# BUZ74A

## N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR

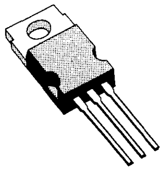
| TYPE | $V_{DSS}$ | $R_{DS(on)}$ | $I_D$ |
|---|---|---|---|
| BUZ74A | 500 V | 4 Ω | 2 A |

- HIGH VOLTAGE - FOR OFF-LINE SMPS
- ULTRA FAST SWITCHING FOR OPERATION AT > 100KHz
- EASY DRIVE - FOR REDUCED COST AND SIZE

**INDUSTRIAL APPLICATIONS:**

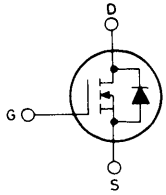
- SWITCH MODE POWER SUPPLIES
- MOTOR CONTROLS

N - channel enhancement mode POWER MOS field effect transistor. Easy drive and very fast switching times make this POWER MOS transistor ideal for high speed switching applications.
Typical applications include switching power supplies, uninterruptible power supplies and motor speed control.



**TO-220**

**INTERNAL SCHEMATIC DIAGRAM**



### ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|---|---|---|
| $V_{DS}$ | Drain-source voltage ($V_{GS}=0$) | 500 | V |
| $V_{DGR}$ | Drain-gate voltage ($R_{GS}=20$ KΩ) | 500 | V |
| $V_{GS}$ | Gate-source voltage | ±20 | V |
| $I_D$ | Drain current (continuous) $T_c=40°C$ | 2 | A |
| $I_{DM}$ | Drain current (pulsed) | 8 | A |
| $P_{tot}$ | Total dissipation at $T_c < 25°C$ | 40 | W |
| $T_{stg}$ | Storage temperature | −55 to 150 | °C |
| $T_j$ | Max. operating junction temperature | 150 | °C |
| | DIN humidity category (DIN 40040) | E | |
| | IEC climatic category (DIN IEC 68-1) | 55/150/56 | |

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## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{thj-case}$ | Thermal resistance junction-case | max | 3.1 | °C/W |
| $R_{thj-amb}$ | Thermal resistance junction-ambient | max | 75 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_j = 25°C$ unless otherwise specified)

### OFF

| Parameters | | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-source breakdown voltage | $I_D = 250\ \mu A$ | $V_{GS} = 0$ | 500 | | | V |
| $I_{DSS}$ | Zero gate voltage drain current ($V_{GS} = 0$) | $V_{DS}$ = Max Rating<br>$V_{DS}$ = Max Rating | <br>$T_j = 125°C$ | | | 250<br>1000 | μA<br>μA |
| $I_{GSS}$ | Gate-body leakage current ($V_{DS} = 0$) | $V_{GS} = \pm 20$ V | | | | ±100 | nA |

### ON

| Parameters | | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_{GS(th)}$ | Gate threshold voltage | $V_{DS} = V_{GS}$ | $I_D = 1$ mA | 2.1 | | 4 | V |
| $R_{DS(on)}$ | Static drain-source on resistance | $V_{GS} = 10$ V | $I_D = 1.2$ A | | | 4.0 | Ω |

### DYNAMIC

| Parameters | | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $g_{fs}$ | Forward transconductance | $V_{DS} = 25$ V | $I_D = 1.2$ A | 0.8 | | | mho |
| $C_{iss}$<br>$C_{oss}$<br>$C_{rss}$ | Input capacitance<br>Output capacitance<br>Reverse transfer capacitance | $V_{DS} = 25$ V<br>$V_{GS} = 0$ | f = 1 MHz | | | 500<br>80<br>55 | pF<br>pF<br>pF |

### SWITCHING

| Parameters | | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $t_{d(on)}$<br>$t_r$<br>$t_{d(off)}$<br>$t_f$ | Turn-on time<br>Rise time<br>Turn-off delay time<br>Fall time | $V_{DD} = 30$ V<br>$R_{GS} = 50\ \Omega$ | $I_D = 2.1$ A<br>$V_{GS} = 10$ V | | | 20<br>60<br>65<br>40 | ns<br>ns<br>ns<br>ns |

