



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.

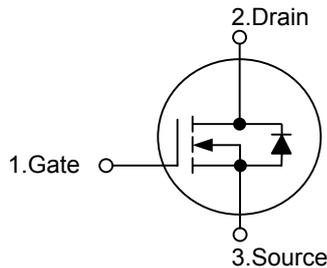
■ FEATURES

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

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

* Low $R_{DS(ON)}$

■ SYMBOL



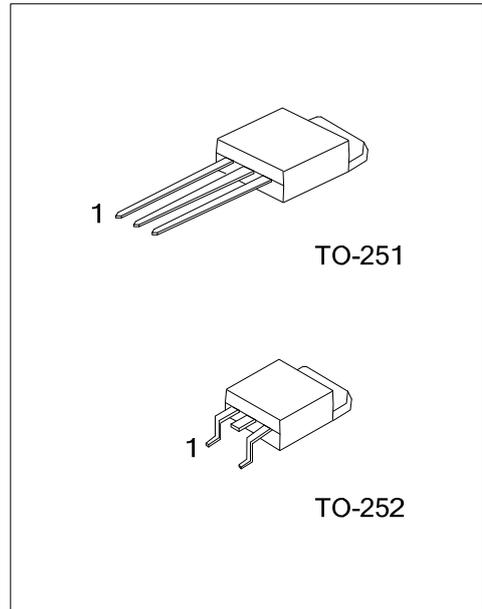
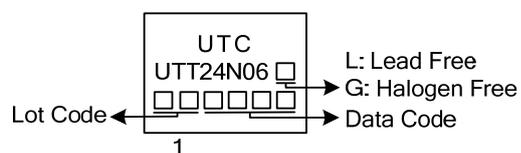
■ ORDERING INFORMATION

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}	± 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	θ_{JA}	110	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	2.1	$^{\circ}\text{C}/\text{W}$

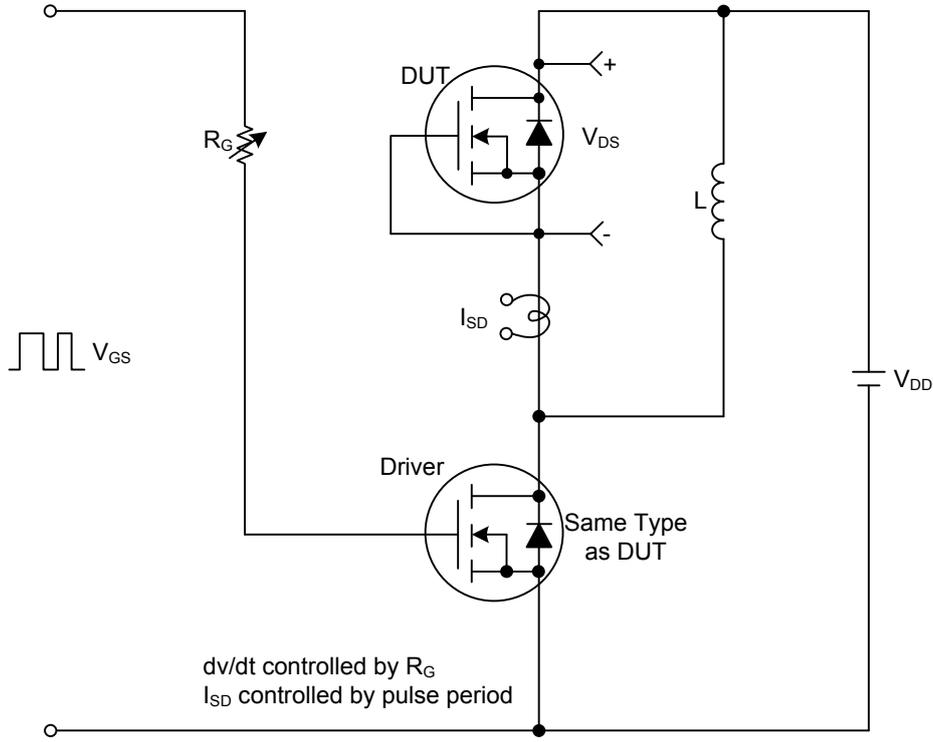
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
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	μA
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$			± 100	nA
ON CHARACTERISTICS						
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 Ω
		$V_{GS}=5.0\text{V}$, $I_{DS}=11\text{A}$			50	m Ω
DYNAMIC PARAMETERS (Note 2)						
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
SWITCHING PARAMETERS (Note 2)						
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
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
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		μC

