



UT30P10H

Preliminary

Power MOSFET

-30A, -100V P-CHANNEL POWER MOSFET

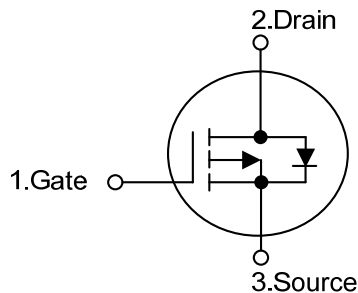
DESCRIPTION

The UTC **UT30P10H** provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

FEATURES

- * $R_{DS(ON)} \leq 65 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -15\text{A}$
- * High Switching Speed
- * 100% Avalanche Tested

SYMBOL



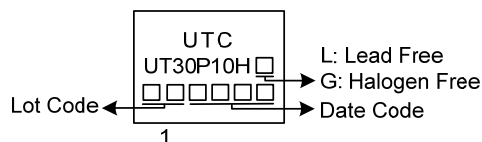
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT30P10HL-TN3-R	UT30P10HG-TN3-R	TO-252	G	D	S	Tape Reel
UT30P10HL-TQ2-T	UT30P10HG-TQ2-T	TO-263	G	D	S	Tube
UT30P10HL-TQ2-R	UT30P10HG-TQ2-R	TO-263	G	D	S	Tape Reel

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

UT30P10HG-TN3-R	(1) Packing Type	(1) R: Tape Reel, T: Tube
	(2) Package Type	(2) TN3: TO-252, TQ2: TO-263
	(3) Green Package	(3) G: Halogen Free and Lead Free L: Lead Free

MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_D	-30	A
	Pulsed (Note 2)	I_{DM}	-60	A
Avalanche Energy	Repetitive (Note 3)	E_{AS}	65	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.2	V/ns
Power Dissipation ($T_C=25^\circ\text{C}$)	TO-252	P_D	50	W
	TO-263		100	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

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. $L = 0.1\text{mH}$, $I_{AS} = -36.1\text{A}$, $V_{DD} = -50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq -30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	θ_{JA}	110	$^\circ\text{C}/\text{W}$
	TO-263		62.5	$^\circ\text{C}/\text{W}$
Junction to Case	TO-252	θ_{JC}	2.5 (Note)	$^\circ\text{C}/\text{W}$
	TO-263		1.25 (Note)	$^\circ\text{C}/\text{W}$

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

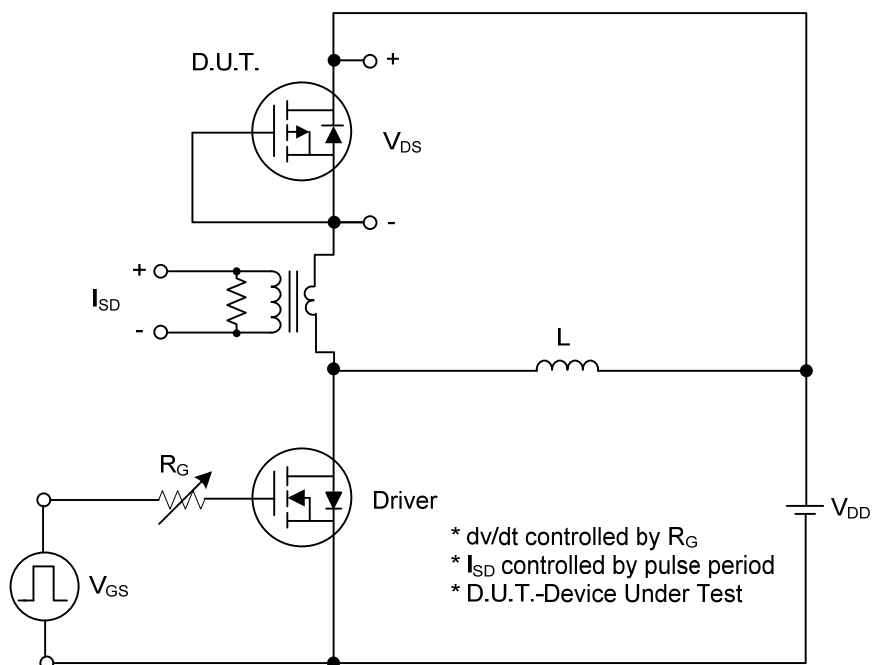
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =-250μA, V _{GS} =0V	-100			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-100V, 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	-2.0		-4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-15A			65	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =-25V, V _{GS} =0V, f=1MHz		2636		pF
Output Capacitance		C _{OSS}			156		pF
Reverse Transfer Capacitance		C _{RSS}			119		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =-80V, V _{GS} =-10V, I _D =-30A (Note 1, 2)		42		nC
Gate to Source Charge		Q _{GS}			9		nC
Gate to Drain Charge		Q _{GD}			16		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =-50V, I _D =-30A, R _G =3Ω (Note 1, 2)		12		ns
Rise Time		t _R			16		ns
Turn-OFF Delay Time		t _{D(OFF)}			36		ns
Fall-Time		t _F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				-30	A
Maximum Body-Diode Pulsed Current		I _{SM}	(Note 1)			-60	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =-30A, V _{GS} =0V (Note 2)			-1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =-30A, V _{GS} =0V,		102		ns
Body Diode Reverse Recovery Charge		Q _{rr}	dI _F /dt=100A/μs		132		nC

