



UT7410

Preliminary

Power MOSFET

30V, 24A N-CHANNEL ENHANCEMENT MODE POWER MOSFET

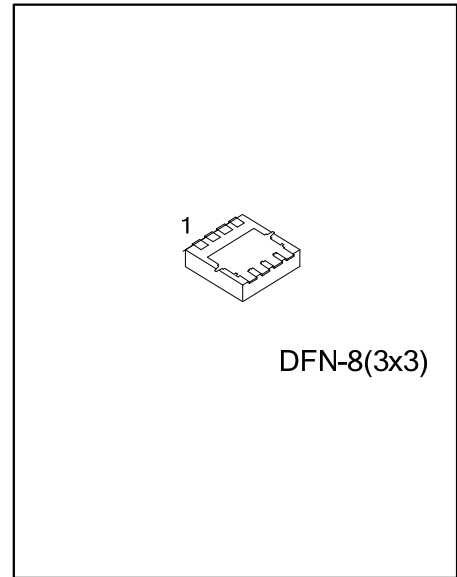
DESCRIPTION

The UTC **UT7410** is an N-channel enhancement MOSFET, it uses UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and low gate charge.

The UTC **UT7410** is suitable for Load Switch and DC-DC converters applications, etc.

FEATURES

- * $R_{DS(ON)} < 24m\Omega$ @ $V_{GS}=10V, I_D=8A$
- $R_{DS(ON)} < 32m\Omega$ @ $V_{GS}=4.5V, I_D=7A$
- * Low Gate Charge (typical 9.8nC)

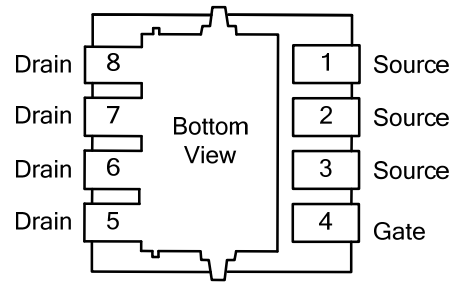
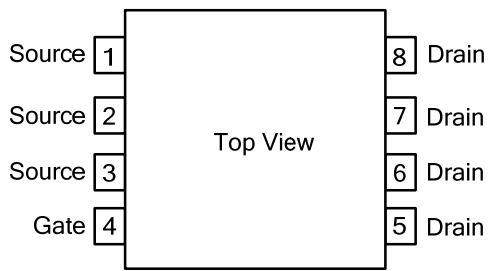


ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UT7410L-K08-3030-R	UT7410G-K08-3030-R	DFN-8(3x3)	Tape Reel

<p>UT7410L-K08-3030-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) R: Tape Reel</p> <p>(2) K08-3030: DFN-8(3x3)</p> <p>(3) L: Lead Free, G: Halogen Free</p>
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■ PIN CONFIGURATION



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

PARAMETER			SYMBOL	RATINGS	UNIT	
Drain-Source Voltage			V_{DSS}	30	V	
Gate-Source Voltage			V_{GSS}	± 20	V	
Drain Current	Continuous	(Note 2)	$T_C=25^\circ\text{C}$	I_D	24	A
			$T_C=100^\circ\text{C}$		15	A
	(Note 1)	$T_A=25^\circ\text{C}$	I_{DSM}	9.5	A	
		$T_A=70^\circ\text{C}$		7.7	A	
Pulsed (Note 3)			I_{DM}	40	A	
Power Dissipation	(Note 2)	$T_C=25^\circ\text{C}$	P_D	20	W	
		$T_C=100^\circ\text{C}$		8.3	W	
	(Note 1)	$T_A=25^\circ\text{C}$	P_{DSM}	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 CHARACTERISTICS

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 1)	$t \leq 10\text{s}$	θ_{JA}		30	40	$^\circ\text{C/W}$
	Steady-State			60	75	$^\circ\text{C/W}$
Junction to Case (Note 2)	Steady-State	θ_{JC}		5	6	$^\circ\text{C/W}$

Notes: 1. The value of θ_{JA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The Power dissipation P_{DSM} is based on θ_{JA} $t \leq 10\text{s}$ value and the maximum allowed junction temperature of 150°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.

