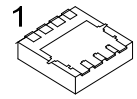
30V, 34A N-CHANNEL ENHANCEMENT MODE POWER MOSFET



PDFN3×3

■ DESCRIPTION

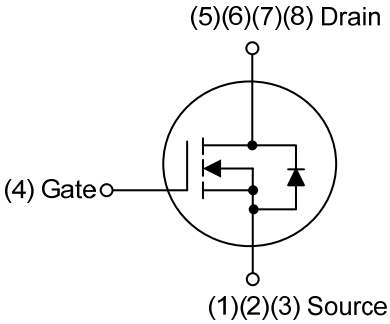
The UTC **UT7430** is an N-Channel MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

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

■ FEATURES

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

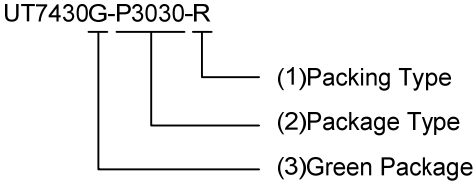
■ SYMBOL



■ ORDERING INFORMATION

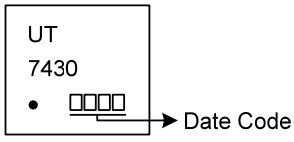
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT7430L-P3030-R	UT7430G-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

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



(1) R: Tape Reel
(2) P3030: PDFN3×3
(3) G: Halogen Free and Lead Free, K: 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
Drain Current	Continuous	T_C=25°C	I_D	34	A
		T_C=100°C		21	A
	Pulsed (Note 3)		I_{DM}	80	A
Repetitive Avalanche Energy		L=0.1mH (Note 3)	E_{AS}	25.5	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	0.95	V/nS
Power Dissipation (Note 2)			P_D	24	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. Repetitive Rating: Pulse width limited by maximum junction temperature
3. L = 0.1mH, I_{AS} = 22.6A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
4. I_{SD} ≤ 34.0A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	75	°C/W
Junction to Case	θ_{JC}	5.2	°C/W

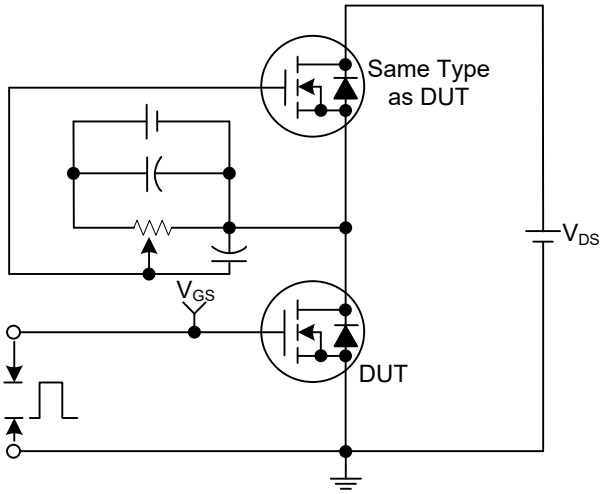
Notes: 1. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
2. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.
3. Repetitive rating, pulse width limited by junction temperature $T_{J\ (MAX)}$=150°C.

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

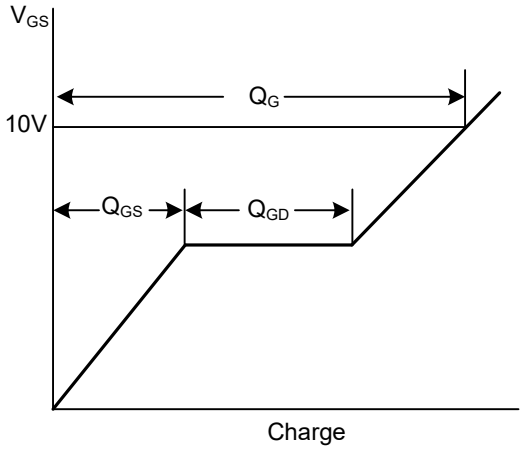
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	30			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		2.5	V
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=20A			12	mΩ
			V_{GS}=4.5V, I_D=20A			16	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=15V, f=1.0MHz		718		pF
Output Capacitance		C_{OSS}			199		pF
Reverse Transfer Capacitance		C_{RSS}			168		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS}=24V ,V_{GS}=10V , I_D=34A		14		nC
Gate to Source Charge		Q_{GS}			3		nC
Gate to Drain Charge		Q_{GD}			9		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DS}=15V, V_{GS}=10V, I_D=34A R_G=3Ω		7		ns
Rise Time		t_R			16		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			18		ns
Fall-Time		t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				34	A
Maximum Body-Diode Pulsed Current		I_{SM}				80	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=1.0A, V_{GS}=0V			1.0	V
Reverse Recovery Time (Note 1)		t_{rr}	I_S=30A, V_{GS}=0V, dI/dt=100A/μs		210		nS
Reverse Recovery Charge		Q_{rr}			353		nC

