SGS-THOMSON MICROELECTRONICS

BYT 12-200 →400

FAST RECOVERY RECTIFIER DIODES

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING

DO 4
(Metal)

SUITABLE APPLICATIONS :

- FREE WHEELING DIODE IN CONVERTERS AND MOTOR CONTROL CIRCUITS
- RECTIFIER IN S.M.P.S.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
I_{FRM}	Repetitive Peak Forward Current	$t_p \leq 10\mu s$	200	A
$I_{F(RMS)}$	RMS Forward Current		25	A
$I_{F(AV)}$	Average Forward Current	$T_{case} = 100°C$ $\delta = 0.5$	12	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ sinusoidal	200	A
P	Power Dissipation	$T_{case} = 100°C$	20	W
T_{stg} T_j	Storage and Junction Temperature Range		− 40 to + 150	°C

Symbol	Parameter	BYT 12−			Unit
		200	300	400	
V_{RRM}	Repetitive Peak Reverse Voltage	200	300	400	V
V_{RSM}	Non Repetitive Peak Reverse Voltage	220	330	440	V

THERMAL RESISTANCE

Symbol	Test Conditions	Value	Unit
$R_{th\ (j-c)}$	Junction-case	2.5	°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				2.5	mA
V_F	T_j = 25°C	I_F = 12A			1.5	V
	T_j = 100°C				1.4	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{rr}	T_j = 25°C	I_F = 1A di_F/dt = – 15A/µs " V_R = 30V			100	ns
		I_F = 0.5A I_R = 1A I_{rr} = 0.25A			50	

TURN -OFF SWITCHING CHARACTERISTICS (Without Series Inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{IRM}	di_F/dt = – 50A/µs	V_{CC} = 200V I_F = 12A $L_p \leq$ 0.05µH T_j = 100°C See Figure 11			75	ns
	di_F/dt = – 100A/µs			50		
I_{RM}	di_F/dt = – 50A/µs				3.8	A
	di_F/dt = – 100A/µs			4.3		

TURN -OFF OVERVOLTAGE COEFFICIENT (With Series Inductance)

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	T_j = 100°C di_F/dt = – 12A/µs	V_{CC} = 120V L_p = 7µH	$I_F = I_{F(AV)}$ See note See Figure 12		3.3		

Note : Applicable to BYT12-400 only

To evaluate the conduction losses use the following equations :

$V_F = 1.1 + 0.022\ I_F$ $\qquad P = 1.1 \times I_{F(AV)} + 0.022\ I_F{}^2{}_{(RMS)}$

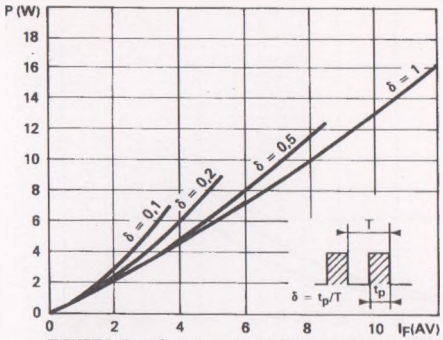

FIGURE 1 : Low frequency power losses versus average current.

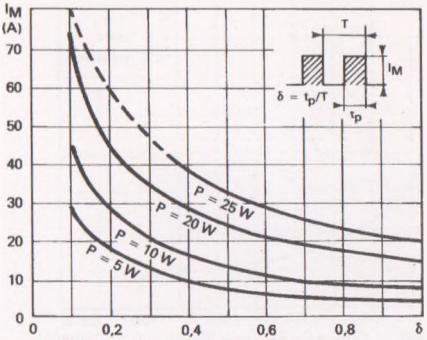

FIGURE 2 : Peak current versus form factor.

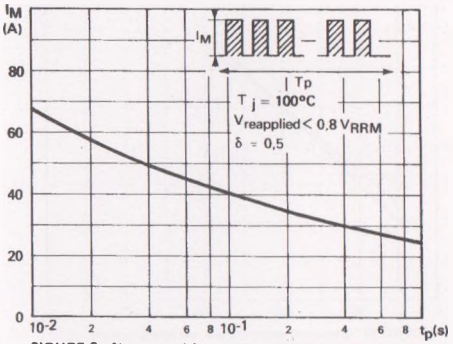

FIGURE 3 : Non repetitive peak surge current versus overload duration.

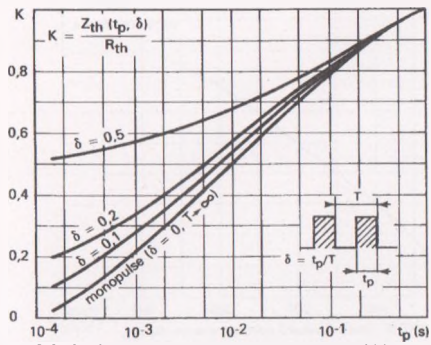

FIGURE 4 : Thermal impedance versus pulse width.

