



## PowerMOS transistor

BUK455-200A/B

## 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	$V_{GS} = 0\text{ V}; I_D = 0.25\text{ mA}$	200	-	-	V
$V_{GS(TO)}$	Gate threshold voltage	$V_{DS} = V_{GS}; I_D = 1\text{ mA}$	2.1	3.0	4.0	V
$I_{DSS}$	Zero gate voltage drain current	$V_{DS} = 200\text{ V}; V_{GS} = 0\text{ V}; T_j = 25\text{ }^{\circ}\text{C}$	-	1	10	$\mu\text{A}$
$I_{DSS}$	Zero gate voltage drain current	$V_{DS} = 200\text{ V}; V_{GS} = 0\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$	-	0.1	1.0	mA
$I_{GSS}$	Gate source leakage current	$V_{GS} = \pm 30\text{ V}; V_{DS} = 0\text{ V}$	-	10	100	nA
$R_{DS(ON)}$	Drain-source on-state resistance	$V_{GS} = 10\text{ V}; I_D = 7\text{ A}$	-	0.2	0.23	$\Omega$
		BUK455-200A	-	0.22	0.28	$\Omega$
		BUK455-200B	-			

## DYNAMIC CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$g_{fs}$	Forward transconductance	$V_{DS} = 25\text{ V}; I_D = 7\text{ A}$	6	8.4	-	S
$C_{iss}$	Input capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 25\text{ V}; f = 1\text{ MHz}$	-	1400	1750	pF
$C_{oss}$	Output capacitance		-	190	250	pF
$C_{rss}$	Feedback capacitance		-	55	80	pF
$t_{don}$	Turn-on delay time	$V_{DD} = 30\text{ V}; I_D = 3\text{ A}; V_{GS} = 10\text{ V}; R_{GS} = 50\text{ }\Omega;$	-	18	30	ns
$t_r$	Turn-on rise time	$R_{gen} = 50\text{ }\Omega$	-	35	60	ns
$t_{doff}$	Turn-off delay time		-	85	120	ns
$t_f$	Turn-off fall time		-	35	50	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

## REVERSE DIODE LIMITING VALUES 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	-	-	-	14	A
$I_{DRM}$	Pulsed reverse drain current	-	-	-	56	A
$V_{SD}$	Diode forward voltage	$I_F = 14\text{ A}; V_{GS} = 0\text{ V}$	-	1.0	1.5	V
$t_{rr}$	Reverse recovery time	$I_F = 14\text{ A}; -di_F/dt = 100\text{ A}/\mu\text{s}; V_{GS} = 0\text{ V}; V_R = 30\text{ V}$	-	180	-	ns
$Q_{rr}$	Reverse recovery charge		-	1.8	-	$\mu\text{C}$

