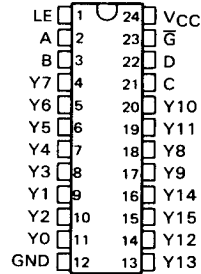


SN54HC4514, SN54HC4515, SN74HC4514, SN74HC4515 4-LINE TO 16-LINE DECODERS/DEMULTIPLEXERS WITH ADDRESS LATCHES

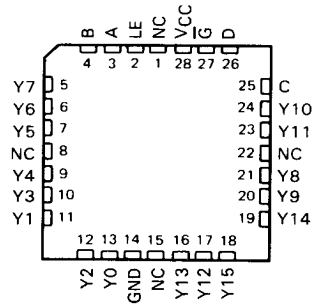
D2684, DECEMBER 1982—REVISED SEPTEMBER 1987

- Two Output Options:
 'HC4514 Has Active-High Outputs
 'HC4515 Has Active-Low Outputs
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

SN54HC... DW OR NT PACKAGE
SN74HC... DW OR NT PACKAGE:
(TOP VIEW)



SN54HC... FK PACKAGE
(TOP VIEW)



NC—No internal connection

description

These devices present two output options of a 4-line to 16-line decoder with latched inputs. The 'HC4514 presents a high level at the selected output. The 'HC4515 presents a low level at the selected output.

These devices consist of four storage latches with common latch enable (LE) and inhibit (\bar{G}) inputs. When a low signal is applied to the LE input, the input data is stored, decoded, and presented to the output. When \bar{G} is high, all sixteen 'HC4514 outputs are at a low logic level, or all 'HC4515 outputs are at a high logic level.

The SN54HC4514 and the SN54HC4515 are characterized for operation over the full military temperature range of -55°C to 125°C . The SN74HC4514 and SN74HC4515 are characterized for operation from -40°C to 85°C .

FUNCTION TABLE

INPUTS						OUTPUT SELECTED	OUTPUTS	
LE	\bar{G}	D	C	B	A		'HC4514	'HC4515
H	L	L	L	L	L	0		
H	L	L	L	L	H	1		
H	L	L	L	H	L	2		
H	L	L	L	H	H	3		
H	L	L	H	L	L	4		
H	L	L	H	L	H	5		
H	L	L	H	H	L	6	Selected	Selected
H	L	L	H	H	H	7	Output = H	Output = L
H	L	H	L	L	L	8	All others = L	All outputs = H
H	L	H	L	L	H	9		
H	L	H	L	H	L	10		
H	L	H	L	H	H	11		
H	L	H	H	L	L	12		
H	L	H	H	L	H	13		
H	L	H	H	H	L	14		
H	L	H	H	H	H	15		
X	H	X	X	X	X		All = L	All = H
L	L	X	X	X	X		All outputs remain in state existing before LE \uparrow	

PRODUCTION DATA documents contain 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.



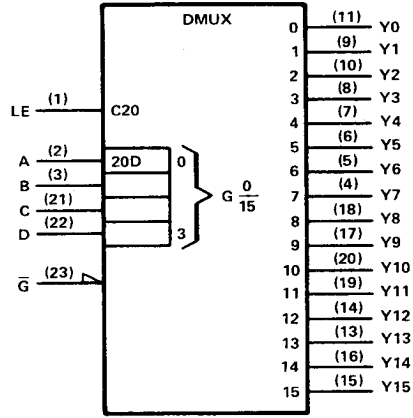
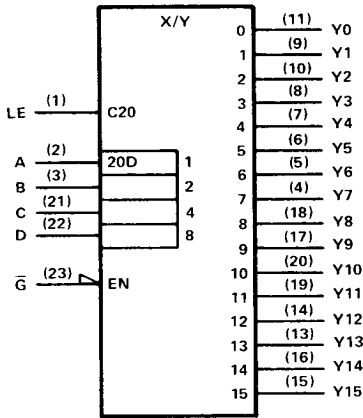
POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

