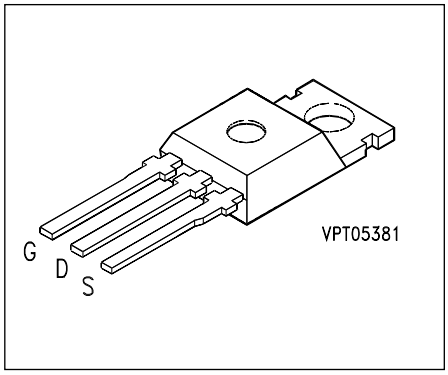
SIEMENS

SIPMOS® Power Transistors

BUZ 50 A
BUZ 50 B, BUZ 50 C

- N channel
- Enhancement mode



Type	V_{DS}	I_D	$R_{DS\ (on)}$	Package [1]	Ordering Code
BUZ 50 A	1000 V	2.5 A	5.0 Ω	TO-220 AB	C67078-A1307-A3
BUZ 50 B	1000 V	2.0 A	8.0 Ω	TO-220 AB	C67078-A1307-A4
BUZ 50 C	1000 V	2.3 A	6.0 Ω	TO-220 AB	C67078-A1307-A5

Maximum Ratings

Parameter	Symbol	BUZ			Unit
		50 A	50 B	50 C	
Continuous drain current T_C = 25 ˚C	I_D	**2.5**	**2.0**	**2.3**	A
Pulsed drain current, T_C = 25 ˚C	$I_{D\ puls}$	**10.0**	**8.0**	**9.0**	
Drain-source voltage	V_{DS}	**1000**			V
Drain-gate voltage, R_{GS} = 20 kΩ	V_{DGR}	**1000**			
Gate-source voltage	V_{GS}	± **20**			
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 ˚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	$V_{(BR)\ DSS}$	1000	–	–	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} =1000 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 = 1.5 A BUZ 50 A I_D = 1.5 A BUZ 50 B I_D = 1.5 A BUZ 50 C	$R_{DS\ (on)}$	 – – –	 4.5 6.5 5.0	 5.0 8.0 6.0	Ω
Dynamic characteristics					
Forward transconductance V_{DS} ≥ 2 x I_D x $R_{DS(on)max}$, I_D =1.5 A	g_{fs}	0.7	1.5	–	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	–	1600	2100	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	–	70	120	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	–	30	55	
Turn-on time t_{on} , (t_{on} = $t_{d\ (on)}$ + t_r) V_{DD} = 30 V, V_{GS} = 10 V, I_D = 2 A, R_{GS} = 50 Ω	$t_{d\ (on)}$	–	30	45	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 = 2 A, R_{GS} = 50 Ω	$t_{d\ (off)}$	–	110	140	
	t_f	–	60	80	

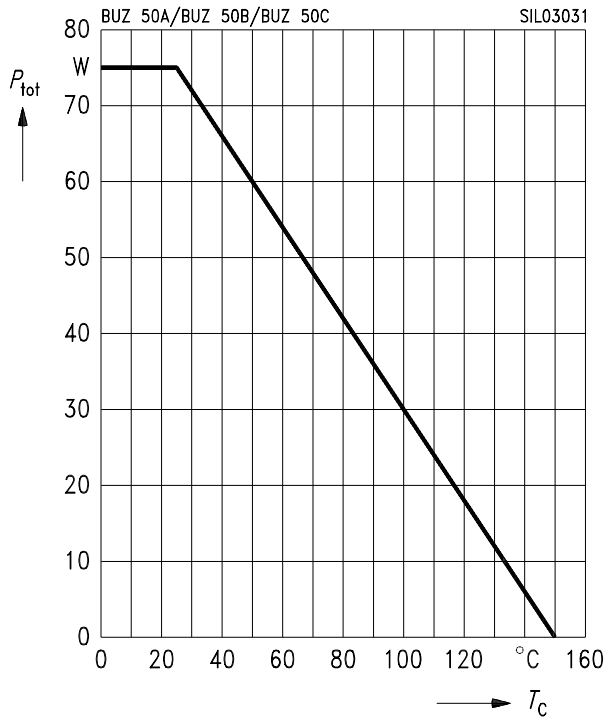
Electrical Characteristics (cont'd)
at T_j = 25 ˚C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse diode					
Continuous reverse drain current	I_S				A
T_C = 25 ˚C BUZ 50 A		–	–	2.5	
BUZ 50 B		–	–	2.0	
BUZ 50 C		–	–	2.3	
Pulsed reverse drain current	I_{SM}				A
T_C = 25 ˚C BUZ 50 A		–	–	10.0	
BUZ 50 B		–	–	8.0	
BUZ 50 C		–	–	9.0	
Diode forward on-voltage I_S = 6 A, V_{GS} = 0 V	V_{SD}	–	1.05	1.3	V
Reverse recovery time V_R = 100 V, $I_F = I_S$, di_F / dt = 100 A/µs	t_{rr}	–	2.0	–	ns
Reverse recovery charge V_R = 100 V, $I_F = I_S$, di_F / dt = 100 A/µs	Q_{rr}	–	15	–	µC

