

54AC08 Quad 2-Input AND Gate

Check for Samples: [54AC08](#)

FEATURES

- I_{CC} reduced by 50%
- Outputs source/sink 24 mA
- Standard Microcircuit Drawing (SMD) 5962-

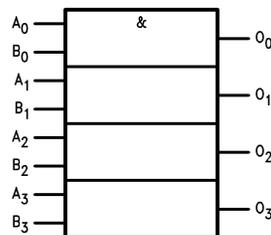
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- 54AC08 now qualified to 300Krad RHA designation, refer to the SMD for more information
- For Military 54ACT08 device, see 54ACTQ08

DESCRIPTION

The 'AC08 contains four, 2-input AND gates.

Figure 1. IEEE/IEC



Connection Diagram

Figure 2. Pin Assignment for DIP and Flatpak

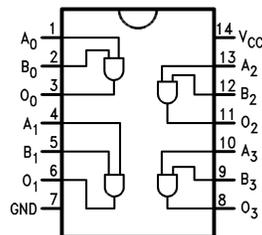
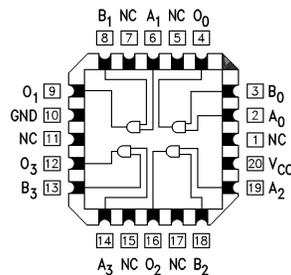


Figure 3. Pin Assignment for LCC



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Pin Names	Description
A_n, B_n	Inputs
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⁾

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 $V_{CC} + 0.5V$
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. National does not recommend operation of FACT™ circuits outside databook 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 ($\Delta V/\Delta t$)	
'AC Devices	
V_{IN} from 30% to 70% of V_{CC}	
V_{CC} @ 3.3V, 4.5V, 5.5V	125 mV/ns

DC Characteristics for 'AC Family Devices

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

(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

		54AC				
Symbol	Parameter	V_{CC}	$T_A = -55^{\circ}\text{C}$		Units	Fig. No.
		(V)	to $+125^{\circ}\text{C}$			
		(1)	$C_L = 50\text{ pF}$			
			Min	Max		
t_{PLH}	Propagation Delay	3.3	1.0	12.5	ns	
		5.0	1.0	9.0		
t_{PHL}	Propagation Delay	3.3	1.0	12.5	ns	
		5.0	1.0	9.0		

(1) Voltage Range 3.3 is $3.3\text{V} \pm 0.3\text{V}$ Voltage Range 5.0 is $5.0\text{V} \pm 0.5\text{V}$

Capacitance

Symbol	Parameter	Typ	Units	Conditions
C_{IN}	Input Capacitance	4.5	pF	$V_{CC} = \text{OPEN}$
C_{PD}	Power Dissipation Capacitance	20.0	pF	$V_{CC} = 5.0\text{V}$

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