



## UTT18P10

Power MOSFET

### -100V, -18A P-CHANNEL POWER MOSFET

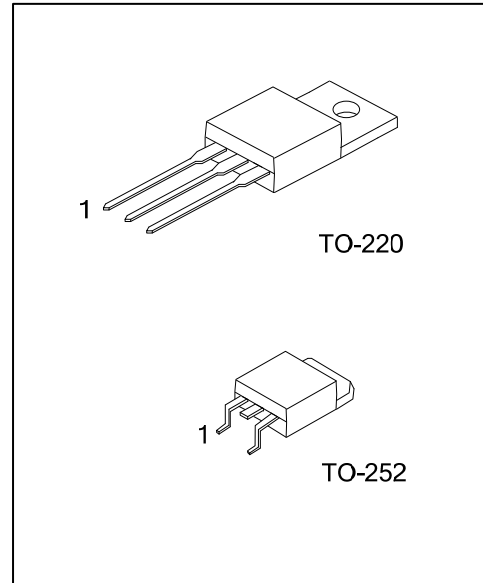
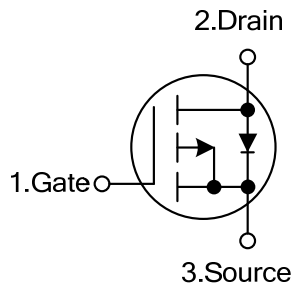
#### DESCRIPTION

The UTC **UTT18P10** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed, cost-effectiveness and a minimum on-state resistance. It can also withstand high energy in the avalanche.

#### FEATURES

- \*  $R_{DS(ON)} < 0.20\Omega @ V_{GS}=-10V, I_D=-18A$
- \* High Switching Speed

#### SYMBOL



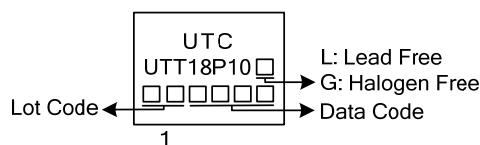
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT18P10L-TA3-T	UTT18P10G-TA3-T	TO-220	G	D	S	Tube
UTT18P10L-TN3-R	UTT18P10G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT18P10L-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TN3: TO-252 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
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#### MARKING



### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>J</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	-100	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Drain Current	Continuous, V <sub>GSS</sub> @-10V T <sub>C</sub> =25°C	I <sub>D</sub>	-18	A
	Pulsed (Note 2)	I <sub>DM</sub>	-72	A
Avalanche Energy	Single Pulsed (Note 3)	E <sub>AS</sub>	40	mJ
Power Dissipation (T <sub>C</sub> =25°C)	TO-220	P <sub>D</sub>	140	W
	TO-252		150	
Junction Temperature		T <sub>J</sub>	+150	°C
Storage Temperature		T <sub>STG</sub>	-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 max. junction temperature

