



7N80Z

Power MOSFET

7A, 800V N-CHANNEL POWER MOSFET

■ DESCRIPTION

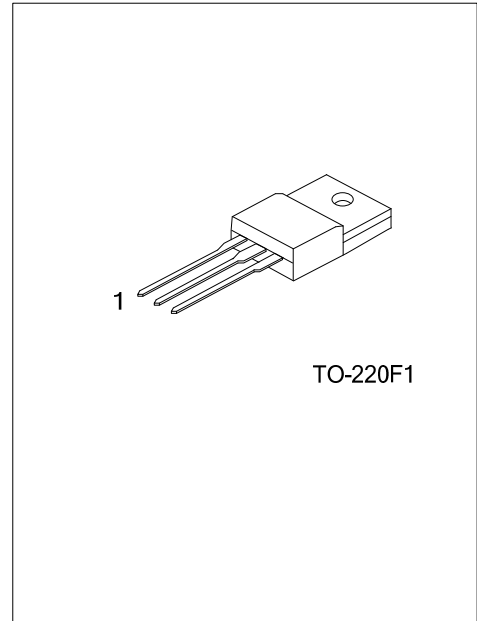
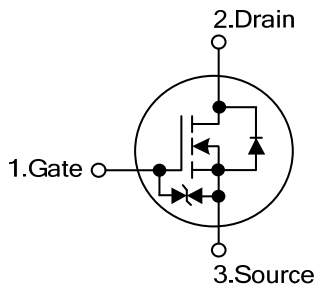
The UTC **7N80Z** is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology specializes in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **7N80Z** is universally applied in high efficiency switch mode power supply.

■ FEATURES

- * $R_{DS(on)}=1.8\Omega@V_{GS}=10V$
- * High switching speed
- * 100% avalanche tested

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
7N80ZL-TF1-T	7N80ZG-TF1-T	TO-220F1	G	D	S	Tube

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

<p>7N80ZL-TF1-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) T: Tube</p> <p>(2) TF1: TO-220F1</p> <p>(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}	± 20	V
Drain Current	Continuous	I_D	7	A
	Pulsed (Note 1)	I_{DM}	26.4	A
Avalanche Energy	Single Pulsed (Note 2)	E_{AS}	580	mJ
	Repetitive (Note 1)	E_{AR}	16.7	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Power Dissipation		P_D	52	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. $L=25\text{mH}$, $I_{AS}=6.6\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, 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	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	2.4	$^\circ\text{C}/\text{W}$