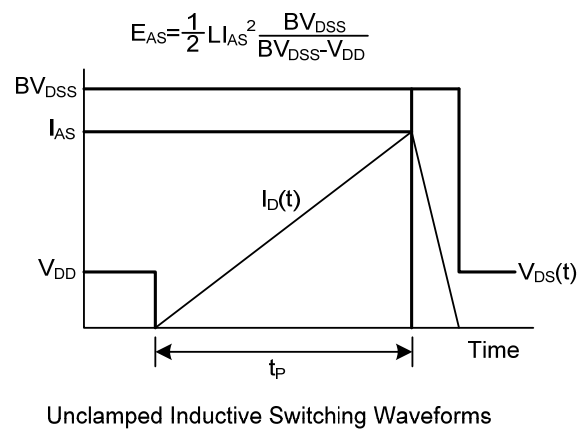
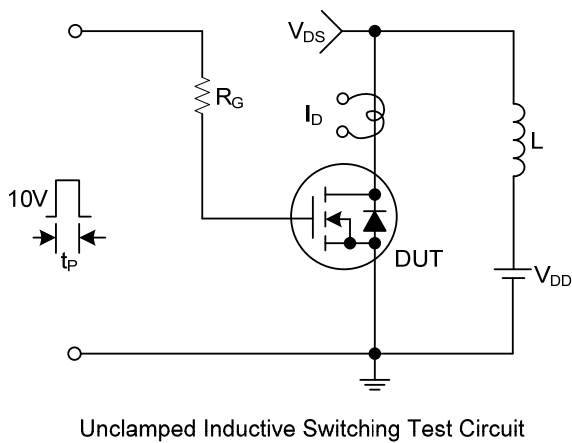
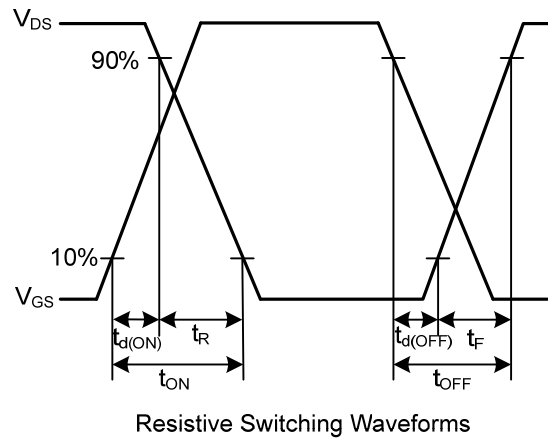
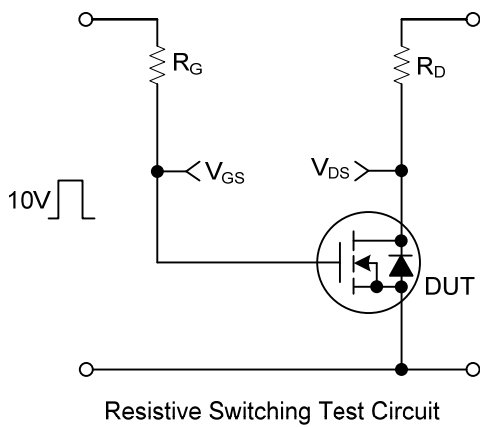
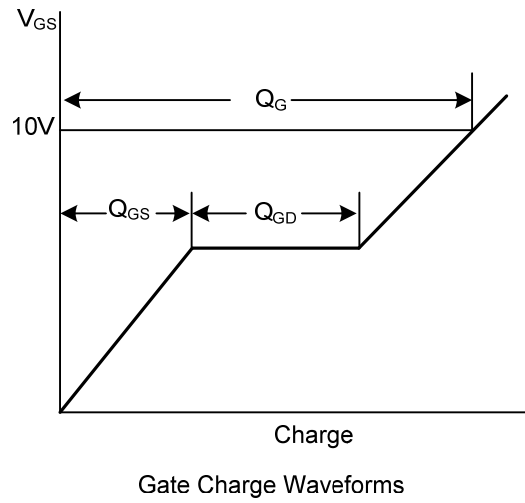
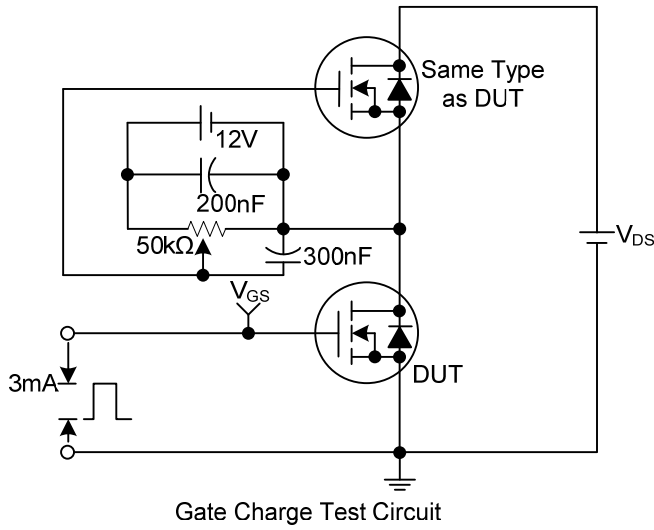
2. The power dissipation P_D is based on $T_{J(MAX)}=150^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

