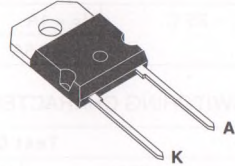


## FAST RECOVERY RECTIFIER DIODES

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

Cathode connected to case



**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
$I_{FRM}$	Repetitive 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	$T_{case} = 100^\circ C$ $\delta = 0.5$ 30	A
$I_{FSM}$	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal 350	A
P	Power Dissipation	$T_{case} = 100^\circ C$ 50	W
$T_{stg}$ $T_j$	Storage and Junction Temperature Range	- 40 to + 150	$^\circ C$

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	Test Conditions	Value	Unit
$R_{th(j-c)}$	Junction-case	1	$^\circ C/W$

**ELECTRICAL CHARACTERISTICS**

**STATIC CHARACTERISTICS**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$I_R$	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			35	$\mu\text{A}$
	$T_j = 100^\circ\text{C}$				6	$\text{mA}$
$V_F$	$T_j = 25^\circ\text{C}$	$I_F = 30\text{A}$			1.5	V
	$T_j = 100^\circ\text{C}$				1.4	

**RECOVERY CHARACTERISTICS**

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
$t_{rr}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$	$di_F/dt = -15\text{A}/\mu\text{s}$	$V_R = 30\text{V}$		100	ns
		$I_F = 0.5\text{A}$	$I_R = 1\text{A}$	$I_{rr} = 0.25\text{A}$		50	

**TURN -OFF SWITCHING CHARACTERISTICS (Without Series Inductance)**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$t_{IRM}$	$di_F/dt = -120\text{A}/\mu\text{s}$	$V_{CC} = 200\text{V}$ $I_F = 30\text{A}$ $L_p < 0.05\mu\text{H}$ $T_j = 100^\circ\text{C}$ See Figure 11			75	ns
	$di_F/dt = -240\text{A}/\mu\text{s}$			50		
$I_{RM}$	$di_F/dt = -120\text{A}/\mu\text{s}$				9	A
	$di_F/dt = -240\text{A}/\mu\text{s}$			12		

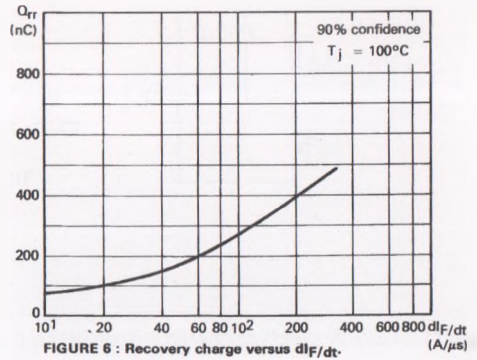
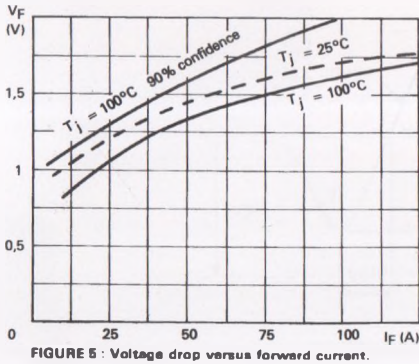
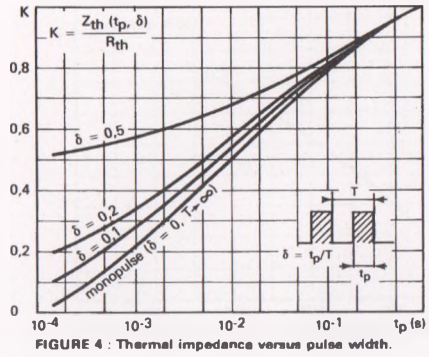
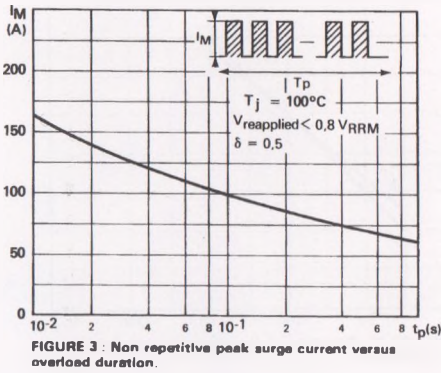
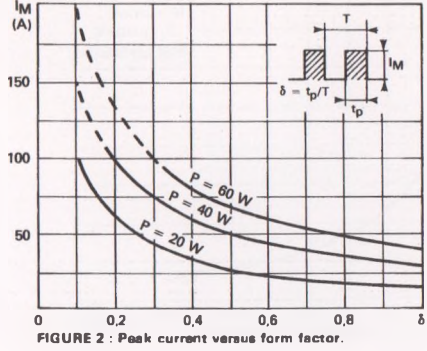
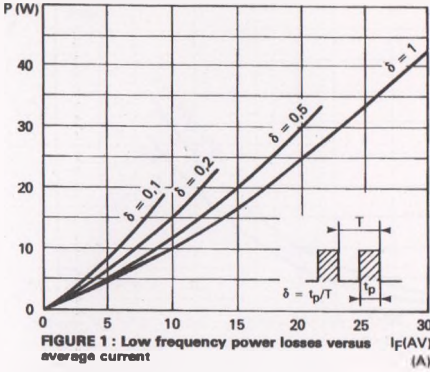
**TURN -OFF OVERVOLTAGE COEFFICIENT (With Series Inductance)**

