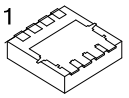
40A, 30V N-CHANNEL MOSFET



DFN-8(3x3)

■ DESCRIPTION

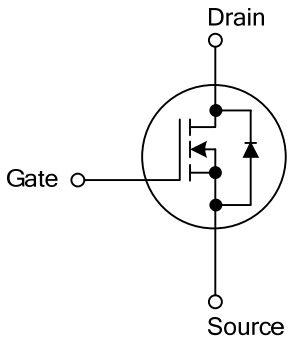
The UTC **UT7422-H** is an N-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, etc.

The UTC **UT7422-H** is suitable for load switch and battery protection applications.

■ FEATURES

* $R_{DS(ON)}$ < 4.3mΩ @ V_{GS}=10V, I_D=20A
  $R_{DS(ON)}$ < 6.0mΩ @ V_{GS}=4.5V, I_D=16A
* Low $R_{DS(ON)}$

■ SYMBOL



■ ORDERING INFORMATION

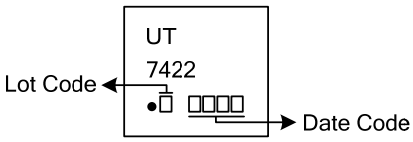
Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
UT7422G-K08-3030-R	DFN-8(3×3)	S	S	S	G	D	D	D	D	Tape Reel

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

UT7422G-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°C, unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Note 6)	T_C=25°C	I_D	40	A
Pulsed Drain Current (Note 4)		I_{DM}	200	A
Continuous Drain Current	T_A=25°C	I_{DSM}	20	A
Avalanche Current (Note 4)		I_{AS}, I_{AR}	45	A
Avalanche Energy L=0.1mH (Note 4)		E_{AS}, E_{AR}	101	mJ
Power Dissipation (Note 3)	T_C=25°C	P_D	36	W
Power Dissipation (Note 2)	T_A=25°C	P_{DSM}	3.1	W
Junction Temperature		T_J	-55~+150	°C
Storage Temperature Range		T_{STG}	-55~+150	°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. 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.
3. 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.
4. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.
5. The θ_{JA} is the sum of the thermal impedence from junction to case θ_{JC} and case to ambient.
6. The maximum current rating is package limited.

■ THERMAL CHARACTERISTICS

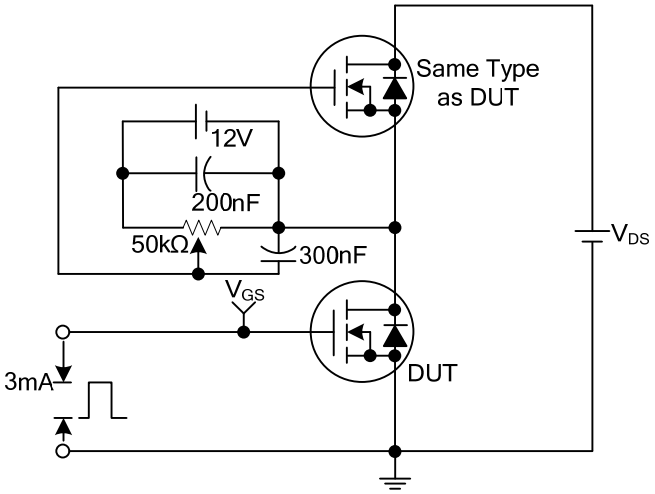
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 2, 5)	θ_{JA}	75	°C/W
Junction-to-Case	θ_{JC}	3.4	°C/W

