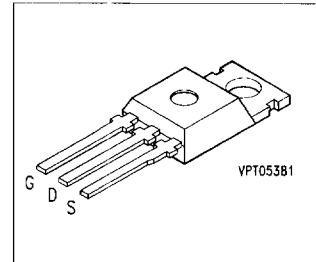


SIPMOS® Power Transistor

BUZ 172

- P channel
- Enhancement mode
- Avalanche rated



Type	V_{DS}	I_D	$R_{DS(on)}$	Package ¹⁾	Ordering Code
BUZ 172	- 100 V	- 5.5 A	0.6 Ω	TO-220 AB	C67078-A1451-A2

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current, $T_C = 37\text{ °C}$	I_D	- 5.5	A
Pulsed drain current, $T_C = 25\text{ °C}$	$I_{D\text{ puls}}$	- 22.0	
Avalanche energy, single pulse $V_{DD} = -25\text{ V}$, $R_{GS} = 25\text{ }\Omega$, $T_j = 25\text{ °C}$ $I_D = -5.5\text{ A}$, $L = 8.4\text{ mH}$	E_{AS}	170	mJ
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	$R_{th\text{ JC}}$	≤ 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 $V_{GS} = 0\text{ V}, I_D = -0.25\text{ mA}$	$V_{(BR)DSS}$	-100	-	-	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 $V_{DS} = -100\text{ V}, V_{GS} = 0\text{ V}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	I_{DSS}	-	-20 -100	-250 -1000	μA
Gate-source leakage current $V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-10	-100	nA
Drain-source on-resistance $V_{GS} = -10\text{ V}, I_D = -3.7\text{ A}$	$R_{DS(on)}$	-	0.4	0.6	Ω

Dynamic characteristics

Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}, I_D = -3.7\text{ A}$	g_{fs}	1.0	2.0	-	S
Input capacitance $V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$	C_{iss}	-	800	1200	pF
Output capacitance $V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$	C_{oss}	-	220	330	
Reverse transfer capacitance $V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$	C_{rss}	-	90	140	
Turn-on time $t_{on}, (t_{on} = t_{d(on)} + t_r)$ $V_{DD} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -2.8\text{ A},$ $R_{GS} = 50\ \Omega$	$t_{d(on)}$	-	20	30	ns
	t_r	-	60	95	
Turn-off time $t_{off}, (t_{off} = t_{d(off)} + t_f)$ $V_{DD} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -2.8\text{ A},$ $R_{GS} = 50\ \Omega$	$t_{d(off)}$	-	70	90	
	t_f	-	55	75	

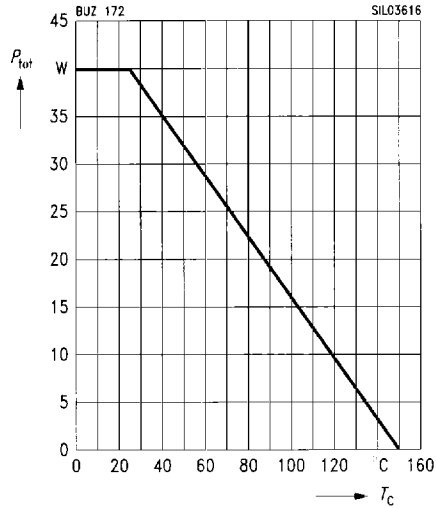
Electrical Characteristics (cont'd)at $T_j = 25\text{ °C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse diode					
Continuous reverse drain current $T_C = 25\text{ °C}$	I_S	–	–	– 5.5	A
Pulsed reverse drain current $T_C = 25\text{ °C}$	I_{SM}	–	–	– 22.0	
Diode forward on-voltage $I_S = -11\text{ A}$, $V_{GS} = 0\text{ V}$	V_{SD}	–	– 1.0	– 1.3	V
Reverse recovery time $V_R = -30\text{ V}$, $I_F = I_S$, $di_F / dt = -100\text{ A}/\mu\text{s}$	t_{rr}	–	200	–	ns
Reverse recovery charge $V_R = -30\text{ V}$, $I_F = I_S$, $di_F / dt = -100\text{ A}/\mu\text{s}$	Q_{rr}	–	0.75	–	μC

