



6A, 800V N-CHANNEL POWER MOSFET

DESCRIPTION

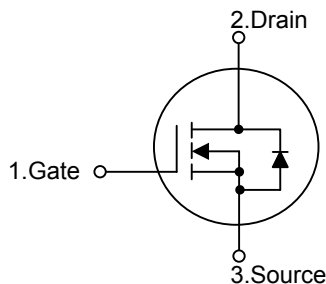
The UTC 6N80 is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche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

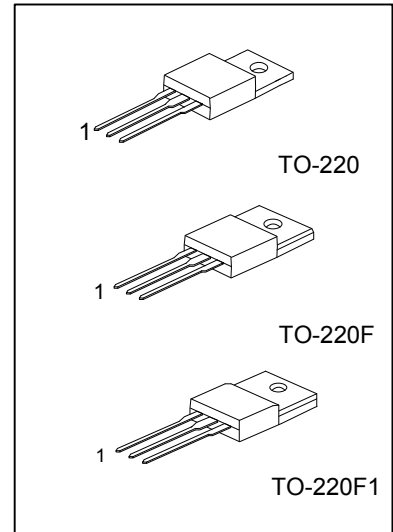


ORDERING INFORMATION

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_{DS}	800	V
Gate-Source Voltage		V_{GS}	± 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	$^{\circ}\text{C}/\text{W}$

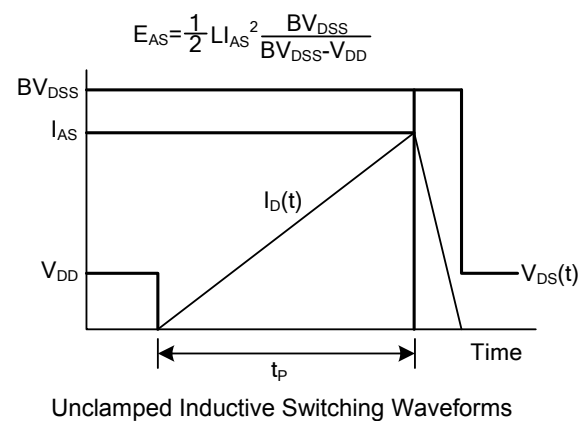
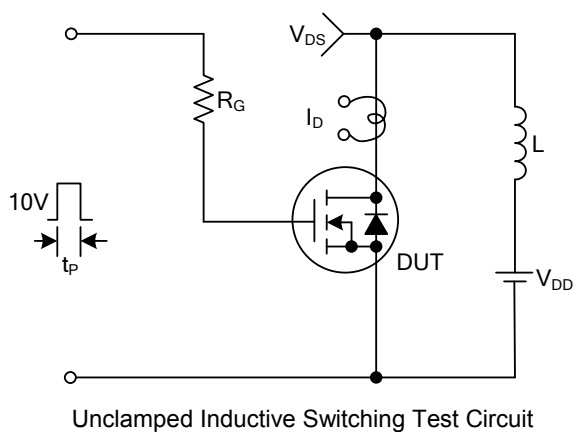
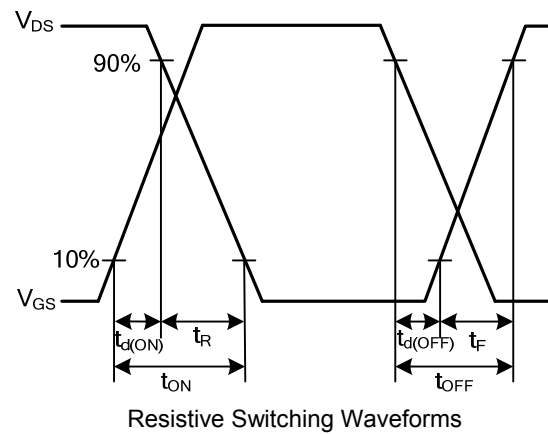
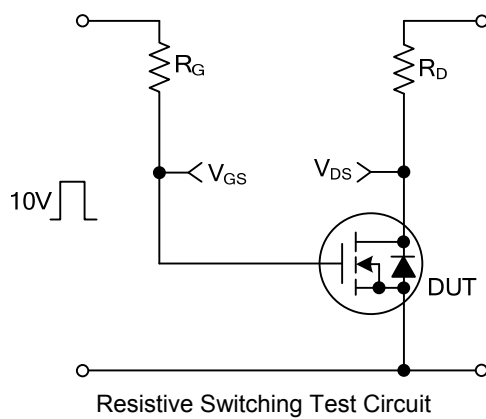
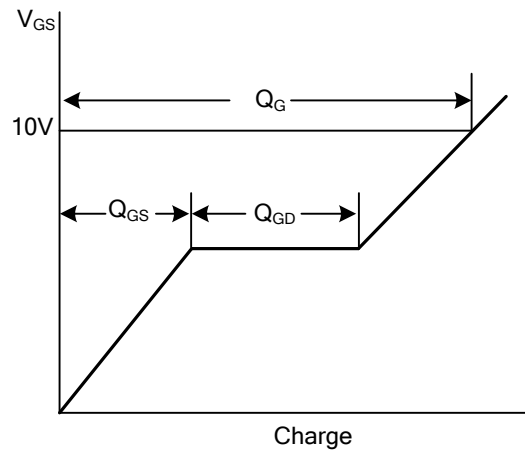
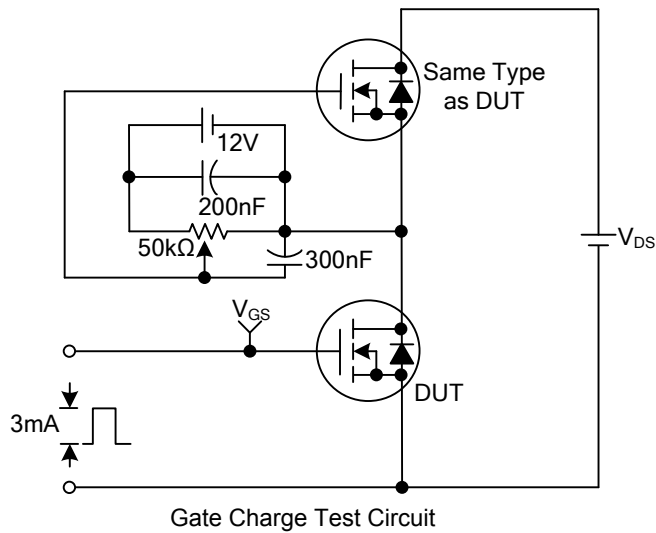
■ **ELECTRICAL CHARACTERISTICS** ($T_C=25^\circ\text{C}$, unless otherwise specified)

