AVG Semiconductors

DDi™

Technical Data

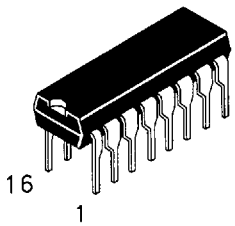
Available Q3, 1995

DV74AC151
DV74ACT151

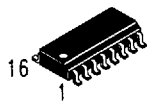
1-of-8 Selector/Multiplexer

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**

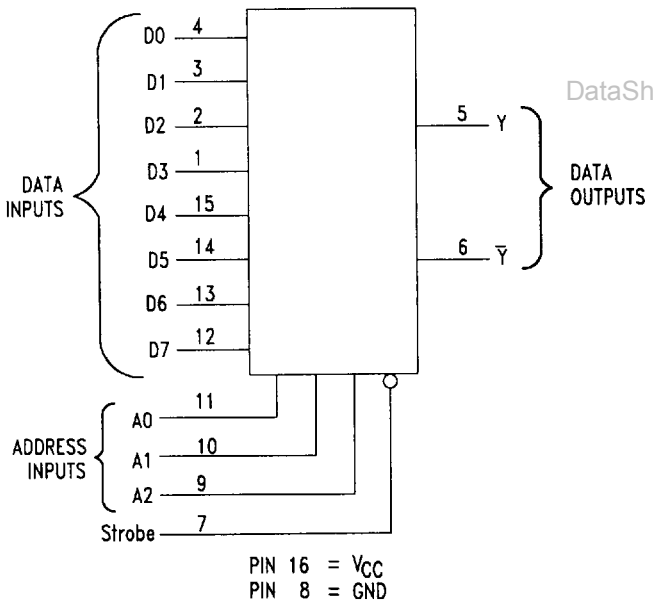


N Suffix
Plastic DIP
AVG-003 Case

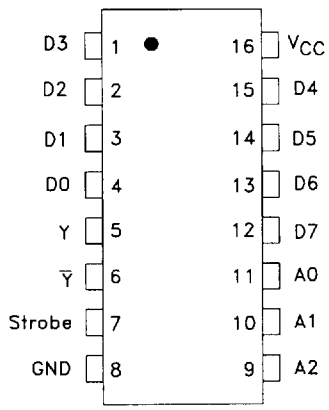


D Suffix
Plastic SOP
AVG-004 Case

LOGIC DIAGRAM



PIN ASSIGNMENT



TRUTH TABLE

Inputs				Outputs	
Strobe	A_2	A1	A0	$\overline{Y}$	Y
H	X	X	X	H	L
L	L	L	L	$\overline{D_0}$	D_0
L	L	L	H	$\overline{D_1}$	D_1
L	L	H	L	$\overline{D_2}$	D_2
L	L	H	H	$\overline{D_3}$	D_3
L	H	L	L	$\overline{D_4}$	D_4
L	H	L	H	$\overline{D_5}$	D_5
L	H	H	L	$\overline{D_6}$	D_6
L	H	H	H	$\overline{D_7}$	D_7

H=HIGH Logic Level
L=LOW Logic Level
X=Don't Care
D_0, D_1...D_7 = Level of the respective D input

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ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	AC151, ACT151	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

ABSOLUTE MAXIMUM RATINGS (continued)

I_{CC}	DC VCC 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		70		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

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DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V_{CC} (V)	AC151 T_A = +25°C Typ	AC151 T_A = −40 to +85°C Guaranteed Limits		Unit
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} I_{OH} −12mA I_{OH} −24mA I_{OH} −24 mA	3.0 4.5 5.5		2.56 3.86 4.86	2.46 3.76 4.76	V
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

