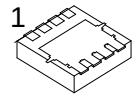
30V, 24A N-CHANNEL ENHANCEMENT MODE POWER MOSFET



DFN3030-8

■ DESCRIPTION

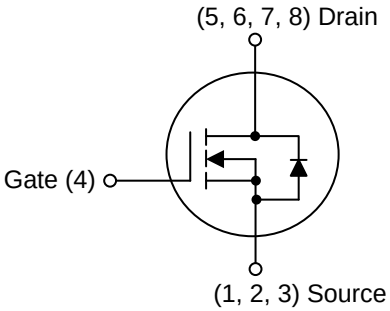
The UTC **UT7410** is an N-channel enhancement MOSFET, it uses UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and low gate charge.

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

■ FEATURES

* $R_{DS(ON)}$ ≤ 17 mΩ @ V_{GS}=10V, I_D=8.0A
  $R_{DS(ON)}$ ≤ 26 mΩ @ V_{GS}=4.5V, I_D=7.0A

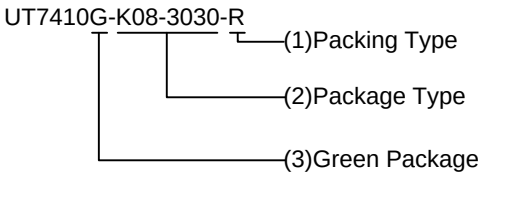
■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT7410L-K08-3030-R	UT7410G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel

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

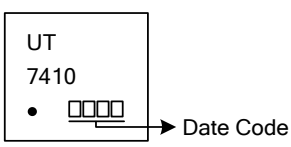


(1) R: Tape Reel

(2) K08-3030: DFN3030-8

(3) G: Halogen Free and Lead Free, K: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°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 (Note 2)	T_C=25°C	I_D	24	A
	Pulsed (Note 3)		I_{DM}	40	A
Power Dissipation (Note 2)		T_C=25°C	P_D	20	W
Junction Temperature			T_J	-55 ~ +150	°C
Storage Temperature Range			T_{STG}	-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 DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 1)	Steady-State	θ_{JA}	60	°C/W
Junction to Case (Note 2)	Steady-State	θ_{JC}	6.25	°C/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°C. The Power dissipation P_{DSM} is based on θ_{JA} t≤10s 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.

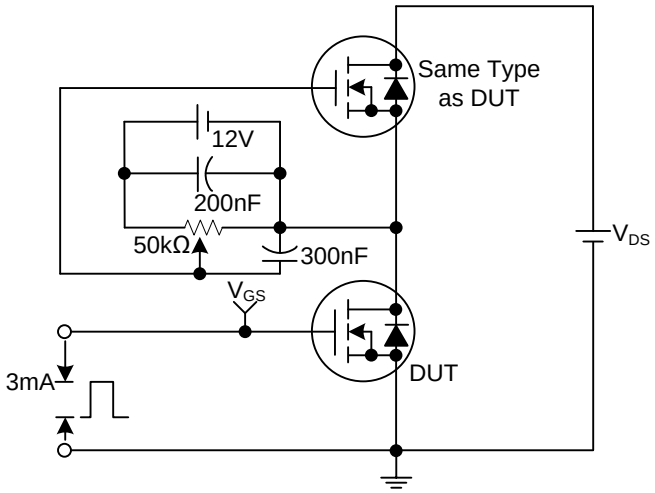
2. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

