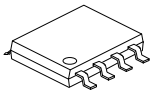
UT4410

Power MOSFET

N-CHANNEL 30-V (D-S) MOSFET



SOP-8

■ DESCRIPTION

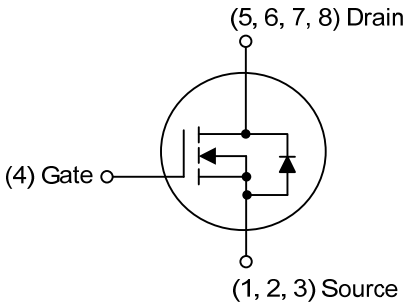
The UTC **UT4410** is a N-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and high switching speed.

The UTC **UT4410** is suitable for load switch and battery protection applications.

■ FEATURES

* $R_{DS(ON)}$ ≤ 11 mΩ @ V_{GS}=10V, I_D=8.0A
* $R_{DS(ON)}$ ≤ 15 mΩ @ V_{GS}=4.5V, I_D=8.0A
* Fast switching capability
* Avalanche energy specified
* Improved dv/dt capability, high ruggedness

■ SYMBOL



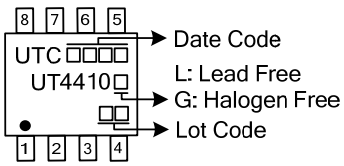
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT4410L-S08-R	UT4410G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT4410G-S08-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current		I_D	11	A
Pulsed Drain Current		I_{DM}	50	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	4	mJ
Power Dissipation		P_D	1.8	W
Junction Temperature		T_J	-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. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. L = 0.1mH, I_{AS} = 9.0A, V_{DD} = 20V, R_G = 25Ω, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	90	°C/W
Junction to Case	θ_{JC}	69 (Note)	°C/W

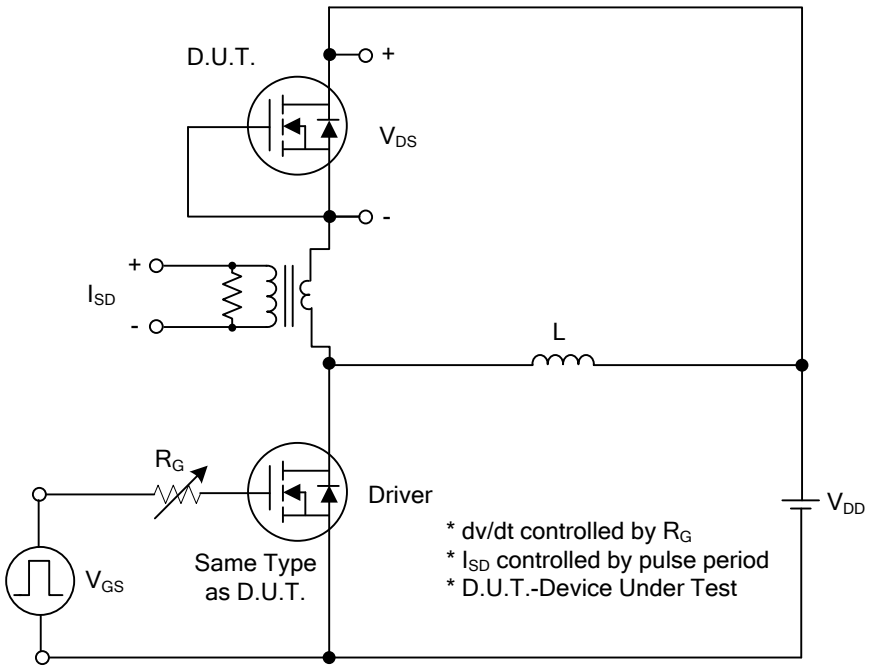
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

