

# PowerMOS transistor

## Isolated version of BUK455-200A/B

### BUK475-200A/B

#### GENERAL DESCRIPTION

N-channel enhancement mode field-effect power transistor in a plastic full-pack envelope. The device is intended for use in Switched Mode Power Supplies (SMPS), motor control, welding, DC/DC and AC/DC converters, and in general purpose switching applications.

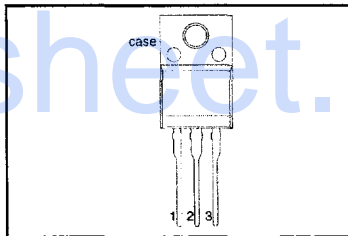
#### QUICK REFERENCE DATA

| SYMBOL       | PARAMETER                        | MAX.         | MAX.         | UNIT |
|--------------|----------------------------------|--------------|--------------|------|
|              | <b>BUK475</b>                    |              |              |      |
| $V_{DS}$     | Drain-source voltage             | -200A<br>200 | -200B<br>200 | V    |
| $I_D$        | Drain current (DC)               | 7.6          | 7            | A    |
| $P_{tot}$    | Total power dissipation          | 30           | 30           | W    |
| $T_j$        | Junction temperature             | 150          | 150          | °C   |
| $R_{DS(ON)}$ | Drain-source on-state resistance | 0.23         | 0.28         | Ω    |

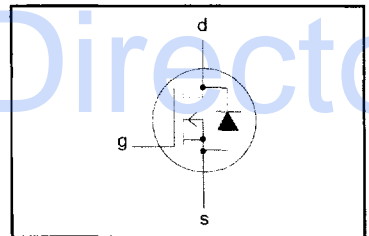
#### PINNING - SOT186A

| PIN  | DESCRIPTION |
|------|-------------|
| 1    | gate        |
| 2    | drain       |
| 3    | source      |
| case | isolated    |

#### PIN CONFIGURATION



#### SYMBOL



#### LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134)

| SYMBOL       | PARAMETER                        | CONDITIONS                            | MIN. | MAX.         | UNIT         |    |
|--------------|----------------------------------|---------------------------------------|------|--------------|--------------|----|
| $V_{DS}$     | Drain-source voltage             | -                                     | -    | 200          | V            |    |
| $V_{DGR}$    | Drain-gate voltage               | $R_{GS} = 20 \text{ k}\Omega$         | -    | 200          | V            |    |
| $\pm V_{GS}$ | Gate-source voltage              | -                                     | -    | 30           | V            |    |
|              |                                  |                                       |      | <b>-200A</b> | <b>-200B</b> |    |
| $I_D$        | Drain current (DC)               | $T_{hs} = 25 \text{ }^\circ\text{C}$  | -    | 7.6          | 7            | A  |
| $I_D$        | Drain current (DC)               | $T_{hs} = 100 \text{ }^\circ\text{C}$ | -    | 4.8          | 4.4          | A  |
| $I_{DM}$     | Drain current (pulse peak value) | $T_{hs} = 25 \text{ }^\circ\text{C}$  | -    | 30           | 28           | A  |
| $P_{tot}$    | Total power dissipation          | $T_{hs} = 25 \text{ }^\circ\text{C}$  | -    | 30           |              | W  |
| $T_{stg}$    | Storage temperature              | -                                     | -55  | 150          |              | °C |
| $T_j$        | Junction temperature             | -                                     | -    | 150          |              | °C |

#### THERMAL RESISTANCES

| SYMBOL        | PARAMETER                               | CONDITIONS             | MIN. | TYP. | MAX. | UNIT |
|---------------|---|------------------------|------|------|------|------|
| $R_{th j-hs}$ | Thermal resistance junction to heatsink | with heatsink compound | -    | -    | 4.17 | K/W  |
| $R_{th j-a}$  | Thermal resistance junction to ambient  |                        | -    | 55   | -    | K/W  |