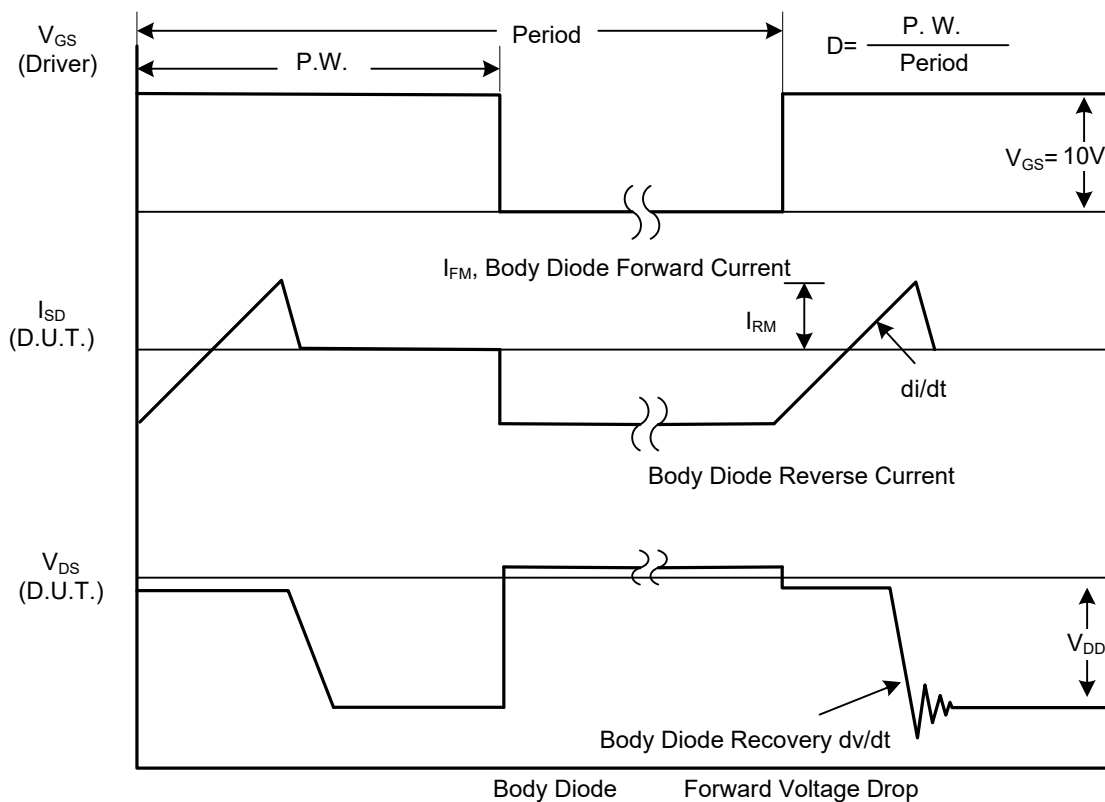
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

