



UT7430

Preliminary

Power MOSFET

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

DESCRIPTION

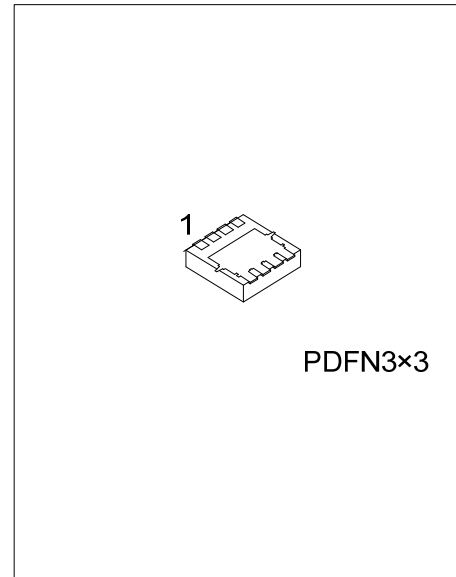
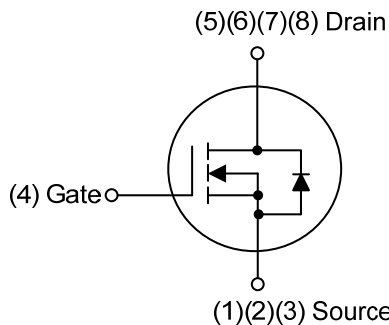
The UTC **UT7430** is an N-Channel MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

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

FEATURES

- * $R_{DS(ON)} \leq 12 \text{ m}\Omega @ V_{GS}=10\text{V}, I_D=20\text{A}$
- * $R_{DS(ON)} \leq 16 \text{ m}\Omega @ V_{GS}=4.5\text{V}, I_D=20\text{A}$
- * Low gate charge
- * High switching speed

SYMBOL



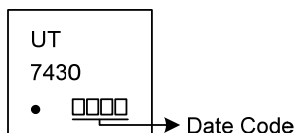
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT7430L-P3030-R	UT7430G-P3030-R	PDFN3x3	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT7430G-P3030-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) P3030: PDFN3x3 (3) G: Halogen Free and Lead Free, K: 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}	± 20	V	
Drain Current	Continuous	I_D	$T_C=25^\circ\text{C}$	34	A
			$T_C=100^\circ\text{C}$	21	A
	Pulsed (Note 3)		I_{DM}	80	A
Continuous Drain Current (Note 1)		I_{DSM}	$T_A=25^\circ\text{C}$	13	A
			$T_A=70^\circ\text{C}$	10.2	A
Avalanche Current (Note 3)		I_{AR}	22	A	
Repetitive Avalanche Energy	$L=0.1\text{mH}$ (Note 3)	E_{AR}	24	mJ	
Power Dissipation (Note 2)		P_D	$T_C=25^\circ\text{C}$	23	W
			$T_C=100^\circ\text{C}$	9	W
Power Dissipation (Note 1)		P_{DSM}	$T_A=25^\circ\text{C}$	3.1	W
			$T_A=70^\circ\text{C}$	2	W
Junction Temperature		T_J	-55 ~ +150	$^\circ\text{C}$	
Storage Temperature Range		T_{STG}	-55 ~ +150	$^\circ\text{C}$	

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 DATA

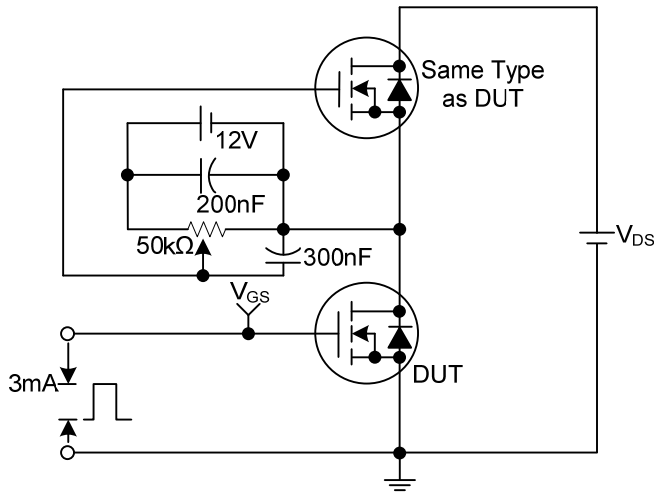
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 1)	θ_{JA}		60	75	$^\circ\text{C}/\text{W}$
Junction to Case (Note 2)	θ_{JC}		4.5	5.4	$^\circ\text{C}/\text{W}$

- Notes: 1. The value of θ_{JA} is measured with the device mounted on 1in^2 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°C may be used if the PCB allows it.
2. The power dissipation P_D is based on $T_{J(\text{MAX})}=150^\circ\text{C}$, 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 $T_{J(\text{MAX})}=150^\circ\text{C}$.

