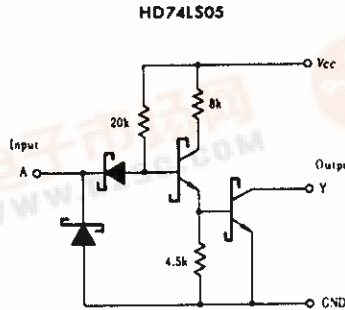
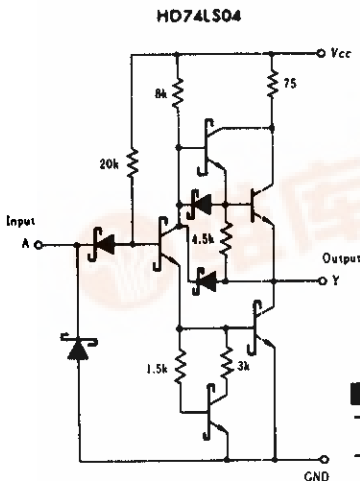
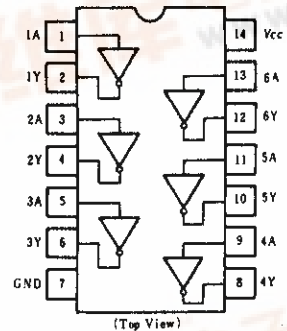


# HD74LS04/HD74LS05 Hex Inverters (with Open Collector Outputs)

## ■CIRCUIT SCHEMATIC(1/6)



## ■PIN ARRANGEMENT



## ■HD74LS05 RECOMMENDED OPERATING CONDITIONS

Item	Symbol	min	typ	max	Unit
High level output voltage	$V_{OH}$	—	—	5.5	V
Low level output current	$I_{OL}$	—	—	8	mA

## ■ELECTRICAL CHARACTERISTICS ( $T_a = -20 \sim +75^\circ\text{C}$ )

Item	Symbol	Test Conditions	HD74LS04			HD74LS05			Unit	
			min	typ*	max	min	typ*	max		
Input voltage	$V_{IH}$		2.0	—	—	2.0	—	—	V	
	$V_{IL}$		—	—	0.8	—	—	0.8	V	
Output voltage	$V_{OH}$	$V_{CC}=4.75\text{V}, V_{IL}=0.8\text{V}, I_{OH}=-400\mu\text{A}$	2.7	—	—	—	—	—	V	
	$V_{OL}$	$V_{CC}=4.75\text{V}, V_{IH}=2\text{V}$	$I_{OL}=8\text{mA}$	—	—	0.5	—	—	0.5	V
			$I_{OL}=4\text{mA}$	—	—	0.4	—	—	0.4	
Output current	$I_{OH}$	$V_{CC}=4.75\text{V}, V_{IL}=0.8\text{V}, V_{OH}=5.5\text{V}$	—	—	—	—	—	100	$\mu\text{A}$	
Input current	$I_{IH}$	$V_{CC}=5.25\text{V}, V_I=2.7\text{V}$	—	—	20	—	—	20	$\mu\text{A}$	
	$I_{IL}$	$V_{CC}=5.25\text{V}, V_I=0.4\text{V}$	—	—	-0.4	—	—	-0.4	mA	
	$I_I$	$V_{CC}=5.25\text{V}, V_I=7\text{V}$	—	—	0.1	—	—	0.1	mA	
	Short-circuit output current	$I_{OS}$	$V_{CC}=5.25\text{V}$	-20	—	-100	—	—	—	mA
Supply current	$I_{CCN}$	$V_{CC}=5.25\text{V}$	—	1.2	2.4	—	1.2	2.4	mA	
	$I_{CCL}$		—	3.6	6.6	—	3.6	6.6		
Input clamp voltage	$V_{IK}$	$V_{CC}=4.75\text{V}, I_{IN}=-18\text{mA}$	—	—	-1.5	—	—	-1.5	V	

