

**OCTAL BUS BUFFER**  
TC74AC240P/F/FW/FS INVERTED, 3-STATE OUTPUTS  
TC74AC244P/F/FW/FS NON-INVERTED, 3-STATE OUTPUTS

The TC74AC240 and 244 are advanced high speed CMOS OCTAL BUS BUFFERS fabricated with silicon gate and double-layer metal wiring C<sup>2</sup>MOS technology. They achieve the high speed operation similar to equivalent Bipolar Schottky TTL while maintaining the CMOS low power dissipation. The 74AC240 is an inverting 3-state buffer while the 74AC244 is non-inverting. Both devices have two active-low output enables. These devices are designed to be used in such applications as 3-state memory address drivers. All inputs are equipped with protection circuits against static discharge or transient excess voltage.

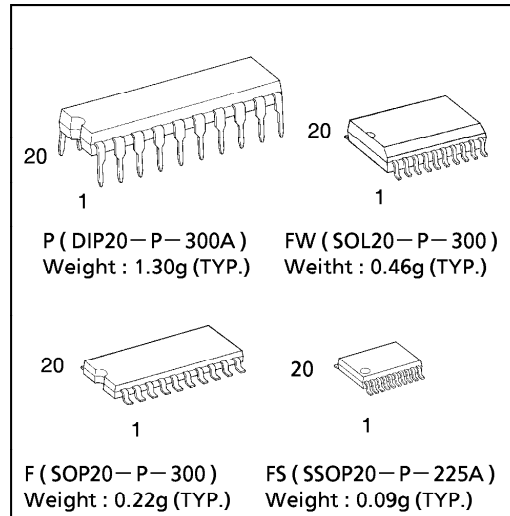
**FEATURES :**

- High Speed.....  $t_{pd} = 4.0ns(typ.)$  at  $V_{CC} = 5V$
- Low Power Dissipation.....  $I_{CC} = 8\mu A(Max.)$  at  $T_a = 25^\circ C$
- High Noise Immunity.....  $V_{NIH} = V_{NIL} = 28\% V_{CC} (Min.)$
- Symmetrical Output Impedance...  $|I_{OH}| = |I_{OL}| = 24mA(Min.)$   
Capability of driving 50 $\Omega$  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 74F240 / 244

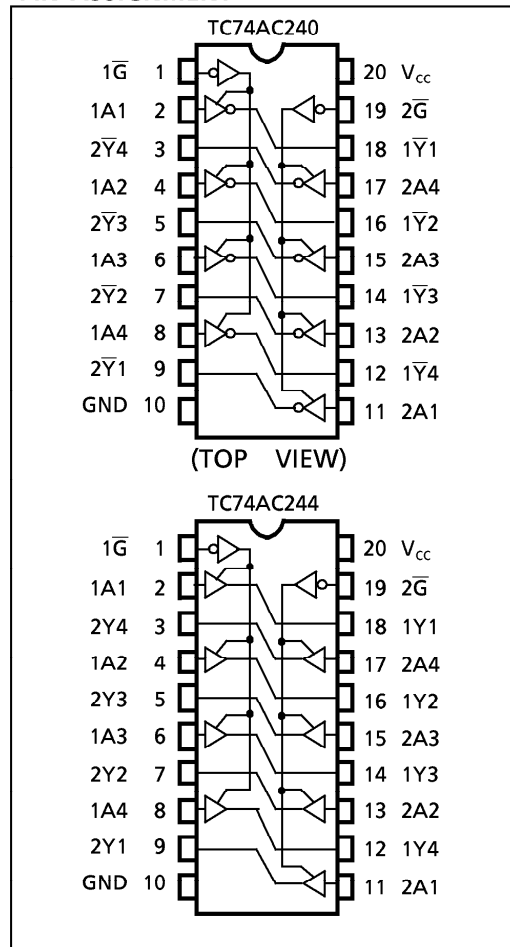
**TRUTH TABLE**

INPUTS		OUTPUTS	
$\bar{G}$	A <sub>n</sub>	Y <sub>n</sub> (244)	$\bar{Y}_n$ (240)
L	L	L	H
L	H	H	L
H	X	Z	Z

