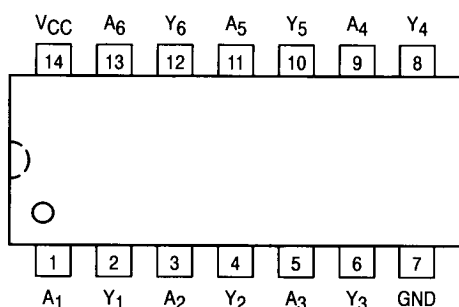


Hex Inverter With Open-Drain Outputs

The MC74AC/ACT05 is identical in pinout to the LS05. The device inputs are compatible with standard CMOS outputs; with pullup resistors, they are compatible with TTL outputs.

- Outputs Source/Sink 24mA
- 'ACT05 Has TTL Compatible Inputs



Pinout: 14-Lead Packages (Top View)

FUNCTION TABLE

Input A	Output Y
L	Z
H	L

Z = High Impedance

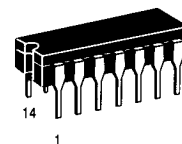
MAXIMUM RATINGS*

Symbol	Parameter	Value	Units
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

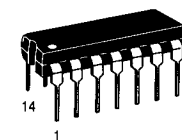
* Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

MC74AC05
MC74ACT05

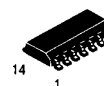
HEX INVERTER
WITH
OPEN-DRAIN OUTPUTS



J SUFFIX
CERAMIC PACKAGE
CASE 632-08

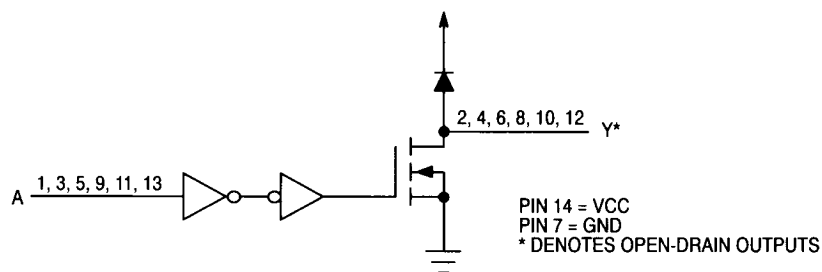


N SUFFIX
PLASTIC PACKAGE
CASE 646-06



D SUFFIX
PLASTIC PACKAGE
CASE 751A-02





Logic Diagram

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit
V _{CC}	Supply Voltage	'AC	2.0	5.0	V
		'ACT	4.5	5.5	
V _{REG}	DC Regulated Power Voltage (Referenced to GND)	0		V _{CC}	V
t _r , t _f	Input Rise and Fall Time ¹ 'AC Devices Except Schmitt Inputs	V _{CC} @ 3.0V	150		ns/V
		V _{CC} @ 4.5V	40		
		V _{CC} @ 5.5V	25		
t _r , t _f	Input Rise and Fall Time ² 'ACT Devices Except Schmitt Inputs	V _{CC} @ 4.5V	10		ns/V
		V _{CC} @ 5.5V	8.0		
T _J	Junction Temperature (PDIP)			140	°C
T _A	Operating Ambient Temperature Range	-40	25	85	°C
I _{OH}	Output Current, HIGH			-24	mA
I _{OL}	Output Current, LOW			24	mA

¹ V_{in} from 30% to 70% V_{CC}; see individual Data Sheets for devices that differ from the typical input rise and fall times.

² V_{in} from 0.8V to 2.0V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

DC CHARACTERISTICS

Symbol	Parameter	V _{CC} (V)	74AC		74AC	Unit	Conditions
			T _A = +25°C		T _A = -40°C to +85°C		
			Typ	Guaranteed Limits			
V _{IH}	Minimum High Level Input Voltage	3.0	1.50	2.10	2.10	V	V _{OUT} = 0.1 V or V _{CC} -0.1 V
		4.5	2.25	3.15	3.15		
		5.5	2.75	3.85	3.85		
V _{IL}	Maximum Low Level Input Voltage	3.0	1.5	0.9	0.9	V	V _{OUT} = 0.1 V or V _{CC} -0.1 V
		4.5	2.25	1.35	1.35		
		5.5	2.75	1.65	1.65		
V _{OL}	Maximum Low Level Output Voltage	3.0	0.002	0.1	0.1	V	I _{OUT} = 50 μA
		4.5	0.001	0.1	0.1		
		5.5	0.001	0.1	0.1		
		3.0		0.36	0.44	V	*V _{IN} = V _{IL} or V _{IH} 12 mA I _{OL} 24 mA 24 mA
		4.5		0.36	0.44		
		5.5		0.36	0.44		
I _{IN}	Maximum Input Leakage Current	5.5		±0.1	±1.0	μA	V _I = V _{CC} , GND
I _{OLD}	**Minimum Dynamic Output Current	5.5			75	mA	V _{OLD} = 1.65 V Max
I _{OHD}		5.5			-75	mA	V _{OHD} = 3.85 V Min
I _{CC}	Maximum Quiescent Supply Current	5.5		4.0	40	μA	V _{IN} = V _{CC} or GND

NOTE: I_{IN} and I_{CC} @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V

* All outputs loaded; thresholds on input associated with output under test.

** Maximum test duration 2.0 ms, one output loaded at a time.

DC CHARACTERISTICS

Symbol	Parameter	V _{CC} (V)	74ACT		74ACT		Unit	Conditions
			T _A = +25°C		T _A = -40°C to +85°C			
			Typ	Guaranteed Limits				
V _{IH}	Minimum High Level Input Voltage	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0	V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V	
V _{IL}	Maximum Low Level Input Voltage	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V	
V _{OL}	Maximum Low Level Output Voltage	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	V	I _{OUT} = 50 μA	
		4.5 5.5		0.36 0.36	0.44 0.44	V	*V _{IN} = V _{IL} or V _{IH} I _{OH} 24 mA 24 mA	
I _{IN}	Maximum Input Leakage Current	5.5		±0.1	±1.0	μA	V _I = V _{CC} , GND	
ΔI _{CCT}	Additional Max I _{CC} /Input	5.5	0.6		1.5	mA	V _I = V _{CC} - 2.1 V	
I _{OLD}	**Minimum Dynamic Output Current	5.5			75	mA	V _{OLD} = 1.65 V Max	
I _{OHD}		5.5			-75	mA	V _{OHD} = 3.85 V Min	
I _{CC}	Maximum Quiescent Supply Current	5.5		4.0	40	μA	V _{IN} = V _{CC} or GND	

* All outputs loaded; thresholds on input associated with output under test.

** Maximum test duration 2.0 ms, one output loaded at a time.

AC CHARACTERISTICS

Symbol	Parameter	V _{CC} * (V)	74AC			74AC		Unit
			T _A = +25°C C _L = 50 pF			T _A = -40°C to +85°C C _L = 50 pF		
			Min	Typ	Max	Min	Max	
t _{PZL}	Propagation Delay Output Enable	3.3 5.0	1.5 1.5		8.0 6.0	1.0 1.0	9.0 6.5	ns
t _{PLZ}	Propagation Delay Output Enable	3.3 5.0	1.5 1.5		8.0 6.0	1.0 1.0	9.0 6.5	ns

* Voltage Range 3.3 is 3.3V ±0.3V

Voltage Range 5.0 is 5.0V ±0.5V

AC CHARACTERISTICS

Symbol	Parameter	VCC* (V)	74ACT			74ACT		Unit
			T _A = +25°C C _L = 50 pF			T _A = -40°C to +85°C C _L = 50 pF		
			Min	Typ	Max	Min	Max	
t _{PZL}	Propagation Delay Output Enable	5.0	1.5		8.0	1.0	8.5	ns
t _{PLZ}	Propagation Delay Output Enable	5.0	1.5		8.5	1.0	9.0	ns

* Voltage Range 5.0 is 5.0V ±0.5V

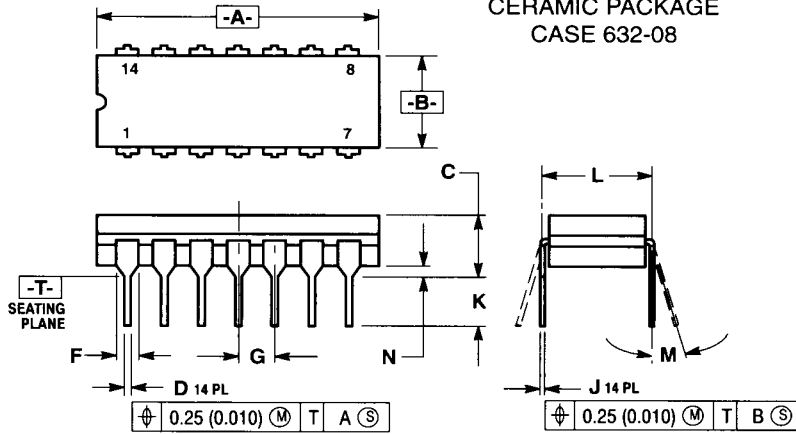
CAPACITANCE

Symbol	Parameter	Value Typ	Unit	Test Conditions
CIN	Input Capacitance	4.5	pF	VCC = 5.0 V
CPD	Power Dissipation Capacitance	30	pF	VCC = 5.0 V

