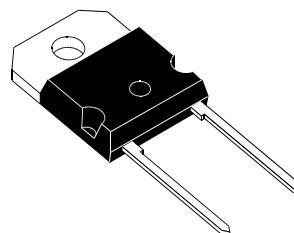


## FAST RECOVERY RECTIFIER DIODE

- VERY HIGH REVERSE VOLTAGE CAPABILITY
- 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 MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage		1000	V
$V_{RSM}$	Non Repetitive Peak Reverse Voltage		1000	V
$I_{FRM}$	Repetive Peak Forward Current	$t_p \leq 10\mu s$	375	A
$I_F (RMS)$	RMS Forward Current		70	A
$I_F (AV)$	Average Forward Current	$T_c = 85^\circ C$ $\delta = 0.5$	30	A
$I_{FSM}$	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	200	A
P	Power Dissipation	$T_c = 85^\circ C$	60	W
$T_{stg}$ $T_j$	Storage and Junction Temperature Range		- 40 to +150 - 40 to +150	$^\circ C$

### THERMAL RESISTANCE

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

## ELECTRICAL CHARACTERISTICS

### STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$I_R$	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			100	$\mu\text{A}$
	$T_j = 100^\circ\text{C}$				5	$\text{mA}$
$V_F$	$T_j = 25^\circ\text{C}$	$I_F = 30\text{A}$			1.9	$\text{V}$
	$T_j = 100^\circ\text{C}$				1.8	

### RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$t_{rr}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$ $di_F/dt = -15\text{A}/\mu\text{s}$ $V_R = 30\text{V}$			165	$\text{ns}$
		$I_F = 0.5\text{A}$ $I_R = 1\text{A}$ $I_{rr} = 0.25\text{A}$			70	

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

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$t_{IRM}$	$di_F/dt = -120\text{A}/\mu\text{s}$	$V_{CC} = 200\text{V}$ $I_F = 30\text{A}$ $L_p \leq 0.05\mu\text{H}$ $T_j = 100^\circ\text{C}$ See figure 11			200	$\text{ns}$
	$di_F/dt = -240\text{A}/\mu\text{s}$			120		
$I_{RM}$	$di_F/dt = -120\text{A}/\mu\text{s}$				19.5	$\text{A}$
	$di_F/dt = -240\text{A}/\mu\text{s}$			22		

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

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	$T_j = 100^\circ\text{C}$ $di_F/dt = -30\text{A}/\mu\text{s}$	$V_{CC} = 200\text{V}$ $I_F = I_{F(AV)}$ $L_p = 5\mu\text{H}$ See figure 12			4.5	

To evaluate the conduction losses use the following equation:

$$V_F = 1.47 + 0.010 I_F \quad P = 1.47 \times I_{F(AV)} + 0.010 I_F^2(\text{RMS})$$

