



11N80

Preliminary

Power MOSFET

11A, 800V N-CHANNEL POWER MOSFET

DESCRIPTION

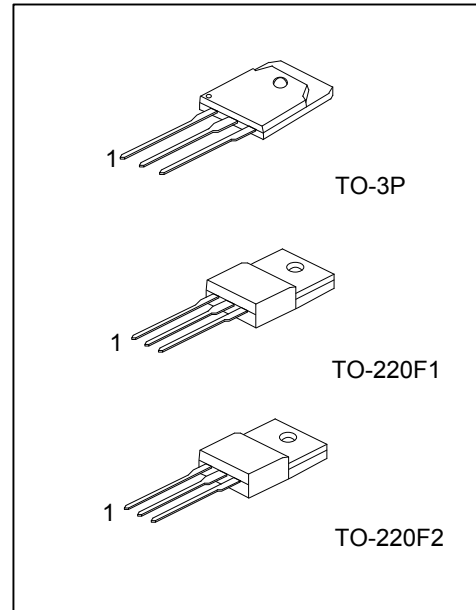
The **UTC 11N80** is an N-Channel power MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The **UTC 11N80** is suitable for high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

FEATURES

* $R_{DS(ON)} \leq 1.0\Omega$ @ $V_{GS}=10V, I_D=5.5A$

* High switching speed



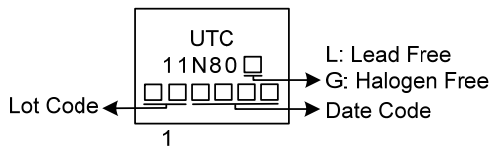
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
11N80L-TF1-T	11N80G-TF1-T	TO-220F1	G	D	S	Tube
11N80L-TF2-T	11N80G-TF2-T	TO-220F2	G	D	S	Tube
11N80L-T3P-T	11N80G-T3P-T	TO-3P	G	D	S	Tube

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

<p>11N80G-TF1-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube (2) TF1: TO-220F1, TF2: TO-220F2, T3P: TO-3P (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ 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	Continuous	I_D	11	A
	Pulsed	I_{DM}	44	A
Avalanche Current		I_{AR}	10.5	A
Avalanche Energy	Single Pulsed	E_{AS}	551	mJ
Peak Diode Recovery dv/dt		dv/dt	1.8	V/ns
Power Dissipation ($T_C=25^\circ\text{C}$)	TO-220F1/TO-220F2	P_D	50	W
	TO-3P		297	
Junction Temperature		T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ +150	$^\circ\text{C}$

Notes: 1. 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.

2. Repetitive Rating : Pulse width limited by maximum junction temperature.

3. $L=10\text{mH}$, $I_{AS}=10.5\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_C=25^\circ\text{C}$.

4. $I_{SD} \leq 11\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F1/ TO-220F2	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-3P		40	
Junction to Case	TO-220F1	θ_{JC}	1.98	$^\circ\text{C}/\text{W}$
	TO-220F2		1.89	
	TO-3P		0.42	

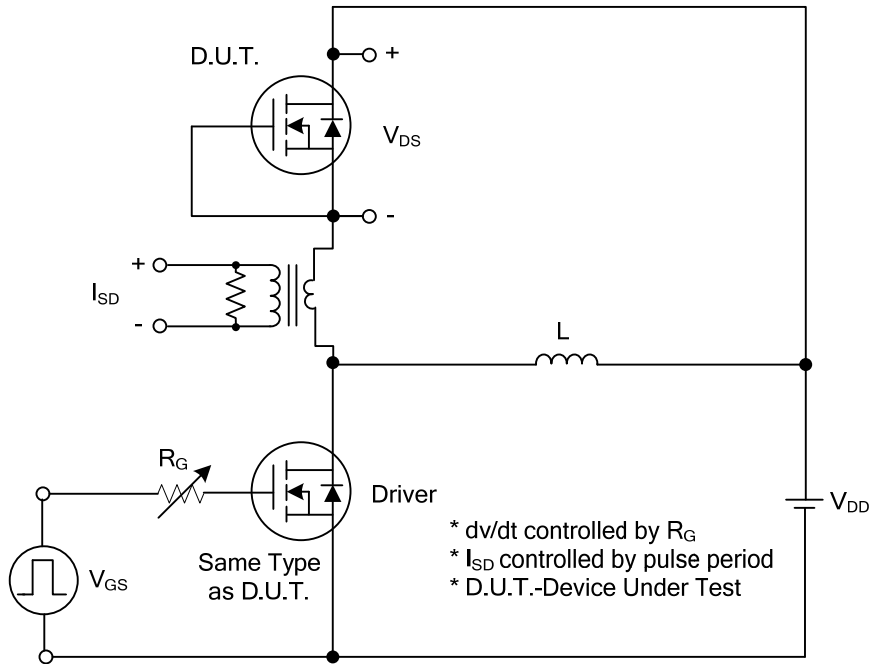
■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	800			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=800V, V_{GS}=0V$			1	μA
Gate-Source Leakage Current	Forward	$V_{GS}=+30V, V_{DS}=0V$			+100	nA
	Reverse		$V_{GS}=-30V, V_{DS}=0V$			-100
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3		5	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5.5A$			1.0	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$		1920		pF
Output Capacitance	C_{OSS}			200		pF
Reverse Transfer Capacitance	C_{RSS}			22		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=50V, V_{GS}=10V, I_D=1.3A$ $I_G=100\mu A$ (Note 1, 2)		140		nC
Gate to Source Charge	Q_{GS}			19		nC
Gate to Drain Charge	Q_{GD}			50		nC
Turn-ON Delay Time (Note 1)	$t_{D(ON)}$	$V_{DD}=30V, V_{GS}=10V, I_D=0.5A,$ $R_G=25\Omega$ (Note 1, 2)		150		ns
Rise Time	t_R			260		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			440		ns
Fall-Time	t_F			140		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				11	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				44	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=11.0A, V_{GS}=0V$			1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	$I_S=11.0A, V_{GS}=0V$		890		ns
Reverse Recovery Charge	Q_{rr}	$dI_F/dt=200A/\mu s$		10.9		μC

