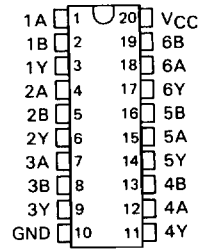
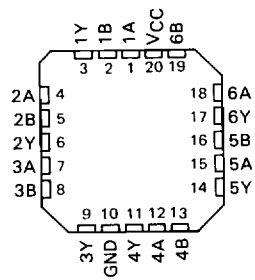
D2661, DECEMBER 1982—REVISED DECEMBER 1983

- **High Capacitive Drive Capability**
- **'ALS804 Has Typical Delay Time of 4 ns (C_L = 50 pF) and Typical Power Dissipation of 3.4 mW per Gate**
- **'AS804A Has Typical Delay Time of 2.6 ns (C_L = 50 pF) and Typical Power Dissipation of Less than 9 mW per Gate**
- **Package Options Include Both Plastic and Ceramic Chip Carriers in Addition to Plastic and Ceramic DIPs**
- **Dependable Texas Instruments Quality and Reliability**

SN54ALS804, SN54AS804A . . . J PACKAGE
SN74ALS804, SN74AS804A . . . N PACKAGE
(TOP VIEW)



SN54ALS804, SN54AS804A . . . FH PACKAGE
SN74ALS804, SN74AS804A . . . FN PACKAGE
(TOP VIEW)



description

These devices contain six independent 2-input NAND drivers. They perform the Boolean functions $Y = \overline{A \cdot B}$ or $Y = \overline{A} + \overline{B}$ in positive logic.

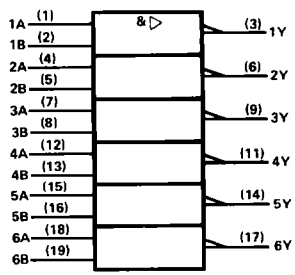
The –1 version of the SN74ALS804 parts is identical to the standard version except that the recommended maximum I_{OL} is increased to 48 milliamperes. There is no –1 version of the SN54ALS804 parts.

The SN54ALS804 and SN54AS804A are characterized for operation over the full military temperature range of –55°C to 125°C. The SN74ALS804 and SN74AS804A are characterized for operation from 0°C to 70°C.

FUNCTION TABLE (each driver)

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

logic symbol



Pin numbers shown are for J and N packages.

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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage . . . . . 7 V
Operating free-air temperature range: SN54ALS804 . . . . . −55 °C to 125 °C
SN74ALS804 . . . . . 0 °C to 70 °C
Storage temperature range . . . . . −65 °C to 150 °C

recommended operating conditions

		SN54ALS804			SN74ALS804			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			12			24	mA
							48†	
T_A	Operating free-air temperature	−55		125	0		70	°C

† The extended limit applies if V_{CC} is maintained between 4.75 V and 5.25 V.
The 48 mA limit applies for the SN74ALS804−1 only.

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

PARAMETER	TEST CONDITIONS		SN54ALS804			SN74ALS804			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,	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} = 4.5 V, I_{OL} = 48 mA for −1 version)	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§	V_{CC} = 5.5 V,	V_O = 2.25 V	−30		−112	−30		−112	mA
I_{CCH}	V_{CC} = 5.5 V,	V_I = 0 V		0.9	2.5		0.9	2.5	mA
I_{CCL}	V_{CC} = 5.5 V,	V_I = 4.5 V		7	12		7	12	mA

‡ 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}.

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX				UNIT
			SN54ALS804		SN74ALS804		
			MIN	MAX	MIN	MAX	
t_{PLH}	A or B	Y	2	8	2	6	ns
t_{PHL}			2	9	2	7	

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

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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
Operating free-air temperature range: SN54AS804A . . . . . −55°C to 125°C
SN74AS804A . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

recommended operating conditions

		SN54AS804A			SN74AS804A			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			−40			−48	mA
I_{OL}	Low-level output current			40			48	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		SN54AS804A			SN74AS804A			UNIT
			MIN	TYP†	MAX	MIN	TYP†	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} = −2 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} = −40 mA	2						
	V_{CC} = 4.5 V,	I_{OH} = −48 mA				2			
V_{OL}	V_{CC} = 4.5 V,	I_{OL} = 40 mA		0.25	0.5				V
	V_{CC} = 4.5 V,	I_{OL} = 48 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			−0.5			−0.5	mA
I_O‡	V_{CC} = 5.5 V,	V_O = 2.25 V		−135			−135		mA
I_{CCH}	V_{CC} = 5.5 V,	V_I = 0 V		2.5	4		2.5	4	mA
I_{CCL}	V_{CC} = 5.5 V,	V_I = 4.5 V		16	27		16	27	mA

† 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}.

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX				UNIT
			SN54AS804A		SN74AS804A		
			MIN	MAX	MIN	MAX	
t_{PLH}	A or B	Y	2	4.5	2	3.5	ns
t_{PHL}			2	4.5	2	3.5	

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