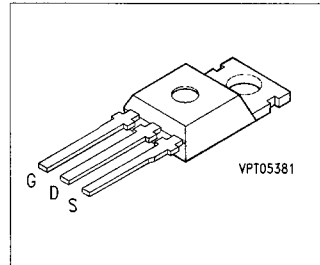


SIPMOS® Power Transistors

- N channel
- Enhancement mode
- Avalanche-rated

BUZ 71 BUZ 71 A, BUZ 71 S2



Type	V_{DS}	I_D	T_C	$R_{DS(on)}$	Package ¹⁾	Ordering Code
BUZ 71	50 V	14 A	28 °C	0.10 Ω	TO-220 AB	C67078-S1316-A2
BUZ 71 A	50 V	13 A	25 °C	0.12 Ω	TO-220 AB	C67078-S1316-A3
BUZ 71 S2	60 V	14 A	28 °C	0.10 Ω	TO-220 AB	C67078-S1316-A9

Maximum Ratings

Parameter	Symbol	BUZ			Unit
		71	71 A	71 S2	
Continuous drain current	I_D	14	13	14	A
Pulsed drain current, $T_C = 25\text{ °C}$	$I_{D(puls)}$	56	52	56	
Avalanche current, limited by $T_{j(max)}$	I_{AR}	14			
Avalanche energy, periodic limited by $T_{j(max)}$	E_{AR}	1			mJ
Avalanche energy, single pulse $V_{DD} = 25\text{ V}$, $R_{GS} = 25\text{ }\Omega$, $T_j = 25\text{ °C}$ $I_D = 14\text{ A}$, $L = 30.6\text{ }\mu\text{H}$	E_{AS}	6			
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 $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static characteristics

Drain-source breakdown voltage $V_{GS} = 0\text{ V}$, $I_D = 0.25\text{ mA}$	$V_{(BR)DSS}$	50	–	–	V
BUZ 71 / 71 A BUZ 71 S2		60	–	–	
Gate threshold voltage $V_{GS} = V_{DS}$, $I_D = 0.25\text{ mA}$	$V_{GS(th)}$	2.1	3.0	4.0	
Zero gate voltage drain current $V_{GS} = 0\text{ V}$	I_{DSS}				μA
$V_{DS} = 50\text{ V}$ BUZ 71 / 71 A					
$V_{DS} = 60\text{ V}$ BUZ 71 S2					
$T_j = 25\text{ }^\circ\text{C}$		–	0.1	1.0	
$T_j = 125\text{ }^\circ\text{C}$		–	10	100	
Gate-source leakage current $V_{GS} = 20\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	–	10	100	nA
Drain-source on-resistance $V_{GS} = 10\text{ V}$, $I_D = 9\text{ A}$	$R_{DS(on)}$	–	0.08	0.10	Ω
BUZ 71 / 71 S2 BUZ 71 A		–	0.10	0.12	



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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Dynamic characteristics

Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, $I_D = 9\text{ A}$	g_{fs}	4.0	7.7	–	S
Input capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{iss}	–	450	600	pF
Output capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{oss}	–	220	350	
Reverse transfer capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{rss}	–	85	150	
Turn-on time t_{on} , ($t_{on} = t_{d(on)} + t_r$) $V_{DD} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 3\text{ A}$, $R_{GS} = 50\text{ }\Omega$	$t_{d(on)}$	–	20	30	ns
	t_r	–	40	60	
Turn-off time t_{off} , ($t_{off} = t_{d(off)} + t_f$) $V_{DD} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 3\text{ A}$, $R_{GS} = 50\text{ }\Omega$	$t_{d(off)}$	–	55	70	
	t_f	–	40	55	

