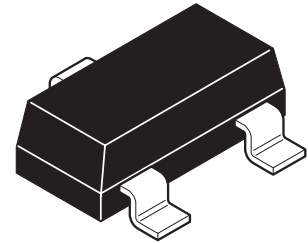


# 2N7002

## 60V SOT23 N-channel enhancement mode MOSFET

### Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
60	7.5 @ $V_{GS} = 10V$	0.5
	7.5 @ $V_{GS} = 5V$	0.05



### Description

A small signal MOSFET for general purpose switching applications.

### Features

- Fast switching speed
- Low gate drive capability
- SOT23 package

### Applications

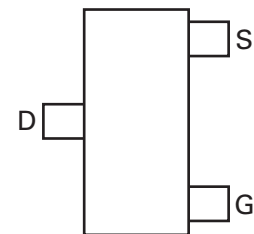
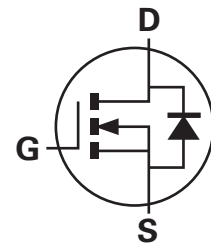
- General switching applications

### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
2N7002	7	8	3,000

### Device marking

702



Top view

## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Drain-source voltage	$V_{DS}$	60	V
Continuous drain current at $T_{amb}=25^{\circ}C$	$I_D$	115	mA
Pulsed drain current	$I_{DM}$	800	mA
Gate-source voltage	$V_{GS}$	$\pm 40$	V
Power dissipation at $T_{amb} = 25^{\circ}C$	$P_{tot}$	330	mW
Operating and storage temperature range	$T_j, T_{stg}$	-55 to +150	$^{\circ}C$

## Electrical characteristics (at $T_{amb} = 25^{\circ}C$ unless otherwise stated)

Parameter	Symbol	Min.	Max.	Unit	Conditions
Drain-source breakdown voltage	$BV_{DSS}$	60		V	$I_D = 10\mu A, V_{GS} = 0V$
Gate-source threshold voltage	$V_{GS(th)}$	1	2.5	V	$I_D = 250\mu A, V_{DS} = V_{GS}$
Gate-body leakage	$I_{GSS}$		10	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
Zero gate voltage drain current	$I_{DSS}$		1 500	$\mu A$ $\mu A$	$V_{DS} = 48V, V_{GS} = 0V$ $V_{DS} = 48V, V_{GS} = 0V, T = 125^{\circ}C$
On-state drain current <sup>(a)</sup>	$I_{D(on)}$	500		mA	$V_{DS} = 25V, V_{GS} = 10V$
Static drain-source on-state voltage <sup>(a)</sup>	$V_{DS(on)}$		3.75 375	V mV	$V_{GS} = 10V, I_D = 500mA$ $V_{GS} = 5V, I_D = 50mA$
Static drain-source on-state resistance <sup>(a)</sup>	$R_{DS(on)}$		7.5 7.5	$\Omega$ $\Omega$	$V_{GS} = 10V, I_D = 500mA$ $V_{GS} = 5V, I_D = 50mA$
Forward transconductance <sup>(a)(b)</sup>	$g_{fs}$	80		mS	$V_{DS} = 25V, I_D = 500mA$
Input capacitance <sup>(b)</sup>	$C_{iss}$		50	pF	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$
Common source output capacitance <sup>(b)</sup>	$C_{oss}$		25	pF	
Reverse transfer capacitance <sup>(b)</sup>	$C_{rss}$		5	pF	
Turn-on time <sup>(b)(c)</sup>	$t_{(on)}$		20	ns	$V_{DD} \approx 30V, I_D = 200mA,$ $R_g = 25\Omega, R_L = 150\Omega$
Turn-off time <sup>(b)(c)</sup>	$t_{(off)}$		20	ns	

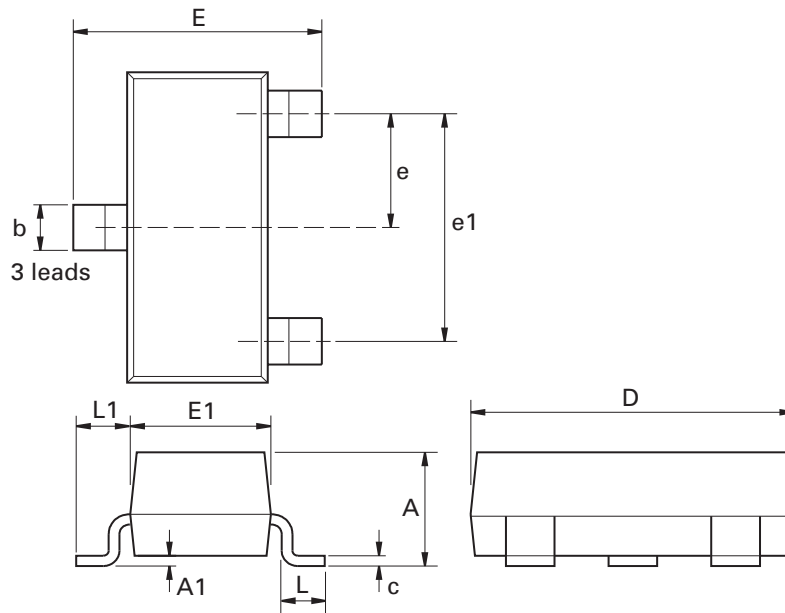
### NOTES:

(a) Measured under pulsed conditions. Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$ .

(b) Sample test.

(c) Switching times measured with  $50\Omega$  source impedance and  $< 5ns$  rise time on a pulse generator  
Spice parameter data is available upon request for this device.

## SOT23 Package outline



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
c	0.085	0.20	0.003	0.008	L	0.25	0.60	0.0098	0.0236
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.037 NOM		-	-	-	-	-

**Note:** Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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"Obsolete"	Production has been discontinued

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