September 1998

National Semiconductor

54AC05
Hex Inverter with Open Drain Outputs

General Description

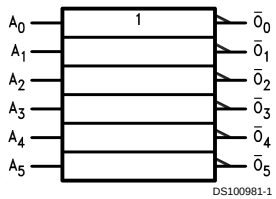
The 'AC05 contains six inverters.

Features

- Outputs sink 24 mA
- Open drain for wired NOR function
- Standard Microcircuit Drawing (SMD) 5962-9059001

Logic Symbol

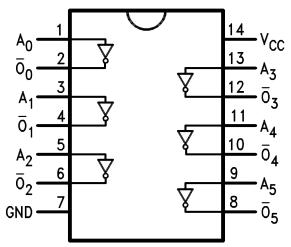
IEEE/IEC



DS100981-1

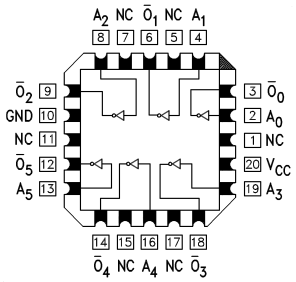
Connection Diagrams

Pin Assignment for DIP and Flatpak



DS100981-3

Pin Assignment for LCC



DS100981-2

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

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Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/ Distributors for availability and specifications.

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

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 ($\Delta V/\Delta t$)	
V_{IN} from 30% to 70% of V_{CC}	
V_{CC} @ 3.3V, 4.5V, 5.5V	125 mV/ns

Note 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.

DC Characteristics for 'AC Family Devices

Symbol	Parameter	V_{CC} (V)	54AC T_A = −55˚C to +125˚C Guaranteed Limits	Units	Conditions
V_{IH}	Minimum High Level Input Voltage	3.0	2.1	V	V_{OUT} = 0.1V or V_{CC} − 0.1V
		4.5	3.15		
		5.5	3.85		
V_{IL}	Maximum Low Level Input Voltage	3.0	0.9	V	V_{OUT} = 0.1V or V_{CC} − 0.1V
		4.5	1.35		
		5.5	1.65		
V_{OL}	Maximum Low Level Output Voltage	3.0	0.1	V	I_{OUT} = 50 µA
		4.5	0.1		
		5.5	0.1		
					(Note 2) V_{IN} = V_{IL} or V_{IH}
		3.0	0.5	V	12 mA
		4.5	0.5		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_{OHC}	Output Leakage Current High	5.5	−10.0	µA	V_{IN} = V_{CC}
I_{OLD}	Minimum Dynamic Output Current	5.5	50.0	mA	V_{OLD} = 1.65V Max (Note 3)
I_{CC}	Maximum Quiescent Supply Current	5.5	80.0	µA	V_{IN} = V_{CC} or GND

Note 2: All outputs loaded; thresholds on input associated with output under test.

Note 3: Maximum test duration 2.0 ms, one output loaded at a time.

