

**6N80**

Preliminary

Power MOSFET**6A, 800V N-CHANNEL
POWER MOSFET**

■ DESCRIPTION

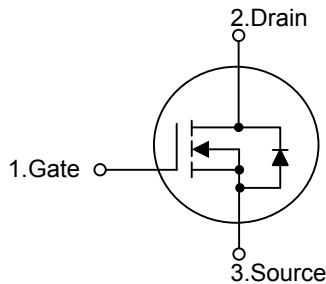
The UTC **6N80** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **6N80** is universally applied in high efficiency switch mode power supply.

■ FEATURES

- * $R_{DS(on)} = 2.0\Omega @ V_{GS} = 10V$
- * Improved dv/dt capability
- * Fast switching
- * 100% avalanche tested

■ SYMBOL

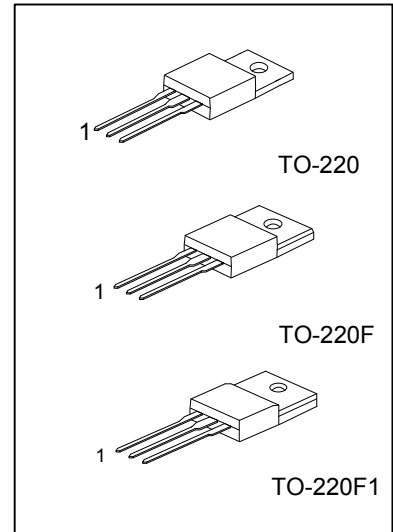


■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
6N80L-TA3-T	6N80G-TA3-T	TO-220	G	D	S	Tube
6N80L-TF3-T	6N80G-TF3-T	TO-220F	G	D	S	Tube
6N80L-TF1-T	6N80G-TF1-T	TO-220F1	G	D	S	Tube

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

6N80L - TA3 - T (1) Packing Type (2) Package Type (3) Lead Free		(1) T: Tube (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1 (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
Drain Current (Note 1)	Continuous	I_D	6	A
	Pulsed	I_{DM}	22	A
Avalanche Energy	Single Pulsed (Note 2)	E_{AS}	680	mJ
	Repetitive (Note 1)	E_{AR}	15.8	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Power Dissipation	TO-220	P_D	138	W
	TO-220F/TO-220F1		51	W
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. $L = 37\text{mH}$, $I_{AS} = 6\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

3. $I_{SD} \leq 5.5\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, 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 CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.9	$^{\circ}\text{C}/\text{W}$
	TO-220F/TO-220F1		2.45	$^{\circ}\text{C}/\text{W}$

