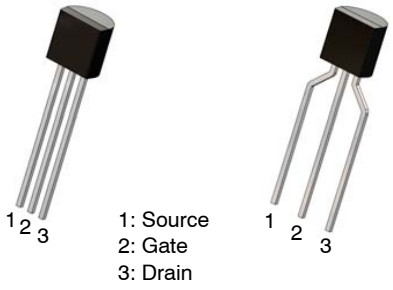
MOSFET – Advanced Small-Signal

2N7000BU / 2N7000TA



TO−92 3
CASE 135AN

TO−92 3
LEADFORMED
CASE 135AR

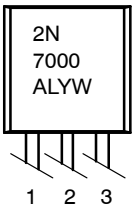
Description

These N−channel enhancement mode field effect transistors are produced using **onsemi**'s proprietary, high cell density, DMOS technology. These products minimize on−state resistance while providing rugged, reliable, and fast switching performance. They can be used in most applications requiring up to 400 mA DC and can deliver pulsed currents up to 2 A. These products are particularly suited for low−voltage, low−current applications, such as small servo motor control, power MOSFET gate drivers, and other switching applications.

Features

- Fast Switching Times
- Improved Inductive Ruggedness
- Lower Input Capacitance
- Extended Safe Operating Area
- Improved High−Temperature Reliability
- This is a Pb−Free Device

MARKING DIAGRAM



2N7000	= Device Code
A	= Assembly Site
L	= Wafer Lot Number
YW	= Assembly Start Week

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DSS}	Drain−to−Source Voltage	60	V
I_D	Continuous Drain Current (T_C = 25°C)	200	mA
	Continuous Drain Current (T_C = 100°C)	110	
I_{DM}	Drain Current Pulsed (Note 1)	1000	mA
V_{GS}	Gate−to−Source Voltage	±30	V
T_J, T_{STG}	Operating Junction and Storage Temperature Range	−55 to 150	°C
T_L	Maximum Lead Temperature for Soldering Purposes, 1/8−inch from Case for 5 Seconds	300	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Repetitive rating: pulse width limited by maximum junction temperature.

THERMAL CHARACTERISTICS (Note 2)

(Values are at T_A = 25°C unless otherwise noted.)

Symbol	Parameter	Value	Unit
P_D	Total Power Dissipation (T_C = 25°C)	400	mW
	Linear Derating Factor	3.2	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction−to−Ambient	312.5	°C/W

2. Device mounted on FR−4 PCB, board size = 101.5 mm x 114.5 mm.

ORDERING INFORMATION

Device	Package	Shipping†
2N7000BU	TO−92 3 / (Pb−Free)	10000 / Bulk Bag
2N7000TA	TO−92 3 (Pb−Free)	2000 / Fan−Fold

ELECTRICAL CHARACTERISTICS

(Values are at T_A = 25°C unless otherwise noted.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
B_{VDSS}	Drain−Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	60	–	–	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 μA	0.3	–	3.9	V
		V_{DS} = V_{GS}, I_D = 1 mA	0.4	–	3.0	
I_{GSS}	Gate−Source Leakage, Forward	V_{GS} = 15 V	–	–	100	nA
	Gate−Source Leakage, Reverse	V_{GS} = −15 V	–	–	−100	
I_{DSS}	Drain−to−Source Leakage Current	V_{DS} = 60 V	–	–	1	mA
		V_{DS} = 45 V, T_C = 125°C	–	–	1000	
$R_{DS(ON)}$	Static Drain−Source On−State Resistance (Note 3)	V_{GS} = 10 V, I_D = 0.5 A	–	–	5.0	Ω
g_{fs}	Forward Transconductance (Note 3)	V_{DS} = 15 V, I_D = 0.5 A	0.1	0.3	–	S
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	–	30	–	pF
C_{oss}	Output Capacitance		–	12	–	pF
C_{rss}	Reverse Transfer Capacitance		–	3.0	–	pF
$t_{d(on)}$	Turn−On Delay	V_{DD} = 30 V, I_D = 0.5 A, R_G = 15 Ω (Note 3), (Note 4)	–	–	10	ns
t_r	Rise Time		–	–	10	ns
$t_{d(off)}$	Turn−Off Delay		–	–	10	ns
t_f	Fall Time		–	–	10	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse test: pulse width = 250 μs, duty cycle ≤2%
4. Essentially independent of operating temperature.