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

Total power dissipation

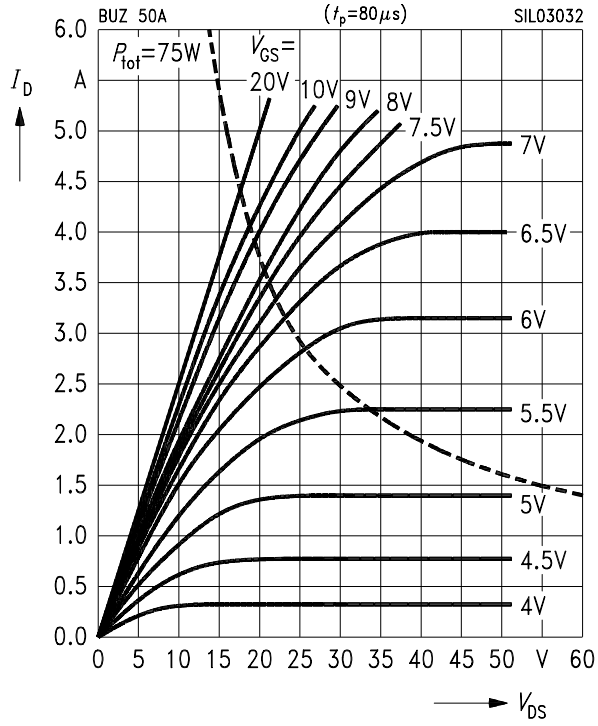
$P_{tot} = f(T_C)$



Typ. output characteristics

$I_D = f(V_{DS})$ **BUZ 50 A**

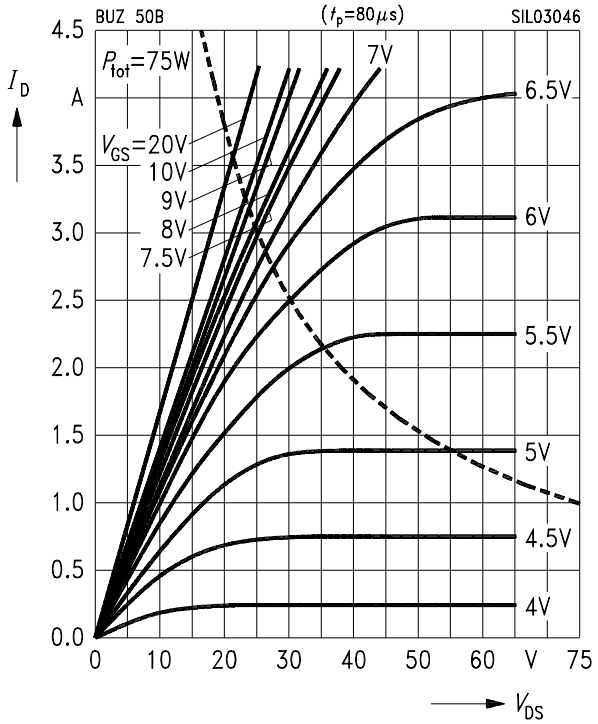
parameter: t_p = 80 µs



Typ. output characteristics

$I_D = f(V_{DS})$ **BUZ 50 B**