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

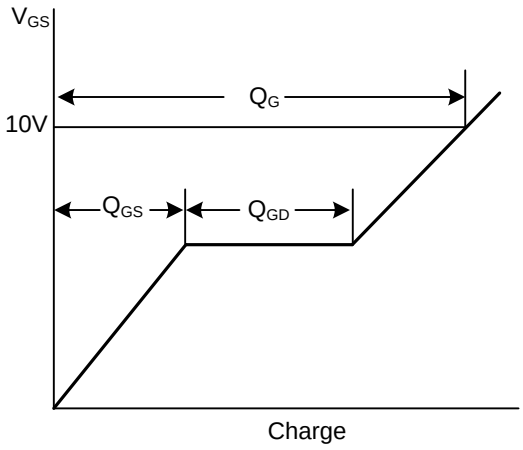
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	30			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		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=8.0A		13	17	mΩ
			V_{GS}=4.5V, I_D=7.0A		22	26	mΩ
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		421		pF
Output Capacitance		C_{OSS}			110		pF
Reverse Transfer Capacitance		C_{RSS}			92		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=20A		13		nC
	4.5V				7		nC
Gate to Source Charge		Q_{GS}			1.8		nC
Gate to Drain Charge		Q_{GD}			3		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{GS}=10V, V_{DS}=15V, I_D=20A, R_{GEN}=3Ω		5		ns
Rise Time		t_R			14		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			13		ns
Fall-Time		t_F			22		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

Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating ambient temperature.

