

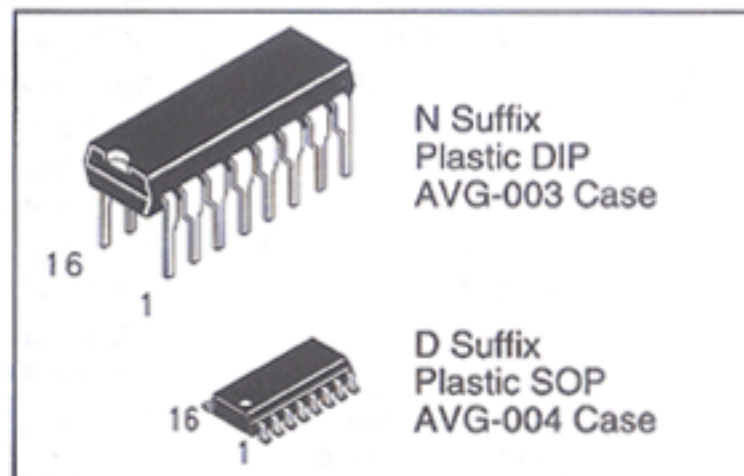
DV74HCT151 Available Q2, 1995

### 8-Input Data Selector/Multiplexer

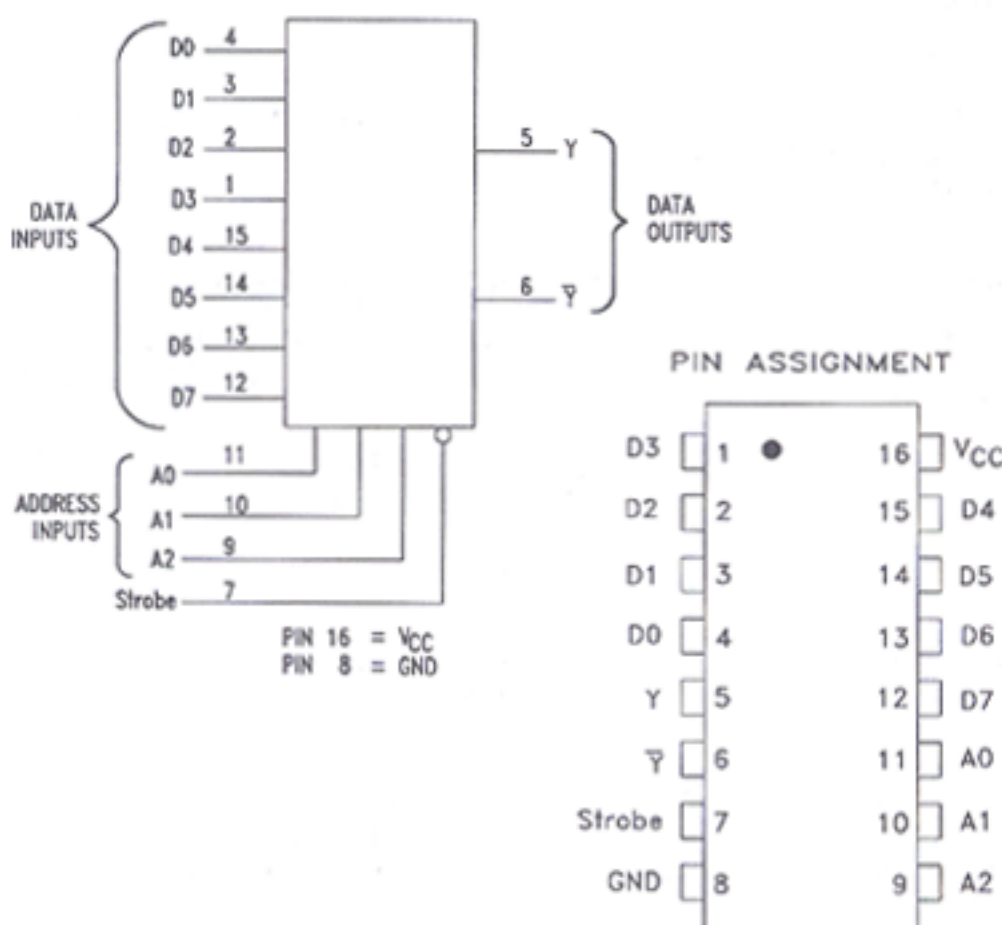
This device selects one of the 8 binary Data Inputs, as determined by the Address Inputs. The Strobe pin must be at a low level for the selected data to appear at the outputs. If Strobe is high, the Y output is forced to a low level and the  $\bar{Y}$  output is forced to a high level.

