TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT   SILICON MONOLITHIC

TC74AC280P, TC74AC280F, TC74AC280FN

9 – BIT PARITY GENERATOR / CHECKER

(Note) The JEDEC SOP (FN) is not available in Japan.

The TC74AC280 is an advanced high speed CMOS 9 - BIT PARITY GENERATOR fabricated with silicon gate and double - layer metal wiring C^{2}MOS technology.

It achieves the high speed operation similar to equivalent Bipolar Schottky TTL while maintaining the CMOS low power dissipation.

The TC74AC280 is composed of nine data inputs (A thru I) and odd / even parity outputs (Σ ODD and Σ EVEN).
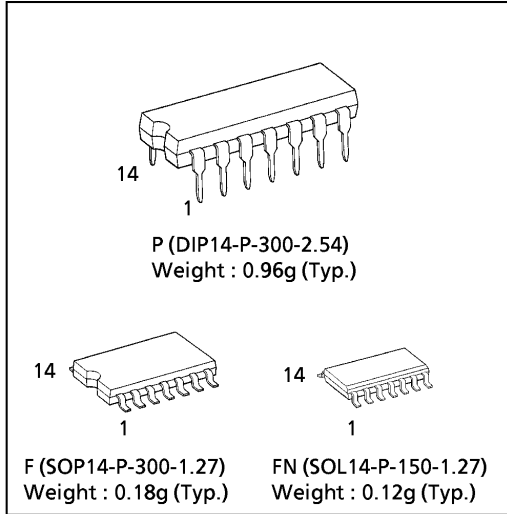
The odd parity output is high when an odd number of data inputs are high. The even parity output is high when an even number of data inputs are high.

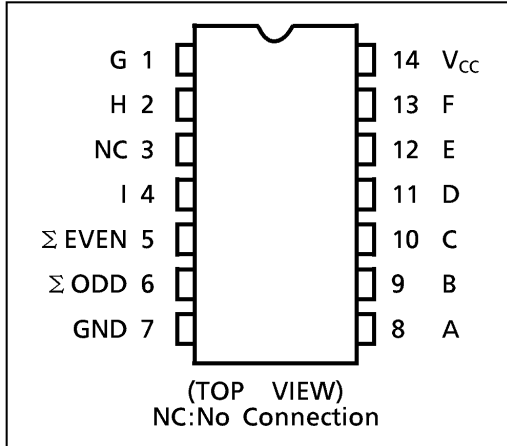The word - length capability is easily expanded by cascading.

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

FEATURES :
- High Speed·································· t_{pd} = 7.8ns(typ.) at V_{CC} = 5V
- Low Power Dissipation················ I_{CC} = 8μA(Max.) at Ta = 25°C
- High Noise Immunity················· V_{NIH} = V_{NIL} = 28% V_{CC} (Min.)
- Symmetrical Output Impedance··· $|I_{OH}|$ = I_{OL} = 24mA(Min.)
  Capability of driving 50Ω transmission lines.
- Balanced Propagation Delays····· t_{pLH} $\approx$ t_{pHL}
- Wide Operating Voltage Range···· V_{CC} (opr.) = 2V $\sim$ 5.5V
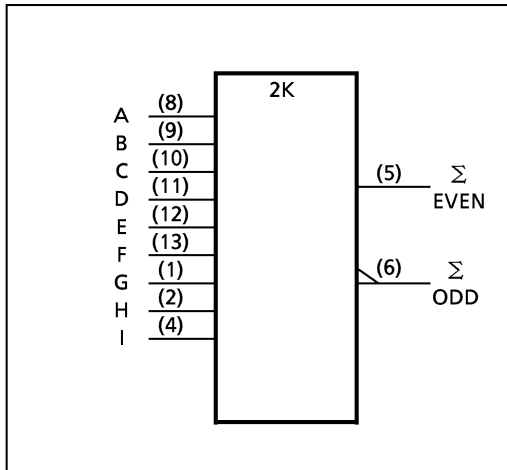- Pin and Function Compatible with 74F280

P (DIP14-P-300-2.54)
Weight : 0.96g (Typ.)

F (SOP14-P-300-1.27)
Weight : 0.18g (Typ.)

FN (SOL14-P-150-1.27)
Weight : 0.12g (Typ.)

PIN ASSIGNMENT

G 1	14 V_{CC}
H 2	13 F
NC 3	12 E
I 4	11 D
Σ EVEN 5	10 C
Σ ODD 6	9 B
GND 7	8 A

(TOP   VIEW)
NC:No Connection

TRUTH TABLE

Number of inputs A through I that are High	Outputs	
	Σ EVEN	Σ ODD
0, 2, 4, 6, 8	H	L
1, 3, 5, 7, 9	L	H

IEC LOGIC SYMBOL

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       2K
A  (8)
B  (9)
C  (10)
D  (11)              (5)   Σ
E  (12)                    EVEN
F  (13)
G  (1)
H  (2)               (6)   Σ
I  (4)                     ODD
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961001EBA2

SYSTEM DIAGRAM

Σ ODD   Σ EVEN

961001EBA2'

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage Range	V_{CC}	$-0.5\sim7.0$	V
DC Input Voltage	V_{IN}	$-0.5\sim V_{CC}+0.5$	V
DC Output Voltage	V_{OUT}	$-0.5\sim V_{CC}+0.5$	V
Input Diode Current	I_{IK}	±20	mA
Output Diode Current	I_{OK}	±50	mA
DC Output Current	I_{OUT}	±50	mA
DC V_{CC}/Ground Current	I_{CC}	±100	mA
Power Dissipation	P_D	500 (DIP)* / 180 (SOP)	mW
Storage Temperature	T_{stg}	$-65\sim150$	°C

*500mW in the range of Ta = −40°C~65°C. From Ta = 65°C to 85°C a derating factor of −10mW/°C should be applied up to 300mW.

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	V_{CC}	$2.0\sim5.5$	V
Input Voltage	V_{IN}	$0\sim V_{CC}$	V
Output Voltage	V_{OUT}	$0\sim V_{CC}$	V
Operating Temperature	T_{opr}	$-40\sim85$	°C
Input Rise and Fall Time	dt / dV	$0\sim 100$ (Vcc = 3.3 ± 0.3V) $0\sim 20$ (Vcc = 5 ± 0.5V)	ns / V

DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION		V_{CC} (V)	Ta = 25°C			Ta = −40~85°C		UNIT
					MIN.	TYP.	MAX.	MIN.	MAX.	
High - Level Input Voltage	V_{IH}			2.0 3.0 5.5	1.50 2.10 3.85	— — —	— — —	1.50 2.10 3.85	— — —	V
Low - Level Input Voltage	V_{IL}			2.0 3.0 5.5	— — —	— — —	0.50 0.90 1.65	— — —	0.50 0.90 1.65	V
High - Level Output Voltage	V_{OH}	$V_{IN} =$ V_{IH} or V_{IL}	$I_{OH} = -50\mu A$	2.0 3.0 4.5	1.9 2.9 4.4	2.0 3.0 4.5	— — —	1.9 2.9 4.4	— — —	V
			$I_{OH} = -4mA$ $I_{OH} = -24mA$ $I_{OH} = -75mA*$	3.0 4.5 5.5	2.58 3.94 —	— — —	— — —	2.48 3.80 3.85	— — —	
Low - Level Output Voltage	V_{OL}	$V_{IN} =$ V_{IH} or V_{IL}	$I_{OL} = 50\mu A$	2.0 3.0 4.5	— — —	0.0 0.0 0.0	0.1 0.1 0.1	— — —	0.1 0.1 0.1	V
			$I_{OL} = 12mA$ $I_{OL} = 24mA$ $I_{OL} = 75mA*$	3.0 4.5 5.5	— — —	— — —	0.36 0.36 —	— — —	0.44 0.44 1.65	V
Input Leakage Current	I_{IN}	$V_{IN} = V_{CC}$ or GND		5.5	—	—	±0.1	—	±1.0	μA
Quiescent Supply Current	I_{CC}	$V_{IN} = V_{CC}$ or GND		5.5	—	—	8.0	—	80.0	

* : This spec indicates the capability of driving 50Ω transmission lines.
   One output should be tested at a time for a 10ms maximum duration.