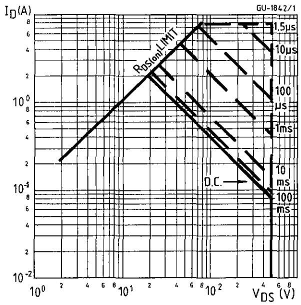
## ELECTRICAL CHARACTERISTICS (Continued)

| Parameters | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|

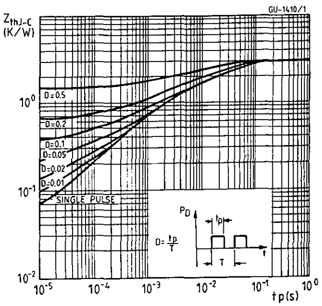
### SOURCE DRAIN DIODE

| | | | | | |
|---|---|---|---|---|---|
| $I_{SD}$ Source-drain current<br>$I_{SDM}$ Source-drain current (pulsed) | $T_c = 25°C$ | | | 2<br>8 | A<br>A |
| $V_{SD}$ Forward on voltage | $I_{SD} = 4$ A $V_{GS} = 0$ | | | 1.3 | V |
| $t_{rr}$ Reverse recovery time<br>$Q_{rr}$ Reverse recovered charge | $I_{SD} = 2$ A di/dt = 100A/µs | | 350<br>3.5 | | ns<br>µC |

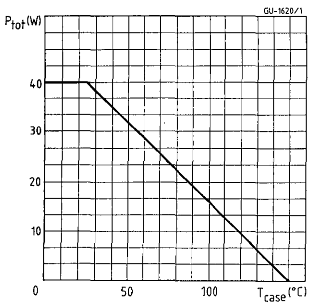
Safe operating areas



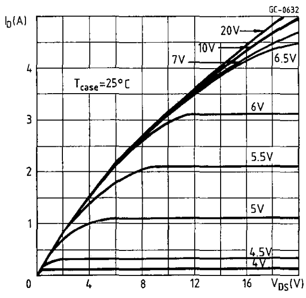
Thermal impedance



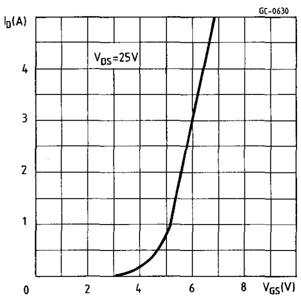
Derating curve



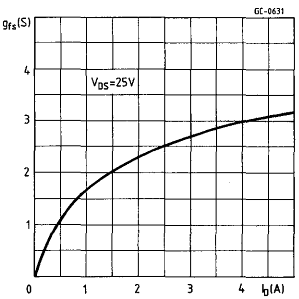
Output characteristics



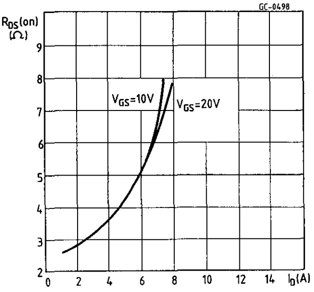
Transfer characteristics



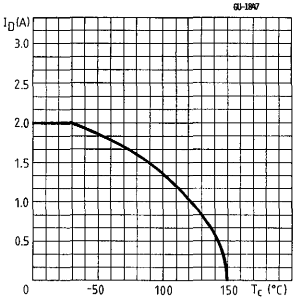
Transconductance



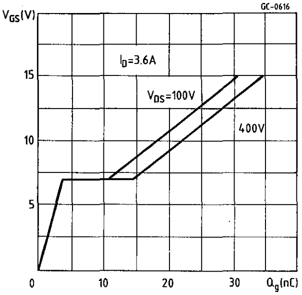
Static drain-source on resistance



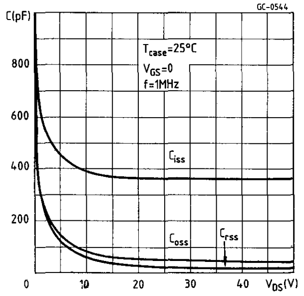
Maximum drain current vs temperature



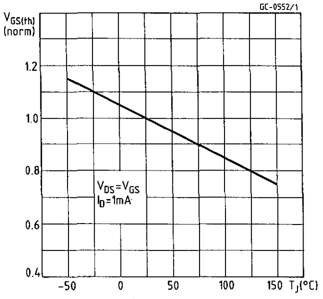
Gate charge vs gate-source voltage



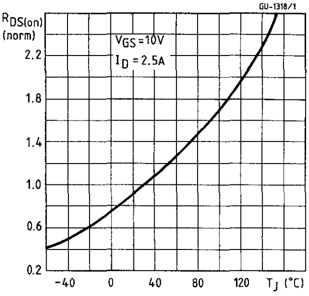
Capacitance variation



Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics