

GD54/74HC280, GD54/74HCT280

9-BIT EVEN/ODD PARITY GENERATOR/CHECKER

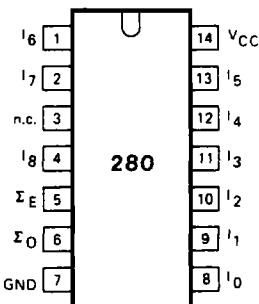
General Description

These devices are identical in pinout to the 54/74LS280. They contain 9-bit inputs and 2 outputs (even and odd parities) to facilitate operation of either even or odd parity applications. Words of greater than 9 bits can be accommodated by cascading other HC/HCT 280 devices. These devices are characterized for operation over wide temperature ranges to meet industry and 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: 80 μ A Max. (74HC)
- High noise immunity characteristic of CMOS
- Diode protection on all inputs

Pin Configuration



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

Function Table

INPUTS	OUTPUTS	
number of HIGH data inputs (I ₀ to I ₈)	Σ_E	Σ_O
even	H	L
odd	L	H

H=LIGH 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_K, 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_{sig}	Storage temperature range		-65	150	°C
P_D	Power dissipation per package	above $+70^{\circ}\text{C}$ derate linearly with $8\text{mW}/\text{K}$		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 4.5V		1000 500 400 500	ns

Logic Diagram

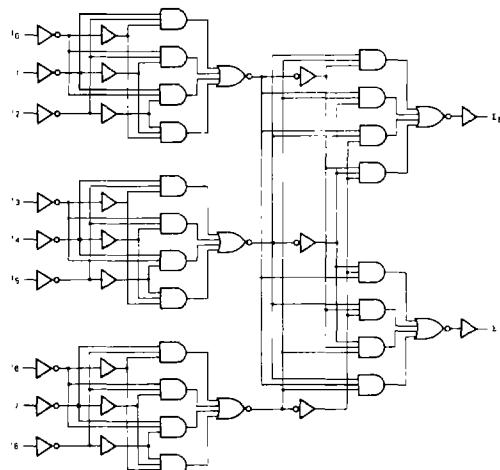


Fig. 1 Logic diagram

GD54/74HC280, GD54/74HCT280

DC Electrical Characteristics for HC

SYMBOL	PARAMETER	TEST CONDITION	V _{CC} (V)	T _A =25°C			GD74HC280		GD54HC280		UNIT
				MIN.	TYP	MAX	MIN	MAX.	MIN	MAX	
V _{IH}	HIGH level input Voltage		2.0 4.5 6.0	1.5 3.15 4.2			1.5 3.15 4.2		1.5 3.15 4.2		V
V _{IL}	LOW level input voltage		2.0 4.5 6.0			0.3 0.9 1.2		0.3 0.9 1.2		0.3 0.9 1.2	V
V _{OH}	HIGH level output voltage	V _{IN} =V _{IH} or V _{IL}	I _{OH} =-20μA	2.0 4.5 6.0	1.9 4.4 5.9	2.0 4.5 6.0		1.9 4.4 5.9		1.9 4.4 5.9	V
			I _{OH} =-4mA I _{OH} =-5.2mA	4.5 6.0	3.98 5.48	4.3 5.2		3.84 5.34		3.7 5.2	
V _{OL}	LOW level output voltage	V _{IN} =V _{IH} or V _{IL}	I _{OL} =20μA	2.0 4.5 6.0		0.1 0.1 0.1		0.1 0.1 0.1		0.1 0.1 0.1	V
			I _{OL} =4mA I _{OL} =5.2mA	4.5 6.0		0.17 0.15	0.26 0.26		0.33 0.33		0.4 0.4
I _{INI}	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			8		80		160	μA

