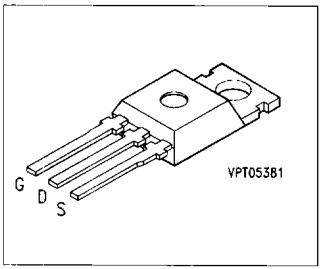
SIEMENS

SIPMOS® Power Transistor — BUZ 173

- P channel
- Enhancement mode
- Avalanche rated



Type	V_{DS}	I_D	$R_{DS\,(on)}$	Package [1]	Ordering Code
BUZ 173	– 200 V	– 3.6 A	1.5 Ω	TO-220 AB	C67078-A1452-A2

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current, T_C = 30 °C	I_D	**– 3.6**	A
Pulsed drain current, T_C = 25 °C	$I_{D\,puls}$	**– 14.0**	
Avalanche energy, single pulse V_{DD} = – 50 V, R_{GS} = 25 Ω, T_j = 25 °C I_D = – 3.6 A, L = 23 mH	E_{AS}	**200**	mJ
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_{GS} = 0 V, I_D = – 0.25 mA	$V_{(BR)\ DSS}$	– 200	–	–	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} = – 200 V, V_{GS} = 0 V T_j = 25 °C T_j = 125 °C	I_{DSS}	 – –	 – 20 – 100	 – 250 – 1000	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 = – 2.3 A	$R_{DS\ (on)}$	–	1.2	1.5	Ω
Dynamic characteristics					
Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, I_D = – 2.3 A	g_{fs}	1.1	2.2	–	S
Input capacitance V_{GS} = 0 V, V_{DS} = – 25 V, f = 1 MHz	C_{iss}	–	750	1150	pF
Output capacitance V_{GS} = 0 V, V_{DS} = – 25 V, f = 1 MHz	C_{oss}	–	125	190	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = – 25 V, f = 1 MHz	C_{rss}	–	40	60	
Turn-on time t_{on} , ($t_{on} = t_{d\ (on)} + t_r$) V_{DD} = – 30 V, V_{GS} = – 10 V, I_D = – 2.6 A, R_{GS} = 50 Ω	$t_{d\ (on)}$ t_r	– –	20 60	30 95	ns
Turn-off time t_{off} , ($t_{off} = t_{d\ (off)} + t_f$) V_{DD} = – 30 V, V_{GS} = – 10 V, I_D = – 2.6 A, R_{GS} = 50 Ω	$t_{d\ (off)}$ t_f	– –	70 55	90 75	

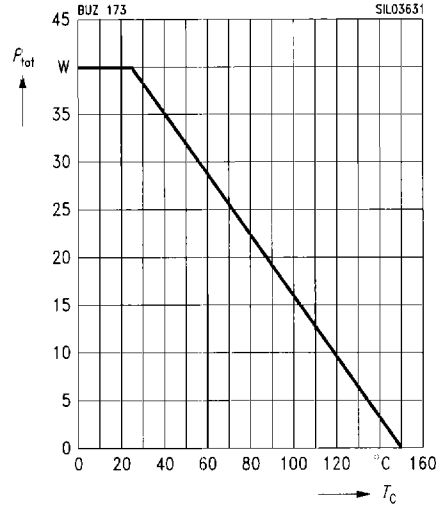
Electrical Characteristics (cont'd)
at T_j = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse diode					
Continuous reverse drain current T_C = 25 °C	I_S	–	–	– 3.6	A
Pulsed reverse drain current T_C = 25 °C	I_{SM}	–	–	– 14.0	
Diode forward on-voltage I_S = – 7.2 A, V_{GS} = 0 V	V_{SD}	–	– 1.0	– 1.3	V
Reverse recovery time V_R = – 30 V, $I_F = I_S$, di_F / dt = – 100 A/µs	t_{rr}	–	200	–	ns
Reverse recovery charge V_R = – 30 V, $I_F = I_S$, di_F / dt = – 100 A/µs	Q_{rr}	–	0.75	–	µC