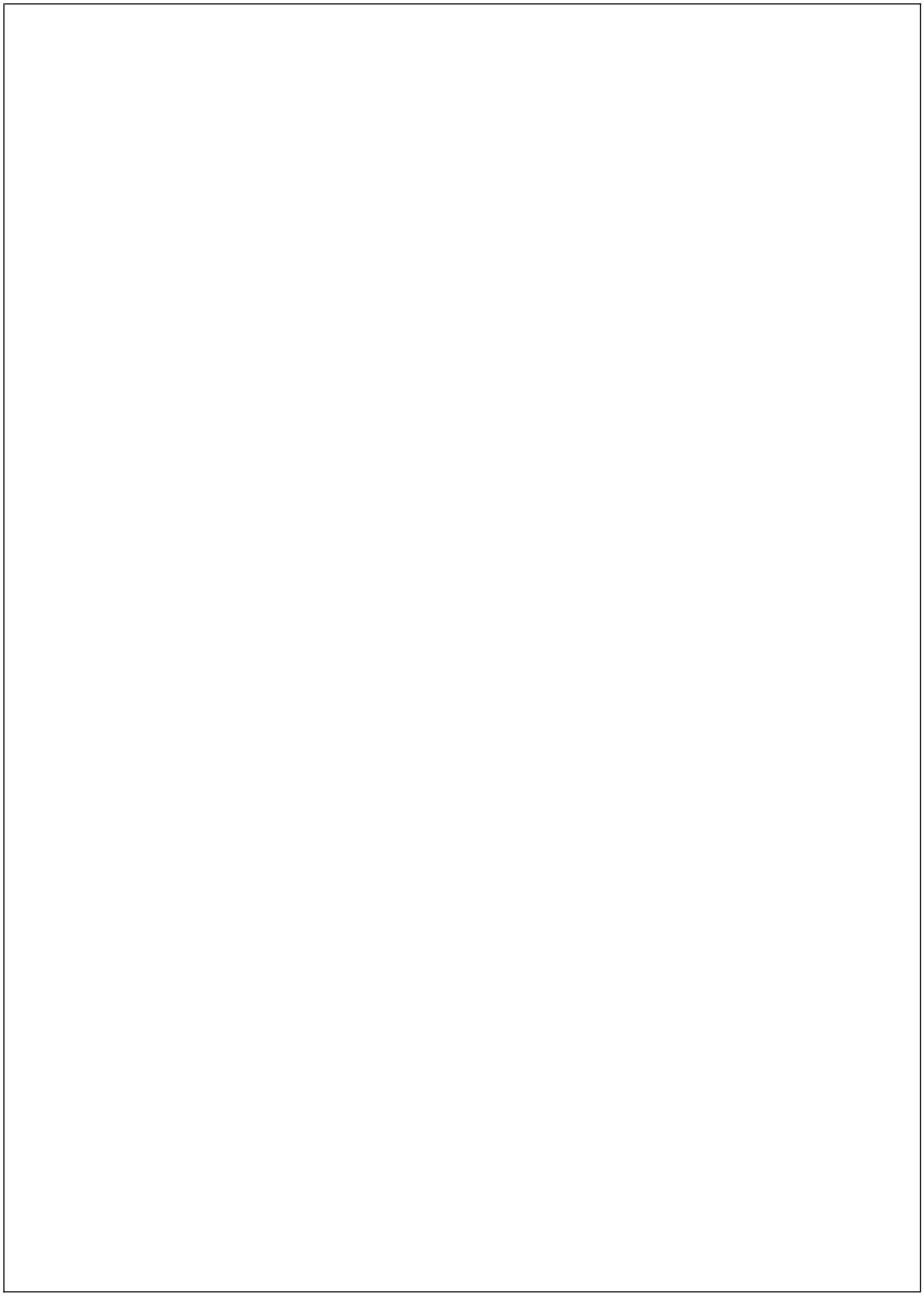
AC Electrical Characteristics

Symbol	Parameter	V_{CC} (V) (Note 4)	54AC $T_A = -55^\circ C$ to $+125^\circ C$ $C_L = 50$ pF		Units	Fig. No.
			Min	Max		
t_{PLH}	Propagation Delay	3.3	1.0	15.5	ns	
		5.0	1.0	15.5		
t_{PHL}	Propagation Delay	3.3	1.0	8.0	ns	
		5.0	1.5	6.0		