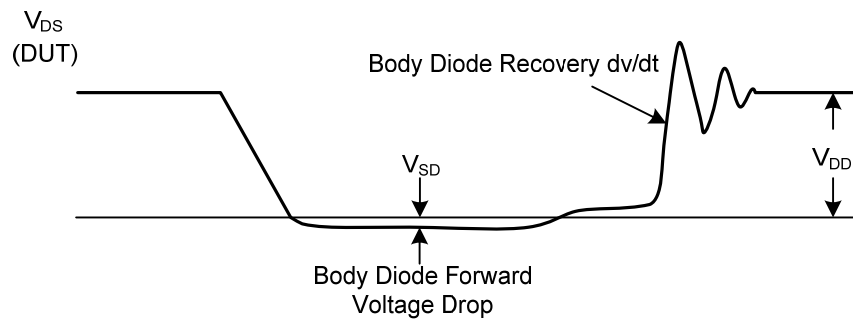
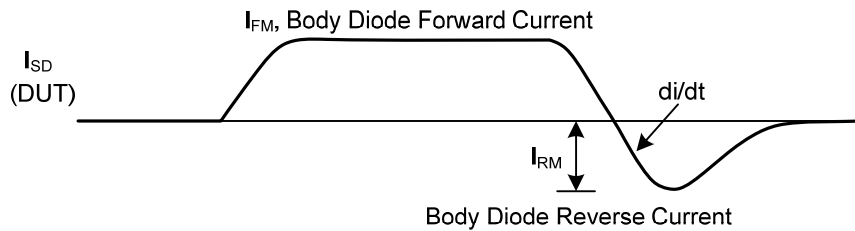
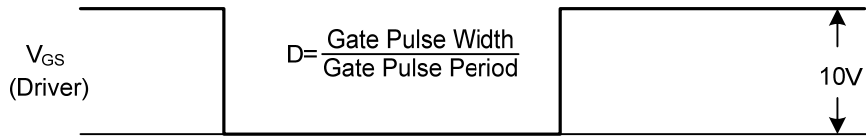
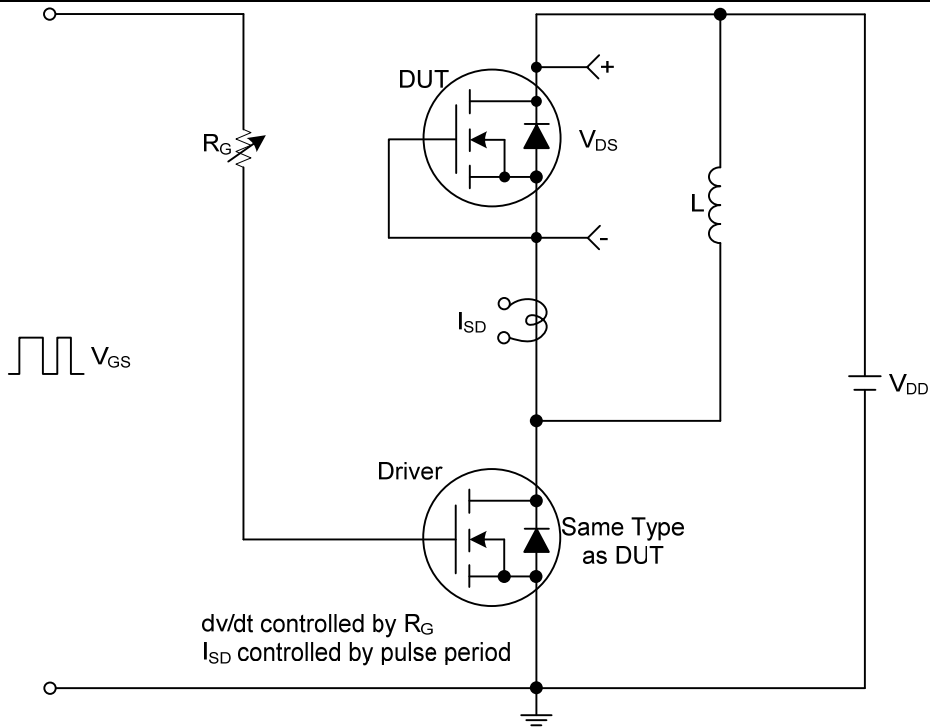
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.

