

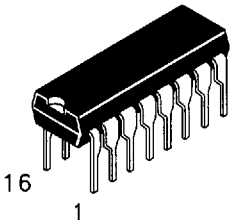
Available Q2, 1995

Dual 4-Input Multiplexer with 3-State Outputs

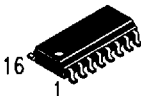
This device is a high speed, dual four input multiplexer with common select inputs. It can select two lines of data from four sources. The outputs may be individually switched to a high impedance state with a HIGH on the respective Output Enable inputs, allowing the outputs to directly interface with bus oriented systems.

- 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

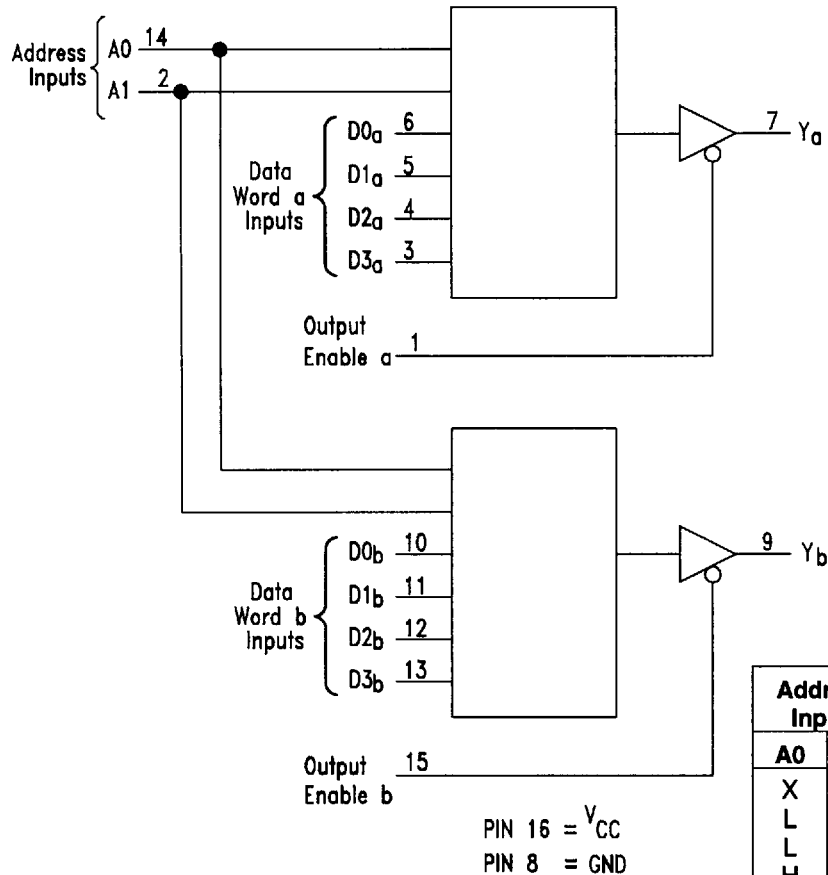
DV74AC253  
DV74ACT253



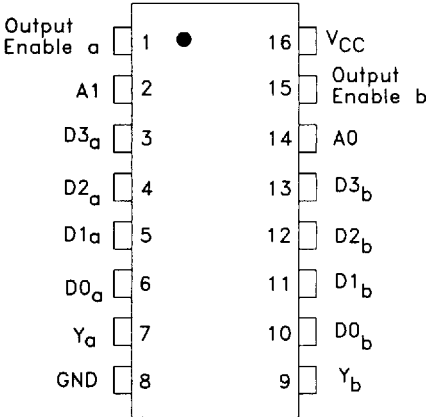
N Suffix  
Plastic DIP  
AVG-003 Case



D Suffix  
Plastic SOP  
AVG-004 Case



PIN ASSIGNMENT



TRUTH TABLE

Address Inputs		Data Inputs				Output Enable	Output
A0	A1	D0	D1	D2	D3		Y
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	L
L	L	L	X	X	X	L	H
L	L	X	L	X	X	L	L
H	L	X	H	X	X	L	H
L	H	X	X	L	X	L	L
L	H	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

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

253

## ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	AC253, ACT253	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 except Schmitt Inputs	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 except Schmitt Inputs	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>IN</sub>	Input Capacitance V <sub>CC</sub> = 5.0 V	V <sub>CC</sub> = 5.0 V		4.5		pF
CPD	Power Dissipation Capacitance	V <sub>CC</sub> = 5.0 V		50		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 — 253

### DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	AC253			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
		–12mA	3.0		2.56	2.46	
		I <sub>OH</sub> –24mA	4.5		3.86	3.76	
		–24 mA	5.5		4.86	4.76	