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

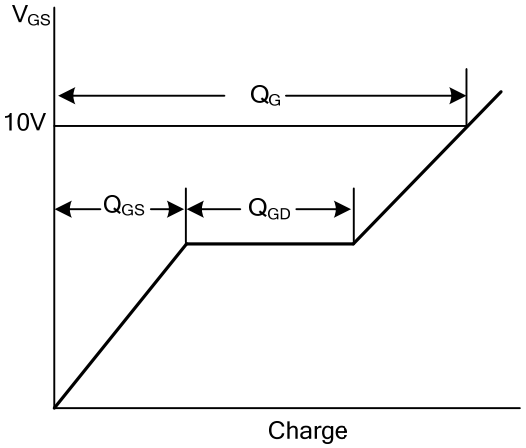
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
		V_{DS}=30V, V_{GS}=0V, T_J=55°C			5	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.3	1.85	2.4	V
On State Drain Current	$I_{D(ON)}$	V_{GS}=10V, V_{DS}=5V	200			A
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		3.5	4.3	mΩ
		V_{GS}=10V, I_D=20A, T_J=125°C		5.5	6.8	mΩ
		V_{GS}=4.5V, I_D=16A		4.5	6	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=20A		85		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=15V, f=1.0MHz	1950	2445	2940	pF
Output Capacitance	C_{OSS}		270	390	510	pF
Reverse Transfer Capacitance	C_{RSS}		130	220	310	pF
Gate Resistance	R_G	V_{DS}=0V, V_{GS}=0V, f=1.0MHz	1.2	2.4	3.6	Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{GS}=10V, V_{DS}=15V, I_D=20A	32	41	50	nC
Total Gate Charge	Q_G	V_{GS}=4.5V, V_{DS}=15V, I_D=20A	15	19	24	nC
Gate to Source Charge	Q_{GS}			7.2		nC
Gate to Drain Charge	Q_{GD}			6.6		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=15V, R_L=0.75Ω, R_{GEN}=3Ω		7		ns
Rise Time	t_R			5		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			41.5		ns
Fall-Time	t_F			10.5		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V		0.7	1	V
Maximum Body-Diode Continuous Current (Note)	I_S				40	A
Body Diode Reverse Recovery Time	t_{rr}	I_F=20A, dI/dt=500A/μs		17.5	22	ns
Body Diode Reverse Recovery Charge	Q_{rr}			31	40	nC

Note: The maximum current rating is package limited.

