



## UTT30N08

Preliminary

Power MOSFET

### 80V, 30A N-CHANNEL POWER MOSFET

#### DESCRIPTION

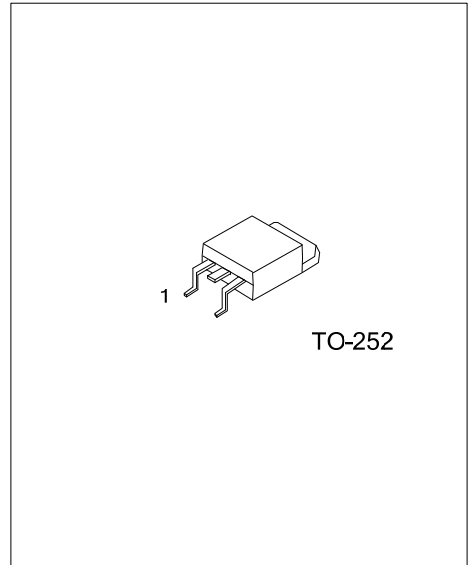
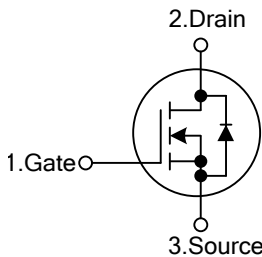
The UTC **UTT30N08** is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **UTT30N08** is generally applied in high efficiency switch mode power supplies.

#### FEATURES

- \*  $R_{DS(ON)} < 40m\Omega @ V_{GS}=10V, I_D=30A$
- \* Low Gate Charge (Typical 48nC)
- \* Low  $C_{RSS}$  (Typical 30pF)
- \* High Switching Speed

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT30N08L-TN3-R	UTT30N08G-TN3-R	TO-252	G	D	S	Tape Reel
UTT30N08L-TN3-T	UTT30N08G-TN3-T	TO-252	G	D	S	Tube

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

UTT30N08L-TN3-R 	(1) Packing Type (2) Package Type (3) Lead Free	(1) R: Tape Reel, T: Tube (2) TN3: TO-252 (3) G: Halogen Free, L: Lead Free
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■ ABSOLUTE MAXIMUM RATINGS ( $T_C=25^\circ\text{C}$ , unless otherwise specified) (Note 4)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain to Source Voltage		$V_{DSS}$	80	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V	
Drain Current (Note 5)	Continuous	$I_D$	$T_C=25^\circ\text{C}$	30	A
			$T_C=100^\circ\text{C}$	21.3	A
Pulsed (Note 2)		$I_{DM}$	120	A	
Avalanche Energy	Single Pulsed (Note 3)	$E_{AS}$	300	mJ	
	Repetitive (Note 2)	$E_{AR}$	8	mJ	
Power Dissipation ( $T_C=25^\circ\text{C}$ )		$P_D$	28	W	
Junction Temperature		$T_J$	+150	$^\circ\text{C}$	
Storage Temperature		$T_{STG}$	-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.  $L=4\text{mH}$ ,  $I_{AS}=30\text{A}$ .  $V_{DD}=50\text{V}$ ,  $R_G=25\Omega$ , Starting  $T_J=25^\circ\text{C}$

4. Drain current limited by maximum junction temperature

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	110	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	4.53	$^\circ\text{C/W}$

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$ , $T_J=150^\circ\text{C}$	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	Forward	$I_{GSS}$	$V_{GS}=+20\text{V}$ , $V_{DS}=0\text{V}$		+100	nA
	Reverse			$V_{GS}=-20\text{V}$ , $V_{DS}=0\text{V}$		-100
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}$ , $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=30\text{A}$		32	40	$\text{m}\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=25$ , $V_{GS}=0\text{V}$ , $f=1.0\text{MHz}$		2400		pF
Output Capacitance	$C_{OSS}$			390		pF
Reverse Transfer Capacitance	$C_{RSS}$			30		pF

