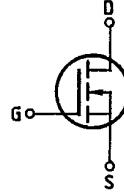


**Main ratings**

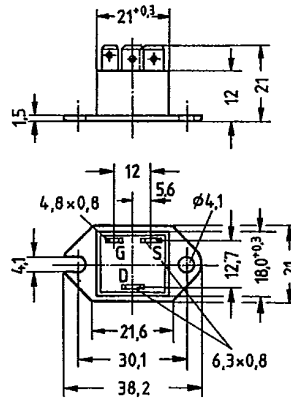
Drain-source voltage  $V_{DS} = 500 \text{ V}$   
 Continuous drain current  $I_D = 7,8 \text{ A}$   
 Drain-source on-resistance  $R_{DS(on)} = 0,6 \Omega$

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   |
|--------|-----------------|
| BUZ 48 | C67078-A1605-A2 |



Dimensions in mm

**Maximum ratings**

| Description                             | Symbols            | Ratings          | Units             | Conditions                    |
|-----------------------------------------|--------------------|------------------|-------------------|-------------------------------|
| Drain-source voltage                    | $V_{DS}$           | 500              | V                 |                               |
| Drain-gate voltage                      | $V_{DGR}$          | 500              | V                 | $R_{GS} = 20 \text{ k}\Omega$ |
| Continuous drain current                | $I_D$              | 7,8              | A                 | $T_C = 25^\circ\text{C}$      |
| Pulsed drain current                    | $I_{D(puls)}$      | 31               | A                 | $T_C = 25^\circ\text{C}$      |
| Gate-source voltage                     | $V_{GS}$           | $\pm 20$         | V                 |                               |
| Max. power dissipation                  | $P_D$              | 83,3             | W                 | $T_C = 25^\circ\text{C}$      |
| Operating and storage temperature range | $T_J$<br>$T_{stg}$ | $-40 \dots +150$ | $^\circ\text{C}$  |                               |
| Isolation test voltage                  | $V_{is}$           | 3500             | Vdc <sup>1)</sup> | $t = 1 \text{ min}$           |
| DIN humidity category                   |                    | F                |                   | DIN 40040                     |
| IEC climatic category                   |                    | 40/150/56        |                   | DIN IEC 68-1                  |

**Thermal resistance**

Chip - case  $R_{th JC} \leq 1,5 \text{ K/W}$

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

## SIEMENS AKTIENGESELLSCHAFT

**Electrical characteristics**(at  $T_j = 25^\circ\text{C}$  unless otherwise specified)

| Description | Symbol | Characteristics |      |      | Unit | Conditions |
|-------------|--------|-----------------|------|------|------|------------|
|             |        | min.            | typ. | max. |      |            |

**Static ratings**

|                                 |                |     |           |             |          |                                                                                           |
|---------------------------------|----------------|-----|-----------|-------------|----------|-------------------------------------------------------------------------------------------|
| Drain-source breakdown voltage  | $V_{(BR) DSS}$ | 500 | —         | —           | 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 | $I_{DSS}$      | —   | 20<br>100 | 250<br>1000 | $\mu A$  | $T_j = 25^\circ\text{C}$<br>$T_j = 125^\circ\text{C}$<br>$V_{DS} = 500V$<br>$V_{GS} = 0V$ |
| Gate-source leakage current     | $I_{GSS}$      | —   | 10        | 100         | nA       | $V_{GS} = 20V$<br>$V_{DS} = 0V$                                                           |
| Drain-source on-resistance      | $R_{DS(on)}$   | —   | 0,55      | 0,6         | $\Omega$ | $V_{GS} = 10V$<br>$I_D = 5A$                                                              |

