

**PowerMOS transistor
Logic Level FET**

**BUK555-50A
BUK555-50B**

T-39-13

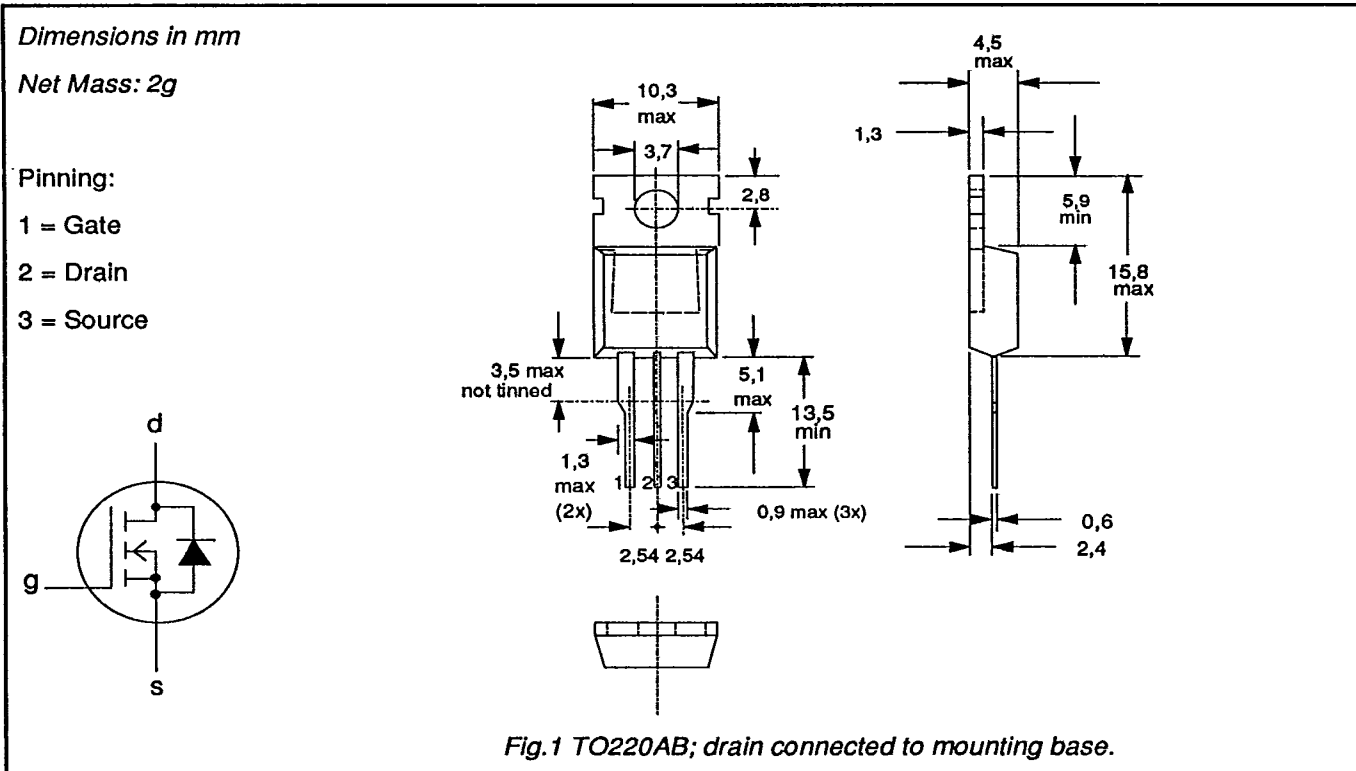
GENERAL DESCRIPTION

N-channel enhancement mode logic level field-effect power transistor in a plastic envelope. The device is intended for use in Switched Mode Power Supplies (SMPS), motor control, welding, DC/DC and AC/DC converters, and in general purpose switching applications.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	UNIT
V_{DS}	Drain-source voltage	-50A	-50B	V
I_D	Drain current (DC)	50	50	A
P_{tot}	Total power dissipation	39	35	W
T_j	Junction temperature	125	125	°C
$R_{DS(ON)}$	Drain-source on-state resistance	175	175	Ω
	$V_{GS} = 5 V$	0.042	0.055	

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 TO220 envelopes.

