



**UTT75P03**

Preliminary

*Power MOSFET*

**-75A, -30V P-CHANNEL  
POWER MOSFET**

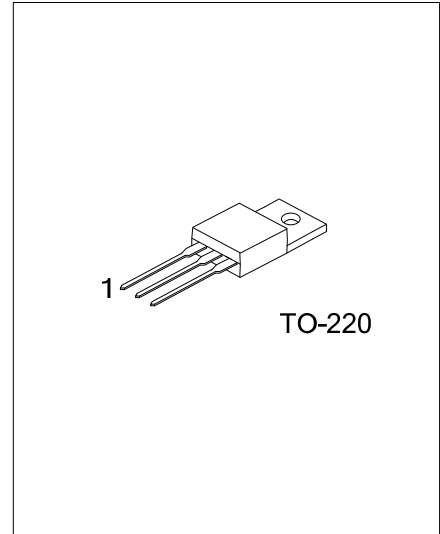
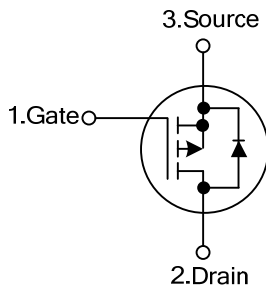
■ DESCRIPTION

The UTC **UTT75P03** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed, high current capacity and a minimum on-state resistance.

■ FEATURES

- \*  $R_{DS(ON)} < 7.0m\Omega @ V_{GS}=-10V, I_D=-30A$
- \* High Switching Speed
- \* High Current Capacity

■ SYMBOL



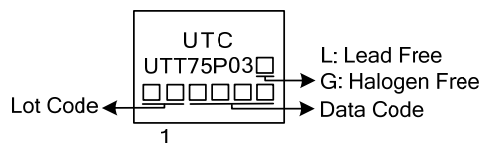
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT75P03L-TA3-T	UTT75P03G-TA3-T	TO-220	G	D	S	Tube

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

<p>UTT75P03L-TA3-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
--	--

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	-30	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous	$T_C=25^\circ\text{C}$	-75 (Note 2)	A
		$T_C=125^\circ\text{C}$		A
	Pulsed	$I_{DM}$	-240	A
Avalanche Current		$I_{AR}$	-60	A
Repetitive Avalanche Energy (Note 3)	$L=0.1\text{mH}$	$E_{AR}$	180	mJ
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	187	W
Junction Temperature		$T_J$	-55 ~ +175	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55 ~ +175	$^\circ\text{C}$

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. Package limited.

3. Duty cycle  $\leq 1\%$ .

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62.5	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	0.8	$^\circ\text{C/W}$