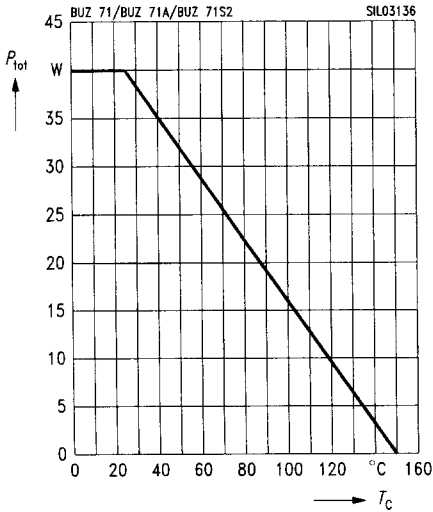
Reverse diode

Continuous reverse drain current $T_C = 25\text{ }^\circ\text{C}$	I_S	–	–	14	A
BUZ 71/71 S2		–	–	13	
Pulsed reverse drain current $T_C = 25\text{ }^\circ\text{C}$	I_{SM}	–	–	56	A
BUZ 71/71 S2		–	–	52	
Diode forward on-voltage $I_S = 28$, $V_{GS} = 0\text{ V}$	V_{SD}	–	1.5	1.8	V
Reverse recovery time $V_R = 30\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	t_{rr}	–	60	–	ns
Reverse recovery charge $V_R = 30\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	–	0.10	–	μC