TO−92 3 4.825x4.76
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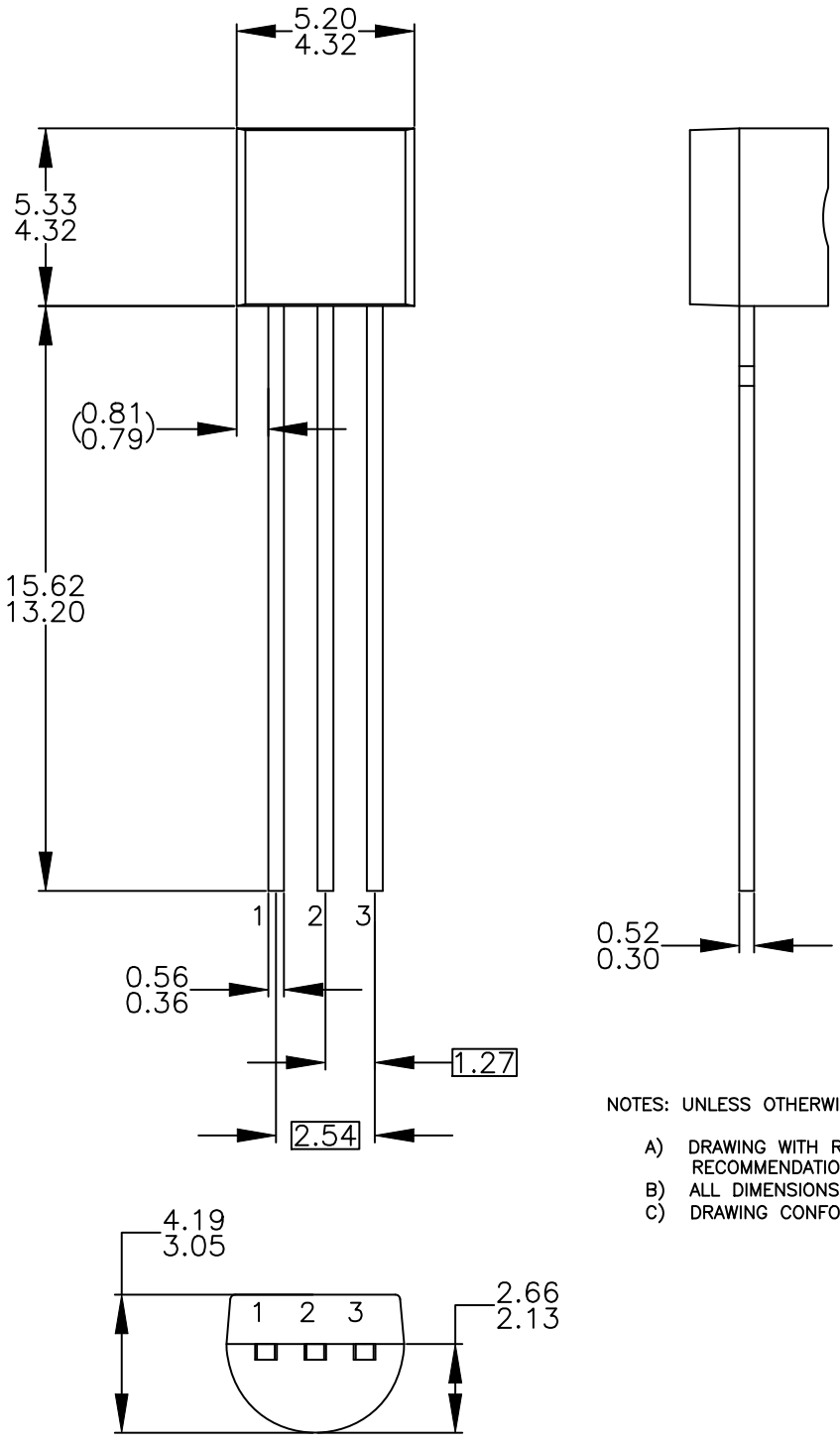

