

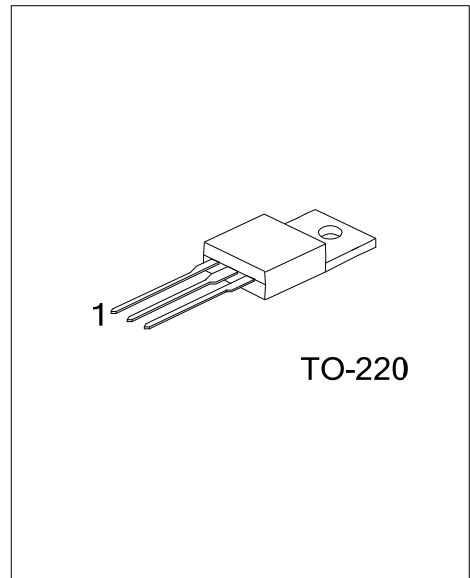


**UTT170N08H**

Preliminary

**POWER MOSFET**

**170A, 80V N-CHANNEL  
ENHANCEMENT MODE  
TRENCH POWER MOSFET**



■ DESCRIPTION

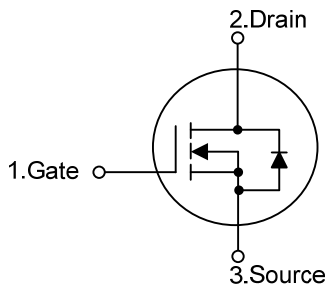
The UTC **UTT170N08H** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and low gate charge, etc.

The UTC **UTT170N08H** applies to primary side switch, synchronous rectifier, Motor Drives, etc.

■ FEATURES

- \*  $R_{DS(ON)} < 5.1 \text{ m}\Omega @ V_{GS}=10V, I_D=60A$
- \* High Cell Density Trench Technology
- \* High Power and Current Handling Capability

■ SYMBOL



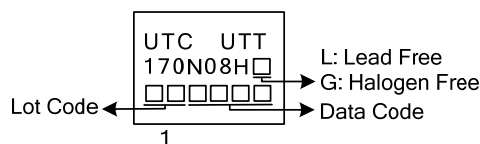
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT170N08HL-TA3-T	UTT170N08HG-TA3-T	TO-220	G	D	S	Tube

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

<p>UTT170N08HG-TA3-T</p> <ul style="list-style-type: none"> <li>(1)Packing Type</li> <li>(2)Package Type</li> <li>(3)Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube</li> <li>(2) TA3: TO-220</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	80	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	Continuous	$I_D$	170	A
Pulsed Drain Current	Pulsed (Note 2)	$I_{DM}$	680	A
Avalanche Current (Note 3)		$I_{AR}$	42	A
Avalanche energy	Single Pulsed (Note 3)	$E_{AS}$	88	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.2	V/nS
Power Dissipation		$P_D$	300	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.  $L=0.1\text{mH}$ ,  $I_{AS}=42\text{A}$ ,  $V_{DD}=50\text{V}$ ,  $R_G=25\Omega$ , 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 CHARACTERISTICS

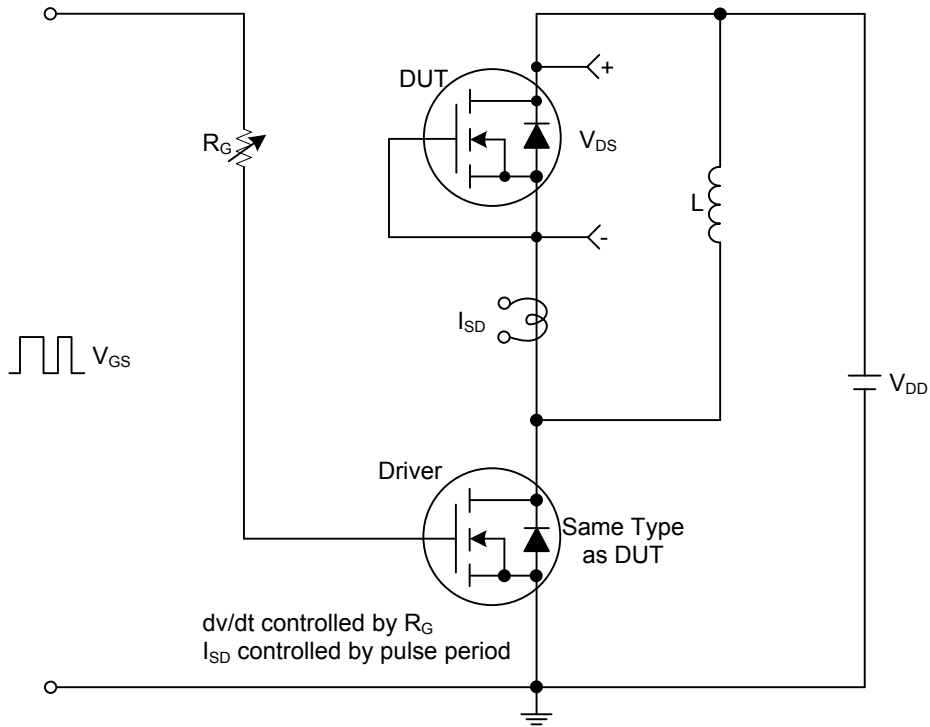
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	$\theta_{JC}$	0.42	$^\circ\text{C}/\text{W}$