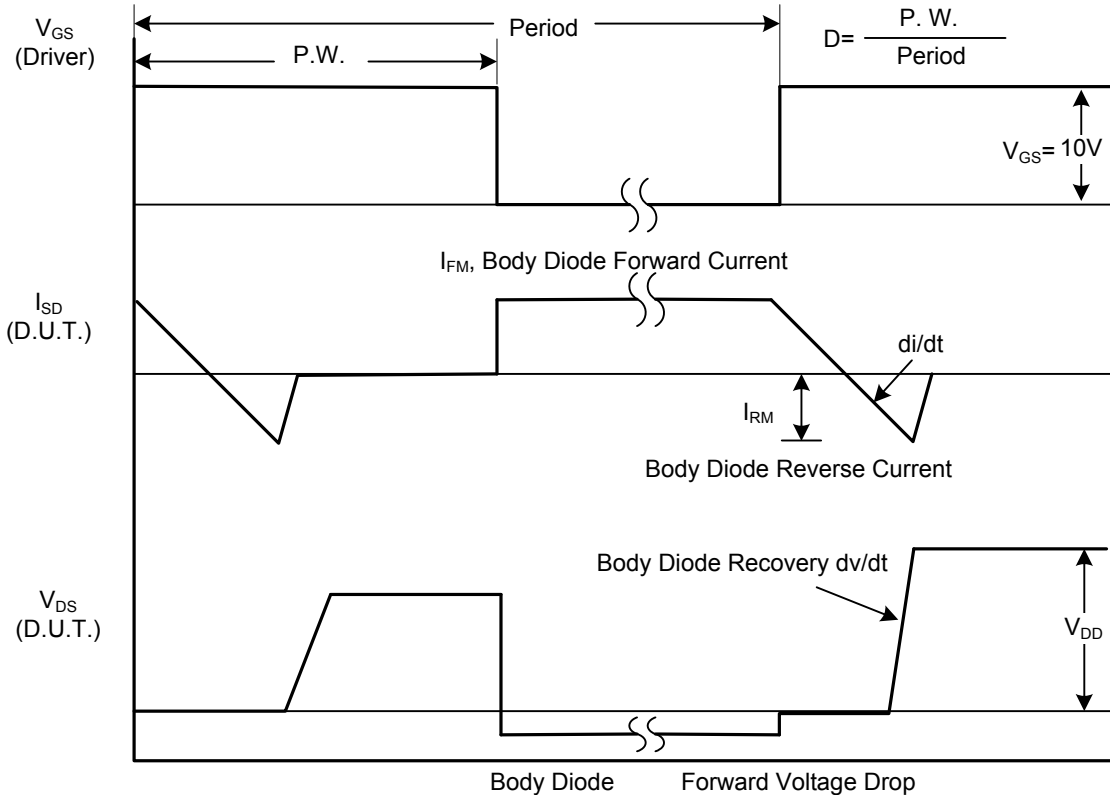
Notes: 1. Pulse Test: Pulse width $\leq 250\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

