



UT41N09

Preliminary

Power MOSFET

**41A, 90V N-CHANNEL
POWER MOSFET**

■ DESCRIPTION

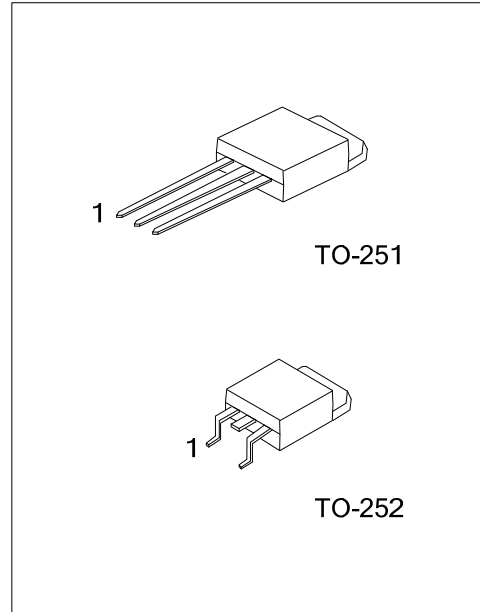
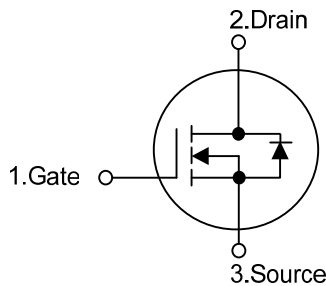
The UTC **UT41N09** is a N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and high switching speed.

The UTC **UT41N09** is suitable for all commercial-industrial applications at power dissipation levels to approximately 50 watts, etc.

■ FEATURES

- * $R_{DS(ON)} \leq 15 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=20.5\text{A}$
- * High Switching Speed

■ SYMBOL



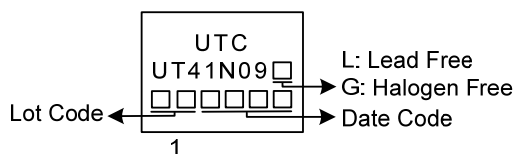
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT41N09L-TM3-T	UT41N09G-TM3-T	TO-251	G	D	S	Tube
UT41N09L-TN3-R	UT41N09G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UT41N09G-TM3-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) TM3: TO-251, TN3: TO-252 (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}	90	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous ($V_{GS}=10V$)	I_D	41	A
	Pulsed (Note 2)	I_{DM}	82	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	31.6	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/ns
Power Dissipation		P_D	48	W
Junction Temperature		T_J	+150	$^{\circ}C$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}C$

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. $L=0.1mH$, $I_{AS}=25.1A$, $V_{DD}=60V$, $R_G=25\Omega$, Starting $T_J=25^{\circ}C$

4. $I_{SD} \leq 30A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}C$

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	110	$^{\circ}C/W$
Junction to Case	θ_{JC}	2.6 (Note)	$^{\circ}C/W$

