

2N7000

Preferred Device

Small Signal MOSFET 200 mAmps, 60 Volts N-Channel TO-92

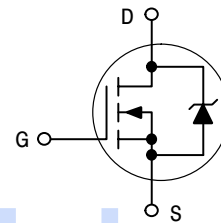


ON Semiconductor

<http://onsemi.com>

200 mAmps
60 Volts
RDS(on) = 5 Ω

N-Channel

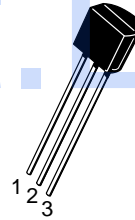


MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	Vdc
Drain-Gate Voltage ($R_{GS} = 1.0 \text{ M}\Omega$)	V_{DGR}	60	Vdc
Gate-Source Voltage	V_{GS}	± 20	Vdc
– Continuous	V_{GSM}	± 40	Vpk
– Non-repetitive ($t_p \leq 50 \mu\text{s}$)			
Drain Current	I_D	200	mA dc
– Continuous	I_{DM}	500	
– Pulsed			
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	P_D	350	mW
Derate above 25°C		2.8	mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

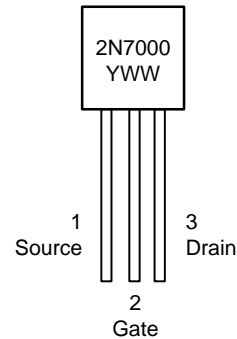
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes, 1/16" from case for 10 seconds	T_L	300	$^\circ\text{C}$



TO-92
CASE 29
Style 22

MARKING DIAGRAM & PIN ASSIGNMENT



Y = Year
WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

2N7000

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Drain–Source Breakdown Voltage (V _{GS} = 0, I _D = 10 μA _{dc})	V _{(BR)DSS}	60	–	V _{dc}
Zero Gate Voltage Drain Current (V _{DS} = 48 V _{dc} , V _{GS} = 0) (V _{DS} = 48 V _{dc} , V _{GS} = 0, T _J = 125°C)	I _{DSS}	–	1.0	μA _{dc} mA _{dc}
Gate–Body Leakage Current, Forward (V _{GSS} = 15 V _{dc} , V _{DS} = 0)	I _{GSSF}	–	–10	nA _{dc}

ON CHARACTERISTICS (Note 1.)

Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = 1.0 mA _{dc})	V _{GS(th)}	0.8	3.0	V _{dc}
Static Drain–Source On–Resistance (V _{GS} = 10 V _{dc} , I _D = 0.5 A _{dc}) (V _{GS} = 4.5 V _{dc} , I _D = 75 mA _{dc})	r _{DS(on)}	–	5.0 6.0	Ohm
Drain–Source On–Voltage (V _{GS} = 10 V _{dc} , I _D = 0.5 A _{dc}) (V _{GS} = 4.5 V _{dc} , I _D = 75 mA _{dc})	V _{DS(on)}	–	2.5 0.45	V _{dc}
On–State Drain Current (V _{GS} = 4.5 V _{dc} , V _{DS} = 10 V _{dc})	I _{d(on)}	75	–	mA _{dc}
Forward Transconductance (V _{DS} = 10 V _{dc} , I _D = 200 mA _{dc})	g _{fs}	100	–	μmhos

DYNAMIC CHARACTERISTICS

Input Capacitance	(V _{DS} = 25 V, V _{GS} = 0, f = 1.0 MHz)	C _{iss}	–	60	pF
Output Capacitance		C _{oss}	–	25	
Reverse Transfer Capacitance		C _{rss}	–	5.0	

SWITCHING CHARACTERISTICS (Note 1.)

Turn–On Delay Time	(V _{DD} = 15 V, I _D = 500 mA, R _G = 25 Ω, R _L = 30 Ω, V _{gen} = 10 V)	t _{on}	–	10	ns
Turn–Off Delay Time		t _{off}	–	10	

