

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 C²MOS 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.

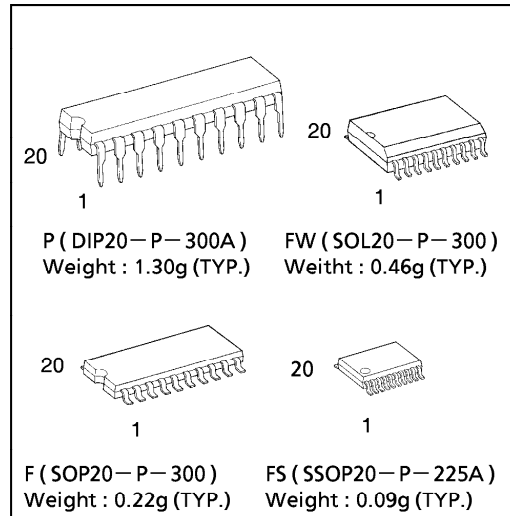
FEATURES :

- 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 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 74F240 / 244

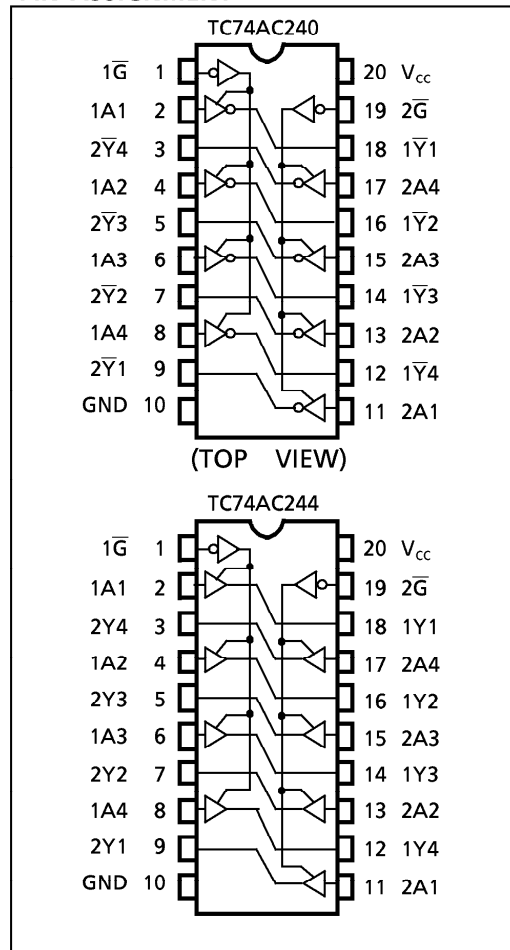
TRUTH TABLE

INPUTS		OUTPUTS	
\bar{G}	A _n	Y _n (244)	\bar{Y}_n (240)
L	L	L	H
L	H	H	L
H	X	Z	Z

X : Don't Care
Z : High Impedance



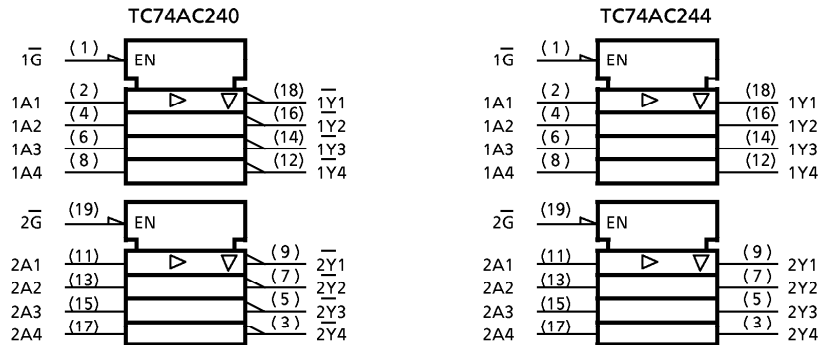
PIN ASSIGNMENT



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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}	± 20	mA
Output Diode Current	I_{OK}	± 50	mA
DC Output Current	I_{OUT}	± 50	mA
DC V_{CC} /Ground Current	I_{CC}	± 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°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 _{CC} (V)	Ta = 25°C			Ta = -40~85°C		UNIT	
				MIN.	TYP.	MAX.	MIN.	MAX.		
High - Level Input Voltage	V _{IH}		2.0	1.50	—	—	1.50	—	V	
			3.0	2.10	—	—	2.10	—		
			5.5	3.85	—	—	3.85	—		
