SGS-THOMSON MICROELECTRONICS

BYT 30P-200 → 400

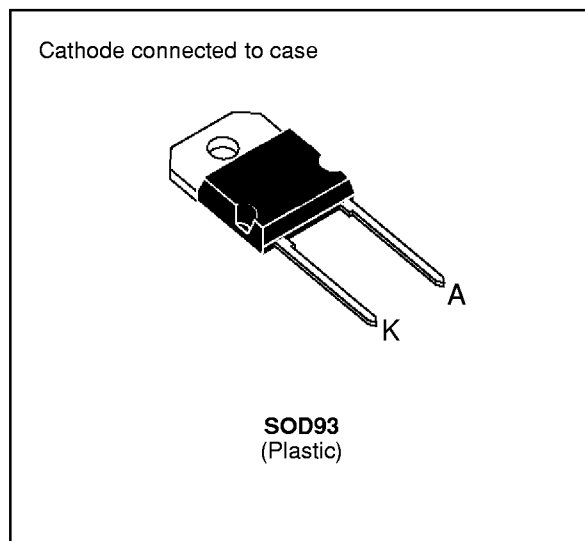# FAST RECOVERY RECTIFIER DIODES

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

Cathode connected to case

A
K

SOD93
(Plastic)

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}	Repetive Peak Forward Current	$t_p \leq 10\mu s$	500	A
$I_{F (RMS)}$	RMS Forward Current		50	A
$I_{F (AV)}$	Average Forward Current	$T_c = 100°C$ $\delta = 0.5$	30	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	350	A
P	Power Dissipation	$T_c = 100°C$	50	W
T_{stg} T_j	Storage and Junction Temperature Range		- 40 to + 150 - 40 to + 150	°C

Symbol	Parameter	BYT 30P-			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	Parameter	Value	Unit
$R_{th (j-c)}$	Junction-case	1	°C/W

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Synbol	Test Conditions		Min.	Typ.	Max.	Unit
I_R	$T_j = 25°C$	$V_R = V_{RRM}$			35	μA
	$T_j = 100°C$				6	mA
V_F	$T_j = 25°C$	$I_F = 30A$			1.5	V
	$T_j = 100°C$				1.4	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions				Min.	Typ.	Max.	Unit
t_{rr}	$T_j = 25°C$	$I_F = 1A$	$di_F/dt = -15A/\mu s$	$V_R = 30V$			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}	$di_F/dt = -120A/\mu s$	$V_{CC} = 200 V$ $I_F = 30A$			75	ns
	$di_F/dt = -240A/\mu s$	$L_p \le 0.05\mu H$ $T_j = 100°C$ See figure 11		50		
I_{RM}	$di_F/dt = -120A/\mu s$				9	A
	$di_F/dt = -240A/\mu s$			12		

TURN-OFF OVERVOLTAGE COEFFICIENT (With Series Inductance)

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
$C = \dfrac{V_{RP}}{V_{CC}}$	$T_j = 100°C$ $di_F/dt = -30A/\mu s$	$V_{CC} = 60V$ $L_p = 1\mu H$	$I_F = I_{F(AV)}$ See figure 12		3.3		

To evaluate the conduction losses use the following equations:

$V_F = 1.1 + 0.0095\,I_F$ $\qquad\qquad$ $P = 1.1 \times I_{F(AV)} + 0.0095\,I^2_{F(RMS)}$
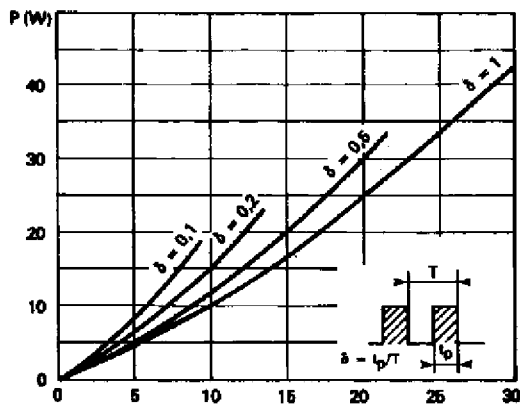
Figure 1. Low frequency power losses versus average current

