



## 8N80

Power MOSFET

### 8A, 800V N-CHANNEL POWER MOSFET

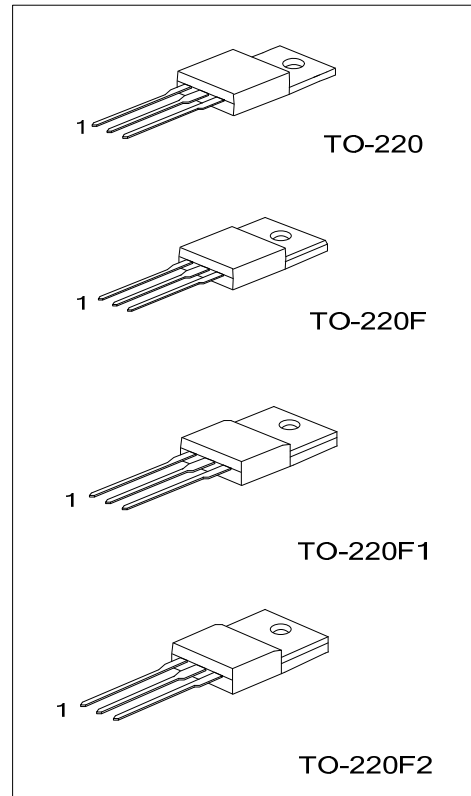
#### DESCRIPTION

The UTC **8N80** is an N-channel mode power MOSFET, it uses UTC's advanced technology to provide costumers planar stripe and DMOS technology. This technology allows a minimum on-state resistance, superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

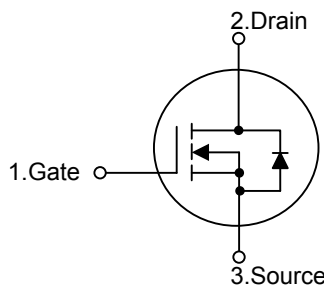
The UTC **8N80** is generally applied in high efficiency switch mode power supplies.

#### FEATURES

- \* Typically 35 nC Low Gate Charge
- \*  $R_{DS(ON)} = 1.45\Omega @V_{GS} = 10V$
- \* Typically 13 pF Low  $C_{RSS}$
- \* Improved dv/dt Capability
- \* Fast Switching Speed
- \* 100% Avalanche Tested
- \* RoHS-Compliant Product



#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
8N80L-TA3-T	8N80G-TA3-T	TO-220	G	D	S	Tube
8N80L-TF3-T	8N80G-TF3-T	TO-220F	G	D	S	Tube
8N80L-TF1-T	8N80G-TF1-T	TO-220F1	G	D	S	Tube
8N80L-TF2-T	8N80G-TF2-T	TO-220F2	G	D	S	Tube

Note: Pin Assignment: G: GND, D: Drain, S: Source

<p>8N80L-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, TF2: TO-220F2 (3) L: Lead Free, G: Halogen 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	$V_{GSS}$	$\pm 30$	V
Drain Current (Continuous) ( $T_C=25^\circ\text{C}$ )	$I_D$	8	A
Drain Current (Pulsed) (Note 1)	$I_{DM}$	32	A
Avalanche Current (Note 1)	$I_{AR}$	8	A
Single Pulse Avalanche Energy (Note 2)	$E_{AS}$	850	mJ
Repetitive Avalanche Energy (Note 1)	$E_{AR}$	17.8	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns
Power Dissipation	TO-220	178	W
	TO-220F/TO-220F1	59	
	TO-220F2	62	
Linear Derating Factor above $T_C=25^\circ\text{C}$	TO-220	1.43	$W/^\circ\text{C}$
	TO-220F/TO-220F1	0.47	
	TO-220F2	0.5	
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.  $L = 25\text{mH}$ ,  $I_{AS} = 8\text{A}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25\ \Omega$ , Starting  $T_J = 25^\circ\text{C}$   
 3.  $I_{SD} \leq 8\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ , 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

