

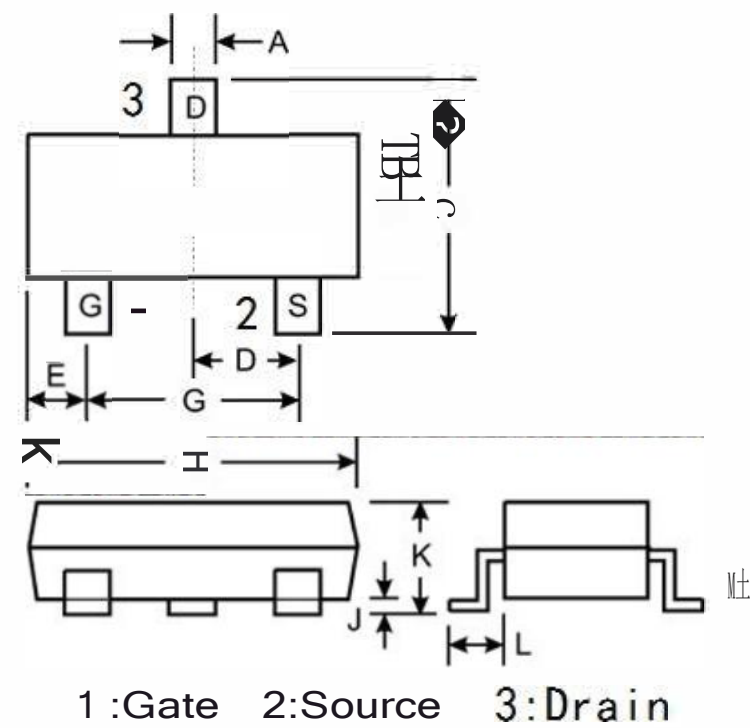
## N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

### ● Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- ESD Protected up to 1kV(HBM)

### ● Mechanical Data

- Case: SOT-323, Molded Plastic
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approx.)



SOT-323		
Dim	Min	Max
A	0.30	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
All Dimensions in mm		

### e Maximum Ratings @TA = 25°C unless otherwise specified

Characteristic	Symbol	2N7002W	Units
Drain-Source Voltage	V <sub>oss</sub>	60	V
Drain-Gate Voltage R <sub>Gs</sub> ≥ 1.0M.Ω	V <sub>oGR</sub>	60	V
Gate-Source Voltage	V <sub>Gss</sub>	±20 ±40	V
Drain Current (Note 1)	I <sub>o</sub>	115 73 800	mA
Total Power Dissipation (Note 1) Derating above T <sub>A</sub> = 25°C	P <sub>d</sub>	200 1.60	mW mW/°C
Thermal Resistance, Junction to Ambient	R <sub>eJA</sub>	625	K/W
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>srn</sub>	-55 to +150	°C