Low - Level Input Voltage	V _{IL}		2.0	—	—	0.50	—	0.50	V	
			3.0	—	—	0.90	—	0.90		
			5.5	—	—	1.65	—	1.65		
High - Level Output Voltage	V _{OH}	V _{IN} = V _{IH} or V _{IL}	I _{OH} = -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	—	
			I _{OH} = -4mA I _{OH} = -24mA I _{OH} = -75mA*	3.0	2.58	—	—	2.48	—	V
				4.5	3.94	—	—	3.80	—	
				5.5	—	—	—	3.85	—	
Low - Level Output Voltage	V _{OL}	V _{IN} = V _{IH} or V _{IL}	I _{OL} = 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	
			I _{OL} = 12mA I _{OL} = 24mA I _{OL} = 75mA*	3.0	—	—	0.36	—	0.44	V
				4.5	—	—	0.36	—	0.44	
				5.5	—	—	—	—	1.65	
3 - State Output Off - State Current	I _{OZ}	V _{IN} = V _{IH} or V _{IL} V _{OUT} = V _{CC} or GND	5.5	—	—	±0.5	—	±5.0	μA	
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	μA	

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

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 :

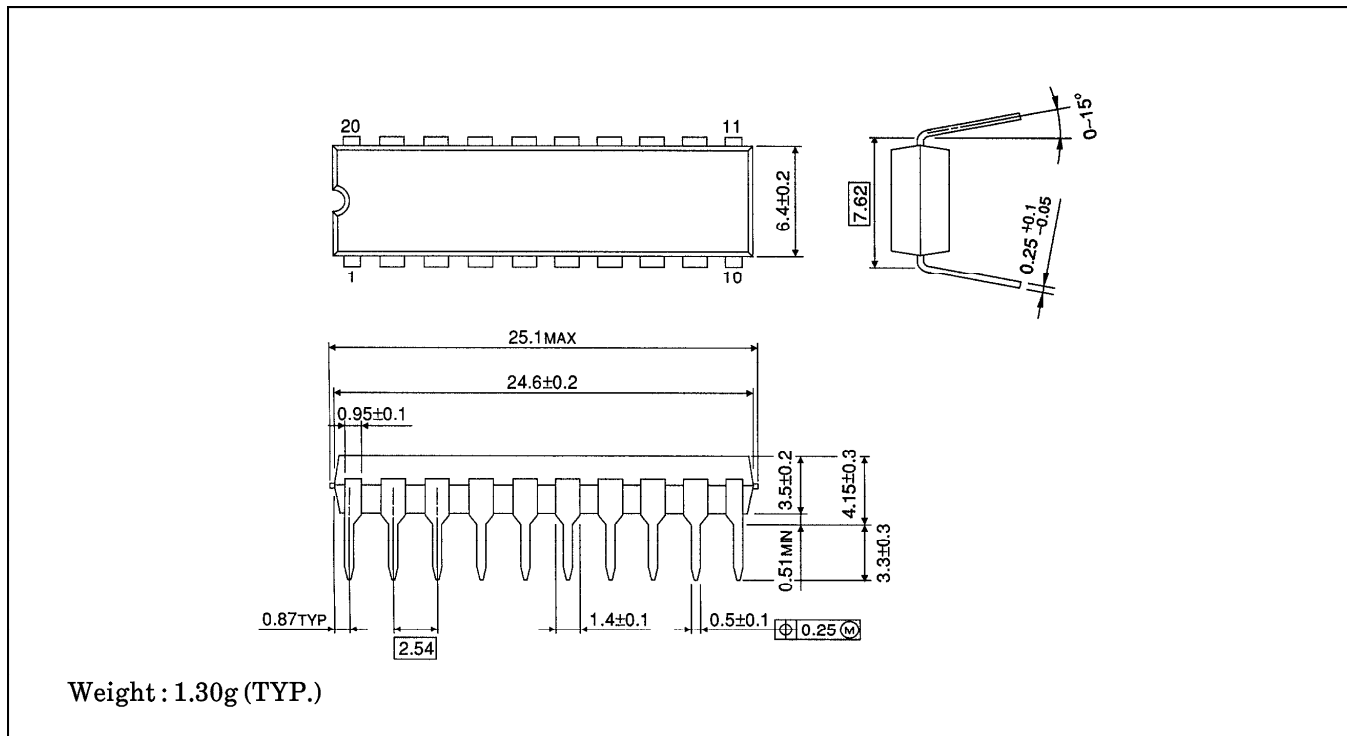
$$I_{CC}(\text{opr.}) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC} / 8 \text{ (per bit)}$$

