



## UTM2513

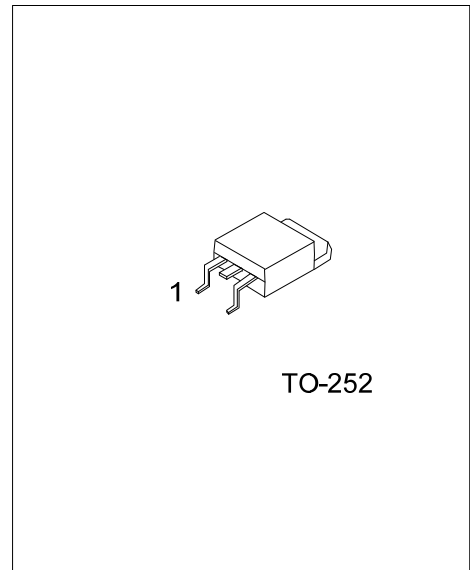
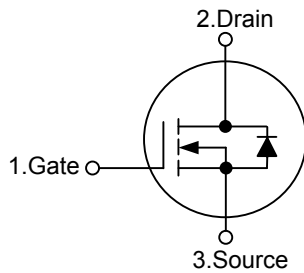
Power MOSFET

### N-CHANNEL ENHANCEMENT MODE

#### FEATURES

- \*  $R_{DS(ON)} = 10.5m\Omega$ (typ.) @  $V_{GS} = 10 V$
- \*  $R_{DS(ON)} = 16m\Omega$ (typ.) @  $V_{GS} = 4.5 V$
- \* Low capacitance
- \* Optimized gate charge
- \* Fast switching capability
- \* Avalanche energy specified

#### SYMBOL



TO-252

Lead-free: UTM2513L  
Halogen-free: UTM2513G

#### ORDERING INFORMATION

| Ordering Number |                   |                | Package | Pin Assignment |   |   | Packing   |
|-----------------|-------------------|----------------|---------|----------------|---|---|-----------|
| Normal          | Lead Free Plating | Halogen Free   |         | 1              | 2 | 3 |           |
| UTM2513-TN3-R   | UTM2513L-TN3-R    | UTM2513G-TN3-R | TO-252  | G              | D | S | Tape Reel |
| UTM2513-TN3-T   | UTM2513L-TN3-T    | UTM2513G-TN3-T | TO-252  | G              | D | S | Tube      |

|  |  |
|--|--|
| <p>UTM2513L-TN3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Plating</p> | <p>(1) R: Tape Reel, T: Tube</p> <p>(2) TN3: TO-252</p> <p>(3) G: Halogen Free, L: Lead Free Plating, Blank: Pb/Sn</p> |
|--|--|



■ ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                | SYMBOL    | RATINGS    | UNIT             |
|--------------------------|-----------|------------|------------------|
| Drain-Source Voltage     | $V_{DSS}$ | 25         | V                |
| Gate-Source Voltage      | $V_{GSS}$ | $\pm 20$   | V                |
| Continuous Drain Current | $I_D$     | 40         | A                |
| Pulsed Drain Current     | $I_{DM}$  | 90         | A                |
| Power Dissipation        | $P_D$     | 50         | W                |
| Junction Temperature     | $T_J$     | 150        | $^\circ\text{C}$ |
| Storage Temperature      | $T_{STG}$ | -55 ~ +150 | $^\circ\text{C}$ |

Note: 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.

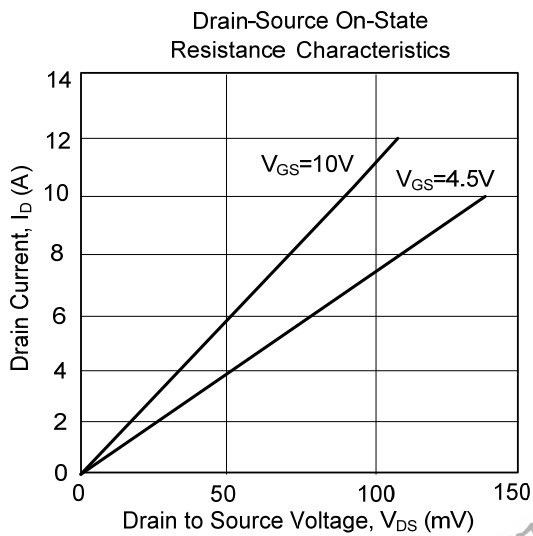
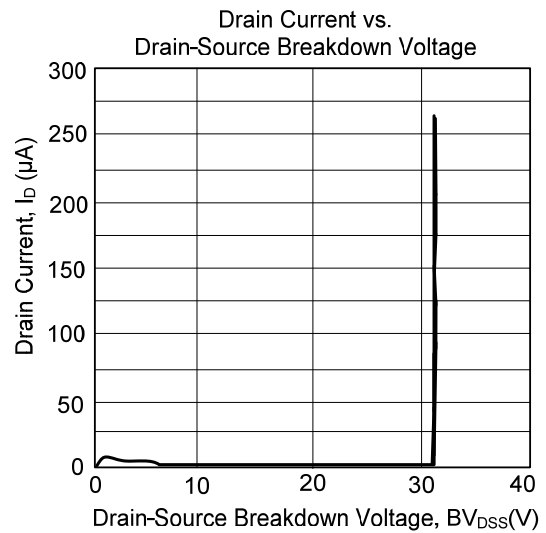
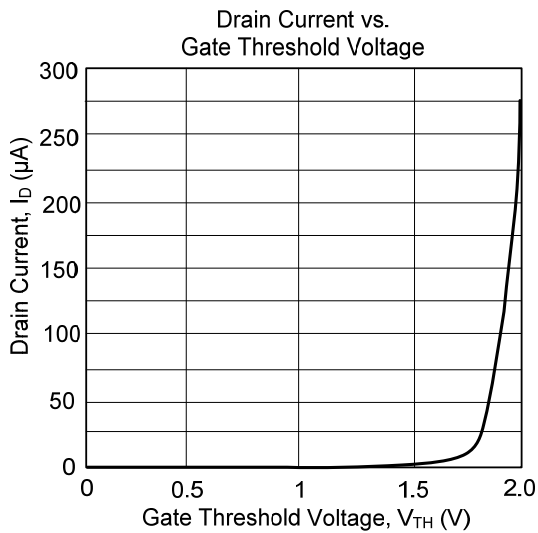
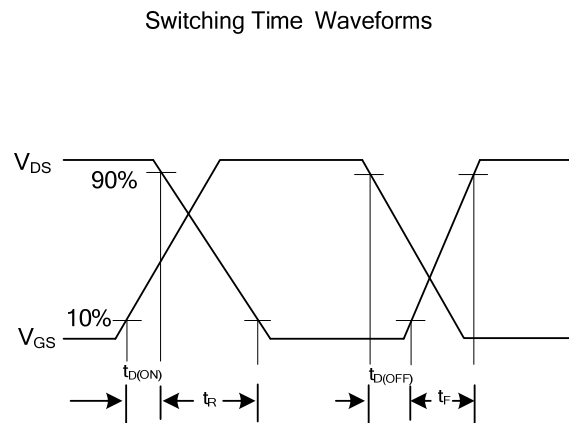
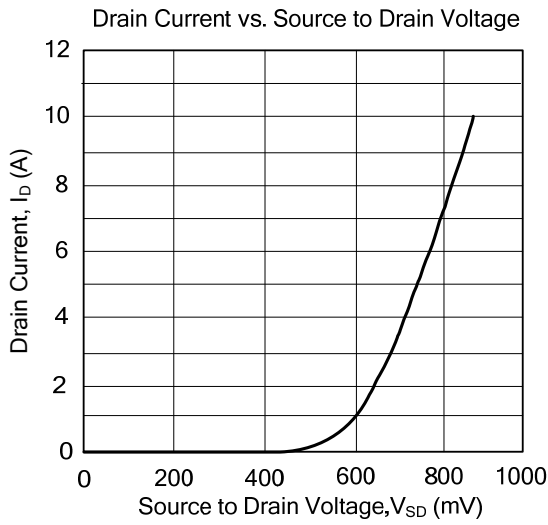
2. Pulse width limited by  $T_{J(MAX)}$

■ 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                         | $BV_{DSS}$   | $V_{GS}=0V, I_{DS}=250\mu A$          | 25   |      |           | V          |
| Drain-Source Leakage Current                           | $I_{DSS}$    | $V_{DS}=24V, V_{GS}=0V$               |      |      | 1         | $\mu A$    |
| Gate-Source Leakage Current                            | $I_{GSS}$    | $V_{DS}=0V, V_{GS}=\pm 20V$           |      |      | $\pm 100$ | nA         |
| <b>ON CHARACTERISTICS</b>                              |              |                                       |      |      |           |            |
| Gate Threshold Voltage                                 | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_{DS}=250\mu A$      | 1.30 | 1.80 | 2.50      | V          |
| Drain-Source On-State Resistance(Note)                 | $R_{DS(ON)}$ | $V_{GS}=10V, I_{DS}=12A$              |      | 10.5 | 13        | m $\Omega$ |
|  |              | $V_{GS}=4.5V, I_{DS}=10A$             |      | 16   | 23        |            |
| <b>DYNAMIC CHARACTERISTICS</b>                         |              |                                       |      |      |           |            |
| Input Capacitance                                      | $C_{ISS}$    | $V_{DS}=15V, V_{GS}=0V, f=1.0MHz$     |      | 1560 |           | pF         |
| Output Capacitance                                     | $C_{OSS}$    |                                       |      | 345  |           | pF         |
| Reverse Transfer Capacitance                           | $C_{RSS}$    |                                       |      | 245  |           | pF         |
| <b>SWITCHING CHARACTERISTICS</b>                       |              |                                       |      |      |           |            |
| Turn-ON Delay Time (Note)                              | $t_{D(ON)}$  | $I_{DS}=1A, V_{DD}=15V, R_G=3\Omega,$ |      | 30   | 35        | ns         |
| Turn-ON Rise Time                                      | $t_R$        |                                       |      | 60   | 67        | ns         |
| Turn-OFF Delay Time                                    | $t_{D(OFF)}$ |                                       |      | 272  | 285       | ns         |
| Turn-OFF Fall Time                                     | $t_F$        |                                       |      | 168  | 172       | ns         |
| Total Gate Charge (Note)                               | $Q_G$        | $V_{DS}=15V, V_{GS}=10V, I_{DS}=10A$  |      | 28   | 38        | nC         |
| Gate-Source Charge                                     | $Q_{GS}$     |                                       |      | 3.6  |           | nC         |
| Gate-Drain Charge                                      | $Q_{GD}$     |                                       |      | 8.4  |           | nC         |
| <b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b> |              |                                       |      |      |           |            |
| Drain-Source Diode Forward Voltage(Note)               | $V_{SD}$     | $I_{SD}=10A, V_{GS}=0V$               |      | 0.9  | 1.3       | V          |

Note: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$

## TYPICAL CHARACTERISTICS



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