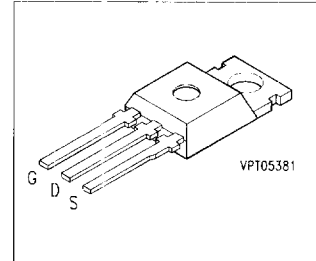


SIPMOS® Power Transistor

BUZ 215

- N channel
- Enhancement mode
- FREDFET



| Type | V_{DS} | I_D | $R_{DS(on)}$ | Package ¹⁾ | Ordering Code |
|----------------|----------|-------|--------------|-----------------------|-----------------|
| BUZ 215 | 500 V | 5.0 A | 1.5 Ω | TO-220 AB | C67078-A1400-A2 |

Maximum Ratings

| Parameter | Symbol | Values | Unit |
|--|----------------------|-----------------------|------------------|
| Continuous drain current, $T_C = 30\text{ }^\circ\text{C}$ | I_D | 5.0 | A |
| Pulsed drain current, $T_C = 25\text{ }^\circ\text{C}$ | $I_{D\text{ pulis}}$ | 20 | |
| Drain-source voltage | V_{DS} | 500 | V |
| Drain-gate voltage, $R_{GS} = 20\text{ k}\Omega$ | V_{DGR} | 500 | |
| Gate-source voltage | V_{GS} | ± 20 | |
| Power dissipation, $T_C = 25\text{ }^\circ\text{C}$ | P_{tot} | 75 | W |
| Operating and storage temperature range | T_J, T_{stg} | - 55 ... + 150 | $^\circ\text{C}$ |
| Thermal resistance, chip-case | $R_{th\text{ JC}}$ | ≤ 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 $T_j = 25\text{ °C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|-----------|--------|--------|------|------|------|
| | | min. | typ. | max. | |

Static characteristics

| | | | | | |
|---|---------------|-----|-----------|-------------|---------------|
| Drain-source breakdown voltage $V_{GS} = 0\text{ V}$, $I_D = 0.25\text{ mA}$ | $V_{(BR)DSS}$ | 500 | – | – | 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 $V_{DS} = 500\text{ V}$, $V_{GS} = 0\text{ V}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$ | I_{DSS} | – | 20 100 | 250 1000 | μA |
| Gate-source leakage current $V_{GS} = 20\text{ V}$, $V_{DS} = 0\text{ V}$ | I_{GSS} | – | 10 | 100 | nA |
| Drain-source on-resistance $V_{GS} = 10\text{ V}$, $I_D = 3.2\text{ A}$ | $R_{DS(on)}$ | – | 1.4 | 1.5 | Ω |

Dynamic characteristics

| | | | | | |
|---|--------------|-----|------|------|----|
| Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, $I_D = 3.2\text{ A}$ | g_{fs} | 1.5 | 2.7 | – | S |
| Input capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$ | C_{iss} | – | 1500 | 2000 | pF |
| Output capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$ | C_{oss} | – | 110 | 170 | |
| Reverse transfer capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$ | C_{rss} | – | 40 | 70 | |
| Turn-on time t_{on} , ($t_{on} = t_{d(on)} + t_r$) $V_{DS} = -30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 2.6\text{ A}$, $R_{GS} = 50\text{ }\Omega$ | $t_{d(on)}$ | – | 30 | 45 | ns |
| | t_r | – | 40 | 60 | |
| Turn-off time t_{off} , ($t_{off} = t_{d(off)} + t_f$) $V_{DS} = -30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 2.6\text{ A}$, $R_{GS} = 50\text{ }\Omega$ | $t_{d(off)}$ | – | 110 | 140 | |
| | t_f | – | 50 | 65 | |

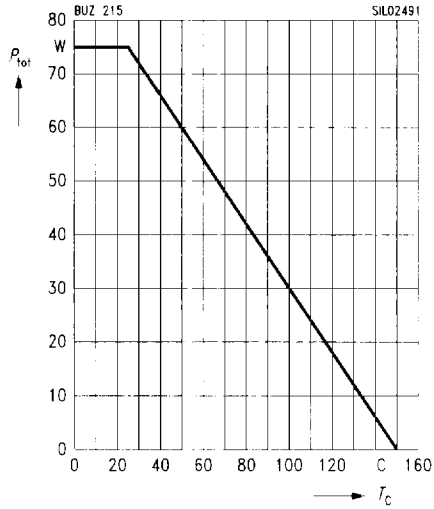
Electrical Characteristics (cont'd)
at $T_j = 25\text{ °C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|--|----------|--------|------|------|---------------|
| | | min. | typ. | max. | |
| Reverse diode | | | | | |
| Continuous reverse drain current $T_C = 25\text{ °C}$ | I_S | – | – | 5.0 | A |
| Pulsed reverse drain current $T_C = 25\text{ °C}$ | I_{SM} | – | – | 20 | |
| Diode forward on-voltage $I_S = 10\text{ A}$, $V_{GS} = 0\text{ V}$ | V_{SD} | – | 1.3 | 1.6 | V |
| Reverse recovery time $V_R = 100\text{ V}$, $I_F = I_S$, $di_F / dt = 100\text{ A}/\mu\text{s}$ | t_{rr} | – | 180 | 250 | ns |
| Reverse recovery charge $V_R = 100\text{ V}$, $I_F = I_S$, $di_F / dt = 100\text{ A}/\mu\text{s}$ | Q_{rr} | – | 0.65 | 1.2 | μC |