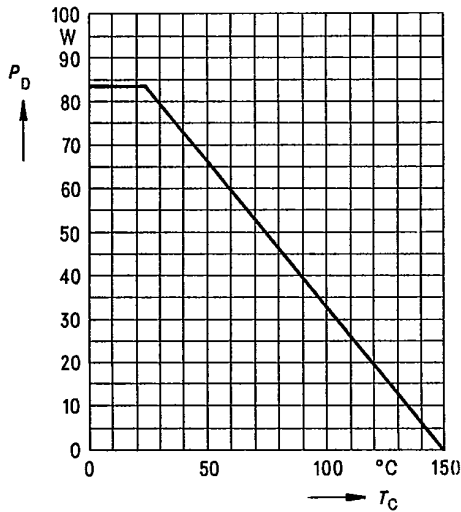
**Dynamic ratings**

|                                                             |              |     |      |      |    |                                                                         |
|-------------------------------------------------------------|--------------|-----|------|------|----|-------------------------------------------------------------------------|
| Forward transconductance                                    | $g_{fs}$     | 2,7 | 5,0  | —    | S  | $V_{DS} = 25V$<br>$I_D = 5A$                                            |
| Input capacitance                                           | $C_{iss}$    | —   | 3800 | 4900 | pF | $V_{GS} = 0V$<br>$V_{DS} = 25V$<br>$f = 1MHz$                           |
| Output capacitance                                          | $C_{oss}$    | —   | 250  | 400  |    |                                                                         |
| Reverse transfer capacitance                                | $C_{rss}$    | —   | 100  | 170  |    |                                                                         |
| Turn-on time $t_{on}$<br>( $t_{on} = t_{d(on)} + t_r$ )     | $t_{d(on)}$  | —   | 50   | 75   | ns | $V_{CC} = 30V$<br>$I_D = 2,8A$<br>$V_{GS} = 10V$<br>$R_{GS} = 50\Omega$ |
|                                                             | $t_r$        | —   | 80   | 120  |    |                                                                         |
| Turn-off time $t_{off}$<br>( $t_{off} = t_{d(off)} + t_f$ ) | $t_{d(off)}$ | —   | 330  | 430  |    |                                                                         |
|                                                             | $t_f$        | —   | 110  | 140  |    |                                                                         |

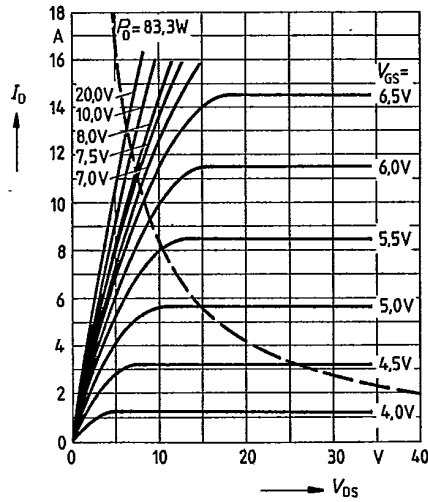
**Reverse diode**

|                                  |           |   |      |     |         |                                                                  |
|----------------------------------|-----------|---|------|-----|---------|------------------------------------------------------------------|
| Continuous reverse drain current | $I_{DR}$  | — | —    | 7,8 | A       | $T_C = 25^\circ\text{C}$                                         |
| Pulsed reverse drain current     | $I_{DRM}$ | — | —    | 31  |         |                                                                  |
| Diode forward on-voltage         | $V_{SD}$  | — | 1,3  | 1,6 | V       | $I_F = 2 \times I_{DR}$<br>$V_{GS} = 0V, T_j = 25^\circ\text{C}$ |
| Reverse recovery time            | $t_{rr}$  | — | 1200 | —   | ns      | $T_j = 25^\circ\text{C}$                                         |
| Reverse recovery charge          | $Q_{rr}$  | — | 12   | —   | $\mu C$ | $I_F = I_{DR}$<br>$dI_F/dt = 100A/\mu s$<br>$V_R = 100V$         |

