

2 Amps, 600Volts

N-CHANNEL MOSFET

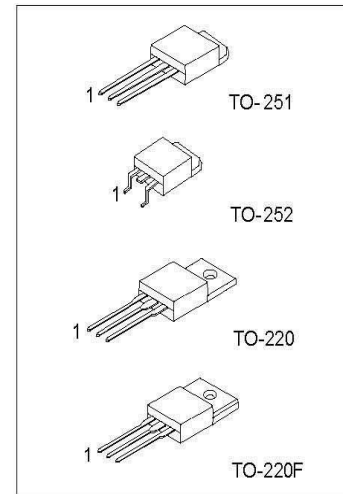
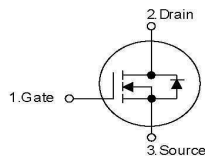
DESCRIPTION

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

2N60L-TA3-T (1) Packing Type (2) Package Type (3) Lead Plating	(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
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ABSOLUTE MAXIMUM RATINGS ($T_c = 25^\circ\text{C}$, 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}	2.0	A
Drain Current	$T_c = 25^\circ\text{C}$	I_D	2.0	A
	$T_c = 100^\circ\text{C}$		1.26	A
Drain Current Pulsed (Note 2)		I_{DP}	8.0	A

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/ $^{\circ}\text{C}$
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 bu maximum junction temperature

3.L=64mH, $I_{AS}=2.0\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$,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	θ_{JA}	112	$^{\circ}\text{C}/\text{W}$
	TO-252		112	
	TO-220		54	
	TO-220F		54	
Thermal Resistance Junction-Case	TO-251	θ_{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
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}	$V_{GS}=30\text{V}$, $V_{DS}=0\text{V}$			100	nA
	Reverse		$V_{GS}=-30\text{V}$, $V_{DS}=0\text{V}$			-100	nA
Breakdown Voltage Temperature		$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\ \mu\text{A}$		0.4		V/ $^{\circ}\text{C}$
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		$R_{DS(ON)}$	$V_{DS}=10\text{V}$, $I_D=1\text{A}$		3.8	5	Ω
Forward Transconductance		g_{FS}	$V_{DS}=50\text{V}$, $I_D=1\text{A}$ (Note 1)		2.25		S
Dynamic Characteristics							
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.)

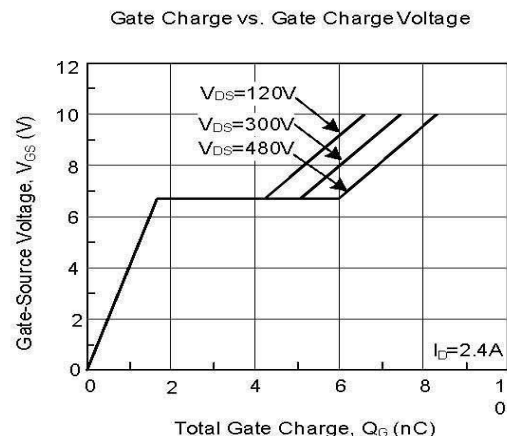
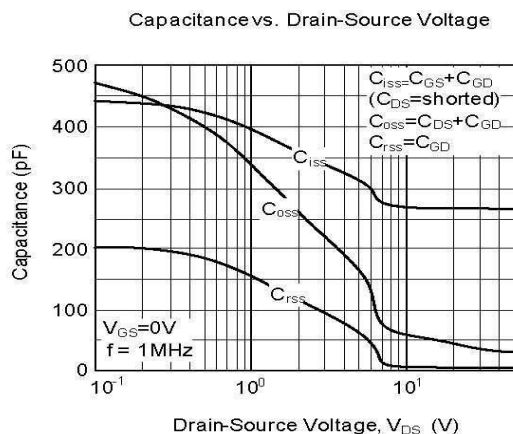
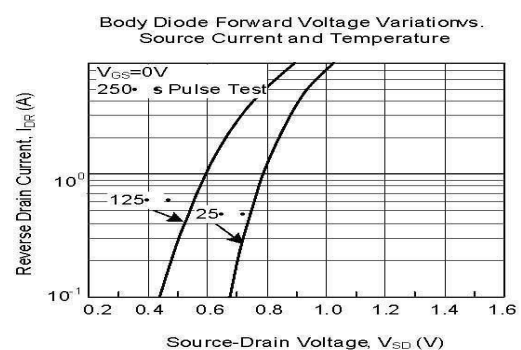
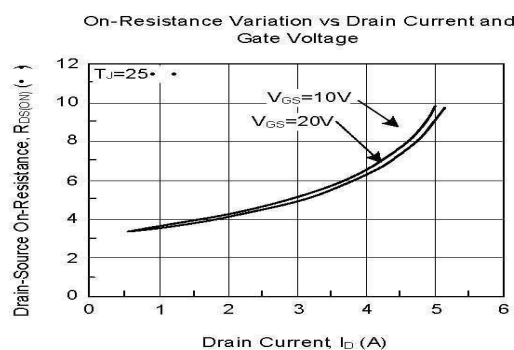
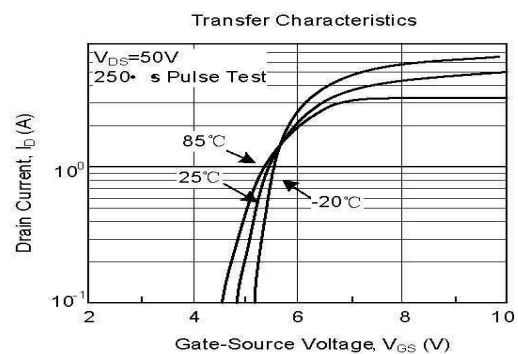
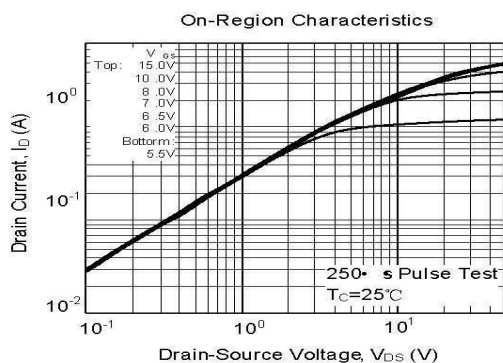
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
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Switching Characteristics						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=300V, I_D=2.4A, R_G=25\ \Omega$		10	30	ns
Rise Time	t_R			25	60	ns
Turn-Off Delay Time	$t_{D(OFF)}$			20	50	ns
Fall Time	t_F			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 $\leq 2\%$

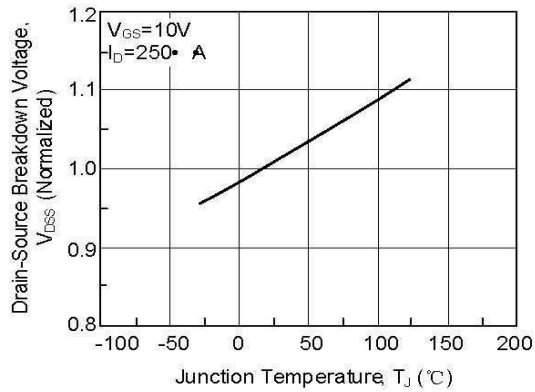
2. Essentially Independent of Operating Temperature

TYPICAL CHARACTERISTICS

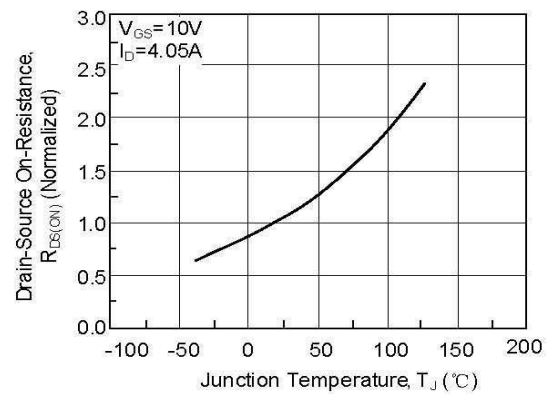


TYPICAL CHARACTERISTICS(Cont)