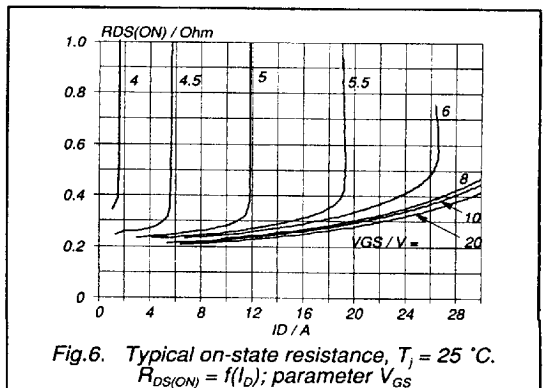
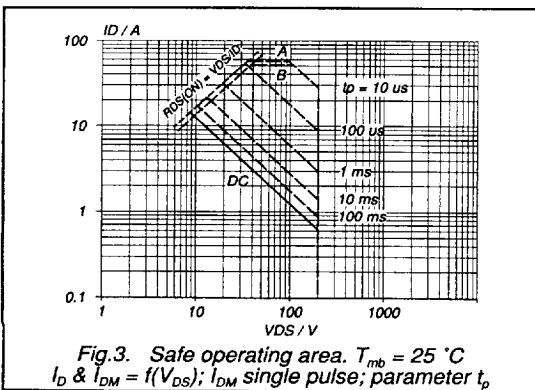
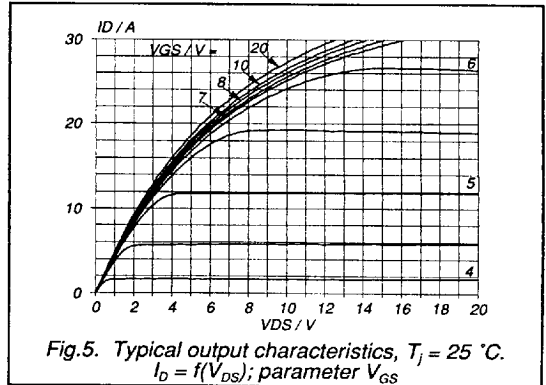
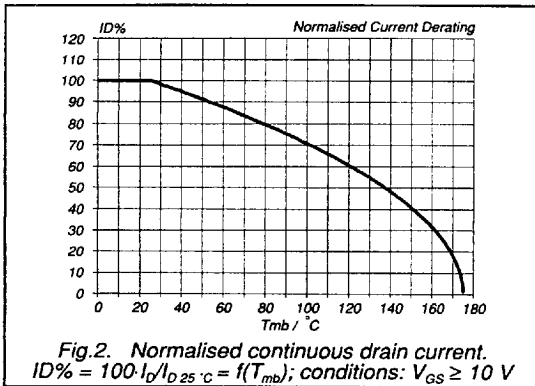
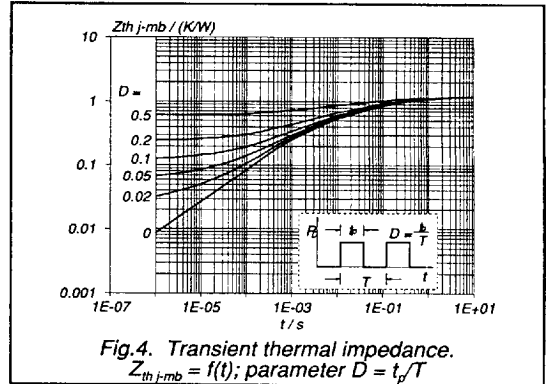
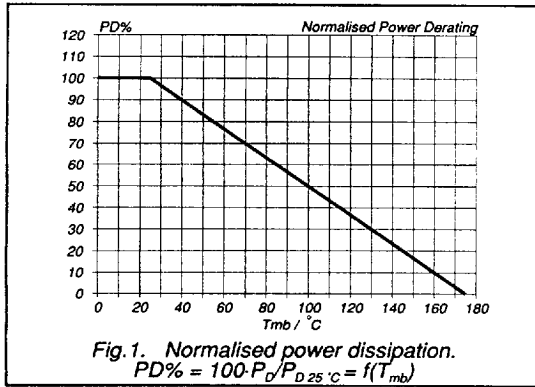
## AVALANCHE LIMITING VALUE

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$W_{DSS}$	Drain-source non-repetitive unclamped inductive turn-off energy	$I_D = 14\text{ A}; V_{DD} \leq 100\text{ V}; V_{GS} = 10\text{ V}; R_{GS} = 50\text{ }\Omega$	-	-	100	mJ

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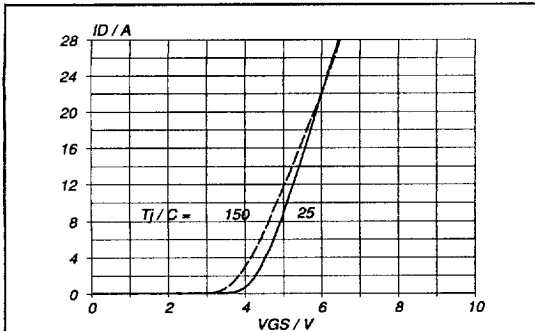


