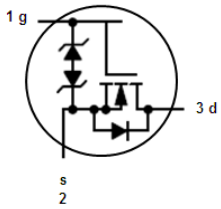
N-Channel 60V MOSFET

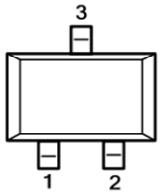
Features:

- Low on-resistance.
- Fast switching speed.
- Low voltage drive.
- Halogen free
- ESD protected 2000V

Application

- DC-DC
- Portable appliance
- Power management





Top View
SOT23S-3L

B_{VDSS}= 60V ,
$R_{DS(ON)}$< 2.3Ω@VGS= 10V
$R_{DS(ON)}$< 2.7Ω@VGS= 5V
I_D= 380mA

Absolute Maximum Ratings (TA=25℃ Unless Otherwise Noted)

Parameter		Symbol	2N7002K	Unit
		Marking	RK	
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (Note 1)	Ta=25℃	I_D	380	mA
	Ta=85℃		270	mA
Pulsed Drain Current (t_p = 10 us)		I_{DM}	1.5	A
Power Dissipation (Note 1)	Ta=25℃	P_D	420	mW
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	300	℃/W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to150	℃

Note：1. Surface mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces)

N-Channel 60V MOSFET

Electrical Characteristics (T_A =25℃ Unless Otherwise Specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250μA	60	--	--	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1	--	2.5	V
I_{GSS}	Gate-Body Leakage	V_{DS} =0V,V_{GS}=±20V	--	--	±10	uA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =60V,V_{GS}=0V	--	--	1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=0.5A	--	1.4	2.3	Ω
		V_{GS}=5V, I_D=0.05A	--	1.7	2.7	Ω
V_{SD}	Diode Forward Voltage (Note 2)	I_S= 115mA, V_{GS} =0V	--	--	1.2	V
g_{FS}	Forward Transconductance	I_D=0.2A, V_{SD}=5V	80	--	--	mS
Dynamic						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	--	25	50	pF
C_{oss}	Output Capacitance		--	5.5	25	
C_{rss}	Reverse Transfer Capacitance		--	3	5	
Qg	Total Gate Charge	V_{DS} =10V, V_{GS} = 4.5V, I_D = 0.5A	--	0.71	--	nC
Q_{GS}	Gate–to–Source Charge		--	0.6	--	
Q_{GD}	Gate–to–Drain Charge		--	0.16	--	
$t_{d(on)}$	Turn-On Delay Time (Note 3)	V_{DS} =10V, I_D = 0.5A, V_{EN} = 10V, R_G=25Ω	--	1.5	10	ns
t_r	Turn-On Rise Time		--	22	10	
$t_{d(off)}$	Turn-Off Delay Time		--	3	40	
t_f	Turn-On Fall Time		--	22	30	

