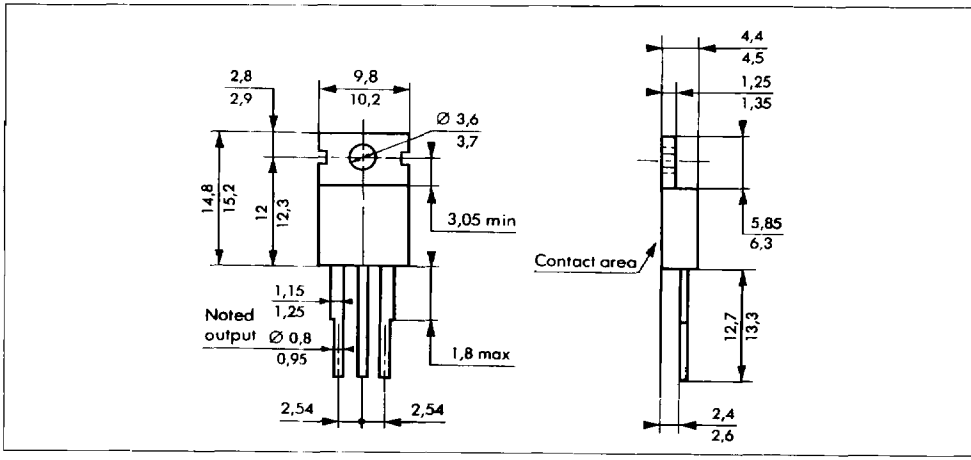
$V_F = 0.66 + 0.014\ I_F$

1 leg : $P = 0.66 \times I_{F(AV)} + 0.014\ I_{F^2(RMS)}$

Total : $P = 0.66 \times I_{F(AV)} + 0.007\ I_{F^2(RMS)}$

PACKAGE MECHANICAL DATA

TO 220 AB Plastic



Cooling method : by conduction (method C)
Marking : type number
Weight : 2.47g

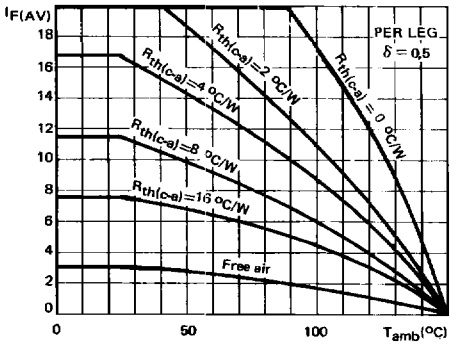


Figure 1: Average forward current versus air temperature and cooling system (1 leg)

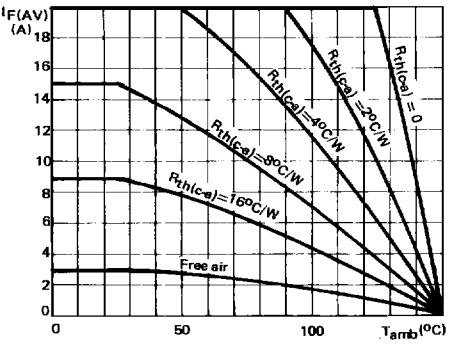


FIGURE 2 : Average forward current versus air temperature and cooling system (2 legs)

