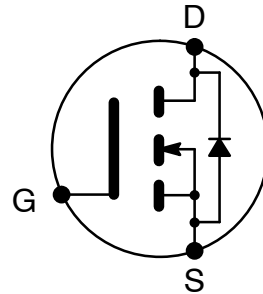




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2N7002

N-Ch, Enhancement Mode Field Effect Transistor SOT-23 Type Package



Features:

- High Density Cell Design for Low $R_{DS(ON)}$
- Voltage Controlled Small Signal Switch
- Rugged and Reliable
- High Saturation Current Capability

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Drain-Source Voltage, V_{DSS}	60V
Drain-Gate Voltage ($R_{GS} \leq 1\text{M}\Omega$), V_{DGR}	60V
Gate-Source Voltage, V_{GS}	
Continuous	$\pm 20\text{V}$
Non-Repetitive ($t_p \leq 50\mu\text{s}$)	$\pm 40\text{V}$
Maximum Drain Current, I_D	
Continuous	115mA
Pulsed	800mA
Maximum Power Dissipation, P_D	200mW
Derate above 25°C	1.6mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient, $R_{th(JA)}$	625 $^\circ\text{C}/\text{W}$
Maximum Lead Temperature (During Soldering, 1/16" from Case, 10sec), T_L	$+300^\circ\text{C}$

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{V}, I_D = 10\mu\text{A}$	60	-	-	V
Zero-Gate-Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{V}, V_{GS} = 0$		-	1.0	μA
			$T_J = +125^\circ\text{C}$	-	0.5	mA
Gate-Body Leakage Current, Forward	I_{GSSF}	$V_{GSF} = 20\text{V}, V_{DS} = 0$	-	-	100	nA
Gate-Body Leakage Current, Reverse	I_{GSSR}	$V_{GSF} = -20\text{V}, V_{DS} = 0$	-	-	-100	nA

Electrical Characteristics (Cont'd): ($T_A = +25^\circ\text{C}$ unless otherwise specified)

ON Characteristics (Note 1)							
Gate Threshold Voltage	$V_{GS(th)}$	$I_D = 250\mu\text{A}, V_{DS} = V_{GS}$	1.0	2.1	2.5	V	
Static Drain-Source ON Resistance	$r_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 500\text{mA}$		-	1.2	7.5	Ω
			$T_J = +100^\circ\text{C}$	-	1.7	13.5	Ω
		$V_{GS} = 5\text{V}, I_D = 50\text{mA}$		-	1.7	7.5	Ω
			$T_J = +100^\circ\text{C}$	-	2.4	13.5	Ω
Drain-Source ON-Voltage	$V_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 500\text{mA}$	-	0.6	3.75	V	
		$V_{GS} = 5\text{V}, I_D = 50\text{mA}$	-	0.09	1.5	V	
ON-State Drain Current	$I_{D(on)}$	$V_{GS} = 10\text{V}, V_{DS} \geq 2 V_{DS(on)}$	500	2700	-	mA	
Forward Transconductance	g_{FS}	$V_{DS} \geq 2 V_{DS(on)}, I_D = 200\text{mA}$	80	320	-	mS	
Dynamic Characteristics							
Input Capacitance	C_{iss}	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	-	20	50	pF	
Reverse Transfer Capacitance	C_{oss}		-	11	25	pF	
Output Capacitance	C_{rss}		-	4	5	pF	
Turn-On Time	t_{on}	$V_{DD} = 30\text{V}, R_L = 150\Omega, I_D = 200\text{mA}, V_{GS} = 10\text{V}, R_{GEN} = 25\Omega$	-	-	20	ns	
Turn-Off Time	t_{off}		-	-	20	ns	
Drain-Source Diode Characteristics and Maximum Ratings							
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	115	mA	
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	0.8	A	
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}, I_S = 115\text{mA}, \text{Note 1}$	-	0.88	1.5	V	

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