Note： 2. Pulse Test: pulse width ≦ 300 us, duty cycle ≦ 2%

3. Switching characteristics are independent of operating junction temperatures

TYPICAL ELECTRICAL CHARACTERISTICS

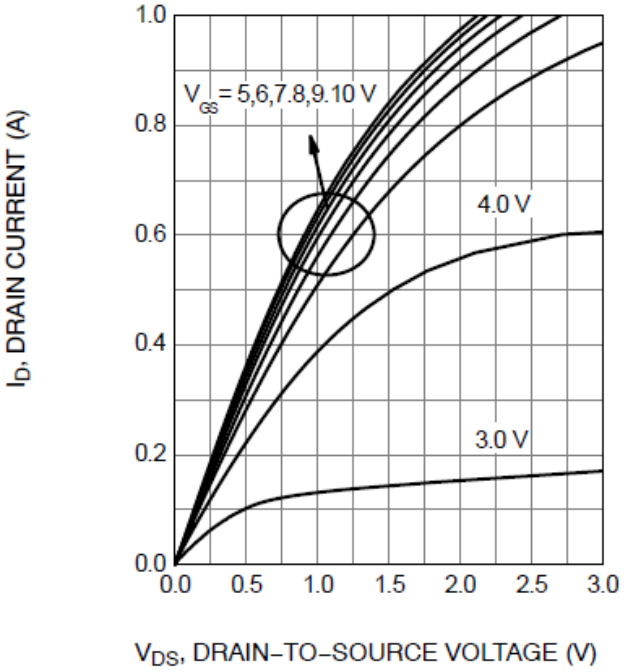


Figure 1. On–Region Characteristics

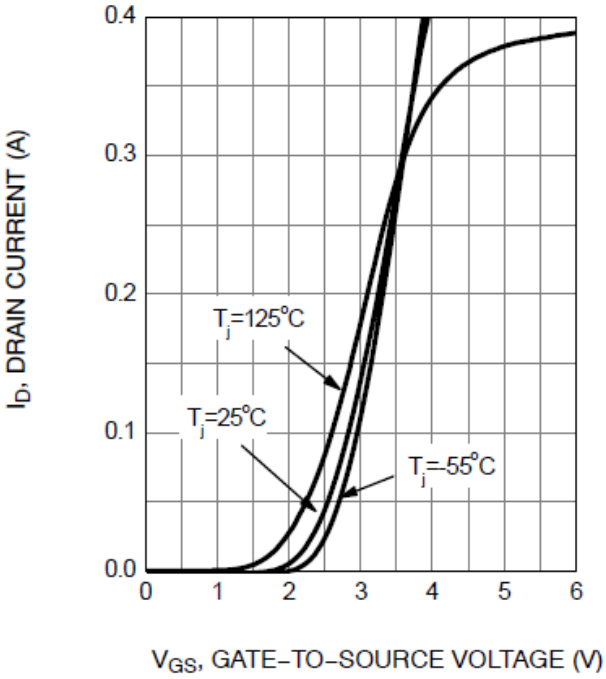


Figure 2. Transfer Characteristics

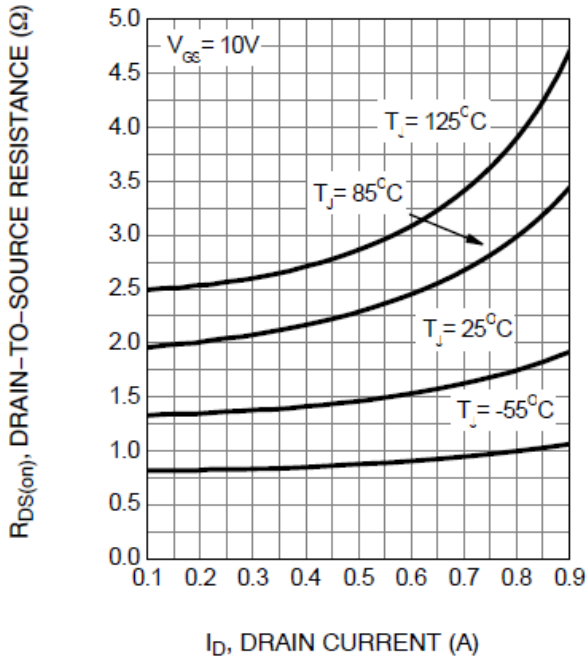