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

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	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA	
	Reverse		V _{GS} =-20V, V _{DS} =0V			-100	nA	
ON CHARACTERISTICS								
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.4	1.8	2.5	V	
Static Drain-Source On-Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =8A		18	24	mΩ	
			V _{GS} =4.5V, I _D =7A		27	32	mΩ	
Forward Transconductance		g _{FS}	V _{DS} =5V, I _D =8A		30		S	
On State Drain Current		I _{D(ON)}	V _{GS} =10V, V _{DS} =5V	40			A	
DYNAMIC PARAMETERS								
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		550		pF	
Output Capacitance		C _{OSS}				110		pF
Reverse Transfer Capacitance		C _{RSS}				55		pF
Gate resistance		R _G	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		4	4.9	Ω	
SWITCHING PARAMETERS								
Total Gate Charge	10V	Q _G	V _{GS} =10V, V _{DS} =15V, I _D =8A		9.8		nC	
	4.5V				4.6		nC	
Gate to Source Charge		Q _{GS}			1.8		nC	
Gate to Drain Charge		Q _{GD}			2.2		nC	
Turn-ON Delay Time		t _{D(ON)}			5		ns	
Rise Time		t _R	V _{GS} =10V, V _{DS} =15V, R _L =2Ω, R _{GEN} =3Ω		3.2		ns	
Turn-OFF Delay Time		t _{D(OFF)}			24		ns	
Fall-Time		t _F			6		ns	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS								
Maximum Body-Diode Continuous Current		I _S				1.7	A	
Drain-Source Diode Forward Voltage		V _{SD}	I _S =1A, V _{GS} =0V		0.75	1	V	

■ TEST CIRCUITS AND WAVEFORMS





Peak Diode Recovery dv/dt Test Circuit and Waveforms

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