



12N80

Power MOSFET

12A, 800V N-CHANNEL POWER MOSFET

DESCRIPTION

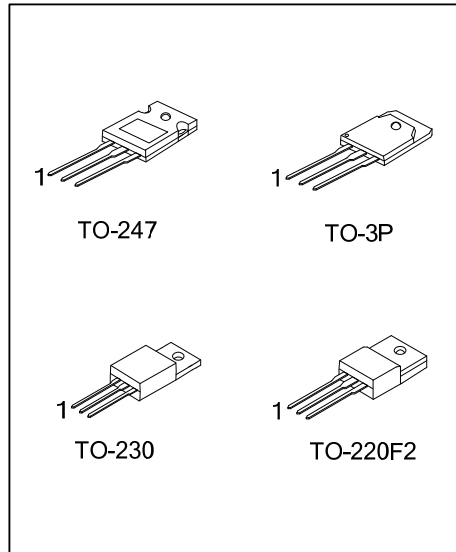
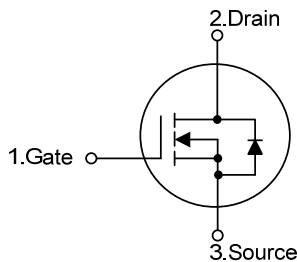
The UTC **12N80** is an N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology is specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **12N80** is universally applied in high efficiency switch mode power supply.

FEATURES

- * $R_{DS(on)} < 1.0 \Omega @ V_{GS}=10V$
- * High switching speed
- * Improved dv/dt capability
- * 100% avalanche tested

SYMBOL



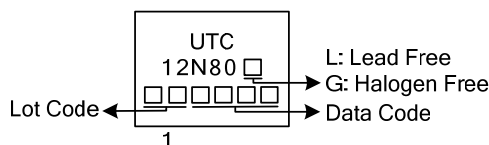
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
12N80L-T47-T	12N80G-T47-T	TO-247	G	D	S	Tube
12N80L-T3P-T	12N80G-T3P-T	TO-3P	G	D	S	Tube
12N80L-TC3-T	12N80G-TC3-T	TO-230	G	D	S	Tube
12N80L-TF2-T	12N80G-TF2-T	TO-220F2	G	D	S	Tube

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

<p>12N80L-T47-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) T: Tube (2) T47: TO-247, T3P: TO-3P, TC3: TO-230, TF2: TO-220F2 (3) L: Lead Free, G: Halogen 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 ($T_C=25^\circ\text{C}$)	I_D	12	A
	Pulsed (Note 2)	I_{DM}	48	A
Avalanche Current (Note 2)		I_{AR}	12	A
Power Dissipation	TO-247	P_D	360	W
	TO-3P		390	W
	TO-230		167	W
	TO-220F2		51	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		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.