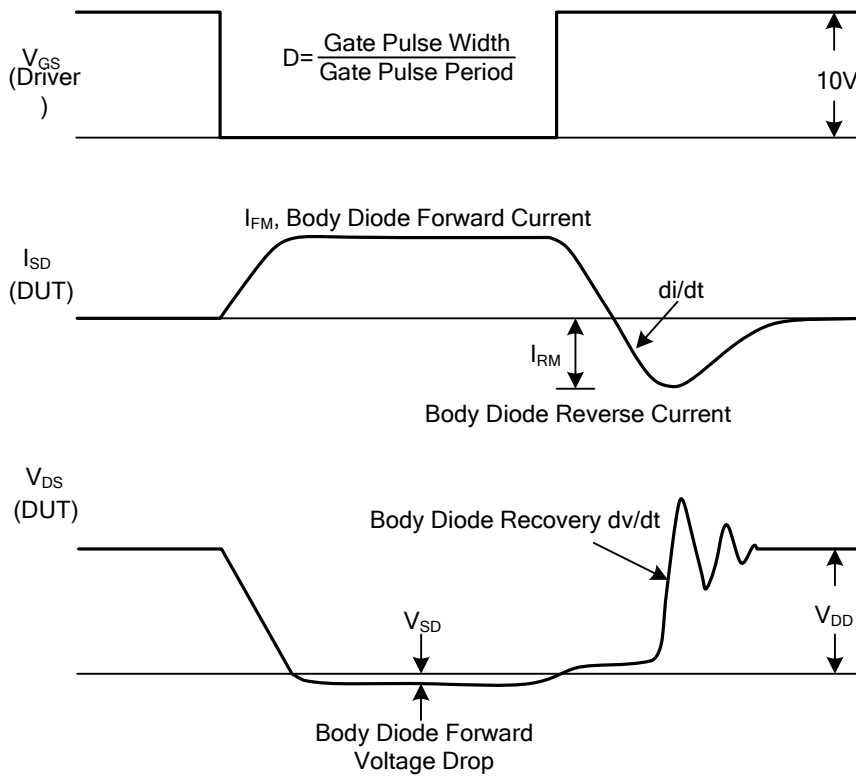
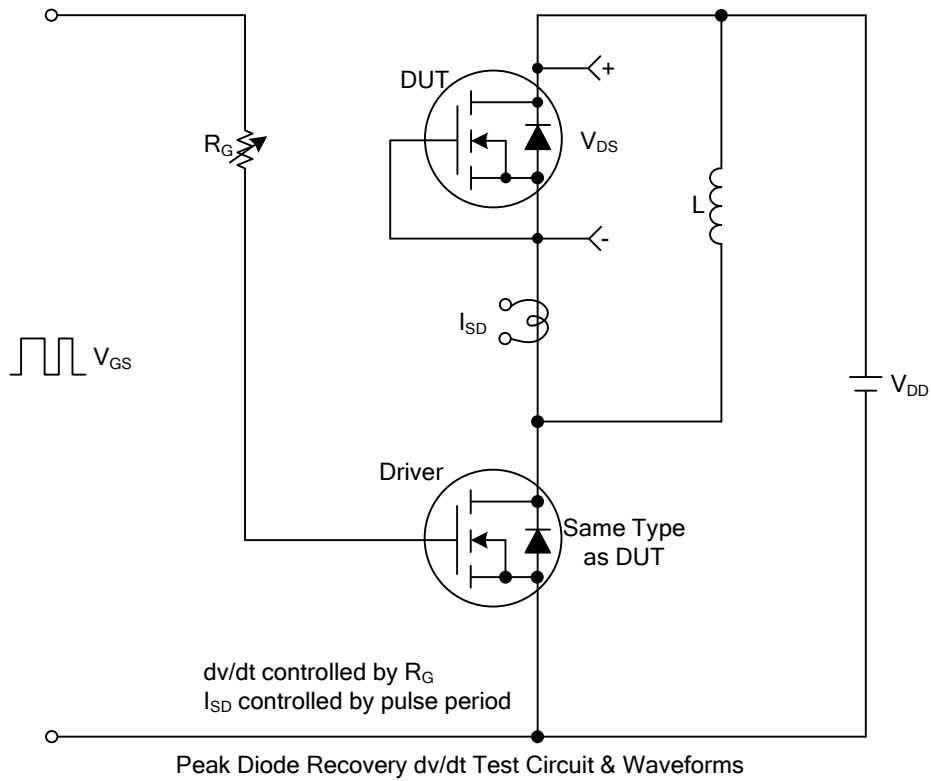
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	0.7	$^\circ\text{C}/\text{W}$
	TO-220F/TO-220F1	2.1	
	TO-220F2	2.0	

