



7P30

POWER MOSFET

-6A, -300V, SWITCHING P-CHANNEL POWER MOSFET

■ DESCRIPTION

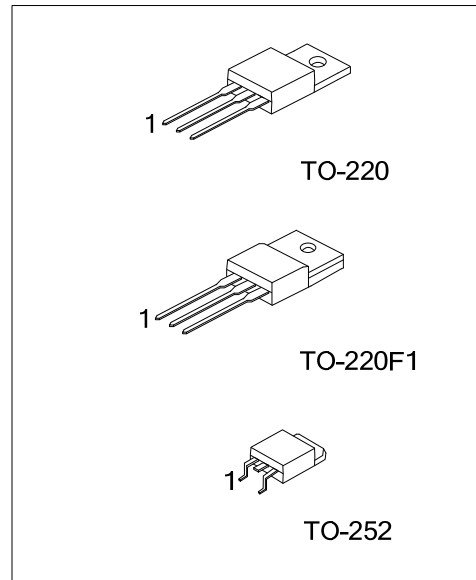
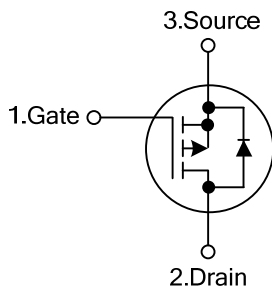
The UTC **7P30** is a P-channel MOS Field Effect Transistor. it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance.

The UTC **7P30** is suitable for high voltage switching applications.

■ FEATURES

- * $R_{DS(ON)} \leq 1.2\Omega @ V_{GS} = -10V, I_D = -3.0A$
- * High switching speed
- * Low input capacitance

■ SYMBOL



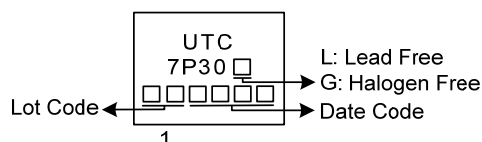
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
7P30L-TA3-T	7P30G-TA3-T	TO-220	G	D	S	Tube
7P30L-TF1-T	7P30G-TF1-T	TO-220F1	G	D	S	Tube
7P30L-TN3-R	7P30G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>7P30G-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF1: TO-220F1, TN3: TO-252</p> <p>(3) G: Halogen Free and Lead Free, G: Halogen Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-300	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	$I_{D(DC)}$	-6.0	A
	Pulsed (Note 2)	$I_{D(pulse)}$	-24	A
Single Avalanche Current (Note 3)		I_{AS}	-6.0	A
Single Avalanche Energy (Note 3)		E_{AS}	180	mJ
Power Dissipation	$T_C=25^\circ\text{C}$	TO-220	110	W
		TO-220F1	38	W
		TO-252	55	W
	$T_A=25^\circ\text{C}$	TO-220	2	W
		TO-220F1		
		TO-252	1.14	W
Channel Temperature		T_{CH}	+150	$^\circ\text{C}$
Storage Temperature Range		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.

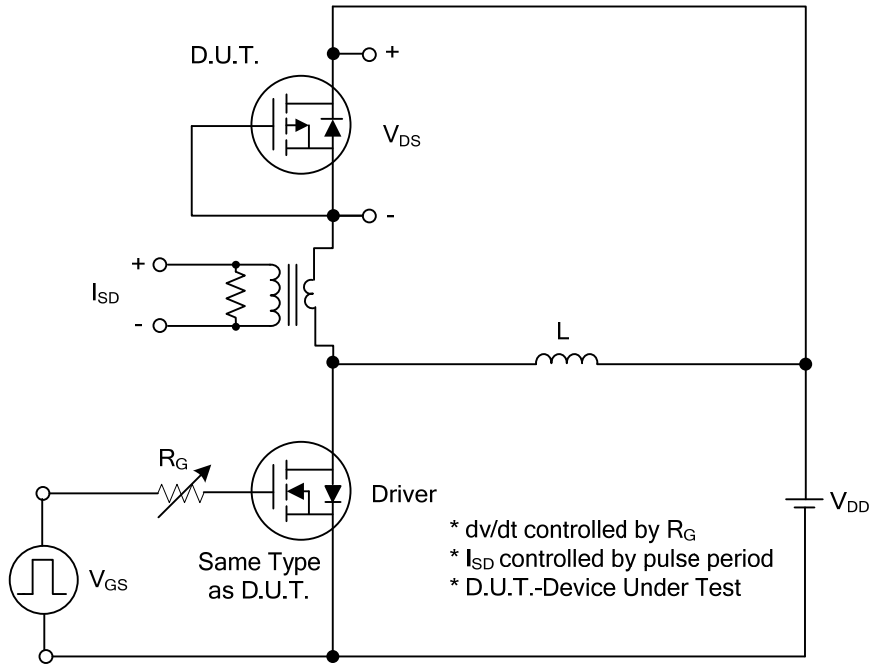
2. $P_w \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$.