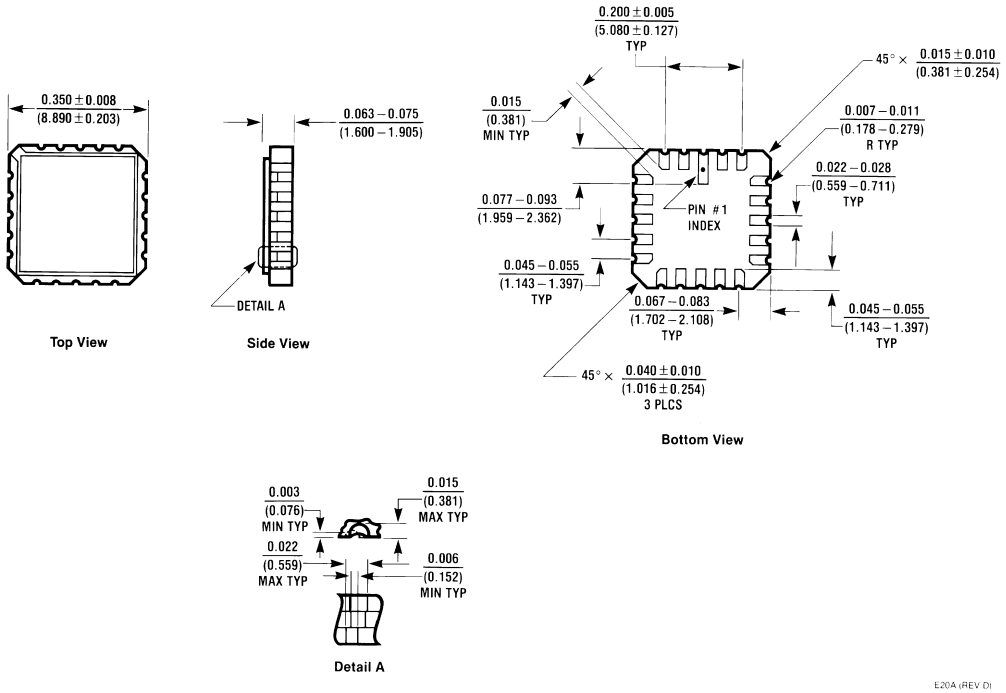
Note 4: Voltage Range 3.3 is 3.3V ±0.3V
Voltage Range 5.0 is 5.0V ±0.5V

Capacitance

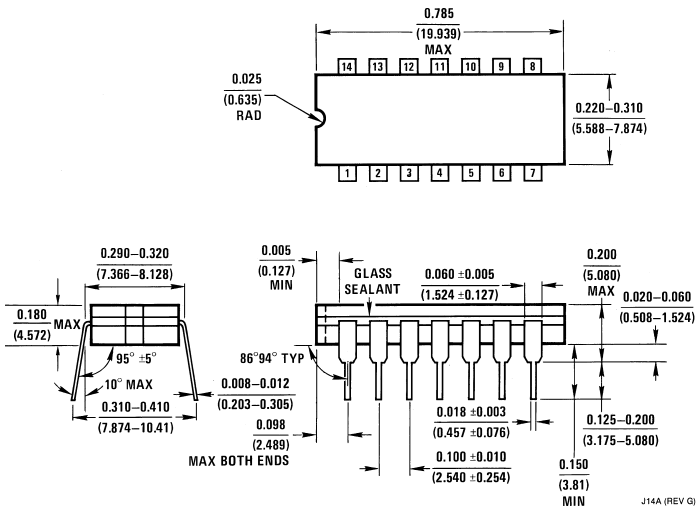
Symbol	Parameter	Max	Units	Conditions
C_{IN}	Input Capacitance	10.0	pF	V_{CC} = Open
C_{PD}	Power Dissipation Capacitance	50.0	pF	V_{CC} = 5.0V



