

**UT96N10H**

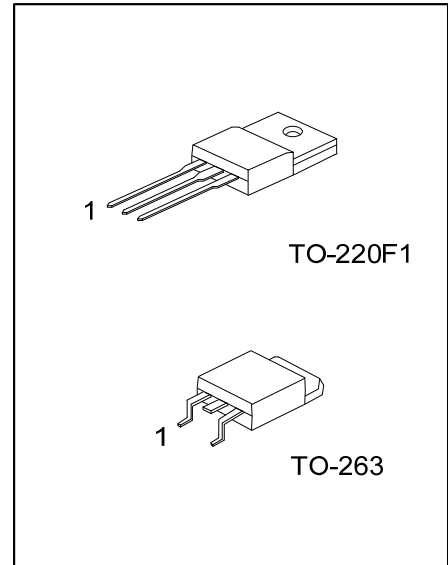
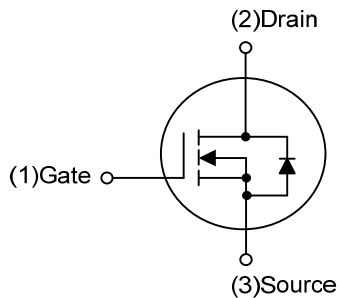
Preliminary

Power MOSFET**96A, 100V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UT96N10H** is a N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

FEATURES

- * $R_{DS(ON)} \leq 9.4 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=60\text{A}$
- * Improved dv/dt capability
- * High Switching Speed
- * Fast switching

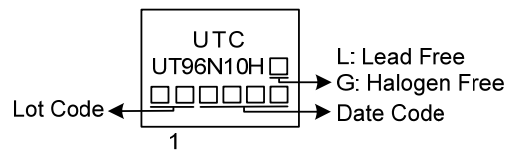
SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT96N10HL-TF1-T	UT96N10HG-TF1-T	TO-220F1	G	D	S	Tube
UT96N10HL-TQ2-T	UT96N10HG-TQ2-T	TO-263	G	D	S	Tube
UT96N10HL-TQ2-R	UT96N10HG-TQ2-R	TO-263	G	D	S	Tape Reel

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

UT96N10HG-TF1-T		(1) Packing Type	(1) T: Tube, R: Tape Reel (2) TF1: TO-220F1, TQ2: TO-263 (3) G: Halogen Free and Lead Free, L: Lead Free
		(2) Package Type	
		(3) Green Package	

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous ($V_{GS}=10\text{V}$)	I_D	96	A
	Pulsed (Note 2)	I_{DM}	192	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	168	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.3	V/ns
Power Dissipation	TO-220F1	P_D	43	W
	TO-263		160	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. $L = 0.1\text{mH}$, $I_{AS} = 58\text{A}$, $V_{DD} = 30\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

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

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220F1	θ_{JC}	2.9	$^{\circ}\text{C}/\text{W}$
	TO-263		0.78	$^{\circ}\text{C}/\text{W}$

