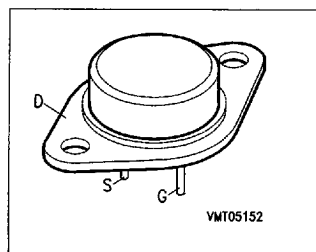


## SIPMOS® Power Transistors

**BUZ 84**  
**BUZ 84 A**

- N channel
- Enhancement mode



Type	$V_{DS}$	$I_D$	$T_C$	$R_{DS(on)}$	Package <sup>1)</sup>	Ordering Code
<b>BUZ 84</b>	800 V	5.3 A	25 °C	2.0 $\Omega$	TO-204 AA	C67078-A1013-A2
<b>BUZ 84 A</b>	800 V	6.0 A	29 °C	1.5 $\Omega$	TO-204 AA	C67078-A1013-A3

### Maximum Ratings

Parameter	Symbol	BUZ		Unit
		84	84 A	
Continuous drain current	$I_D$	5.3	6.0	A
Pulsed drain current, $T_C = 25\text{ °C}$	$I_{D\text{ puls}}$	21	24	
Drain-source voltage	$V_{DS}$	800		V
Drain-gate voltage, $R_{GS} = 20\text{ k}\Omega$	$V_{DGR}$	800		
Gate-source voltage	$V_{GS}$	$\pm 20$		
Power dissipation, $T_C = 25\text{ °C}$	$P_{tot}$	125		W
Operating and storage temperature range	$T_j, T_{stg}$	- 55 ... + 150		°C
Thermal resistance, chip-case	$R_{thJC}$	$\leq 1.0$		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 $V_{GS} = 0\text{ V}, I_D = 0.25\text{ mA}$	$V_{(BR)DSS}$	800	–	–	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 $V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ $T_j = 125\text{ }^\circ\text{C}$	$I_{DSS}$	– –	20 100	250 1000	$\mu\text{A}$
Gate-source leakage current $V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	$I_{GSS}$	–	10	100	nA
Drain-source on-resistance $V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}$	$R_{DS(on)}$	– –	1.6 1.3	2.0 1.5	$\Omega$
					BUZ 84 BUZ 84 A

### Dynamic characteristics

Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}, I_D = 3.0\text{ A}$	$g_{fs}$	1.8	3.0	–	S
Input capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	$C_{iss}$	–	3.9	5.0	pF
Output capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	$C_{oss}$	–	200	350	
Reverse transfer capacitance $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	$C_{rss}$	–	80	140	
Turn-on time $t_{on}, (t_{on} = t_{d(on)} + t_r)$ $V_{DD} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}, R_{GS} = 50\text{ }\Omega$	$t_{d(on)}$	–	60	90	ns
	$t_r$	–	90	140	
Turn-off time $t_{off}, (t_{off} = t_{d(off)} + t_f)$ $V_{DD} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}, R_{GS} = 50\text{ }\Omega$	$t_{d(off)}$	–	330	430	
	$t_f$	–	110	140	

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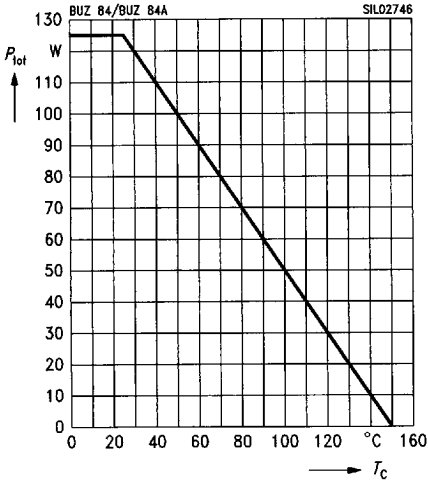
**Electrical Characteristics (cont'd)**  
at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Reverse diode</b>					
Continuous reverse drain current $T_C = 25\text{ }^\circ\text{C}$	$I_S$	–	–	5.3	A
BUZ 84 BUZ 84 A		–	–	6.0	
Pulsed reverse drain current $T_C = 25\text{ }^\circ\text{C}$	$I_{SM}$	–	–	21	
BUZ 84 BUZ 84 A		–	–	24	
Diode forward on-voltage $I_S = 12\text{ A}$ , $V_{GS} = 0\text{ V}$	$V_{SD}$	–	1.1	1.5	V
Reverse recovery time $V_R = 100\text{ V}$ , $I_F = I_S$ , $di_F / dt = 100\text{ A}/\mu\text{s}$	$t_{rr}$	–	1.8	–	$\mu\text{s}$
Reverse recovery charge $V_R = 100\text{ V}$ , $I_F = I_S$ , $di_F / dt = 100\text{ A}/\mu\text{s}$	$Q_{rr}$	–	25	–	$\mu\text{C}$