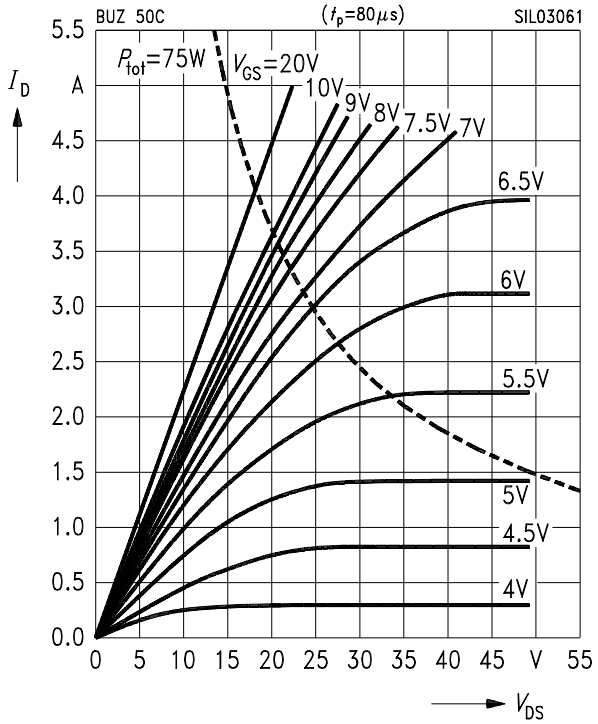
parameter: t_p = 80 µs



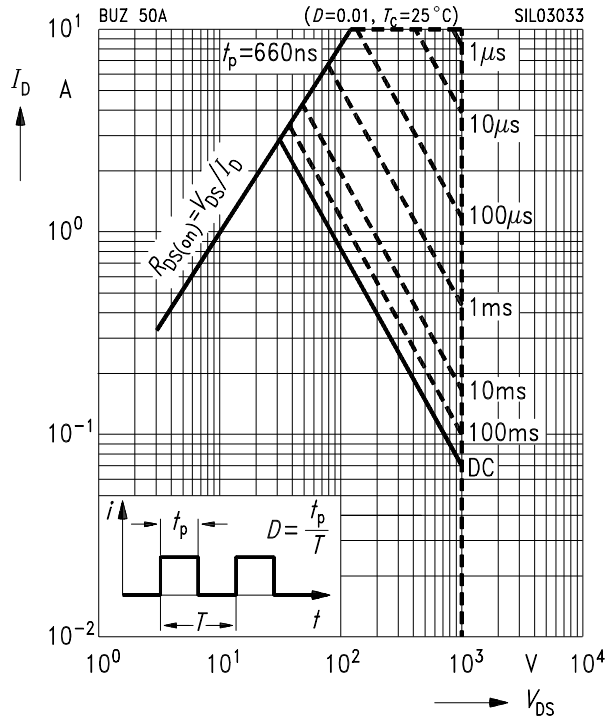
Typ. output characteristics

$I_D = f(V_{DS})$ **BUZ 50 C**

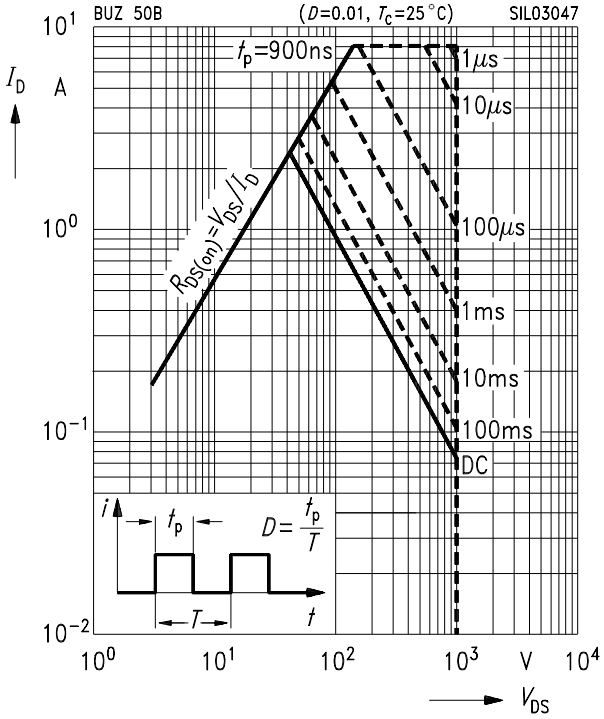
parameter: t_p = 80 µs



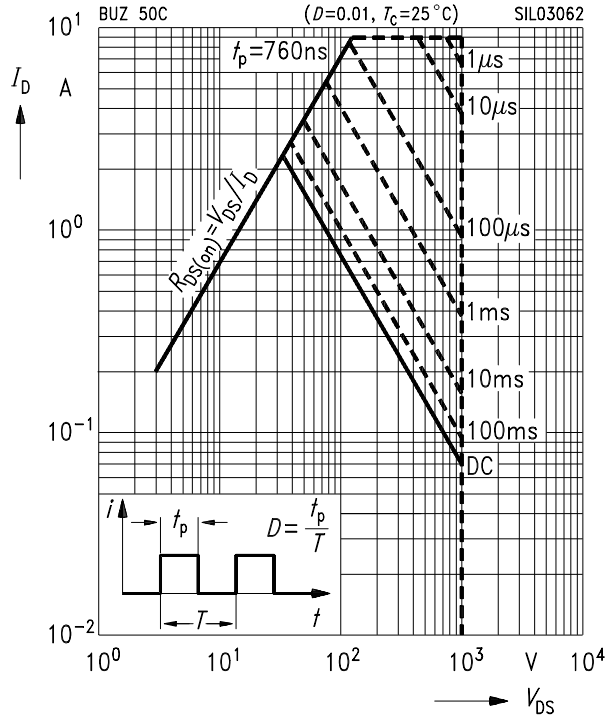
Safe operating area
