

# BUZ54

## PowerMOS Transistor

### GENERAL DESCRIPTION

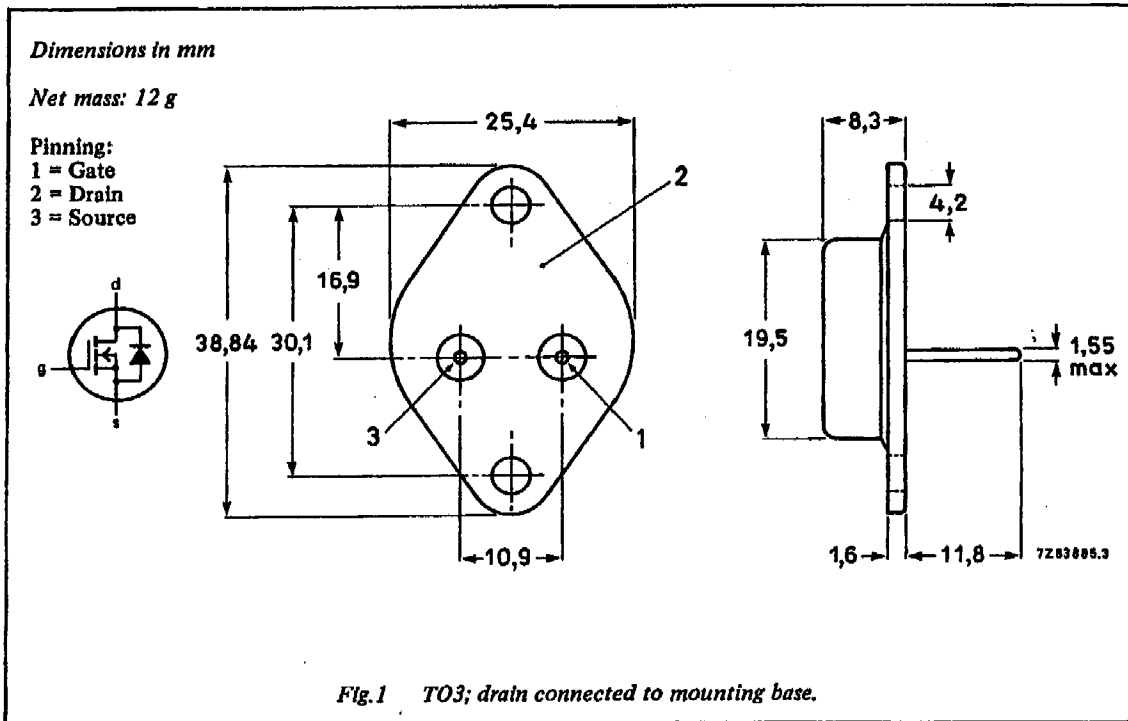
N-channel enhancement mode field-effect power transistor in a metal envelope.

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

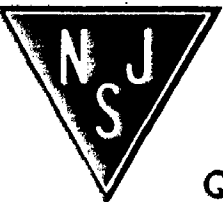
SYMBOL	PARAMETER	MAX.	UNIT
V <sub>DS</sub>	Drain-source voltage	1000	V
I <sub>D</sub>	Drain current (d.c.)	5,1	A
P <sub>tot</sub>	Total power dissipation	125	W
R <sub>DS(ON)</sub>	Drain-source on-state resistance	2,0	Ω

### 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	—	—	1000	V
V <sub>DGR</sub>	Drain-gate voltage	R <sub>GS</sub> = 20 kΩ	—	1000	V
±V <sub>GS</sub>	Gate-source voltage	—	—	20	V
I <sub>D</sub>	Drain current (d.c.)	T <sub>mb</sub> = 25 °C	—	5,1	A
I <sub>D</sub>	Drain current (d.c.)	T <sub>mb</sub> = 100 °C	—	3,2	A
I <sub>DM</sub>	Drain current (pulse peak value)	T <sub>mb</sub> = 25 °C	—	20	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	1000	—	—	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> = 1000 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> = 1000 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> = 2,6 A	—	1,7	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> = 2,6 A	1,4	3,5	—	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		—	180	300	pF
C <sub>rss</sub>	Feedback capacitance		—	70	120	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<sub>mb</sub> = 25 °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>DR</sub>	Continuous reverse drain current	T <sub>mb</sub> = 25 °C	—	—	5,1	A
I <sub>DRM</sub>	Pulsed reverse drain current	T <sub>mb</sub> = 25 °C	—	—	20	A
V <sub>SD</sub>	Diode forward on-voltage	I <sub>F</sub> = 10,2 A; V <sub>GS</sub> = 0 V; T <sub>j</sub> = 25 °C	—	1,15	1,4	V
t <sub>rr</sub>	Reverse recovery time	I <sub>F</sub> = 5,1 A; T <sub>j</sub> = 25 °C	—	2000	—	ns
Q <sub>rr</sub>	Reverse recovery charge	-dI <sub>F</sub> /dt = 100 A/μs; T <sub>j</sub> = 25 °C; V <sub>GS</sub> = 0 V; V <sub>R</sub> = 100 V	—	30	—	μC