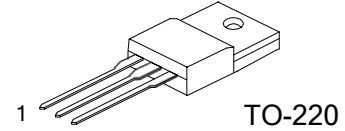


## 7.0A 800V N-CHANNEL POWER MOSFET

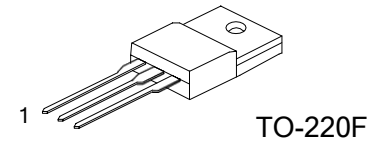
### Features:

- \*  $V_{DS} = 800V$
- \*  $I_D = 7.0A$
- \*  $R_{DS(on)} = 1.8 \text{ ohm}@V_{GS} = 10V$
- \* High switching speed
- \* 100% avalanche tested

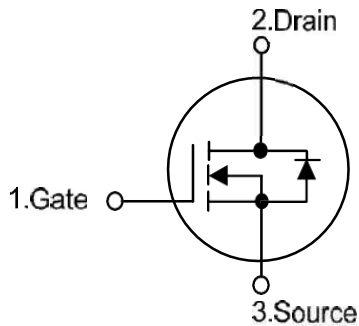


### Description:

The KWNJ7N80 is an N-channel mode power MOSFET using 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 KWNJ7N80 is universally applied in high efficiency switch mode power supply.



### SYMBOL



### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
KWNJ7N80-LI	TO-220	G	D	S	Tape Box
KWNJ7N80-BL	TO-220	G	D	S	Bulk
KWNJ7N80F-LI	TO-220F	G	D	S	Tube

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

**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	$I_D$	7
	Pulsed (Note 1)	$I_{DM}$	26.4
Avalanche Energy	Single Pulsed (Note 2)	$E_{AS}$	580
	Repetitive (Note 1)	$E_{AR}$	16.7
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns
Power Dissipation	TO-220	$P_D$	142
	TO-220F		52
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**

