

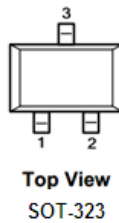
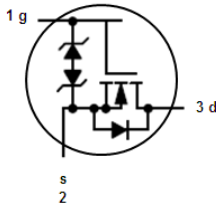
N-Channel 60V MOSFET

Features:

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

Application

- DC-DC
- Portable appliance
- Power management



$B_{VDSS} = 60V$,
$R_{DS(ON)} < 2.3\Omega @ V_{GS} = 10V$
$R_{DS(ON)} < 2.7\Omega @ V_{GS} = 5V$
$I_D = 380mA$

Absolute Maximum Ratings (TA=25°C Unless Otherwise Noted)

Parameter	Symbol	2N7002KW	Unit
	Marking	SK	
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Note 1)	I_D	Ta=25°C	380
		Ta=85°C	270
Pulsed Drain Current ($t_p = 10 \mu s$)	I_{DM}	1.5	A
Power Dissipation (Note 1)	P_D	420	mW
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	°C

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

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Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	--	--	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	--	2.5	V
I_{GSS}	Gate-Body Leakage	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	± 10	μA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	--	--	1	μA
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=0.5A$	--	--	2.3	Ω
		$V_{GS}=5V, I_D=0.05A$	--	--	2.7	Ω
V_{SD}	Diode Forward Voltage (Note 2)	$I_S = 115mA, V_{GS} = 0V$	--	--	1.4	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	--	pF
C_{oss}	Output Capacitance		--	5.5	--	
C_{rss}	Reverse Transfer Capacitance		--	3	--	
Q_g	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)	$V_{DS} = 10V, I_D = 0.5A,$ $V_{EN} = 10V, R_G = 25\Omega$	--	1.5	--	ns
t_r	Turn-On Rise Time		--	22	--	
$t_{d(off)}$	Turn-Off Delay Time		--	3	--	
t_f	Turn-On Fall Time		--	22	--	

Note : 2. Pulse Test: pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$

3. Switching characteristics are independent of operating junction temperatures

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TYPICAL ELECTRICAL CHARACTERISTICS

