

**9N100**

Preliminary

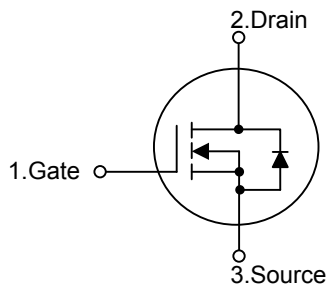
Power MOSFET**9A, 1000V N-CHANNEL
POWER MOSFET**■ **DESCRIPTION**

The UTC **9N100** is an N-channel mode power MOSFET using UTC's advanced technology to provide costumers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **9N100** is generally applied in high efficiency switch mode power supplies.

■ **FEATURES**

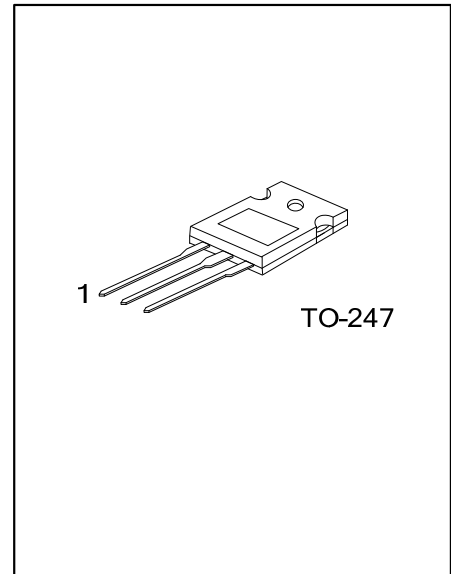
- * $R_{DS(ON)}=1.7\Omega$ @ $V_{GS}=10V$
- * Fast Switching Speed
- * 100% Avalanche Tested
- * Improved dv/dt Capability

■ **SYMBOL**■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
9N100L-T47-T	9N100G-T47-T	TO-247	G	D	S	Tube

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

9N100L-T47-T (1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube (2) T47: TO-247 (3) G: Halogen Free, L: Lead Free
--	--



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Drain to Source Voltage	V_{DSS}	1000	V
Gate to Source Voltage	V_{GSS}	± 30	V
Continuous Drain Current ($T_C=25^\circ\text{C}$)	I_D	9	A
Pulsed Drain Current (Note 1)	I_{DM}	36	A
Avalanche Current (Note 1)	I_{AR}	9	A
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	850	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.0	V/ns
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	160	W
Linear Derating Factor above $T_C=25^\circ\text{C}$		1.28	W/ $^\circ\text{C}$
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~+150	$^\circ\text{C}$

Note: 1. Repetitive Rating : Pulse width limited by maximum junction temperature

2. $L=27\text{mH}$, $I_{AS}=9\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

3. $I_{SD}\leq 9\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J=25^\circ\text{C}$

4. 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 DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	50	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	0.78	$^\circ\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	1000			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu\text{A}$, Referenced to 25°C		1.4		$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=1000\text{V}$, $V_{GS}=0\text{V}$			10	μA
		$V_{DS}=800\text{V}$, $T_C=125^\circ\text{C}$			100	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 30\text{V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	3.0		5.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=4\text{A}$		1200	1700	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$		2475	3220	pF
Output Capacitance	C_{OSS}			195	255	pF
Reverse Transfer Capacitance	C_{RSS}			16	24	pF