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

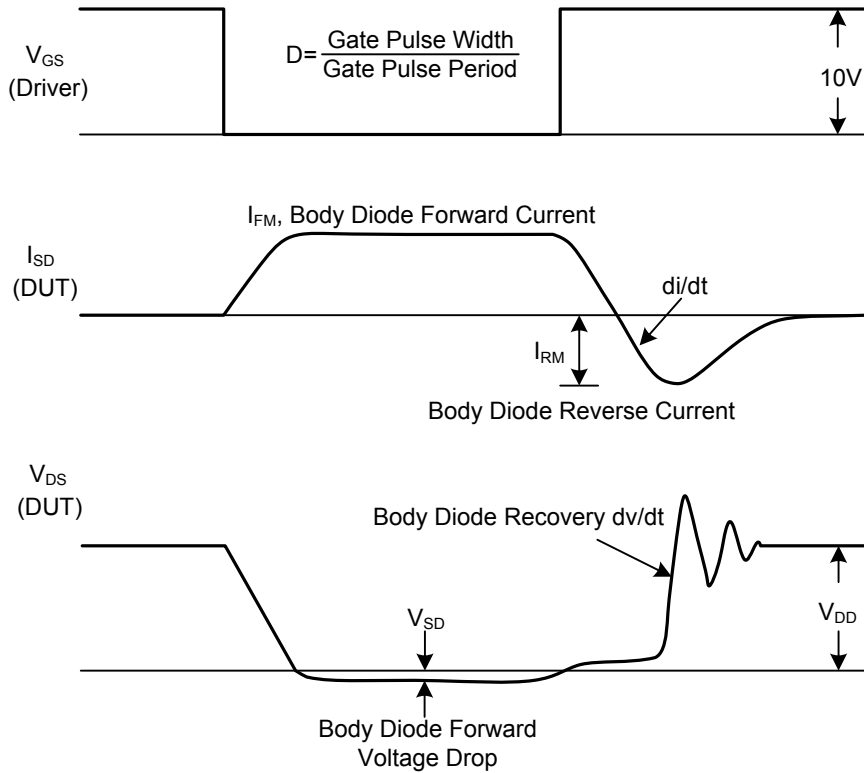
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	80			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=80\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	Forward			+100	nA
		Reverse	$V_{GS}=-20\text{V}$ , $V_{DS}=0\text{V}$		-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=60\text{A}$			5.1	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$		4360		pF
Output Capacitance	$C_{OSS}$			595		pF
Reverse Transfer Capacitance	$C_{RSS}$			260		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note 1)	$Q_G$	$V_{DS}=50\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=1.3\text{A}$ , $I_D=100\mu\text{A}$ (Note 1, 2)		260		nC
Gate to Source Charge	$Q_{GS}$			30		nC
Gate to Drain Charge	$Q_{GD}$			45		nC
Turn-on Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=30\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=0.5\text{A}$ , $R_G=25\Omega$ (Note 1, 2)		190		ns
Rise Time	$t_R$			220		ns
Turn-off Delay Time	$t_{D(OFF)}$			650		ns
Fall-Time	$t_F$			340		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				170	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				680	A
Drain-Source Diode Forward Voltage (Note 1)	$V_{SD}$	$I_S=40\text{A}$ , $V_{GS}=0\text{V}$			1.0	V
Reverse Recovery Time (Note 1)	$t_{rr}$	$I_S=30\text{A}$ , $V_{GS}=0\text{V}$ ,		45		nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt=100\text{A}/\mu\text{s}$		53		nC

- Notes: 1. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .  
 2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



