



## UT7430

Preliminary

Power MOSFET

### 30V, 34A N-CHANNEL ENHANCEMENT MODE POWER MOSFET

#### DESCRIPTION

The UTC **UT7430** is an N-Channel MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

The UTC **UT7430** is suitable for general purpose applications and high side switch in SMPS.

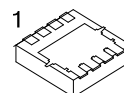
#### FEATURES

\*  $R_{DS(ON)} < 12m\Omega$  @  $V_{GS}=10V$ ,  $I_D=20A$

$R_{DS(ON)} < 16m\Omega$  @  $V_{GS}=4.5V$ ,  $I_D=20A$

\* Low gate charge

\* High switching speed



DFN-8(3x3)

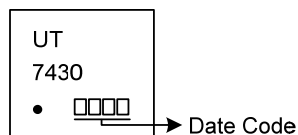
#### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
UT7430G-K08-3030-R	DFN-8(3×3)	S	S	S	G	D	D	D	D	Tape Reel

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

UT7430G-K08-3030-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) K08-3030: DFN-8(3×3)
	(3)Green Package	(3) G: Halogen Free and Lead Free

#### MARKING



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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V <sub>DSS</sub>	30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Drain Current	Continuous	T <sub>C</sub> =25°C	I <sub>D</sub>	34	A
		T <sub>C</sub> =100°C		21	A
	Pulsed (Note 3)		I <sub>DM</sub>	80	A
Continuous Drain Current (Note 1)		T <sub>A</sub> =25°C	I <sub>DSM</sub>	13	A
		T <sub>A</sub> =70°C		10.2	A
Avalanche Current (Note 3)			I <sub>AR</sub>	22	A
Repetitive Avalanche Energy		L=0.1mH (Note 3)	E <sub>AR</sub>	24	mJ
Power Dissipation (Note 2)		T <sub>C</sub> =25°C	P <sub>D</sub>	23	W
		T <sub>C</sub> =100°C		9	W
Power Dissipation (Note 1)		T <sub>A</sub> =25°C	P <sub>DSM</sub>	3.1	W
		T <sub>A</sub> =70°C		2	W
Junction Temperature			T <sub>J</sub>	-55~+150	°C
Storage Temperature Range			T <sub>STG</sub>	-55~+150	°C

Note: 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.

■ THERMAL CHARACTERISTICS

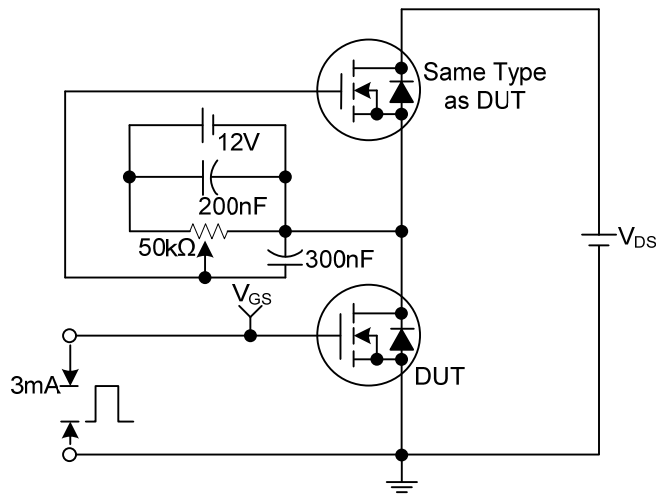
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 1)	$\theta_{JA}$		60	75	$^\circ\text{C/W}$
Junction to Case (Note 2)	$\theta_{JC}$		4.5	5.4	$^\circ\text{C/W}$

- Notes: 1. The value of  $\theta_{JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design, and the maximum temperature of  $150^\circ\text{C}$  may be used if the PCB allows it.
2. The power dissipation  $P_D$  is based on  $T_{J(MAX)}=150^\circ\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.
3. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=150^\circ\text{C}$ .