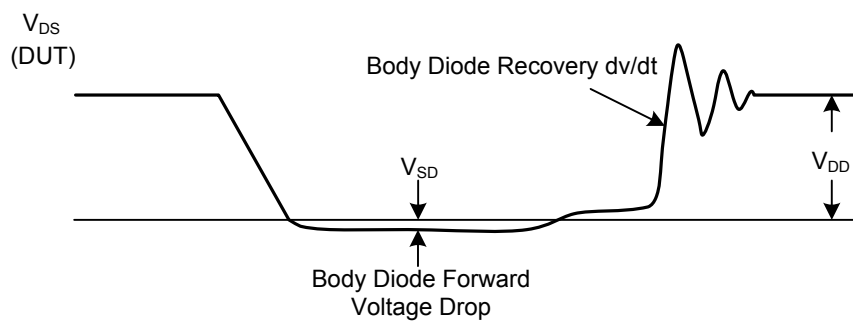
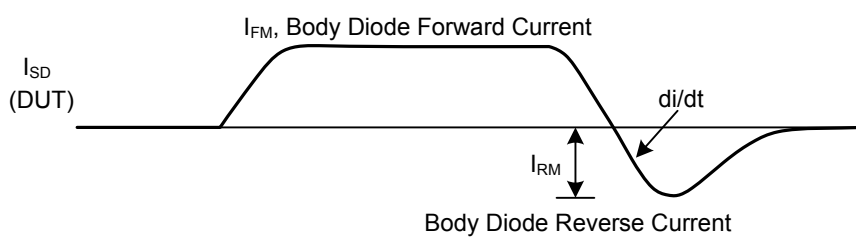
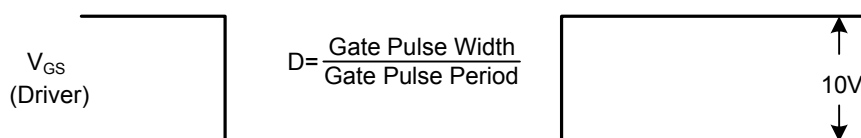
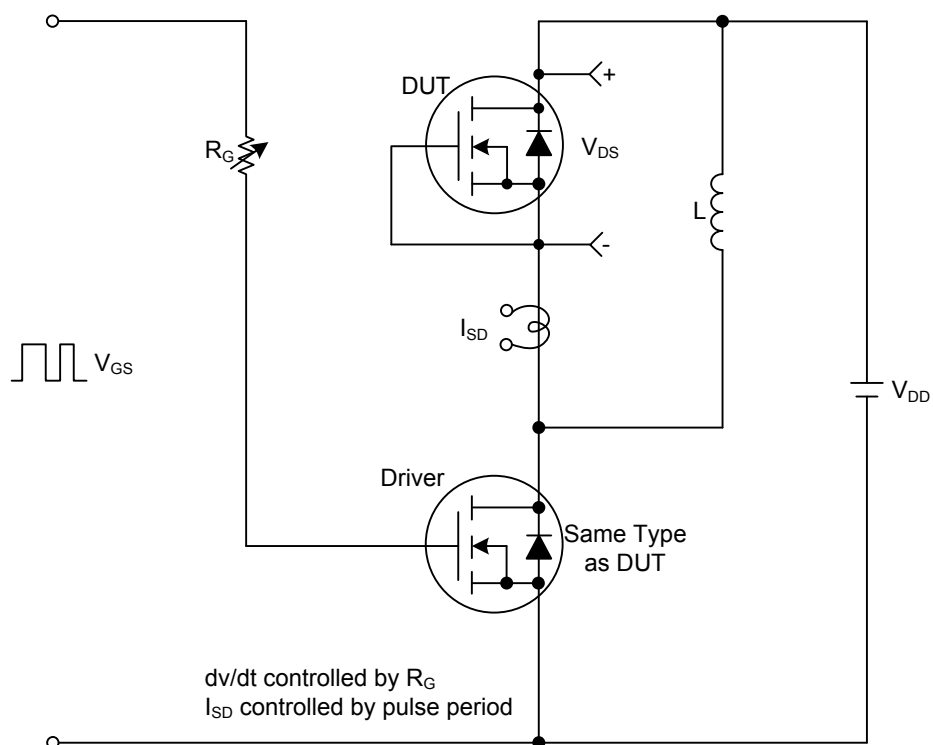
■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SWITCHING PARAMETERS (Note 1, Note 2)						
Total Gate Charge	Q _G	V _{DS} =800V, V _{GS} =10V, I _D =8A		53	70	nC
Gate-Source Charge	Q _{GS}			13		nC
Gate-Drain Charge	Q _{GD}			23		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =500V, I _D =8A, R _G =25Ω		50	110	ns
Turn-ON Rise Time	t _R			95	200	ns
Turn-OFF Delay Time	t _{D(OFF)}			122	254	ns
Turn-OFF Fall Time	t _F			80	170	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				9	A
Maximum Body-Diode Pulsed Current	I _{SM}				36	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =9A, V _{GS} =0V			1.4	V

