

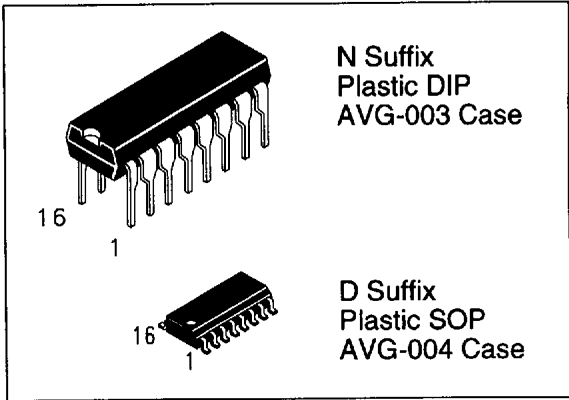
Available Q2, 1995

### Dual 4-Input Multiplexer

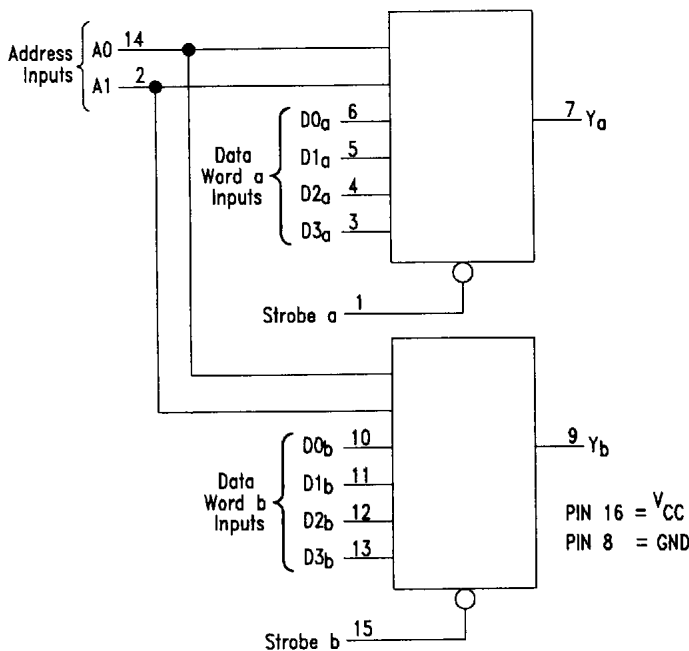
This device is a high speed, dual 4-input multiplexer with common address inputs and individual strobe inputs for each section. It can select two lines of data from four sources. The two buffered outputs present data in the true(non-inverted) form. In addition to multiplexer operation, it can act as a function generator and generate any two functions of three variables.

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

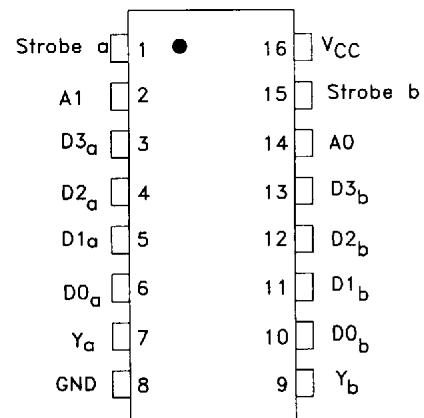
## DV74AC153 DV74ACT153



### LOGIC DIAGRAM



### PIN ASSIGNMENT



### TRUTH TABLE

Address Inputs		Inputs					Output
A0	A1	Strobe	D0	D1	D2	D3	Y
X	X	H	X	X	X	X	L
L	L	L	L	X	X	X	L
L	L	L	H	X	X	X	H
H	L	L	X	L	X	X	L
H	L	L	X	H	X	X	H
L	H	L	X	X	L	X	L
L	H	L	X	X	H	X	H
H	H	L	X	X	X	L	L
H	H	L	X	X	X	H	H

H=HIGH Voltage Level  
L=LOW Voltage Level  
X=Either Low or High Logic Level

## ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	AC153, ACT153	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
I <sub>CC</sub>	DC V <sub>CC</sub> 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) 'AC 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) 'ACT 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	
CPD	Power Dissipation Capacitance	V <sub>CC</sub> = 5.0 V	60		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 — 153

### DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	AC153			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>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub>					V
I <sub>OH</sub> -12mA	3.0		2.56	2.46			
I <sub>OH</sub> -24mA	4.5		3.86	3.76			
		I <sub>OH</sub> -24 mA	5.5		4.86	4.76	

153

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	AC153			Unit
				T <sub>A</sub> = +25°C		T <sub>A</sub> = -40 to +85°C	
				Typ	Guaranteed Limits		
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	
		V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OH</sub> = 12mA 24mA 24mA	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