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

Total power dissipation

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

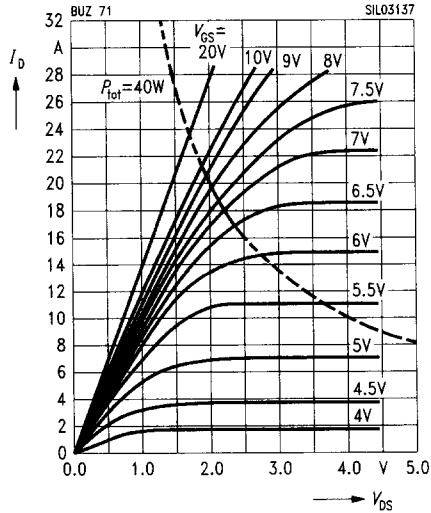


Typ. output characteristics

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

BUZ 71 / BUZ 71 S2

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

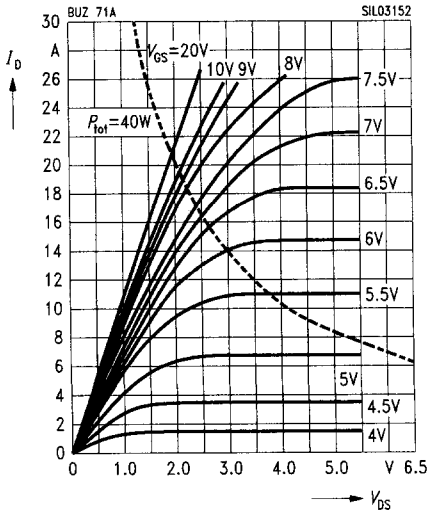


Typ. output characteristics

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

BUZ 71 A

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

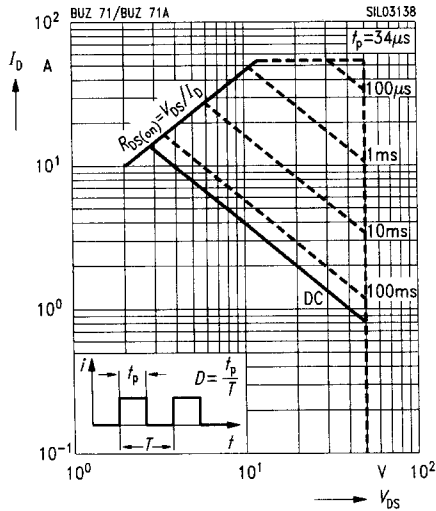


Safe operating area

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

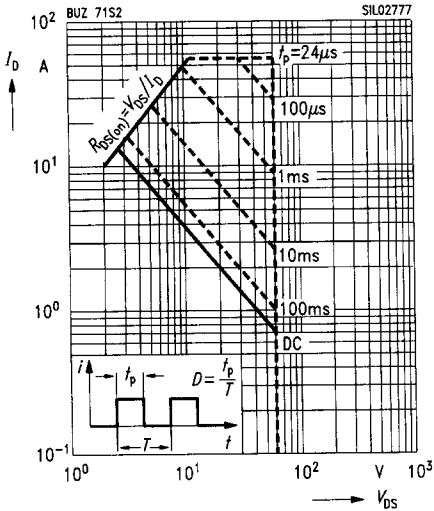
BUZ 71 / BUZ 71 A

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



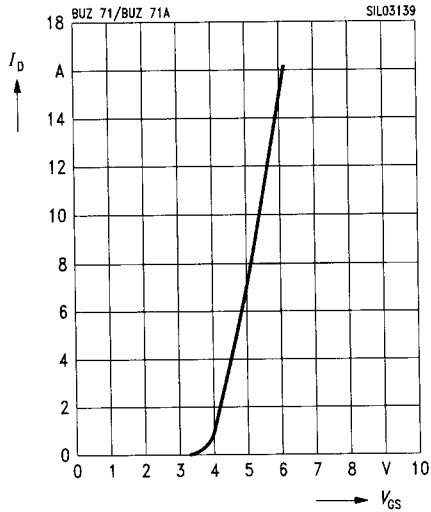
Safe operating area

$I_D = f(V_{DS})$ **BUZ 71 S2**
parameter: $D = 0.01, T_C = 25^\circ C$



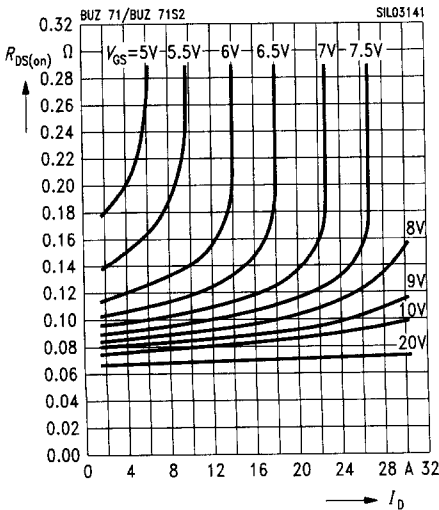
Typ. transfer characteristics

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



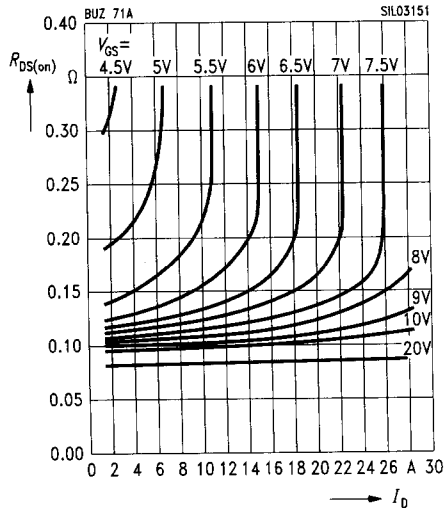
Typ. drain-source on-resistance

$R_{DS(on)} = f(I_D)$ **BUZ 71 / BUZ 71 S2**
parameter: V_{GS}



Typ. drain-source on-resistance

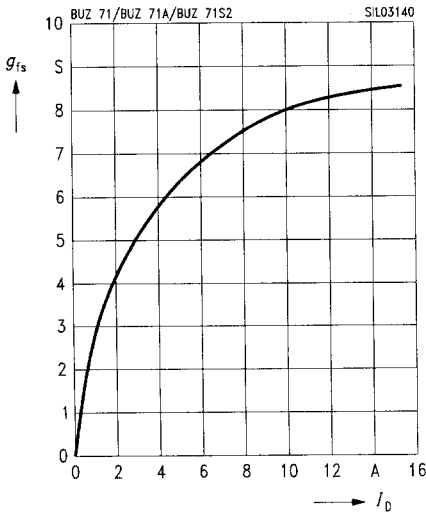
$R_{DS(on)} = f(I_D)$ **BUZ 71 A**
parameter: V_{GS}