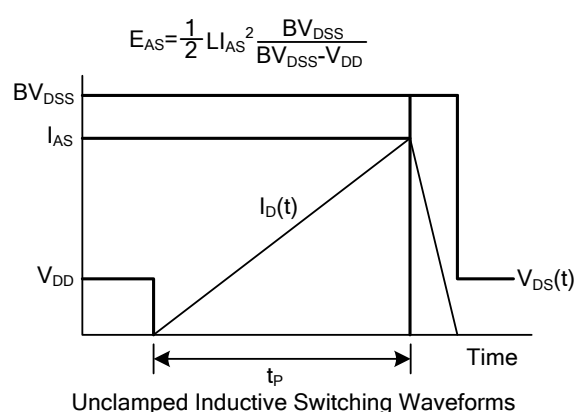
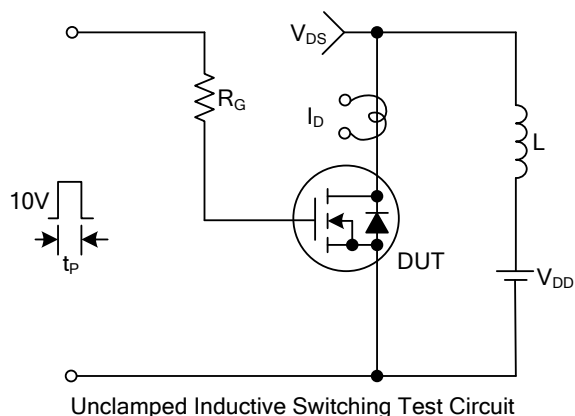
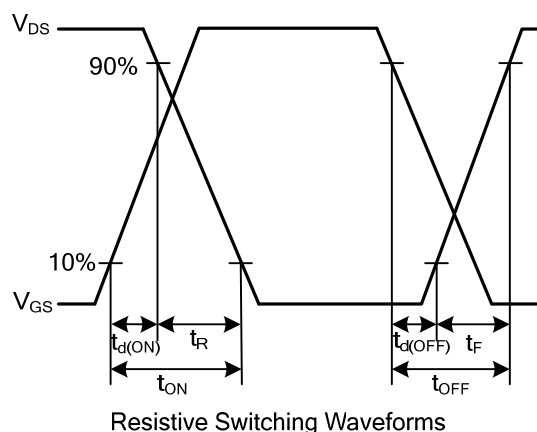
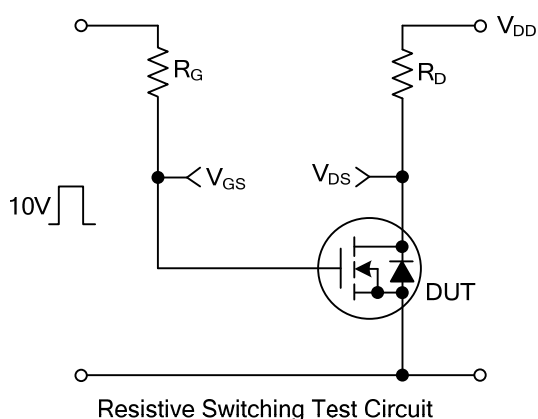
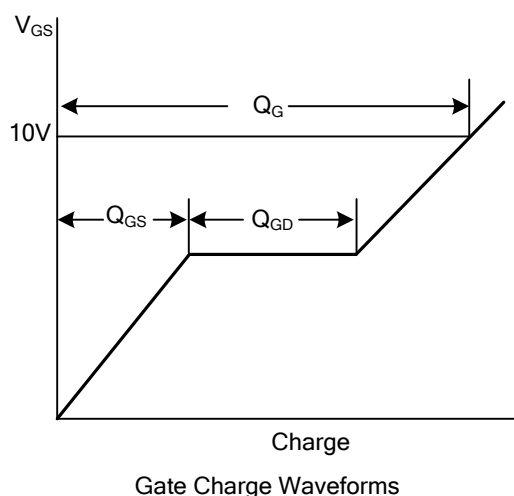
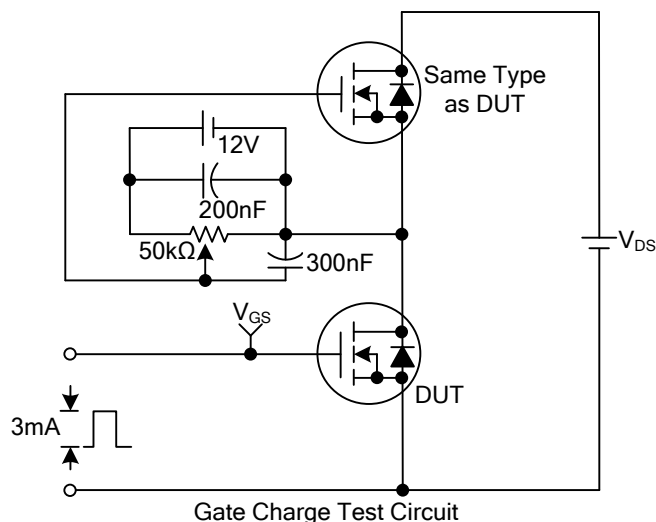
Note: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

Peak Diode Recovery dv/dt Test Circuit & Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)



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. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.