■ THERMAL DATA

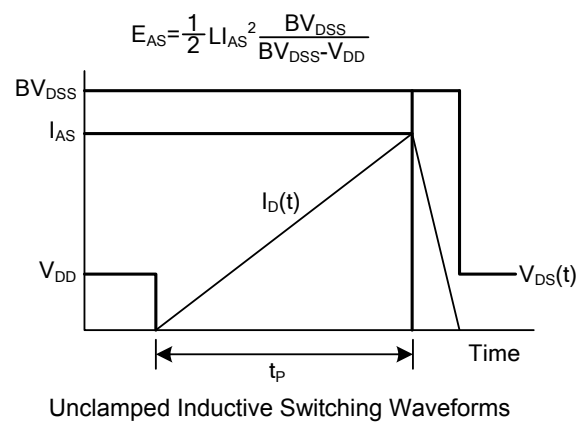
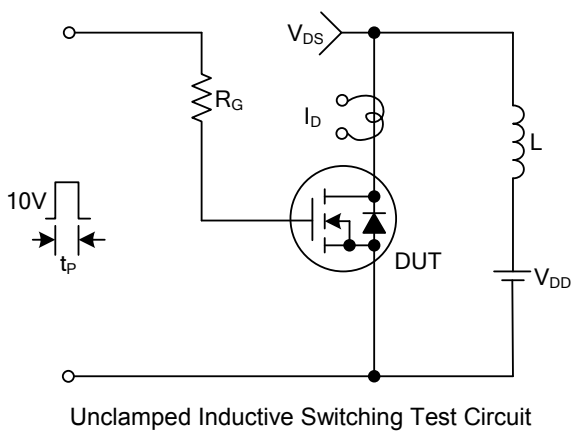
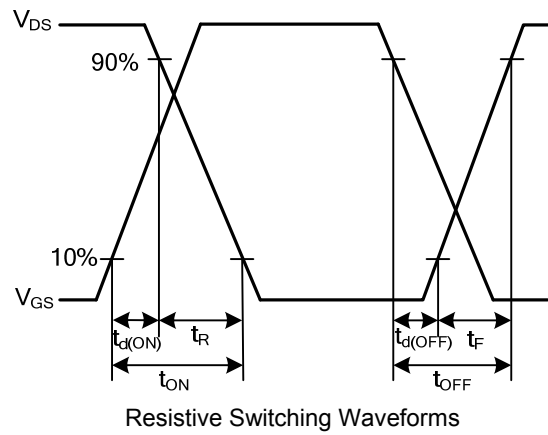
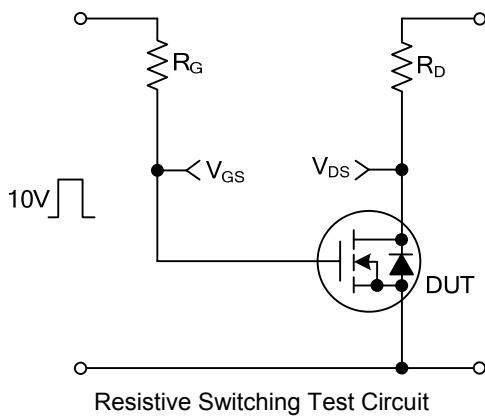
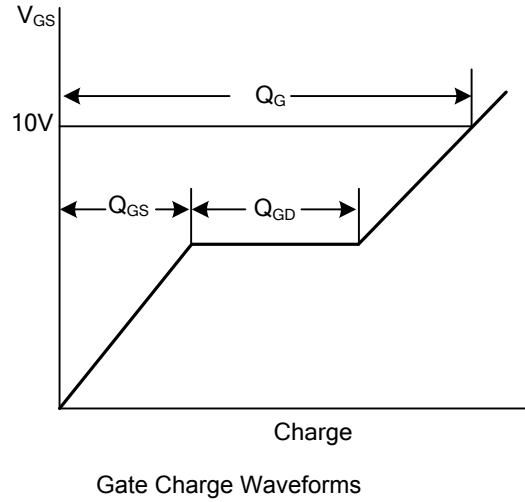
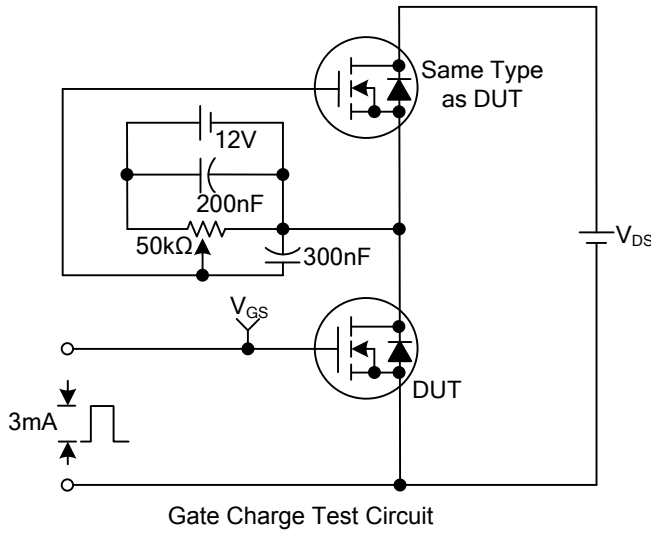
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-247	θ_{JA}	50	$^\circ\text{C/W}$
	TO-3P		40	$^\circ\text{C/W}$
	TO-220F2/TO-230		62.5	$^\circ\text{C/W}$
Junction to Case	TO-247	θ_{JC}	0.35	$^\circ\text{C/W}$
	TO-3P		0.32	$^\circ\text{C/W}$
	TO-230		0.75	$^\circ\text{C/W}$
	TO-220F2		2.43	$^\circ\text{C/W}$