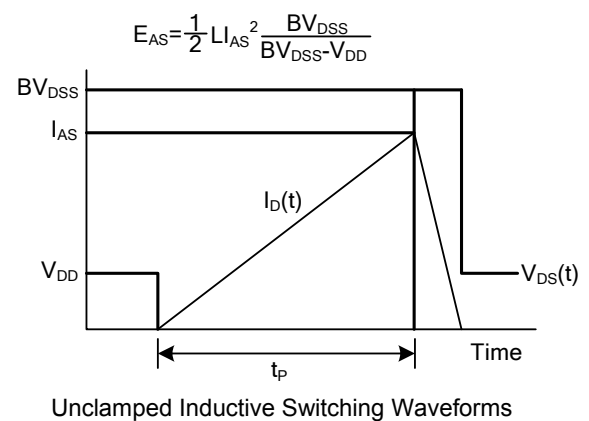
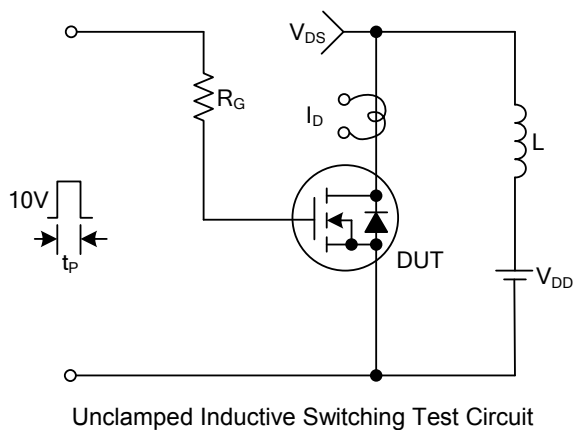
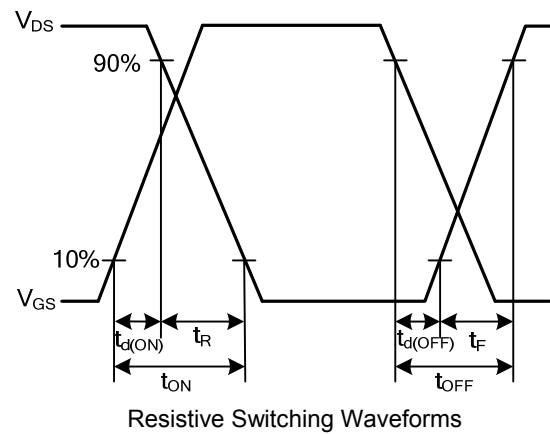
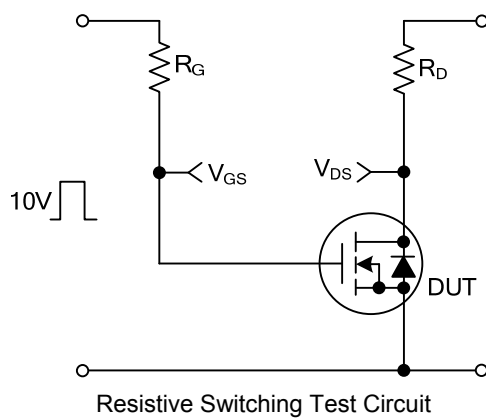
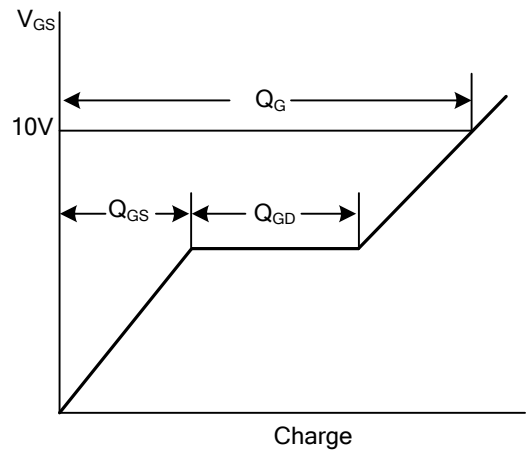
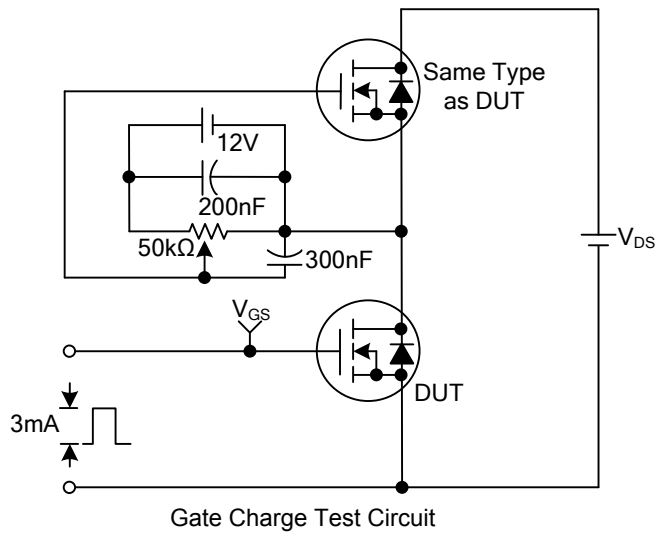
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	800			V
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =250μA		0.97		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 =3A		1.6	2.0	Ω
Forward Transconductance		g _{FS}	V _{DS} =50V, I _D =3A (Note 1)		5.4		S
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		1010	1310	pF
Output Capacitance		C _{OSS}			90	115	pF
Reverse Transfer Capacitance		C _{RSS}			8	11	pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{GS} =10V, V _{DS} =640V, I _D =6A (Note 1, 2)		21	30	nC
Gate to Source Charge		Q _{GS}			6		nC
Gate to Drain Charge		Q _{GD}			9		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =400V, I _D =6A, R _G =25Ω (Note 1, 2)		26	60	ns
Rise Time		t _R			65	140	ns
Turn-OFF Delay Time		t _{D(OFF)}			47	105	ns
Fall-Time		t _F			44	90	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				6	A
Maximum Body-Diode Pulsed Current		I _{SM}				22	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =6A, V _{GS} =0V			1.4	V
Reverse Recovery Time		t _{rr}	I _S =6A, V _{GS} =0V,		615		ns
Reverse Recovery Charge		Q _{RR}	dl _F /dt=100A/μs (Note 1)		5.4		μC

