

# SN54ALS805A, SN54AS805B, SN74ALS805A, SN74AS805B HEX 2-INPUT NOR DRIVERS

SDAS023C – DECEMBER 1982 – REVISED JANUARY 1995

- High Capacitive-Drive Capability
- 'ALS805A Has Typical Delay Time of 4.2 ns ( $C_L = 50$  pF) and Typical Power Dissipation of 4.2 mW Per Gate
- 'AS805B Has Typical Delay Time of 2.6 ns ( $C_L = 50$  pF) and Typical Power Dissipation of 12 mW Per Gate
- Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

## description

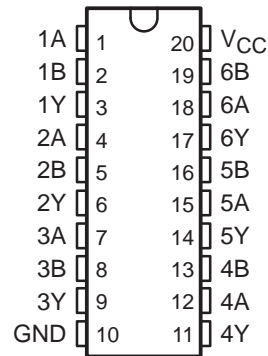
These devices contain six independent 2-input NOR drivers. They perform the Boolean functions  $Y = \overline{A + B}$  or  $Y = \overline{A} \cdot \overline{B}$  in positive logic.

The SN54ALS805A and SN54AS805B are characterized for operation over the full military temperature range of  $-55^\circ\text{C}$  to  $125^\circ\text{C}$ . The SN74ALS805A and SN74AS805B are characterized for operation from  $0^\circ\text{C}$  to  $70^\circ\text{C}$ .

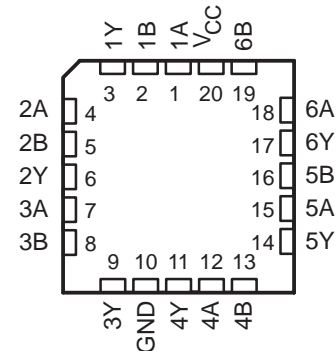
FUNCTION TABLE  
(each driver)

INPUTS		OUTPUT
A	B	Y
H	X	L
X	H	L
L	L	H

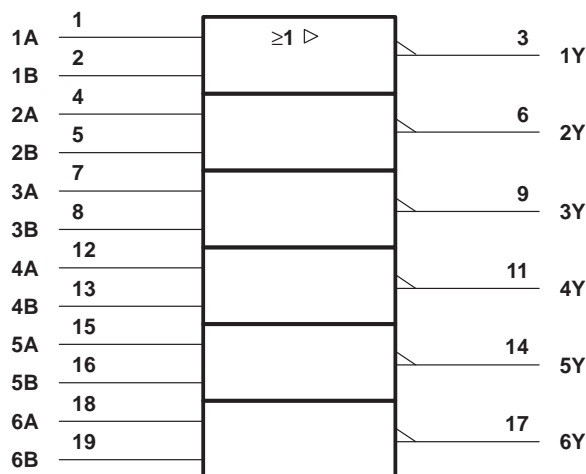
SN54ALS805A, SN54AS805B . . . J PACKAGE  
SN74ALS805A, SN74AS805B . . . DW OR N PACKAGE  
(TOP VIEW)



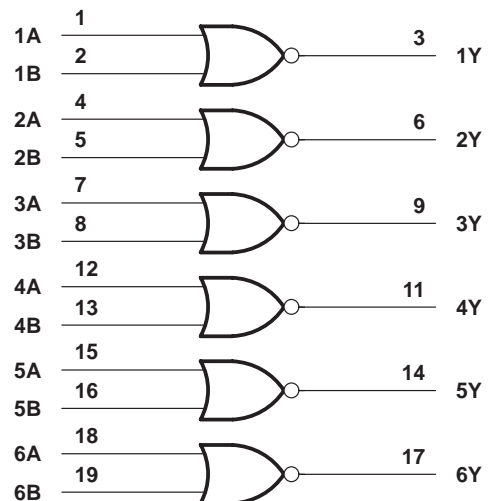
SN54ALS805A, SN54AS805B . . . FK PACKAGE  
(TOP VIEW)



## logic symbol†



## logic diagram (positive logic)



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

# SN54ALS805A, SN54AS805B, SN74ALS805A, SN74AS805B

## HEX 2-INPUT NOR DRIVERS

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### absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>

Supply voltage, $V_{CC}$	7 V
Input voltage, $V_I$	7 V
Operating free-air temperature range, $T_A$ : SN54ALS805A	–55°C to 125°C
SN74ALS805A	0°C to 70°C
Storage temperature range	–65°C to 150°C

