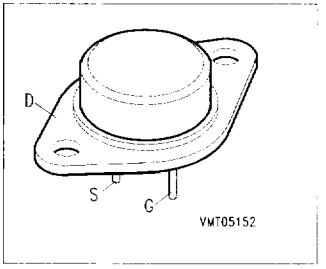
SIEMENS

SIPMOS® Power Transistors

BUZ 210
BUZ 211

- N channel
- Enhancement mode
- FREDFET



Type	V_{DS}	I_D	$R_{DS\,(on)}$	Package [1]	Ordering Code
BUZ 210	500 V	10.5 A	0.6 Ω	TO-204 AA	C67078-A1102-A2
BUZ 211	500 V	9.0 A	0.8 Ω	TO-204 AA	C67078-A1100-A2

Maximum Ratings

Parameter	Symbol	BUZ		Unit
		210	211	
Continuous drain current, T_C = 25 °C	I_D	**10.5**	**9.0**	A
Pulsed drain current, T_C = 25 °C	$I_{D\,puls}$	**42**	**36**	
Drain-source voltage	V_{DS}	**500**		V
Drain-gate voltage, R_{GS} = 20 kΩ	V_{DGR}	**500**		
Gate-source voltage	V_{GS}	**± 20**		
Power dissipation, T_C = 25 °C	P_{tot}	**125**		W
Operating and storage temperature range	T_j , T_{stg}	**– 55 ... + 150**		°C
Thermal resistance, chip-case	$R_{th\,JC}$	**≤ 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 °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	$V_{(BR)\ DSS}$	500	–	–	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} = 500 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 = 6.5 A BUZ 210 BUZ 211	$R_{DS\ (on)}$	 – –	 0.55 0.7	 0.6 0.8	Ω
Dynamic characteristics					
Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, I_D = 6.5 A	g_{fs}	2.7	5.3	–	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	–	3800	4900	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	–	250	400	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	–	100	170	
Turn-on time t_{on} , ($t_{on} = t_{d\ (on)} + t_r$) V_{DD} = 30 V, V_{GS} = 10 V, I_D = 2.8 A, R_{GS} = 50 Ω	$t_{d\ (on)}$	–	50	75	ns
	t_r	–	80	120	
Turn-off time t_{off} , ($t_{off} = t_{d\ (off)} + t_f$) V_{DD} = 30 V, V_{GS} = 10 V, I_D = 2.8 A, R_{GS} = 50 Ω	$t_{d\ (off)}$	–	330	430	
	t_f	–	110	140	

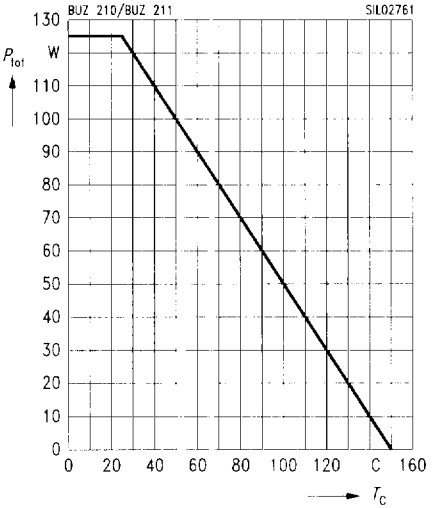
Electrical Characteristics (cont'd)
at T_j = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse diode					
Continuous reverse drain current	I_S				A
T_C = 25 °C BUZ 210		–	–	10.5	
BUZ 211		–	–	9.0	
Pulsed reverse drain current	I_{SM}				
T_C = 25 °C BUZ 210		–	–	42	
BUZ 211		–	–	36	
Diode forward on-voltage I_S = 21 A, V_{GS} = 0 V	V_{SD}	–	1.3	1.7	V
Reverse recovery time V_R = 100 V, $I_F = I_S$, di_F / dt = 100 A/µs	t_{rr}	–	180	250	ns
Reverse recovery charge V_R = 100 V, $I_F = I_S$, di_F / dt = 100 A/µs	Q_{rr}	–	0.65	1.2	µC

