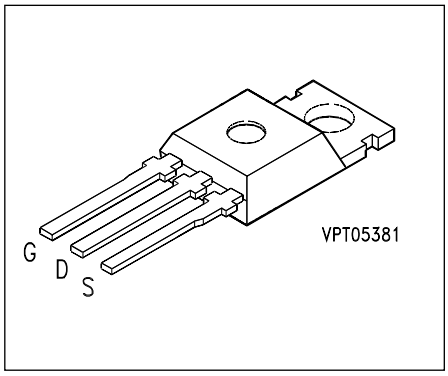
SIEMENS

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} ≥ 2 x I_D x $R_{DS(on)max}$, 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	$t_{d\ (on)}$	–	10	15	ns
	t_r	–	45	70	
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	$t_{d\ (off)}$	–	55	75	
	t_f	–	40	55	

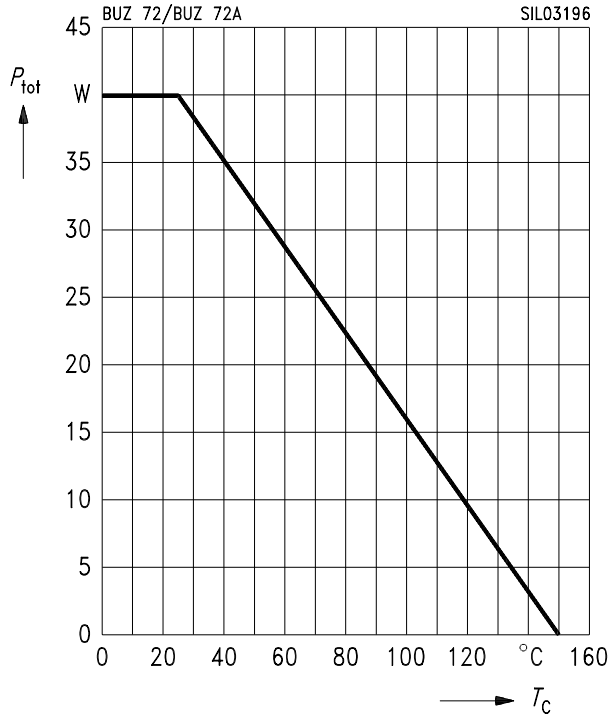
Electrical Characteristics (cont'd)
at T_j = 25 ˚C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse diode					
Continuous reverse drain current T_C = 25 ˚C BUZ 72 BUZ 72 A	I_S	 – –	 – –	 10 9.0	A
Pulsed reverse drain current T_C = 25 ˚C BUZ 72 BUZ 72 A	I_{SM}	 – –	 – –	 40 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