- Output Drive Capability: 10 LSTTL Loads
- Outputs Directly Interface to CMOS, NMOS, and TTL
- Operating Voltage Range: 2 to 6 V for HC devices
- Low Input Current: 1  $\mu$ A
- DC, AC parameters guaranteed from -55°C to 125°C

**DV74HC151**  
**DV74HCT151**



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#### TRUTH TABLE

Inputs				Outputs	
A2	A1	A0	Strobe	Y	$\bar{Y}$
X	X	X	H	L	H
L	L	L	L	D0	$\bar{D0}$
L	L	H	L	D1	$\bar{D1}$
L	H	L	L	D2	$\bar{D2}$
L	H	H	L	D3	$\bar{D3}$
H	L	L	L	D4	$\bar{D4}$
H	L	H	L	D5	$\bar{D5}$
H	H	L	L	D6	$\bar{D6}$
H	H	H	L	D7	$\bar{D7}$

D0, D1...D7 = the level of the respective D input  
H = High Logic Level  
L = Low Logic Level  
X = Don't Care

#### ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	DC Supply Voltage (Referenced to GND)	-0.5 to +7.0	V
V <sub>IN</sub>	DC Input Voltage (Referenced to GND)	-1.5 to V <sub>CC</sub> + 1.5	V
V <sub>OUT</sub>	DC Output Voltage (Referenced to GND)	-0.5 to V <sub>CC</sub> + 0.5	V
I <sub>IN</sub>	DC Input Current, per Pin	± 20	mA
I <sub>OUT</sub>	DC Output Current, per Pin	± 25	mA
I <sub>CC</sub>	DC Supply Current, V <sub>CC</sub> and GND Pins	± 50	mA
P <sub>D</sub>	Power Dissipation in Still Air, Plastic DIP SOP Package	750 500	mW
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C
TL	Lead Temperature, 1mm from Case for 10 Seconds	260	°C



## GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V <sub>CC</sub>	DC Supply Voltage, HC (HCT), Referenced to GND	2.0 (4.5)	6.0 (5.5)	V
V <sub>IN</sub> , V <sub>OUT</sub>	DC Input Voltage, Output Voltage, Referenced to GND	0	V <sub>CC</sub>	V
T <sub>A</sub>	Ambient Temperature	-55	+125	°C
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time: HC: V <sub>CC</sub> =2.0V HCT: V <sub>CC</sub> =5.5V / HC: V <sub>CC</sub> =4.5V HC: V <sub>CC</sub> =6.0V	0 0 0	1000 500 400	ns

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### DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V <sub>CC</sub> V	Guaranteed Limits			Unit
				25°C to -55°C	≤85°C	≤125°C	
V <sub>IH</sub>	Minimum High-Level Input Voltage	V <sub>OUT</sub> = 0.1 V, or V <sub>OUT</sub> = V <sub>CC</sub> - 0.1V I <sub>OUT</sub> ≤ 20 μA	2.0	1.5	1.5	1.5	V
			4.5	3.15	3.15	3.15	
			6.0	4.2	4.2	4.2	
V <sub>IL</sub>	Maximum Low-Level Input Voltage	V <sub>OUT</sub> = 0.1 V, or V <sub>OUT</sub> = V <sub>CC</sub> - 0.1V I <sub>OUT</sub> ≤ 20 μA	2.0	0.3	0.3	0.3	V
			4.5	0.9	0.9	0.9	
			6.0	1.2	1.2	1.2	
V <sub>OH</sub>	Minimum High-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OUT</sub> ≤ 20 μA	2.0	1.9	1.9	1.9	V
			4.5	4.4	4.4	4.4	
			6.0	5.9	5.9	5.9	
V <sub>OL</sub>	Maximum Low Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OUT</sub> ≤ 20 μA	2.0	0.1	0.1	0.1	V
			4.5	0.1	0.1	0.1	
			6.0	0.1	0.1	0.1	
I <sub>IN</sub>	Maximum Input Leakage Current	V <sub>IN</sub> = V <sub>CC</sub> or GND	6.0	±0.1	±1.0	±1.0	μA
			4.5	0.26	0.33	0.40	
			6.0	0.26	0.33	0.40	
I <sub>CC</sub>	Maximum Quiescent Supply Current	V <sub>IN</sub> = V <sub>CC</sub> or GND, I <sub>OUT</sub> = 0 μA	6.0	8.0	80	160	μA

