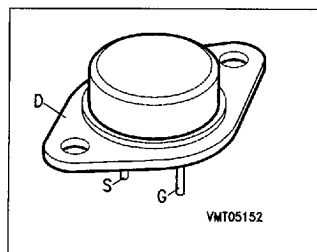


SIPMOS® Power Transistors

- N channel
- Enhancement mode
- Avalanche-rated

BUZ 16
BUZ 16 S2



Type	V_{DS}	I_D	$R_{DS(on)}$	Package ¹⁾	Ordering Code
BUZ 16	50 V	48 A	0.018 Ω	TO-204 AE	C67078-S1020-A2
BUZ 16 S2	60 V	48 A	0.018 Ω	TO-204 AE	C67078-S1020-A3

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current, $T_C = 79^\circ\text{C}$	I_D	48	A
Pulsed drain current, $T_C = 25^\circ\text{C}$	$I_{D\text{ puls}}$	192	
Avalanche current, limited by $T_{j\text{ max}}$	I_{AR}	48	
Avalanche energy, periodic limited by $T_{j\text{ (max)}}$	E_{AR}	4.5	mJ
Avalanche energy, single pulse $V_{DD} = 25\text{ V}$, $R_{GS} = 25\ \Omega$, $T_j = 25^\circ\text{C}$ $I_D = 48\text{ A}$, $L = 31.3\ \mu\text{H}$	E_{AS}	72	
Gate-source voltage	V_{GS}	± 20	V
Power dissipation, $T_C = 25^\circ\text{C}$	P_{tot}	125	W
Operating and storage temperature range	T_j, T_{stg}	- 55 ... + 150	$^\circ\text{C}$
Thermal resistance, chip-case	R_{thJC}	≤ 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 $V_{GS} = 0\text{ V}$, $I_D = 0.25\text{ mA}$ BUZ 16 BUZ 16 S2	$V_{(BR)\text{ DSS}}$	50 60	— —	— —	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 $V_{GS} = 0\text{ V}$, $V_{DS} = 50\text{ V}$ BUZ 16 $V_{GS} = 0\text{ V}$, $V_{DS} = 60\text{ V}$ BUZ 16 S2 $T_j = 25\text{ }^{\circ}\text{C}$ $T_j = 125\text{ }^{\circ}\text{C}$	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	nA
Drain-source on-resistance $V_{GS} = 10\text{ V}$, $I_D = 40\text{ A}$	$R_{DS(on)}$	—	0.012	0.018	Ω

Dynamic characteristics

Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$ $I_D = 40\text{ A}$	g_{fs}	30	40	—	S
Input capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{iss}	—	2900	4300	pF
Output capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{oss}	—	1400	2100	
Reverse transfer capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{rss}	—	500	750	
Turn-on time t_{on} , ($t_{on} = t_{d(on)} + t_r$) $V_{DD} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 3\text{ A}$, $R_{GS} = 50\text{ }\Omega$	$t_{d(on)}$	—	55	80	ns
	t_r	—	140	210	
Turn-off time t_{off} , ($t_{off} = t_{d(off)} + t_f$) $V_{DD} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 3\text{ A}$, $R_{GS} = 50\text{ }\Omega$	$t_{d(off)}$	—	420	560	
	t_f	—	250	330	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

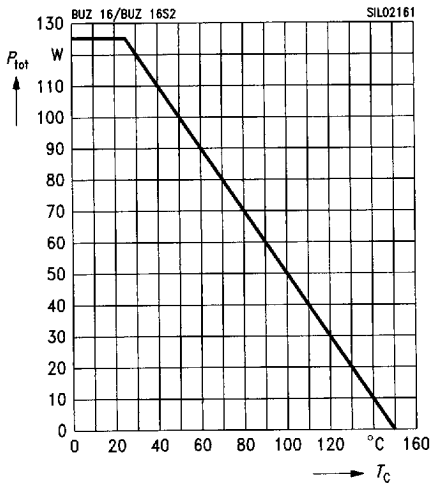
Reverse diode

Continuous reverse drain current $T_C = 25\text{ }^{\circ}\text{C}$	I_S	—	—	48	A
Pulsed reverse drain current $T_C = 25\text{ }^{\circ}\text{C}$	I_{SM}	—	—	192	
Diode forward on-voltage $I_S = 96\text{ A}$, $V_{GS} = 0\text{ V}$	V_{SD}	—	1.6	2.0	V
Reverse recovery time $V_R = 30\text{ V}$, $I_F = I_S$, $di_F / dt = 100\text{ A}/\mu\text{s}$	t_{rr}	—	100	—	ns
Reverse recovery charge $V_R = 30\text{ V}$, $I_F = I_S$, $di_F / dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	—	0.3	—	μC

