

OCTAL BUS BUFFER
TC74ACT240P/F/FS INVERTED, 3-STATE OUTPUTS
TC74ACT244P/F/FS NON-INVERTED, 3-STATE OUTPUTS

The TC74ACT240 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 74ACT240 is an inverting 3-state buffer while the 74ACT244 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.

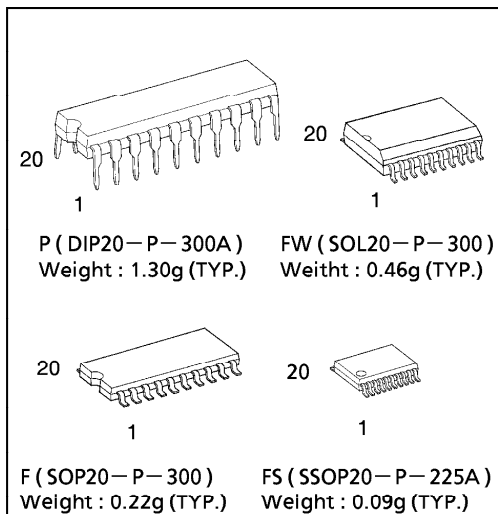
FEATURES :

- High Speed..... $t_{pd} = 5.0ns$ (typ.) at $V_{CC} = 5V$
- Low Power Dissipation..... $I_{CC} = 8\mu A$ (Max.) at $T_a = 25^\circ C$
- Compatible with TTL outputs.... $V_{IL} = 0.8V$ (Max.)
 $V_{IH} = 2.0V$ (Min.)
- Symmetrical Output Impedance... $|I_{OH}| = I_{OL} = 24mA$ (Min.)
Capability of driving 50 Ω transmission lines.
- Balanced Propagation Delays..... $t_{pLH} \approx t_{pHL}$
- Pin and Function Compatible with 74F240/244

