



UT3401

Power MOSFET

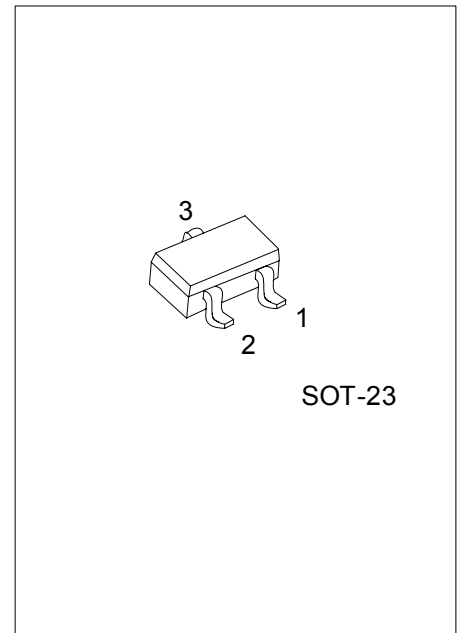
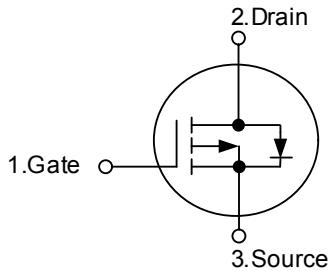
P-CHANNEL ENHANCEMENT MODE

DESCRIPTION

The UTC UT3401 is P-channel enhancement mode Power MOSFET, designed with high density cell, with fast switching speed, low on-resistance, excellent thermal and electrical capabilities, operation with low gate voltages.

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

SYMBOL



SOT-23

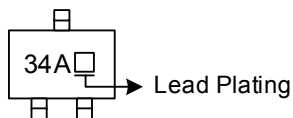
*Pb-free plating product number: UT3401L

ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|-----------------|-------------------|---------|----------------|---|---|-----------|
| Normal | Lead Free Plating | | 1 | 2 | 3 | |
| UT3401-AE3-R | UT3401L-AE3-R | SOT-23 | S | G | D | Tape Reel |

| | |
|--|--|
| <p>UT3401L-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) L: Lead Free Plating, Blank: Pb/Sn</p> |
|--|--|

MARKING



■ ABSOLUTE MAXIMUM RATINGS (Ta = 25 , unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNITS | |
|-----------------------------------|------------------|------------|-------|---|
| Drain-Source Voltage | V _{DSS} | -30 | V | |
| Gate-Source Voltage | V _{GSS} | ±12 | V | |
| Continuous Drain Current (Note 1) | I _D | Ta =25°C | -4.2 | A |
| | | Ta =70°C | -3.5 | A |
| Pulsed Drain Current (Note 2) | I _{DM} | -30 | A | |
| Power Dissipation (Note 1) | P _D | 1.4 | W | |
| Junction Temperature | T _J | +150 | | |
| Storage Temperature | T _{STG} | -55 ~ +150 | | |

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 | θ _{JA} | | 65 | 90 | °C/W |