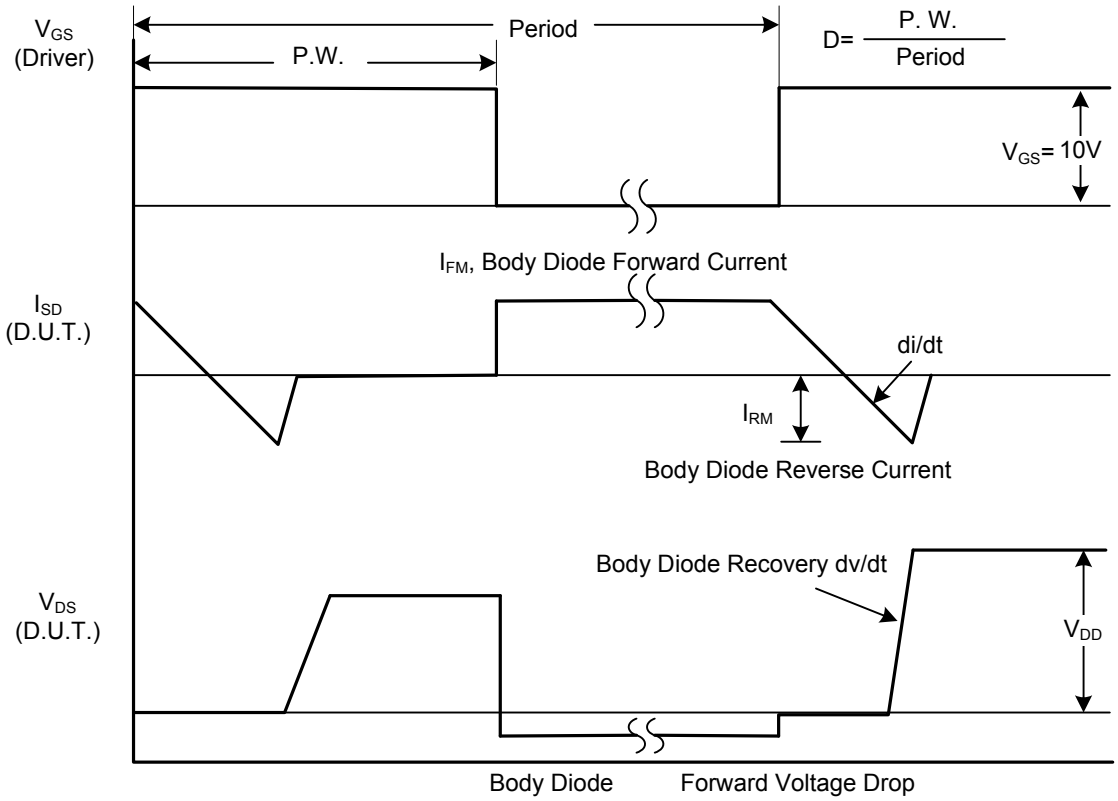
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=-250μA, V_{GS}=0V	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Static Drain–Source On–Resistance(Note)	$R_{DS(ON)}$	V_{GS}=10V, I_D=8.0A			11	mΩ
		V_{GS}=4.5V, I_D=8.0A			15	
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS}=0V, f=1.0MHz		820		pF
Output Capacitance	C_{OSS}			280		pF
Reverse Transfer Capacitance	C_{RSS}			150		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=15V, V_{GS}=10V, I_D=11A		38		nC
Gate Source Charge	Q_{GS}			5		nC
Gate Drain Charge	Q_{GD}			11		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DS}=15V, V_{GS}=4.5V, I_D=11A, R_G=3.0Ω (Note 1, 2)		8		ns
Turn-ON Rise Time	t_R			16		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			23		ns
Turn-OFF Fall-Time	t_F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				11	A
Maximum Body-Diode Pulsed Current	I_{SM}				50	A
Diode Forward Voltage	V_{SD}	I_S=11A , V_{GS}=0V			1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	I_S=11A, V_{GS}=0V		210		ns
Reverse Recovery Charge	Q_{rr}	dI_F/dt=100A/μs (Note1)		1		μC

