SIEMENS

SIPMOS® Power Transistor

BUZ 32

- N channel
- Enhancement mode
- Avalanche-rated

VPT05381

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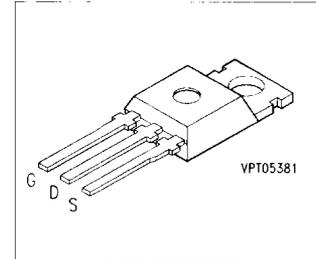
Type	V_{DS}	I_D	$R_{DS(on)}$	Package [1]	Ordering Code
BUZ 32	200 V	9.5 A	0.4 Ω	TO-220 AB	C67078-S1310-A2

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current, $T_C = 29\ °C$	I_D	9.5	A
Pulsed drain current, $T_C = 25\ °C$	$I_{D\,puls}$	38	
Avalanche current, limited by $T_{j\,max}$	I_{AR}	9.5	
Avalanche energy, periodic limited by $T_{j(max)}$	E_{AR}	6.5	mJ
Avalanche energy, single pulse $I_D = 9.5\ A, V_{DD} = 50\ V, R_{GS} = 25\ \Omega$ $L = 2.0\ mH, T_j = 25\ °C$	E_{AS}	120	
Gate-source voltage	V_{GS}	± 20	V
Power dissipation, $T_C = 25\ °C$	P_{tot}	75	W
Operating and storage temperature range	T_j , T_{stg}	– 55 ... + 150	°C

Thermal resistance, chip-case	$R_{th\,JC}$	≤ 1.67	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 $T_j = 25\ ^\circ$C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static characteristics

Parameter	Symbol	min.	typ.	max.	Unit
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	I_{DSS}				µA
$T_j = \quad 25\ ^\circ$C		–	0.1	1.0	
$T_j = \ 125\ ^\circ$C		–	10	100	
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, $I_D = 6.0$ A	$R_{DS(on)}$	–	0.3	0.4	Ω

Dynamic characteristics

Parameter	Symbol	min.	typ.	max.	Unit
Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, $I_D = 6.0$ A	g_{fs}	3.0	4.6	–	S
Input capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{iss}	–	400	530	pF
Output capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{oss}	–	85	130	
Reverse transfer capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{rss}	–	45	70	
Turn-on time t_{on}, ($t_{on} = t_{d(on)} + t_r$) $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 3.0$ A, $R_{GS} = 50\ \Omega$	$t_{d(on)}$	–	10	15	ns
	t_r	–	40	60	
Turn-off time t_{off}, ($t_{off} = t_{d(off)} + t_f$) $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 3.0$ A, $R_{GS} = 50\ \Omega$	$t_{d(off)}$	–	55	75	
	t_f	–	30	40	

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Electrical Characteristics (cont'd)

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

Parameter	Symbol	min.	typ.	max.	Unit
		Values			

Reverse diode

Parameter	Symbol	min.	typ.	max.	Unit
Continuous reverse drain current $T_C = 25\ ^\circ C$	I_S	–	–	9.5	A
Pulsed reverse drain current $T_C = 25\ ^\circ C$	I_{SM}	–	–	38	
Diode forward on-voltage $I_S = 19$ A, $V_{GS} = 0$ V	V_{SD}	–	1.4	1.7	V
Reverse recovery time $V_R = 100$ V, $I_F = I_S$, $di_F / dt = 100$ A/μs	t_{rr}	–	200	–	ns
Reverse recovery charge $V_R = 100$ V, $I_F = I_S$, $di_F / dt = 100$ A/μs	Q_{rr}	–	0.60	–	μC