Notes: 1. Pulse Test: Pulse width ≤ 1200μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

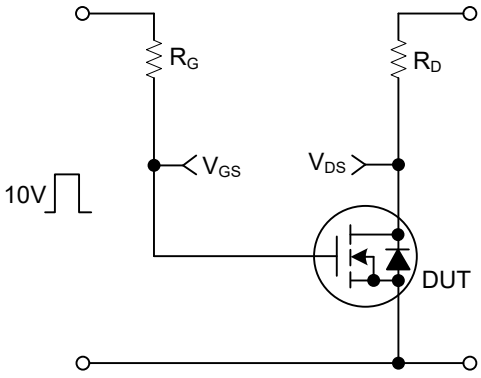
■ TEST CIRCUITS AND WAVEFORMS



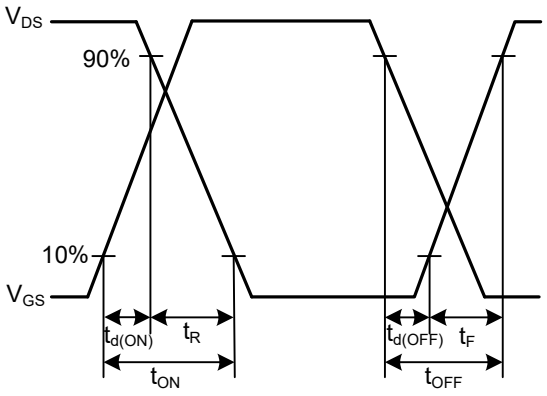
Gate Charge Test Circuit



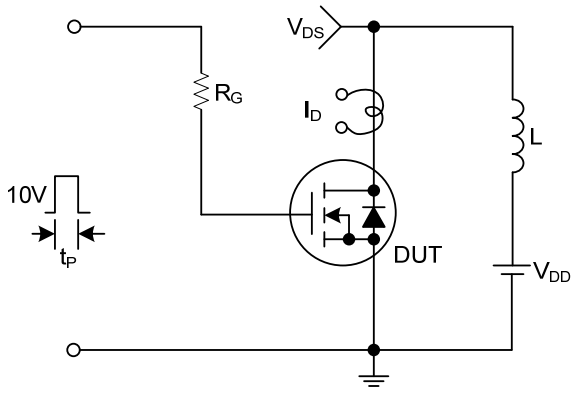
Gate Charge Waveforms



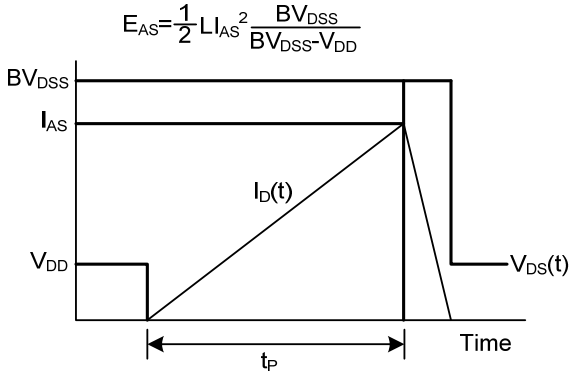
Resistive Switching Test Circuit