Typ. forward transconductance

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

parameter: $t_p = 80 \mu s$

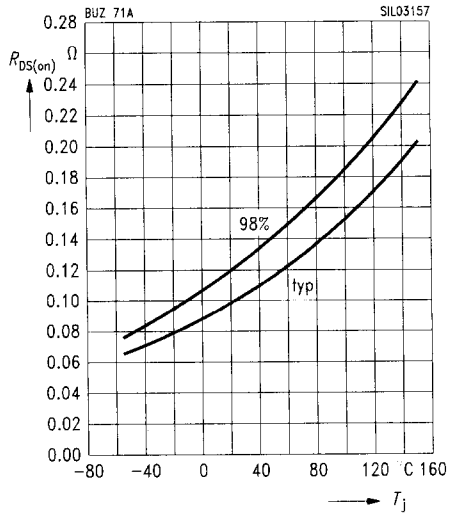


Drain-source on-resistance

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

BUZ 71 / BUZ 71 S2

parameter: $I_D = 9 A$, $V_{GS} = 10 V$, (spread)

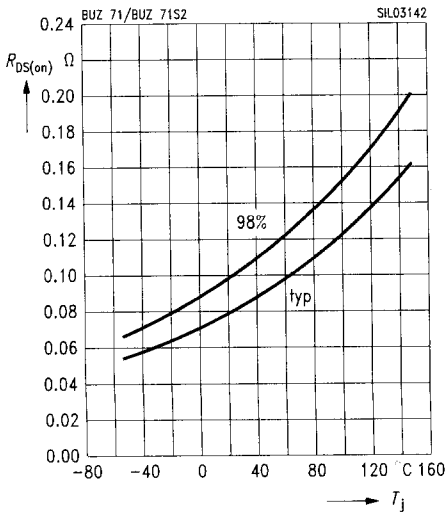


Drain-source on-resistance

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

BUZ 71 A

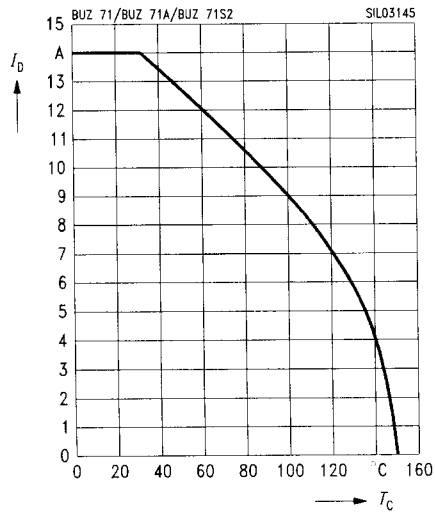
parameter: $I_D = 9 A$, $V_{GS} = 10 V$, (spread)



