

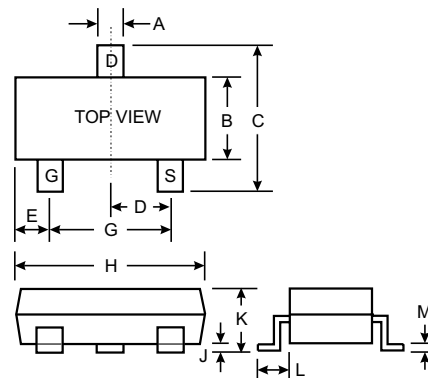
Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package

2N7002W



SOT-323



Mechanical Data

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

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	2N7002W	Units
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage $R_{GS} \leq 1.0M\Omega$	V_{DGR}	60	V
Gate-Source Voltage	V_{GSS}	Continuous	± 20
		Pulsed	± 40
Drain Current (Note 1)	I_D	Continuous	115
		Continuous @ 100°C	73
		Pulsed	800
Total Power Dissipation (Note 1) Derating above $T_A = 25^\circ\text{C}$	P_d		200
			1.60
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	625	K/W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 2)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	70	—	V	$V_{GS} = 0V, I_D = 10\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0	μA	$V_{DS} = 60V, V_{GS} = 0V$
				500		
Gate-Body Leakage	I_{GSS}	—	—	± 10	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	2.0	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	3.2	7.5	Ω	$V_{GS} = 5.0V, I_D = 0.05A$
			4.4	13.5		$V_{GS} = 10V, I_D = 0.5A$
On-State Drain Current	$I_{D(ON)}$	0.5	1.0	—	A	$V_{GS} = 10V, V_{DS} = 7.5V$
Forward Transconductance	g_{FS}	80	—	—	mS	$V_{DS} = 10V, I_D = 0.2A$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	22	50	pF	$V_{DS} = 25V, V_{GS} = 0V$ $f = 1.0MHz$
Output Capacitance	C_{oss}	—	11	25	pF	
Reverse Transfer Capacitance	C_{rss}	—	2.0	5.0	pF	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	—	7.0	20	ns	$V_{DD} = 30V, I_D = 0.2A,$ $R_L = 150\Omega, V_{GEN} = 10V,$ $R_{GEN} = 25\Omega$
Turn-Off Delay Time	$t_{D(OFF)}$	—	11	20	ns	

Note: 1. Valid provided that terminals are kept at specified ambient temperature.
2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

