

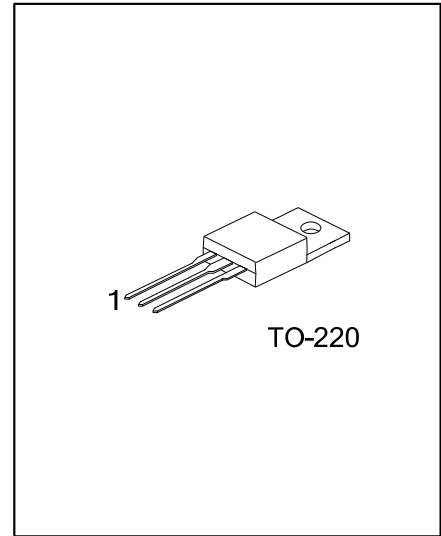


**UTT75N07**

Preliminary

**POWER MOSFET**

**75A, 70V N-CHANNEL  
ENHANCEMENT MODE  
TRENCH POWER MOSFET**



■ DESCRIPTION

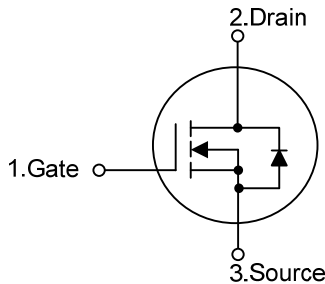
The UTC **UTT75N07** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with low  $R_{DS(ON)}$  and high switching speed characteristic by high cell density trench and low gate charge technology.

The UTC **UTT75N07** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

■ FEATURES

- \*  $R_{DS(ON)} \leq 10 \text{ m}\Omega @ V_{GS}=10V, I_D=37.5A$
- \* High Cell Density Trench Technology
- \* High Power and Current Handling Capability

■ SYMBOL



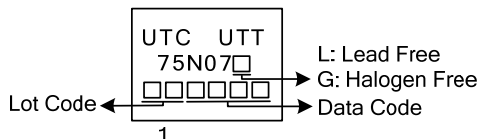
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT75N07L-TA3-T	UTT75N07G-TA3-T	TO-220	G	D	S	Tube

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

<p>UTT75N07L-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	70	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V	
Drain Current	Continuous	$I_D$	75	A	
	Pulsed (Note 2)	$I_{DM}$	300	A	
Avalanche Energy		Single Pulsed (Note 3)	$E_{AS}$	1382	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	13	V/ns	
Power Dissipation		$P_D$	110	W	
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.  $L = 120\text{mH}$ ,  $I_{AS} = 4.8\text{A}$ ,  $V_{DD} = 48\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$ .

4.  $I_{SD} \leq 30\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J = 25^\circ\text{C}$ .

■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62	$^\circ\text{C}/\text{W}$
Junction to Case	$\theta_{JC}$	1.13	$^\circ\text{C}/\text{W}$