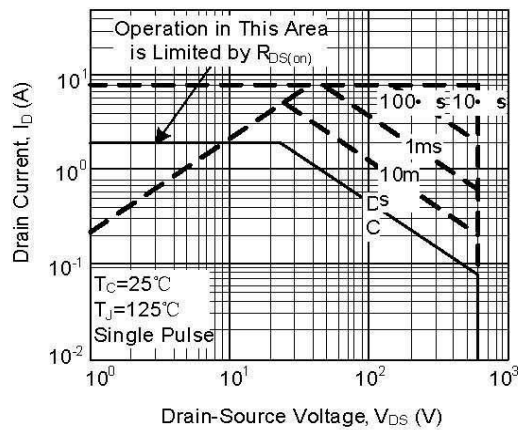
Breakdown Voltage vs Temperature



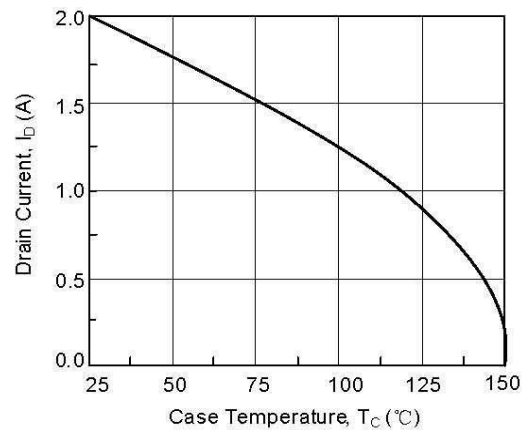
On-Resistance vs. Temperature



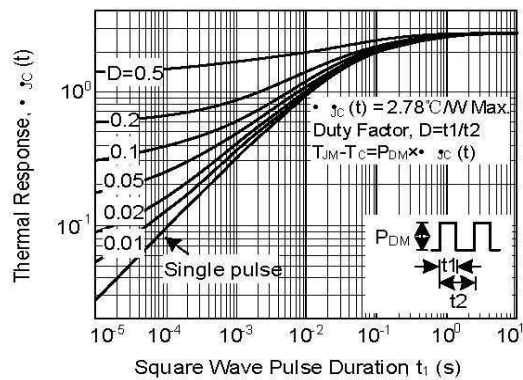
Max. Safe Operating Area

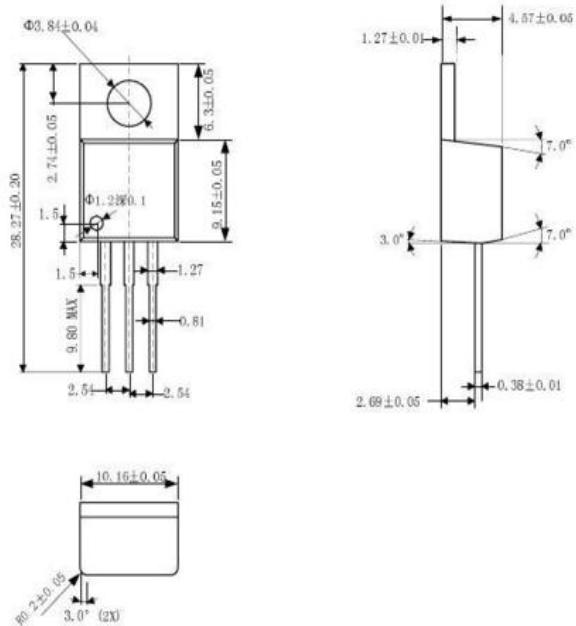


Max. Drain Current vs. Case Temperature

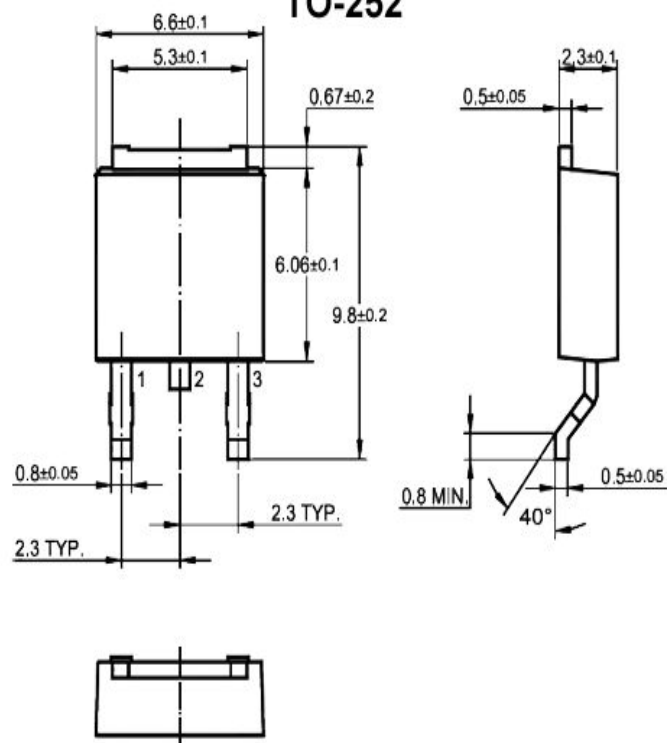


Thermal Response





TO-252



TO-251

