

**TC74AC125P/F/FN/FS QUAD BUS BUFFER**  
**TC74AC126P/F/FN QUAD BUS BUFFER**

The TC74AC125 / 126 are advanced high speed CMOS QUAD 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.

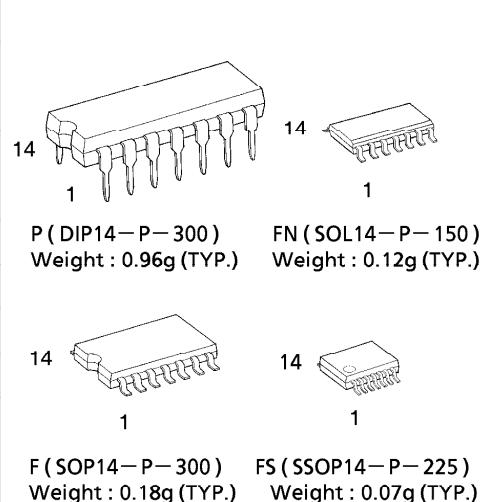
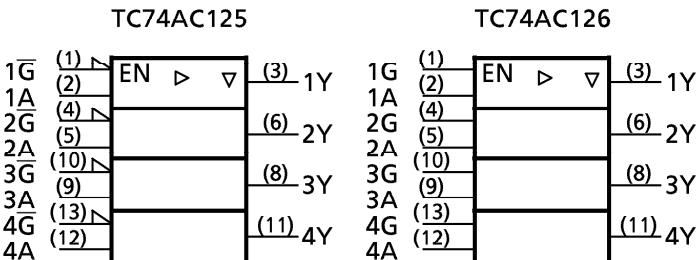
The TC74AC125 requires the 3 - state control input  $\bar{G}$  to be set high to place the output into the high impedance state, whereas the TC74AC126 requires the control input to be set low to place the output into high impedance.

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

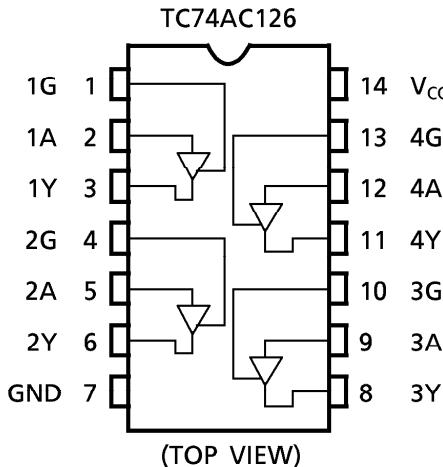
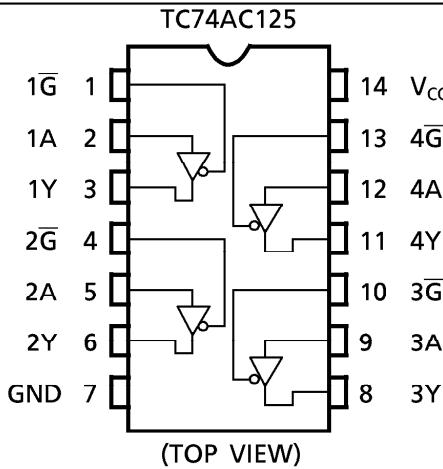
**FEATURES :**

- High Speed..... $t_{pd} = 4.0\text{ns}(\text{typ.})$  at  $V_{CC} = 5\text{V}$
- Low Power Dissipation..... $I_{CC} = 8\mu\text{A}(\text{Max.})$  at  $T_a = 25^\circ\text{C}$
- High Noise Immunity..... $V_{NIH} = V_{NIL} = 28\% V_{CC}$  (Min.)
- Symmetrical Output Impedance...  $|I_{OH}| = I_{OL} = 24\text{mA}(\text{Min.})$   
Capability of driving 50 $\Omega$  transmission lines.
- Balanced Propagation Delays..... $t_{pLH} \approx t_{pHL}$
- Wide Operating Voltage Range.... $V_{CC}(\text{opr}) = 2\text{V} \sim 5.5\text{V}$
- Pin and Function Compatible with 74F125 / 126

