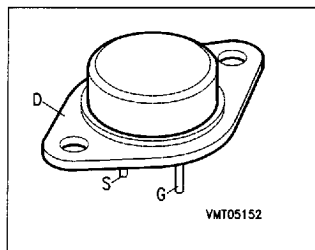


SIPMOS® Power Transistor

BUZ 36

- N channel
- Enhancement mode
- Avalanche-rated



Type	V_{DS}	I_D	$R_{DS(on)}$	Package ¹⁾	Ordering Code
BUZ 36	200 V	22 A	0.12 Ω	TO-204 AE	C67078-S1018-A2

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current, $T_C = 33\text{ }^\circ\text{C}$	I_D	22	A
Pulsed drain current, $T_C = 25\text{ }^\circ\text{C}$	$I_{D\text{ puls}}$	88	
Avalanche current, limited by $T_{j\text{ max}}$	I_{AR}	22.0	
Avalanche energy, periodic limited by $T_{j\text{ (max)}}$	E_{AR}	13	mJ
Avalanche energy, single pulse $I_D = 22\text{ A}$, $V_{DD} = 50\text{ V}$, $R_{GS} = 25\text{ }\Omega$ $L = 1.77\text{ mH}$, $T_j = 25\text{ }^\circ\text{C}$	E_{AS}	570	
Gate-source voltage	V_{GS}	± 20	V
Power dissipation, $T_C = 25\text{ }^\circ\text{C}$	P_{tot}	125	W
Operating and storage temperature range	T_j, T_{stg}	$- 55 \dots + 150$	$^\circ\text{C}$
Thermal resistance, chip-case	$R_{th\text{ JC}}$	≤ 1.0	K/W
DIN humidity category, DIN 40 040		C	—
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 $V_{GS} = 0\text{ V}, I_D = 0.25\text{ mA}$	$V_{(BR)DSS}$	200	—	—	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 $V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}$ $T_j = 25\text{ }^{\circ}\text{C}$ $T_j = 125\text{ }^{\circ}\text{C}$	I_{DSS}	— —	0.1 10	1.0 100	μA
Gate-source leakage current $V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	—	10	100	
Drain-source on-resistance $V_{GS} = 10\text{ V}, I_D = 14\text{ A}$	$R_{DS(on)}$	—	0.09	0.12	Ω

Dynamic characteristics

Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}, I_D = 14\text{ A}$	g_{fs}	9.0	15	—	S
Input capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	C_{iss}	—	1400	1900	pF
Output capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	C_{oss}	—	280	400	
Reverse transfer capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	C_{rss}	—	130	200	
Turn-on time $t_{on}, (t_{on} = t_{d(on)} + t_r)$ $V_{DD} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 3\text{ A}, R_{GS} = 50\text{ }\Omega$	$t_{d(on)}$	—	30	45	ns
	t_r	—	70	110	
Turn-off time $t_{off}, (t_{off} = t_{d(off)} + t_t)$ $V_{DD} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 3\text{ A}, R_{GS} = 50\text{ }\Omega$	$t_{d(off)}$	—	250	320	
	t_t	—	90	120	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

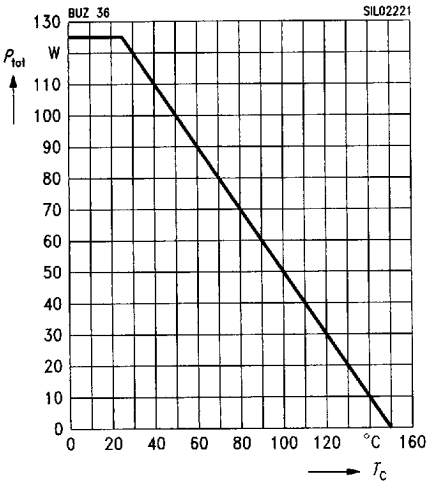
Reverse diode

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}	—	1.2	1.7	V
Reverse recovery time $V_R = 100\text{ V}$, $I_F = I_S$, $di_F / dt = 100\text{ A}/\mu\text{s}$	t_{rr}	—	180	—	ns
Reverse recovery charge $V_R = 100\text{ V}$, $I_F = I_S$, $di_F / dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	—	1.2	—	μC