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BUK475-200A/B

## STATIC CHARACTERISTICS

 $T_{hs} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified

| SYMBOL        | PARAMETER                        | CONDITIONS  | MIN. | TYP. | MAX. | UNIT          |
|---------------|----------------------------------|---|------|------|------|---------------|
| $V_{(BR)DSS}$ | Drain-source breakdown voltage   | $V_{GS} = 0\text{ V}; I_D = 0.25\text{ mA}$                                     | 200  | -    | -    | V             |
| $V_{GS(TO)}$  | Gate threshold voltage           | $V_{DS} = V_{GS}; I_D = 1\text{ mA}$  | 2.1  | 3.0  | 4.0  | V             |
| $I_{DSS}$     | Zero gate voltage drain current  | $V_{DS} = 200\text{ V}; V_{GS} = 0\text{ V}; T_J = 25\text{ }^{\circ}\text{C}$  | -    | 1    | 10   | $\mu\text{A}$ |
| $I_{DSS}$     | Zero gate voltage drain current  | $V_{DS} = 200\text{ V}; V_{GS} = 0\text{ V}; T_J = 125\text{ }^{\circ}\text{C}$ | -    | 0.1  | 1.0  | $\text{mA}$   |
| $I_{GSS}$     | Gate source leakage current      | $V_{GS} = \pm 30\text{ V}; V_{DS} = 0\text{ V}$                                 | -    | 10   | 100  | $\text{nA}$   |
| $R_{DS(ON)}$  | Drain-source on-state resistance | $V_{GS} = 10\text{ V}; I_D = 7\text{ A}$  | -    | 0.2  | 0.23 | $\Omega$      |
|               |                                  | <b>BUK475-200A</b>  | -    | 0.22 | 0.28 | $\Omega$      |
|               |                                  | <b>BUK475-200B</b>  | -    | 0.22 | 0.28 | $\Omega$      |

## DYNAMIC CHARACTERISTICS

 $T_{hs} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified

| SYMBOL       | PARAMETER                  | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|--------------|----------------------------|--|------|------|------|------|
| $g_{fs}$     | Forward transconductance   | $V_{DS} = 25\text{ V}; I_D = 7\text{ A}$                       | 6    | 8.4  | -    | S    |
| $C_{iss}$    | Input capacitance          | $V_{GS} = 0\text{ V}; V_{DS} = 25\text{ V}; f = 1\text{ MHz}$  | -    | 1400 | 1750 | pF   |
| $C_{oss}$    | Output capacitance         |  | -    | 190  | 250  | pF   |
| $C_{rss}$    | Feedback capacitance       |  | -    | 55   | 80   | pF   |
| $t_{d\ on}$  | Turn-on delay time         | $V_{DD} = 30\text{ V}; I_D = 3\text{ A};$                      | -    | 18   | 30   | ns   |
| $t_r$        | Turn-on rise time          | $V_{GS} = 10\text{ V}; R_{GS} = 50\text{ }\Omega;$             | -    | 35   | 60   | ns   |
| $t_{d\ off}$ | Turn-off delay time        | $R_{gen} = 50\text{ }\Omega$                                   | -    | 85   | 120  | ns   |
| $t_f$        | Turn-off fall time         |  | -    | 35   | 50   | ns   |
| $L_d$        | Internal drain inductance  | Measured from drain lead 6 mm from package to centre of die    | -    | 4.5  | -    | nH   |
| $L_s$        | Internal source inductance | Measured from source lead 6 mm from package to source bond pad | -    | 7.5  | -    | nH   |

## ISOLATION LIMITING VALUE &amp; CHARACTERISTIC

 $T_{hs} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified

| SYMBOL     | PARAMETER  | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|------------|--|--|------|------|------|------|
| $V_{isol}$ | R.M.S. isolation voltage from all three terminals to external heatsink | $f = 50\text{-}60\text{ Hz};$ sinusoidal waveform;<br>$R.H. \leq 65\%;$ clean and dustfree | -    |      | 2500 | V    |
| $C_{isol}$ | Capacitance from T2 to external heatsink                               | $f = 1\text{ MHz}$   | -    | 10   | -    | pF   |