Figure 3. On–Resistance vs. Drain Current and Temperature

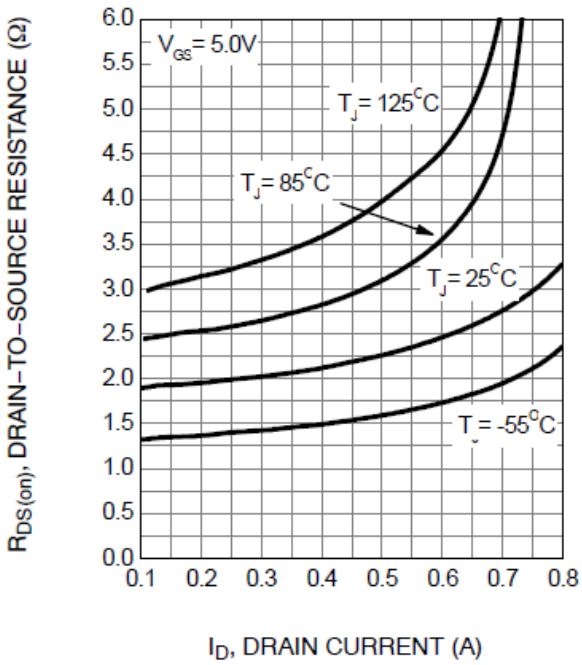


Figure 4. On–Resistance vs. Drain Current and Temperature

TYPICAL ELECTRICAL CHARACTERISTICS

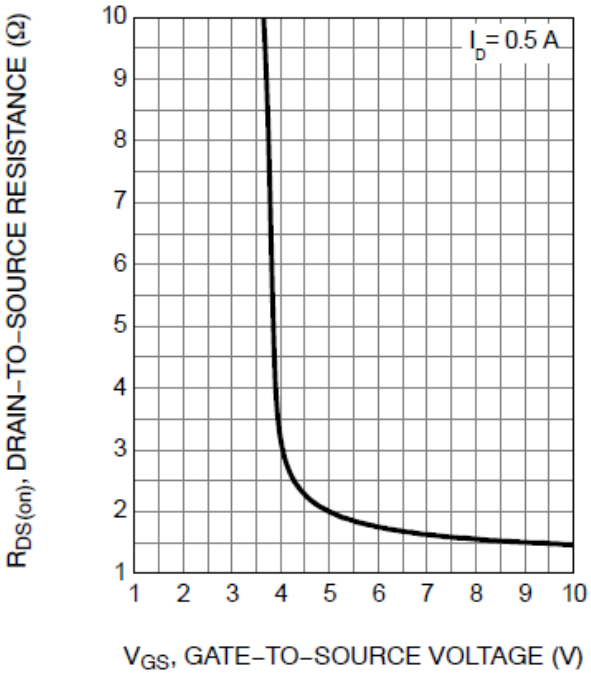


Figure 5. On–Resistance vs. Gate–to–Source Voltage

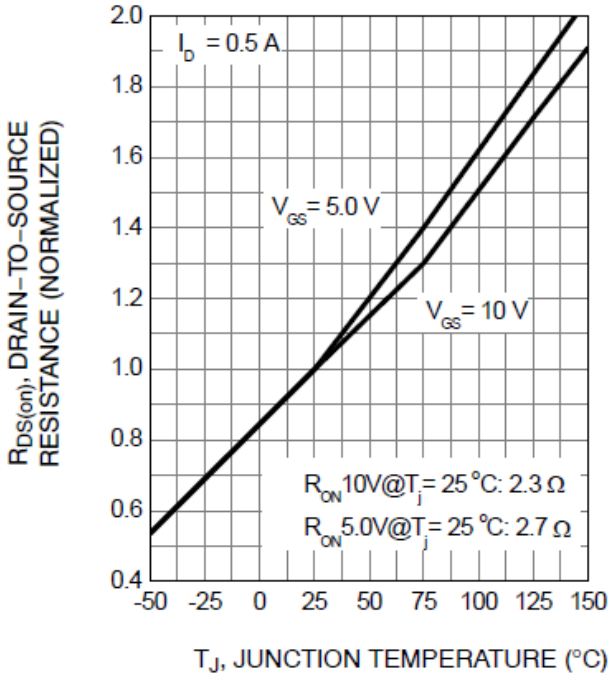