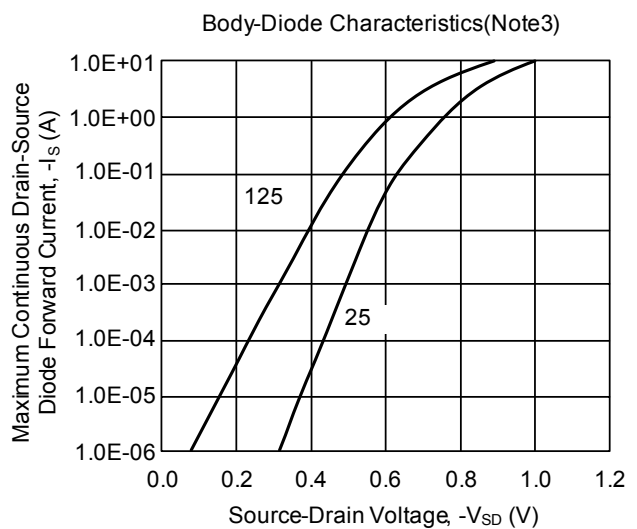
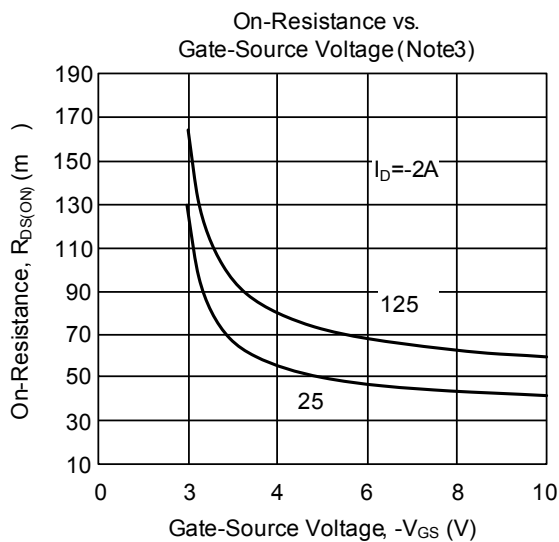
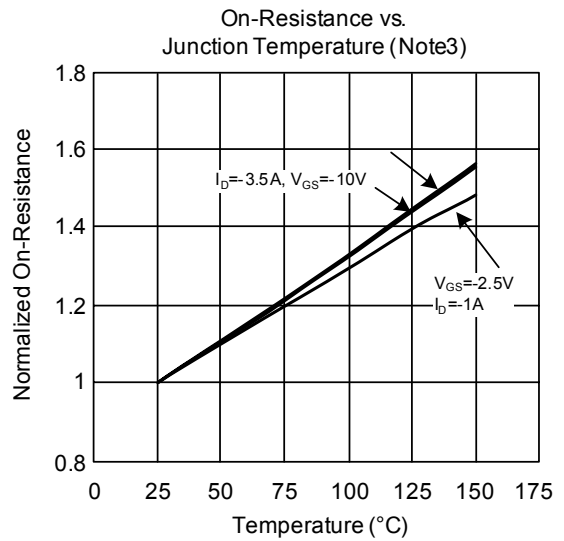
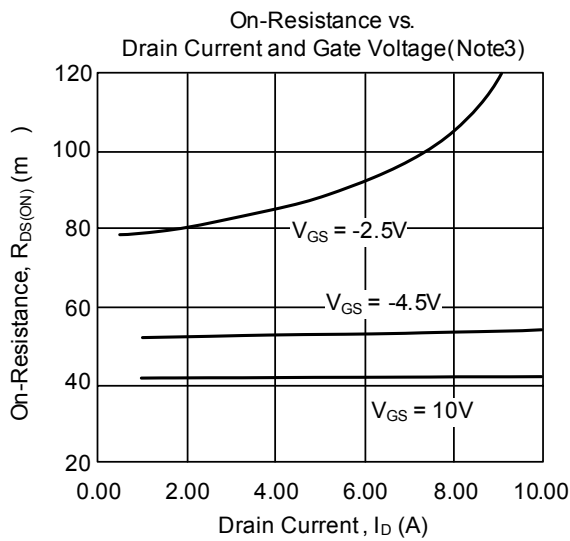
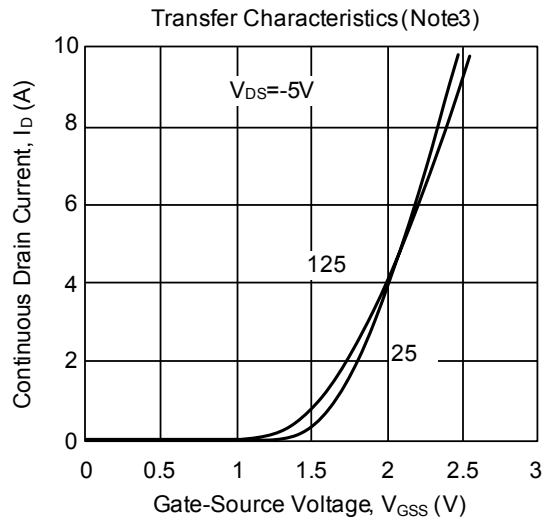
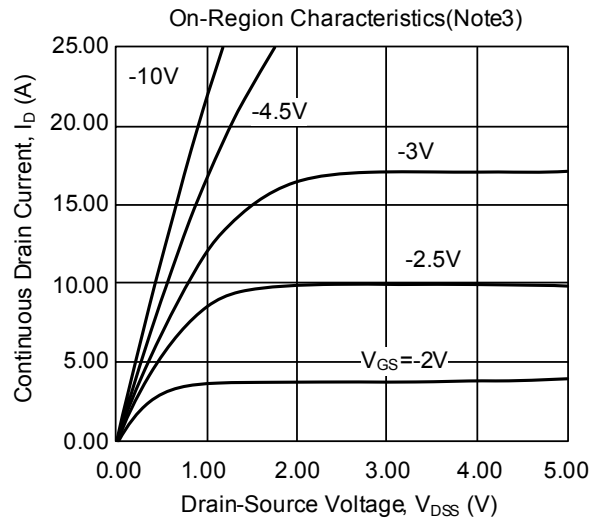
■ ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|---------------------|--|------|-------|-------|------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | I _D =-250μA, V _{GS} =0V | -30 | | | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =-24V, V _{GS} =0V | | | -1 | μA |
| Gate-Source Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±12V | | | ± 100 | nA |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | V _{DS} =V _{GS} , I _D =-250μA | -0.7 | -1 | -1.3 | V |
| Static Drain-Source On-Resistance | R _{DS(ON)} | V _{GS} =-10V, I _D =-4.2A | | 42 | 50 | mΩ |
| | | V _{GS} =-4.5V, I _D =-4A | | 53 | 65 | mΩ |
| | | V _{GS} =-2.5V, I _D =-1A | | 80 | 120 | mΩ |
| Forward Transconductance | g _{FS} | V _{DS} =-5V, I _D =-5A | 7 | 11 | | S |
| DYNAMIC PARAMETERS | | | | | | |