3. V<sub>DD</sub>=-50V, starting T<sub>J</sub>=25°C, L=1mH, R<sub>G</sub>=25Ω, I<sub>AS</sub>=-9A. (See Figure 2a, 2b)

### ■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	TO-220	θ <sub>JC</sub>	1.1	°C/W
	TO-252		1.0	

### ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage		BV <sub>DSS</sub>	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-100			V
Drain-Source Leakage Current		I <sub>DSS</sub>	V <sub>DS</sub> =-100V, V <sub>GS</sub> =0V,			-1	μA
Gate- Source Leakage Current	Forward	I <sub>GSS</sub>	V <sub>GS</sub> =+20V			+100	nA
	Reverse		V <sub>GS</sub> =-20V			-100	nA
<b>ON CHARACTERISTICS</b>							
Gate Threshold Voltage		V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.5		-2.5	V
Static Drain-Source On-State Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-18A (Note 2)			0.20	Ω
<b>DYNAMIC PARAMETERS</b>							
Input Capacitance		C <sub>ISS</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1.0MHz		1400		pF
Output Capacitance		C <sub>OSS</sub>			590		pF
Reverse Transfer Capacitance		C <sub>RSS</sub>			140		pF
<b>SWITCHING PARAMETERS</b>							
Total Gate Charge		Q <sub>G</sub>	V <sub>DS</sub> =-80V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-18A, See Fig 3 (Note 2)			61	nC
Gate to Source Charge		Q <sub>GS</sub>				14	nC
Gate to Drain ("Miller") Charge		Q <sub>GD</sub>				29	nC
Turn-ON Delay Time		t <sub>D(ON)</sub>	V <sub>DD</sub> =-50V, I <sub>D</sub> =-18A, R <sub>G</sub> =9.1Ω, R <sub>D</sub> = 2.4Ω, See Fig. 1(Note 2)		16		ns
Rise Time		t <sub>R</sub>			73		ns
Turn-OFF Delay Time		t <sub>D(OFF)</sub>			34		ns
Fall-Time		t <sub>F</sub>			57		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>							
Maximum Body-Diode Continuous Current		I <sub>S</sub>				-18	A
Maximum Body-Diode Pulsed Current (Note 1)		I <sub>SM</sub>				-72	A
Drain-Source Diode Forward Voltage		V <sub>SD</sub>	T <sub>J</sub> =25°C, I <sub>S</sub> =-18A, V <sub>GS</sub> =0V (Note 2)			-5.0	V

Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. Pulse width ≤ 300μs; duty cycle ≤ 2%.

