54AC04 Hex Inverter

Check for Samples: 54AC04

FEATURES

- **I_{CC} Reduced by 50% on 54AC Only**
- **Outputs Source/Sink 24 mA**
- **'ACT04 has TTL-Compatible Inputs**
- **Standard Military Drawing (SMD)**
  - **'AC04: 5962–87609**
- **54AC04 now Qualified to 300Krad RHA Designation, Refer to the SMD for More Information**
- **For Military 54ACT04 Device see 54ACTQ04**

DESCRIPTION

The AC04 contains six inverters.

Logic Symbol

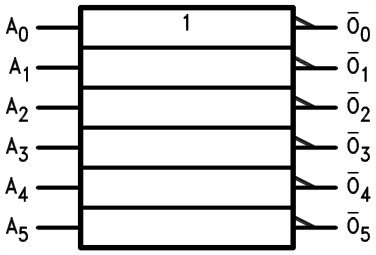

Figure 1. IEEE/IEC

Connection Diagrams

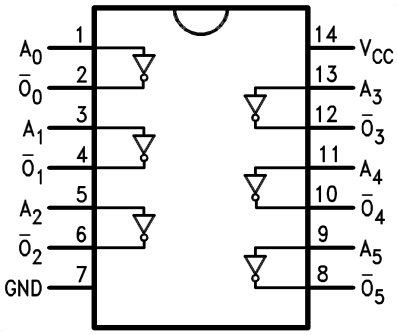

Figure 2. 14-Pin CDIP or CLGA
See J or NAD0014B Package

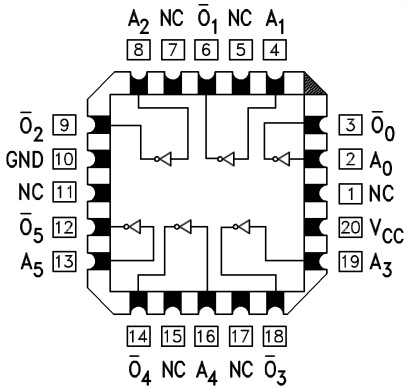

Figure 3. 20-Pin LCCC
See NAJ0020A Package

Pin Names	Description
A_n	Inputs
$\overline{O}_n$	Outputs

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

Absolute Maximum Ratings(1)(2)

Supply Voltage (V_{CC})		−0.5V to +7.0V
DC Input Diode Current (I_{IK})	V_I = −0.5V	−20 mA
	V_I = V_{CC} + 0.5V	+20 mA
DC Input Voltage (V_I)		−0.5V to V_{CC} + 0.5V
DC Output Diode Current (I_{OK})	V_O = −0.5V	−20 mA
	V_O = V_{CC} + 0.5V	+20 mA
DC Output Voltage (V_O)		−0.5V to to V_{CC} + 0.5V
DC Output Source or Sink Current (I_O)		±50 mA
DC V_{CC} or Ground Current per Output Pin (I_{CC} or I_{GND})		±50 mA
Storage Temperature (T_{STG})		−65°C to +150°C
Junction Temperature (T_J)	CDIP	175°C

(1) Absolute Maximum Ratings are those values beyond which damage to the device may occur. The databook specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. TI does not recommend operation of FACT® circuits outside databook specifications.

(2) If Military/Aerospace specified devices are required, please contact the Texas Instruments Sales Office/Distributors for availability and specifications.

Recommended Operating Conditions

Supply Voltage (V_{CC})	'AC	2.0V to 6.0V
Input Voltage (V_I)		0V to V_{CC}
Output Voltage (V_O)		0V to V_{CC}
Operating Temperature (T_A)	54AC	−55°C to +125°C
Minimum Input Edge Rate (ΔV/Δt) 'AC Devices	V_{IN} from 30% to 70% of V_{CC}	125 mV/ns
	V_{CC} @ 3.3V, 4.5V, 5.5V	

DC Characteristics for 'AC Family Devices

Symbol	Parameter	V_{CC} (V)	54AC T_A = −55°C to +125°C Ensured Limits	Units	Conditions
V_{IH}	Minimum High Level Input Voltage	3.0 4.5 5.5	2.1 3.15 3.85	V	V_{OUT} = 0.1V or V_{CC} − 0.1V
V_{IL}	Maximum Low Level Input Voltage	3.0 4.5 5.5	0.9 1.35 1.65	V	V_{OUT} = 0.1V or V_{CC} − 0.1V
V_{OH}	Minimum High Level Output Voltage	3.0 4.5 5.5	2.9 4.4 5.4	V	I_{OUT} = −50 µA
					V_{IN} = V_{IL} or V_{IH} (1)
		3.0	2.4		−12 mA
		4.5	3.7	V	I_{OH} −24 mA
		5.5	4.7		−24 mA
V_{OL}	Maximum Low Level Output Voltage	3.0 4.5 5.5	0.1 0.1 0.1	V	I_{OUT} = 50 µA
					V_{IN} = V_{IL} or V_{IH} (1)
		3.0	0.5		12 mA
		4.5	0.5	V	I_{OL} 24 mA
		5.5	0.5		24 mA
I_{IN}	Maximum Input Leakage Current	5.5	±1.0	µA	V_I = V_{CC}, GND
I_{OLD}	Minimum Dynamic Output Current (2)	5.5	50	mA	V_{OLD} = 1.65V Max
I_{OHD}		5.5	−50	mA	V_{OHD} = 3.85V Min
I_{CC}	Maximum Quiescent Supply Current	5.5	40.0	µA	V_{IN} = V_{CC} or GND

(1) All outputs loaded; thresholds on input associated with output under test.
(2) Maximum test duration 2.0 ms, one output loaded at a time.

AC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)[1]	54AC		Units	Fig. No.
			T_A = −55°C to +125°C C_L = 50 pF			
			Min	Max		
t_{PLH}	Propagation Delay	3.3	1.0	11.0	ns	
		5.0	1.5	8.5		
t_{PHL}	Propagation Delay	3.3	1.0	10.0	ns	
		5.0	1.5	7.5		

(1) Voltage Range 3.3 is 3.3V ±0.3V.
Voltage Range 5.0 is 5.0V ±0.5V.

Table 1. Capacitance

Symbol	Parameter	Typ	Units	Conditions
C_{IN}	Input Capacitance	4.5	pF	V_{CC} = Open
C_{PD}	Power Dissipation Capacitance	30.0	pF	V_{CC} = 5.0V

REVISION HISTORY

Changes from Revision B (April 2013) to Revision C	Page
• Changed layout of National Data Sheet to TI format	4

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