

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
 - Class Q Military
 - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
 - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

SN54ALS244C, SN54AS244, SN74ALS244C, SN74AS244A OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

SDAS142B – JULY 1987 – REVISED DECEMBER 1994

- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- pnp Inputs Reduce dc Loading
- Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

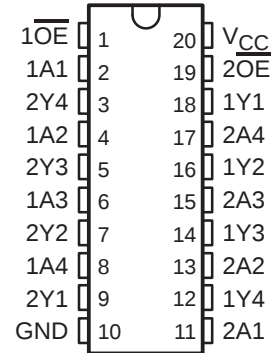
description

These octal buffers and line drivers are designed specifically to improve the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. With the 'ALS240A, 'ALS241C, 'AS240A, SN54AS241, and SN74AS241A, these devices provide the choice of selected combinations of inverting outputs, symmetrical active-low output-enable ($\overline{\text{OE}}$) inputs, and complementary OE and $\overline{\text{OE}}$ inputs.

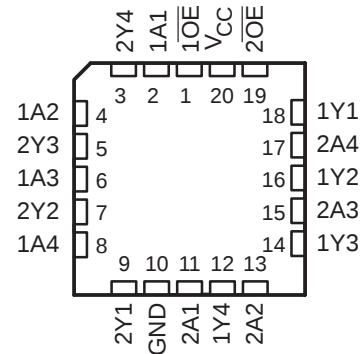
The -1 version of SN74ALS244C is identical to the standard version, except that the recommended maximum I_{OL} of the -1 version is 48 mA. There is no -1 version of the SN54ALS244C.

The SN54ALS244C and SN54AS244 are characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS244C and SN74AS244A are characterized for operation from 0°C to 70°C .

SN54ALS244C, SN54AS244 . . . J PACKAGE
SN74ALS244C, SN74AS244A . . . DW OR N PACKAGE
(TOP VIEW)



SN54ALS244C, SN54AS244 . . . FK PACKAGE
(TOP VIEW)



FUNCTION TABLE
(each buffer)

INPUTS		OUTPUT
$\overline{\text{OE}}$	A	Y
L	H	H
L	L	L
H	X	Z

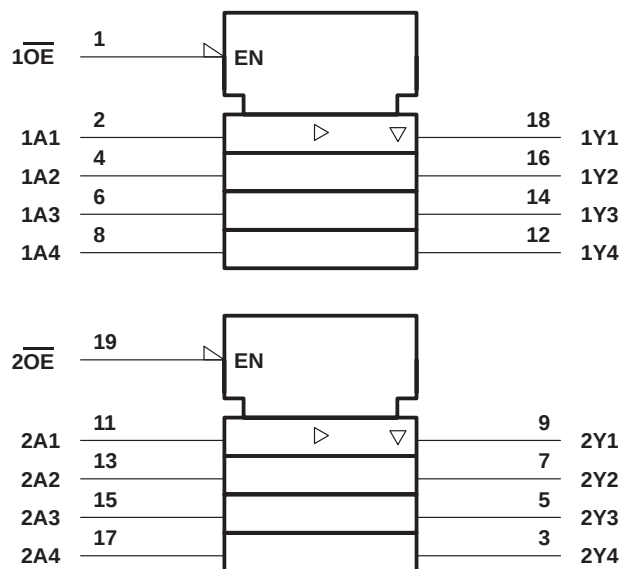
SN54ALS244C, SN54AS244, SN74ALS244C, SN74AS244A

OCTAL BUFFERS AND LINE DRIVERS

WITH 3-STATE OUTPUTS

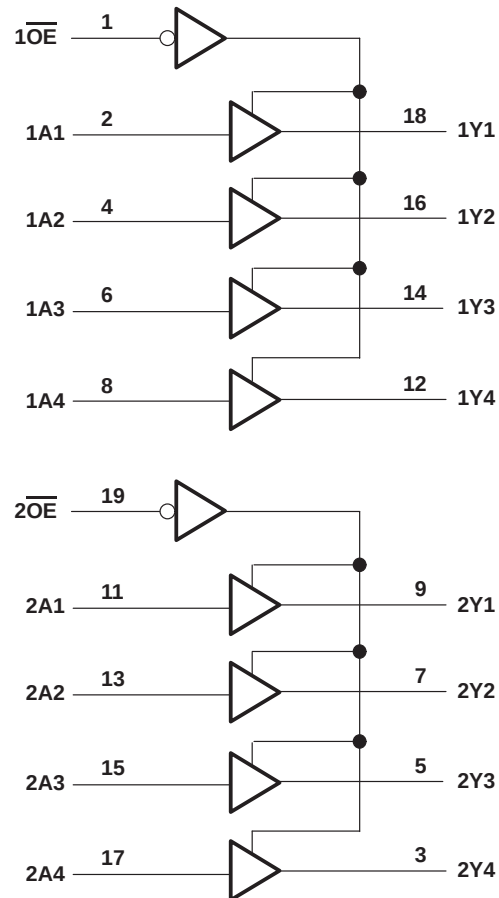
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logic symbol†



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

logic diagram (positive logic)



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

Supply voltage, V_{CC}	7 V
Input voltage, V_I	7 V
Voltage applied to a disabled 3-state output	5.5 V
Operating free-air temperature range, T_A : SN54ALS244C	–55°C to 125°C
SN74ALS244C	0°C to 70°C
Storage temperature range	–65°C to 150°C

‡ Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

SN54ALS244C, SN54AS244, SN74ALS244C, SN74AS244A

OCTAL BUFFERS AND LINE DRIVERS

WITH 3-STATE OUTPUTS

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recommended operating conditions

		SN54ALS244C			SN74ALS244C			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
				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

[†] Applies over temperature range –55°C to 70°C

[‡] Applies over temperature range 70°C to 125°C

[§] Applies only to the -1 version and only if V_{CC} is between 4.75 V and 5.25 V

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

PARAMETER	TEST CONDITIONS		SN54ALS244C			SN74ALS244C			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
		I _{OH} = –3 mA	2.4	3.2		2.4	3.2		
	V _{CC} = 4.5 V	I _{OH} = –12 mA	2						
		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
		I _{OL} = 24 mA					0.35	0.5	
		I _{OL} = 48 mA (-1 version)					0.35	0.5	
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	–20		–112	–30		–112	mA
I _{CC}	V _{CC} = 5.5 V	Outputs high		9	15		9	17	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}.

SN54ALS244C, SN54AS244, SN74ALS244C, SN74AS244A

OCTAL BUFFERS AND LINE DRIVERS

WITH 3-STATE OUTPUTS

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switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	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
			SN54ALS244C		SN74ALS244C		
			MIN	MAX	MIN	MAX	
t _{PLH}	A	Y	1	16	2	10	ns
t _{PHL}			3	12	3	10	
t _{PZH}	$\overline{\text{OE}}$	Y	1	26	3	20	ns
t _{PZL}			1	24	3	20	
t _{PHZ}	$\overline{\text{OE}}$	Y	2	10	2	10	ns
t _{PLZ}			1	26	1	13	

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

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

Supply voltage, V _{CC}	7 V
Input voltage, V _I	7 V
Voltage applied to a disabled 3-state output	5.5 V
Operating free-air temperature range, T _A : SN54AS244	–55°C to 125°C
SN74AS244A	0°C to 70°C
Storage temperature range	–65°C to 150°C

‡ Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

recommended operating conditions

		SN54AS244			SN74AS244A			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



SN54ALS244C, SN54AS244, SN74ALS244C, SN74AS244A
OCTAL BUFFERS AND LINE DRIVERS
WITH 3-STATE OUTPUTS

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

PARAMETER	TEST CONDITIONS		SN54AS244			SN74AS244A			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		
		$I_{OH} = -12\text{ mA}$	2.4						
		$I_{OH} = -15\text{ mA}$				2.4			
V_{OL}	$V_{CC} = 4.5\text{ V}$	$I_{OL} = 48\text{ mA}$			0.55				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}	$\overline{\text{OE}}$ A	$V_{CC} = 5.5\text{ V}$, $V_I = 0.4\text{ V}$			-0.5			-0.5	mA
					-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} .

switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	VCC = 4.5 V to 5.5 V, CL = 50 pF, R1 = 500 Ω, R2 = 500 Ω, TA = MIN to MAX§				UNIT
			SN54AS244		SN74AS244A		
			MIN	MAX	MIN	MAX	
tPLH	A	Y	2	9	2	6.2	ns
tPHL			2	7	1	6.2	
tPZH	OE	Y	2	10	1	9	ns
tPZL			2	8	2	7.5	
tPHZ	OE	Y	2	6.5	1	6	ns
tPLZ			2	10.5	1	9	