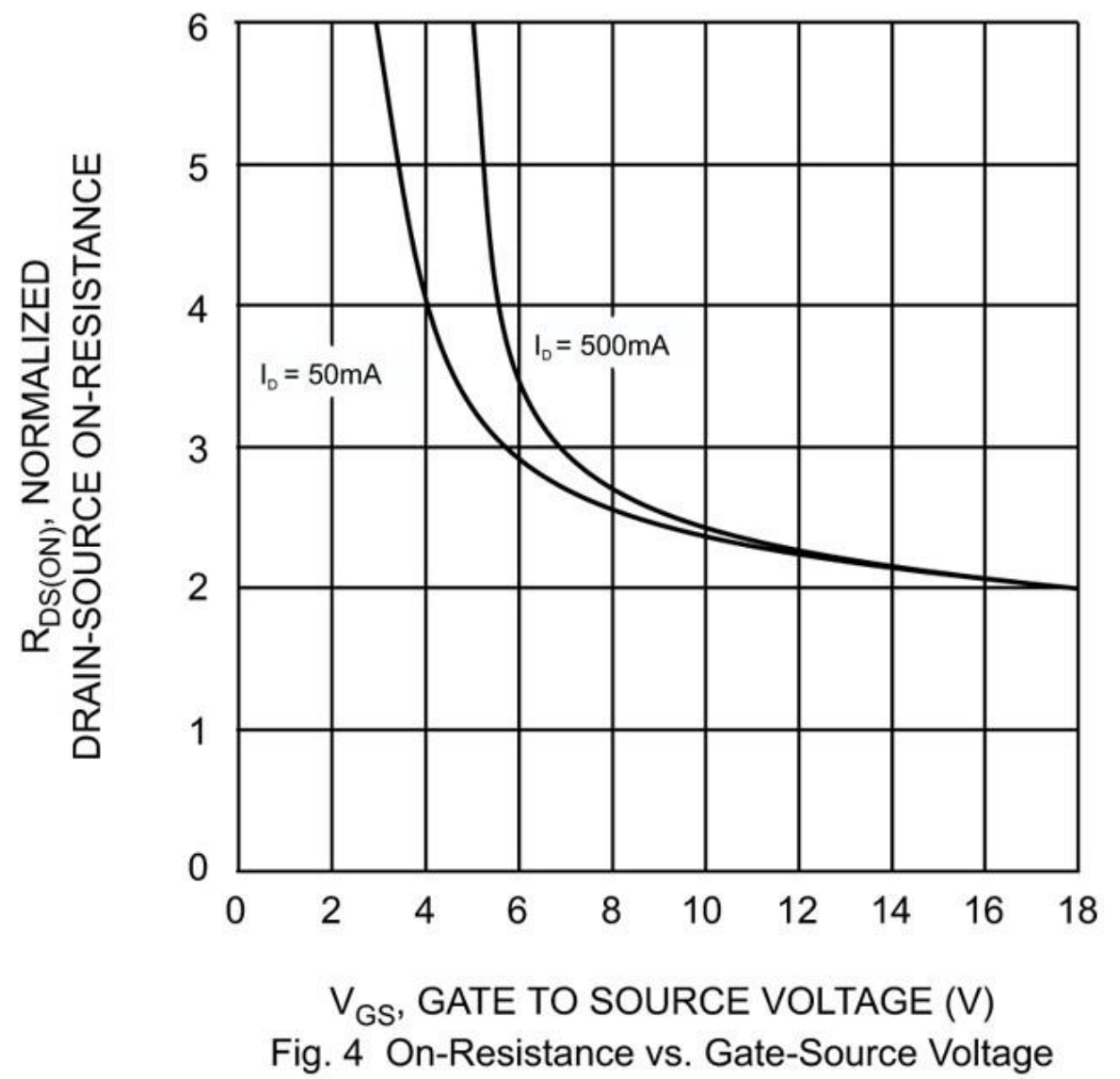
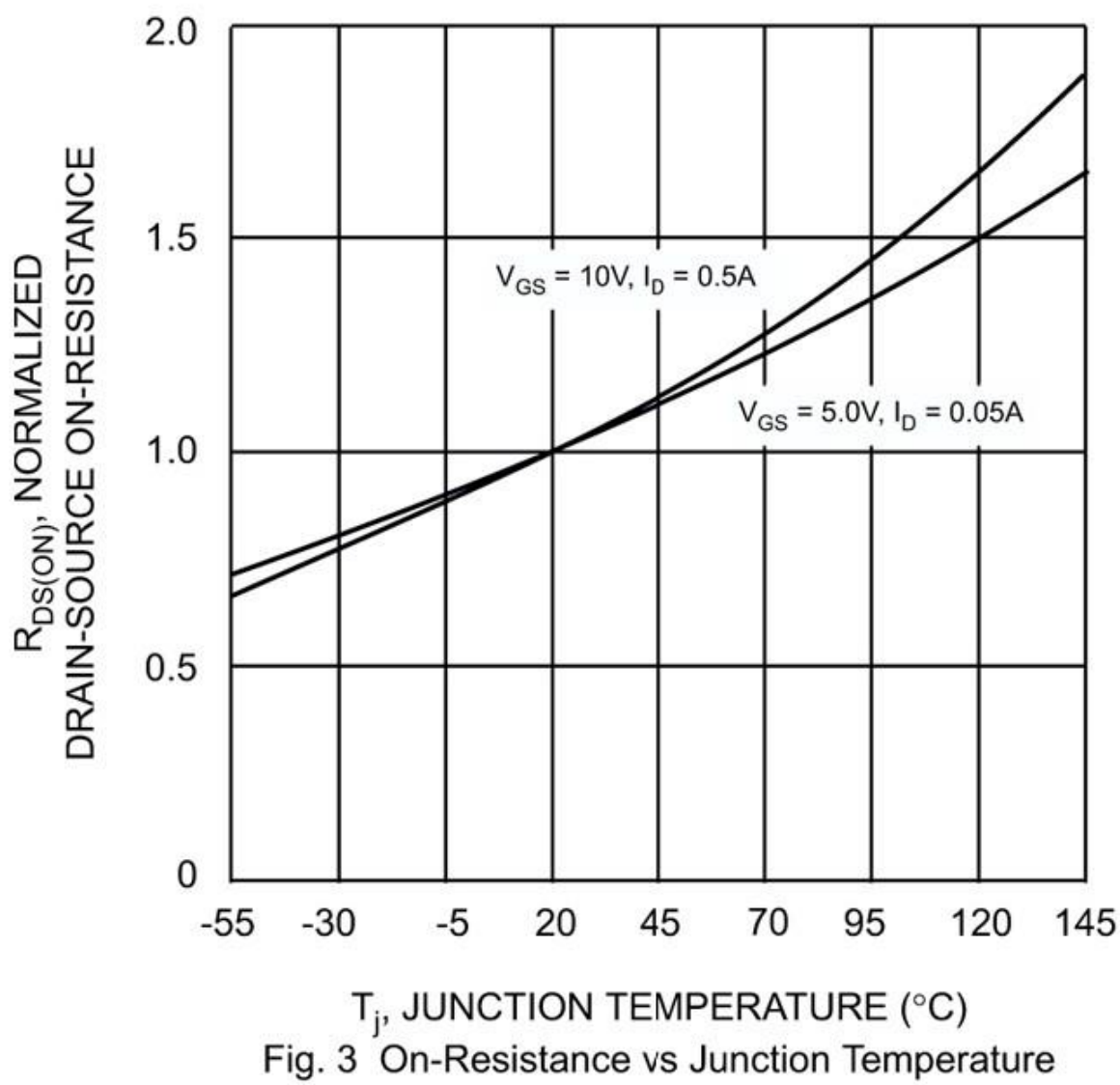
