



## UT4435

Power MOSFET

### 30V P-CHANNEL POWER MOSFET

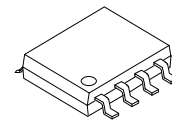
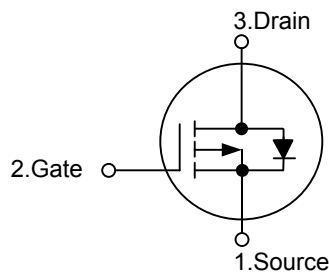
#### DESCRIPTION

The **UT4435** uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

#### FEATURES

- \*  $R_{DS(ON)} \leq 20m\Omega$  @  $V_{GS} = -10V$
- \*  $R_{DS(ON)} \leq 35m\Omega$  @  $V_{GS} = -4.5V$
- \* Low capacitance
- \* Low gate charge
- \* Fast switching capability
- \* Avalanche energy specified

#### SYMBOL



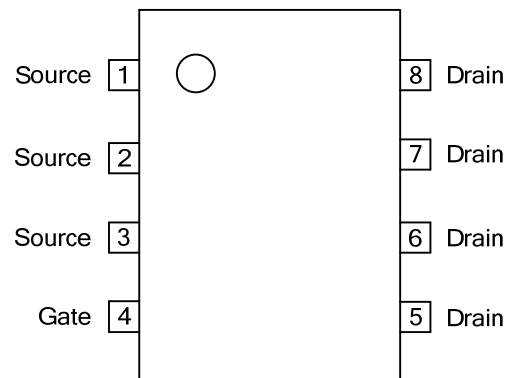
SOP-8

#### ORDERING INFORMATION

| Ordering Number |               | Package | Packing   |
|-----------------|---------------|---------|-----------|
| Lead Free       | Halogen Free  |         |           |
| UT4435L-S08-R   | UT4435G-S08-R | SOP-8   | Tape Reel |

|                                                                                                                                      |  |                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------|
| <p>UT4435L-S08-R</p> <ul style="list-style-type: none"><li>(1) Packing Type</li><li>(2) Package Type</li><li>(3) Lead Free</li></ul> |  | <p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) G: Halogen Free, L: Lead Free</p> |
|--------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------|

## ■ PIN CONFIGURATION



■ 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               | $V_{GSS}$ | $\pm 25$   | V                |
| Continuous Drain Current (Note 2) | $I_D$     | -8.8       | A                |
| Pulsed Drain Current (Note 2)     | $I_{DM}$  | -50        | A                |
| Power Dissipation                 | $P_D$     | 1          | W                |
| Junction Temperature              | $T_J$     | 175        | $^\circ\text{C}$ |
| Storage Temperature               | $T_{STG}$ | -55 ~ +175 | $^\circ\text{C}$ |

