



DC COMPONENTS CO., LTD.

DISCRETE SEMICONDUCTORS

2N7002

TECHNICAL SPECIFICATIONS OF N-CHANNEL SMALL SIGNAL MOSFET

Description

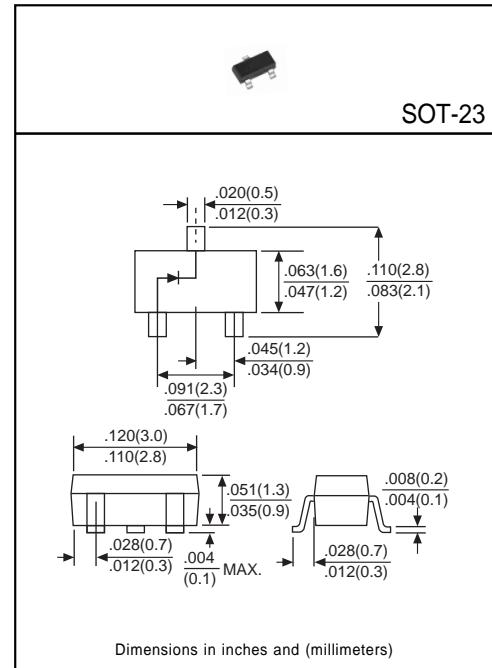
Designed for low voltage and low current applications such as small servo motor control, power MOSFET gate drivers, and other switching applications.

Pinning

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

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

Characteristic	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage ($R_{GS}=1\text{M}\Omega$)	V_{DGR}	60	V
Gate-Source Voltage (Continuous)	V_{GS}	± 20	V
Drain Current (Continuous, $T_c=25^\circ\text{C}$) ⁽¹⁾	I_D	115	mA
Drain Current (Pulsed) ⁽²⁾	I_{DM}	800	mA
Total Power Dissipation Derate above 25°C	P_D	200 1.8	mW mW°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°C ambient temperature unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	60	-	-	V	$I_D=10\mu\text{A}, V_{GS}=0$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS}=60\text{V}, V_{GS}=0$
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 ⁽²⁾	$V_{GS(\text{th})}$	1	-	2.5	V	$V_{DS}=2.5\text{V}, I_D=0.25\text{mA}$
On-State Drain Current ⁽²⁾	$I_{D(on)}$	500	-	-	mA	$V_{DS}>2V_{DS(\text{on})}, V_{GS}=10\text{V}$
Static Drain-Source On-State Voltage ⁽²⁾	$V_{DS(on)1}$	-	-	0.375	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 ⁽²⁾	$R_{DS(on)1}$	-	-	7.5	Ω	$I_D=50\text{mA}, V_{GS}=5\text{V}$
	$R_{DS(on)2}$	-	-	7.5	Ω	$I_D=500\text{mA}, V_{GS}=10\text{V}$
Forward Transconductance ⁽²⁾	g_{FS}	80	-	-	mS	$V_{DS}>2V_{DS(\text{on})}, I_D=200\text{mA}$
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	$R_{\theta JA}$	-	-	625	$^\circ\text{C}/\text{W}$	-

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

(2)Pulse Test: Pulse Width $\leq 380\mu\text{s}$, Duty Cycle $\leq 2\%$

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Electrical Characteristic Curves

Fig. 2 Max Power Dissipation vs.
Ambient Temperature

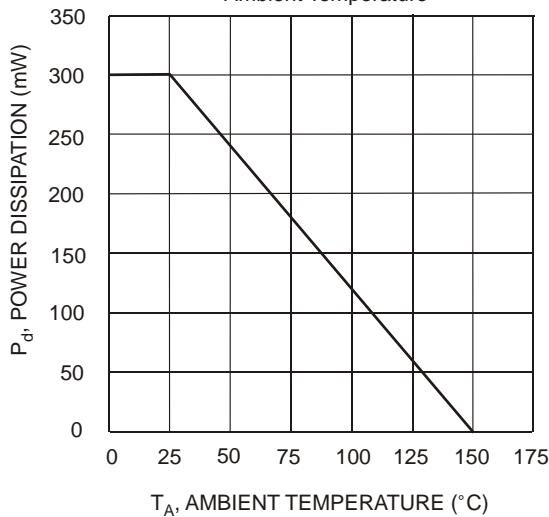


Fig. 2 On-Region Characteristics

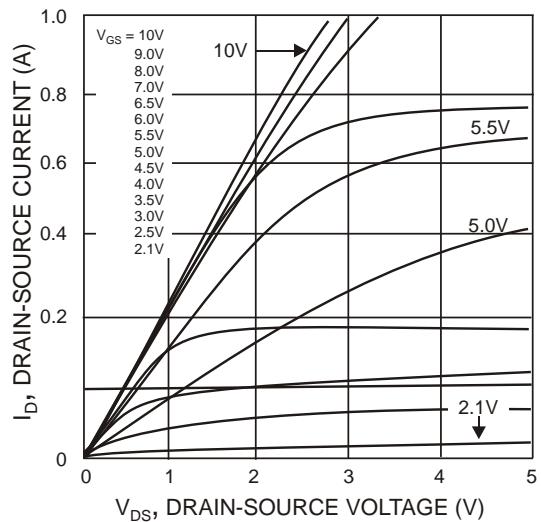


Fig. 3 On-Resistance vs Drain Current

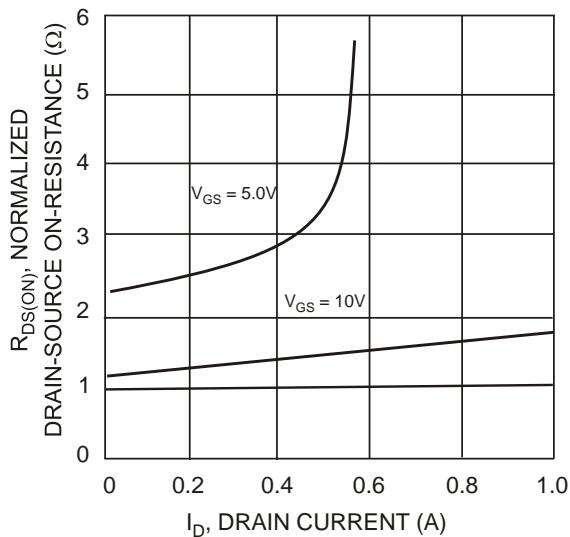
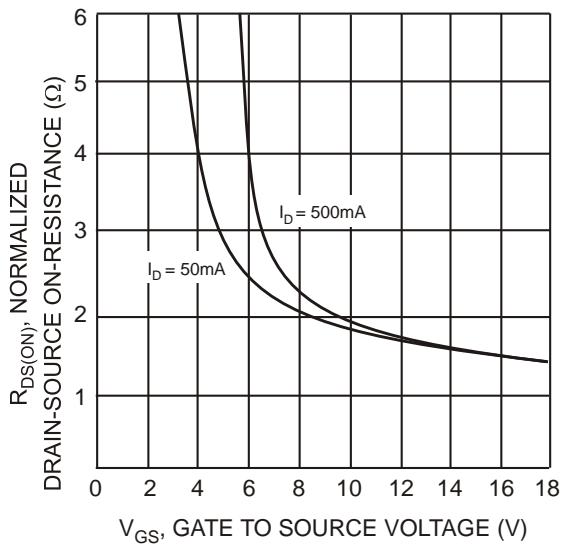


Fig. 4 On-Resistance vs. Gate-Source Voltage



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