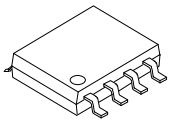
# 15A, 30V N-CHANNEL ENHANCEMENT MODE



SOP-8

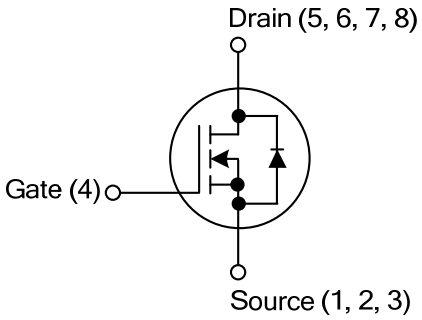
## ■ DESCRIPTION

The **UT4446-H** uses UTC's 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

* $R_{DS(ON)}$ < 13mΩ @ $V_{GS}$=10V, $I_D$=15A
* $R_{DS(ON)}$ < 18mΩ @ $V_{GS}$=4.5V, $I_D$=11A
* Low capacitance
* Low gate charge
* Fast switching capability
* Avalanche energy specified

## ■ SYMBOL



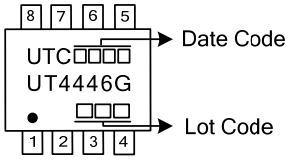

## ■ ORDERING INFORMATION

| Ordering Number | Package | Pin Assignment | | | | | | | | Packing |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| UT4446G-S08-R | SOP-8 | S | S | S | G | D | D | D | D | Tape Reel |

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

| | |
|---|---|
| UT4446G-S08-R<br>(1)Packing Type | (1) R: Tape Reel |
| (2)Package Type | (2) S08: SOP-8 |
| (3)Green Package | (3) G: Halogen Free and Lead Free |

## ■ MARKING



## ■ ABSOLUTE MAXIMUM RATINGS ($T_A$=25°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 | $I_D$ | 15 | A |
| Pulsed Drain Current | $I_{DM}$ | 40 | A |
| Avalanche Current | $I_{AR}$ | 20 | A |
| Repetitive avalanche energy L=0.1mH | $E_{AR}$ | 25 | mJ |
| Power Dissipation | $P_D$ | 1.6 | W |
| Junction Temperature | $T_J$ | +150 | °C |
| Storage Temperature | $T_{STG}$ | -55 ~ +150 | °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

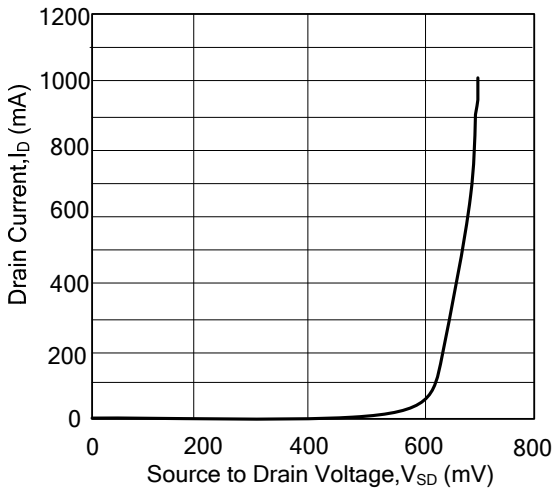
| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Junction-to-Ambient | $\theta_{JA}$ | 75 | °C/W |

