



**UTT80N07H**

Preliminary

**Power MOSFET**

**80A, 70V N-CHANNEL  
POWER MOSFET**

■ DESCRIPTION

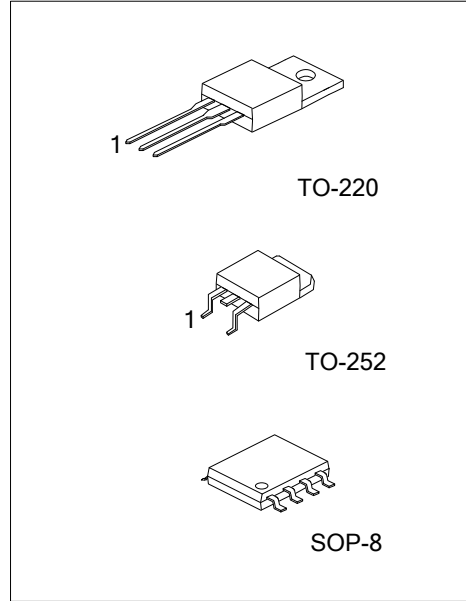
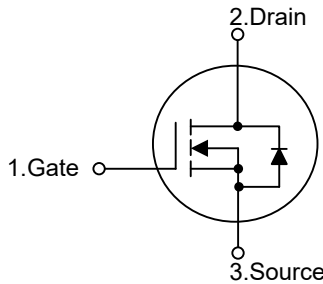
The UTC **UTT80N07H** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and low gate charge, etc.

The UTC **UTT80N07H** applies to primary side switch, synchronous rectifier, Motor Drives, etc.

■ FEATURES

- \*  $R_{DS(ON)} \leq 9.0\ m\Omega$  @  $V_{GS}=10V, I_D=40A$
- \* 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	4	5	6	7	8	
UTT80N07HL-TA3-T	UTT80N07HG-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT80N07HL-TN3-R	UTT80N07HG-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT80N07HL-S08-R	UTT80N07HG-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UTT80N07HG-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, S08: SOP-8 (3) G: Halogen Free and Lead Free L: Lead Free</p>
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■ MARKING

TO-220 / TO-252	SOP-8
<p>UTC UTT80N07H □ L: Lead Free □ □ □ □ □ G: Halogen Free □ □ □ □ □ Date Code Lot Code ← □ 1</p>	<p>8 7 6 5 UTC □ □ □ □ □ Date Code UTT80N07H □ L: Lead Free □ □ □ □ □ G: Halogen Free □ □ □ □ □ Lot Code 1 2 3 4</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	70	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Drain Current	Continuous	TO-220	80	A
		TO-252		
	SOP-8	30	A	
Pulsed (Note 2)		I <sub>DM</sub>	160	A
Single Pulsed Avalanche Energy (Note 3)		E <sub>AS</sub>	103	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.0	V/ns
Power Dissipation	TO-220	P <sub>D</sub>	180	W
	TO-252		64	W
	SOP-8		6	W
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 maximum junction temperature.

3. L = 0.1mH, I<sub>AS</sub> = 45.4A, V<sub>DD</sub> = 50V, R<sub>G</sub> = 25Ω, Starting T<sub>J</sub> = 25°C.

4. I<sub>SD</sub> ≤ 30A, di/dt ≤ 200A/μs, V<sub>DD</sub> ≤ BV<sub>DSS</sub>, Starting T<sub>J</sub> = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ <sub>JA</sub>	62.5	°C/W
	TO-252		110	°C/W
	SOP-8		125	°C/W
Junction to Case	TO-220	θ <sub>JC</sub>	0.69	°C/W
	TO-252		1.95 (Note)	°C/W
	SOP-8		20.8 (Note)	°C/W

Note: The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.

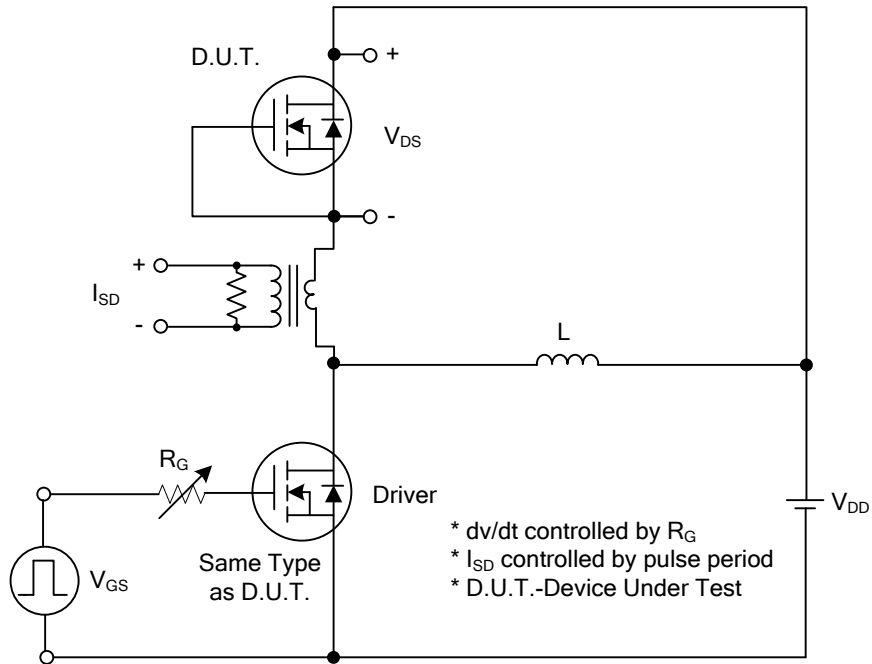
■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