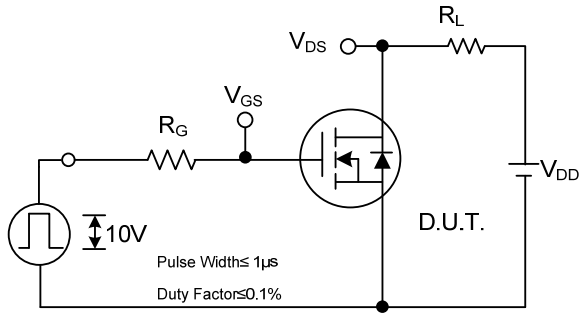


Peak Diode Recovery dv/dt Test Circuit

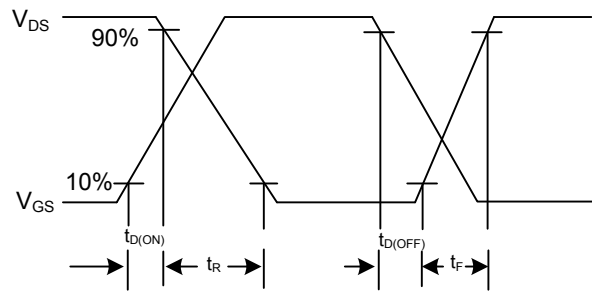


Peak Diode Recovery dv/dt Waveforms

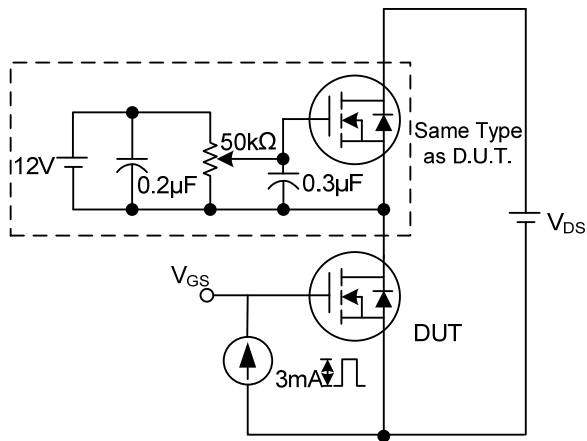
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



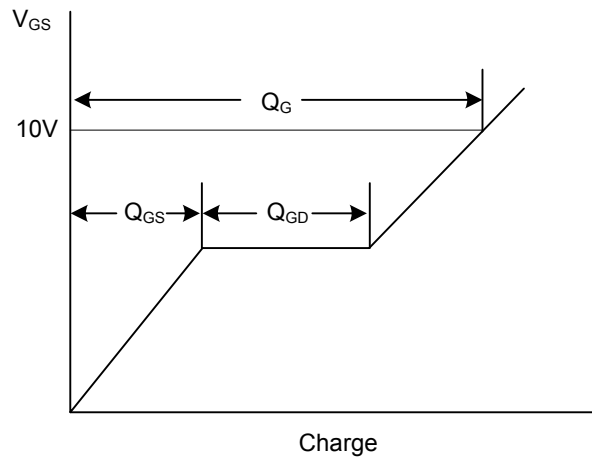
Switching Test Circuit



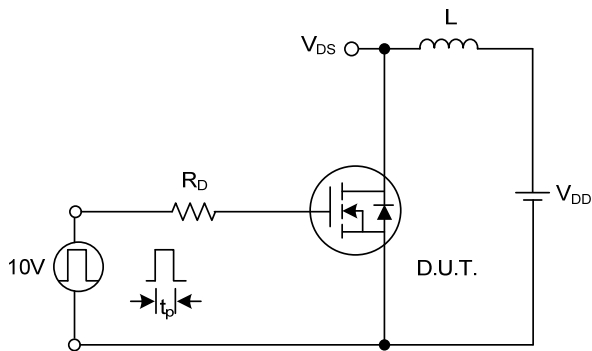
Switching Waveforms



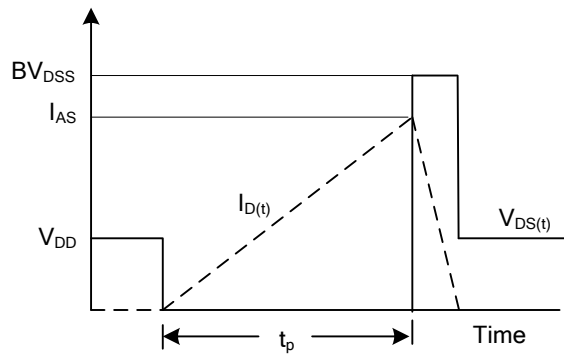
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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