



## UT4446-H

Power MOSFET

### 15A, 30V N-CHANNEL ENHANCEMENT MODE

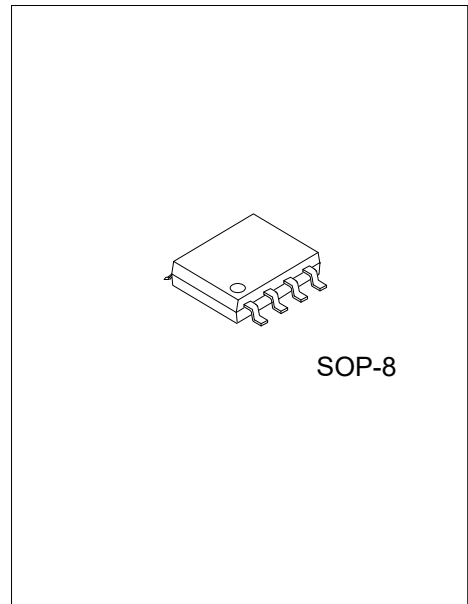
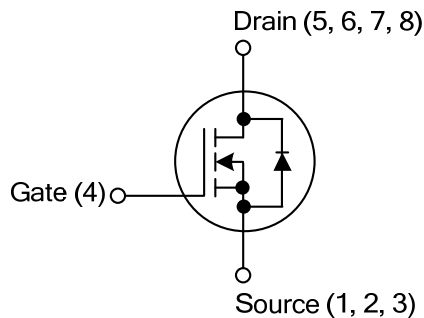
#### DESCRIPTION

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

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

#### SYMBOL



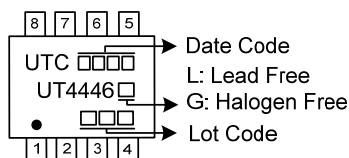
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing		
Lead Free	Halogen Free		1	2	3	4	5	6		7	8
UT4446L-S08-R	UT4446G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT4446G-S08-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free</p>
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#### 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	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	15	A
Pulsed Drain Current	$I_{DM}$	40	A
Avalanche Current	$I_{AS}$	8.6	A
Repetitive avalanche energy	$E_{AS}$	3.6	mJ
Power Dissipation	$P_D$	1.6	W
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. Repetitive Rating: Pulse width limited by maximum junction temperature.  
 3.  $L=0.1\text{mH}$ ,  $I_{AS}=8.6\text{A}$ ,  $V_{DD}=25\text{V}$ ,  $R_G=20\Omega$ , Starting  $T_J=25^\circ\text{C}$ .

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction-to-Ambient	$\theta_{JA}$	75	$^\circ\text{C/W}$