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

Total power dissipation

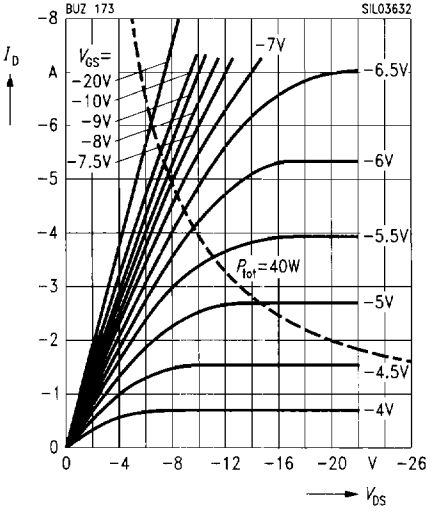
$P_{tot} = f(T_C)$



Typ. output characteristics

$I_D = f(V_{DS})$

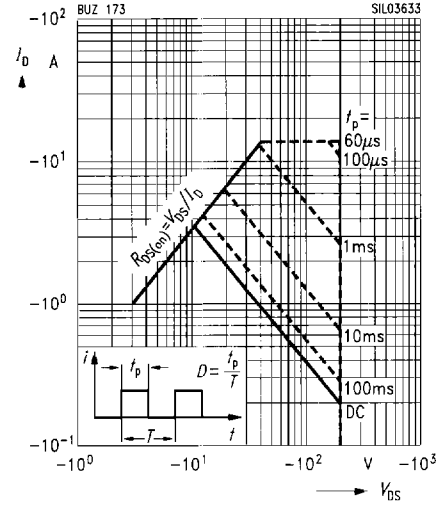
parameter: t_p = 80 µs



Safe operating area

$I_D = f(V_{DS})$

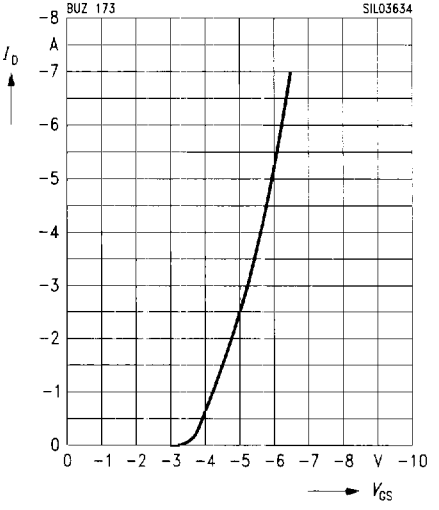
parameter: D = 0.01, T_C = 25 °C



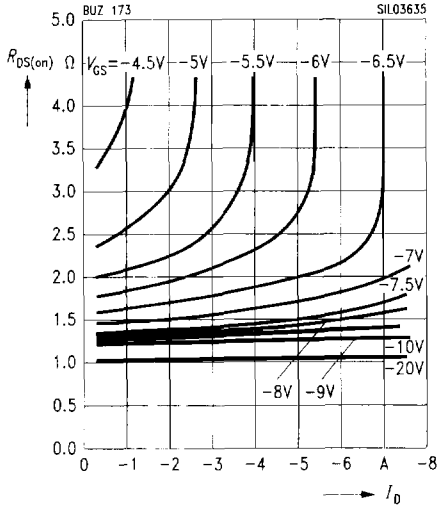
Typ. transfer characteristics

$I_D = f(V_{GS})$

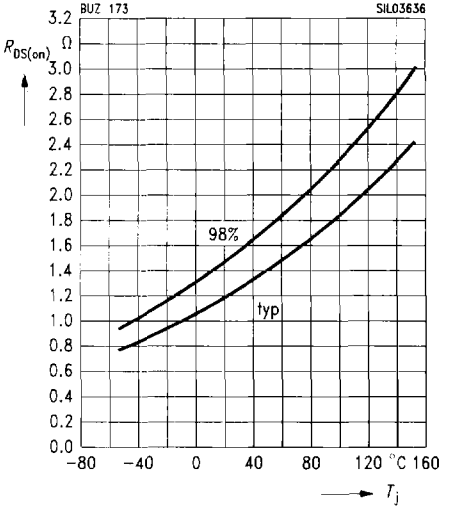
parameter: t_p = 80 µs, V_{DS} = – 25 V



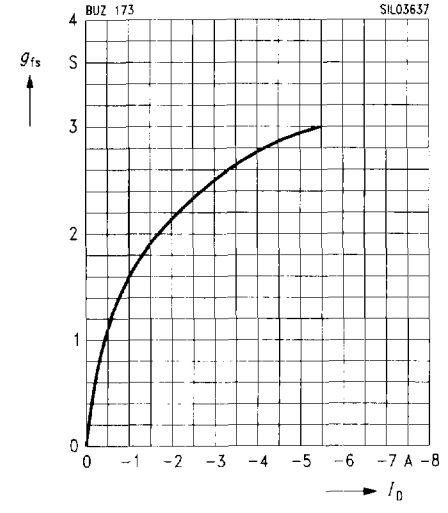
Typ. drain-source on-resistance
$R_{DS\,(on)} = f(I_D)$
parameter: V_{GS}



