



TECHNICAL SPECIFICATIONS OF N-CHANNEL SMALL SIGNAL MOSFET

**Description**

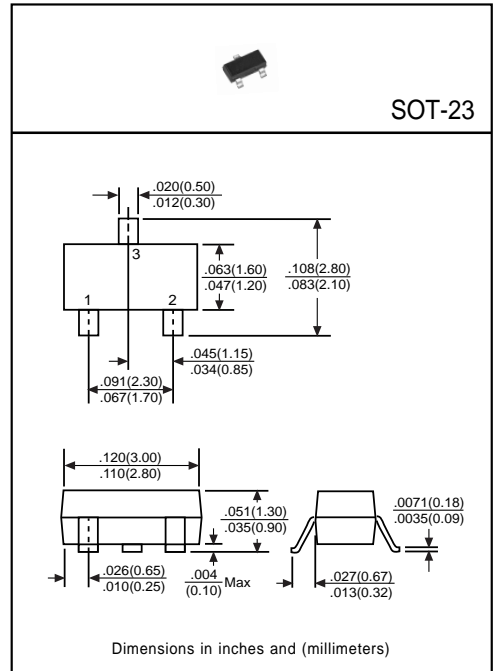
Designed for low voltage and low current applications such as small servo motor control, power MOSFET gate drivers, and other switching applications.

**Pinning**

- 1 = Gate
- 2 = Source
- 3 = Drain

**Absolute Maximum Ratings**( $T_A=25^{\circ}\text{C}$ )

Characteristic	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Drain-Gate Voltage ( $R_{GS}=1\text{M}\Omega$ )	$V_{DGR}$	60	V
Gate-Source Voltage (Continuous)	$V_{GS}$	$\pm 20$	V
Drain Current (Continuous, $T_c=25^{\circ}\text{C}$ ) <sup>(1)</sup>	$I_D$	115	mA
Drain Current (Pulsed) <sup>(2)</sup>	$I_{DM}$	800	mA
Total Power Dissipation Derate above $25^{\circ}\text{C}$	$P_D$	225 1.8	mW mW/ $^{\circ}\text{C}$
Operating Junction Temperature	$T_J$	-55 to +150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 to +150	$^{\circ}\text{C}$
Maximum Lead Temperature, for 10 Seconds Soldering Purpose	$T_L$	260	$^{\circ}\text{C}$



**Electrical Characteristics**

(Ratings at  $25^{\circ}\text{C}$  ambient temperature unless otherwise specified)

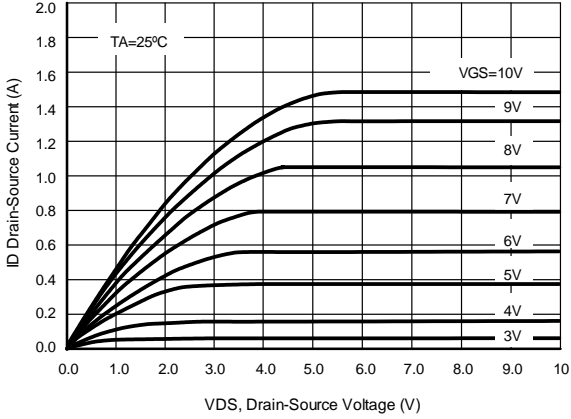
Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	60	-	-	V	$I_D=10\mu\text{A}$ , $V_{GS}=0$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=60\text{V}$ , $V_{GS}=0$
Gate-Source Forward Leakage Current	$I_{GSSF}$	-	-	100	nA	$V_{GSF}=20\text{V}$ , $V_{DS}=0$
Gate-Source Reverse Leakage Current	$I_{GSSR}$	-	-	-100	nA	$V_{GSR}=-20\text{V}$ , $V_{DS}=0$
Gate Threshold Voltage <sup>(2)</sup>	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=V_{GS}$ , $I_D=0.25\text{mA}$
On-State Drain Current <sup>(2)</sup>	$I_{D(on)}$	500	-	-	mA	$V_{DS}>2V_{DS(on)}$ , $V_{GS}=10\text{V}$
Static Drain-Source On-State Voltage <sup>(2)</sup>	$V_{DS(on)1}$	-	-	1.5	V	$I_D=50\text{mA}$ , $V_{GS}=5\text{V}$
	$V_{DS(on)2}$	-	-	3.75	V	$I_D=500\text{mA}$ , $V_{GS}=10\text{V}$
Static Drain-Source On-State Resistance <sup>(2)</sup>	$R_{DS(on)1}$	-	-	7.5	$\Omega$	$I_D=50\text{mA}$ , $V_{GS}=5\text{V}$
	$R_{DS(on)2}$	-	-	7.5	$\Omega$	$I_D=500\text{mA}$ , $V_{GS}=10\text{V}$
Forward Transconductance <sup>(2)</sup>	$g_{FS}$	80	-	-	mS	$V_{DS}>2V_{DS(on)}$ , $I_D=200\text{mA}$
Input Capacitance	$C_{iss}$	-	-	50	pF	$V_{DS}=25\text{V}$ , $V_{GS}=0$ , $f=1\text{MHz}$
Output Capacitance	$C_{oss}$	-	-	25	pF	
Reverse Transfer Capacitance	$C_{rss}$	-	-	5	pF	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	-	-	417	$^{\circ}\text{C/W}$	-

(1)The Power Dissipation of the package may result in a lower continuous drain current.

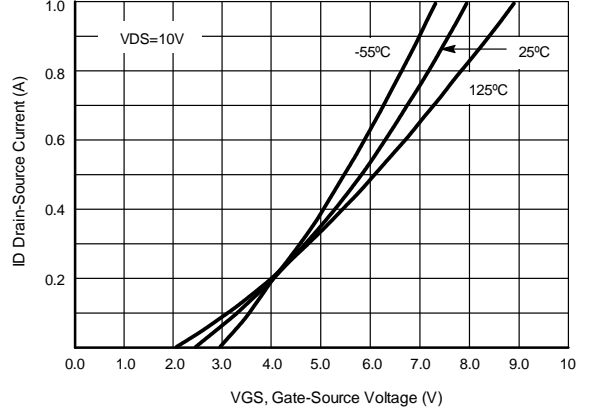
(2)Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

# Rating and Characteristic Curves of 2N7002

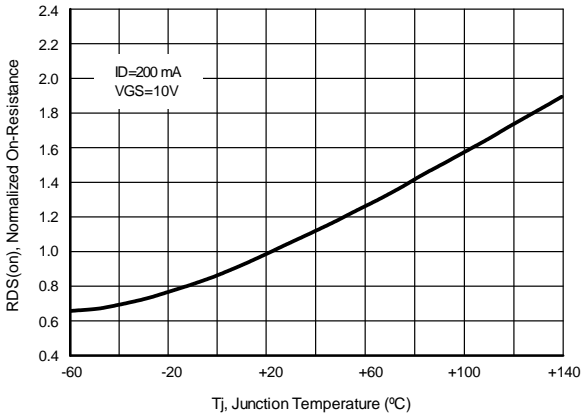
**Fig1. Ohmic Region**



**Fig2. Transfer Characteristics**



**Fig3. Temperature versus Static Drain-Source On-Resistance**



**Fig4. Temperature versus Gate Threshold Voltage**