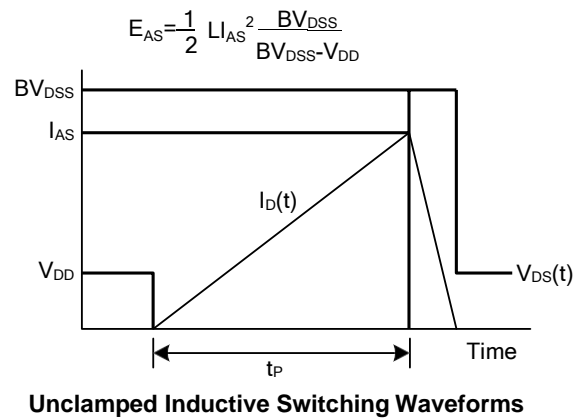
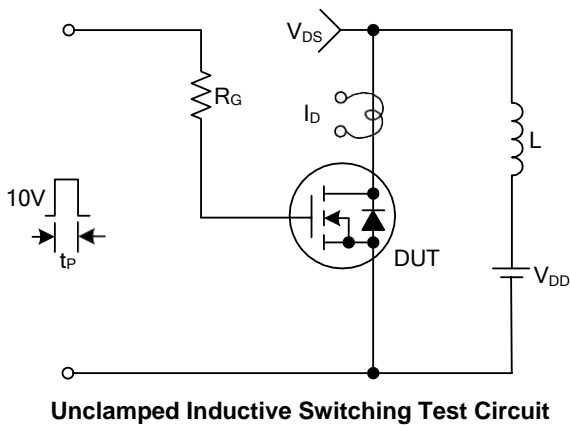
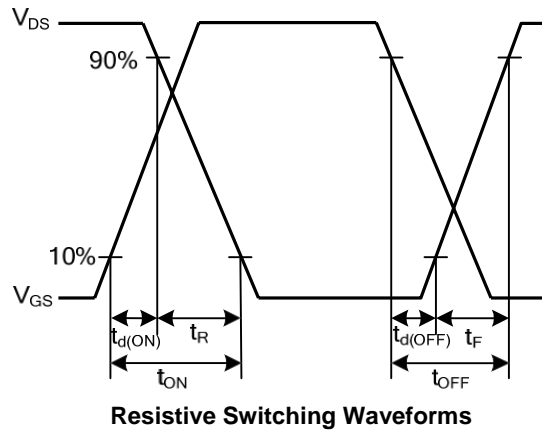
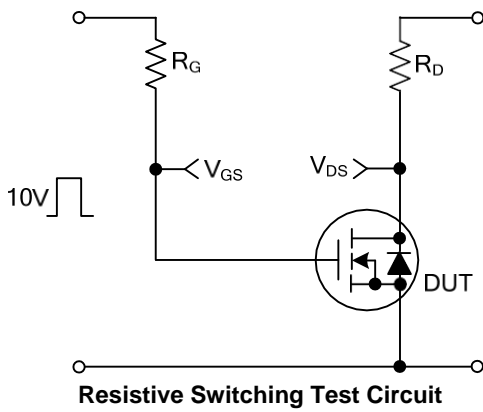
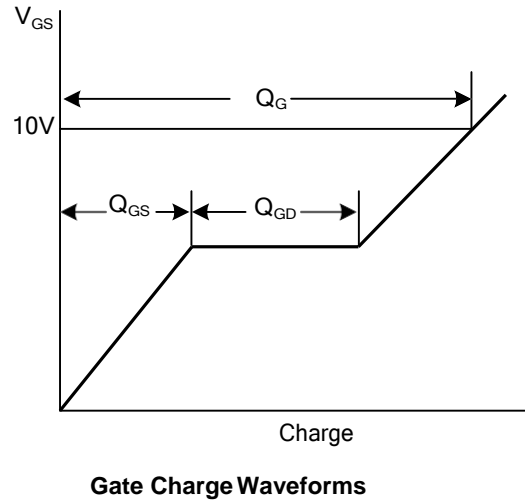
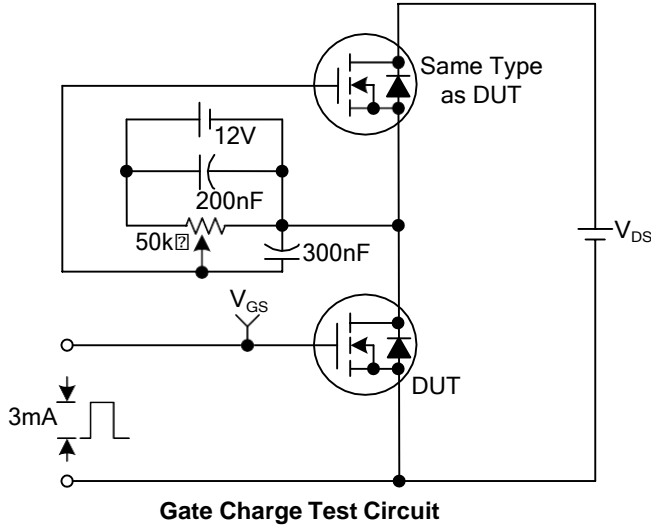
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	$\theta_{JA}$	0.88
	TO-220F		2.4