<sup>†</sup> 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

		SN54ALS805A			SN74ALS805A			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			–12			–15	mA
$I_{OL}$	Low-level output current			12			24	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		SN54ALS805A			SN74ALS805A			UNIT
			MIN	TYP <sup>‡</sup>	MAX	MIN	TYP <sup>‡</sup>	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
	$V_{CC} = 4.5$ V	$I_{OH} = -3$ mA	2.4	3.2		2.4	3.2		
		$I_{OH} = -12$ 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	
$I_I$	$V_{CC} = 5.5$ 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
$I_{O}^{\S}$	$V_{CC} = 5.5$ V,	$V_O = 2.25$ V	–20		–112	–30		–112	mA
$I_{CCH}$	$V_{CC} = 5.5$ V,	$V_I = 0$		2	4		2	4	mA
$I_{CCL}$	$V_{CC} = 5.5$ V,	$V_I = 4.5$ V		8	14		8	14	mA

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

<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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# SN54ALS805A, SN54AS805B, SN74ALS805A, SN74AS805B HEX 2-INPUT NOR DRIVERS

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## switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 4.5 V to 5.5 V, C <sub>L</sub> = 50 pF, R <sub>L</sub> = 500 Ω, T <sub>A</sub> = MIN to MAX†				UNIT
			SN54ALS805A		SN74ALS805A		
			MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A or B	Y	1	12	2	7	ns
t <sub>PHL</sub>			1	9	2	8	

† 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 <sub>CC</sub>	7 V
Input voltage, V <sub>I</sub>	7 V
Operating free-air temperature range, T <sub>A</sub> : SN54AS805B	–55°C to 125°C
SN74AS805B	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§

		SN54AS805B			SN74AS805B			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V <sub>CC</sub>	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V <sub>IH</sub>	High-level input voltage	2			2			V
V <sub>IL</sub>	Low-level input voltage			0.8			0.8	V
I <sub>OH</sub>	High-level output current			–40			–48	mA
I <sub>OL</sub>	Low-level output current			40			48	mA
T <sub>A</sub>	Operating free-air temperature	–55		125	0		70	°C

§ These high sink- or source-current devices are not recommended for use above 40 MHz.

# SN54ALS805A, SN54AS805B, SN74ALS805A, SN74AS805B

## HEX 2-INPUT NOR DRIVERS

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

PARAMETER	TEST CONDITIONS		SN54AS805B			SN74AS805B			UNIT
			MIN	TYP†	MAX	MIN	TYP†	MAX	
V <sub>IK</sub>	V <sub>CC</sub> = 4.5 V, I <sub>I</sub> = −18 mA		−1.2			−1.2			V
V <sub>OH</sub>	V <sub>CC</sub> = 4.5 V to 5.5 V, I <sub>OH</sub> = −2 mA		V <sub>CC</sub> − 2			V <sub>CC</sub> − 2			V
	V <sub>CC</sub> = 4.5 V	I <sub>OH</sub> = −3 mA	2.4	3.2		2.4	3.2		
		I <sub>OH</sub> = −40 mA	2						
		I <sub>OH</sub> = −48 mA				2			
V <sub>OL</sub>	V <sub>CC</sub> = 4.5 V	I <sub>OL</sub> = 40 mA	0.25	0.5				V	
		I <sub>OL</sub> = 48 mA				0.35	0.5		
I <sub>I</sub>	V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 7 V		0.1			0.1			mA
I <sub>IH</sub>	V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 2.7 V		20			20			μA
I <sub>IL</sub>	V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 0.4 V		−0.5			−0.5			mA
I <sub>O</sub> ‡	V <sub>CC</sub> = 5.5 V, V <sub>O</sub> = 2.25 V		−50		−200	−50		−200	mA
I <sub>CC</sub> H	V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 0		6.5	10		6.5	10		mA
I <sub>CC</sub> L	V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 4.5 V		20	32		20	32		mA