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

Total power dissipation

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

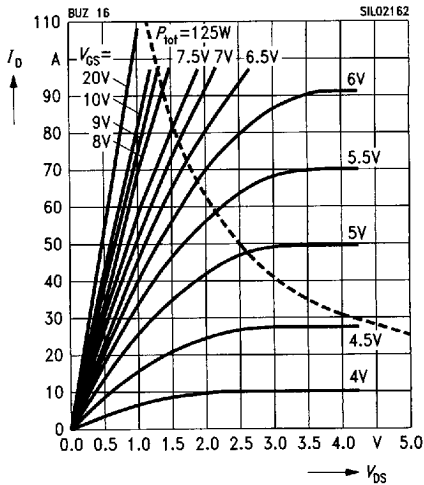


Typ. output characteristics

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

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

BUZ 16

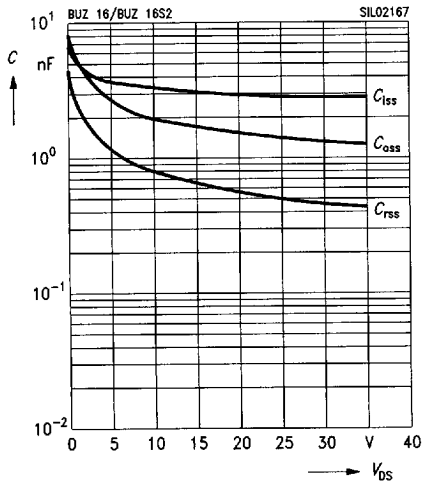


Typ. output characteristics

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

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

BUZ 16 S2

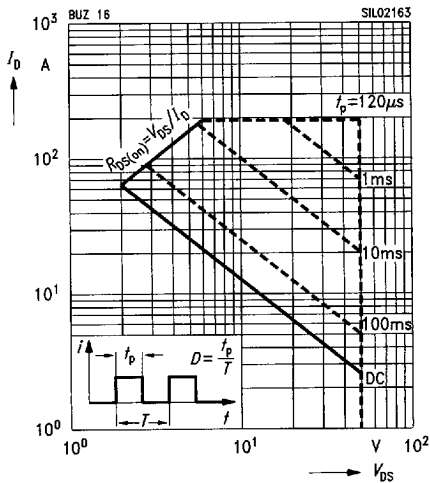


Safe operating area

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

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

BUZ 16

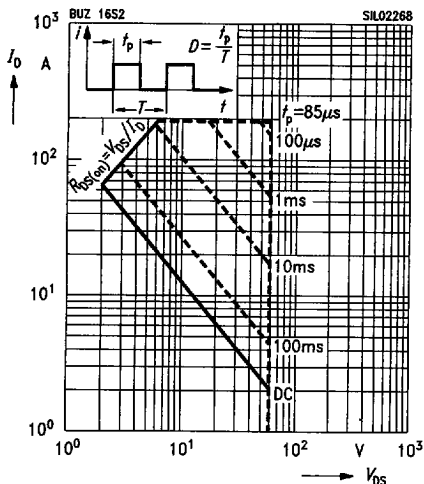


Safe operating area

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

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

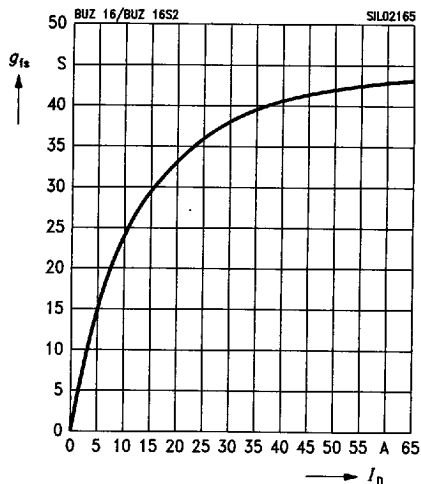
