



UT3401Z

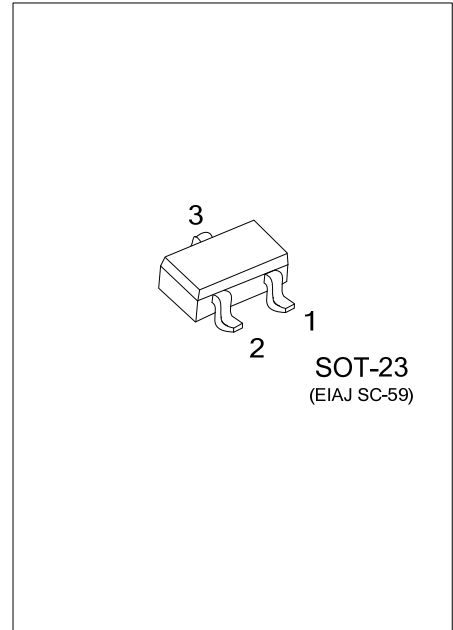
Power MOSFET

P-CHANNEL ENHANCEMENT MODE

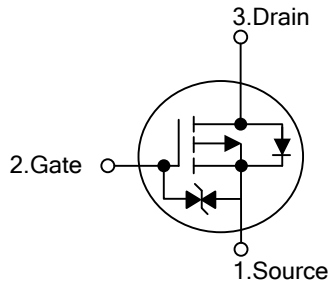
DESCRIPTION

The UTC **UT3401Z** is P-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



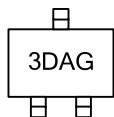
ORDERING INFORMATION

| Ordering Number | Package | Pin Assignment | | | Packing |
|-----------------|---------|----------------|---|---|-----------|
| | | 1 | 2 | 3 | |
| UT3401ZG-AE3-R | SOT-23 | S | G | D | Tape Reel |

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

| | |
|--|---|
| | <p>(1) R: Tape Reel</p> <p>(2) AE3: SOT-23</p> <p>(3) G: Halogen Free and Lead Free</p> |
|--|---|

MARKING



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

| PARAMETER | SYMBOL | RATINGS | UNITS |
|----------------------------|--------------------|------------|--------------------|
| Drain-Source Voltage | V_{DSS} | -30 | V |
| Gate-Source Voltage | V_{GSS} | ± 12 | V |
| Drain Current | Continuous (Note2) | I_D | -4.2 |
| | Pulsed (Note3) | I_{DM} | -30 |
| Power Dissipation (Note 2) | P_D | 1.4 | W |
| ESD(HBM) | | ± 100 | V |
| Junction Temperature | T_J | +150 | $^{\circ}\text{C}$ |
| Storage Temperature | T_{STG} | -55 ~ +150 | $^{\circ}\text{C}$ |

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

3. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

■ THERMAL DATA

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNIT |
|---------------------|---------------|-----|-----|-----|----------------------|
| Junction to Ambient | θ_{JA} | | 65 | 90 | $^{\circ}\text{C/W}$ |