$I_D = f(V_{DS})$ **BUZ 50 A**
parameter: $D = 0.01$, $T_C = 25$ °C



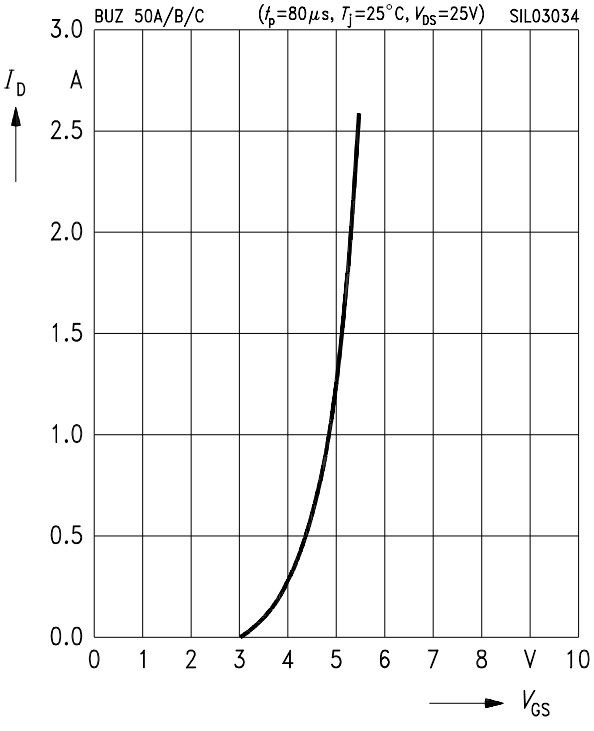
Safe operating area
$I_D = f(V_{DS})$ **BUZ 50 B**
parameter: $D = 0.01$, $T_C = 25$ °C



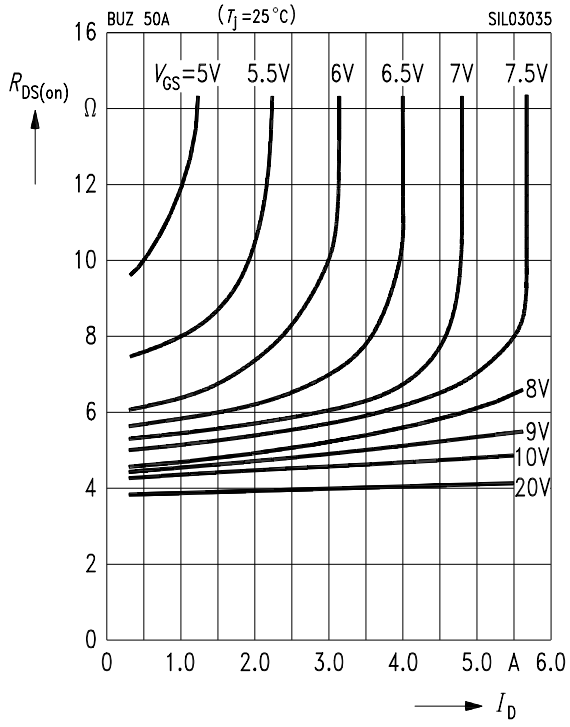
Safe operating area
$I_D = f(V_{DS})$ **BUZ 50 C**
parameter: $D = 0.01$, $T_C = 25$ °C