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

Total power dissipation

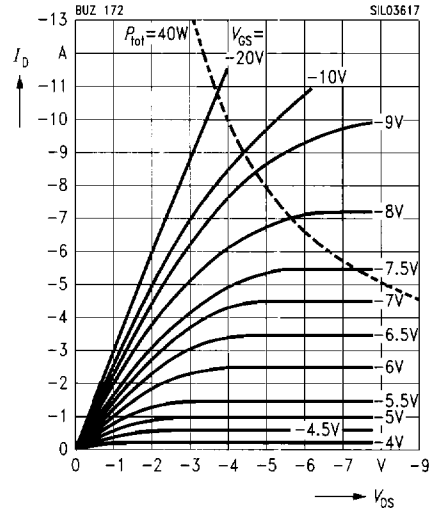
$P_{\text{tot}} = f(T_C)$



Typ. output characteristics

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

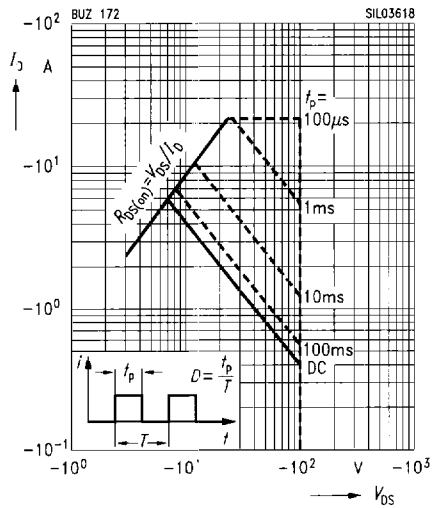
parameter: $t_p = 80\text{ }\mu\text{s}$



Safe operating area

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

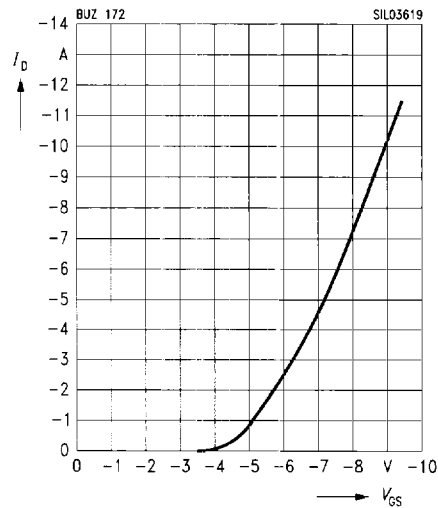
parameter: $D = 0.01$, $T_C = 25\text{ }^\circ\text{C}$