**IEC LOGIC SYMBOL**



**PIN ASSIGNMENT**



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**TRUTH TABLE**

**TC74AC125**

INPUTS		OUTPUTS
$\bar{G}$	A	Y
H	X	Z
L	L	L
L	H	H

X: Don't Care  
 Z : High Impedance

**TC74AC126**

INPUTS		OUTPUTS
G	A	Y
L	X	Z
H	L	L
H	H	H

X: Don't Care  
 Z : High Impedance

**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	$I_{CC}$	$\pm 100$	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>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = -50μA	2.0 3.0 4.5	1.9 2.9 4.4	2.0 3.0 4.5	— — —	1.9 2.9 4.4	— — —	
			I <sub>OH</sub> = -4mA I <sub>OH</sub> = -24mA I <sub>OH</sub> = -75mA*	3.0 4.5 5.5	2.58 3.94 —	— — —	— — —	2.48 3.80 3.85	— — —	
			I <sub>OL</sub> = 50μA  I <sub>OL</sub> = 12mA I <sub>OL</sub> = 24mA I <sub>OL</sub> = 75mA*	2.0 3.0 4.5	— — —	0.0 0.0 0.0	0.1 0.1 0.1	— — —	0.1 0.1 0.1	
Low - Level Output Voltage	V <sub>OL</sub>	V <sub>IH</sub> or V <sub>IL</sub>		3.0 4.5 5.5	— — —	— — —	0.36 0.36 —	— — —	0.44 0.44 1.65	
				5.5	—	—	±0.5	—	±5.0	
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> t <sub>pHL</sub>		3.3 ± 0.3 5.0 ± 0.5	— —	6.4 4.7	10.5 7.0	1.0 1.0	12.0 8.0	ns
Output Enable Time	t <sub>pZL</sub> t <sub>pZH</sub>		3.3 ± 0.3 5.0 ± 0.5	— —	7.1 5.0	12.3 7.9	1.0 1.0	14.0 9.0	ns
Output Disable Time	t <sub>pLZ</sub> t <sub>pHZ</sub>		3.3 ± 0.3 5.0 ± 0.5	— —	5.1 4.6	8.8 6.6	1.0 1.0	10.0 7.5	ns
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)			—	24	—	—	—	

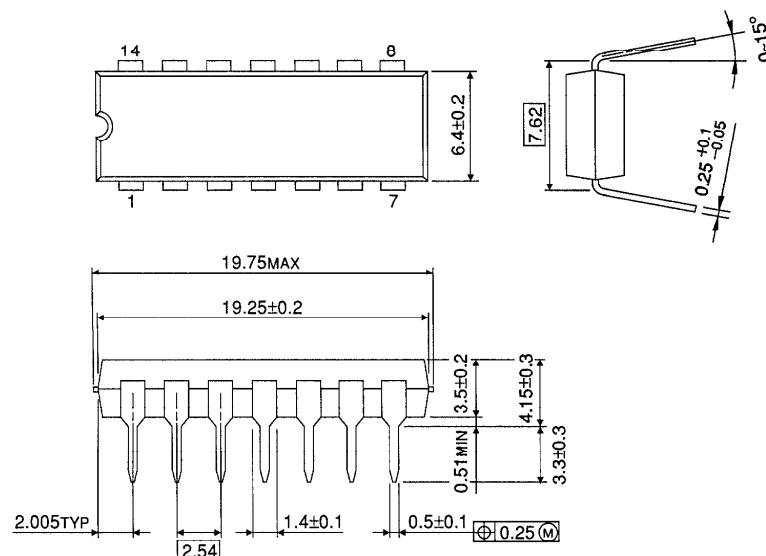
Note (1) C<sub>PD</sub> is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation :

$$I_{CC(\text{opr.})} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}/4 \text{ (per Gate)}$$

