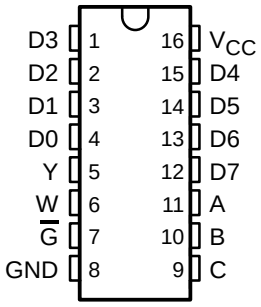
- **8-Line to 1-Line Multiplexers Can Perform as:**
  - **Boolean Function Generators**
  - **Parallel-to-Serial Converters**
  - **Data Source Selectors**
- **Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs**

description

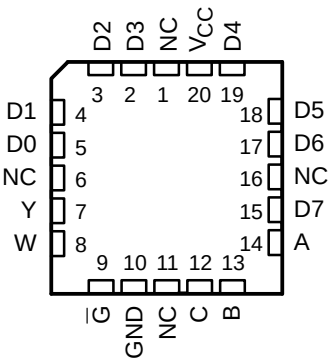
These monolithic data selectors/multiplexers provide full binary decoding to select one of eight data sources. The strobe ($\overline{G}$) input must be at a low logic level to enable the data selection/multiplexing function. A high level at the strobe terminal forces the W output high and the Y output low.

The SN54F151B is characterized for operation over the full military temperature range of –55°C to 125°C. The SN74F151B is characterized for operation from 0°C to 70°C.

SN54F151B . . . J PACKAGE
SN74F151B . . . D OR N PACKAGE
(TOP VIEW)



SN54F151B . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

FUNCTION TABLE

INPUTS				OUTPUTS	
SELECT			STROBE $\overline{G}$		
C	B	A		Y	W
X	X	X	H	L	H
L	L	L	L	D0	$\overline{D0}$
L	L	H	L	D1	$\overline{D1}$
L	H	L	L	D2	$\overline{D2}$
L	H	H	L	D3	$\overline{D3}$
H	L	L	L	D4	$\overline{D4}$
H	L	H	L	D5	$\overline{D5}$
H	H	L	L	D6	$\overline{D6}$
H	H	H	L	D7	$\overline{D7}$

D0, D1, . . . D7 = the level of the respective D input.

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.

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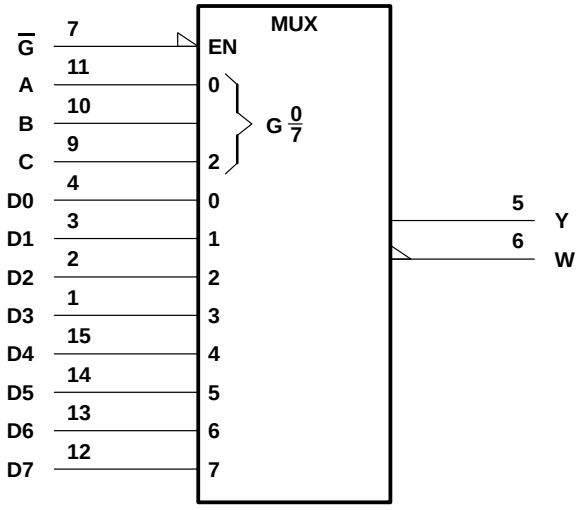
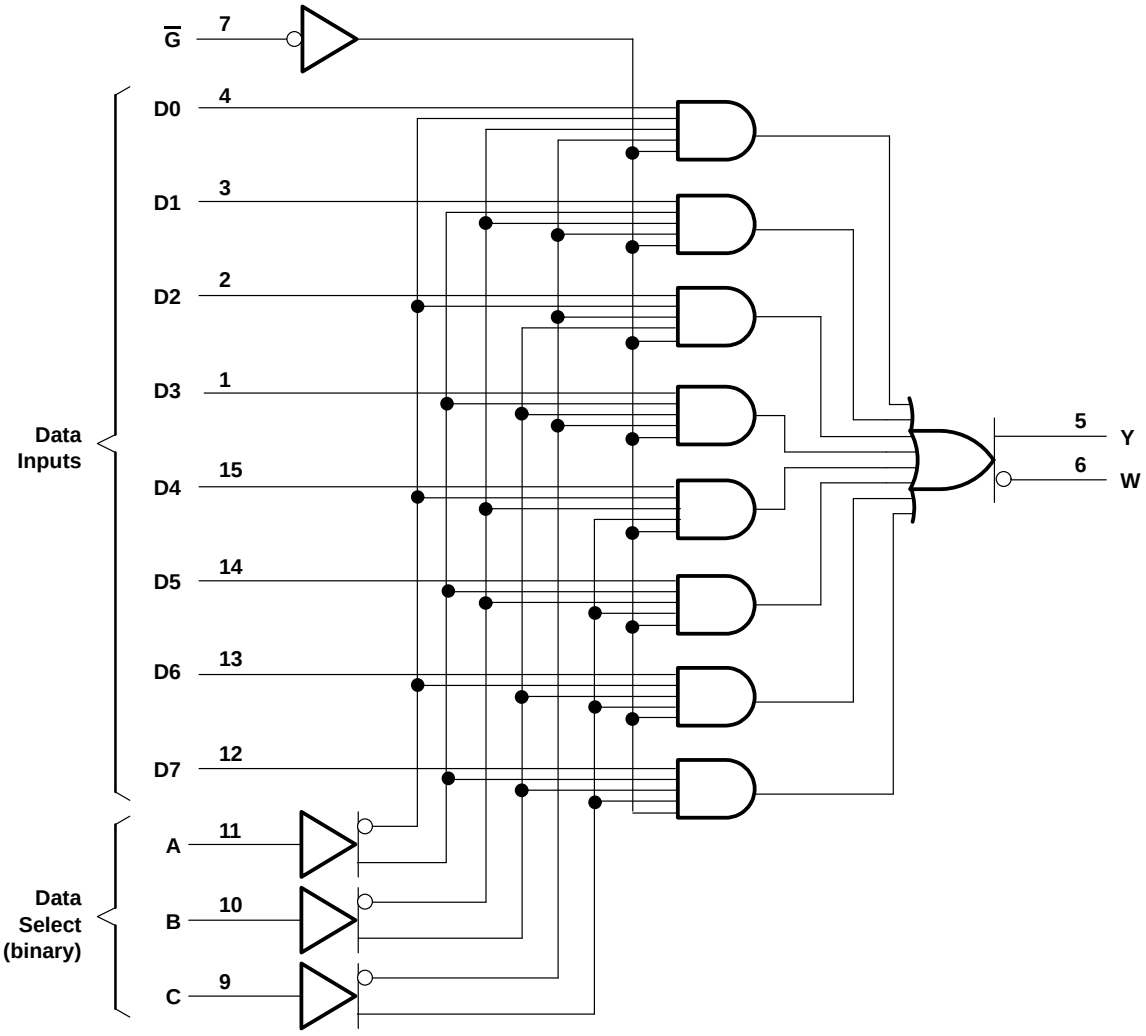
logic symbol†



