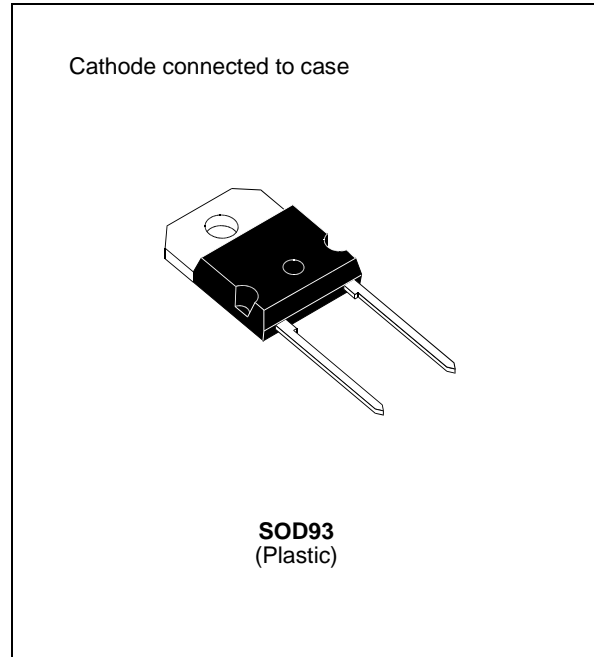


**FAST RECOVERY RECTIFIER DIODE**

- VERY HIGH REVERSE VOLTAGE CAPABILITY
- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING



**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                | $T_c = 85^\circ C$<br>$\delta = 0.5$ | 30                           | A          |
| $I_{FSM}$          | Surge non Repetitive Forward Current   | $t_p = 10ms$<br>Sinusoidal           | 200                          | A          |
| P                  | Power Dissipation                      | $T_c = 85^\circ C$                   | 60                           | W          |
| $T_{stg}$<br>$T_j$ | Storage and Junction Temperature Range |                                      | - 40 to +150<br>- 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 <sub>R</sub> | T <sub>j</sub> = 25°C  | V <sub>R</sub> = V <sub>RRM</sub> |      |      | 100  | μA   |
|                | T <sub>j</sub> = 100°C |                                   |      |      | 5    | mA   |
| V <sub>F</sub> | T <sub>j</sub> = 25°C  | I <sub>F</sub> = 30A              |      |      | 1.9  | V    |
|                | T <sub>j</sub> = 100°C |                                   |      |      | 1.8  |      |

**RECOVERY CHARACTERISTICS**

| Symbol          | Test Conditions       |                       |                                | Min.                 | Typ.                    | Max. | Unit |
|-----------------|-----------------------|-----------------------|--------------------------------|----------------------|-------------------------|------|------|
| t <sub>rr</sub> | T <sub>j</sub> = 25°C | I <sub>F</sub> = 1A   | di <sub>F</sub> /dt = - 15A/μs | V <sub>R</sub> = 30V |                         | 165  | ns   |
|                 |                       | I <sub>F</sub> = 0.5A | I <sub>R</sub> = 1A            |                      | I <sub>rr</sub> = 0.25A |      |      |

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

| Symbol           | Test Conditions                 |   | Min. | Typ. | Max. | Unit |
|------------------|---------------------------------|---|------|------|------|------|
| t <sub>iRM</sub> | di <sub>F</sub> /dt = - 120A/μs | V <sub>CC</sub> = 200 V I <sub>F</sub> = 30A<br>L <sub>p</sub> ≤ 0.05μH T <sub>j</sub> = 100°C<br>See figure 11 |      |      | 200  | ns   |
|                  | di <sub>F</sub> /dt = - 240A/μs |   |      | 120  |      |      |
| I <sub>RM</sub>  | di <sub>F</sub> /dt = -120A/μs  |   |      |      | 19.5 | A    |
|                  | di <sub>F</sub> /dt = - 240A/μs |   |      | 22   |      |      |

