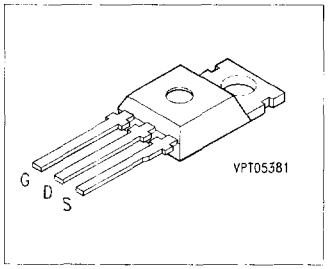
SIEMENS

SIPMOS® Power Transistors

BUZ 71
BUZ 71 A, BUZ 71 S2

- N channel
- Enhancement mode
- Avalanche-rated



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 °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 V, R_{GS} = 25 Ω, T_j = 25 °C I_D = 14 A, L = 30.6 µH	E_{AS}	6			
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		$V_{(BR)\,DSS}$				V
V_{GS} = 0 V, I_D = 0.25 mA	BUZ 71 / 71 A		50	–	–	
	BUZ 71 S2		60	–	–	
Gate threshold voltage		$V_{GS\,(th)}$	2.1	3.0	4.0	
V_{GS} = V_{DS} , I_D = 0.25 mA						
Zero gate voltage drain current		I_{DSS}				µA
V_{GS} = 0 V V_{DS} = 50 V	BUZ 71 / 71 A					
V_{DS} = 60 V	BUZ 71 S2					
T_j = 25 °C			–	0.1	1.0	
T_j = 125 °C			–	10	100	
Gate-source leakage current		I_{GSS}	–	10	100	nA
V_{GS} = 20 V, V_{DS} = 0 V						
Drain-source on-resistance		$R_{DS(on)}$				Ω
V_{GS} = 10 V, I_D = 9 A	BUZ 71 / 71 S2		–	0.08	0.10	
	BUZ 71 A		–	0.10	0.12	

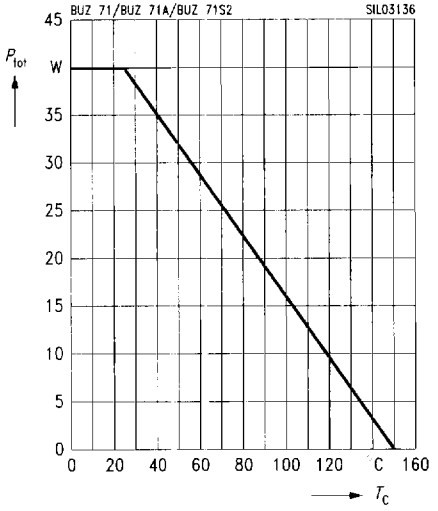
Electrical Characteristics (cont'd)
at T_j = 25 °C, unless otherwise specified.

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 A	g_{fs}	4.0	7.7	–	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	–	450	600	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	–	220	350	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	–	85	150	
Turn-on time t_{on} , ($t_{on} = t_{d\,(on)} + t_r$) V_{DD} = 30 V, V_{GS} = 10 V, I_D = 3 A, R_{GS} = 50 Ω	$t_{d\,(on)}$	–	20	30	ns
	t_r	–	40	60	
Turn-off time t_{off} , ($t_{off} = t_{d\,(off)} + t_f$) V_{DD} = 30 V, V_{GS} = 10 V, I_D = 3 A, R_{GS} = 50 Ω	$t_{d\,(off)}$	–	55	70	
	t_f	–	40	55	
Reverse diode					
Continuous reverse drain current T_C = 25 °C BUZ 71/71 S2	I_S	–		14	A
BUZ 71 A		–		13	
Pulsed reverse drain current T_C = 25 °C BUZ 71/71 S2	I_{SM}	–		56	A
BUZ 71		–		52	
Diode forward on-voltage I_S = 28, V_{GS} = 0 V	V_{SD}	–	1.5	1.8	V
Reverse recovery time V_R = 30 V, $I_F = I_S$, di_F / dt = 100 A/µs	t_{rr}	–	60	–	ns
Reverse recovery charge V_R = 30 V, $I_F = I_S$, di_F / dt = 100 A/µs	Q_{rr}	–	0.10	–	µC

