

## N-Channel Enhancement MOSFET

## 2N7002E

## ■ Features

- Low On-Resistance:  $R_{DS(ON)}$
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

■ Absolute Maximum Ratings  $T_a=25^\circ\text{C}$ 

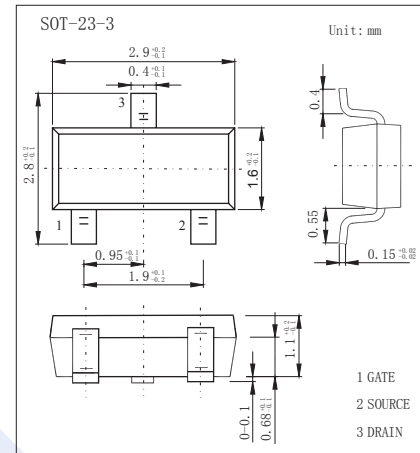
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Drain-Gate Voltage $R_{GS} \leq 1.0\text{M}\Omega$	$V_{DGR}$	60	
Gate-Source Voltage -Continuous -Pulsed	$V_{GS}$	$\pm 20$ $\pm 40$	
Continuous Drain Current	$I_D$	240	mA
Power Dissipation	$P_D$	300	mW
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	417	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Junction and Storage Temperature Range	$T_{stg}$	-55 to 150	

■ Electrical Characteristics  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit	
Drain-Source Breakdown Voltage	$V_{DSS}$	$V_{GS} = 0\text{V}, I_D = 100\mu\text{A}$	60	70		V	
Zero Gate Voltage Drain Current @ $T_c = 25^\circ\text{C}$ @ $T_c = 125^\circ\text{C}$	$I_{DSS}$	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$			1.0 500	$\mu\text{A}$	
Gate-Body Leakage	$I_{GSS}$	$V_{GS} = \pm 15\text{V}, V_{DS} = 0\text{V}$			$\pm 10$	$\mu\text{A}$	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0		2.5	V	
Static Drain-Source On-Resistance @ $T_J = 25^\circ\text{C}$	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 250\text{mA}$ $V_{GS} = 4.5\text{V}, I_D = 200\text{mA}$		1.6 2.0	3 4	$\Omega$	
On-State Drain Current	$I_{D(ON)}$	$V_{GS} = 10\text{V}, V_{DS} = 7.5\text{V}$	0.8	1.0		A	
Forward Transconductance	$g_{FS}$	$V_{DS} = 10\text{V}, I_D = 0.2\text{A}$	80			mS	
Input Capacitance	$C_{iss}$	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$		22	50	pF	
Output Capacitance	$C_{oss}$				11	25	pF
Reverse Transfer Capacitance	$C_{rss}$				2.0	5.0	pF
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 30\text{V}, I_D = 0.2\text{A}, R_L = 150\Omega, V_{GEN} = 10\text{V}, R_{GEN} = 25\Omega$		7.0	20	ns	
Turn-Off Delay Time	$t_{D(OFF)}$				11	20	ns

