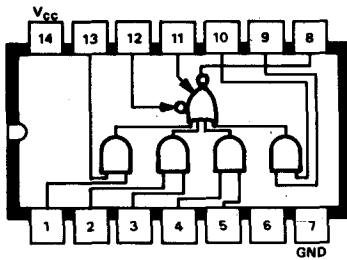


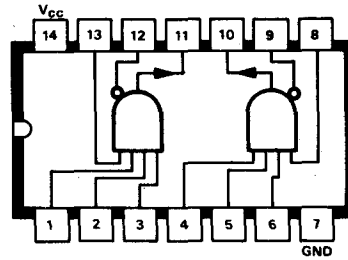
Semiconductors

Connection Diagrams

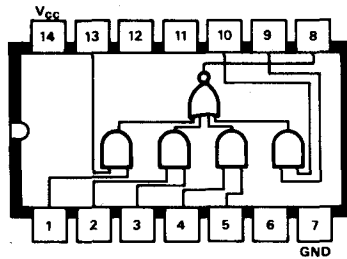
**B43 SN7453N
SN74H53N/SN74S53N**
Expandable 4-wide 2-input
AND-OR-INVERT gate



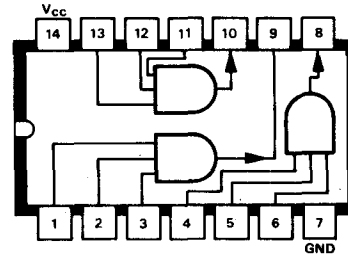
**B46 SN7460N
SN74H60N**
Dual 4-input expander



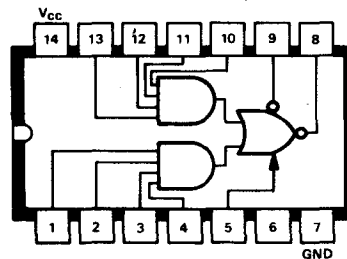
**B44 SN7454N
SN74H54N**
4-wide 2-input AND-OR-INVERT gate



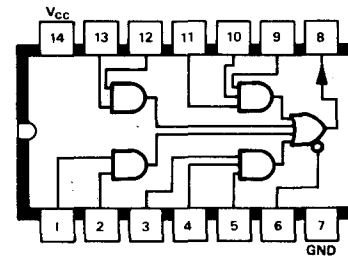
B47 SN74H61N
Triple 3-input expander



B45 SN74H55N
Expandable 2-wide 4-input
AND-OR-INVERT gate



B48 SN74H62N
4-wide 3-2-2-3-input
AND-OR expander



MANUFACTURER'S CURRENT LIST PRICES ARE ALWAYS CHARGED

TYPES SN5460, SN54H60, SN7460, SN74H60 DUAL 4-INPUT EXPANDERS

REVISED DECEMBER 1983

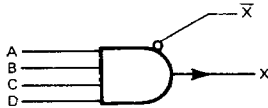
- Package Options Include Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

description

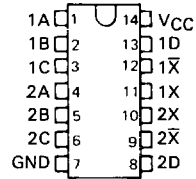
These devices contain two independent 4-input expanders. The '60 perform the Boolean function $X = ABCD$ when connected to X and \bar{X} inputs of SN5423/SN7423, SN5450/SN7450, or SN5453/SN7453. The 'H60 performs the same function when connected to X and \bar{X} inputs of SN54H50/SN74H50, SN54H53/SN74H53, or SN54H55/SN74H55.

The SN5460 and SN54H60 are characterized for operation over the full military temperature range of -55°C to 125°C . The SN7460 and SN74H60 are characterized for operation from 0°C to 70°C .

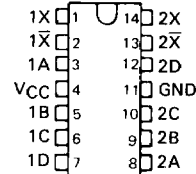
logic diagram (each gate)



SN5460, SN54H60 . . . J PACKAGE
SN7460, SN74H60 . . . J OR N PACKAGE
(TOP VIEW)



SN5460, SN54H60 . . . W PACKAGE
(TOP VIEW)



3

TTL DEVICES

PRODUCTION DATA

This document contains information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

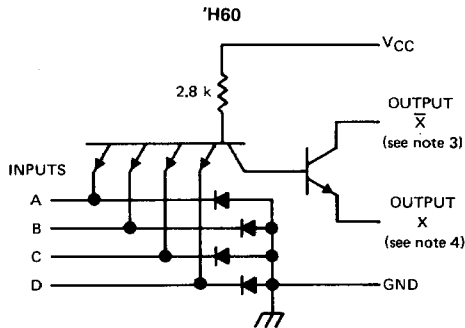
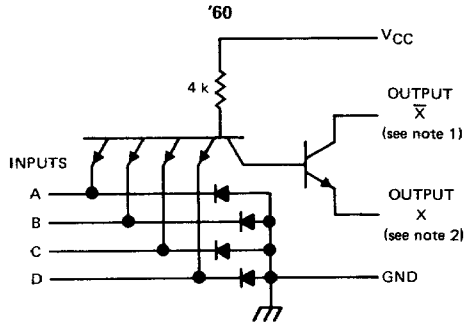
TEXAS
INSTRUMENTS

POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

3-245

**TYPES SN5460, SN54H60,
SN7460, SN74H60
DUAL 4-INPUT EXPANDERS**

schematics (each gate)



- NOTES: 1. Connect to \bar{X} input of '23, '50, or '53 circuit.
 2. Connect to X input of '23, '50, or '53 circuit.
 3. Connect to \bar{X} input of 'H50, 'H53, or 'H55 circuit.
 4. Connect to X input of 'H50, 'H53, or 'H55 circuit.
 Resistor values shown are nominal.

