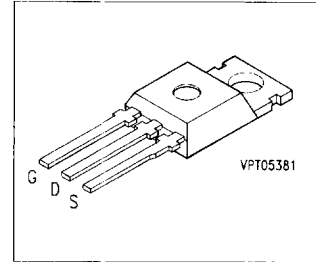


SIPMOS® Power Transistors

- N channel
- Enhancement mode
- Avalanche-rated

BUZ 73 BUZ 73 A



Type	V_{DS}	I_D	T_C	$R_{DS(on)}$	Package ¹⁾	Ordering Code
BUZ 73	200 V	7.0 A	28 °C	0.4 Ω	TO-220 AB	C67078-S1317-A2
BUZ 73 A	200 V	5.5 A	37 °C	0.6 Ω	TO-220 AB	C67078-S1317-A3

Maximum Ratings

Parameter	Symbol	BUZ		Unit
		73	73 A	
Continuous drain current	I_D	7.0	5.5	A
Pulsed drain current, $T_C = 25\text{ °C}$	$I_{D,puls}$	28	22	
Avalanche current, limited by $T_{j,max}$	I_{AR}	7.0		
Avalanche energy, periodic limited by $T_{j(max)}$	E_{AR}	6.5		mJ
Avalanche energy, single pulse $I_D = 7\text{ A}$, $V_{DD} = 50\text{ V}$, $R_{GS} = 25\text{ }\Omega$ $L = 3.67\text{ mH}$, $T_j = 25\text{ °C}$	E_{AS}	120		
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		°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 $T_j = 25\text{ °C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static characteristics

Drain-source breakdown voltage $V_{GS} = 0\text{ V}, I_D = 0.25\text{ mA}$	$V_{(BR)DSS}$	200	–	–	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 $V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	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 $V_{GS} = 10\text{ V}, I_D = 4.5\text{ A}$	$R_{DS(on)}$	– –	0.3 0.5	0.4 0.6	Ω
					BUZ 73 BUZ 73 A

Dynamic characteristics

Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}, I_D = 4.5\text{ A}$	g_{fs}	3.0	4.2	–	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}	–	85	130	
Reverse transfer capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	C_{rss}	–	45	70	
Turn-on time $t_{on}, (t_{on} = t_{d(on)} + t_r)$ $V_{DD} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}, R_{GS} = 50\text{ }\Omega$	$t_{d(on)}$	–	10	15	ns
	t_r	–	40	60	
Turn-off time $t_{off}, (t_{off} = t_{d(off)} + t_f)$ $V_{DD} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}, R_{GS} = 50\text{ }\Omega$	$t_{d(off)}$	–	55	75	
	t_f	–	30	40	

Electrical Characteristics (cont'd)

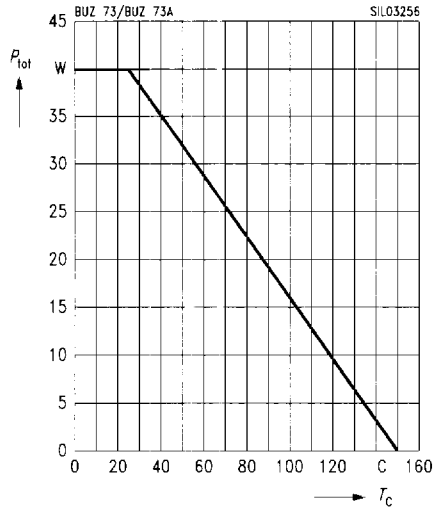
at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse diode					
Continuous reverse drain current $T_C = 25\text{ }^\circ\text{C}$	I_S				A
BUZ 73		–	–	7.0	
BUZ 73 A		–	–	5.5	
Pulsed reverse drain current $T_C = 25\text{ }^\circ\text{C}$	I_{SM}				
BUZ 73		–	–	28	
BUZ 73 A		–	–	22	
Diode forward on-voltage $I_S = 14\text{ A}$, $V_{GS} = 0\text{ V}$	V_{SD}	–	1.3	1.7	V
Reverse recovery time $V_R = 100\text{ V}$, $I_F = I_S$, $di_F / dt = 100\text{ A}/\mu\text{s}$	t_{rr}	–	200	–	ns
Reverse recovery charge $V_R = 100\text{ V}$, $I_F = I_S$, $di_F / dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	–	0.60	–	μC