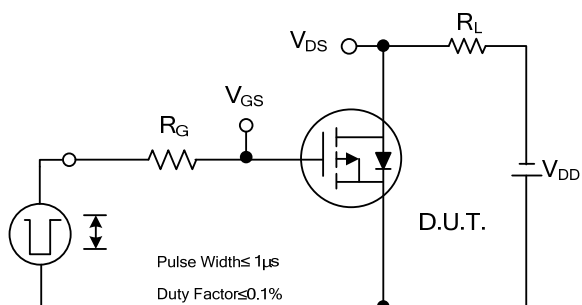


Peak Diode Recovery dv/dt Test Circuit

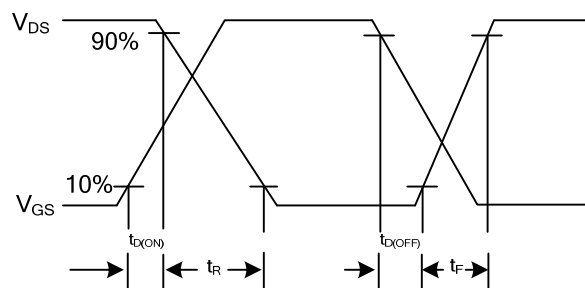


Peak Diode Recovery dv/dt Waveforms

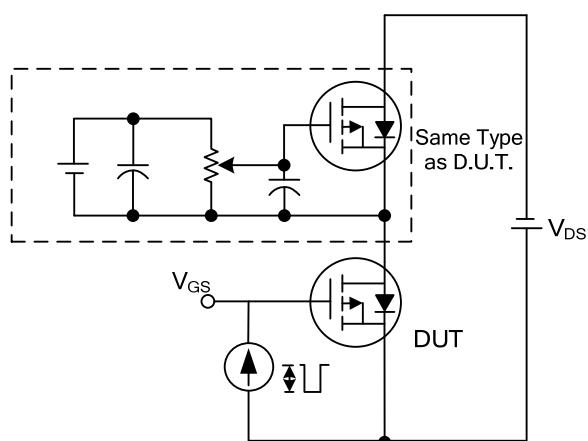
■ TEST CIRCUITS AND WAVEFORMS



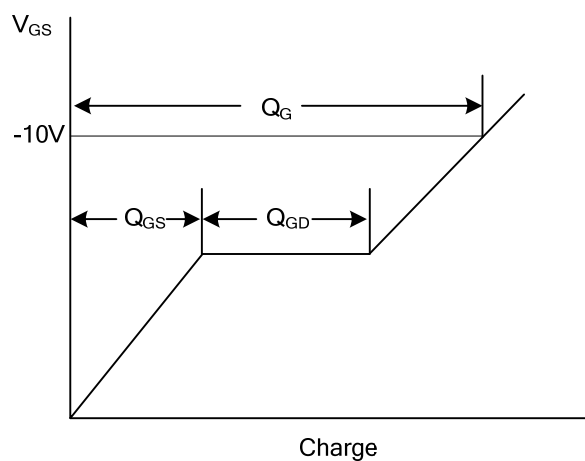
Switching Test Circuit



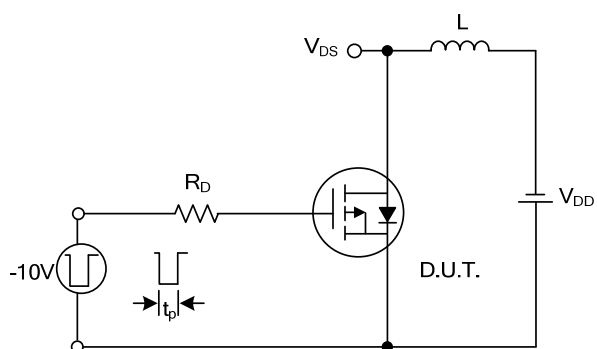
Switching Waveforms



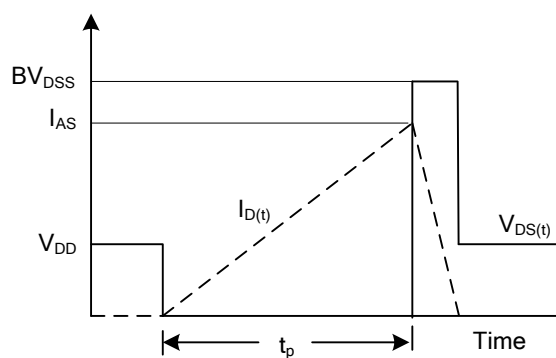
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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