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

### Total power dissipation

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

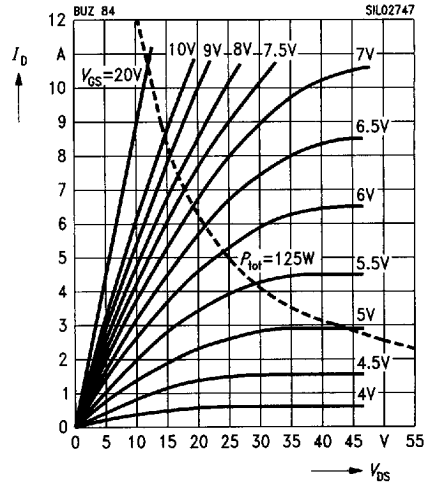


### Typ. output characteristics

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

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

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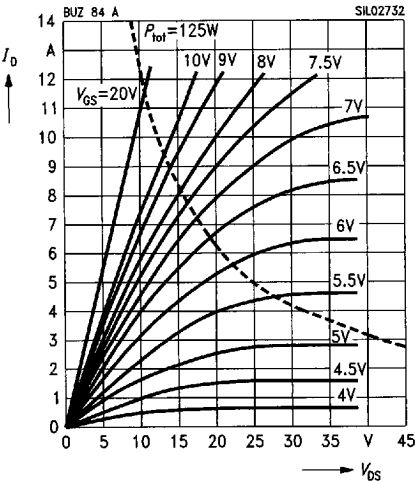