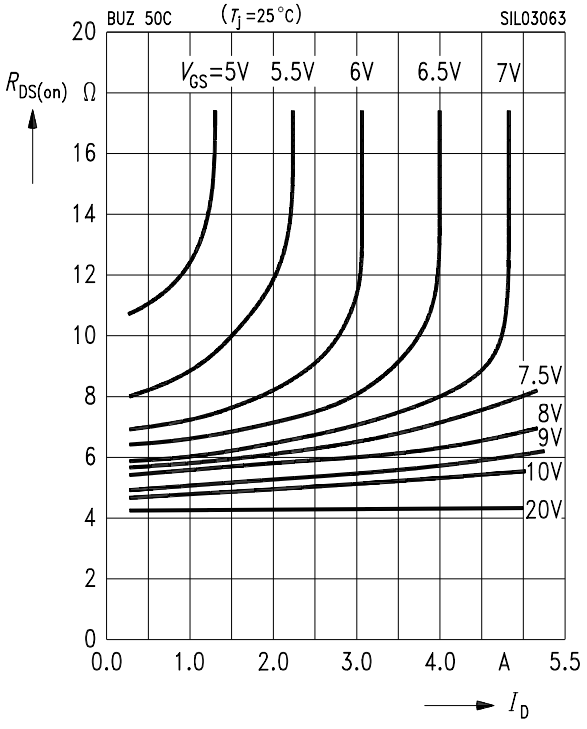
Typ. transfer characteristics
$I_D = f(V_{GS})$
parameter: $t_p = 80$ µs, $V_{DS} = 25$ V



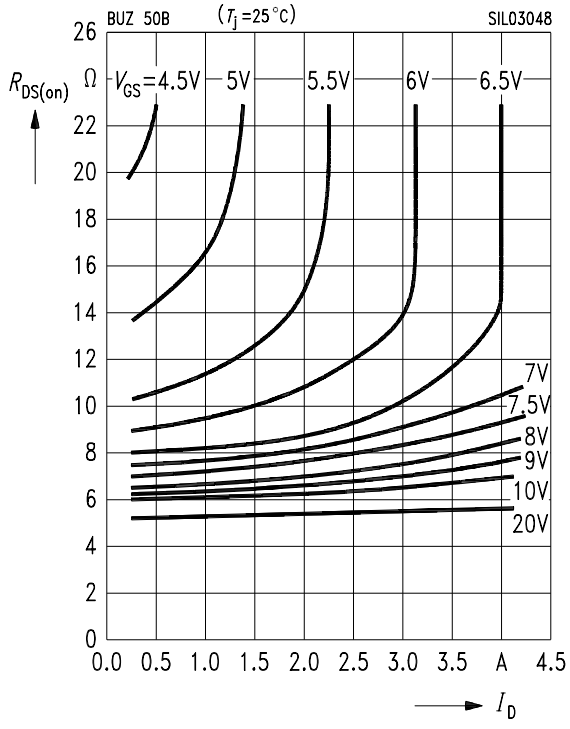
Typ. drain-source on-resistance
$R_{DS\ (on)} = f\ (I_D)$ **BUZ 50 A**
parameter: V_{GS}



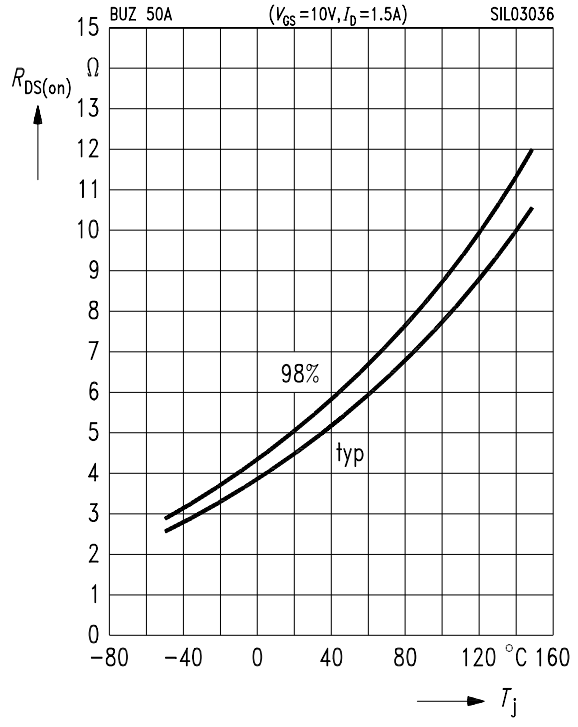
Typ. drain-source on-resistance
$R_{DS\ (on)} = f\ (I_D)$ **BUZ 50 C**
parameter: V_{GS}