| Input Capacitance | C _{ISS} | V _{GS} =0V, V _{DS} =-15V, f=1MHz | | 954 | | pF |
| Output Capacitance | C _{OSS} | | | 115 | | pF |
| Reverse Transfer Capacitance | C _{RSS} | | | 77 | | pF |
| SWITCHING PARAMETERS | | | | | | |
| Turn-ON Delay Time | t _{D(ON)} | V _{GS} =-10V, V _{DS} =-15V R _L =3.6Ω, R _G =6Ω | | 6.3 | | ns |
| Turn-ON Rise Time | t _R | | | 3.2 | | ns |
| Turn-OFF Delay Time | t _{D(OFF)} | | | 38.2 | | ns |
| Turn-OFF Fall-Time | t _F | | | 12 | | ns |
| Total Gate Charge | Q _G | V _{GS} =-4.5V, V _{DS} =-15V, I _D =-4A | | 9.4 | | nC |
| Gate-Source Charge | Q _{GS} | | | 2 | | nC |
| Gate-Drain Charge | Q _{GD} | | | 3 | | nC |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS | | | | | | |
| Drain-Source Diode Forward Voltage | V _{SD} | V _{DS} =0V, I _S =-1A | | -0.75 | -1 | V |
| Maximum Continuous Drain-Source Diode Forward Current | I _S | | | | -2.2 | A |
| Reverse Recovery Time | t _{RR} | I _F =-4A, dI/dt=100A/μs | | 20.2 | | ns |
| Reverse Recovery Charge | Q _{RR} | | | | 11.2 | |

