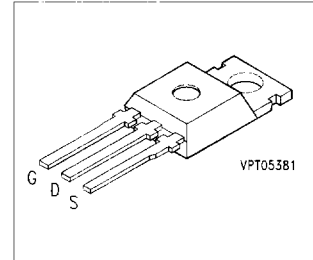


## SIPMOS® Power Transistor

## BUZ 271

- P channel
- Enhancement mode
- Avalanche rated



Type	$V_{DS}$	$I_D$	$R_{DS(on)}$	Package <sup>1)</sup>	Ordering Code
<b>BUZ 271</b>	- 50 V	- 22 A	0.15 $\Omega$	TO-220 AB	C67078-S1453-A2

### Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current, $T_C = 26\text{ }^\circ\text{C}$	$I_D$	- 22	A
Pulsed drain current, $T_C = 25\text{ }^\circ\text{C}$	$I_{D\text{ puls}}$	- 88	
Avalanche energy, single pulse $I_D = -22\text{ A}$ , $V_{DD} = -25\text{ V}$ , $R_{GS} = 25\text{ }\Omega$ $L = 413\text{ }\mu\text{H}$ , $T_J = 25\text{ }^\circ\text{C}$	$E_{AS}$	200	mJ
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Power dissipation, $T_C = 25\text{ }^\circ\text{C}$	$P_{tot}$	125	W
Operating and storage temperature range	$T_J, T_{stg}$	- 55 ... + 150	$^\circ\text{C}$
Thermal resistance, chip-case	$R_{th\text{ JC}}$	$\leq 1.0$	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  $T_j = 25\text{ }^\circ\text{C}$ , 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
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 $V_{DS} = -50\text{ V}$ , $V_{GS} = 0\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ $T_j = 125\text{ }^\circ\text{C}$	$I_{DSS}$	-	- 0.1 - 10	- 1.0 - 100	$\mu\text{A}$
Gate-source leakage current $V_{GS} = -20\text{ V}$ , $V_{DS} = 0\text{ V}$	$I_{GSS}$	-	- 10	- 100	nA
Drain-source on-resistance $V_{GS} = -10\text{ V}$ , $I_D = -14\text{ A}$	$R_{DS(on)}$	-	0.12	0.15	$\Omega$

**Dynamic characteristics**

Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$ , $I_D = -14\text{ A}$	$g_{fs}$	1.5	4.0	-	S
Input capacitance $V_{GS} = 0\text{ V}$ , $V_{DS} = -25\text{ V}$ , $f = 1\text{ MHz}$	$C_{iss}$	-	2000	2700	pF
Output capacitance $V_{GS} = 0\text{ V}$ , $V_{DS} = -25\text{ V}$ , $f = 1\text{ MHz}$	$C_{oss}$	-	650	975	
Reverse transfer capacitance $V_{GS} = 0\text{ V}$ , $V_{DS} = -25\text{ V}$ , $f = 1\text{ MHz}$	$C_{rss}$	-	250	375	
Turn-on time $t_{on}$ , ( $t_{on} = t_{d(on)} + t_r$ ) $V_{DD} = -30\text{ V}$ , $V_{GS} = -10\text{ V}$ , $I_D = -2.95\text{ A}$ , $R_{GS} = 50\text{ }\Omega$	$t_{d(on)}$	-	30	45	ns
	$t_r$	-	120	180	
Turn-off time $t_{off}$ , ( $t_{off} = t_{d(off)} + t_f$ ) $V_{DD} = -30\text{ V}$ , $V_{GS} = -10\text{ V}$ , $I_D = -2.95\text{ A}$ , $R_{GS} = 50\text{ }\Omega$	$t_{d(off)}$	-	130	175	
	$t_f$	-	140	190	

### Electrical Characteristics (cont'd)

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

#### Reverse diode

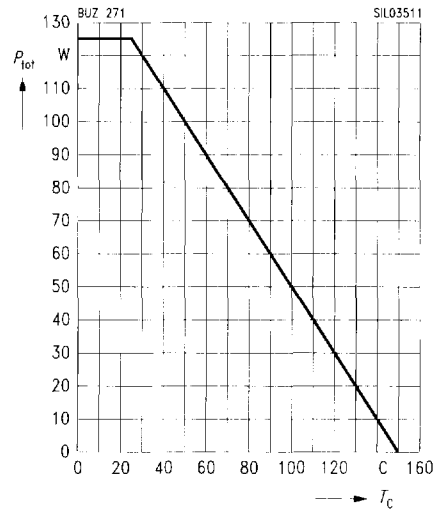
Continuous reverse drain current $T_C = 25\text{ }^\circ\text{C}$	$I_S$	–	–	– 22	A
Pulsed reverse drain current $T_C = 25\text{ }^\circ\text{C}$	$I_{SM}$	–	–	– 88	
Diode forward on-voltage $I_S = -44\text{ A}$ , $V_{GS} = 0\text{ V}$	$V_{SD}$	–	– 1.25	– 1.7	V
Reverse recovery time $V_R = -30\text{ V}$ , $I_F = I_S$ , $di_F / dt = -100\text{ A}/\mu\text{s}$	$t_{rr}$	–	90	–	ns
Reverse recovery charge $V_R = -30\text{ V}$ , $I_F = I_S$ , $di_F / dt = -100\text{ A}/\mu\text{s}$	$Q_{rr}$	–	0.23	–	$\mu\text{C}$