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

Total power dissipation

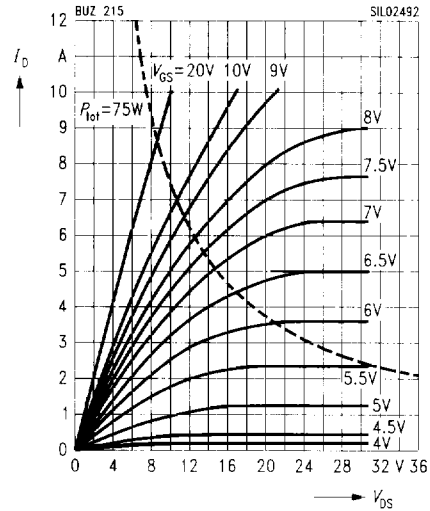
$P_{\text{tot}} = f(T_c)$



Typ. output characteristics

$I_D = f(V_{DS})$

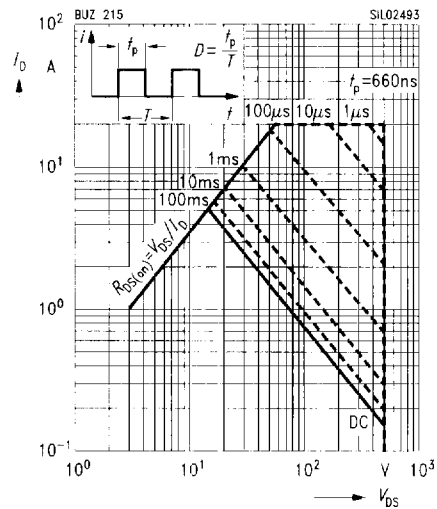
parameter: $t_p = 80\text{ }\mu\text{s}$



Safe operating area

$I_D = f(V_{DS})$

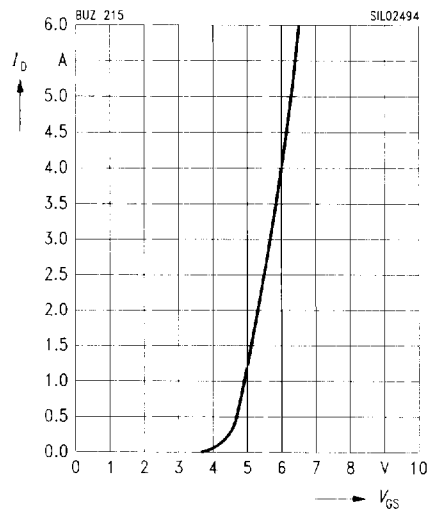
parameter: $D = 0.01$, $T_c = 25\text{ }^\circ\text{C}$