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RATINGS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	Drain-source voltage	-	-	50	V
V_{DGR}	Drain-gate voltage	$R_{GS} = 20 \text{ k}\Omega$	-	50	V
$\pm V_{GS}$	Gate-source voltage	-	-	15	V
I_D	Drain current (DC)	$T_{mb} = 25 \text{ }^\circ\text{C}$	-	-50A 39	A
I_D	Drain current (DC)	$T_{mb} = 100 \text{ }^\circ\text{C}$	-	-50B 35	A
I_{DM}	Drain current (pulse peak value)	$T_{mb} = 25 \text{ }^\circ\text{C}$	-	156	A
P_{tot}	Total power dissipation	$T_{mb} = 25 \text{ }^\circ\text{C}$	-	125	W
T_{stg}	Storage temperature	-	-55	175	$^\circ\text{C}$
T_j	Junction Temperature	-	-	175	$^\circ\text{C}$

THERMAL RESISTANCES

From junction to mounting base	$R_{thj-mb} = 1.2 \text{ K/W}$
From junction to ambient	$R_{thj-a} = 60 \text{ K/W}$

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	Drain-source breakdown voltage	$V_{GS} = 0 \text{ V}; I_D = 0.25 \text{ mA}$	50	-	-	V
$V_{GS(TO)}$	Gate threshold voltage	$V_{DS} = V_{GS}; I_D = 1 \text{ mA}$	1.0	1.5	2.0	V
I_{DSS}	Zero gate voltage drain current	$V_{DS} = 50 \text{ V}; V_{GS} = 0 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	1	10	μA
I_{DSS}	Zero gate voltage drain current	$V_{DS} = 50 \text{ V}; V_{GS} = 0 \text{ V}; T_j = 125 \text{ }^\circ\text{C}$	-	0.1	1.0	mA
I_{DSS}	Gate source leakage current	$V_{GS} = \pm 15 \text{ V}; V_{DS} = 0 \text{ V}$	-	10	100	nA
$R_{DS(ON)}$	Drain-source on-state resistance	$V_{GS} = 5 \text{ V}; I_D = 20 \text{ A}$	-	0.035	0.042	Ω
		BUK555-50A		0.045	0.055	Ω
		BUK555-50B				

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
g_{fs}	Forward transconductance	$V_{DS} = 25 \text{ V}; I_D = 20 \text{ A}$	15	20	-	S
C_{iss}	Input capacitance	$V_{GS} = 0 \text{ V}; V_{DS} = 25 \text{ V}; f = 1 \text{ MHz}$	-	1450	1750	pF
C_{oss}	Output capacitance		-	500	600	pF
C_{rss}	Feedback capacitance		-	220	275	pF
t_{don}	Turn-on delay time	$V_{DD} = 30 \text{ V}; I_D = 3 \text{ A};$	-	25	40	ns
t_r	Turn-on rise time	$V_{GS} = 5 \text{ V}; R_{GS} = 50 \text{ } \Omega;$	-	120	150	ns
t_{doff}	Turn-off delay time	$R_{gen} = 50 \text{ } \Omega$	-	160	220	ns
t_f	Turn-off fall time		-	110	145	ns
L_d	Internal drain inductance	Measured from contact screw on tab to centre of die	-	3.5	-	nH
L_d	Internal drain inductance	Measured from drain lead 6 mm from package to centre of die	-	4.5	-	nH
L_s	Internal source inductance	Measured from source lead 6 mm from package to source bond pad	-	7.5	-	nH