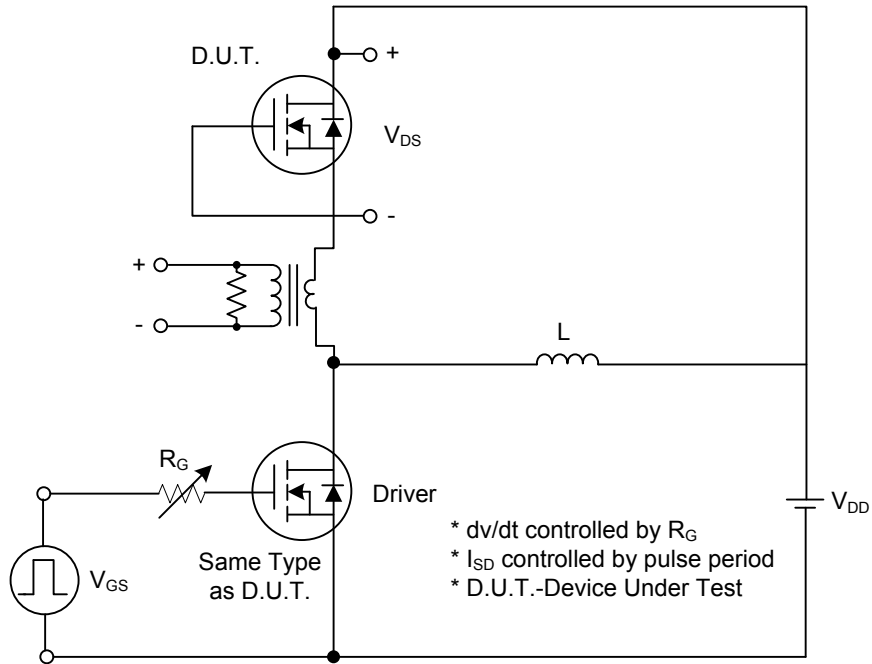
■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{DS}=60V, V_{GS}=10V, I_D=30A$ (Note 1, 2)		48	60	nC
Gate to Source Charge	$Q_{GS}$			15		nC
Gate to Drain ("Miller") Charge	$Q_{GD}$			20		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30V, I_D=15A, R_G=4.7\Omega$ (Note 1, 2)		45		ns
Rise Time	$t_R$			60		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			115		ns
Fall-Time	$t_F$			66		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				30	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				120	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_{SD}=30A, V_{GS}=0V$			1.4	V

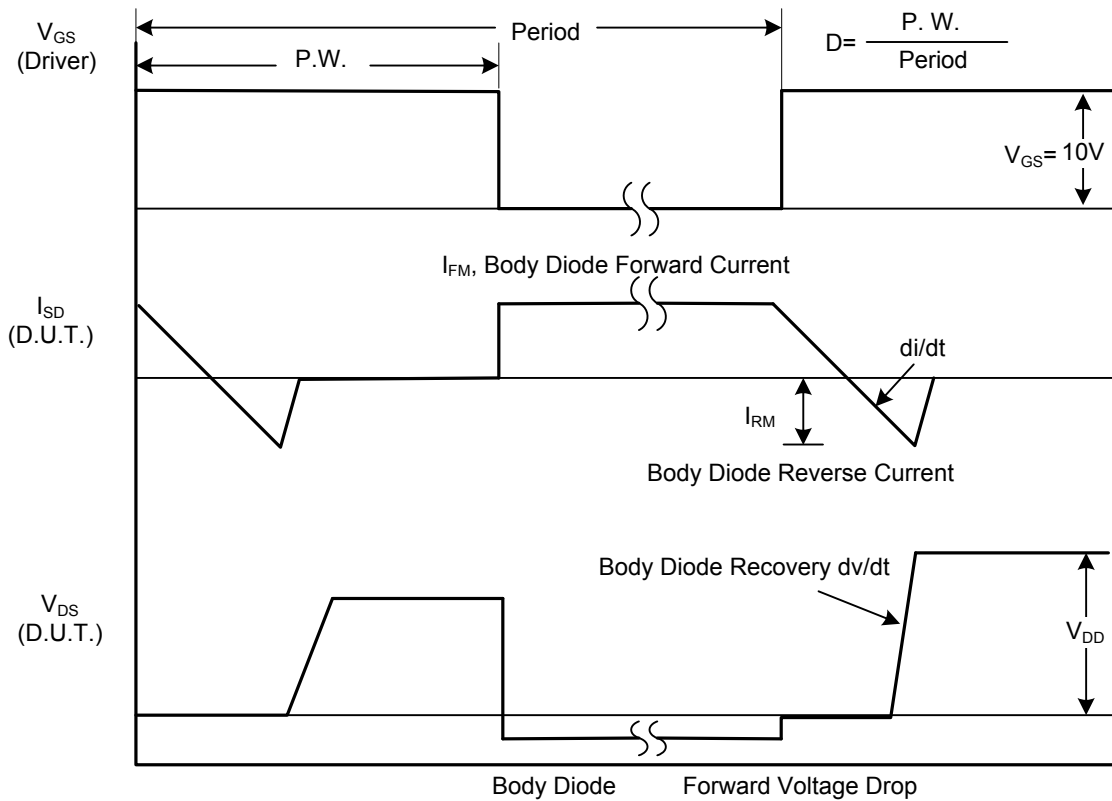
Notes: 1. Pulse Test: Pulse width $\leq$ 300 $\mu$ s; Duty Cycles $\leq$ 2%.