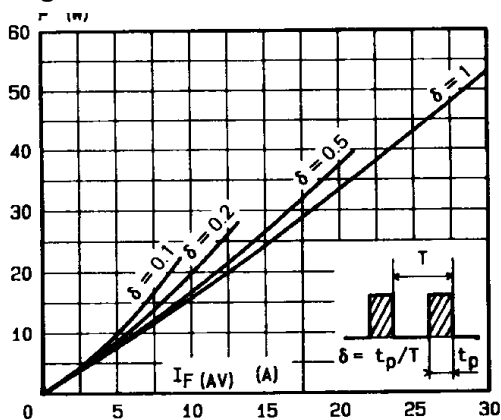
**TURN-OFF OVERVOLTAGE COEFFICIENT (With Series Inductance)**

| Symbol                      | Test Conditions  |  | Min.   | Typ. | Max. | Unit |
|-----------------------------|--|--|--|------|------|------|
| $C = \frac{V_{RP}}{V_{CC}}$ | T <sub>j</sub> = 100°C<br>di <sub>F</sub> /dt = - 30A/μs | V <sub>CC</sub> = 200V<br>L <sub>p</sub> = 5μH | I <sub>F</sub> = I <sub>F(AV)</sub><br>See figure 12 |      | 4.5  |      |

To evaluate the conduction losses use the following equation:

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

**Figure 1. Low frequency power losses versus average current**



**Figure 2. Peak current versus form factor**

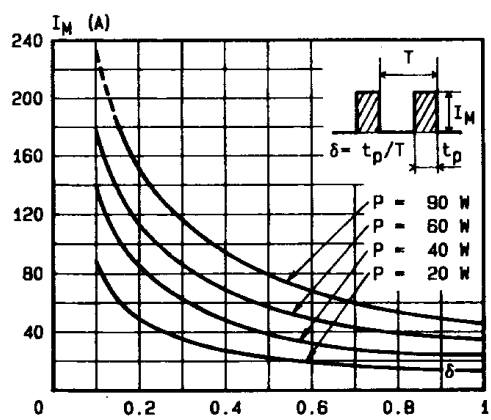


Figure 3. Non repetitive peak surge current versus overload duration

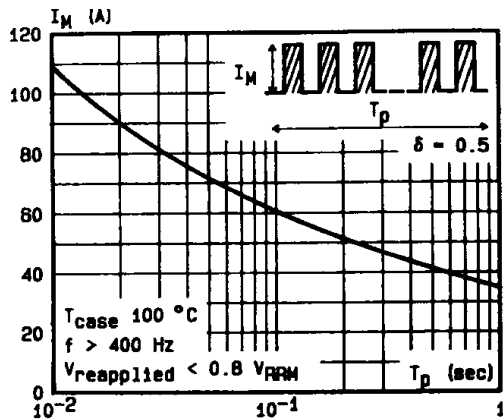


Figure 4. Thermal impedance versus pulse width

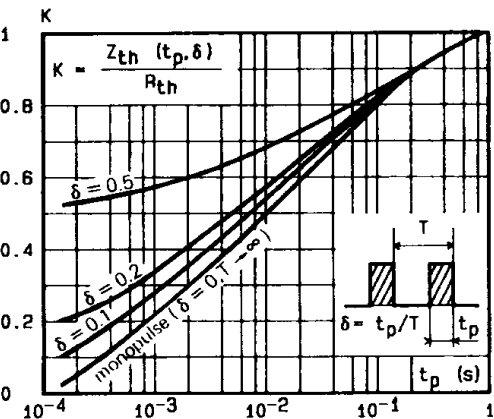


Figure 5. Voltage drop versus forward current

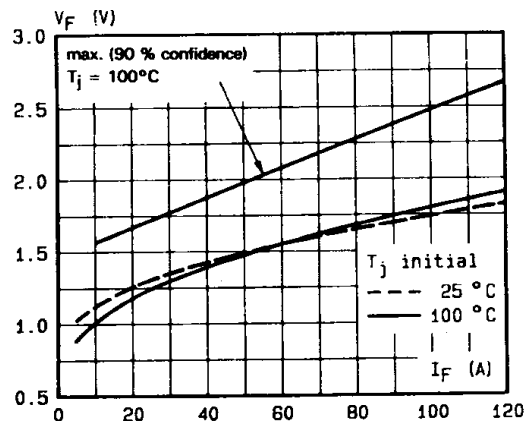


Figure 6. Recovery charge versus di\_F/d\_t

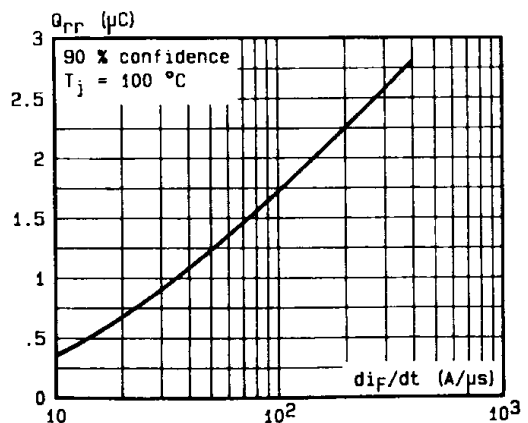


Figure 7. Recovery time versus di\_F/d\_t

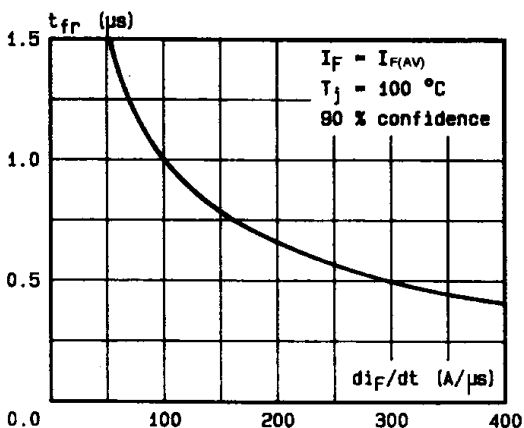


Figure 8. Peak reverse current versus di\_F/d\_t

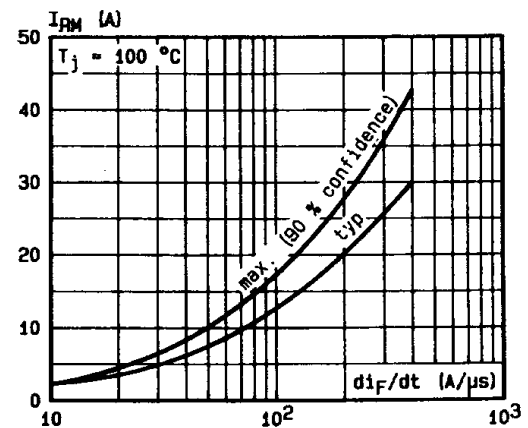


Figure 9. Peak forward voltage versus  $di_F/dt$ .

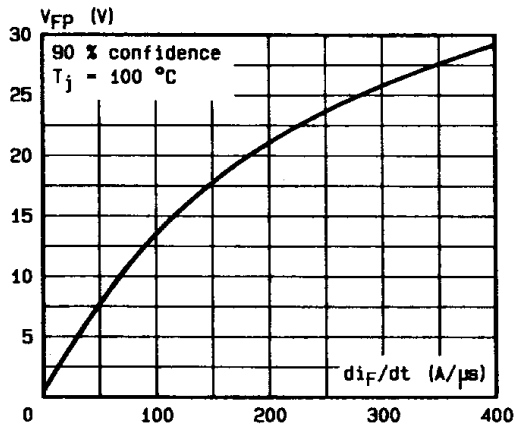


Figure 10. Dynamic parameters versus junction temperature.

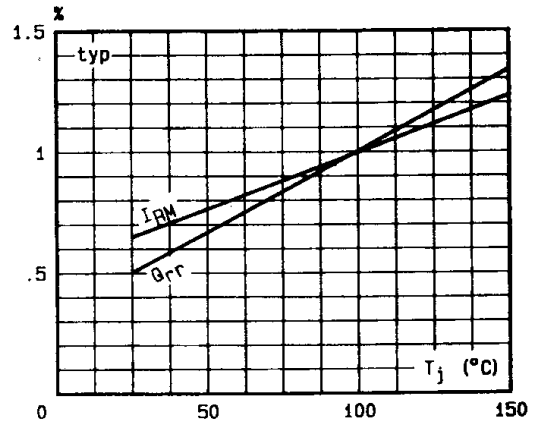


Figure 11. Turn-off switching characteristics (without series inductance).