### Typ. output characteristics

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

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

BUZ 84 A

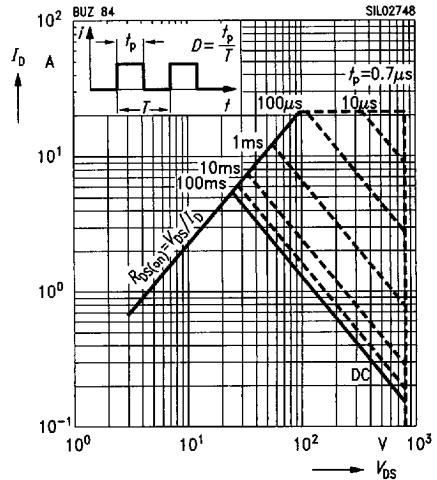


### Safe operating area

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

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

BUZ 84

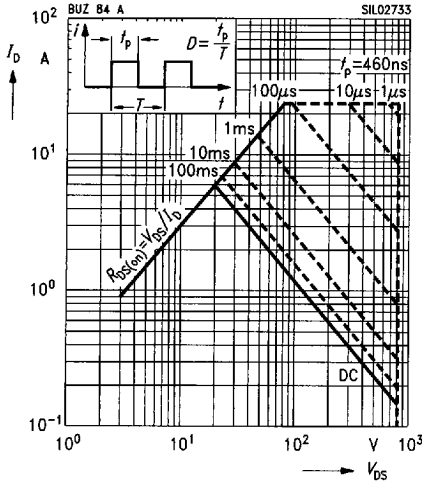


**Safe operating area**

$I_D = f(V_{DS})$

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

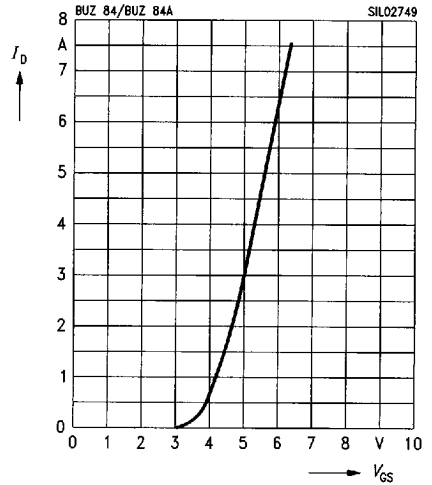
BUZ 84 A



**Typ. transfer characteristics**

$I_D = f(V_{GS})$

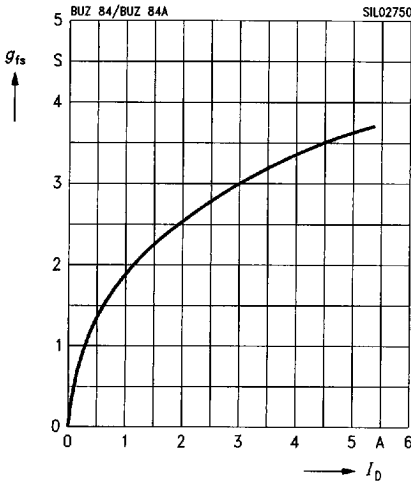
parameter:  $t_p = 80 \mu s, V_{DS} = 25 V$



**Typ. forward transconductance**

$g_{fs} = f(I_D)$

parameter:  $t_p = 80 \mu s$

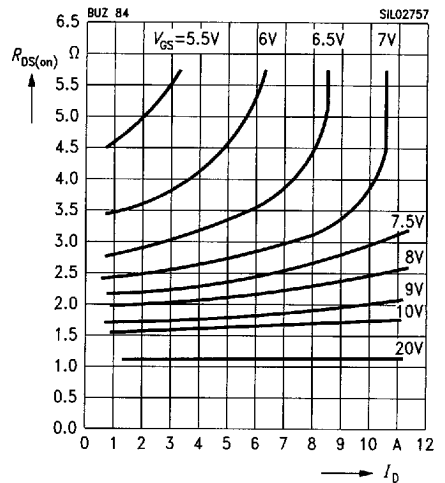


**Typ. drain-source on-resistance**

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

parameter:  $V_{GS}$

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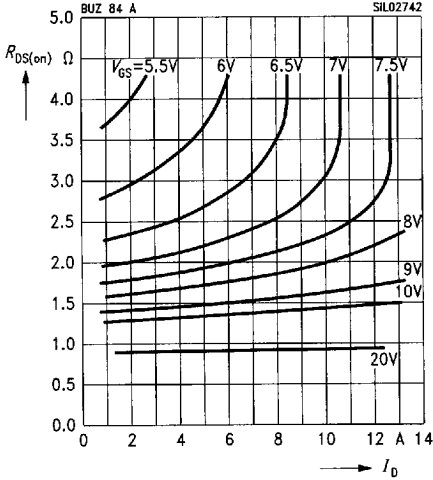


**Typ. drain-source on-resistance**

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

parameter:  $V_{GS}$

BUZ 84 A

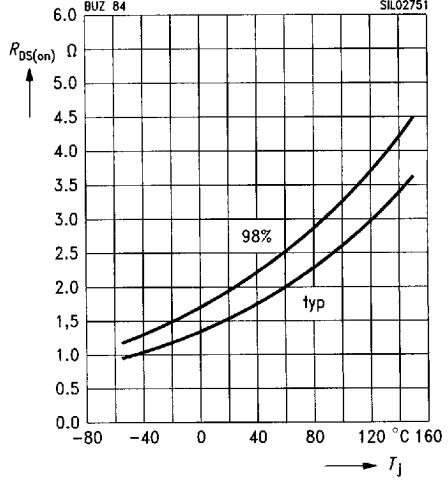


**Drain-source on-resistance**

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

parameter:  $I_D = 3.0$  A,  $V_{GS} = 10$  V, (spread)

BUZ 84

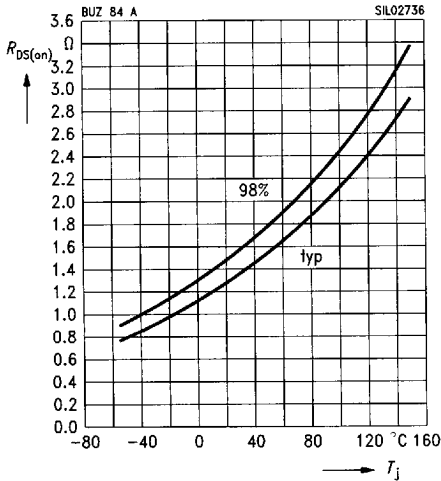


**Drain-source on-resistance**

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

parameter:  $I_D = 3.0$  A,  $V_{GS} = 10$  V, (spread)

