

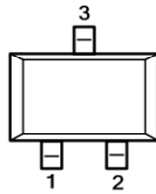
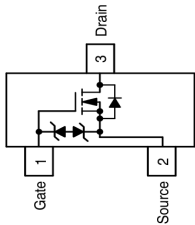
## N-Channel 60V MOSFET

### Features:

- Low on-resistance.
- Fast switching speed.
- Low voltage drive.
- Halogen free
- ESD protected 1000V

### Application

- DC-DC
- Portable appliance
- Power management



Top View  
SOT23S-3L

$B_{VDSS} = 60V$  ,  
 $R_{DS(ON)} < 7.5\Omega @ V_{GS} = 10V$   
 $I_D = 115mA$

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

Parameter	Symbol	2N7002AK	Unit	
	Marking	702		
Drain-Source Voltage	V <sub>DSS</sub>	60	V	
Gate-Source Voltage	V <sub>GS</sub>	±20	V	
Drain Current	Continuous <sup>(1)</sup>	I <sub>D</sub>	115	mA
	Pulsed <sup>(2)</sup>	I <sub>DM</sub>	800	mA
Power Dissipation FR-5 Board <sup>(3)</sup>	T <sub>a</sub> =25°C	P <sub>D</sub>	225	mW
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	556	°C/W	
Power Dissipation alumina Substrate <sup>(4)</sup>	T <sub>a</sub> =25°C	P <sub>D</sub>	300	mW
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	417	°C/W	
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	300	°C/W	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150	°C	

Note :

- (1) The Power Dissipation of the package may result in a lower continuous drain current.
- (2) Pulse test: Pulse Width ≤ 300us, Duty cycle ≤ 2%
- (3) FR-5= 1x0.75x0.062 inch
- (4) Alumina=0.4x0.3x0.025 inch 99.5% alumina.

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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	1.6	2	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	$V_{GS}=10V, I_D=0.5A$	--	2.5	7.5	$\Omega$
		$V_{GS}=5V, I_D=0.05A$	--	3	7.5	$\Omega$
$V_{SD}$	Diode Forward voltage	$I_S=115mA, V_{GS}=0V$	--	--	1.5	V
$g_{FS}$	Forward Transconductance	$I_D=200mA, V_{DS}=2V$	80	--	--	mS
$I_S$	Maximum Diode Forward Current		--	--	115	mA
Dynamic						
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	--	17	--	pF
$C_{oss}$	Output Capacitance		--	15	--	
$C_{rss}$	Reverse Transfer Capacitance		--	5	--	
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=25V, I_D=0.5A,$ $V_{GS}=10V, R_L=50\Omega, R_{GS}=25\Omega$	--	7	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	30	--	
$Q_g$	Total Gate Charge	$V_{DS}=48V, I_D=0.5A, V_{GS}=10V$	--	1.22	--	nC

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

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TYPICAL ELECTRICAL CHARACTERISTICS

