

7.0Amps , 600Volts

N-CHANNEL MOSFET

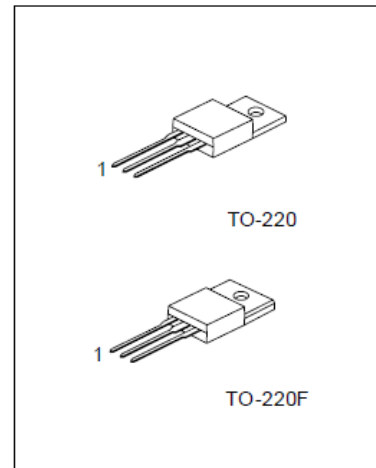
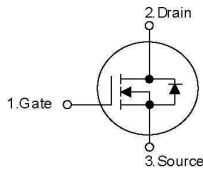
■ **DESCRIPTION**

The SSS7N60 is a high voltage MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies .PWM motor controls, high efficient DC to DC converters and bridge circuits.

■ **FEATURES**

- $R_{DS(ON)}=1.2\ \Omega@V_{GS}=10V$
- Ultra Low gate charge(typical 29nC)
- Low reverse transfer capacitance(Cr_{ss} =typical6.0pF)
- Fast switching capability
- Avalanche energy tested
- Improved dv/dt capability,high ruggedness

■ **SYMBOL**



*Pb-free plating product number:7N60L

■ **ORDERING INFORMATION**

Order Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
7N60-TA3-T	7N60L-TA3-T	TO-220	G	D	S	Tube
2N60-TF3-T	2N60L-TF3-T	TO-220F	G	D	S	Tube

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

<p>2N60L-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Plating</p>	<p>(1)T:Tube,R:Tape Reel (2)TA3:TO220,TF3:TO-220F (3)L:Lead Free Plating Blank: Pb/Sn</p>
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■ **ABSOLUTE MAXIMUM RATINGS**($T_c=25^{\circ}C$, unless otherwise specified)

PARAMETER	SYMBOL	PATINGS	UNIT
Drain-Source Voltage	V_{DSS}	600	V
Gate-Source Voltage	V_{GSS}	± 30	V
Avalanche Current(Note 2)	I_{AP}	7.4	A
Drain Current Continuous	I_D	7.4	A
	$T_c=25^{\circ}C$		
Drain Current Pulsed(Note 2)	I_{DP}	29.6	A
Avalanche Energy	Repetitive(Note 2)	E_{AR}	14.2 mJ
	Single Pulse(Note 3)	E_{AS}	530 mJ
Peak Diode Recovery dv/dt(Note 4)	dv/dt	4.5	v/ns



Total Power Dissipation	$T_c=25^{\circ}\text{C}$	P_D	142	W
	Derate above 25°C		81	W/ $^{\circ}\text{C}$
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55~+150	$^{\circ}\text{C}$

Note: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. $L=64\text{mH}, I_{AS}=2.0\text{A}, V_{DD}=50\text{V}, R_G=25\ \Omega$, Starting $T_J=25^{\circ}\text{C}$

4. $I_{SD} \leq 2.4\text{A}, di/dt \leq 200\text{A}/\mu\text{s}, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER	PACKAGE	SYMBOL	RATINGS	UNIT
Thermal Resistance Junction-Ambient	TO-220	θ_{JA}	62	$^{\circ}\text{C}/\text{W}$
	TO-220F		62	
Thermal Resistance Junction-Case	TO-220	θ_{JC}	0.88	
	TO-220F		1.54	

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNI
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}, I_D=250\ \mu\text{A}$	600			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600\text{V}, V_{GS}=0\text{V}$			10	μA
Gate-Body Leakage Current	Forward	I_{GSS}			100	nA
	Reverse				$V_{GS}=-30\text{V}, V_{DS}=0\text{V}$	-100
Breakdown Voltage Temperature	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\ \mu\text{A}$		0.67		V/
On Characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\ \mu\text{A}$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{DS}=10\text{V}, I_D=3.5\text{A}$			1.2	Ω
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$			1400	pF
Output Capacitance	C_{OSS}				180	pF
Reverse Transfer Capacitance	C_{RSS}			16	21	pF

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Switching Characteristics						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=300\text{V}, I_D=7.4\text{A}, R_G=25\ \Omega$			70	ns
Rise Time	t_R				170	ns
Turn-Off Delay Time	$t_{D(OFF)}$				140	ns
Fall Time	t_F				130	ns
Total Gate Charge	Q_G	$V_{DS}=480\text{V}, V_{GS}=10\text{V}, I_D=7.4\text{A}$		29	38	nC
Gate-Source Charge	Q_{GS}			7		nC
Gate-Drain Charge	Q_{GD}			14.5		nC
Drain-Source Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0\text{V}, I_{SD}=7.4\text{A}$			1.4	V
Continuous Drain-Source Current	I_{SD}				7.4	A
Pulsed Drain-Source Current	I_{SM}				29.6	A