Figure 6. On–Resistance Variation with Temperature

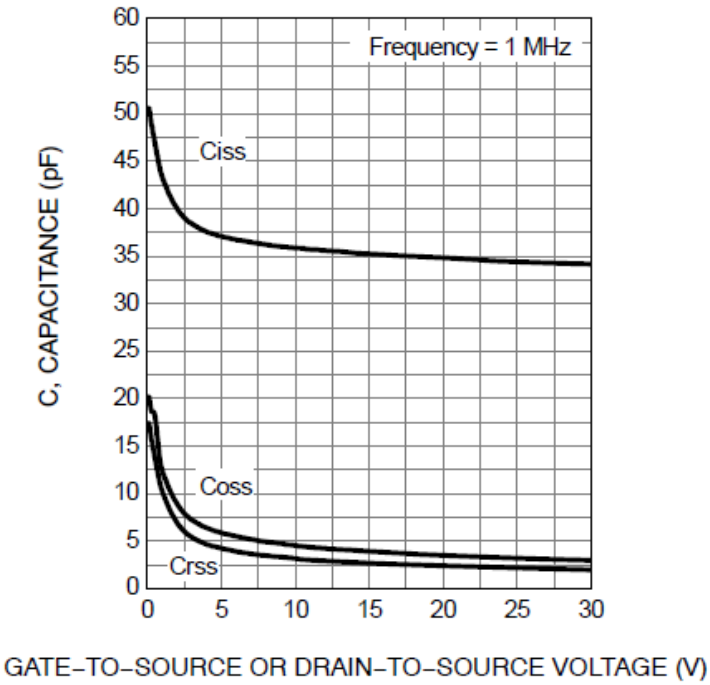


Figure 7. Capacitance Variation

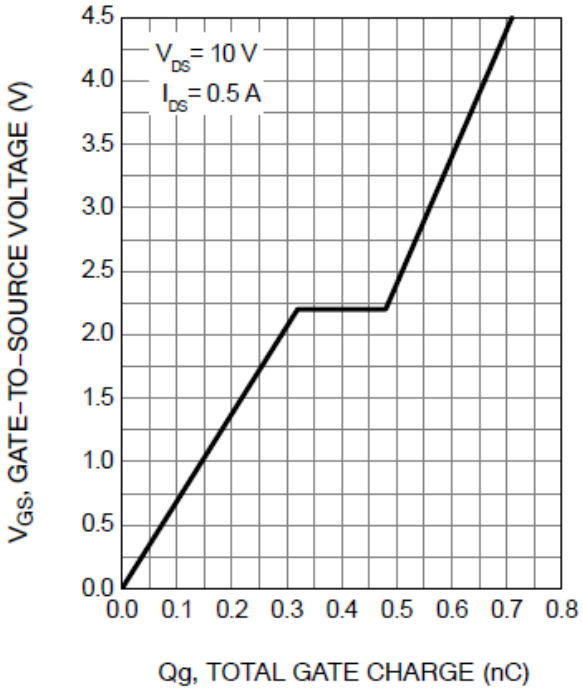


Figure 8. Gate–to–Source and Drain–to–Source Voltage vs. Total Charge

TYPICAL ELECTRICAL CHARACTERISTICS

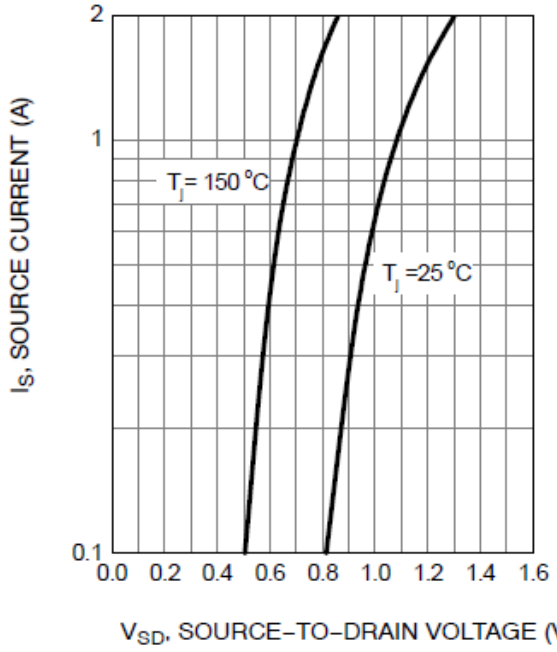


Figure 9. Diode Forward Voltage vs. Current

