

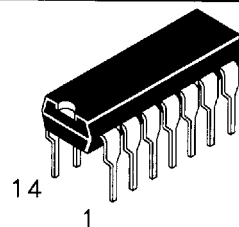
Technical Data

DV74ACT04 Available Q2, 1995

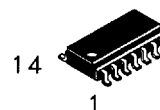
Hex Inverter

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

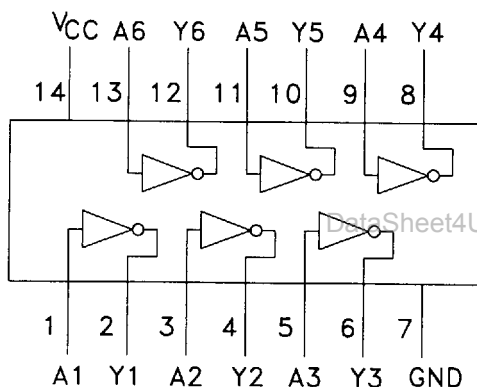
- **Advanced very high speed CMOS**
- **Outputs source/sink 24 mA**
- **Transmission line driving 50 ohms**
- **ACT has TTL compatible inputs**
- **AC device operation guaranteed from 2 to 6 volts**
- **DC & AC Parameters guaranteed over -40 to +85°C**

DV74AC04
DV74ACT04

N Suffix
Plastic DIP
AVG-001 Case



D Suffix
Plastic SOP
AVG-002 Case

**TRUTH TABLE**

Inputs	Outputs
A	Y
L	H
H	L

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

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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}		
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	

GUARANTEED OPERATING CONDITIONS (continued)

Symbol	Parameter	Min	Typ	Max	Unit
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	25	85	°C
C_{IN}	Input Capacitance	$V_{CC} = 5.0 V$	4.5		pF
CPD	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	V_{CC} (V)	AC04			Unit		
				$T_A = +25^\circ C$		$T_A = -40$ to $+85^\circ C$			
				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	$I_{OUT} = -50 \mu A$	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	$I_{OUT} = 50 \mu A$	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	V_{CC} $\pm 10\%$ (V)	AC04				Unit
			$T_A = +25^\circ C$ $C_L = 50 pF$		$T_A = -40^\circ C$ to $+85^\circ C$ $C_L = 50 pF$		
			Min	Max	Min	Max	
tPLH	Propagation Delay	3.3	1.5	9.0	1.0	10	ns
			5.0	1.5	7.0	1.0	
tPHL	Propagation Delay	3.3	1.5	8.5	1.0	9.5	ns
			5.0	1.5	6.5	1.0	

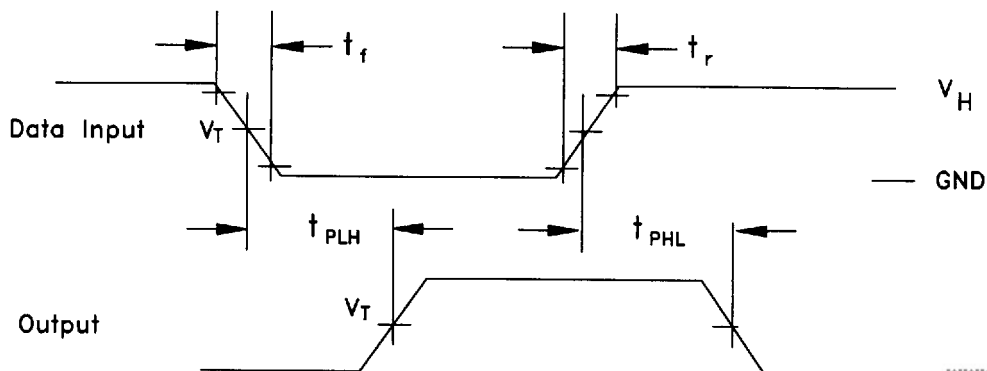
DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} (V)	ACT04			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	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} = V _{CC} 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

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AC CHARACTERISTICS over full operating conditions

Symbol	Parameter	V _{CC} ±10% (V)	ACT04				Unit
			T _A = +25°C C _L = 50 pF		T _A = -40°C to +85°C C _L = 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

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

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