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

Total power dissipation

$P_{tot} = f(T_C)$
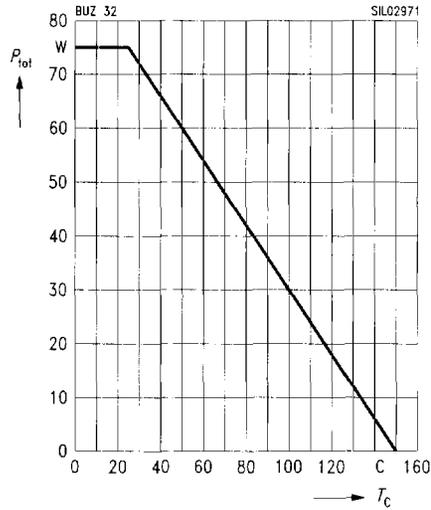
Typ. output characteristics

$I_D = f(V_{DS})$

parameter: $t_p = 80$ µs
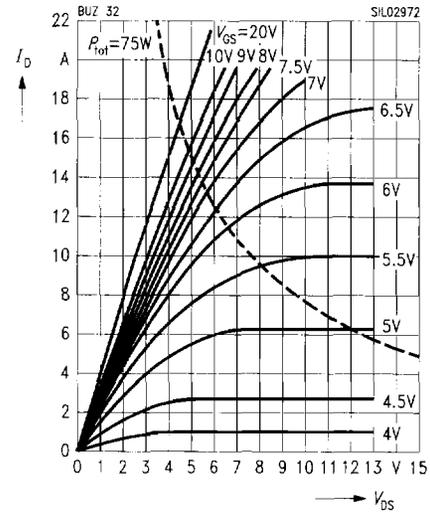
Safe operating area

$I_D = f(V_{DS})$

parameter: $D = 0.01$, $T_C = 25$ °C
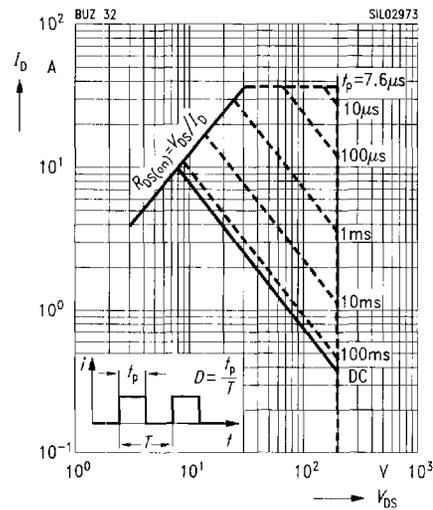
Typ. transfer characteristics

$I_D = f(V_{GS})$

parameter: $t_p = 80$ µs, $V_{DS} = 25$ V
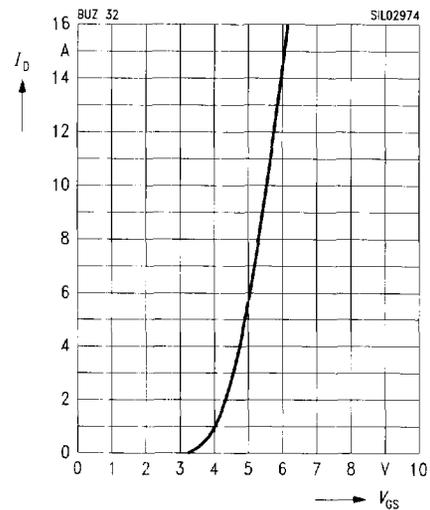
Typ. drain-source on-resistance

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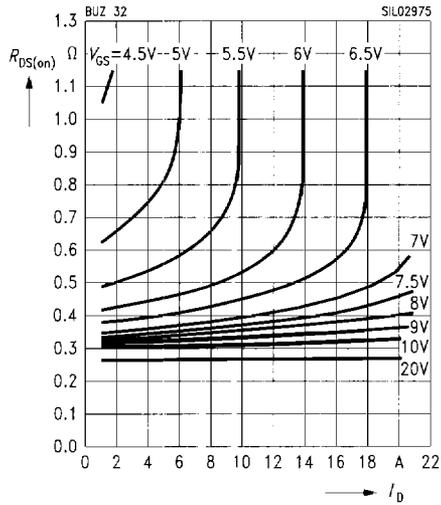
Drain-source on-resistance