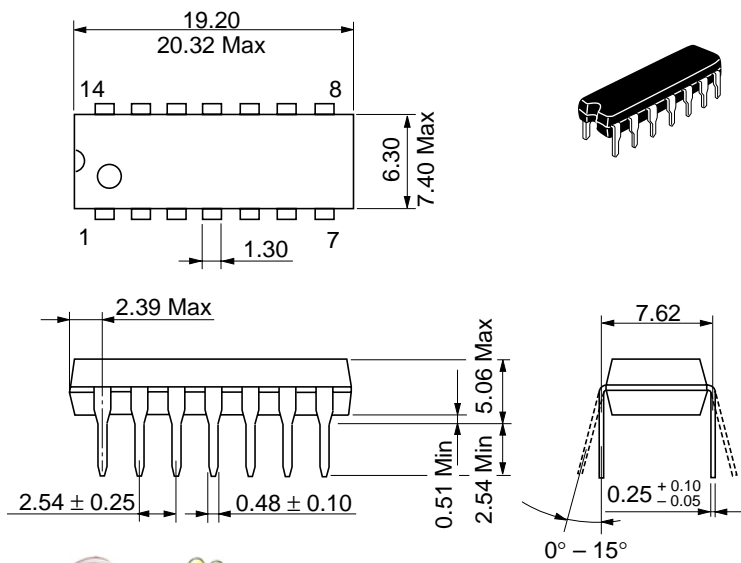
\*  $V_{CC}=5\text{V}, T_a=25^\circ\text{C}$

## ■SWITCHING CHARACTERISTICS ( $V_{CC}=5\text{V}, T_a=25^\circ\text{C}$ )

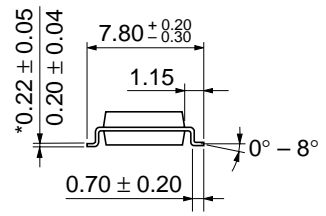
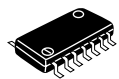
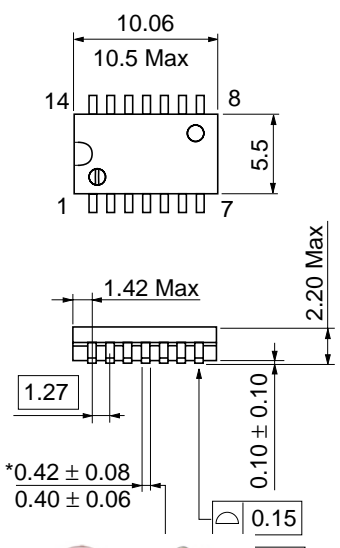
Item	Symbol	Test Conditions	HD74LS04			HD74LS05			Unit
			min	typ	max	min	typ	max	
Propagation delay time	$t_{PLH}$	$C_L=15\text{pF}, R_L=2\text{k}\Omega$	—	9	15	—	17	32	ns
	$t_{PHL}$		—	10	15	—	15	28	

Note: Refer to Test Circuit and Waveform of the Common Item

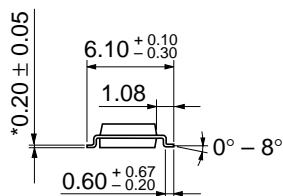
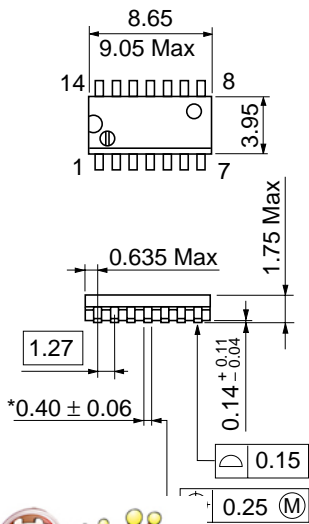
Unit: mm



Unit: mm



Unit: mm



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