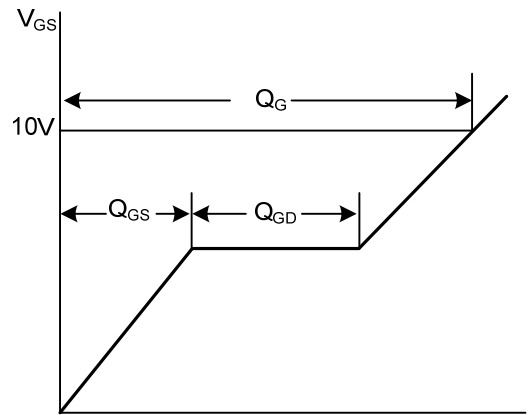
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			100	nA
		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.5	1.9	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A		10	12	mΩ
		V _{GS} =4.5V, I _D =20A		13	16	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =20A		45		S
On State Drain Current	I _{D(ON)}	V _{GS} =10V, V _{DS} =5V	80			A
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		780		pF
Output Capacitance	C _{OSS}			200		pF
Reverse Transfer Capacitance	C _{RSS}			165		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{GS} =4.5V, V _{DS} =15V, I _D =20A		15.2		nC
Total Gate Charge	Q _G	V _{GS} =10V, V _{DS} =15V, I _D =20A		32.7		nC
Gate to Source Charge	Q _{GS}			7.6		nC
Gate to Drain Charge	Q _{GD}			7.2		nC
Turn-ON Delay Time	t _{D(ON)}			16		ns
Rise Time	t _R	V _{GS} =10V, V _{DS} =15V, R _L =0.75Ω, R _{GEN} =3Ω		33		ns
Turn-OFF Delay Time	t _{D(OFF)}			45		ns
Fall-Time	t _F			18		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				25	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V		0.7	1	V

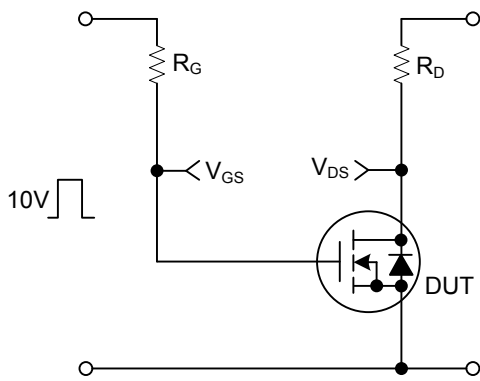
■ TEST CIRCUITS AND WAVEFORMS



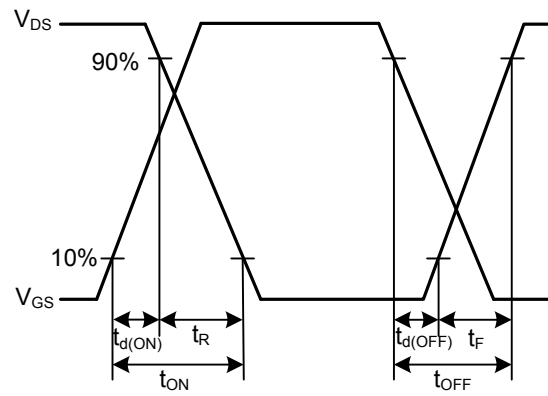
Gate Charge Test Circuit



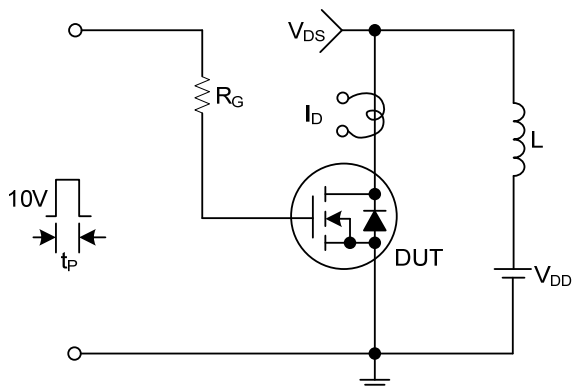
Gate Charge Waveforms



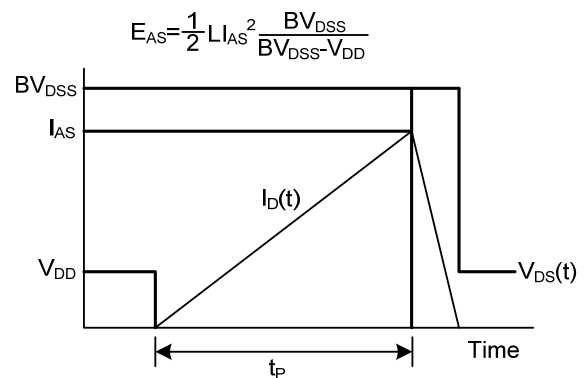
Resistive Switching Test Circuit



Resistive Switching Waveforms

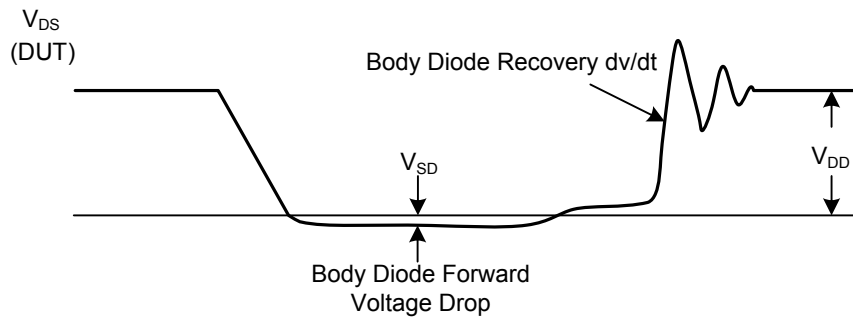
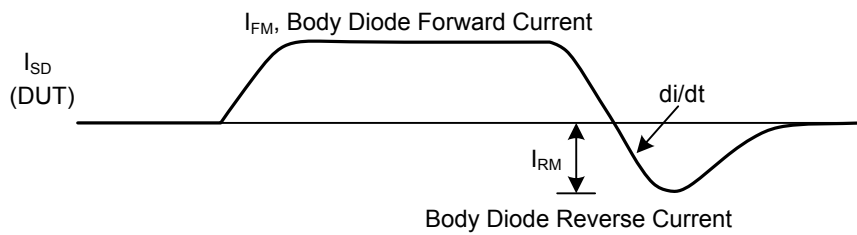
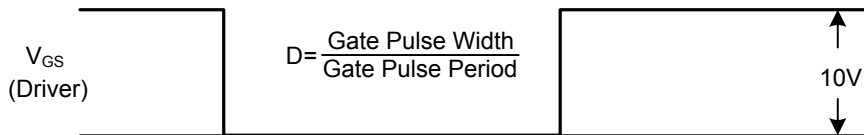
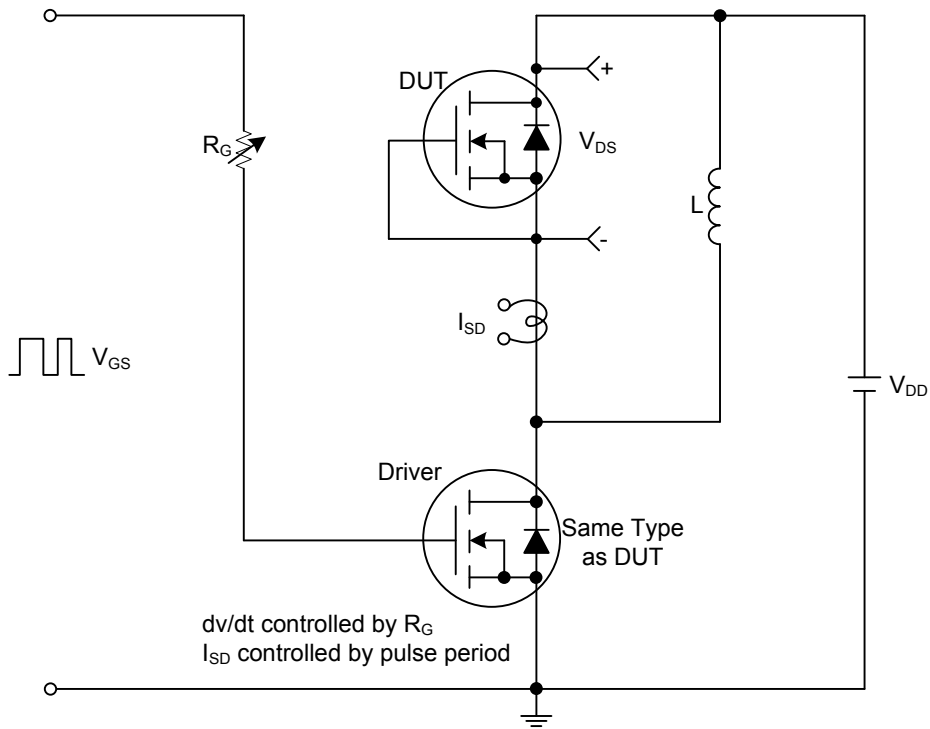


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit and Waveforms

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