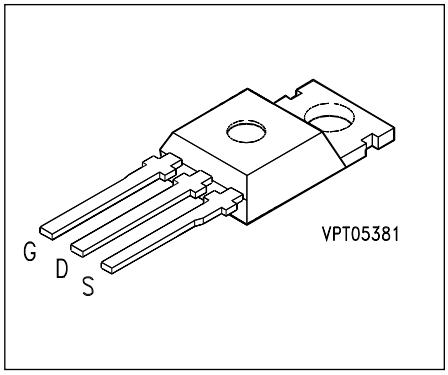
SIEMENS

SIPMOS® Power Transistor — BUZ 271

- P channel
- Enhancement mode
- Avalanche rated



Type	V_{DS}	I_D	$R_{DS\ (on)}$	Package [1]	Ordering Code
BUZ 271	– 50 V	– 22 A	0.15 Ω	TO-220 AB	C67078-S1453-A2

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current, T_C = 26 ˚C	I_D	**– 22**	A
Pulsed drain current, T_C = 25 ˚C	$I_{D\ puls}$	**– 88**	
Avalanche energy, single pulse I_D = – 22 A, V_{DD} = – 25 V, R_{GS} = 25 Ω L = 413 µH, T_j = 25 ˚C	E_{AS}	**200**	mJ
Gate-source voltage	V_{GS}	± **20**	V
Power dissipation, T_C = 25 ˚C	P_{tot}	**125**	W
Operating and storage temperature range	T_j , T_{stg}	**– 55 ... + 150**	˚C

Thermal resistance, chip-case	$R_{th\ JC}$	≤ **1.0**	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	$V_{(BR)\ DSS}$	– 50	–	–	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} = – 50 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 = – 14 A	$R_{DS\ (on)}$	–	0.12	0.15	Ω
Dynamic characteristics					
Forward transconductance V_{DS} ≥ 2 x I_D x $R_{DS(on)max}$, I_D = – 14 A	g_{fs}	1.5	4.0	–	S
Input capacitance V_{GS} = 0 V, V_{DS} = – 25 V, f = 1 MHz	C_{iss}	–	2000	2700	pF
Output capacitance V_{GS} = 0 V, V_{DS} = – 25 V, f = 1 MHz	C_{oss}	–	650	975	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = – 25 V, f = 1 MHz	C_{rss}	–	250	375	
Turn-on time t_{on} , (t_{on} = $t_{d\ (on)}$ + t_r) V_{DD} = – 30 V, V_{GS} = – 10 V, I_D = – 2.95 A, R_{GS} = 50 Ω	$t_{d\ (on)}$	–	30	45	ns
	t_r	–	120	180	
Turn-off time t_{off} , (t_{off} = $t_{d\ (off)}$ + t_f) V_{DD} = – 30 V, V_{GS} = – 10 V, I_D = – 2.95 A, R_{GS} = 50 Ω	$t_{d\ (off)}$	–	130	175	
	t_f	–	140	190	

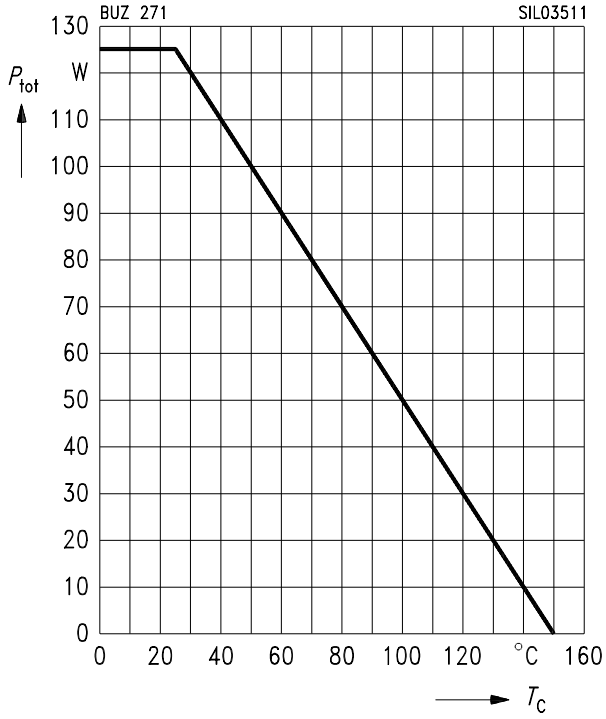
Electrical Characteristics (cont'd)
at T_j = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse diode					
Continuous reverse drain current T_C = 25 °C	I_S	–	–	– 22	A
Pulsed reverse drain current T_C = 25 °C	I_{SM}	–	–	– 88	
Diode forward on-voltage I_S = – 44 A, V_{GS} = 0 V	V_{SD}	–	– 1.25	– 1.7	V
Reverse recovery time V_R = – 30 V, $I_F = I_S$, di_F/dt = – 100 A/µs	t_{rr}	–	90	–	ns
Reverse recovery charge V_R = – 30 V, $I_F = I_S$, di_F/dt = – 100 A/µs	Q_{rr}	–	0.23	–	µC

