



7P50

POWER MOSFET

-7.0A, -500V P-CHANNEL POWER MOSFET

■ DESCRIPTION

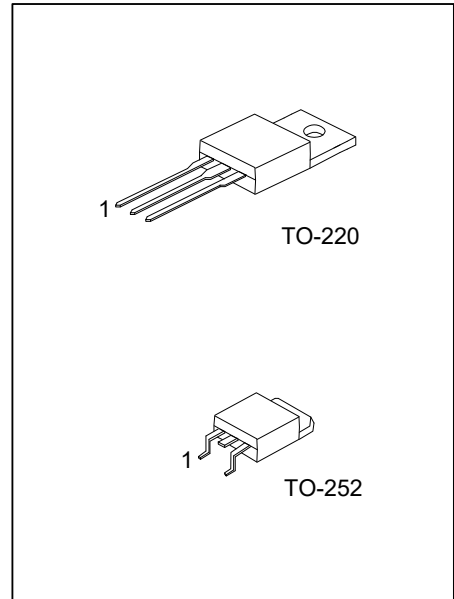
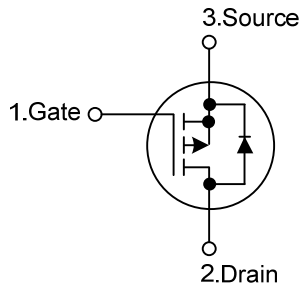
The UTC **7P50** is a P-channel MOS Field Effect Transistor. it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance.

The UTC **7P50** is suitable for high voltage switching applications.

■ FEATURES

- * $R_{DS(ON)} \leq 1.8 \Omega @ V_{GS} = -10V, I_D = -3.5A$
- * High switching speed
- * Low input capacitance

■ SYMBOL



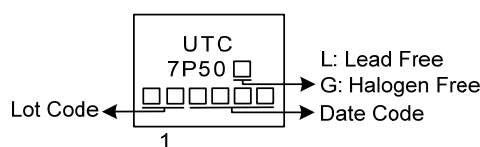
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
7P50L-TA3-T	7P50G-TA3-T	TO-220	G	D	S	Tube
7P50L-TN3-R	7P50G-TN3-R	TO-252	G	D	S	Tape Reel

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

	<p>(1) Packing Type (1) T: Tube, R: Tape Reel</p> <p>(2) Package Type (2) TA3: TO-220, TN3: TO-252</p> <p>(3) Green Package (3) G: Halogen Free and Lead Free L: Lead 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}	-500	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	$I_{D(DC)}$	-7
	Pulsed (Note 2)	$I_{D(pulse)}$	-14
Single Avalanche Energy (Note 3)	E_{AS}	331	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	12.7	V/ns
Power Dissipation ($T_C=25^\circ\text{C}$)	TO-220	P_D	85
	TO-252		45
Junction Temperature	T_J	+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. Repetitive Rating : Pulse width limited by maximum junction temperature.

3. $L=30\text{mH}$, $I_{AS}=-4.7\text{A}$, $V_{DD}=-50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.

4. $I_{SD}\leq-7.0\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J=25^\circ\text{C}$.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	TO-220	62.5
		TO-252	100
Junction to Case	θ_{JC}	TO-220	1.47
		TO-252	2.77 (Note)

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

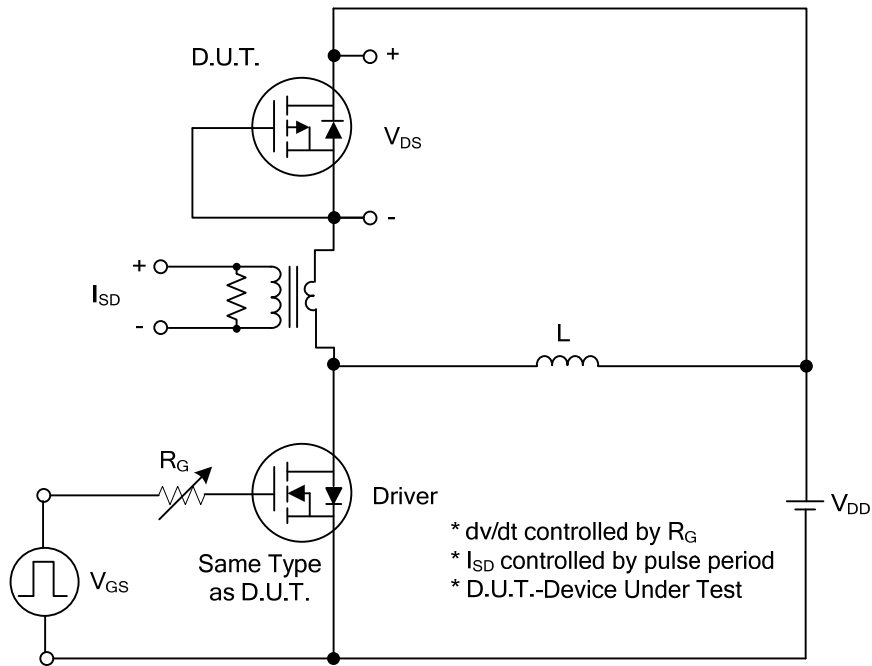
■ ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-500			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-500V, V _{GS} =0V			-10	μA
Gate-Source Leakage Current	Forward	I _{GSS}			+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 =-3.5A			1.8	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		1335		pF
Output Capacitance	C _{OSS}			128		pF
Reverse Transfer Capacitance	C _{RSS}			16		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =-100V, V _{GS} =-10V, I _D =-7.0A , (Note 1, 2)		34.5		nC
Gate to Source Charge	Q _{GS}			8.6		nC
Gate to Drain Charge	Q _{GD}			7.6		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =-100V, V _{GS} =-10V, I _D =-7.0A, R _G =-25Ω (Note 1, 2)		16		ns
Rise Time	t _R			19		ns
Turn-OFF Delay Time	t _{D(OFF)}			127		ns
Fall-Time	t _F			44		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				-7	A
Maximum Body-Diode Pulsed Current	I _{SM}				-14	A
Diode Forward Voltage	V _{SD}	I _F =-7.0A, V _{GS} =0V			-1.4	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =-7.0A, V _{GS} =0V, di/dt=100A/μs		280		ns
Body Diode Reverse Recovery Charge	Q _{rr}				6.9	