X : Don't Care  
Z : High Impedance



**PIN ASSIGNMENT**

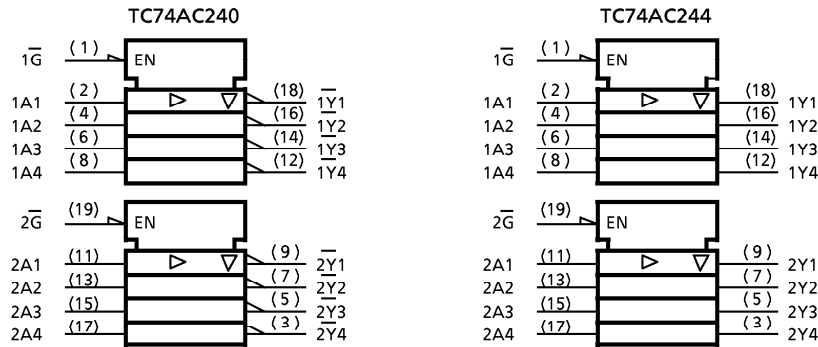


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**IEC LOGIC SYMBOL**



**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage Range	$V_{CC}$	-0.5~7.0	V
DC Input Voltage	$V_{IN}$	-0.5~ $V_{CC} + 0.5$	V
DC Output Voltage	$V_{OUT}$	-0.5~ $V_{CC} + 0.5$	V
Input Diode Current	$I_{IK}$	$\pm 20$	mA
Output Diode Current	$I_{OK}$	$\pm 50$	mA
DC Output Current	$I_{OUT}$	$\pm 50$	mA
DC $V_{CC}$ /Ground Current	$I_{CC}$	$\pm 200$	mA
Power Dissipation	$P_D$	500 (DIP)* / 180 (SOP / SSOP)	mW
Storage Temperature	$T_{stg}$	-65~150	°C

\*500mW in the range of  $T_a = -40^{\circ}\text{C} \sim 65^{\circ}\text{C}$ . From  $T_a = 65^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  a derating factor of  $-10\text{mW}/^{\circ}\text{C}$  should be applied up to 300mW.

**RECOMMENDED OPERATING CONDITIONS**

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	$V_{CC}$	2.0~5.5	V
Input Voltage	$V_{IN}$	0~ $V_{CC}$	V
Output Voltage	$V_{OUT}$	0~ $V_{CC}$	V
Operating Temperature	$T_{opr}$	-40~85	°C
Input Rise and Fall Time	$dt/dV$	0~100 ( $V_{CC} = 3.3 \pm 0.3\text{V}$ ) 0~20 ( $V_{CC} = 5 \pm 0.5\text{V}$ )	ns/V

**DC ELECTRICAL CHARACTERISTICS**

PARAMETER	SYMBOL	TEST CONDITION	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40~85°C		UNIT	
				MIN.	TYP.	MAX.	MIN.	MAX.		
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	V <sub>IL</sub>		2.0 3.0 5.5	— — —	— — —	0.50 0.90 1.65	— — —	0.50 0.90 1.65	V	
High - Level Output Voltage	V <sub>OH</sub>	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = -50μA	2.0	1.9	2.0	—	1.9	—	V
				3.0	2.9	3.0	—	2.9	—	
				4.5	4.4	4.5	—	4.4	—	
Low - Level Output Voltage	V <sub>OL</sub>	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> = 50μA	2.0	—	0.0	0.1	—	0.1	V
				3.0	—	0.0	0.1	—	0.1	
				4.5	—	0.0	0.1	—	0.1	
3 - State Output Off - State Current	I <sub>OZ</sub>	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> V <sub>OUT</sub> = V <sub>CC</sub> or GND	I <sub>OH</sub> = -4mA I <sub>OH</sub> = -24mA I <sub>OH</sub> = -75mA*	3.0	2.58	—	—	2.48	—	μA
				4.5	3.94	—	—	3.80	—	
				5.5	—	—	—	3.85	—	
Input Leakage Current	I <sub>IN</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND	5.5	—	—	±0.1	—	±1.0		
Quiescent Supply Current	I <sub>CC</sub>	V <sub>IN</sub> = V <sub>CC</sub> 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<sub>L</sub> = 50pF , R<sub>L</sub> = 500Ω , Input t<sub>r</sub> = t<sub>f</sub> = 3ns )**