Drain current

$$I_D = f(T_C)$$

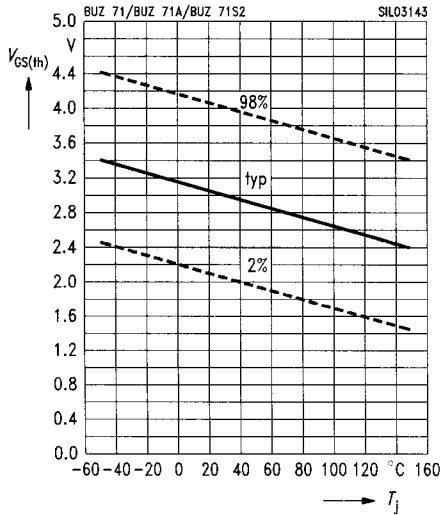
parameter: $V_{GS} \geq 10 V$



Gate threshold voltage

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

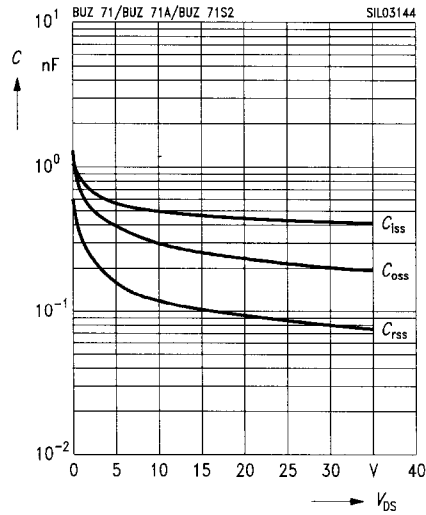
parameter: $V_{GS} = V_{DS}$, $I_D = 1 \text{ mA}$, (spread)



Typ. capacitances

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

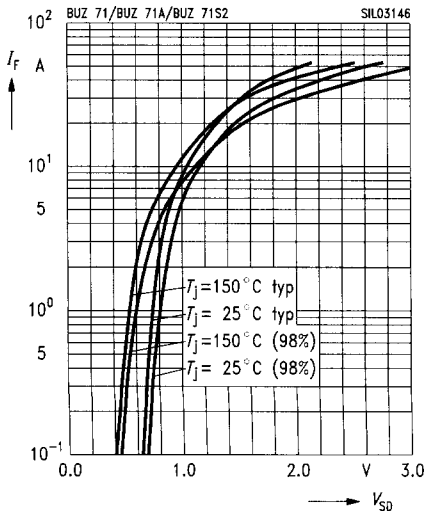
parameter: $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$



Forward characteristics of reverse diode

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

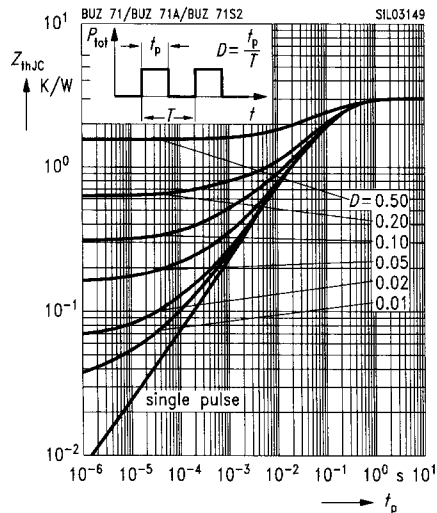
parameter: T_j , $t_p = 80 \mu\text{s}$, (spread)



Transient thermal impedance

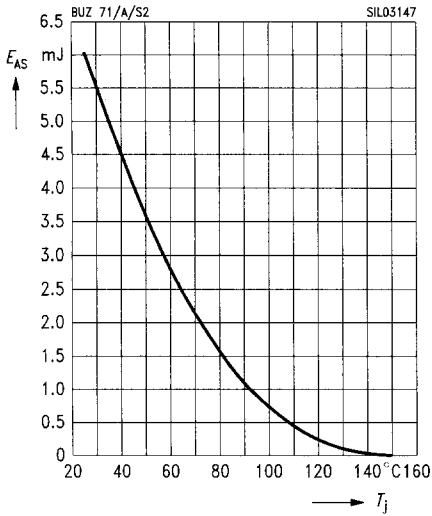
$$Z_{thJC} = f(t_p)$$

parameter: $D = t_p / T$



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

parameter: $I_D = 14 \text{ A}$, $V_{DD} = 25 \text{ V}$
 $R_{GS} = 25 \text{ } \Omega$, $L = 30.6 \text{ } \mu\text{H}$



Typ. gate charge

$V_{GS} = f(Q_{Gate})$
 parameter: $I_{D \text{ puls}} = 22.5 \text{ A}$

