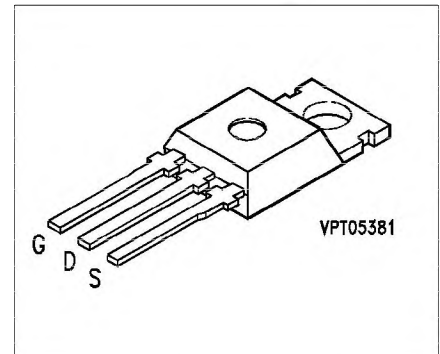


SIPMOS® Power Transistors

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, $T_C = 25\text{ °C}$	I_D	10	9.0	A
Pulsed drain current, $T_C = 25\text{ °C}$	$I_{D\text{ puls}}$	40	36	
Avalanche current, limited by $T_{j\text{ max}}$	I_{AR}	10		
Avalanche energy, periodic limited by $T_{j\text{ (max)}}$	E_{AR}	7.9		mJ
Avalanche energy, single pulse $I_D = 10\text{ A}$, $V_{DD} = 25\text{ V}$, $R_{GS} = 25\text{ }\Omega$ $L = 885\text{ }\mu\text{H}$, $T_j = 25\text{ °C}$	E_{AS}	59		
Gate-source voltage	V_{GS}	± 20		V
Power dissipation, $T_C = 25\text{ °C}$	P_{tot}	40		W
Operating and storage temperature range	T_j, T_{stg}	- 55 ... + 150		$^{\circ}\text{C}$
Thermal resistance, chip-case	$R_{th\text{ JC}}$	≤ 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 $T_j = 25\text{ °C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static characteristics

Drain-source breakdown voltage $V_{GS} = 0\text{ V}, I_D = 0.25\text{ mA}$	$V_{(BR)DSS}$	100	–	–	V
Gate threshold voltage $V_{GS} = V_{DS}, I_D = 1\text{ mA}$	$V_{GS(th)}$	2.1	3.0	4.0	
Zero gate voltage drain current $V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	I_{DSS}	–	0.1 10	1.0 100	μA
Gate-source leakage current $V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	–	10	100	nA
Drain-source on-resistance $V_{GS} = 10\text{ V}, I_D = 6\text{ A}$	$R_{DS(on)}$	–	0.15 0.2	0.2 0.25	Ω
					BUZ 72 BUZ 72 A

Dynamic characteristics

Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}, I_D = 6\text{ A}$	g_{fs}	3.0	4.3	–	S
Input capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	C_{iss}	–	400	530	pF
Output capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	C_{oss}	–	120	180	
Reverse transfer capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	C_{rss}	–	70	105	
Turn-on time t_{on} , ($t_{on} = t_{d(on)} + t_r$) $V_{DD} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}, R_{GS} = 50\ \Omega$	$t_{d(on)}$	–	10	15	ns
	t_r	–	45	70	
Turn-off time t_{off} , ($t_{off} = t_{d(off)} + t_f$) $V_{DD} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}, R_{GS} = 50\ \Omega$	$t_{d(off)}$	–	55	75	
	t_f	–	40	55	

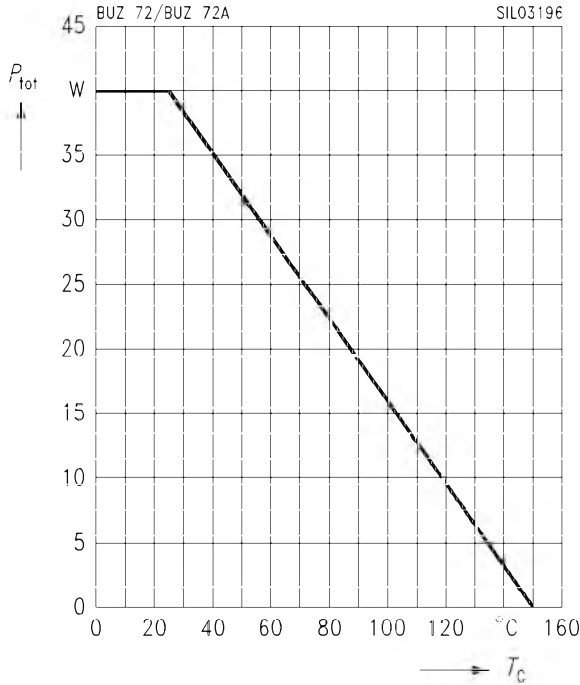
Electrical Characteristics (cont'd)
at $T_j = 25\text{ °C}$, unless otherwise specified.