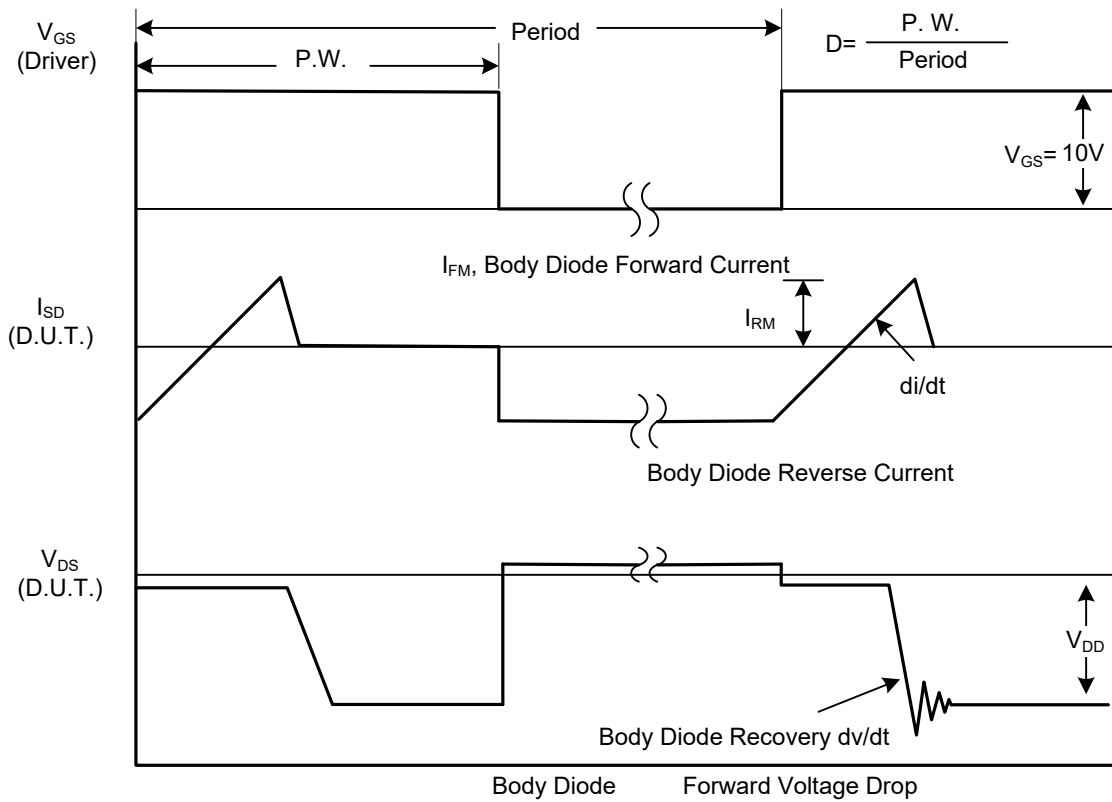
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