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OUTLINE DIMENSIONS

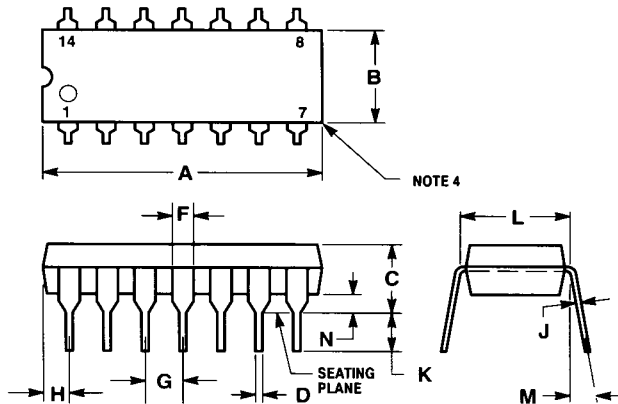
J SUFFIX CERAMIC PACKAGE CASE 632-08



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
 4. DIM F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY.
 5. 632-01 THRU -07 OBSOLETE, NEW STANDARD 632-08.

DIM	MIN	MAX	MIN	MAX
A	19.05	19.94	0.750	0.785
B	6.23	7.11	0.245	0.280
C	3.94	5.08	0.155	0.200
D	0.39	0.50	0.015	0.020
F	1.40	1.65	0.055	0.065
G	2.54 BSC		0.100 BSC	
J	0.21	0.38	0.008	0.015
K	3.18	4.31	0.125	0.170
L	7.62 BSC		0.300 BSC	
M	0°	15°	0°	15°
N	0.51	1.01	0.020	0.040

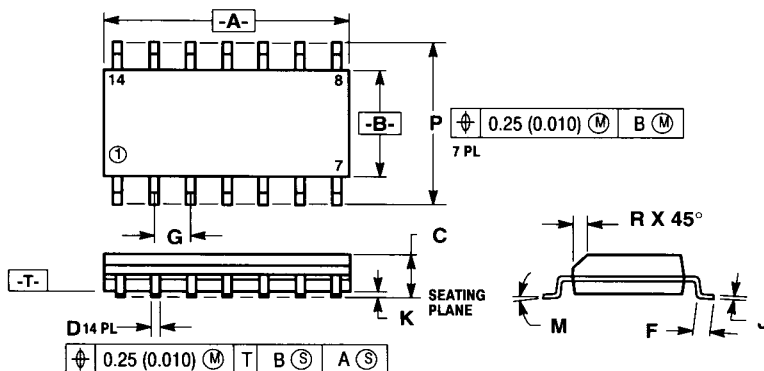
N SUFFIX PLASTIC PACKAGE CASE 646-06



- NOTES:
1. LEADS WITHIN 0.13 mm (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.
 2. DIMENSION "L" TO CENTER OF LEADS WHEN FORMED PARALLEL.
 3. DIMENSION "B" DOES NOT INCLUDE MOLD FLASH.
 4. ROUNDED CORNERS OPTIONAL.
 5. 646-05 OBSOLETE, NEW STANDARD 646-06.

DIM	MIN	MAX	MIN	MAX
A	18.16	19.56	0.715	0.770
B	6.10	6.60	0.240	0.260
C	3.69	4.69	0.145	0.185
D	0.38	0.53	0.015	0.021
F	1.02	1.78	0.040	0.070
G	2.54 BSC		0.100 BSC	
H	1.32	2.41	0.052	0.095
J	0.20	0.38	0.008	0.015
K	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300 BSC	
M	0°	10°	0°	10°
N	0.39	1.01	0.015	0.039

D SUFFIX SOIC PACKAGE CASE 751A-02



- NOTES:
1. DIMENSIONS "A" AND "B" ARE DATUMS AND "T" IS A DATUM SURFACE.
 2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 3. CONTROLLING DIMENSION: MILLIMETER.
 4. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
 5. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
 6. 751A-01 IS OBSOLETE, NEW STANDARD 751A-02.

DIM	MIN	MAX	MIN	MAX
A	8.55	8.75	0.337	0.344
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019