- Inputs Are TTL-Voltage Compatible
- Buffered Inputs and Outputs
- Package Options Include Plastic Small-Outline (D) and Ceramic Flat (W) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

SN54HCT157 . . . J OR W PACKAGE
SN74HCT157 . . . D OR N PACKAGE
(TOP VIEW)

Pin		Pin
$\overline{A}$/B	1	16 V$_{CC}$
1A	2	15 $\overline{G}$
1B	3	14 4A
1Y	4	13 4B
2A	5	12 4Y
2B	6	11 3A
2Y	7	10 3B
GND	8	9 3Y
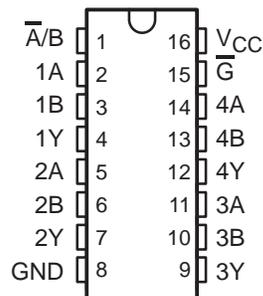
SN54HCT157 . . . FK PACKAGE
(TOP VIEW)

Top labels: 1A, $\overline{A}$/B, NC, V$_{CC}$, $\overline{G}$ (pins 3 2 1 20 19)

1B	4	18 4A
1Y	5	17 4B
NC	6	16 NC
2A	7	15 4Y
2B	8	14 3A

Bottom pins 9 10 11 12 13: 2Y, GND, NC, 3Y, 3B
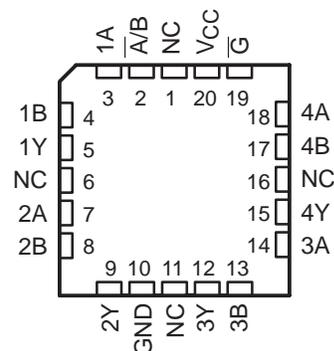
NC – No internal connection

description

These monolithic data selectors/multiplexers contain inverters and drivers to supply full data selection to the four output gates. A separate strobe ($\overline{G}$) input is provided. A 4-bit word is selected from one of two sources and is routed to the four outputs.

The SN54HCT157 is characterized for operation over the full military temperature range of –55°C to 125°C. The SN74HCT157 is characterized for operation from –40°C to 85°C.

FUNCTION TABLE

INPUTS				OUTPUT
STROBE $\overline{G}$	SELECT $\overline{A}$/B	DATA A	DATA B	Y
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

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TEXAS INSTRUMENTS

SN54HCT157, SN74HCT157
QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS
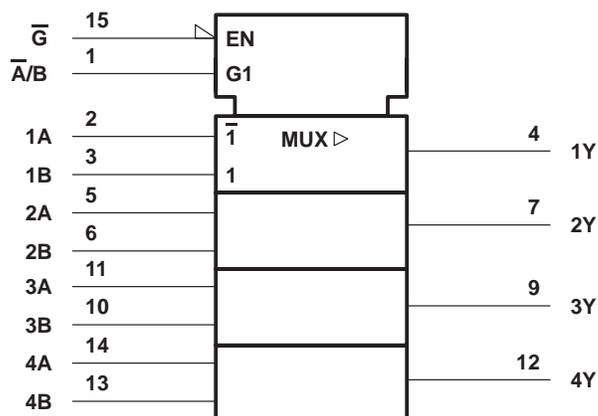
logic symbol†

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

logic diagram (positive logic)

Pin numbers shown are for the D, J, N, and W packages.

TEXAS
INSTRUMENTS
POST OFFICE BOX 655303 ● DALLAS, TEXAS 75265

absolute maximum ratings over operating free-air temperature range†

Supply voltage range, V_{CC}	−0.5 V to 7 V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$) (see Note 1)	±20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$) (see Note 1)	±20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	±35 mA
Continuous current through V_{CC} or GND	±70 mA
Package thermal impedance, θ_{JA} (see Note 2): D package	113°C/W
N package	78°C/W
Storage temperature range, T_{stg}	−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.

NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
       2. The package thermal impedance is calculated in accordance with JESD 51, except for through-hole packages, which use a trace length of zero.

recommended operating conditions

			SN54HCT157			SN74HCT157			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	V_{CC} = 4.5 V to 5.5 V	2			2			V
V_{IL}	Low-level input voltage	V_{CC} = 4.5 V to 5.5 V	0		0.8	0		0.8	V
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) time		0		500	0		500	ns
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}	$T_A = 25°C$			SN54HCT157		SN74HCT157		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V_{OH}	$V_I = V_{IH}$ or V_{IL}	$I_{OH} = -20\ \mu A$	4.5 V	4.4	4.499		4.4		4.4		V
		$I_{OH} = -6\ mA$		3.98	4.3		3.7		3.84		
V_{OL}	$V_I = V_{IH}$ or V_{IL}	$I_{OL} = 20\ \mu A$	4.5 V		0.001	0.1		0.1		0.1	V
		$I_{OL} = 6\ mA$			0.17	0.26		0.4		0.33	
I_I	$V_I = V_{CC}$ or 0		5.5 V		±0.1	±100		±1000		±1000	nA
I_{CC}	$V_I = V_{CC}$ or 0, $I_O = 0$		5.5 V			8		160		80	μA
ΔI_{CC}‡	One input at 0.5 V or 2.4 V, Other inputs at 0 or V_{CC}		5.5 V		1.4	2.4		3		2.9	mA
C_i			4.5 V to 5.5 V	3		10		10*		10	pF

* On products compliant to MIL-PRF-38535, this parameter is not production tested.
‡ This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather than 0 V or V_{CC}.

TEXAS INSTRUMENTS

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	T_A = 25°C MIN	TYP	MAX	SN54HCT157 MIN	MAX	SN74HCT157 MIN	MAX	UNIT
t_{pd}	A or B	Y	4.5 V		18	28		42		35	ns
			5.5 V		15	25		38		32	
	$\overline{A}$/B	Y	4.5 V		20	32		48		40	
			5.5 V		17	29		43		36	
	$\overline{G}$	Y	4.5 V		18	26		39		33	
			5.5 V		15	23		35		30	
t_t		Any	4.5 V		8	15		22		19	ns
			5.5 V		7	14		21		17	

switching characteristics over recommended operating free-air temperature range, C_L = 150 pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	T_A = 25°C MIN	TYP	MAX	SN54HCT157 MIN	MAX	SN74HCT157 MIN	MAX	UNIT
t_{pd}	A or B	Y	4.5 V		23	42		63		52	ns
			5.5 V		19	38		52		46	
	$\overline{A}$/B	Y	4.5 V		24	46		72		58	
			5.5 V		21	41		61		52	
	$\overline{G}$	Y	4.5 V		21	39		58		48	
			5.5 V		19	35		49		43	
t_t		Any	4.5 V		17	42		63		53	ns
			5.5 V		14	38		57		48	

operating characteristics, T_A = 25°C

PARAMETER	TEST CONDITIONS	TYP	UNIT
C_{pd} Power dissipation capacitance	No load	12	pF

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PARAMETER MEASUREMENT INFORMATION

LOAD CIRCUIT

VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
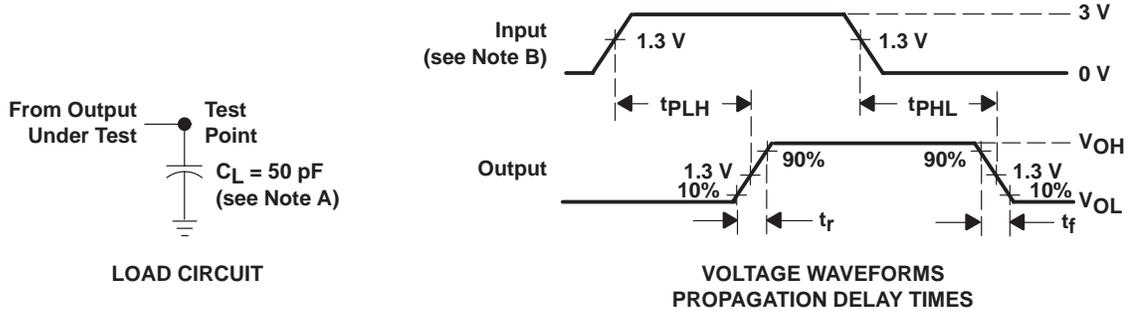
NOTES: A. C_L includes probe and test-fixture capacitance.
B. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: PRR ≤ 1 MHz, Z_O = 50 Ω, t_r = 6 ns, t_f = 6 ns.
C. The outputs are measured one at a time with one input transition per measurement.
D. t_{PLH} and t_{PHL} are the same as t_{pd}.

Figure 1. Load Circuit and Voltage Waveforms

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