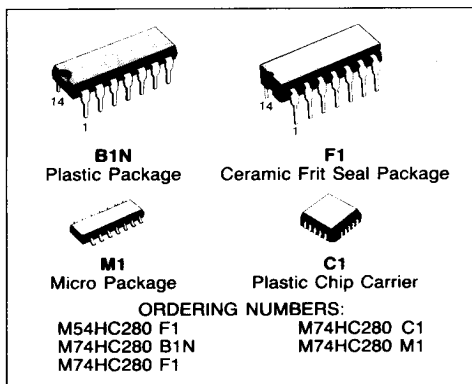


9-BIT PARITY GENERATOR

- **HIGH SPEED**
 $t_{PD} = 26 \text{ ns (TYP.) at } V_{CC} = 5V$
- **LOW POWER DISSIPATION**
 $I_{CC} = 4 \mu A \text{ (MAX.) at } T_A = 25^\circ C \text{ 6V}$
- **HIGH NOISE IMMUNITY**
 $V_{NIH} = V_{NIL} = 28\% V_{CC} \text{ (MIN.)}$
- **OUTPUT DRIVE CAPABILITY**
 10 LSTTL LOADS
- **SYMMETRICAL OUTPUT IMPEDANCE**
 $|I_{OH}| = |I_{OL}| = 4 \text{ mA (MIN.)}$
- **BALANCED PROPAGATION DELAYS**
 $t_{PLH} = t_{PHL}$
- **WIDE OPERATING VOLTAGE RANGE**
 $V_{CC} \text{ (opr)} = 2V \text{ to } 6V$
- **PIN AND FUNCTION COMPATIBLE**
 WITH 54/74LS280



DESCRIPTION

The M54/74HC280 is a high speed CMOS 9-BIT PARITY GENERATOR fabricated in silicon gate CMOS technology. It has the same high speed performance of LSTTL combined with true CMOS low consumption.

It is composed of nine data inputs (A to I) and odd/even parity outputs (Σ ODD and Σ EVEN). The nine data inputs control the output conditions. When the number of high level inputs is odd, Σ ODD output is kept high and Σ EVEN output low. Conversely, when the number is even, Σ EVEN output is kept high and Σ ODD low.

This IC generates either odd or even parity making it flexible application.

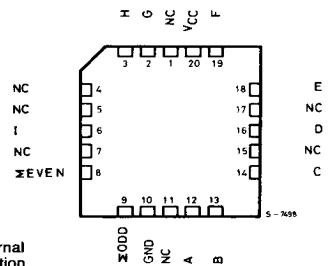
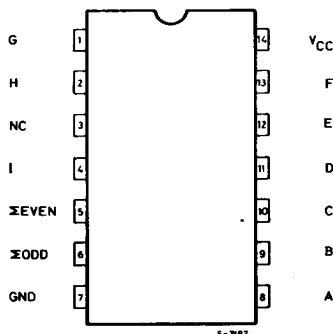
The word-length capability is easily expanded by cascading.

All inputs are equipped with protection circuits against static discharge and transient excess voltage.