BUZ 16 S2



Typ. forward transconductance

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

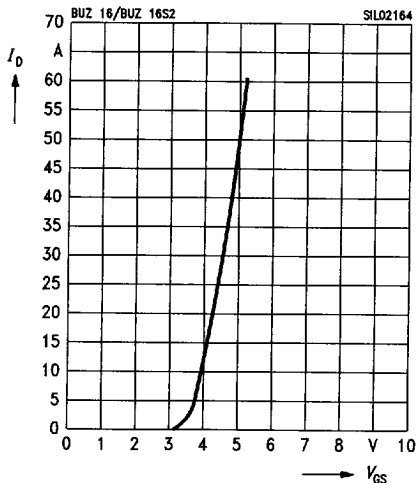
parameter: $t_p = 80 \mu\text{s}$



Typ. transfer characteristics

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

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

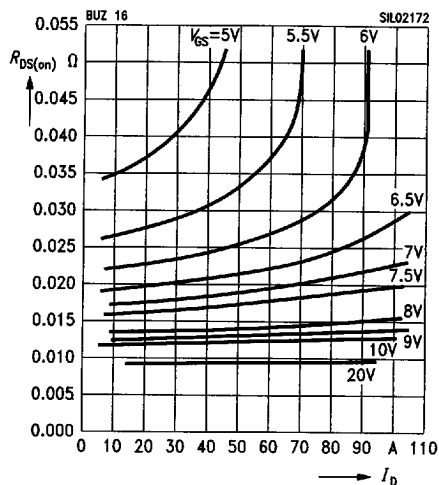


Typ. drain-source on-resistance

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

parameter: V_{GS}

BUZ 16

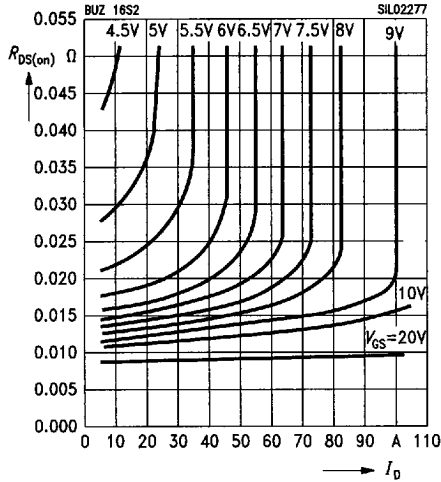


Typ. drain-source on-resistance

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

BUZ 16 S2

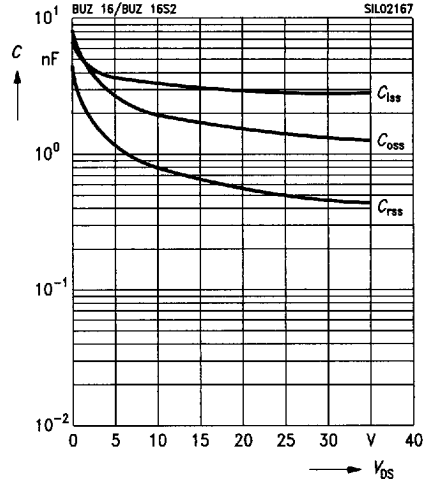
parameter: V_{GS}



Typ. capacitances

$C = f(V_{DS})$

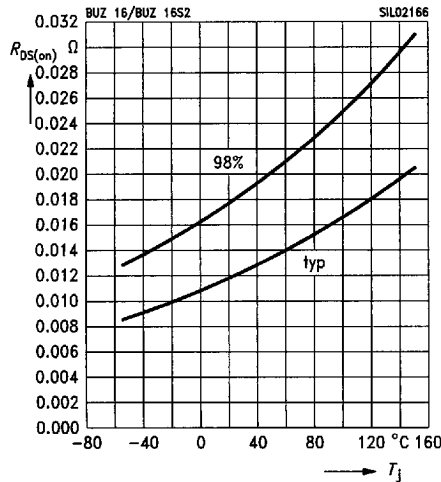
parameter: $V_{GS} = 0V, f = 1MHz$



Drain-source on-resistance

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

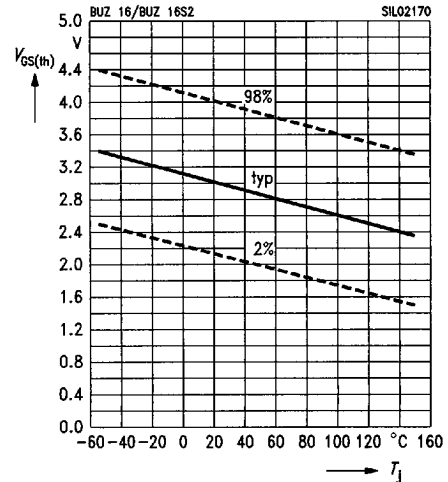