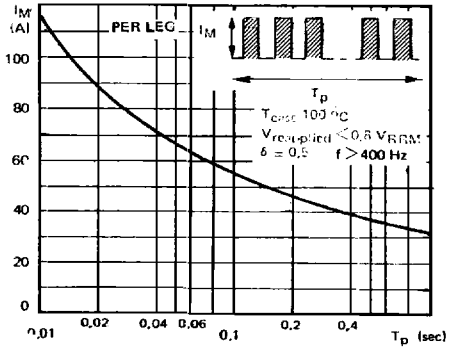


FIGURE 3 : Non repetitive peak surge current versus duration

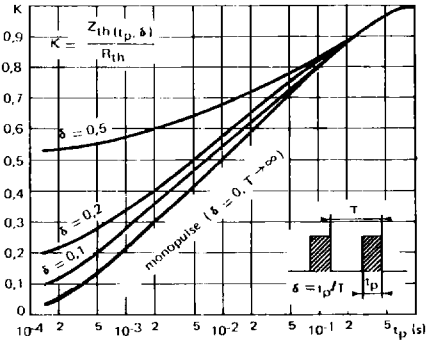


FIGURE 4 : Thermal impedance versus pulse width

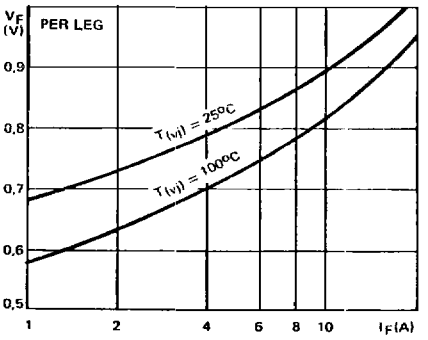


FIGURE 5 : Voltage drop versus forward current

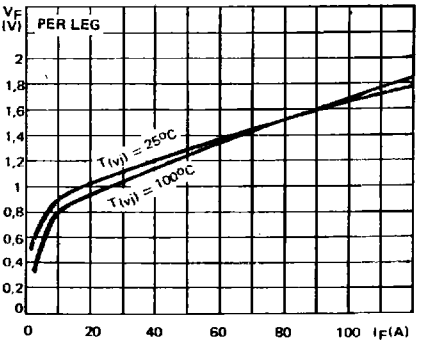


FIGURE 6 : Voltage drop versus forward current

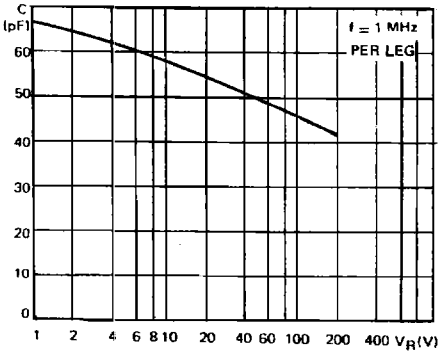


FIGURE 7 : Capacitance versus reverse voltage applied

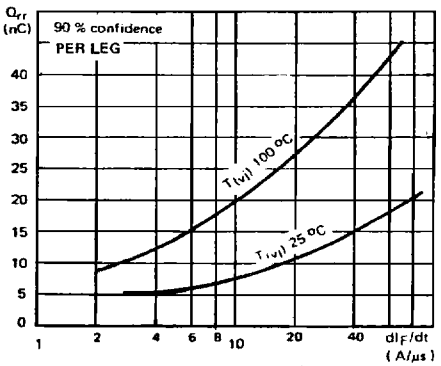


FIGURE 8 : Recovery charge versus dI_F/dt

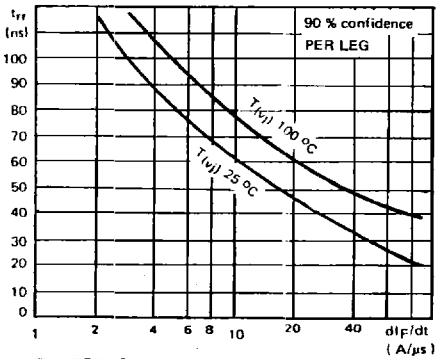


FIGURE 9 : Recovery time versus dI_F/dt

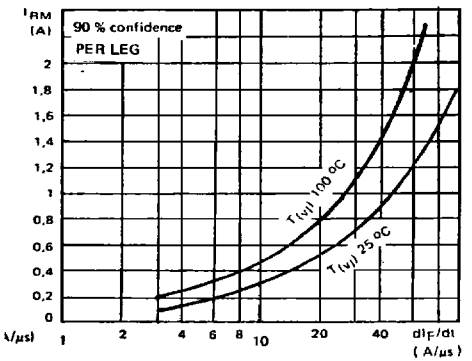


FIGURE 10 : Peak reverse current versus dI_F/dt

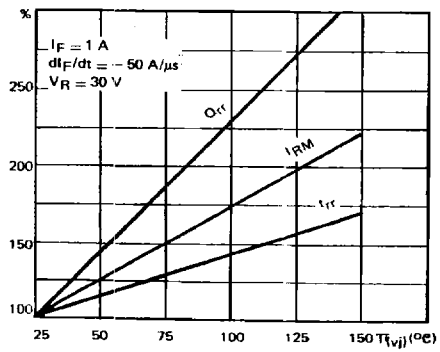


FIGURE 11 : Dynamic paramaters versus junction temperature

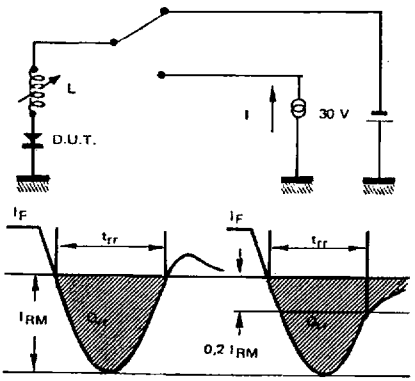


FIGURE 12 : Measurement of t_{rr} (fig.9) and I_{RM}