PARAMETER	SYMBOL	TEST CONDITION	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40~85°C		UNIT
				MIN.	TYP.	MAX.	MIN.	MAX.	
Propagation Delay Time*	t <sub>pLH</sub>		3.3 ± 0.3	—	6.3	10.5	1.0	12.0	ns
	t <sub>pHL</sub>		5.0 ± 0.5	—	4.8	7.0	1.0	8.0	
Propagation Delay Time**	t <sub>pLH</sub>		3.3 ± 0.3	—	7.0	11.4	1.0	13.0	
	t <sub>pHL</sub>		5.0 ± 0.5	—	5.2	7.5	1.0	8.5	
Output Enable Time	t <sub>pZL</sub>		3.3 ± 0.3	—	8.4	14.0	1.0	16.0	
	t <sub>pZH</sub>		5.0 ± 0.5	—	5.9	8.7	1.0	10.0	
Output Disable Time	t <sub>pLZ</sub>		3.3 ± 0.3	—	6.4	10.5	1.0	12.0	
	t <sub>pHZ</sub>		5.0 ± 0.5	—	5.5	7.9	1.0	9.0	
Input Capacitance	C <sub>IN</sub>			—	5	10	—	10	pF
Output Capacitance	C <sub>OUT</sub>			—	10	—	—	—	
Power Dissipation Capacitance	C <sub>PD</sub> (1)			—	30	—	—	—	

Note (1) C<sub>PD</sub> 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 :

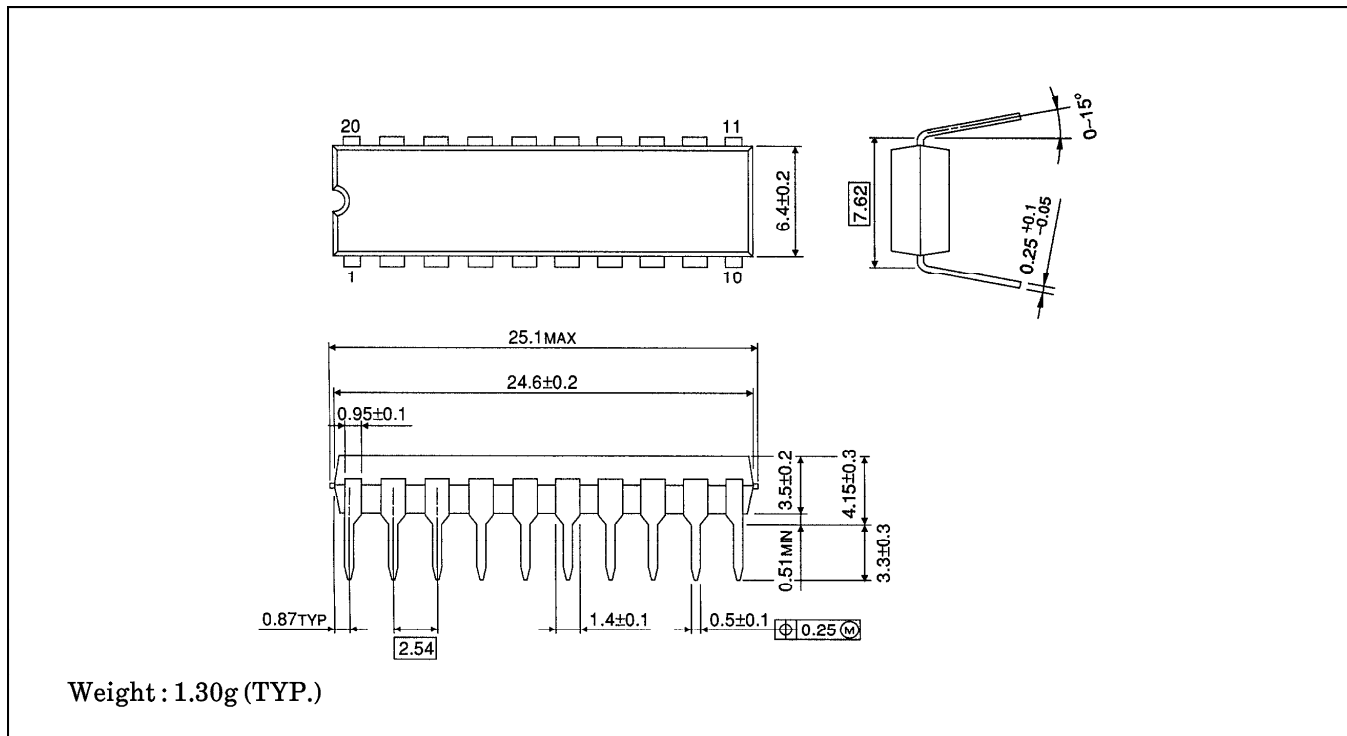
$$I_{CC}(\text{opr.}) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC} / 8 (\text{per bit})$$

