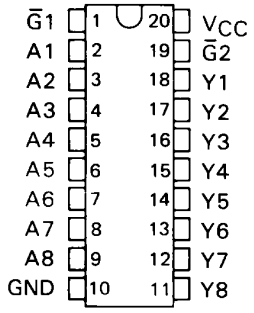
SN54ALS2540, SN54ALS2541, SN74ALS2540, SN74ALS2541
OCTAL LINE DRIVERS/MOS DRIVERS WITH 3-STATE OUTPUTS

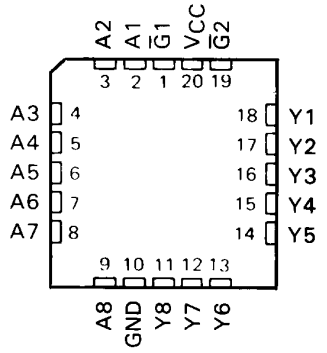
JUNE 1984—REVISED MAY 1986

- **3-State Outputs Drive Bus Lines or Buffer Memory Address Registers**
- **P-N-P Inputs Reduce DC Loading**
- **Outputs Have 25-Ω Series Resistor, So No External Resistors are Required**
- **Package Options Include Plastic "Small Outline" Packages, Plastic and Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs**
- **Dependable Texas Instruments Quality and Reliability**

SN54ALS2540, SN54ALS2541 . . . J PACKAGE
SN74ALS2540, SN74ALS2541 . . . DW OR N PACKAGE
(TOP VIEW)



SN54ALS2540, SN54ALS2541 . . . FK PACKAGE
(TOP VIEW)



description

These octal buffers and line drivers are designed to drive capacitive input characteristics of MOS devices and have the performance of the popular SN54ALS240A/SN74ALS240A series. At the same time, they offer a pinout with inputs and outputs on opposite sides of the package. This arrangement greatly enhances printed-circuit-board layout.

The three-state control gate is a 2-input AND with active-low inputs such that if either $\overline{G}1$ or $\overline{G}2$ is high, all eight outputs are in the high-impedance state.

The 'ALS2540 offers inverting data and the 'ALS2541 offers true data at the outputs.

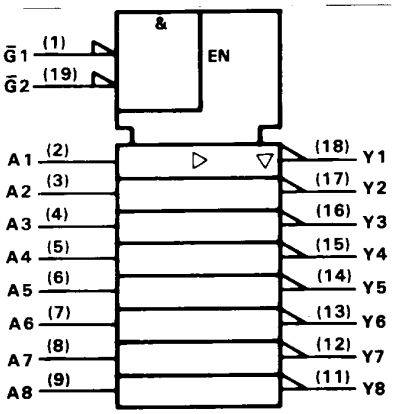
The SN54ALS' is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74ALS' is characterized for operation from 0°C to 70°C.

