TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TC74AC280P, TC74AC280F, TC74AC280FN

#### 9-BIT PARITY GENERATOR/CHECKER

The TC74AC280 is an advanced high speed CMOS 9-BIT PARITY GENERATOR fabricated with silicon gate and double-layer metal wiring  $C^2MOS$  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 ( $\Sigma$  ODD and  $\Sigma$  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.

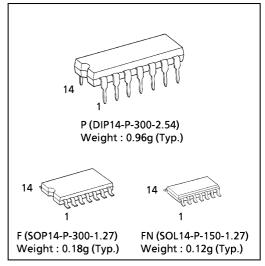
#### FEATURES:

- High Speed······  $t_{pd} = 7.8 \text{ns}(typ.)$  at  $V_{CC} = 5V$
- Low Power Dissipation ·······  $I_{CC} = 8\mu A(Max.)$  at  $Ta = 25^{\circ}C$
- High Noise Immunity  $V_{NIH} = V_{NIL} = 28\% V_{CC}$  (Min.)
- Symmetrical Output Impedance···  $| I_{OH} | = I_{OL} = 24 mA(Min.)$ Capability of driving  $50 \Omega$ transmission lines.
- Balanced Propagation Delays ····· t<sub>pLH</sub> ≃ t<sub>pHL</sub>
- Wide Operating Voltage Range ···· V<sub>CC</sub> (opr.) = 2V ~ 5.5V
- Pin and Function Compatible with 74F280

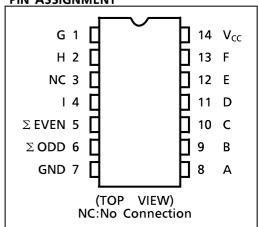
### TRUTH TABLE

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

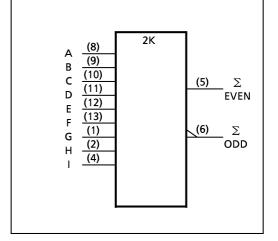
(Note) The JEDEC SOP (FN) is not available in Japan.



#### **PIN ASSIGNMENT**



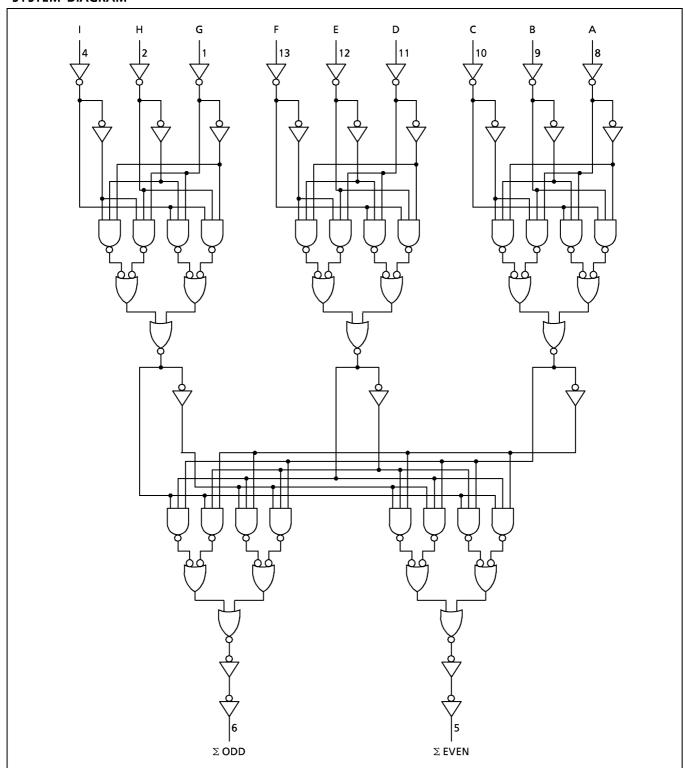
### IEC LOGIC SYMBOL



961001EBA2

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## SYSTEM DIAGRAM



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#### **ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage Range	V <sub>cc</sub>	-0.5~7.0	٧
DC Input Voltage	VIN	$-0.5 \sim V_{CC} + 0.5$	٧
DC Output Voltage	V <sub>OUT</sub>	$-0.5 \sim V_{CC} + 0.5$	٧
Input Diode Current	I <sub>IK</sub>	± 20	mA
Output Diode Current	I <sub>OK</sub>	± 50	mA
DC Output Current	I <sub>OUT</sub>	± 50	mA
DC V <sub>cc</sub> /Ground Current	I <sub>CC</sub>	± 100	mA
Power Dissipation	P <sub>D</sub>	500 (DIP)* / 180 (SOP)	mW
Storage Temperature	T <sub>stg</sub>	<b>−65~150</b>	°C

\*500mW in the range of Ta =  $-40^{\circ}$ 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 <sub>cc</sub>	2.0~5.5	V
Input Voltage	VIN	0~V <sub>CC</sub>	V
Output Voltage	V <sub>OUT</sub>	0∼V <sub>CC</sub>	V
Operating Temperature	T <sub>opr</sub>	<b>−40~85</b>	°C
Input Rise and Fall Time	dt/dV	$0 \sim 100 \text{ (Vcc} = 3.3 \pm 0.3 \text{V)}$ $0 \sim 20 \text{ (Vcc} = 5 \pm 0.5 \text{V)}$	ns / V

### DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION		V <sub>CC</sub>	Ta = 25°C			Ta = −40~85°C		UNIT
LAVAINIELEY 21MBC		TEST CONDITION			MIN.	TYP.	MAX.	MIN.	MAX.	וואוטן
High - Level Input Voltage	V <sub>IH</sub>		2.0 3.0 5.5	1.50 2.10 3.85	_ _ _	_ _ _	1.50 2.10 3.85		V	
Low - Level Input Voltage	VIL		2.0 3.0 5.5	_ _ _	_ _ _	0.50 0.90 1.65	_ _ _	0.50 0.90 1.65	V	
High - Level	.,,	V <sub>I N</sub> =	$I_{OH} = -50\mu A$	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
Output Voltage	V <sub>OH</sub>	V <sub>IH</sub> or V <sub>IL</sub>	$I_{OH} = -4mA$ $I_{OH} = -24mA$ $I_{OH} = -75mA*$	3.0 4.5 5.5	2.58 3.94 —	_ _ _	_ _ _	2.48 3.80 3.85		V
Low - Level	V	V <sub>I N</sub> =	I <sub>OL</sub> = 50μA	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
Output Voltage	V <sub>OL</sub>	V <sub>IH</sub> or V <sub>IL</sub>	$I_{OL} = 12mA$ $I_{OL} = 24mA$ $I_{OL} = 75mA*$	3.0 4.5 5.5			0.36 0.36 —	_ _ _	0.44 0.44 1.65	V
Input Leakage Current	I <sub>IN</sub>	$V_{IN} = V_{CC}$ or GND		5.5	_	_	±0.1	_	± 1.0	
Quiescent Supply Current	I <sub>cc</sub>	$V_{IN} = V_{CC}$ or GN	5.5	_	_	8.0	_	80.0	$\mu A$	

<sup>\* :</sup> This spec indicates the capability of driving  $50\Omega$  transmission lines. One output should be tested at a time for a 10ms maximum duration.

# AC ELECTRICAL CHARACTERISTICS ( $C_L$ = 50pF , $\,R_L$ = $500\Omega$ , input $\,t_r$ = $t_f$ = 3ns )

	•								
PARAMETER	SYMBOL	TEST CONDITION		•	Ta = 25°C	:	Ta = -40~85°C		UNIT
			V <sub>cc</sub> (V)	MIN.	TYP.	MAX.	MIN.	MAX.	ONIT
Propagation Delay Time	t <sub>pLH</sub> t <sub>pHL</sub>		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 <sub>IN</sub>			_	5	10	_	10	рF
Power Dissipation Capacitance	C <sub>PD</sub> (1)			_	80	_	_	_	ן אי

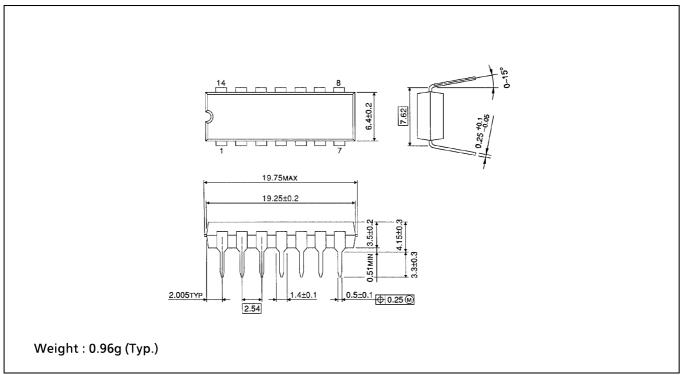
Note (1)  $C_{PD}$  is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation:

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

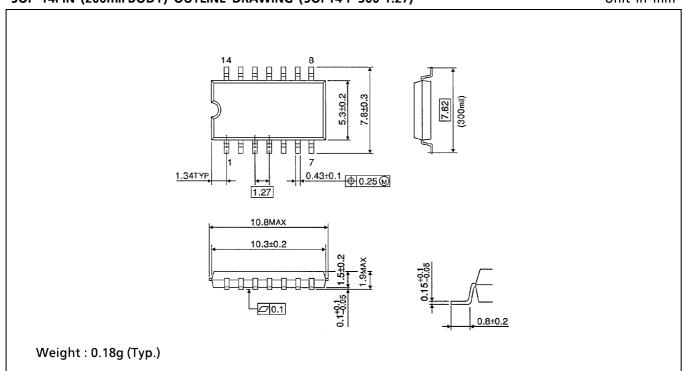
# DIP 14PIN OUTLINE DRAWING (DIP14-P-300-2.54)

Unit in mm



# SOP 14PIN (200mil BODY) OUTLINE DRAWING (SOP14-P-300-1.27)

Unit in mm



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

Unit in mm