Drain-source on-resistance
$R_{DS\ (on)} = f\ (I_D)$ **BUZ 50 B**
parameter: V_{GS}



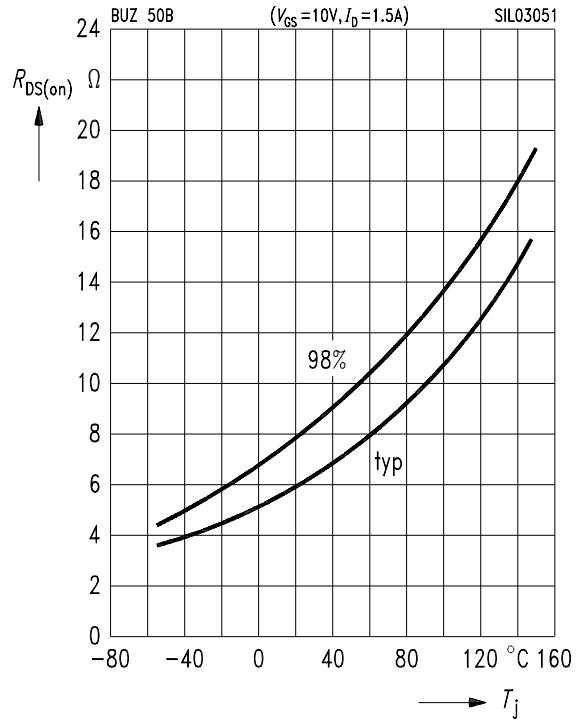
Drain-source on-resistance
$R_{DS\ (on)} = f\ (T\mathrm{j})$ **BUZ 50 A**
parameter: V_{GS} = 10 V, I_D = 1.5 A



