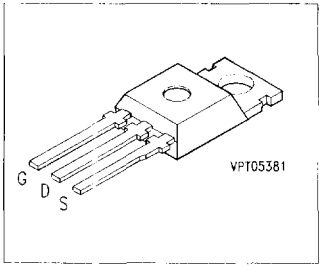
SIEMENS

SIPMOS® Power Transistors

BUZ 72
BUZ 72 A

- N channel
- Enhancement mode
- Avalanche-rated



Type	V_{DS}	I_D	$R_{DS\,(on)}$	Package [1]	Ordering Code
BUZ 72	100 V	10 A	0.20 Ω	TO-220 AB	C67078-S1313-A2
BUZ 72 A	100 V	9.0 A	0.25 Ω	TO-220 AB	C67078-S1313-A3

Maximum Ratings

Parameter	Symbol	BUZ		Unit
		72	72 A	
Continuous drain current, T_C = 25 °C	I_D	**10**	**9.0**	A
Pulsed drain current, T_C = 25 °C	$I_{D\,puls}$	**40**	**36**	
Avalanche current, limited by $T_{j\,max}$	I_{AR}	**10**		
Avalanche energy, periodic limited by $T_{j\,(max)}$	E_{AR}	**7.9**		mJ
Avalanche energy, single pulse I_D = 10 A, V_{DD} = 25 V, R_{GS} = 25 Ω L = 885 µH, T_j = 25 °C	E_{AS}	**59**		
Gate-source voltage	V_{GS}	**± 20**		V
Power dissipation, T_C = 25 °C	P_{tot}	**40**		W
Operating and storage temperature range	T_j , T_{stg}	**– 55 ... + 150**		°C
Thermal resistance, chip-case	$R_{th\,JC}$	**≤ 3.1**		K/W
DIN humidity category, DIN 40 040	–	**E**		–
IEC climatic category, DIN IEC 68-1	–	**55/150/56**		

1) See chapter Package Outlines.

Electrical Characteristics

at T_j = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static characteristics					
Drain-source breakdown voltage V_{GS} = 0 V, I_D = 0.25 mA	$V_{(BR)\,DSS}$	100	–	–	V
Gate threshold voltage V_{GS} = V_{DS} , I_D = 1 mA	$V_{GS\,(th)}$	2.1	3.0	4.0	
Zero gate voltage drain current V_{DS} = 100 V, V_{GS} = 0 V T_j = 25 °C T_j = 125 °C	I_{DSS}	 – –	 0.1 10	 1.0 100	µA
Gate-source leakage current V_{GS} = 20 V, V_{DS} = 0 V	I_{GSS}	–	10	100	nA
Drain-source on-resistance V_{GS} = 10 V, I_D = 6 A BUZ 72 BUZ 72 A	$R_{DS\,(on)}$	 – –	 0.15 0.2	 0.2 0.25	Ω
Dynamic characteristics					
Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, I_D = 6 A	g_{fs}	3.0	4.3	–	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	–	400	530	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	–	120	180	
Reverse transfer capacitance V_{GS} = 0 V , V_{DS} = 25 V, f = 1 MHz	C_{rss}	–	70	105	
Turn-on time t_{on} , ($t_{on} = t_{d\,(on)} + t_r$) V_{DD} = 30 V, V_{GS} = 10 V, I_D = 3.0 A, R_{GS} = 50 Ω	$t_{d\,(on)}$ t_r	– –	10 45	15 70	ns
Turn-off time t_{off} , ($t_{off} = t_{d\,(off)} + t_f$) V_{DD} = 30 V, V_{GS} = 10 V, I_D = 3.0 A, R_{GS} = 50 Ω	$t_{d\,(off)}$ t_f	– –	55 40	75 55	

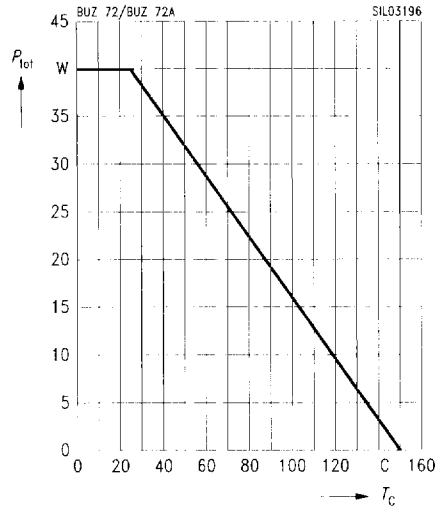
Electrical Characteristics (cont'd)
at T_j = 25 °C, unless otherwise specified.