Figure 1. Low frequency power losses versus average current

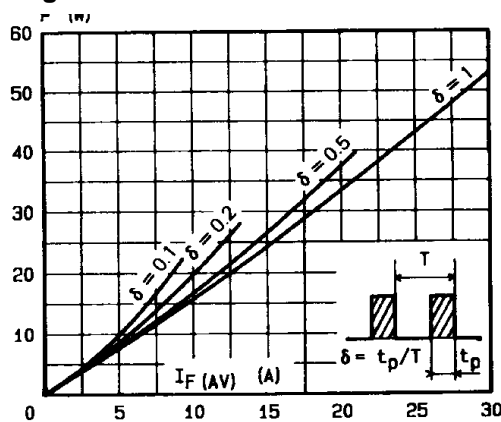


Figure 2. Peak current versus form factor

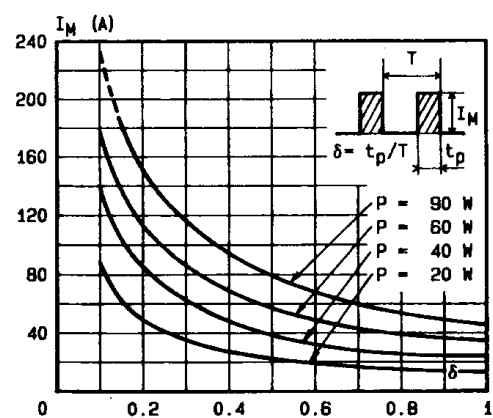


Figure 3. Non repetitive peak surge current versus overload duration

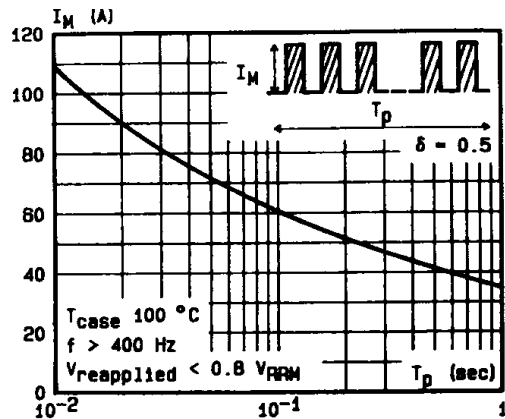


Figure 4. Thermal impedance versus pulse width

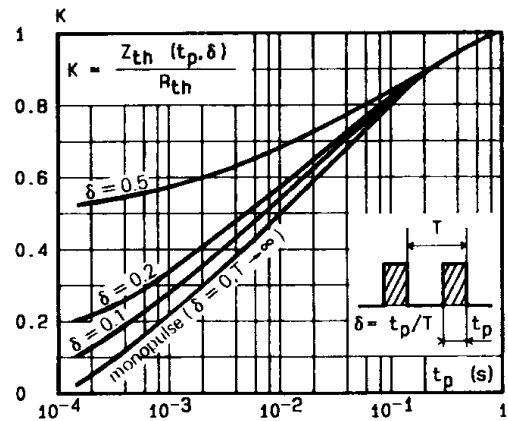


Figure 5. Voltage drop versus forward current

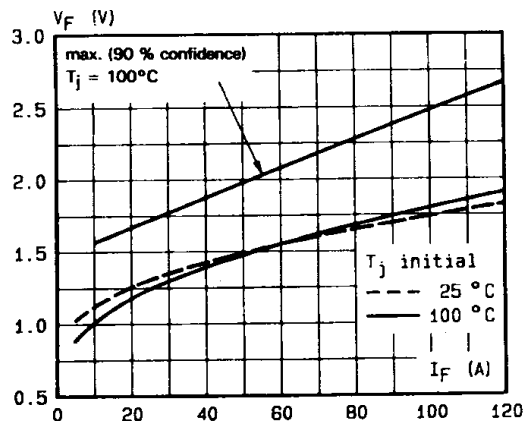


Figure 6. Recovery charge versus di\_F/dt

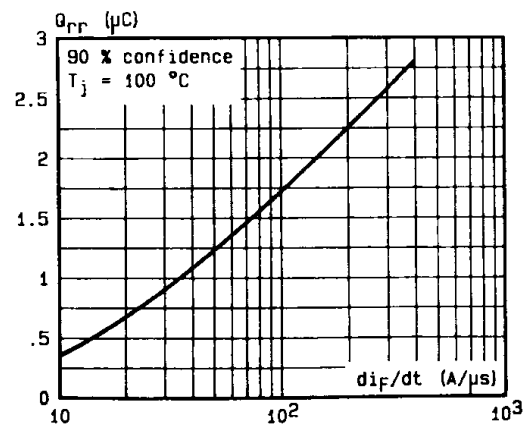


Figure 7. Recovery time versus di\_F/dt

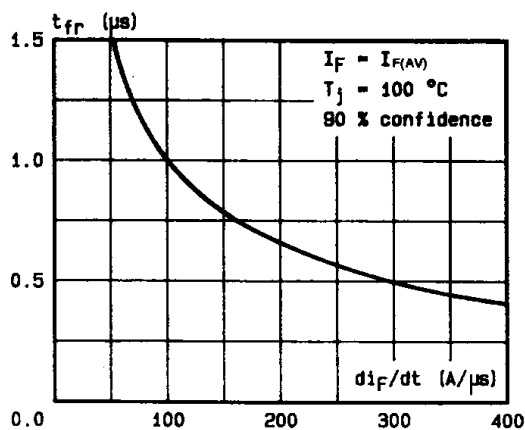


Figure 8. Peak reverse current versus di\_F/dt

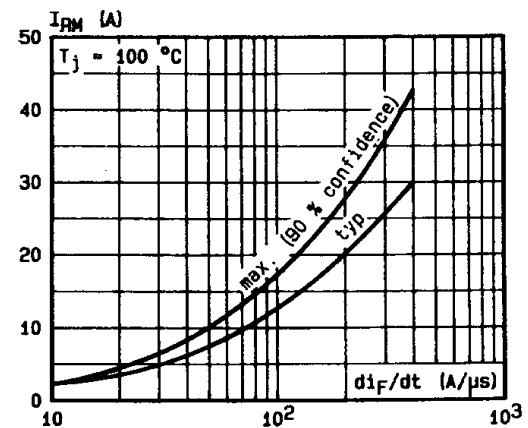


Figure 9. Peak forward voltage versus  $di_F/dt$ .

