



MOTOROLA

SN74ALS03

TYPES SN54ALS03, SN74ALS03

QUADRUPLE 2-INPUT POSITIVE-NAND GATES

WITH OPEN-COLLECTOR OUTPUTS

000209

VSS 1700/1220

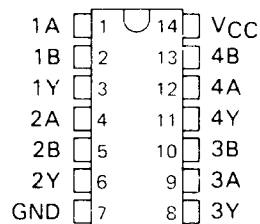
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description

These devices contain four independent 2-input NAND gates. They perform the boolean functions $Y = \overline{A \cdot B}$ or $Y = \overline{A} + \overline{B}$ in positive logic. The open-collector outputs require pull-up resistors to perform correctly. They may be connected to other open-collector outputs to implement active-low wired-OR or active-high wired-AND functions. Open-collector devices are often used to generate higher V_{OH} levels.

The SN54ALS03 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS03 is characterized for operation from 0°C to 70°C .

(TOP VIEW)



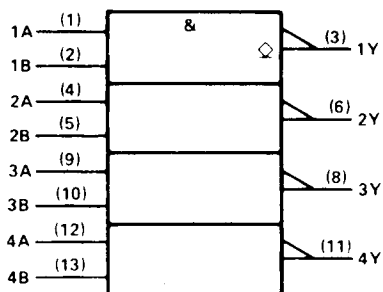
J Suffix—Case 632-07 (Ceramic)

N Suffix—Case 646-05 (Plastic)

FUNCTION TABLE (each gate)

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.

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QUADRUPLE 2-INPUT POSITIVE-NAND GATES

WITH OPEN-COLLECTOR OUTPUTS

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

Supply voltage, V_{CC}	7 V
Input voltage	7 V
Off-state output voltage	7 V
Operating free-air temperature range: SN54ALS03	-55 °C to 125 °C
SN74ALS03	0 °C to 70 °C
Storage temperature range	-65 °C to 150 °C

recommended operating conditions

		SN54ALS03			SN74ALS03			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
V_{OH}	High-level output voltage			5.5			5.5	V
I_{OL}	Low-level output current			4			8	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	SN54ALS03			SN74ALS03			UNIT
		MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	$V_{CC} = 4.5 \text{ V}$, $I_I = -18 \text{ mA}$			-1.5			-1.5	V
I_{OH}	$V_{CC} = 4.5 \text{ V}$, $V_{OH} = 5.5 \text{ V}$			0.1			0.1	mA
V_{OL}	$V_{CC} = 4.5 \text{ V}$, $I_{OL} = 4 \text{ mA}$		0.25	0.4		0.25	0.4	V
	$V_{CC} = 4.75 \text{ V}$, $I_{OL} = 8 \text{ mA}$					0.35	0.5	
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}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0.4 \text{ V}$			-0.1			-0.1	mA
I_{CCH}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0 \text{ V}$			0.8			0.8	mA
I_{CCL}	$V_{CC} = 5.5 \text{ V}$, $V_I = 4.5 \text{ V}$			2.2			2.2	mA

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

switching characteristics

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5 \text{ V},$ $C_L = 15 \text{ pF},$ $R_L = 2 \text{ k}\Omega,$ $T_A = 25^\circ\text{C}$	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V},$ $C_L = 50 \text{ pF},$ $R_L = 2 \text{ k}\Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			'ALS03	SN54ALS03		SN74ALS03		
			TYP	MIN	MAX	MIN	MAX	
tPLH	A or B	Y	8	3	20	3	15	ns
tPHL	A or B	Y	12	5	26	5	22	ns

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