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

Characteristics at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified.

Total power dissipation

$P_{tot} = f(T_C)$

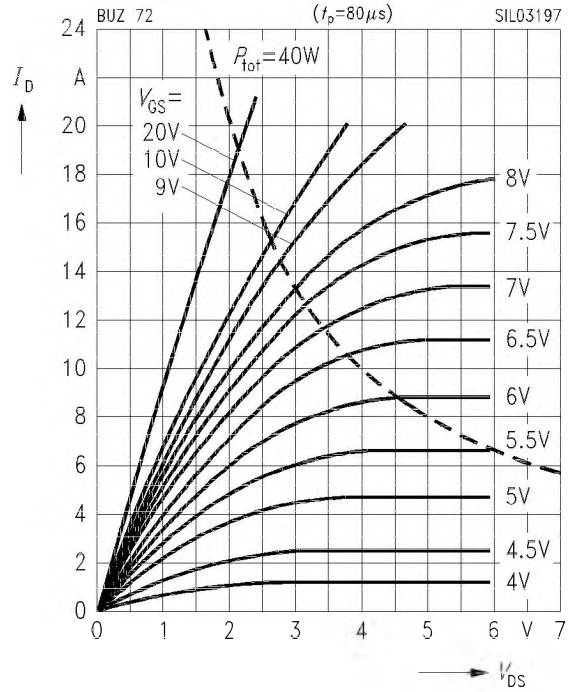


Typ. output characteristics

$I_D = f(V_{DS})$

parameter: $t_p = 80\text{ }\mu\text{s}$

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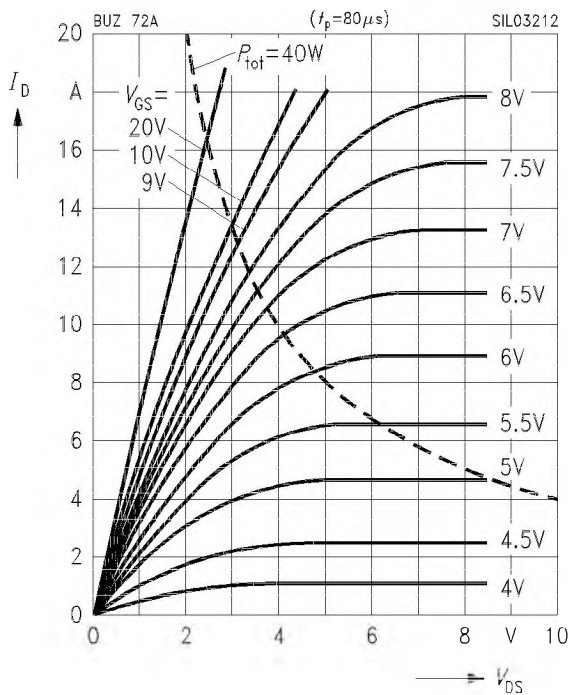


Typ. output characteristics

$I_D = f(V_{DS})$

parameter: $t_p = 80\text{ }\mu\text{s}$

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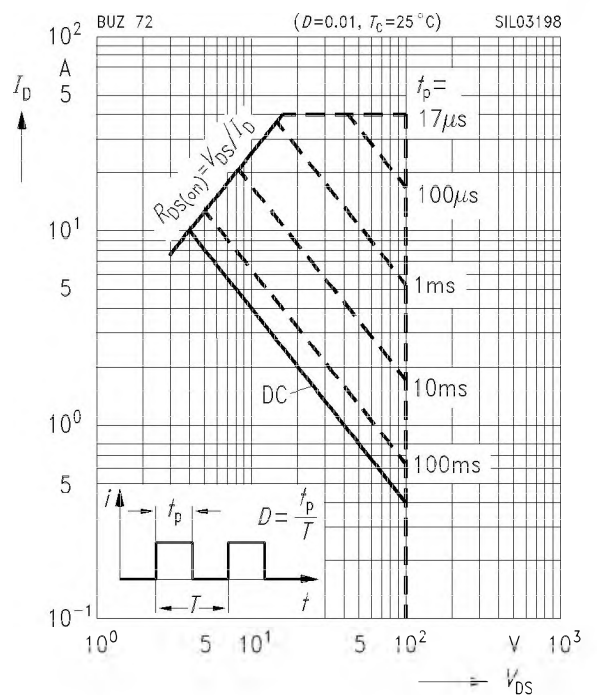