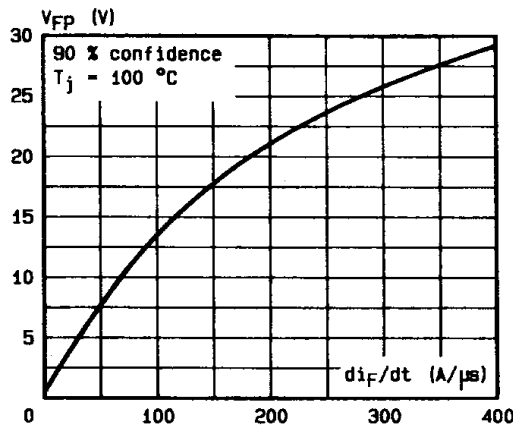


Figure 10. Dynamic parameters versus junction temperature.

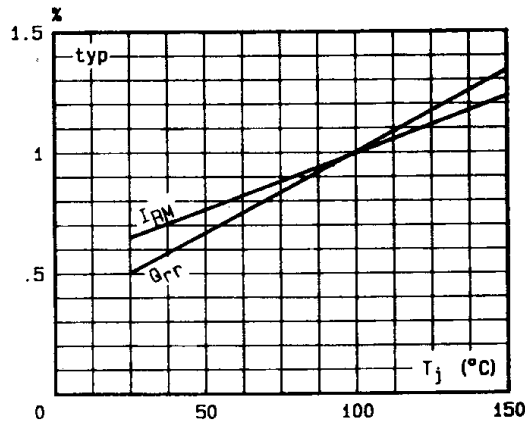


Figure 11. Turn-off switching characteristics (without series inductance).