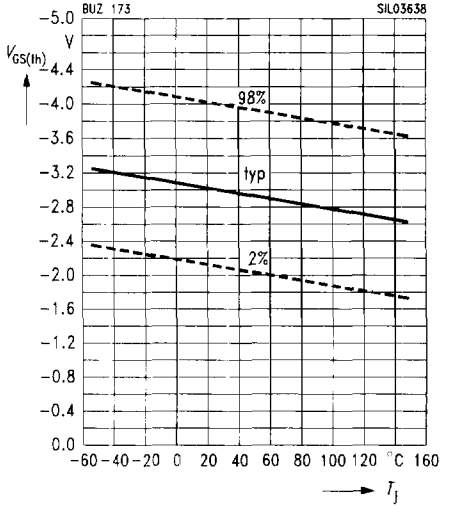
Drain-source on-resistance
$R_{DS\,(on)} = f(T_j)$
parameter: $I_D = -2.3$ A, $V_{GS} = -10$ V, (spread)



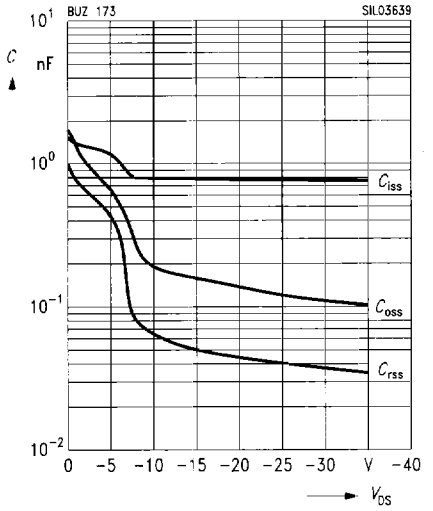
Typ. forward transconductance
$g_{fs} = f(I_D)$
parameter: t_p = 80 µs



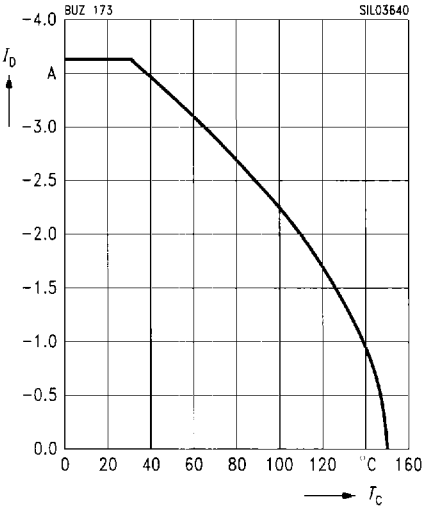
Gate threshold voltage
$V_{GS\,(th)} = f(T_j)$
parameter: $V_{GS} = V_{DS}$, $I_D = -1$ mA, (spread)



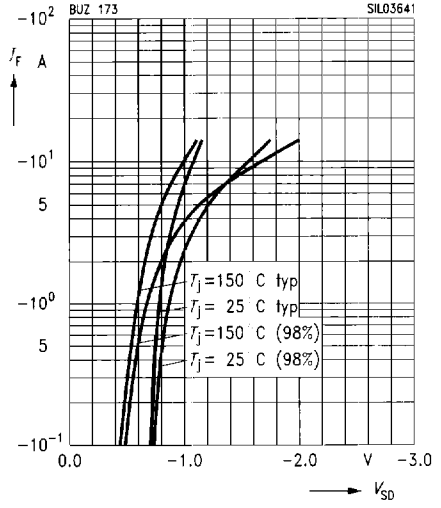
Typ. capacitances
$C = f(V_{DS})$
parameter: V_{GS} = 0 V, f = 1 MHz



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: $D = t_p / T$