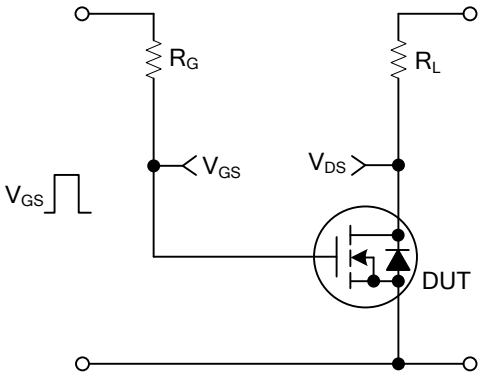
■ TEST CIRCUITS AND WAVEFORMS



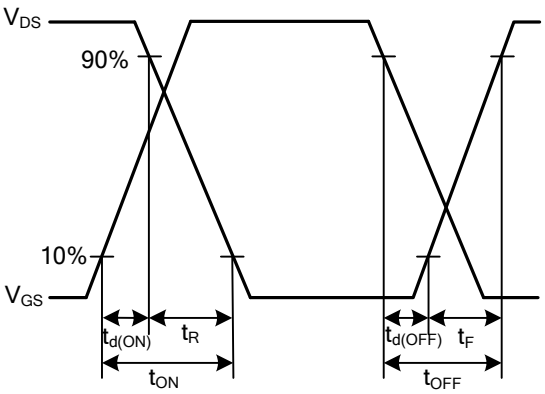
Gate Charge Test Circuit



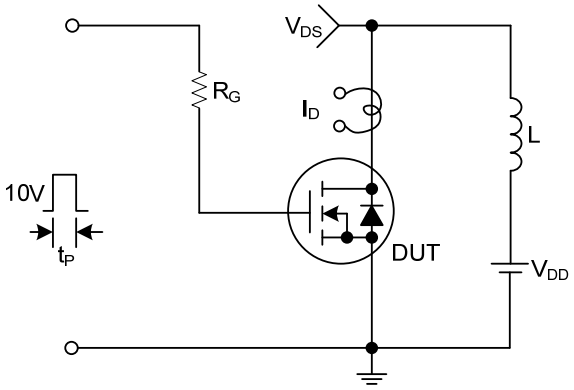
Gate Charge Waveforms



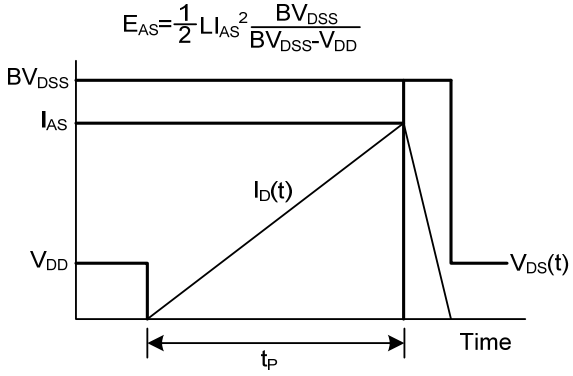
Resistive Switching Test Circuit



Resistive Switching Waveforms

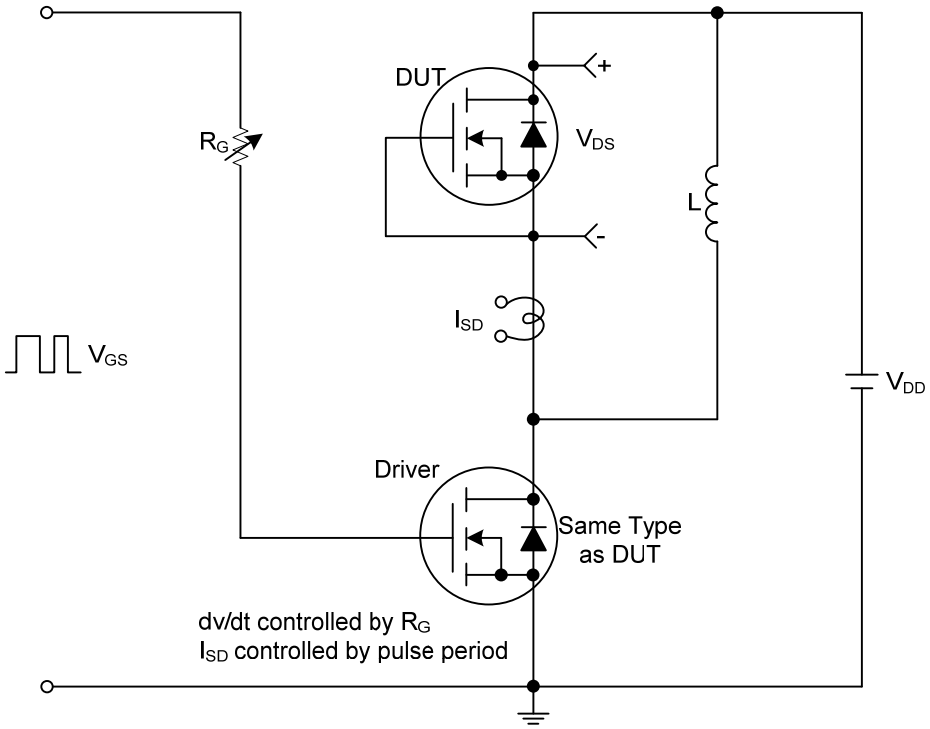


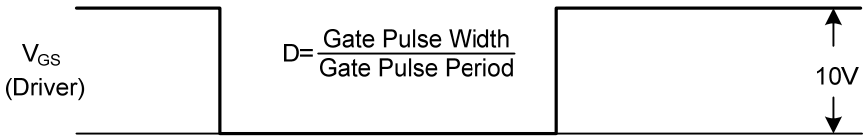
Unclamped Inductive Switching Test Circuit

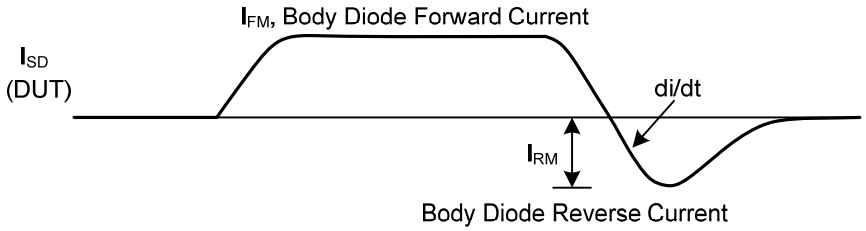


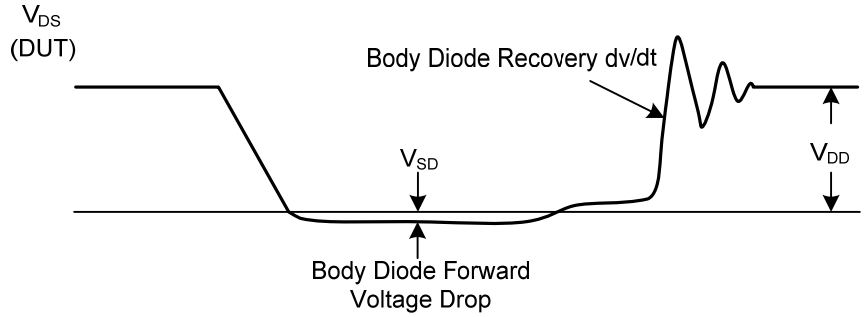
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)









Peak Diode Recovery dv/dt Test Circuit and Waveforms