Technical Data

DV74ACT04 Available Q2, 1995

Hex Inverter

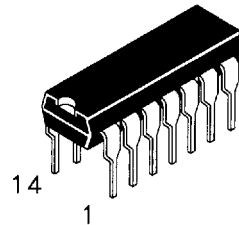| DV74AC04 |
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| **DV74ACT04** |

This device contains six independent three-stage-inverters, each of which perfoms the logic INVERT function.

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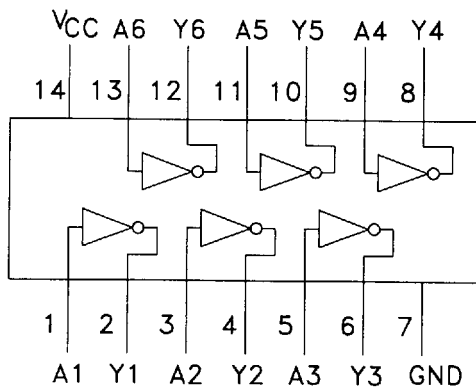- **DC & AC Parameters guaranteed over −40 to +85°C**

N Suffix
Plastic DIP
AVG-001 Case

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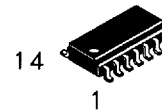
D Suffix
Plastic SOP
AVG-002 Case

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TRUTH TABLE

Inputs	Outputs
A	**Y**
L	H
H	L

H=High Level Logic
L=Low Level Logic
X=Don't Care

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	AC04, ACT04	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

Symbol	Parameter		Min	Typ	Max	Unit
t_r, t_f	Input Rise and Fall Time (Note 2)	V_{CC} @ 4.5 V			10	ns/V
	'ACT Devices	V_{CC} @ 5.5 V			8.0	ns/V
T_A	Operating Ambient Temperature Range		−40	25	85	°C
C_{IN}	Input Capacitance	V_{CC} = 5.0 V		4.5		pF
C_{PD}	Power Dissipation Capacitance	V_{CC} = 5.0 V		30		pF

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

AC — 04

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Vcc (V)	AC04			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	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_{IL}	Maximum Low Level Input Voltage	V_{OUT} = 0.1V or V_{CC} − 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_{OH}	Minimum High Level Output Voltage	I_{OUT} = −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_{IN} = V_{IL} or V_{IH} I_{OH} −12mA	3.0		2.56	2.46	V
		−24mA	4.5		3.86	3.76	
		−24mA	5.5		4.86	4.76	
V_{OL}	Maximum Low Level Output Voltage	I_{OUT} = 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_{IN} = V_{IL} or V_{IH} I_{OL} 12mA	3.0		0.36	0.44	V
		24mA	4.5		0.36	0.44	
		24mA	5.5		0.36	0.44	
I_{IN}	Maximum Input Leakage Current	V_{IN} = V_{CC} or GND	5.5		±0.1	±1.0	µA
I_{CC}	Maximum Quiescent Supply Current	V_{IN} = V_{CC} or GND	5.5		4.0	40	µA

AC CHARACTERISTICS over full operating conditions

Symbol	Parameter	Vcc ±10% (V)	AC04				Unit
			TA = +25°C CL = 50 pF		TA = −40°C to +85°C CL = 50 pF		
			Min	Max	Min	Max	
t_{PLH}	Propagation Delay	3.3	1.5	9.0	1.0	10	ns
		5.0	1.5	7.0	1.0	7.5	
t_{PHL}	Propagation Delay	3.3	1.5	8.5	1.0	9.5	ns
		5.0	1.5	6.5	1.0	7.0	

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Vcc (V)	ACT04			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 −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 24 mA	4.5 5.5		0.36 0.36	0.44 0.44	V
I_{IN}	Maximum Input Leakage Current	V_{IN} = VCC or GND	5.5		±0.1	±1.0	μA
ΔI_{CCT}	Additional Max I_{CC}/ Input	V_{IN} = 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		4.0	40	μA

AC CHARACTERISTICS over full operating conditions

Symbol	Parameter	Vcc ±10% (V)	ACT04				Unit
			TA = +25°C CL = 50 pF		TA = − 40°C to +85°C CL = 50 pF		
			Min	Max	Min	Max	
t_{PLH}	Propagation Delay	5.0	1.5	8.5	1.0	9.0	ns
t_{PHL}	Propagation Delay	5.0	1.5	8.0	1.0	8.5	ns

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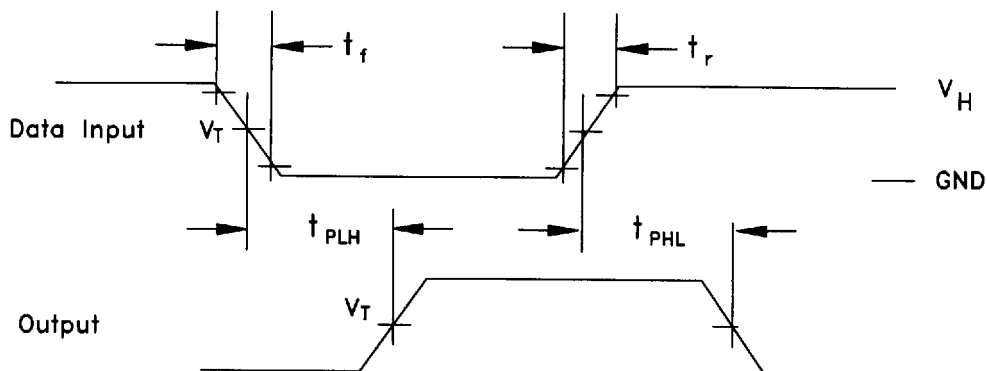
Input and output threshold voltage:
V_T = 50% Vcc for AC; 1.5V for ACT
V_H = V_{CC} for AC, 3V for ACT