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  $T_{J(MAX)}$

■ THERMAL DATA

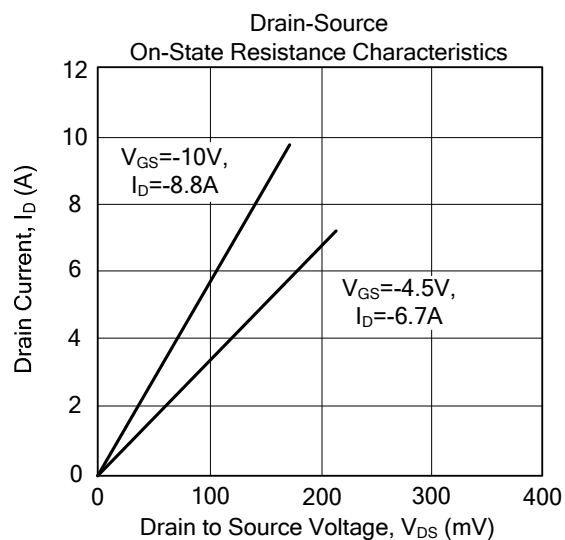
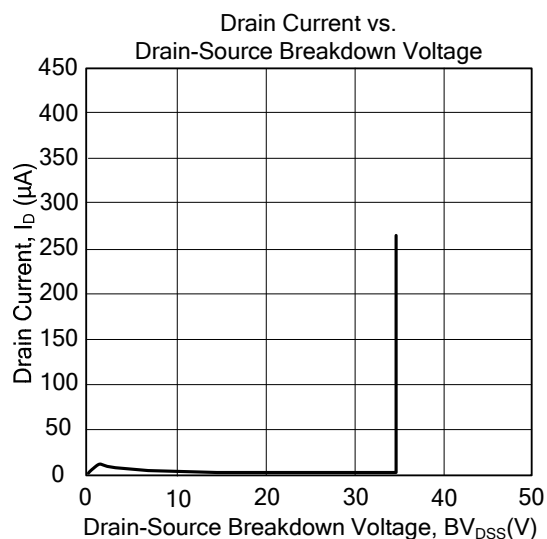
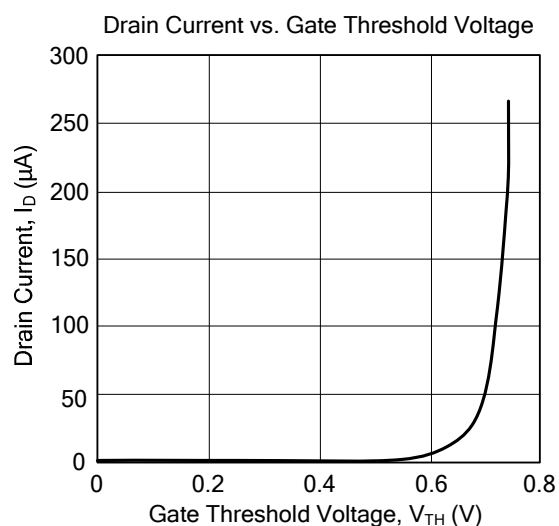
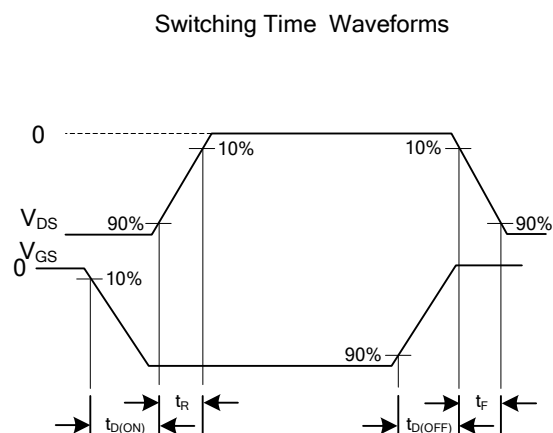
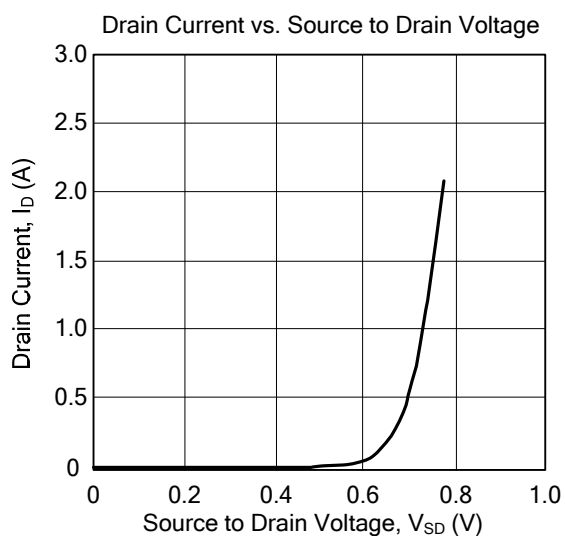
| PARAMETER           | SYMBOL        | MIN | TYP | MAX | UNIT               |
|---------------------|---------------|-----|-----|-----|--------------------|
| Junction-to-Ambient | $\theta_{JA}$ |     | 125 |     | $^\circ\text{C/W}$ |
| Junction-to-Case    | $\theta_{JC}$ |     | 25  |     | $^\circ\text{C/W}$ |