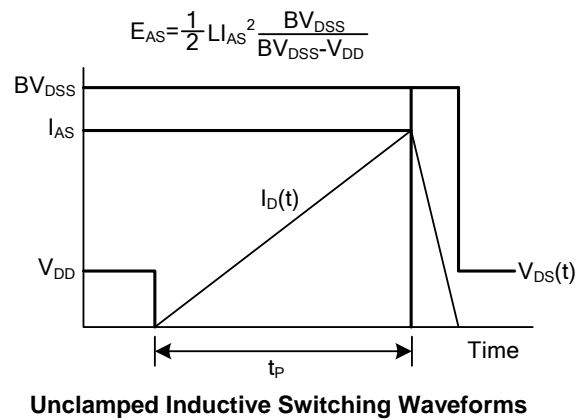
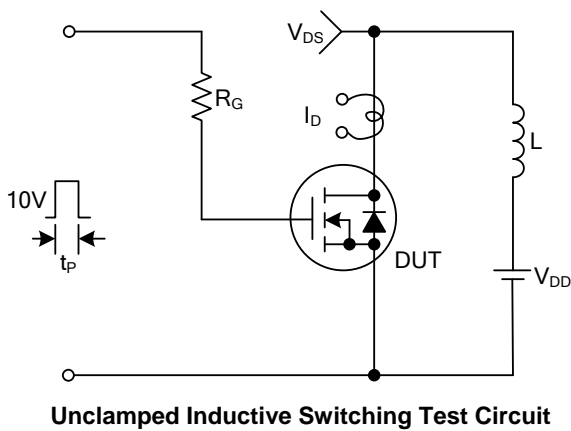
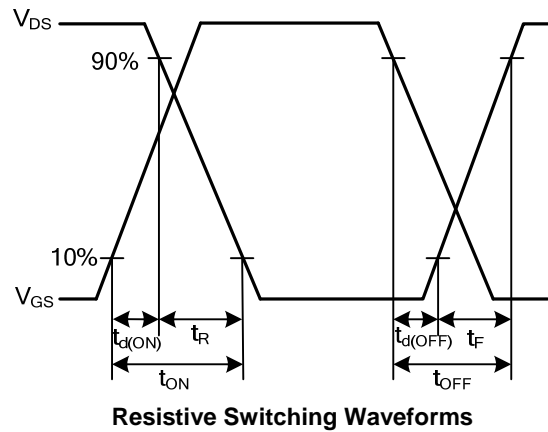
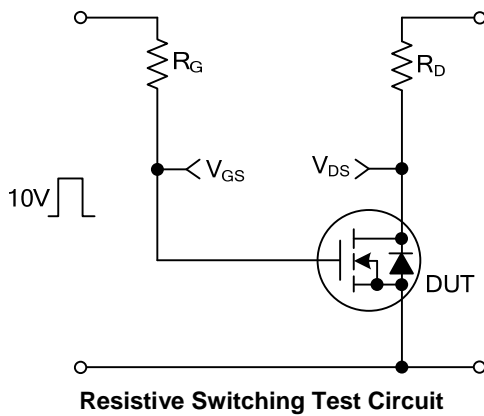
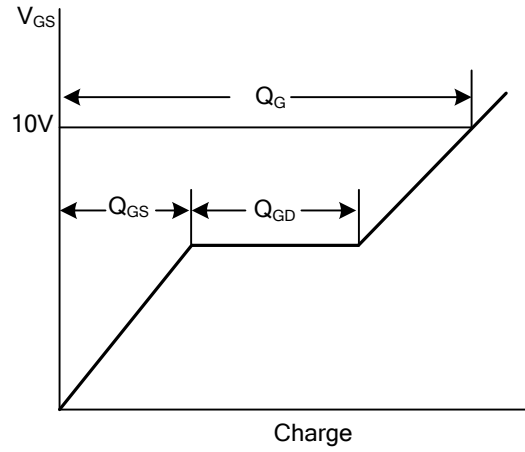
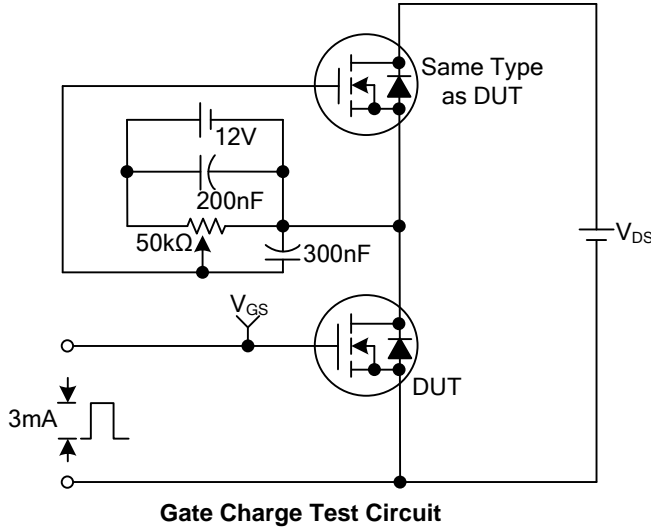
■ ELECTRICAL CHARACTERISTICS (T_c=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	B _V DSS	V _{GS} =0V, I _D =250μA	800			V
Breakdown Voltage Temperature Coefficient	ΔB _V DSS/ΔT _J	I _D =250μA, Referenced to 25°C		0.93		V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =800V, V _{GS} =0V			10	μA
		V _{DS} =640V, T _C =125°C			100	μA
Gate-Source Leakage Current	Forward	V _{DS} =0V, V _{GS} =20V			5	μA
	Reverse	V _{DS} =0V, V _{GS} =-20V			-5	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	3.0		5.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =3.3A		1.4	1.8	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		1290	1680	pF
Output Capacitance	C _{OSS}			120	155	pF
Reverse Transfer Capacitance	C _{RSS}			10	13	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =640V, V _{GS} =10V, I _D =6.6A (Note 1,2)		27	35	nC
Gate-Source Charge	Q _{GS}			8.2		nC
Gate-Drain Charge	Q _{GD}			11		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =400V, I _D =6.6A, R _G =25Ω (Note 1,2)		35	80	ns
Turn-ON Rise Time	t _R			100	210	ns
Turn-OFF Delay Time	t _{D(OFF)}			50	110	ns
Turn-OFF Fall Time	t _F			60	130	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				6.6	A
Maximum Body-Diode Pulsed Current	I _{SM}				26.4	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =6.6A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _S =6.6A,		650		ns
Body Diode Reverse Recovery Charge	Q _{RR}	dI _F /dt=100A/μs (Note 1)		7.0		μC

