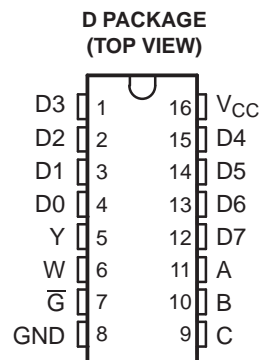


FEATURES

- Qualified for Automotive Applications
- Customer-Specific Configuration Control Can Be Supported Along With Major-Change Approval
- Wide Operating Voltage Range of 2 V to 6 V
- Outputs Can Drive up to 10 LSTTL Loads
- ± 6 -mA Output Drive at 5 V
- Low Input Current of 1 μ A Max
- 8-Line to 1-Line Multiplexers Can Perform as:
 - Boolean-Function Generators
 - Parallel-to-Serial Converters
 - Data Source Selectors



DESCRIPTION/ORDERING INFORMATION

This data selector/multiplexer provides 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 inputs. A high level at the strobe terminal forces the W output high and the Y output low.

ORDERING INFORMATION

T_A	PACKAGE ⁽¹⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 125°C	SOIC – D	Reel of 2500	SN74HC151QDRQ1	HC151Q

(1) Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

FUNCTION TABLE

INPUTS				OUTPUTS ⁽¹⁾	
SELECT			STROBE \overline{G}	Y	W
C	B	A			
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	$\overline{D7}$

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



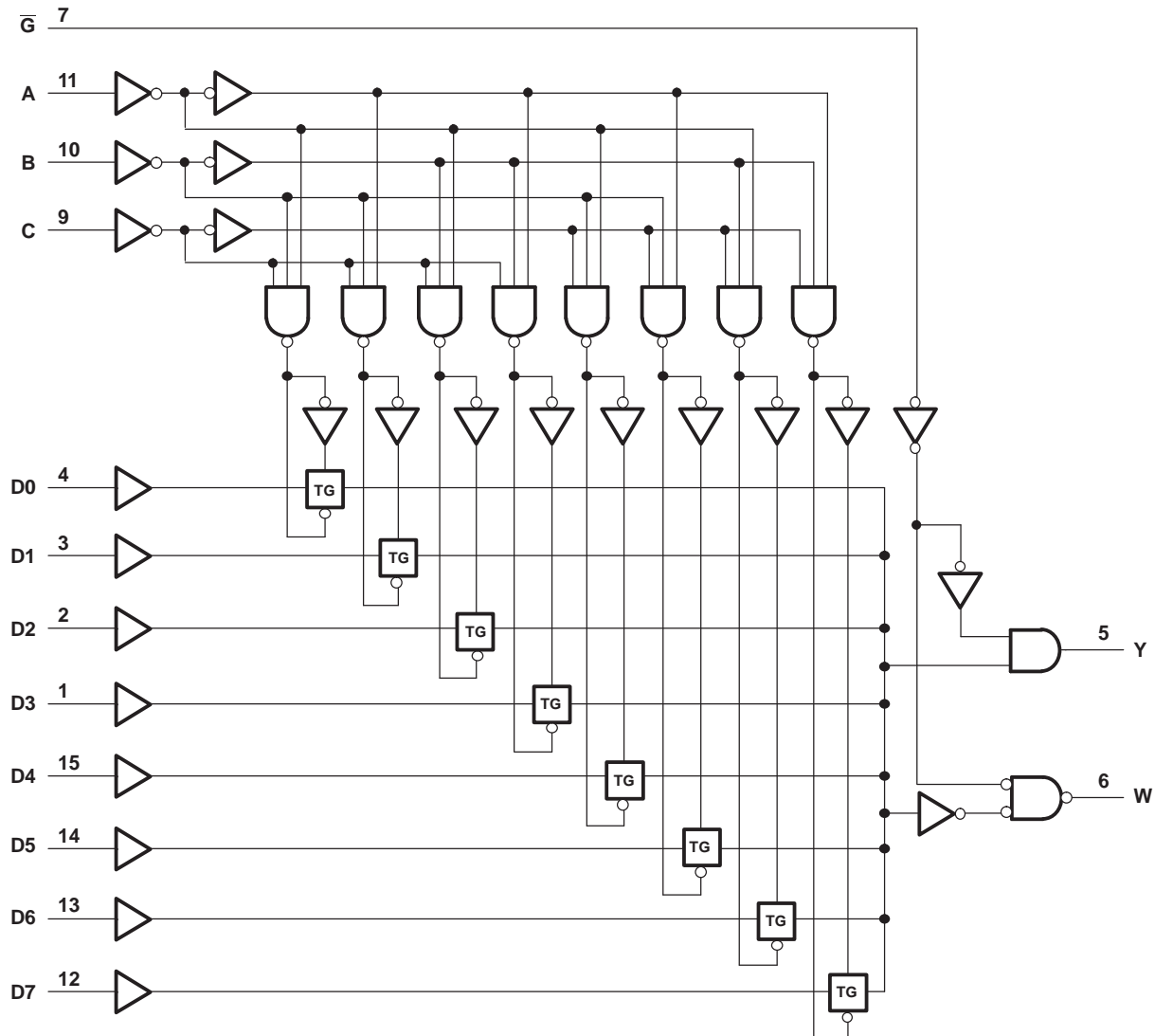
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SN74HC151-Q1

8-LINE TO 1-LINE DATA SELECTOR/MULTIPLEXER

SCLS701A—JUNE 2006—REVISED JUNE 2006

LOGIC DIAGRAM (POSITIVE LOGIC)



Absolute Maximum Ratings⁽¹⁾

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

			MIN	MAX	UNIT
V _{CC}	Supply voltage range		–0.5	7	V
I _{IK}	Input clamp current	V _I < 0 or V _I > V _{CC} ⁽²⁾		±20	mA
I _{OK}	Output clamp current	V _O < 0 or V _O > V _{CC} ⁽²⁾		±20	mA
I _O	Continuous output current	V _O = 0 to V _{CC}		±35	mA
	Continuous current through V _{CC} or GND			±70	mA
θ _{JA}	Package thermal impedance ⁽³⁾			73	°C/W
T _{stg}	Storage temperature range		–65	150	°C
ESD rating		Human-body model		2	kV
		Charged-device model		1	kV
		Machine model		200	V

(1) 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) The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

(3) The package thermal impedance is calculated in accordance with JESD 51-7.