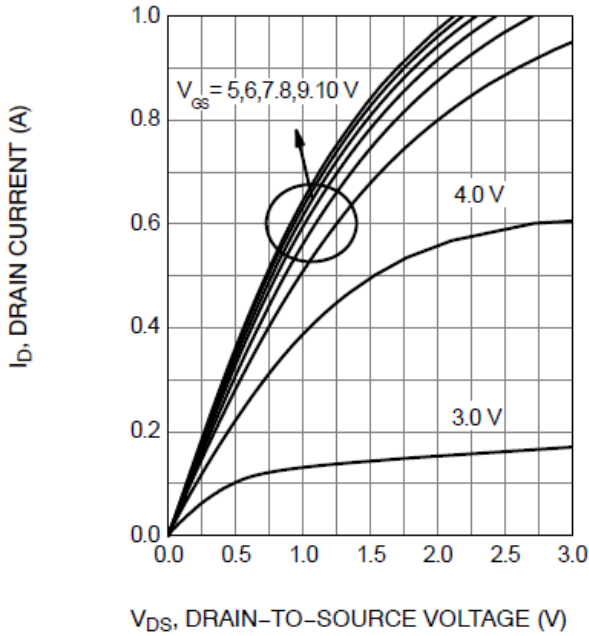


Figure 1. On-Region Characteristics



Figure 2. Transfer Characteristics

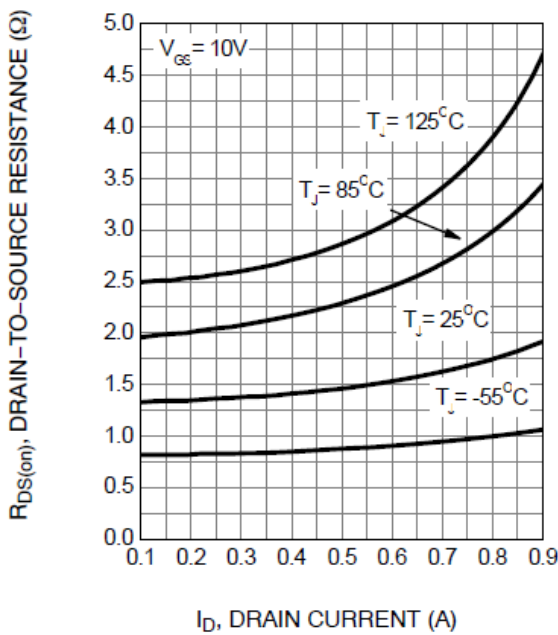


Figure 3. On-Resistance vs. Drain Current and Temperature

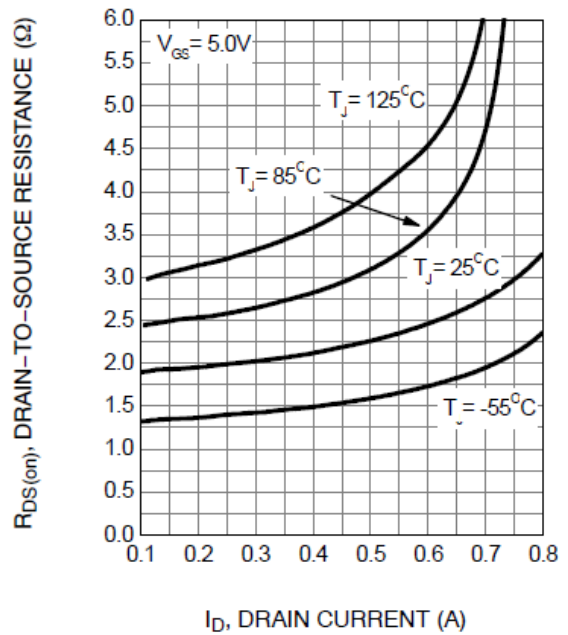


Figure 4. On-Resistance vs. Drain Current and Temperature

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TYPICAL ELECTRICAL CHARACTERISTICS

