



**UTT24N06**

**Power MOSFET**

**24A, 60V N-CHANNEL  
ENHANCEMENT MODE  
MOSFET**

■ DESCRIPTION

The UTC **UTT24N06** is an N-Channel enhancement mode MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and low gate charge, etc.

The UTC **UTT24N06** is suitable for switching application in Industry and converter application in LED TV, etc.

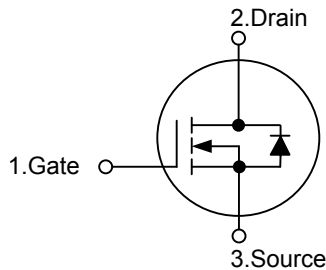
■ FEATURES

\*  $R_{DS(ON)} < 40\text{ m}\Omega$  @  $V_{GS}=10\text{V}$ ,  $I_{DS}=12\text{A}$

$R_{DS(ON)} < 50\text{ m}\Omega$  @  $V_{GS}=5\text{V}$ ,  $I_{DS}=11\text{A}$

\* Low  $R_{DS(ON)}$

■ SYMBOL



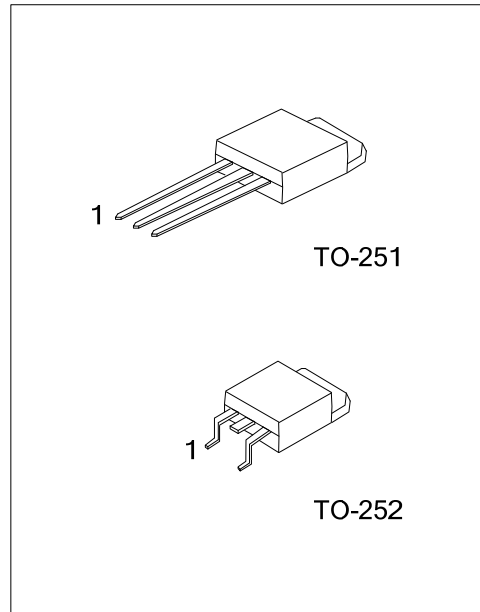
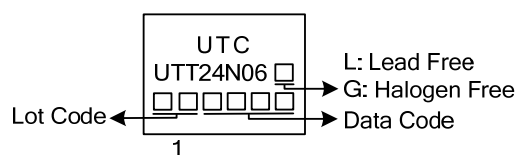
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT24N06L-TM3-T	UTT24N06G-TM3-T	TO-251	G	D	S	Tube
UTT24N06L-TN3-R	UTT24N06G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT24N06G-TM3-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) TM3: TO-251, TN3: TO-252</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	60	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	Continuous	$I_D$	24	A
Pulsed Drain Current	Pulsed (Note 2)	$I_{DM}$	96	A
Avalanche Current (Note 3)		$I_{AR}$	17.8	A
Avalanche energy	Single Pulsed (Note 3)	$E_{AS}$	160	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.27	V/nS
Power Dissipation		$P_D$	60	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.  $L = 1.0\text{mH}$ ,  $I_{AS} = 17.8\text{A}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$   
 4.  $I_{SD} \leq 12\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ , Starting  $T_J = 25^\circ\text{C}$