Recommended Operating Conditions⁽¹⁾

			MIN	NOM	MAX	UNIT
V _{CC}	Supply voltage		2	5	6	V
V _{IH}	High-level input voltage	V _{CC} = 2 V	1.5			V
		V _{CC} = 4.5 V	3.15			
		V _{CC} = 6 V	4.2			
V _{IL}	Low-level input voltage	V _{CC} = 2 V			0.5	V
		V _{CC} = 4.5 V			1.35	
		V _{CC} = 6 V			1.8	
V _I	Input voltage		0		V _{CC}	V
V _O	Output voltage		0		V _{CC}	V
Δt/Δv	Input transition rise/fall time	V _{CC} = 2 V			1000	ns
		V _{CC} = 4.5 V			500	
		V _{CC} = 6 V			400	
T _A	Operating free-air temperature		–40		125	°C

(1) All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

SN74HC151-Q1

8-LINE TO 1-LINE DATA SELECTOR/MULTIPLEXER

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Electrical Characteristics

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

PARAMETER	TEST CONDITIONS		V _{CC}	T _A = 25°C			MIN	MAX	UNIT
				MIN	TYP	MAX			
V _{OH}	V _I = V _{IH} or V _{IL}	I _{OH} = –20 µA	2 V	1.9	1.998		1.9		V
			4.5 V	4.4	4.499		4.4		
			6 V	5.9	5.999		5.9		
		I _{OH} = –6 mA	4.5 V	3.98	4.3		3.7		
		I _{OH} = –7.8 mA	6 V	5.48	5.8		5.2		
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	
			6 V		0.001	0.1		0.1	
		I _{OL} = 6 mA	4.5 V		0.17	0.26		0.4	
		I _{OL} = 7.8 mA	6 V		0.15	0.26		0.4	
I _I	V _I = V _{CC} or 0		6 V		±0.1	±100		±1000	nA
I _{CC}	V _I = V _{CC} or 0, I _O = 0		6 V			8		160	µA
C _i			2 V to 6 V		3	10		10	pF

Switching Characteristics

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

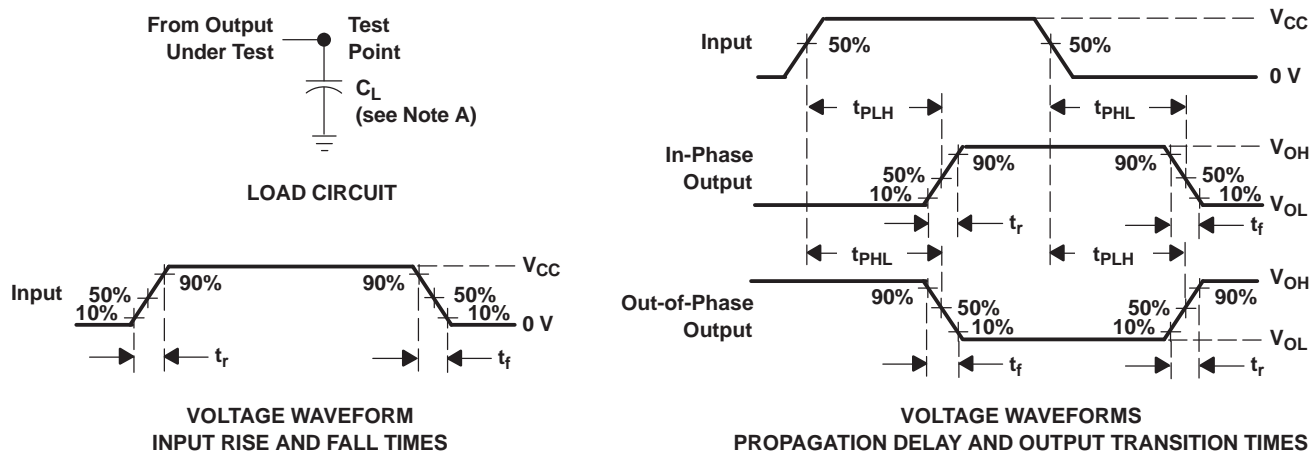
PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC}	T _A = 25°C			MIN	MAX	UNIT
				MIN	TYP	MAX			
t _{pd}	A, B, or C	Y or W	2 V		94	250		360	ns
			4.5 V		30	50		73	
			6 V		25	43		62	
	Any D	Y or W	2 V		74	195		283	
			4.5 V		23	39		57	
			6 V		20	33		48	
	\overline{G}	Y or W	2 V		49	127		185	
			4.5 V		15	25		37	
			6 V		13	22		32	
t _t		Y or W	2 V		22	75		110	ns
			4.5 V		9	15		22	
			6 V		8	13		19	

Operating Characteristics

T_A = 25°C

PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd} Power dissipation capacitance	No load	70	pF

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 ≤ 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

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN74HC151QDRQ1	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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D (R-PDSO-G16)

PLASTIC SMALL-OUTLINE PACKAGE



4040047-4/H 11/2006

NOTES:

- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 (0,15) per end.
- D. Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
- E. Reference JEDEC MS-012 variation AC.

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