



9A, 1000V N-CHANNEL POWER MOSFET

DESCRIPTION

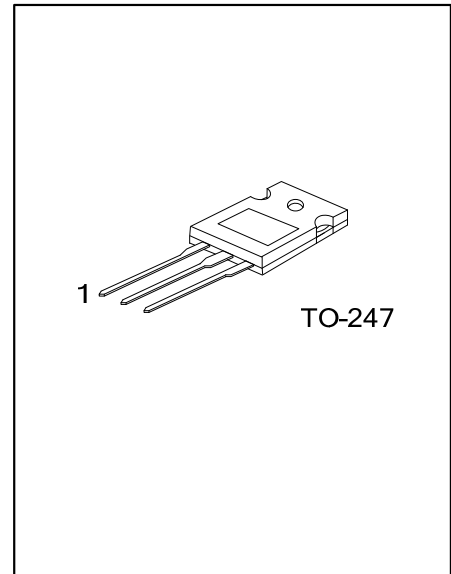
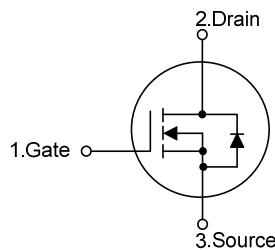
The UTC **9N100** is an N-channel mode power MOSFET using UTC's advanced technology to provide costumers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation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



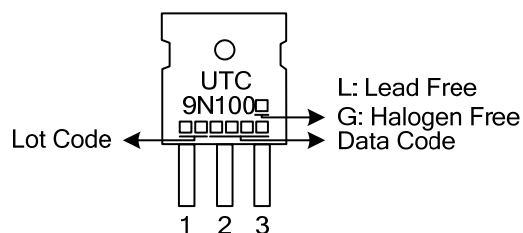
ORDERING INFORMATION

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

MARKING INFORMATION



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}	600	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. $L=14.75\text{mH}$, $I_{AS}=9\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, 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	$^\circ\text{C}/\text{W}$

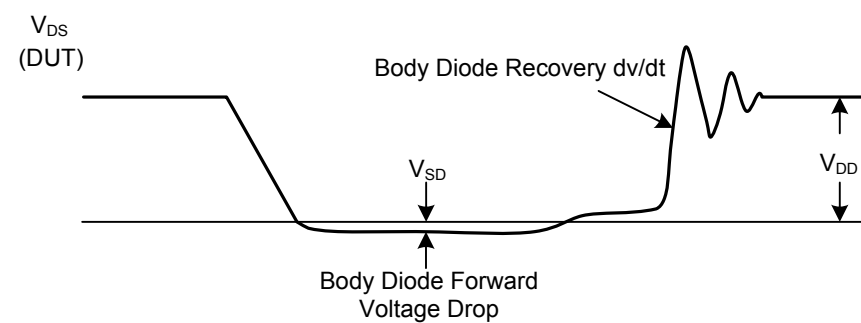
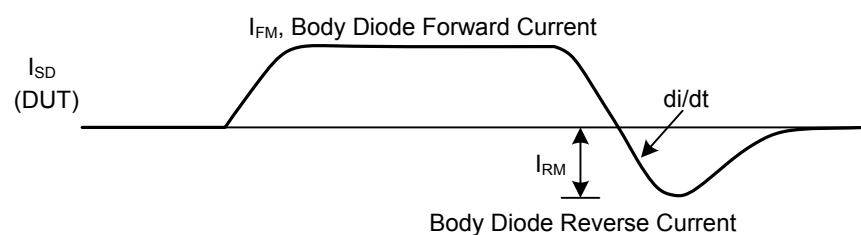
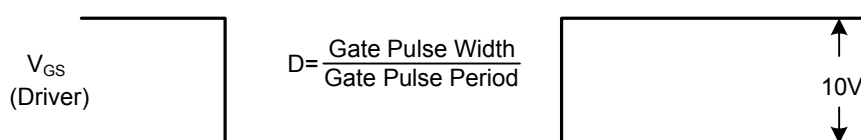
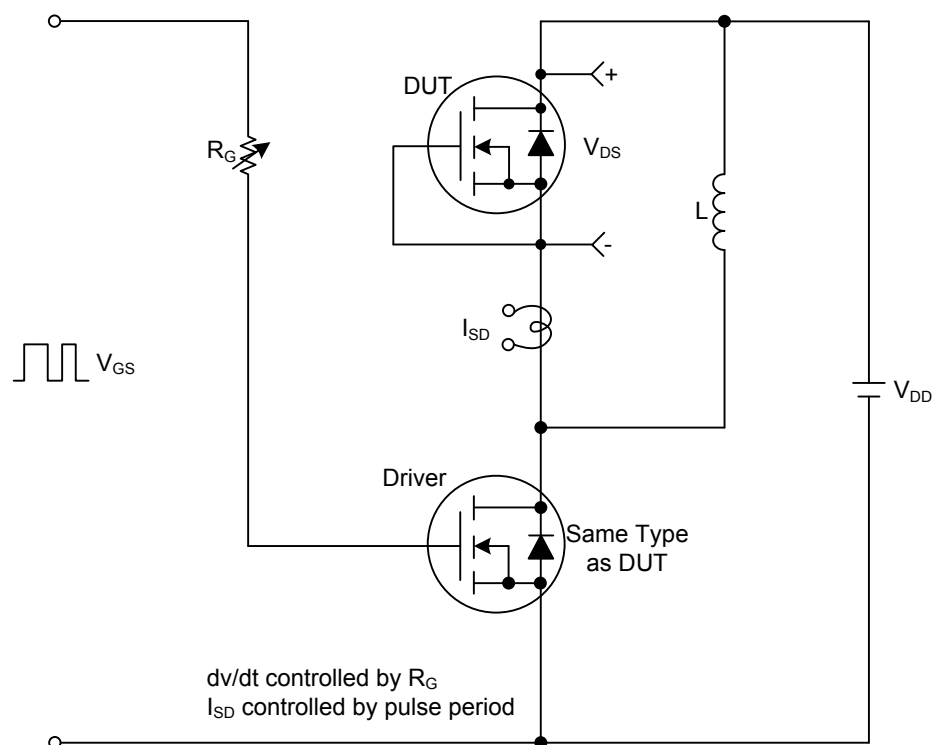
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	1000			V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C		1.4		V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =1000V, V _{GS} =0V			10	μA
		V _{DS} =800V, T _C =125°C			100	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V ,V _{GS} =±30V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	3.0		5.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =4.5A		1500	1700	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		960	3220	pF
Output Capacitance	C _{OSS}			160	255	pF
Reverse Transfer Capacitance	C _{RSS}			20	24	pF
SWITCHING PARAMETERS (Note 1, Note 2)						
Total Gate Charge	Q _G	V _{DS} =120V, V _{GS} =10V, I _D =9A		225	260	nC
Gate-Source Charge	Q _{GS}			22		nC
Gate-Drain Charge	Q _{GD}			58		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =30V, I _D =1A, R _G =25Ω		100	110	ns
Turn-ON Rise Time	t _R			170	200	ns
Turn-OFF Delay Time	t _{D(OFF)}			350	400	ns
Turn-OFF Fall Time	t _F			175	190	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