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

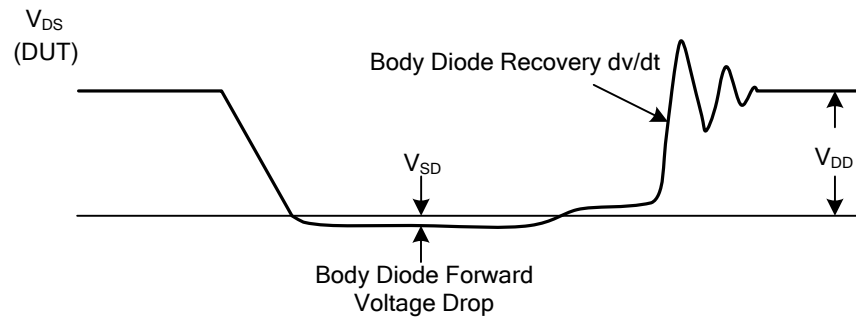
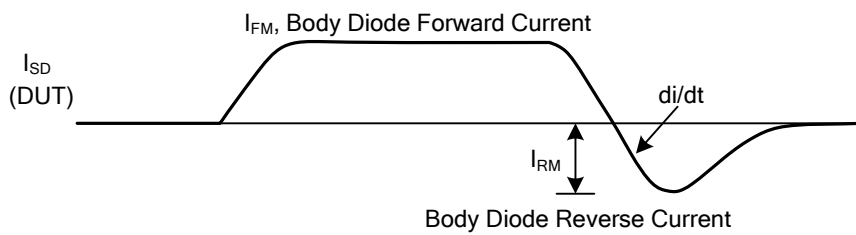
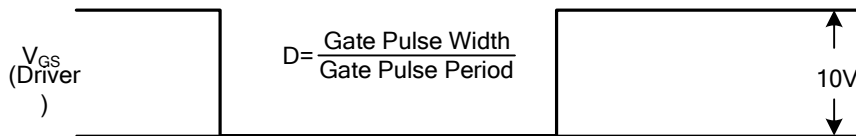
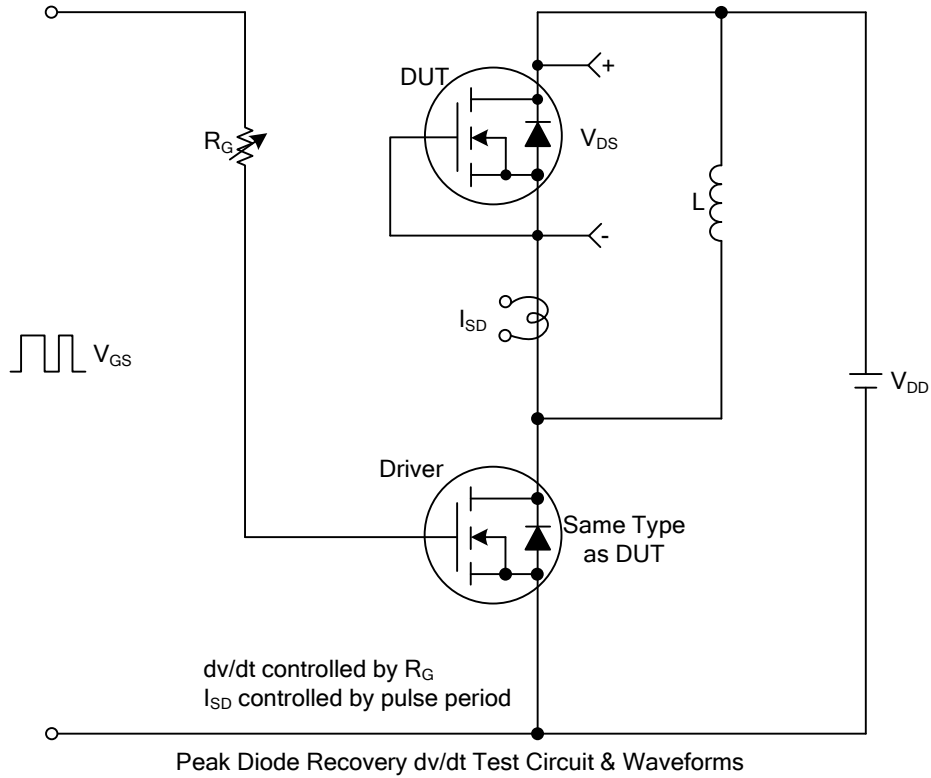
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	800			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu\text{A}$, Referenced to 25°C		1.0		$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=800\text{V}, V_{GS}=0\text{V}$			10	μA
		$V_{DS}=640\text{V}, T_C=125^\circ\text{C}$			100	
Gate- Source Leakage Current	Forward	$V_{GS}=+30\text{V}, V_{DS}=0\text{V}$			100	nA
	Reverse	$V_{GS}=-30\text{V}, V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS						
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	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=6\text{A}$		0.75	1.0	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1.0\text{MHz}$		4200		pF
Output Capacitance	C_{OSS}			315		pF
Reverse Transfer Capacitance	C_{RSS}			90		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{GS}=10\text{V}, V_{DS}=640\text{V}, I_D=12\text{A}$ (Note 1, 2)		123	155	nC
Gate to Source Charge	Q_{GS}			27	45	nC
Gate to Drain Charge	Q_{GD}			49	80	nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=400\text{V}, I_D=12\text{A}, R_G=25\Omega$ (Note 1, 2)		100	120	ns
Rise Time	t_R			198	220	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			340	360	ns
Fall-Time	t_F			180	200	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				12	A
Maximum Body-Diode Pulsed Current	I_{SM}				48	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=12\text{A}, V_{GS}=0\text{V}$			1.4	V
Body Diode Reverse Recovery Time	t_{rr}	$V_{GS}=0\text{V}, I_S=12\text{A}, dI_F/dt=100\text{A}/\mu\text{s}$		1000		ns
Body Diode Reverse Recovery Charge	Q_{RR}	(Note 1)		17.0		μC