## REVERSE DIODE LIMITING VALUES AND CHARACTERISTICS

 $T_{hs} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified

| SYMBOL    | PARAMETER                        | CONDITIONS   | MIN. | TYP. | MAX. | UNIT          |
|-----------|----------------------------------|--|------|------|------|---------------|
| $I_{DR}$  | Continuous reverse drain current | -  | -    | -    | 7.6  | A             |
| $I_{DRM}$ | Pulsed reverse drain current     | -  | -    | -    | 30   | A             |
| $V_{SD}$  | Diode forward voltage            | $I_F = 7.6\text{ A}; V_{GS} = 0\text{ V}$                  | -    | 1.0  | 1.5  | V             |
| $t_{rr}$  | Reverse recovery time            | $I_F = 7.6\text{ A}; -di_F/dt = 100\text{ A}/\mu\text{s};$ | -    | 150  | -    | ns            |
| $Q_{rr}$  | Reverse recovery charge          | $V_{GS} = 0\text{ V}; V_R = 30\text{ V}$                   | -    | 1.3  | -    | $\mu\text{C}$ |

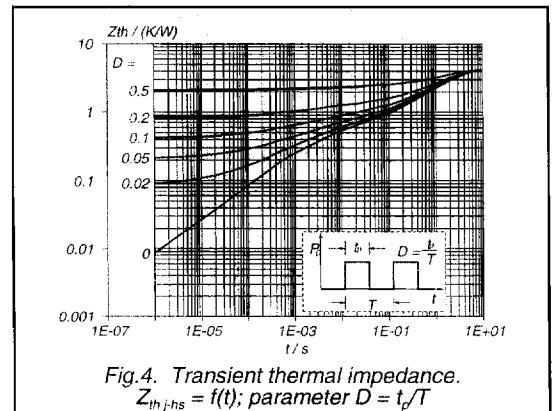
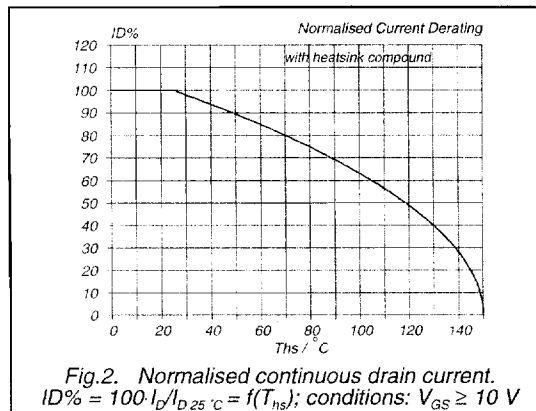
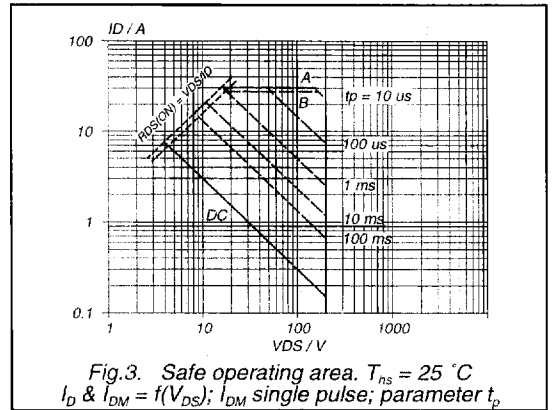
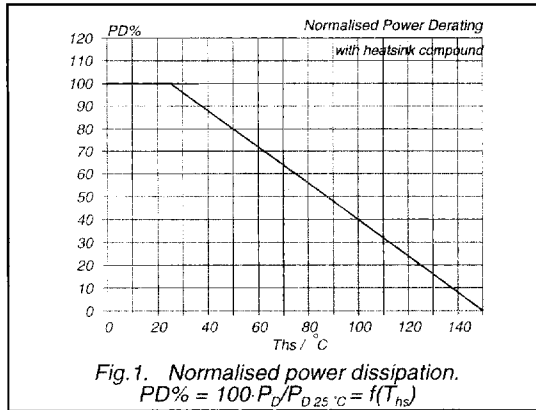
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**AVALANCHE LIMITING VALUE**