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

**Total power dissipation**

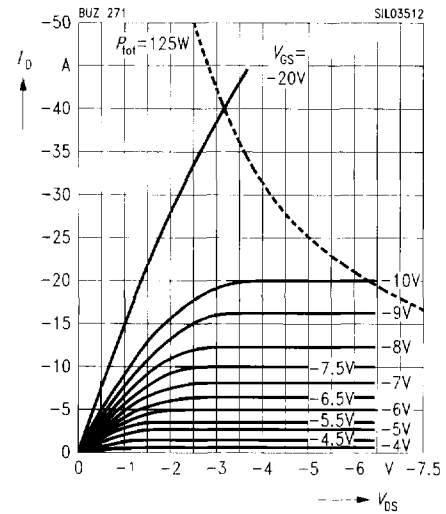
$P_{\text{tot}} = f(T_C)$



**Typ. output characteristics**

$I_D = f(V_{DS})$

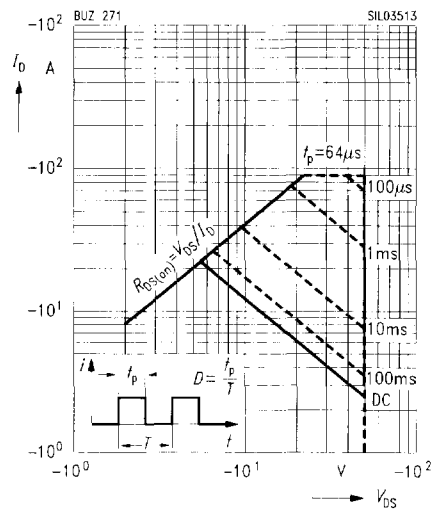
parameter:  $t_p = 80 \mu\text{s}$



**Safe operating area**

$I_D = f(V_{DS})$

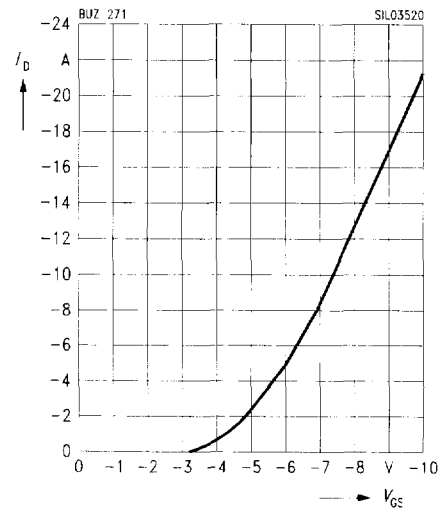
parameter:  $D = 0.01$ ,  $T_C = 25^\circ\text{C}$



**Typ. transfer characteristics**

$I_D = f(V_{GS})$

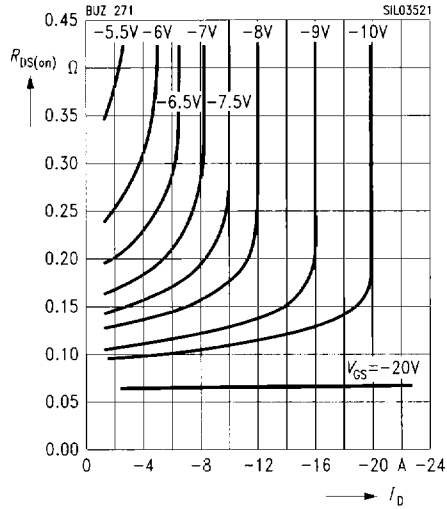
parameter:  $t_p = 80 \mu\text{s}$ ,  $V_{DS} = -25 \text{ V}$