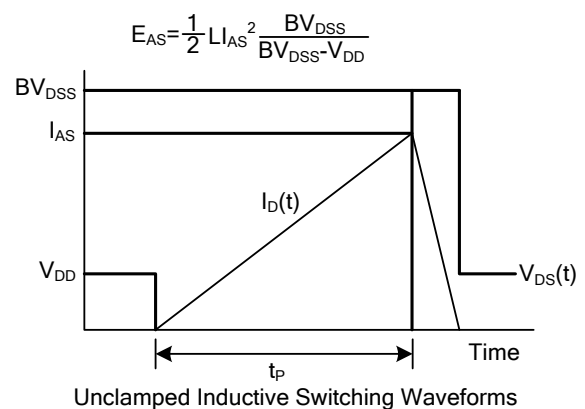
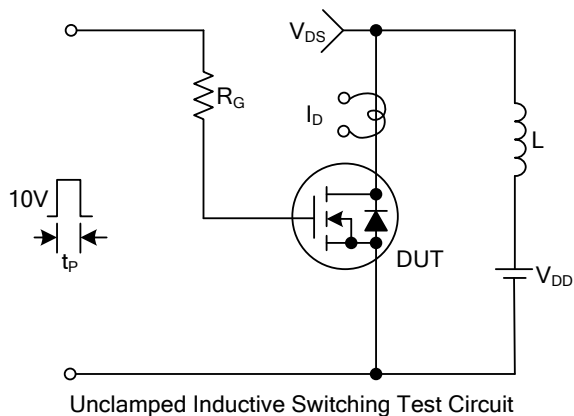
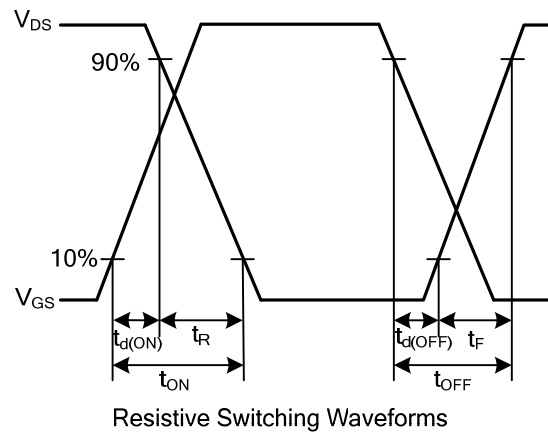
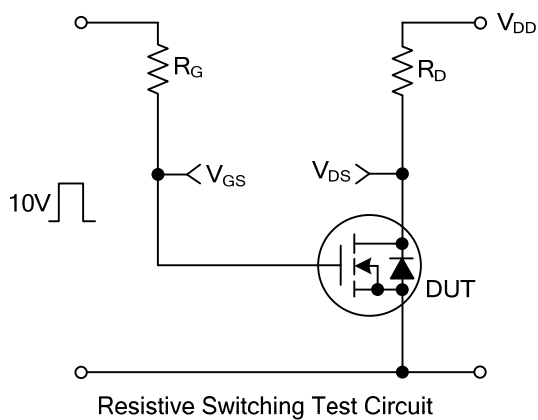
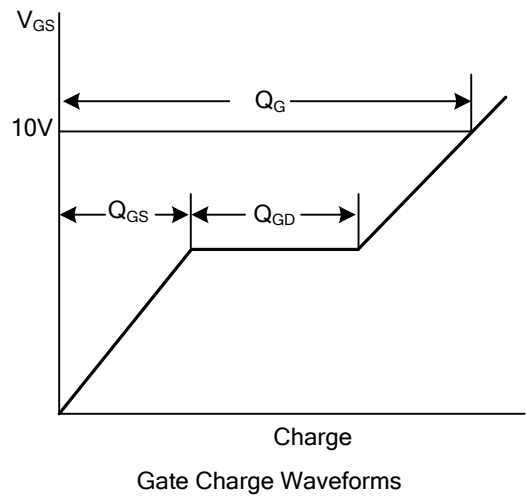
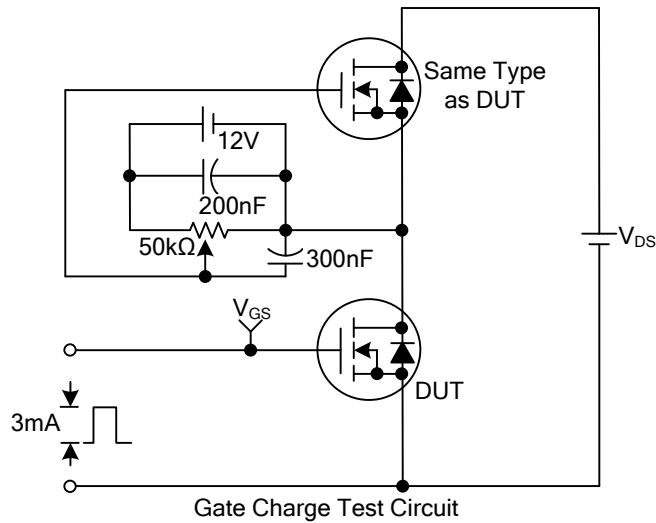
Note: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

Peak Diode Recovery dv/dt Test Circuit & Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)



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