(2) \* for TC74AC240 only

\*\* for TC74AC244 only

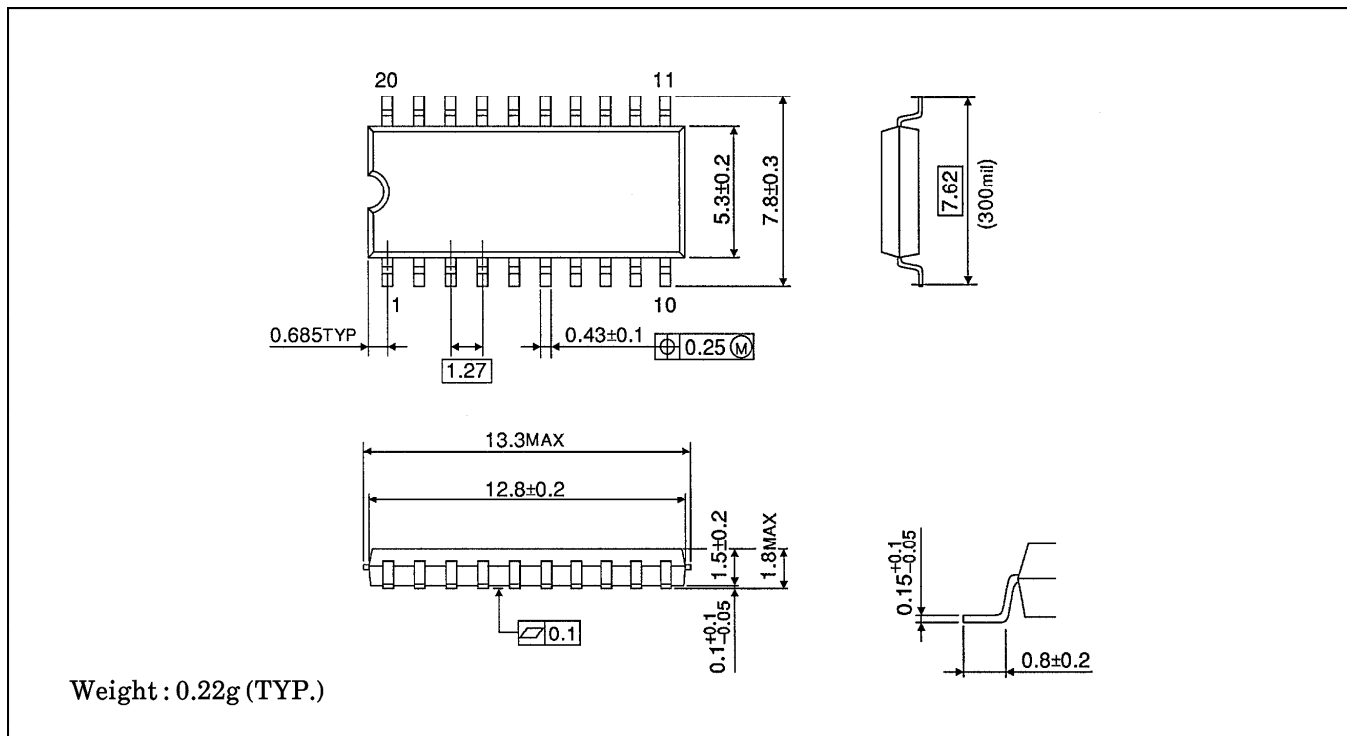
**DIP 20PIN OUTLINE DRAWING ( DIP20-P-300A )**