Parameter		Symbol	Values			Unit
			min.	typ.	max.	
Reverse diode						
Continuous reverse drain current		I_S				A
T_C = 25 °C	BUZ 72		–	–	10	
	BUZ 72 A		–	–	9.0	
Pulsed reverse drain current		I_{SM}				
T_C = 25 °C	BUZ 72		–	–	40	
	BUZ 72 A		–	–	36	
Diode forward on-voltage I_S = 20 A, V_{GS} = 0 V		V_{SD}	–	1.4	1.6	V
Reverse recovery time V_R = 30 V, $I_F = I_S$, di_F/dt = 100 A/µs		t_{rr}	–	170	–	ns
Reverse recovery charge V_R = 30 V, $I_F = I_S$, di_F/dt = 100 A/µs		Q_{rr}	–	0.30	–	µC

Characteristics at $T_j = 25$ °C, unless otherwise specified.

Total power dissipation

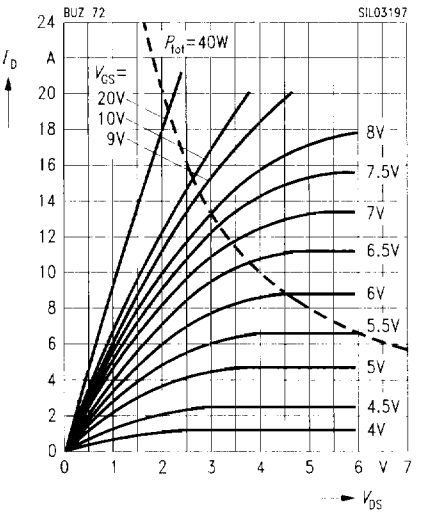
$P_{tot} = f(T_C)$



Typ. output characteristics

$I_D = f(V_{DS})$ **BUZ 72**

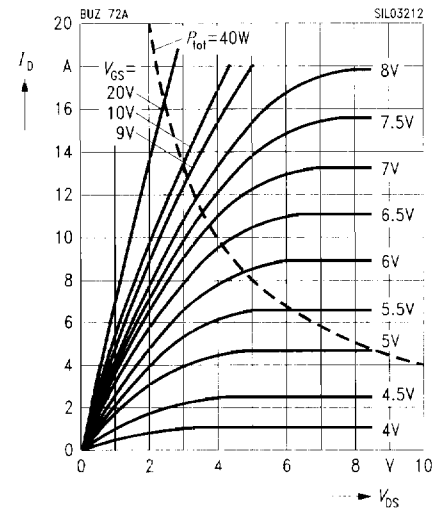
