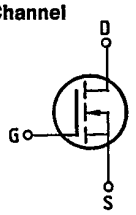
SIEMENS AKTIENGESELLSCHAF

## Main ratings

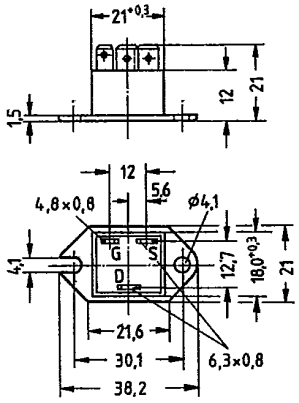
| | | |
|---|---|---|
| **Drain-source voltage** | $V_{DS}$ | **= 200 V** |
| **Continuous drain current** | $I_D$ | **= 18 A** |
| **Drain-source on-resistance** | $R_{DS(on)}$ | **= 0,12 Ω** |

**N-Channel**




**Description** SIPMOS, N-channel, enhancement mode
**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| S BUZ 38 | C67078-A1611-A2 |




Dimensions in mm

## Maximum ratings

| Description | Symbols | Ratings | Units | Conditions |
|---|---|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200 | V | |
| Drain-gate voltage | $V_{DGR}$ | 200 | V | $R_{GS}$ = 20 kΩ |
| Continuous drain current | $I_D$ | 18 | A | $T_C$ = 30 °C |
| Pulsed drain current | $I_{Dpuls}$ | 70 | A | $T_C$ = 25 °C |
| Gate-source voltage | $V_{GS}$ | ±20 | V | |
| Max. power dissipation | $P_D$ | 83,3 | W | $T_C$ = 25 °C |
| Operating and storage temperature range | $T_j$<br>$T_{stg}$ | −40 ... +150 | °C | |
| Isolation test voltage | $V_{is}$ | 3500 | Vdc[1]) | $t$ = 1 min |
| DIN humidity category | | F | – | DIN 40040 |
| IEC climatic category | | 40/150/56 | | DIN IEC 68-1 |
| **Thermal resistance** | | | | |
| Chip – case | $R_{th\,JC}$ | ≤1,5 | K/W | |

[1]) Isolation test voltage between drain and base plate referred to standard climate 23/50 in accordance with DIN 50014.

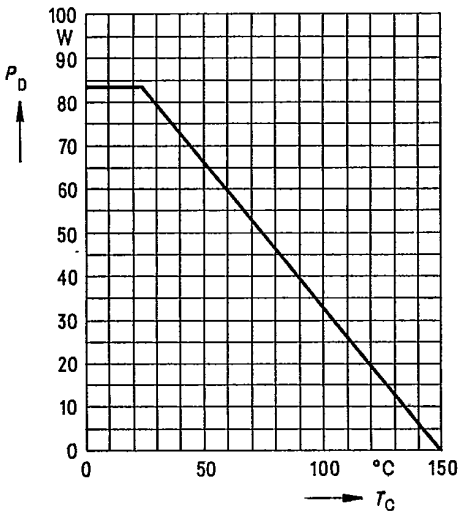
## Electrical characteristics

(at $T_j$ = 25 °C unless otherwise specified)

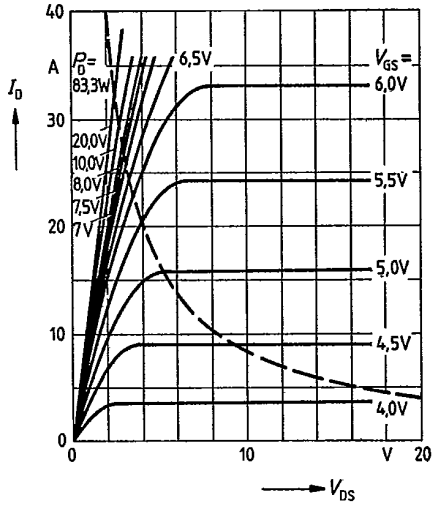
| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| **Static ratings** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 0,25mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 20<br>100 | 250<br>1000 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-resistance | $R_{DS\,(on)}$ | – | 0,09 | 0,12 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 11A |
| **Dynamic ratings** | | | | | | |
| Forward transconductance | $g_{fs}$ | 9,0 | 13,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 11A |
| Input capacitance | $C_{iss}$ | – | 1500 | 2000 | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 500 | 800 | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 200 | 350 | | |
| Turn-on time $t_{on}$ ($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 30 | 45 | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | 110 | | |
| Turn-off time $t_{off}$ ($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 330 | 430 | | |
| | $t_f$ | – | 120 | 160 | | |
| **Reverse diode** | | | | | | |
| Continuous reverse drain current | $I_{DR}$ | – | – | 18 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 70 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,6 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = $I_{DR}$<br>$d_{IF/dt}$ = 100A/µs<br>$V_R$ = 100V |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