Typ. transfer characteristics

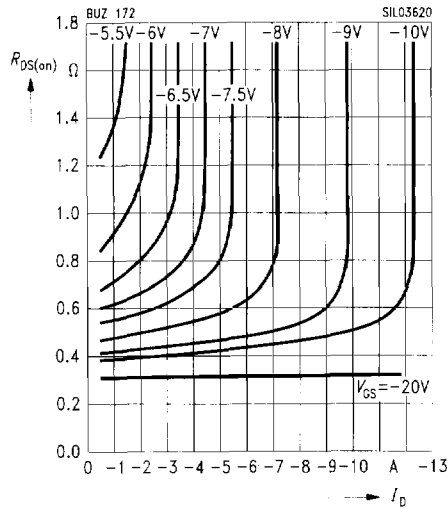
$I_D = f(V_{\text{GS}})$

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



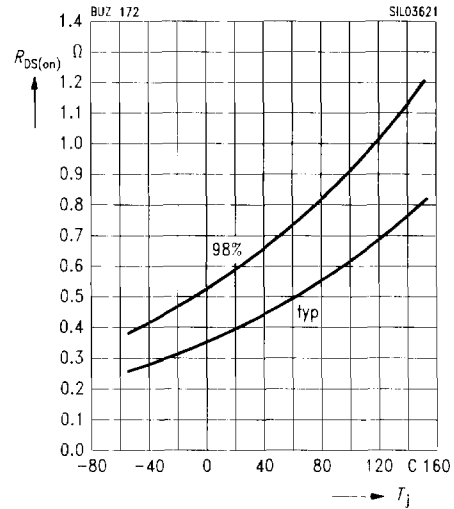
Typ. drain-source on-resistance

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



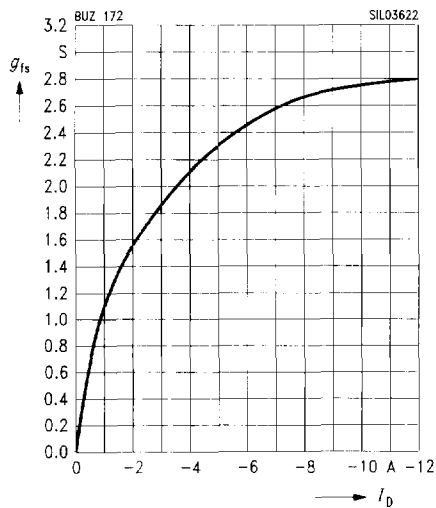
Drain-source on-resistance

$R_{DS(on)} = f(T_j)$
parameter: $I_D = -3.7 A, V_{GS} = -10 V$, (spread)



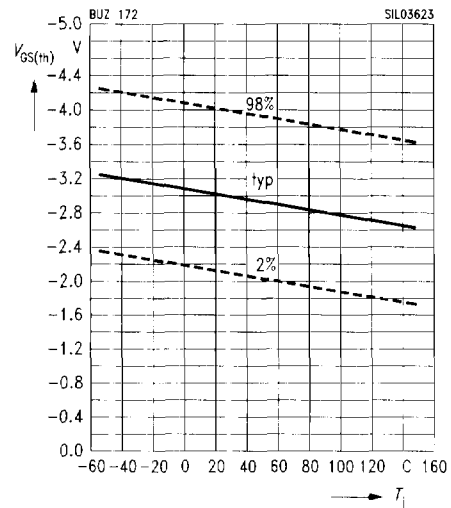
Typ. forward transconductance

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



Gate threshold voltage

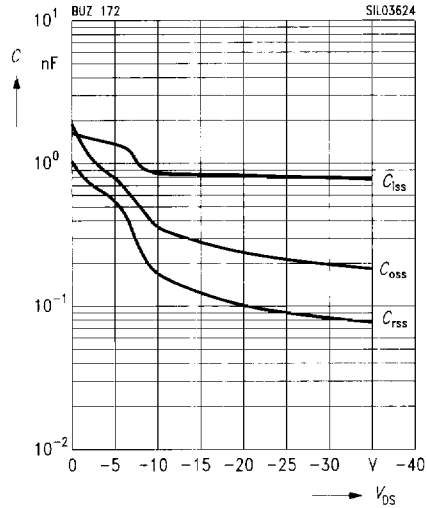
$V_{GS(th)} = f(T_j)$
parameter: $V_{GS} = V_{DS}, I_D = -1 mA$, (spread)



Typ. capacitances

$C = f(V_{DS})$

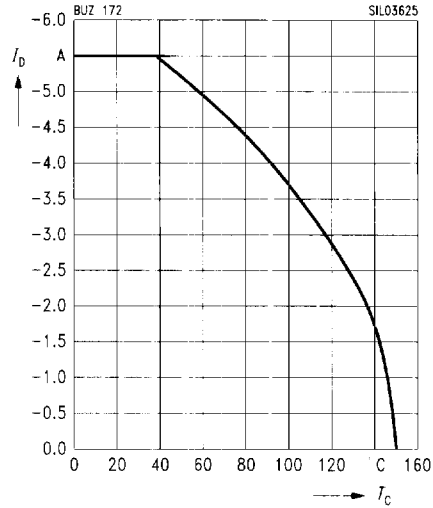
parameter: $V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$



Drain current

$I_D = f(T_C)$

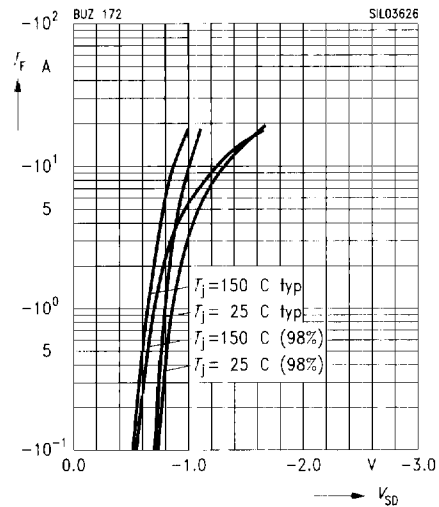
parameter: $V_{GS} \geq -10 \text{ V}$



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: $D = t_p / T$