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

logic diagram (positive logic)



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

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

Supply voltage range, V_{CC} . . . . . –0.5 V to 7 V
Input voltage range (see Note 1) . . . . . –1.2 V to 7 V
Input current range . . . . . –30 mA to 5 mA
Voltage range applied to any output in the high state . . . . . –0.5 V to V_{CC}
Current into any output in the low state: SN54F151B . . . . . 40 mA
SN74F151B . . . . . 48 mA
Operating free-air temperature range: SN54F151B . . . . . –55°C to 125°C
SN74F151B . . . . . 0°C to 70°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.

NOTE 1: The input voltage rating may be exceeded provided that the input current rating is observed.

recommended operating conditions

		SN54F151B			SN74F151B			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	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
I_{IK}	Input clamp current			–18			–18	mA
I_{OH}	High-level output current			– 1			– 1	mA
I_{OL}	Low-level output current			20			24	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		SN54F151B			SN74F151B			UNIT
			MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	V_{CC} = 4.5 V,	I_I = –18 mA			–1.2			–1.2	V
V_{OH}	V_{CC} = 4.5 V,	I_{OH} = – 1 mA	2.5	3.4		2.5	3.4		V
	V_{CC} = 4.75 V,	I_{OH} = – 1 mA				2.7			
V_{OL}	V_{CC} = 4.5 V,	I_{OL} = 20 mA		0.3	0.5		0.3	0.5	V
I_I	V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}	V_{CC} = 5.5 V,	V_I = 2.7 V			20			20	µA
I_{IL}	V_{CC} = 5.5 V,	V_I = 0.5 V			– 0.6			– 0.6	mA
I_{OS}‡	V_{CC} = 5.5 V,	V_O = 0	–60		–150	–60		–150	mA
I_{CC}	V_{CC} = 5.5 V,	V_I = 4.5 V		13.5	21		13.5	21	mA

† 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 (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R_L = 500 Ω, T_A = 25°C			V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX§				UNIT
			′F151B			SN54F151B		SN74F151B		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A, B, or C	W	3.8	5.2	9	2	11.5	3.5	9.5	ns
t_{PHL}			2.9	4.3	7.5	2.6	8	2.7	7.5	
t_{PLH}	A, B, or C	Y	4.5	6	10.5	4	13.5	4	12	ns
t_{PHL}			4	5.6	9	3.6	9.5	3.6	9	
t_{PLH}	$\overline{G}$	W	3	4.1	6.1	3	7.5	3	7	ns
t_{PHL}			2.8	3.5	6	2.5	6.5	2.5	6	
t_{PLH}	$\overline{G}$	Y	4.4	5.3	9.5	3.8	12	3.8	10.5	ns
t_{PHL}			3.5	4.5	7	3	8	3	7.5	
t_{PLH}	Data (any D)	W	2.7	3.6	6.5	1.8	7.5	2.3	7	ns
t_{PHL}			1.2	1.9	4	1	6	1	5	
t_{PLH}	Data (any D)	Y	2.9	3.7	6.5	2.4	8.5	2.5	7.5	ns
t_{PHL}			3.3	4.2	7	2.1	9	2.6	7.5	

§ For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
NOTE 2: Load circuits and waveforms are shown in Section 1.

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