

SN74LS541

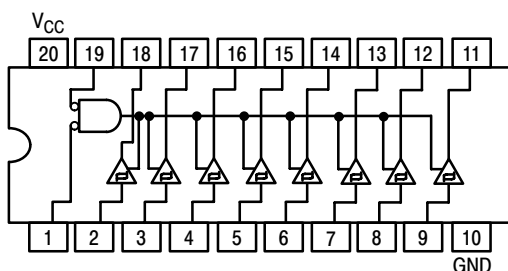
Octal Buffer/Line Driver with 3-State Outputs

The SN74LS541 is an octal buffer and line driver with the same functions as the LS241, but with pinouts on the opposite side of the package.

This device type is designed to be used as a memory address driver, clock driver and bus-oriented transmitter/receiver. This device is especially useful as output ports for the microprocessors, allowing ease of layout and greater PC board density.

- Hysteresis at Inputs to Improve Noise Margin
- PNP Inputs Reduce Loading
- 3-State Outputs Drive Bus Lines
- Inputs and Outputs Opposite Side of Package, Allowing Easier Interface to Microprocessors
- Input Clamp Diodes Limit High-Speed Termination Effects

LOGIC AND CONNECTION DIAGRAM DIP (TOP VIEW)



GUARANTEED OPERATING RANGES

Symbol	Parameter	Min	Typ	Max	Unit
V_{CC}	Supply Voltage	4.75	5.0	5.25	V
T_A	Operating Ambient Temperature Range	0	25	70	°C
I_{OH}	Output Current – High			-15	mA
I_{OL}	Output Current – Low			24	mA

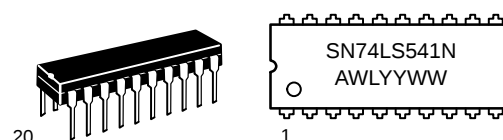


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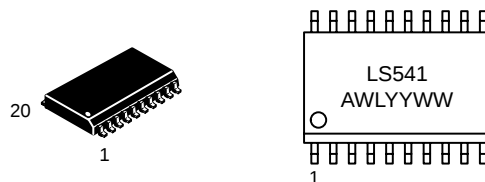
<http://onsemi.com>

LOW
POWER
SCHOTTKY

MARKING
DIAGRAMS



PDIP-20
N SUFFIX
CASE 738



SOIC-20
DW SUFFIX
CASE 751D

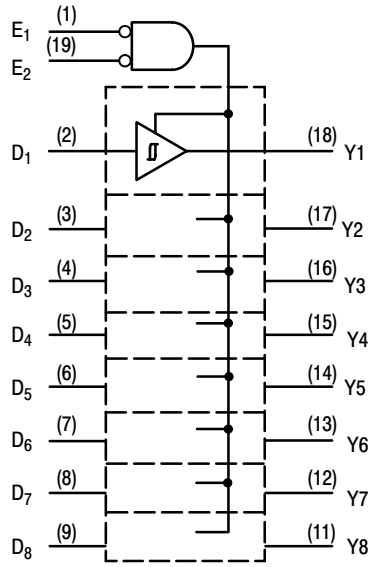
A = Assembly Location
WL = Wafer Lot
YY = Year
WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping
SN74LS541N	PDIP-20	1440 Units/Box
SN74LS541DW	SOIC-20	2500/Tape & Reel

SN74LS541

BLOCK DIAGRAM



INPUTS			OUTPUTS	
E ₁	E ₂	D	LS540	LS541
L	L	H	L	H
H	X	X	Z	Z
X	H	X	Z	Z
L	L	L	H	L

L = LOW Voltage Level
 H = HIGH Voltage Level
 X = Immaterial
 Z = High Impedance

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	Parameter	Limits			Unit	Test Conditions
		Min	Typ	Max		
V _{IH}	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage for All Inputs
V _{IL}	Input LOW Voltage			0.8	V	Guaranteed Input LOW Voltage for All Inputs
V _{IK}	Input Clamp Diode Voltage		-0.65	-1.5	V	V _{CC} = MIN, I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	2.4	3.4		V	V _{CC} = MIN, I _{OH} = -3.0 mA
		2.0			V	V _{CC} = MIN, I _{OH} = MAX, V _{IL} = 0.5 V
V _{OL}	Output LOW Voltage		0.25	0.4	V	I _{OL} = 12 mA, V _{CC} = V _{CC} MIN, V _{IN} = V _{IL} or V _{IH} per Truth Table
			0.35	0.5	V	I _{OL} = 24 mA
V _{T+} -V _{T-}	Hysteresis	0.2	0.4		V	V _{CC} = MIN
I _{OZH}	Output Off Current HIGH			20	μA	V _{CC} = MAX, V _{OUT} = 2.7 V
I _{OZL}	Output Off Current LOW			-20	μA	V _{CC} = MAX, V _{OUT} = 0.4 V
I _{IH}	Input HIGH Current			20	μA	V _{CC} = MAX, V _{IN} = 2.7 V
				0.1	mA	V _{CC} = MAX, V _{IN} = 7.0 V
I _{IL}	Input LOW Current			-0.2	mA	V _{CC} = MAX, V _{IN} = 0.4 V
I _{OS}	Short Circuit Current (Note 1.)	-40		-225	mA	V _{CC} = MAX
I _{CC}	Power Supply Current Total, Output HIGH			32	mA	V _{CC} = MAX
	Total, Output LOW			52	mA	
	Total Output 3-State			55	mA	