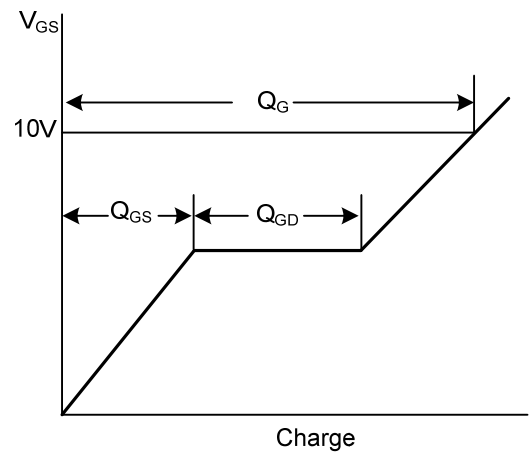
■ ELECTRICAL CHARACTERISTICS ( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	30			V
Drain-Source Leakage Current		I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μA
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V			100	nA
	Reverse		V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V			100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.5	1.9	2.5	V
Static Drain-Source On-Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		10	12	mΩ
			V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		13	16	mΩ
Forward Transconductance		g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =20A		45		S
On State Drain Current		I <sub>D(ON)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =5V	80			A
DYNAMIC PARAMETERS							
Input Capacitance		C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1.0MHz		760		pF
Output Capacitance		C <sub>OSS</sub>			125		pF
Reverse Transfer Capacitance		C <sub>RSS</sub>			70		pF
Gate Resistance		R <sub>G</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	0.8	1.6	2.4	Ω
SWITCHING PARAMETERS							
Total Gate Charge		Q <sub>G</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =15V, I <sub>D</sub> =20A		6.6		nC
Total Gate Charge		Q <sub>G</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =20A		14		nC
Gate to Source Charge		Q <sub>GS</sub>			2.4		nC
Gate to Drain Charge		Q <sub>GD</sub>			3		nC
Turn-ON Delay Time		t <sub>D(ON)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =0.75Ω, R <sub>GEN</sub> =3Ω		4.4		ns
Rise Time		t <sub>R</sub>			9		ns
Turn-OFF Delay Time		t <sub>D(OFF)</sub>			17		ns
Fall-Time		t <sub>F</sub>			6		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I <sub>S</sub>				25	A
Drain-Source Diode Forward Voltage		V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V		0.7	1	V