**Typ. drain-source on-resistance**

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

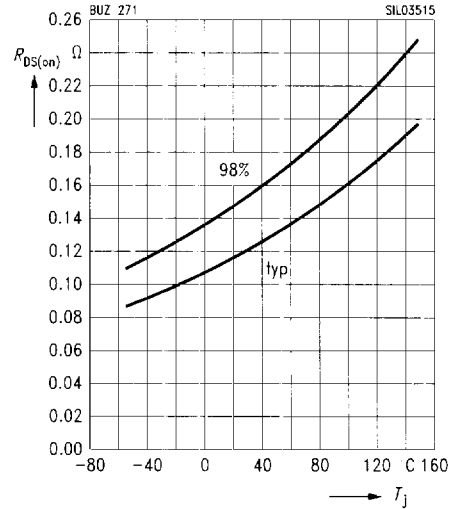
parameter:  $V_{GS}$



**Drain-source on-resistance**

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

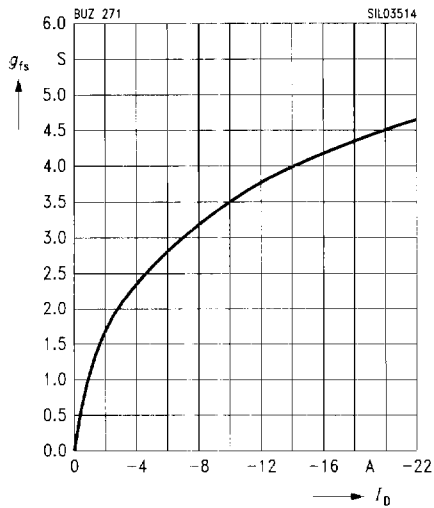
parameter:  $I_D = 14 A, V_{GS} = -10 V$ , (spread)



**Typ. forward transconductance**

$g_{fs} = f(I_D)$

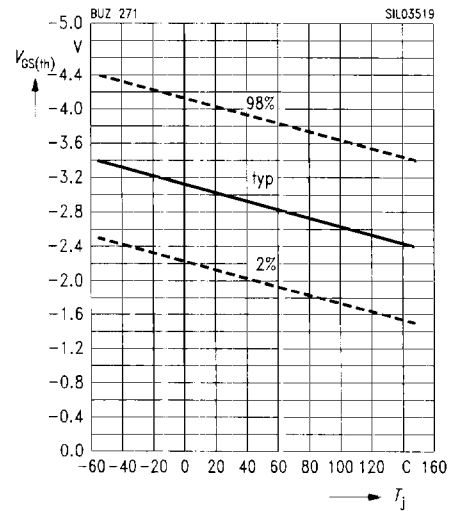
parameter:  $t_p = 80 \mu s$



**Gate threshold voltage**

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

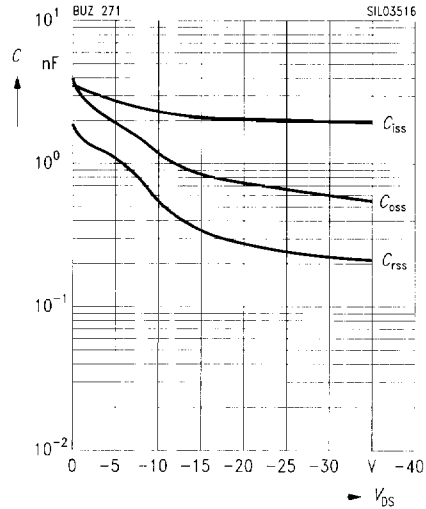
parameter:  $V_{GS} = V_{DS}, I_D = -1 mA$ , (spread)



**Typ. capacitances**

$C = f(V_{DS})$

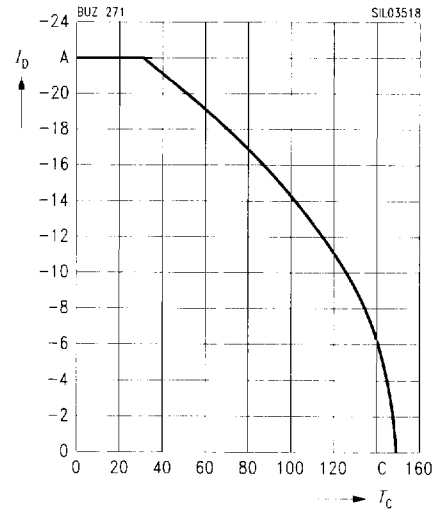
parameter:  $V_{GS} = 0 \text{ V}$ ,  $f = 1 \text{ MHz}$



**Drain current**

$I_D = f(T_C)$

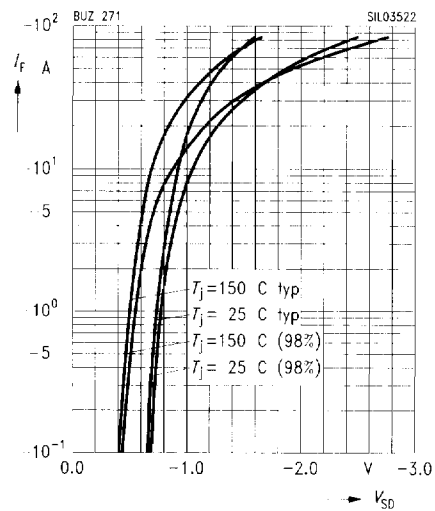
parameter:  $V_{GS} \geq 10 \text{ V}$



**Forward characteristics of reverse diode**

$I_F = f(V_{SD})$

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



**Transient thermal impedance**

$Z_{thJC} = f(t_p)$

parameter:  $D = t_p / T$