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

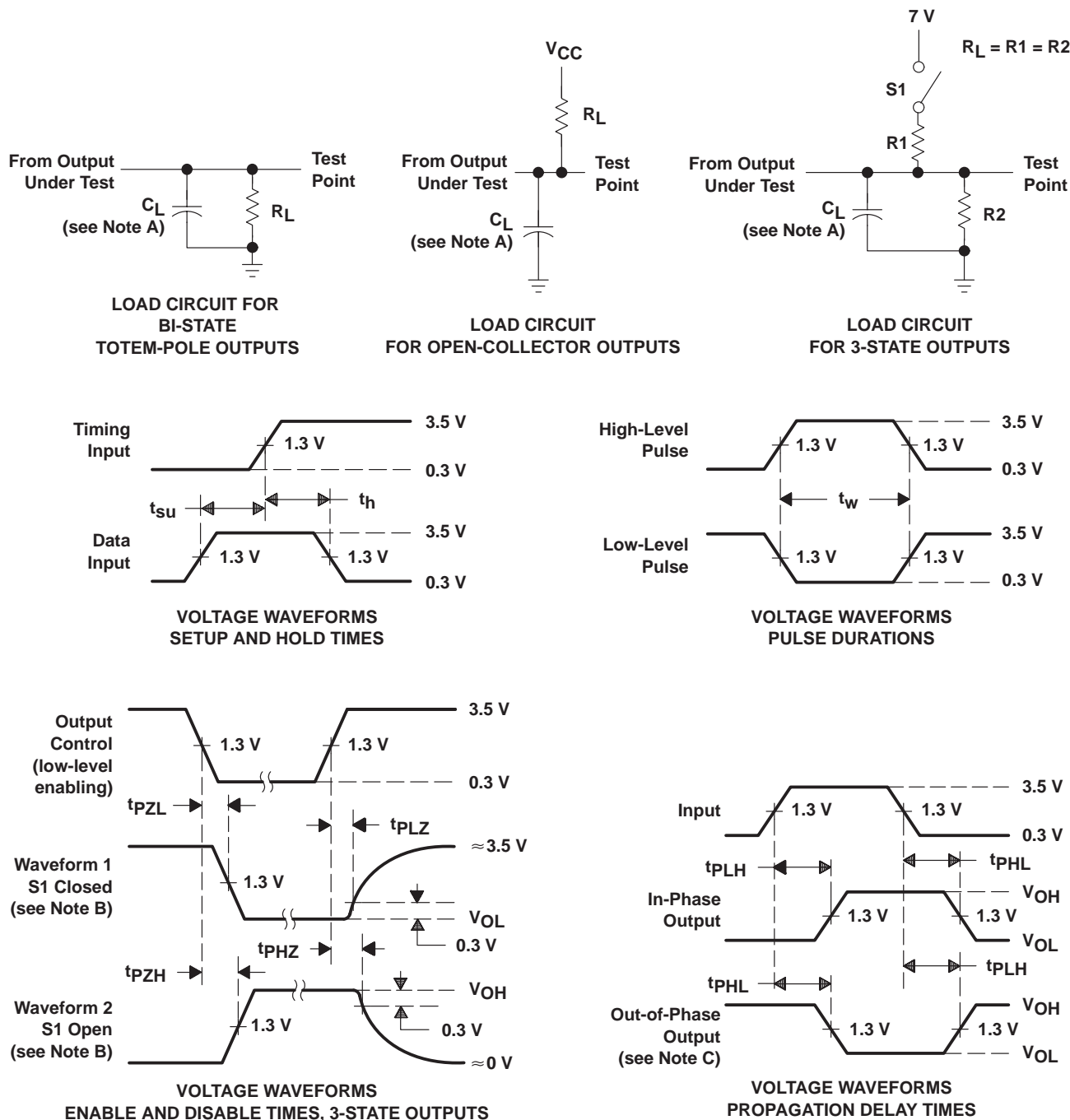
‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current,  $I_{OS}$ .

### switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 4.5 V to 5.5 V, C <sub>L</sub> = 50 pF, R <sub>L</sub> = 500 Ω, T <sub>A</sub> = MIN to MAX§				UNIT
			SN54AS805B		SN74AS805B		
			MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A or B	Y	1	4.8	1	4.3	ns
t <sub>PHL</sub>			1	4.8	1	4.3	

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

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 S1 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

**PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
5962-87794012A	ACTIVE	LCCC	FK	20	1	None	Call TI	Level-NC-NC-NC
5962-8779401RA	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
5962-8779401SA	ACTIVE	CFP	W	20	1	None	Call TI	Level-NC-NC-NC
5962-8869401SA	OBSOLETE	CFP	W	20		None	Call TI	Call TI
SN54ALS805AJ	OBSOLETE	CDIP	J	20		None	Call TI	Call TI
SN54AS805BJ	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
SN74ALS805ADW	ACTIVE	SOIC	DW	20	25	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74ALS805ADWR	ACTIVE	SOIC	DW	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74ALS805AN	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74ALS805AN3	OBSOLETE	PDIP	N	20		None	Call TI	Call TI
SN74AS805BDW	ACTIVE	SOIC	DW	20	25	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74AS805BDWR	ACTIVE	SOIC	DW	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74AS805BN	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SNJ54ALS805AFK	OBSOLETE	LCCC	FK	20		None	Call TI	Call TI
SNJ54ALS805AJ	OBSOLETE	CDIP	J	20		None	Call TI	Call TI
SNJ54AS805BFK	ACTIVE	LCCC	FK	20	1	None	Call TI	Level-NC-NC-NC
SNJ54AS805BJ	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
SNJ54AS805BW	ACTIVE	CFP	W	20	1	None	Call TI	Level-NC-NC-NC

<sup>(1)</sup> The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

<sup>(2)</sup> Eco Plan - May not be currently available - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**None:** Not yet available Lead (Pb-Free).

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean "Pb-Free" and in addition, uses package materials that do not contain halogens, including bromine (Br) or antimony (Sb) above 0.1% of total product weight.

<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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