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

Total power dissipation

$$P_{\text{tot}} = f(T_c)$$

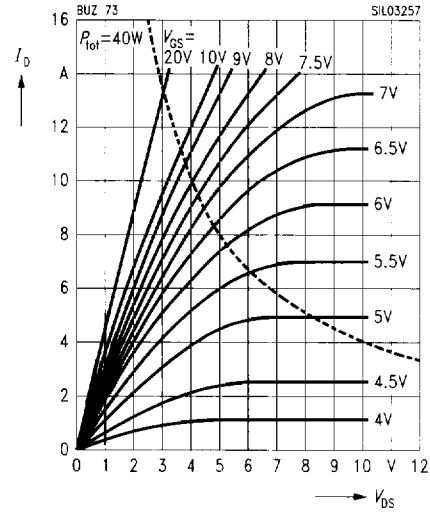


Typ. output characteristics

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

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

BUZ 73

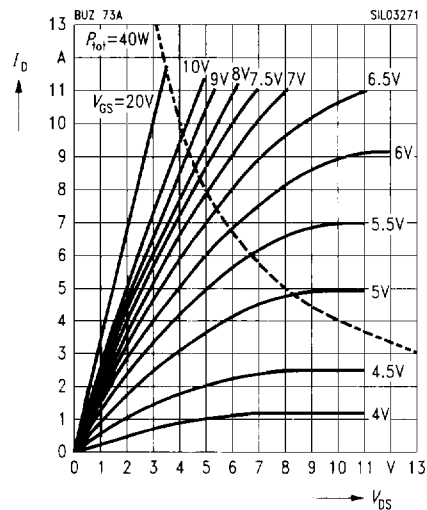


Typ. output characteristics

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

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

BUZ 73 A

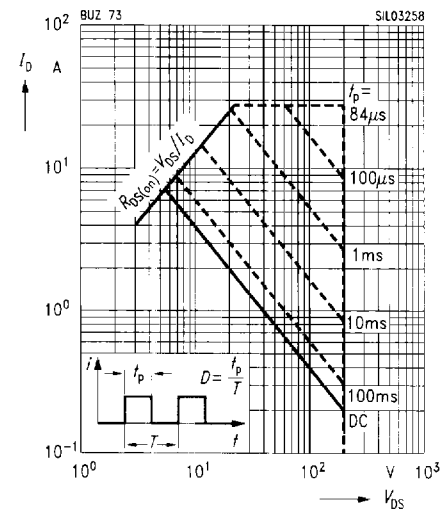


Safe operating area

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

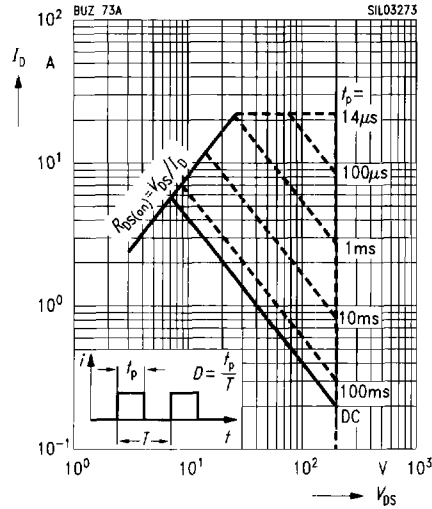
parameter: $D = 0.01$, $T_c = 25\text{ }^\circ\text{C}$

BUZ 73



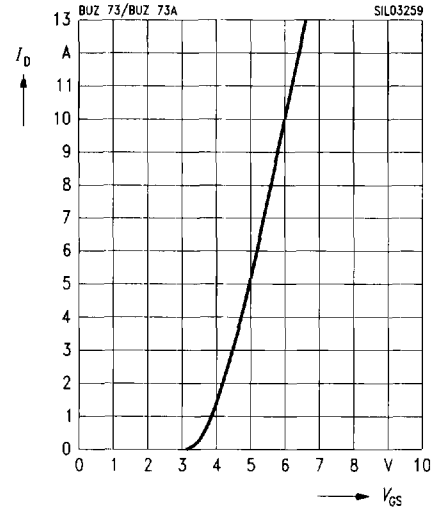
Safe operating area

$I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_C = 25^\circ\text{C}$ **BUZ 73 A**