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REVERSE DIODE RATINGS AND CHARACTERISTICS

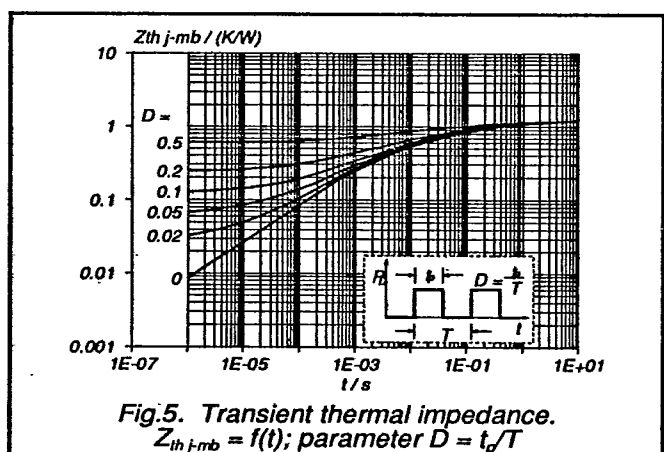
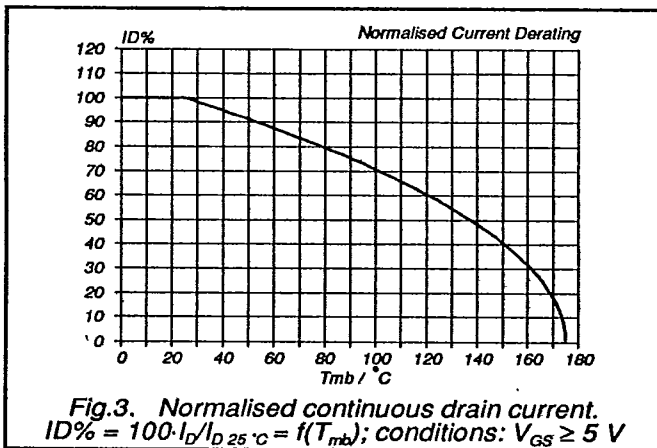
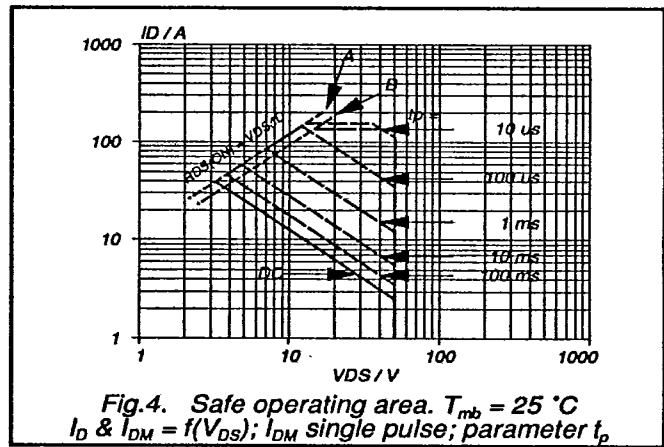
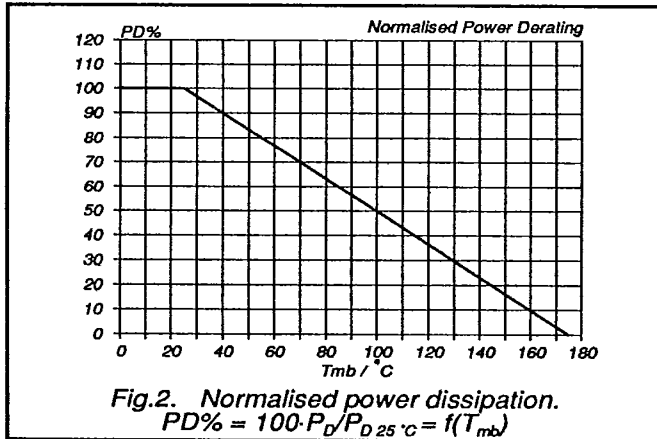
$T_{mb} = 25\text{ }^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{DR}	Continuous reverse drain current	-	-	-	39	A
I_{DRM}	Pulsed reverse drain current	-	-	-	156	A
V_{SD}	Diode forward voltage	$I_F = 39\text{ A}; V_{GS} = 0\text{ V}$	-	1.4	2.0	V
t_{rr}	Reverse recovery time	$I_F = 39\text{ A}; -di_F/dt = 100\text{ A}/\mu\text{s}; V_{GS} = 0\text{ V}; V_R = 30\text{ V}$	-	250	-	ns
Q_{rr}	Reverse recovery charge	$V_{GS} = 0\text{ V}; V_R = 30\text{ V}$	-	0.30	-	μC