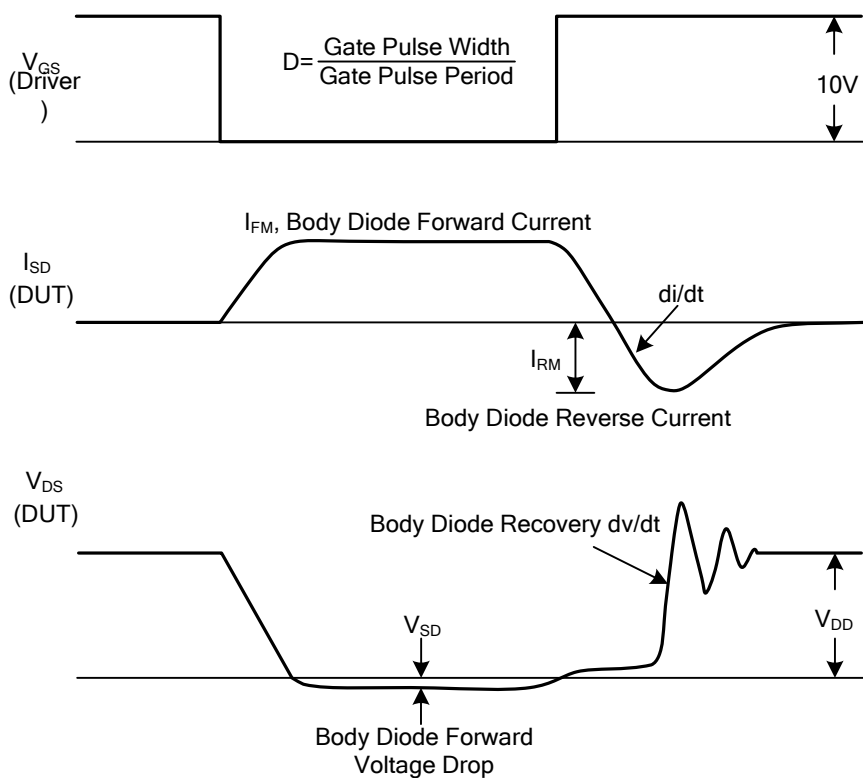
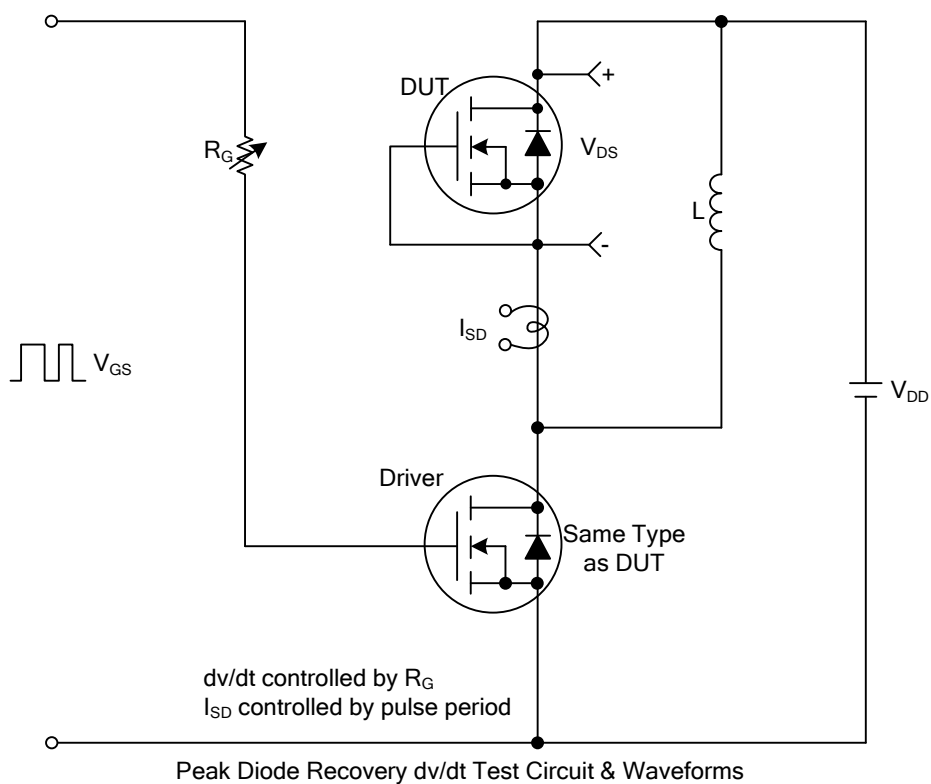
Note: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



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