Drain-source on-resistance

$R_{DS\ (on)} = f\ (Tj)$ **BUZ 50 B**

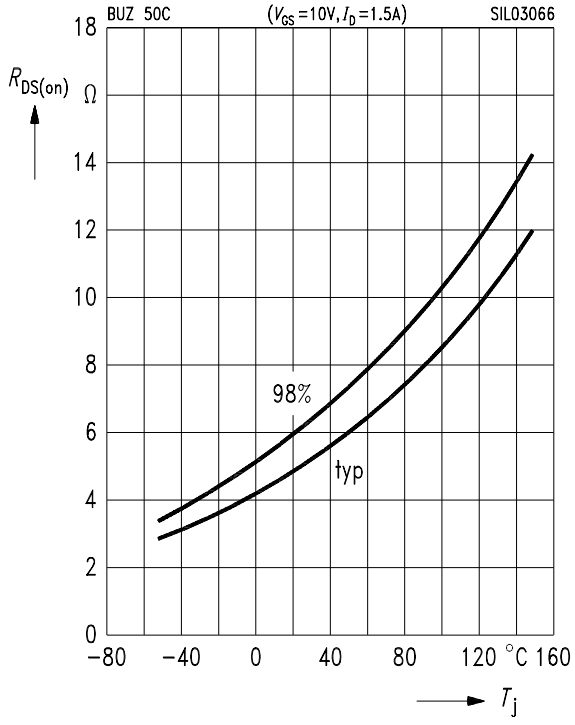
parameter: V_{GS} = 10 V, I_D = 1.5 A



Drain-source on-resistance

$R_{DS\ (on)} = f\ (Tj)$ **BUZ 50 C**

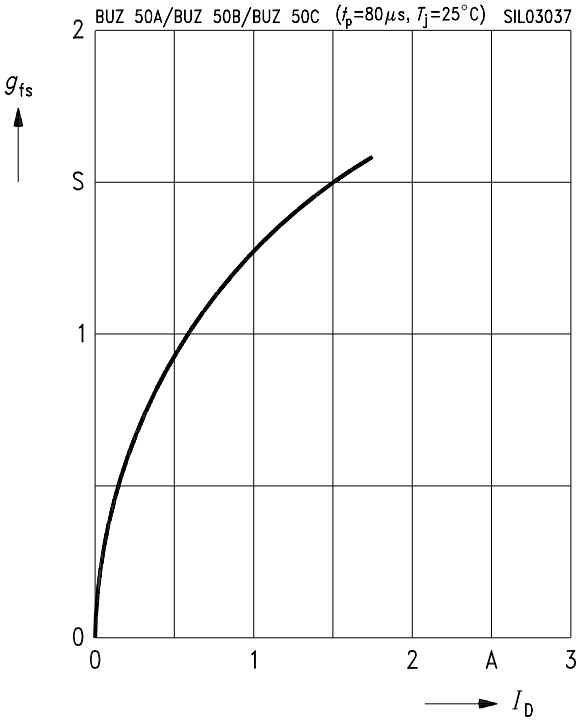
parameter: V_{GS} = 10 V, I_D = 1.5 A



Typ. forward transconductance

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

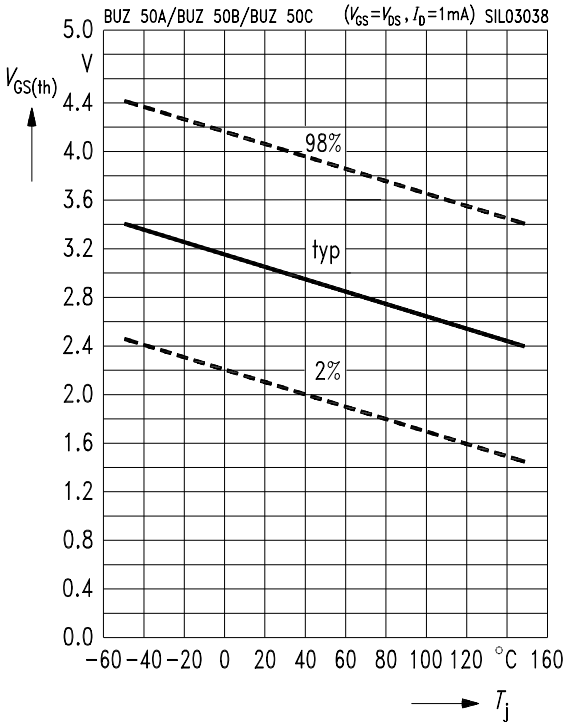
parameter: t_p = 80 µs



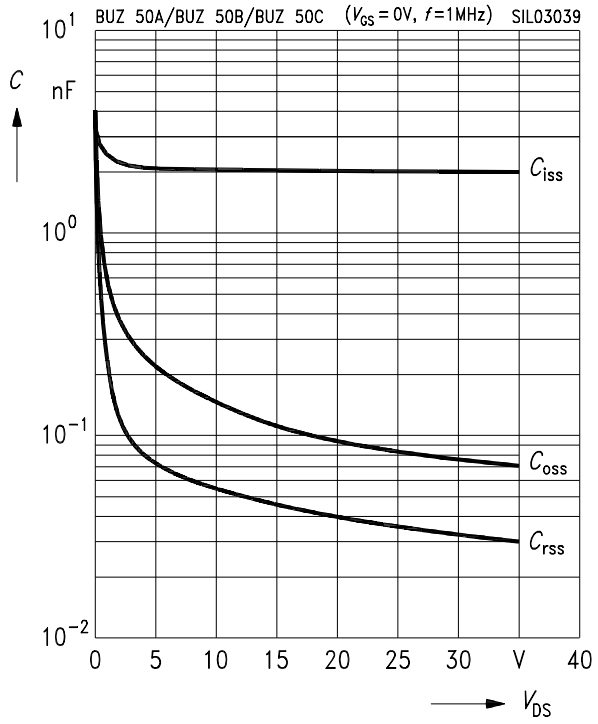
Gate threshold voltage

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