Fig. 7. Typical transfer characteristics.  
 $I_D = f(V_{GS})$ ; conditions:  $V_{DS} = 25\text{ V}$ ; parameter  $T_j$

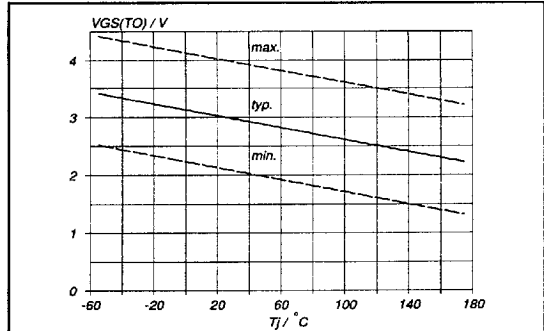


Fig. 10. Gate threshold voltage.  
 $V_{GS(T0)} = f(T_j)$ ; conditions:  $I_D = 1\text{ mA}$ ;  $V_{DS} = V_{GS}$

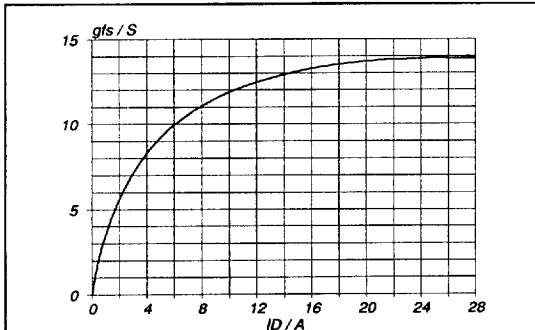


Fig. 8. Typical transconductance,  $T_j = 25\text{ °C}$ .  
 $g_{fs} = f(I_D)$ ; conditions:  $V_{DS} = 25\text{ V}$

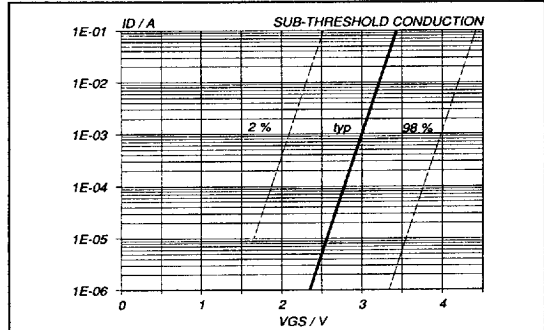


Fig. 11. Sub-threshold drain current.  
 $I_D = f(V_{GS})$ ; conditions:  $T_j = 25\text{ °C}$ ;  $V_{DS} = V_{GS}$

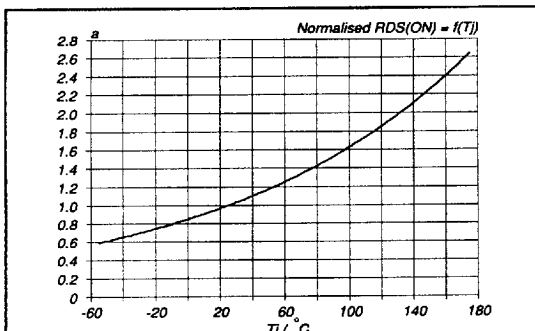


Fig. 9. Normalised drain-source on-state resistance.  
 $a = R_{DS(ON)}/R_{DS(ON)25\text{ °C}} = f(T_j)$ ;  $I_D = 7\text{ A}$ ;  $V_{GS} = 10\text{ V}$