parameter: $t_p = 80$ µs



Typ. output characteristics

$I_D = f(V_{DS})$ **BUZ 72 A**

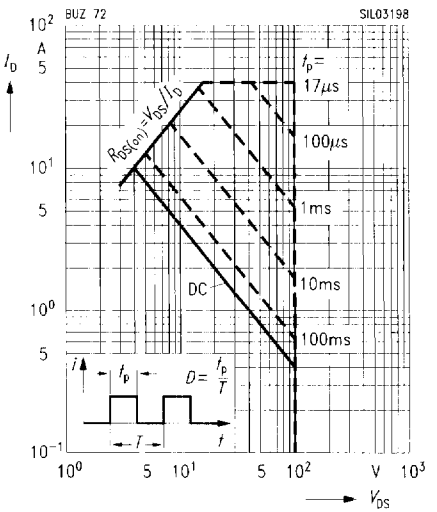
parameter: $t_p = 80$ µs



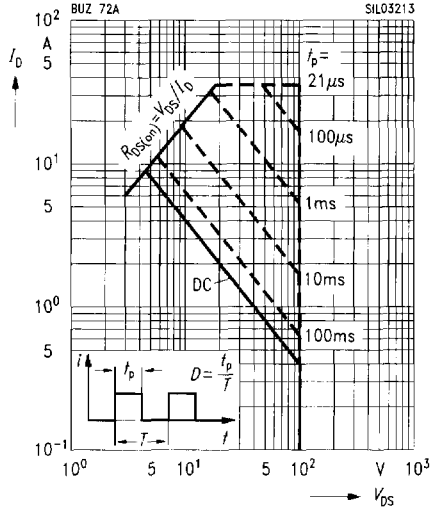
Safe operating area

$I_D = f(V_{DS})$ **BUZ 72**

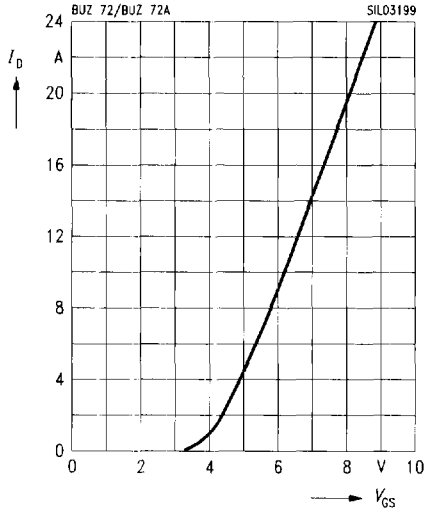
parameter: $D = 0.01$, $T_C = 25$ °C



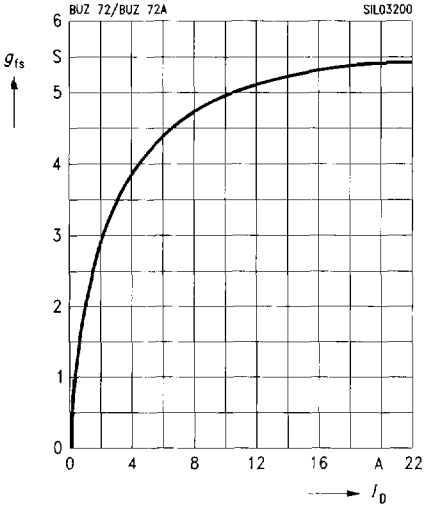
Safe operating area
$I_D = f(V_{DS})$ **BUZ 72 A**
parameter: $D = 0.01$, $T_C = 25$ °C



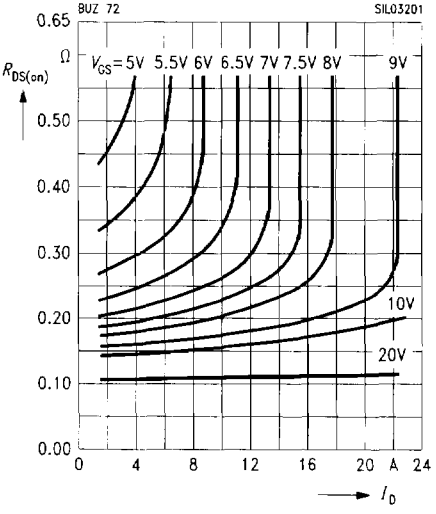
Typ. transfer characteristics
$I_D = f(V_{GS})$
parameter: $t_p = 80$ µs, $V_{DS} = 25$ V



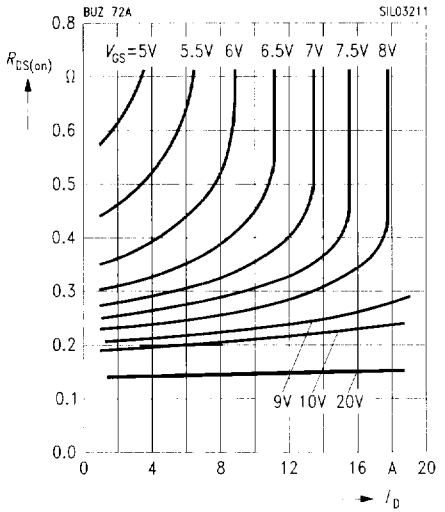
Typ.forward transconductance
$g_{fs} = f(I_D)$
parameter: $t_p = 80$ µs