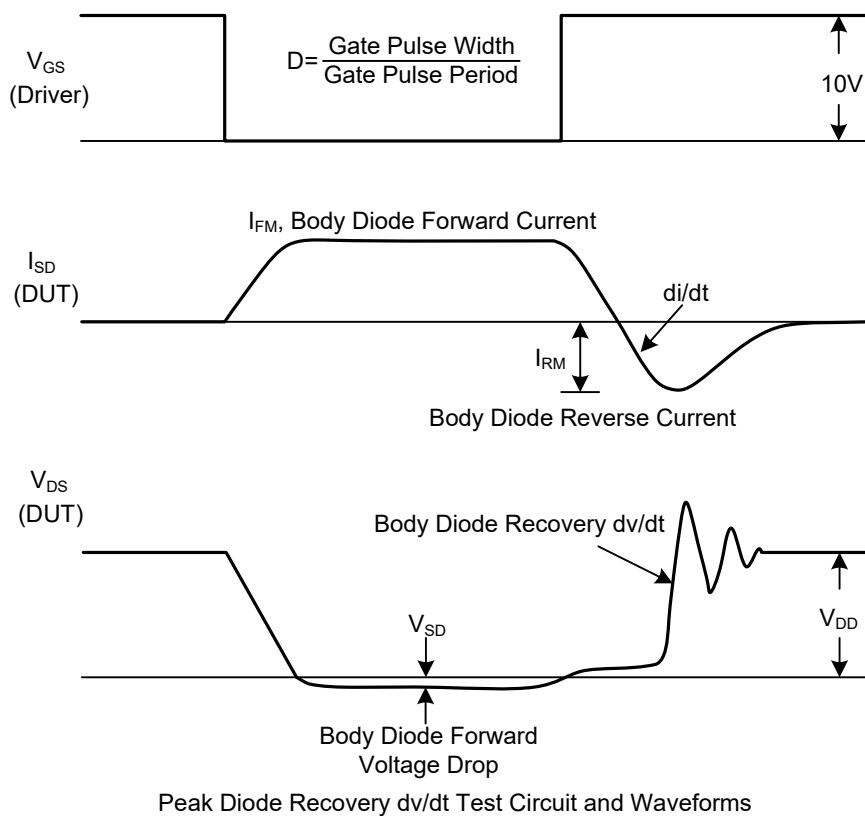
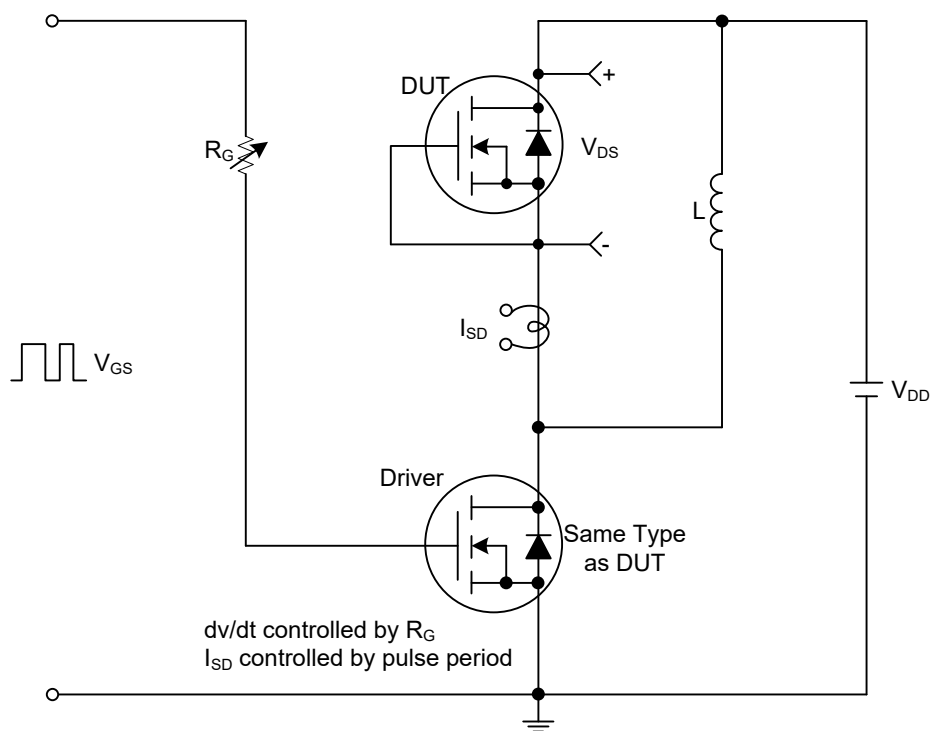
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	100			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =60A			9.4	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		12.8		nF
Output Capacitance		C _{OSS}			636		pF
Reverse Transfer Capacitance		C _{RSS}			369		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =80V, V _{GS} =10V, I _D =96A (Note 1, 2)		239		nC
Gate to Source Charge		Q _{GS}			42		nC
Gate to Drain Charge		Q _{GD}			84		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =50V, V _{GS} =10V, I _D =96A, R _G =3Ω (Note 1, 2)		37		ns
Rise Time		t _R			22		ns
Turn-OFF Delay Time		t _{D(OFF)}			93		ns
Fall-Time		t _F			41		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				96	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				192	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =96A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time		t _{rr}	I _F =30A, V _{GS} =0V, di/dt=100A/μs		98		ns
Body Diode Reverse Recovery Charge		Q _{rr}			120		nC