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

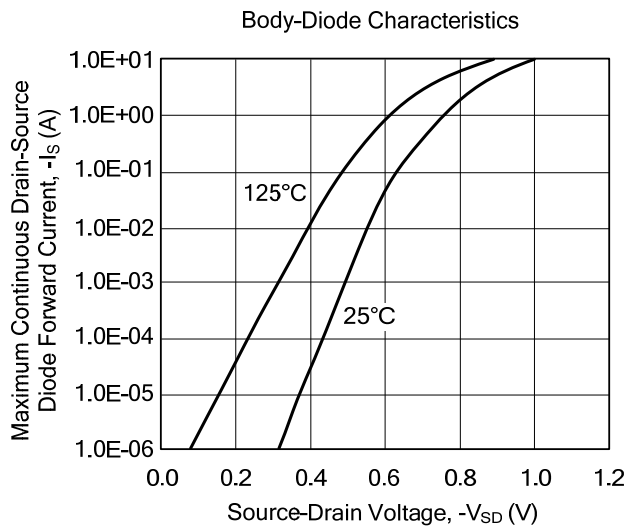
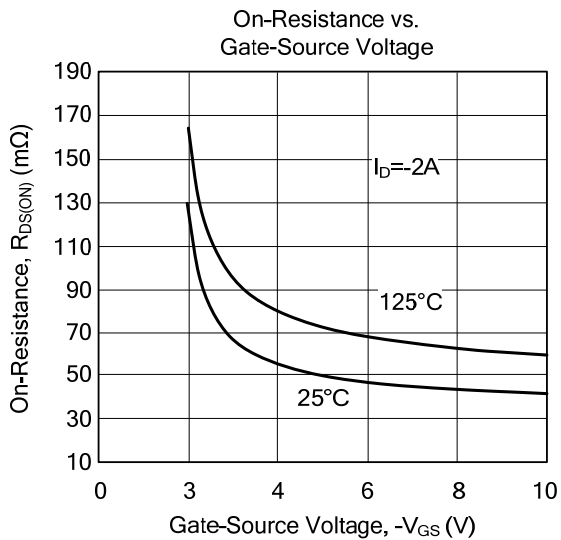
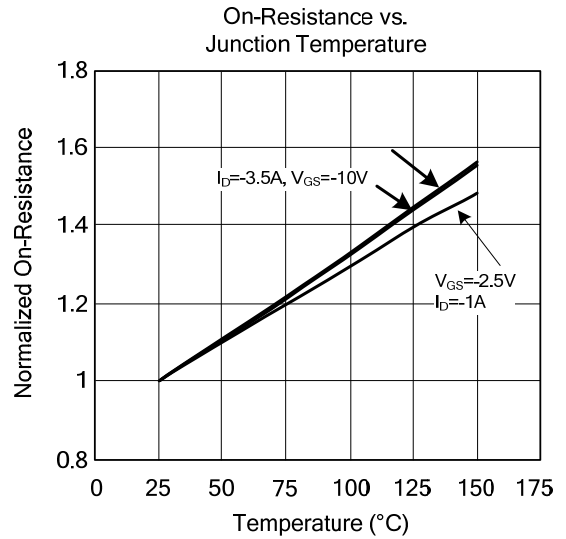
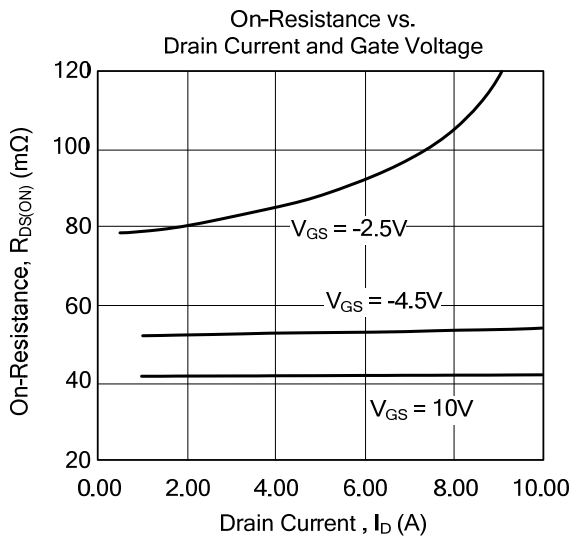
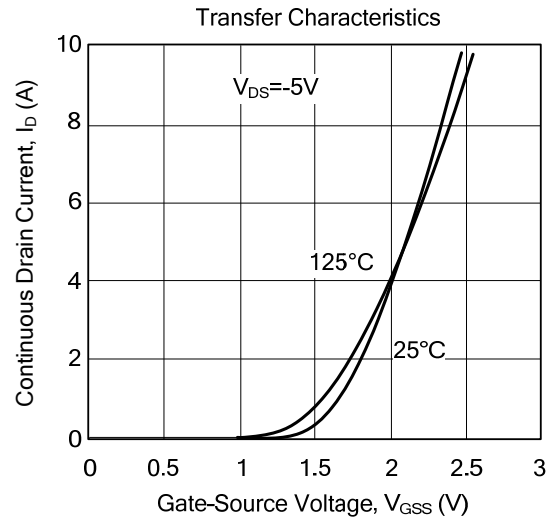
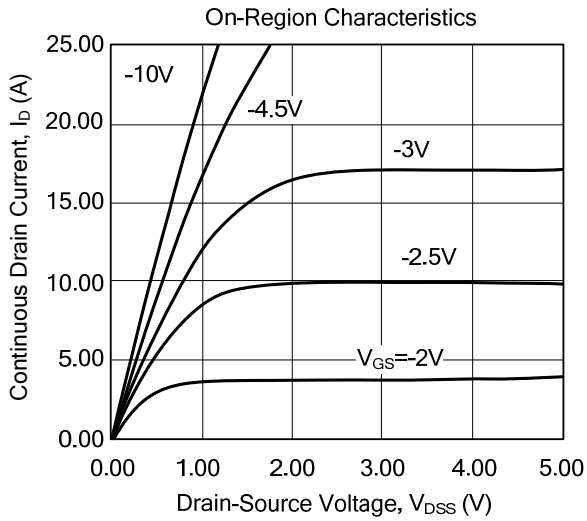
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|--------------|--|------|-------|---------|------------------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$ | -30 | | | V |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS}=-24\text{V}$, $V_{GS}=0\text{V}$ | | | -1 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0\text{V}$, $V_{GS}=\pm 12\text{V}$ | | | ± 5 | μA |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$ | -0.7 | -1 | -1.3 | V |
| Drain-Source On-State Resistance (Note 2) | $R_{DS(ON)}$ | $V_{GS}=-10\text{V}$, $I_D=4.2\text{A}$ | | 42 | 50 | $\text{m}\Omega$ |
| | | $V_{GS}=-4.5\text{V}$, $I_D=4\text{A}$ | | 53 | 65 | $\text{m}\Omega$ |