(2) * for TC74AC240 only

** for TC74AC244 only

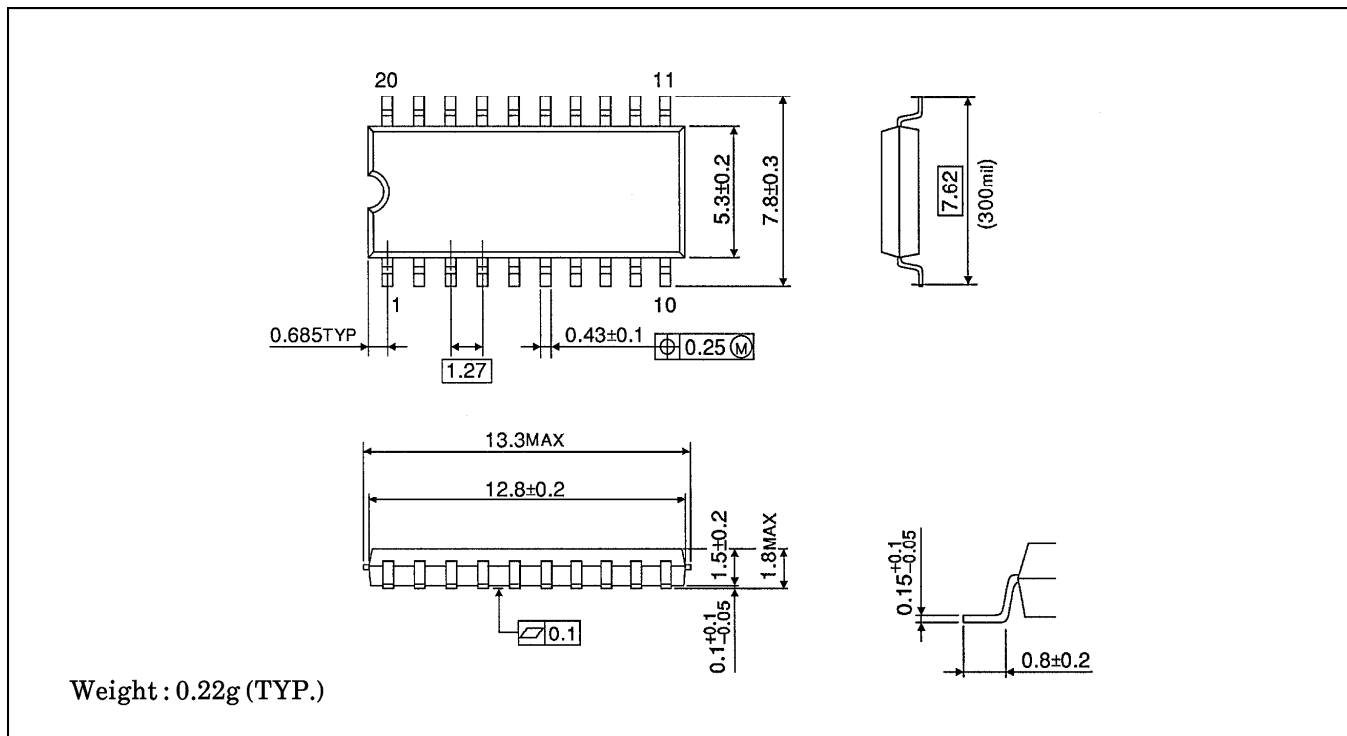
DIP 20PIN OUTLINE DRAWING (DIP20-P-300A)