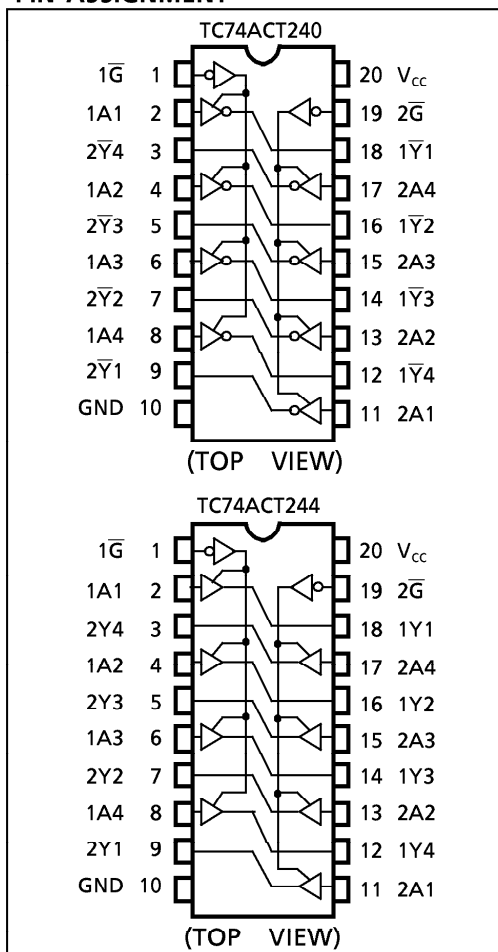
TRUTH TABLE

| 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

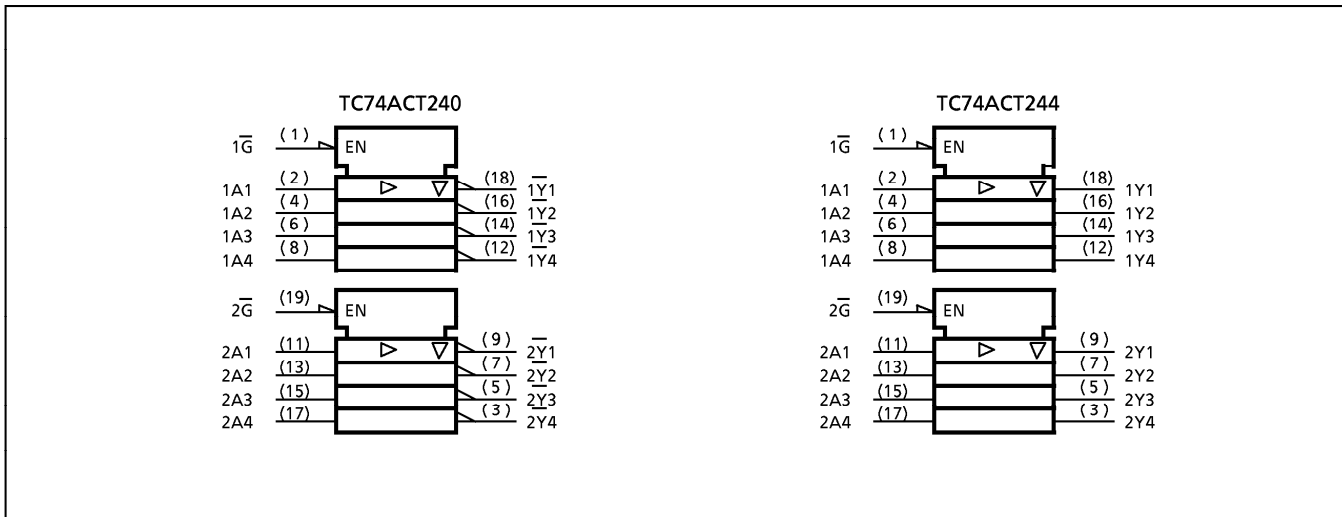


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IEC LOGIC SYMBOL



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} | 4.5~5.5 | 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 | 0~10 | 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} | | 4.5 ┆ 5.5 | 2.0 | — | — | 2.0 | — | V | |
| Low - Level Input Voltage | V _{IL} | | 4.5 ┆ 5.5 | — | — | 0.8 | — | 0.8 | V | |
| High - Level Output Voltage | V _{OH} | V _{IN} = V _{IH} or V _{IL} | I _{OH} = -50μA | 4.5 | 4.4 | 4.5 | — | 4.4 | — | V |
| | | | I _{OH} = -24mA | 4.5 | 3.94 | — | — | 3.80 | — | |
| | | | I _{OH} = -75mA* | 5.5 | — | — | — | 3.85 | — | |
| Low - Level Output Voltage | V _{OL} | V _{IN} = V _{IH} or V _{IL} | I _{OL} = 50μA | 4.5 | — | 0.0 | 0.1 | — | 0.1 | V |
| | | | I _{OL} = 24mA | 4.5 | — | — | 0.36 | — | 0.44 | |
| | | | I _{OL} = 75mA* | 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 | | |
| Quiescent Supply Current | I _{CC} | V _{IN} = V _{CC} or GND | 5.5 | — | — | 8.0 | — | 80.0 | | |
| | I _c | PER INPUT : V _{IN} = 3.4V OTHER INPUT : V _{CC} or GND | 5.5 | — | — | 1.35 | — | 1.5 | mA | |

* : 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} | | 5.0 ± 0.5 | — | 5.7 | 8.0 | 1.0 | 9.0 | ns |
| | t _{pHL} | | | | | | | | |
| Output Enable Time | t _{pZL} | | 5.0 ± 0.5 | — | 6.0 | 9.0 | 1.0 | 10.5 | |
| | t _{pZH} | | | | | | | | |
| Output Disable Time | t _{pLZ} | | 5.0 ± 0.5 | — | 5.9 | 8.5 | 1.0 | 10.0 | |
| | t _{pHZ} | | | | | | | | |
| Input Capacitance | C _{IN} | | | — | 5 | 10 | — | 10 | pF |
| Output Capacitance | C _{OUT} | | | — | 10 | — | — | — | |
| Power Dissipation Capacitance | C _{PD} (1) | TC74ACT240 | | — | 25 | — | — | — | |
| | | TC74ACT244 | | — | 29 | — | — | — | |

