

**PowerMOS transistor**

**BUZ84**

**GENERAL DESCRIPTION**

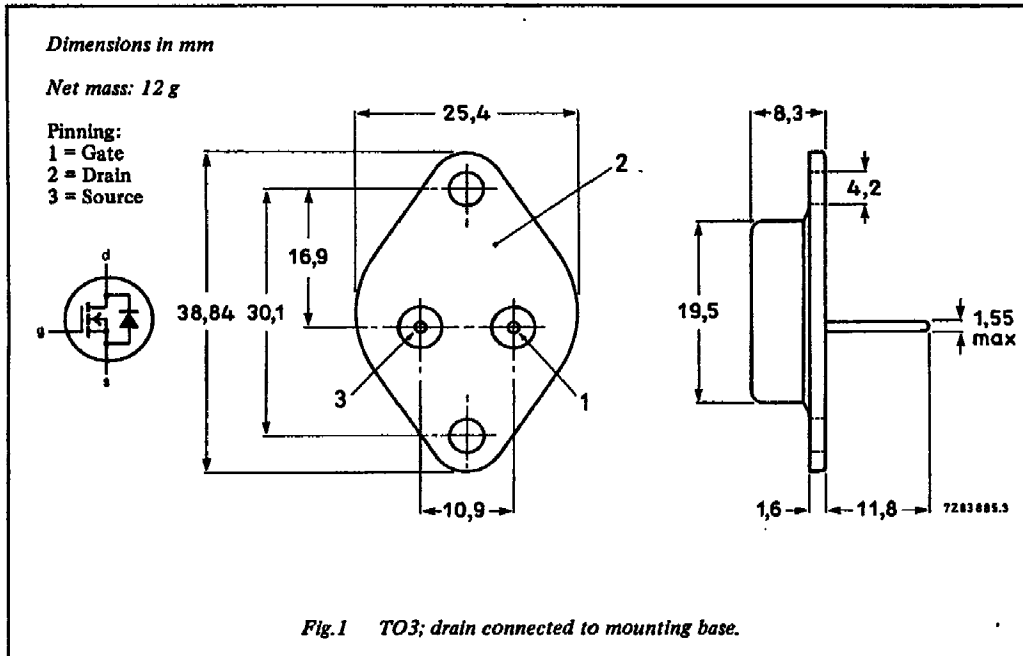
N-channel enhancement mode field-effect power transistor in a metal envelope.

This device is intended for use in Switched Mode Power Supplies (SMPS), motor control, welding, DC/DC and DC/AC converters, and in general purpose switching applications.

**QUICK REFERENCE DATA**

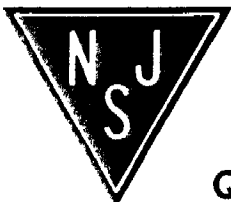
| SYMBOL              | PARAMETER                        | MAX. | UNIT |
|---------------------|----------------------------------|------|------|
| V <sub>DS</sub>     | Drain-source voltage             | 800  | V    |
| I <sub>D</sub>      | Drain current (d.c.)             | 5,3  | A    |
| P <sub>tot</sub>    | Total power dissipation          | 125  | W    |
| R <sub>DS(ON)</sub> | Drain-source on-state resistance | 2,0  | Ω    |

**MECHANICAL DATA**



**Notes**

1. Observe the general handling precautions for electrostatic-discharge sensitive devices (ESDs) to prevent damage to MOS gate oxide.
2. Accessories supplied on request: refer to Mounting instructions for TO3 envelopes.



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## RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

| SYMBOL           | PARAMETER                        | CONDITIONS               | MIN. | MAX. | UNIT |
|------------------|----------------------------------|--------------------------|------|------|------|
| V <sub>DS</sub>  | Drain-source voltage             | —                        | —    | 800  | V    |
| V <sub>DGR</sub> | Drain-gate voltage               | R <sub>GS</sub> = 20 kΩ  | —    | 800  | V    |
| ±V <sub>GS</sub> | Gate-source voltage              | —                        | —    | 20   | V    |
| I <sub>D</sub>   | Drain current (d.c.)             | T <sub>mb</sub> = 25 °C  | —    | 5,3  | A    |
| I <sub>D</sub>   | Drain current (d.c.)             | T <sub>mb</sub> = 100 °C | —    | 3,4  | A    |
| I <sub>DM</sub>  | Drain current (pulse peak value) | T <sub>mb</sub> = 25 °C  | —    | 21   | A    |
| P <sub>tot</sub> | Total power dissipation          | T <sub>mb</sub> = 25 °C  | —    | 125  | W    |
| T <sub>stg</sub> | Storage temperature              | —                        | -55  | 150  | °C   |
| T <sub>j</sub>   | Junction temperature             | —                        | —    | 150  | °C   |