1. Not more than one output should be shorted at a time, nor for more than 1 second.

SN74LS541

AC CHARACTERISTICS (T_A = 25°C)

Symbol	Parameter	Limits			Unit	Test Conditions
		Min	Typ	Max		
t _{PLH}	Propagation Delay, Data to Output		12	15	ns	V _{CC} = 5.0 V C _L = 45 pF R _L = 667 Ω
t _{PHL}			12	18		
t _{PZH}	Output Enable Time to HIGH Level		15	32	ns	
t _{PZL}	Output Enable Time to LOW Level		20	38	ns	
t _{PHZ}	Output Disable Time to HIGH Level		10	18	ns	C _L = 5.0 pF
t _{PLZ}	Output Disable Time to LOW Level		15	29	ns	

AC WAVEFORMS

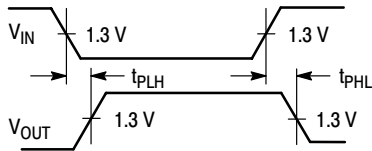


Figure 1.

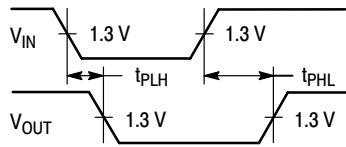


Figure 2.

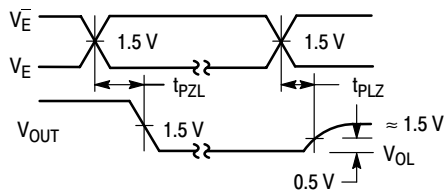


Figure 3.

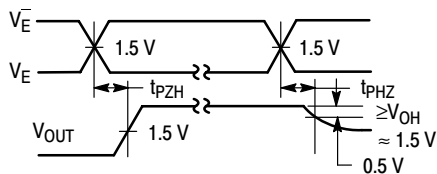
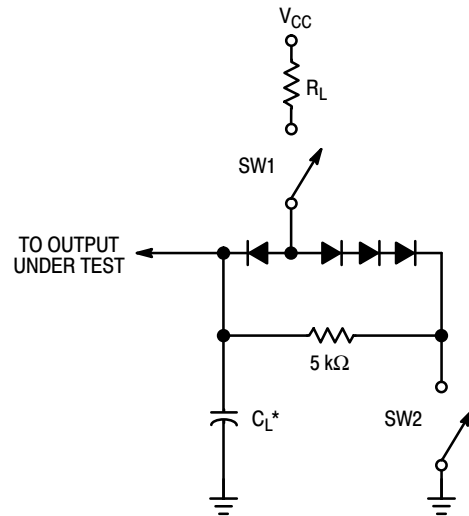


Figure 4.



SWITCH POSITIONS

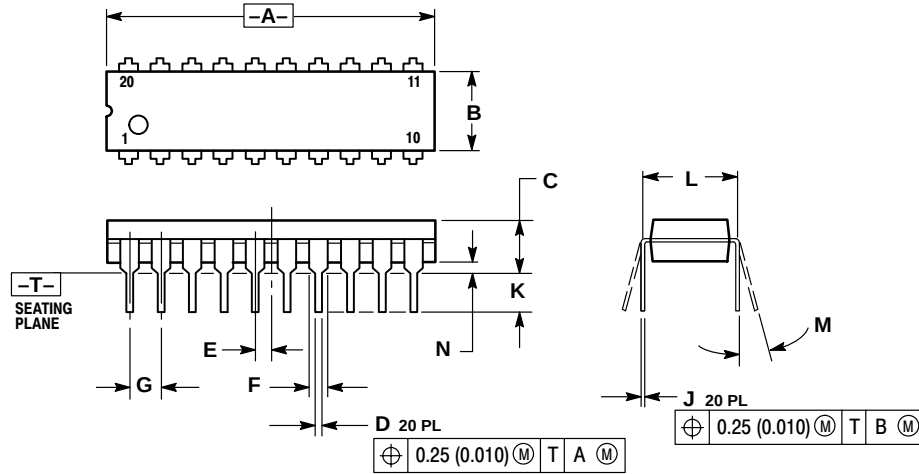
SYMBOL	SW1	SW2
t _{PZH}	Open	Closed
t _{PZL}	Closed	Open
t _{PLZ}	Closed	Closed
t _{PHZ}	Closed	Closed

Figure 5.

SN74LS541

PACKAGE DIMENSIONS

N SUFFIX
PLASTIC PACKAGE
CASE 738-03
ISSUE E



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.010	1.070	25.66	27.17
B	0.240	0.260	6.10	6.60
C	0.150	0.180	3.81	4.57
D	0.015	0.022	0.39	0.55
E	0.050 BSC		1.27 BSC	
F	0.050	0.070	1.27	1.77
G	0.100 BSC		2.54 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.140	2.80	3.55
L	0.300 BSC		7.62 BSC	
M	0° 15°		0° 15°	
N	0.020	0.040	0.51	1.01

Notes

Notes

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