Figure 2. Peak current versus form factor

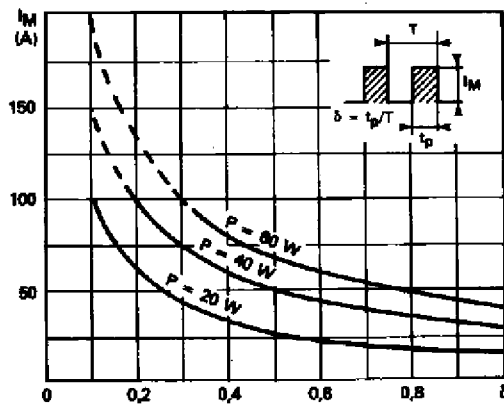SGS-THOMSON
MICROELECTRONICS

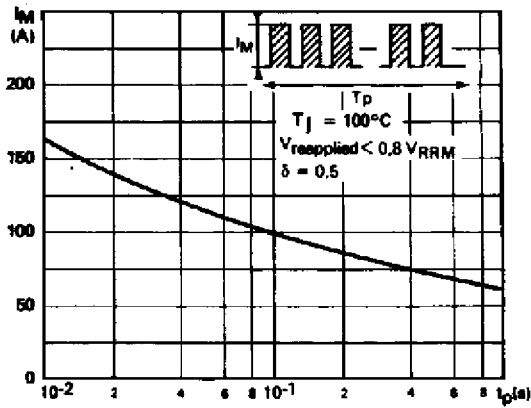**Figure 3. Non repetitive peak surge current versus overload duration**

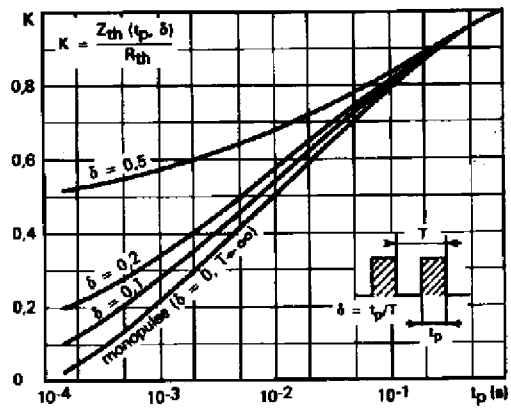**Figure 4. Thermal impedance versus pulse width**
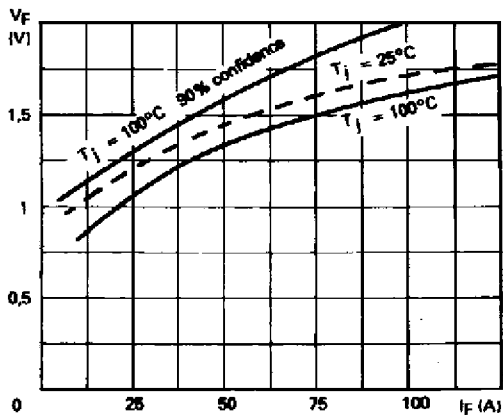

Figure 5. Voltage drop versus forward current
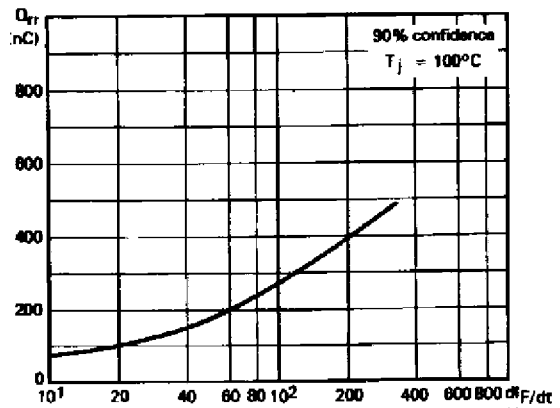

Figure 6. Recovery charge versus di_F/dt.