AC ELECTRICAL CHARACTERISTICS (C_L = 50pF , R_L = 500Ω , Input t_r = t_f = 3ns)

| PARAMETER	SYMBOL	TEST CONDITION	Ta = 25°C			Ta = −40~85°C		UNIT
		V_{CC} (V)	MIN.	TYP.	MAX.	MIN.	MAX.	
Propagation Delay Time	t_{pLH} t_{pHL}	3.3±0.3 5.0±0.5	— —	12.9 8.5	21.9 12.7	1.0 1.0	25.0 14.5	ns
Input Capacitance	C_{IN}		—	5	10	—	10	pF
Power Dissipation Capacitance	C_{PD}(1)		—	80	—	—	—	

Note (1) C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation :

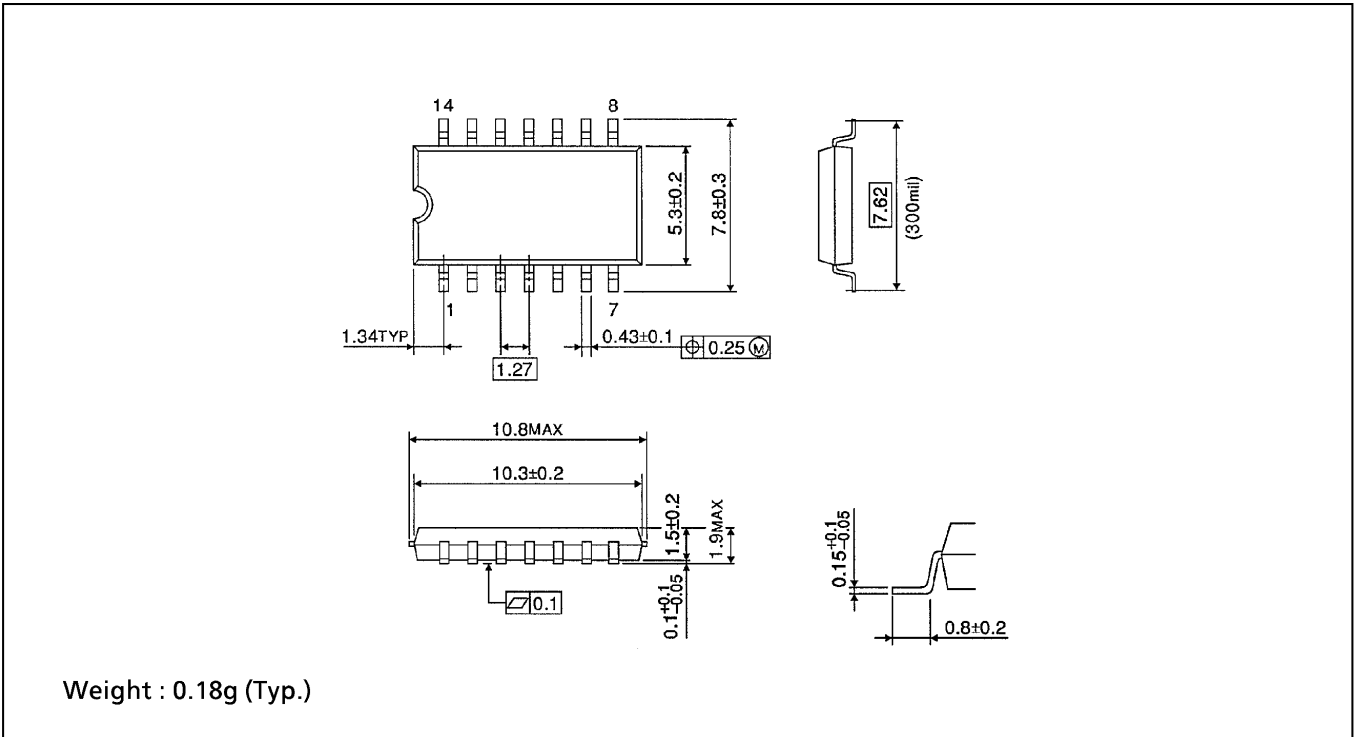$$I_{CC}(opr.) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$$

DIP 14PIN OUTLINE DRAWING (DIP14-P-300-2.54)