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

Total power dissipation

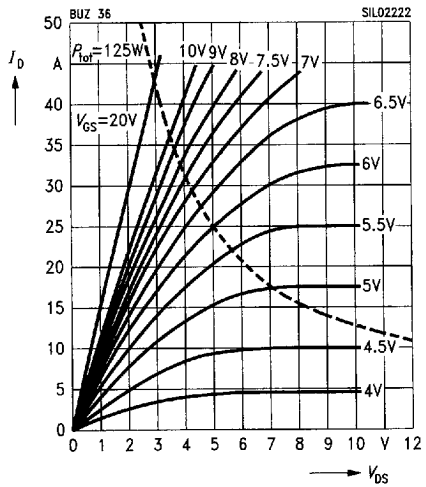
$P_{\text{tot}} = f(T_C)$



Typ. output characteristics

$I_D = f(V_{DS})$

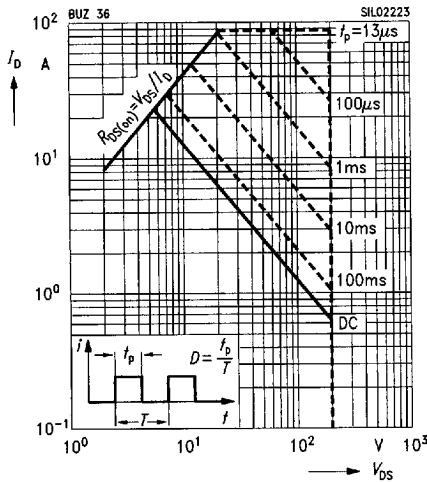
parameter: $t_p = 80\text{ }\mu\text{s}$



Safe operating area

$I_D = f(V_{DS})$

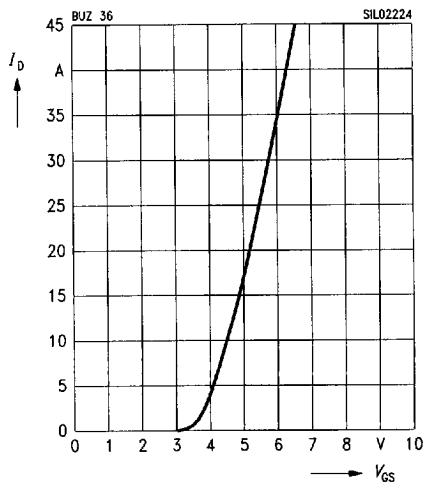
parameter: $D = 0.01$, $T_C = 25\text{ }^{\circ}\text{C}$



Typ. transfer characteristics

$I_D = f(V_{GS})$

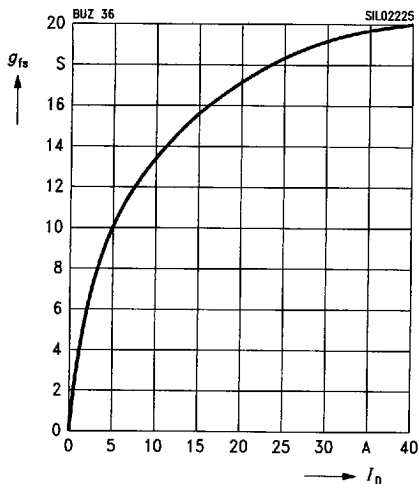
parameter: $t_p = 80\text{ }\mu\text{s}$, $V_{DS} = 25\text{ V}$



Typ. forward transconductance

$$g_{fs} = f(I_D)$$

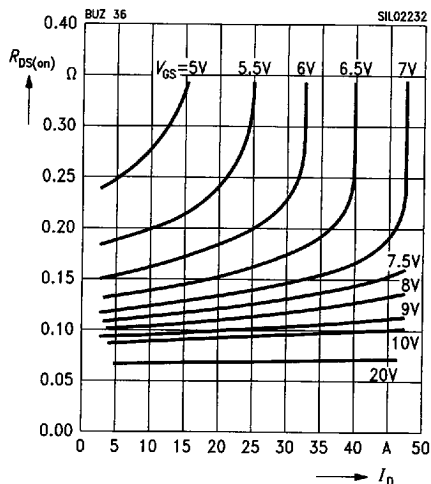
parameter: $t_p = 80 \mu s$



Typ. drain-source on-resistance

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

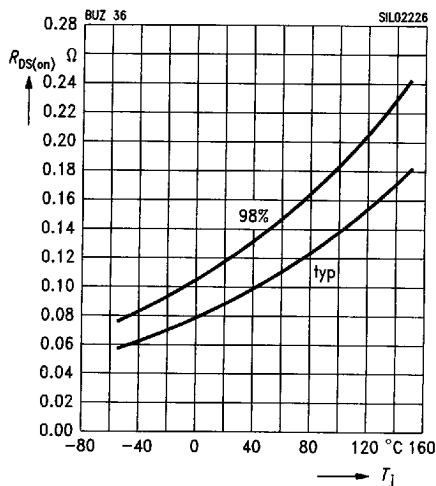
parameter: V_{GS}



Drain-source on-resistance

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

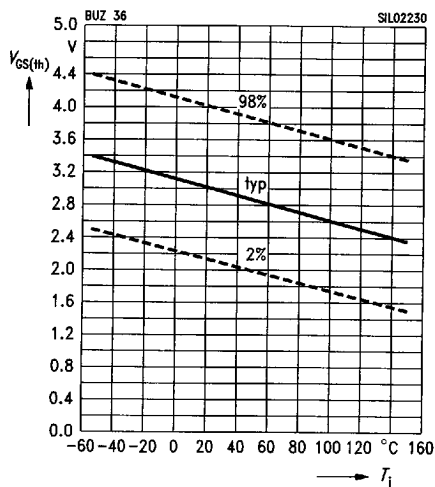
parameter: $I_D = 14 A$, $V_{GS} = 10 V$, (spread)