$R_{DS\,(on)} = f(T_j)$
parameter: $I_D = 6.0$ A, $V_{GS} = 10$ V, (spread)
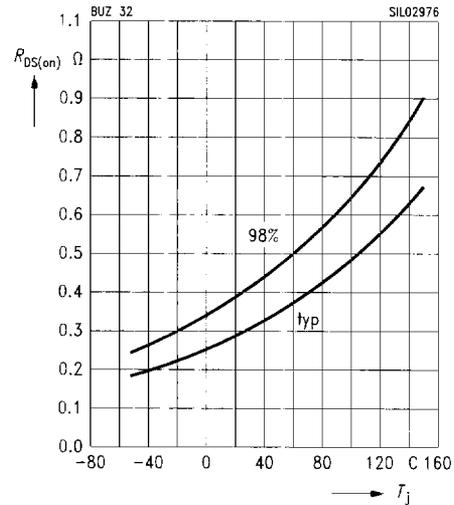

Typ. forward transconductance

$g_{fs} = f(I_D)$
parameter: $t_p = 80$ µs
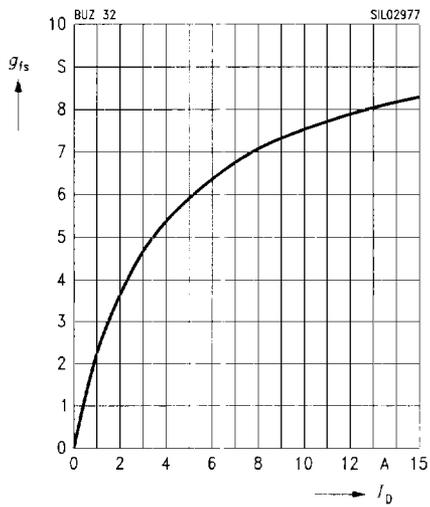
## Gate threshold voltage

$V_{GS\,(th)} = f(T_j)$
parameter: $V_{GS} = V_{DS}$, $I_D = 1$ mA, (spread)
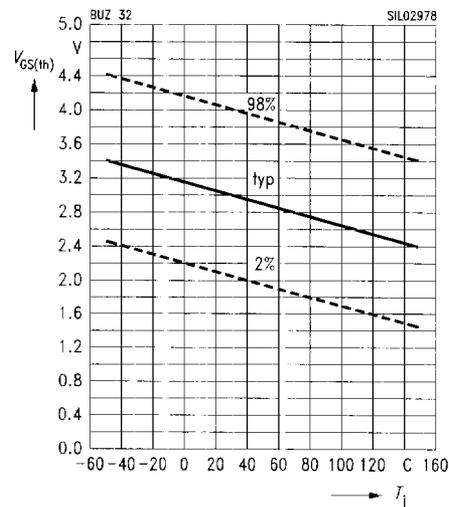
Typ. capacitances

$C = f(V_{DS})$

parameter: $V_{GS} = 0$ V, $f = 1$ MHz
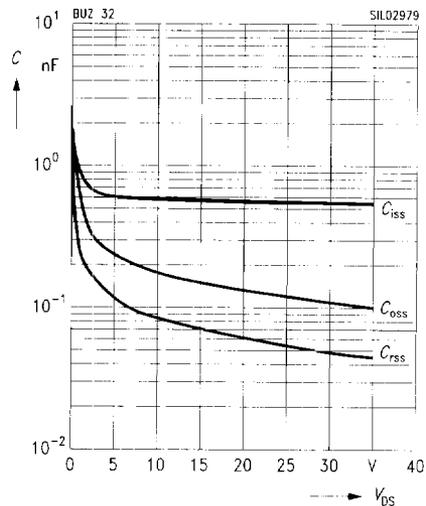
Drain current