SIEMENS AKTIENGESELLSCHAF

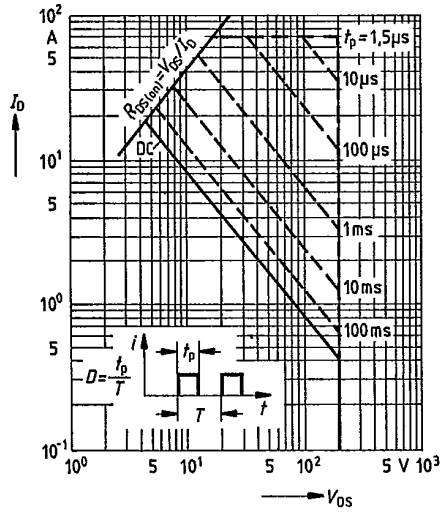
**Power dissipation** $P_D = f(T_C)$



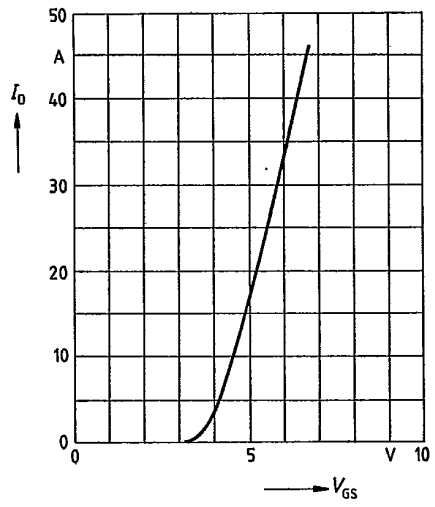

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_j = 25$°C



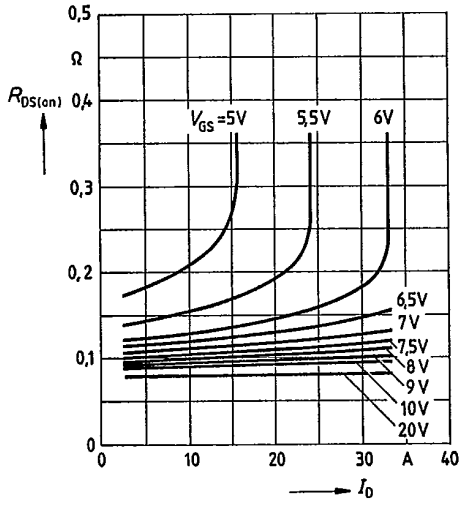

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_C = 25$°C



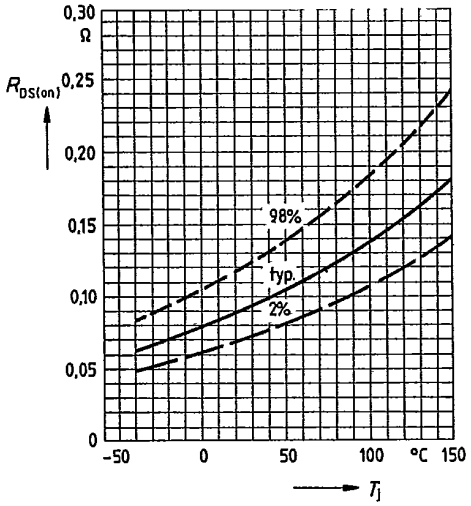

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25$V, $T_j = 25$°C



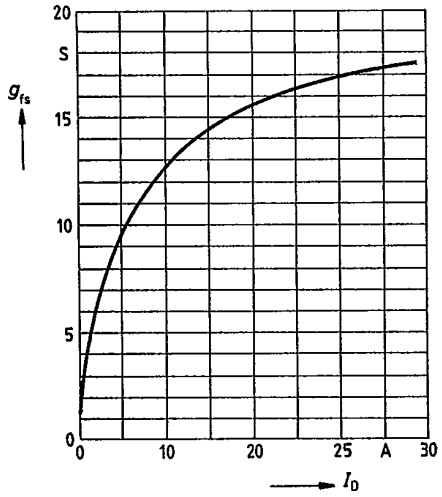
**Typical drain-source on-state resistance**
$R_{DS\,(on)} = f(I_D)$
parameter: $V_{GS}$; $T_j$ = 25°C



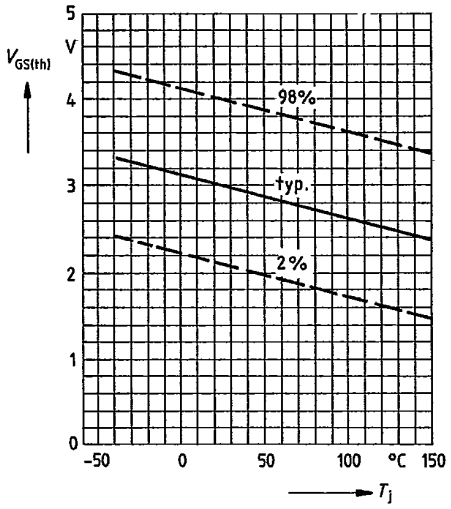

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
parameter: $I_D$ = 11A, $V_{GS}$ = 10V
(spread)



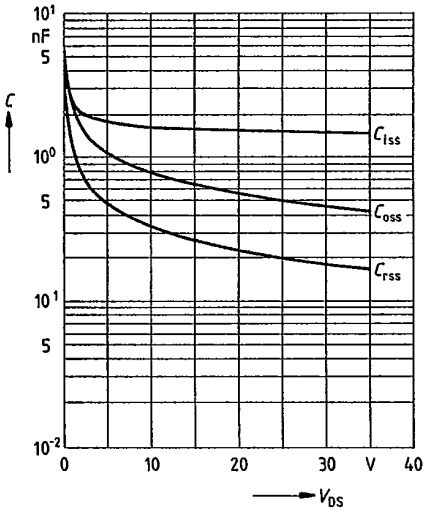

**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25°C



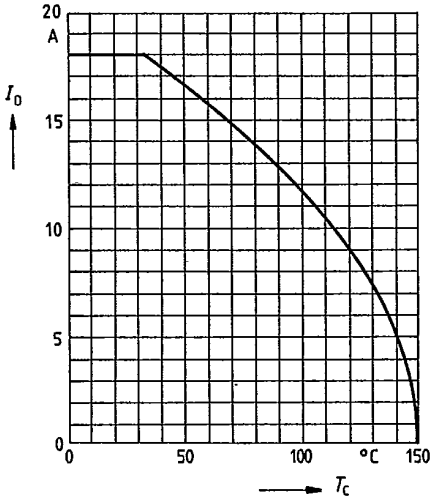

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D$ = 1mA
(spread)



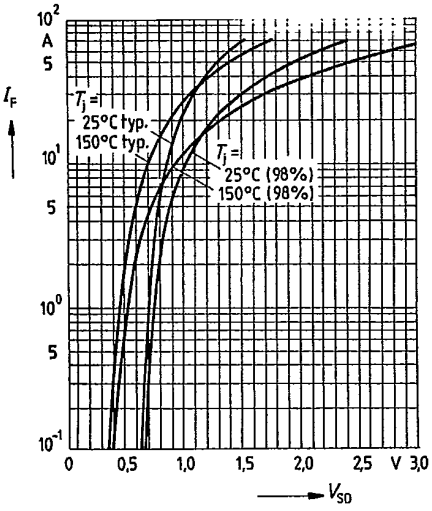
**Typical capacitances $C = f(V_{DS})$**
parameter: $V_{GS} = 0$, $f = 1$MHz




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

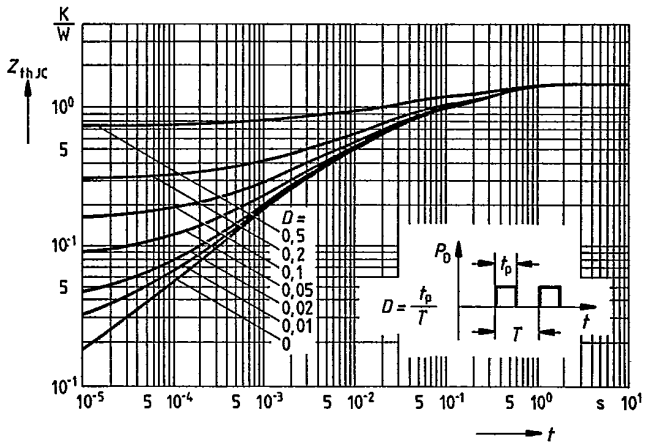



**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs
(spread)



SIEMENS AKTIENGESELLSCHAF

**Transient thermal impedance $Z_{thJC} = f(t)$**
**parameter: $D = t_p / T$**




**Typical gate-charge $V_{GS} = f(Q_{Gate})$**
**parameter: $I_{D\,puls} = 33A$**