3. Starting $T_{CH}=25^\circ\text{C}$, $R_G=25\Omega$, $V_{GS}=-20\text{V} \rightarrow 0$.

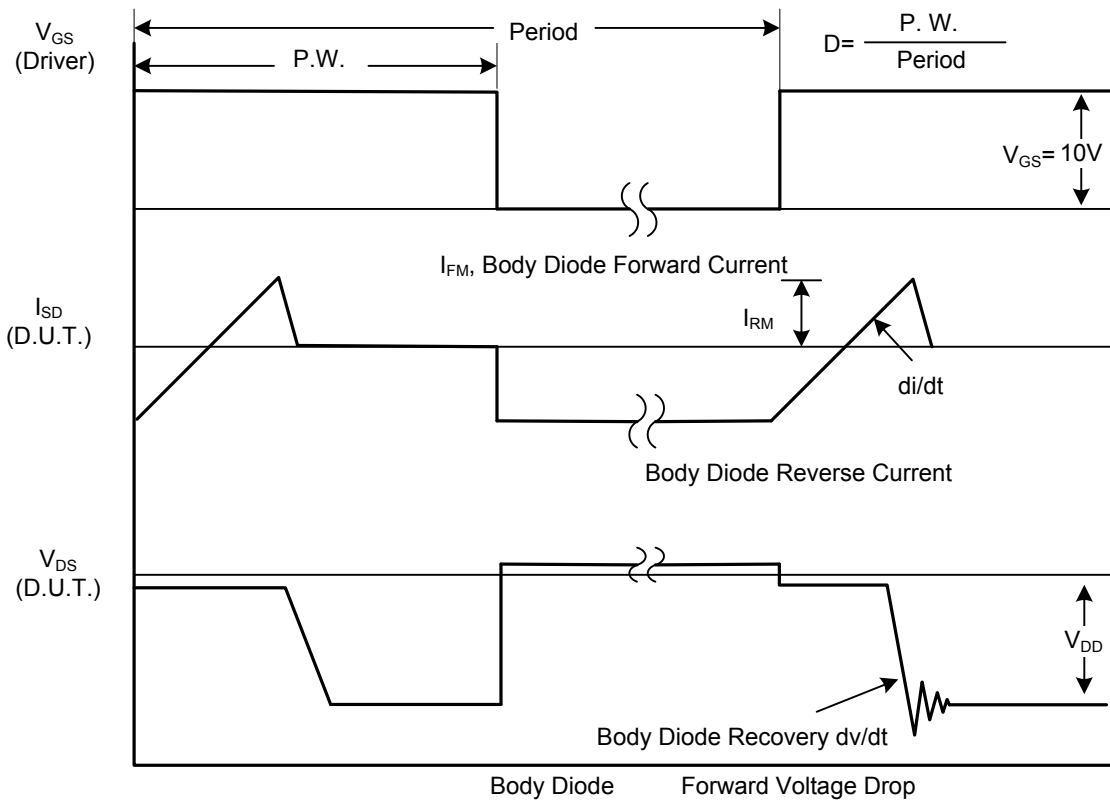
■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-300\text{V}$, $V_{GS}=0\text{V}$			-1.0	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+30\text{V}$, $V_{DS}=0\text{V}$		+100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-2.0		-4.5	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-3.0\text{A}$			1.2	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=-10\text{V}$, $f=1.0\text{MHz}$		1040		pF
Output Capacitance	C_{OSS}			360		pF
Reverse Transfer Capacitance	C_{RSS}			70		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{GS}=-10\text{V}$, $V_{DD}=-200\text{V}$, $I_D=-6.0\text{A}$		23.1		nC
Gate to Source Charge	Q_{GS}			7.1		nC
Gate to Drain Charge	Q_{GD}			12.9		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=-125\text{V}$, $V_{GS(ON)}=-10\text{V}$, $I_D=-3.0\text{A}$, $R_G=10\Omega$, $R_L=42\Omega$		24		ns
Rise Time	t_R			16		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			47		ns
Fall-Time	t_F			14		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	$I_F=-6.0\text{A}$, $V_{GS}=0\text{V}$		3.4		V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-6.0\text{A}$, $V_{GS}=0\text{V}$, $di/dt=50\text{A}/\mu\text{s}$		155		ns
Body Diode Reverse Recovery Charge	Q_{rr}			930		nC

■ TEST CIRCUITS AND WAVEFORMS

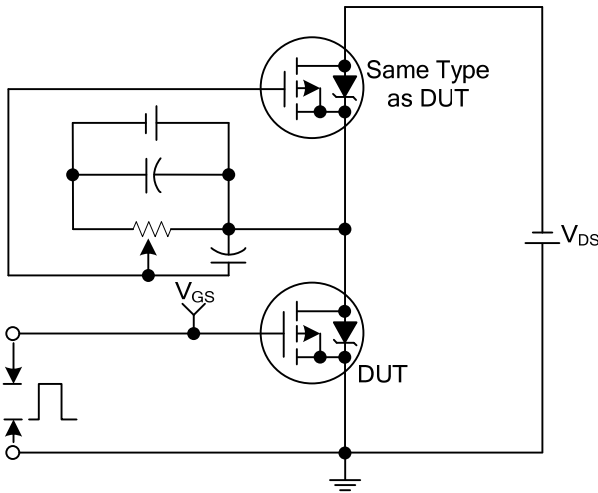


Peak Diode Recovery dv/dt Test Circuit

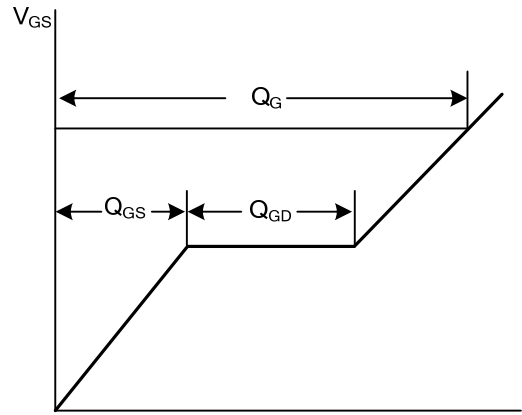


Peak Diode Recovery dv/dt Waveforms

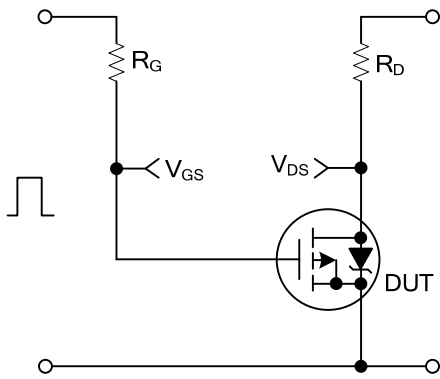
■ TEST CIRCUITS AND WAVEFORMS



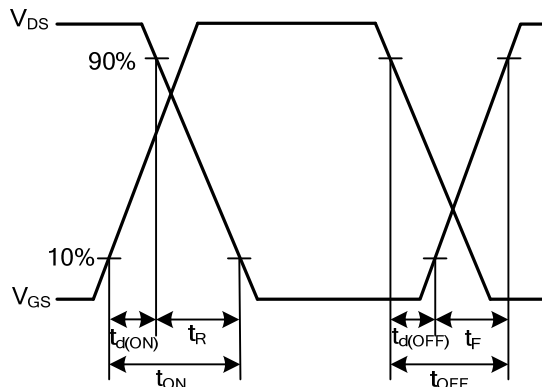
Gate Charge Test Circuit



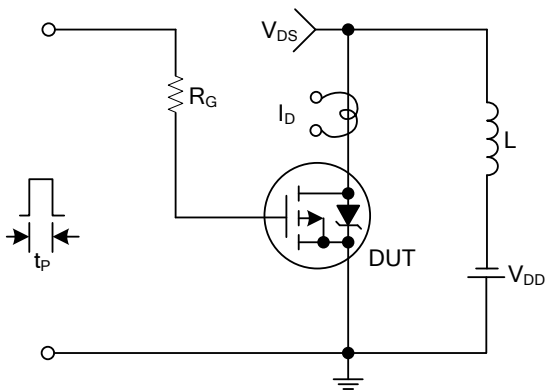
Gate Charge Waveforms