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

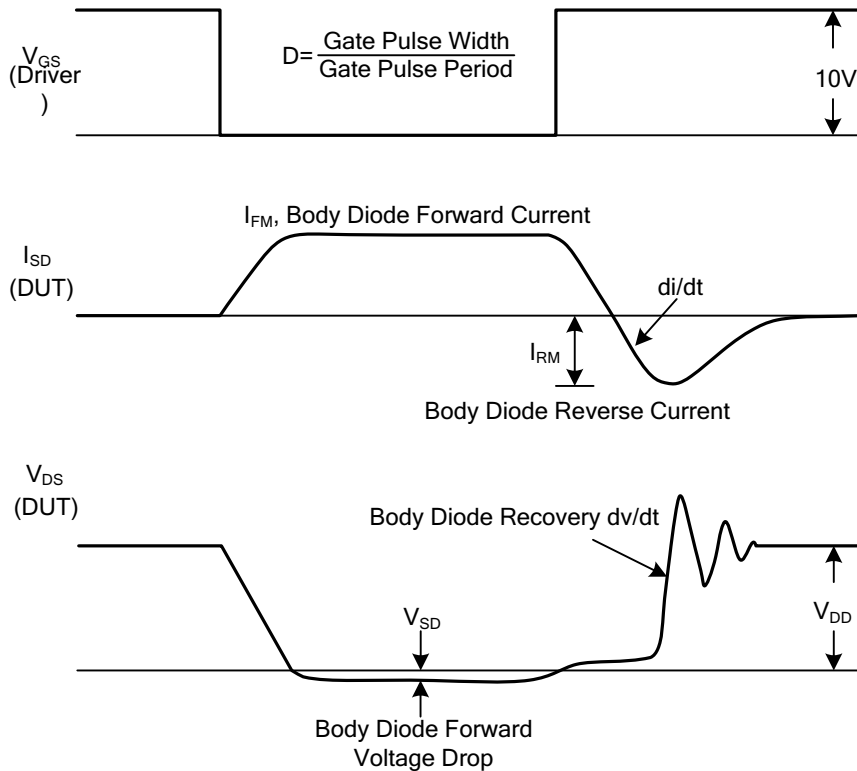
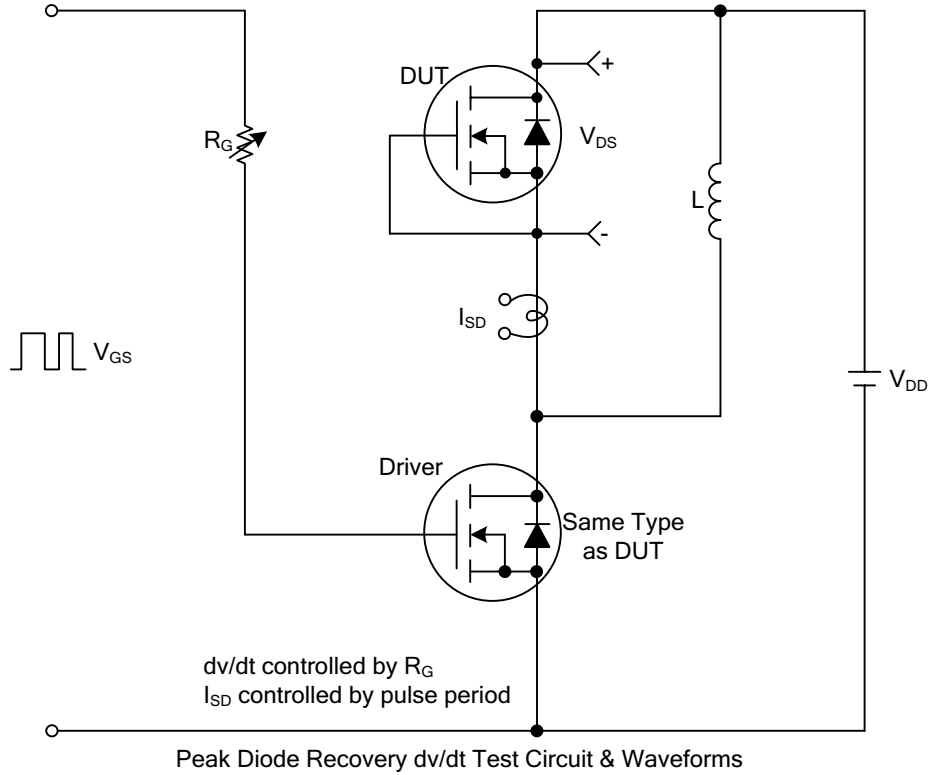
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	800			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$ , Referenced to $25^\circ\text{C}$		0.93		$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=800V, V_{GS}=0V$			10	$\mu A$
		$V_{DS}=640V, T_C=125^\circ\text{C}$			100	$\mu A$
Gate-Source Leakage Current	Forward	$V_{DS}=0V, V_{GS}=30V$			100	nA
	Reverse	$V_{DS}=0V, V_{GS}=-30V$			-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3.0		5.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=3.3A$		1.4	1.8	$\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=50V, I_D=3.3A$ (Note 1)		5.5		S
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$		1290	1680	pF
Output Capacitance	$C_{OSS}$			120	155	pF
Reverse Transfer Capacitance	$C_{RSS}$			10	13	pF
<b>SWITCHING PARAMETERS</b>						
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	$t_{D(ON)}$	$V_{DD}=400V, I_D=6.6A, R_G=25\Omega$ (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
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
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	$Q_{RR}$	$di_F/dt=100A/\mu s$ (Note 1)		7.0		$\mu C$

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

**TEST CIRCUITS AND WAVEFORMS**



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



**TYPICAL CHARACTERISTICS**