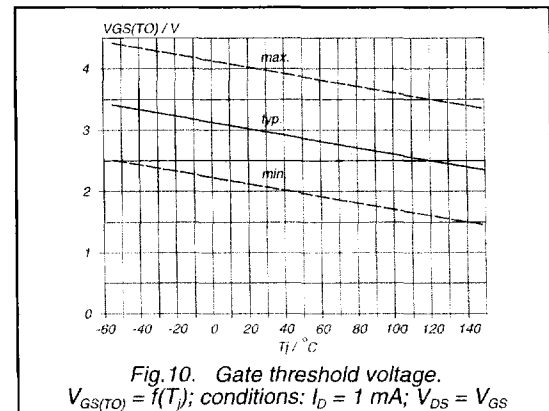
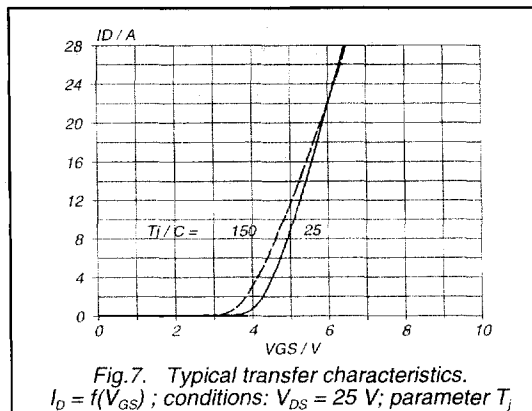
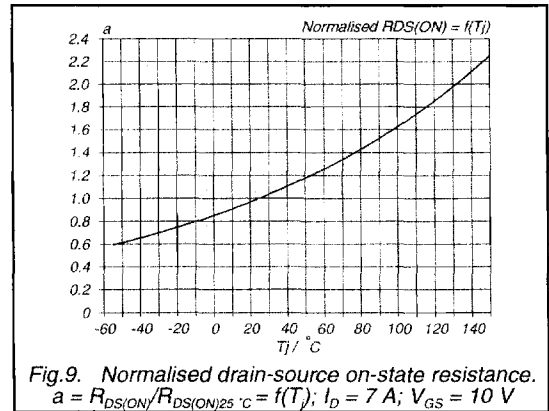
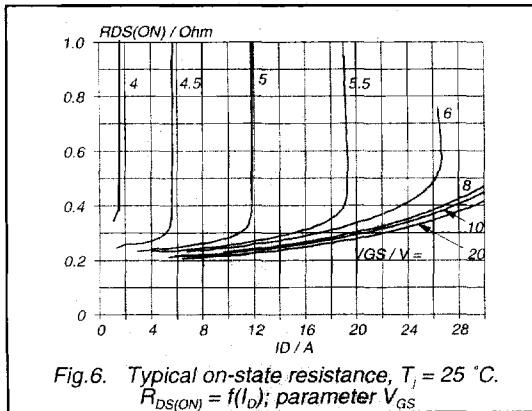
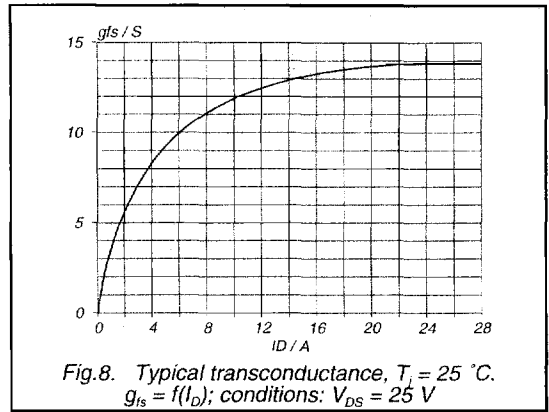
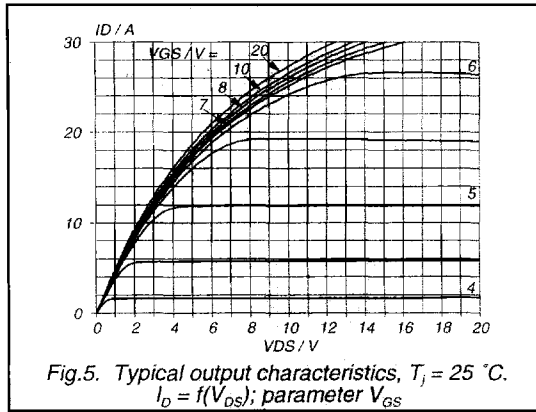
$T_{hs} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified

| SYMBOL    | PARAMETER   | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|-----------|---|--|------|------|------|------|
| $W_{DSS}$ | Drain-source non-repetitive unclamped inductive turn-off energy | $I_D = 14\text{ A}$ ; $V_{DD} \leq 100\text{ V}$ ;<br>$V_{GS} = 10\text{ V}$ ; $R_{GS} = 50\text{ }\Omega$ | -    | -    | 100  | mJ   |



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