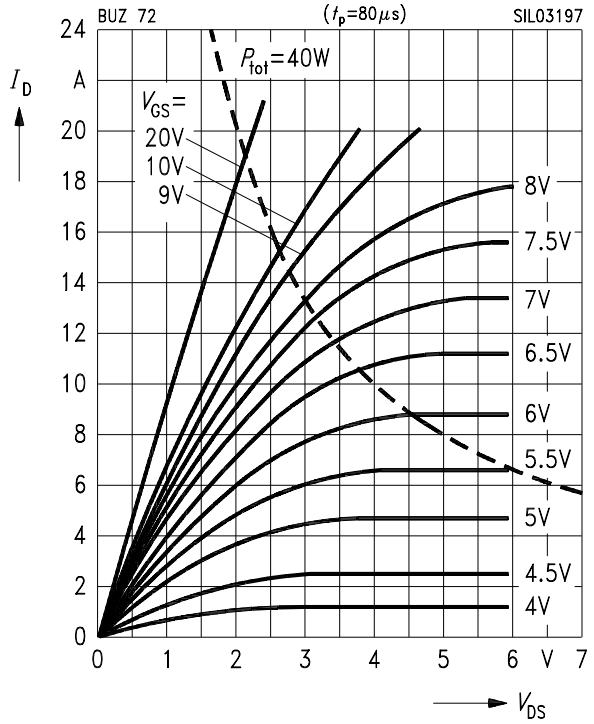
$P_{tot} = f(T_C)$



Typ. output characteristics

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

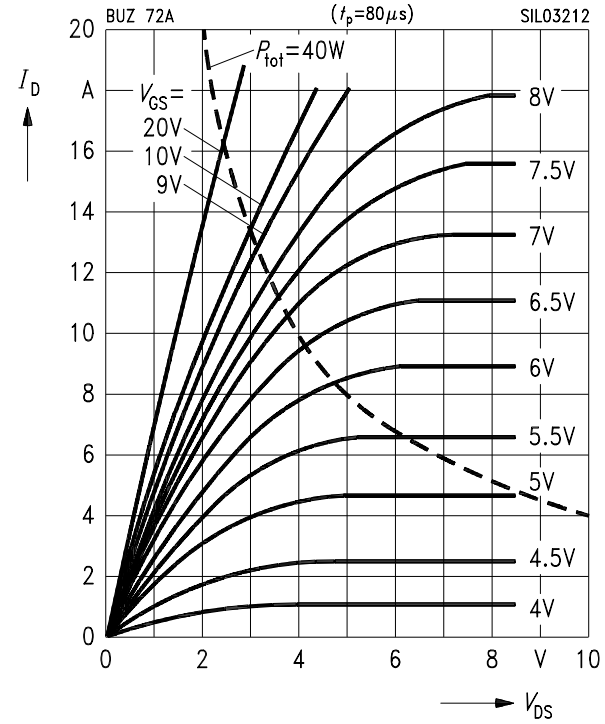
parameter: t_p = 80 µs



Typ. output characteristics

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

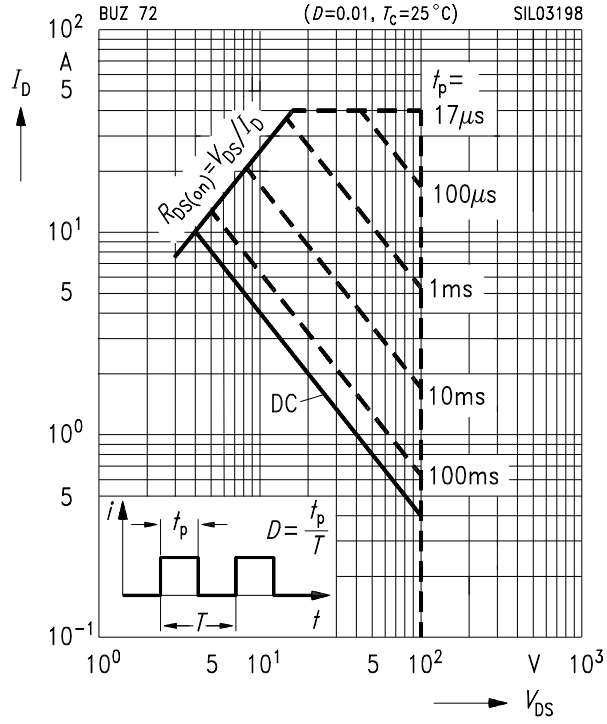
parameter: t_p = 80 µs



Safe operating area

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

parameter: D = 0.01, T_C = 25 °C



Safe operating area

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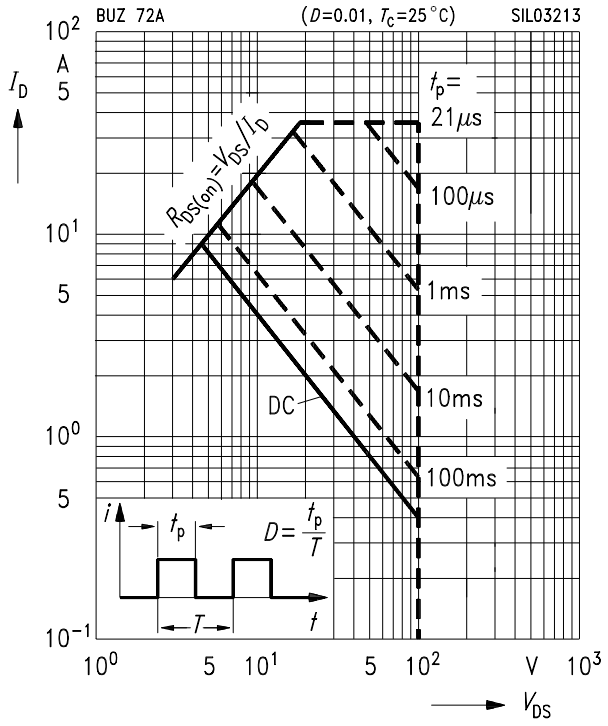
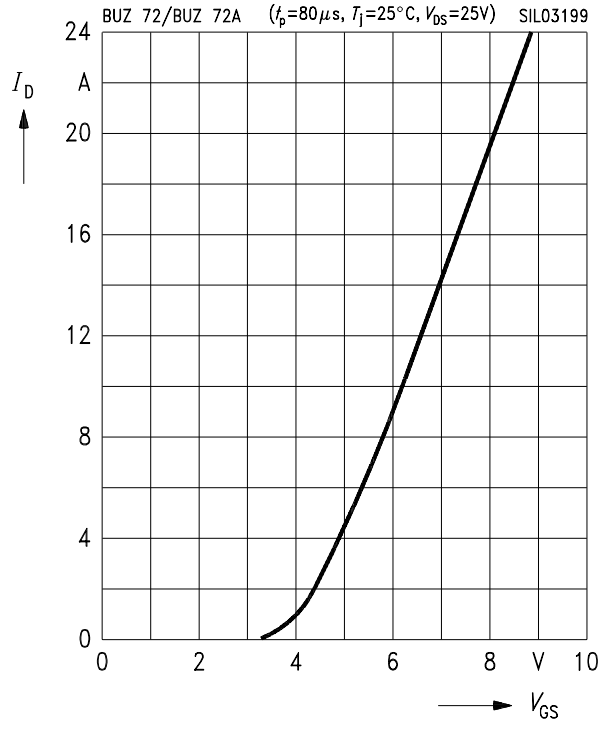


