

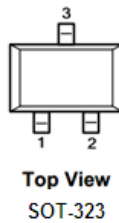
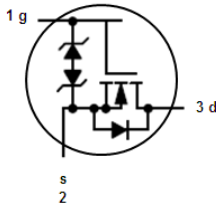
## N-Channel 60V MOSFET

### 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 (T<sub>A</sub>=25°C Unless Otherwise Noted)

Parameter	Symbol	2N7002KW	Unit
	Marking	SK	
Drain-Source Voltage	V <sub>DSS</sub>	60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current (Note 1)	I <sub>D</sub>	Ta=25°C	380
		Ta=85°C	270
Pulsed Drain Current ( t <sub>p</sub> = 10 us)	I <sub>DM</sub>	1.5	A
Power Dissipation (Note 1)	P <sub>D</sub>	420	mW
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-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)

**N-Channel 60V MOSFET**
**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	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	$\pm 10$	$\mu A$
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	--	--	1	$\mu A$
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=0.5A$	--	--	2.3	$\Omega$
		$V_{GS}=5V, I_D=0.05A$	--	--	2.7	$\Omega$
$V_{SD}$	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

N-Channel 60V MOSFET

TYPICAL ELECTRICAL CHARACTERISTICS

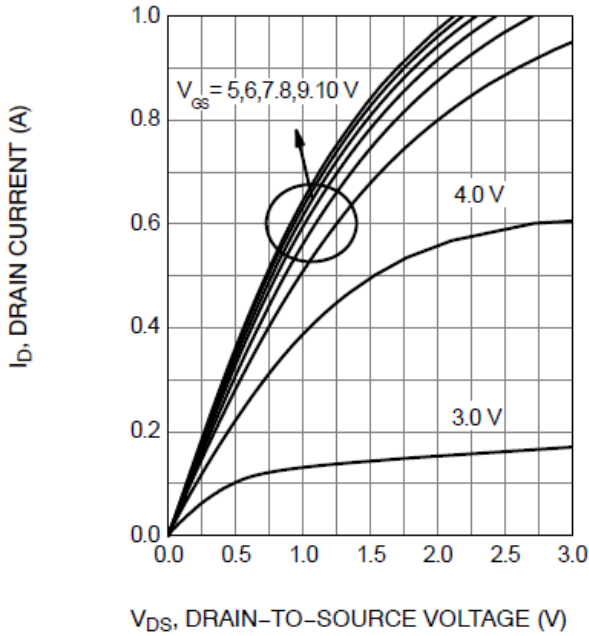


Figure 1. On-Region Characteristics



Figure 2. Transfer Characteristics

