



UT3404

Power MOSFET

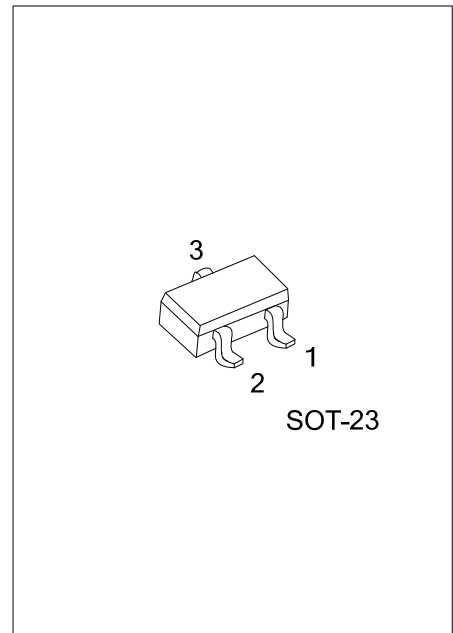
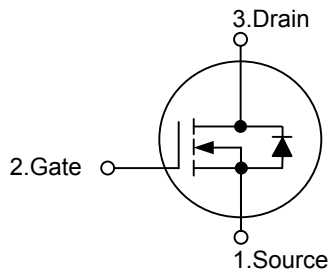
N-CHANNEL ENHANCEMENT MODE MOSFET

DESCRIPTION

The **UT3404** is N-Channel enhancement mode power MOSFET, designed with high density cell, with fast switching speed, low on-resistance, excellent thermal and electrical capabilities and operation with low gate voltages.

This device is suitable for use as a load switch or in PWM applications.

SYMBOL

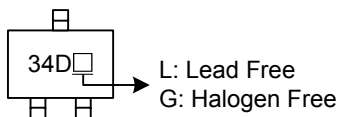


ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|-----------------|---------------|---------|----------------|---|---|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UT3404L-AE3-R | UT3404G-AE3-R | SOT-23 | S | G | D | Tape Reel |

| | |
|--|---|
| <p>UT3404L-AE3-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Plating</p> | <p>(1) R: Tape Reel</p> <p>(2) AE3: SOT-23</p> <p>(3) G: Halogen Free, L: Lead Free</p> |
|--|---|

MARKING



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

| PARAMETER | SYMBOL | RATINGS | UNIT |
|-----------------------------------|-----------|------------|------------------|
| Drain-Source Voltage | V_{DSS} | 30 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| Continuous Drain Current (Note 3) | I_D | 5.8 | A |
| Pulsed Drain Current (Note 1, 2) | I_{DM} | 20 | A |
| Power Dissipation | P_D | 1.4 | W |
| Junction Temperature | T_J | +150 | $^\circ\text{C}$ |
| Strong Temperature | T_{STG} | -55 ~ +150 | $^\circ\text{C}$ |

Note: 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.

■ THERMAL DATA

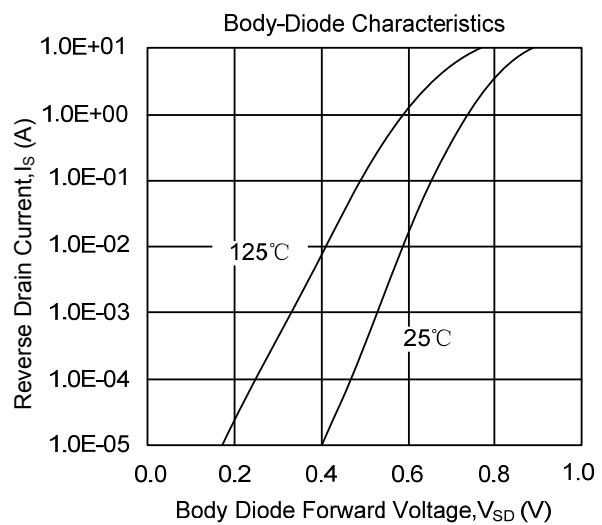
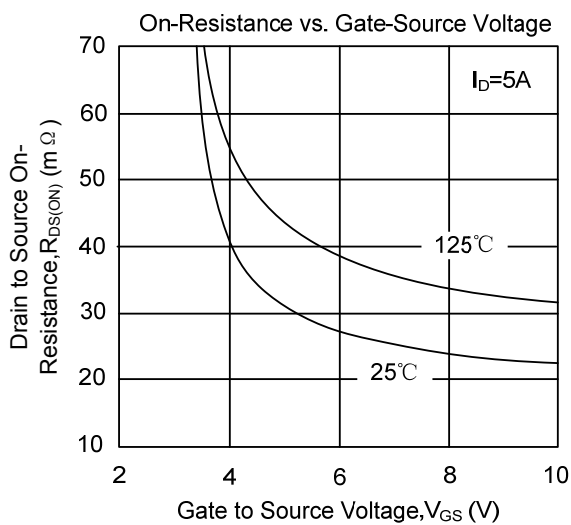
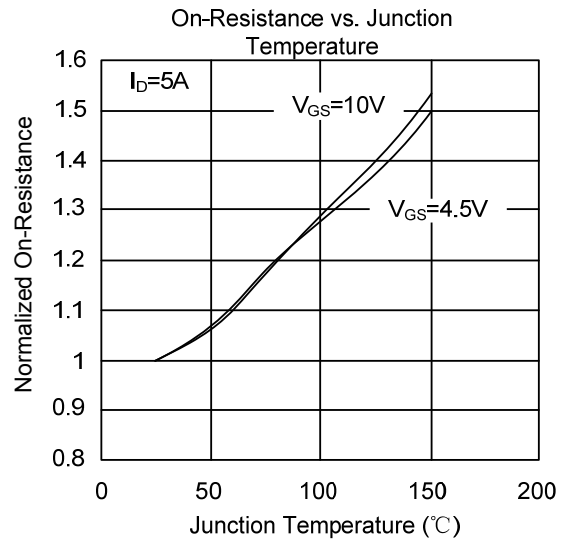
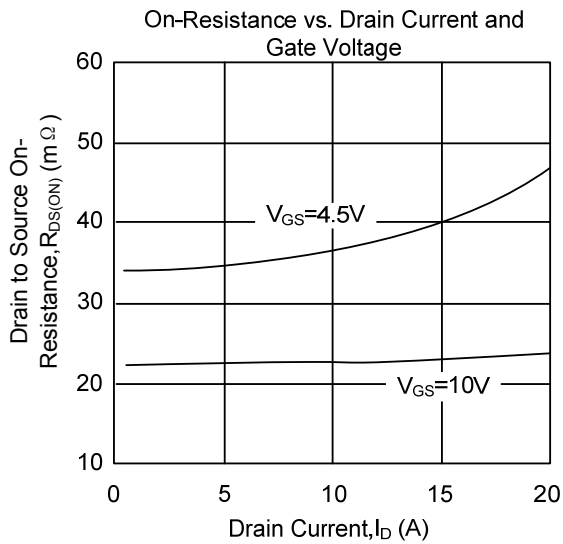
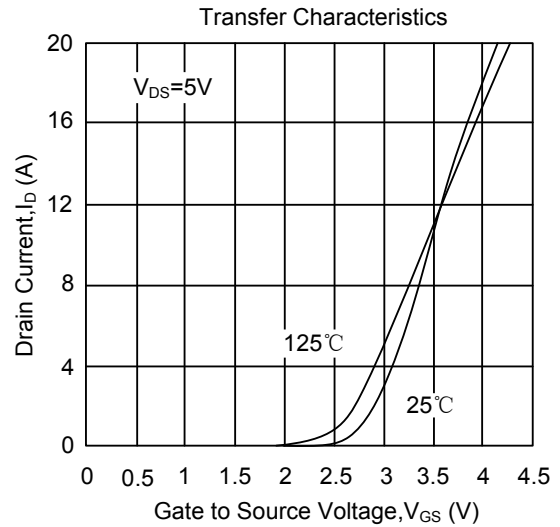
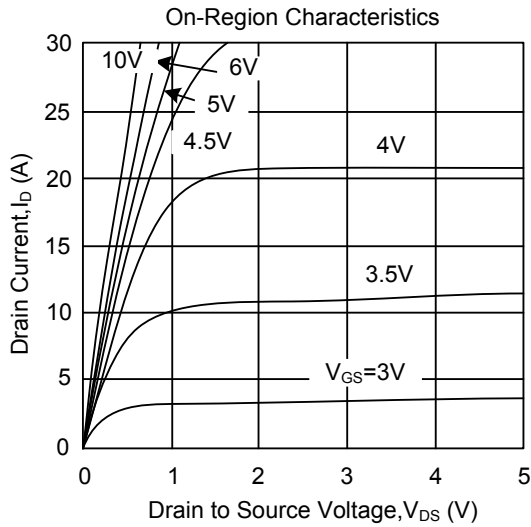
| PARAMETER | SYMBOL | MIN | TYP | MAX | UNIT |
|------------------------------|---------------|-----|-----|-----|---------------------------|
| Junction to Ambient (Note 3) | θ_{JA} | | 85 | 125 | $^\circ\text{C}/\text{W}$ |

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

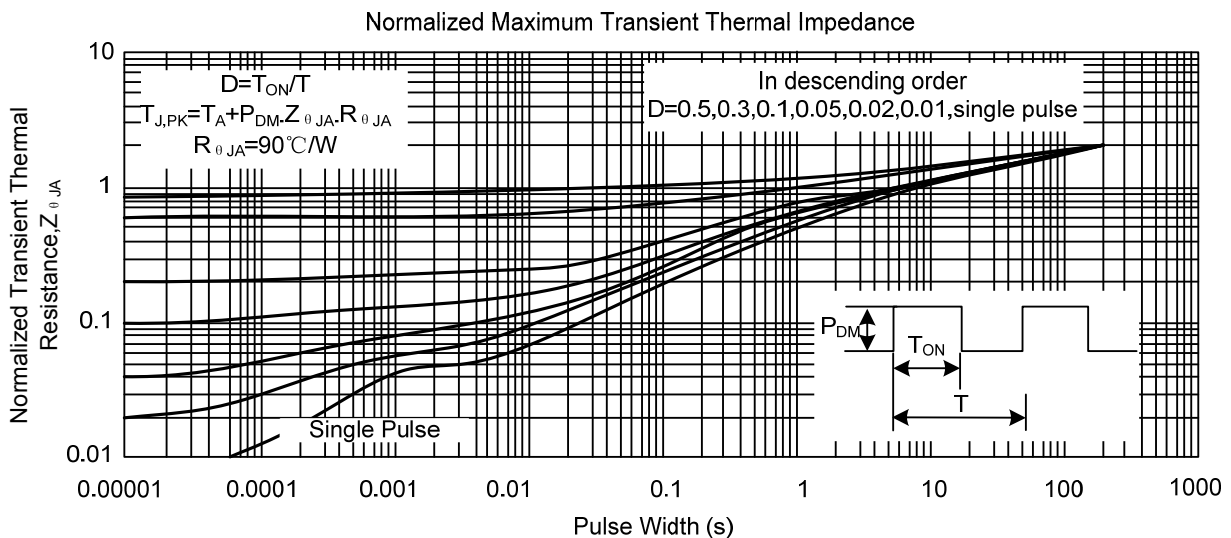
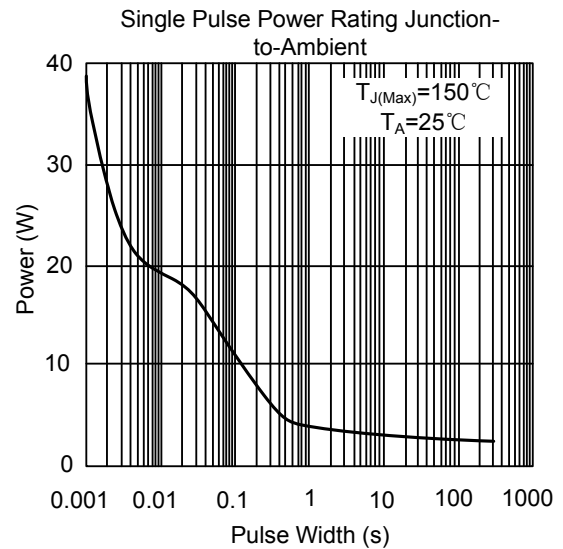
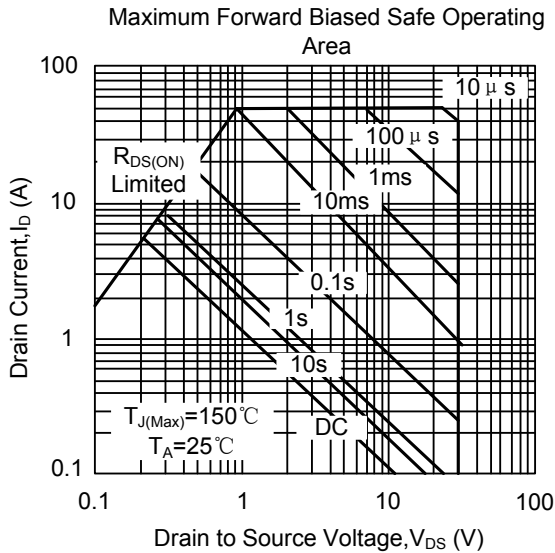
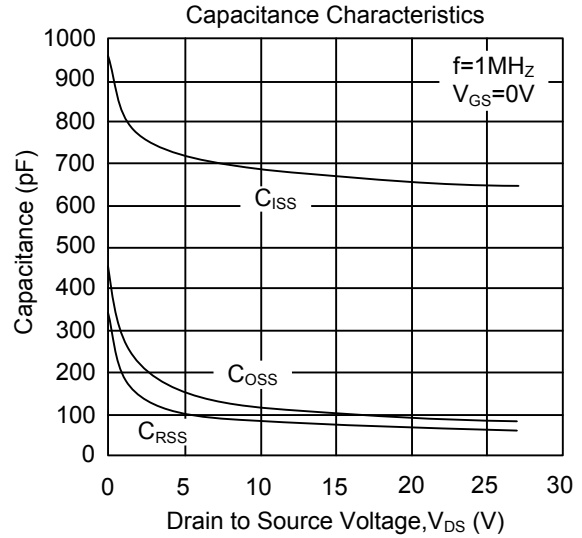
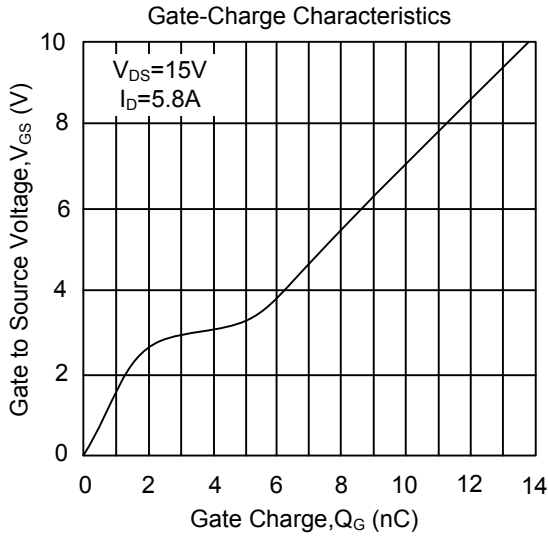
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|--------------|--|-----|-------|-----------|------------------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0\text{V}, I_D=250\mu\text{A}$ | 30 | | | V |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS}=24\text{V}, V_{GS}=0\text{V}$ | | | 1 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$ | | | ± 100 | nA |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$ | 1 | 1.9 | 3 | V |
| On State Drain Current | $I_{D(ON)}$ | $V_{GS}=4.5\text{V}, V_{DS}=5\text{V}$ | 20 | | | A |
| Drain-Source On-State Resistance (Note 2) | $R_{DS(ON)}$ | $V_{GS}=10\text{V}, I_D=5.8\text{A}$ | | 22.5 | 28 | $\text{m}\Omega$ |
| | | $V_{GS}=4.5\text{V}, I_D=5\text{A}$ | | 34.5 | 43 | $\text{m}\Omega$ |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | C_{ISS} | $V_{GS}=0\text{V}, V_{DS}=15\text{V}, f=1.0\text{MHz}$ | | 680 | 820 | pF |
| Output Capacitance | C_{OSS} | | | 102 | | pF |
| Reverse Transfer Capacitance | C_{RSS} | | | 77 | | pF |