TRUTH TABLE

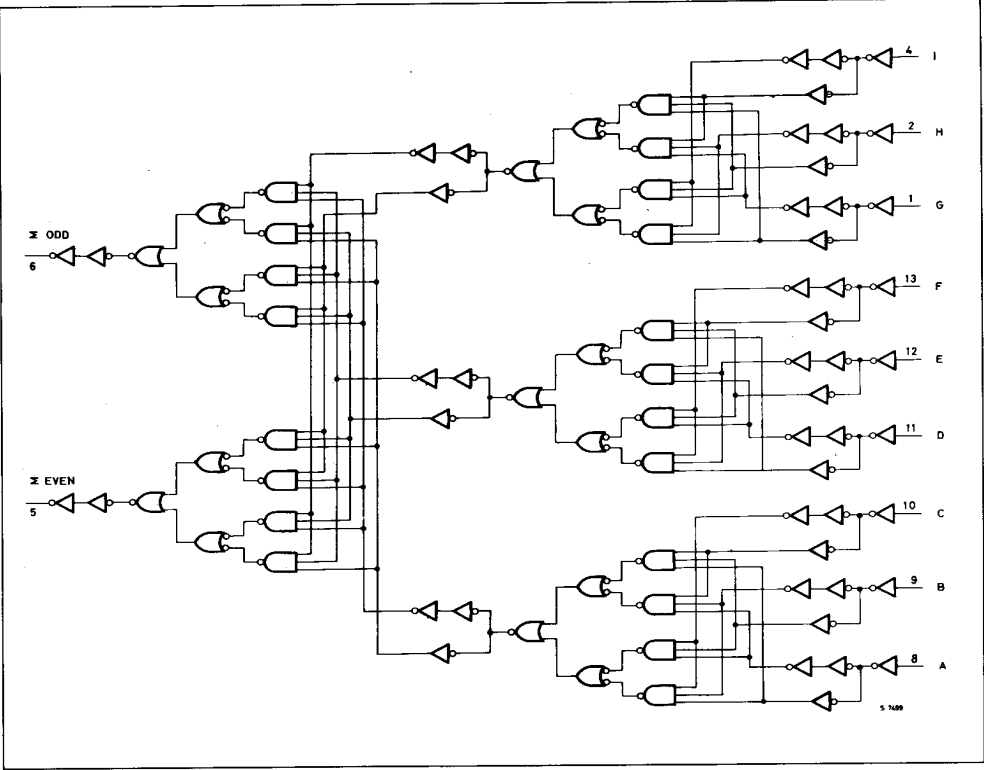
NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS	
	Σ EVEN	Σ ODD
0, 2, 4, 6, 8,	H	L
1, 3, 5, 7, 9,	L	H

PIN CONNECTIONS (top view)



NC =
No Internal
Connection

LOGIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	- 0.5 to 7	V
V_I	DC Input Voltage	- 0.5 to $V_{CC}+0.5$	V
V_O	DC Output Voltage	- 0.5 to $V_{CC}+0.5$	V
I_{IK}	DC Input Diode Current	± 20	mA
I_{OK}	DC Output Diode Current	± 20	mA
I_O	DC Output Source Sink Current Per Output Pin	± 25	mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current	± 50	mA
P_D	Power Dissipation	500 (*)	mW
T_{stg}	Storage Temperature	- 65 to 150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

(*) 500 mW: $\equiv$ 65°C derate to 300 mW by 10 mW/°C: 65°C to 85°C.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	2 to 6	V
V_I	Input Voltage	0 to V_{CC}	V
V_O	Output Voltage	0 to V_{CC}	V
T_A	Operating Temperature 74HC Series 54HC Series	-40 to 85 -55 to 125	°C
t_r, t_f	Input Rise and Fall Time	$V_{CC} \begin{cases} 2 \text{ V} & 0 \text{ to } 1000 \\ 4.5 \text{ V} & 0 \text{ to } 500 \\ 6 \text{ V} & 0 \text{ to } 400 \end{cases}$	ns