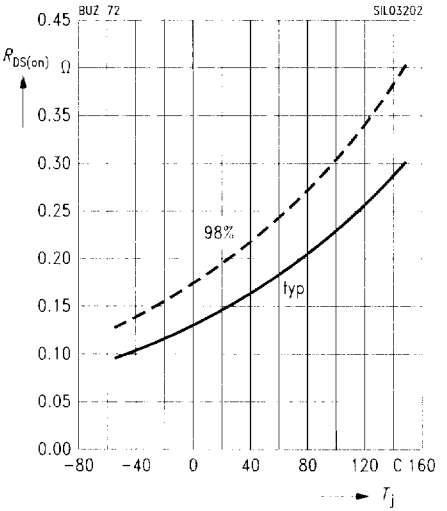
Typ. drain-source on-resistance
$R_{DS\,(on)} = f(I_D)$ **BUZ 72**
parameter: V_{GS}



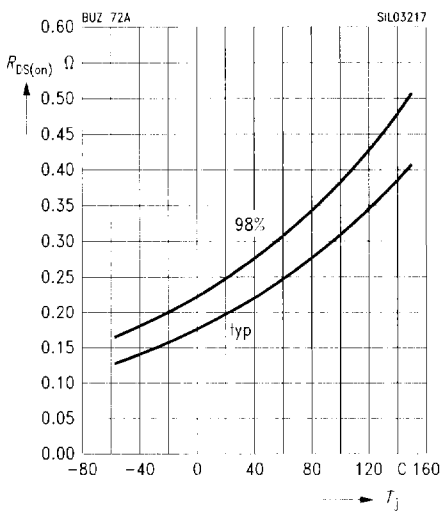
Typ. drain-source on-resistance
$R_{DS\,(on)} = f\,(I_D)$ **BUZ 72 A**
parameter: V_{GS}



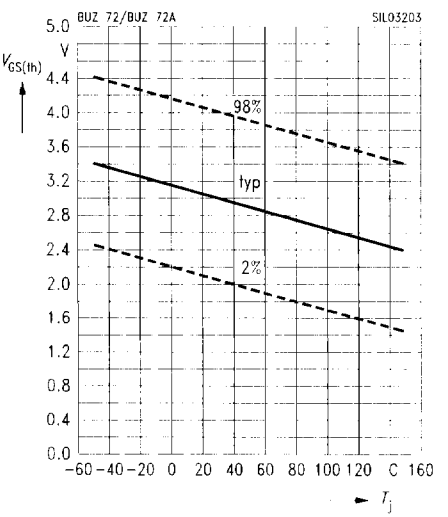
Drain-source on-resistance
$R_{DS\,(on)} = f\,(T_j)$ **BUZ 72**
parameter: I_D = 6 A, V_{GS} = 10 V, (spread)



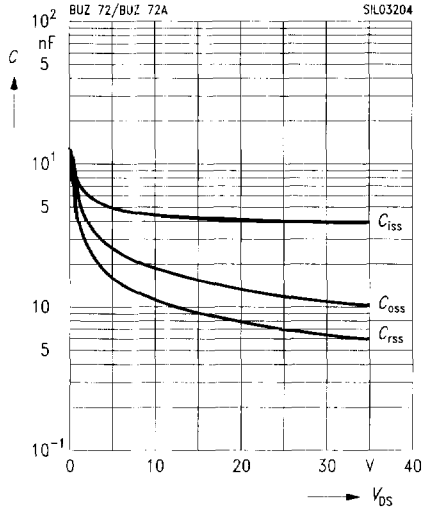
Drain-source on-resistance
$R_{DS\,(on)} = f\,(T_j)$ **BUZ 72 A**
parameter: I_D = 6 A, V_{GS} = 10 V, (spread)