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

Total power dissipation

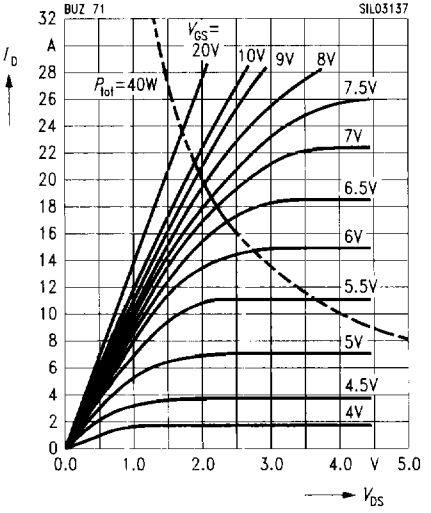
$P_{tot} = f(T_C)$



Typ. output characteristics

$I_D = f(V_{DS})$ **BUZ 71 / BUZ 71 S2**

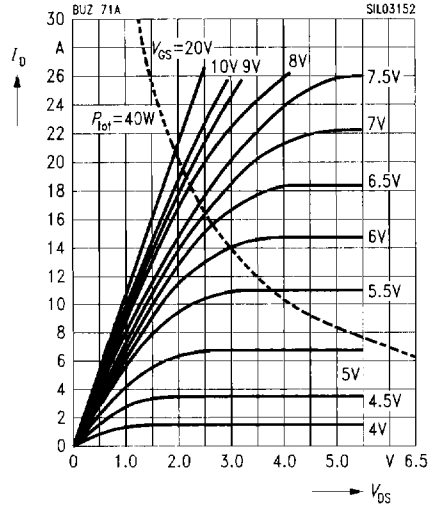
parameter: t_p = 80 µs



Typ. output characteristics

$I_D = f(V_{DS})$ **BUZ 71 A**

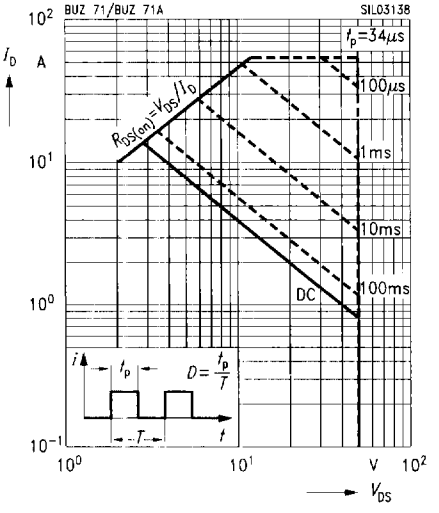
parameter: t_p = 80 µs



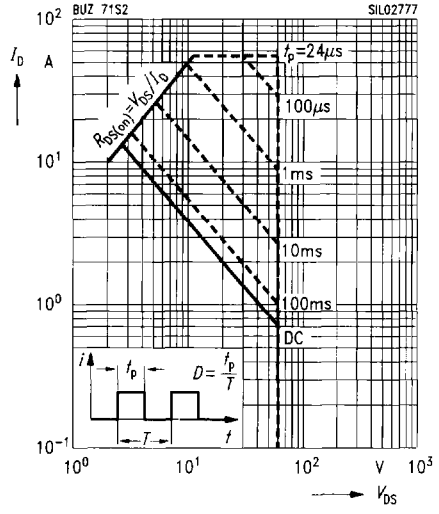
Safe operating area

$I_D = f(V_{DS})$ **BUZ 71 / BUZ 71 A**

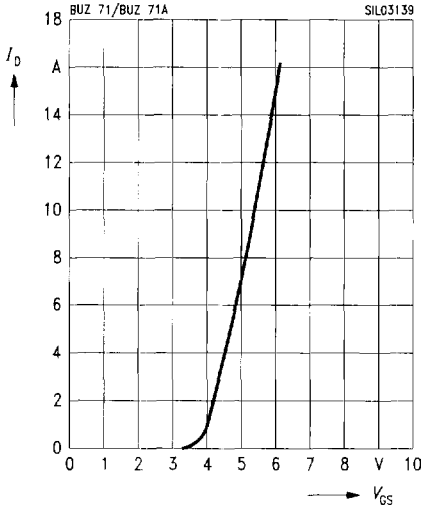
parameter: D = 0.01, T_C = 25 °C



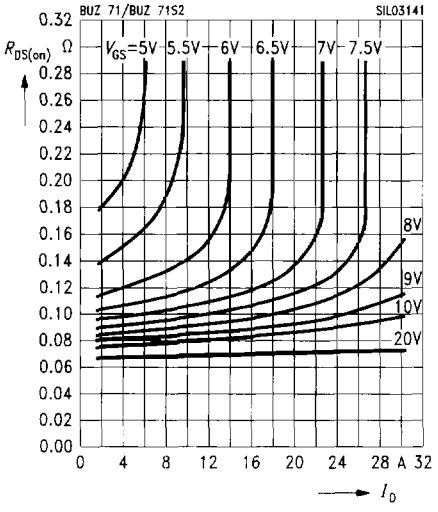
Safe operating area
$I_D = f(V_{DS})$ **BUZ 71 S2**
parameter: $D = 0.01$, $T_C = 25$ °C