■ 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 <sub>DSS</sub>   | V <sub>GS</sub> =0 V, I <sub>D</sub> =-250μA                                                | -30 |       |      | V    |
| Drain-Source Leakage Current                           | I <sub>DSS</sub>    | V <sub>DS</sub> =-24 V, V <sub>GS</sub> =0V                                                 |     |       | -1   | μA   |
| Gate-Source Leakage Current                            | I <sub>GSS</sub>    | V <sub>GS</sub> = ±25 V, V <sub>DS</sub> =0V                                                |     |       | ±100 | nA   |
| ON CHARACTERISTICS(Note)                               |                     |                                                                                             |     |       |      |      |
| Gate-Threshold Voltage                                 | V <sub>GS(TH)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250μA                                  | -1  | -1.7  | -3   | V    |
| On State Drain Current                                 | I <sub>D(ON)</sub>  | V <sub>GS</sub> = -10V, V <sub>DS</sub> =-5V                                                | -50 |       |      | A    |
| Static Drain–Source On–Resistance                      | R <sub>DS(ON)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-8.8A                                                |     | 15    | 20   | mΩ   |
|                                                        |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =-6.7A                                                |     | 22    | 35   |      |
| Forward Transconductance                               | g <sub>FS</sub>     | V <sub>DS</sub> =-5V, I <sub>D</sub> =-8.8A                                                 |     | 24    |      | S    |
| DYNAMIC PARAMETERS                                     |                     |                                                                                             |     |       |      |      |
| Input Capacitance                                      | C <sub>ISS</sub>    | V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1.0MHz                                        |     | 1604  |      | pF   |
| Output Capacitance                                     | C <sub>OSS</sub>    |                                                                                             |     | 408   |      | pF   |
| Reverse Transfer Capacitance                           | C <sub>RSS</sub>    |                                                                                             |     | 202   |      | pF   |
| SWITCHING PARAMETERS(Note)                             |                     |                                                                                             |     |       |      |      |
| Total Gate Charge                                      | Q <sub>G</sub>      | V <sub>DS</sub> =-15 V, V <sub>GS</sub> =-5 V, I <sub>D</sub> =-8.8 A                       |     | 17    | 24   | nC   |
| Gate-Source Charge                                     | Q <sub>GS</sub>     |                                                                                             |     | 5     |      | nC   |
| Gate-Drain Charge                                      | Q <sub>GD</sub>     |                                                                                             |     | 6     |      | nC   |
| Turn-ON Delay Time                                     | t <sub>D(ON)</sub>  | V <sub>DD</sub> =-15V, I <sub>D</sub> =-1 A, V <sub>GS</sub> =-10 V<br>R <sub>G</sub> =6 Ω, |     | 13    | 23   | ns   |
| Turn-ON Rise Time                                      | t <sub>R</sub>      |                                                                                             |     | 13.5  | 24   | ns   |
| Turn-OFF Delay Time                                    | t <sub>D(OFF)</sub> |                                                                                             |     | 42    | 68   | ns   |
| Turn-OFF Fall-Time                                     | t <sub>F</sub>      |                                                                                             |     | 25    | 40   | ns   |
| DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS |                     |                                                                                             |     |       |      |      |
| Diode Forward Voltage(Note)                            | V <sub>SD</sub>     | I <sub>S</sub> =-2.1A, V <sub>GS</sub> =0V                                                  |     | -0.73 | -1.2 | V    |
| Maximum Body-Diode Continuous Current                  | I <sub>S</sub>      |                                                                                             |     |       | -2.1 | A    |

Note: Pulse Test: Pulse Width < 300ms, Duty Cycle < 2.0%

## TYPICAL CHARACTERISTICS



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