



## UT4430

Power MOSFET

### N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

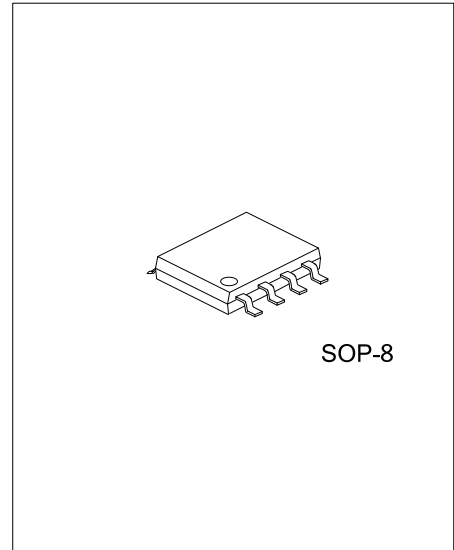
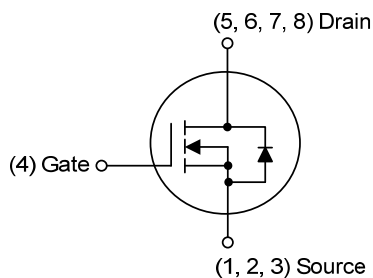
#### DESCRIPTION

The **UT4430** uses UTC advanced technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for applications, such as high-side DC/DC conversion, notebook and sever.

#### FEATURES

- \*  $V_{DS}(V)=30V$
- \*  $I_D=18A$  ( $V_{GS} = 10V$ )
- \*  $R_{DS(ON)} < 5.5m\Omega$  @  $V_{GS}=10V, I_D=18A$
- \*  $R_{DS(ON)} < 7.5m\Omega$  @  $V_{GS}=4.5V, I_D=15A$

#### SYMBOL



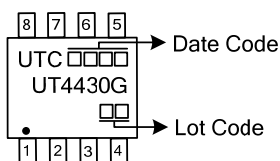
#### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
UT4430G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT4430G-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	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_A=25^{\circ}\text{C}$ ) (Note 2)	$I_D$	18	A
Pulsed Drain Current (Note 3)	$I_{DM}$	80	A
Avalanche Current (Note 3)	$I_{AR}$	30	A
Repetitive avalanche energy (Note 3)	$E_{AR}$	135	mJ
Power Dissipation ( $T_A=25^{\circ}\text{C}$ )	$P_D$	3	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. Surface mounted on 1 in2 copper pad of FR4 board.

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

■ THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient (Note)	$\theta_{JA}$		59	75	$^{\circ}\text{C/W}$

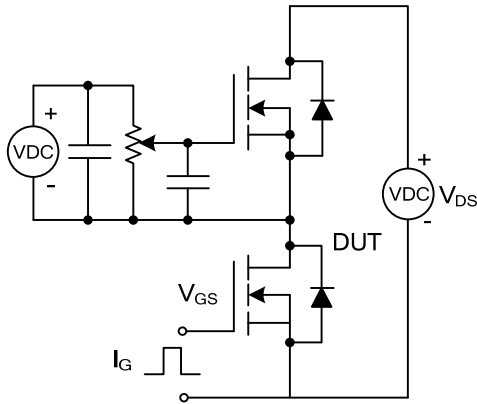
Note: Surface mounted on 1 in2 copper pad of FR4 board

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

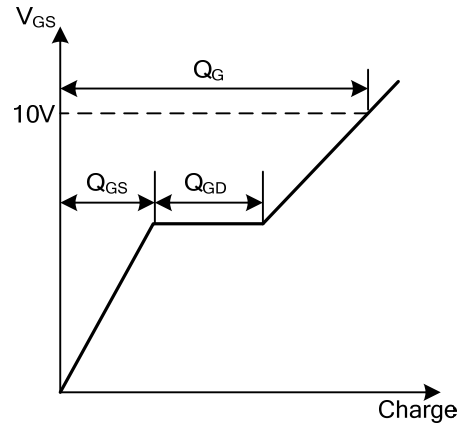
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	30			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$			100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=18\text{A}$		4.7	5.5	m $\Omega$
		$V_{GS}=4.5\text{V}, I_D=15\text{A}$		6.2	7.5	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=15\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$	4660	6060	7270	pF
Output Capacitance	$C_{OSS}$		425	638	960	pF
Reverse Transfer Capacitance	$C_{RSS}$		240	355	530	pF
Gate Resistance	$R_G$	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$	0.2	0.45	0.9	$\Omega$
<b>SWITCHING PARAMETERS</b>						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, R_L=0.83\Omega, R_{GEN}=3\Omega$		12	16	ns
Turn-ON Rise Time	$t_R$		8	12	ns	
Turn-OFF Delay Time	$t_{D(OFF)}$		51.5	70	ns	
Turn-OFF Fall-Time	$t_F$		8.8	14	ns	
Total Gate Charge	$Q_G$	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, I_D=18\text{A}$	80	103	124	nC
Gate Source Charge	$Q_{GS}$		18		nC	
Gate Drain Charge	$Q_{GD}$		15		nC	
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=1\text{A}, V_{GS}=0\text{V}$		0.7	1	V
Diode Continuous Forward Current	$I_S$				4.5	A
Reverse Recovery Time	$t_{RR}$	$I_F=18\text{A}, di/dt=100\text{A}/\mu\text{s}$		33.5	44	ns
Reverse Recovery Charge	$Q_{RR}$			22	30	nC