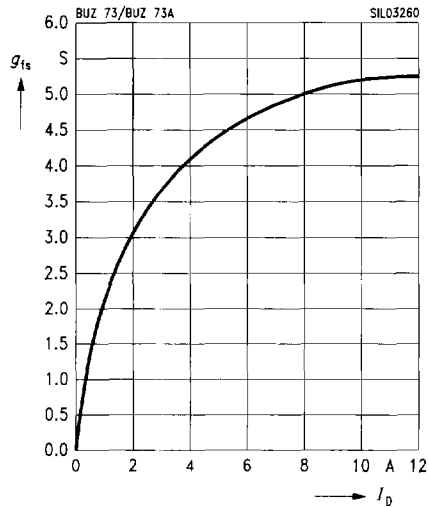
Typ. transfer characteristics

$I_D = f(V_{GS})$
parameter: $t_p = 80 \mu\text{s}$, $V_{DS} = 25 \text{ V}$



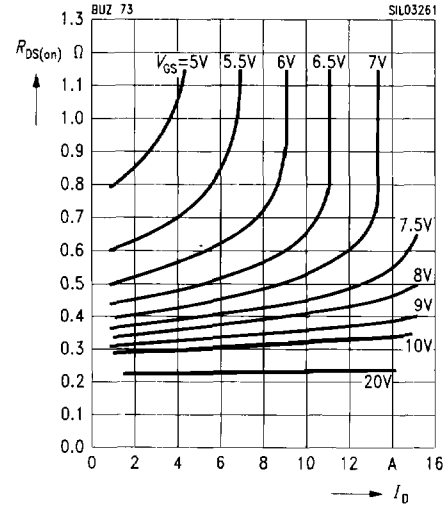
Typ. forward transconductance

$g_{fs} = f(I_D)$
parameter: $t_p = 80 \mu\text{s}$



Typ. drain-source on-resistance

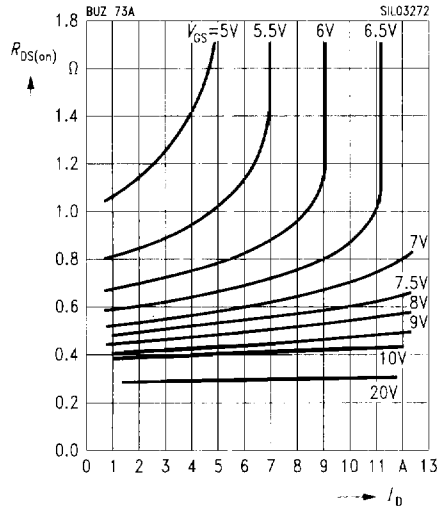
$R_{DS(on)} = f(I_D)$ **BUZ 73**
parameter: V_{GS}



Typ. drain-source on-resistance

$R_{DS(on)} = f(I_D)$
parameter: V_{GS}

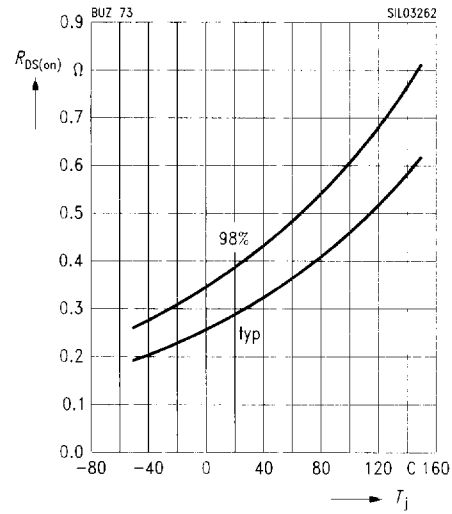
BUZ 73 A



Drain-source on-resistance

$R_{DS(on)} = f(T_j)$
parameter: $I_D = 4.5$ A, $V_{GS} = 10$ V, (spread)

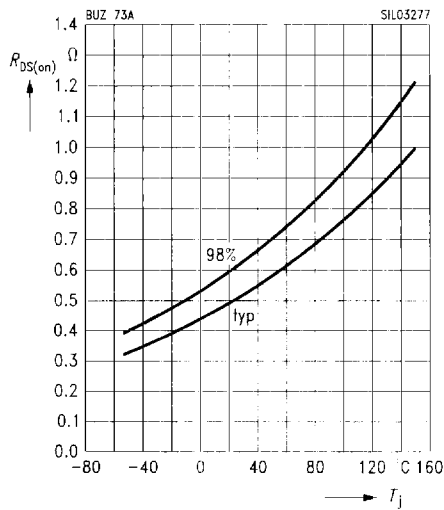
BUZ 73



Drain-source on-resistance

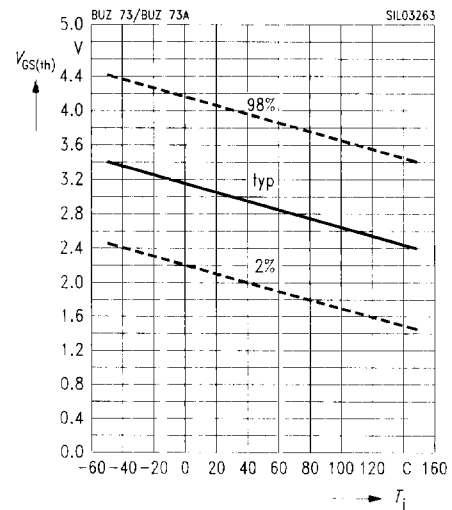
$R_{DS(on)} = f(T_j)$
parameter: $I_D = 4.5$ A, $V_{GS} = 10$ V, (spread)