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

Total power dissipation

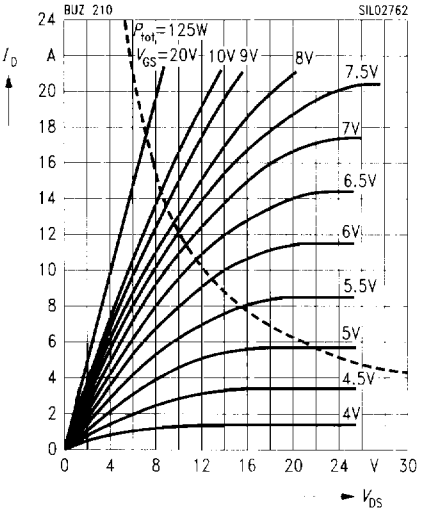
$P_{tot} = f(T_C)$



Typ. output characteristics

$I_D = f(V_{DS})$ **BUZ 210**

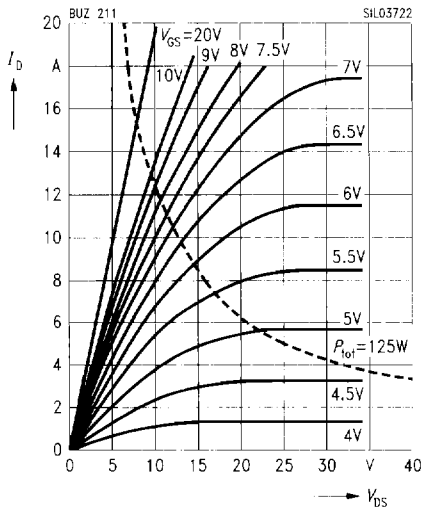
parameter: t_p = 80 µs



Typ. output characteristics

$I_D = f(V_{DS})$ **BUZ 211**

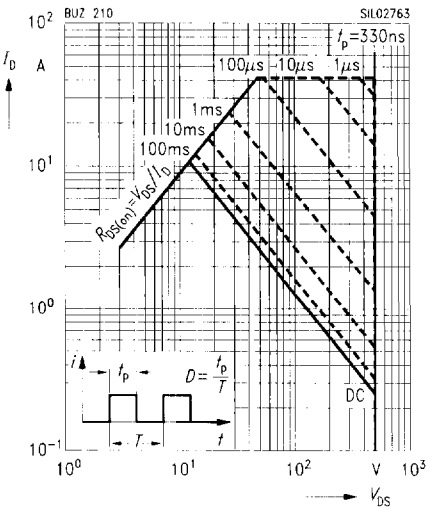
parameter: t_p = 80 µs



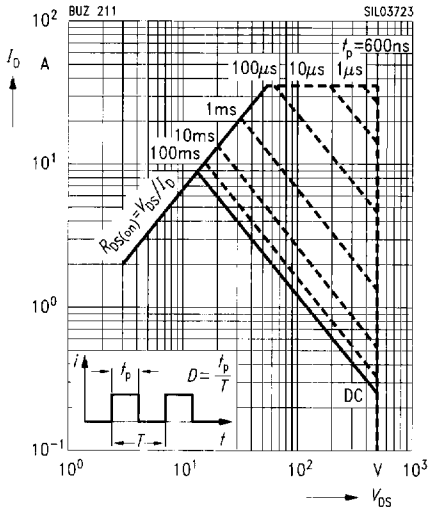
Safe operating area

$I_D = f(V_{DS})$ **BUZ 210**

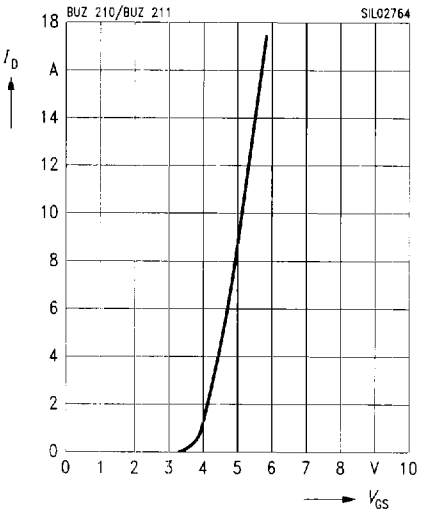
parameter: D = 0.01, T_C = 25 °C



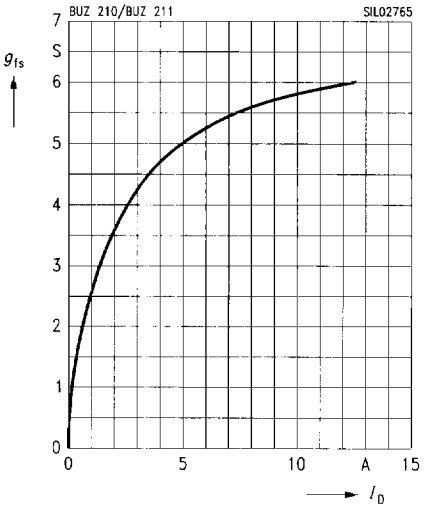
Safe operating area
$I_D = f(V_{DS})$ **BUZ 211**
parameter: D = 0.01, T_C = 25 °C