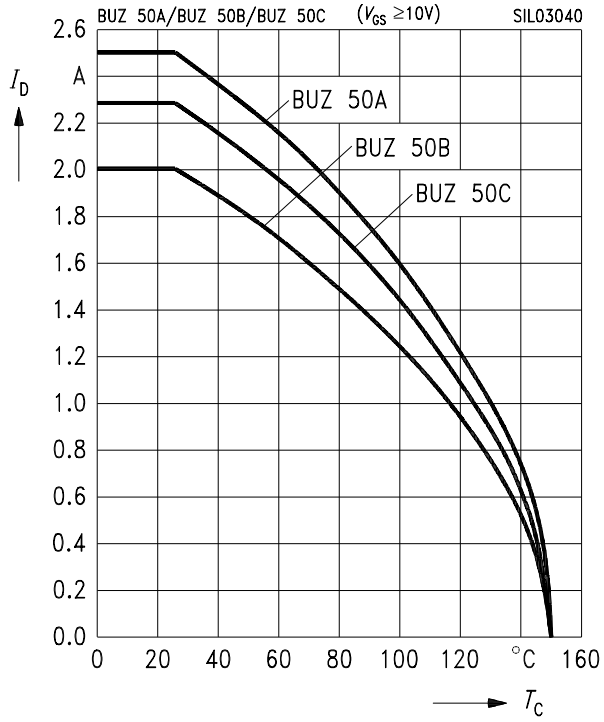
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA, (spread)



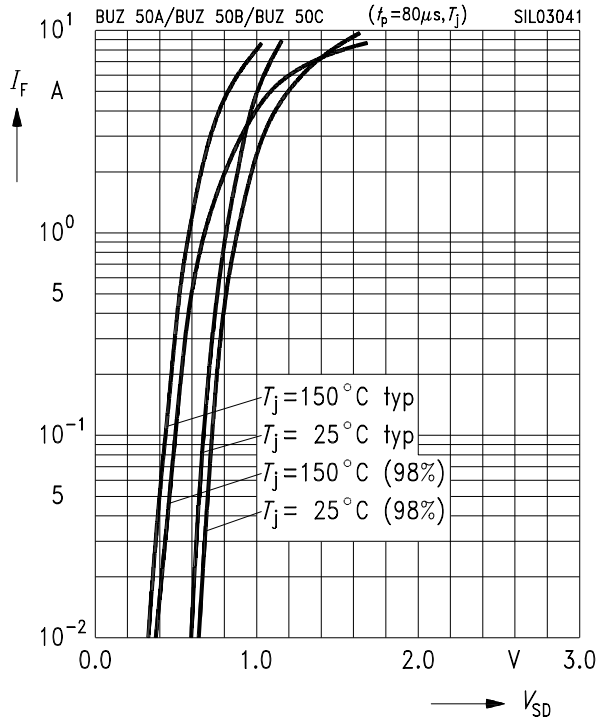
Typ. capacitances
$C = f(V_{DS})$
parameter: V_{GS} = 0 V, f = 1 MHz



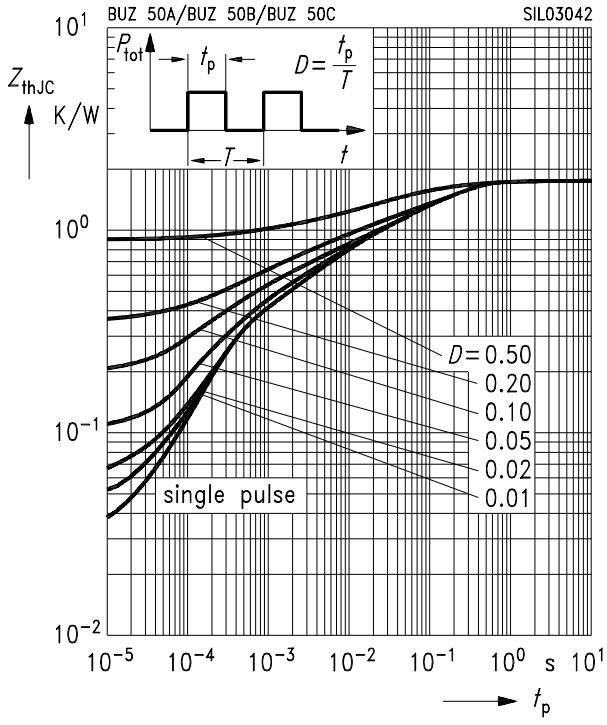
Drain current
$I_D = f(T_C)$
parameter: $V_{GS} \geq 10$ V



Forward characteristics of reverse diode
$I_F = f(V_{SD})$
parameter: T_j , t_p = 80 µs, (spread)



Transient thermal impedance
$Z_{th\,JC} = f(t_p)$
parameter: $D = t_p / T$



Typ. gate charge

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

parameter: $I_{D\ puls}$ = 3.75 A