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AC CHARACTERISTICS

Symbol	Parameter (C_L = 50 pF)	Vcc ±10% (V)	AC151 T_A = +25°C Min	AC151 T_A = +25°C Max	AC151 T_A = – 40°C to +85°C Min	AC151 T_A = – 40°C to +85°C Max	Unit
t_{PLH}	Propagation Delay A_n to Y or $\overline{Y}$	3.3	3.0	18	3.0	20	ns
		5.0	2.5	13	2.0	15	
t_{PHL}		3.3	2.5	18	2.5	20	
		5.0	2.0	13	1.5	15	
t_{PLH}	Propagation Delay Strobe to Y or $\overline{Y}$	3.3	2.5	13	2.0	14	ns
		5.0	2.0	10	1.5	11	
t_{PHL}		3.3	1.5	13	1.5	14	ns
		5.0	1.5	10	1.5	11	
t_{PLH}	Propagation Delay D_n to Y or $\overline{Y}$	3.3	2.5	14	2.0	15.5	ns
		5.0	2.0	10.5	1.5	11	
t_{PHL}		3.3	2.5	15	2.0	16	ns
		5.0	1.5	11	1.5	11	

ACT — 151

DC ELECTRICAL CHARACTERISTICS

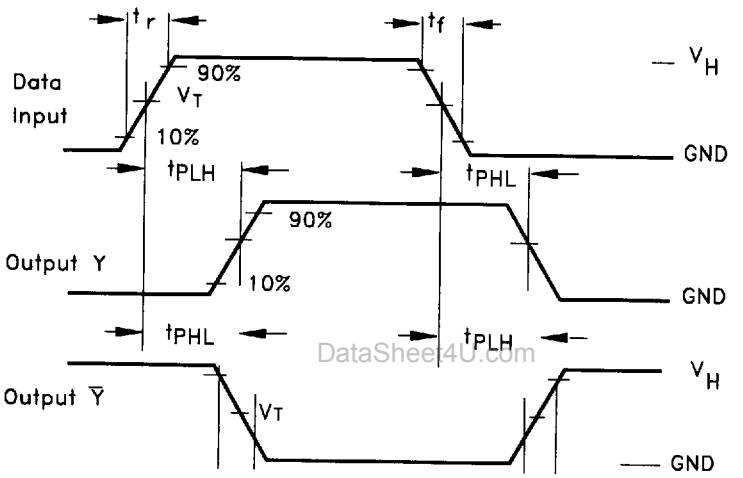
Symbol	Parameter	Conditions	Vcc ±10% (V)	ACT151 T_A = +25°C Typ	ACT151 T_A = –40 to +85°C Guaranteed Limits		Unit
V_{IH}	Minimum High Level Input Voltage	V_{OUT} = 0.1V or V_{CC} – 0.1 V	4.5	1.5	2.0	2.0	V
			5.5	1.5	2.0	2.0	
V_{IL}	Maximum Low Level Input Voltage	V_{OUT} = 0.1V or V_{CC} – 0.1 V	4.5	1.5	0.8	0.8	V
			5.5	1.5	0.8	0.8	
V_{OH}	Minimum High Level Output Voltage	I_{OUT} = –50 µA	4.5	4.49	4.4	4.4	V
			5.5	5.49	5.4	5.4	
		V_{IN} = V_{IL} or V_{IH} I_{OH} –24mA	4.5		3.86	3.76	V
		–24 mA	5.5		4.86	4.76	
V_{OL}	MaximumLow Level Output Voltage	I_{OUT} = 50 µA	4.5	0.001	0.1	0.1	V
			5.5	0.001	0.1	0.1	
		V_{IN} = V_{IL} or V_{IH} I_{OL} 24mA	4.5		0.36	0.44	V
		24 mA	5.5		0.36	0.44	
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
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)	ACT151 T_A = +25°C Min	ACT151 T_A = +25°C Max	ACT151 T_A = – 40°C to +85°C Min	ACT151 T_A = – 40°C to +85°C Max	Unit
t_{PLH}	Propagation Delay A_n to Y or Y	5.0	3.5	15.5	3.0	17.0	ns
t_{PHL}		5.0	3.5	15.5	3.0	16.5	
t_{PLH}	Propagation Delay A_n to Y or $\overline{Y}$	5.0	3.5	15.0	3.0	16.5	ns
t_{PHL}		5.0	4.0	16.5	3.5	18.5	
t_{PLH}	Propagation Delay Strobe to Y	5.0	2.5	9.5	2.5	10.0	ns
t_{PHL}		5.0	2.5	9.0	2.5	10.0	ns

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