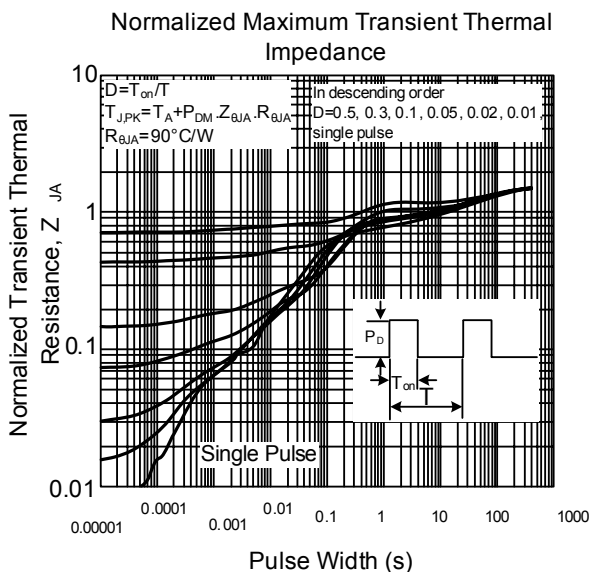
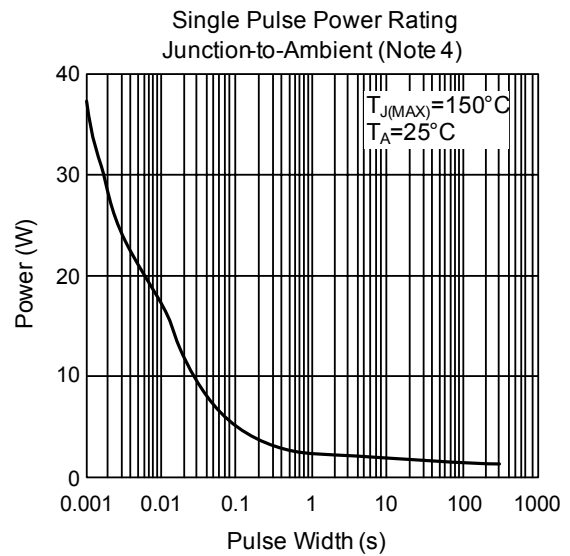
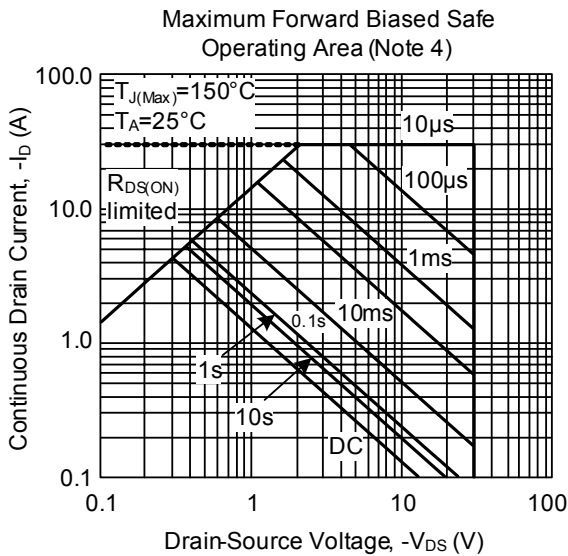
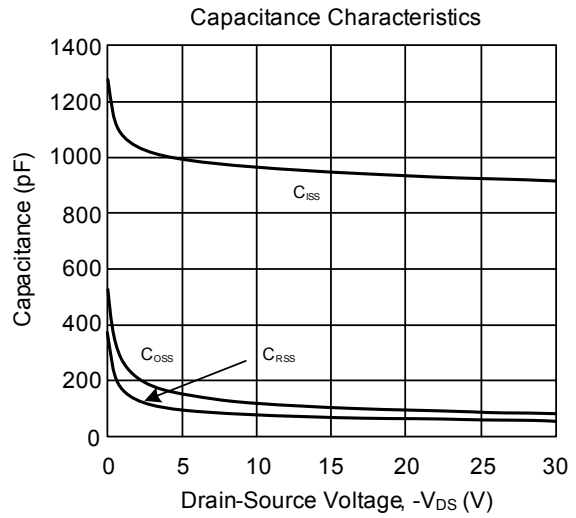
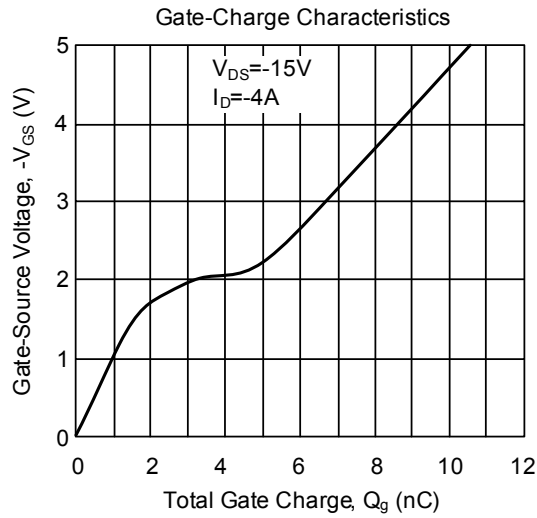
Note: 1. The value of θ_{JA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user ' s specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

2. Repetitive Rating: Pulse width limited by T_J

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(Cont.)



Note:

3. The static characteristics obtained using 80 μs pulses, duty cycle 0.5% max.
4. The measurements are performed with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ C$. The SOA curve provides a single pulse rating

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