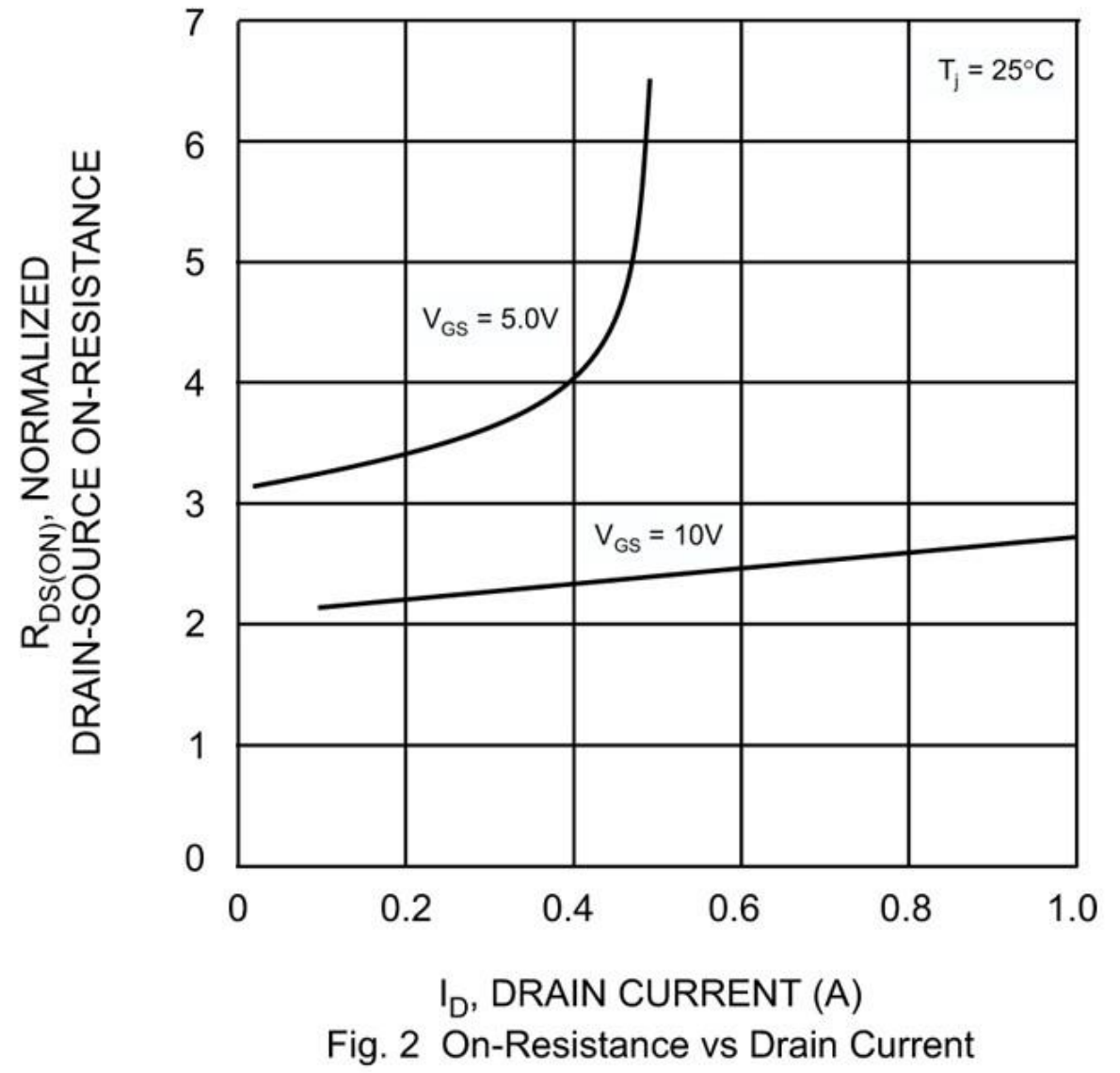
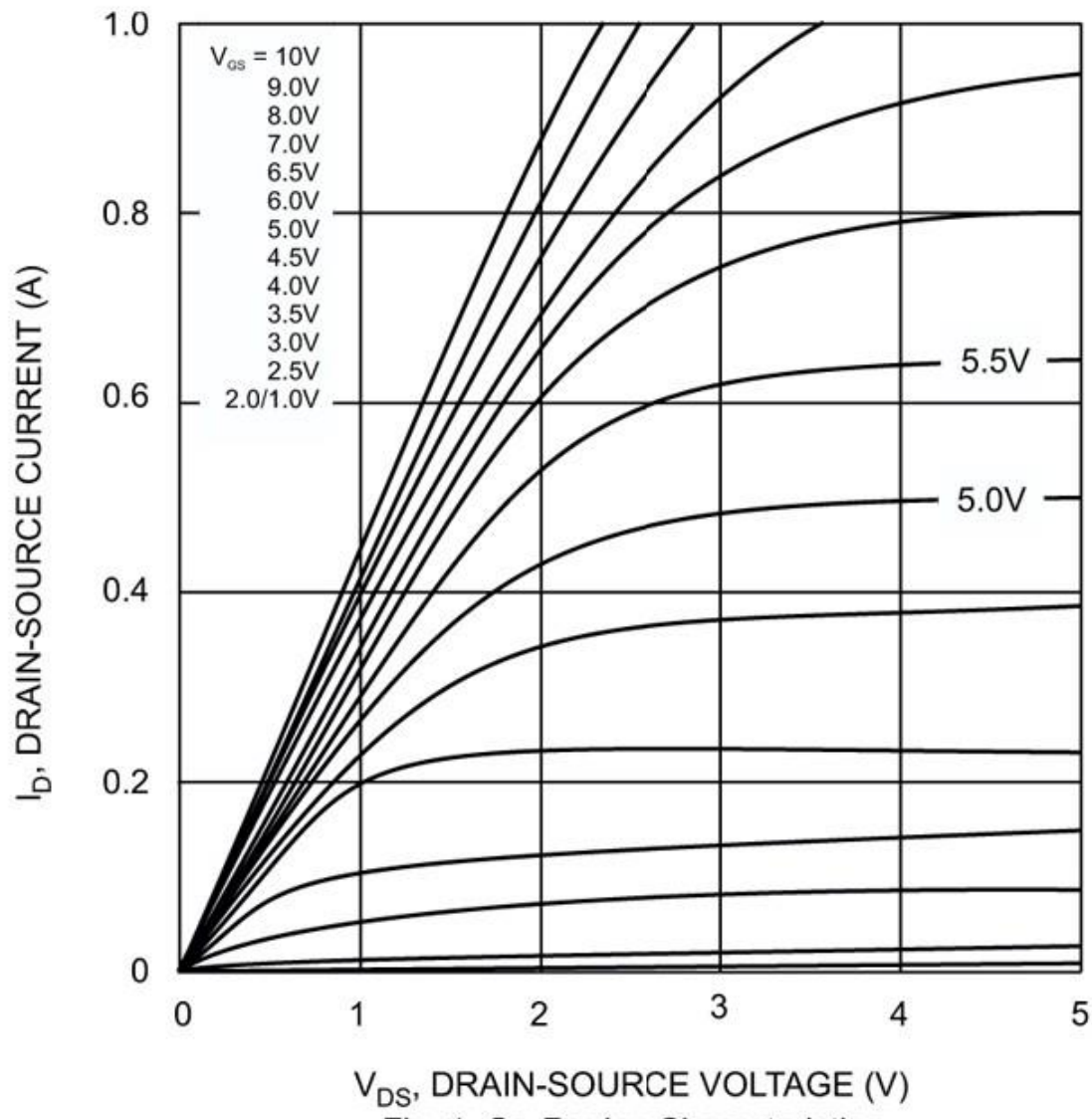
- Note: 1. Valid provided that terminals are kept at specified ambient temperature.  
2. Pulse width ≥ 300μs, duty cycle ≥ 2%.