253

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	AC253			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	
			5.5	0.001	0.1	0.1	
		V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> 12mA I <sub>OL</sub> 24mA 24 mA	3.0		0.36	0.44	V
			4.5		0.36	0.44	
			5.5		0.36	0.44	
I <sub>OZ</sub>	Maximum 3-State Current	V <sub>IN</sub> =(OE)=V <sub>IL</sub> , V <sub>IH</sub> V <sub>IN</sub> =V <sub>CC</sub> , GND V <sub>OUT</sub> =V <sub>CC</sub> , GND	5.5		±0.5	±5.0	mA
I <sub>IN</sub>	Maximum Input Leakage Current	V <sub>IN</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> (V) ±10%	AC253				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 <sub>n</sub>	3.3 5.0	2.0 2.0	15.5 11	2.0 1.5	17.5 12.5	ns
t <sub>PHL</sub>		3.3 5.0	2.5 2.0	16 11.5	2.0 1.5	18.0 13.0	
t <sub>PLH</sub>	Propagation Delay I <sub>n</sub> to Y <sub>n</sub>	3.3 5.0	1.5 1.0	14.5 10	1.5 1.5	17.0 11.5	ns
t <sub>PHL</sub>		3.3 5.0	2.0 1.5	13 9.5	1.5 1.5	15.0 11.0	
t <sub>PZH</sub>	Output Enable Time	3.3 5.0	1.5 1.5	8.0 6.0	1.0 1.0	8.5 6.5	ns
t <sub>PZL</sub>		3.3 5.0	1.5 1.5	8.0 6.0	1.0 1.0	9.0 7.0	
t <sub>PHZ</sub>	Output Disable Time	3.3 5.0	2.0 2.0	9.5 8.0	1.5 1.5	10.0 8.5	ns
t <sub>PLZ</sub>		3.3 5.0	1.5 1.5	8.0 7.0	1.0 1.0	9.0 7.5	

## ACT — 253

## DC ELECTRICAL CHARACTERISTICS

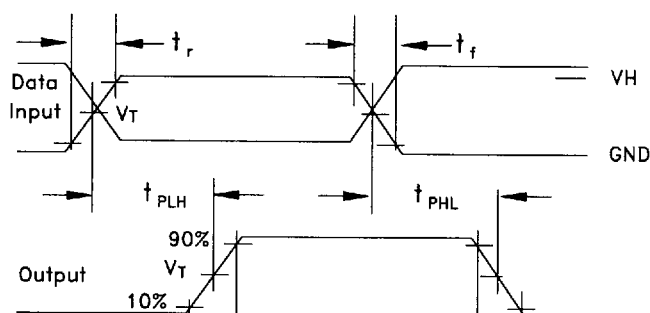
Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	ACT253			Unit
				TA = +25°C		TA = −40 to +85°C	
				Typ	Guaranteed Limits		
VIH	Minimum High Level Input Voltage	VOUT = 0.1V or VCC − 0.1 V	4.5	1.5	2.0	2.0	V
			5.5	1.5	2.0	2.0	
VIL	Maximum Low Level Input Voltage	VOUT = 0.1V or VCC − 0.1 V	4.5	1.5	0.8	0.8	V
			5.5	1.5	0.8	0.8	
VOH	Minimum High Level Output Voltage	IOUT = −50 μA	4.5	4.49	4.4	4.4	V
			5.5	5.49	5.4	5.4	
		VIN = VIL or VIH IOH −24mA −24 mA	4.5		3.86	3.76	V
			5.5		4.86	4.76	

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	ACT253			Unit
				TA = +25°C		TA = -40 to +85°C	
				Typ	Guaranteed Limits		
VOL	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>OZ</sub>	Maximum 3-State Current	V <sub>IN</sub> =(OE)=V <sub>IL</sub> , V <sub>IH</sub> V <sub>IN</sub> =V <sub>CC</sub> , GND V <sub>OUT</sub> =V <sub>CC</sub> , GND	5.5		±0.5	±5.0	mA
I <sub>IN</sub>	Maximum Input Leakage Current	V <sub>IN</sub> =V <sub>CC</sub> , GND	5.5		±0.1	±1.0	μA
ΔI <sub>CCT</sub>	Additional Max I <sub>CC</sub> /Input	V <sub>IN</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	V <sub>CC</sub> (V) ±10%	ACT253				Unit
			T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF		T <sub>A</sub> = - 40°C to +85°C C <sub>L</sub> = 50 pF		
			Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay A <sub>n</sub> to Y	5.0	2.0	11.5	2.0	13	ns
t <sub>PHL</sub>		5.0	3.0	13	2.5	14.5	ns
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to Y	5.0	2.5	10	2.0	11	ns
t <sub>PHL</sub>		5.0	3.5	11	3.0	12.5	ns
t <sub>PZH</sub>	Output Enable Time	5.0	2.0	7.5	1.5	8.5	ns
t <sub>PZL</sub>		5.0	2.0	8.0	1.5	9.0	ns
t <sub>PHZ</sub>	Output Disable Time	5.0	3.0	9.5	2.5	10	ns
t <sub>PLZ</sub>		5.0	2.5	7.5	2.0	8.5	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