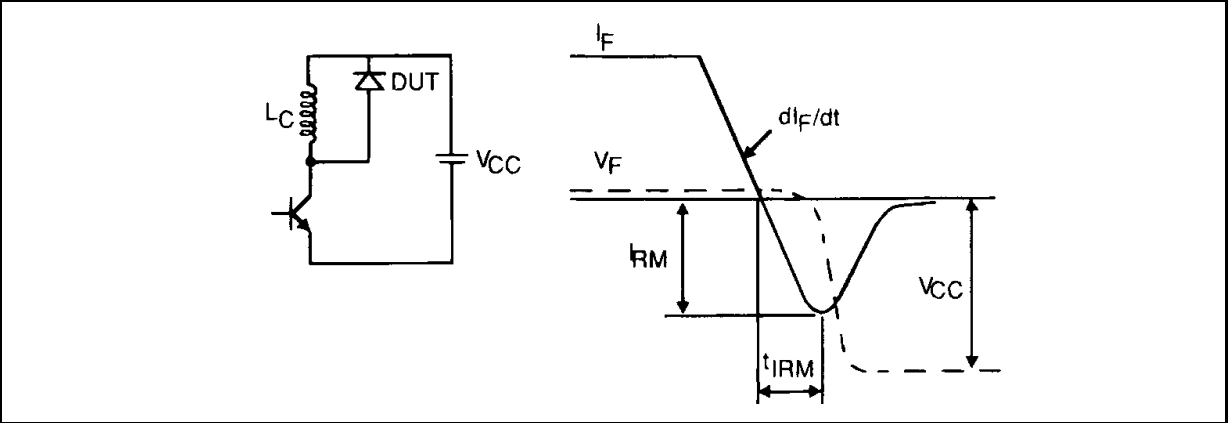
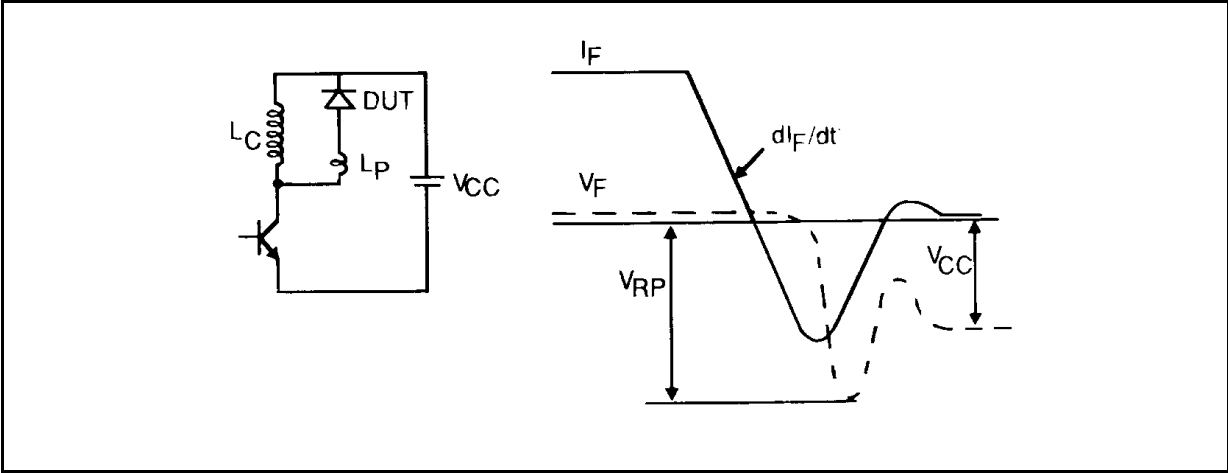
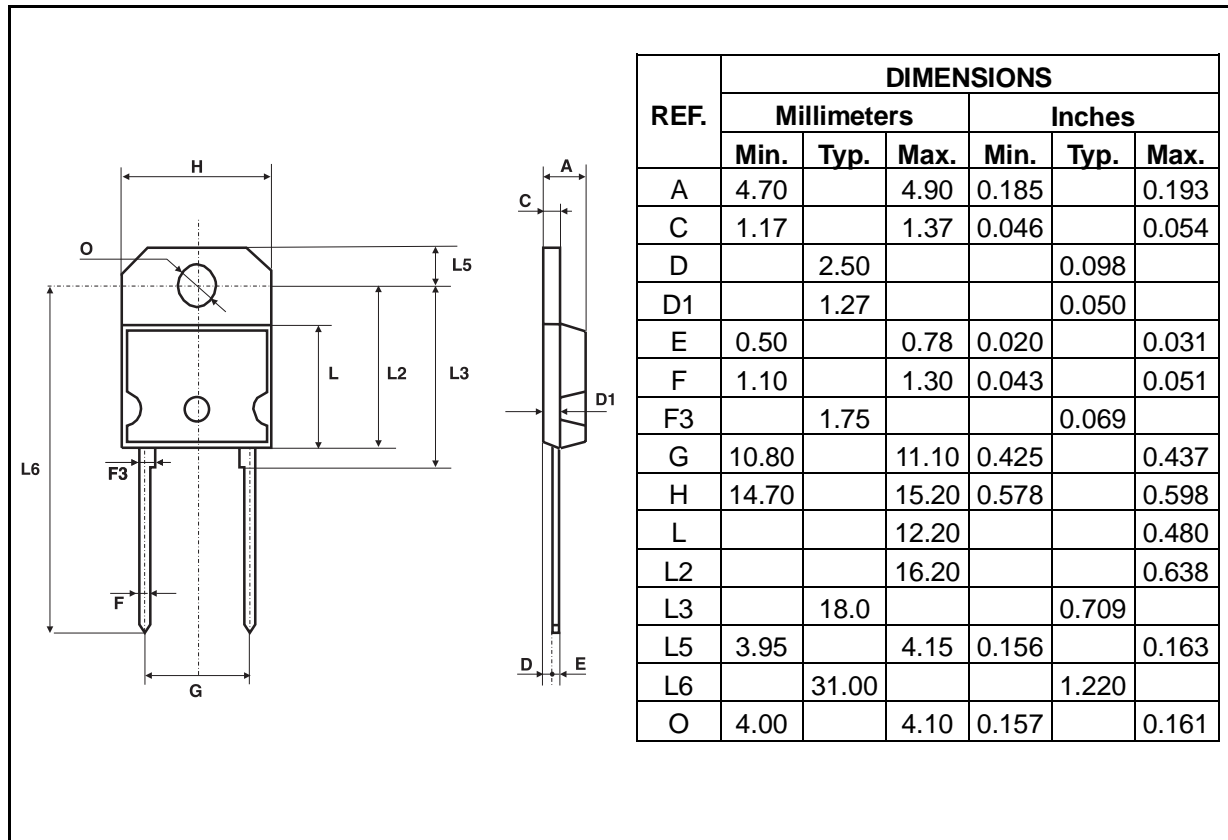


Figure 12. Turn-off switching characteristics (with series inductance)



**PACKAGE MECHANICAL DATA**  
SOD93 Plastic



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

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