

GD54/74HCU04

HEX UNBUFFERED INVERTERS

General Description

These devices are identical in pinout to the 54/74 LSO4. They contain six independent unbuffered inverters. These inverters are well suited for use as oscillators, pulse shapers and in many other applications requiring a high-input impedance amplifier. These devices are characterized for over wide temperature ranges to meet industry and ation over military specifications.

Features

- Low Power consumption characteristic of CMOS devices
- Output drive capability: 10 LS TTL Loads Min.
- Operating speed superior to LS TTL
- Wide operating voltage range: for HC 2 to 6 volts
for HCT 4.5 to 5.5 volts
- Low input current: 1 μ A Max.
- Low quiescent current: 20 μ A Max (74HCU)
- High noise immunity characteristic of CMOS
- Diode protection on all inputs

Logic Diagram

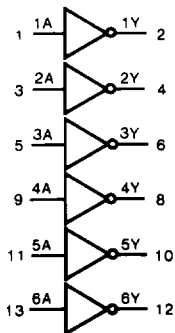
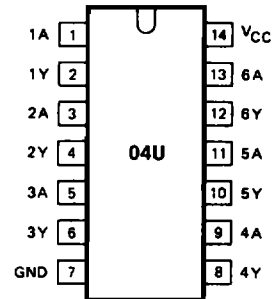


Fig. 1 Logic diagram

Pin Configuration



- Suffix-Blank : Plastic Dual In Line Package
- Suffix-J : Ceramic Dual In Line Package
- Suffix-D : Small Outline Package

Function Table

INPUT	OUTPUT
nA	nY
L	H
H	L

H=HIGH Voltage level
L=LOW Voltage level

Absolute Maximum Ratings

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CC}	DC Supply voltage		-0.5	+7	V
I_{IK} I_{OK}	DC input or output diode current	for $V_I < -0.5$ or $V_I > V_{CC} + 0.5V$		20	mA
I_O	DC output source or sink current	for $-0.5V < V_O < V_{CC} + 0.5V$		25	mA
I_{CC}	DC V_{CC} or GND current			50	mA
T_{stg}	Storage temperature range		-65	150	°C
P_D	Power dissipation per package	above +70°C: derate linearly with 8mW/K		500	mW
T_L	Lead temperature	At distance 1/16±1/32 in. from case for 60 sec(CERAMIC) 10 sec(PLASTIC)		300 260	°C

Recommended Operating Conditions

CHARACTERISTIC	LIMITS		UNITS
	MIN.	MAX.	
Supply-Voltage Range V_{CC} : GD54/74HC Types GD54/74HCT Types	2 4.5	6 5.5	V
DC Input or Output Voltage V_I , V_O	0	V_{CC}	V
Operating Temperature T_A : GD74 Types GD54 Types	-40 -55	+85 +125	°C
Input Rise and Fall times t_r , t_f : GD54/74HC Types at 2V at 4.5V at 6V GD54/74HCT Types at 4.5 V		1000 500 400 500	ns

DC Electrical Characteristics for HCU: $t_r=t_f=6ns$ $C_L=50$ pF

SYMBOL	PARAMETER	TEST CONDITION	V _{CC} (V)	T _A =25°C			GD74HCU04		GD54HCU04		UNIT
				MIN.	TYP.	MAX.	MIN.	MAX.	MIN.	MAX.	
V _{IH}	HIGH level input Voltage		2.0	1.7			1.7		1.7		V
			4.5	3.6			3.6		3.6		
			6.0	4.8			4.8		4.8		
V _{IL}	LOW level input voltage		2.0			0.3		0.3		0.3	V
			4.5			0.8		0.8		0.8	
			6.0			1.1		1.1		1.1	
V _{OH}	HIGH level output voltage	V _{IN} =V _{IH} or V _{IL}	I _{OH} =-20μA	2.0	1.8			1.8		1.8	V
			I _{OH} =-4mA	4.5	3.98			3.84		3.7	
			I _{OH} =-5.2mA	6.0	5.48			5.34		5.2	
V _{OL}	LOW level output voltage	V _{IN} =V _{IH} or V _{IL}	I _{OL} =20μA	2.0		0.2		0.2		0.2	V
			I _{OL} =4mA	4.5		0.5		0.5		0.5	
			I _{OL} =5.2mA	6.0		0.5		0.5		0.5	
I _{IN}	Input leakage Current	V _{IN} =V _{CC} or GND	6.0			0.1		1.0		1.0	μA
I _{CC}	Quiescent Supply Current	V _{IN} =V _{CC} or GND I _{out} =0μA	6.0			2		20		40	μA

AC Characteristics for HCU: $t_r=t_f=6ns$ $C_L=50$ pF

SYMBOL	PARAMETER	V _{CC} (V)	T _A =25°C			GD74HCU04		GD54HCU04		UNIT
			MIN.	TYP.	MAX.	MIN.	MAX.	MIN.	MAX.	
t _{PLH} ⁽¹⁾ t _{PHL}	Propagation Delay Time nA to nY	2.0		23	75		95		110	ns
		4.5		7	15		19		22	
		6.0		6	13		16		19	
t _{TLH} ⁽¹⁾ t _{THL}	Output Transition Time	2.0		25	70		85		100	ns
		4.5		8	15		18		22	
		6.0		7	13		16		19	

AC Waveforms