## ■ Marking

Marking	703
---------	-----



# 2N7002E

## Typical Characteristics

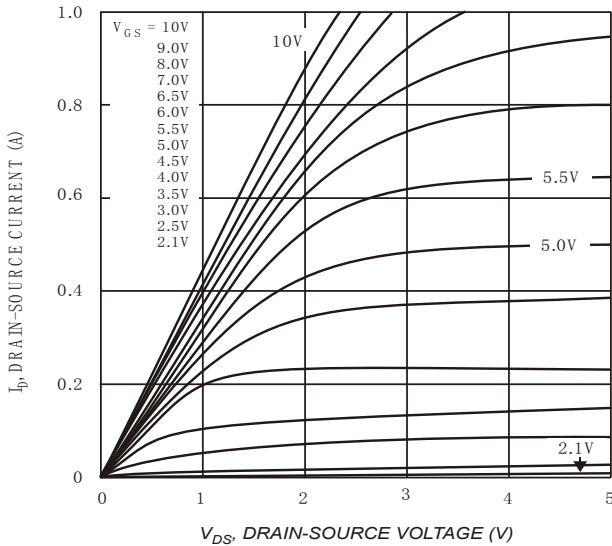


Fig. 1 On-Region Characteristics

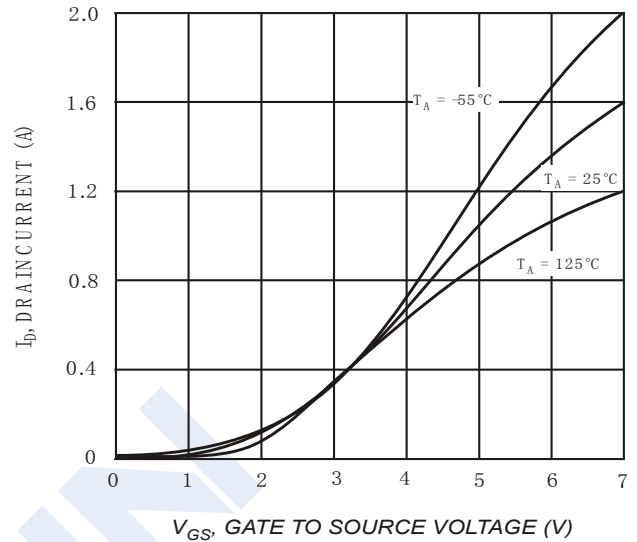


Fig. 2 Drain Current vs. Gate-Source Voltage

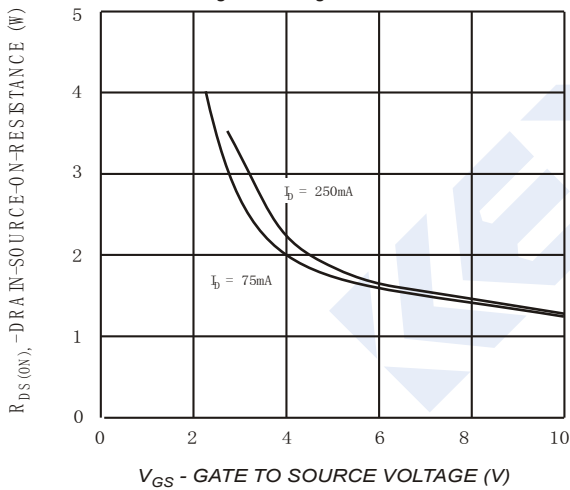


Fig. 3 On Resistance vs. Gate to Source Voltage

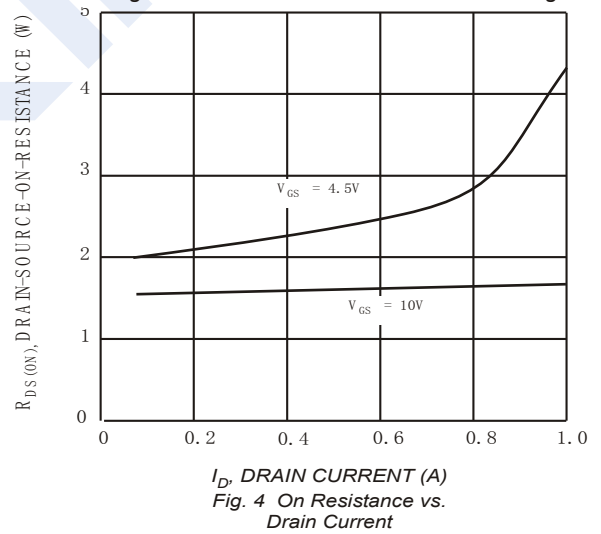


Fig. 4 On Resistance vs. Drain Current

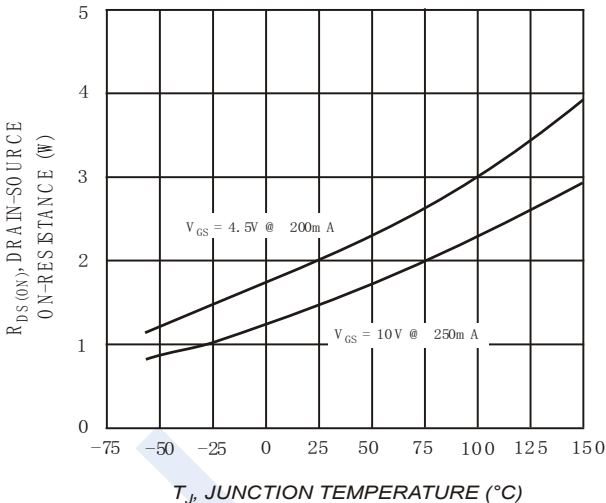


Fig. 5 On-Resistance vs. Junction Temperature

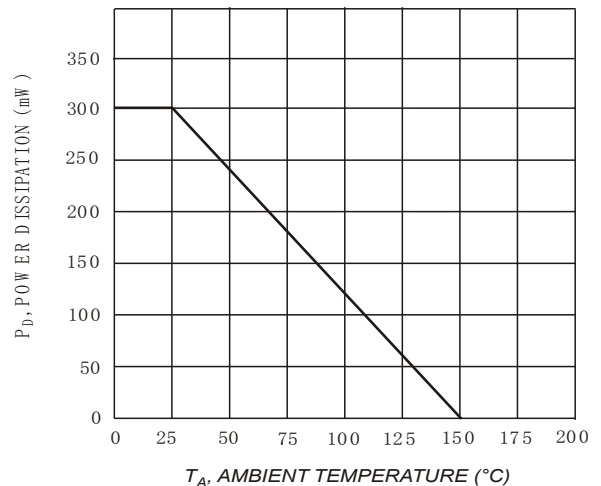


Fig. 6, Max Power Dissipation vs Ambient Temperature