### ■ THERMAL CHARACTERISTICS

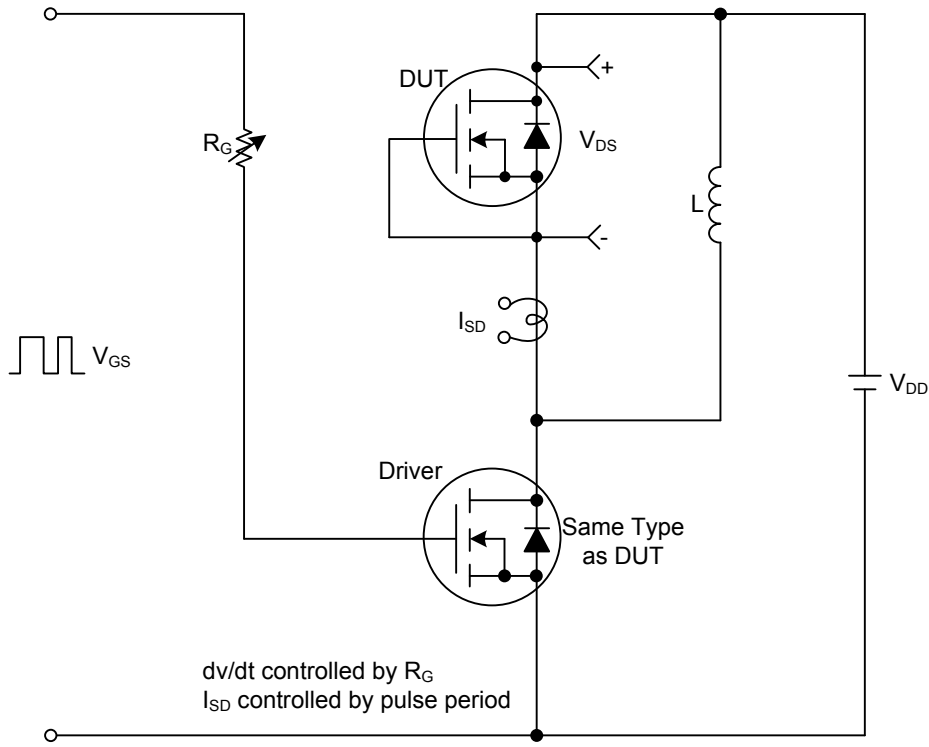
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	110	$^\circ\text{C}/\text{W}$
Junction to Case	$\theta_{JC}$	2.1	$^\circ\text{C}/\text{W}$

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

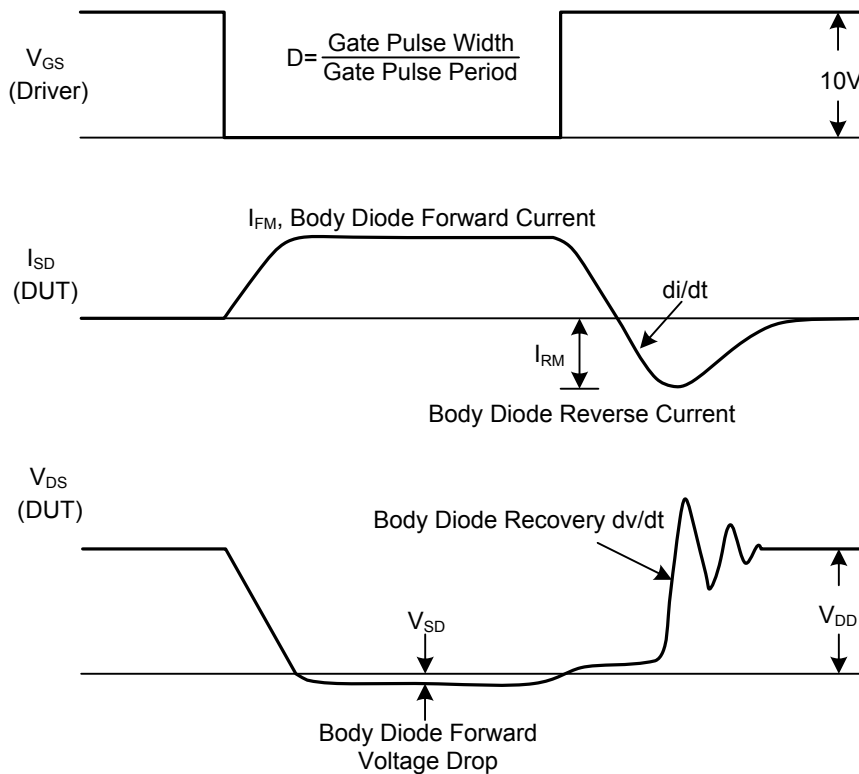
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=48\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}$ , $V_{DS}=0\text{V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_{DS}=250\mu\text{A}$	1.0		3.0	V
Drain-Source On-State Resistance (Note 1)	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_{DS}=12\text{A}$			40	m $\Omega$
		$V_{GS}=5.0\text{V}$ , $I_{DS}=11\text{A}$			50	m $\Omega$
<b>DYNAMIC PARAMETERS (Note 2)</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$		1080		pF
Output Capacitance	$C_{OSS}$			130		pF
Reverse Transfer Capacitance	$C_{RSS}$			85		pF
<b>SWITCHING PARAMETERS (Note 2)</b>						
Total Gate Charge (Note 1)	$Q_G$	$V_{DS}=30\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=1.3\text{A}$ $I_G=100\mu\text{A}$ (Note 1, 2)		115		nC
Gate to Source Charge	$Q_{GS}$			6		nC
Gate to Drain Charge	$Q_{GD}$			8		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)		36		ns
Rise Time	$t_R$			49		ns
Turn-off Delay Time	$t_{D(OFF)}$			320		ns
Fall-Time	$t_F$			108		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				12	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				48	A
Drain-Source Diode Forward Voltage (Note 1)	$V_{SD}$	$I_S=12\text{A}$ , $V_{GS}=0\text{V}$		0.8	1.3	V
Reverse Recovery Time (Note 1)	$t_{rr}$	$I_S=12\text{A}$ , $V_{GS}=0\text{V}$		124		ns
Reverse Recovery Charge	$Q_{rr}$	$di/dt=100\text{A}/\mu\text{s}$		165		$\mu\text{C}$

