

SN54ALS244B, SN54AS244, SN74ALS244B, SN74AS244 OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

SDAS142 – D2661, DECEMBER 1982 – REVISED JULY 1987

- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- PNP inputs Reduce DC Loading
- Package Options include Plastic Small Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

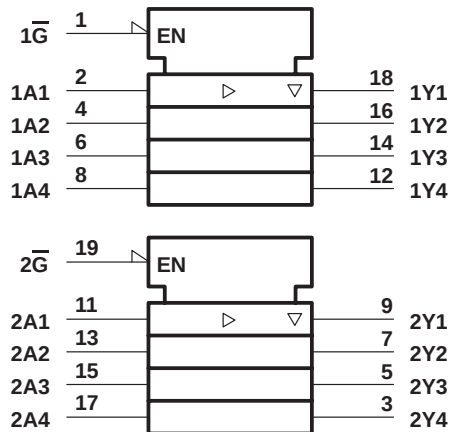
description

These octal buffers and line drivers are designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. Taken together with the 'ALS240A, 'ALS241A, 'AS240, and 'AS241, these devices provide the choice of selected combinations of inverting outputs, symmetrical $\overline{G}$ (active-low input control) inputs, and complementary $\overline{G}$ and $\overline{G}$ inputs.

The -1 version of the SN74ALS244B is identical to the standard version except that the recommended maximum I_{OL} is increased to 48 mA. There is no -1 version of the SN54ALS244B.

The SN54ALS244B and SN54AS244 are characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS244B and SN74AS244 are characterized for operation from 0°C to 70°C .

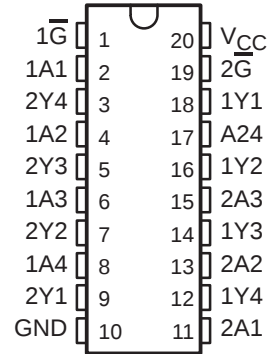
logic symbol†



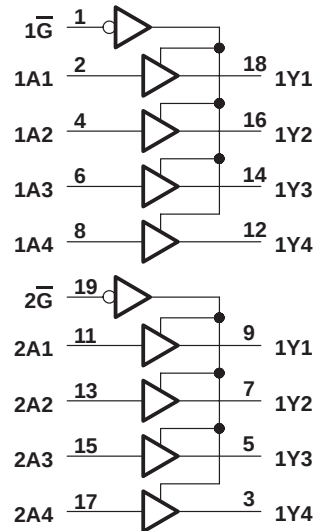
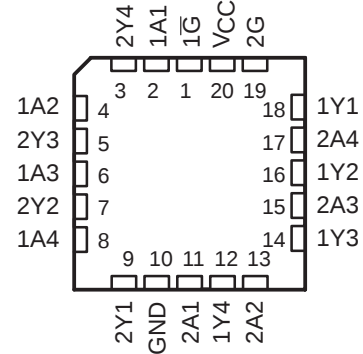
† This is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

Pin numbers are for DW, J, and N packages.

SN54ALS244B, SN54AS244 ... J PACKAGE
SN74ALS244B, SN74AS244 ... DW OR N PACKAGE
(TOP VIEW)



SN54ALS244B, SN54AS244 ... FK PACKAGE
(TOP VIEW)



SN54ALS244B, SN74ALS244B

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

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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: SN54ALS244B	–55°C to 125°C
SN74ALS244B	0°C to 70°C
Storage temperature range	–65°C to 150°C

recommended operating conditions

	SN54ALS244B			SN74ALS244B			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
			0.8 [†]				
			0.7 [‡]				
I_{OH} High-level output current			–12			–15	mA
I_{OL} Low-level output current				12		24	mA
						48 [§]	
T_A Operating free-air temperature	–55		125	0		70	°C

[†] Tested at –55°C to 70°C.

[‡] Tested at 70°C to 125°C, per MIL-STD-883, method 5005, sub-group 1, 2, and 3. Static tests are performed at 25°C, 125°C, and 55°C.

[§] The extended limits apply only if V_{CC} is maintained between 4.75 V and 5.25 V. The 48-mA limit applies for the SN74ALS244B-1 only.

