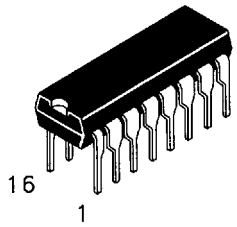
Available Q2, 1995

Dual 4-Input Multiplexer

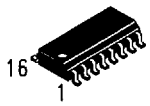
DV74AC153
DV74ACT153

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**

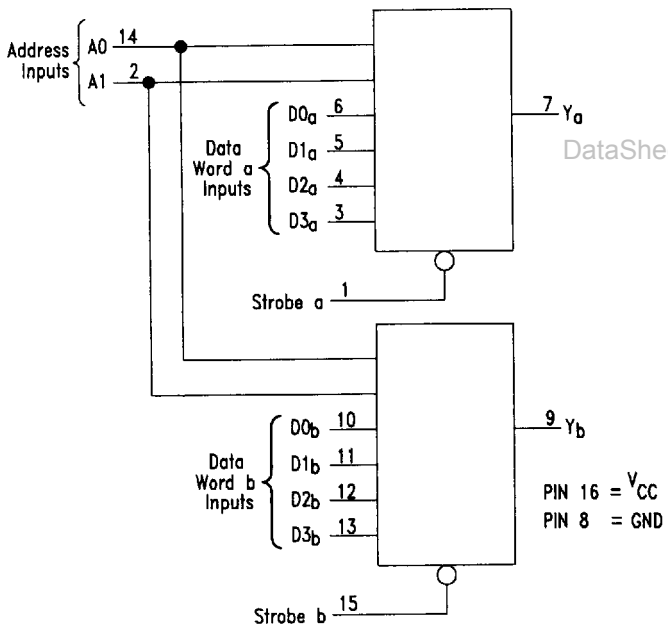


N Suffix
Plastic DIP
AVG-003 Case

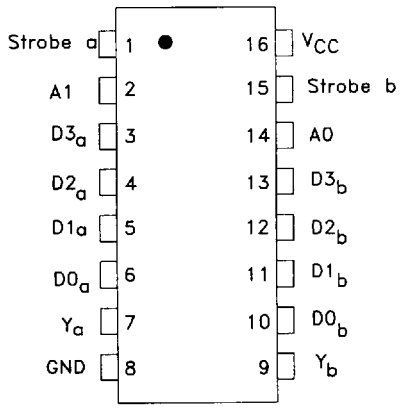


D Suffix
Plastic SOP
AVG-004 Case

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=HIGHVoltageLevel
L=LOWVoltageLevel
X=EitherLoworHighLogicLevel

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	AC153, ACT153	Unit
V_{CC}	DC Supply Voltage (Referenced to GND)	− 0.5 to +7.0	V
V_{IN}	DC Input Voltage (Referenced to GND)	− 0.5 to V_{CC} +0.5	V
V_{OUT}	DC Output Voltage (Referenced to GND)	− 0.5 to V_{CC} +0.5	V
I_{IN}	DC Input Current, per Pin	± 20	mA
I_{OUT}	DC Output Sink/Source Current, per Pin	± 50	mA
I_{CC}	DC V_{CC} or GND Current per Output Pin	± 50	mA
T_{STG}	Storage Temperature	− 65 to +150	°C

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter		Min	Typ	Max	Unit
V_{CC}	Supply Voltage	'AC	2.0	5.0	6.0	V
		'ACT	4.5	5.0	5.5	
V_{IN}, V_{OUT}	DC Input Voltage, Output Voltage, (Ref. to GND)		0		V_{CC}	V
t_r, t_f	Input Rise and Fall Time (Note 1) **'AC** Devices	V_{CC} @ 3.0 V			150	ns/V
		V_{CC} @ 4.5 V			40	ns/V
		V_{CC} @ 5.5 V			25	ns/V
t_r, t_f	Input Rise and Fall Time (Note 2) **'ACT** Devices	V_{CC} @ 4.5 V			10	ns/V
		V_{CC} @ 5.5 V			8.0	ns/V
T_A	Operating Ambient Temperature Range		−40		85	°C
C_{PD}	Power Dissipation Capacitance	V_{CC} = 5.0 V		60		pF
C_{IN}	Input Capacitance V_{CC} = 5.0 V	V_{CC} = 5.0 V		4.5		pF

1. V_{IN} from 30% to 70% V_{CC}
2. V_{IN} from 0.8 to 2.0 V

AC — 153

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Vcc (V)	AC153			Unit
				T_A = +25°C	T_A = −40 to +85°C		
				Typ	Guaranteed Limits		
V_{IH}	Minimum High Level Input Voltage	V_{OUT} = 0.1V or V_{CC} − 0.1 V	3.0 4.5 5.5	1.5 2.25 2.75	2.1 3.15 3.85	2.1 3.15 3.85	V
V_{IL}	Maximum Low Level Input Voltage	V_{OUT} = 0.1V or V_{CC} − 0.1 V	3.0 4.5 5.5	1.5 2.25 2.75	0.9 1.35 1.65	0.9 1.35 1.65	V
V_{OH}	Minimum High Level Output Voltage	I_{OUT} = −50 µA	3.0 4.5 5.5	2.99 4.49 5.49	2.9 4.4 5.4	2.9 4.4 5.4	V
		V_{IN} = V_{IL} or V_{IH} −12mA I_{OH} −24mA −24 mA	3.0 4.5 5.5		2.56 3.86 4.86	2.46 3.76 4.76	V