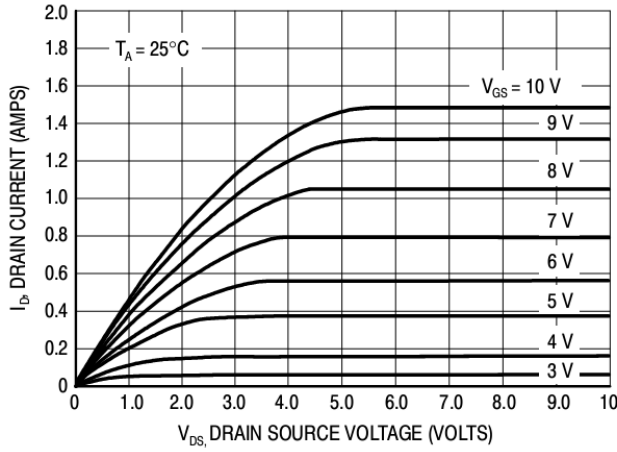


Figure 1. Ohmic Region

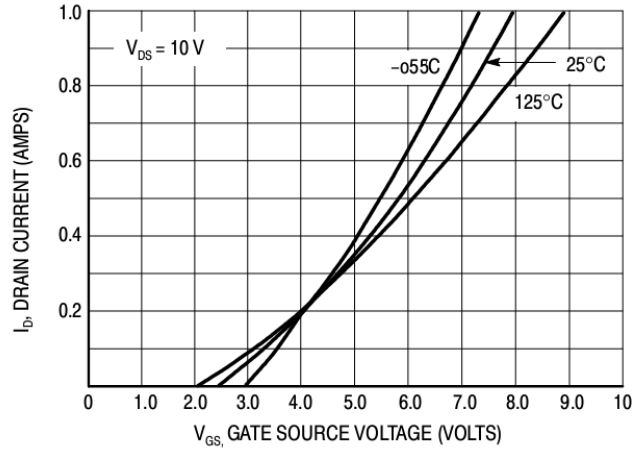


Figure 2. Transfer Characteristics

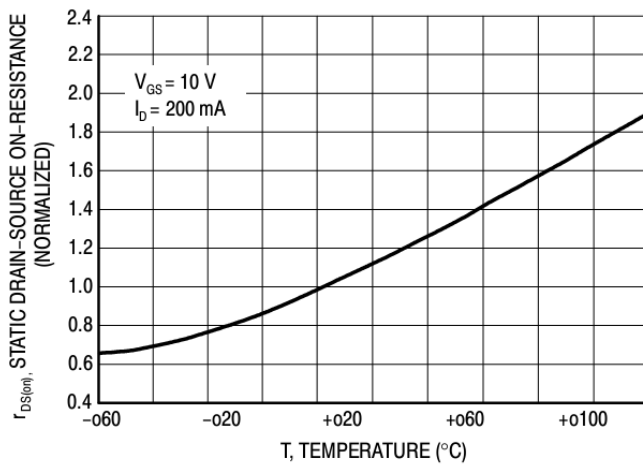


Figure 3. Temperature versus Static Drain-Source On-Resistance

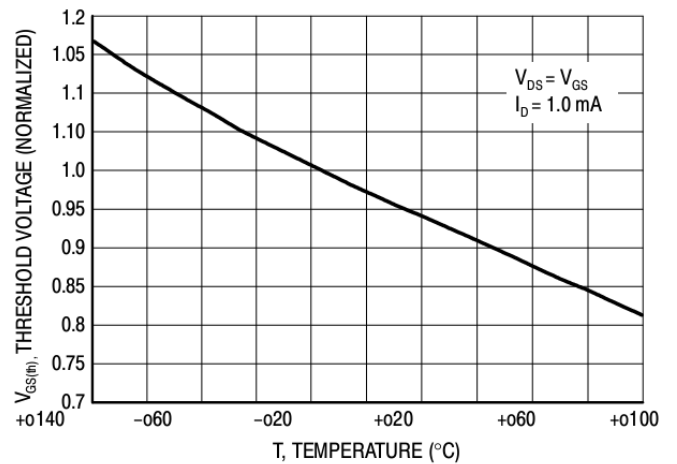
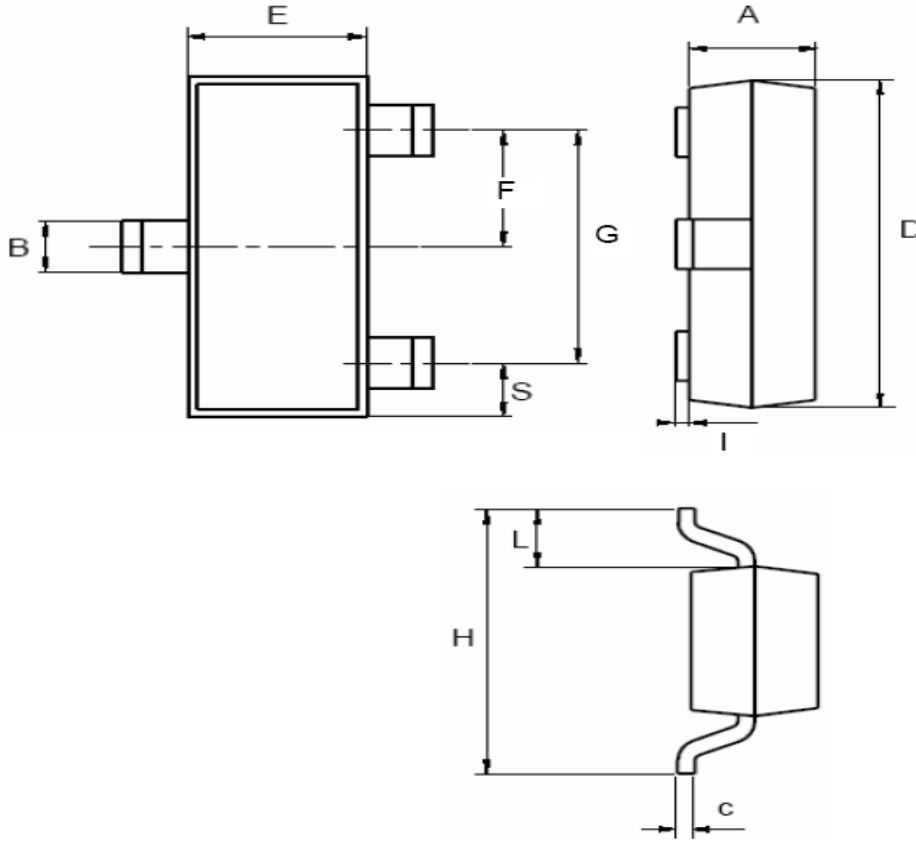


Figure 4. Temperature versus Gate Threshold Voltage

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SOT-23		
DIM.	MIN.	MAX.
A	0.89	1.40
B	0.30	0.51
C	0.085	0.18
D	2.75	3.04
E	1.20	1.60
F	0.85	1.05
G	1.70	2.10
H	2.10	2.75
I	0.0	0.1
L	0.60 typ.	
S	0.35	0.65
All Dimensions in millimeter		

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