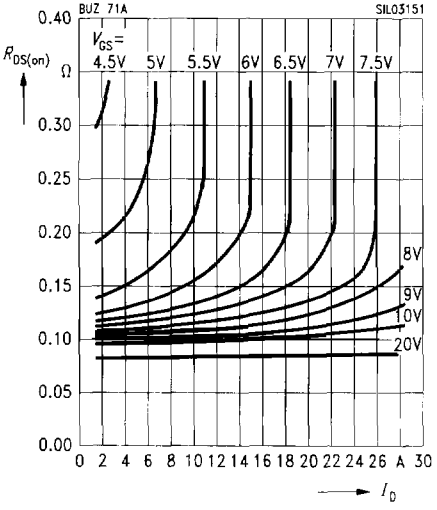
Typ. transfer characteristics
$I_D = f(V_{GS})$
parameter: t_p = 80 µs, V_{DS} = 25 V



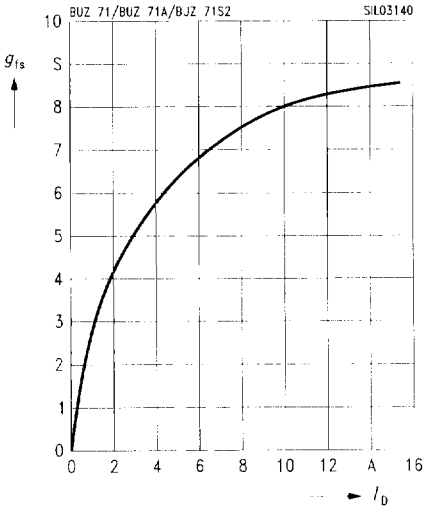
Typ. drain-source on-resistance
$R_{DS\ (on)} = f(I_D)$ **BUZ 71 / BUZ 71 S2**
parameter: V_{GS}



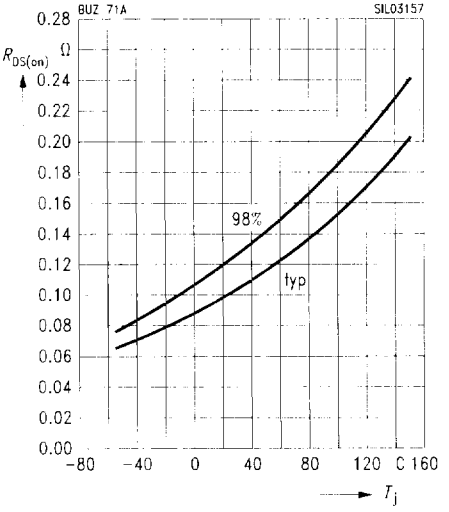
Typ. drain-source on-resistance
$R_{DS\ (on)} = f(I_D)$ **BUZ 71 A**
parameter: V_{GS}



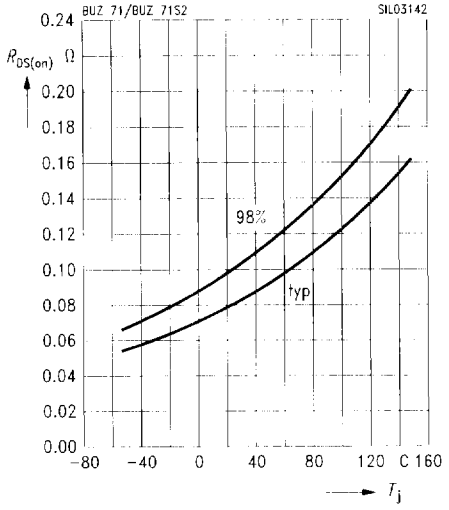
Typ. forward transconductance
$g_{fs} = f(I_D)$
parameter: t_p = 80 µs



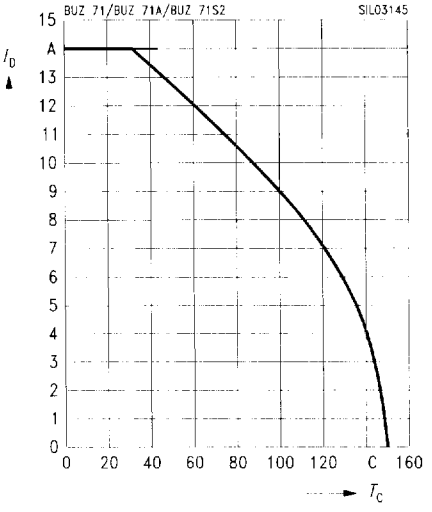
Drain-source on-resistance
$R_{DS\ (on)} = f(T_j)$ **BUZ 71 / BUZ 71 S2**
parameter: I_D = 9 A, V_{GS} = 10 V, (spread)



Drain-source on-resistance
$R_{DS\ (on)} = f(T_j)$ **BUZ 71 A**
parameter: I_D = 9 A, V_{GS} = 10 V, (spread)