## ■ ELECTRICAL CHARACTERISTICS ($T_J$=25°C, unless otherwise specified)

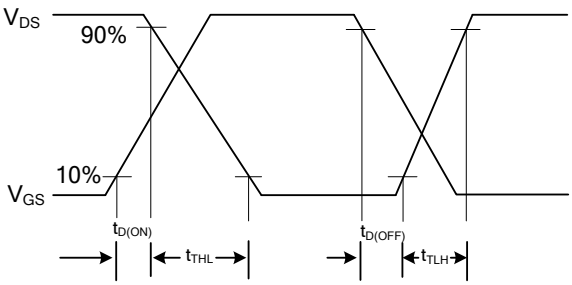
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=250μA | 30 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=24V, $V_{GS}$=0V | | | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±20V | | | 100 | nA |
| **ON CHARACTERISTICS** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1 | 2.2 | 3 | V |
| On State Drain Current | $I_{D(ON)}$ | $V_{DS}$=5V, $V_{GS}$=10V | 40 | | | A |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=15A | | | 13 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=11A | | | 18 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=5 V, $I_D$=15 A | | 27 | | S |
| **DYNAMIC PARAMETERS** | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$=25V, $V_{GS}$=0V, f=1MHz | | 800 | | pF |
| Output Capacitance | $C_{OSS}$ | | | 120 | | pF |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 60 | | pF |
| **SWITCHING PARAMETERS** | | | | | | |
| Total Gate Charge | $Q_G$ | $V_{GS}$=30V, $V_{DS}$=10V, $I_D$=1A, $I_G$=100μA | | 50 | | nC |
| Gate Source Charge | $Q_{GS}$ | | | 1.0 | | nC |
| Gate Drain Charge | $Q_{GD}$ | | | 5.5 | | nC |
| Turn-ON Delay Time | $t_{D(ON)}$ | $V_{GS}$=10V, $V_{DS}$=30V, $I_D$=0.5A, $R_G$=25Ω | | 63 | | ns |
| Turn-ON Rise Time | $t_R$ | | | 61 | | ns |
| Turn-OFF Delay Time | $t_{D(OFF)}$ | | | 96 | | ns |
| Turn-OFF Fall-Time | $t_F$ | | | 48 | | ns |
| **SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS** | | | | | | |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1A, $V_{GS}$=0V | | 0.71 | 1 | V |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | 4 | A |
| Body Diode Reverse Recovery Time | $t_{RR}$ | $I_F$=15A, dI/dt=100A/μs | | 24 | 30 | ns |
| Body Diode Reverse Recovery Charge | $Q_{RR}$ | $I_F$=15A, dI/dt=100A/μs | | 19 | | nC |

## ■ TYPICAL CHARACTERISTICS

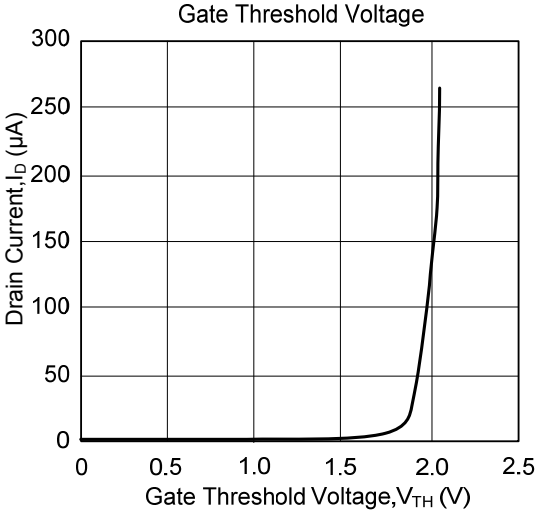
Drain Current vs. Source to Drain Voltage



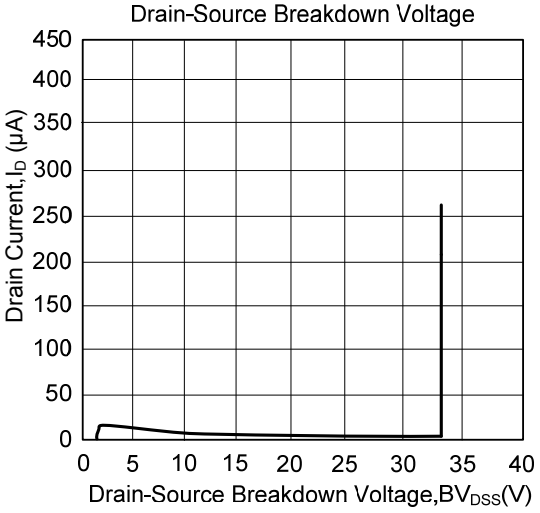

Switching Time Waveforms




Drain Current vs.
Gate Threshold Voltage




Drain Current vs.
Drain-Source Breakdown Voltage




Drain-Source On-State Resistance Characteristics