Physical Dimensions inches (millimeters) unless otherwise noted

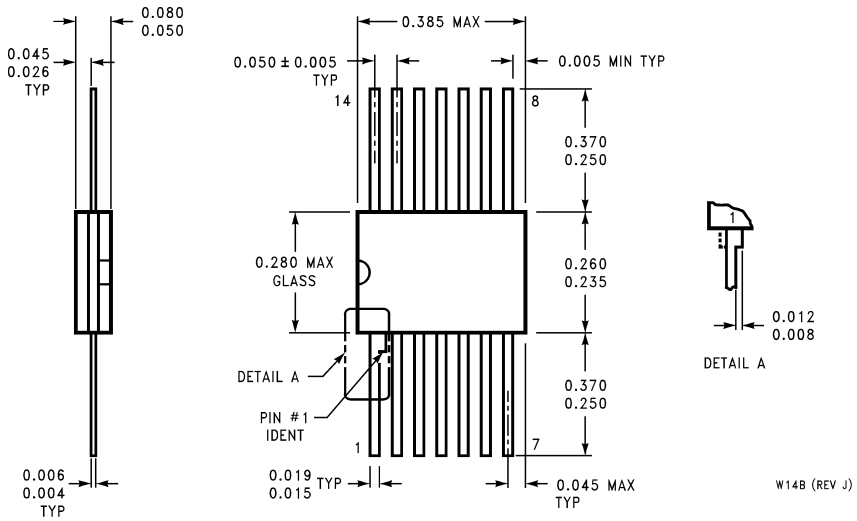


20 Terminal Ceramic Leadless Chip Carrier (L)
NS Package Number E20A



14 Lead Ceramic Dual-In-Line Package (D)
NS Package Number J14A

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



14 Lead Ceramic Flatpak (F)
NS Package Number W14B

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54AC05 Product Folder

Hex Inverter

General Description | Features | Datasheet | Package & Models | Samples & Pricing

Datasheet

Title	Size in Kbytes	Date	View Online	Download	Receive via Email
54AC05 Hex Inverter with Open Drain Outputs	113 Kbytes	29-Sep-98	View Online	Download	Receive via Email
54AC05 Mil-Aero Datasheet MN54AC05-X	12 Kbytes		View Online	Download	Receive via Email

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Package Availability, Models, Samples & Pricing

Part Number	Package			Status	Models		Samples & Electronic Orders	Budgetary Pricing		Std Pack Size	Package Marking
	Type	Pins	MSL		SPICE	IBIS		Qty	$US each		
5962-9059001M2A (54AC05LMQB)	LCC	20	MSL	Full production	N/A	N/A	Buy Now	50+	$8.6000	rail of 50	[logo]¢Z¢S¢4¢A 54AC05LMQB /Q¢M $E 5962-9059001M2A
5962-9059001MCA (54AC05DMQB)	CERDIP	14	MSL	Full production	N/A	N/A	Buy Now	50+	$5.5000	rail of 25	[logo]¢Z¢S¢4¢A$E 54AC05DMQB /Q¢M 5962-9059001MCA
5962-9059001MDA (54AC05FMQB)	CERPACK	14	MSL	Full production	N/A	N/A	Buy Now	50+	$8.6000	rail of 19	[logo]¢Z¢S¢4¢A$E 54AC05FMQB Q¢M 5962-9059001MDA
5962R9059001B2A	LCC	20	MSL	Full production	N/A	N/A		50+	$76.0000	rail of 50	[logo]¢Z¢S¢4¢A 5962R 9059001B2A 27014 QS $E
5962R9059001BCA	CERDIP	14	MSL	Full production	N/A	N/A		50+	$76.0000	rail of 25	[logo]¢Z¢S¢4¢A$E 5962R9059001BCA 27014 QS

5962R9059001BDA	CERPACK	14	MSL	Full production	N/A	N/A		50+	$76.0000	rail of 19	[logo]¢Z¢S¢4¢A$E 5962R 9059001BDA 27014 QS
5962R9059001S2A	LCC	20	MSL	Full production	N/A	N/A		50+	$138.0000	rail of 50	[logo]¢Z¢S¢4¢A 27014 Q$E 5962R 9059001S2A
5962R9059001SCA	CERDIP	14	MSL	Full production	N/A	N/A		50+	$138.0000	rail of 25	[logo]¢Z¢S¢4¢A$E 27014 Q 5962R 9059001SCA
RM54AC05SDA	CERPACK	14	MSL	Preliminary	N/A	N/A				rail of N/A	RM54AC05SDA ¢R WAFER #
5962R9059001SDA	CERPACK	14	MSL	Full production	N/A	N/A		50+	$138.0000	rail of 19	[logo]¢Z¢S¢4¢A 27014 Q $E 5962R 9059001SDA
JM54AC05SZA-RH	Ceramic SOIC	14	MSL	Preliminary	N/A	N/A				tray of N/A	[logo]¢Z¢S¢4¢A 27014 Q $E 5962R 9059001SZA

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[Information as of 5-Aug-2002]

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