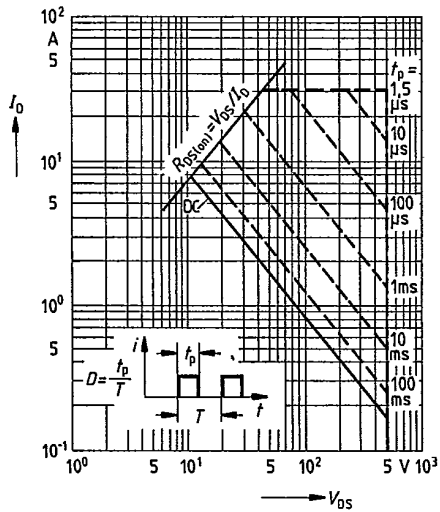
Power dissipation  $P_D = f(T_C)$



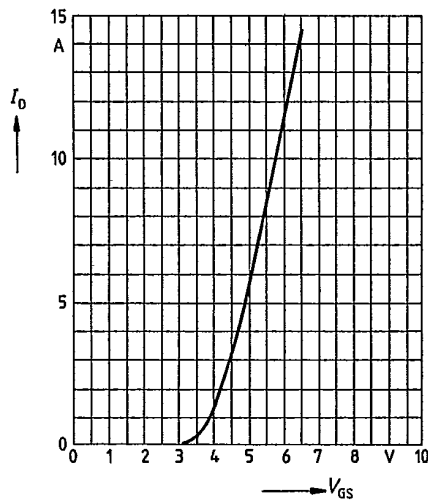
Typical output characteristics  $I_D = f(V_{DS})$   
parameter: 80  $\mu$ s pulse test,  
 $T_J = 25^\circ\text{C}$



Safe operating area  $I_D = f(V_{DS})$   
parameter:  $D = 0.01$ ,  $T_C = 25^\circ\text{C}$

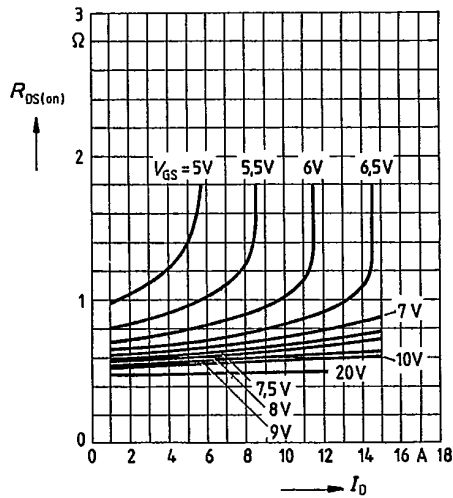


Typical transfer characteristic  $I_D = f(V_{GS})$   
parameter: 80  $\mu$ s pulse test,  
 $V_{DS} = 25\text{V}$ ,  $T_J = 25^\circ\text{C}$



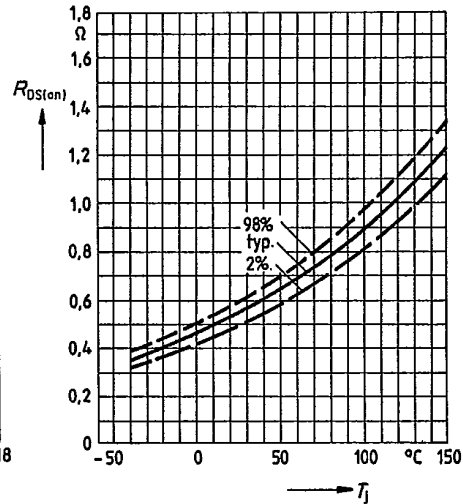
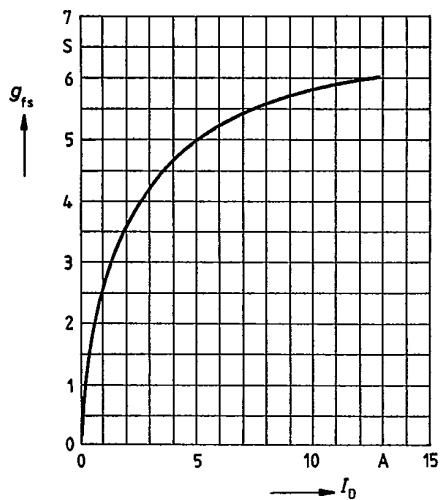
Typical drain-source on-state resistance

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

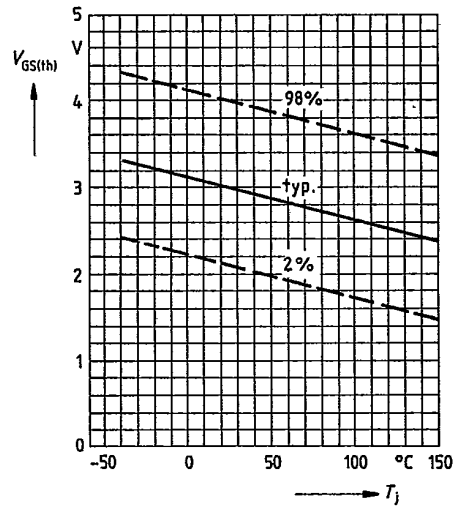
parameter:  $V_{GS}$ ;  $T_j = 25^\circ\text{C}$ 