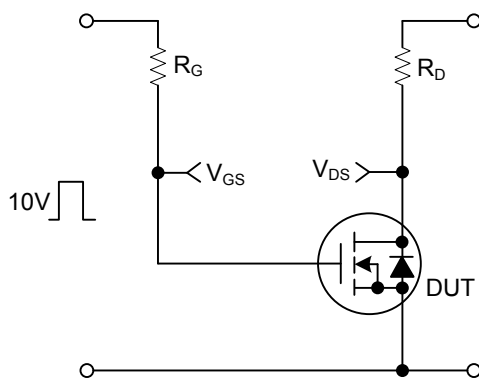
## ■ TEST CIRCUITS AND WAVEFORMS



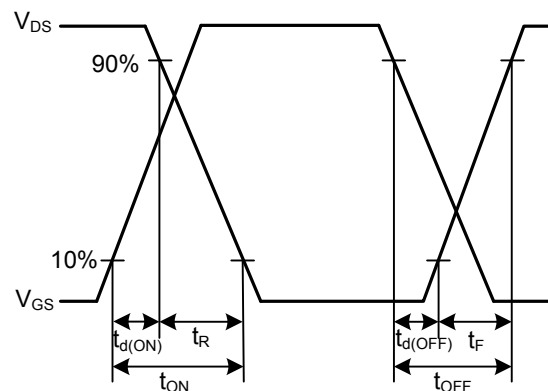
Gate Charge Test Circuit



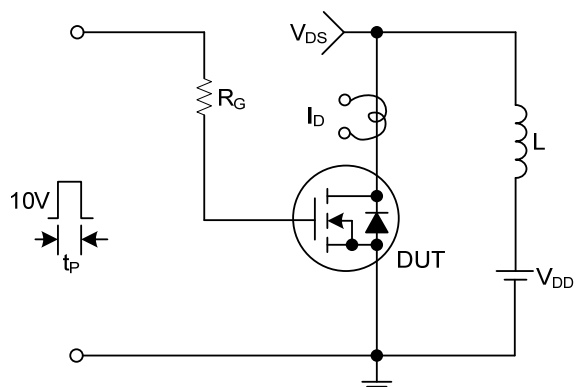
Gate Charge Waveforms



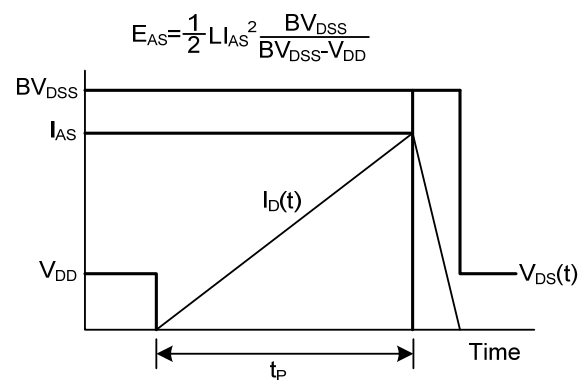
Resistive Switching Test Circuit



Resistive Switching Waveforms

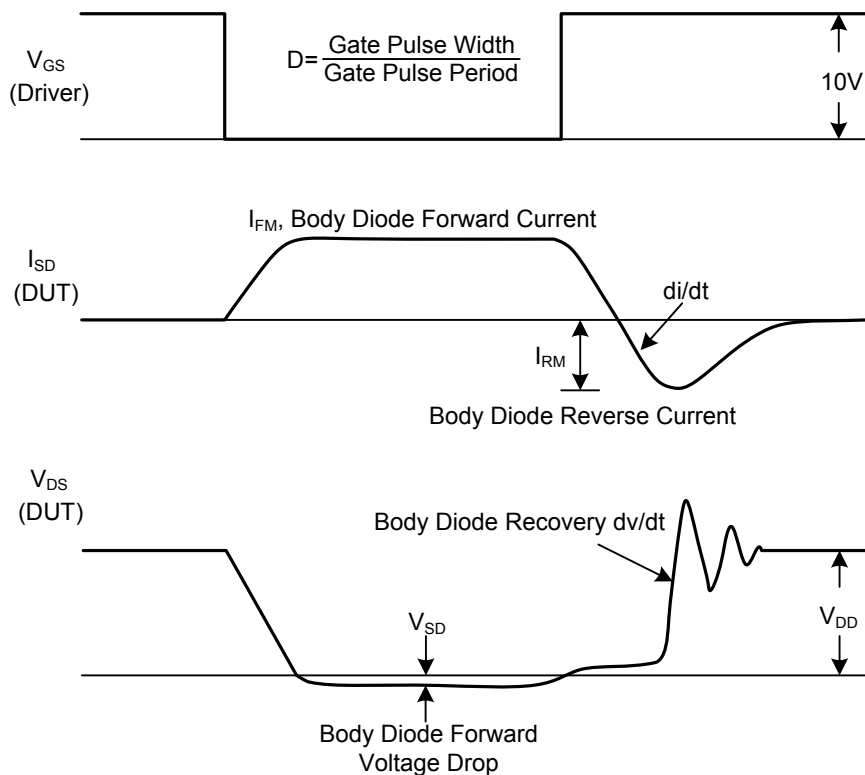
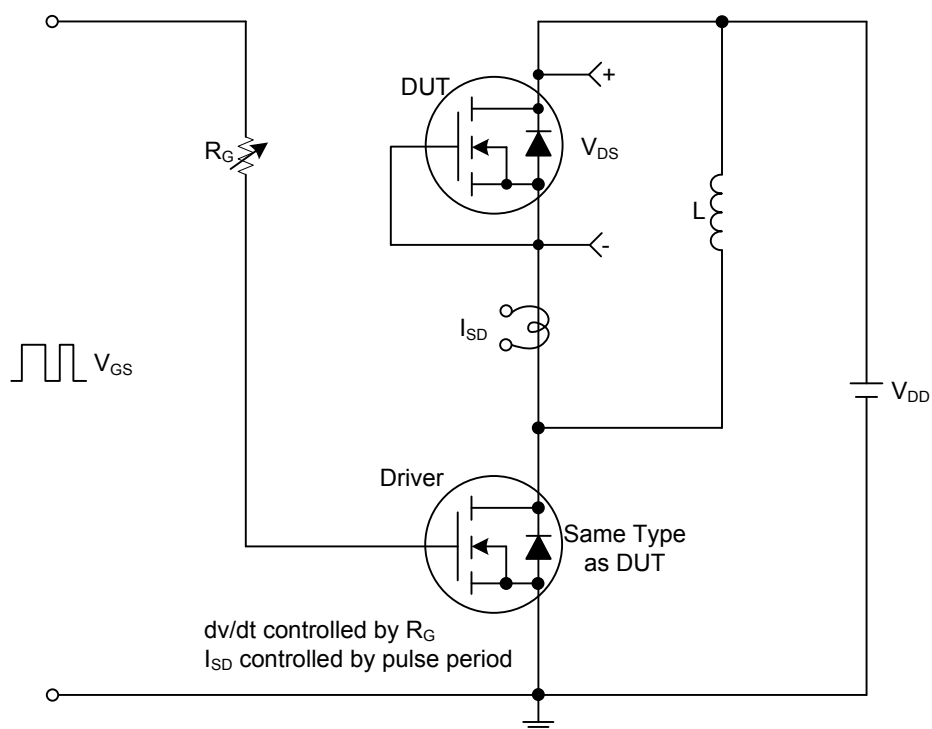


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

# ■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery  $dv/dt$  Test Circuit and Waveforms

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