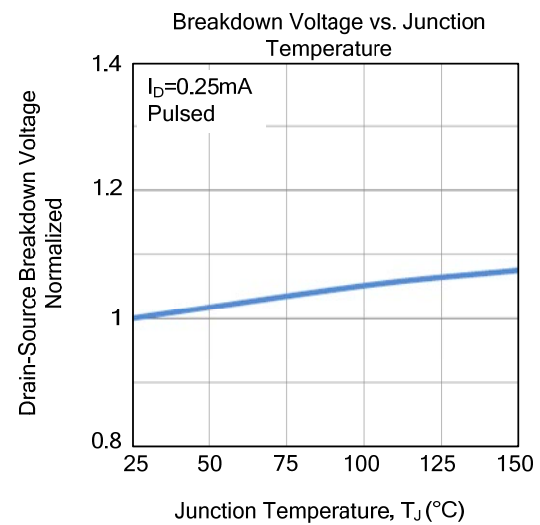
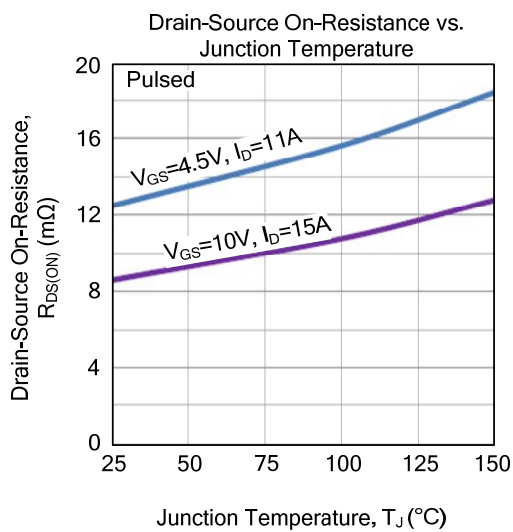
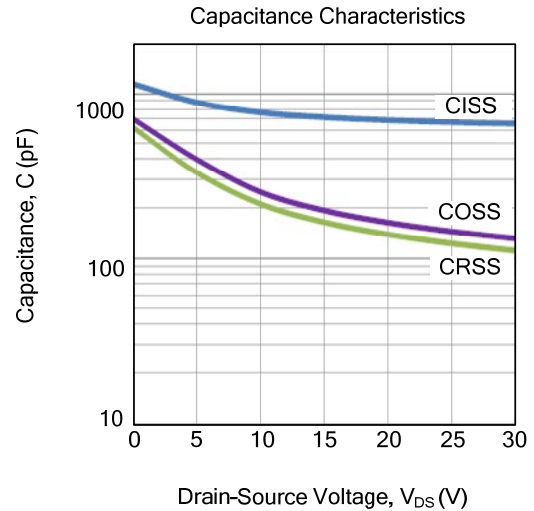
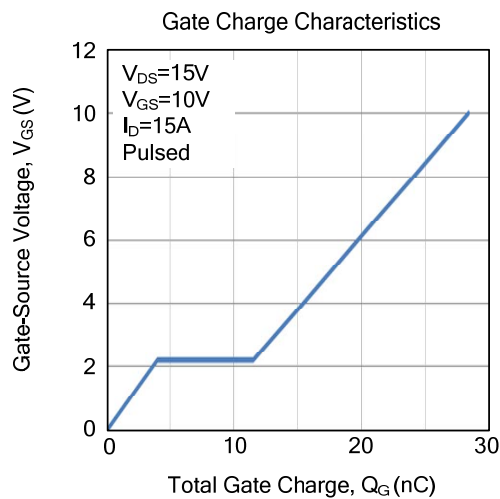
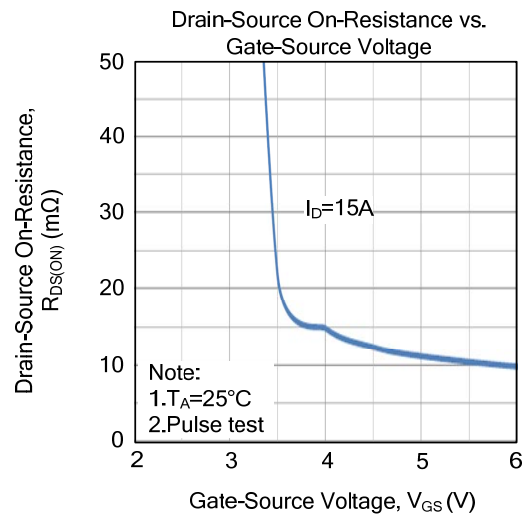
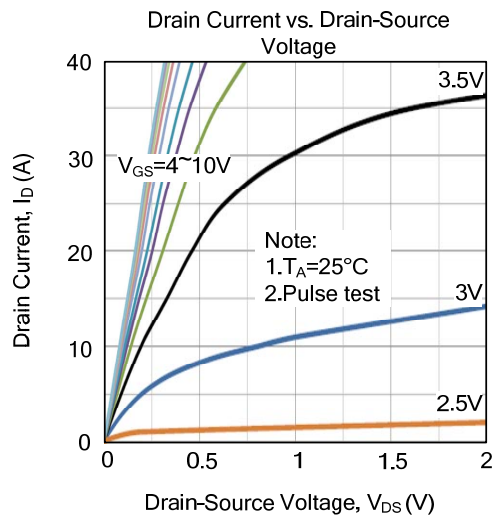
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