AVALANCHE RATING

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

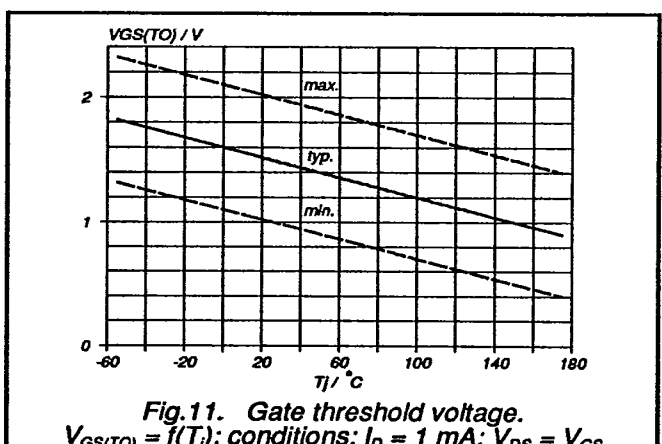
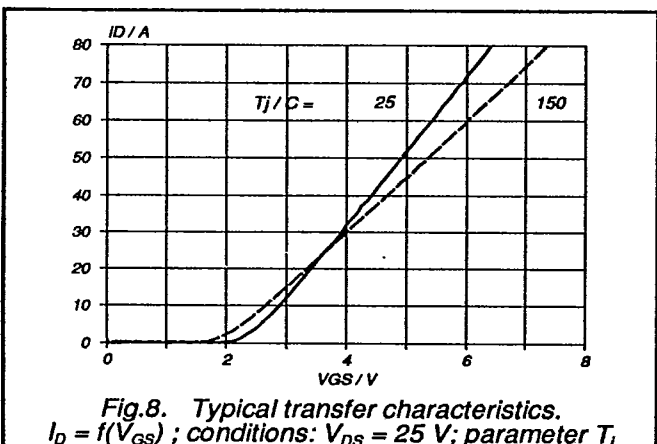
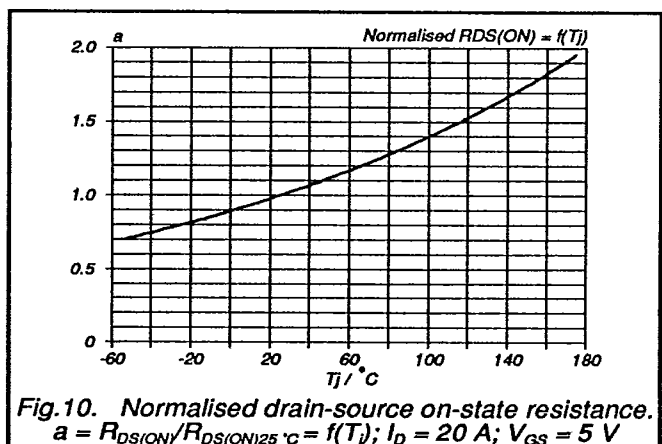
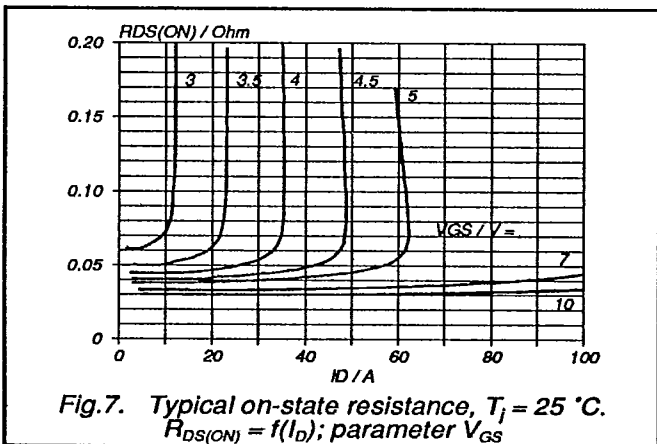
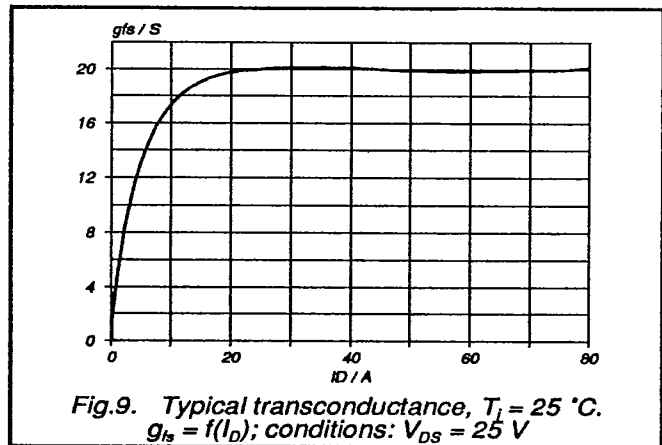
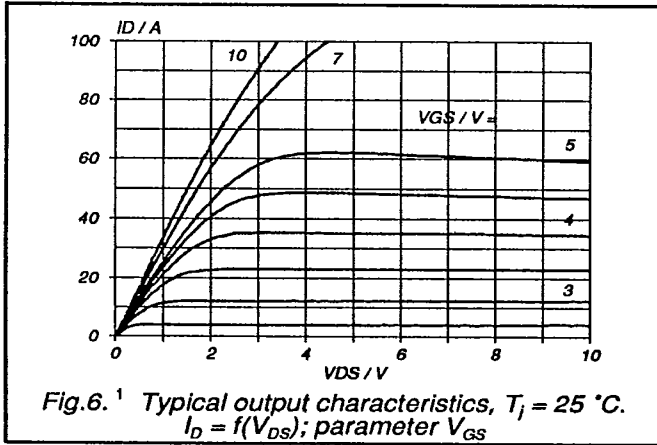
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
W_{DSS}	Drain-source non-repetitive unclamped inductive turn-off energy	$I_D = 39\text{ A}; V_{DD} \leq 25\text{ V}; V_{GS} = 5\text{ V}; R_{GS} = 50\text{ }\Omega$	-	-	90	mJ



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