

TYPES SN54ALS15, SN74ALS15 TRIPLE 3-INPUT POSITIVE-AND GATES WITH OPEN-COLLECTOR OUTPUTS

D2661, APRIL 1982—REVISED DECEMBER 1983

- Package Options include Both Plastic and Ceramic Chip Carriers in Addition to Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

description

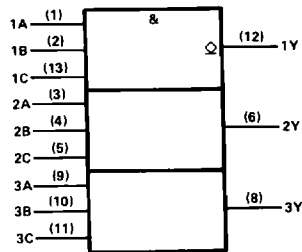
These devices contain three independent 3-input AND gates with open-collector outputs. These gates perform the Boolean functions $Y = A \cdot B \cdot C$ or $Y = \overline{A + B + C}$ in positive logic. The open-collector outputs require pull-up resistors to perform correctly. They may be connected to 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 SN54ALS15 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS15 is characterized for operation from 0°C to 70°C .

FUNCTION TABLE (each gate)

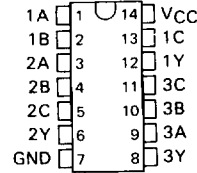
INPUTS			OUTPUT
A	B	C	Y
H	H	H	H
L	X	X	L
X	L	X	L
X	X	L	L

logic symbol

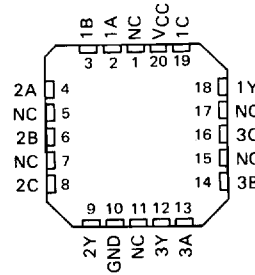


Pin numbers shown are for J and N packages.

SN54ALS15 . . . J PACKAGE
SN74ALS15 . . . N PACKAGE
(TOP VIEW)



SN54ALS15 . . . FH PACKAGE
SN74ALS15 . . . FN PACKAGE
(TOP VIEW)



NC — No internal connection

**TYPES SN54ALS15, SN74ALS15
TRIPLE 3-INPUT POSITIVE-AND 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: SN54ALS15	- 55 °C to 125 °C
SN74ALS15	0 °C to 70 °C
Storage temperature range	- 65 °C to 150 °C

recommended operating conditions

		SN54ALS15			SN74ALS15			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			V	
V_{OH}	High-level output voltage				5.5			V	
I_{OL}	Low-level output current				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	SN54ALS15			SN74ALS15			UNIT	
		MIN	TYP†	MAX	MIN	TYP†	MAX		
V_{IK}	$V_{CC} = 4.5 V, I_I = -18 mA$	-1.5			-1.5			V	
I_{OH}	$V_{CC} = 4.5 V, V_{OH} = 5.5 V$	0.1			0.1			mA	
V_{OL}	$V_{CC} = 4.5 V, I_{OL} = 4 mA$	0.25			0.25			V	
	$V_{CC} = 4.5 V, I_{OL} = 8 mA$				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_{CCH}	$V_{CC} = 5.5 V, V_I = 4.5 V$	1			1			1.8	mA
I_{CCL}	$V_{CC} = 5.5 V, V_I = 0 V$	1.66			1.66			3	mA

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

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 V$ to $5.5 V,$ $C_L = 50 pF,$ $R_L = 2 k\Omega,$ $T_A = MIN$ to MAX				UNIT
			SN54ALS15		SN74ALS15		
			MIN	MAX	MIN	MAX	
t_{PLH}	Any	Y	23	59	23	54	ns
t_{PHL}	Any	Y	6	14	6	13	ns

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

2 ALS AND AS CIRCUITS