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

To evaluate the conduction losses use the following equations :

$$V_F = 1.1 + 0.0095I_F$$

$$P = 1.1 \times I_{F(AV)} = 0.0095I_{F(RMS)}^2$$



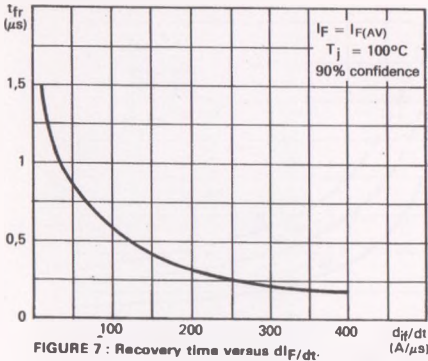


FIGURE 7 : Recovery time versus  $dI_F/dt$ .

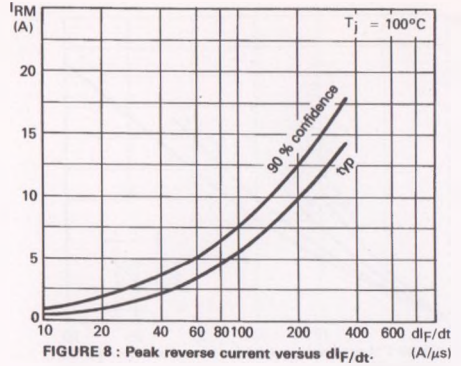


FIGURE 8 : Peak reverse current versus  $dI_F/dt$ .

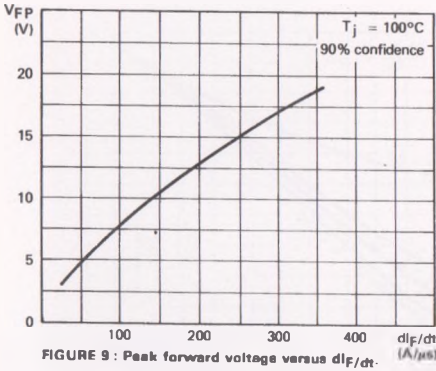


FIGURE 9 : Peak forward voltage versus  $dI_F/dt$ .

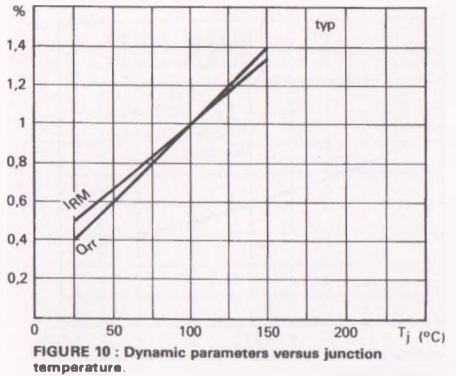


FIGURE 10 : Dynamic parameters versus junction temperature.

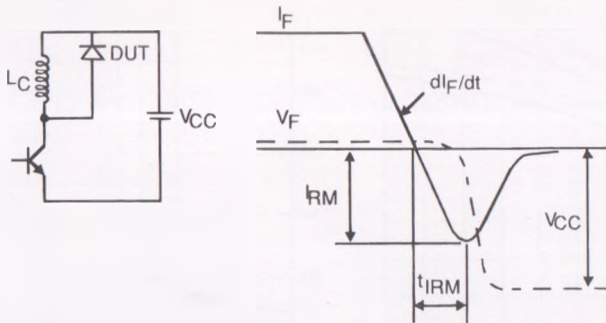


Figure 11 : Turn-off switching characteristics (without series inductance).

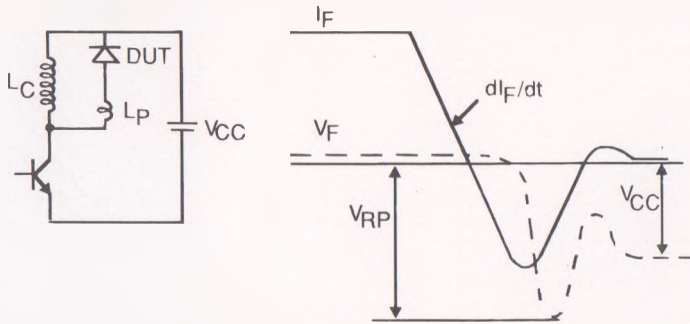


Figure 12 : Turn-off switching characteristics (with series inductance).