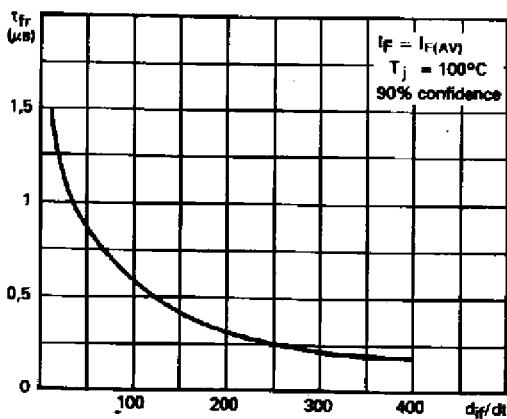**Figure 7. Recovery time versus di_F/dt.**
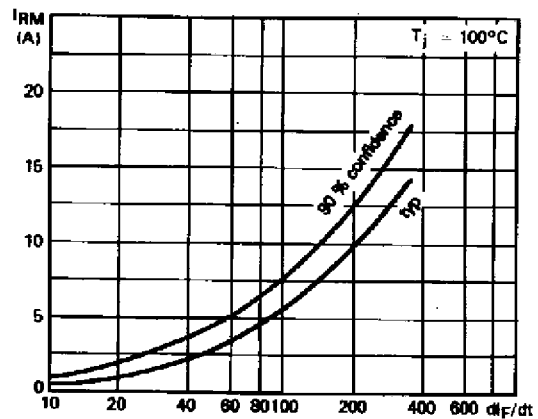

Figure 8. Peak reverse current versus di_F/dt.
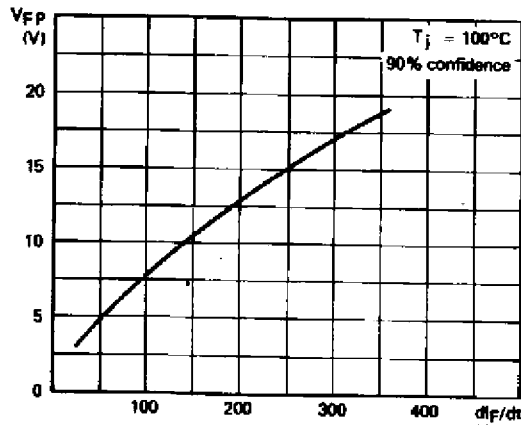
Figure 9. Peak forward voltage versus di$_F$/d$_t$-

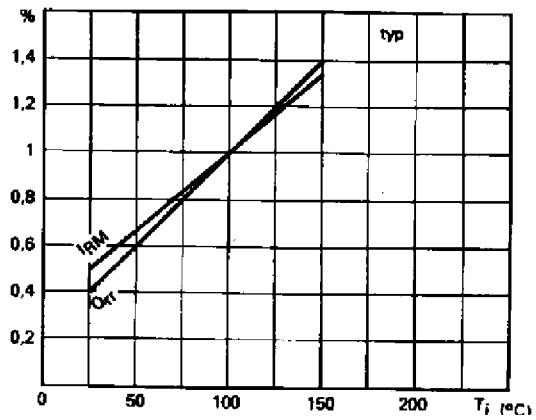

Figure 10. Dynamic parameters versus junction temperature.