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

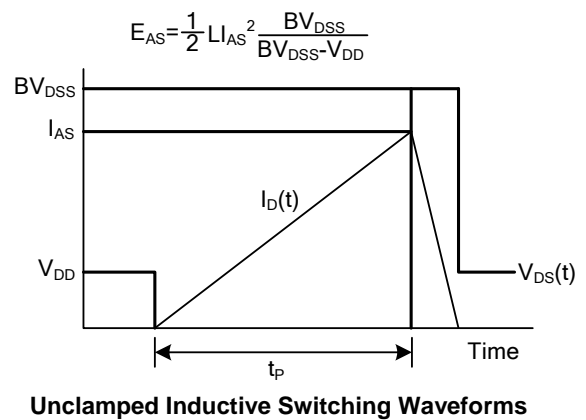
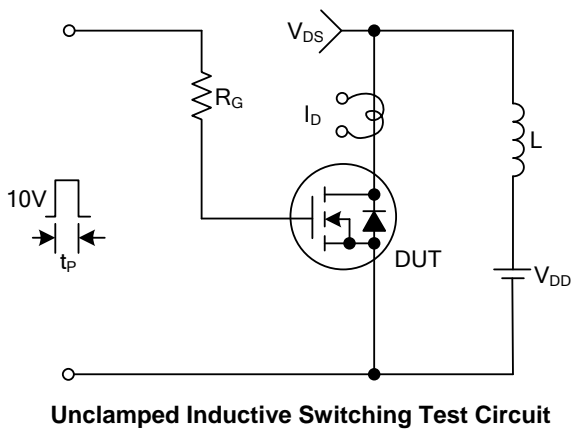
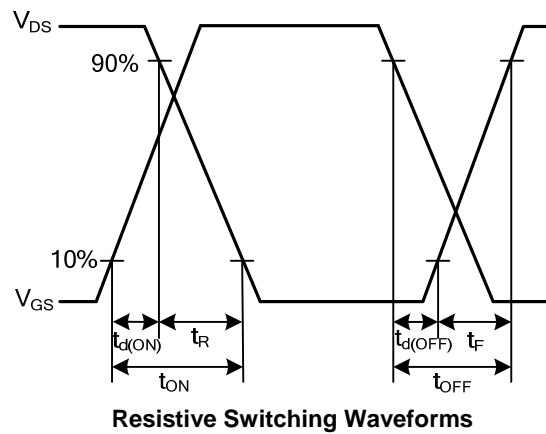
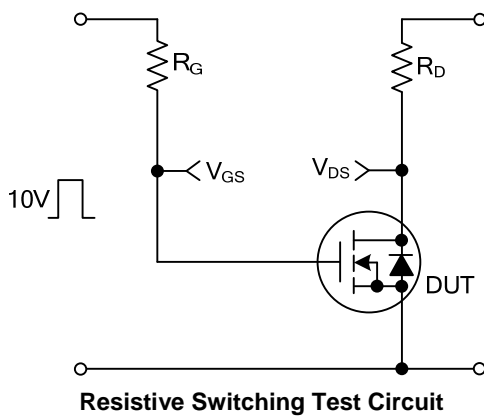
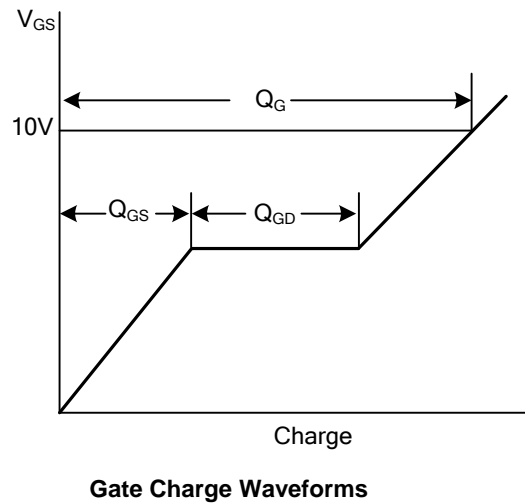
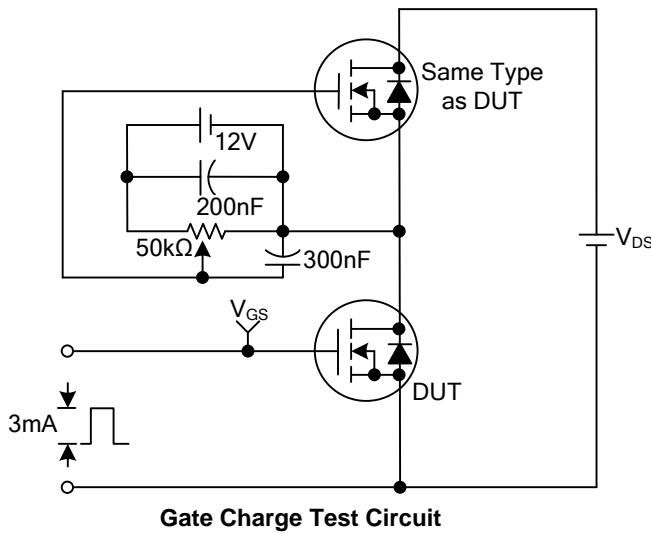
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	800			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=250\mu\text{A}$		0.5		$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=800\text{V}$ , $V_{GS}=0\text{V}$			10	$\mu\text{A}$
		$V_{DS}=640\text{V}$ , $T_C=125^\circ\text{C}$			100	
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30\text{V}$ , $V_{DS}=0\text{V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	3.0		5.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=4\text{A}$		1.18	1.45	$\Omega$
Forward Transconductance (Note 1)	$g_{FS}$	$V_{DS}=50\text{V}$ , $I_D=4\text{A}$		5.6		S
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$		1580	2050	pF
Output Capacitance	$C_{OSS}$			135	175	
Reverse Transfer Capacitance	$C_{RSS}$			13	17	
<b>SWITCHING PARAMETERS</b> (Note 1, Note 2)						
Total Gate Charge	$Q_G$	$V_{GS}=10\text{V}$ , $V_{DS}=640\text{V}$ , $I_D=8\text{A}$		35	45	nC
Gate to Source Charge	$Q_{GS}$			10		
Gate to Drain Charge	$Q_{GD}$			14		
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=400\text{V}$ , $I_D=8\text{A}$ , $R_G=25\Omega$		40	90	ns
Rise Time	$t_R$			110	230	
Turn-OFF Delay Time	$t_{D(OFF)}$			65	140	
Fall-Time	$t_F$			70	150	
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$				8	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$				32	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=8\text{A}$ , $V_{GS}=0\text{V}$			1.4	V
Reverse Recovery Time (Note 1)	$t_{rr}$	$I_S=8\text{A}$ , $V_{GS}=0\text{V}$ ,		690		ns
Reverse Recovery Charge (Note 1)	$Q_{RR}$	$di_F/dt=100\text{A}/\mu\text{s}$		8.2		