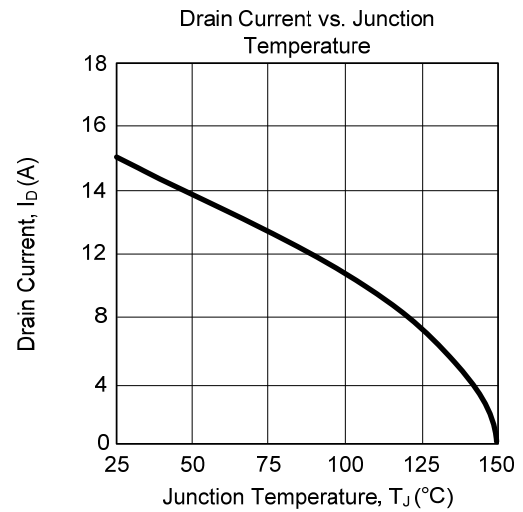
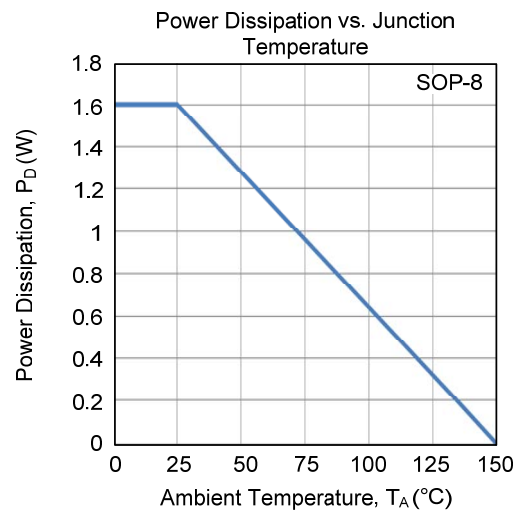
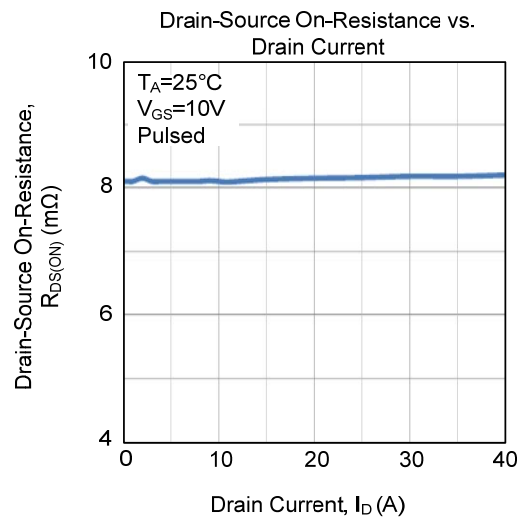
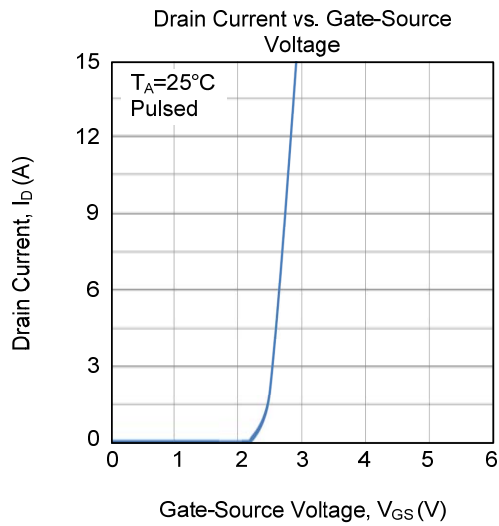
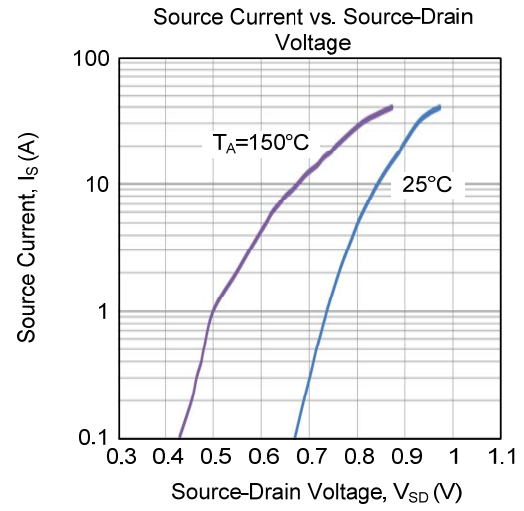
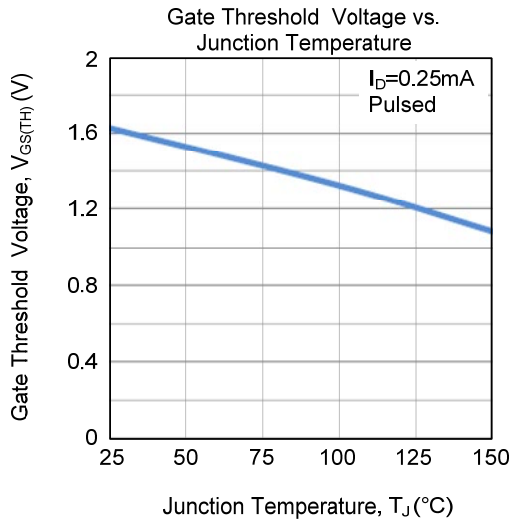
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0\text{V}$ , $I_D=250\mu\text{A}$	30			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=24\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS}=0\text{V}$ , $V_{GS}=\pm 20\text{V}$			100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	1.0		3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=15\text{A}$			13	m $\Omega$
		$V_{GS}=4.5\text{V}$ , $I_D=11\text{A}$			18	
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=15\text{V}$ , $V_{GS}=0\text{V}$ , $f=1\text{MHz}$		717		pF
Output Capacitance	$C_{OSS}$			194		pF
Reverse Transfer Capacitance	$C_{RSS}$			165		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{DS}=24\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=15\text{A}$ , $I_G=1\text{mA}$		28.4		nC