2N7002W Typical Characteristics

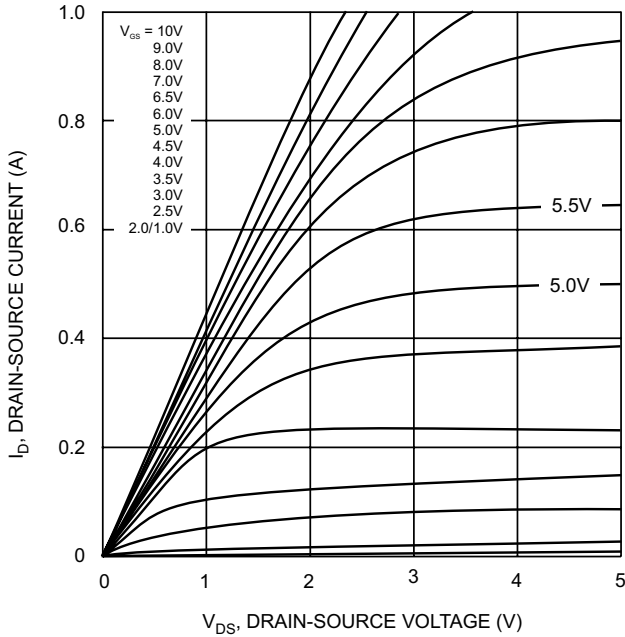


Fig. 1 On-Region Characteristics

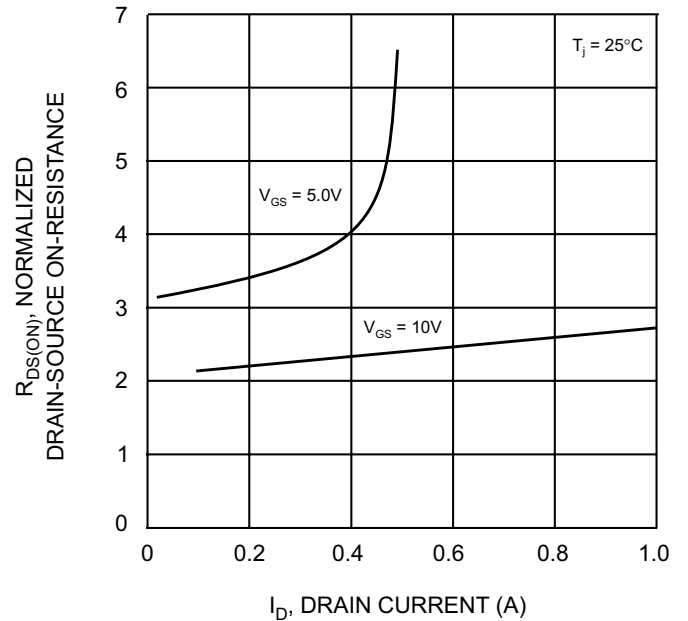


Fig. 2 On-Resistance vs Drain Current

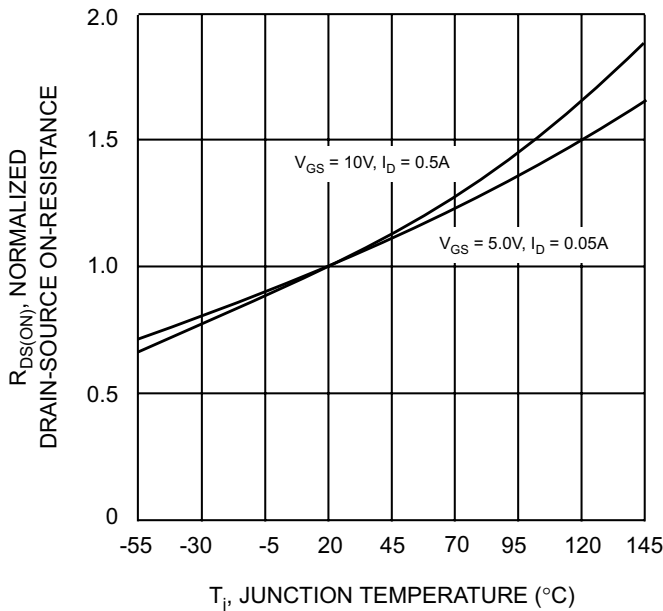


Fig. 3 On-Resistance vs Junction Temperature

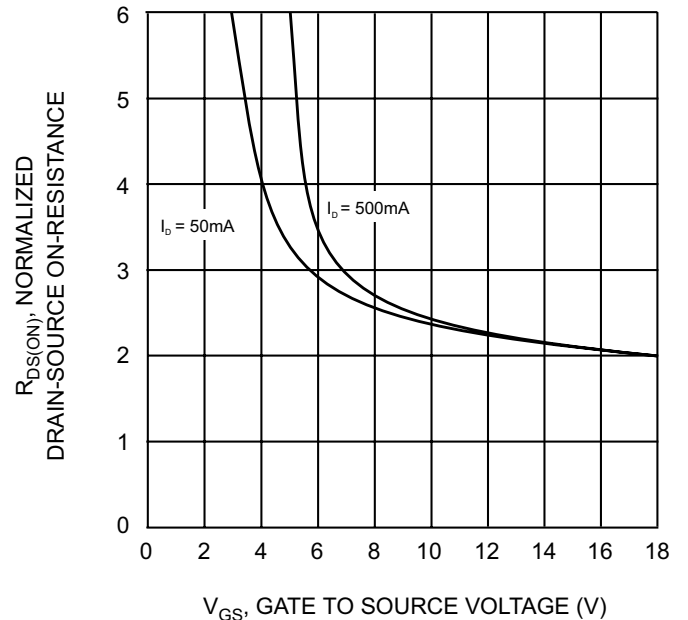


Fig. 4 On-Resistance vs. Gate-Source Voltage