

SN54HC157, SN74HC157

QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

SCLS113B – DECEMBER 1982 – REVISED MAY 1997

- 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

description

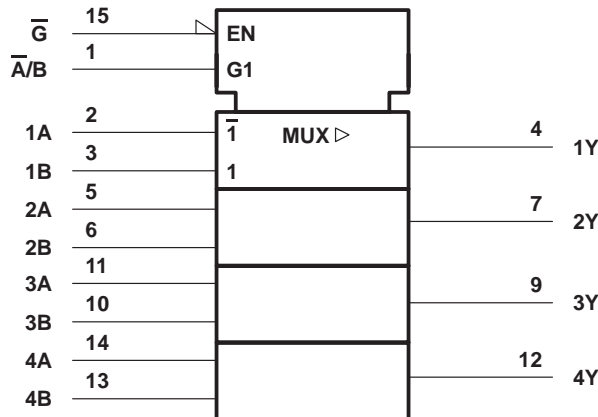
These monolithic data selectors/multiplexers contain inverters and drivers to supply full data selection to the four output gates. A separate strobe (\bar{G}) input is provided. A 4-bit word is selected from one of two sources and is routed to the four outputs. The 'HC157 present true data.

The SN54HC157 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74HC157 is characterized for operation from -40°C to 85°C .

FUNCTION TABLE

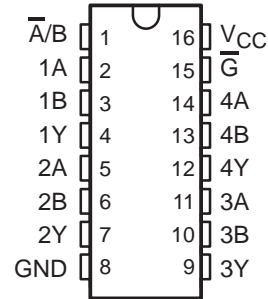
INPUTS		DATA		OUTPUT Y
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

logic symbol†

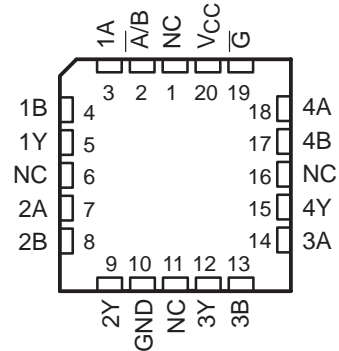


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12. Pin numbers shown are for the D, J, N, and W packages.

SN54HC157 . . . J OR W PACKAGE
SN74HC157 . . . D OR N PACKAGE
(TOP VIEW)



SN54HC157 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection



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PRODUCTION DATA information is 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**

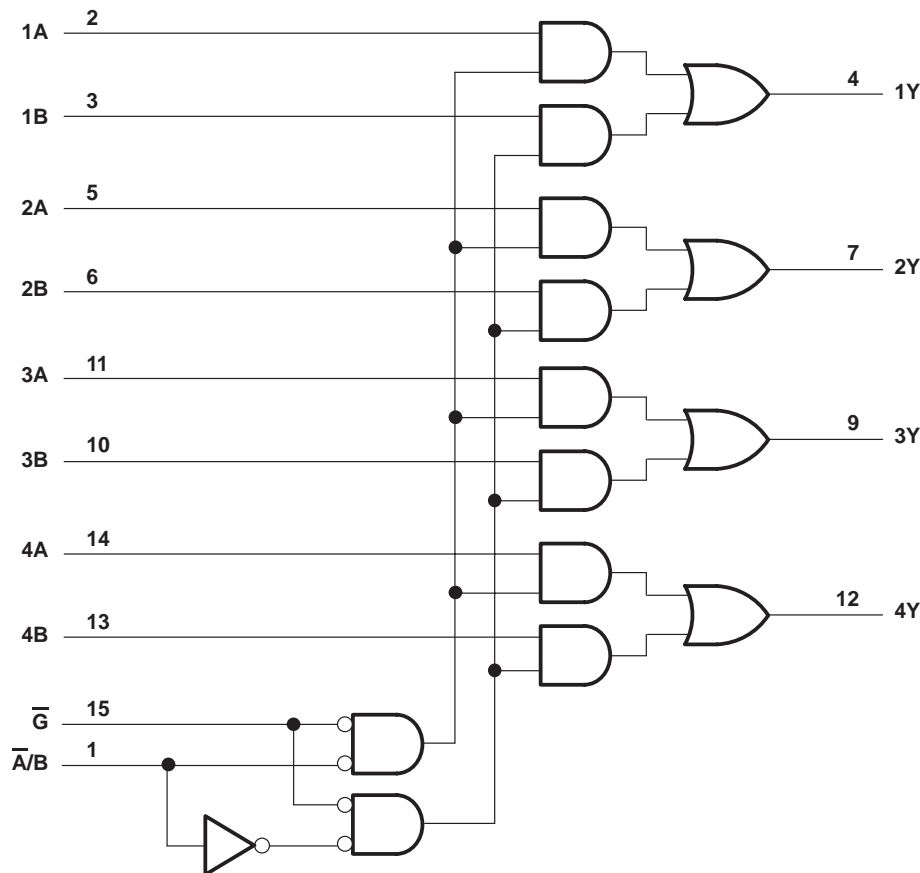
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SN54HC157, SN74HC157 QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

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logic diagram (positive logic)



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

absolute maximum ratings over operating free-air temperature†

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.