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

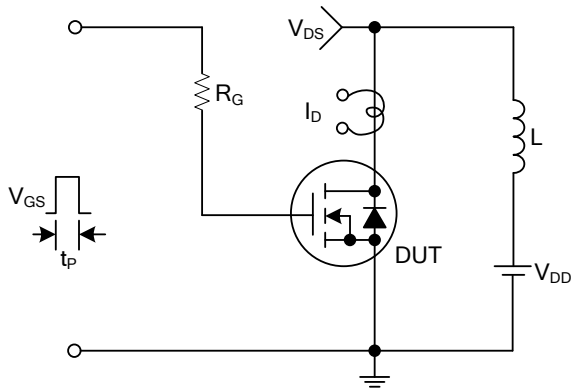
■ TEST CIRCUITS AND WAVEFORMS



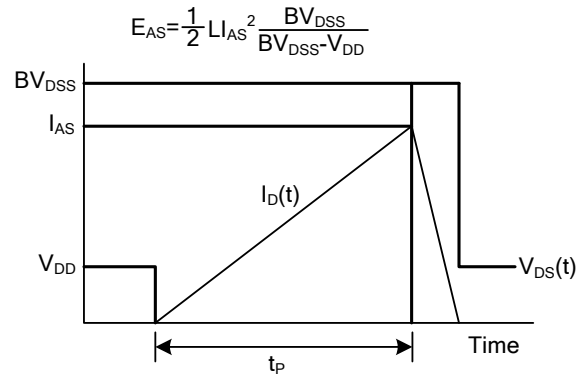
Peak Diode Recovery dv/dt Test Circuit & Waveforms



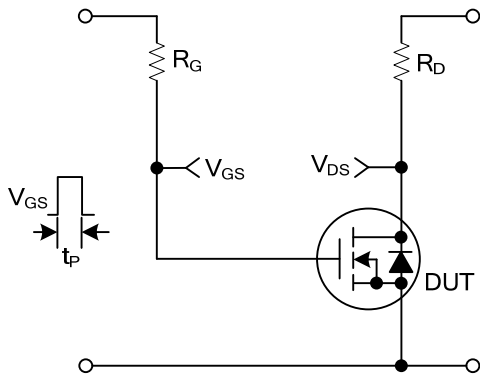
### ■ TEST CIRCUITS AND WAVEFORMS



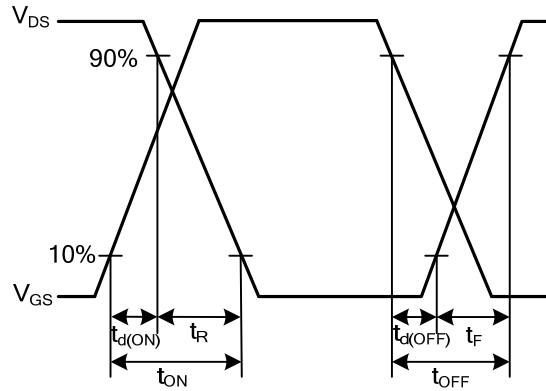
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



Resistive Switching Test Circuit



Resistive Switching Waveforms

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