DC SPECIFICATIONS

Symbol	Parameter	V_{CC}	Test Condition	$T_A = 25^\circ\text{C}$ 54HC and 74HC			-40 to 85°C 74HC		-55 to 125°C 54HC		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		— — —	— — —	0.5 1.35 1.8	— 1.35 1.8	0.5 1.35 1.8	— — —	0.5 1.35 1.8	V
V_{OH}	High Level Output Voltage	2.0	V_I	I_O	1.9	2.0	—	1.9	—	1.9	V
		4.5	V_{IH} or V_{IL}	-20 μA	4.4	4.5	—	4.4	—	4.4	
		6.0			5.9	6.0	—	5.9	—	5.9	
V_{OL}	Low Level Output Voltage	2.0			—	0.0	0.1	—	0.1	—	V
		4.5	V_{IH} or V_{IL}	20 μA	—	0.0	0.1	—	0.1	—	
		6.0			—	0.0	0.1	—	0.1	—	
I_I	Input Leakage Current	4.5			—	0.0	0.1	—	0.1	—	V
		6.0			—	0.0	0.1	—	0.1	—	
		6.0			—	0.0	0.1	—	0.1	—	
I_I	Input Leakage Current	4.5	V_I or V_{IL}	4.0 mA	—	0.17	0.26	—	0.33	—	V
		6.0			—	0.17	0.26	—	0.33	—	
		6.0			—	0.18	0.26	—	0.33	—	
I_I	Input Leakage Current	6.0	$V_I = V_{CC}$ or GND	—	—	± 0.1	—	± 1.0	—	± 1.0	μA
I_{CC}	Quiescent Supply Current	6.0	$V_I = V_{CC}$ or GND	—	—	4	—	40	—	80	μA

AC ELECTRICAL CHARACTERISTICS ($V_{CC} = 5V$, $T_A = 25^\circ C$, $C_L = 15pF$, Input $t_r = t_f = 6ns$)

Symbol	Parameter	54HC and 74HC			Unit
		Min.	Typ.	Max.	
t_{TLH} t_{THL}	Output Transition Time		4	8	ns
t_{PLH} t_{PHL}	Propagation Delay Time		26	41	ns

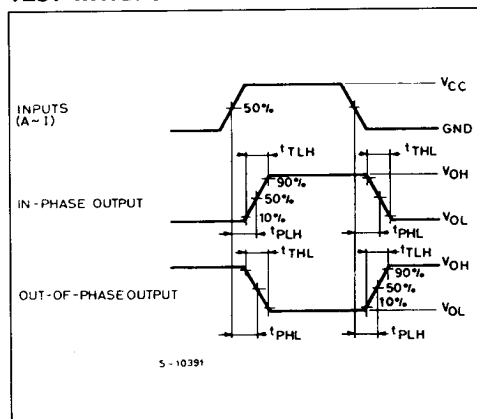
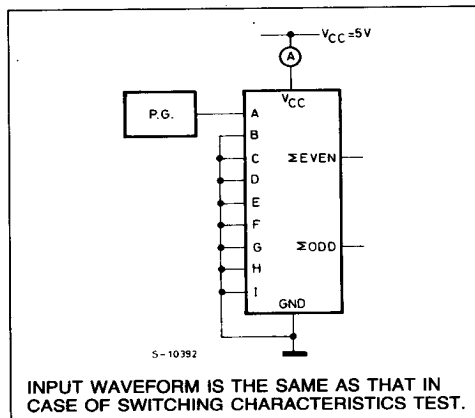
AC ELECTRICAL CHARACTERISTICS ($C_L = 50pF$, Input $t_r = t_f = 6ns$)

Symbol	Parameter	V_{CC}	Test Condition	$T_A = 25^\circ C$ 54HC and 74HC			-40 to 85°C 74HC		-55 to 125°C 54HC		Unit
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
t_{TLH} t_{THL}	Output Transition Time	2.0 4.5 6.0		— — —	30 8 7	75 15 13	— — —	95 19 16		110 22 19	ns
t_{PLH} t_{PHL}	Propagation Delay Time	2.0 4.5 6.0		— — —	124 31 26	235 47 40	— — —	295 59 50		355 71 60	ns
C_{IN}	Input Capacitance			—	5	10	—	10		10	pF
$C_{PD} (*)$	Power Dissipation Capacitance			—	110	—	—	—			pF

Note (*) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the following equation.

$$I_{CC} (Opr) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$$

SWITCHING CHARACTERISTICS TEST WAVEFORM**TEST CIRCUIT $I_{CC} (Opr.)$** 

INPUT WAVEFORM IS THE SAME AS THAT IN CASE OF SWITCHING CHARACTERISTICS TEST.