§ For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

SN54ALS244C, SN54AS244, SN74ALS244C, SN74AS244A

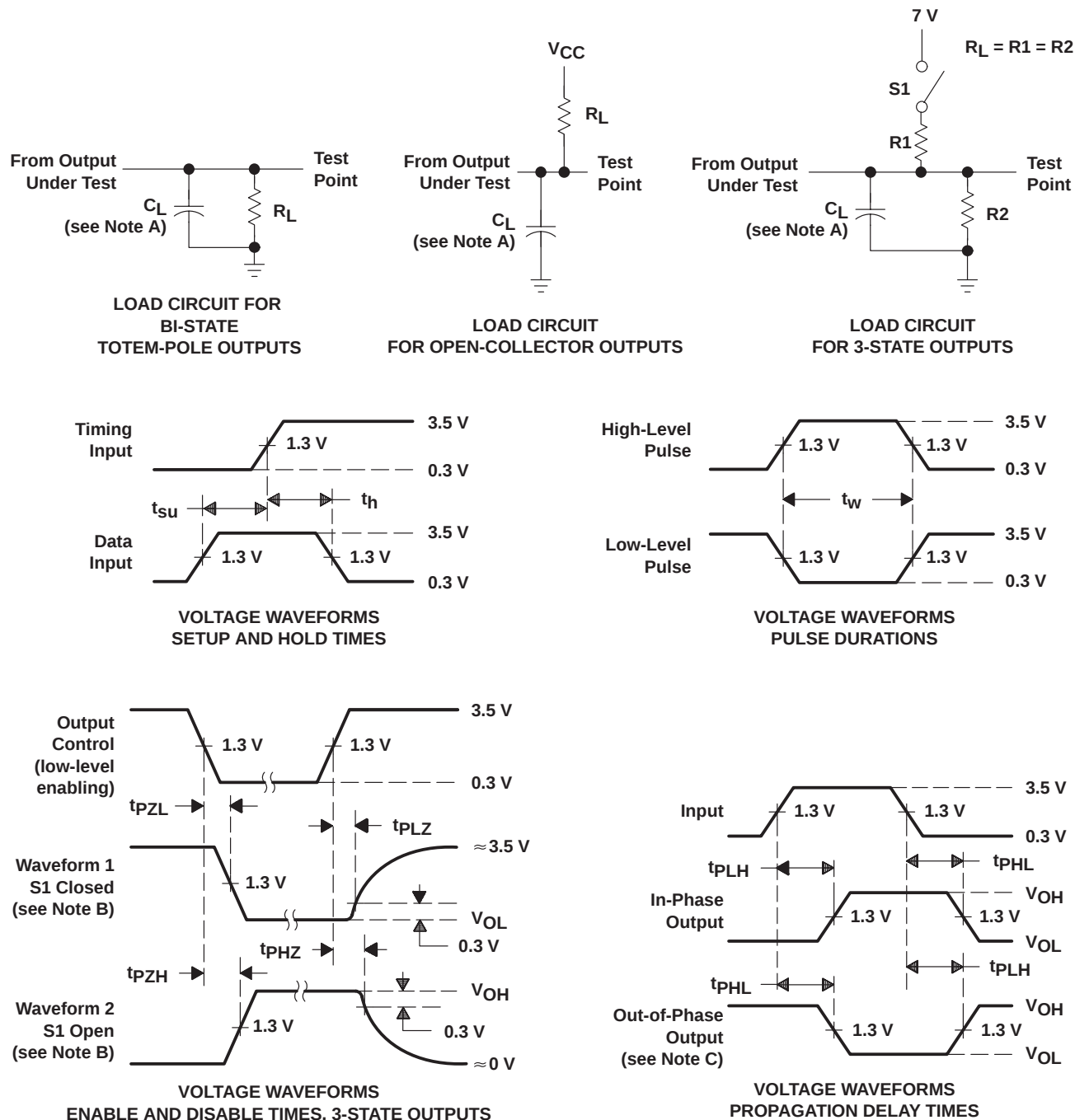
OCTAL BUFFERS AND LINE DRIVERS

WITH 3-STATE OUTPUTS

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PARAMETER MEASUREMENT INFORMATION

SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



- NOTES: A. C_L includes probe and jig capacitance.
 B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
 C. When measuring propagation delay items of 3-state outputs, switch S_1 is open.
 D. All input pulses have the following characteristics: $PRR \leq 1$ MHz, $t_r = t_f = 2$ ns, duty cycle = 50%.
 E. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuits and Voltage Waveforms

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