Resistive Switching Waveforms

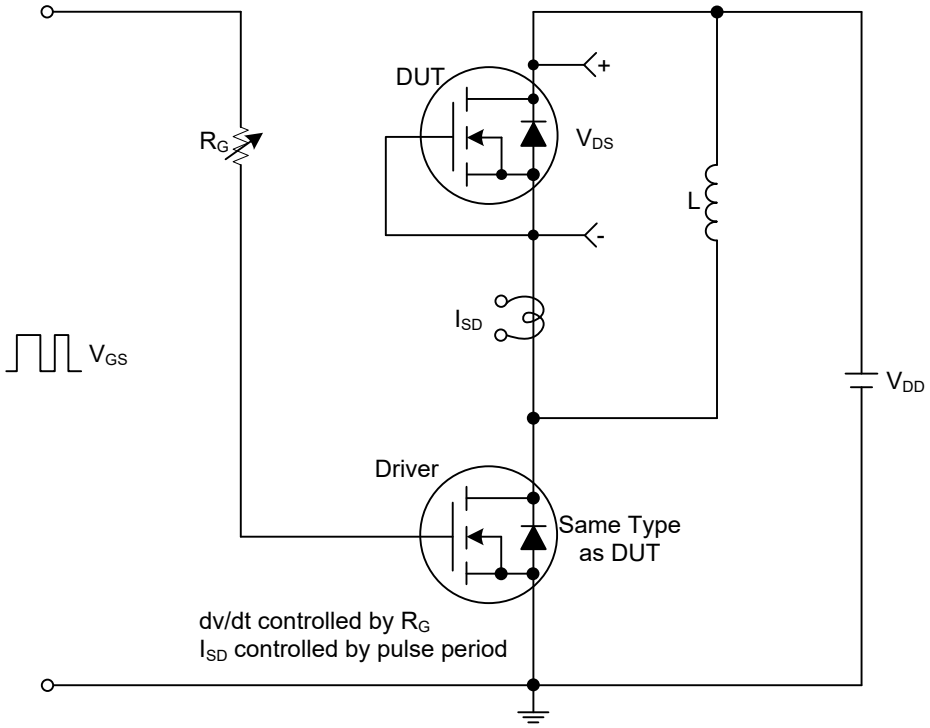


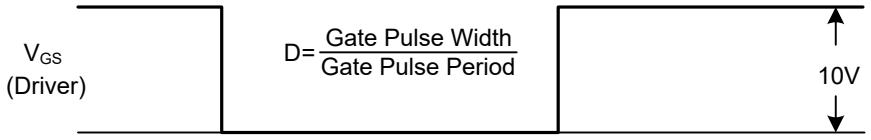
Unclamped Inductive Switching Test Circuit

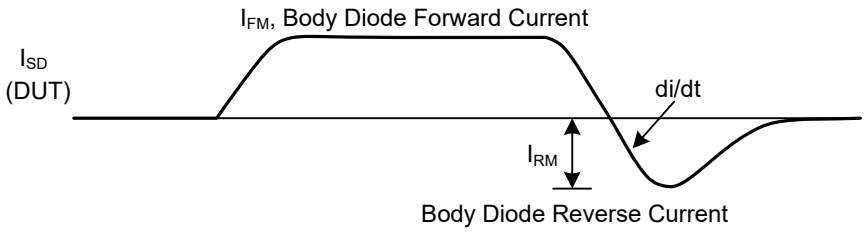


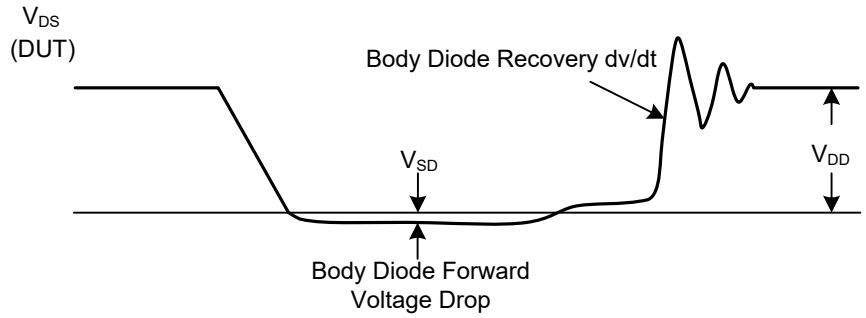
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS









Peak Diode Recovery dv/dt Test Circuit and Waveforms