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

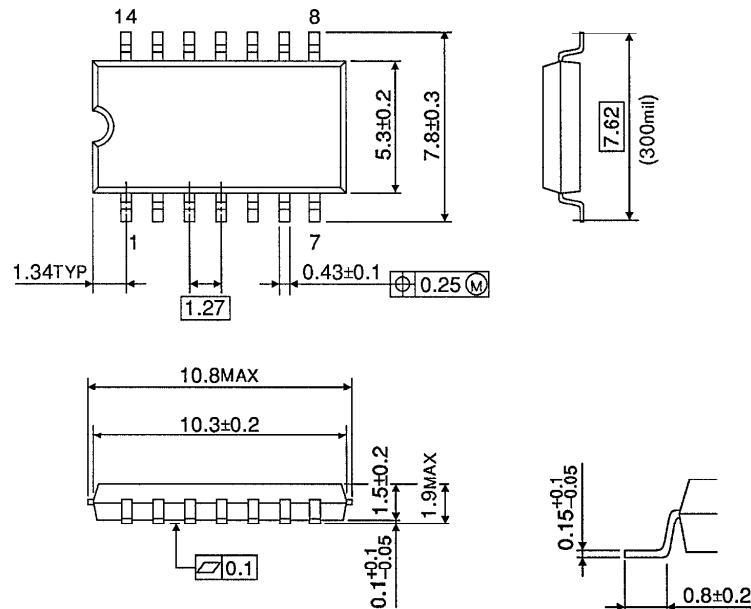
Unit in mm



Weight : 0.96g (TYP.)

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

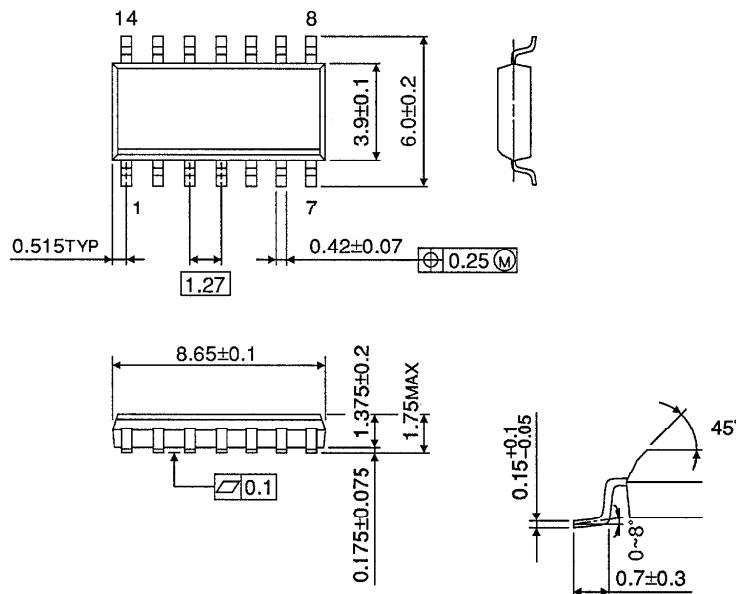
Unit in mm



Weight : 0.18g (TYP.)

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

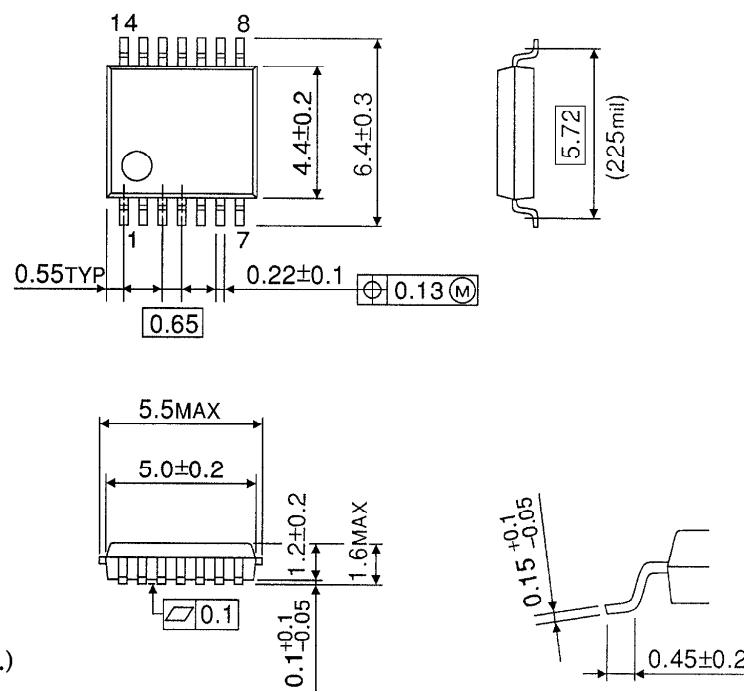
Unit in mm



Weight : 0.12g (TYP.)

**SSOP 14PIN OUTLINE DRAWING (SSOP14-P-225)**

Unit in mm



Weight : 0.07g (TYP.)