Unit in mm

Weight : 0.96g (Typ.)
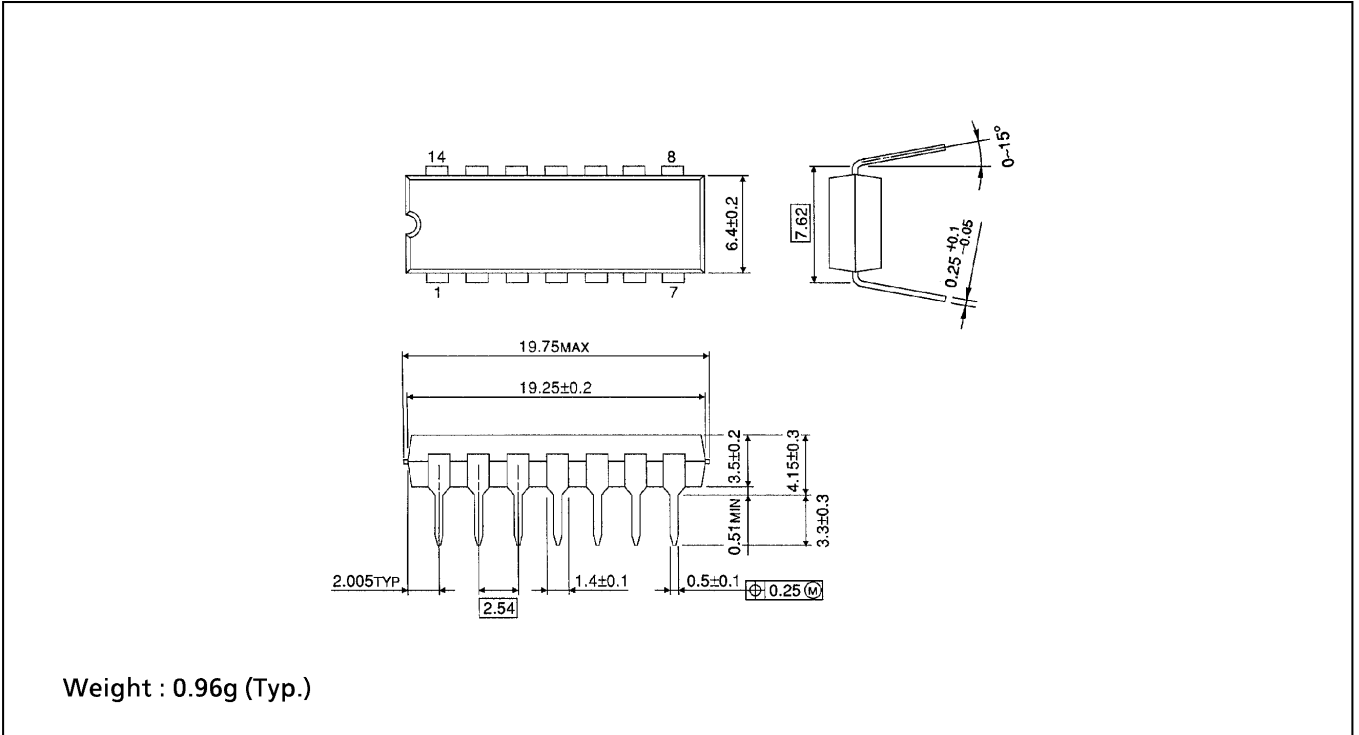
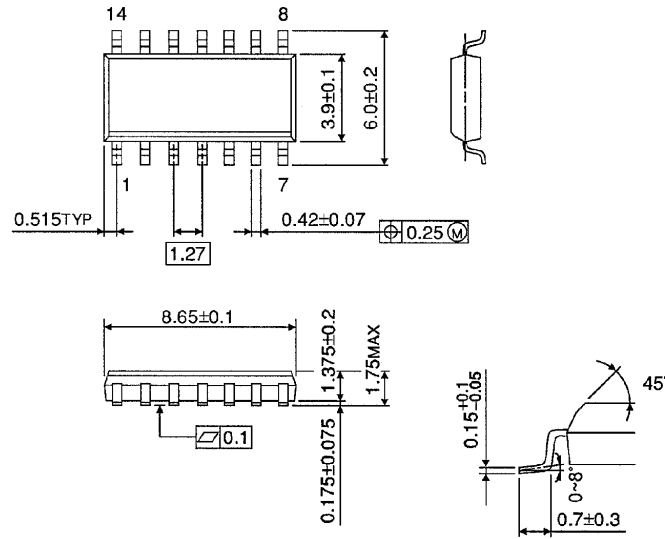## SOP 14PIN (200mil BODY) OUTLINE DRAWING (SOP14-P-300-1.27)

Unit in mm

Weight : 0.18g (Typ.)

SOP 14PIN (150mil BODY) OUTLINE DRAWING (SOL14-P-150-1.27)

Unit in mm

(Note) This package is not available in Japan.

14   8

3.9±0.1
6.0±0.2

1   7

0.515TYP

1.27

0.42±0.07

⊕ 0.25 Ⓜ

8.65±0.1

1.375±0.2

1.75MAX

0.175±0.075

▱ 0.1

0.15 +0.1 −0.05

0~8°

45°

0.7±0.3

Weight : 0.12g (Typ.)