

GD54/74LS04

HEX INVERTERS

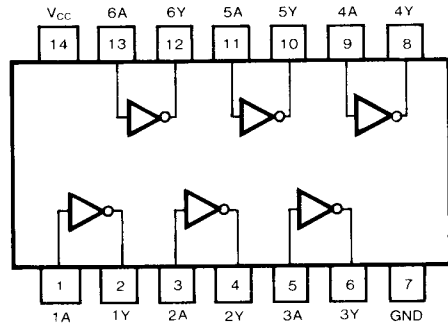
Description

This device contains six independent inverters. It performs the Boolean function $Y = \bar{A}$.

Function Table (each inverter)

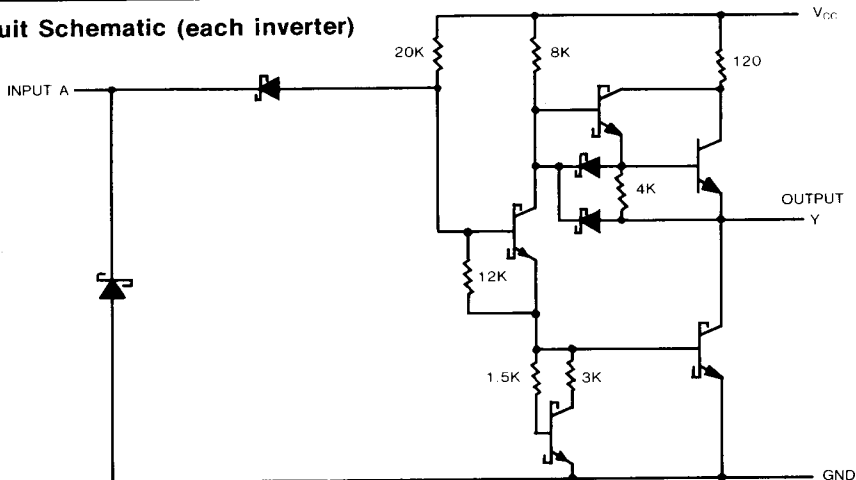
INPUT	OUTPUT
A	Y
H	L
L	H

Pin Configuration



Suffix-Blank: Plastic Dual In Line Package
 Suffix-J : Ceramic Dual In Line Package

Circuit Schematic (each inverter)



Absolute Maximum Ratings

- Supply voltage, V_{cc} 7V
- Input voltage 7V
- Operating free-air temperature range 54LS -55°C to 125°C
 74LS 0°C to 70°C
- Storage temperature range -65°C to 150°C

Recommended Operating Conditions

SYMBOL	PARAMETER		MIN	NOM	MAX	UNIT
V _{CC}	Supply voltage	54	4.5	5	5.5	V
		74	4.75	5	5.25	
I _{OH}	High-level output current	54,74			-400	μA
I _{OL}	Low-level output current	54			4	mA
		74			8	
T _A	Operating free-air temperature	54	-55		125	°C
		74	0		70	

Electrical Characteristics over recommended operating free air temperature (unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP (Note 1)	MAX	UNIT	
V _{IH}	High-level input voltage			2		V	
V _{IL}	Low-level input voltage		54		0.7	V	
			74		0.8		
V _{IK}	Input clamp voltage	V _{CC} =Min, I _I =-18mA			-1.5	V	
V _{OH}	High-level output voltage	V _{CC} =Min, V _{IL} =Max I _{OH} =Max	54	2.5	3.4	V	
			74	2.7	3.4		
V _{OL}	Low-level output voltage	V _{CC} =Min V _{IH} =Min	I _{OL} =4mA	54,74	0.25	0.4	V
			I _{OL} =8mA	74	0.35	0.5	
I _I	Input current at maximum input voltage	V _{CC} =Max, V _I =7V			0.1	mA	
I _{IH}	High-level input current	V _{CC} =Max, V _I =2.7V			20	μA	
I _{IL}	Low-level input current	V _{CC} =Max, V _I =0.4V			-0.4	mA	
I _{OS}	Short-circuit output current	V _{CC} =Max (Note 2)	-20		-100	mA	
I _{CCH}	Supply current	Total with outputs high	V _{CC} =Max		1.2	2.4	mA
I _{CCL}		Total with outputs low	V _{CC} =Max		3.6	6.6	mA

Note 1: All typical values are at V_{CC}=5V, T_A=25°C.

Note 2: Not more than one output should be shorted at a time, and duration should not exceed one second.

Switching Characteristics, V_{CC} = 5V, T_A = 25°C

SYMBOL	PARAMETER	TEST CONDITION#	MIN	TYP	MAX	UNIT
t _{PLH}	Propagation delay time, low-to-high-level output	C _L = 15pF, R _L = 2kΩ		9	15	ns
t _{PHL}	Propagation delay time, high-to-low-level output			10	15	ns

#For load circuit and voltage waveforms, see page 3-11.