

**2 Amps, 600Volts**

**N-CHANNEL MOSFET**

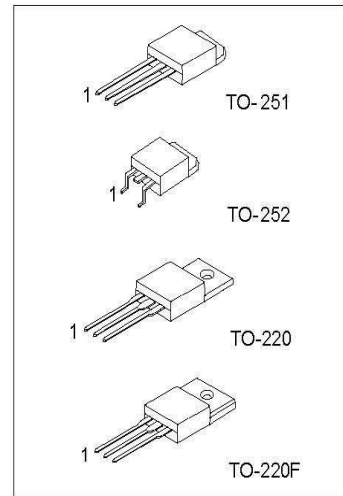
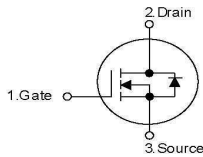
**DESCRIPTION**

The SSS2N60 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**

- $R_{DS(ON)}=3.8\ \Omega @V_{GS}=10V$
- Ultra Low gate charge(typical 9.0nC)
- Low reverse transfer capacitance( $C_{rss}$ =typical 5.0pF)
- Fast switching capability
- Avalanche energy specified
- Improved dv/dt capability,high ruggedness

**SYMBOL**

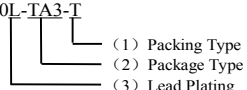


\*Pb-free plating product number: 2N60

**ORDERING INFORMATION**

Order Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
2N60-TA3-T	2N60L-TA3-T	TO-220	G	D	S	Tube
2N60-TF3-T	2N60L-TF3-T	TO-220F	G	D	S	Tube
2N60-TM3-T	2N60L-TM3-T	TO-251	G	D	S	Tube
2N60-TN3-R	2N60L-TN3-R	TO-252	G	D	S	Tape Reel
2N60-TN3-T	2N60L-TN3-T	TO-252	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,TM3:TO-251,TN3:TO-252 (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	$V_{GSS}$	$\pm 30$	V
Avalanche Current(Note 2)	$I_{AP}$	2.0	A
Drain Current	$I_D$	$T_c=25^\circ C$	2.0
		$T_c=100^\circ C$	1.26
Drain Current Pulsed(Note 2)	$I_{DP}$	8.0	A



N-CHANNEL MOSFET

SSS2N60

Avalanche Energy	Repetitive(Note 2)	$E_{AR}$	4.5	mJ
	Single Pulse(Note 3)	$E_{AS}$	120	mJ
Peak Diode Recovery dv/dt(Note 4)		dv/dt	4.5	v/ns
Total Power Dissipation	$T_c=25^\circ\text{C}$	$P_D$	45	W
	Derate above 25°C		0.36	w/°C
Junction Temperature		$T_J$	+150	°C
Storage Temperature		$T_{STG}$	-55~+150	°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-251	$\theta_{JA}$	112	°C/W
	TO-252		112	
	TO-220		54	
	TO-220F		54	
Thermal Resistance Junction-Case	TO-251	$\theta_{JC}$	12	
	TO-252		12	
	TO-220		4	
	TO-220F		4	

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0\text{V}, I_D=250\ \mu\text{A}$	600			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=600\text{V}, V_{GS}=0\text{V}$			10	$\mu\text{A}$
Gate-Body Leakage Current	Forward	$I_{GSS}$			100	nA
	Reverse				-100	nA
Breakdown Voltage Temperature	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\ \mu\text{A}$		0.4		V/°C
<b>On Characteristics</b>						
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	$R_{DS(ON)}$	$V_{DS}=10\text{V}, I_D=1\text{A}$		3.8	5	$\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=50\text{V}, I_D=1\text{A}$ (Note 1)		2.25		S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		270	350	pF
Output Capacitance	$C_{OSS}$			40	50	pF
Reverse Transfer Capacitance	$C_{RSS}$			5	7	pF

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
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N-CHANNEL MOSFET

