

**UTT80N08H**

Preliminary

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

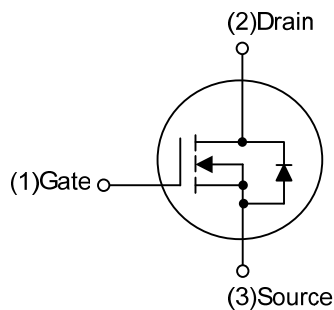
The UTC **UTT80N08H** is an N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and low gate charge, etc.

The UTC **UTT80N08H** applies to primary side switch, synchronous rectifier, Motor Drives, etc.

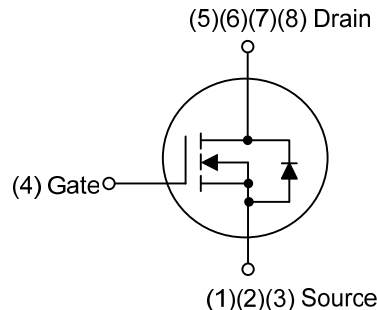
FEATURES*** TO-220** $R_{DS(ON)} \leq 10.5 \text{ m}\Omega @ V_{GS}=10V, I_D=40A$ *** TO-252/PDFN5×6** $R_{DS(ON)} \leq 8.5 \text{ m}\Omega @ V_{GS}=10V, I_D=40A$

* High Cell Density Trench Technology

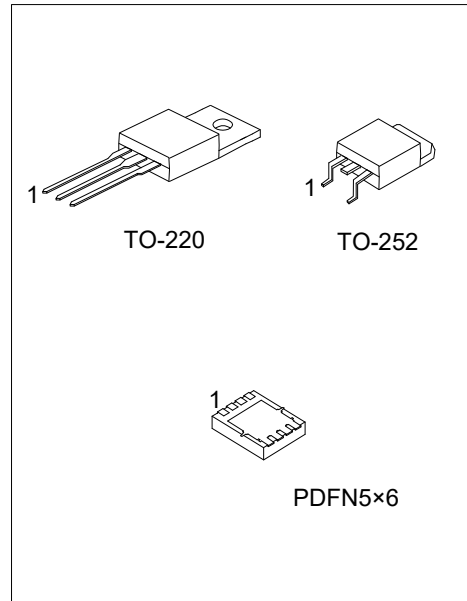
* High Power and Current Handling Capability

SYMBOL

TO-220/TO-252



PDFN5×6

**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT80N08HL-TA3-T	UTT80N08HG-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT80N08HL-TN3-R	UTT80N08HG-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT80N08HL-P5060-R	UTT80N08HG-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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

UTT80N08HG-TA3-T	(1)Packing Type	(1) T: Tube, R: Tape Reel
	(2)Package Type	(2) TA3: TO-220, TN3: TO-252, P5060: PDFN5×6
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-220 / TO-252	PDFN5×6
UTC UTT 80N08H □ □ □ □ □ □ □ Lot Code ← → Date Code 1 L: Lead Free G: Halogen Free	UTC UTT 80N08H • □ □ □ □ □ Lot Code ← → Date Code

■ **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}	± 20	V
Continuous Drain Current	Continuous	I_D	80	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	160	A
Avalanche energy	Single Pulsed (Note 3)	E_{AS}	61	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.6	V/nS
Power Dissipation	TO-220	P_D	142	W
	TO-252		64	W
	PDFN5×6		56	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. $L = 0.1\text{mH}$, $I_{AS} = 35\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, 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 DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-252		110	$^{\circ}\text{C}/\text{W}$
	PDFN5×6		65 (Note)	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.88	$^{\circ}\text{C}/\text{W}$
	TO-252		1.95	$^{\circ}\text{C}/\text{W}$
	PDFN5×6		2.23 (Note)	$^{\circ}\text{C}/\text{W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