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

Total power dissipation

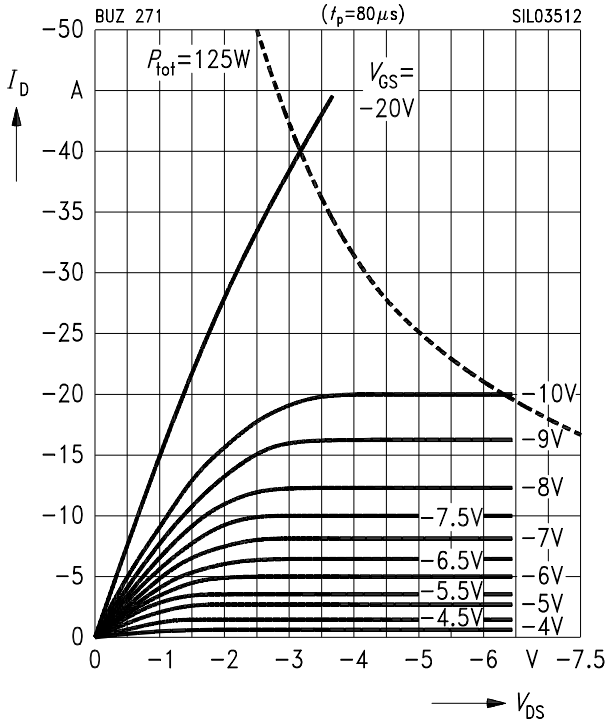
$P_{tot} = f(T_C)$



Typ. output characteristics

$I_D = f(V_{DS})$

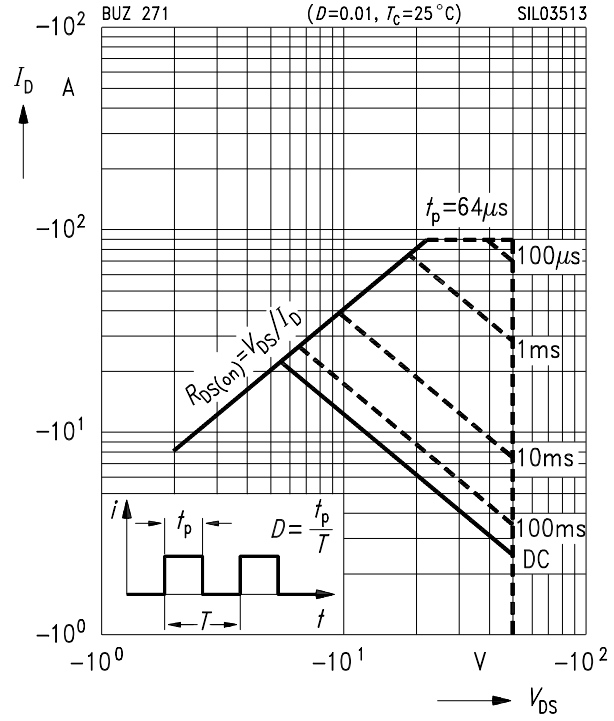
parameter: t_p = 80 µs



Safe operating area

$I_D = f(V_{DS})$