## SWITCHING TIME TEST CIRCUIT

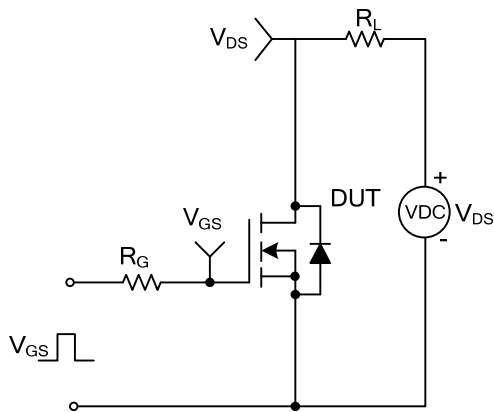
Gate Charge Test Circuit



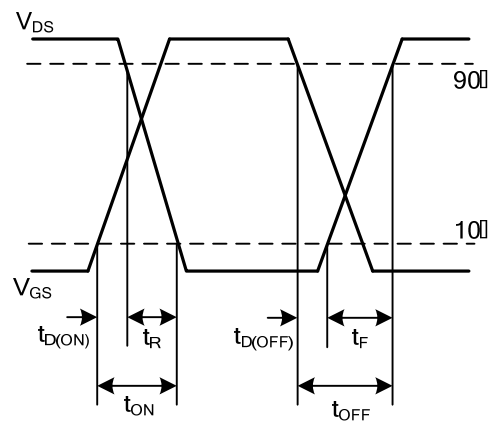
Gate Charge Waveform



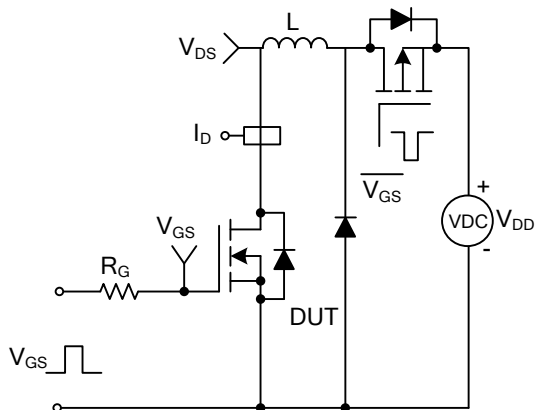
Resistive Switching Test Circuit



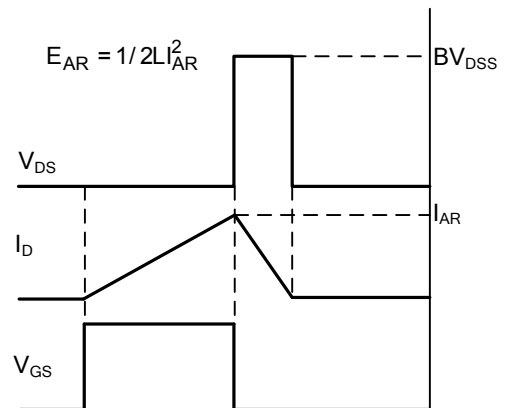
Resistive Switching Waveforms



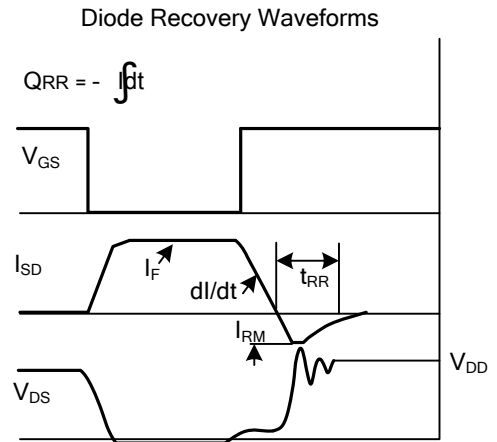
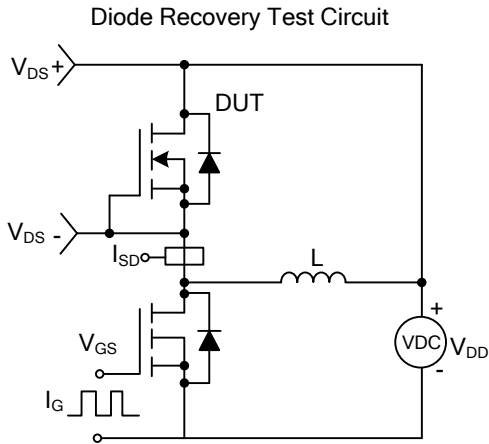
Unclamped Inductive Switching (UIS) Test Circuit