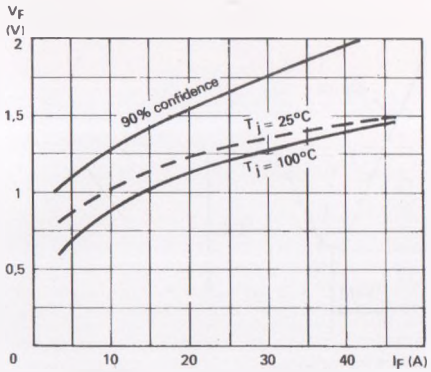

FIGURE 5 : Voltage drop versus forward current.

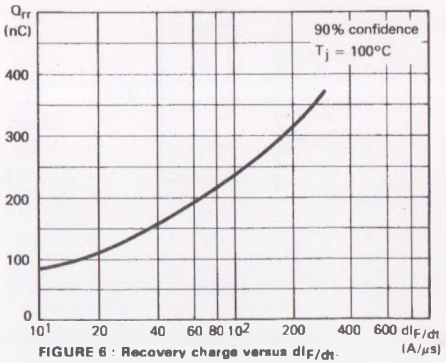

FIGURE 6 : Recovery charge versus $dI_{F/dt}$.

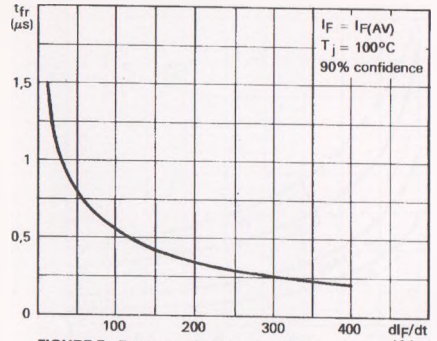

FIGURE 7 : Recovery time versus dI_F/dt.

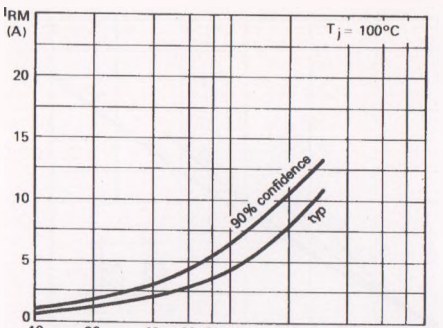

FIGURE 8 : Peak reverse current versus dI_F/dt.

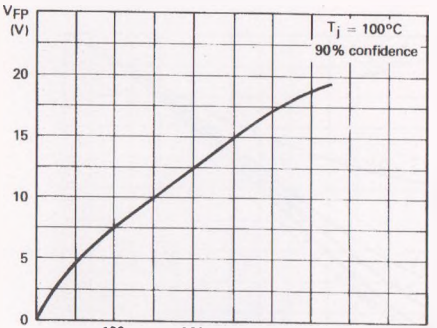

FIGURE 9 : Peak forward voltage versus dI_F/dt.

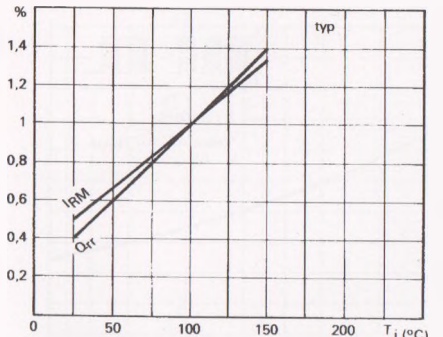

FIGURE 10 : Dynamic parameters versus junction temperature.

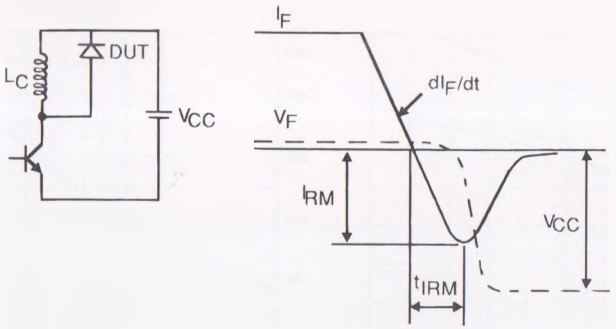

Figure 11 : Turn-off switching characteristics (without series inductance).

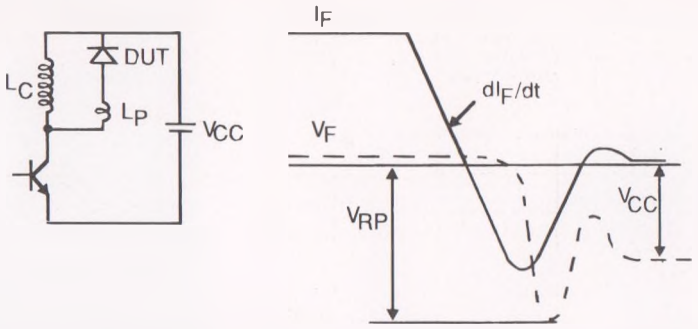

Figure 12 : Turn-off switching characteristics (with series inductance).