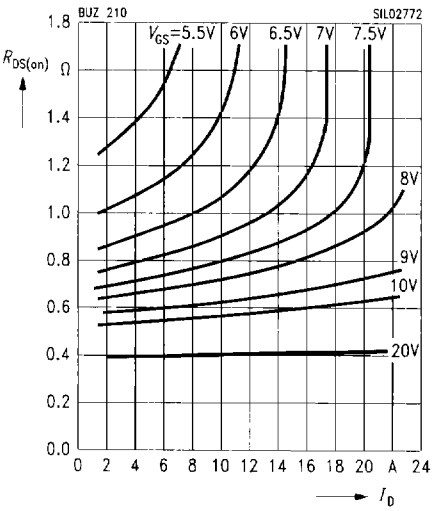
Typ. transfer characteristics
$I_D = f(V_{GS})$
parameter: t_p = 80 µs, V_{DS} = 25 V



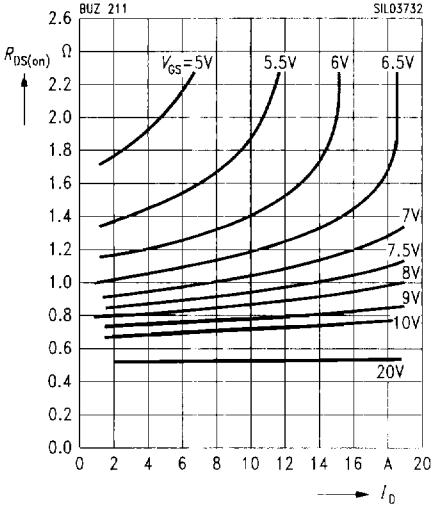
Typ. forward transconductance
$g_{fs} = f(I_D)$
parameter: t_p = 80 µs



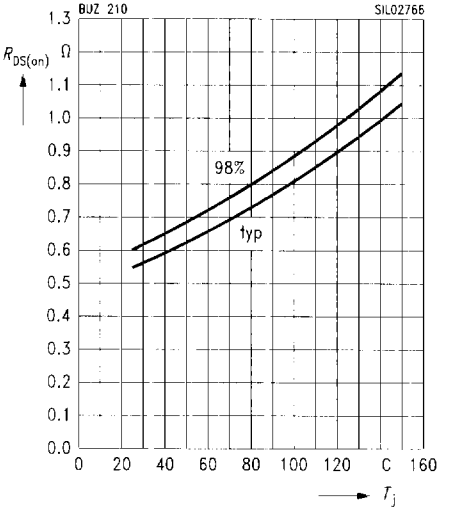
Typ. drain-source on-resistance
$R_{DS(on)} = f(I_D)$ **BUZ 210**
parameter: V_{GS}



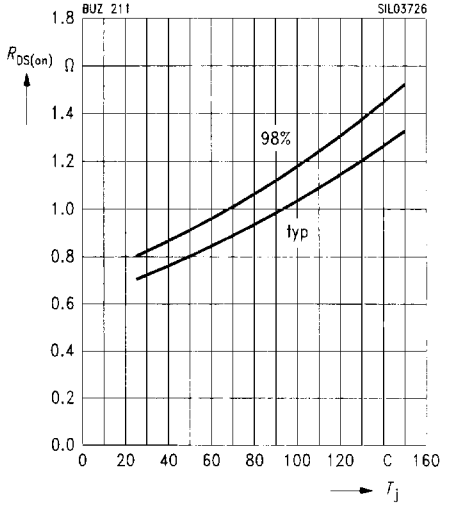
Typ. drain-source on-resistance
$R_{DS\,(on)} = f(I_D)$ **BUZ 211**
parameter: V_{GS}



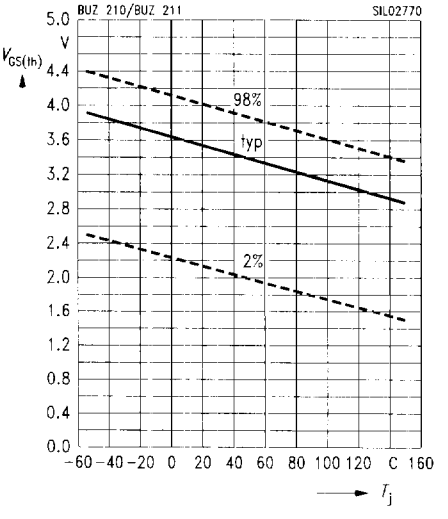
Drain-source on-resistance
$R_{DS\,(on)} = f(T_j)$ **BUZ 210**
parameter: I_D = 6.5 A, V_{GS} = 10 V, (spread)