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recommended operating conditions

		SN54HC157			SN74HC157			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	0.5	0	0.5	V	
		V _{CC} = 4.5 V	0	1.35	0	1.35		
		V _{CC} = 6 V	0	1.8	0	1.8		
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	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°C			SN54HC157		SN74HC157		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V _{OH}	V _I = V _{IH} or V _{IL}	I _{OH} = -20 μA	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		
		I _{OH} = -6 mA	4.5 V	3.98	4.3		3.7		3.84		
		I _{OH} = -7.8 mA	6 V	5.48	5.8		5.2		5.34		
V _{OL}	V _I = V _{IH} or V _{IL}	I _{OL} = 20 μA	2 V		0.002	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
		I _{OL} = 6 mA	4.5 V		0.17	0.26		0.4			0.33
		I _{OL} = 7.8 mA	6 V		0.15	0.26		0.4			0.33
I _I	V _I = V _{CC} or 0	6 V		±0.1	±100		±1000		±1000	nA	
I _{CC}	V _I = V _{CC} or 0, I _O = 0	6 V			8		160		80	μA	
C _i		2 V to 6 V		3	10		10		10	pF	



SN54HC157, SN74HC157 QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	$T_A = 25^\circ\text{C}$			SN54HC157		SN74HC157		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A or B	Y	2 V		63	125		190		160	ns
			4.5 V		13	25		38		32	
			6 V		11	21		32		27	
	\bar{A}/B	Y	2 V		67	125		190		160	
			4.5 V		18	25		38		31	
			6 V		14	21		32		27	
	\bar{G}	Y	2 V		59	115		170		145	
			4.5 V		16	23		34		29	
			6 V		13	20		29		25	
t_t		Y	2 V		28	60		90		75	ns
			4.5 V		8	12		18		15	
			6 V		6	10		15		13	

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	$T_A = 25^\circ\text{C}$			SN54HC157		SN74HC157		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A or B	Y	2 V		81	190		290		235	ns
			4.5 V		23	38		58		47	
			6 V		18	33		49		41	
	\bar{A}/B	Y	2 V		81	210		320		260	
			4.5 V		23	42		64		52	
			6 V		18	36		54		45	
	\bar{G}	Y	2 V		91	190		290		235	
			4.5 V		24	38		58		47	
			6 V		18	33		49		41	
t_t		Y	2 V		45	210		315		265	ns
			4.5 V		17	42		63		53	
			6 V		13	36		53		45	

operating characteristics, $T_A = 25^\circ\text{C}$

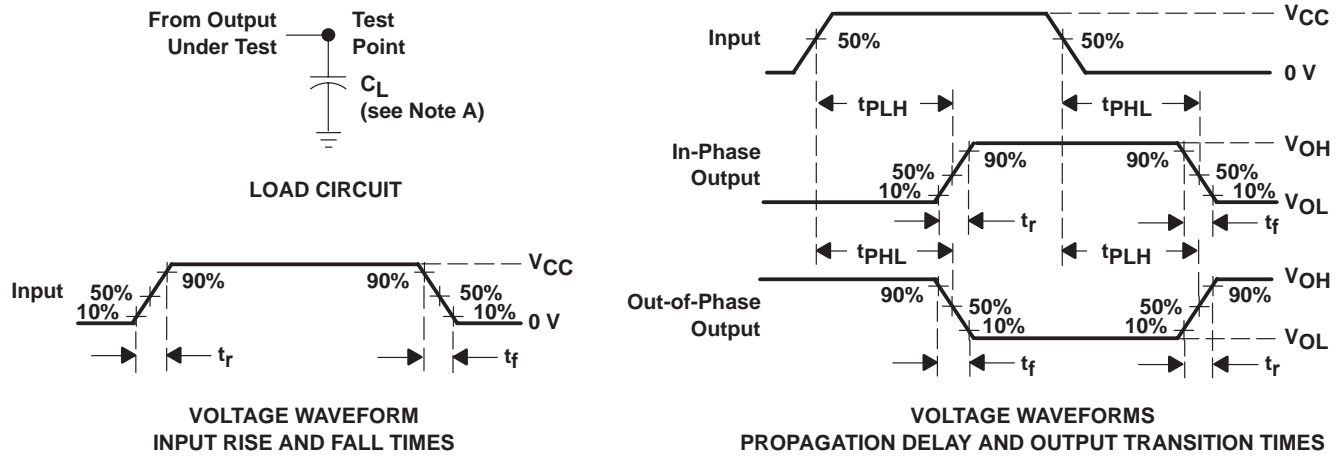
PARAMETER	TEST CONDITIONS	TYP	UNIT
C_{pd} Power dissipation capacitance	No load	40	pF