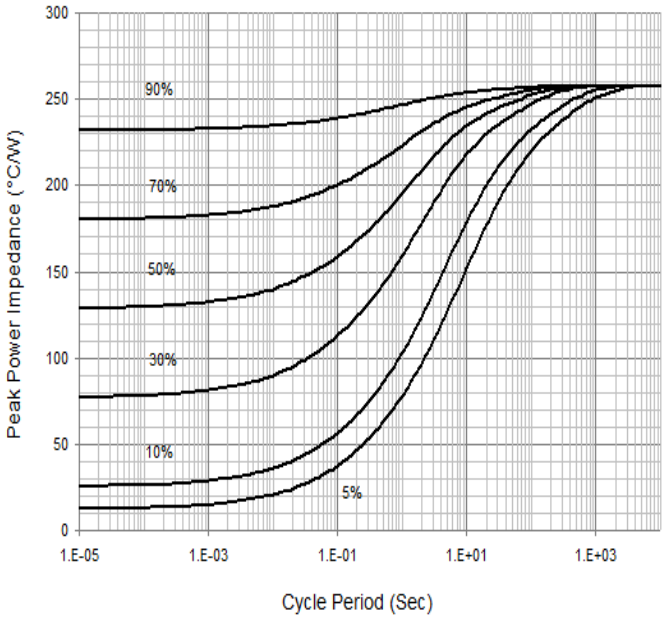


Figure 10. Thermal Transient Impedance

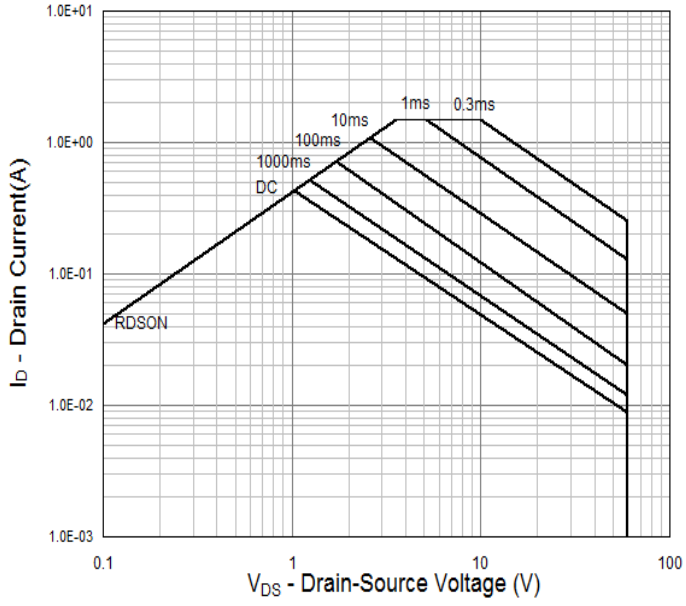
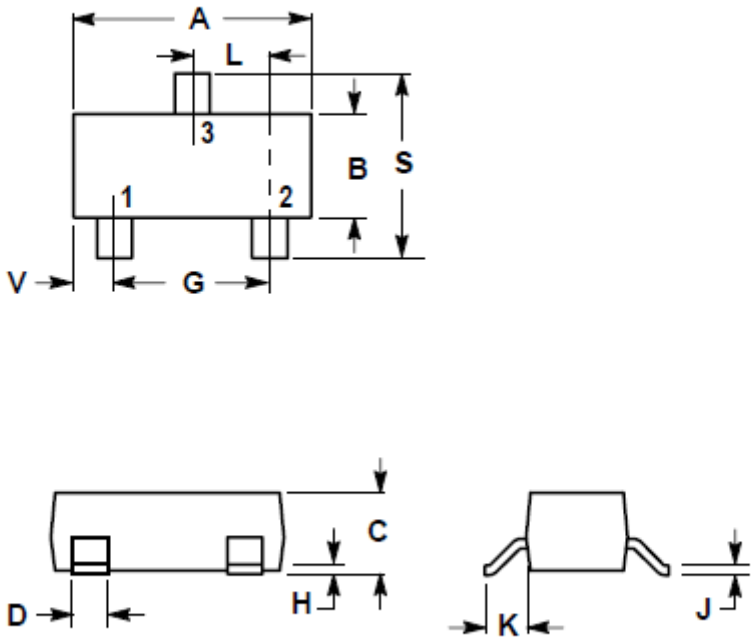


Figure 11. Safe Operation Area

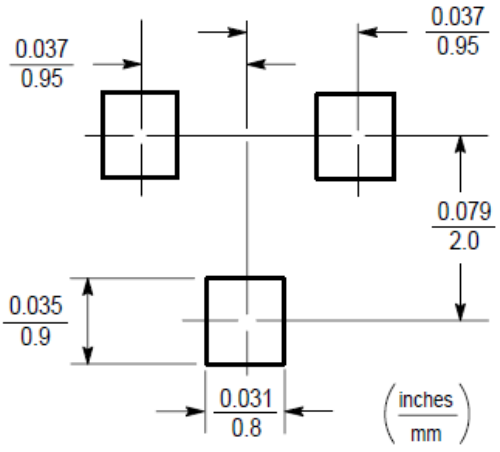
Package Dimension：SOT-23



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60



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