

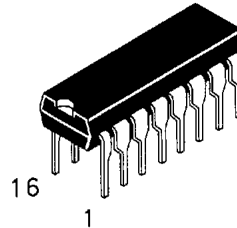
Available Q3, 1995

# 1-of-8 Selector/Multiplexer

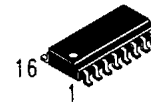
This device is a high speed, 1-of-8 digital multiplexer. It is able to select one line of data from up to eight inputs. Both true and complementary outputs are provided.

- Advanced very high speed CMOS
- Outputs source/sink 24 mA
- Transmission line driving 50 ohms
- ACT has TTL compatible inputs
- AC Device Operation from 2 to 6 volts guaranteed
- DC & AC Parameters guaranteed over -40 to +85°C

## DV74AC151 DV74ACT151

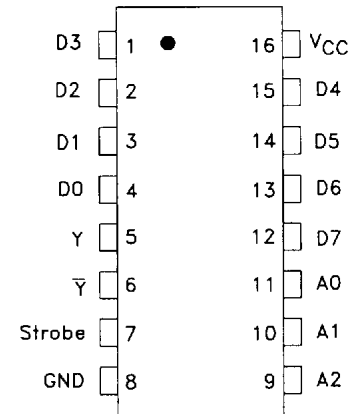


N Suffix  
Plastic DIP  
AVG-003 Case

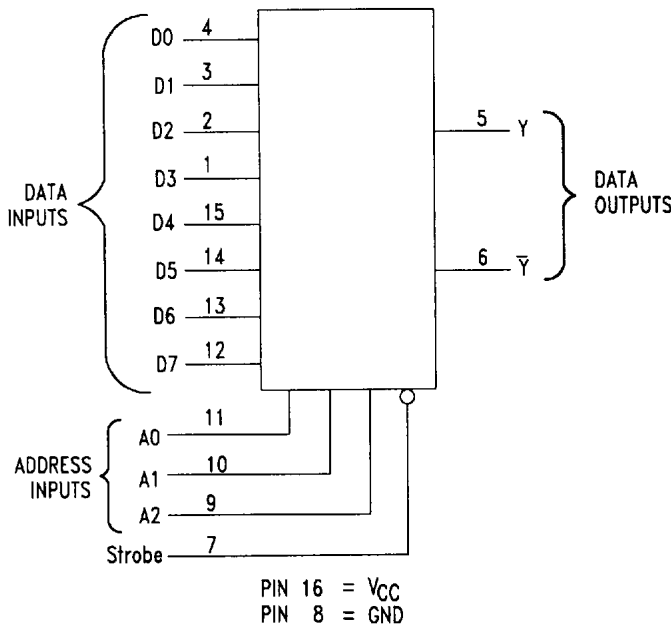


D Suffix  
Plastic SOP  
AVG-004 Case

### PIN ASSIGNMENT



### LOGIC DIAGRAM



### TRUTH TABLE

Inputs				Outputs	
Strobe	A <sub>2</sub>	A <sub>1</sub>	A <sub>0</sub>	$\bar{Y}$	Y
H	X	X	X	H	L
L	L	L	L	$\bar{D}_0$	D <sub>0</sub>
L	L	L	H	$\bar{D}_1$	D <sub>1</sub>
L	L	H	L	$\bar{D}_2$	D <sub>2</sub>
L	L	H	H	$\bar{D}_3$	D <sub>3</sub>
L	H	L	L	$\bar{D}_4$	D <sub>4</sub>
L	H	L	H	$\bar{D}_5$	D <sub>5</sub>
L	H	H	L	$\bar{D}_6$	D <sub>6</sub>
L	H	H	H	$\bar{D}_7$	D <sub>7</sub>

H=HIGH Logic Level

L=LOW Logic Level

X=Don't Care

D<sub>0</sub>, D<sub>1</sub>...D<sub>7</sub> = Level of the respective D input

### ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	AC151, ACT151	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)	- 0.5 to V <sub>CC</sub> +0.5	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 Sink/Source Current, per Pin	± 50	mA

151

**ABSOLUTE MAXIMUM RATINGS** (continued)

I <sub>CC</sub>	DC VCC or GND Current per Output Pin	± 50	mA
T <sub>STG</sub>	Storage Temperature	- 65 to +150	°C