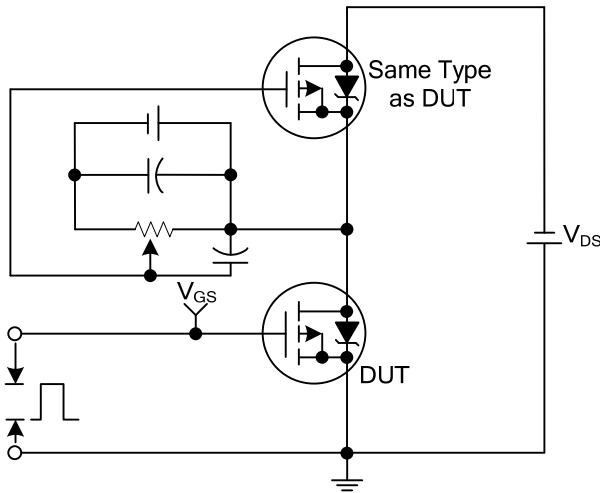


Peak Diode Recovery dv/dt Test Circuit

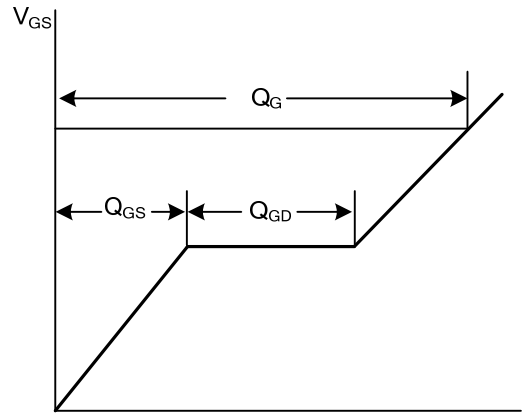


Peak Diode Recovery dv/dt Waveforms

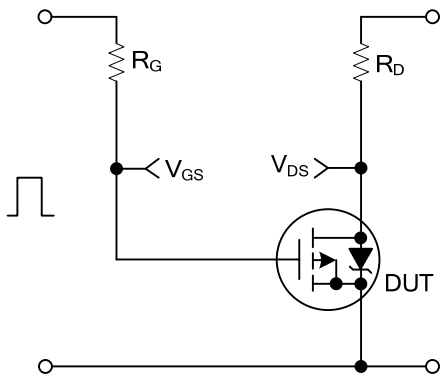
■ TEST CIRCUITS AND WAVEFORMS



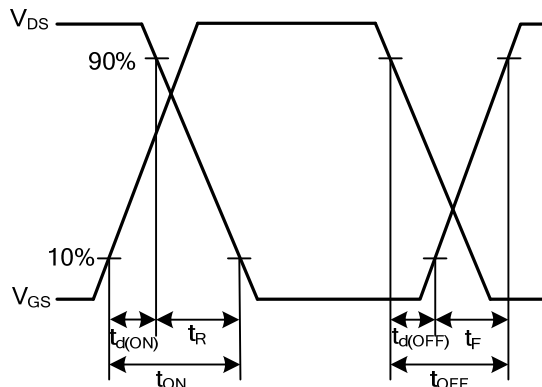
Gate Charge Test Circuit



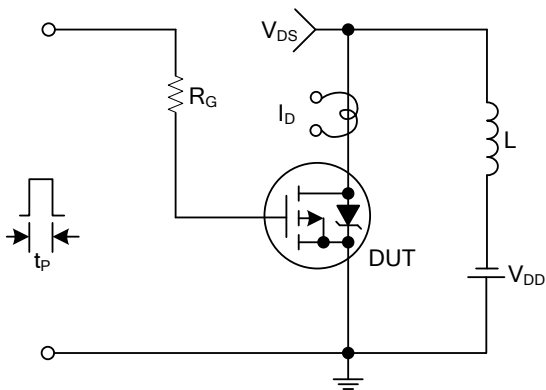
Gate Charge Waveforms



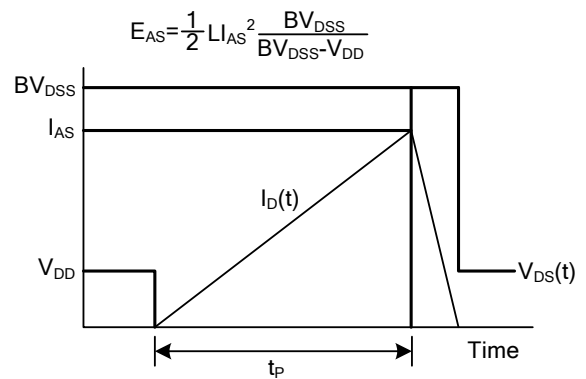
Resistive Switching Test Circuit



Resistive Switching Waveforms

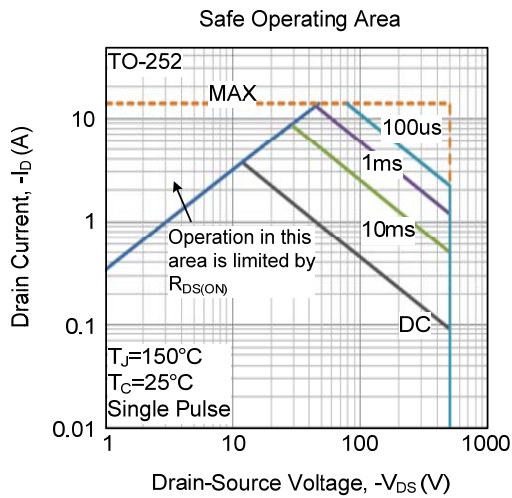


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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