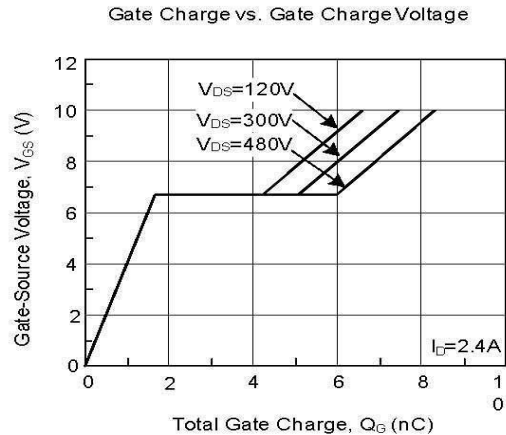
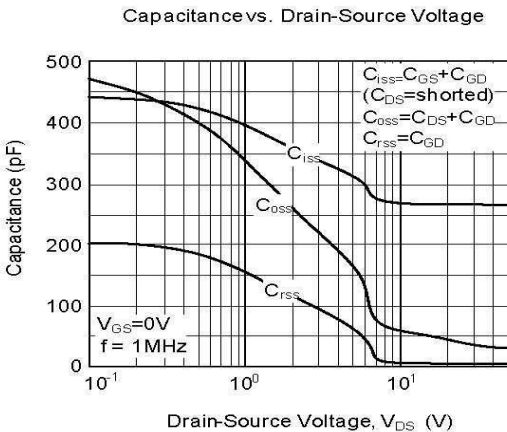
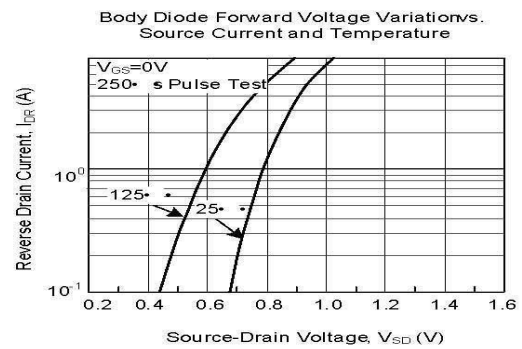
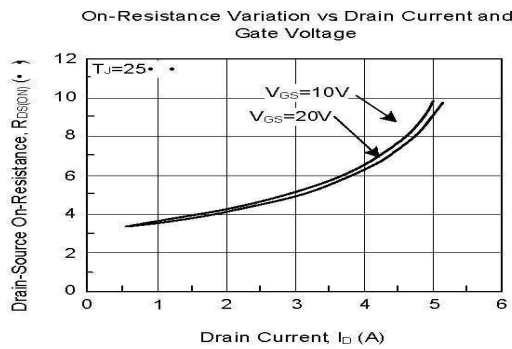
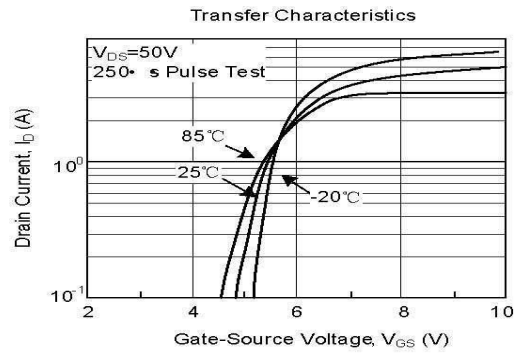
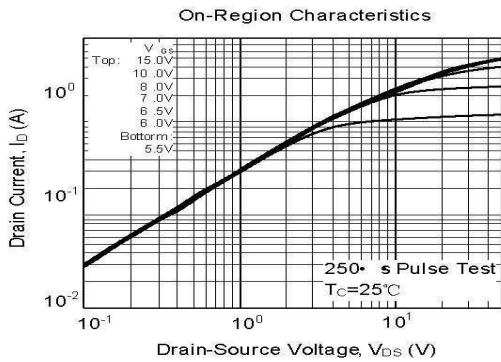
SSS2N60

Switching Characteristics						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=300V, I_D=2.4A, R_G=25\Omega$	10	30	ns	
Rise Time	$t_R$		25	60	ns	
Turn-Off Delay Time	$t_{D(OFF)}$		20	50	ns	
Fall Time	$t_F$		25	60	ns	
Total Gate Charge	$Q_G$	$V_{DS}=480V, V_{GS}=10V, I_D=2.4A$	9.0	11	nC	
Gate-Source Charge	$Q_{GS}$		1.6		nC	
Gate-Drain Charge	$Q_{GD}$		4.3		nC	
Drain-Source Diode Characteristics						
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_{SD}=2.0A$		1.4	V	
Continuous Drain-Source Current	$I_{SD}$			2.0	A	
Pulsed Drain-Source Current	$I_{SM}$			8.0	A	
Reverse Recovery Time	$t_{RR}$	$V_{GS}=0V, I_{SD}=2.4A,$	180		ns	
Reverse Recovery Charge	$Q_{RR}$	$di/dt=100A/\mu A$	0.72		$\mu C$	

