



2N80

Power MOSFET

2.4A, 800V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **2N80** is an N-channel mode power MOSFET using UTC's advanced technology to provide costumers planar stripe and DMOS technology. This technology is specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

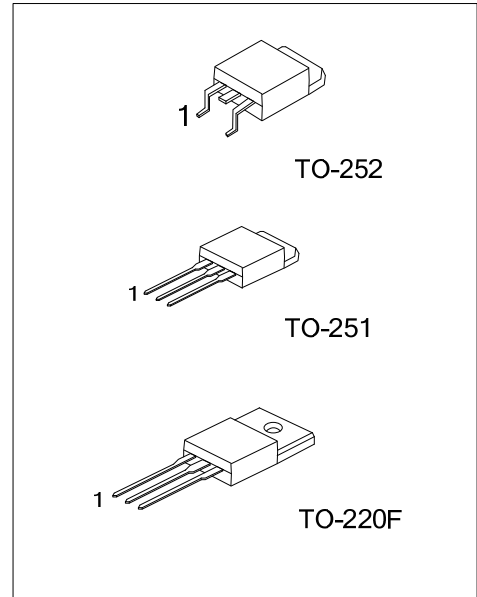
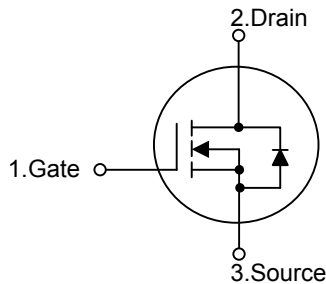
The UTC **2N80** is universally applied in high efficiency switch mode power supply.

FEATURES

* $R_{DS(on)} = 6.3\Omega$ @ $V_{GS} = 10V$

* High switching speed

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2N80L-TF3-T	2N80G-TF3-T	TO-220F	G	D	S	Tube
2N80L-TM3-R	2N80G-TM3-R	TO-251	G	D	S	Tube
2N80L-TN3-R	2N80G-TN3-R	TO-252	G	D	S	Tape Reel
2N80L-TN3-T	2N80G-TN3-T	TO-252	G	D	S	Tube

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

2N80L-TF3-T (1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube, R: Tape Reel (2) TF3: TO-220F, TM3: TO-251, TN3: TO-252 (3) G: Halogen Free, L: Lead Free
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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}	2.4	A
Drain Current	Continuous	I_D	2.4	A
	Pulsed (Note 1)	I_{DM}	9.6	A
Avalanche Energy	Single Pulsed (Note 2)	E_{AS}	180	mJ
	Repetitive (Note 1)	E_{AR}	8.5	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.0	V/ns
Power Dissipation	TO-220F	P_D	24	W
	TO-251/TO-252		43	
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55~+150	$^{\circ}\text{C}$

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

2. $L = 59\text{mH}$, $I_{AS} = 2.4\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^{\circ}\text{C}$

3. $I_{SD} \leq 2.4\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, 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	TO-220F	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-251/TO-252		110	
Junction to Case	TO-220F	θ_{JC}	5.2	$^{\circ}\text{C}/\text{W}$
	TO-251/TO-252		2.85	

■ 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}	I _D =250μA, V _{GS} =0V	800			V
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =250μA		0.9		V/°C
Drain-Source Leakage Current		I _{DSS}	V _{DS} =800V, V _{GS} =0V			10	μA
			V _{DS} =640V, T _C =125°C			100	
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+30V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-30V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	3.0		5.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =1.2A		4.8	6.3	Ω
Forward Transconductance (Note 1)		g _{FS}	V _{DS} =50V, I _D =1.2A		2.65		S
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		425	550	pF
Output Capacitance		C _{OSS}			45	60	pF
Reverse Transfer Capacitance		C _{RSS}			5.5	7.0	pF

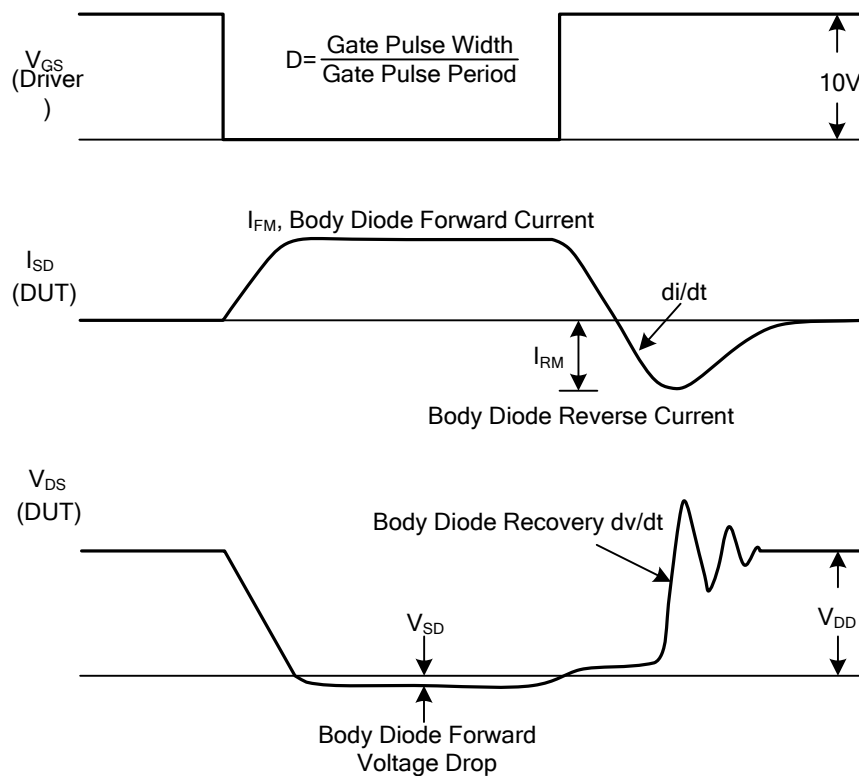
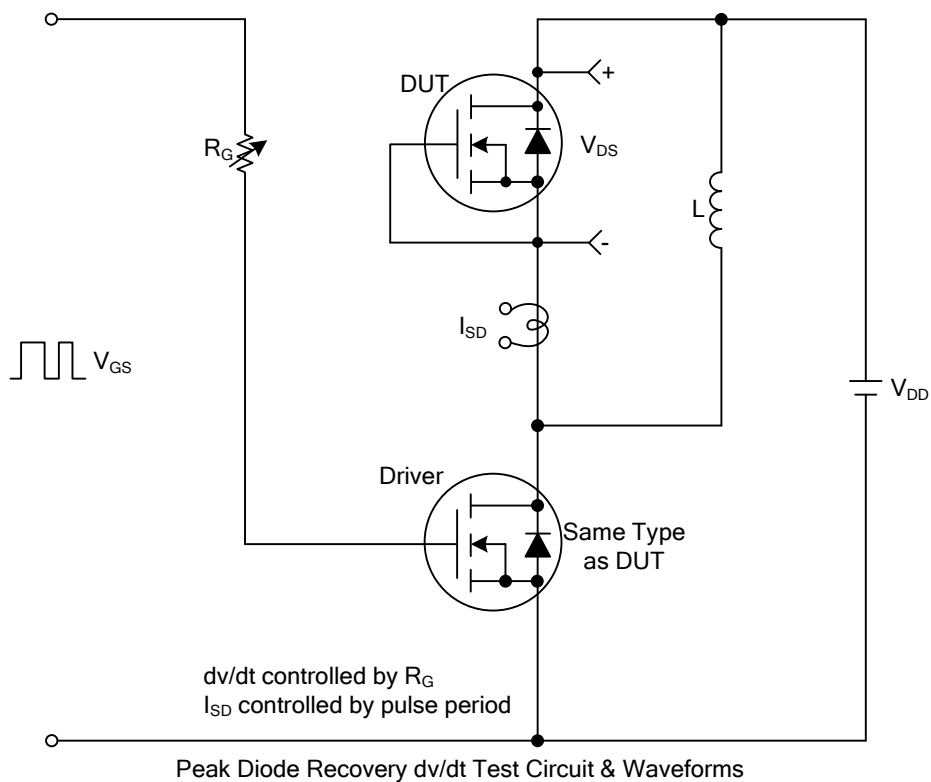
■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{GS}=10V, V_{DS}=640V,$ $I_D=2.4A$ (Note 1,2)		12	15	nC
Gate to Source Charge	Q_{GS}			2.6		nC
Gate to Drain Charge	Q_{GD}			6.0		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=400V, I_D=2.4A,$ $R_G=25\Omega$ (Note 1,2)		12	35	ns
Rise Time	t_R			30	70	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			25	60	ns
Fall-Time	t_F			28	65	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				2.4	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				9.6	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=2.4A, V_{GS}=0V$			1.4	V
Reverse Recovery Time (Note 1)	t_{RR}	$I_S=2.4A, V_{GS}=0V,$		480		ns
Reverse Recovery Charge (Note 1)	Q_{RR}	$dI_F/dt=100A/\mu s$		2.0		μC

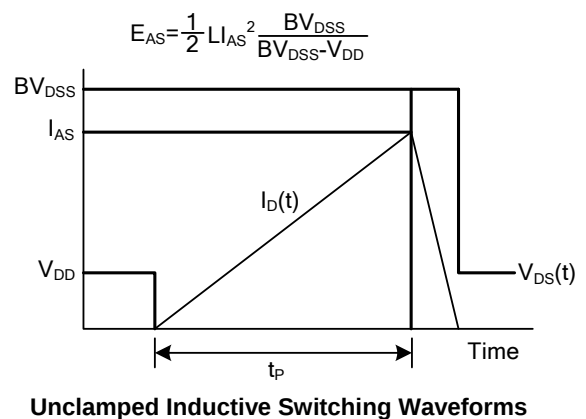
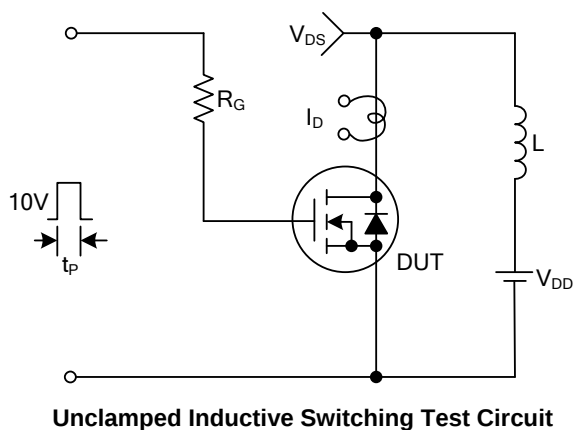
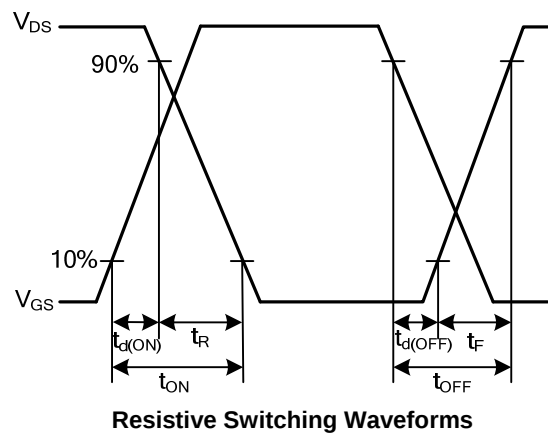
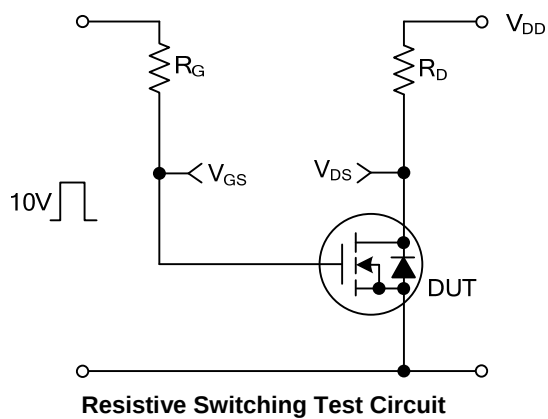
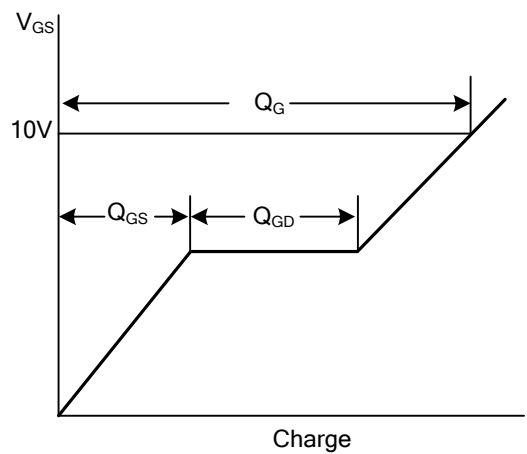
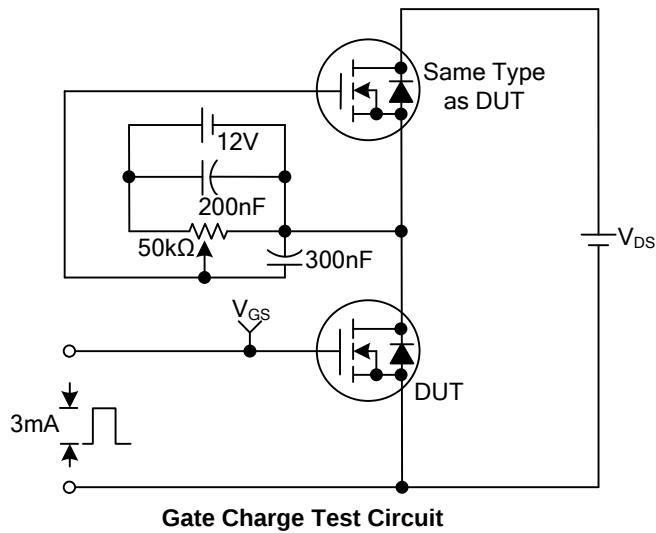
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

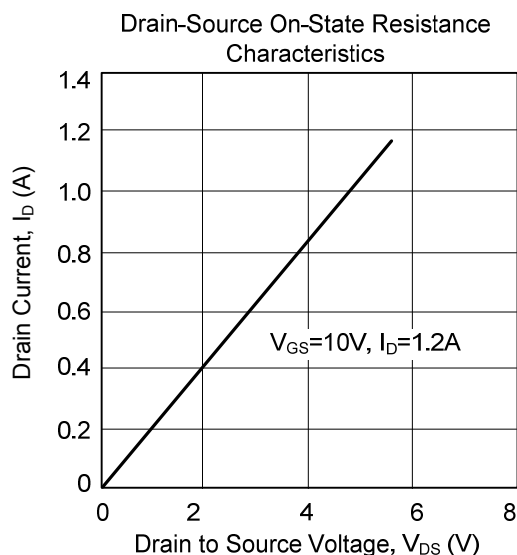
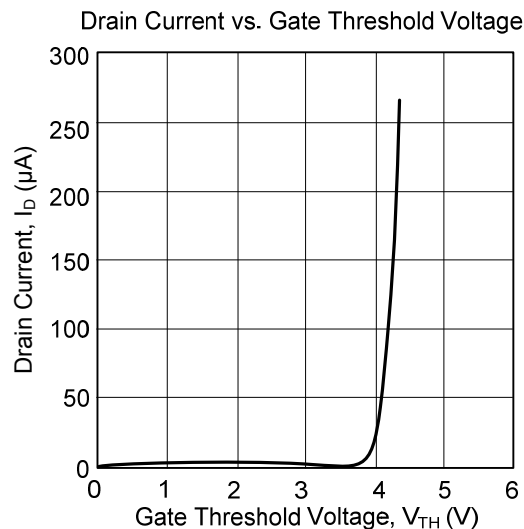
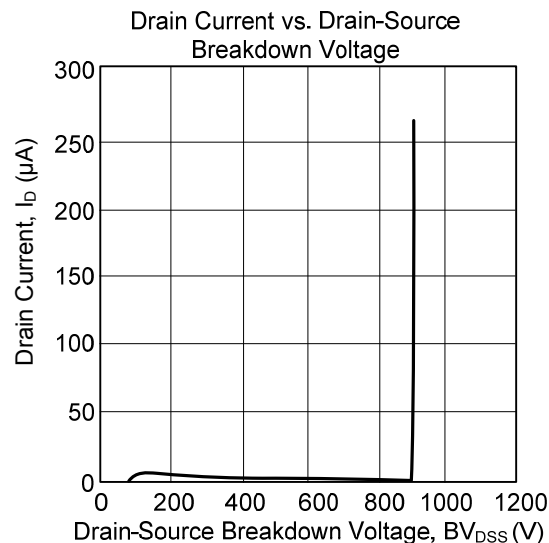
■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



■ TYPICAL CHARACTERISTICS



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