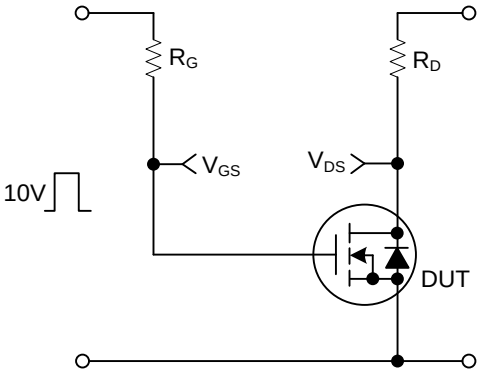
■ TEST CIRCUITS AND WAVEFORMS



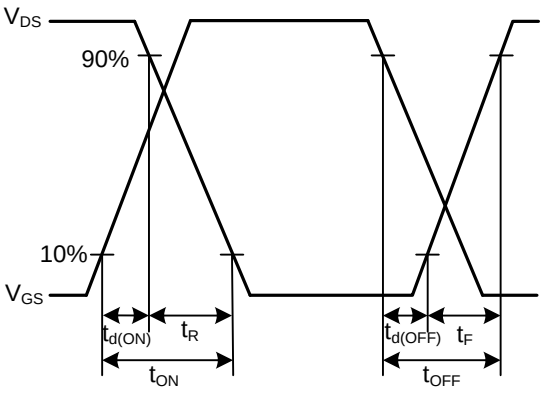
Gate Charge Test Circuit



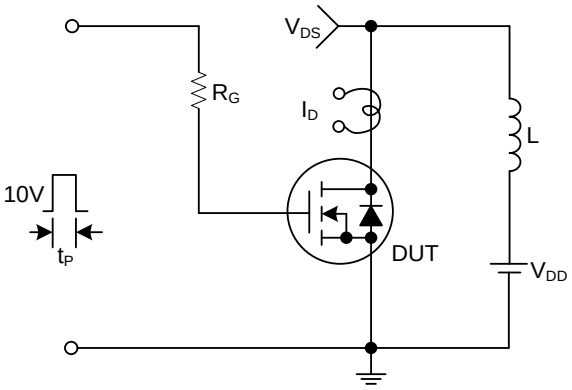
Gate Charge Waveforms



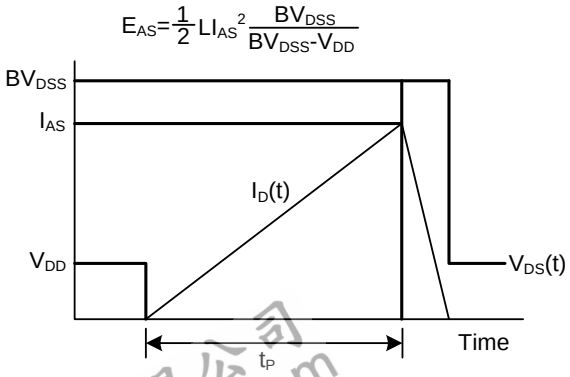
Resistive Switching Test Circuit



Resistive Switching Waveforms

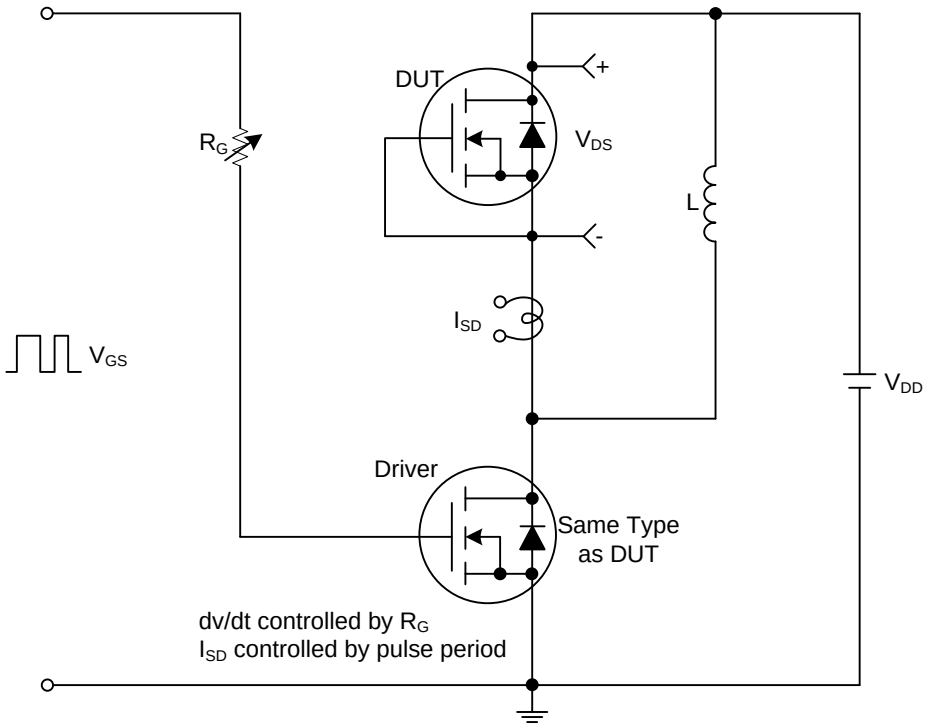


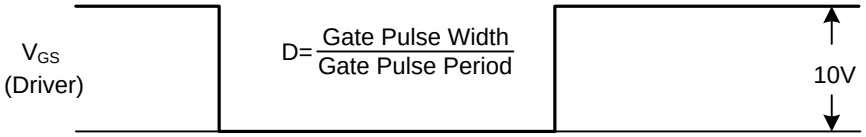
Unclamped Inductive Switching Test Circuit

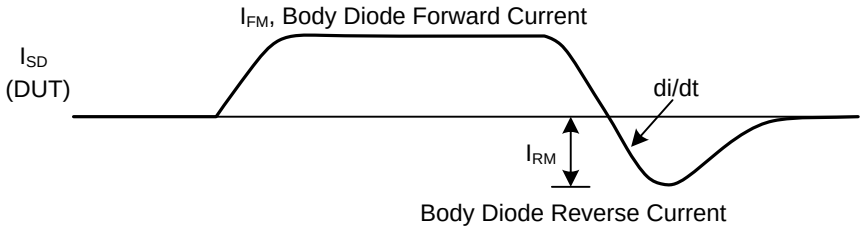


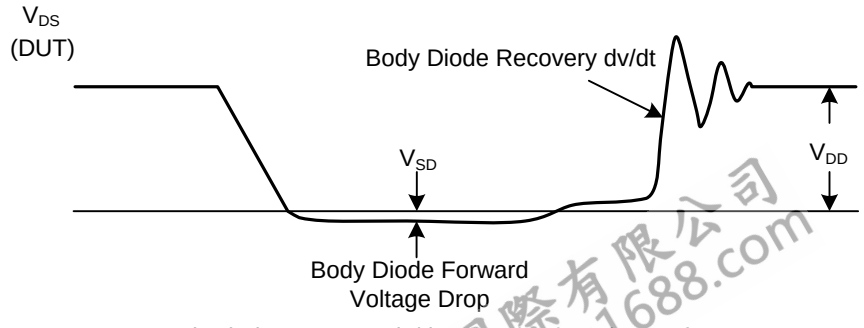
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS









Peak Diode Recovery dv/dt Test Circuit and Waveforms