### AC ELECTRICAL CHARACTERISTICS over full operating conditions (C<sub>L</sub>=50pF, Input t<sub>r</sub>=t<sub>f</sub>=6ns)

Symbol	Parameter	V <sub>CC</sub> V	Guaranteed Limit			Unit
			25°C to -55°C	≤85°C	≤125°C	
t <sub>PLH</sub> , t <sub>PHL</sub>	Maximum Propagation Delay Time, Input D to Output Y or $\bar{Y}$	2.0	185	230	280	ns
		4.5	37	46	56	
		6.0	31	39	48	
t <sub>PLH</sub> , t <sub>PHL</sub>	Maximum Propagation Delay Time, Input A to Output Y or $\bar{Y}$	2.0	205	255	310	ns
		4.5	41	51	62	
		6.0	35	43	53	
t <sub>PLH</sub> , t <sub>PHL</sub>	Maximum Propagation Delay Time, Strobe to Output Y or $\bar{Y}$	2.0	125	155	190	ns
		4.5	25	31	38	
		6.0	21	26	32	
t <sub>TLH</sub> , t <sub>THL</sub>	Maximum Output Transition Time Any Output	2.0	75	95	110	ns
		4.5	15	19	22	
		6.0	13	16	19	
C <sub>IN</sub>	Maximum Input Capacitance	—	10	10	10	pF
C <sub>PD</sub>	Power Dissipation Capacitance (Per Gate) Used to determine the no-load dynamic power consumption, P <sub>D</sub> = C <sub>PD</sub> V <sub>CC</sub> <sup>2</sup> f + I <sub>CC</sub> V <sub>CC</sub>	Typical @ 25°C, V <sub>CC</sub> = 5 V			pF	
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## DC ELECTRICAL CHARACTERISTICS

