

PowerMOS transistor

Logic level FET

BUK556-60A

GENERAL DESCRIPTION

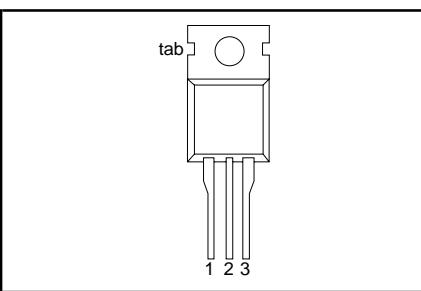
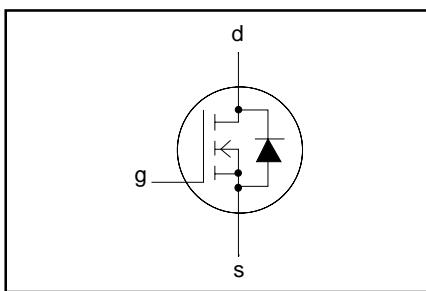
N-channel enhancement mode logic level field-effect power transistor in a plastic envelope. The device is intended for use in Switched Mode Power Supplies (SMPS), motor control, welding, DC/DC and AC/DC converters, and in automotive and general purpose switching applications.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{DS}	Drain-source voltage	60	V
I_D	Drain current (DC)	50	A
P_{tot}	Total power dissipation	150	W
$R_{DS(ON)}$	Drain-source on-state resistance $V_{GS} = 5 \text{ V}$	26	$\text{m}\Omega$

PINNING - TO220AB

PIN	DESCRIPTION
1	gate
2	drain
3	source
tab	drain

PIN CONFIGURATION**SYMBOL****LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	Drain-source voltage	-	-	60	V
V_{DGR}	Drain-gate voltage	$R_{GS} = 20 \text{ k}\Omega$	-	60	V
$\pm V_{GS}$	Gate-source voltage	-	-	15	V
$\pm V_{GSM}$	Non-repetitive gate-source voltage	$t_p \leq 50 \mu\text{s}$	-	20	V
I_D	Drain current (DC)	$T_{mb} = 25^\circ\text{C}$	-	50	A
I_D	Drain current (DC)	$T_{mb} = 100^\circ\text{C}$	-	38	A
I_{DM}	Drain current (pulse peak value)	$T_{mb} = 25^\circ\text{C}$	-	200	A
P_{tot}	Total power dissipation	$T_{mb} = 25^\circ\text{C}$	-	150	W
T_{stg}	Storage temperature	-	-55	175	$^\circ\text{C}$
T_j	Junction Temperature	-	-	175	$^\circ\text{C}$

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th j-mb}$	Thermal resistance junction to mounting base		-	-	1.0	K/W
$R_{th j-a}$	Thermal resistance junction to ambient		-	60	-	K/W

PowerMOS transistor

Logic level FET

BUK556-60A

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	Drain-source breakdown voltage	$V_{GS} = 0 V; I_D = 0.25 mA$	60	-	-	V
$V_{GS(TO)}$	Gate threshold voltage	$V_{DS} = V_{GS}; I_D = 1 mA$	1.0	1.5	2.0	V
I_{DSS}	Zero gate voltage drain current	$V_{DS} = 60 V; V_{GS} = 0 V; T_j = 25^\circ C$	-	1	10	μA
I_{DSS}	Zero gate voltage drain current	$V_{DS} = 60 V; V_{GS} = 0 V; T_j = 125^\circ C$	-	0.1	1.0	mA
I_{GSS}	Gate source leakage current	$V_{GS} = \pm 15 V; V_{DS} = 0 V$	-	10	100	nA
$R_{DS(ON)}$	Drain-source on-state resistance	$V_{GS} = 5 V; I_D = 25 A$	-	20	26	$m\Omega$

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
g_{fs}	Forward transconductance	$V_{DS} = 25 V; I_D = 25 A$	17	30	-	S
C_{iss}	Input capacitance	$V_{GS} = 0 V; V_{DS} = 25 V; f = 1 MHz$	-	2200	2800	pF
C_{oss}	Output capacitance		-	700	1000	pF
C_{rss}	Feedback capacitance		-	280	400	pF
$t_{d(on)}$	Turn-on delay time	$V_{DD} = 30 V; I_D = 3 A;$	-	40	50	ns
t_r	Turn-on rise time	$V_{GS} = 5 V;$	-	150	250	ns
$t_{d(off)}$	Turn-off delay time	$R_{GS} = 50 \Omega;$	-	350	450	ns
t_f	Turn-off fall time	$R_{gen} = 50 \Omega$	-	190	250	ns
L_d	Internal drain inductance	Measured from contact screw on tab to centre of die	-	5	-	nH
L_d	Internal drain inductance	Measured from drain lead 6 mm from package to centre of die	-	5	-	nH
L_s	Internal source inductance	Measured from source lead 6 mm from package to source bond pad	-	12.5	-	nH

REVERSE DIODE LIMITING VALUES AND CHARACTERISTICS $T_{mb} = 25^\circ C$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{DR}	Continuous reverse drain current	-	-	-	50	A
I_{DRM}	Pulsed reverse drain current	-	-	-	200	A
V_{SD}	Diode forward voltage	$I_F = 50 A; V_{GS} = 0 V$	-	1.1	2.0	V
t_{rr}	Reverse recovery time	$I_F = 50 A; -dI_F/dt = 100 A/\mu s;$	-	80	-	ns
Q_{rr}	Reverse recovery charge	$V_{GS} = 0 V; V_R = 30 V$	-	0.4	-	μC

AVALANCHE LIMITING VALUE $T_{mb} = 25^\circ C$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
W_{DSS}	Drain-source non-repetitive unclamped inductive turn-off energy	$I_D = 25 A; V_{DD} \leq 25 V; V_{GS} = 5 V; R_{GS} = 50 \Omega$	-	-	150	mJ