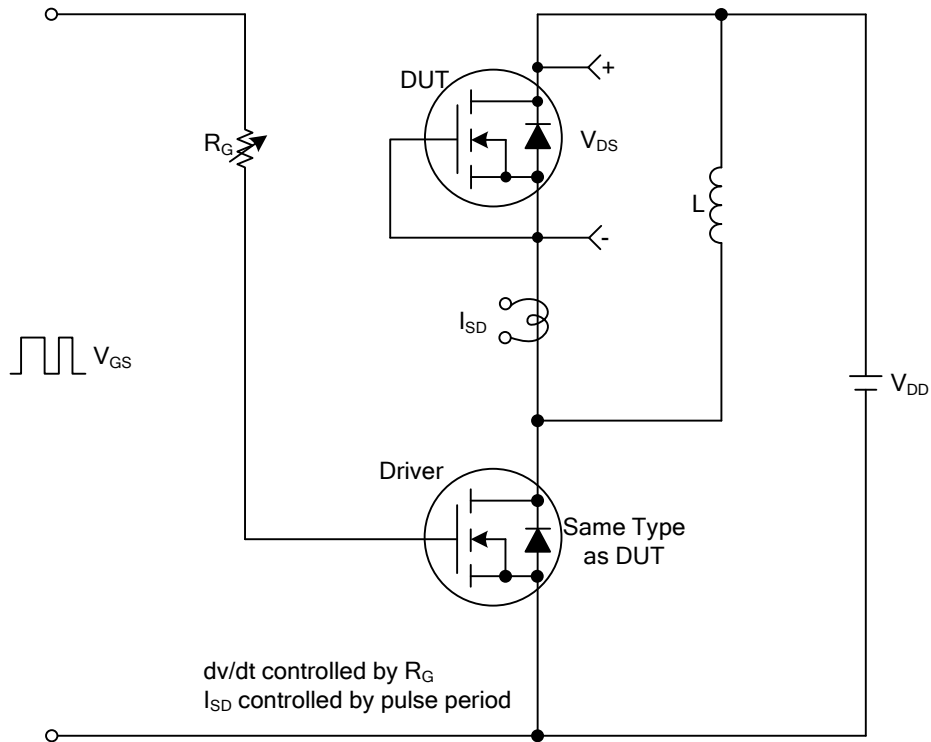
Note: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