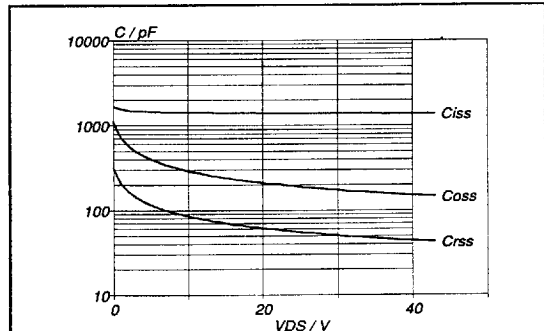


Fig. 12. Typical capacitances,  $C_{iss}$ ,  $C_{oss}$ ,  $C_{rss}$ .  
 $C = f(V_{DS})$ ; conditions:  $V_{GS} = 0\text{ V}$ ;  $f = 1\text{ MHz}$

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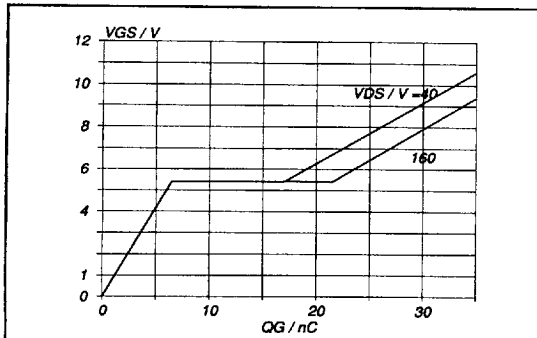


Fig.13. Typical turn-on gate-charge characteristics.  
 $V_{GS} = f(Q_G)$ ; conditions:  $I_D = 14 \text{ A}$ ; parameter  $V_{DS}$

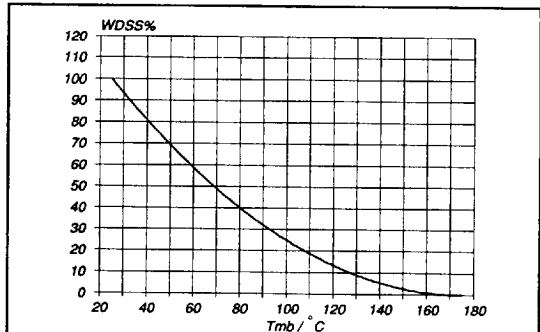


Fig.15. Normalised avalanche energy rating.  
 $W_{DSS\%} = f(T_{mb})$ ; conditions:  $I_D = 14 \text{ A}$

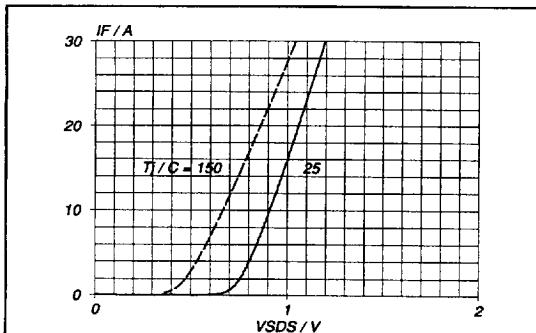


Fig.14. Typical reverse diode current.  
 $I_F = f(V_{SDS})$ ; conditions:  $V_{GS} = 0 \text{ V}$ ; parameter  $T_j$

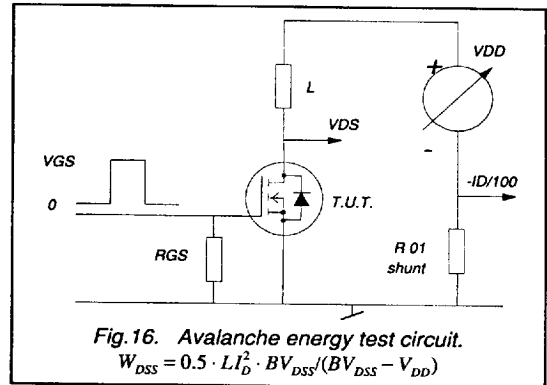


Fig.16. Avalanche energy test circuit.  
 $W_{DSS} = 0.5 \cdot L I_D^2 \cdot BV_{DSS} / (BV_{DSS} - V_{DD})$