

SEMICONDUCTORTM

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DM74ALS1005 Hex Inverting Driver with Open Collector Outputs

General Description

These devices contain six independent drivers, each of which performs the logic INVERT/Complement function. The outputs require external pull-up resistors for proper logical operation. The DM74ALS1005 is a driver version of the DM74ALS05A.

Pull-Up Resistor Equations

$$R_{MAX} = \frac{V_{CC} \left(Min\right) - V_{OH}}{N_1 \left(I_{OH}\right) + N_2 \left(I_{IH}\right)}$$

$$R_{MIN} = \frac{V_{CC} (Max) - V_{OL}}{I_{OL} - N_3 (I_{IL})}$$

Where:

 N_1 (I_{OH}) = total maximum output high current

for all outputs tied to pull-up resistor

N₂ (I_{IH}) = total maximum input high current for

all inputs tied to pull-up resistor

 N_3 (I_{IL}) = total maximum input low current for

all inputs tied to pull-up resistor

Features

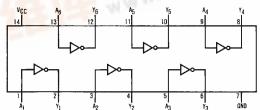
- Switching specifications at 50 pF
- \blacksquare Switching specifications guaranteed over full temperature and V_{CC} range
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Functionally and pin for pin compatible with Schottky and low power Schottky TTL counterpart
- Improved AC performance over Schottky and low power Schottky counterparts

Ordering Code:

Order Number	Package Number	Packag <mark>e Descri</mark> ption			
DM74ALS1005M	M14A	14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow			
DM74ALS1005N	N14A	14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide			

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Connection Diagram



Function Table

L = LOW Logic Level H = HIGH Logic Le<mark>ve</mark>

Absolute Maximum Ratings(Note 1)

Supply Voltage 7V Input Voltage 7V OFF-State Output Voltage 7V Operating Free Air Temperature Range $0^{\circ}\text{C to } + 70^{\circ}\text{C}$

Storage Temperature Range -65°C to +150°C

Typical θ_{JA}

 N Package
 76.0°C/W

 M Package
 106.5°C/W

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Recommended Operating Conditions

Symbol	Parameter	Min	Nom	Max	Units
V _{CC}	Supply Voltage	4.5	5	5.5	V
V _{IH}	HIGH Level Input Voltage	2			V
V _{IL}	LOW Level Input Voltage			0.8	V
V _{OH}	HIGH Level Output Voltage			5.5	V
I _{OL}	LOW Level Output Current			24	mA
T _A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

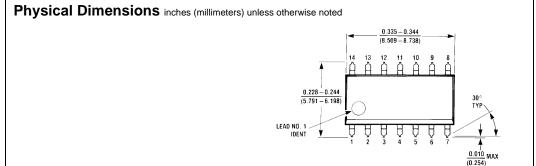
over recommended operating free air temperature range. All typical values are measured at $V_{CC} = 5V$, $T_A = 25^{\circ}C$.

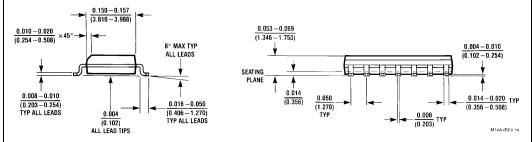
Symbol	Parameter	Conditions		Min	Тур	Max	Units
V _{IK}	Input Clamp Voltage	$V_{CC} = 4.5V, I_I = -18 \text{ mA}$				-1.5	V
I _{OH}	HIGH Level Output Current	V _{CC} = 4.5V, V _{OH} = 5.5V				100	μΑ
V _{OL}	LOW Level	V _{CC} = 4.5V	I _{OL} = 12 mA		0.25	0.4	V
	Output Voltage		I _{OL} = 24 mA		0.35	0.5	V
II	Input Current at Maximum	V _{CC} = 5.5V, V _{IH} = 7V				0.1	mA
	Input Voltage	VCC = 3.3 V, VIH = 7 V				0.1	IIIA
I _{IH}	HIGH Level Input Current	$V_{CC} = 5.5V, V_{IH} = 2.7V$				20	μΑ
I _{IL}	LOW Level Input Current	$V_{CC} = 5.5V, V_{IL} = 0.4V$				-0.1	mA
I _{CC}	Supply Current	V _{CC} = 5.5V	Outputs HIGH		0.9	3	mA
			Outputs LOW		7	12	mA

Switching Characteristics

over recommended operating free air temperature range

Symbol	Parameter	Conditions	Min	Max	Units
t _{PLH}	Propagation Delay Time	V _{CC} = 4.5V to 5.5V	5	30	ns
	LOW-to-HIGH Level Output	$R_L = 680\Omega$	3		
t _{PHL}	Propagation Delay Time	$C_L = 50 \text{ pF}$	2	10	ns
	HIGH-to-LOW Level Output		2	10	115





14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow Package Number M14A

Physical Dimensions inches (millimeters) unless otherwise noted (Continued) 0.740 - 0.770 (18.80 - 19.56)ก กฤก (2.286) 14 13 12 11 10 9 14 13 12 INDEX AREA 0.250 ± 0.010 (6.350 ± 0.254) PIN NO. 1 IDENT 1 2 3 1 2 3 4 5 6 7 0.030 MAX (2.337) DIA (0.762) DEPTH OPTION 1 OPTION 02 0.135 ± 0.005 0.300 - 0.320 (3.429 ± 0.127) (7.620 - 8.128)0.145 - 0.200 4° TYP (1.651) (3.683 - 5.080)* $\frac{0.008 - 0.016}{(0.203 - 0.406)}$ TYP 95° ±5° 0.020 (0.508) MIN 0.125 - 0.150 0.075 ± 0.015 0.280 (7.112) MIN 0.014 - 0.023 $\frac{0.100 \pm 0.010}{(2.540 \pm 0.254)} \text{ TYP}$ TYP (0.356 - 0.584) $\frac{0.050 \pm 0.010}{(1.270 - 0.254)}$ TYP -0.015 8.255 + 1.016 - 0.381 N14A (REV F)

Fairchild does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and Fairchild reserves the right at any time without notice to change said circuitry and specifications.

14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide Package Number N14A

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- 2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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