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	$\mu\text{A}$
Gate-Source Leakage Current	Forward	$V_{GS}=+20\text{V}$ , $V_{DS}=0\text{V}$			+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	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=40\text{A}$			9.0	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=25\text{V}$ , $V_{GS}=0\text{V}$ , $f=1.0\text{MHz}$		3640		pF
Output Capacitance	$C_{OSS}$			418		pF
Reverse Transfer Capacitance	$C_{RSS}$			364		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{DS}=35\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=80\text{A}$		144		nC
Gate to Source Charge	$Q_{GS}$			26		nC
Gate to Drain Charge	$Q_{GD}$			58		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=35\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=80\text{A}$ , $R_G=3\Omega$ (Note 2)		16		ns
Rise Time	$t_R$			21		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			54		ns
Fall-Time	$t_F$			24		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				80	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				160	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_{SD}=80\text{A}$			1.25	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_S=30\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$		42		ns
Body Diode Reverse Recovery Charge	$Q_{rr}$			43		nC

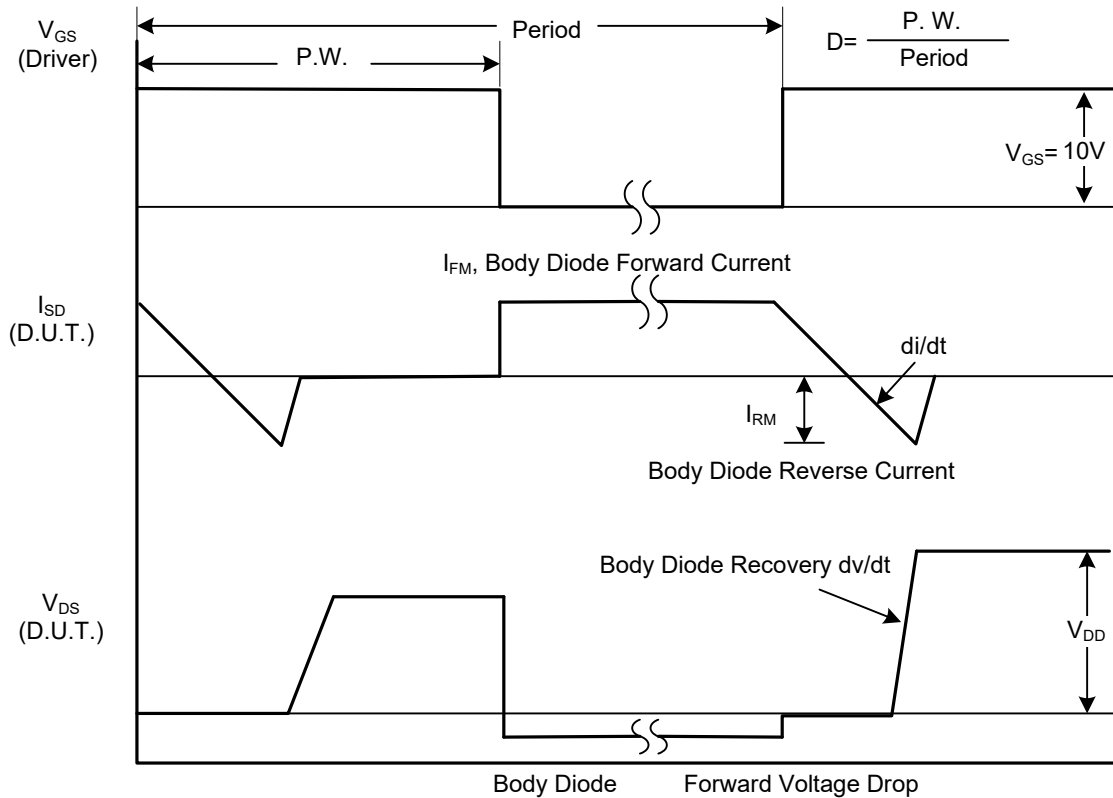
Notes: 1. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

