



MOTOROLA

**TYPES SN54ALS10, SN74ALS10
TRIPLE 3-INPUT POSITIVE-NAND GATES**

000212

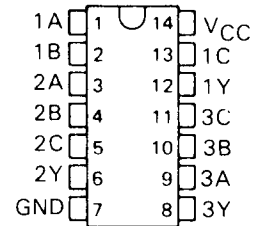
USS 1702/1228

description

These devices contain three independent 3-input NAND gates. They perform the boolean functions $Y = \overline{A \cdot B \cdot C}$ or $Y = \overline{\overline{A} + \overline{B} + \overline{C}}$ in positive logic.

The SN54ALS10 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS10 is characterized for operation from 0°C to 70°C .

(TOP VIEW)

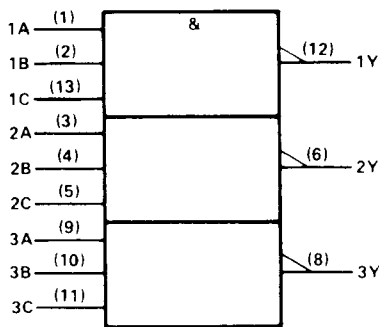


J Suffix—Case 632-07 (Ceramic)
N Suffix—Case 646-05 (Plastic)

FUNCTION TABLE (each gate)

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

logic symbol



Pin numbers shown are for J and N packages.

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TYPES SN54ALS10, SN74ALS10

TRIPLE 3-INPUT POSITIVE-NAND GATES

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: SN54ALS10	-55 °C to 125 °C
SN74ALS10	0 °C to 70 °C
Storage temperature range	-65 °C to 150 °C

recommended operating conditions

		SN54ALS10			SN74ALS10			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			-0.4			-0.4	mA
I_{OL}	Low-level output current			4				mA
							8	
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		SN54ALS10			SN74ALS10			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,	$I_{OH} = -0.4$ mA	2.5	3.4		2.5			V
	$V_{CC} = 4.75$ V,	$I_{OH} = -0.4$ mA				2.7	3.4		
V_{OL}	$V_{CC} = 4.5$ V,	$I_{OL} = 4$ mA		0.25	0.4		0.25	0.4	V
	$V_{CC} = 4.75$ V,	$I_{OL} = 8$ 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_{OS}^*	$V_{CC} = 5.5$ V,	$V_O = GND$	-25		-150	-25		-150	mA
I_{CCH}	$V_{CC} = 5.5$ V,	$V_I = 0$ V			0.6			0.6	mA
I_{CCL}	$V_{CC} = 5.5$ V,	$V_I = 4.5$ V			1.65			1.65	mA

[†]All typical values are at $V_{CC} = 5$ V, $T_A = 25$ °C.

*The current produced by grounding the outputs is approximately twice that produced with 2.25 V on the outputs.

switching characteristics

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5$ V, $C_L = 15$ pF, $R_L = 500$ Ω, $T_A = 25$ °C	$V_{CC} = 4.5$ V to 5.5 V, $C_L = 50$ pF, $R_L = 500$ Ω, $T_A = MIN$ to MAX				UNIT		
				'ALS10		SN54ALS10			SN74ALS10	
				TYP	MIN	MAX	MIN		MAX	
t_{PLH}	Any	Y	4	3	17	3	15	ns		
t_{PHL}	Any	Y	10	4	18	4	18	ns		



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