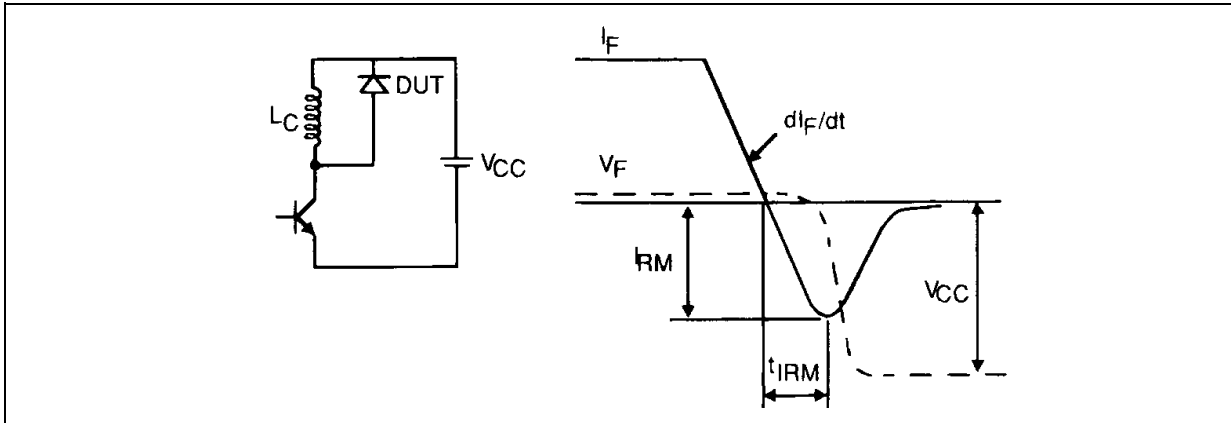
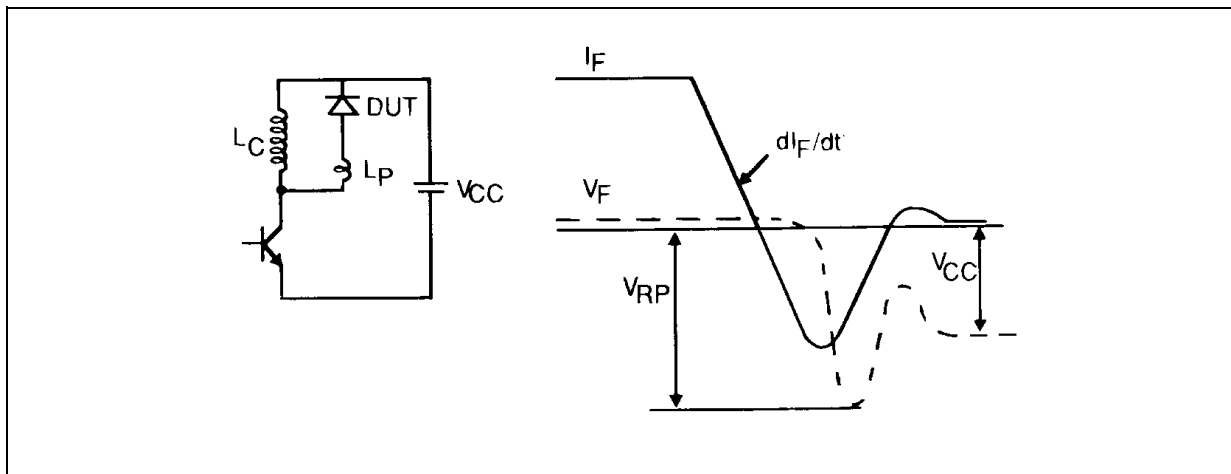
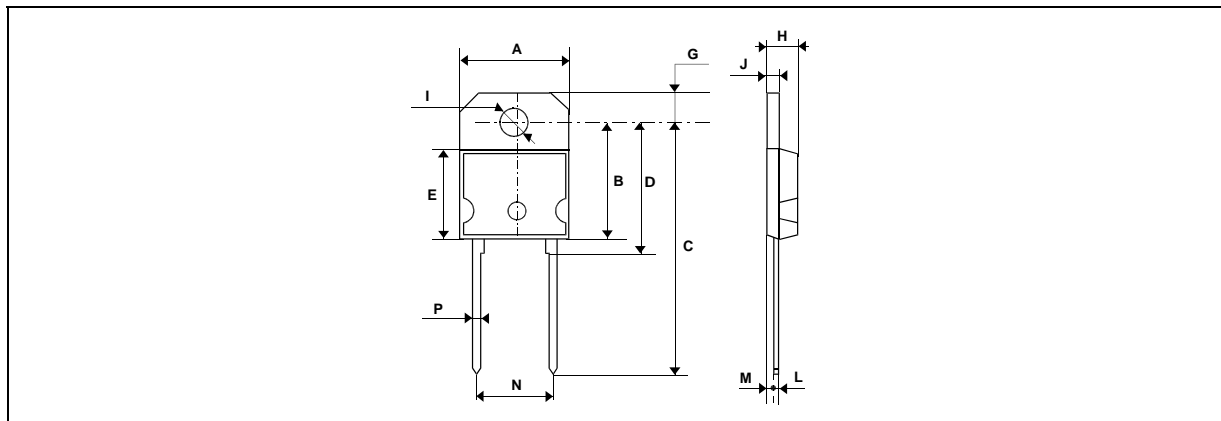


Figure 12. Turn-off switching characteristics (with series inductance)



**PACKAGE MECHANICAL DATA**  
 SOD93 Plastic


| 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

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