SN54HC157, SN74HC157 QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

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PARAMETER MEASUREMENT INFORMATION



- 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: $PRR \leq 1$ MHz, $Z_O = 50 \Omega$, $t_r = 6$ 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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SN74HC157, Quadruple 2-Line To 1-Line Data Selectors/Multiplexers

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	SN54HC157	SN74HC157
Voltage Nodes (V)	6, 5, 2	6, 5, 2
Vcc range (V)	2.0 to 6.0	2.0 to 6.0
Input Level	CMOS	CMOS
Output Level	CMOS	CMOS
Output Drive (mA)		-6/6
Output	2S	2S
From	2	2
To	1	1

FEATURES

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- 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

DESCRIPTION

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These monolithic data selectors/multiplexers contain inverters and drivers to supply full data selection to the four output gates. A separate strobe (G_V) input is provided. A 4-bit word is selected from one of two sources and is routed to the four outputs. The 'HC157 present true data.

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TECHNICAL DOCUMENTS

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DATASHEET

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Full datasheet in Acrobat PDF: [sn74hc157.pdf](#) (93 KB, Rev. B) (Updated: 05/01/1997)

APPLICATION NOTES

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- [CMOS Power Consumption and CPD Calculation \(Rev. B\)](#) (SCAA035B - Updated: 06/01/1997)
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- [Implications of Slow or Floating CMOS Inputs \(Rev. C\)](#) (SCBA004C - Updated: 02/01/1998)
- [Input and Output Characteristics of Digital Integrated Circuits](#) (SDYA010 - Updated: 10/01/1996)
- [Live Insertion](#) (SDYA012 - Updated: 10/01/1996)
- [SN54/74HCT CMOS Logic Family Applications and Restrictions](#) (SCLA011 - Updated: 05/01/1996)

- [Selecting the Right Texas Instruments Signal Switch \(SZZA030 - Updated: 09/07/2001\)](#)
- [Using High Speed CMOS and Advanced CMOS in Systems With Multiple Vcc \(SCLA008 - Updated: 04/01/1996\)](#)

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- [Logic Reference Guide \(SCYB004, 1032 KB - Updated: 10/23/2001\)](#)
- [Logic Selection Guide Second Half 2002 \(Rev. R\) \(SDYU001R, 4274 KB - Updated: 07/19/2002\)](#)
- [Military Semiconductors Selection Guide 2002 \(Rev. B\) \(SGYC003B, 1648 KB - Updated: 04/22/2002\)](#)

SAMPLES

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ORDERABLE DEVICE	PACKAGE INDUSTRY (TI)	PINS	TEMP (°C)	STATUS	PRODUCT CONTENT	SAMPLES
SN74HC157D	SOP (D)	16	-40 TO 85	ACTIVE	View Product Content	Request Samples
SN74HC157N	PDIP (N)	16	-40 TO 85	ACTIVE	View Product Content	Request Samples
SN74HC157NSR	SOP (NS)	16	-40 TO 85	ACTIVE	View Product Content	Request Samples


PRICING/AVAILABILITY/PKG

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DEVICE INFORMATION							TI INVENTORY STATUS AS OF 3:00 PM GMT, 26 Sep 2002			REPORTED DISTRIBUTOR INVENTORY AS OF 3:00 PM GMT, 26 Sep 2002		
ORDERABLE DEVICE	STATUS	PACKAGE TYPE PINS	TEMP (°C)	PRODUCT CONTENT	BUDGETARY PRICING QTY \$US	STD PACK QTY	IN STOCK	IN PROGRESS QTY DATE	LEAD TIME	DISTRIBUTOR COMPANY REGION	IN STOCK	PURCHASE
SN74HC157D	ACTIVE	SOP (D) 16	-40 TO 85	View Contents	1KU 0.28	40	280	3000 10 Oct	3 WKS	Avnet AMERICA	> 1k	BUY NOW
								7120 14 Oct				
SN74HC157DR	ACTIVE	SOP (D) 16	-40 TO 85	View Contents	1KU 0.28	2500	N/A*	2501 14 Oct	3 WKS			
SN74HC157N	ACTIVE	PDIP (N) 16	-40 TO 85	View Contents	1KU 0.28	25	7500	> 10k 03 Oct	2 WKS	Avnet AMERICA	> 1k	BUY NOW
								500 21 Oct		DigiKey AMERICA	986	BUY NOW
								> 10k 28 Oct				
								5000 30 Oct				
SN74HC157N3	OBSOLETE	PDIP (N) 16	-40 TO 85	View Contents	1KU		N/A*		Not Available			
SN74HC157NSR	ACTIVE	SOP (NS) 16	-40 TO 85	View Contents	1KU 0.36	2000	N/A*	4000 03 Oct	2 WKS			
								2000 30 Oct				
SN74HC157PWR	ACTIVE	TSSOP (PW) 16	-40 TO 85	View Contents	1KU 0.28	2000	N/A*		6 WKS			

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