2. Essentially independent of operating temperature

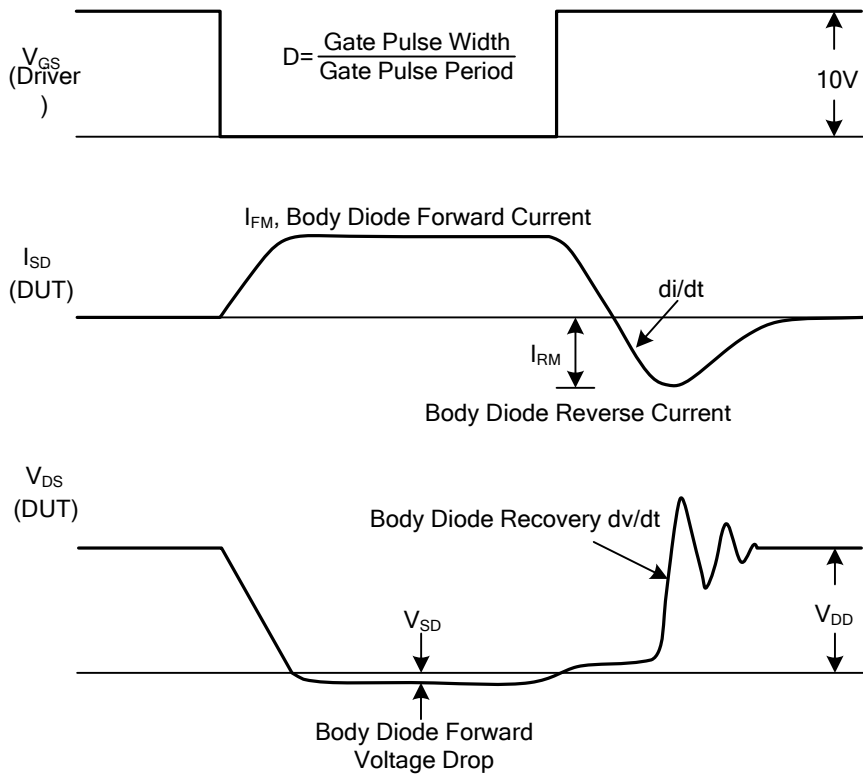
■ TEST CIRCUITS AND WAVEFORMS



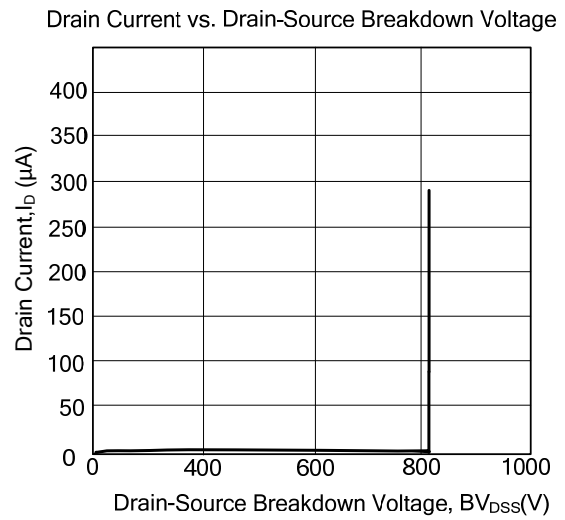
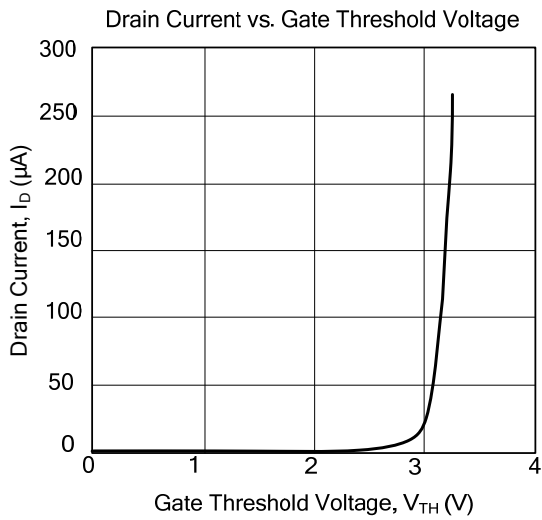
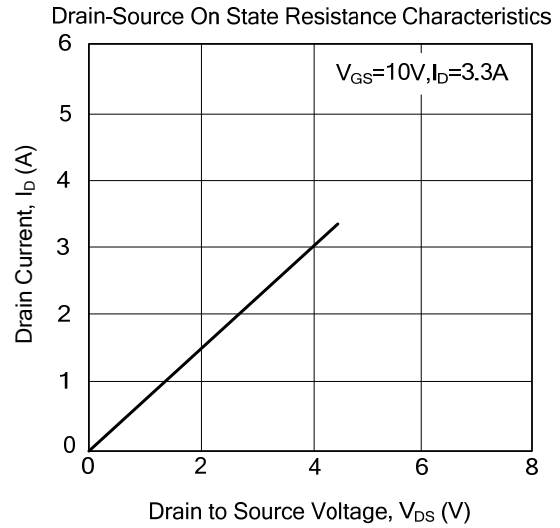
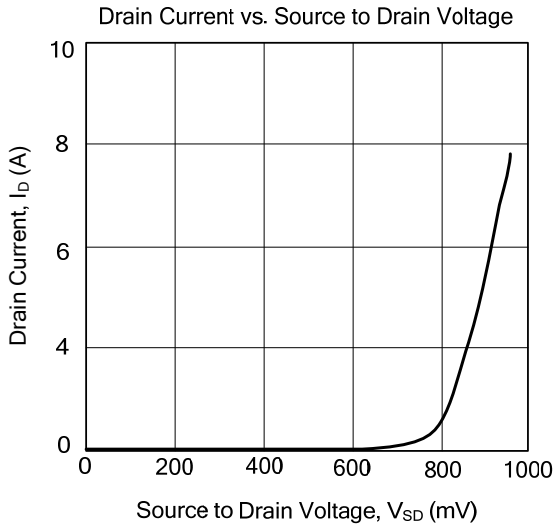
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit & Waveforms



■ TYPICAL CHARACTERISTICS



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