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

■ TEST CIRCUITS AND WAVEFORMS

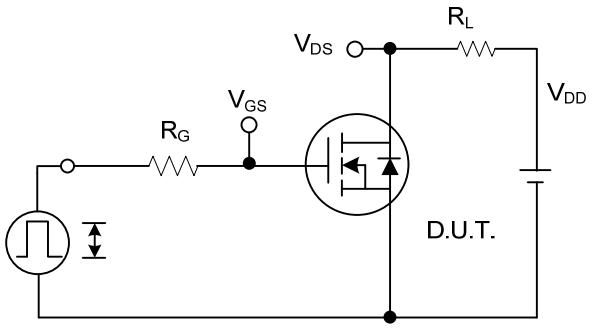


Peak Diode Recovery dv/dt Test Circuit

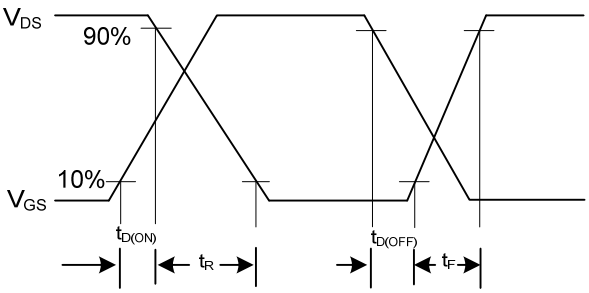


Peak Diode Recovery dv/dt Waveforms

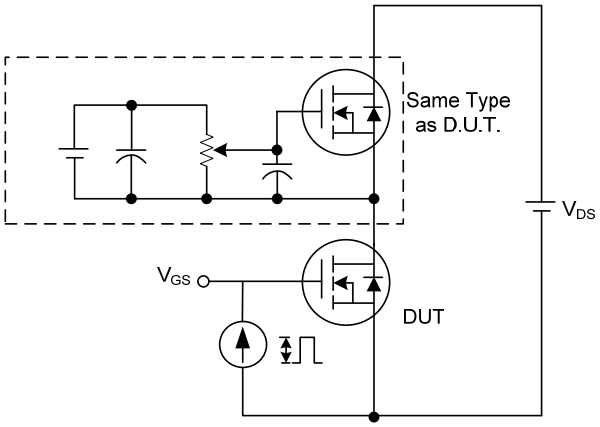
■ TEST CIRCUITS AND WAVEFORMS



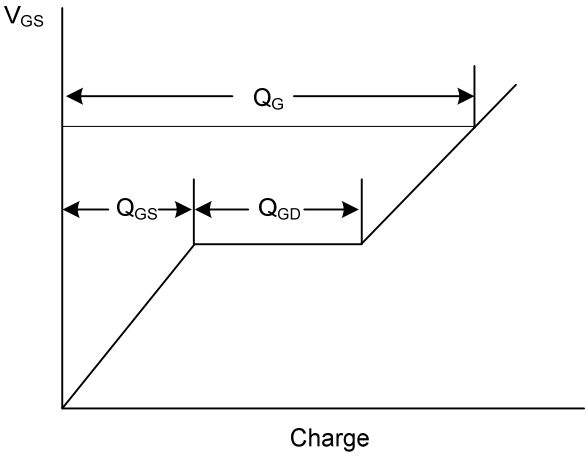
Switching Test Circuit



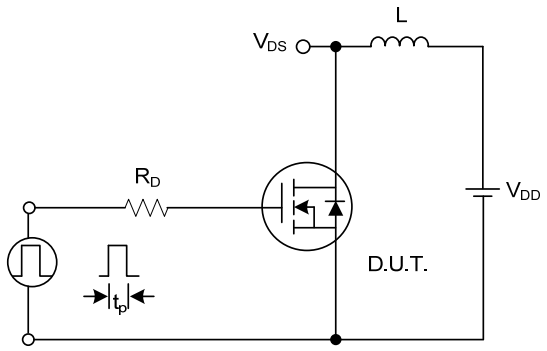
Switching Waveforms



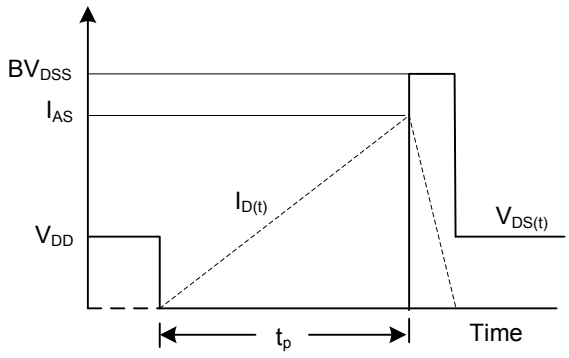
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms