

## UTT60N10

**Power MOSFET**

### 60A, 100V N-CHANNEL ENHANCEMENT MODE POWER MOSFET TRANSISTOR

#### DESCRIPTION

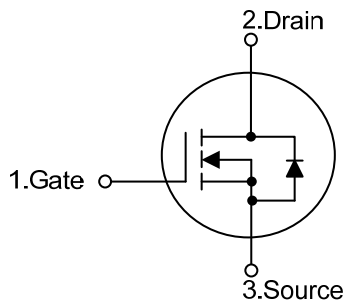
The **UTT60N10** is an N-channel enhancement power MOSFET using's advanced technology to provide the customers with perfect  $R_{DS(ON)}$ , high switching speed, high current capacity and low gate charge.

The **UTT60N10** is suitable for motor control, AC-DC or DC-DC converters and audio amplifiers, etc.

#### FEATURES

- \*  $R_{DS(ON)} < 24m\Omega @ V_{GS}=10V, I_D=30A$
- \* High Switching Speed
- \* High Current Capacity

#### SYMBOL

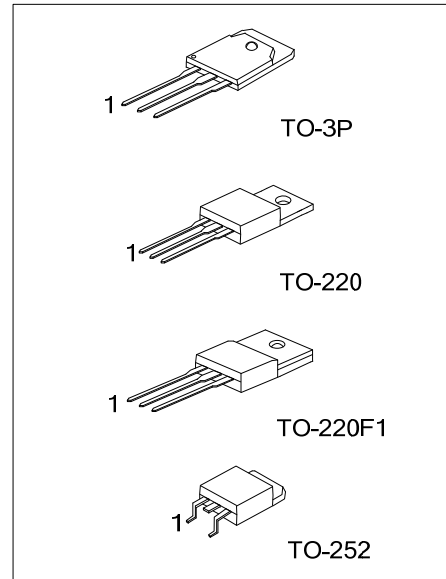


#### ORDERING INFORMATION

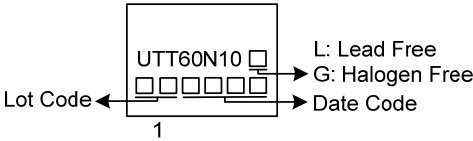
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT60N10L-TA3-T	UTT60N10G-TA3-T	TO-220	G	D	S	Tube
UTT60N10L-TF1-T	UTT60N10G-TF1-T	TO-220F1	G	D	S	Tube
UTT60N10L-T3P-T	UTT60N10G-T3P-T	TO-3P	G	D	S	Tube
UTT60N10L-TN3-R	UTT60N10G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT60N10G-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF1: TO-220F1, TN3: TO-252 T3P: TO-3P</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	100	V
Gate-Source Voltage		$V_{GSS}$	±20	V
Drain Current	Continuous	$I_D$	60	A
	Pulsed	$I_{DM}$	100	A
Avalanche Energy		$E_{AS}$	270	mJ
Power Dissipation	TO-220	$P_D$	100	W
	TO-220F1		70	W
	TO-252		114	W
	TO-3P		118	W
Junction Temperature		$T_J$	150	°C
Storage Temperature		$T_{STG}$	-55 ~ 150	°C

Note: 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.

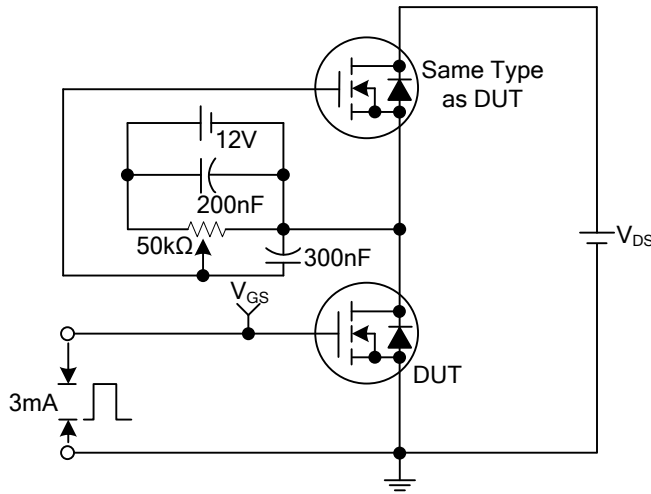
### ■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/ TO-220F1	$\theta_{JA}$	62.5	°C/W
	TO-252		100	
	TO-3P		30	
Junction to Case	TO-220	$\theta_{JC}$	1.25	°C/W
	TO-220F1		1.77	
	TO-252		2.5	
	TO-3P		1.06	

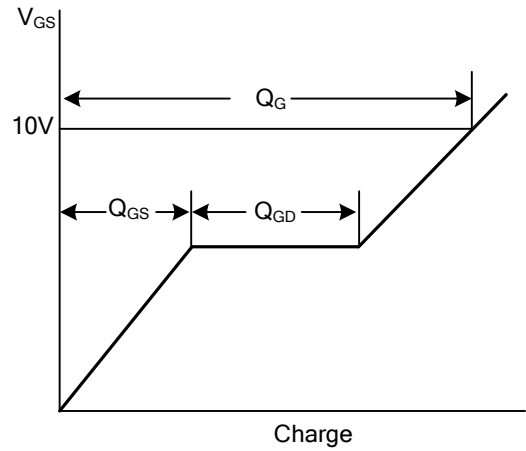
### ■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage		$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	100			V
Drain-Source Leakage Current		$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$			10	$\mu A$
Gate- Source Leakage Current	Forward	$I_{GSS}$	$V_{GS}=+20V, V_{DS}=0V$			+100	nA
	Reverse		$V_{GS}=-20V, V_{DS}=0V$			-100	nA
<b>ON CHARACTERISTICS</b>							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$			24	m $\Omega$
<b>DYNAMIC PARAMETERS</b>							
Input Capacitance		$C_{ISS}$	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$		1320	1900	pF
Output Capacitance		$C_{OSS}$			330	680	pF
Reverse Transfer Capacitance		$C_{RSS}$			132	200	pF
<b>SWITCHING PARAMETERS</b>							
Total Gate Charge		$Q_G$	$V_{GS}=10V, V_{DS}=25V, I_D=1.3A, I_G=100\mu A$		213		nC
Gate to Source Charge		$Q_{GS}$			17		nC
Gate to Drain Charge		$Q_{GD}$			33		nC
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=30V, I_D=0.5A, R_G=50\Omega, V_{GS}=10V$		140		ns
Rise Time		$t_R$			180		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			2180		ns
Fall-Time		$t_F$			396		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>							
Maximum Body-Diode Continuous Current		$I_S$		60			A
Maximum Body-Diode Pulsed Current		$I_{SM}$		100			A
Drain-Source Diode Forward Voltage		$V_{SD}$	$I_S=30A, V_{GS}=0V$			1.5	V

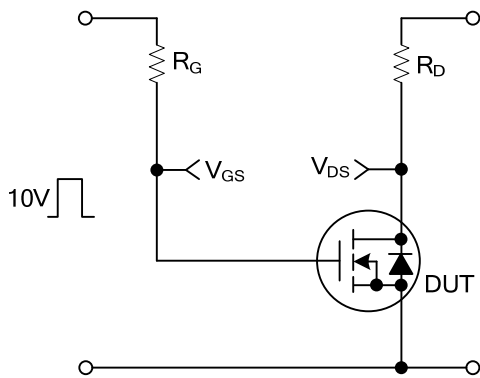
## TEST CIRCUITS AND WAVEFORMS



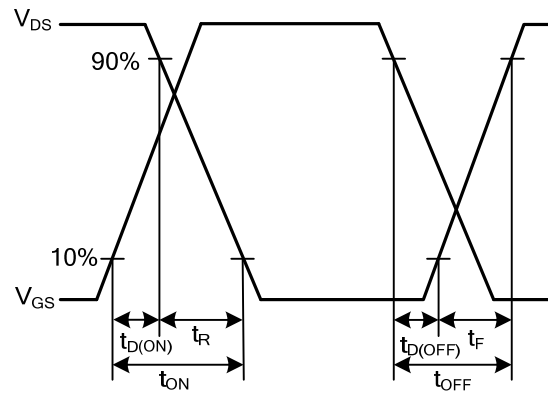
**Gate Charge Test Circuit**



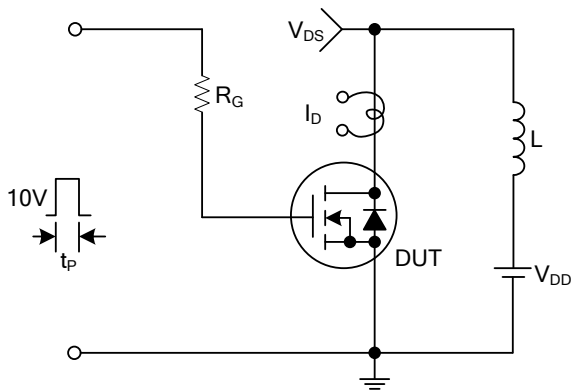
**Gate Charge Waveforms**



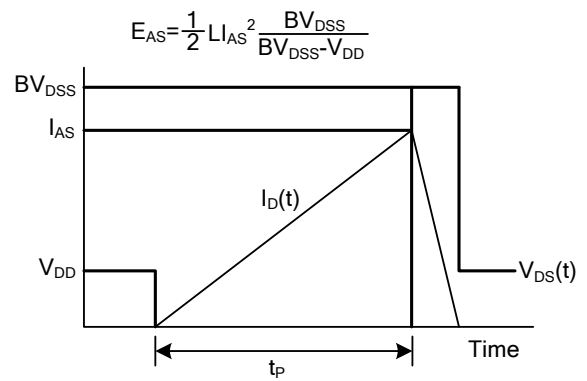
**Resistive Switching Test Circuit**



**Resistive Switching Waveforms**

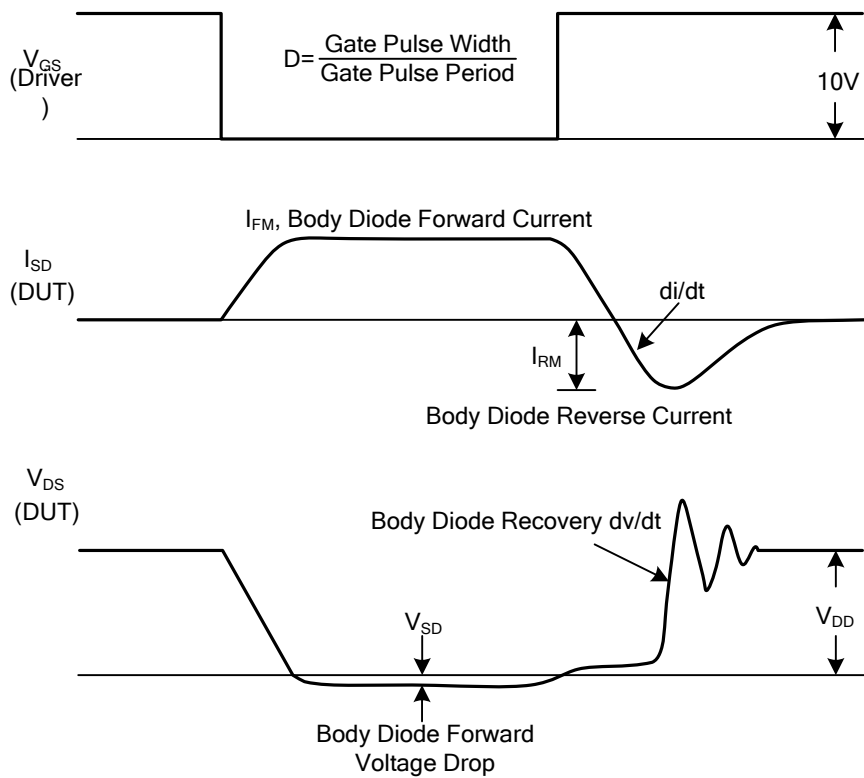
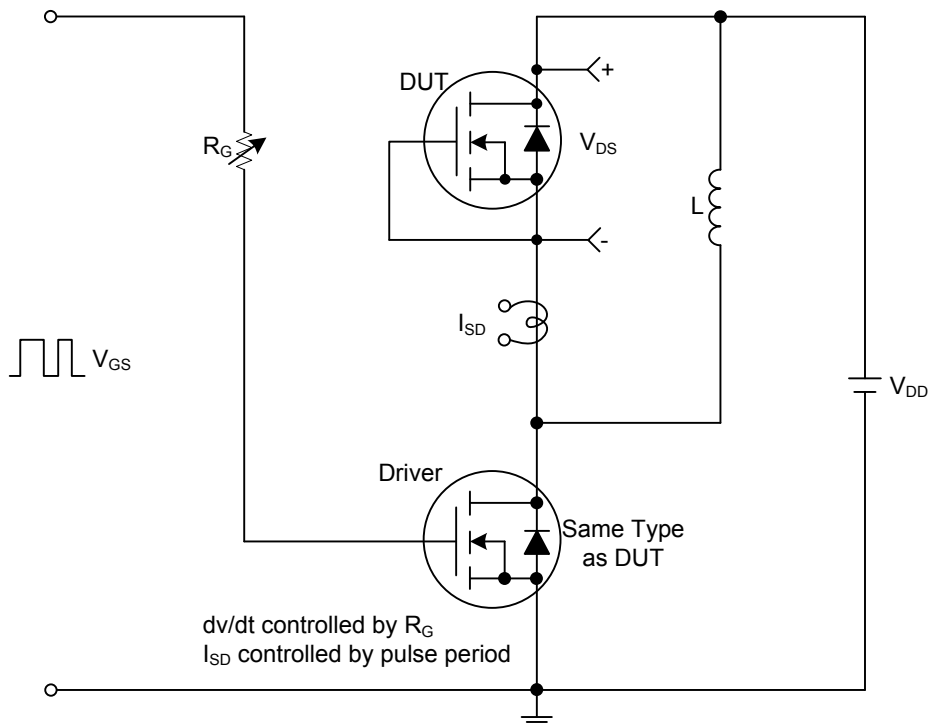