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Symbol	Parameter	Conditions	Vcc (V)	AC153			Unit
				T_A = +25°C		T_A = –40 to +85°C	
				Typ	Guaranteed Limits		
V_{OL}	MaximumLow Level Output Voltage	I_{OUT}= 50 µA	3.0 4.5 5.5	0.002 0.001 0.001	0.1 0.1 0.1	0.1 0.1 0.1	V
		V_{IN} = V_{IL} or V_{IH} I_{OH} 12mA I_{OH} 24mA I_{OH} 24 mA	3.0 4.5 5.5		0.36 0.36 0.36	0.44 0.44 0.44	V
I_{IN}	Maximum Input Leakage Current	VI=V_{CC}, GND	5.5		±0.1	±1.0	µA
I_{CC}	Maximum Quiescent Supply Current	V_{IN} = V_{CC} or GND	5.5		8.0	80	µA

AC CHARACTERISTICS

Symbol	Parameter (C_L = 50 pF)	Vcc ±10% (V)	AC153				Unit
			T_A = +25°C		T_A = – 40°C to +85°C		
			Min	Max	Min	Max	
t_{PLH}	Propagation Delay A_n to Y	3.3 5.0	2.5 2.0	15 11	2.5 2.0	17.5 12.5	ns
t_{PHL}		3.3 5.0	3.0 2.5	14.5 11.0	2.5 2.0	16.5 12.0	
t_{PLH}	Propagation Delay Strobe to Y	3.3 5.0	2.5 1.5	13.5 9.5	2.0 1.5	16.0 11.0	ns
t_{PHL}		3.3 5.0	2.5 2.0	11.0 8.0	2.0 1.5	12.5 9.0	ns
t_{PLH}	Propagation Delay D_n to Y	3.3 5.0	2.5 1.5	12.5 9.0	2.0 1.5	14.5 10.5	ns
t_{PHL}		3.3 5.0	1.5 1.5	11.5 8.5	1.5 1.5	13.0 10.0	ns

ACT — 153

DC ELECTRICAL CHARACTERISTICS

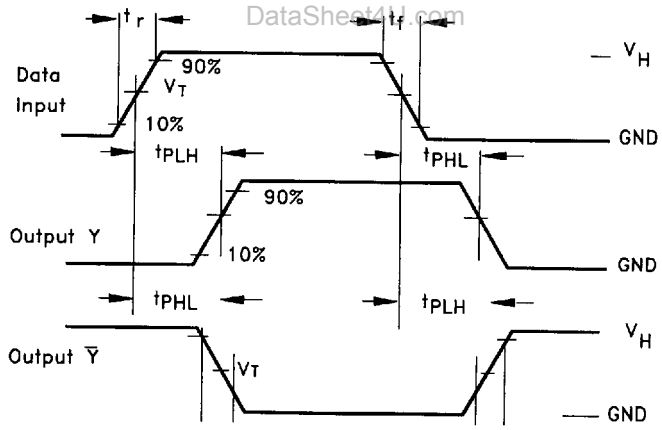
Symbol	Parameter	Conditions	Vcc (V)	ACT153			Unit
				TA = +25°C		TA = –40 to +85°C	
				Typ	Guaranteed Limits		
V_{IH}	Minimum High Level Input Voltage	V_{OUT} = 0.1V or V_{CC} – 0.1 V	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0	V
V_{IL}	Maximum Low Level Input Voltage	V_{OUT} = 0.1V or V_{CC} – 0.1 V	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	V
V_{OH}	Minimum High Level Output Voltage	I_{OUT} = –50 µA	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4	V
		V_{IN} = V_{IL} or V_{IH} I_{OH} –24mA I_{OH} –24 mA	4.5 5.5		3.86 4.86	3.76 4.76	V
V_{OL}	Maximum Low Level Output Voltage	I_{OUT}= 50 µA	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	V
		V_{IN} = V_{IL} or V_{IH} I_{OL} 24mA I_{OL} 24 mA	4.5 5.5		0.36 0.36	0.44 0.44	V
I_{IN}	Maximum Input Leakage Current	V_I=V_{CC}, GND	5.5		±0.1	±1.0	µA
ΔI_{CCT}	Additional Max I_{CC}/Input	V_I=V_{CC} – 2.1 V	5.5	0.6		1.5	mA

Symbol	Parameter	Conditions	Vcc (V)	ACT153			Unit
				TA = +25°C		TA = –40 to +85°C	
				Typ	Guaranteed Limits		
I_{CC}	Maximum Quiescent Supply Current	V_{IN} = V_{CC} or GND	5.5		8.0	80	µA

AC CHARACTERISTICS

Symbol	Parameter (C_L = 50 pF)	Vcc ±10% (V)	ACT153				Unit
			T_A = +25°C		T_A = – 40°C to +85°C		
			Min	Max	Min	Max	
t_{PLH}	Propagation Delay, A_n to Y	5.0	3.0	11.5	2.0	13.5	ns
t_{PHL}	Propagation Delay, A_n to Y	5.0	3.0	11.5	2.5	13.5	ns
t_{PLH}	Propagation Delay, Strobe to Y	5.0	2.0	10.5	2.0	12.5	ns
t_{PHL}	Propagation Delay, Strobe to Y	5.0	3.0	9.5	2.5	11.0	ns
t_{PLH}	Propagation Delay, D_n to Y	5.0	2.5	9.5	2.0	11.0	ns
t_{PHL}	Propagation Delay, D_n to Y	5.0	2.0	9.5	2.0	11.0	ns

SWITCHING WAVEFORMS



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

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