DC Electrical Characteristics for HCT

SYMBOL	PARAMETER	TEST CONDITION	V _{CC} (V)	T _A =25°C			GD74HCT280		GD54HCT280		UNIT
				MIN	TYP	MAX	MIN	MAX.	MIN	MAX	
V _{IH}	HIGH level input Voltage		4.5 to 5.5	2.0			2.0		2.0		V
V _{IL}	LOW level input voltage		4.5 to 5.5			0.8		0.8		0.8	V
V _{OH}	HIGH level output voltage	V _{IN} =V _{IH} or V _{IL}	I _{OH} =-20μA	4.5	4.4	4.5		4.4		4.4	V
			I _{OH} =-4mA	4.5	3.98	4.3		3.84		3.7	
V _{OL}	LOW level output voltage	V _{IN} =V _{IH} or V _{IL}	I _{OL} =20μA	4.5		0.1		0.1		0.1	V
			I _{OL} =4mA	4.5		0.17	0.26		0.33		0.4
I _{INI}	Input leakage Current	V _{IN} =V _{CC} or GND	5.5			0.1		1.0		1.0	μA
I _{CC}	Quiescent Supply Current	V _{IN} =V _{CC} or GND I _{out} =0μA	5.5			8		80		160	μA

AC Characteristics for HC: $t_r=t_f=6\text{ns}$ $C_L=50\text{ pF}$

SYMBOL	PARAMETER	V_{CC} (V)	$T_A=25^\circ C$			GD74HC280		GD54HC280		UNIT
			MIN.	TYP.	MAX.	MIN.	MAX.	MIN.	MAX.	
t_{PLH} / t_{PHL}	Propagation Delay Time I to Σ_E	2.0		50	160		210		260	ns
		4.5		18	35		42		50	
		6.0		16	30		38		40	
t_{PLH} / t_{PHL}	Propagation Delay Time I to Σ_O	2.0		60	180		230		280	ns
		4.5		20	38		50		58	
		6.0		18	32		42		49	
t_{TLH} / 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 Characteristics for HCT: $t_r=t_f=6\text{ns}$ $C_L=50\text{ pF}$

SYMBOL	PARAMETER	V_{CC} (V)	$T_A=25^\circ C$			GD74HCT280		GD54HCT280		UNIT
			MIN.	TYP.	MAX.	MIN.	MAX.	MIN.	MAX.	
t_{PLH} / t_{PHL}	Propagation Delay Time I to Σ_E	4.5		20	38		46		55	ns
t_{PLH} / t_{PHL}	Propagation Delay Time I to Σ_O	4.5		22	40		52		60	ns
t_{TLH} / t_{THL}	Output Transition Time	4.5		8	15		18		22	ns

AC Waveform

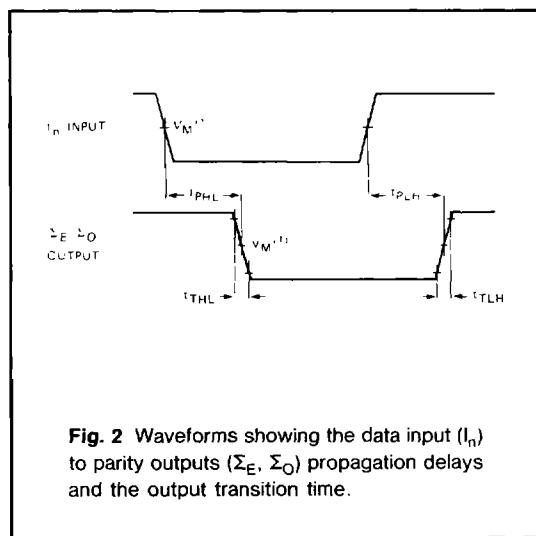


Fig. 2 Waveforms showing the data input (I_n) to parity outputs (Σ_E , Σ_O) propagation delays and the output transition time.

Note to AC waveform

- (1) HC : $V_M=50\%$, $V_i=GND$ to V_{CC}
- HCT $V_M=1.3\%$, $V_i=GND$ to 3V