2. Essentially Independent of Operating Temperature Typical Characteristics

■ TEST CIRCUITS AND WAVEFORMS

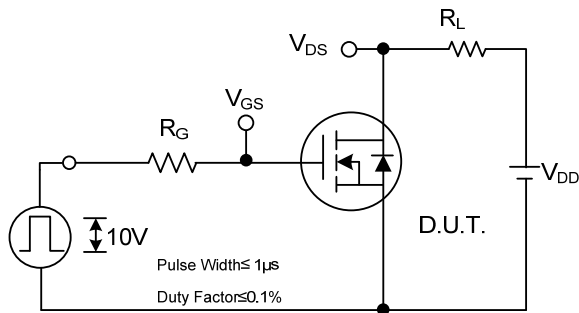


Peak Diode Recovery  $dv/dt$  Test Circuit

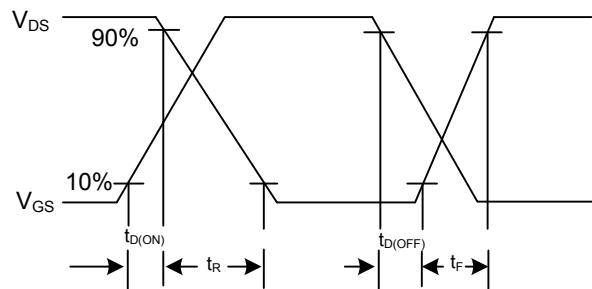


Peak Diode Recovery  $dv/dt$  Waveforms

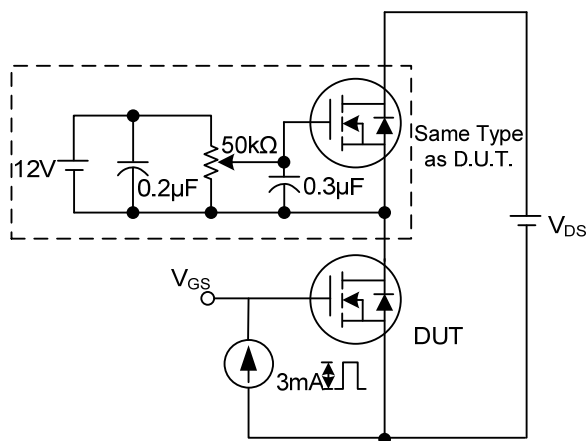
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



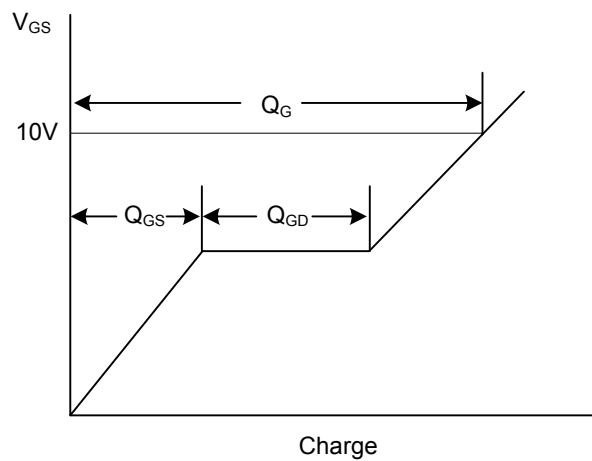
Switching Test Circuit



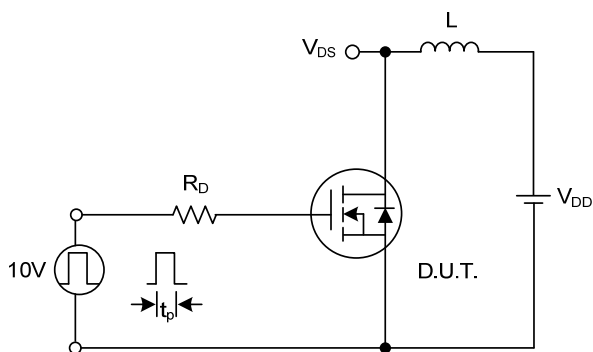
Switching Waveforms



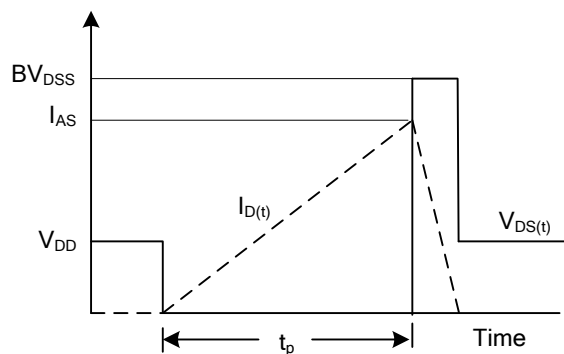
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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