**Unclamped Inductive Switching Test Circuit**



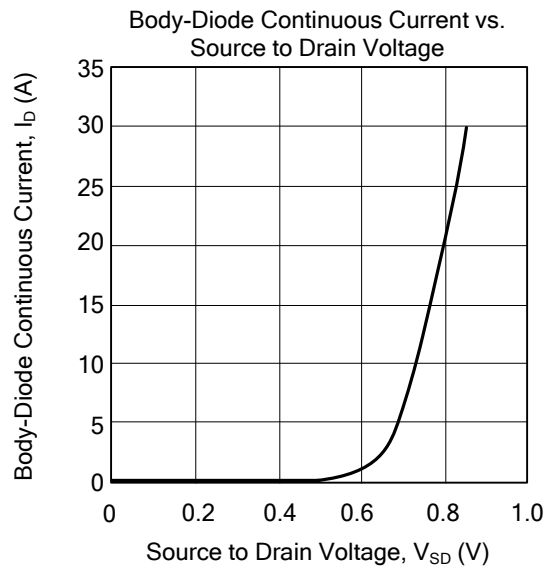
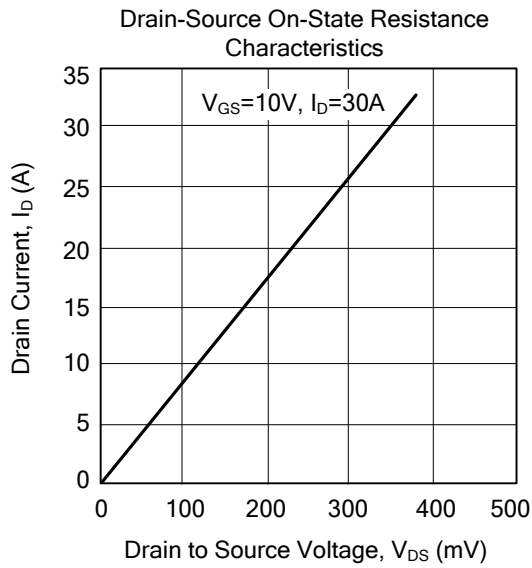
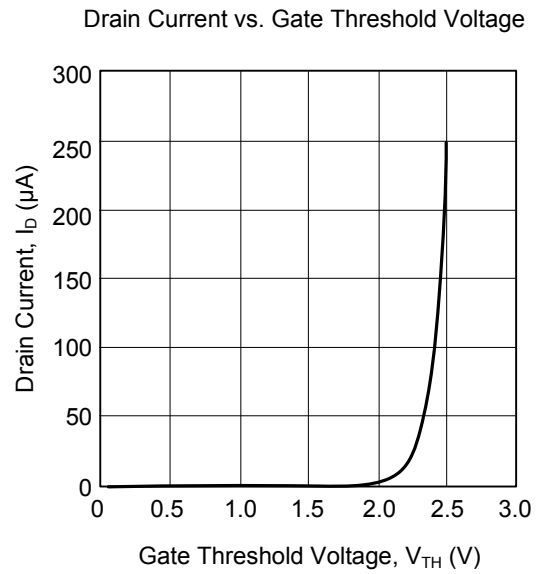
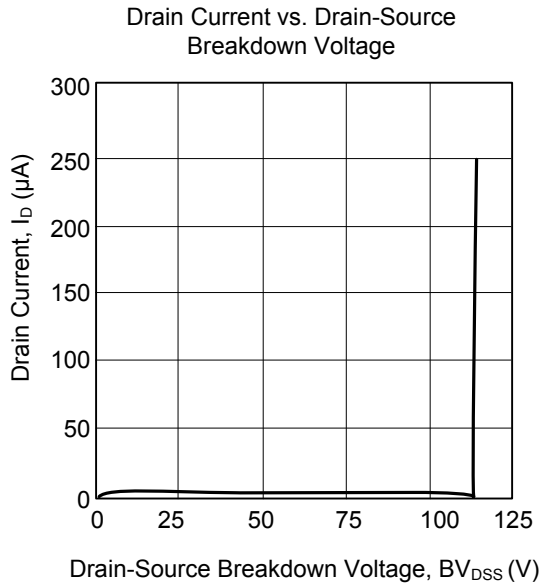
**Unclamped Inductive Switching Waveforms**

## TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

■ TYPICAL CHARACTERISTICS



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