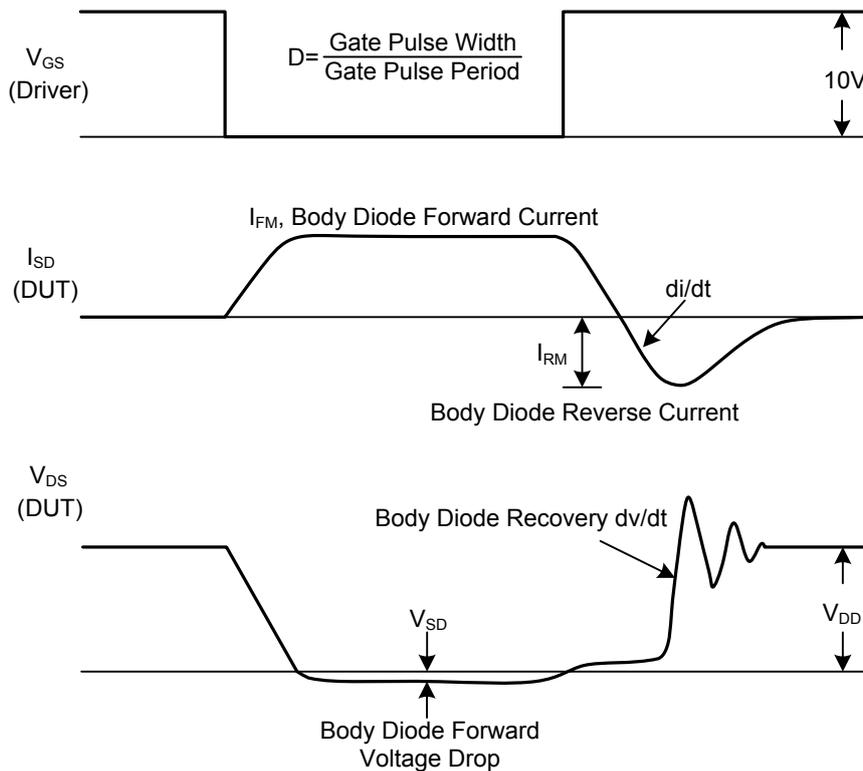
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

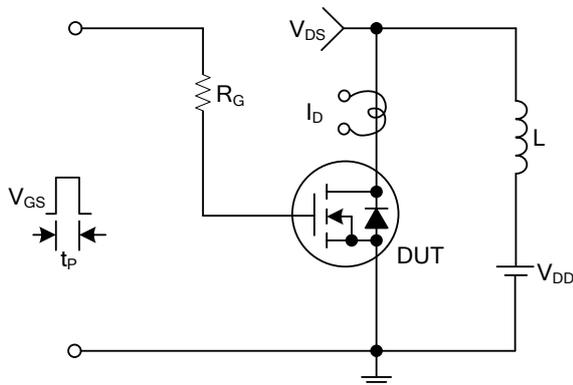
■ TEST CIRCUITS AND WAVEFORMS



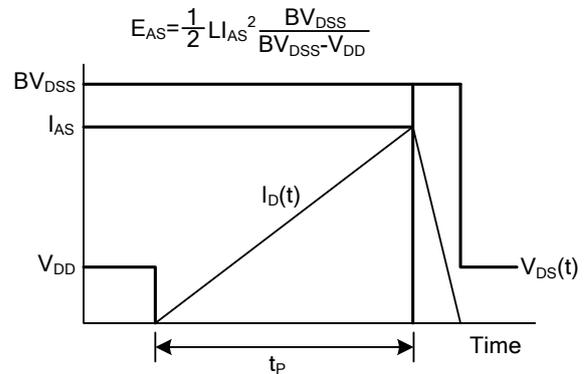
Peak Diode Recovery dv/dt Test Circuit & Waveforms



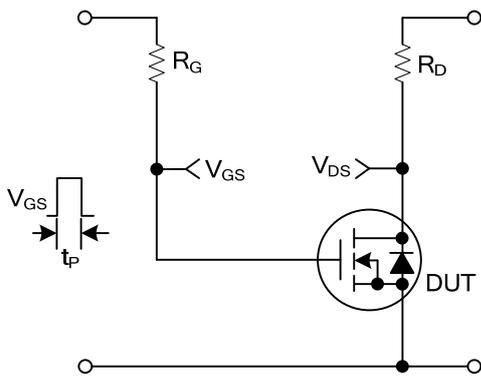
■ TEST CIRCUITS AND WAVEFORMS



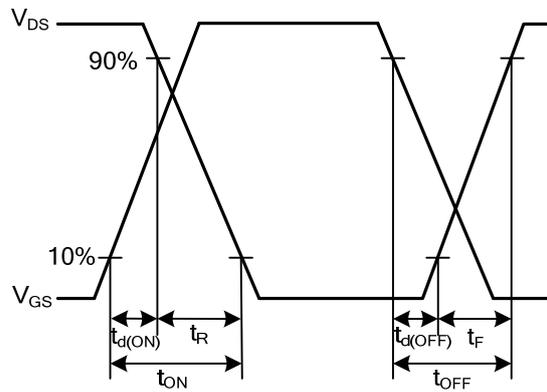
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



Resistive Switching Test Circuit



Resistive Switching Waveforms

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