## THERMAL RESISTANCES

|                                |                                |
|--------------------------------|--------------------------------|
| From junction to mounting base | R <sub>th j-mb</sub> = 1,0 K/W |
| From junction to ambient       | R <sub>th j-a</sub> = 35 K/W   |

## STATIC CHARACTERISTICS

T<sub>mb</sub> = 25 °C unless otherwise specified

| SYMBOL               | PARAMETER                        | CONDITIONS  | MIN. | TYP. | MAX. | UNIT |
|----------------------|----------------------------------|---|------|------|------|------|
| V <sub>(BR)DSS</sub> | Drain-source breakdown voltage   | V <sub>GS</sub> = 0 V; I <sub>D</sub> = 0,25 mA                         | 800  | —    | —    | V    |
| V <sub>GS(TO)</sub>  | Gate threshold voltage           | V <sub>DS</sub> = V <sub>GS</sub> ; I <sub>D</sub> = 1 mA               | 2,1  | 3,0  | 4,0  | V    |
| I <sub>DSS</sub>     | Zero gate voltage drain current  | V <sub>DS</sub> = 800 V; V <sub>GS</sub> = 0 V; T <sub>j</sub> = 25 °C  | —    | 20   | 250  | μA   |
| I <sub>DSS</sub>     | Zero gate voltage drain current  | V <sub>DS</sub> = 800 V; V <sub>GS</sub> = 0 V; T <sub>j</sub> = 125 °C | —    | 0,1  | 1,0  | mA   |
| I <sub>GSS</sub>     | Gate source leakage current      | V <sub>GS</sub> = ±20 V; V <sub>DS</sub> = 0 V                          | —    | 10   | 100  | nA   |
| R <sub>DS(ON)</sub>  | Drain-source on-state resistance | V <sub>GS</sub> = 10 V; I <sub>D</sub> = 3 A                            | —    | 1,6  | 2,0  | Ω    |

## DYNAMIC CHARACTERISTICS

T<sub>mb</sub> = 25 °C unless otherwise specified

| SYMBOL             | PARAMETER                  | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|--------------------|----------------------------|--|------|------|------|------|
| g <sub>fs</sub>    | Forward transconductance   | V <sub>DS</sub> = 25 V; I <sub>D</sub> = 3 A                                 | 1,8  | 3,0  | —    | S    |
| C <sub>iss</sub>   | Input capacitance          | V <sub>GS</sub> = 0 V; V <sub>DS</sub> = 25 V; f = 1 MHz                     | —    | 3900 | 5000 | pF   |
| C <sub>oss</sub>   | Output capacitance         |  | —    | 200  | 350  | pF   |
| C <sub>rss</sub>   | Feedback capacitance       |  | —    | 80   | 140  | pF   |
| t <sub>d on</sub>  | Turn-on delay time         | V <sub>DD</sub> = 30 V; I <sub>D</sub> = 2,5 A;                              | —    | 60   | 90   | ns   |
| t <sub>r</sub>     | Turn-on rise time          | V <sub>GS</sub> = 10 V; R <sub>GS</sub> = 50 Ω;                              | —    | 90   | 140  | ns   |
| t <sub>d off</sub> | Turn-off delay time        | R <sub>gen</sub> = 50 Ω  | —    | 330  | 430  | ns   |
| t <sub>f</sub>     | Turn-off fall time         |  | —    | 110  | 140  | ns   |
| L <sub>d</sub>     | Internal drain inductance  | Measured from contact screw on header closer to source pin and centre of die | —    | 5,0  | —    | nH   |
| L <sub>s</sub>     | Internal source inductance | Measured from source lead 6 mm from package to source bond pad               | —    | 12,5 | —    | nH   |

### REVERSE DIODE RATINGS AND CHARACTERISTICS

$T_{mb} = 25^\circ\text{C}$  unless otherwise specified

| SYMBOL    | PARAMETER                        | CONDITIONS   | MIN. | TYP. | MAX. | UNIT          |
|-----------|----------------------------------|--|------|------|------|---------------|
| $I_{DR}$  | Continuous reverse drain current | $T_{mb} = 25^\circ\text{C}$  | —    | —    | 5,3  | A             |
| $I_{DRM}$ | Pulsed reverse drain current     | $T_{mb} = 25^\circ\text{C}$  | —    | —    | 21   | A             |
| $V_{SD}$  | Diode forward on-voltage         | $I_F = 10,6\text{ A}; V_{GS} = 0\text{ V}; T_j = 25^\circ\text{C}$                                     | —    | 1,0  | 1,45 | V             |
| $t_{rr}$  | Reverse recovery time            | $I_F = 5,3\text{ A}; T_j = 25^\circ\text{C}$   | —    | 1800 | —    | ns            |
| $Q_{rr}$  | Reverse recovery charge          | $-dI_F/dt = 100\text{ A}/\mu\text{s}; T_j = 25^\circ\text{C}; V_{GS} = 0\text{ V}; V_R = 100\text{ V}$ | —    | 25   | —    | $\mu\text{C}$ |