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TO−92 3 4.83x4.76 LEADFORMED
CASE 135AR
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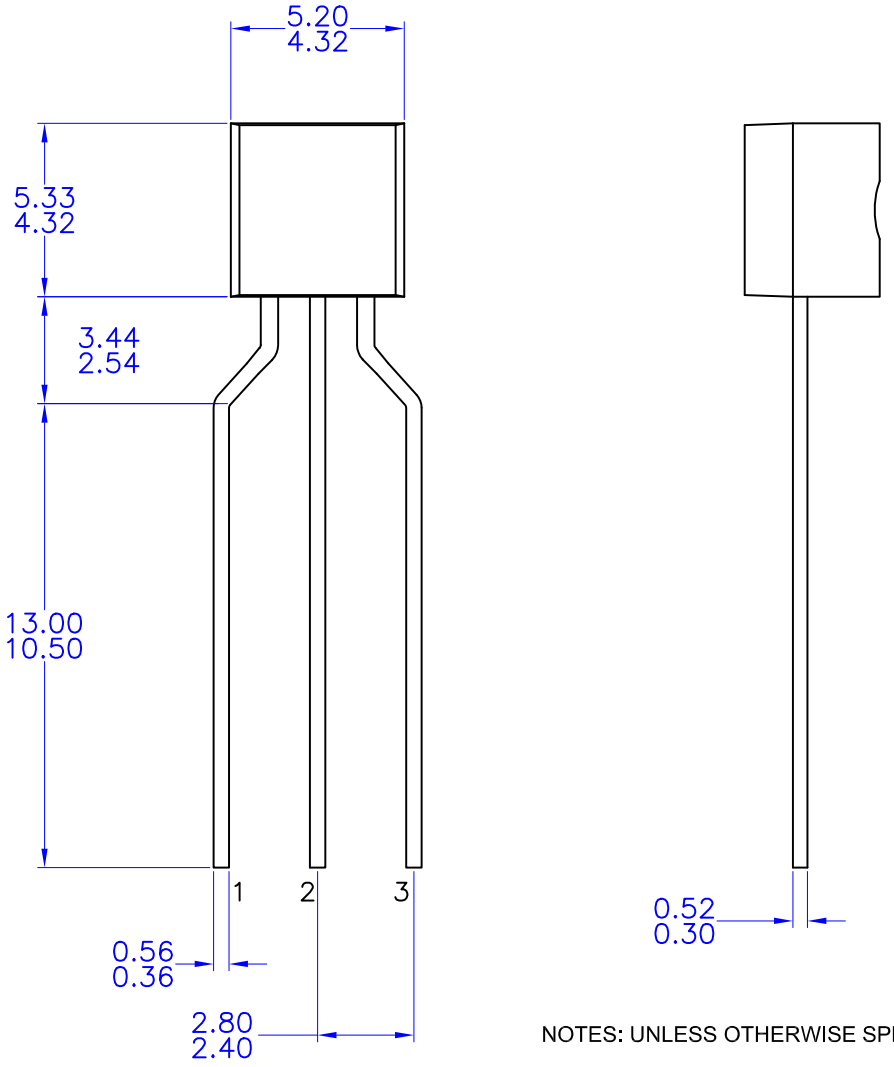

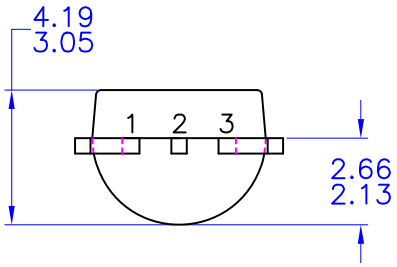

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