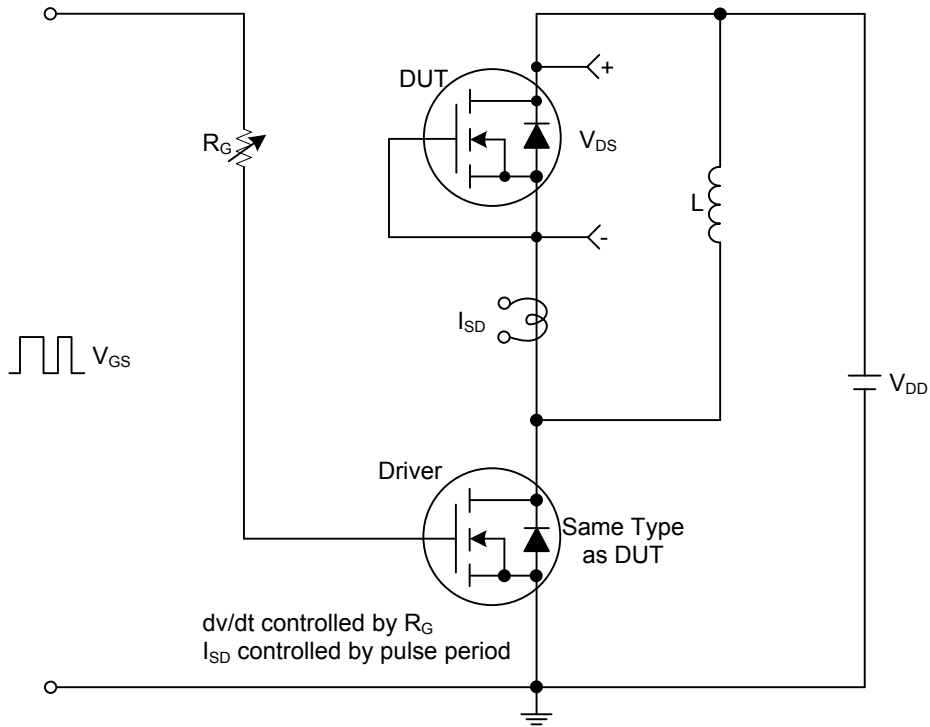
■ ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	70			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=70\text{V}$ , $V_{GS}=0\text{V}$			1.0	$\mu\text{A}$
Gate-Source Leakage Current	Forward	$I_{GSS}$			+100	nA
	Reverse				-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	1.0		3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=37.5\text{A}$			10	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$		3700		pF
Output Capacitance	$C_{OSS}$			290		pF
Reverse Transfer Capacitance	$C_{RSS}$			245		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note 1)	$Q_G$	$V_{DS}=50\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=1.3\text{A}$ , $I_G=100\mu\text{A}$ (Note 1, 2)		430		nC
Gate to Source Charge	$Q_{GS}$			20		nC
Gate to Drain Charge	$Q_{GD}$			34		nC
Turn-on Delay Time (Note 1)	$t_{D(ON)}$	$V_{DD}=30\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=0.5\text{A}$ , $R_G=25\Omega$ (Note 1, 2)		64		ns
Rise Time	$t_R$			120		ns
Turn-off Delay Time	$t_{D(OFF)}$			1700		ns
Fall-Time	$t_F$			420		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				75	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				300	A
Drain-Source Diode Forward Voltage (Note 1)	$V_{SD}$	$I_S=75\text{A}$ , $V_{GS}=0\text{V}$			1.2	V
Reverse Recovery Time (Note 1)	$t_{rr}$	$I_S=30\text{A}$ , $V_{GS}=0\text{V}$ , $di_F/dt = 100\text{A}/\mu\text{s}$		66		nS
Reverse Recovery Charge	$Q_{rr}$			0.1		$\mu\text{C}$

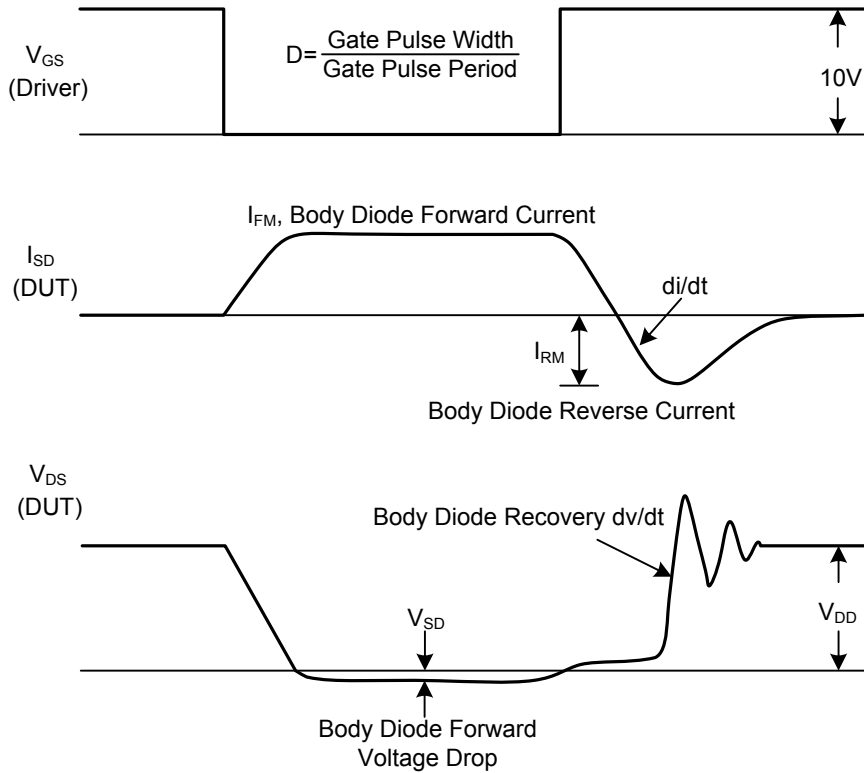
Notes: 1. Pulse Test : Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS



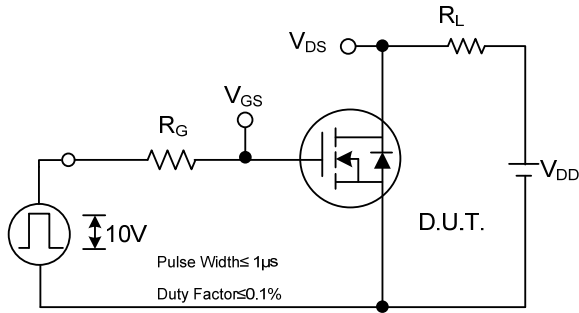
Peak Diode Recovery dv/dt Test Circuit



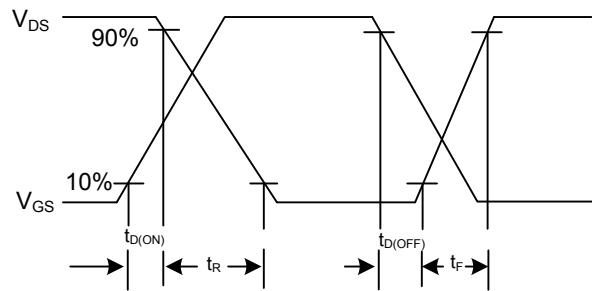
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

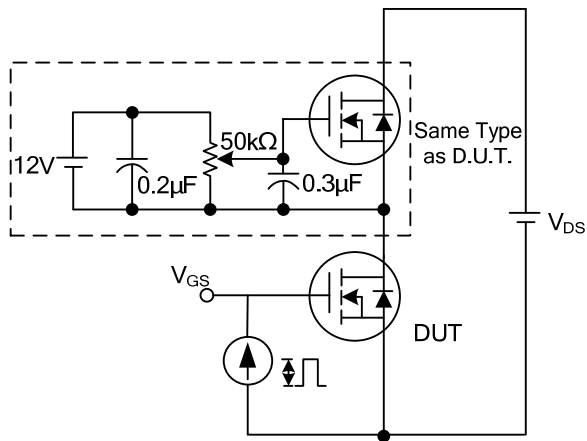
■ TEST CIRCUITS AND WAVEFORMS



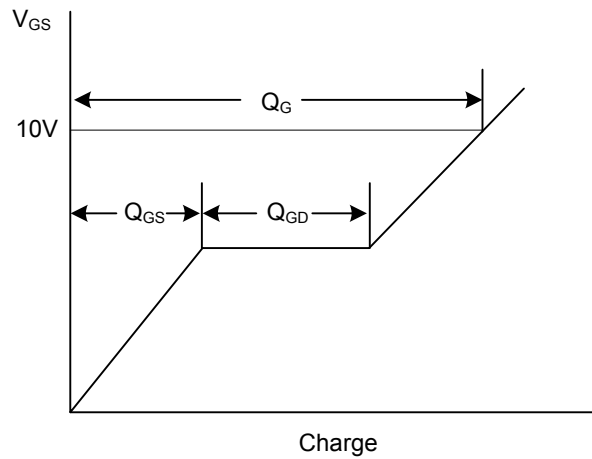
Switching Test Circuit



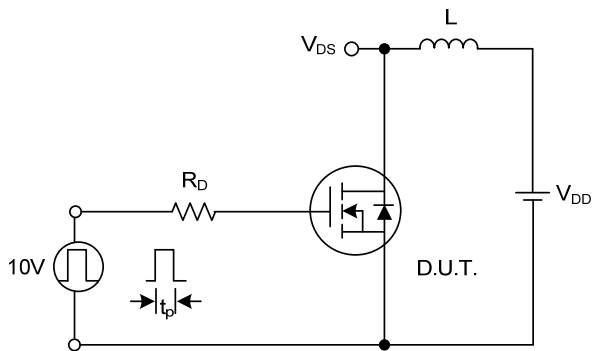
Switching Waveforms



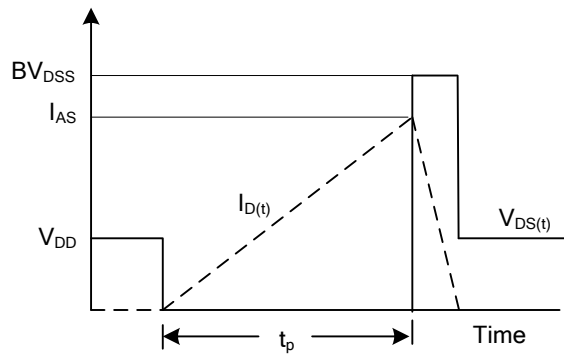
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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