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

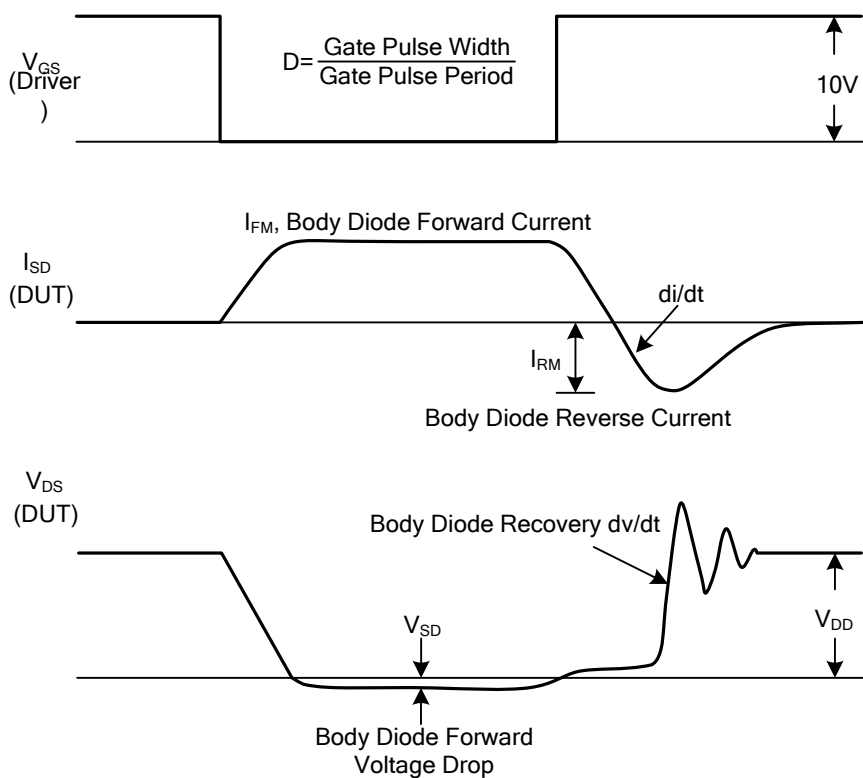
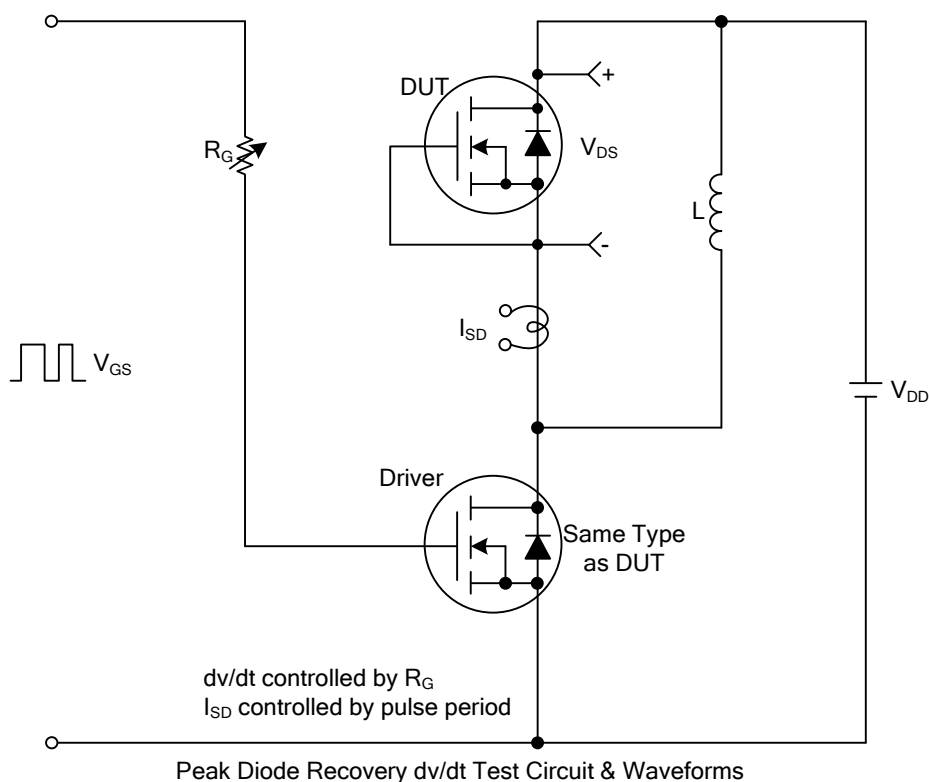
Note: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



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