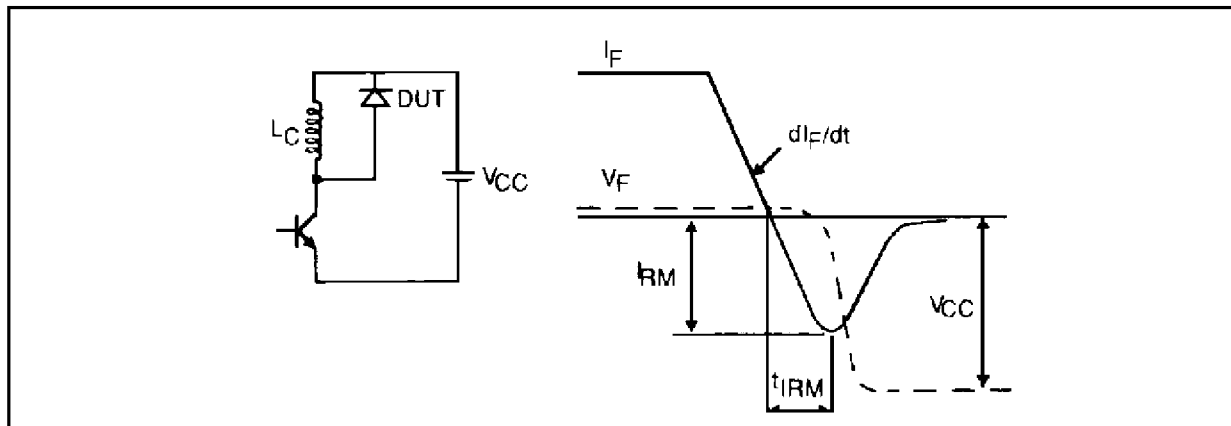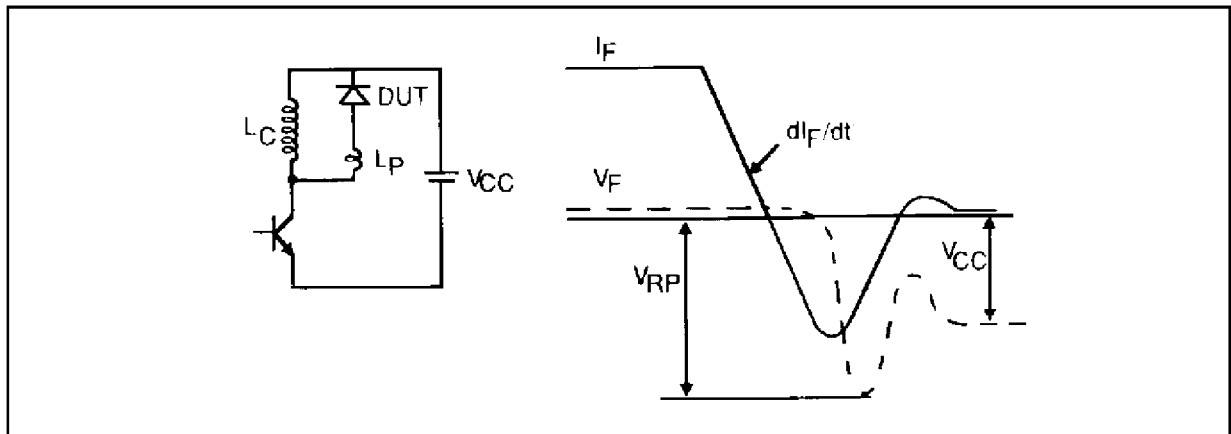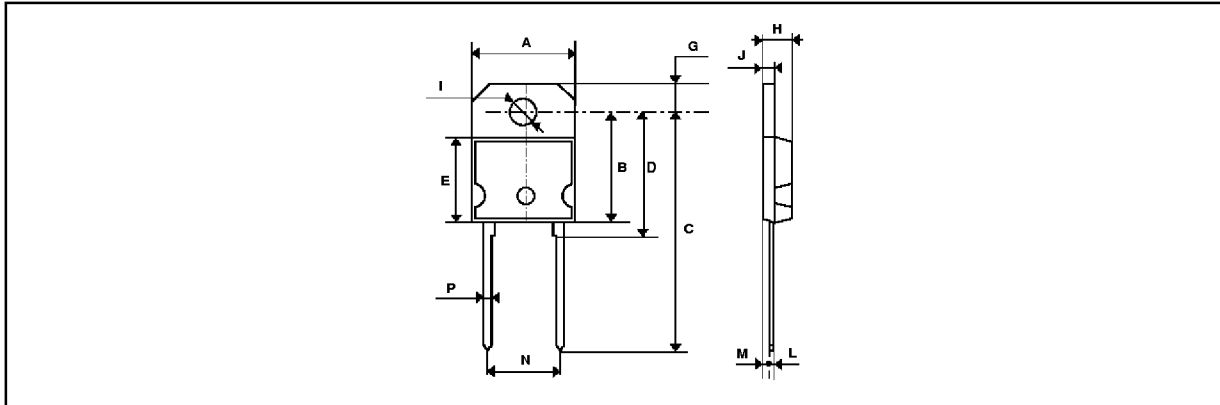### Figure 11. Turn-off switching characteristics (without series inductance).

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

SGS-THOMSON
MICROELECTRONICS

PACKAGE MECHANICAL DATA :
SOD93 Plastic

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	14.7	15.2	0.578	0.596
B		16.2		0.637
C	31 typ		1.220 typ	
D	18 typ		0.708 typ	
E		12.2		0.480
G	3.95	4.15	0.155	0.163
H	4.7	4.9	0.185	0.193
I	4	4.1	0.157	0.161
J	1.17	1.37	0.046	0.054
L	0.5	0.78	0.019	0.030
M	2.5 typ		0.098 typ	
N	10.8	11.1	0.425	0.437
P	1.1	1.3	0.043	0.051

Cooling method: by conduction (method C)
Marking: type number
Weight: 4.3g
Recommended torque value: 80cm. N
Maximum torque value: 100cm. N

SGS-THOMSON
MICROELECTRONICS