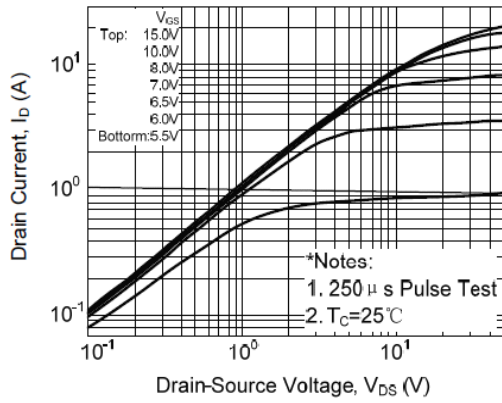
Reverse Recovery Time	t_{RR}	$V_{GS}=0V, I_{SD}=7.4A,$	320	ns
Reverse Recovery Charge	Q_{RR}	$di/dt=100A/\mu A$	2.4	μC

Note: 1. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$

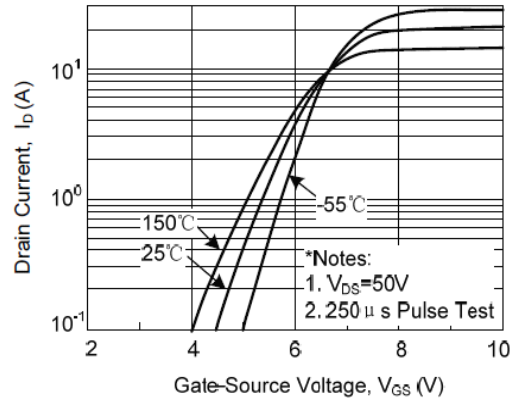
2. Essentially Independent of Operating Temperature

TYPICAL CHARACTERISTICS

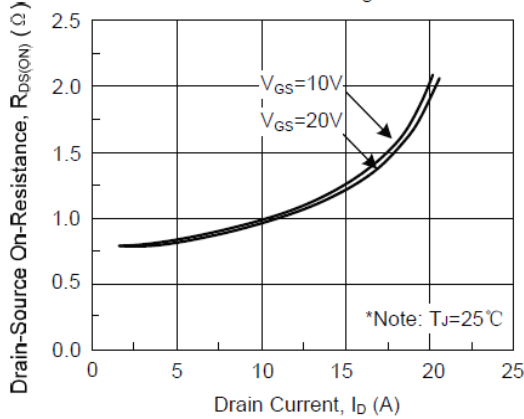
On-Region Characteristics



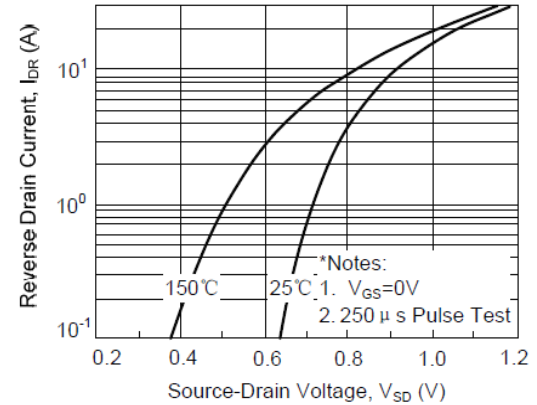
Transfer Characteristics



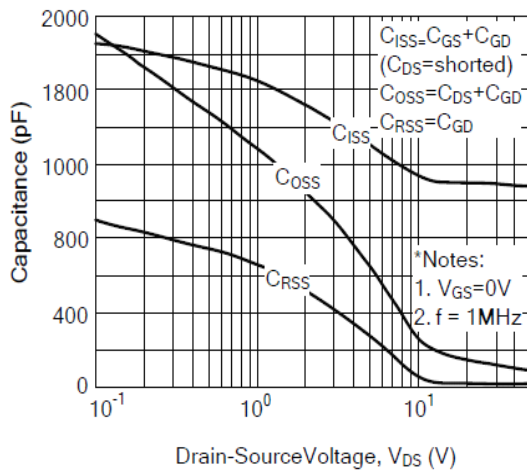
On-Resistance Variation vs. Drain Current and Gate Voltage



Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics



Maximum Safe Operating Area