| SWITCHING CHARACTERISTICS | | | | | | |
| Turn-ON Delay Time (Note 2) | $t_{D(ON)}$ | $V_{DS}=15\text{V}, V_{GS}=10\text{V}, R_G=3\Omega, R_D=2.7\Omega$ | | 4.6 | 6.5 | ns |
| Turn-ON Rise Time | t_R | | | 3.8 | 5.7 | ns |
| Turn-OFF Delay Time | $t_{D(OFF)}$ | | | 20.9 | 30 | ns |
| Turn-OFF Fall Time | t_F | | | 5 | 7.5 | ns |
| Total Gate Charge (Note 2) | Q_G | $V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=5.8\text{A}$ | | 13.88 | 17 | nC |
| Gate-Source Charge | Q_{GS} | | | 1.8 | | nC |
| Gate-Drain Charge | Q_{GD} | | | 3.12 | | nC |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS | | | | | | |
| Drain-Source Diode Forward Voltage(Note2) | V_{SD} | $I_S=1\text{A}$ | | 0.76 | 1 | V |
| Maximum Continuous Drain-Source Diode Forward Current | I_S | | | | 2.5 | A |
| Reverse Recovery Time | t_{RR} | $I_F=5.8\text{A}, dI/dt=100\text{A}/\mu\text{s}$ | | 16.1 | 21 | ns |
| Reverse Recovery Charge | Q_{RR} | | | 7.4 | 10 | nC |

- Notes: 1. Pulse width limited by $T_{J(MAX)}$
 2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
 3. Surface mounted on 1 in² copper pad of FR4 board.

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(Cont.)



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