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

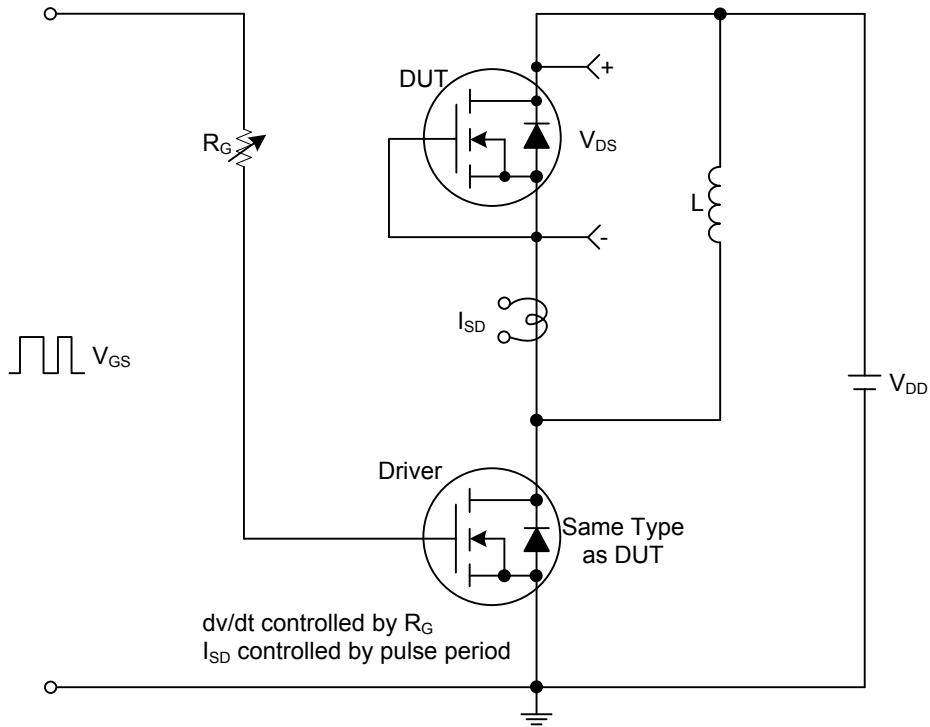
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-30			V	
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V			-1	μA	
		V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C			-50	μA	
		V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =175°C			-250	μA	
Gate- Source Leakage Current	Forward	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V			+100	nA	
	Reverse	V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V			-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		-3	V	
Static Drain-Source On-State Resistance (Note 1)	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-30A		5.5	7	mΩ	
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-30A, T <sub>J</sub> =125°C			10	mΩ	
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-30A, T <sub>J</sub> =175°C			13	mΩ	
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-20A		8	10	mΩ	
On State Drain Current (Note 1)	I <sub>D(ON)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V	-120			A	
<b>DYNAMIC PARAMETERS (Note 2)</b>							
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V, f=1.0MHz		9000		pF	
Output Capacitance	C <sub>OSS</sub>			1565		pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>			715		pF	
<b>SWITCHING PARAMETERS</b>							
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-75A (Note 3)		160	240	nC	
Gate to Source Charge	Q <sub>GS</sub>			32		nC	
Gate to Drain Charge	Q <sub>GD</sub>			30		nC	
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =-15V, R <sub>L</sub> =0.2Ω, I <sub>D</sub> ≈-75A, V <sub>GEN</sub> =-10V, R <sub>G</sub> =2.5Ω (Note 3)		25	40	ns	
Rise Time	t <sub>R</sub>			225	360	ns	
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			150	240	ns	
Fall-Time	t <sub>F</sub>			210	340	ns	
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>C</sub>=25°C) (Note 2)</b>							
Maximum Body-Diode Continuous Current	I <sub>S</sub>				-75	A	
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				-240	A	
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>F</sub> =-75A, V <sub>GS</sub> =0V		-1.2	-1.5	V	
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-75A, di/dt=100A/μs		55	100	ns	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>				0.07	0.25	μC
Peak Reverse Recovery Current	I <sub>RM(REC)</sub>				2.5	5	A

Notes: 1. Pulse test; pulse width ≤ 300μs, duty cycle ≤ 2%.

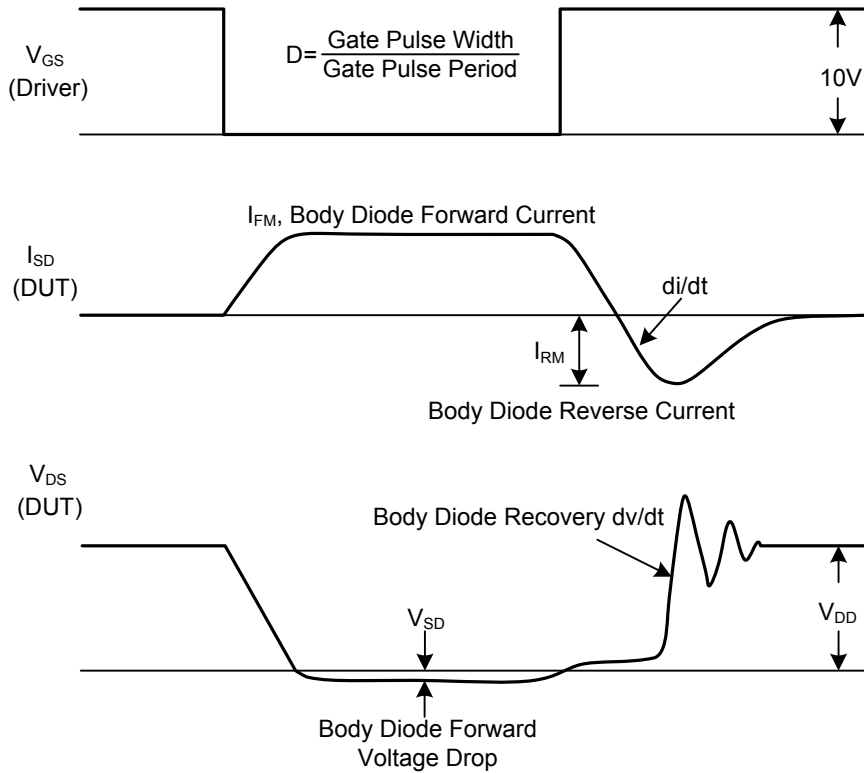
2. Guaranteed by design, not subject to production testing.

3. Independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



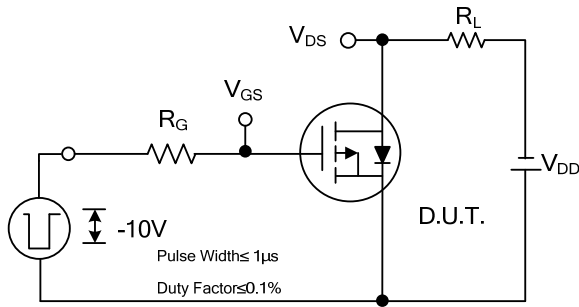
Peak Diode Recovery dv/dt Test Circuit



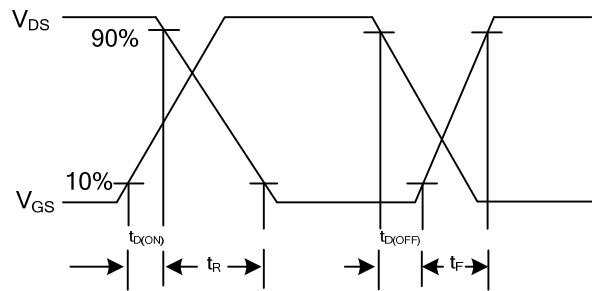
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

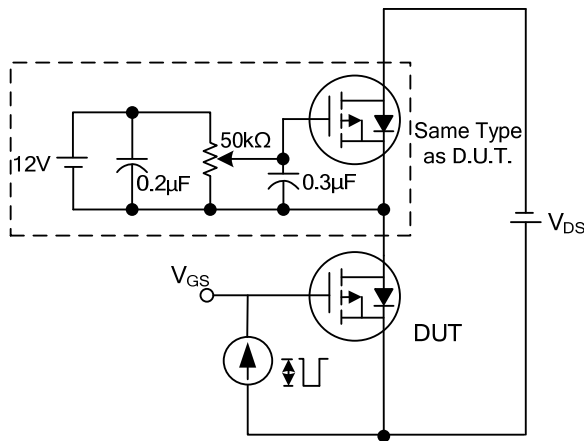
TEST CIRCUITS AND WAVEFORMS



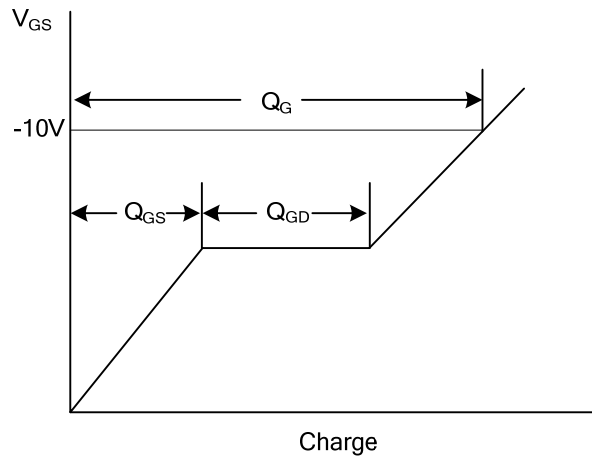
Switching Test Circuit



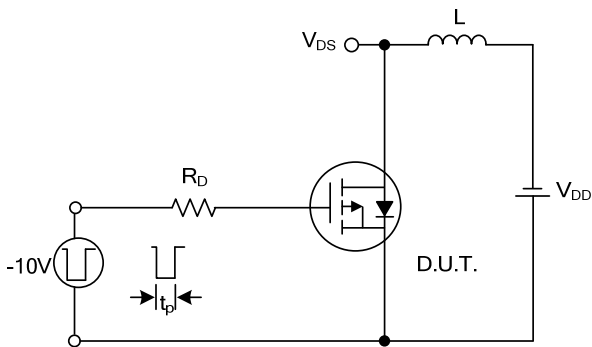
Switching Waveforms



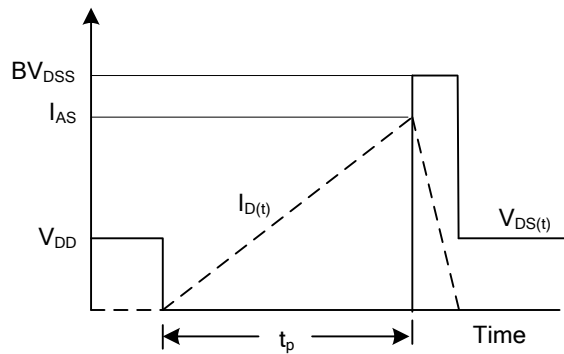
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.