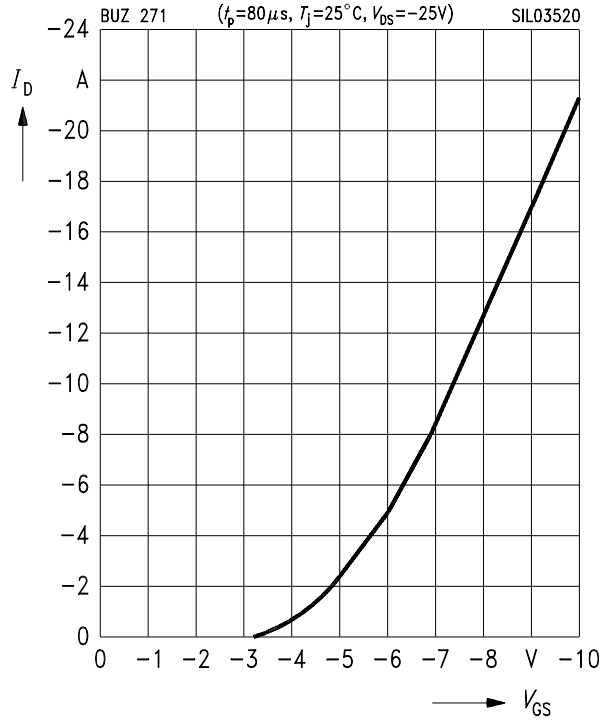
parameter: D = 0.01, T_C = 25 ˚C



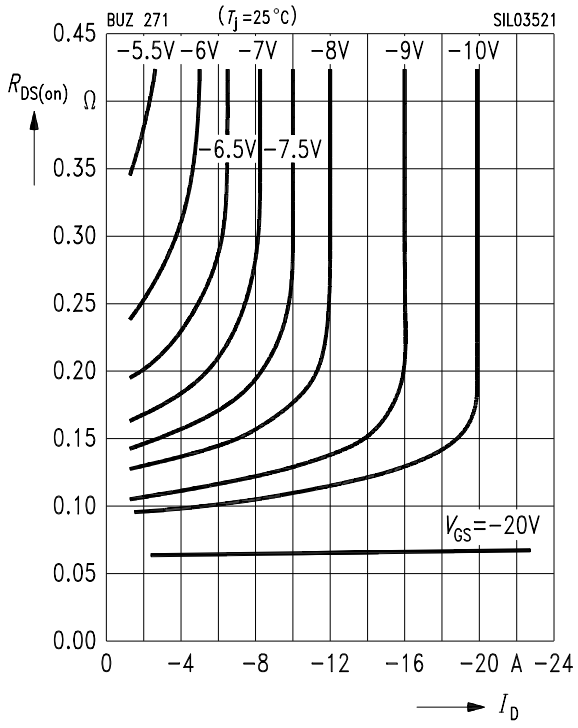
Typ. transfer characteristics

$I_D = f(V_{GS})$

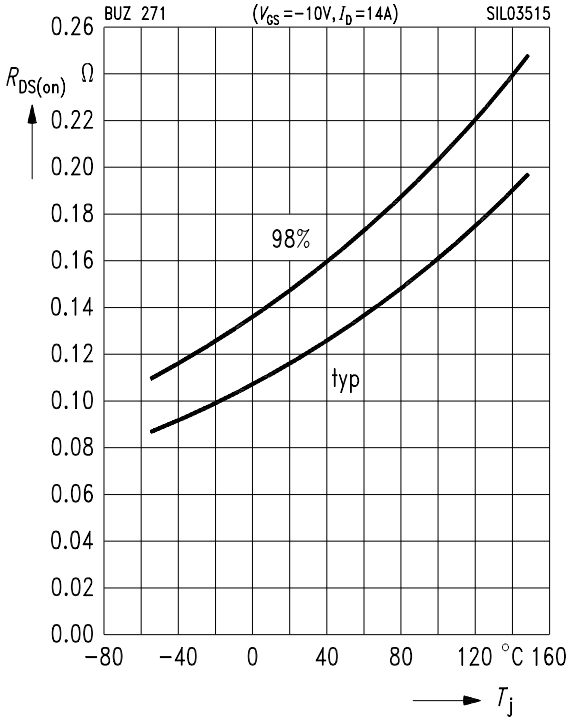
parameter: t_p = 80 µs, V_{DS} = – 25 V



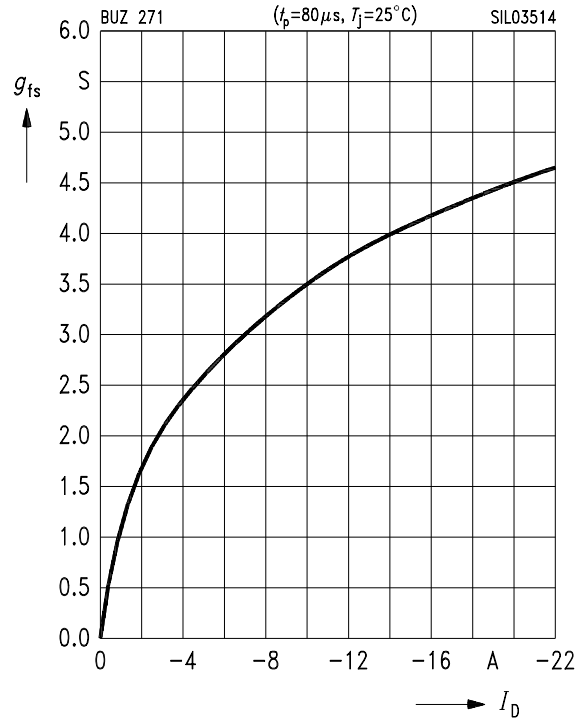
Typ. drain-source on-resistance
