



## UF3055

Power MOSFET

### N-CHANNEL ENHANCEMENT MODE POWER MOSFET

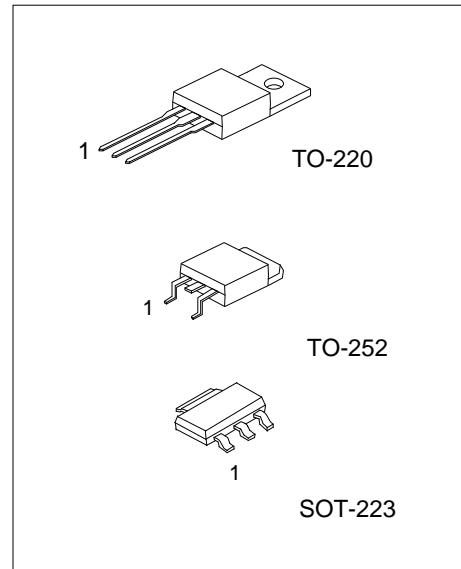
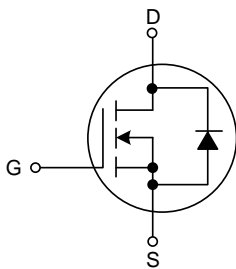
#### DESCRIPTION

As an N-channel enhancement mode power MOSFET, the UTC UF3055 is designed for low voltage, high speed switching applications in power supplies, converters and power motor controls and bridge circuits.

#### FEATURES

\*  $R_{DS(ON)} \leq 110 \text{ m}\Omega @ V_{GS} = 10 \text{ V}, I_D = 1.5 \text{ A}$

#### SYMBOL



#### ORDERING INFORMATION

| Ordering Number |               | Package | Pin Assignment |   |   | Packing   |
|-----------------|---------------|---------|----------------|---|---|-----------|
| Lead Free       | Halogen Free  |         | 1              | 2 | 3 |           |
| UF3055L-AA3-R   | UF3055G-AA3-R | SOT-223 | G              | D | S | Tape Reel |
| UF3055L-TA3-R   | UF3055G-TA3-R | TO-220  | G              | D | S | Tube      |
| UF3055L-TN3-R   | UF3055G-TN3-R | TO-252  | G              | D | S | Tape Reel |

Note: Pin Assignment: G: Gate D: Drain S: Source

|  |  |
|--|--|
| <p>UF3055G-AA3-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul> | <ul style="list-style-type: none"> <li>(1) R: Tape Reel, T: Tube</li> <li>(2) AA3: SOT-223, TA3: TO-220, TN3: TO-252</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul> |
|--|--|

#### MARKING

| SOT-223   | TO-220 / TO-252  |
|---|--|
| <p>UF3055 □<br/>□ □ □ □ □ □<br/>1</p> <p>L: Lead Free<br/>G: Halogen Free<br/>Date Code</p> | <p>UTC<br/>UF3055 □<br/>□ □ □ □ □ □<br/>1</p> <p>L: Lead Free<br/>G: Halogen Free<br/>Date Code<br/>Lot Code</p> |

■ **ABSOLUTE MAXIMUM RATINGS** ( $T_C = 25^\circ\text{C}$ , unless otherwise noted)

| PARAMETER   | SYMBOL    | RATINGS                            | UNIT             |
|---|-----------|------------------------------------|------------------|
| Drain Source Voltage                                  | $V_{DSS}$ | 60                                 | V                |
| Drain Gate Voltage ( $R_{GS} = 10M\Omega$ )           | $V_{DGR}$ | 60                                 | V                |
| Gate Source Voltage                                   | $V_{GSS}$ | Continuous                         | $\pm 20$         |
|   |           | Non-Repetitive ( $t_P \leq 10$ ms) | $\pm 30$         |
| Continuous Drain Current ( $T_A = 25^\circ\text{C}$ ) | $I_D$     | 3.0                                | A                |
| Pulsed Drain Current ( $t_P \leq 10$ $\mu\text{s}$ )  | $I_{DM}$  | 9.0                                | A                |
| Single Pulsed Avalanche Energy (Note 2)               | EAS       | 74                                 | mJ               |
| Power Dissipation ( $T_A = 25^\circ\text{C}$ )        | SOT-223   | 0.8                                | W                |
|   | TO-220    | 2                                  | W                |
|   | TO-252    | 1.13                               | W                |
| Junction Temperature                                  | $T_J$     | +150                               | $^\circ\text{C}$ |
| Strong Temperature                                    | $T_{STG}$ | -55 ~ +175                         | $^\circ\text{C}$ |