Typ. transfer characteristics

$I_D = f(V_{GS})$

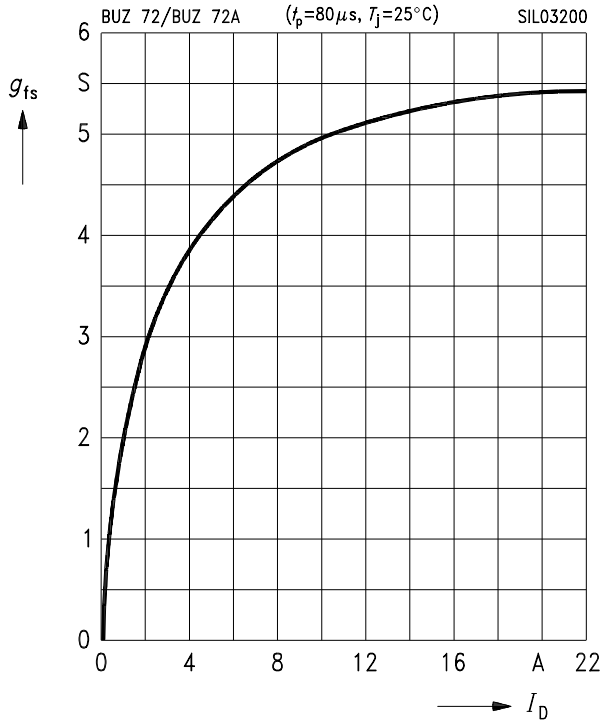
parameter: t_p = 80 µs, V_{DS} = 25 V



Typ.forward transconductance

$g_{fs} = f(I_D)$

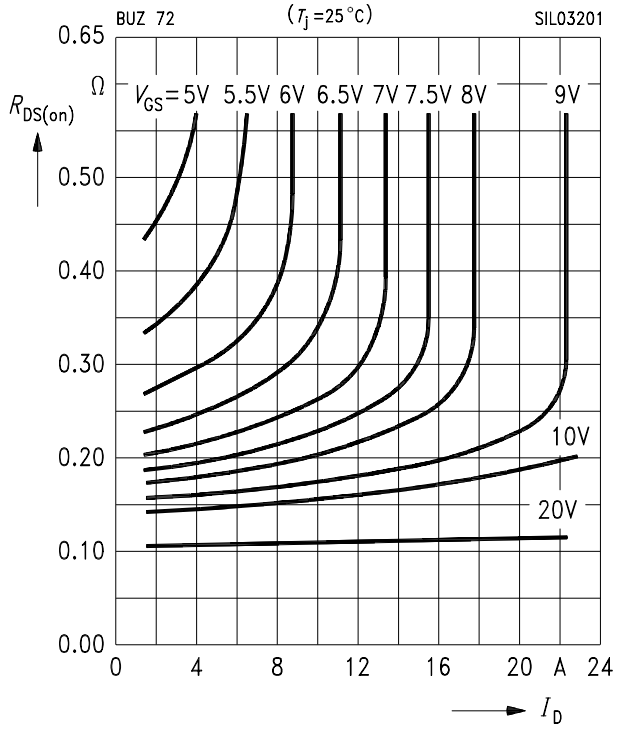
parameter: t_p = 80 µs



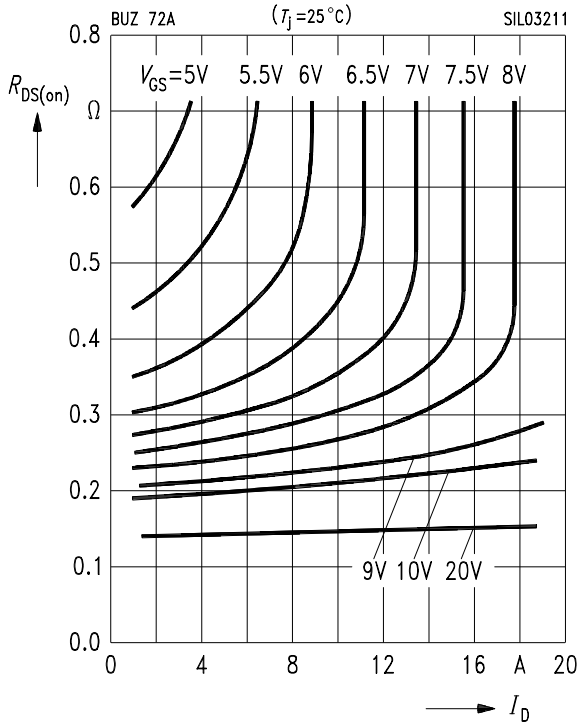
Typ. drain-source on-resistance

$R_{DS\,(on)} = f(I_D)$ **BUZ 72**

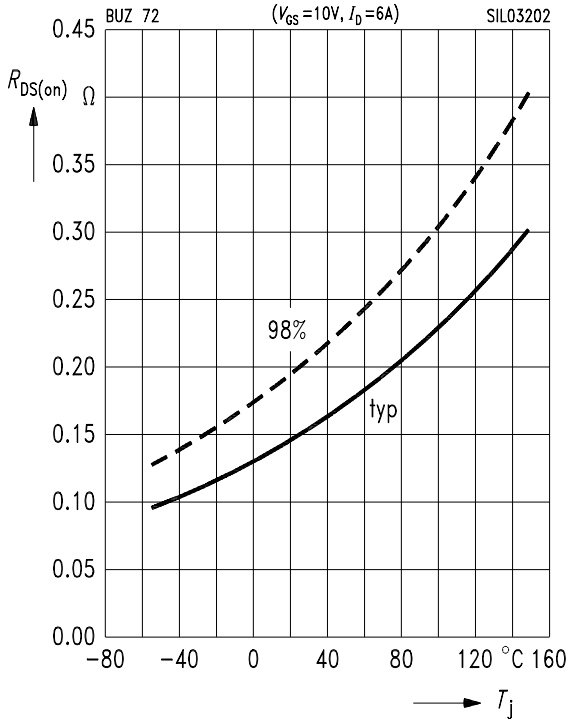
parameter: V_{GS}



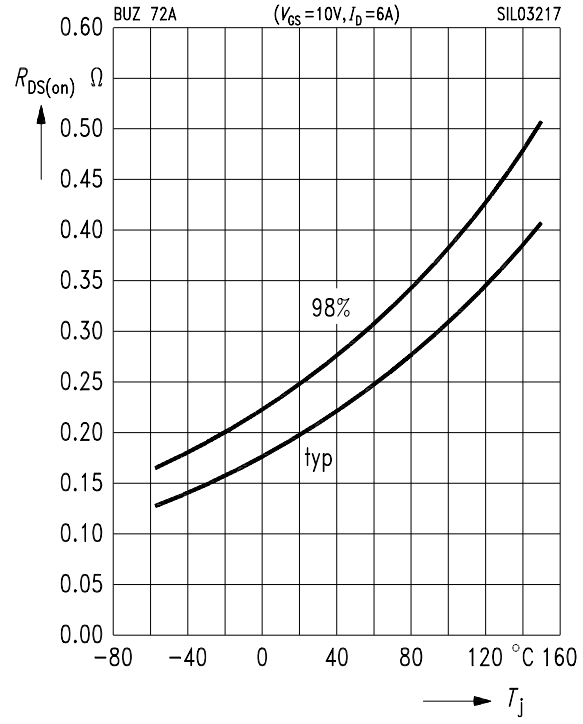
Typ. drain-source on-resistance
$R_{DS\ (on)} = f\ (I_D)$ **BUZ 72 A**
parameter: V_{GS}



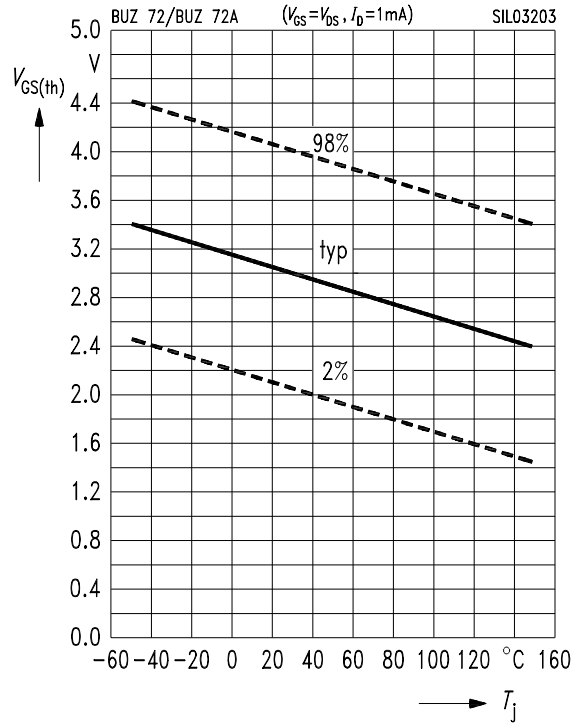
Drain-source on-resistance
$R_{DS\ (on)} = f\ (T_j)$ **BUZ 72**
parameter: I_D = 6 A, V_{GS} = 10 V, (spread)



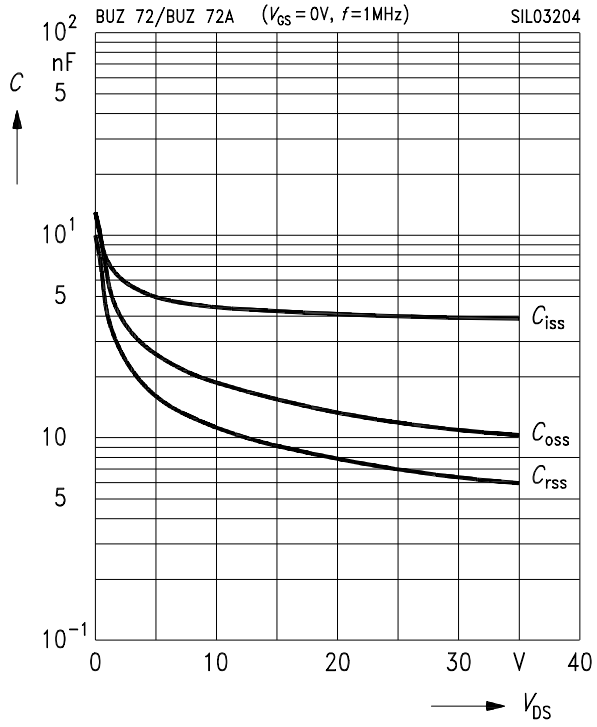
Drain-source on-resistance
$R_{DS\ (on)} = f\ (T_j)$ **BUZ 72 A**
parameter: I_D = 6 A, V_{GS} = 10 V, (spread)



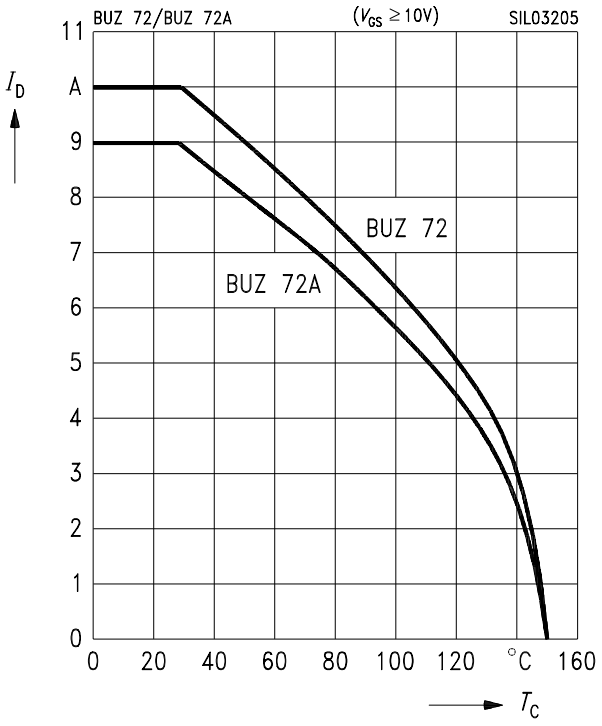
Gate threshold voltage
$V_{GS\ (th)} = f\ (T_j)$
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA, (spread)



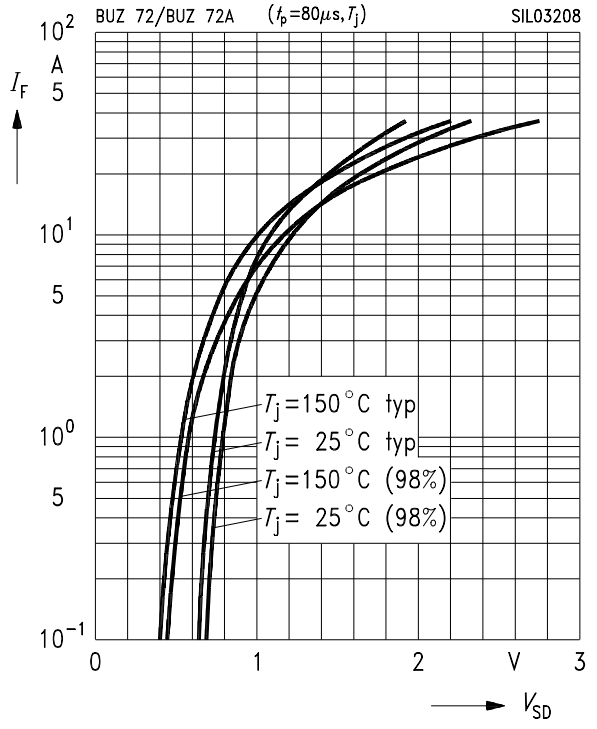
Typ. capacitances
$C = f(V_{DS})$
parameter: V_{GS} = 0 V, f = 1 MHz



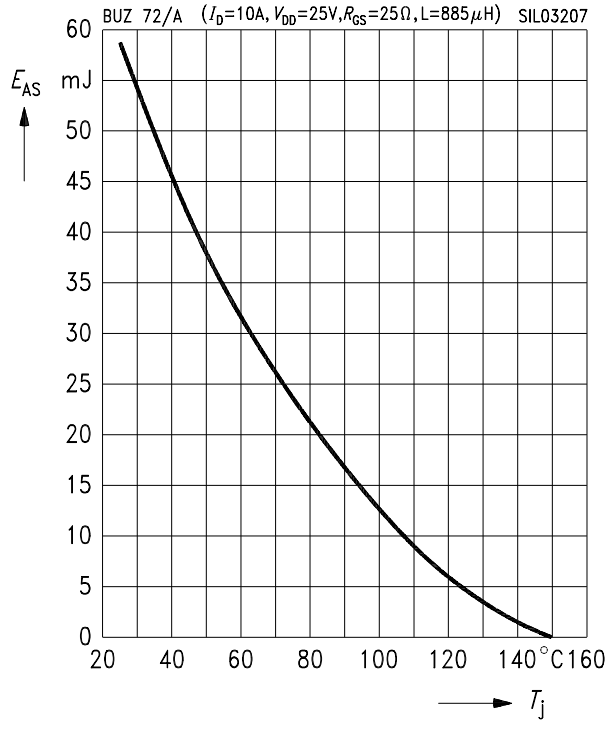
Drain current
$I_D = f(T_C)$
parameter: $V_{GS} \geq 10$ V



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



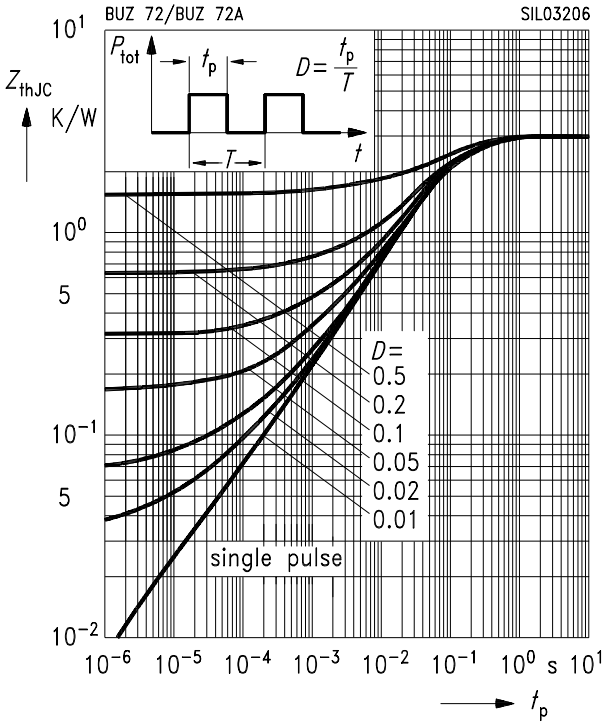
Avalanche energy $E_{AS} = f(T_j)$
parameter: I_D = 10 A, V_{DD} = 25 V
R_{GS} = 25 Ω, L = 885 µH



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