| | | $V_{GS}=-2.5\text{V}$, $I_D=1\text{A}$ | | 80 | 120 | $\text{m}\Omega$ |
| DYNAMIC PARAMETERS | | | | | | |
| Input Capacitance | C_{ISS} | $V_{GS}=0\text{V}$, $V_{DS}=-15\text{V}$, $f=1\text{MHz}$ | | 954 | | pF |
| Output Capacitance | C_{OSS} | | | 115 | | pF |
| Reverse Transfer Capacitance | C_{RSS} | | | 77 | | pF |
| SWITCHING PARAMETERS | | | | | | |
| Turn-ON Delay Time (Note 2) | $t_{D(ON)}$ | $V_{GS}=-10\text{V}$, $V_{DS}=-15\text{V}$ $R_L=3.6\Omega$, $R_G=6\Omega$ | | 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 (Note 2) | Q_G | $V_{GS}=-4.5\text{V}$, $V_{DS}=-15\text{V}$, $I_D=4\text{A}$ | | 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(Note2) | V_{SD} | $V_{DS}=0\text{V}$, $I_S=-1\text{A}$ | | -0.75 | -1 | V |
| Maximum Continuous Drain-Source Diode Forward Current | I_S | | | | -2.2 | A |
| Reverse Recovery Time | t_{RR} | $I_F=4\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$ | | 20.2 | | ns |
| Reverse Recovery Charge | Q_{RR} | | | | 11.2 | |