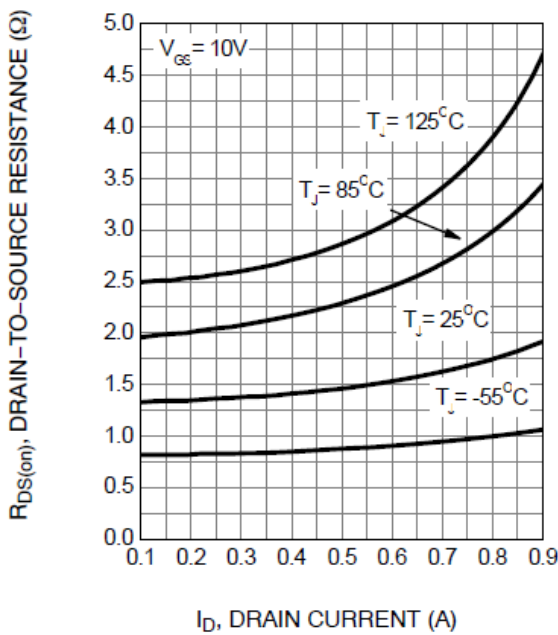


Figure 3. On-Resistance vs. Drain Current and Temperature

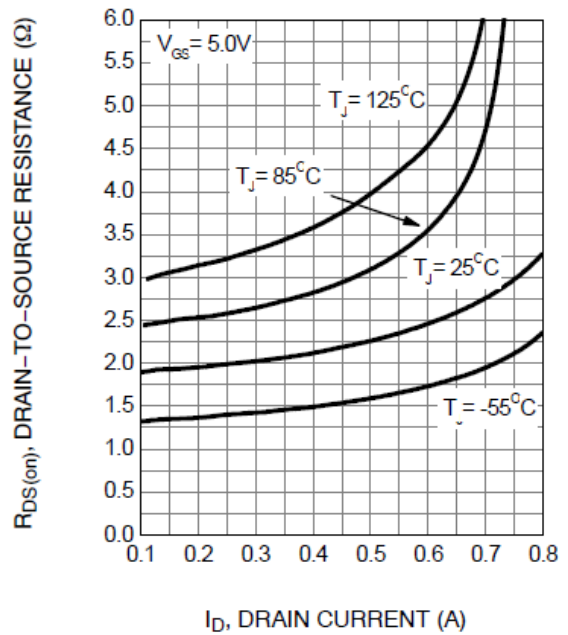


Figure 4. On-Resistance vs. Drain Current and Temperature

N-Channel 60V MOSFET

TYPICAL ELECTRICAL CHARACTERISTICS

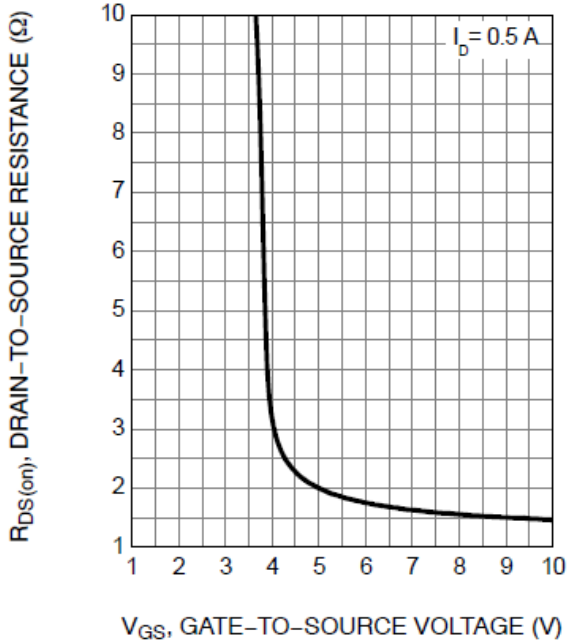


Figure 5. On-Resistance vs. Gate-to-Source Voltage

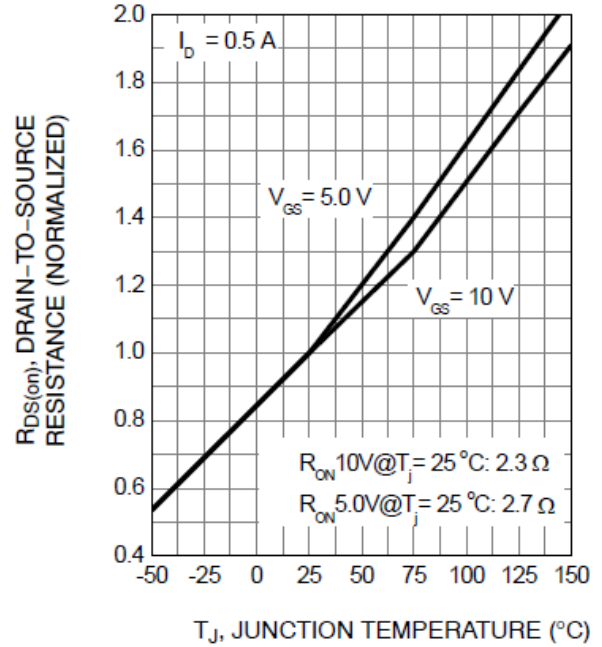


Figure 6. On-Resistance Variation with Temperature

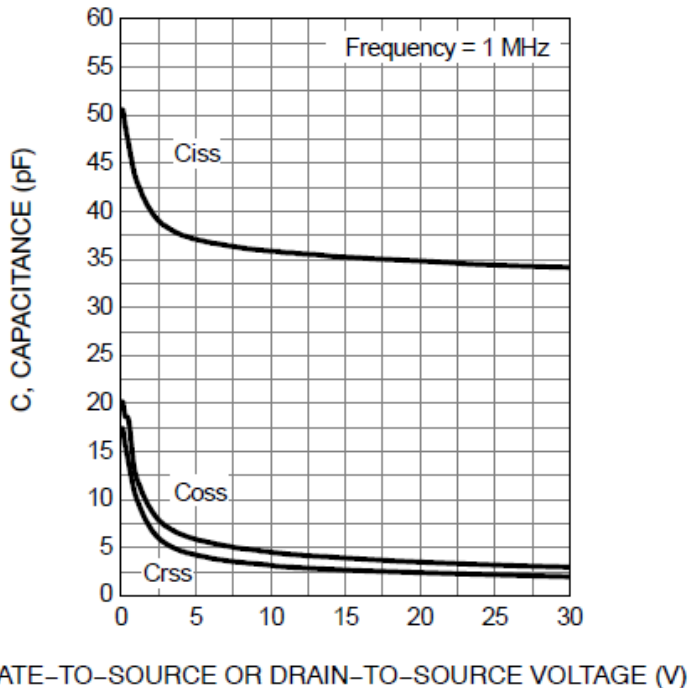


Figure 7. Capacitance Variation

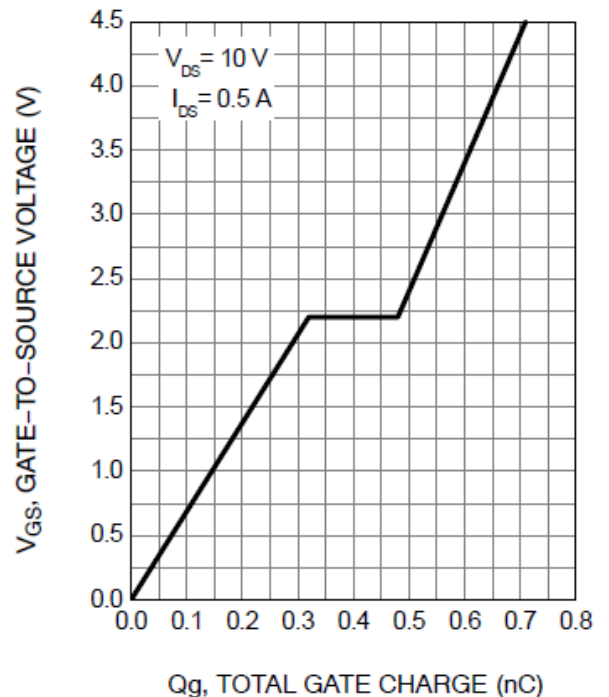
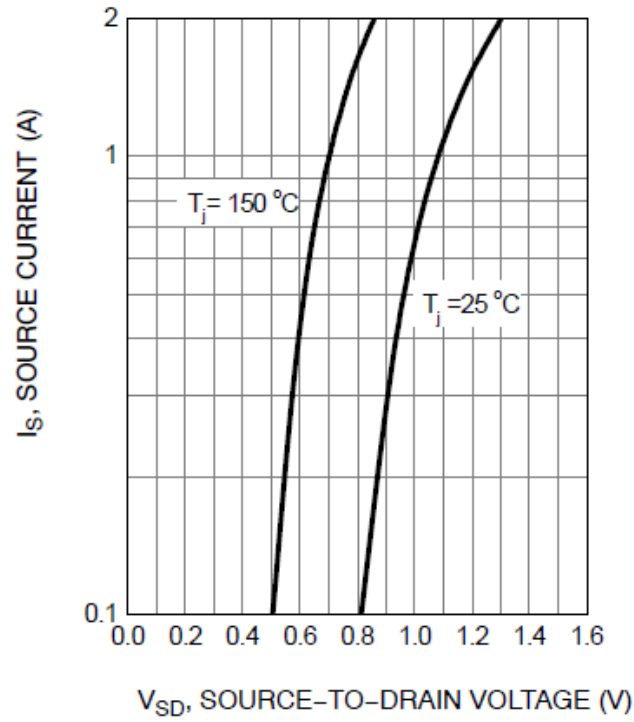