$R_{DS\,(on)} = f\,(I_D)$
parameter: V_{GS}



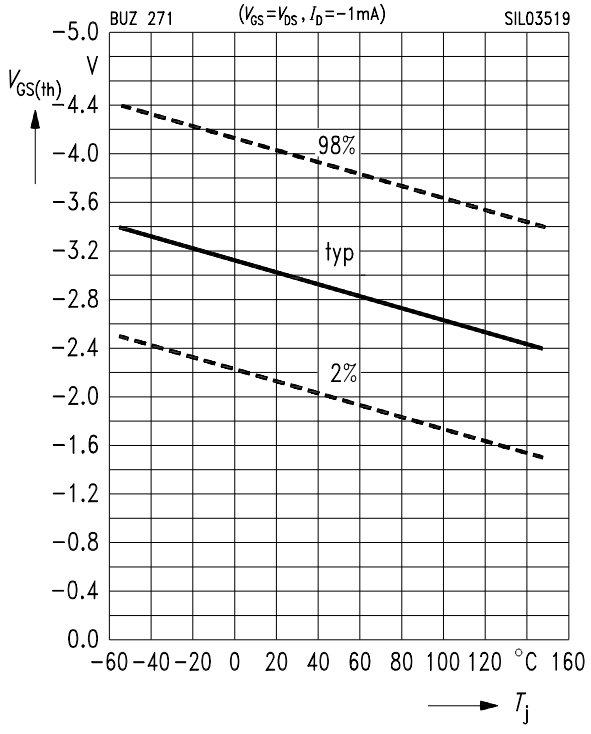
Drain-source on-resistance
$R_{DS\,(on)} = f\,(T_j)$
parameter: I_D = 14 A, V_{GS} = – 10 V, (spread)



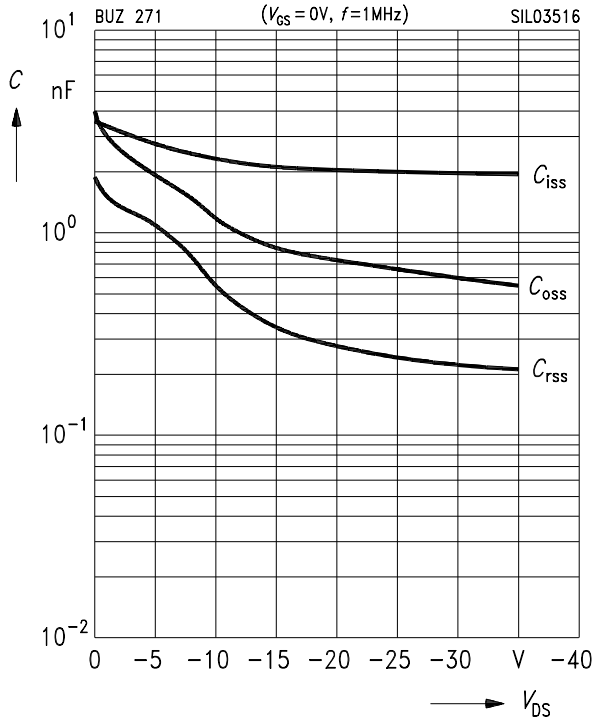
Typ. forward transconductance
$g_{fs} = f\,(I_D)$
parameter: t_p = 80 µs