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

2N7000

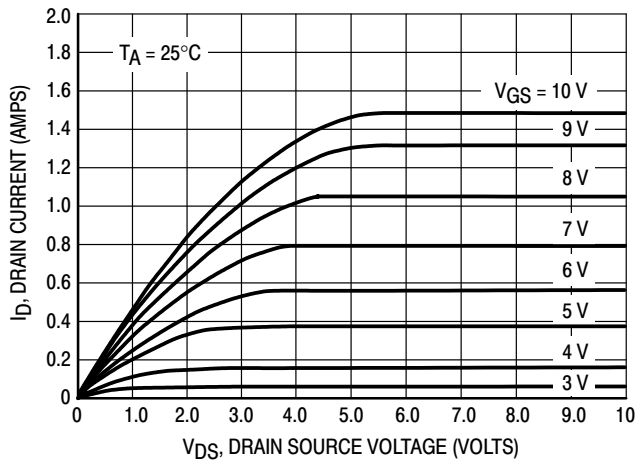


Figure 1. Ohmic Region

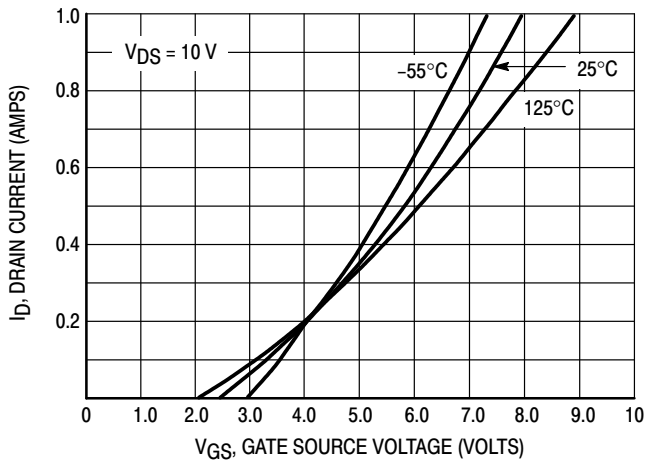


Figure 2. Transfer Characteristics

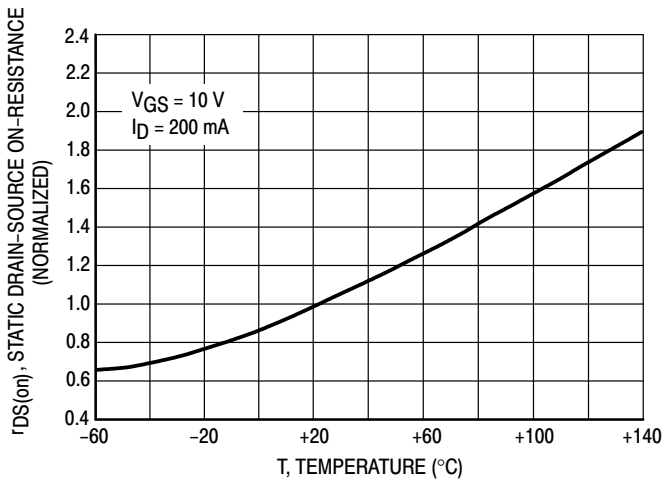


Figure 3. Temperature versus Static Drain-Source On-Resistance

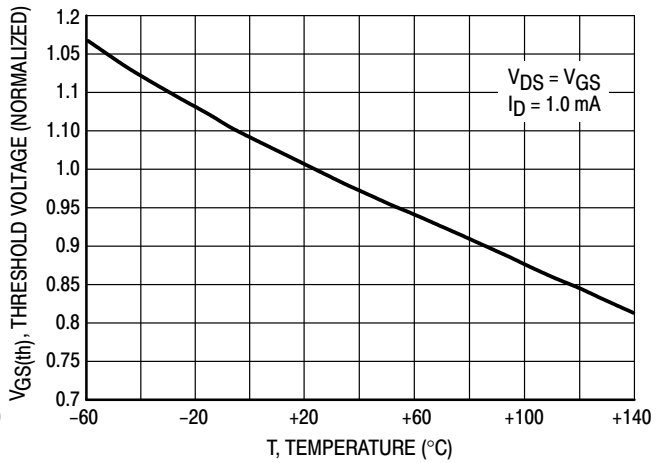


Figure 4. Temperature versus Gate Threshold Voltage

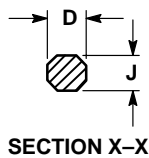
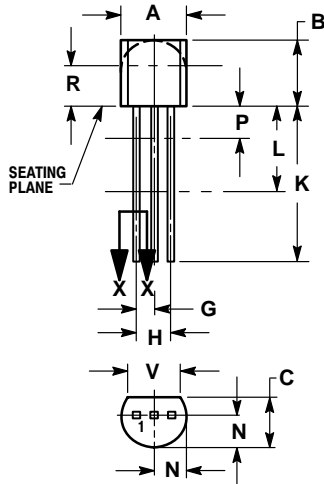
ORDERING INFORMATION

Device	Package	Shipping
2N7000	TO-92	1000 Unit/Box
2N7000RLRA	TO-92	2000 Tape & Reel
2N7000RLRM	TO-92	2000 Ammo Pack
2N7000RLRP	TO-92	2000 Ammo Pack
2N7000ZL1	TO-92	2000 Ammo Pack

2N7000

PACKAGE DIMENSIONS

TO-92
CASE 29-11
ISSUE AL




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

STYLE 22:

- PIN 1. SOURCE
2. GATE
3. DRAIN

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