## AC CHARACTERISTICS

Symbol	Parameter (C <sub>L</sub> = 50 pF)	V <sub>CC</sub> ±10% (V)	AC153				Unit
			T <sub>A</sub> = +25°C		T <sub>A</sub> = -40°C to +85°C		
			Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay A <sub>n</sub> to Y	3.3	2.5	15	2.5	17.5	ns
t <sub>PHL</sub>		5.0	2.0	11	2.0	12.5	
t <sub>PLH</sub>	Propagation Delay Strobe to Y	3.3	3.0	14.5	2.5	16.5	ns
t <sub>PHL</sub>		5.0	2.5	11.0	2.0	12.0	
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to Y	3.3	2.5	13.5	2.0	16.0	ns
t <sub>PHL</sub>		5.0	1.5	9.5	1.5	11.0	
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to Y	3.3	2.5	11.0	2.0	12.5	ns
t <sub>PHL</sub>		5.0	2.0	8.0	1.5	9.0	
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to Y	3.3	2.5	12.5	2.0	14.5	ns
t <sub>PHL</sub>		5.0	1.5	9.0	1.5	10.5	
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to Y	3.3	1.5	11.5	1.5	13.0	ns
t <sub>PHL</sub>		5.0	1.5	8.5	1.5	10.0	

## ACT — 153

### DC ELECTRICAL CHARACTERISTICS

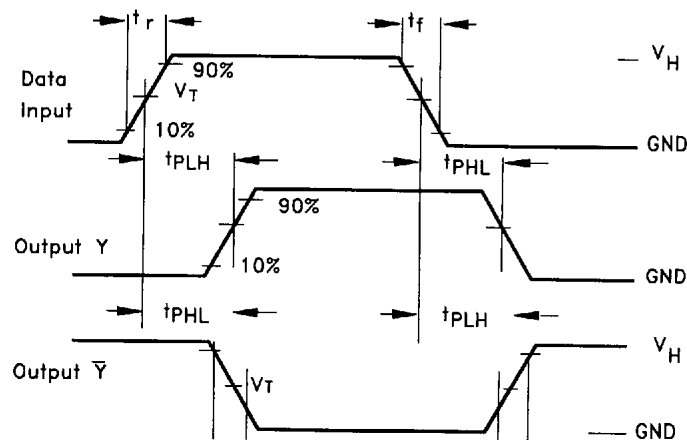
Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	ACT153			Unit
				T <sub>A</sub> = +25°C		T <sub>A</sub> = -40 to +85°C	
				Typ	Guaranteed Limits		
V <sub>IH</sub>	Minimum High Level Input Voltage	V <sub>OUT</sub> = 0.1V or V <sub>CC</sub> - 0.1 V	4.5	1.5	2.0	2.0	V
			5.5	1.5	2.0	2.0	
V <sub>IL</sub>	Maximum Low Level Input Voltage	V <sub>OUT</sub> = 0.1V or V <sub>CC</sub> - 0.1 V	4.5	1.5	0.8	0.8	V
			5.5	1.5	0.8	0.8	
V <sub>OH</sub>	Minimum High Level Output Voltage	I <sub>OUT</sub> = -50 μA	4.5	4.49	4.4	4.4	V
			5.5	5.49	5.4	5.4	
		V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OH</sub> = -24mA -24 mA	4.5		3.86	3.76	V
			5.5		4.86	4.76	
			5.5		4.86	4.76	
V <sub>OL</sub>	Maximum Low Level Output Voltage	I <sub>OUT</sub> = 50 μA	4.5	0.001	0.1	0.1	V
			5.5	0.001	0.1	0.1	
		V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OL</sub> = 24mA 24 mA	4.5		0.36	0.44	V
			5.5		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
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

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	ACT153			Unit
				T <sub>A</sub> = +25°C		T <sub>A</sub> = -40 to +85°C	
				Typ	Guaranteed Limits		
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 <sub>L</sub> = 50 pF)	V <sub>CC</sub> ±10% (V)	ACT153				Unit
			T <sub>A</sub> = +25°C		T <sub>A</sub> = -40°C to +85°C		
			Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay, A <sub>n</sub> to Y	5.0	3.0	11.5	2.0	13.5	ns
t <sub>PHL</sub>	Propagation Delay, A <sub>n</sub> to Y	5.0	3.0	11.5	2.5	13.5	ns
t <sub>PLH</sub>	Propagation Delay, Strobe to Y	5.0	2.0	10.5	2.0	12.5	ns
t <sub>PHL</sub>	Propagation Delay, Strobe to Y	5.0	3.0	9.5	2.5	11.0	ns
t <sub>PLH</sub>	Propagation Delay, D <sub>n</sub> to Y	5.0	2.5	9.5	2.0	11.0	ns
t <sub>PHL</sub>	Propagation Delay, D <sub>n</sub> to Y	5.0	2.0	9.5	2.0	11.0	ns

### SWITCHING WAVEFORMS



Input and output threshold voltage:  
V<sub>T</sub> = 50% V<sub>CC</sub> for AC; 1.5V for ACT  
V<sub>H</sub> = V<sub>CC</sub> for AC, 3V for ACT