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2.  $T_J = 25^\circ\text{C}$ ,  $V_{DD} = 25\text{V}$ ,  $V_{GS} = 10\text{V}$ ,  $I_L = 7.0\text{A}$ ,  $L = 3.0\text{mH}$ ,  $V_{DS} = 60\text{V}$

■ **THERMAL DATA**

| PARAMETER                  | SYMBOL        | RATINGS | UNIT |
|----------------------------|---------------|---------|------|
| Junction to Ambient (Note) | $\theta_{JA}$ | SOT-223 | 150  |
|                            |               | TO-220  | 62   |
|                            |               | TO-252  | 110  |

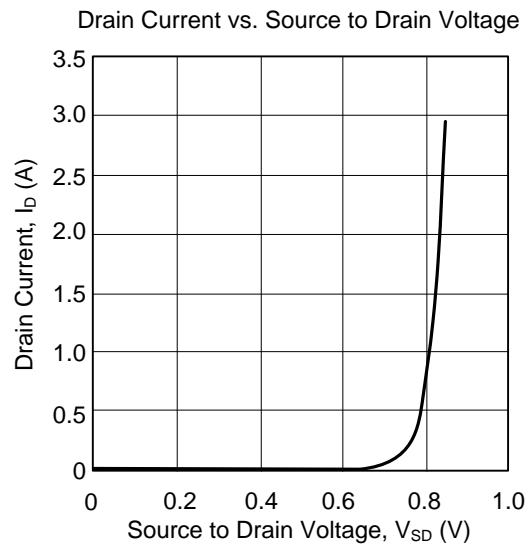
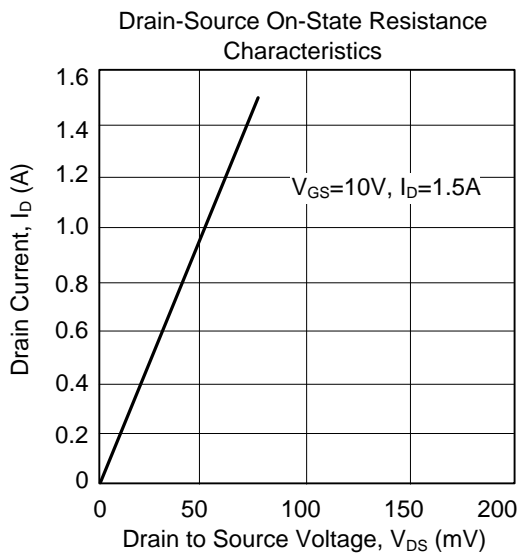
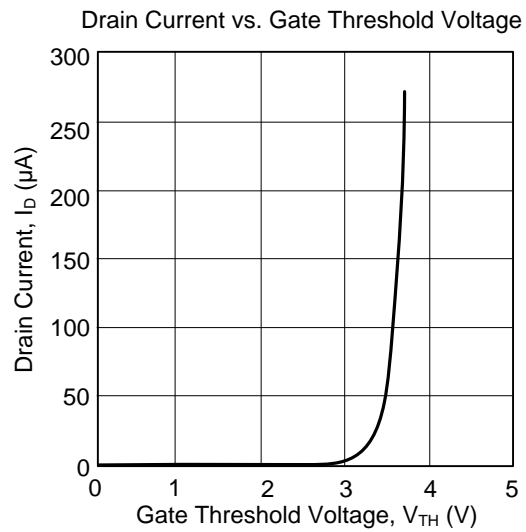
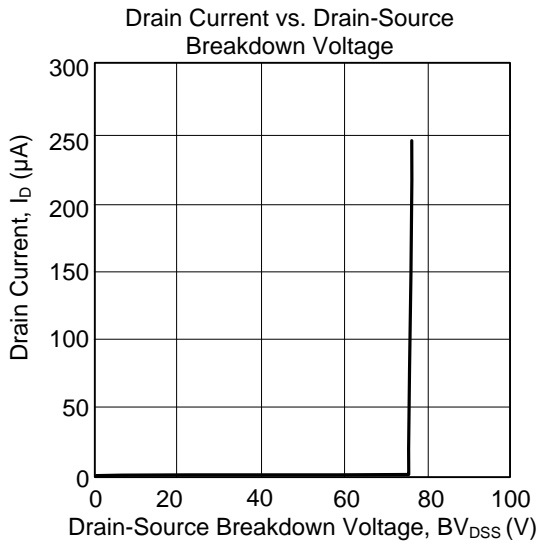
■ **ELECTRICAL CHARACTERISTICS** ( $T_J = 25^\circ\text{C}$ , unless otherwise noted)