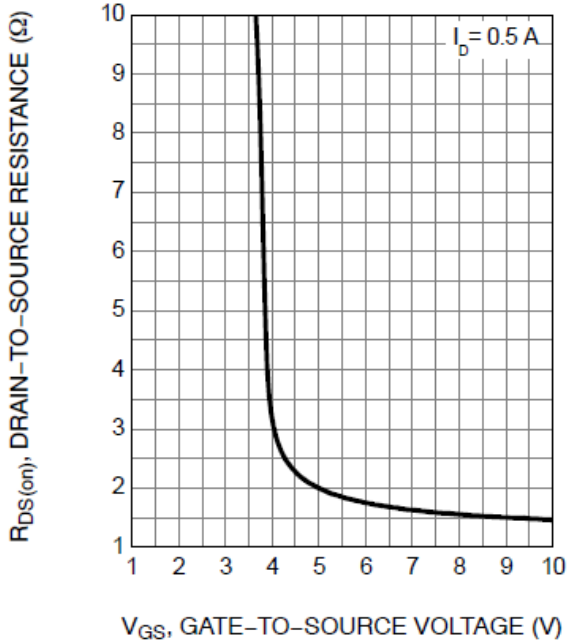


Figure 5. On-Resistance vs. Gate-to-Source Voltage

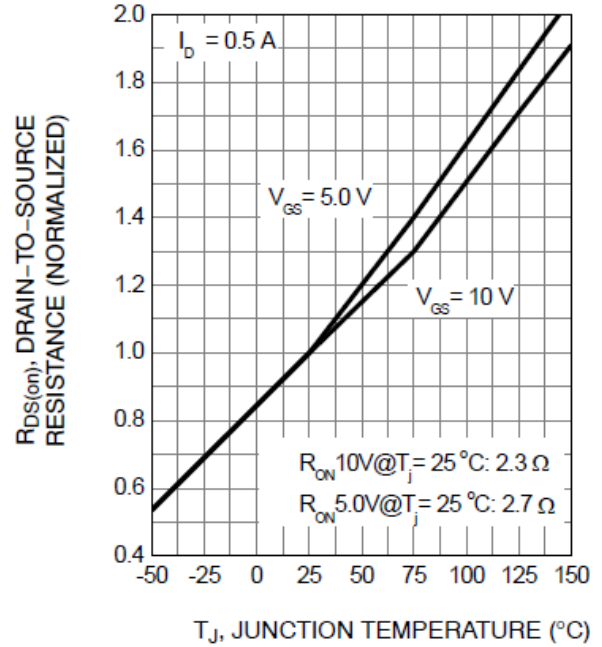


Figure 6. On-Resistance Variation with Temperature

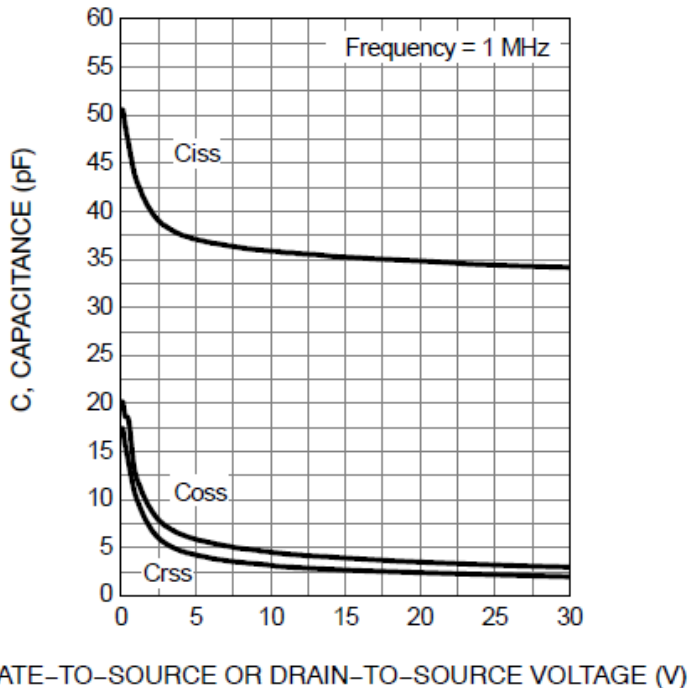


Figure 7. Capacitance Variation

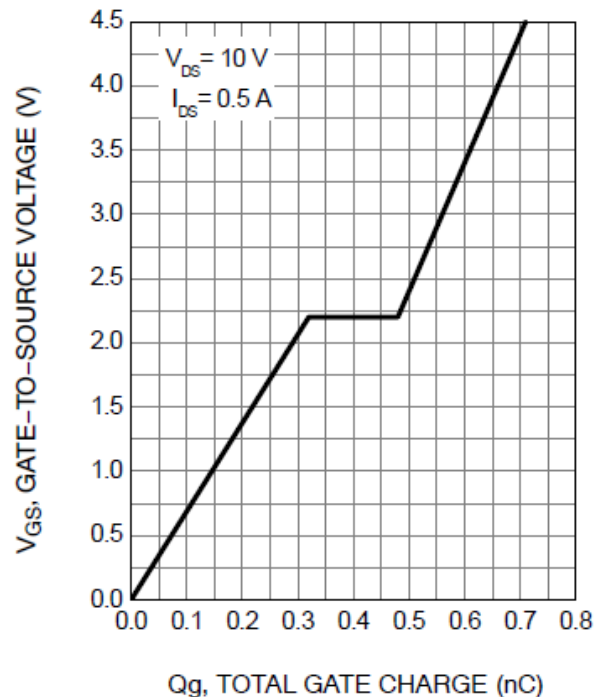
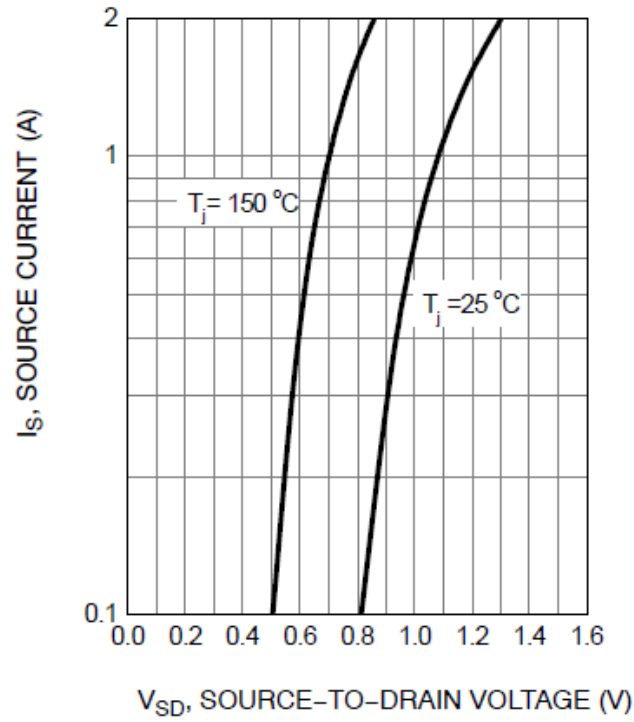