Gate Source Charge	$Q_{GS}$			4		nC
Gate Drain Charge	$Q_{GD}$			7.5		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=15\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=15\text{A}$ , $R_G=3.3\Omega$		6.4		ns
Turn-ON Rise Time	$t_R$			16.4		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			22.4		ns
Turn-OFF Fall-Time	$t_F$			22		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Diode Forward Voltage	$V_{SD}$	$I_S=1\text{A}$ , $V_{GS}=0\text{V}$			1	V
Maximum Body-Diode Continuous Current	$I_S$				15	A
Body Diode Reverse Recovery Time	$t_{RR}$	$I_F=15\text{A}$ , $dI/dt=100\text{A}/\mu\text{s}$		274		ns
Body Diode Reverse Recovery Charge	$Q_{RR}$	$I_F=15\text{A}$ , $dI/dt=100\text{A}/\mu\text{s}$		0.8		$\mu\text{C}$

- Notes: 1. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .  
 2. Essentially independent of operating ambient temperature.

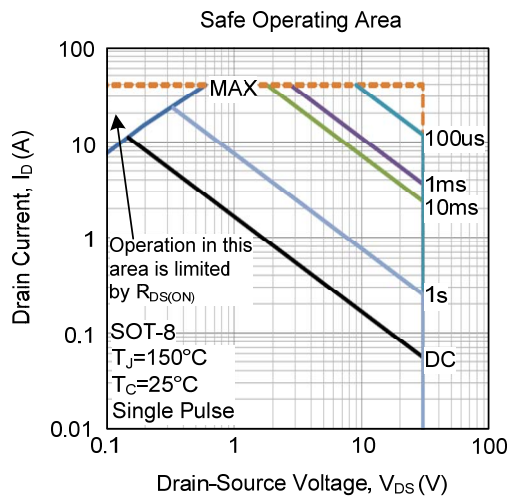
## TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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