Safe operating area

$I_D = f(V_{DS})$

parameter: $D = 0.01, T_C = 25\text{ }^\circ\text{C}$

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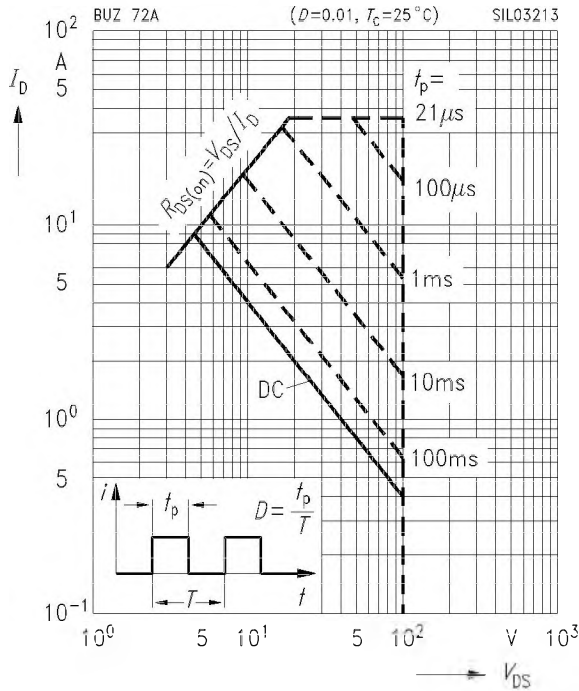


Safe operating area

$$I_D = f(V_{DS})$$

BUZ 72 A

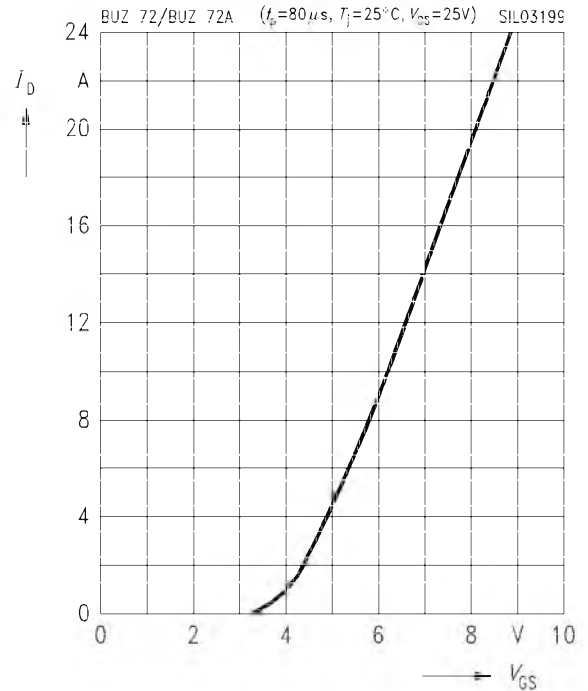
parameter: $D = 0.01$, $T_C = 25^\circ\text{C}$