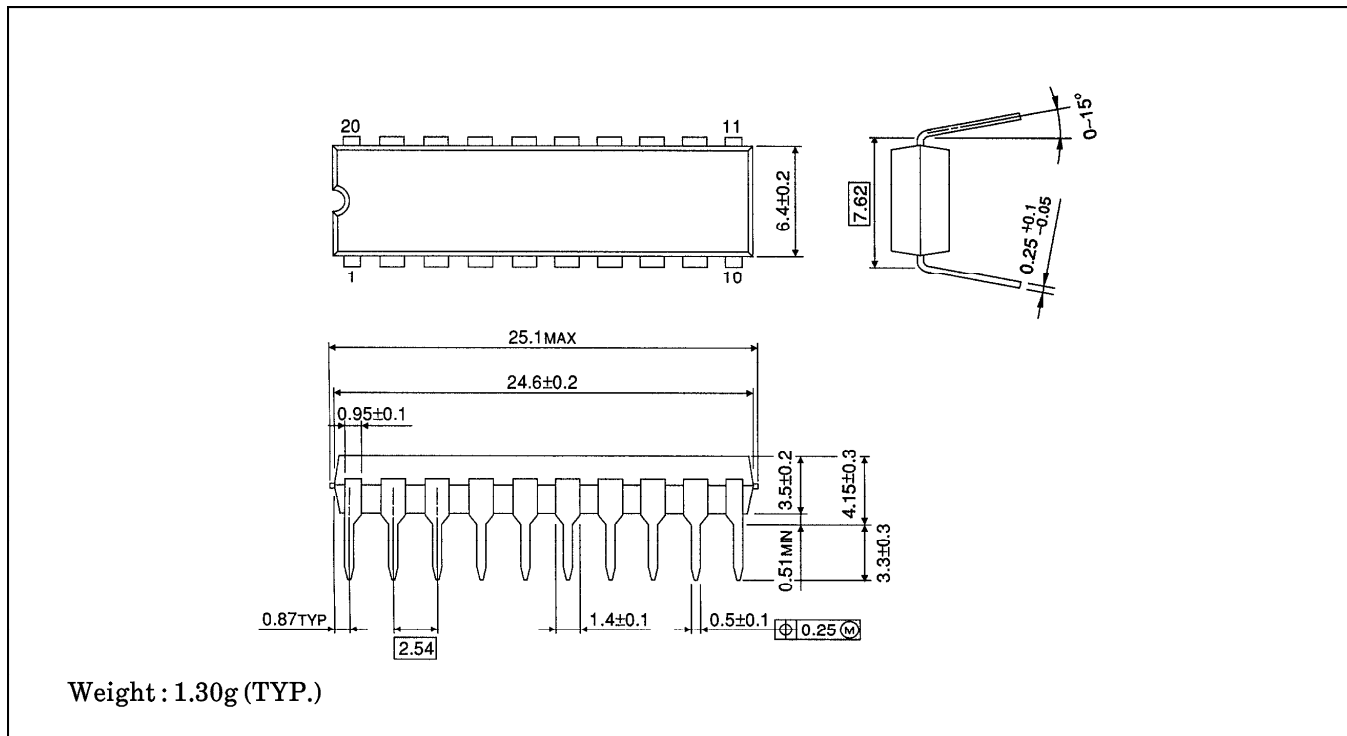
Note (1) C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation :

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

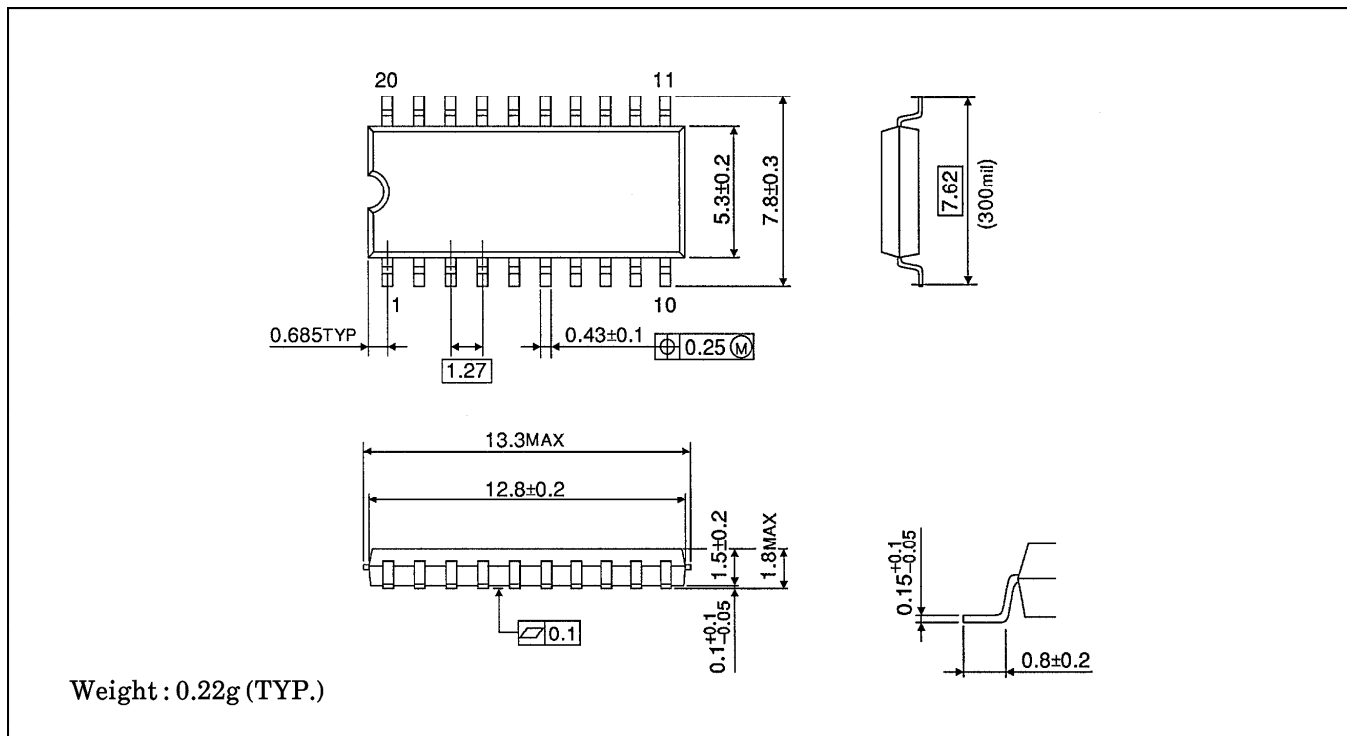
DIP 20PIN OUTLINE DRAWING (DIP20-P-300A)