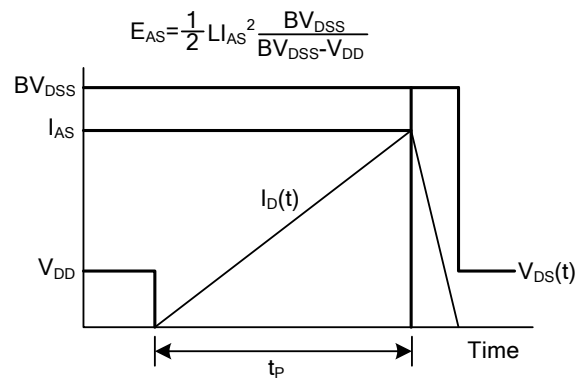
Resistive Switching Test Circuit



Resistive Switching Waveforms

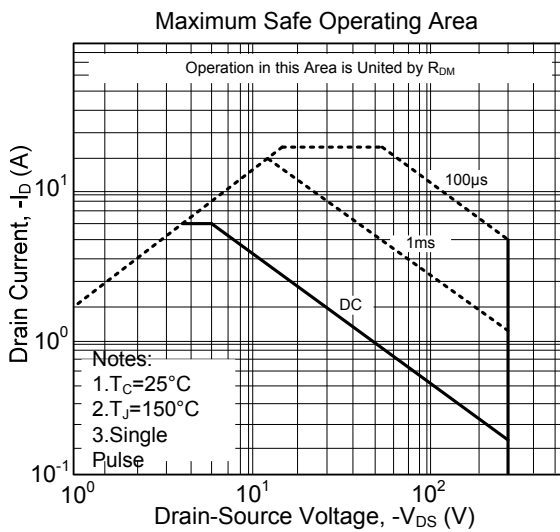
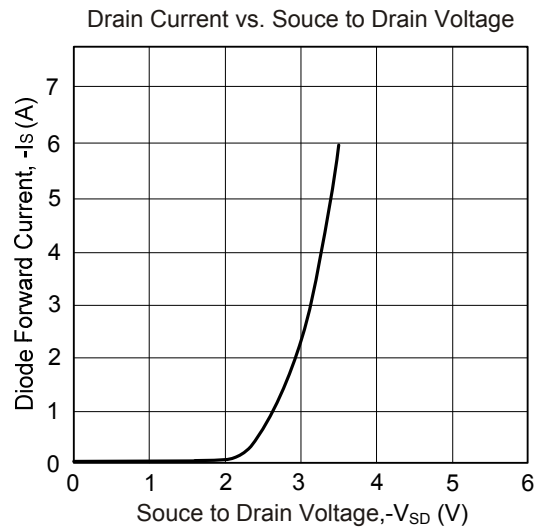
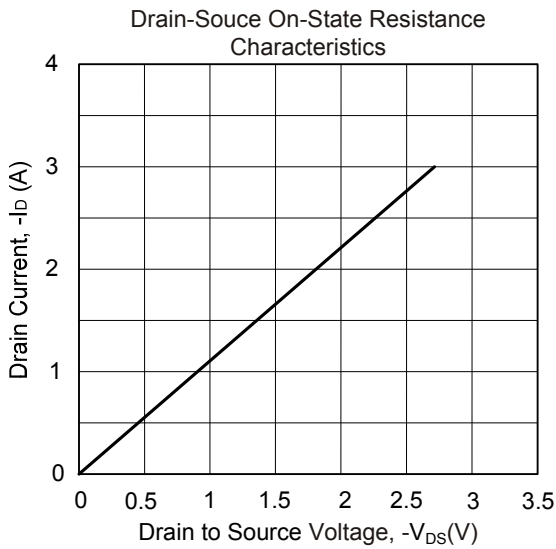
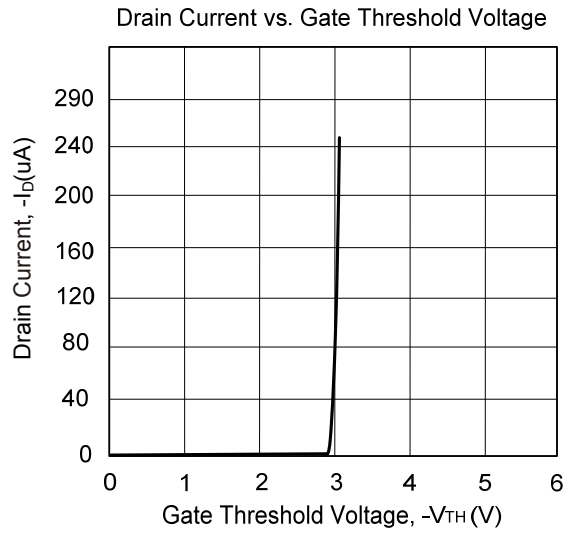
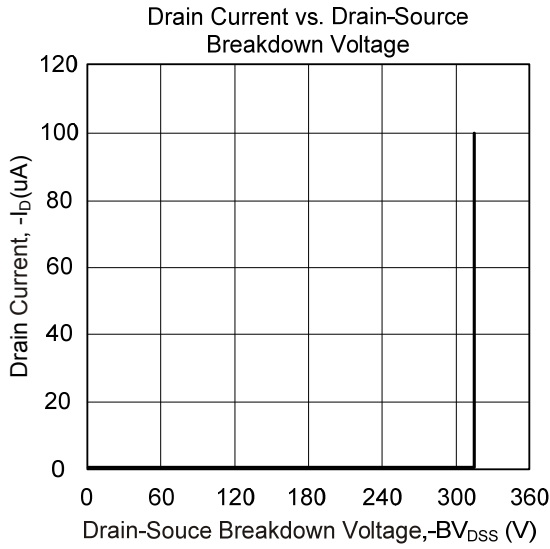


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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