Typ. transfer characteristics

$$I_D = f(V_{GS})$$

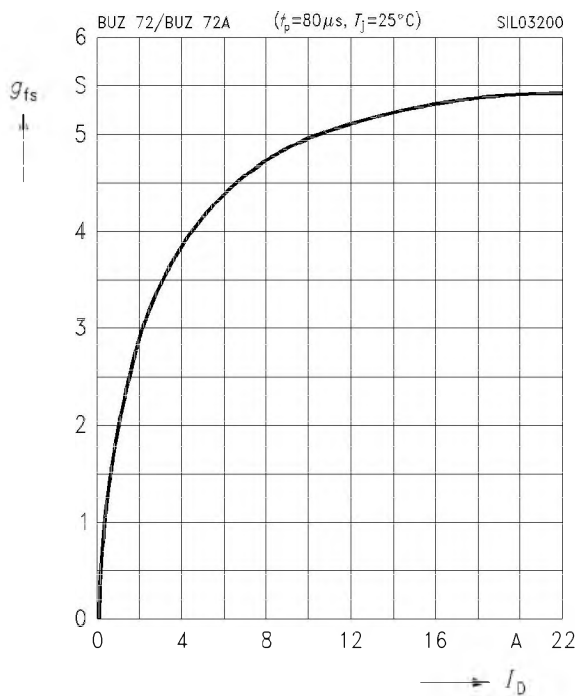
parameter: $t_p = 80 \mu\text{s}$, $V_{DS} = 25 \text{ V}$



Typ. forward transconductance

$$g_{fs} = f(I_D)$$

parameter: $t_p = 80 \mu\text{s}$

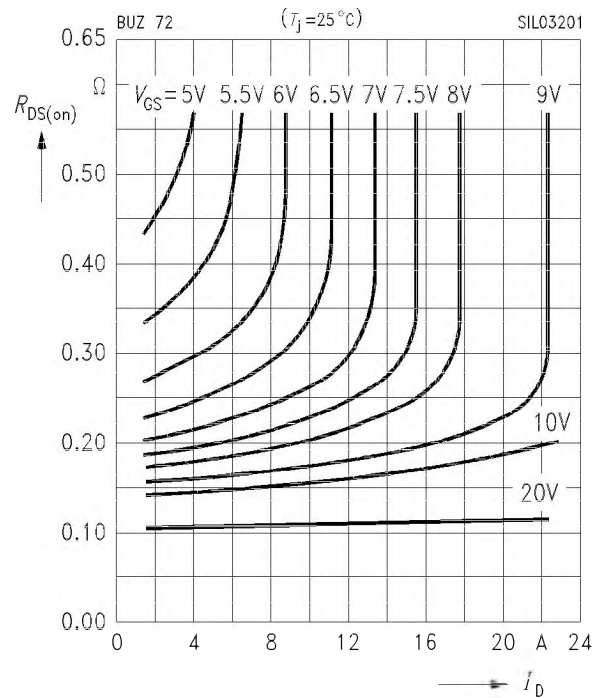


Typ. drain-source on-resistance

$$R_{DS(on)} = f(I_D)$$

BUZ 72

parameter: V_{GS}

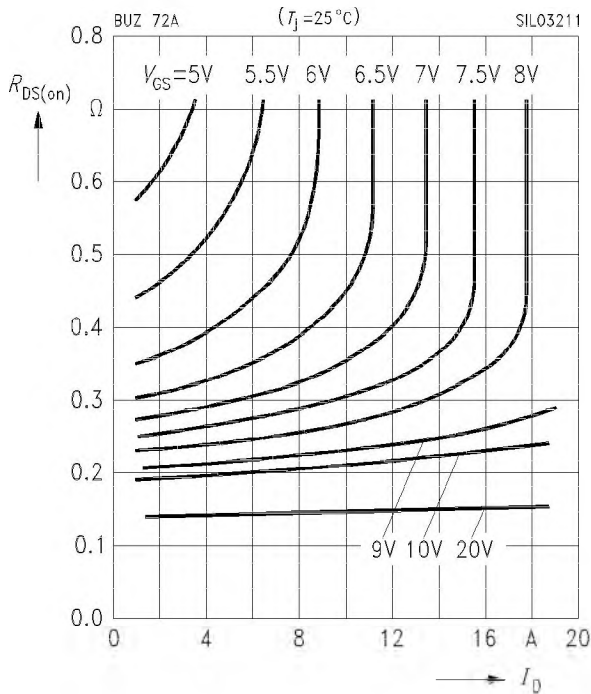


Typ. drain-source on-resistance

$$R_{DS(on)} = f(I_D)$$

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parameter: V_{GS}

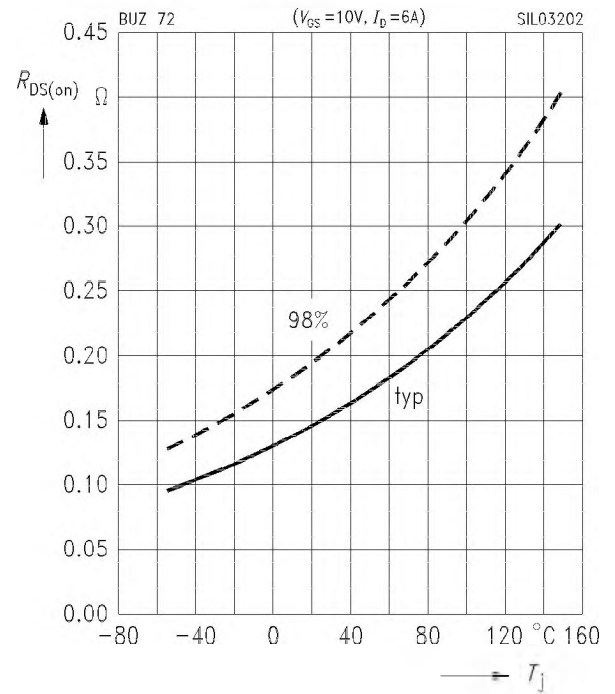


Drain-source on-resistance

$$R_{DS(on)} = f(T_j)$$

BUZ 72

parameter: $I_D = 6\text{ A}$, $V_{GS} = 10\text{ V}$, (spread)

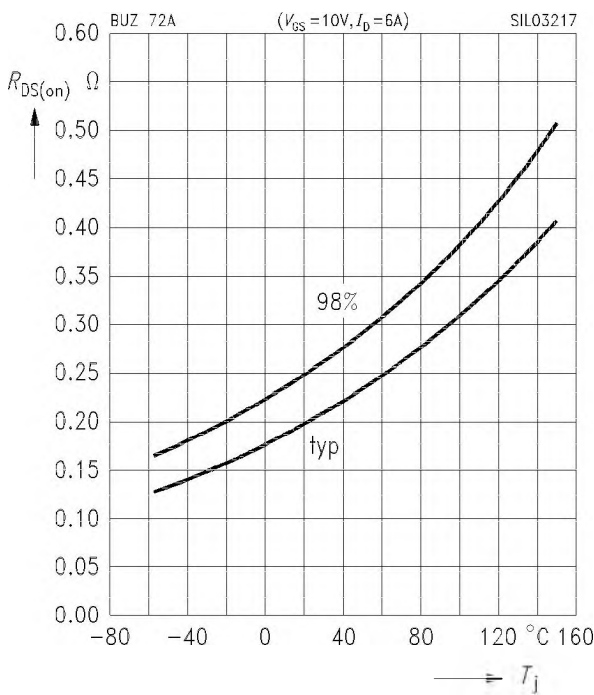


Drain-source on-resistance

$$R_{DS(on)} = f(T_j)$$

BUZ 72 A

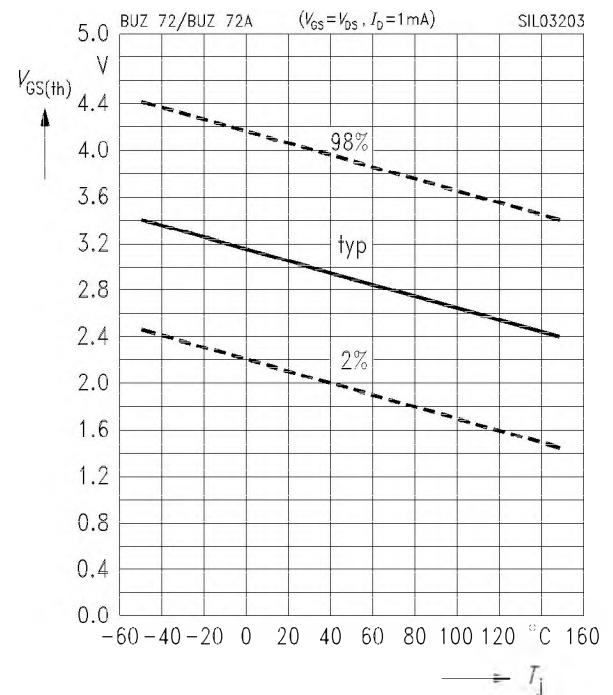
parameter: $I_D = 6\text{ A}$, $V_{GS} = 10\text{ V}$, (spread)



Gate threshold voltage

$$V_{GS(th)} = f(T_j)$$

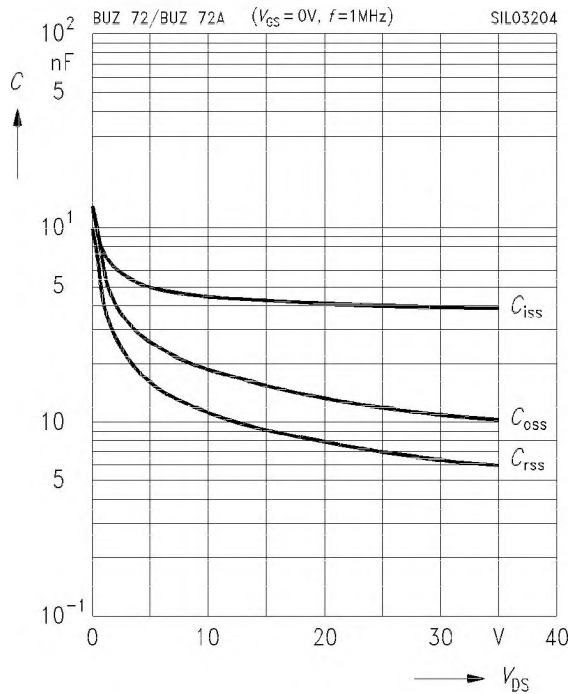
parameter: $V_{GS} = V_{DS}$, $I_D = 1\text{ mA}$, (spread)



Typ. capacitances

$$C = f(V_{DS})$$

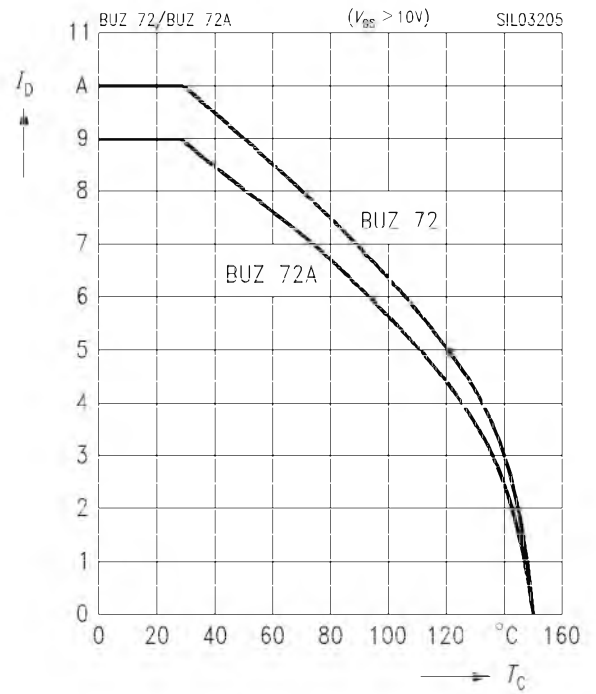
parameter: $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$



Drain current

$$I_D = f(T_C)$$

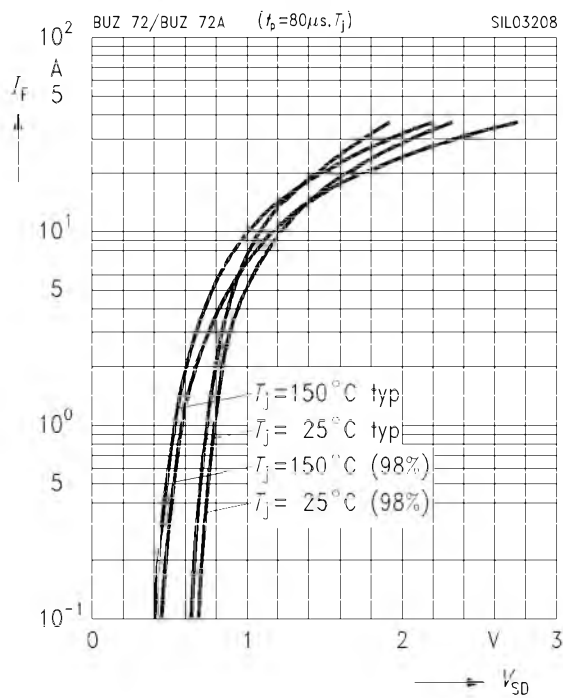
parameter: $V_{GS} \geq 10 \text{ V}$



Forward characteristics of reverse diode

$$I_F = f(V_{SD})$$

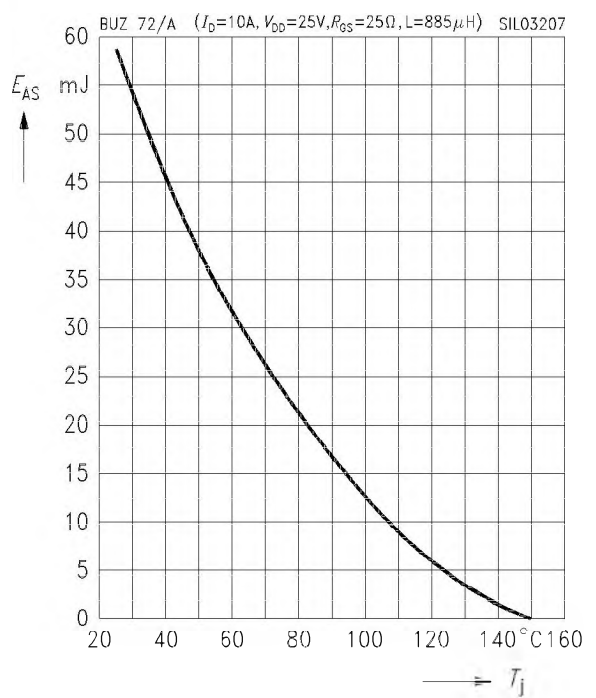
parameter: T_i , $t_p = 80 \mu\text{s}$, (spread)



Avalanche energy $E_{AS} = f(T_j)$

parameter: $I_D = 10 \text{ A}$, $V_{DD} = 25 \text{ V}$

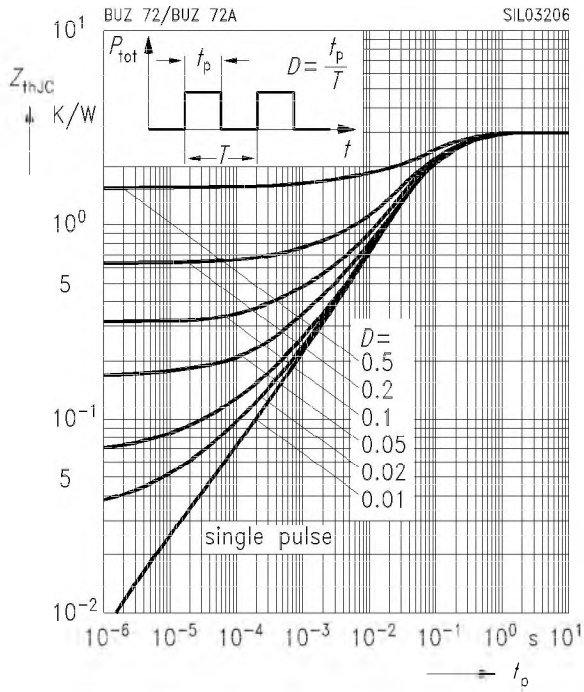
$R_{GS} = 25 \Omega$, $L = 885 \mu\text{H}$



Transient thermal impedance

$Z_{thJC} = f(t_p)$

parameter: $D = t_p / T$



Typ. gate charge

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

parameter: $I_{D\ pulis} = 21\ A$