Unit in mm



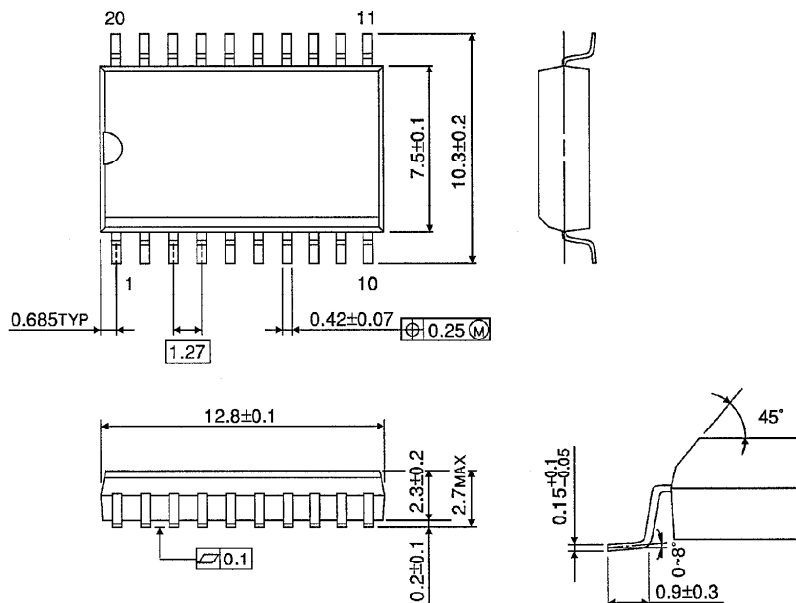
SOP 20PIN (200mil BODY) OUTLINE DRAWING (SOP20-P-300)

Unit in mm



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

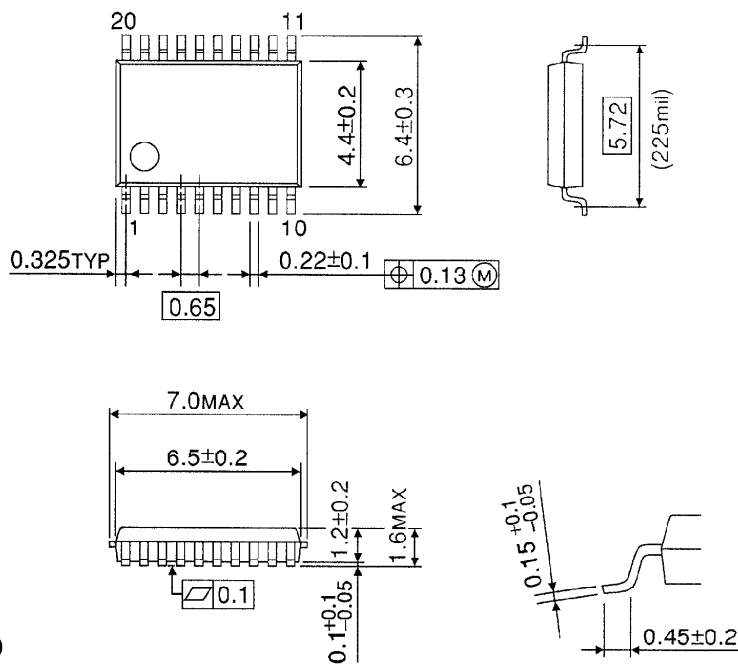
Unit in mm



Weight : 0.46g (TYP.)

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

Unit in mm



Weight : 0.09g (TYP.)