Typ. transfer characteristics

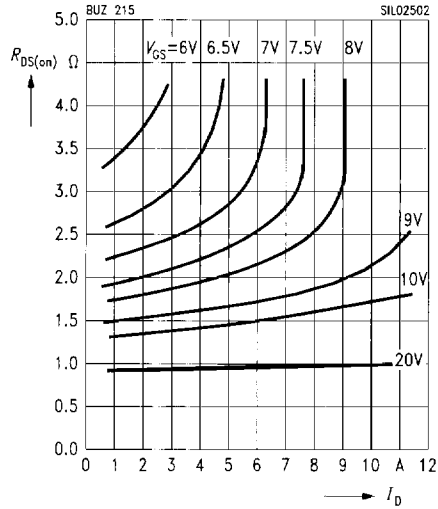
$I_D = f(V_{GS})$

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



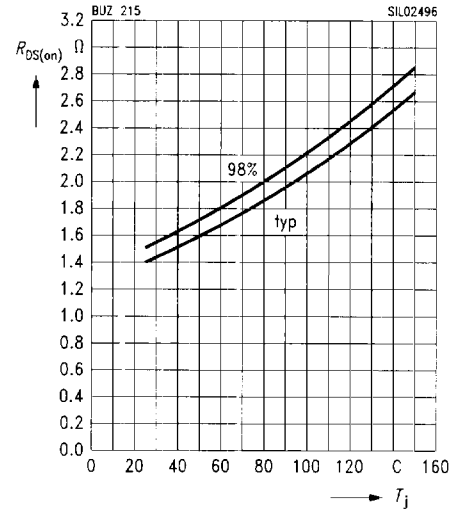
Typ. drain-source on-resistance

$R_{DS(on)} = f(I_D)$
parameter: V_{GS}



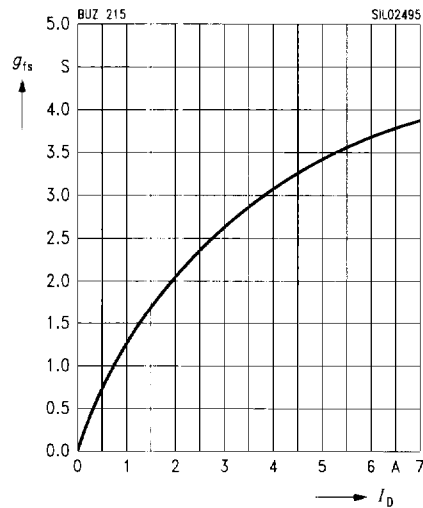
Drain-source on-resistance

$R_{DS(on)} = f(T_j)$
parameter: $I_D = 3.2$ A, $V_{GS} = 10$ V, (spread)



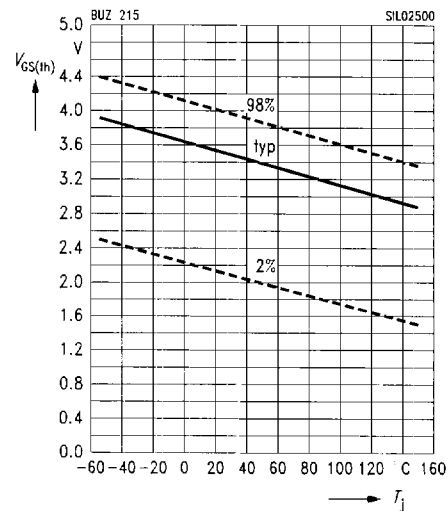
Typ. forward transconductance

$g_{fs} = f(I_D)$
parameter: $t_p = 80$ μs



Gate threshold voltage

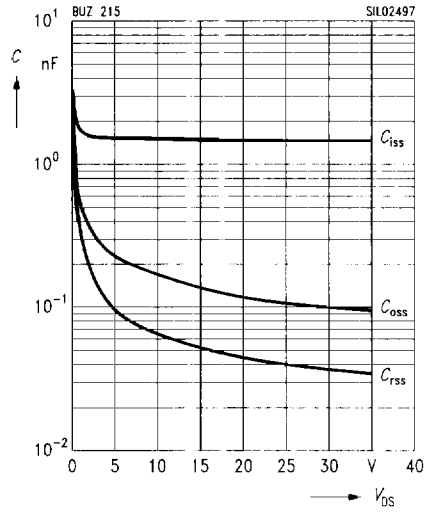
$V_{GS(th)} = f(T_j)$
parameter: $V_{GS} = V_{DS}$, $I_D = 1$ mA, (spread)



Typ. capacitances

$C = f(V_{DS})$

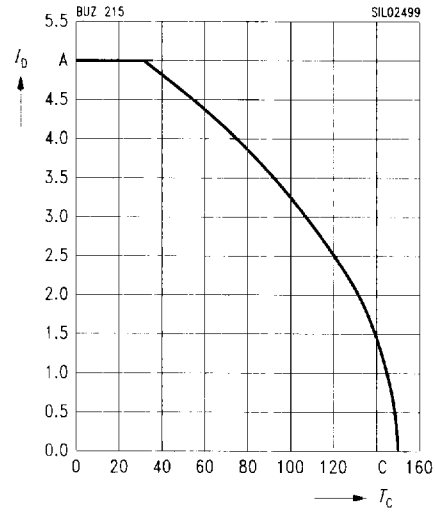
parameter: $V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$



Drain current

$I_D = f(T_C)$

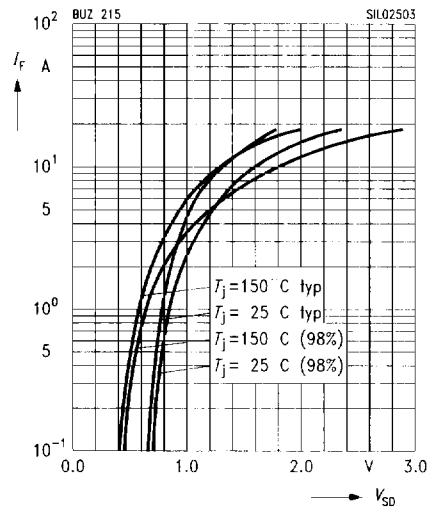
parameter: $V_{GS} \geq 10 \text{ V}$



Forward characteristics of reverse diode

$I_F = f(V_{SD})$

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



Transient thermal impedance

$Z_{thJC} = f(t_p)$

parameter: $D = t_p / T$