• **Electrical Characteristics** @TA= 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 2)</b>						
Drain-Source Breakdown Voltage	BV <sub>oss</sub>	60	70	—	V	V <sub>GS</sub> = 0V, I <sub>o</sub> = 10μA
Zero Gate Voltage Drain Current	I <sub>oss</sub>	—	—	1.0 500	μA	@T <sub>c</sub> = 25°C @T <sub>c</sub> = 125°C V <sub>os</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GS</sub>	—	—	±5	μA	V <sub>GS</sub> = ±20V, V <sub>os</sub> = 0V
<b>ON CHARACTERISTICS (Note 2)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.0	—	2.0	V	V <sub>os</sub> = V <sub>GS</sub> , I <sub>o</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>os(ON)</sub>	—	3.2 4.4	7.5 13.5	Ω	@T <sub>c</sub> = 25°C @T <sub>c</sub> = 125°C V <sub>GS</sub> = 5.0V, I <sub>o</sub> = 0.05A V <sub>GS</sub> = 10V, I <sub>o</sub> = 0.5A
On-State Drain Current	I <sub>o(ON)</sub>	0.5	1.0	—	A	V <sub>GS</sub> = 10V, V <sub>os</sub> = 7.5V
Forward Transconductance	g <sub>FS</sub>	80	—	—	mS	V <sub>os</sub> = 10V, I <sub>o</sub> = 0.2A
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	—	22	50	pF	V <sub>os</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	11	25	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	2.0	5.0	pF	
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	t <sub>o(ON)</sub>	—	7.0	20	ns	V <sub>oo</sub> = 30V, I <sub>o</sub> = 0.2A, R <sub>L</sub> = 150Ω, V <sub>GEN</sub> = 10V, R <sub>GEN</sub> = 25Ω
Turn-Off Delay Time	t <sub>o(OFF)</sub>	—	11	20	ns	

Note: 1. Valid provided that terminals are kept at specified ambient temperature.

2. Pulse width ≤ 300μs, duty cycle ≤ 2%.



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