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

PARAMETER	TEST CONDITIONS		SN54ALS244B			SN74ALS244B			UNIT
			MIN	TYP [†]	MAX	MIN	TYP [†]	MAX	
V_{IK}	$V_{CC} = 4.5$ V,	$I_I = -18$ mA			–1.5			–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 to 5.5 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,	$I_{OL} = 12$ mA	0.25	0.4		0.25	0.4		V
	$V_{CC} = 4.75$ V,	$I_{OL} = 24$ mA ($I_{OL} = 48$ mA for –1 version)							
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_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	–30		–112	–30		–112	mA
I_{CC}	$V_{CC} = 5.5$ V	Outputs high	9	15		9	15		mA
		Outputs low	15	24		15	24		
		Outputs disabled	17	27		17	27		

[†] All typical values are at $V_{CC} = 5$ V, $T_A = 25^\circ\text{C}$.

[#] The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .



SN54ALS244B, 2N74ALS244B

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

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switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = MIN to MAX†				UNIT
			SN54AS244		SN74AS244		
			MIN	MAX	MIN	MAX	
t _{PLH}	A	Y	1	16	3	10	ns
t _{PHL}			3	12	3	10	
t _{PZH}	$\overline{G}$	Y	1	26	3	20	ns
t _{PZL}			1	24	3	20	
t _{PHZ}	$\overline{G}$	Y	2	10	3	10	ns
t _{PLZ}			1	26	3	13	

[†] For conditions shown MIN or MAX, use the appropriate value specified under recommended operating conditions.

NOTE 1: Load circuit and voltage waveforms are shown in Section 1 of the *ALS/AS Logic Data Book, 1986*.

SN54AS244, SN74AS244

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

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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: SN54AS244	–55°C to 125°C
SN74AS244	0°C to 70°C
Storage temperature range	–65°C to 150°C

recommended operating conditions

	SN54AS244			SN74AS244			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			0.8	V
I_{OH} High-level output current			–12			–15	mA
I_{OL} Low-level output current			48			64	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	SN54AS244			SN74AS244			UNIT
			MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		$V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$			–1.2			–1.2	V
V_{OH}		$V_{CC} = 4.5\text{ V to } 5.5\text{ V}$, $I_{OH} = -2\text{ mA}$	$V_{CC} - 2$			$V_{CC} - 2$			V
		$V_{CC} = 4.5\text{ V}$, $I_{OH} = -3\text{ mA}$	2.4	3.4		2.4	3.4		
		$V_{CC} = 4.5\text{ V}$, $I_{OH} = -12\text{ mA}$	2.4						
		$V_{CC} = 4.5\text{ V}$, $I_{OH} = -15\text{ mA}$				2.4			
V_{OL}		$V_{CC} = 4.5\text{ V}$, $I_{OL} = 48\text{ mA}$			0.55				V
		$V_{CC} = 4.5\text{ V}$, $I_{OL} = 64\text{ mA}$						0.55	
I_{OZH}		$V_{CC} = 5.5\text{ V}$, $V_O = 2.7\text{ V}$			50			50	μA
I_{OZL}		$V_{CC} = 5.5\text{ V}$, $V_O = 0.4\text{ V}$			–50			–50	μA
I_I		$V_{CC} = 5.5\text{ V}$, $V_I = 7\text{ V}$			0.1			0.1	mA
I_{IH}		$V_{CC} = 5.5\text{ V}$, $V_I = 2.7\text{ V}$			20			20	μA
I_{IL}	$\overline{G}$	$V_{CC} = 5.5\text{ V}$, $V_I = 0.4\text{ V}$			–0.5			–0.5	mA
	A				–1			–1	
$I_O^\ddagger$		$V_{CC} = 5.5\text{ V}$, $V_O = 2.25\text{ V}$	–50		–150	50		–150	mA
I_{CC}		Outputs high		22	34		22	34	mA
		Outputs low		60	90		60	90	
		Outputs disabled		34	54		34	54	

† All typical values are at $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$.

‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

SN54AS244, SN74AS244

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switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = MIN to MAX†				UNIT
			SN54AS244		SN74AS244		
			MIN	MAX	MIN	MAX	
t _{PLH}	A	Y	2	9	2	6.2	ns
t _{PHL}			2	7	2	6.2	
t _{PZH}	$\overline{G}$	Y	2	10	2	9	ns
t _{PZL}			2	8	2	7.5	
t _{PHZ}	$\overline{G}$	Y	2	6.5	2	6	ns
t _{PLZ}			2	10.5	2	9	

[†] For conditions shown MIN or MAX, use the appropriate value specified under recommended operating conditions.

NOTE 1: Load circuit and voltage waveforms are shown in Section 1 of the *ALS/AS Logic Data Book, 1986*.

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