- **Package Options Include Plastic ''Small Outline'' Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs**

- **Dependable Texas Instruments Quality and Reliability**

description

These devices contain three independent 3-input AND gates.

The SN54LS11 and SN54S11 are characterized for operation over the full military temperature range of −55°C to 125°C. The SN74LS11 and SN74S11 are 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

SN54LS11, SN74S11 . . . J OR W PACKAGE
SN74LS11, SN74S11 . . . D OR N PACKAGE
(TOP VIEW)

SN54LS11, SN54S11 . . . FK PACKAGE
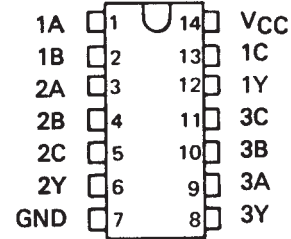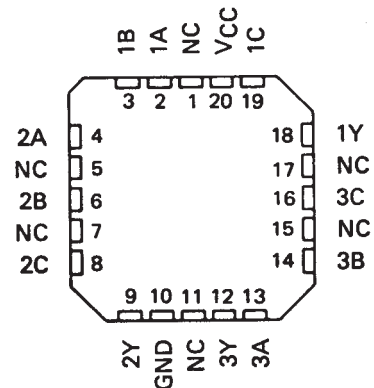(TOP VIEW)

NC−No internal connection

logic symbol[†]

[†]This symbol is in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, N, and W packages.

logic diagram (positive logic)
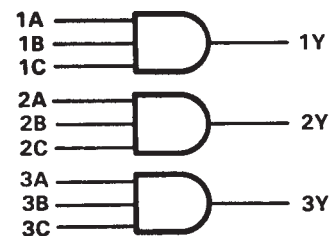
$$Y = A \cdot B \cdot C \text{ or}$$

$$Y = \overline{\overline{A} + \overline{B} + \overline{C}}$$

TEXAS INSTRUMENTS

schematics (each gate)

'LS11

'S11

Resistor values shown are nominal.

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

Supply voltage, V_{CC} (see Note 1) .... 7 V
Input voltage: 'S11 .... 5.5 V
'LS11 .... 7 V
Operating free-air temperature range: SN54' .... −55°C to 125°C
SN74' .... 0°C to 70°C
Storage temperature range .... −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

		SN54LS11			SN74LS11			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	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			− 0.4			− 0.4	mA
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 †		SN54LS11			SN74LS11			UNIT
			MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}	V_{CC} = MIN,	I_I = − 18 mA			− 1.5			− 1.5	V
V_{OH}	V_{CC} = MIN,	V_{IH} = 2 V, I_{OH} = − 0.4 mA	2.5	3.4		2.7	3.4		V
V_{OL}	V_{CC} = MIN,	V_{IL} = MAX, I_{OL} = 4 mA		0.25	0.4		0.25	0.4	V
	V_{CC} = MIN,	V_{IL} = MAX, I_{OL} = 8 mA					0.35	0.5	
I_I	V_{CC} = MAX,	V_I = 7 V			0.1			0.1	mA
I_{IH}	V_{CC} = MAX,	V_I = 2.7 V			20			20	µA
I_{IL}	V_{CC} = MAX,	V_I = 0.4 V			− 0.4			− 0.4	mA
I_{OS} §	V_{CC} = MAX		− 20		− 100	− 20		− 100	mA
I_{CCH}	V_{CC} = MAX,	V_I = 4.5 V		1.8	3.6		1.8	3.6	mA
I_{CCL}	V_{CC} = MAX,	V_I = 0 V		3.3	6.6		3.3	6.6	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ Not more than one output should be shorted at a time, and the duration of the short-circuit should not exceed one second.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	A, B or C	Y	R_L = 2 kΩ, C_L = 15 pF		8	15	ns
t_{PHL}					10	20	ns