**GUARANTEED OPERATING CONDITIONS**

Symbol	Parameter	Min	Typ	Max	Unit	
V <sub>CC</sub>	Supply Voltage	'AC	2.0	5.0	6.0	V
		'ACT	4.5	5.0	5.5	
V <sub>IN</sub> , V <sub>OUT</sub>	DC Input Voltage, Output Voltage, (Ref. to GND)	0		V <sub>CC</sub>	V	
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time (Note 1) <b>AC</b> Devices	V <sub>CC</sub> @ 3.0 V			150	ns/V
		V <sub>CC</sub> @ 4.5 V			40	ns/V
		V <sub>CC</sub> @ 5.5 V			25	ns/V
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time (Note 2) <b>ACT</b> Devices	V <sub>CC</sub> @ 4.5 V			10	ns/V
		V <sub>CC</sub> @ 5.5 V			8.0	ns/V
T <sub>A</sub>	Operating Ambient Temperature Range	-40		85	°C	
C <sub>PD</sub>	Power Dissipation Capacitance	V <sub>CC</sub> = 5.0 V		70	pF	
C <sub>IN</sub>	Input Capacitance V <sub>CC</sub> = 5.0 V	V <sub>CC</sub> = 5.0 V		4.5	pF	

 1. V<sub>IN</sub> from 30% to 70% V<sub>CC</sub>

 2. V<sub>IN</sub> from 0.8 to 2.0 V

# AC — 151

**DC ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	AC151			Unit
				T <sub>A</sub> = +25°C		T <sub>A</sub> = -40 to +85°C	
				Typ	Guaranteed Limits		
V <sub>IH</sub>	Minimum High Level Input Voltage	V <sub>OUT</sub> = 0.1V or V <sub>CC</sub> - 0.1 V	3.0	1.5	2.1	2.1	V
			4.5	2.25	3.15	3.15	
			5.5	2.75	3.85	3.85	
V <sub>IL</sub>	Maximum Low Level Input Voltage	V <sub>OUT</sub> = 0.1V or V <sub>CC</sub> - 0.1 V	3.0	1.5	0.9	0.9	V
			4.5	2.25	1.35	1.35	
			5.5	2.75	1.65	1.65	
V <sub>OH</sub>	Minimum High Level Output Voltage	I <sub>OUT</sub> = -50 μA	3.0	2.99	2.9	2.9	V
			4.5	4.49	4.4	4.4	
			5.5	5.49	5.4	5.4	
V <sub>OL</sub>	Maximum Low Level Output Voltage	I <sub>OUT</sub> = 50 μA	3.0	0.002	0.1	0.1	V
			4.5	0.001	0.1	0.1	
			5.5	0.001	0.1	0.1	
V <sub>OL</sub>	Maximum Low Level Output Voltage	V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OH</sub> = 24 mA	3.0		0.36	0.44	V
			4.5		0.36	0.44	
			5.5		0.36	0.44	
I <sub>IN</sub>	Maximum Input Leakage Current	V <sub>I</sub> = V <sub>CC</sub> , GND	5.5		±0.1	±1.0	μA
I <sub>CC</sub>	Maximum Quiescent Supply Current	V <sub>IN</sub> = V <sub>CC</sub> or GND	5.5		8.0	80	μA

151

## AC CHARACTERISTICS

Symbol	Parameter ( $C_L = 50 \text{ pF}$ )	$V_{CC} \pm 10\%$ (V)	ACT151				Unit
			$T_A = +25^\circ\text{C}$		$T_A = -40^\circ\text{C to } +85^\circ\text{C}$		
			Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay A <sub>n</sub> to Y or $\bar{Y}$	3.3	3.0	18	3.0	20	ns
t <sub>PHL</sub>		5.0	2.5	13	2.0	15	
t <sub>PLH</sub>	Propagation Delay Strobe to Y or $\bar{Y}$	3.3	2.5	13	2.0	14	ns
t <sub>PHL</sub>		5.0	2.0	10	1.5	11	
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to Y or $\bar{Y}$	3.3	2.5	14	2.0	15.5	ns
t <sub>PHL</sub>		5.0	2.0	10.5	1.5	11	
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to Y or $\bar{Y}$	3.3	2.5	15	2.0	16	ns
t <sub>PHL</sub>		5.0	1.5	11	1.5	11	