## TEST CIRCUITS AND WAVEFORMS

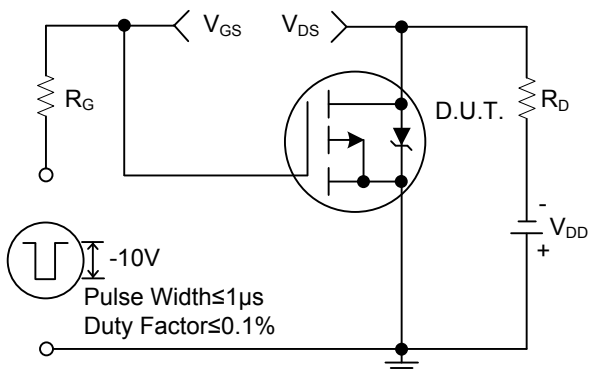


Fig. 1a Switching Time Test Circuit

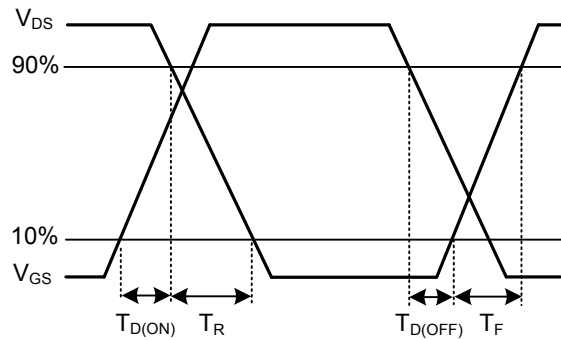


Fig. 1b Switching Time Waveforms

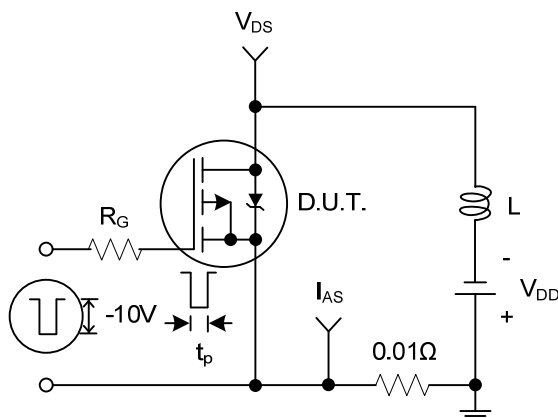


Fig. 2a Unclamped Inductive Test Circuit

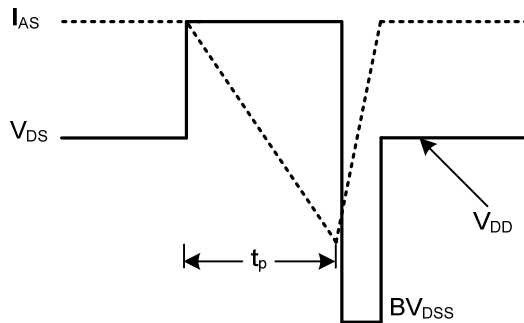


Fig. 2b Unclamped Inductive Waveforms

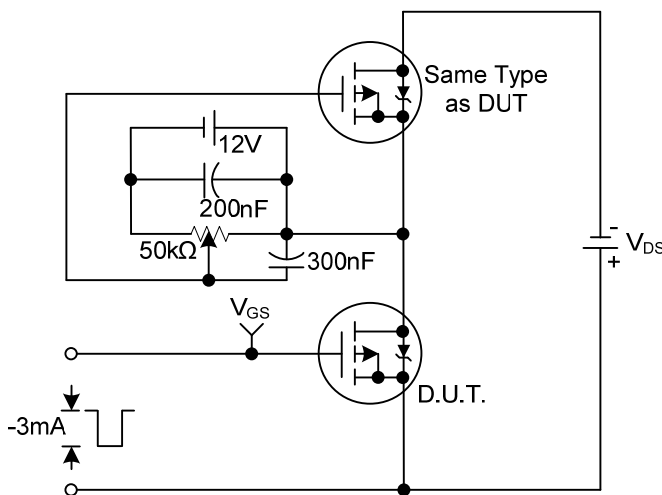


Fig.3a Gate Charge Test Circuit

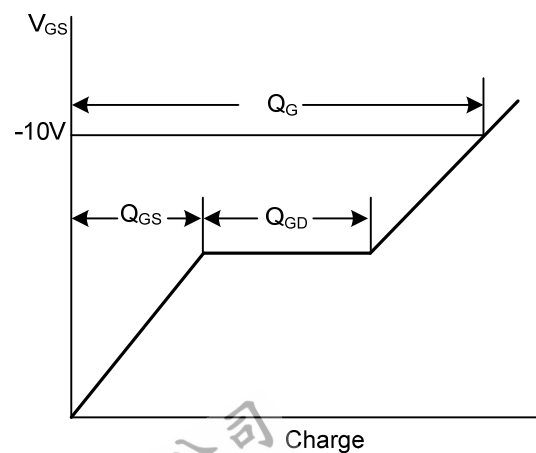
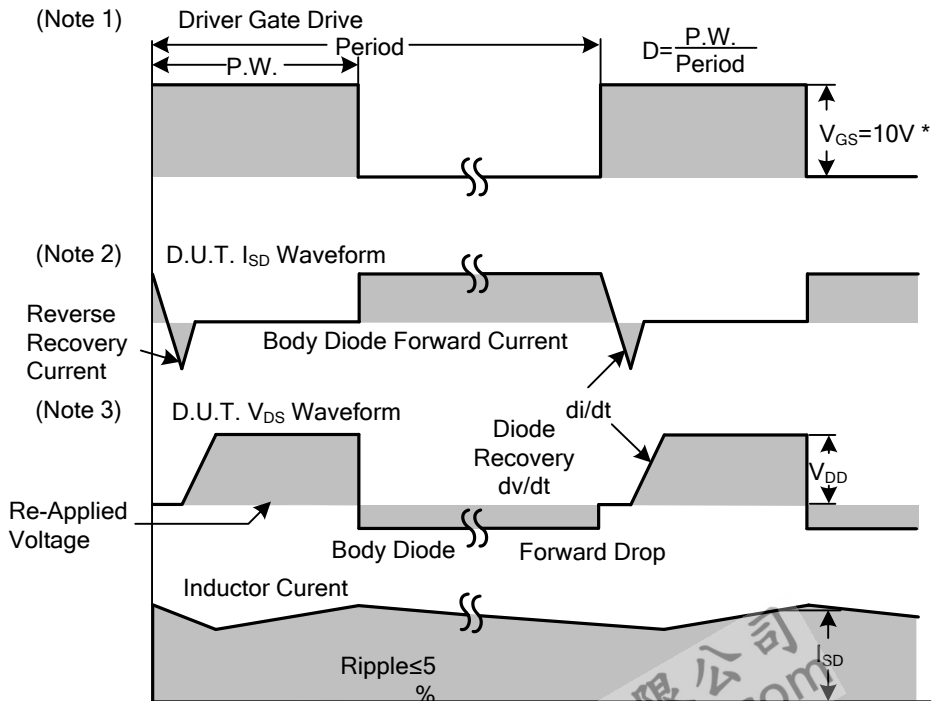
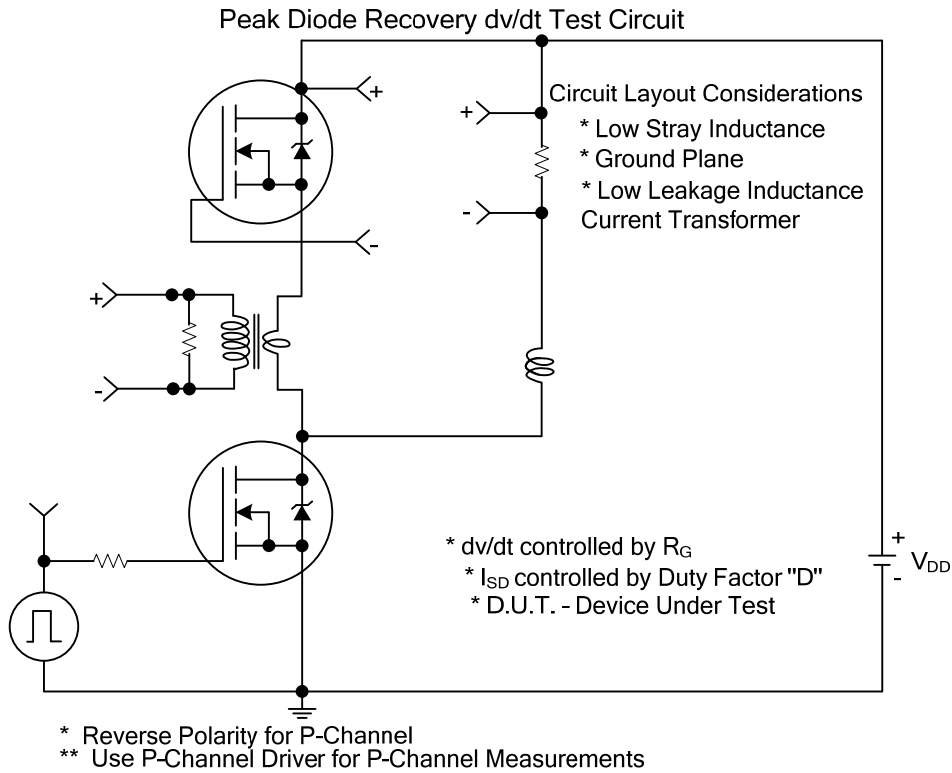


