



7A, 800V N-CHANNEL POWER MOSFET

DESCRIPTION

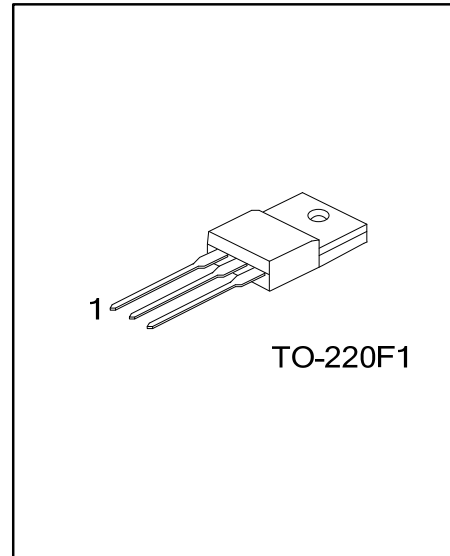
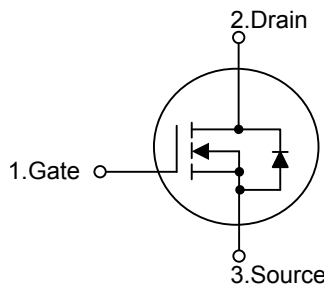
The UTC **7N80-CS** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **7N80-CS** is universally applied in high efficiency switch mode power supply.

FEATURES

- * $R_{DS(on)} < 2.0\Omega @ V_{GS}=10V, I_D=3.5A$
- * Improved dv/dt capability
- * Fast switching
- * 100% avalanche tested

SYMBOL



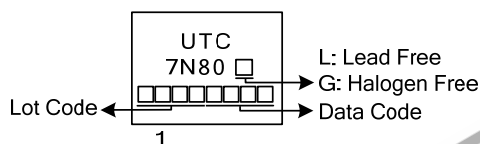
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
7N80L-TF1-T	7N80G-TF1-T	TO-220F1	G	D	S	Tube

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

<p>7N80G-TF1-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) TF1: TO-220F1</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
--	--

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 (Note 2)	Continuous	I_D	7
	Pulsed	I_{DM}	28
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	265
Peak Diode Recovery dv/dt (Note 4)	dv/dt	1.08	V/ns
Power Dissipation	P_D	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.

3. $L = 24\text{mH}$, $I_{AS} = 4.7\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 7\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	2.45	$^\circ\text{C}/\text{W}$