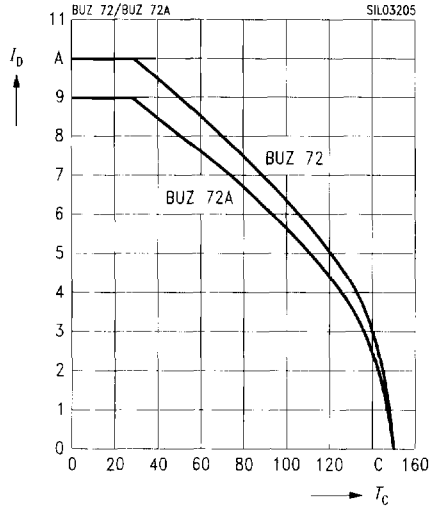
Gate threshold voltage
$V_{GS\,(th)} = f\,(T_j)$
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA, (spread)



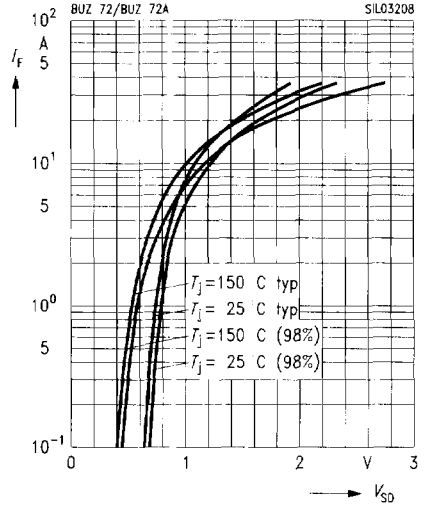
Typ. capacitances
$C = f(V_{DS})$
parameter: V_{GS} = 0 V, f = 1 MHz



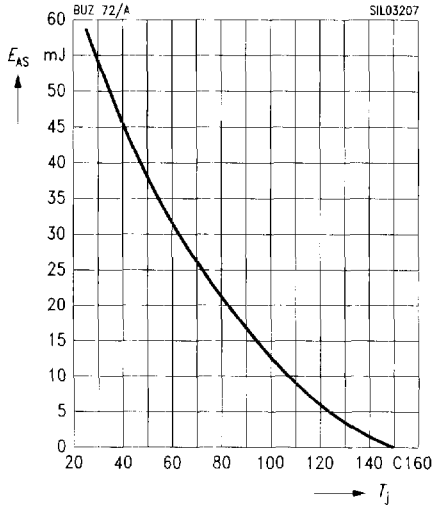
Drain current
$I_D = f(T_C)$
parameter: $V_{GS} \geq 10$ V



Forward characteristics of reverse diode
$I_F = f(V_{SD})$
parameter: T_j, t_p = 80 µs, (spread)



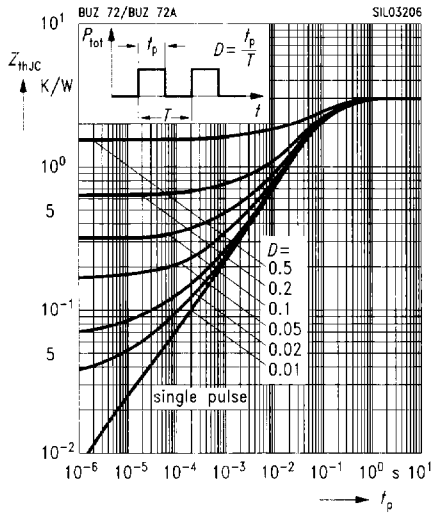
Avalanche energy $E_{AS} = f(T_j)$
parameter: I_D = 10 A, V_{DD} = 25 V
R_{GS} = 25 Ω, L = 885 µH



Transient thermal impedance

$Z_{th\,JC} = f(t_p)$

parameter: $D = t_p / T$



Typ. gate charge

$V_{GS} = f(Q_{Gate})$

parameter: $I_{D\,puls}$ = 21 A