SN54ALS2540, SN54ALS2541, SN74ALS2540, SN74ALS2541
OCTAL LINE DRIVERS/MOS DRIVERS WITH 3-STATE OUTPUTS

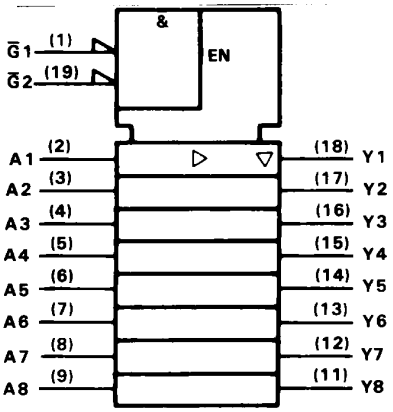
JUNE 1984—REVISED MAY 1986

logic symbols†

'ALS2540



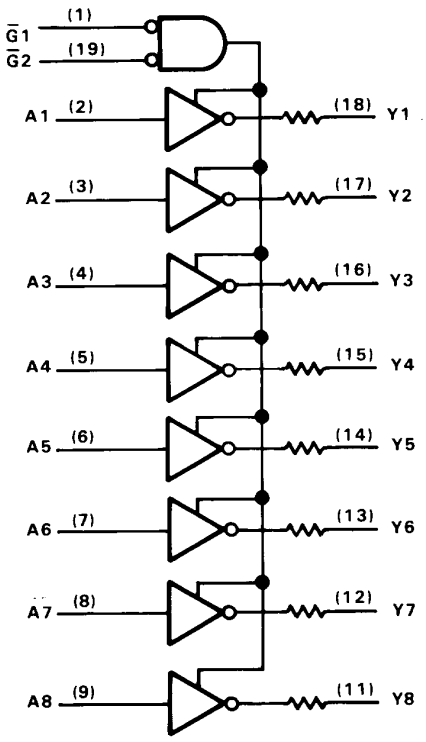
'ALS2541



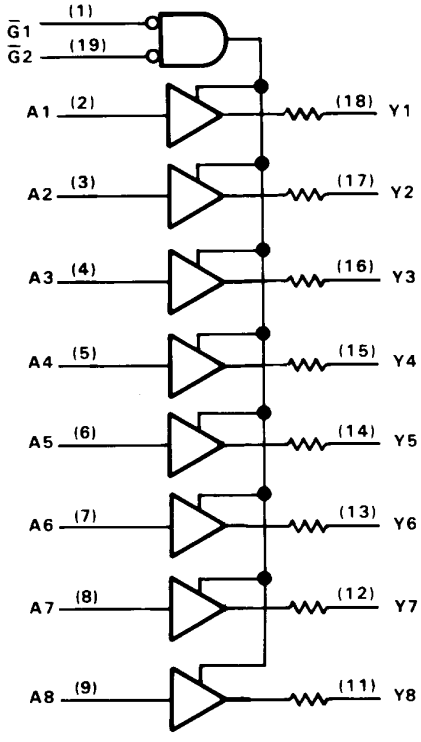
†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagrams (positive logic)

'ALS2540



'ALS2541



All output resistors are 25 Ω.

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} . . . . . 7 V
Input voltage . . . . . 7 V
Voltage applied to a disabled 3-state output . . . . . 5.5 V
Operating free-air temperature range: SN54ALS2540, SN54ALS2541 . . . . . −55°C to 125°C
SN74ALS2540, SN74ALS2541 . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

recommended operating conditions

		SN54ALS2540 SN54ALS2541			SN74ALS2540 SN74ALS2541			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.7			0.8	V
I_{OH}	High-level output current			−0.4			−0.4	mA
I_{OL}	Low-level output current			12			12	mA
T_A	Operating free-air temperature	−55		125	0		70	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS		SN54ALS2540 SN54ALS2541			SN74ALS2540 SN74ALS2541			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
V_{OH}		V_{CC} = 4.5 V to 5.5 V,	I_{OH} = −0.4 mA	V_{CC}−2			V_{CC}−2			V
V_{OL}		V_{CC} = 4.5 V,	I_{OL} = 1 mA		0.15	0.5		0.15	0.5	V
		V_{CC} = 4.5 V,	I_{OL} = 12 mA		0.35	0.8		0.35	0.8	
I_{OZH}		V_{CC} = 5.5 V,	V_O = 2.7 V			20			20	μA
I_{OZL}		V_{CC} = 5.5 V,	V_O = 0.4 V			−20			−20	μA
I_{OH}		V_{CC} = 4.5 V,	V_O = 2 V	−15			−15			mA
I_{OL}		V_{CC} = 4.5 V,	V_O = 2 V	30			30			mA
I_I		V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}		V_{CC} = 5.5 V,	V_I = 2.7 V			20			20	μA
I_{IL}		V_{CC} = 5.5 V,	V_I = 0.4 V			−0.1			−0.1	mA
I_O‡		V_{CC} = 5.5 V,	V_O = 2.25 V	−15		−70	−15		−70	mA
I_{CC}	'ALS2540	V_{CC} = 5.5 V	Outputs high		5	10		5	10	mA
			Outputs low		13	22		13	22	
			Outputs disabled		11	19		11	19	
	'ALS2541	V_{CC} = 5.5 V	Outputs high		6	14		6	14	mA
			Outputs low		15	25		15	25	
			Outputs disabled		13.5	22		13.5	22	

†All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS}.

'ALS2540 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = 25°C	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX				UNIT
			'ALS2540	SN54ALS2540		SN74ALS2540		
			TYP	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	7.5	2	14	2	12	ns
t_{PHL}			5.6	2	13	2	11	
t_{PZH}	$\overline{G}$	Y	9	5	18	5	15	ns
t_{PZL}			12.6	8	24	8	20	
t_{PHZ}	$\overline{G}$	Y	4	1	12	1	10	ns
t_{PLZ}			7	2	14	2	12	

'ALS2541 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = 25°C	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX				UNIT
			'ALS2541	SN54ALS2541		SN74ALS2541		
			TYP	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	8.7	2	17	2	15	ns
t_{PHL}			7	2	14	2	12	
t_{PZH}	$\overline{G}$	Y	9	5	18	5	15	ns
t_{PZL}			12.6	8	24	8	20	
t_{PHZ}	$\overline{G}$	Y	4	1	12	1	10	ns
t_{PLZ}			7	2	14	2	12	

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

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