Copyright © 1982, Texas Instruments Incorporated

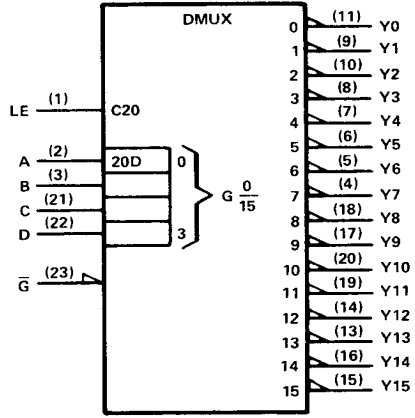
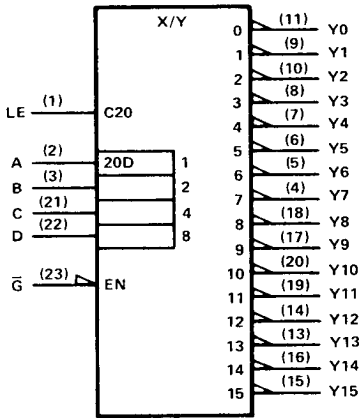
2-725

SN64HC4514, SN54HC4515, SN74HC4514, SN74HC4515
4-LINE TO 16-LINE DECODERS/DEMULTIPLEXERS
WITH ADDRESS LATCHES

HC4514 logic symbols (alternatives)†



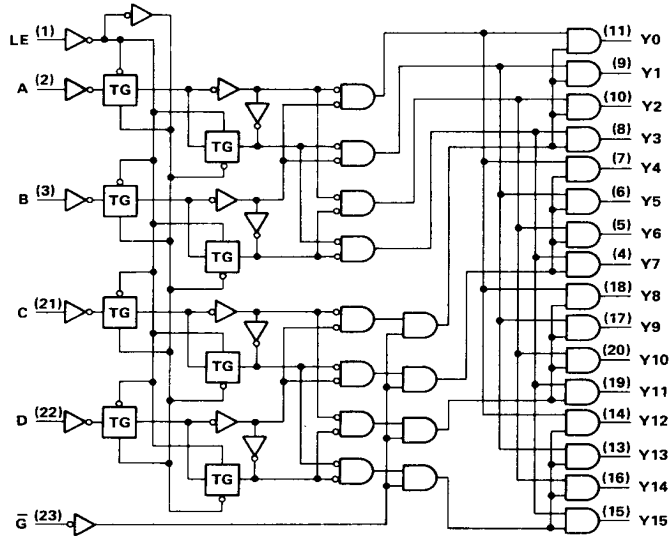
HC4515 logic symbols (alternatives)



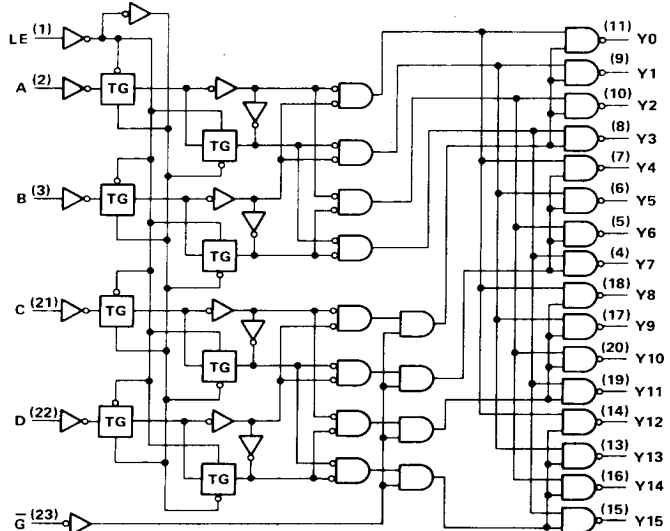
†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
 Pin numbers shown are for DW, JT, and NT packages.

SN54HC4514, SN54HC4515, SN74HC4514, SN74HC4515
4-LINE TO 16-LINE DECODERS/DEMULTIPLEXERS
WITH ADDRESS LATCHES

'HC4514 logic diagram (positive logic)



'HC4515 logic diagram (positive logic)



Pin numbers shown are for DW, JT, and NT packages.