Gate threshold voltage

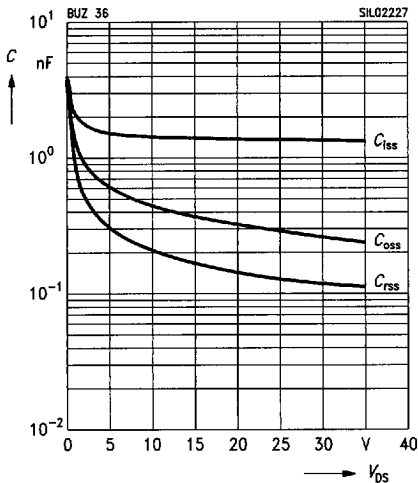
$$V_{GS(th)} = f(T_j)$$

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



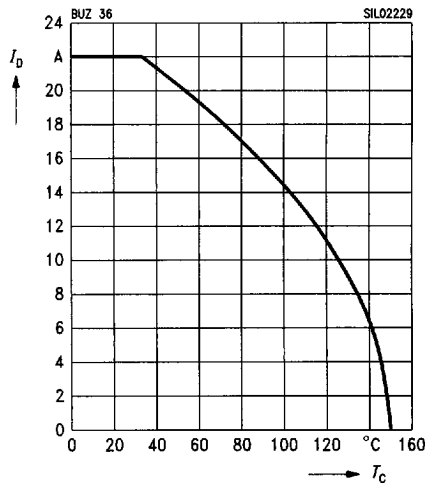
Typ. capacitances

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



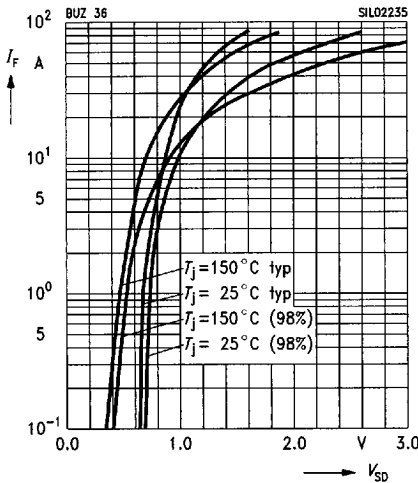
Drain current

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



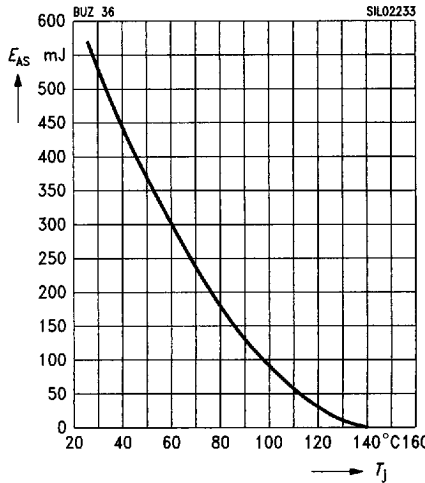
Forward characteristics of reverse diode

$I_F = f(V_{SD})$
parameter: $T_j, t_p = 80\text{ }\mu\text{s}$, (spread)



Avalanche energy $E_{AS} = f(T_j)$

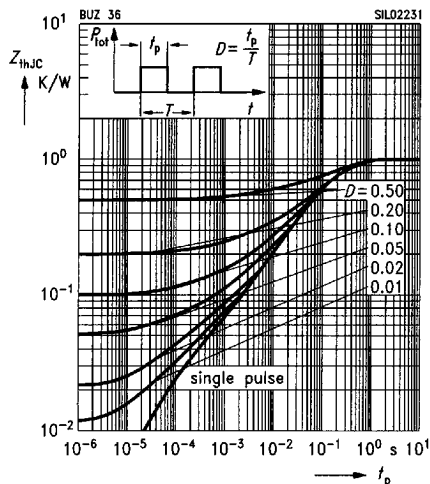
parameter: $I_D = 22\text{ A}, V_{DD} = 50\text{ V}$
 $R_{GS} = 25\text{ }\Omega, L = 1.77\text{ mH}$



Transient thermal impedance

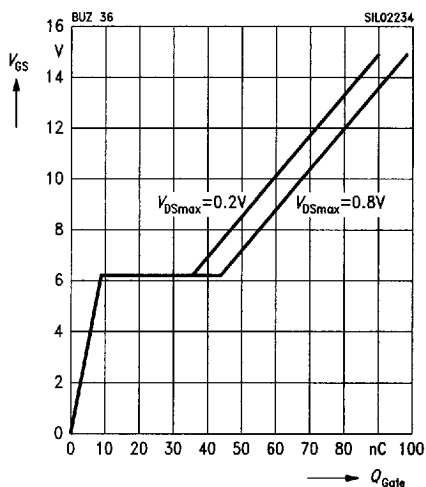
$$Z_{thJC} = f(t_p)$$

parameter: $D = t_p / T$

**Typ. gate charge**

$$V_{GS} = f(Q_{Gate})$$

parameter: $I_{D\ puls} = 33.0\ A$



8235605 0067835 86T