Unit in mm



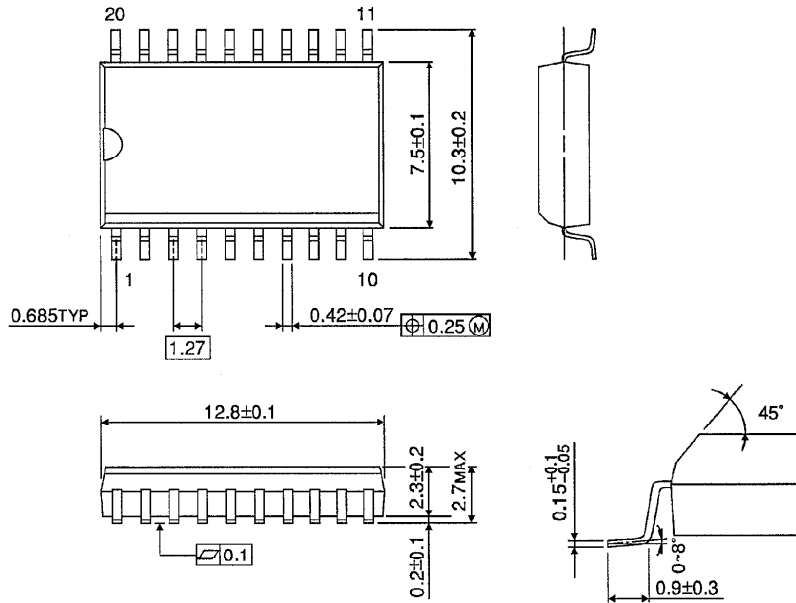
SOP 20PIN (200mil BODY) OUTLINE DRAWING (SOP20-P-300)

Unit in mm



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

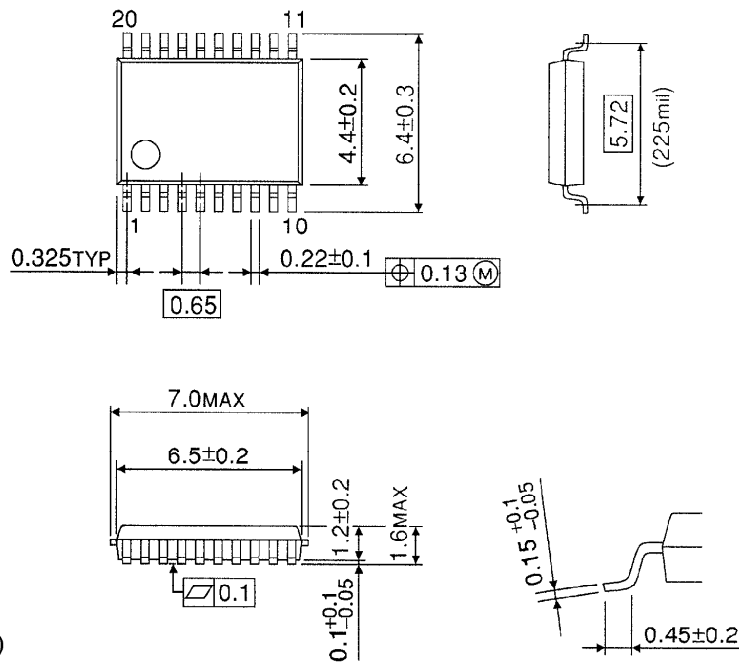
Unit in mm



Weight : 0.46g (TYP.)

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

Unit in mm



Weight : 0.09g (TYP.)