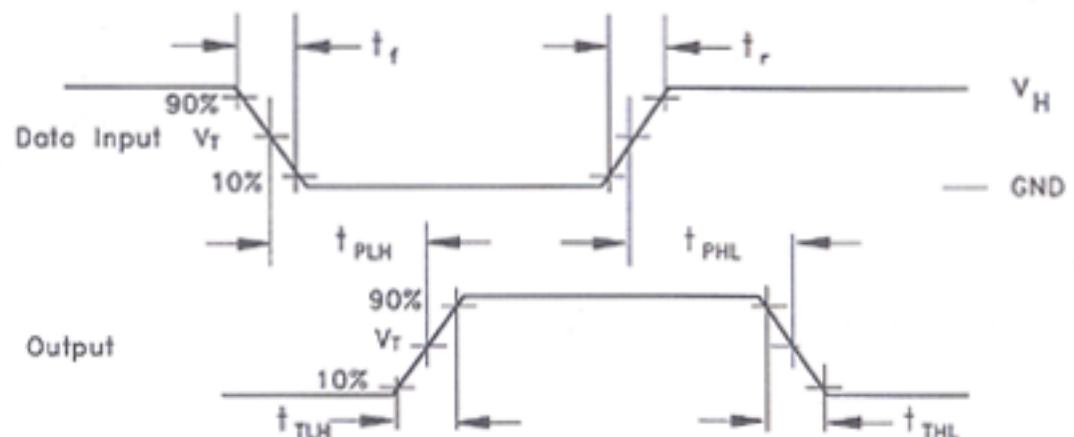
Symbol	Parameter	Conditions	V <sub>CC</sub> V	Guaranteed Limits			Unit
				25°C to -55°C	≤85°C	≤125°C	
V <sub>IH</sub>	Minimum High-Level Input Voltage	V <sub>OUT</sub> = 0.1 V, I <sub>OUT</sub> ≤ 20 μA or V <sub>out</sub> = V <sub>CC</sub> - 0.1V	4.5 5.5	2.0 2.0	2.0 2.0	2.0 2.0	V
V <sub>IL</sub>	Maximum Low-Level Input Voltage	V <sub>OUT</sub> = 0.1 V, I <sub>OUT</sub> ≤ 20 μA or V <sub>out</sub> = V <sub>CC</sub> - 0.1V	4.5 5.5	0.8 0.8	0.8 0.8	0.8 0.8	V
V <sub>OH</sub>	Minimum High-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OUT</sub> ≤ 20 μA	4.5 5.5	4.4 5.4	4.4 5.4	4.4 5.4	V
		V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OUT</sub> ≤ 4.0 mA	4.5	3.98	3.84	3.7	
V <sub>OL</sub>	Maximum Low Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OUT</sub> ≤ 20 μA	4.5 5.5	0.1 0.1	0.1 0.1	0.1 0.1	V
		V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OUT</sub> ≤ 4.0 mA	4.5	0.26	0.33	0.40	
I <sub>IN</sub>	Maximum Input Leakage Current	V <sub>IN</sub> = V <sub>CC</sub> or GND	6.0	± 0.1	± 1.0	± 1.0	μA
I <sub>CC</sub>	Maximum Quiescent Supply Current (Per Package)	V <sub>IN</sub> = V <sub>CC</sub> or GND I <sub>OUT</sub> = 0 μA	6.0	4.0	40	160	μA
ΔI <sub>CC</sub>	Additional Quiescent Supply Current	V <sub>IN</sub> = 2.4 V, Any one Input V <sub>IN</sub> = V <sub>CC</sub> or GND, Other Inputs I <sub>OUT</sub> = 0 mA	5.5	> -55°C 2.9	25°C to 125°C 2.4		mA

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## AC ELECTRICAL CHARACTERISTICS over full operating conditions (CL=50 pF, Input t<sub>f</sub>=t<sub>r</sub>=6ns)

Symbol	Parameter	V <sub>CC</sub> V	Guaranteed Limit			Unit
			25°C to -55°C	≤85°C	≤125°C	
t <sub>PLH</sub> , t <sub>PHL</sub>	Maximum Propagation Delay Time, Input A to Output Y	5.0 ±10%	37	46	56	ns
t <sub>PLH</sub> , t <sub>PHL</sub>	Maximum Propagation Delay Time, CS1 to Output Y	5.0 ±10%	41	51	62	ns
t <sub>PLH</sub> , t <sub>PHL</sub>	Maximum Propagation Delay Time, CS2 or CS3 to Output Y	5.0 ±10%	25	31	38	ns
t <sub>TLH</sub> , t <sub>THL</sub>	Maximum Output Transition Time Any Output	5.0 ±10%	15	19	22	ns
C <sub>IN</sub>	Maximum Input Capacitance	—	10	10	10	pF
C <sub>PD</sub>	Power Dissipation Capacitance (Per Gate) Used to determine the no-load dynamic power consumption, P <sub>D</sub> = C <sub>PD</sub> V <sub>CC</sub> <sup>2</sup> f + I <sub>CC</sub> V <sub>CC</sub>	Typical @ 25°C, V <sub>CC</sub> = 5 V			pF	
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## SWITCHING WAVEFORMS



Input and Output Threshold Voltage: V<sub>T</sub> = 50% V<sub>CC</sub> for HC, 1.3V for HCT, V<sub>H</sub> = V<sub>CC</sub> for HC, 3V for HCT