

**TC74VHCT367AF, TC74VHCT367AFN, TC74VHCT367AFT**

HEX BUS BUFFER  
 TC74VHCT367 AF/AFN/AFT NON-INVERTED, 3-STATE OUTPUTS

The TC74VHCT367A is advanced high speed CMOS HEX BUS BUFFERS fabricated with silicon gate 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. They contain six buffers; four buffers are controlled by an enable input ( $\overline{G1}$ ), and the other two buffers are controlled by another enable input ( $\overline{G2}$ ). The outputs of each buffer group are enabled when  $\overline{G1}$  and/or  $\overline{G2}$  inputs are held low; if held high, these outputs are in a high impedance state. The TC74VHCT367A is a non-inverting output type. Input protection and output circuit ensure that 0 to 5.5V can be applied to the input and output\*1 pins without regard to the supply voltage. These structure prevents device destruction due to mismatched supply and input/output voltages such as battery back up, hot board insertion, etc.

\*1: output in off-state

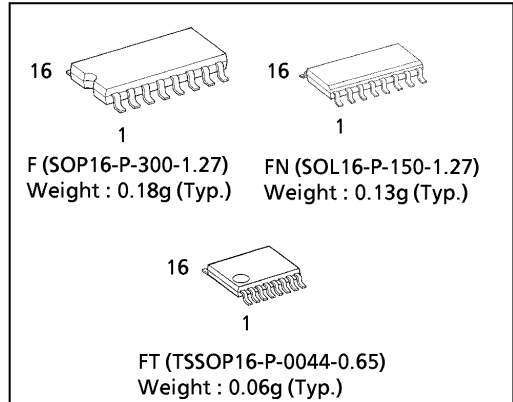
**FEATURES :**

- High Speed.....  $t_{pd} = 5.5ns$  (typ.) at  $V_{CC} = 5V$
- Low Power Dissipation.....  $I_{CC} = 4\mu A$  (Max.) at  $T_a = 25^\circ C$
- Compatible with TTL outputs ...  $V_{IL} = 0.8V$  (Max.)  
 $V_{IH} = 2.0V$  (Min.)
- Power Down Protection is provided on all inputs and outputs
- Balanced Propagation Delays.....  $t_{pLH} \approx t_{pHL}$
- Low Noise .....  $V_{OLP} = 0.8V$  (Max.)
- Pin and Function Compatible with the 74ALS367.