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

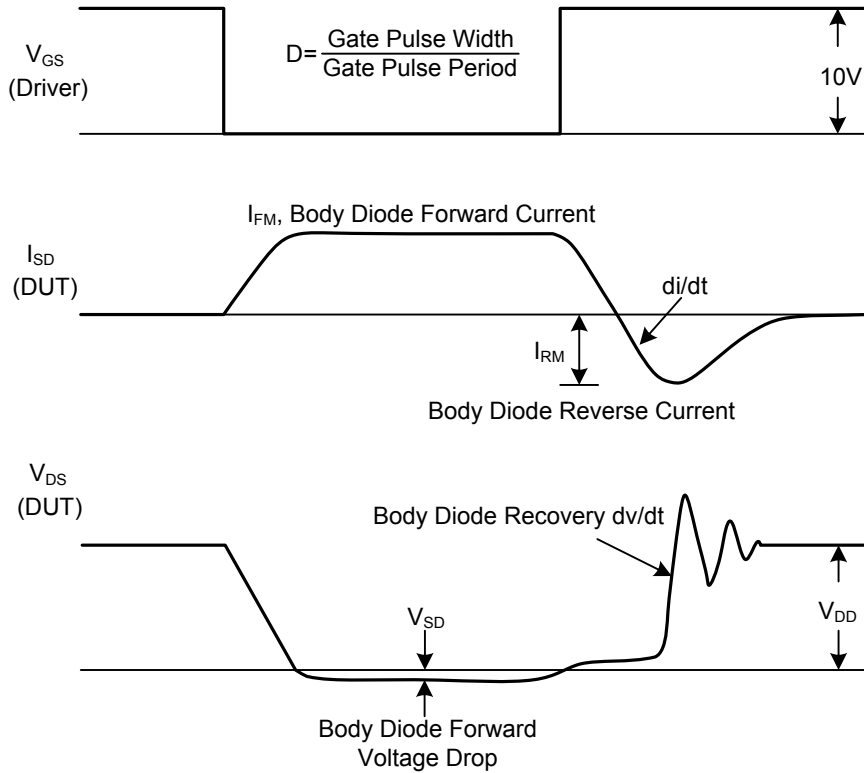
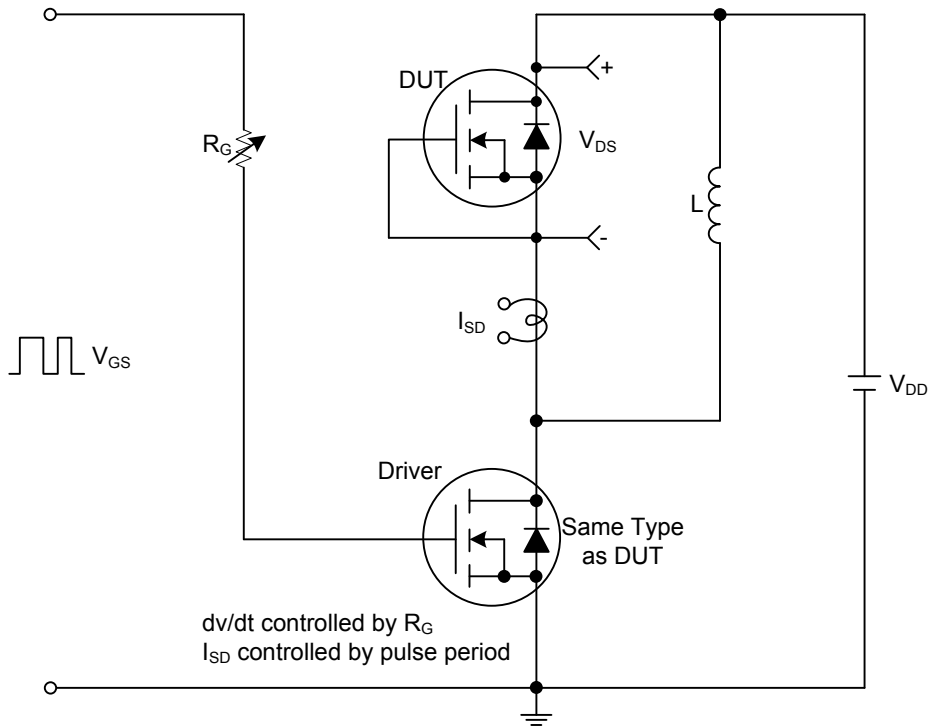
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	90			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =90V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS}			+100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		3.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20.5A			15	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		4624		pF
Output Capacitance	C _{OSS}			317.6		pF
Reverse Transfer Capacitance	C _{RSS}			259.9		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =72V, V _{GS} =10V, I _D =41A I _G =1mA (Note 2)		118.6		nC
Gate to Source Charge	Q _{GS}			39.2		nC
Gate to Drain Charge	Q _{GD}			38		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =45V, V _{GS} =10V, I _D =41A, R _G =6Ω, (Note 2)		26.1		ns
Rise Time	t _R			23.3		ns
Turn-OFF Delay Time	t _{D(OFF)}			89.6		ns
Fall-Time	t _F			28.7		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				41	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				82	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =41A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =30A, V _{GS} =0V, di/dt=100A/μs		72.6		ns
Body Diode Reverse Recovery Charge	Q _{rr}				351.8	