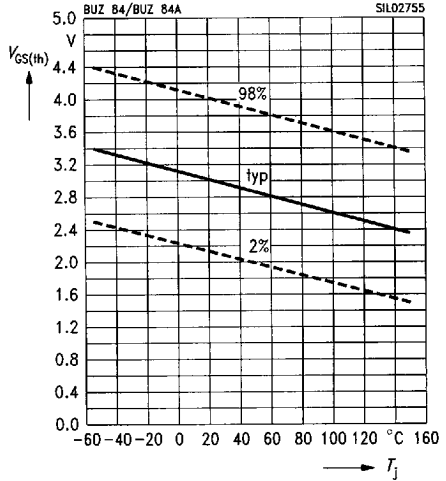
BUZ 84 A



**Gate threshold voltage**

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

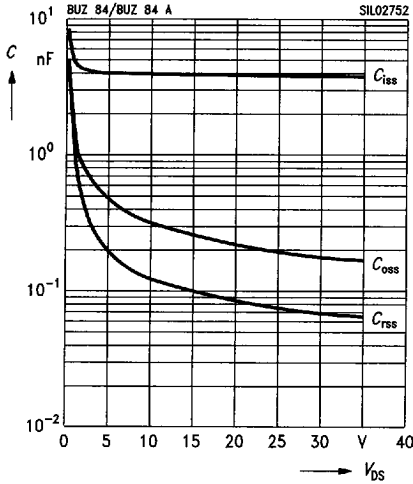
parameter:  $V_{GS} = V_{DS}$ ,  $I_D = 1$  mA, (spread)



### Typ. capacitances

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

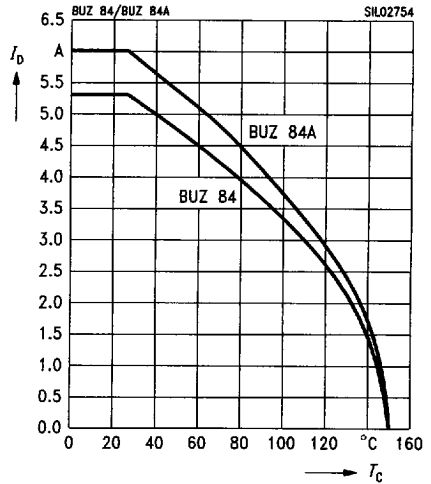
parameter:  $V_{GS} = 0 \text{ V}$ ,  $f = 1 \text{ MHz}$



### Drain current

$$I_D = f(T_C)$$

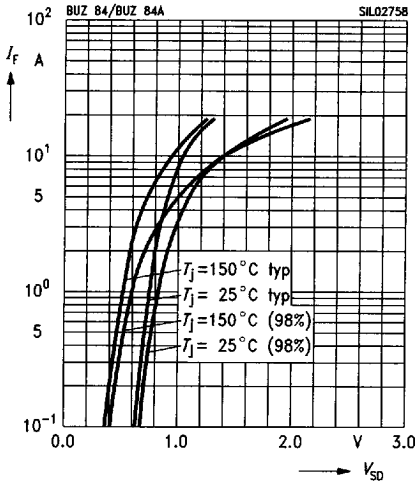
parameter:  $V_{GS} \geq 10 \text{ V}$



### Forward characteristics of reverse diode

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

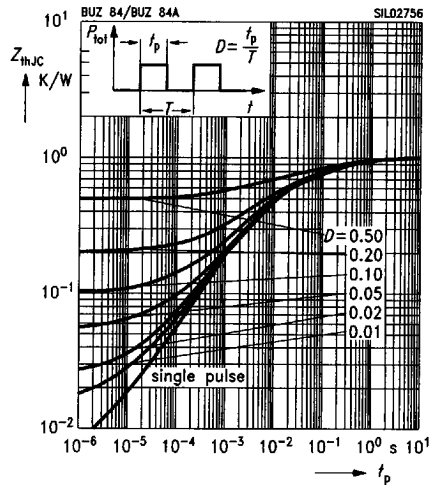
parameter:  $T_J, t_p = 80 \mu\text{s}$ , (spread)



### Transient thermal impedance

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

parameter:  $D = t_p / T$



Typ. gate charge

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

parameter:  $I_D \text{ puls} = 9 \text{ A}$