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

Supply voltage, V_{CC} (see Note 5).....	7 V
Input voltage:.....	5.5 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 5: Voltage values are with respect to network ground terminal.

3

TTL DEVICES

TYPES SN5460, SN7460 DUAL 4-INPUT EXPANDERS

recommended operating conditions

	SN5460			SN7460			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
T _A Operating free-air temperature	-55			125			°C

The '23, '50, and '53 are designed for use with up to four '60 expanders.

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

PARAMETER	TEST CONDITIONS†	SN5460			SN7460			UNIT
		MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V _X (on)	V _{CC} = MIN, V _{IH} = 2 V, V _X = 1.1 V, I _X = 3.5 mA, T _A = -55°C	0.4						V
	V _{CC} = MIN, V _{IH} = 2 V, V _X = 1 V, I _X = 3.8 mA, T _A = 0°C				0.4			
I _X (on)	V _{CC} = MIN, V _{IH} = 2 V, V _X = 1.1 V, I _X = 0, T _A = -55°C	-0.3						mA
	V _{CC} = MIN, V _{IH} = 2 V, V _X = 1 V, I _X = 0, T _A = 0°C				-0.43			
I _X (off)	V _{CC} = MIN, V _{IL} = 0.8 V, V _X = 4.5 V, R _X = 1.2 kΩ, T _A = -55°C	0.15						mA
	V _{CC} = MIN, V _{IL} = 0.8 V, V _X = 4.5 V, R _X = 1.2 kΩ, T _A = 0°C				0.27			
I _I	V _{CC} = MAX, V _I = 5.5 V	1			1			mA
I _{IH}	V _{CC} = MAX, V _I = 2.4 V	40			40			μA
I _{IL}	V _{CC} = MAX, V _I = 0.4 V	-1.6			-1.6			mA
I _{CC} (on)	V _{CC} = MAX, V _I = 4.5 V, V _X = 0.85 V, I _X = 0	1.2		2.5	1.2		2.5	mA
I _{CC} (off)	V _{CC} = MAX, V _I = 0, V _X = 0.85 V, I _X = 0	2		4	2		4	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

3

TTL DEVICES

TYPES SN54H60, SN74H60 DUAL 4-INPUT EXPANDERS

recommended operating conditions

	SN54H60			SN74H60			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
T _A Operating free-air temperature	- 55			125			°C

The 'H50, 'H53, and 'H55 are designed for use with up to four 'H60 expanders.

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

PARAMETER	TEST CONDITIONS†	SN54H60		SN74H60		UNIT	
		MIN	TYP‡	MAX	MIN		TYP‡
V _{XX(on)}	V _{CC} = MIN, V _{IH} = 2 V, V _X = 1.1 V, I _X = 5.85 mA, T _A = - 55°C			0.4		V	
	V _{CC} = MIN, V _{IH} = 2 V, V _X = 1 V, I _X = 6.3 mA, T _A = 0°C				0.4		
	V _{CC} = MAX, V _{IH} = 2 V, V _X = 1 V, I _X = 7.85 mA, T _A = 125°C			0.4			
	V _{CC} = MAX, V _{IH} = 2 V, V _X = 1 V, I _X = 7.4 mA, T _A = 70°C				0.4		
I _{X(on)}	V _{CC} = MIN, V _{IH} = 2 V, V _X = 1.1 V, I _X = 0, T _A = - 55°C	- 0.47				mA	
	V _{CC} = MIN, V _{IH} = 2 V, V _X = 1 V, I _X = 0, T _A = 0°C			- 0.6			
I _{X(off)}	V _{CC} = MIN, V _{IL} = 0.8 V, V _X = 4.5 V, R _X = 575 Ω, T _A = - 55°C		0.32			mA	
	V _{CC} = MIN, V _{IL} = 0.8 V, V _X = 4.5 V, R _X = 575 Ω, T _A = 0°C				0.57		
I _I	V _{CC} = MAX, V _I = 5.5 V			1	1	mA	
I _{IH}	V _{CC} = MAX, V _I = 2.4 V			50	50	mA	
I _{IL}	V _{CC} = MAX, V _I = 0.4 V			- 2	- 2	mA	
I _{CC(on)}	V _{CC} = MAX, V _I = 4.5 V, V _X = 0.85 V, I _X = 0		1.9	3.5	1.9	3.5	mA
I _{CC(off)}	V _{CC} = MAX, V _I = 0, V _X = 0.85 V, I _X = 0		3	4.5	3	4.5	mA
C _X	V _{CC} , inputs, and X open, f = 1 MHz		5.4		5.4	pF	

† 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 (except C_X), T_A = 25°C.

TTL DEVICES