Unit in mm



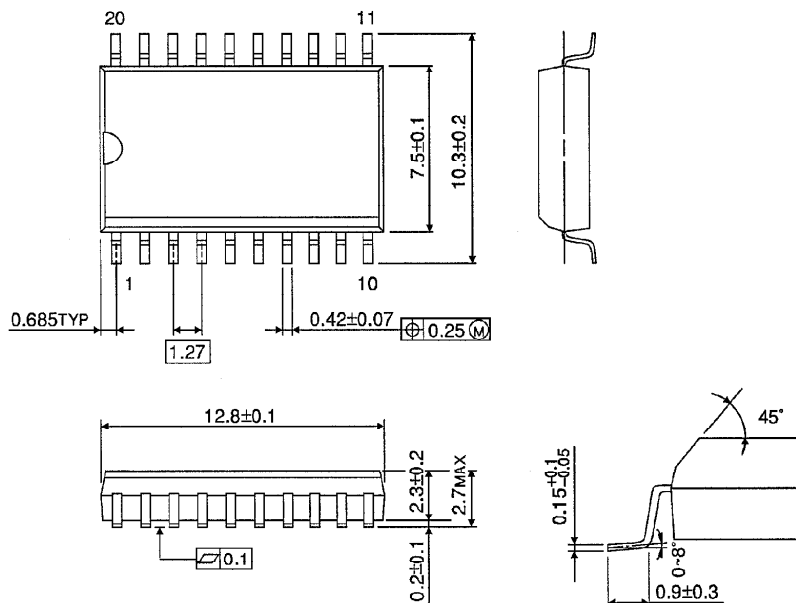
**SOP 20PIN ( 200mil BODY ) OUTLINE DRAWING ( SOP20-P-300 )**

Unit in mm



**SOP 20PIN (300mil BODY) OUTLINE DRAWING (SOL20-P-300)**

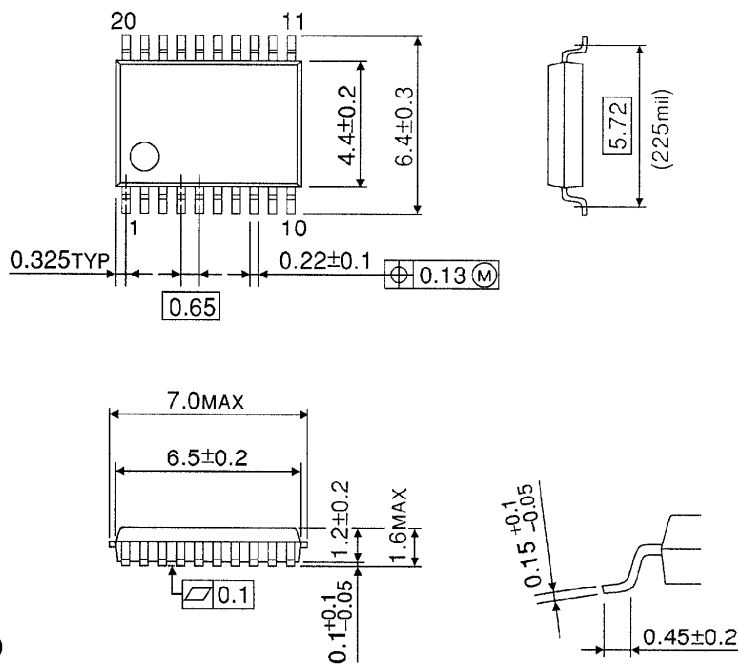
Unit in mm



Weight : 0.46g (TYP.)

**SSOP 20PIN OUTLINE DRAWING (SSOP20-P-225A)**

Unit in mm



Weight : 0.09g (TYP.)