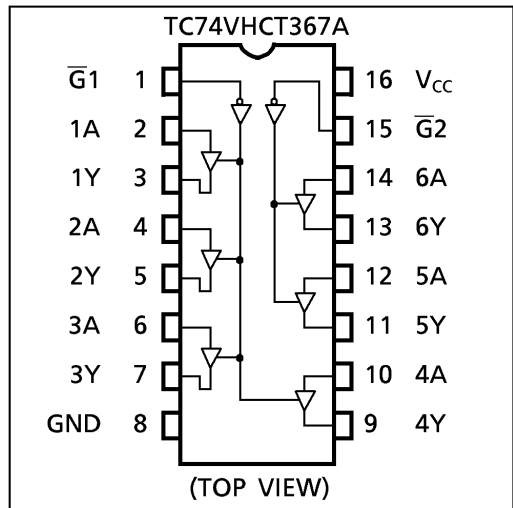
**TRUTH TABLE**

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

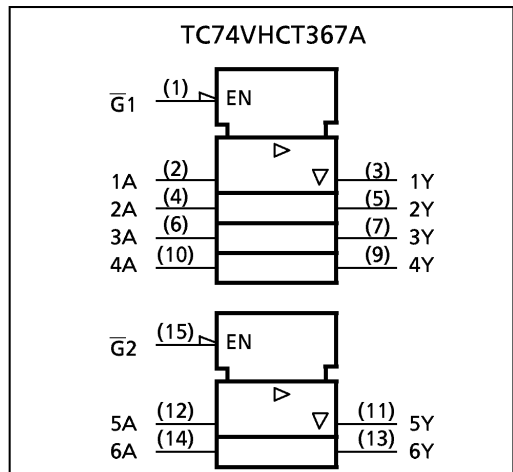
X : Don't Care  
 Z : High Impedance



**PIN ASSIGNMENT**



**IEC LOGIC SYMBOL**



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## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage Range	$V_{CC}$	-0.5~7.0	V
DC Input Voltage	$V_{IN}$	-0.5~7.0	V
DC Output Voltage	$V_{OUT}$	-0.5~7.0 (Note 1)	V
		-0.5~ $V_{CC} + 0.5$ (Note 2)	
Input Diode Current	$I_{IK}$	-20	mA
Output Diode Current	$I_{OK}$	$\pm 20$ (Note 3)	mA
DC Output Current	$I_{OUT}$	$\pm 25$	mA
DC Vcc/Ground Current	$I_{CC}$	$\pm 75$	mA
Power Dissipation	$P_D$	180	mW
Storage Temperature	$T_{stg}$	-65~150	°C

(Note 1)  $V_{CC} = 0V$

(Note 2) High or Low State.  $I_{OUT}$  absolute maximum rating must be observed.

(Note 3)  $V_{OUT} < GND$ ,  $V_{OUT} > V_{CC}$

## RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	$V_{CC}$	4.5~5.5	V
Input Voltage	$V_{IN}$	0~5.5	V
Output Voltage	$V_{OUT}$	0~5.5 (Note 4)	V
		0~ $V_{CC}$ (Note 5)	
Operating Temperature	$T_{opr}$	-40~85	°C
Input Rise and Fall Time	$dt/dV$	0~20	ns/V

(Note 4)  $V_{CC} = 0V$

(Note 5) High or Low State

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## DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITON		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>			4.5~5.5	2.0	—	—	2.0	—	V
Low - Level Input Voltage	V <sub>IL</sub>			4.5~5.5	—	—	0.8	—	0.8	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	4.5	4.40	4.50	—	4.40	—	V
			I <sub>OH</sub> = -8mA	4.5	3.94	—	—	3.80	—	
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	4.5	—	0.0	0.10	—	0.10	V
			I <sub>OL</sub> = 8mA	4.5	—	—	0.36	—	0.44	
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		5.5	—	—	± 0.25	—	± 2.50	μA
Input Leakage Current	I <sub>IN</sub>	V <sub>IN</sub> = 5.5V or GND		0~5.5	—	—	± 0.1	—	± 1.0	
Quiescent Supply Current	I <sub>CC</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND		5.5	—	—	4.0	—	40.0	mA
	I <sub>CCT</sub>	PER INPUT : V <sub>IN</sub> = 3.4V OTHER INPUT : V <sub>CC</sub> or GND		5.5	—	—	1.35	—	1.50	
Output Leakage Current	I <sub>OPD</sub>	V <sub>OUT</sub> = 5.5V		0	—	—	+ 0.5	—	+ 5.0	μA

AC ELECTRICAL CHARACTERISTICS (Input  $t_r = t_f = 3\text{ns}$ )

PARAMETER	SYMBOL	TEST CONDITION		Ta = 25°C			Ta = -40~85°C		UNIT	
		V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	MIN.	TYP.	MAX.	MIN.	MAX.		
Propagation Delay Time	t <sub>pLH</sub>	5.0 ± 0.5	15	—	4.7	7.4	1.0	8.5	ns	
	t <sub>pHL</sub>		50	—	5.2	8.4	1.0	9.5		
3-State Output Enable Time	t <sub>pZL</sub>	R <sub>L</sub> = 1kΩ	15	—	4.9	10.4	1.0	12.0		
	t <sub>pZH</sub>		50	—	5.4	11.4	1.0	13.0		
3-State Output Disable Time	t <sub>pLZ</sub>	R <sub>L</sub> = 1kΩ	5.0 ± 0.5	50	—	6.3	11.4	1.0		13.0
	t <sub>pHZ</sub>		(Note 6)	5.0 ± 0.5	50	—	—	1.0		—
Output to Output Skew	t <sub>osLH</sub> t <sub>osHL</sub>	(Note 6)	5.0 ± 0.5	50	—	—	1.0	—	1.0	
Input Capacitance	C <sub>IN</sub>			—	4	10	—	10	pF	
Output Capacitance	C <sub>OUT</sub>			—	9	—	—	—		
Power Dissipation Capacitance (Note 7)	C <sub>PD</sub>	TC74VHCT367A		—	16	—	—	—		

