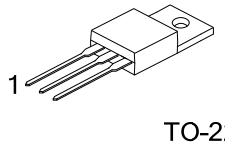
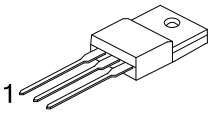
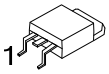
-6A, -300V, SWITCHING P-CHANNEL POWER MOSFET



TO-220



TO-220F1



TO-252

■ DESCRIPTION

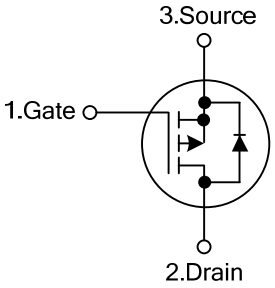
The UTC **7P30** is a P-channel MOS Field Effect Transistor. it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance.

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

■ FEATURES

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

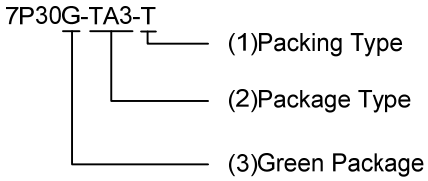
■ SYMBOL



■ 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

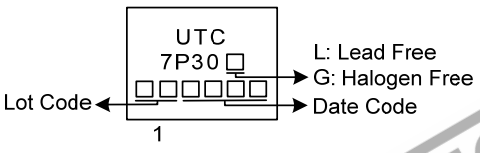


(1) T: Tube, R: Tape Reel

(2) TA3: TO-220, TF1: TO-220F1, TN3: TO-252

(3) G: Halogen Free and Lead Free, G: Halogen Free

■ MARKING



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■ ABSOLUTE MAXIMUM RATING (T_A=25°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°C	TO-220	P_{D1}	110	W
		TO-220F1		38	W
		TO-252		55	W
	T_A=25°C	TO-220 TO-220F1	P_{D2}	2	W
		TO-252		1.14	W
Channel Temperature			T_{CH}	+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. Pw≤10μs, Duty cycle≤1%.
3. Starting T_{CH}=25°C, R_G=25Ω, V_{GS}=-20V→0.

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-300V, V_{GS}=0V			-1.0	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+30V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-30V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=-250μA	-2.0		-4.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=-10V, I_D=-3.0A			1.2	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=-10V, f=1.0MHz		1040		pF
Output Capacitance		C_{OSS}			360		pF
Reverse Transfer Capacitance		C_{RSS}			70		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=-10V, V_{DD}=-200V, I_D=-6.0A		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}=-125V, $V_{GS(ON)}$=-10V, I_D=-3.0A, R_G=10Ω, R_L=42Ω		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=-6.0A, V_{GS}=0V		3.4		V
Body Diode Reverse Recovery Time		t_{rr}	I_F=-6.0A, V_{GS}=0V, di/dt=50A/μs		155		ns
Body Diode Reverse Recovery Charge		Q_{rr}			930		nC