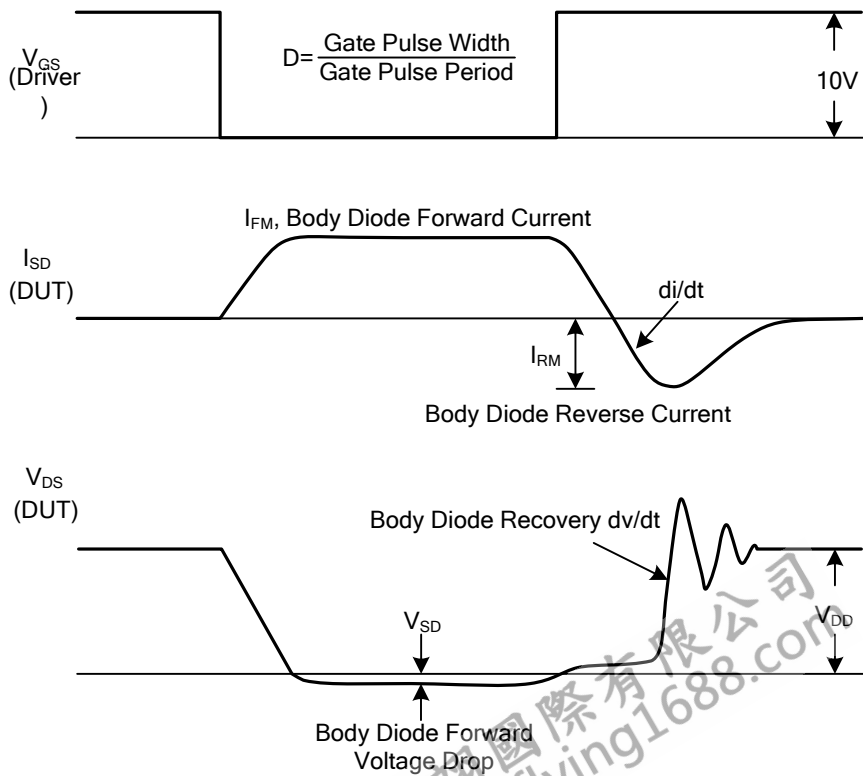
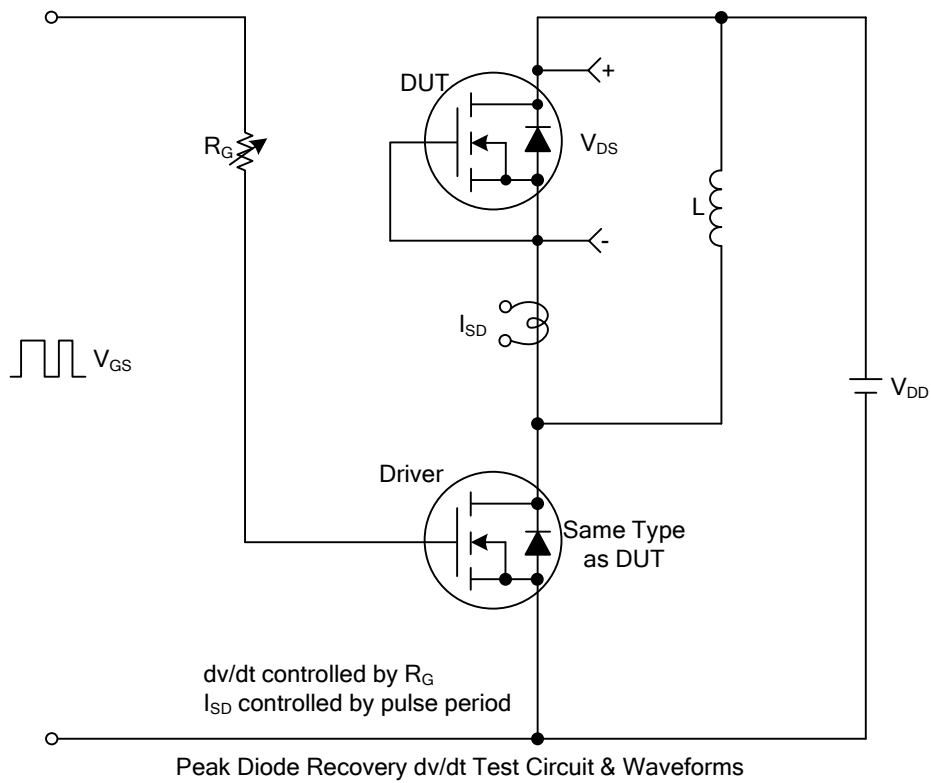
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

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
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	I_{GSS}			100	nA
	Reverse					
					-100	nA
		$V_{GS}=-30\text{V}$, $V_{DS}=0\text{V}$				
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	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=3.5\text{A}$			2.0	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		700		pF
Output Capacitance	C_{OSS}			110		pF
Reverse Transfer Capacitance	C_{RSS}			15		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=50\text{V}$, $I_D=1.3\text{A}$ $I_G=100\mu\text{A}$ (Note 1, 2)		74		nC
Gate to Source Charge	Q_{GS}			9		nC
Gate to Drain Charge	Q_{GD}			12		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=400\text{V}$, $V_{GS}=10\text{V}$, $I_D=0.5\text{A}$, $R_G=25\Omega$ (Note 1, 2)		66		ns
Rise Time	t_R			82		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			218		ns
Fall-Time	t_F			46		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				7	A
Maximum Body-Diode Pulsed Current	I_{SM}				28	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=7\text{A}$, $V_{GS}=0\text{V}$			1.4	V
Reverse Recovery Time	t_{rr}	$I_S=7\text{A}$, $V_{GS}=0\text{V}$		740		ns
Reverse Recovery Charge	Q_{rr}	$dI_F/dt=100\text{A}/\mu\text{s}$ (Note 1)		4.4		μC