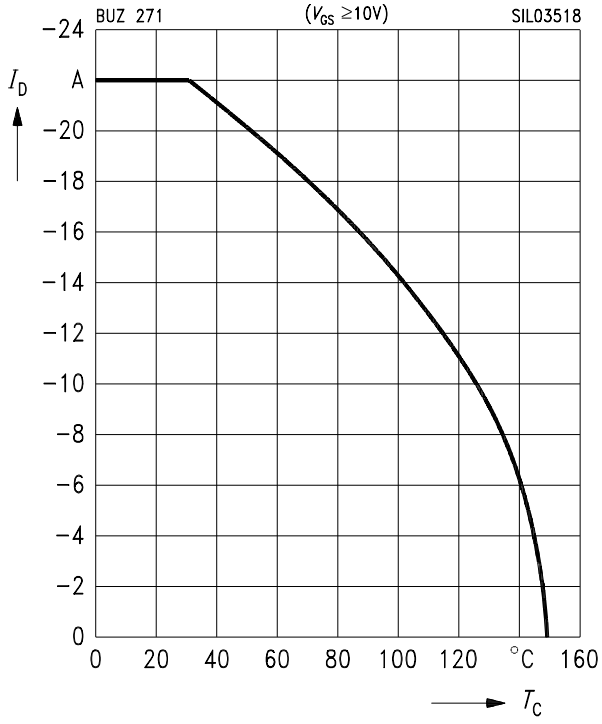
Gate threshold voltage
$V_{GS\,(th)} = f\,(T_j)$
parameter: $V_{GS} = V_{DS}$, I_D = – 1 mA, (spread)



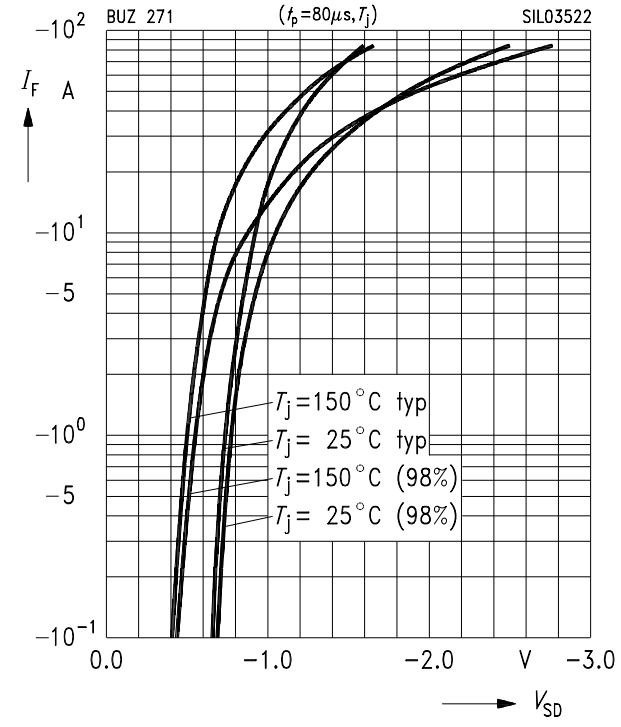
Typ. capacitances
$C = f(V_{DS})$
parameter: V_{GS} = 0 V, f = 1 MHz



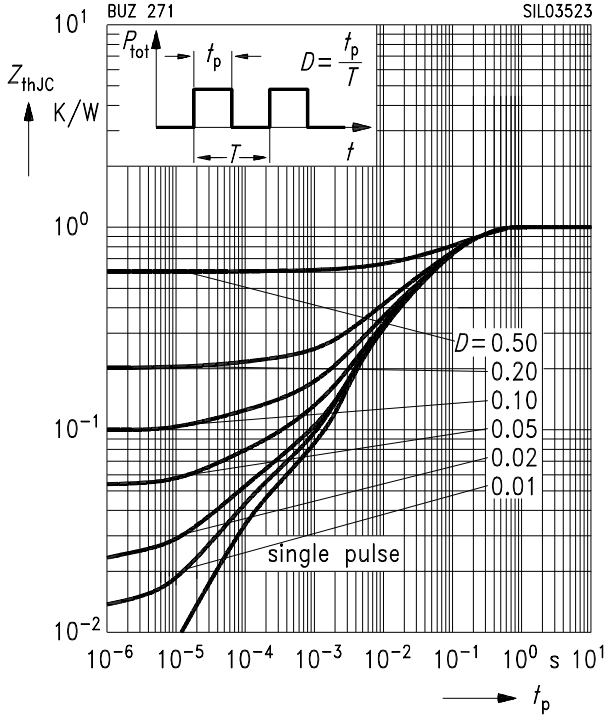
Drain current
$I_D = f(T_C)$
parameter: $V_{GS} \geq 10$ V



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



Transient thermal impedance
$Z_{th\,JC} = f(t_p)$
parameter: $D = t_p / T$



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