



1N80

Preliminary

Power MOSFET

1A, 800V N-CHANNEL POWER MOSFET

DESCRIPTION

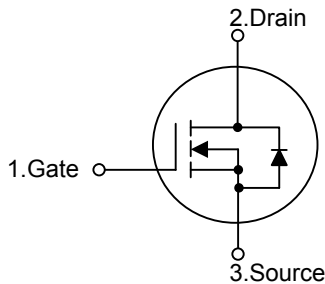
The UTC **1N80** is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology specializes in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **1N80** is universally applied in high efficiency switch mode power supply.

FEATURES

- * $R_{DS(on)}=13.5\Omega @V_{GS}=10V$
- * High switching speed
- * Improved dv/dt capability
- * 100% avalanche tested

SYMBOL

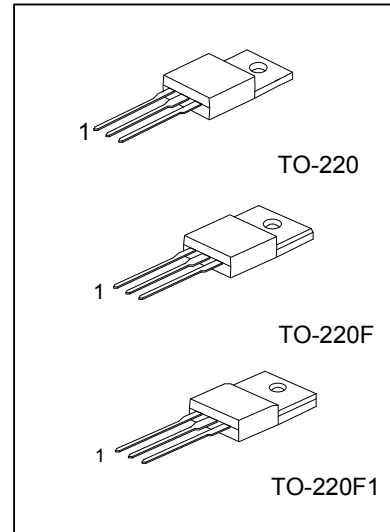


ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
1N80L-TA3-T	1N80G-TA3-T	TO-220	G	D	S	Tube
1N80L-TF3-T	1N80G-TF3-T	TO-220F	G	D	S	Tube
1N80L-TF1-T	1N80G-TF1-T	TO-220F1	G	D	S	Tube

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

<p>1N80L - TA3 - T</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) T: Tube (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1 (3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ($T_c=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	800	V
Gate-Source Voltage		V_{GSS}	± 30	V
Avalanche Current (Note 1)		I_{AR}	1.0	A
Drain Current	Continuous	I_D	1.0	A
	Pulsed (Note 1)	I_{DM}	4.0	A
Avalanche Energy	Single Pulsed (Note 2)	E_{AS}	90	mJ
	Repetitive (Note 1)	E_{AR}	4.5	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.0	V/ns
Power Dissipation	TO-220	P_D	39	W
	TO-220F/TO-220F1		23	
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. $L=170\text{mH}$, $I_{AS}=1.0\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

3. $I_{SD}\leq 1.0\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, 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}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	3.13	$^\circ\text{C}/\text{W}$
	TO-220F/TO-220F1		5.35	

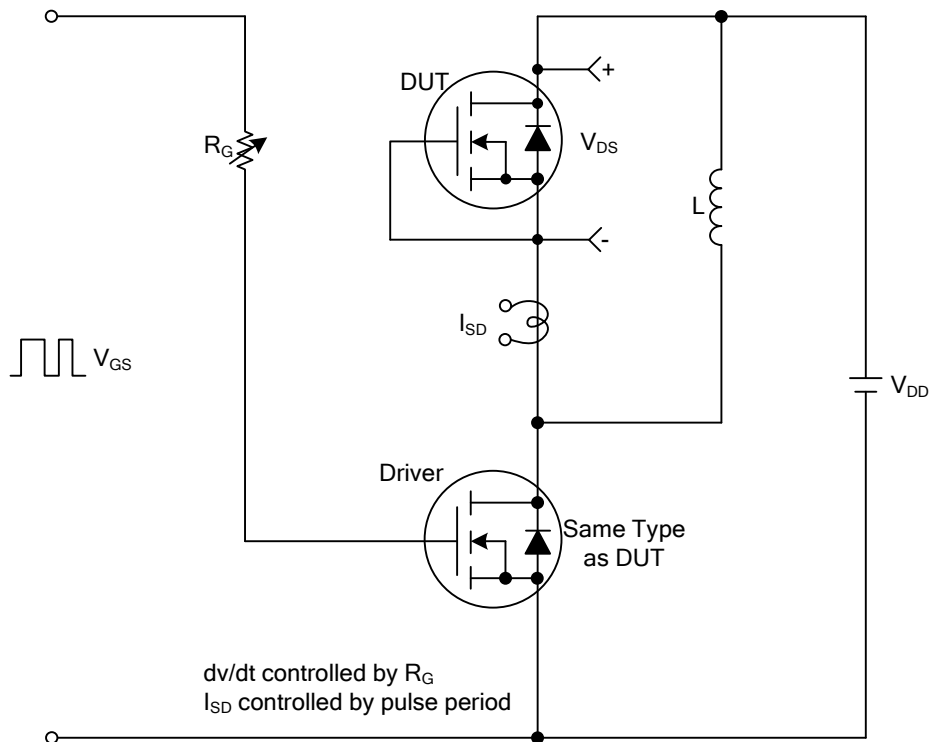
■ ELECTRICAL CHARACTERISTICS (T_c=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	800			V
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C		1.0		V/°C
Drain-Source Leakage Current		I _{DSS}	V _{DS} =800V, V _{GS} =0V			10	μA
			V _{DS} =640V, T _C =125°C			100	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{DS} =0V, V _{GS} =30V			100	nA
	Reverse		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 =0.5A		11	13.5	Ω
Forward Transconductance		g _{FS}	V _{DS} =50V, I _D =0.5A (Note 1)		0.75		S
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		150	195	pF
Output Capacitance		C _{OSS}			20	26	pF
Reverse Transfer Capacitance		C _{RSS}			2.7	3.5	pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =640V, V _{GS} =10V, I _D =1.0A (Note 1,2)		5.5	7.2	nC
Gate-Source Charge		Q _{GS}			1.1		nC
Gate-Drain Charge		Q _{GD}			3.3		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =400V, I _D =1.0A, R _G =25Ω (Note 1,2)		10	30	ns
Turn-ON Rise Time		t _R			25	60	ns
Turn-OFF Delay Time		t _{D(OFF)}			15	40	ns
Turn-OFF Fall Time		t _F			25	60	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				1.0	A
Maximum Body-Diode Pulsed Current		I _{SM}				4.0	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =1.0A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time		t _{RR}	V _{GS} =0V, I _S =1.0A,		300		ns
Body Diode Reverse Recovery Charge		Q _{RR}	di _F /dt=100A/μs (Note 1)		0.6		μC

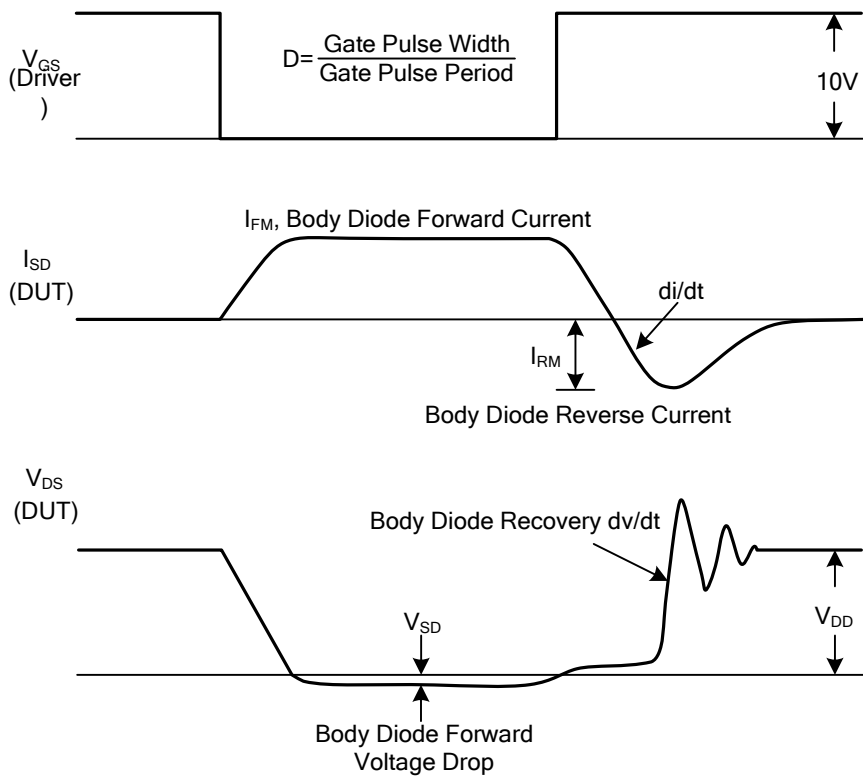
Note: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

2. Essentially independent of operating temperature

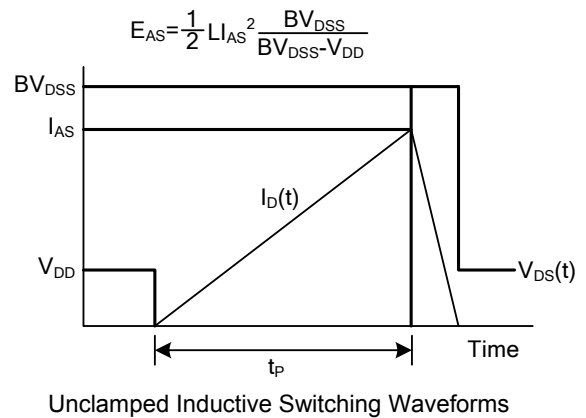
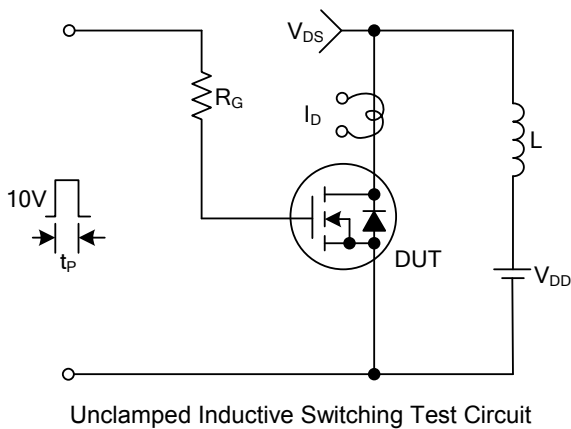
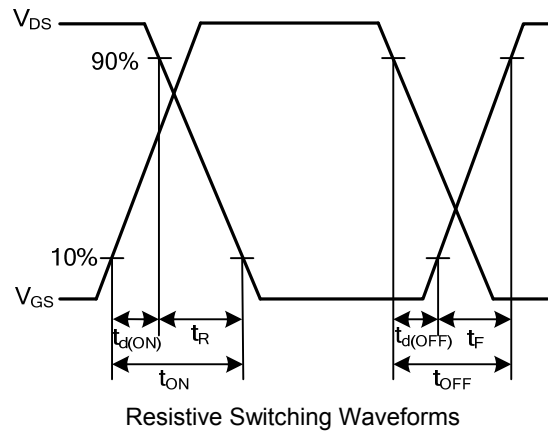
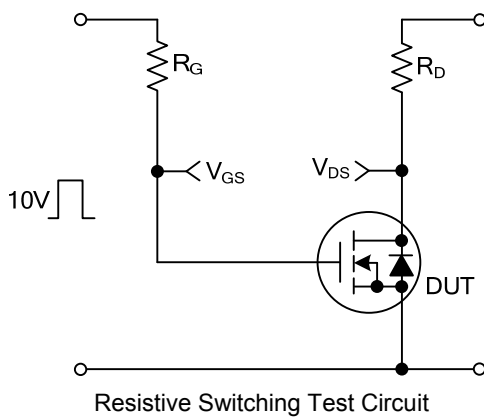
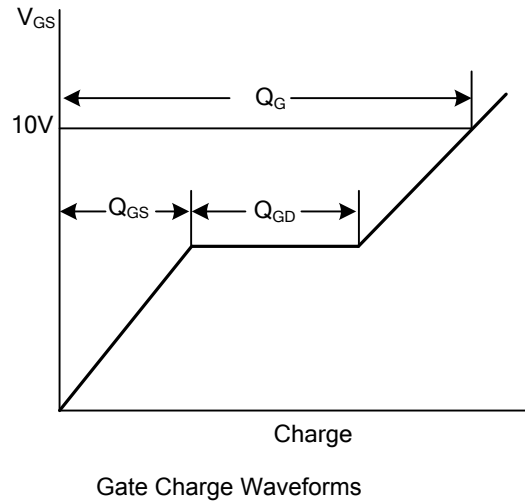
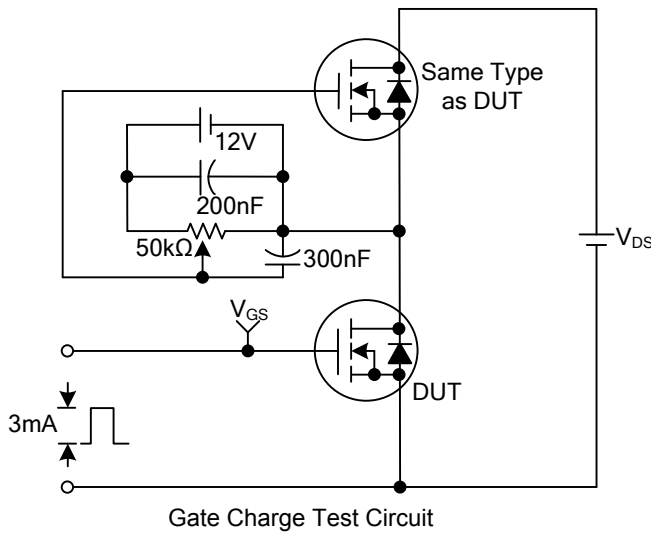
■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit & Waveforms



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



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