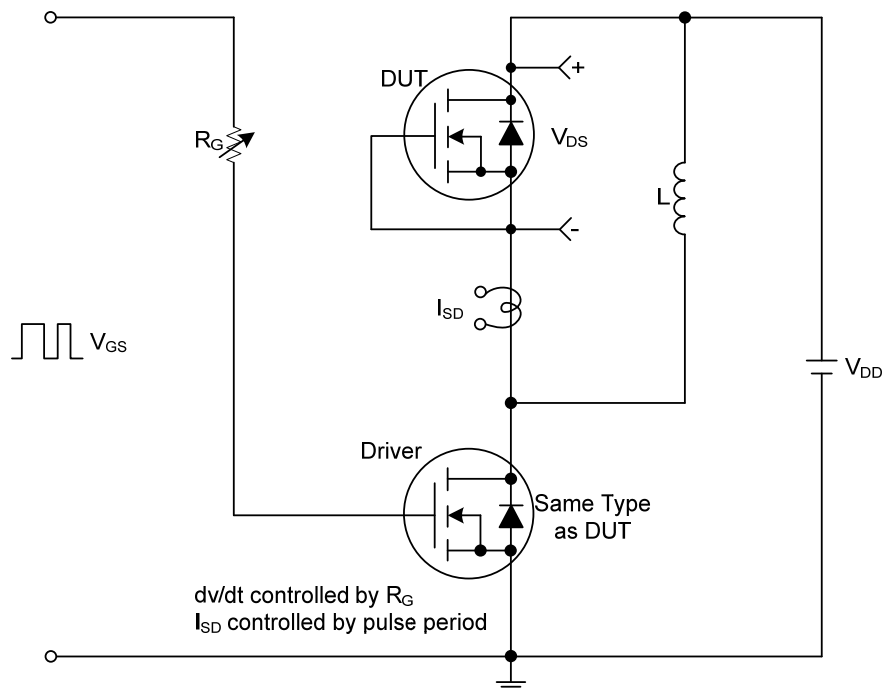
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	80			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =80V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	TO-220	R _{DS(ON)}	V _{GS} =10V, I _D =40A			10.5	mΩ
	TO-252 PDFN5×6		V _{GS} =10V, I _D =40A			8.5	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		3765		pF
Output Capacitance		C _{OSS}			320		pF
Reverse Transfer Capacitance		C _{RSS}			265		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =64V, V _{GS} =10V, I _D =80A, (Note 1, 2)		130		nC
Gate to Source Charge		Q _{GS}			20		nC
Gate to Drain Charge		Q _{GD}			56		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DS} =40V, V _{GS} =10V, I _D =80A, R _G =3Ω (Note 1, 2)		17		ns
Rise Time		t _R			18		ns
Turn-OFF Delay Time		t _{D(OFF)}			46		ns
Fall-Time		t _F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				80	A
Maximum Body-Diode Pulsed Current		I _{SM}				160	A
Diode Forward Voltage (Note 1)		V _{SD}	I _S =80A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =30A, V _{GS} =0V,		33		nS
Body Diode Reverse Recovery Charge		Q _{rr}	dlF/dt=100A/μs		25		nC

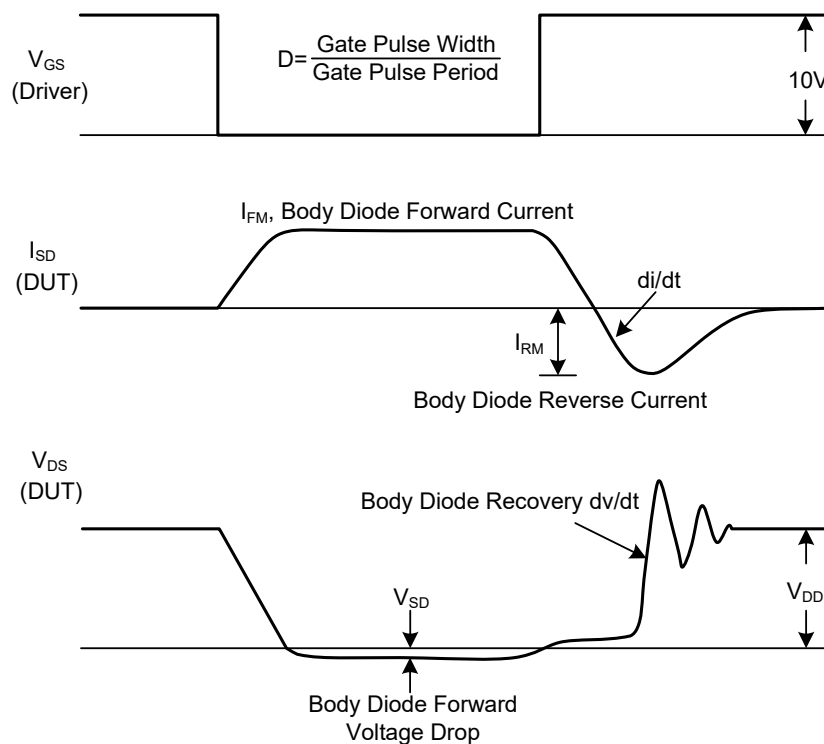
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