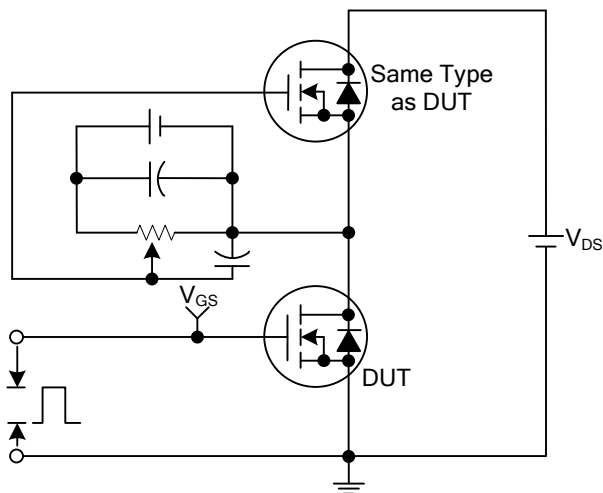
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

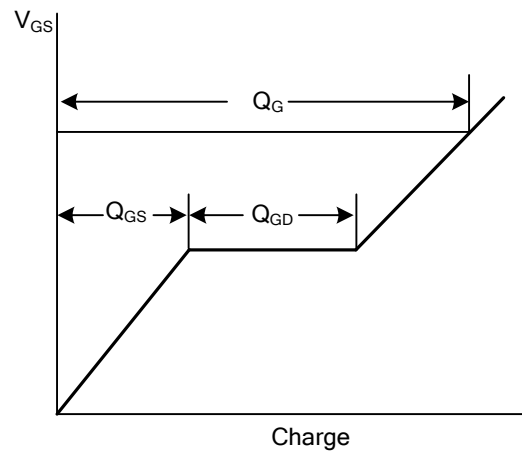
■ TEST CIRCUITS AND WAVEFORMS



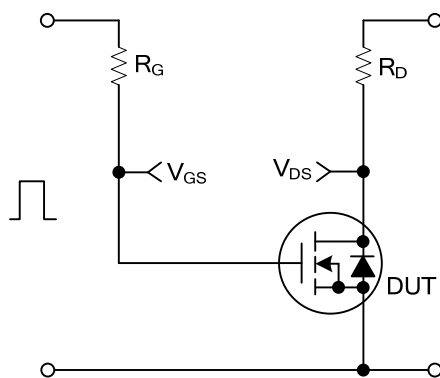
■ TEST CIRCUITS AND WAVEFORMS



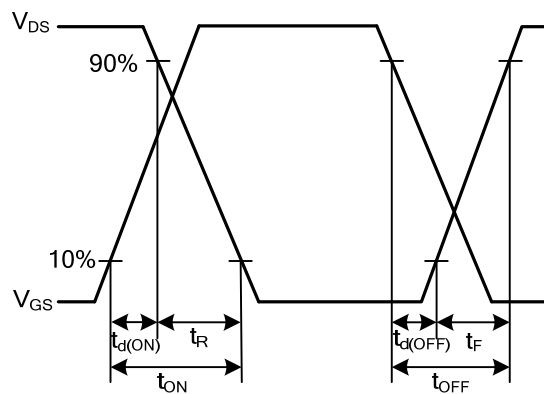
Gate Charge Test Circuit



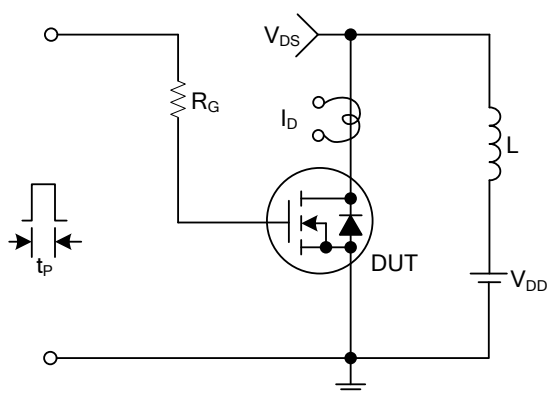
Gate Charge Waveforms



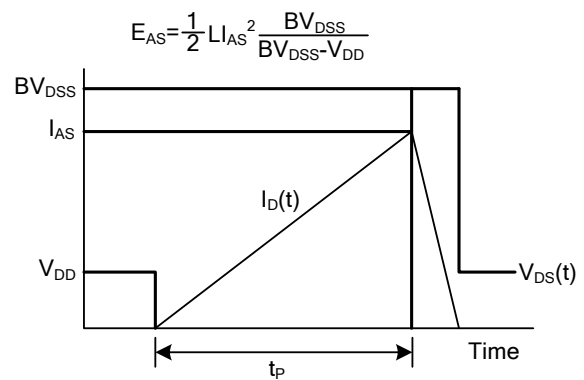
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.