Notes: 1. Pulse width limited by $T_{J(MAX)}$

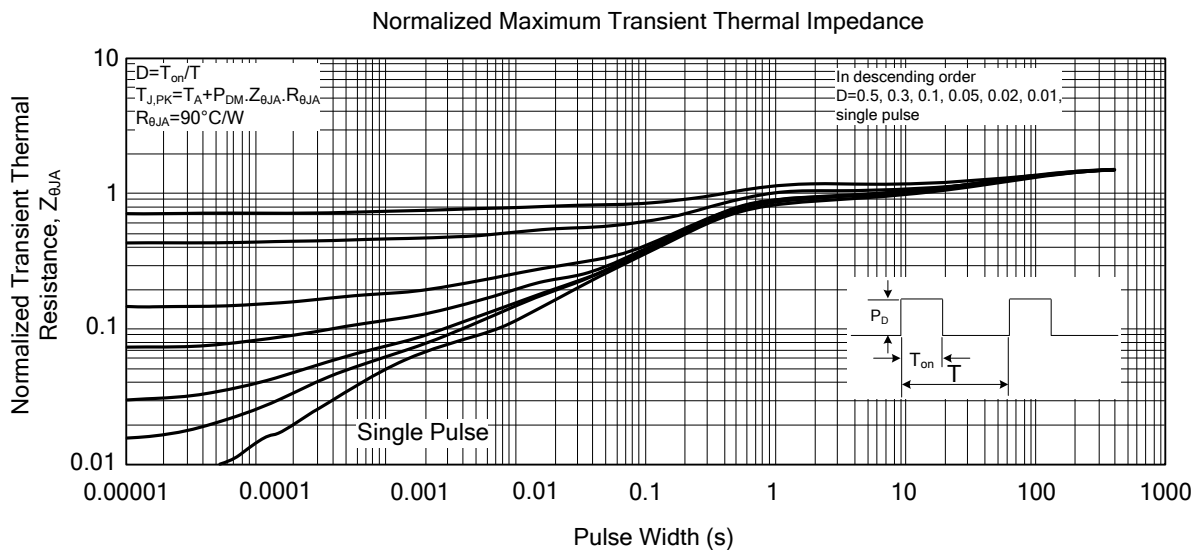
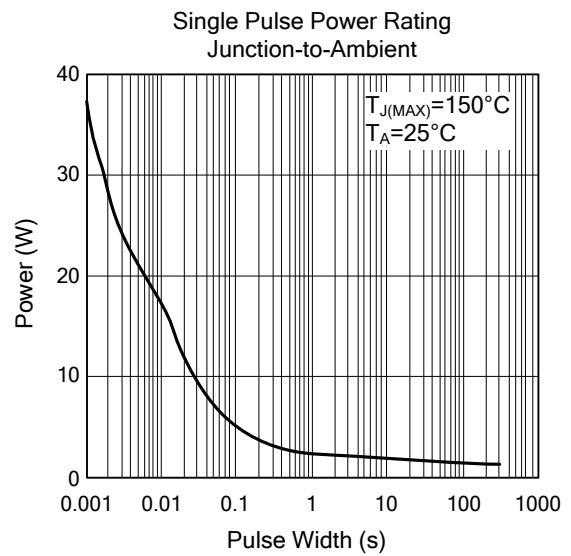
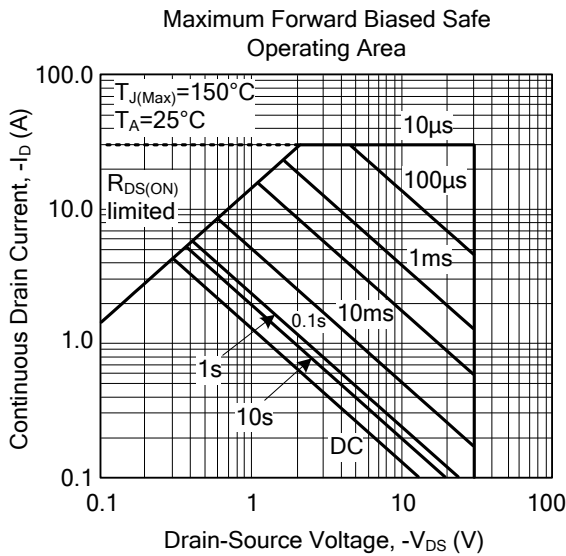
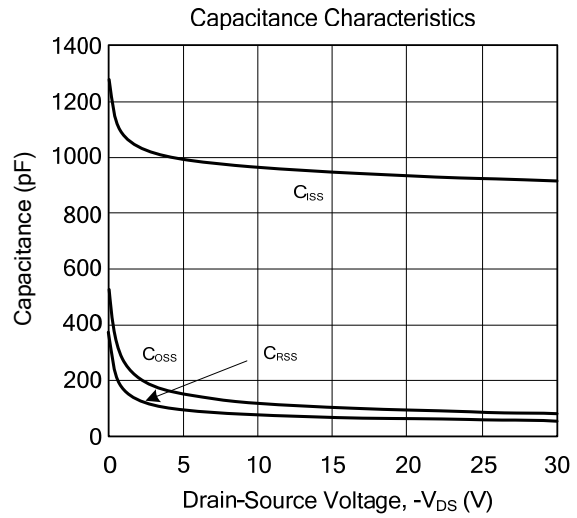
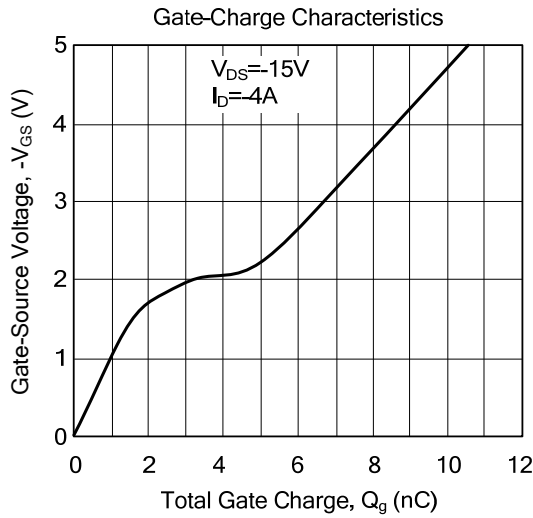
2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

3. Surface mounted on 1 in² copper pad of FR4 board

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(Cont.)



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