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

recommended operating conditions

		SN54S11			SN74S11			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	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			−1			−1	mA
I_{OL}	Low-level output current			20			20	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 †			SN54S11			SN74S11			UNIT
				MIN	TYP ‡	MAX	MIN	TYP ‡	MAX	
V_{IK}	V_{CC} = MIN,	I_I = −18 mA				−1.2			−1.2	V
V_{OH}	V_{CC} = MIN,	V_{IH} = 2 V,	I_{OH} = −1 mA	2.5	3.4		2.7	3.4		V
V_{OL}	V_{CC} = MIN,	V_{IL} = 0.8 V,	I_{OL} = 20 mA			0.5			0.5	V
I_I	V_{CC} = MAX,	V_I = 5.5 V				1			1	mA
I_{IH}	V_{CC} = MAX,	V_I = 2.7 V				50			50	µA
I_{IL}	V_{CC} = MAX,	V_I = 0.5 V				−2			−2	mA
I_{OS} §	V_{CC} = MAX			−40		−100	−40		−100	mA
I_{CCH}	V_{CC} = MAX,	V_I = 4.5 V			13.5	24		13.5	24	mA
I_{CCL}	V_{CC} = MAX,	V_I = 0 V			24	42		24	42	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ Not more than one output should be shorted at a time, and the duration of the short-circuit should not exceed one second.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	A, B or C	Y	R_L = 280 Ω,	C_L = 15 pF		4.5	7	ns
t_{PHL}						5	7.5	ns
t_{PLH}			R_L = 280 Ω,	C_L = 50 pF		6		ns
t_{PHL}						7.5		ns

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

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Product Folder: SN74LS11, Triple 3-input positive-AND gates

TEXAS INSTRUMENTS

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PRODUCT SUPPORT: TRAINING

SN74LS11, Triple 3-input positive-AND gates
DEVICE STATUS: **ACTIVE**

PARAMETER NAME	SN54LS11	SN74LS11
Voltage Nodes (V)	5	5
Vcc range (V)	4.5 to 5.5	4.75 to 5.25
Input Level	TTL	TTL
Output Level	TTL	TTL
Output Drive (mA)		-0.4/8
No. of Gates	3	3
Static Current		5.1
tpd max (ns)		20

FEATURES   ▲Back to Top

- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

DESCRIPTION   ▲Back to Top

These devices contain three independent 3-input AND gates.

The SN54LS11 and SN54S11 are characterized for operation over the full military temperature range of -55°C to 125°C. The SN74LS11 and SN74S11 are characterized for operation from 0°C to 70°C.

TECHNICAL DOCUMENTS   ▲Back to Top
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To download a document to your hard drive, right-click on the link and choose 'Save'.

DATASHEET   ▲Back to Top
Full datasheet in Acrobat PDF: sn74ls11.pdf (153 KB) (Updated: 04/01/1985)
Full datasheet in Zipped PostScript: sdls131.psz (296 KB)

APPLICATION NOTES   ▲Back to Top
View Application Reports for Digital Logic

- Designing With Logic (Rev. C) (SDYA009C - Updated: 06/01/1997)
- Designing with the SN54/74LS123 (Rev. A) (SDLA006A - Updated: 03/01/1997)
- Evaluation of Nickel/Palladium/Gold-Finished Surface-Mount Integrated Circuits (SZZA026 - Updated: 06/20/2001)
- Input and Output Characteristics of Digital Integrated Circuits (SDYA010 - Updated: 10/01/1996)
- Live Insertion (SDYA012 - Updated: 10/01/1996)

RELATED DOCUMENTS   ▲Back to Top

- Advanced Bus Interface Logic Selection Guide (SCYT126, 448 KB - Updated: 01/09/2001)
- Documentation Rules (SAP) And Ordering Information (Rev. B) (SZZU001B, 13 KB - Updated: 05/06/1999)
- Logic Selection Guide First Half 2002 (Rev. Q) (SDYU001Q, 3368 KB - Updated: 12/17/2001)
- MicroStar Junior BGA Design Summary (SCET004, 167 KB - Updated: 07/28/2000)
- More Power In Less Space - Technical Article (Rev. A) (SCAU001A, 850 KB - Updated: 03/01/1996)
- Overview of IEEE Std 91-1984, Explanation of Logic Symbols Training Booklet (Rev. A) (SDYZ001A, 138 KB - Updated: 07/01/1996)

PRICING/AVAILABILITY/PKG   ▲Back to Top

ORDERABLE DEVICE	PACKAGE	PINS	TEMP (ºC)	STATUS	BUDGETARY PRICE US$/UNIT QTY=1000+	PACK QTY	PRICING/AVAILABILITY/PKG
SN74LS11D	D	14	0 TO 70	ACTIVE	0.28	50	Check stock or order
SN74LS11DR	D	14	0 TO 70	ACTIVE	0.31	2500	Check stock or order
SN74LS11J	J	14	0 TO 70	OBSOLETE			
SN74LS11N	N	14	0 TO 70	ACTIVE	0.28	25	Check stock or order
SN74LS11N3	N	14	0 TO 70	OBSOLETE			
SN74LS11NSR	NS	14	0 TO 70	ACTIVE	0.35	2000	Check stock or order

Table Data Updated on: 2/18/2002