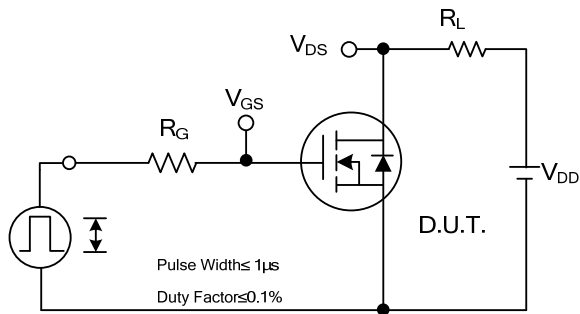
Peak Diode Recovery dv/dt Test Circuit



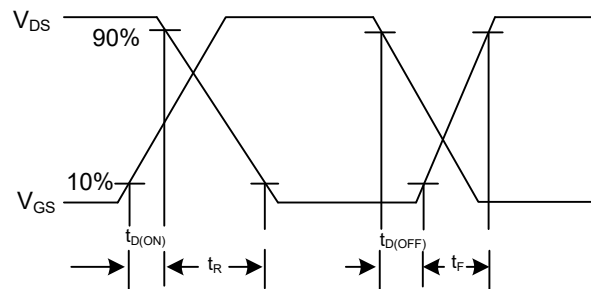
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

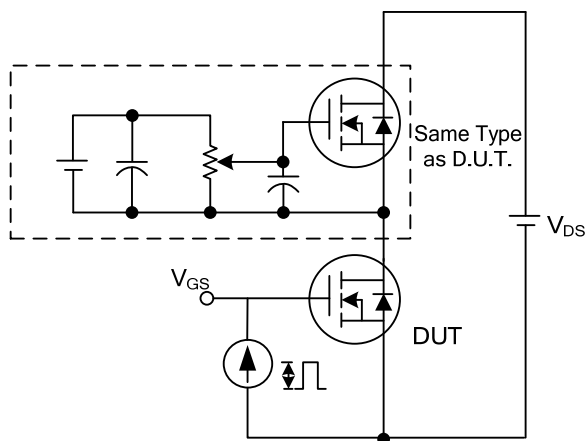
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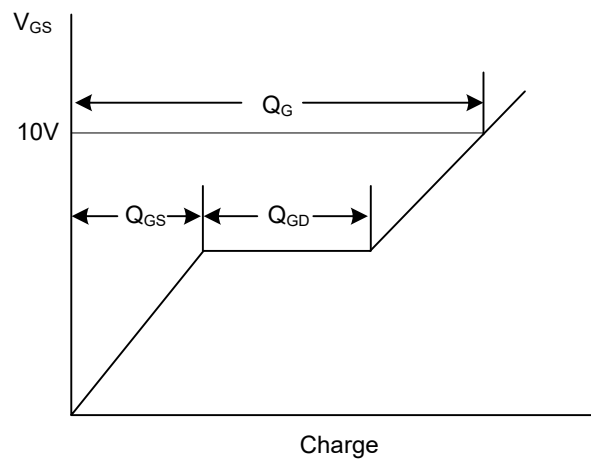
Switching Test Circuit



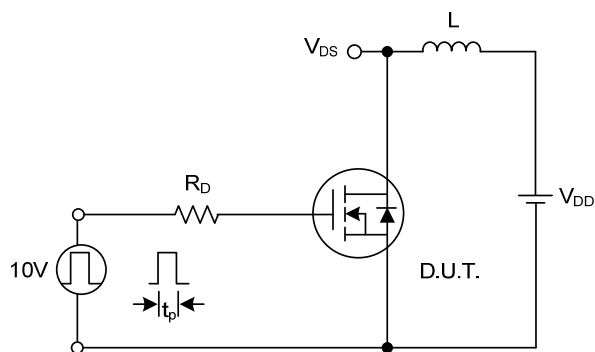
Switching Waveforms



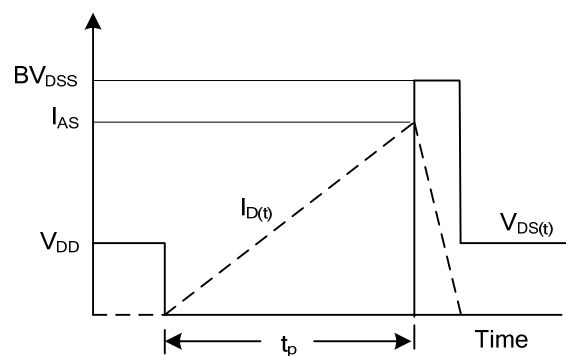
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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