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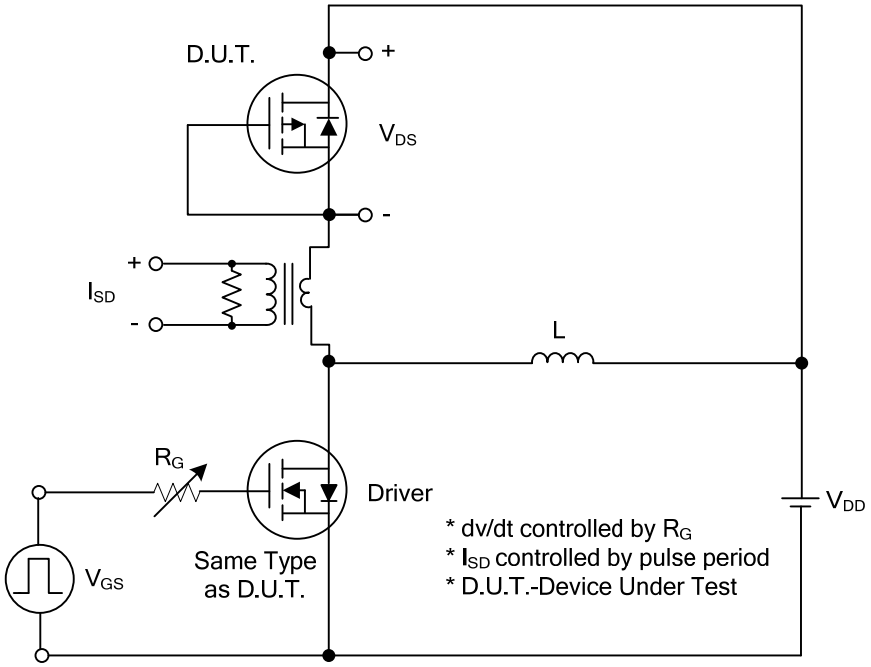
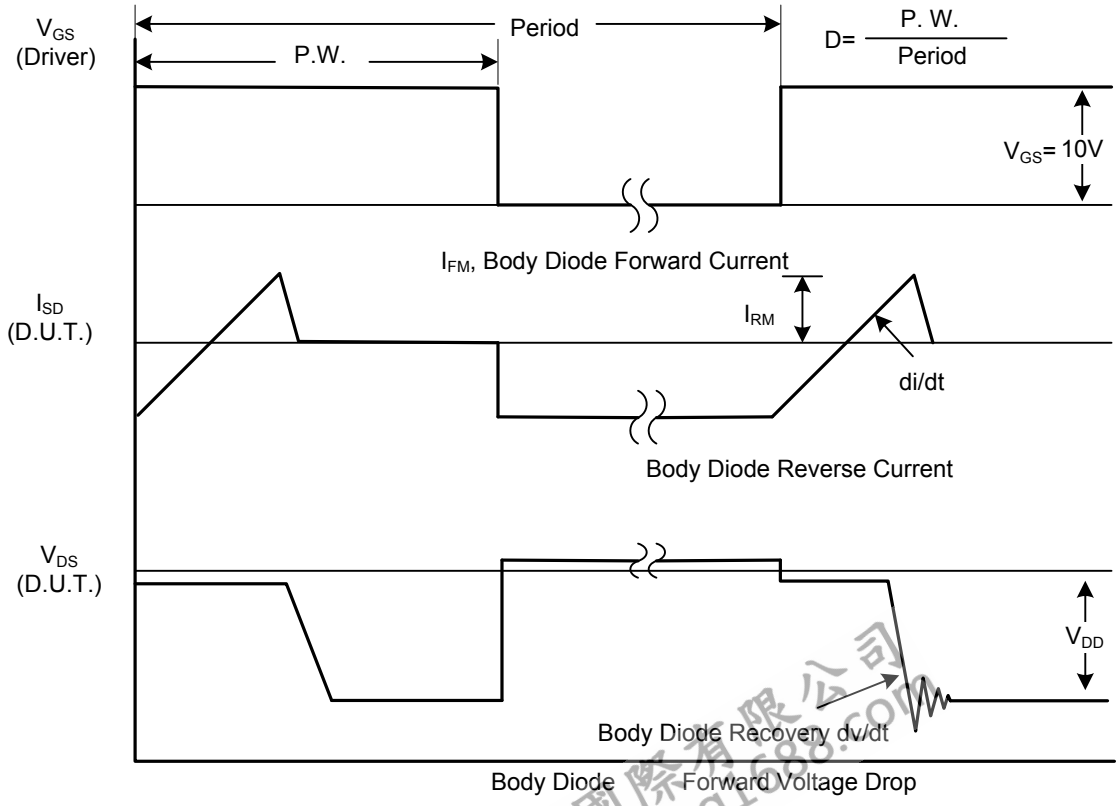
■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms

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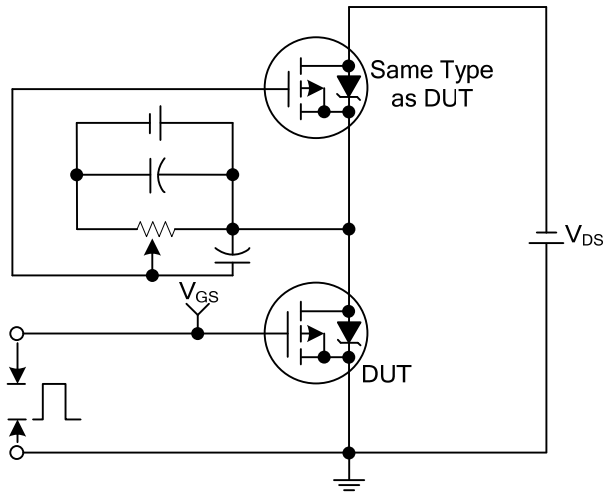
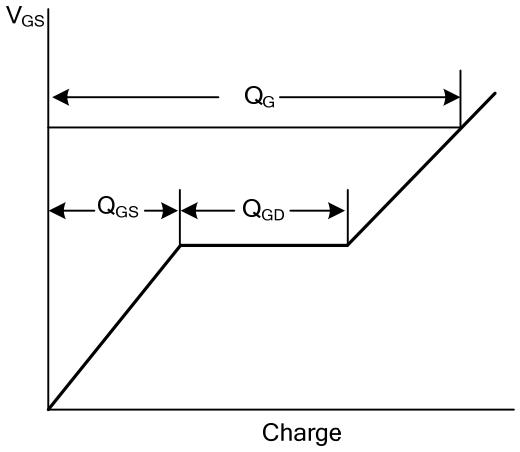
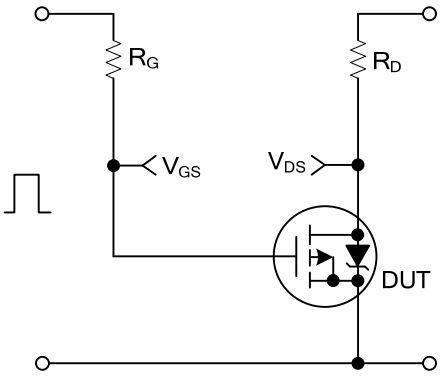
■ TEST CIRCUITS AND WAVEFORMS



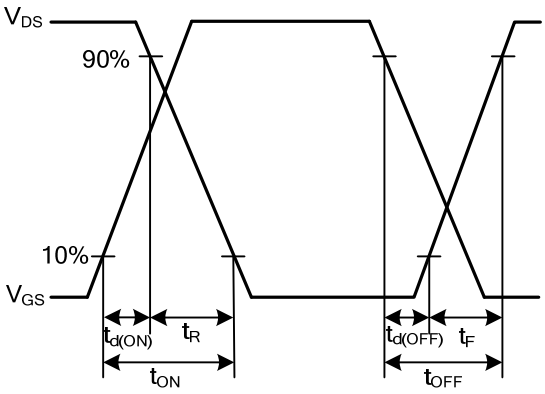
Gate Charge Test Circuit



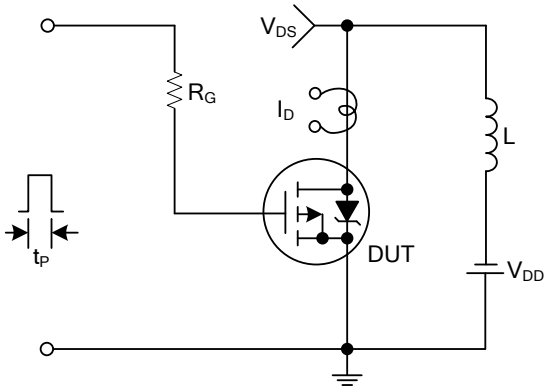
Gate Charge Waveforms



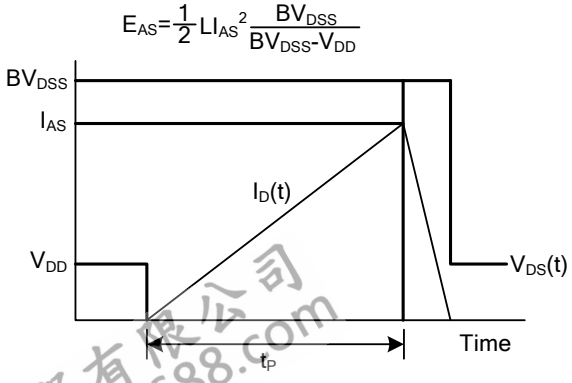
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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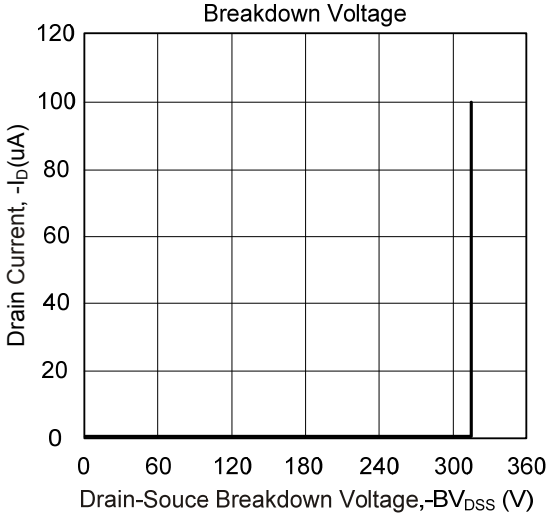
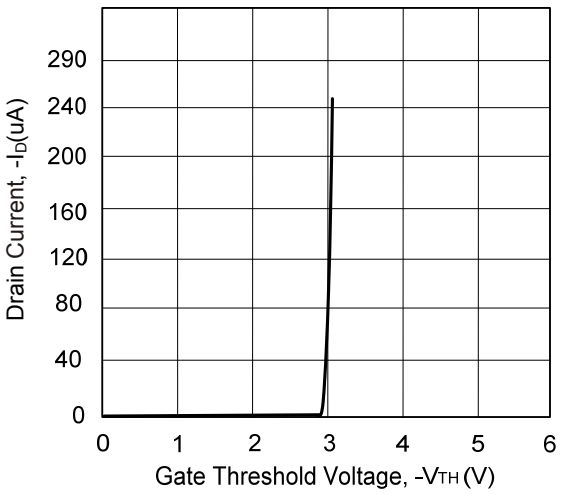
■ TYPICAL CHARACTERISTICS

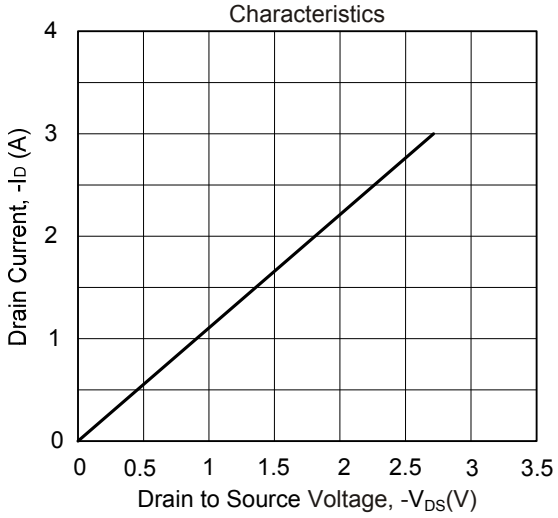
Drain Current vs. Drain-Source Breakdown Voltage



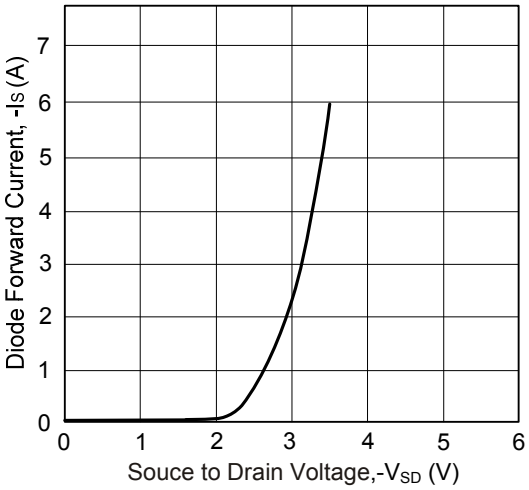
Drain Current vs. Gate Threshold Voltage



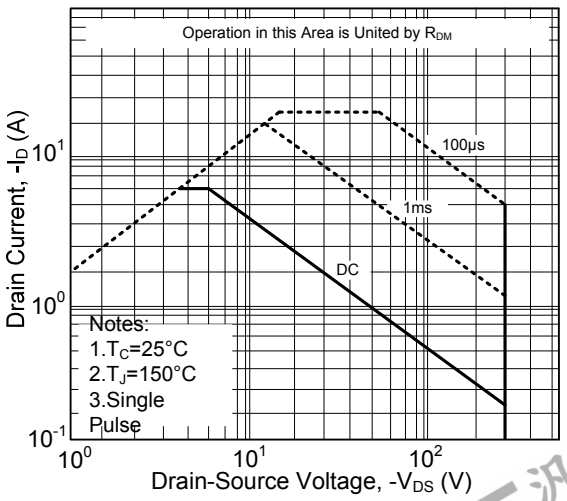
Drain-Souce On-State Resistance Characteristics



Drain Current vs. Souce to Drain Voltage



Maximum Safe Operating Area



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