BUZ 73 A



Gate threshold voltage

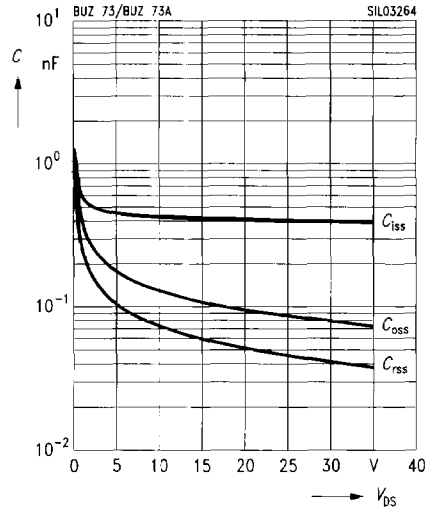
$V_{GS(th)} = f(T_j)$
parameter: $V_{GS} = V_{DS}$, $I_D = 1$ mA, (spread)



Typ. capacitances

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

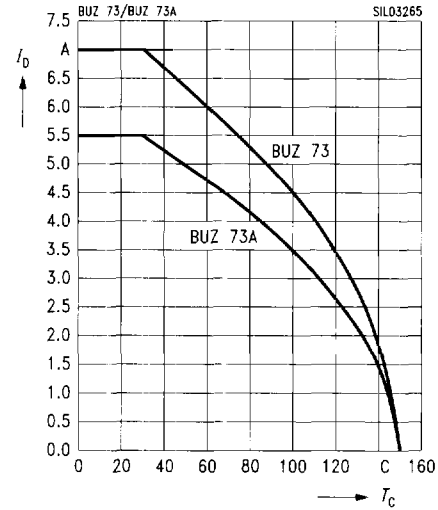
parameter: $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$



Drain current

$$I_D = f(T_C)$$

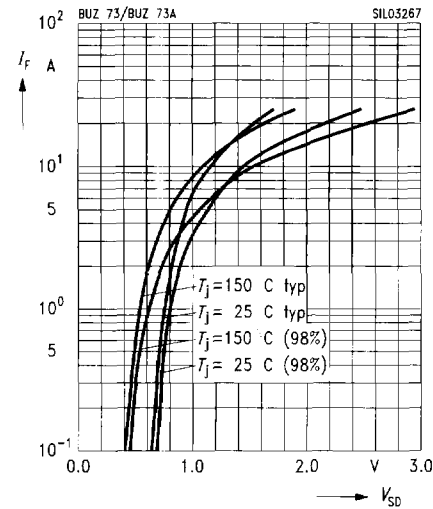
parameter: $V_{GS} \geq 10 \text{ V}$



Forward characteristics of reverse diode

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

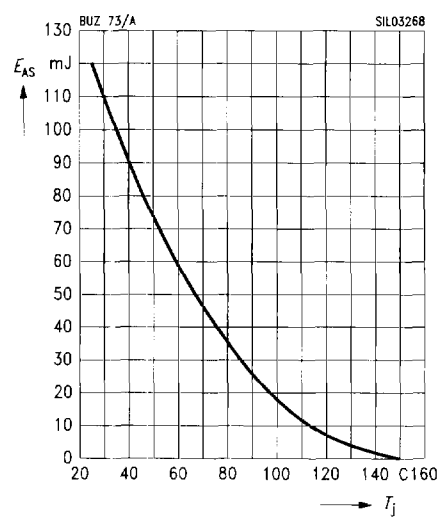
parameter: T_j , $t_p = 80 \mu\text{s}$



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

parameter: $I_D = 7 \text{ A}$, $V_{DD} = 50 \text{ V}$

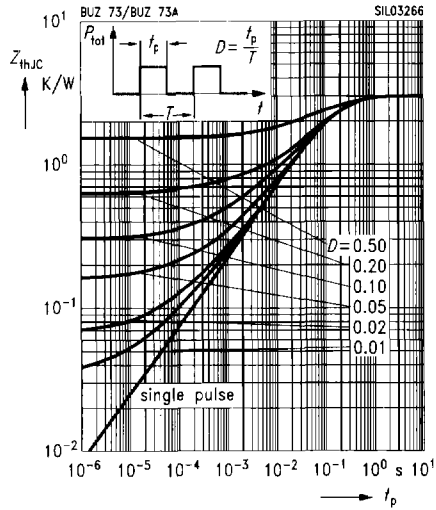
$R_{GS} = 25 \Omega$, $L = 3.67 \text{ mH}$



Transient thermal impedance

$Z_{thJC} = f(t_p)$

parameter: $D = t_p / T$



Typ. gate charge

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

parameter: $I_{D\ puls} = 13.5\ A$