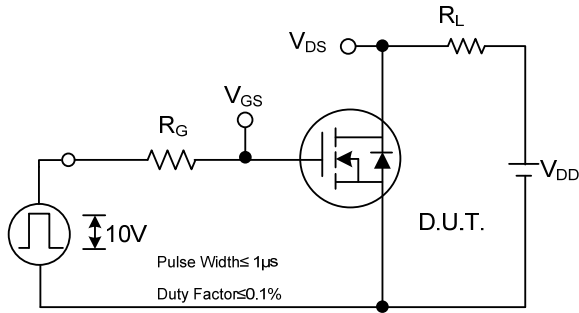
Peak Diode Recovery dv/dt Test Circuit



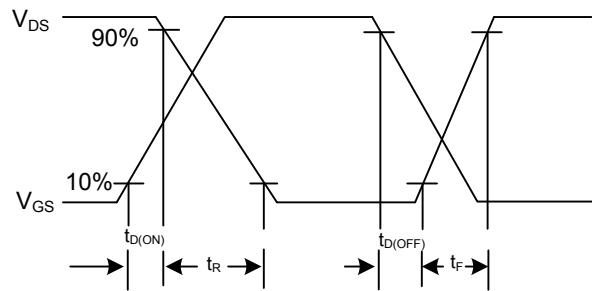
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

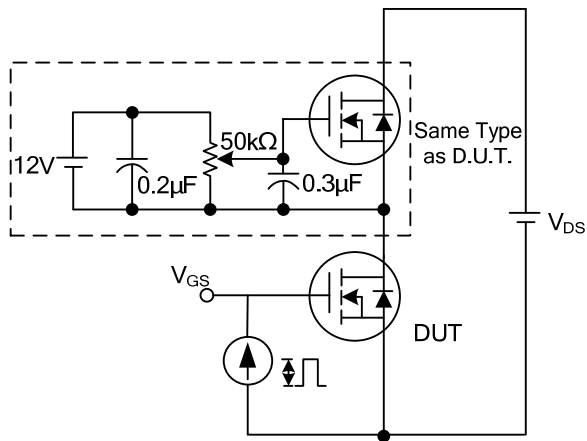
TEST CIRCUITS AND WAVEFORMS



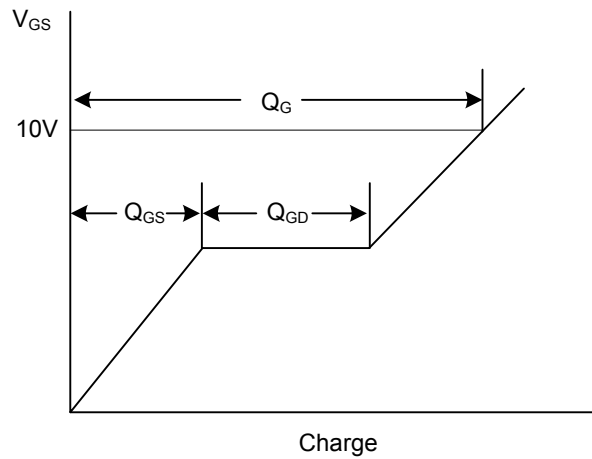
Switching Test Circuit



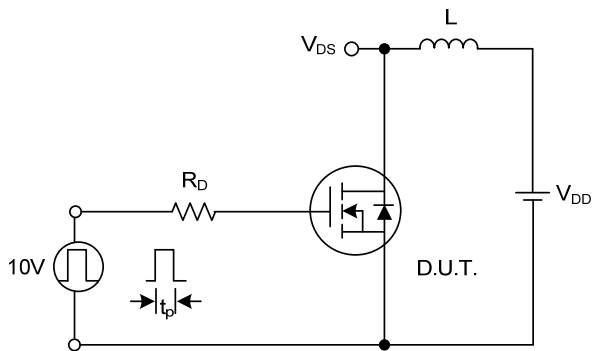
Switching Waveforms



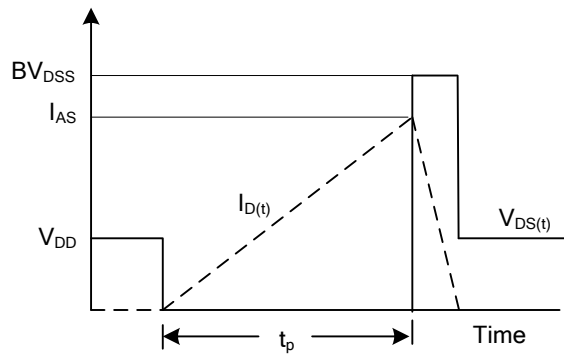
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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