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

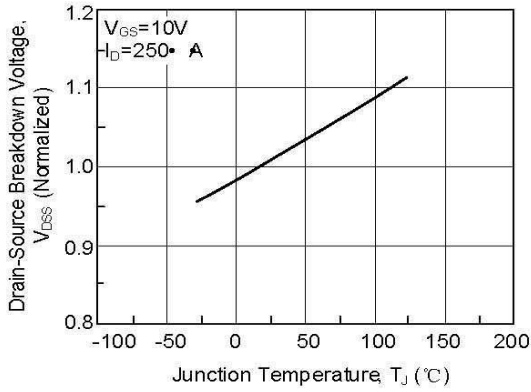
2. Essentially Independent of Operating Temperature

**TYPICAL CHARACTERISTICS**

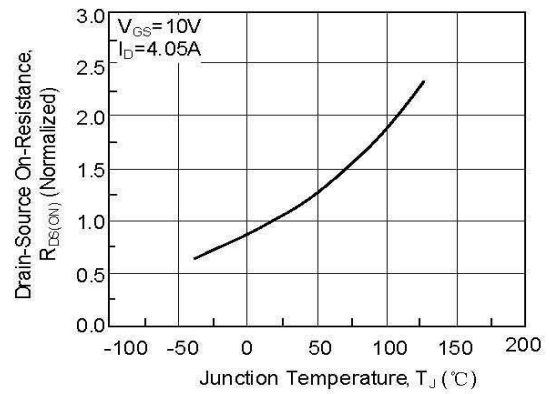


**TYPICAL CHARACTERISTICS(Cont)**

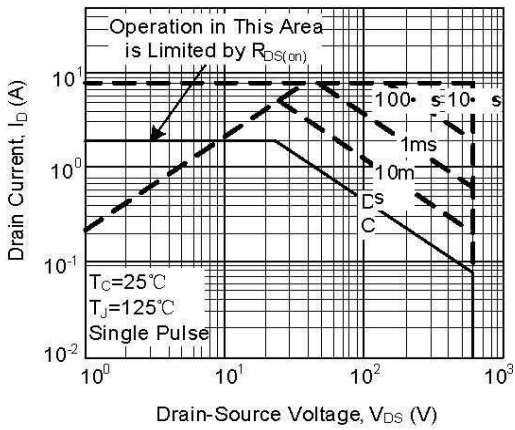
Breakdown Voltage vs Temperature



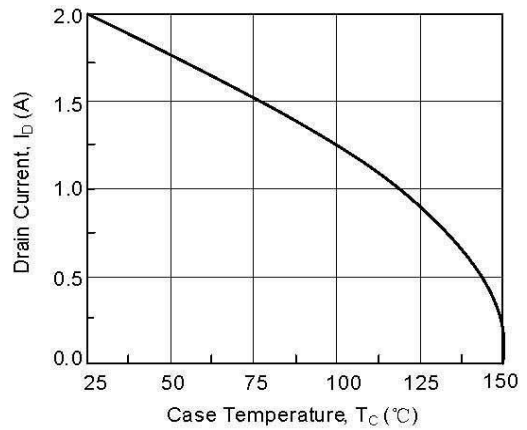
On-Resistance vs Temperature



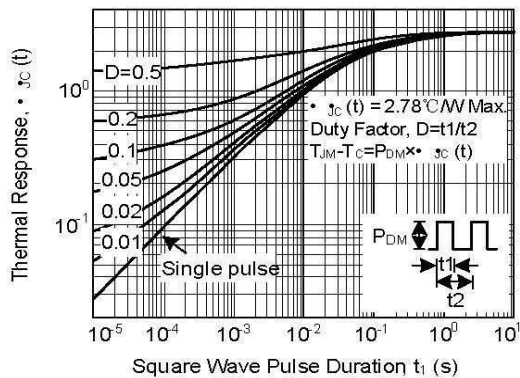
Max. Safe Operating Area



Max. Drain Current vs. Case Temperature



Thermal Response



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