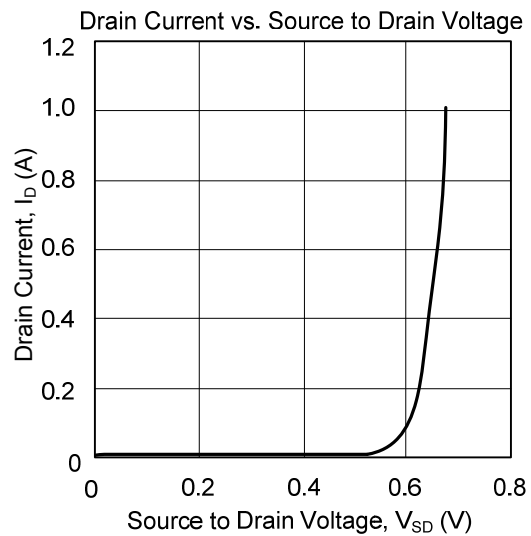
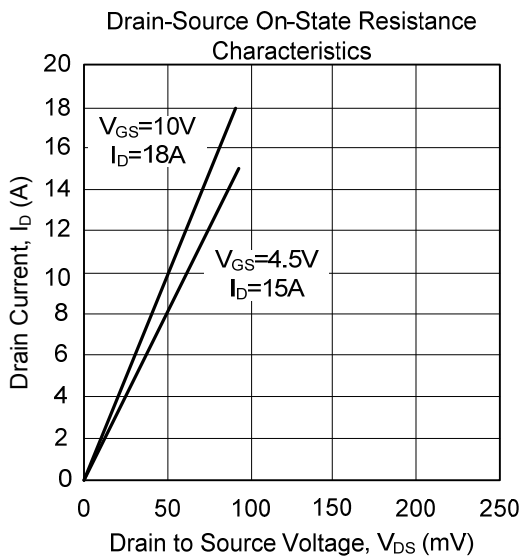
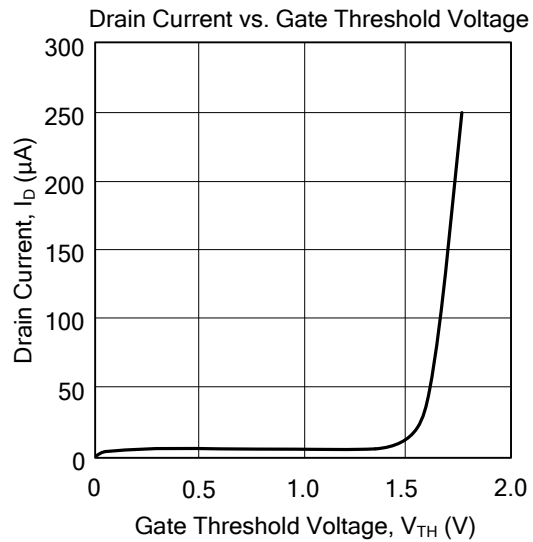
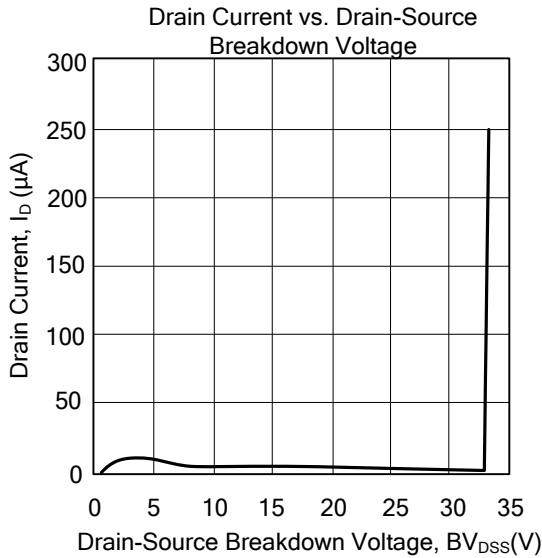
Unclamped Inductive Switching (UIS) Waveforms



■ SWITCHING TIME TEST CIRCUIT



### ■ TYPICAL CHARACTERISTICS



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