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

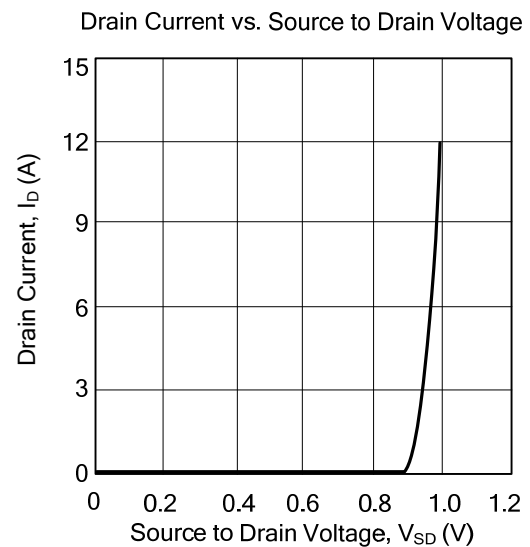
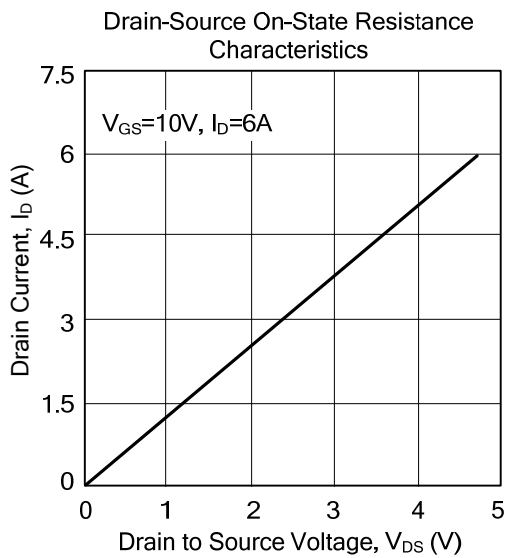
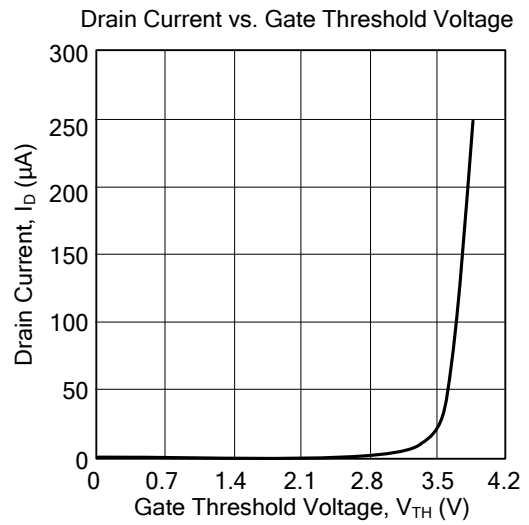
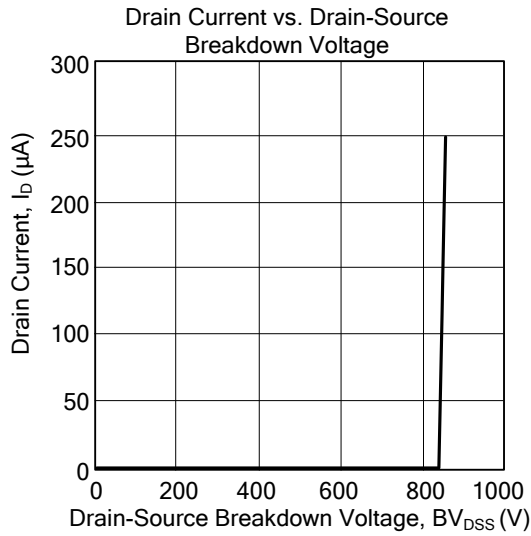
TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



TYPICAL CHARACTERISTICS



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