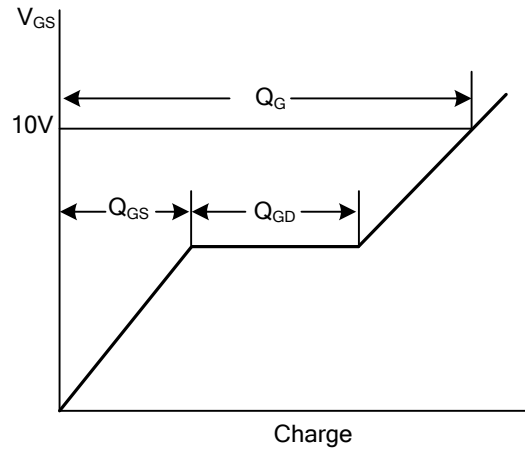
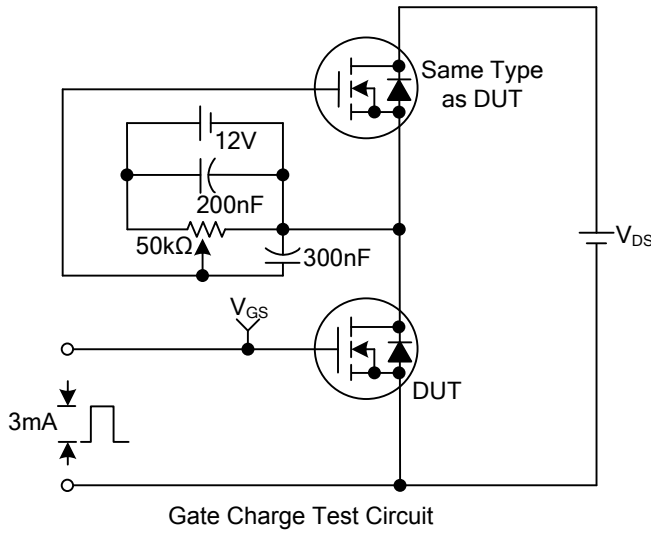
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

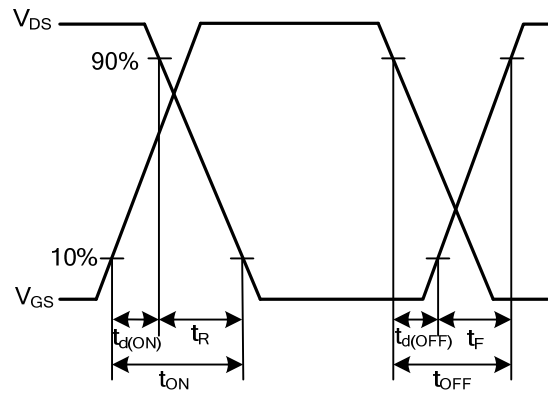
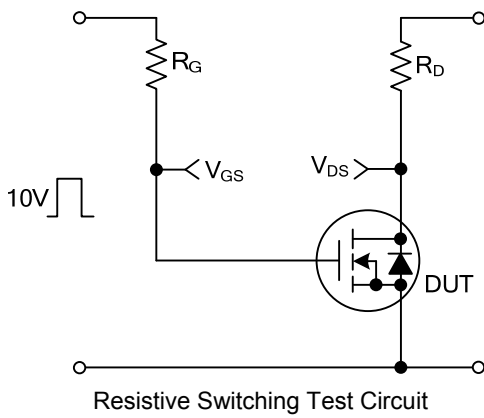


■ TEST CIRCUITS AND WAVEFORMS (Cont.)



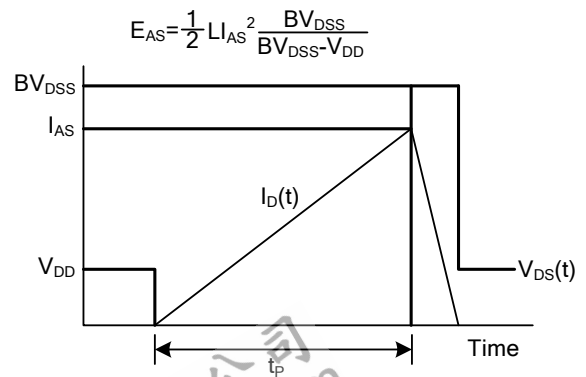
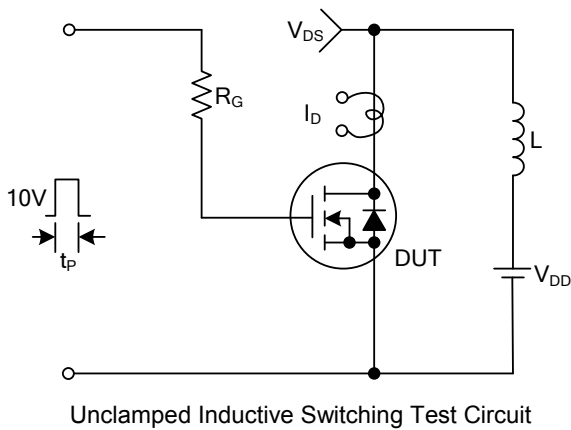
Gate Charge Test Circuit

Gate Charge Waveforms



Resistive Switching Test Circuit

Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit

Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.