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

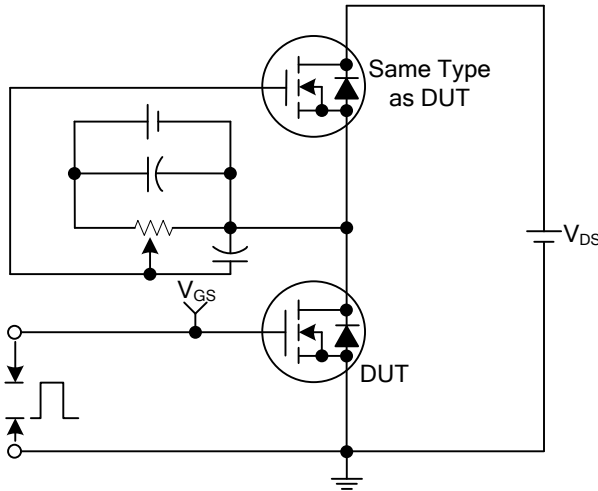
2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

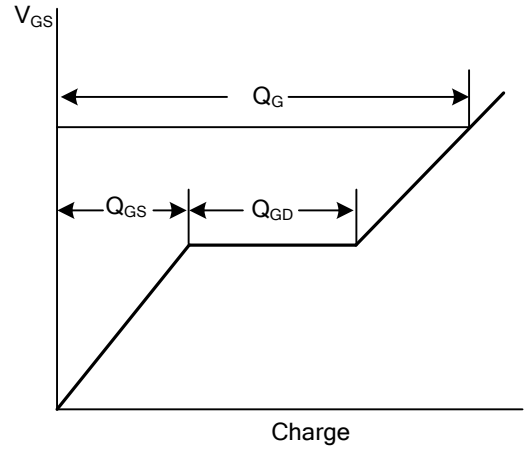


Peak Diode Recovery dv/dt Test Circuit and Waveforms

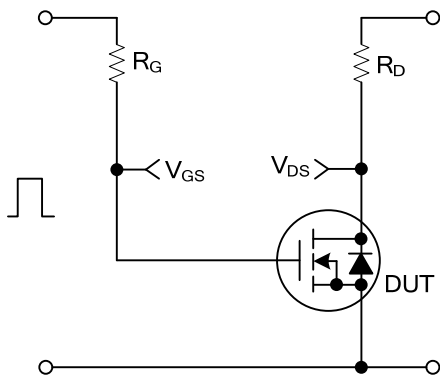
■ TEST CIRCUITS AND WAVEFORMS



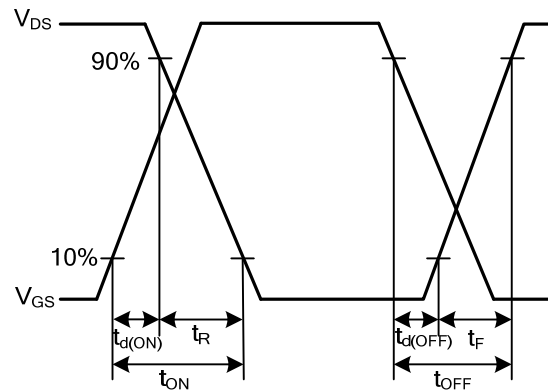
Gate Charge Test Circuit



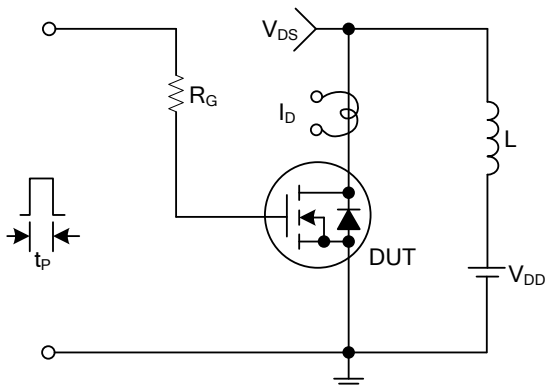
Gate Charge Waveforms



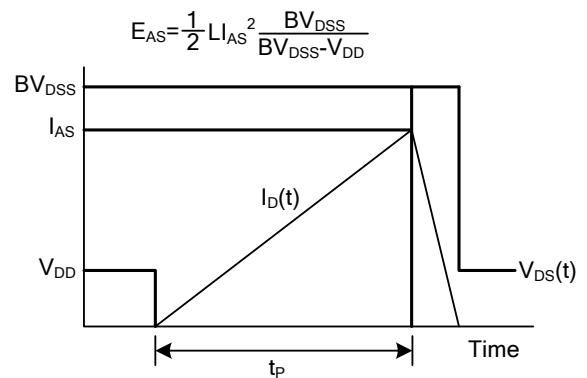
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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