$I_D = f(T_C)$

parameter: $V_{GS} \geq 10$ V
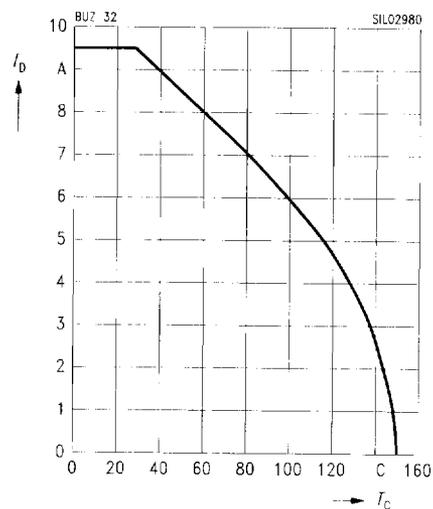
**Forward characteristics of reverse diode**

$I_F = f(V_{SD})$

parameter: T_1, $t_p = 80$ μs, (spread)

Curve labels:
$T_j = 150$ C typ
$T_j = 25$ C typ
$T_j = 150$ C (98%)
$T_j = 25$ C (98%)
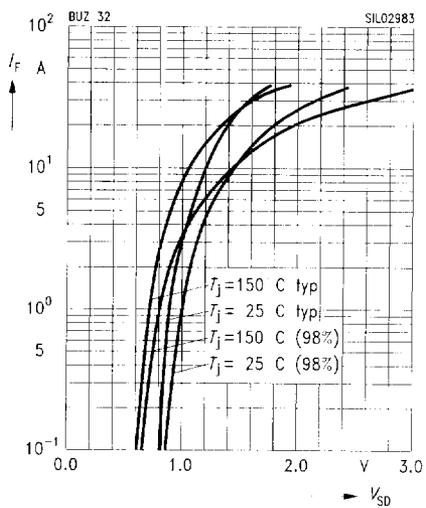
Avalanche energy $E_{AS} = f(T_j)$

parameter: $I_D = 9.5$ A, $V_{DD} = 50$ V

$R_{GS} = 25$ Ω, $L = 2.0$ mH
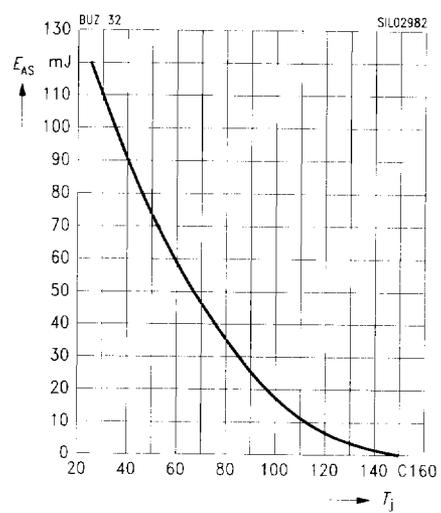
Transient thermal impedance

$Z_{th\,JC} = f(t_p)$

parameter: $D = t_p / T$
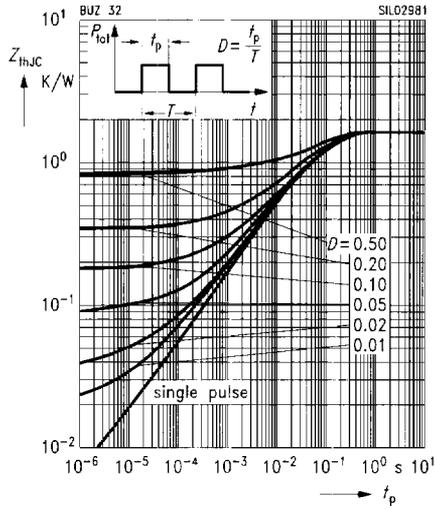
Typ. gate charge

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

parameter: $I_{D\,puls} = 13.5$ A