Fig. 3b Gate Charge Waveform

## TEST CIRCUITS AND WAVEFORMS(Cont.)

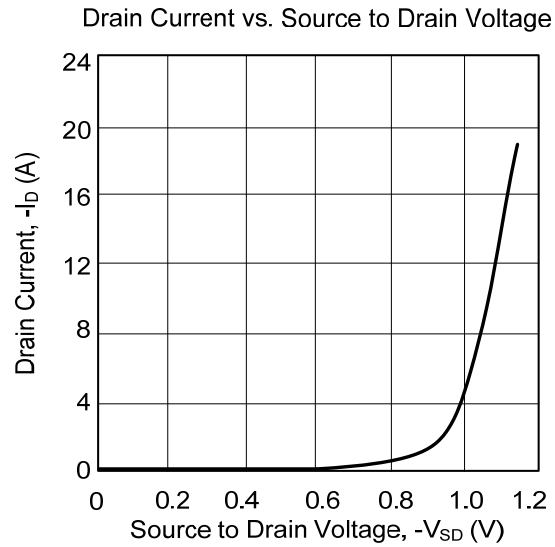


\*\*\*  $V_{GS} = 5V$  for Logic Level and 3V Drive Devices

For N and P Channel Power MOSFET

- Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.  
 2.  $V_{DD} = -25V$ , starting  $T_J = 25^\circ C$ ,  $L = 2.7mH$ ,  $R_G = 25\Omega$ ,  $I_{AS} = 18A$ . (See Figure 2)  
 3.  $I_{SD} \leq 18A$ ,  $di/dt \leq 200A/\mu s$ ,  $V_{DD} \leq BV_{DSS}$ ,  $T_J \leq 150^\circ C$

## ■ TYPICAL CHARACTERISTICS



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