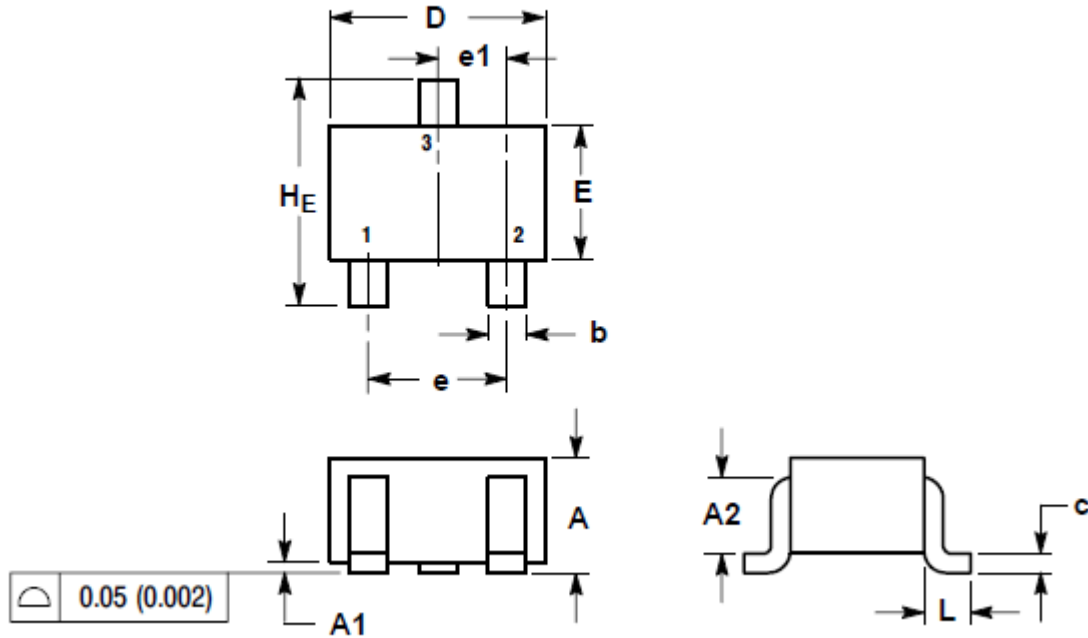
Figure 8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

N-Channel 60V MOSFET

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

N-Channel 60V MOSFET

Package Dimension : SOT-323

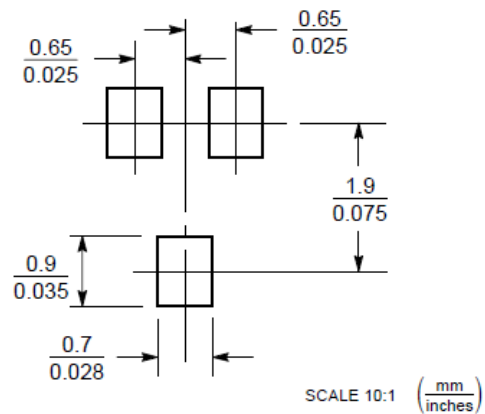


NOTES:

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\*



## **Important Notice and Disclaimer**

LSC reserves the right to make changes to this document and its products and specifications at any time without notice. Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

LSC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does LSC assume any liability for application assistance or customer product design. LSC does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of LSC.

LSC products are not authorized for use as critical components in life support devices or systems without express written approval of LSC.