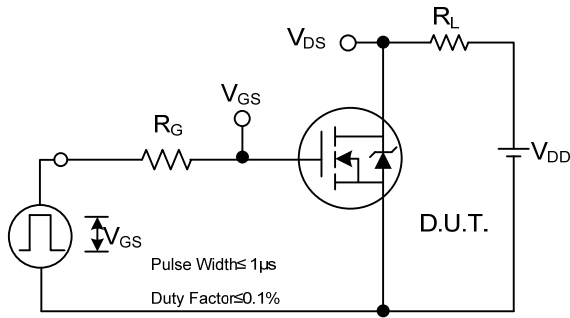


Peak Diode Recovery dv/dt Test Circuit

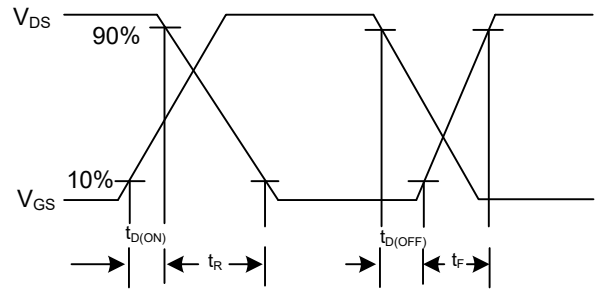


Peak Diode Recovery dv/dt Waveforms

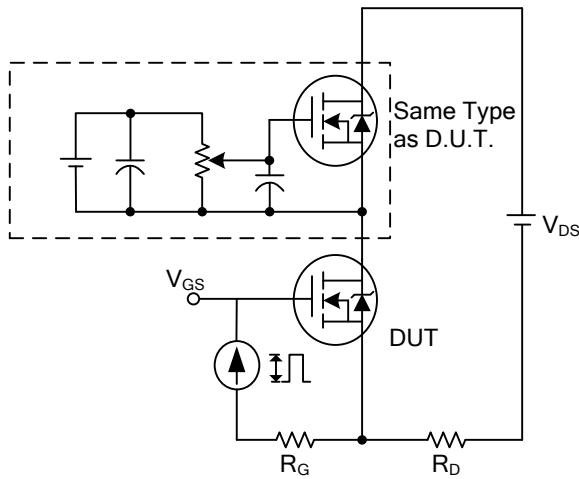
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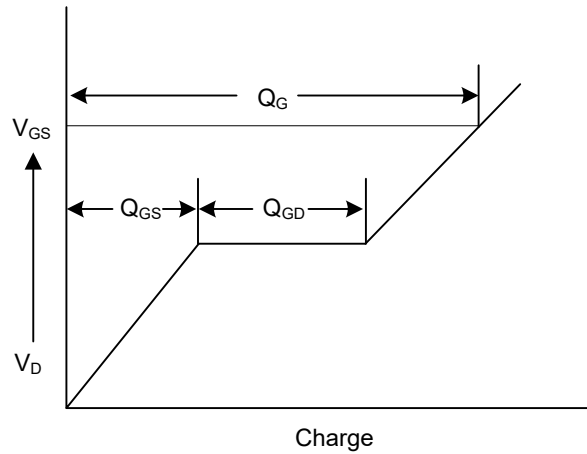
Switching Test Circuit



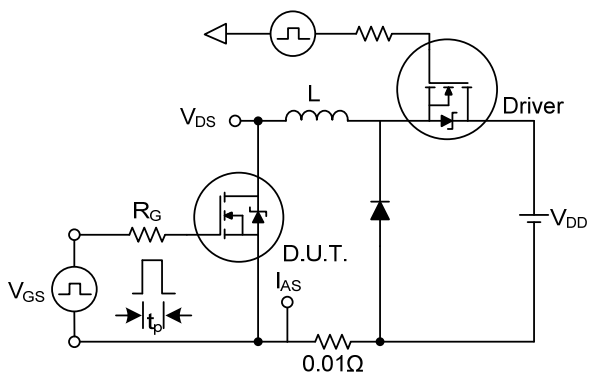
Switching Waveforms



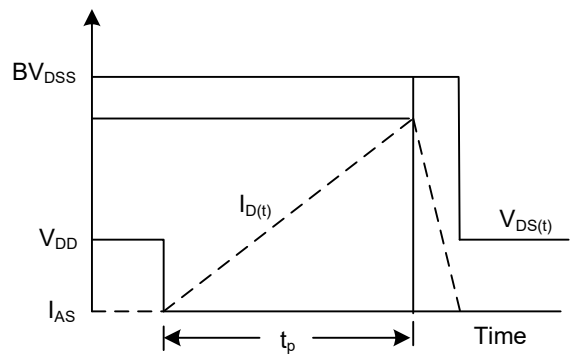
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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