

Technical Data

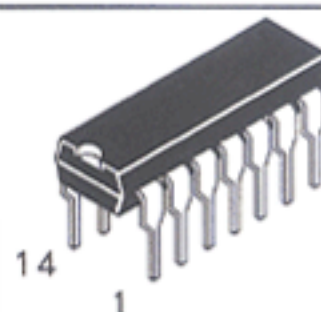
DV74ACT04 Available Q2, 1995

Hex Inverter

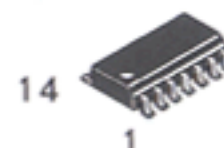
This device contains six independent three-stage-inverters, each of which performs the logic INVERT function.

- 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 $+85^{\circ}\text{C}$

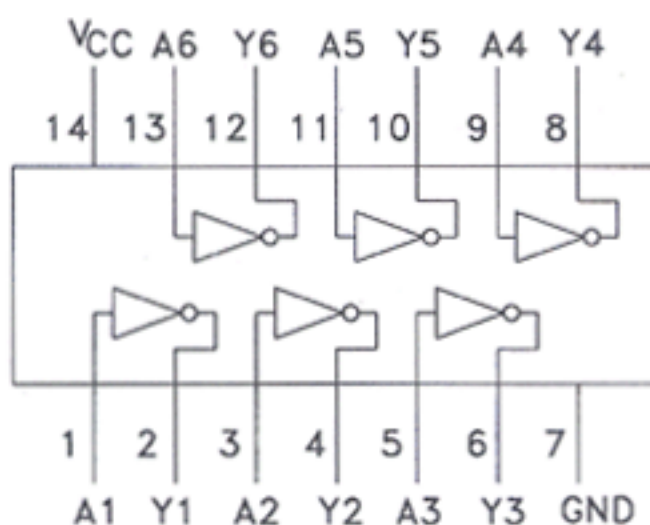
DV74AC04
DV74ACT04



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

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 $+150$	$^{\circ}\text{C}$

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit
V_{CC}	Supply Voltage	'AC	2.0	5.0	6.0
		'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	$V_{CC} @ 3.0 \text{ V}$		150	ns/V
		$V_{CC} @ 4.5 \text{ V}$		40	ns/V
		$V_{CC} @ 5.5 \text{ V}$		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
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	V _{CC} (V)	AC04			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	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} −12mA	3.0		2.56	2.46	V
			I _{OH} −24mA	4.5		3.86	
		−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} 12mA	3.0		0.36	0.44	V
			I _{OL} 24mA	4.5		0.36	
		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} ±10% (V)	AC04				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	3.3 5.0	1.5 1.5	9.0 7.0	1.0 1.0	10 7.5	ns
t _{PHL}	Propagation Delay	3.3 5.0	1.5 1.5	8.5 6.5	1.0 1.0	9.5 7.0	ns

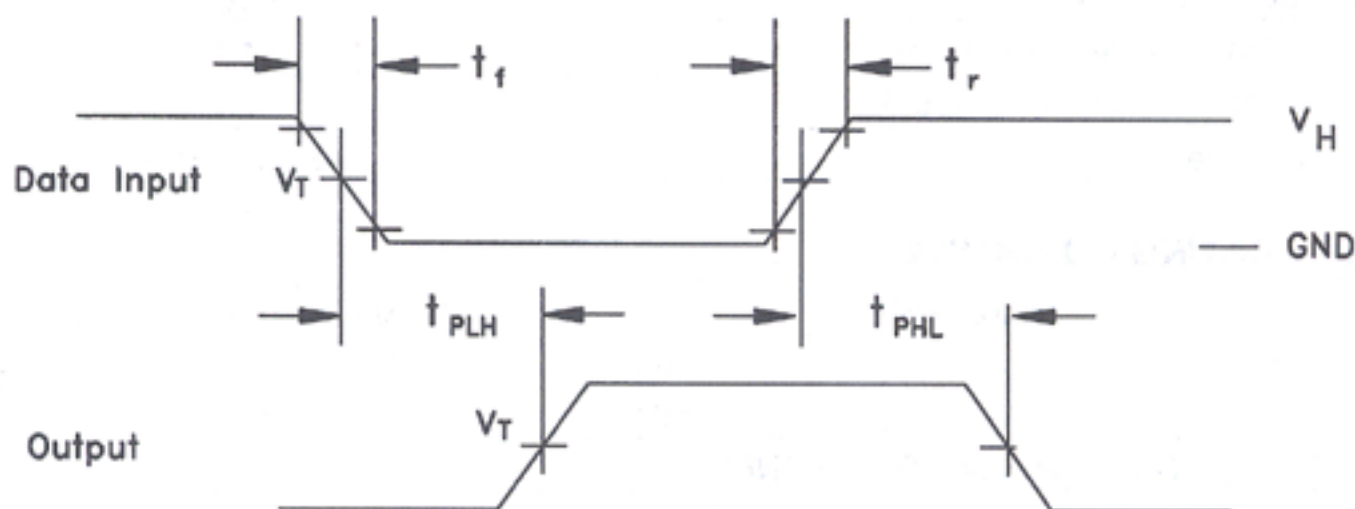
DC ELECTRICAL CHARACTERISTICS

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 _{CC} T	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	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



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