## ACT — 151

### DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	$V_{CC} \pm 10\%$ (V)	ACT151			Unit
				$T_A = +25^\circ\text{C}$		$T_A = -40$ to $+85^\circ\text{C}$	
				Typ	Guaranteed Limits		
V <sub>IH</sub>	Minimum High Level Input Voltage	V <sub>OUT</sub> = 0.1V or V <sub>CC</sub> - 0.1 V	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0	V
V <sub>IL</sub>	Maximum Low Level Input Voltage	V <sub>OUT</sub> = 0.1V or V <sub>CC</sub> - 0.1 V	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	V
V <sub>OH</sub>	Minimum High Level Output Voltage	I <sub>OUT</sub> = -50 μA	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4	V
		V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OH</sub> -24mA -24 mA	4.5 5.5		3.86 4.86	3.76 4.76	V
V <sub>OL</sub>	Maximum Low Level Output Voltage	I <sub>OUT</sub> = 50 μA	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	V
		V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OL</sub> 24mA 24 mA	4.5 5.5		0.36 0.36	0.44 0.44	V
I <sub>IN</sub>	Maximum Input Leakage Current	V <sub>I</sub> = V <sub>CC</sub> , GND	5.5		±0.1	±1.0	μA
ΔI <sub>CC</sub>	Additional Max I <sub>CC</sub> /Input	V <sub>I</sub> = V <sub>CC</sub> - 2.1 V	5.5	0.6		1.5	mA
I <sub>CC</sub>	Maximum Quiescent Supply Current	V <sub>IN</sub> = V <sub>CC</sub> or GND	5.5		8.0	80	μA

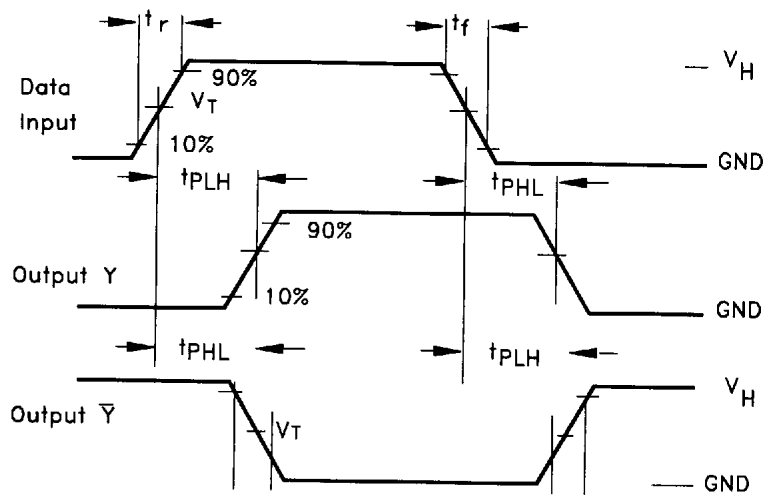
### AC CHARACTERISTICS

Symbol	Parameter ( $C_L = 50 \text{ pF}$ )	$V_{CC} \pm 10\%$ (V)	ACT151				Unit
			$T_A = +25^\circ\text{C}$		$T_A = -40^\circ\text{C to } +85^\circ\text{C}$		
			Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay A <sub>n</sub> to Y or $\bar{Y}$	5.0	3.5	15.5	3.0	17.0	ns
t <sub>PHL</sub>		5.0	3.5	15.5	3.0	16.5	
t <sub>PLH</sub>	Propagation Delay A <sub>n</sub> to Y or $\bar{Y}$	5.0	3.5	15.0	3.0	16.5	ns
t <sub>PHL</sub>		5.0	4.0	16.5	3.5	18.5	
t <sub>PLH</sub>	Propagation Delay Strobe to Y	5.0	2.5	9.5	2.5	10.0	ns
t <sub>PHL</sub>		5.0	2.5	9.0	2.5	10.0	

151

Symbol	Parameter ( $C_L = 50 \text{ pF}$ )	$V_{CC}$ $\pm 10\%$ (V)	ACT151				Unit
			$T_A = +25^\circ\text{C}$		$T_A = -40^\circ\text{C to } +85^\circ\text{C}$		
			Min	Max	Min	Max	
$t_{PLH}$	Propagation Delay Strobe to $\bar{Y}$	5.0	2.5	8.5	2.5	9.5	ns
$t_{PHL}$			3.0	10.0	2.5	10.5	
$t_{PLH}$	Propagation Delay Dn to Y	5.0	2.5	11.5	3.0	12.5	ns
$t_{PHL}$			2.5	12.0	3.0	13.5	
$t_{PLH}$	Propagation Delay Dn to $\bar{Y}$	5.0	2.5	12.0	3.0	13.0	ns
$t_{PHL}$			2.5	12.5	3.0	14.0	

## SWITCHING WAVEFORMS



Input and output threshold voltage:  
 $V_T = 50\% V_{CC}$  for AC; 1.5V for ACT  
 $V_H = V_{CC}$  for AC, 3V for ACT