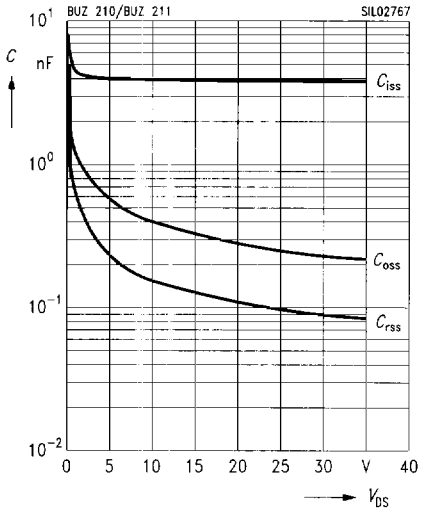
Drain-source on-resistance
$R_{DS\,(on)} = f(T_j)$ **BUZ 211**
parameter: I_D = 6.5 A, V_{GS} = 10 V, (spread)



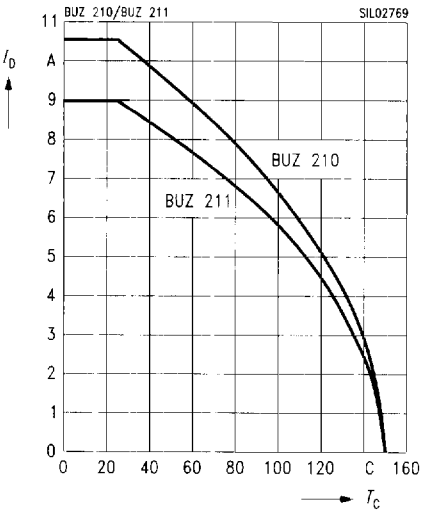
Gate threshold voltage
$V_{GS\,(th)} = f(T_j)$
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA



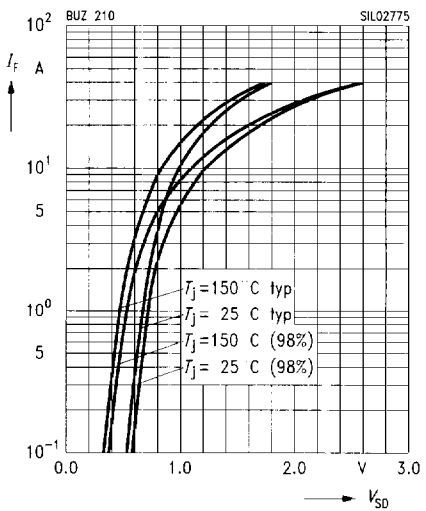
Typ. capacitances
$C = f(V_{DS})$
parameter: V_{GS} = 0 V, f = 1 MHz



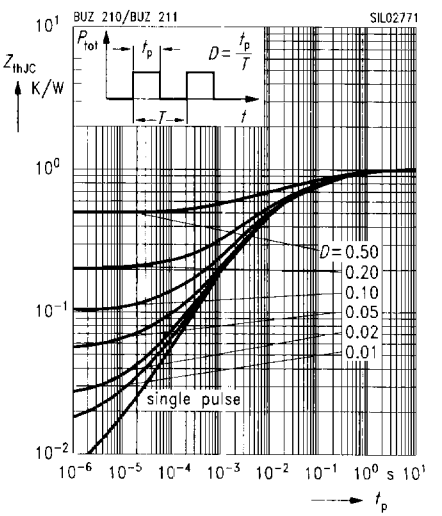
Drain current
$I_D = f(T_C)$
parameter: $V_{GS} \geq 10$ V



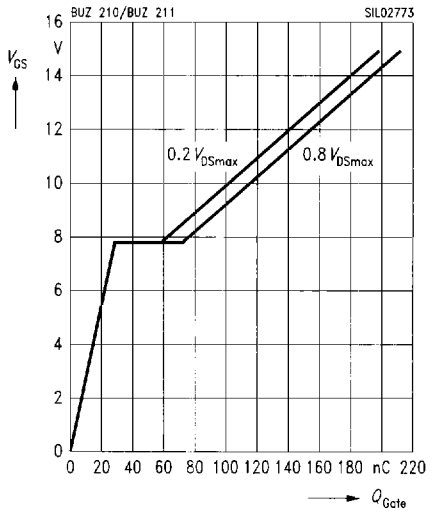
Forward characteristics of reverse diode
$I_F = f(V_{SD})$
parameter: t_p = 80 µs, T_j



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



Typ. gate charge
$V_{GS} = f(Q_{Gate})$
parameter: $I_{D\,puls}$ = 14.4 A



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