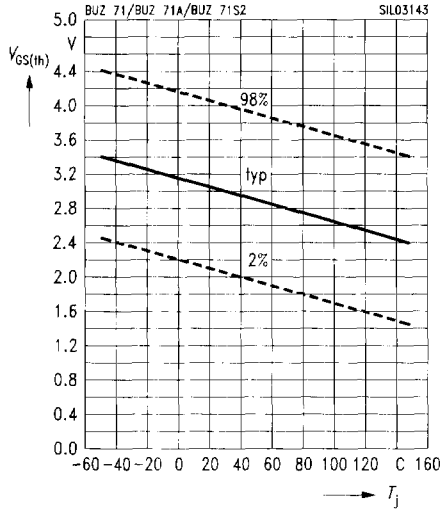
Drain current
$I_D = f(T_C)$
parameter: $V_{GS} \geq 10$ V



Gate threshold voltage

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

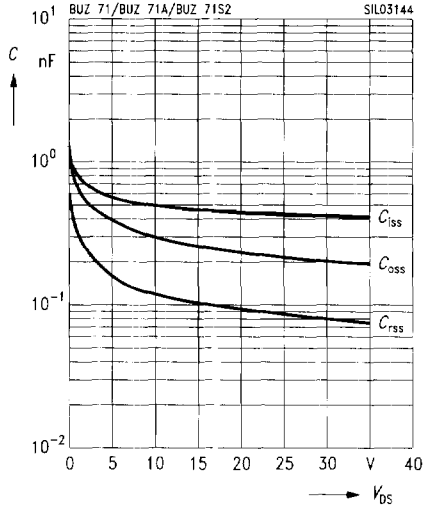
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA, (spread)



Typ. capacitances

$C = f(V_{DS})$

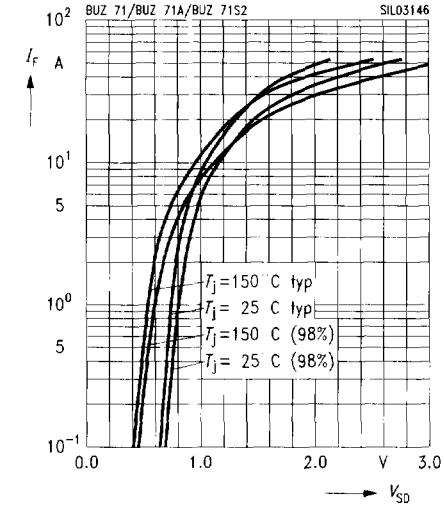
parameter: V_{GS} = 0 V, f = 1 MHz



Forward characteristics of reverse diode

$I_F = f(V_{SD})$

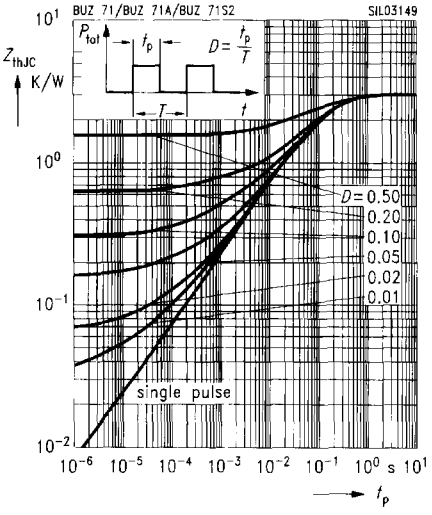
parameter: T_j, t_p = 80 µs, (spread)



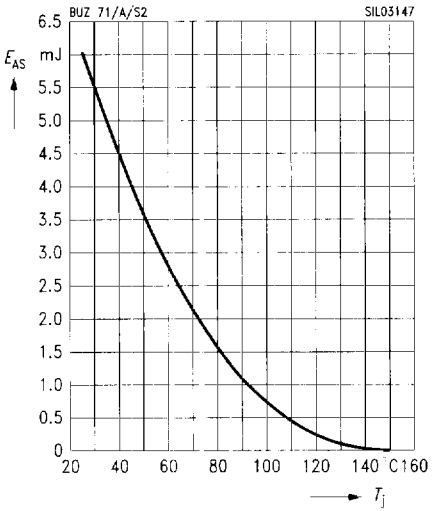
Transient thermal impedance

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

parameter: $D = t_p / T$



Avalanche energy $E_{AS} = f(T_j)$
parameter: I_D = 14 A, V_{DD} = 25 V
R_{GS} = 25 Ω, L = 30.6 µH



Typ. gate charge
$V_{GS} = f(Q_{Gate})$
parameter: $I_{D\,puls}$ = 22.5 A