| PARAMETER   | SYMBOL       | TEST CONDITIONS   | MIN | TYP  | MAX       | UNIT       |
|---|--------------|---|-----|------|-----------|------------|
| <b>OFF CHARACTERISTICS</b>                                    |              |   |     |      |           |            |
| Drain Source Breakdown Voltage (Note 1)                       | $BV_{DSS}$   | $V_{GS} = 0V, I_D = 250\mu A$   | 60  | 68   |           | V          |
| Temperature Coefficient (Positive)                            |              |   |     | 66   |           | mV/°C      |
| Drain-Source Leakage Current                                  | $I_{DSS}$    | $V_{GS} = 0V, V_{DS} = 60V$   |     |      | 1.0       | $\mu A$    |
| Gate-Source Leakage Current                                   | $I_{GSS}$    | $V_{GS} = \pm 20V, V_{DS} = 0V$   |     |      | $\pm 100$ | nA         |
| <b>ON CHARACTERISTICS</b> (Note 1)                            |              |   |     |      |           |            |
| Gate Threshold Voltage  | $V_{GS(TH)}$ | $V_{GS} = V_{DS}, I_D = 250\mu A$                                       | 2.0 | 3.0  | 4.0       | V          |
| Temperature Coefficient (Negative)                            |              |   |     |      | 6.6       |            |
| Static Drain-Source On-State Resistance                       | $R_{DS(ON)}$ | $V_{GS} = 10V, I_D = 1.5A$  |     | 50   | 110       | m $\Omega$ |
| Static Drain-to-Source On-Resistance                          | $V_{DS(ON)}$ | $V_{GS} = 10V, I_D = 3A$  |     | 0.15 | 0.40      | V          |
| Forward Transconductance                                      | $g_{FS}$     | $V_{DS} = 8.0V, I_D = 1.7A$   |     | 3.2  |           | S          |
| <b>DYNAMIC PARAMETERS</b>                                     |              |   |     |      |           |            |
| Input Capacitance   | $C_{ISS}$    | $V_{GS} = 0V, V_{DS} = 25V,$<br>$f = 1.0MHz$                            |     | 700  | 780       | pF         |
| Output Capacitance  | $C_{OSS}$    |   |     | 180  | 210       | pF         |
| Reverse Transfer Capacitance                                  | $C_{RSS}$    |   |     | 20   | 50        | pF         |
| <b>SWITCHING PARAMETERS</b> (Note 2)                          |              |   |     |      |           |            |
| Total Gate Charge   | $Q_G$        | $V_{GS} = 10V, V_{DS} = 48V,$<br>$I_D = 3.0A$ (Note 1)                  |     | 50   | 70        | nC         |
| Gate-Source Charge  | $Q_{GS}$     |   |     | 6    |           | nC         |
| Gate-Drain Charge   | $Q_{GD}$     |   |     | 3    |           | nC         |
| Turn-ON Delay Time  | $t_{D(ON)}$  | $V_{GS} = 10V, V_{DD} = 30V,$<br>$I_D = 3.0A, R_G = 9.1\Omega$ (Note 1) |     | 50   | 70        | ns         |
| Turn-ON Rise Time   | $t_R$        |   |     | 40   | 60        | ns         |
| Turn-OFF Delay Time   | $t_{D(OFF)}$ |   |     | 95   | 115       | ns         |
| Turn-OFF Fall-Time  | $t_F$        |   |     | 30   | 50        | ns         |
| <b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b> |              |   |     |      |           |            |
| Diode Forward Voltage   | $V_{SD}$     | $V_{GS} = 0V, I_S = 3.0A$   |     | 0.89 | 1.0       | V          |
| Body Diode Reverse Recovery Time                              | $t_{rr}$     | $V_{GS} = 0V, I_S = 3.0A,$<br>$di/dt = 100 A/\mu s$ (Note 1)            |     | 30   |           | ns         |
|   | $t_A$        |   |     | 22   |           | ns         |
|   | $t_B$        |   |     | 8.6  |           | ns         |
| Body Diode Reverse Recovery Charge                            | $Q_{rr}$     |   |     | 0.04 |           | nC         |

Notes: 1. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

2. Switching characteristics are independent of operating junction temperatures.

## TYPICAL CHARACTERISTICS



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