Drain-source on-state resistance

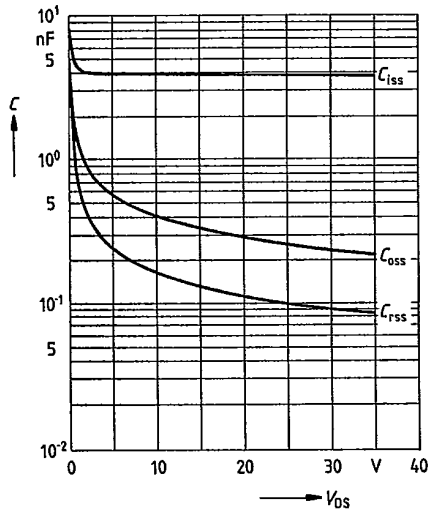
$R_{DS(on)} = f(T_j)$

parameter:  $I_D = 5.5\text{A}$ ,  $V_{GS} = 10\text{V}$  (spread)Typical transconductance  $g_{fs} = f(I_D)$ parameter: 80  $\mu\text{s}$  pulse test, $V_{DS} = 25\text{V}$ ,  $T_j = 25^\circ\text{C}$ Gate threshold voltage  $V_{GS(th)} = f(T_j)$ parameter:  $V_{DS} = V_{GS}$ ,  $I_D = 1\text{mA}$ 

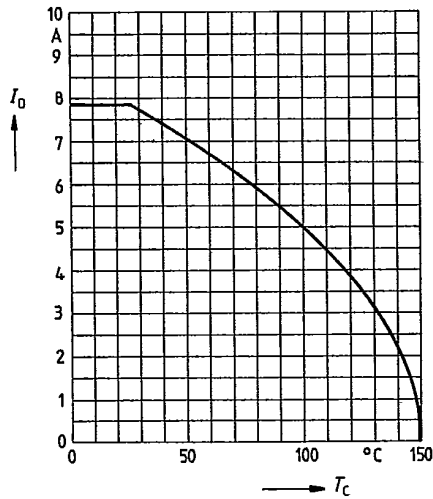
(spread)



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

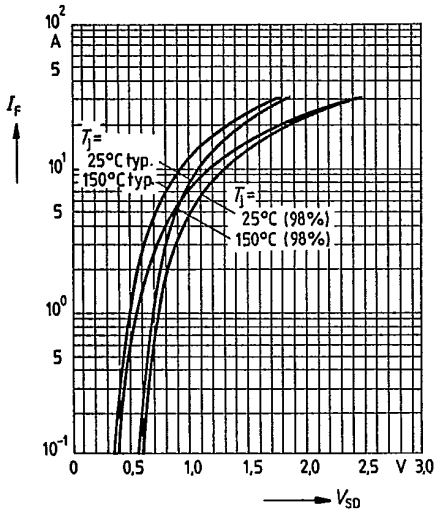


Continuous drain current  $I_D = f(T_C)$   
 parameter:  $V_{GS} \geq 10\text{ V}$

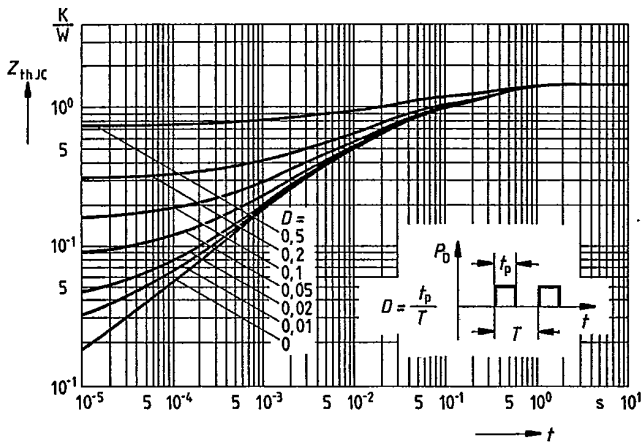


Forward characteristic of reverse diode

$I_F = f(V_{SD})$   
 parameter:  $T_f, t_p = 80\text{ }\mu\text{s}$   
 (spread)



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



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