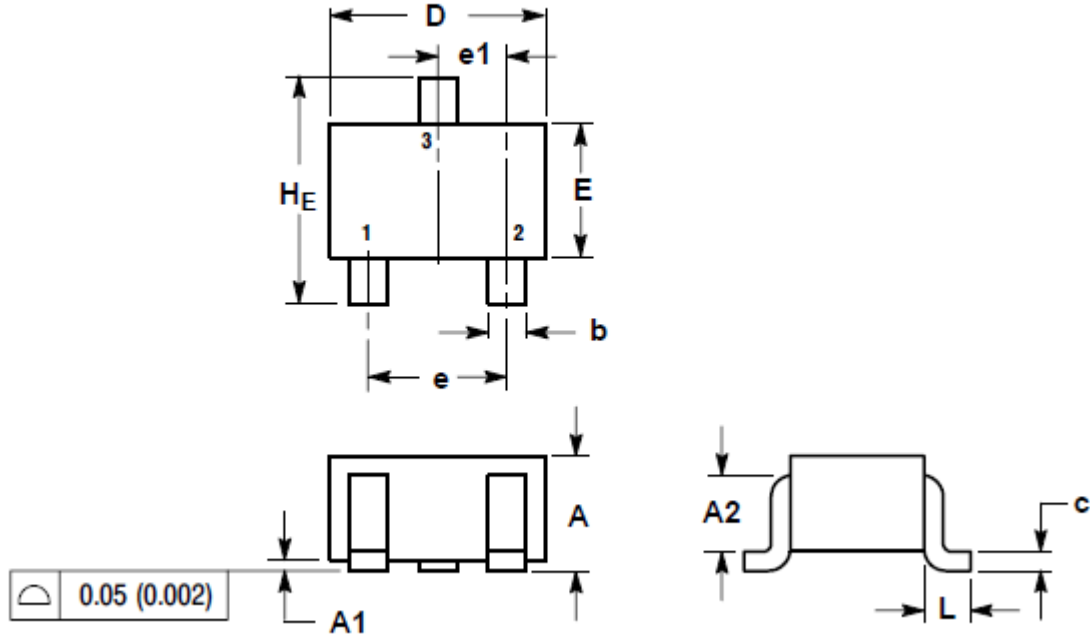
Figure 8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

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TYPICAL ELECTRICAL CHARACTERISTICS**Figure 9. Diode Forward Voltage vs. Current**

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Package Dimension : SOT-323

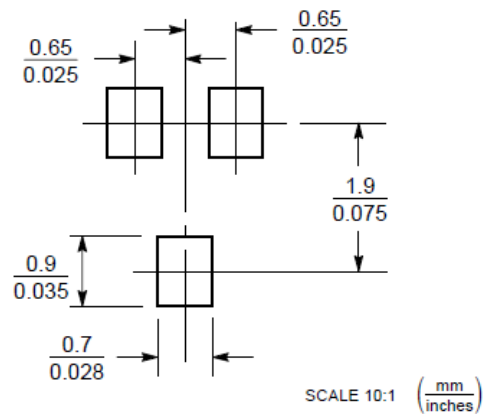


NOTES:

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

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.7 REF			0.028 REF		
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.10	2.20	0.071	0.083	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	0.047	0.051	0.055
e1	0.65 BSC			0.026 BSC		
L	0.425 REF			0.017 REF		
HE	2.00	2.10	2.40	0.079	0.083	0.095

SOLDERING FOOTPRINT*



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