

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

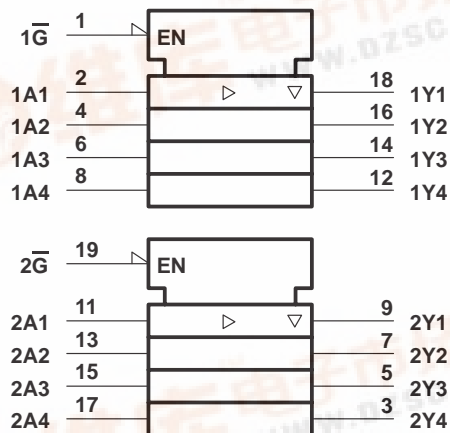
description

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 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.

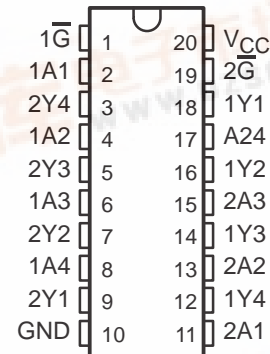
logic symbol†



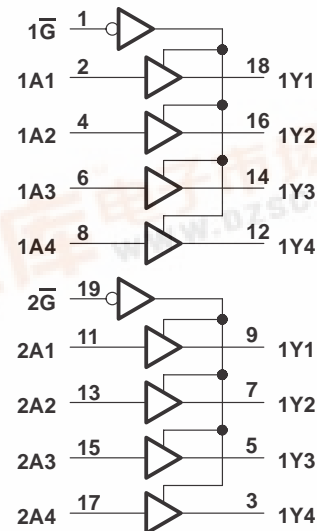
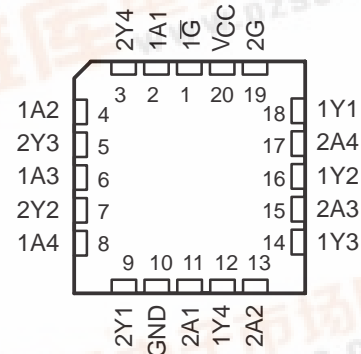
† This is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

SDAS142 – D2661, DECEMBER 1982 – REVISED JULY 1987

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†
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	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, $T_A = 25$ °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

SDAS142 – D2661, DECEMBER 1982 – REVISED JULY 1987

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5\text{ V to }5.5\text{ V,}$ $C_L = 50\text{ pF,}$ $R_1 = 500\ \Omega,$ $R_2 = 500\ \Omega,$ $T_A = \text{MIN to MAX}^\dagger$				UNIT
			SN54AS244		SN74AS244		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	1	16	3	10	ns
t_{PHL}			3	12	3	10	
t_{PZH}	\bar{G}	Y	1	26	3	20	ns
t_{PZL}			1	24	3	20	
t_{PHZ}	\bar{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

SDAS142 – D2661, DECEMBER 1982 – REVISED JULY 1987

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}	$V_{CC} = 5.5\text{ V}$, $V_I = 0.4\text{ V}$	\bar{G}			–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}	$V_{CC} = 5.5\text{ V}$	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

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

SDAS142 – D2661, DECEMBER 1982 – REVISED JULY 1987

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5\text{ V to }5.5\text{ V,}$ $C_L = 50\text{ pF,}$ $R_1 = 500\ \Omega,$ $R_2 = 500\ \Omega,$ $T_A = \text{MIN to MAX}^\dagger$				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}	\bar{G}	Y	2	10	2	9	ns
t_{PZL}			2	8	2	7.5	
t_{PHZ}	\bar{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*.

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

CERTAIN APPLICATIONS USING SEMICONDUCTOR PRODUCTS MAY INVOLVE POTENTIAL RISKS OF DEATH, PERSONAL INJURY, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE ("CRITICAL APPLICATIONS"). TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS. INCLUSION OF TI PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE FULLY AT THE CUSTOMER'S RISK.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.