

# TYPES SN54ALS1244A, SN74ALS1244A OCTAL BUFFER AND DRIVER WITH 3-STATE OUTPUTS

D2661, DECEMBER 1982—REVISED DECEMBER 1983

- Low-Power Version of 'ALS244A
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- P-N-P Inputs Reduce DC Loading
- Package Options Include Both Plastic and Ceramic Chip Carriers in Addition to Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

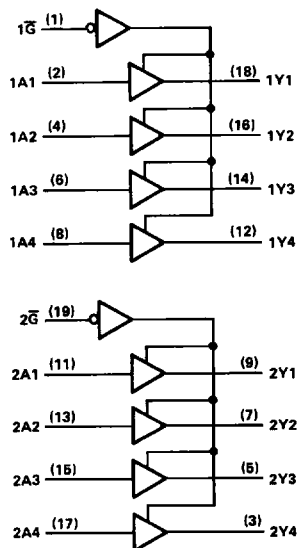
## description

This octal buffer and line driver is designed specifically to improve both the performance and density of three-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. Taken together with the 'ALS1240 and 'ALS1241 this device provides the choice of selected combinations of inverting and noninverting outputs symmetrical  $\bar{G}$  (active-low input control) inputs, and complementary  $\bar{G}$  and  $\bar{G}$  inputs.

The -1 version of the SN74ALS1244A is identical to the standard version except that the recommended maximum  $I_{OL}$  is increased to 24 milliamperes. There is no -1 version of the SN54ALS1244A.

The SN54ALS1244A is characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN74ALS1244A is characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

## functional block diagram (positive logic)

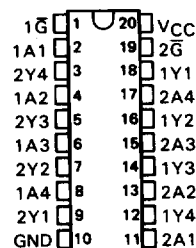


Pin numbers shown are for J and N packages

SN54ALS1244A . . . J PACKAGE

SN74ALS1244A . . . N PACKAGE

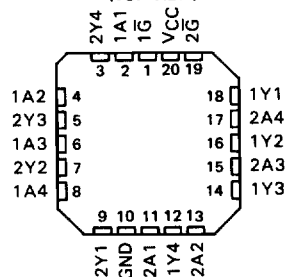
(TOP VIEW)



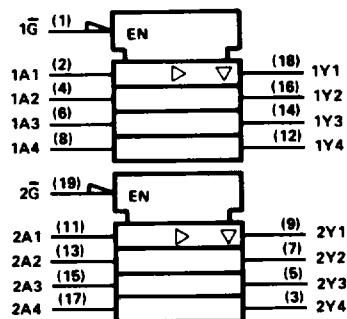
SN54ALS1244A . . . FH PACKAGE

SN74ALS1244A . . . FN PACKAGE

(TOP VIEW)



## logic symbol



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# TYPES SN54ALS1244A, SN74ALS1244A

## OCTAL BUFFER AND DRIVER WITH 3-STATE OUTPUTS

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: SN54ALS1244A	-55°C to 125°C
SN74ALS1244A	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54ALS1244A			SN74ALS1244A			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				0.8			V
$I_{OH}$	High-level output current				-12			mA
$I_{OL}$	Low-level output current				8			mA
					16			mA
					24 <sup>†</sup>			mA
$T_A$	Operating free-air temperature	-55			125			°C
					0			°C
					70			°C

<sup>†</sup>The extended limits apply only if  $V_{CC}$  is maintained between 4.75 V and 5.25 V.  
The 24-mA limit applies for the SN74ALS1244A-1 only.

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

PARAMETER	TEST CONDITIONS	SN54ALS1244A			SN74ALS1244A			UNIT	
		MIN	TYP <sup>‡</sup>	MAX	MIN	TYP <sup>‡</sup>	MAX		
$V_{IK}$	$V_{CC} = 4.5$ V, $I_I = -18$ mA				-1.5			V	
$V_{OH}$	$V_{CC} = 4.5$ V to 5.5 V, $I_{OH} = -0.4$ mA	$V_{CC} - 2$			$V_{CC} - 2$			V	
	$V_{CC} = 4.5$ V, $I_{OH} = -3$ mA	2.4	3.2		2.4	3.2			
	$V_{CC} = 4.5$ V, $I_{OH} = -12$ mA	2							
	$V_{CC} = 4.5$ V, $I_{OH} = -15$ mA				2				
$V_{OL}$	$V_{CC} = 4.5$ V, $I_{OL} = 8$ mA	0.25			0.4	0.25		0.4	V
	$V_{CC} = 4.5$ V, $I_{OL} = 16$ mA ( $I_{OL} = 24$ mA for -1 versions)				0.35			0.5	
$I_{OZH}$	$V_{CC} = 5.5$ V, $V_O = 2.7$ V				20			$\mu$ A	
$I_{OZL}$	$V_{CC} = 5.5$ V, $V_I = 0.4$ V				-20			$\mu$ A	
$I_I$	$V_{CC} = 5.5$ V, $V_I = 7$ V				0.1			mA	
$I_{IH}$	$V_{CC} = 5.5$ V, $V_I = 2.7$ V				20			$\mu$ A	
$I_{IL}$	$V_{CC} = 5.5$ V, $V_I = 0.4$ V				-0.1			mA	
$I_O^{\S}$	$V_{CC} = 5.5$ V, $V_O = 2.25$ V	-30			-112			mA	
$I_{CC}$	$V_{CC} = 5.5$ V	Outputs high		6	15	6		11	mA
		Outputs low		10	20	10		17	
		Outputs disabled		11	25	11		20	

<sup>‡</sup>All typical values are at  $V_{CC} = 5$  V,  $T_A = 25^\circ$ C.

<sup>\S</sup>The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current,  $I_{OS}$ .

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# TYPES SN54ALS1244A, SN74ALS1244A OCTAL BUFFER AND DRIVER WITH 3-STATE OUTPUTS

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V,}$ $C_L = 50 \text{ pF,}$ $R_1 = 500 \Omega,$ $R_2 = 500 \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			SN54ALS1244A		SN74ALS1244A		
			MIN	MAX	MIN	MAX	
$t_{PLH}$	A	Y	3	16	3	14	ns
$t_{PHL}$			3	16	3	14	
$t_{PZH}$	$\bar{G}$	Y	6	26	6	22	ns
$t_{PZL}$			6	26	6	22	
$t_{PHZ}$	$\bar{G}$	Y	2	12	2	10	ns
$t_{PLZ}$			3	16	3	13	

NOTE 1: For load circuit and voltage waveforms, see page 1-12.

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