POST OFFICE BOX 855012 • DALLAS, TEXAS 75265

2-727

SN54HC4514, SN54HC4515, SN74HC4514, SN74HC4515
4-LINE TO 16-LINE DECODERS/DEMULTIPLEXERS
WITH ADDRESS LATCHES

absolute maximum ratings over operating free-air temperature range†

Supply voltage, V_{CC}	-0.5 V to 7 V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$)	± 20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$)	± 20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	± 25 mA
Continuous current through V_{CC} or GND pins	± 50 mA
Lead temperature 1,6 mm (1/16 in) from case for 60 s: FK or JT package	300°C
Lead temperature 1,6 mm (1/16 in) from case for 10 s: DW or NT package	260°C
Storage temperature range	-65°C to 150°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

2
HCMOS Devices

recommended operating conditions

		SN54HC4514 SN54HC4515			SN74HC4514 SN74HC4515			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	2	5	6	2	5	6	V
V_{IH}	High-level input voltage	$V_{CC} = 2$ V	1.5		1.5			V
		$V_{CC} = 4.5$ V	3.15		3.15			
		$V_{CC} = 6$ V	4.2		4.2			
V_{IL}	Low-level input voltage	$V_{CC} = 2$ V	0	0.3	0	0.3		V
		$V_{CC} = 4.5$ V	0	0.9	0	0.9		
		$V_{CC} = 6$ V	0	1.2	0	1.2		
V_I	Input voltage	0	V_{CC}		0	V_{CC}		V
V_O	Output voltage	0	V_{CC}		0	V_{CC}		V
t_t	Input transition (rise and fall) times	$V_{CC} = 2$ V	0	1000	0	1000		ns
		$V_{CC} = 4.5$ V	0	500	0	500		
		$V_{CC} = 6$ V	0	400	0	400		
T_A	Operating free-air temperature	-55	125		-40	85		°C

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

PARAMETER	TEST CONDITIONS	V_{CC}	$T_A = 25^\circ\text{C}$		SN54HC4514 SN54HC4515		SN74HC4514 SN74HC4515		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	
V_{OH}	$V_I = V_{IH}$ or V_{IL} , $I_{OH} = -20 \mu\text{A}$	2 V	1.9	1.998		1.9	1.9		V
		4.5 V	4.4	4.499		4.4	4.4		
		6 V	5.9	5.999		5.9	5.9		
		4.5 V	3.98	4.30		3.7	3.84		
V_{OL}	$V_I = V_{IH}$ or V_{IL} , $I_{OL} = 20 \mu\text{A}$	2 V	0.002	0.1		0.1	0.1		V
		4.5 V	0.001	0.1		0.1	0.1		
		6 V	0.001	0.1		0.1	0.1		
		4.5 V	0.17	0.26		0.4	0.33		
I_I	$V_I = V_{CC}$ or 0	6 V	± 0.1	± 100		± 1000	± 1000		nA
		6 V		8		160	80		μA
I_{CC}	$V_I = V_{CC}$ or 0, $I_O = 0$	6 V							μA
C_i		2 to 6 V	3	10		10	10		pF

**SN54HC4514, SN54HC4515, SN74HC4514, SN74HC4515
4-LINE TO 16-LINE DECODERS/DEMULTIPLEXERS
WITH ADDRESS LATCHES**

timing requirements over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	V _{CC}	T _A = 25°C		SN54HC4514 SN54HC4515		SN74HC4514 SN74HC4515		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	
		t_w Pulse duration, LE high	2 V 4.5 V 6 V	80 16 14		119 24 20		
t_{su} Setup time, A thru D before LE $\bar{1}$	2 V 4.5 V 6 V	100 20 17		149 30 25		125 25 21		ns
t_h Hold time, A thru D before LE $\bar{1}$	2 V 4.5 V 6 V	5 5 5		5 5 5		5 5 5		ns

switching characteristics over recommended operating free-air temperature range (unless otherwise noted), C_L = 50 pF (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC}	T _A = 25°C			SN54HC4514 SN54HC4515		SN74HC4514 SN74HC4515		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
				t_{pd}	A thru D	Any	2 V 4.5 V 6 V	115 23 20	230 46 39		
t_{pd}	LE	Any	2 V 4.5 V 6 V	115 23 20	230 46 39		343 69 58		290 58 49	ns	
t_{pd}	\bar{G}	Any	2 V 4.5 V 6 V	88 18 15	175 35 30		261 52 44		221 44 37	ns	
t_t		Any	2 V 4.5 V 6 V	38 8 6	75 15 13		110 22 19		95 19 16	ns	

C _{pd}	Power dissipation capacitance	No load, T _A = 25°C	60 pF typ
-----------------	-------------------------------	--------------------------------	-----------

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

2
HCMOS Devices



POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

2-729