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

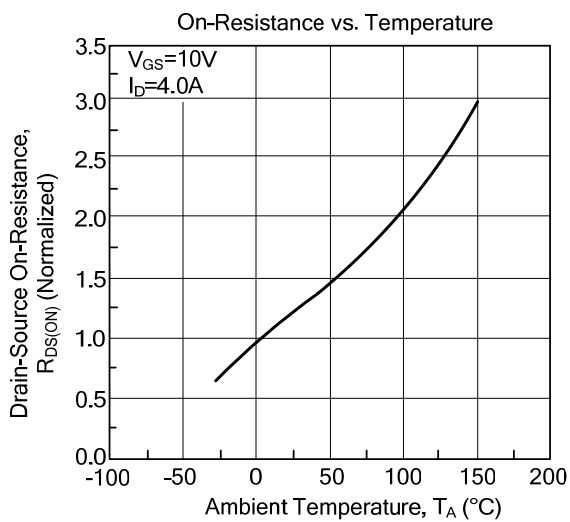
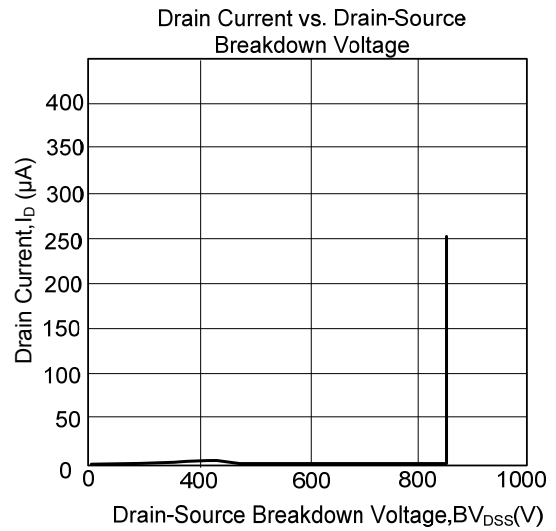
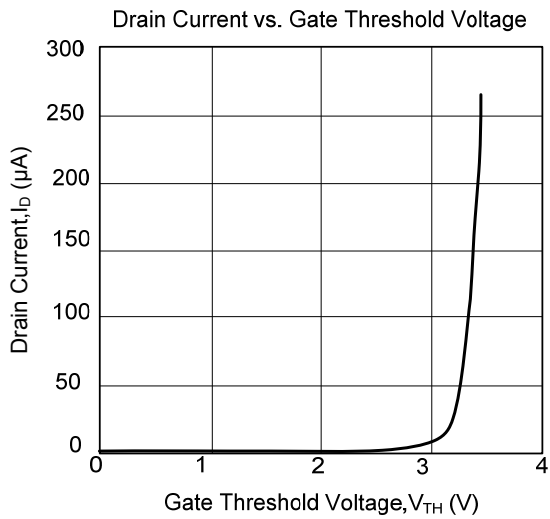
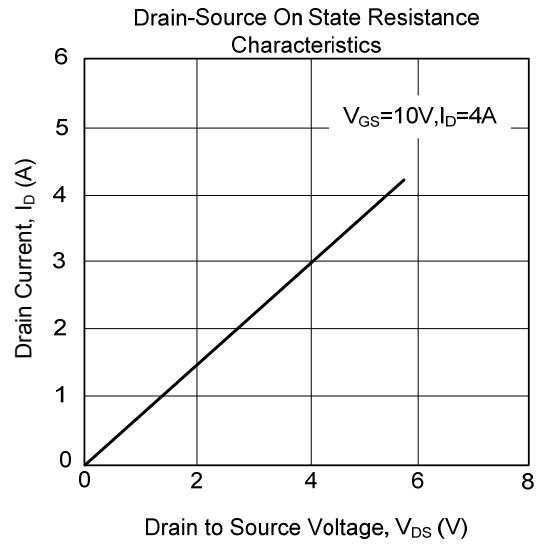
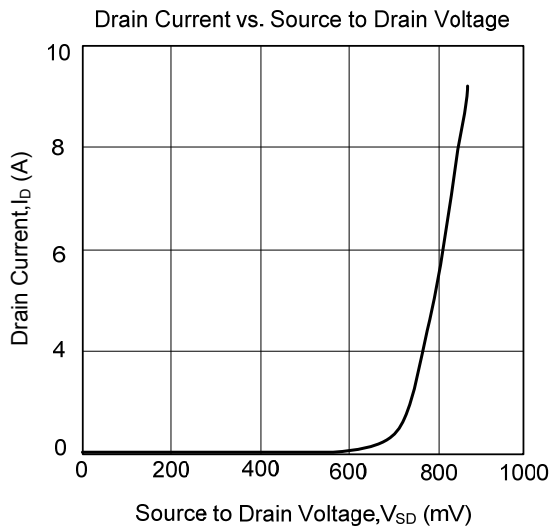
■ TEST CIRCUITS AND WAVEFORMS



## TEST CIRCUITS AND WAVEFORMS(Cont.)



■ TYPICAL CHARACTERISTICS



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