parameter: $I_D = 40A, V_{GS} = 10V$, (spread)



Gate threshold voltage

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

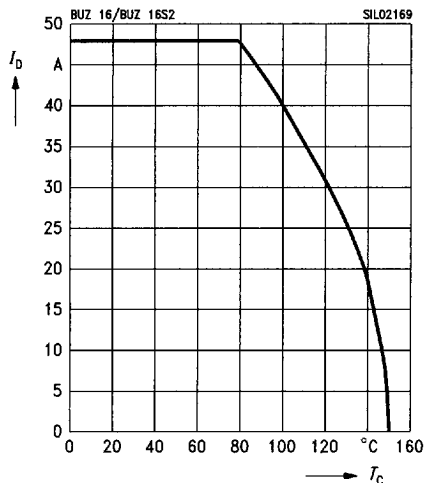
parameter: $V_{GS} = V_{DS}, I_D = 1mA$, (spread)



Drain current

$$I_D = f(T_C)$$

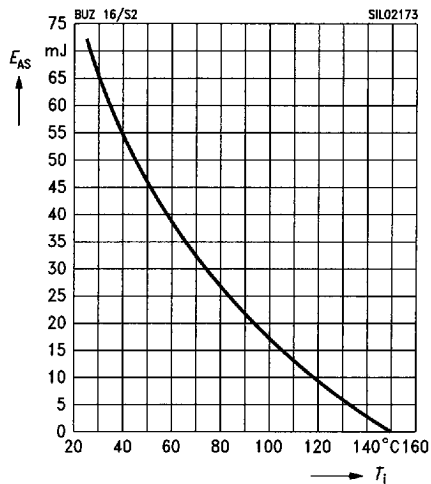
parameter: $V_{GS} \geq 10 \text{ V}$



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

parameter: $I_D = 48 \text{ A}$, $V_{DD} = 25 \text{ V}$

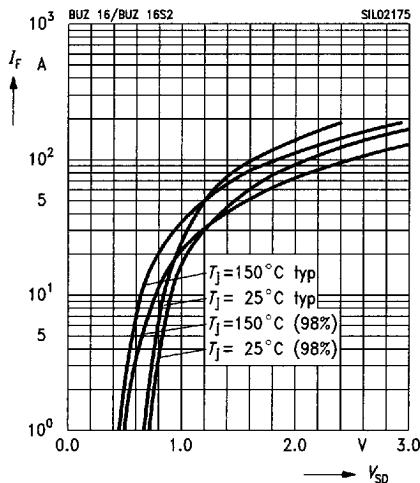
$R_{GS} = 25 \Omega$, $L = 31.3 \mu\text{H}$



Forward characteristics of reverse diode

$$I_F = f(V_{SD})$$

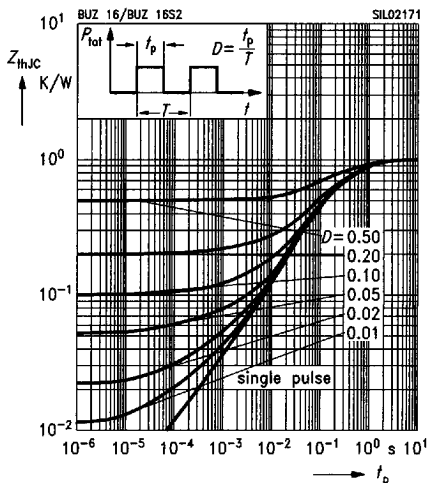
parameter: T_j , $t_p = 80 \mu\text{s}$, (spread)



Transient thermal impedance

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

parameter: $D = t_p / T$



Typ. gate charge

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

parameter: $I_{D\ pulse} = 87.0\ A$