(Note 6) Parameter guaranteed by design.  $t_{osLH} = |t_{pLHm} - t_{pLHn}|$ ,  $t_{osHL} = |t_{pHLm} - t_{pHLn}|$

(Note 7) 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 :

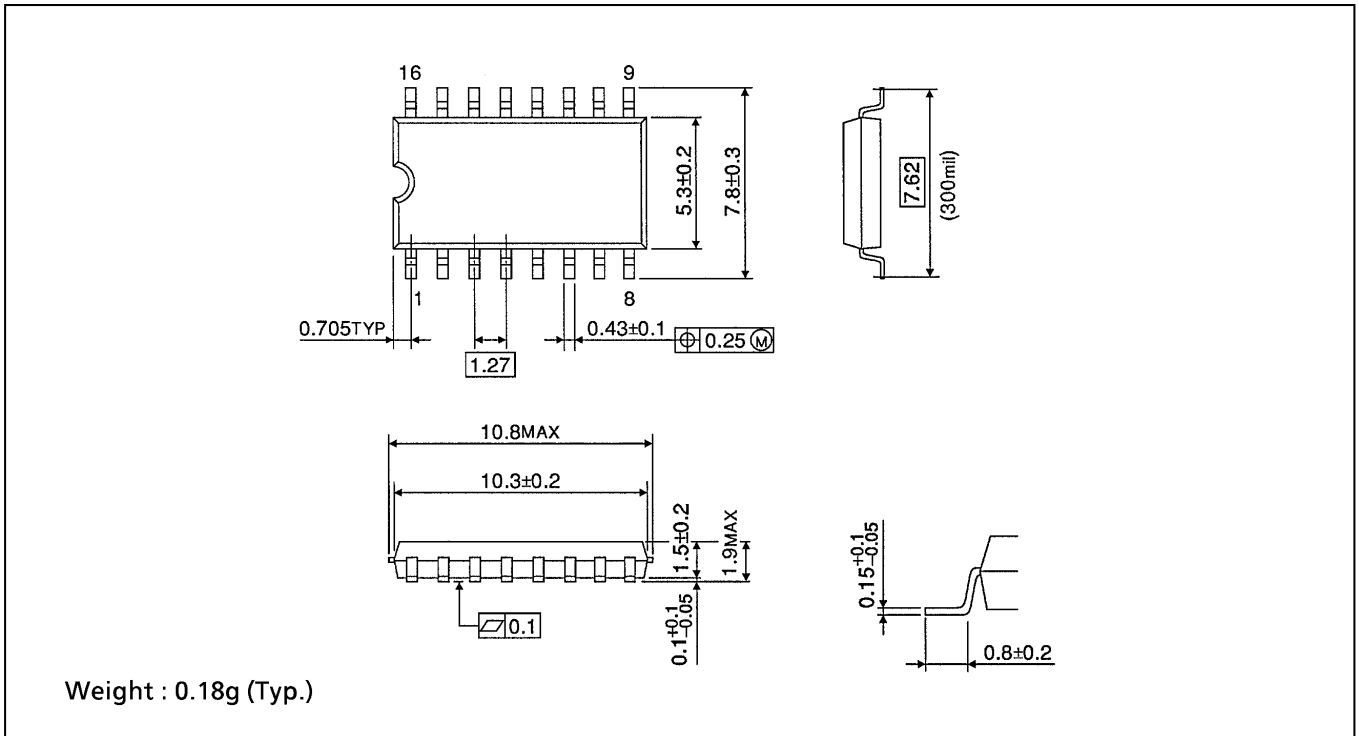
$$I_{CC(opr.)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC} / 6 \text{ (per bit)}$$

NOISE CHARACTERISTICS (Input  $t_r = t_f = 3\text{ns}$ )

PARAMETER	SYMBOL	TEST CONDITION		Ta = 25°C		UNIT
		V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	TYP.	MAX.	
Quiet Output Maximum Dynamic V <sub>OL</sub>	V <sub>OLP</sub>	C <sub>L</sub> = 50pF	5.0	0.6	0.8	V
Quiet Output Minimum Dynamic V <sub>OL</sub>	V <sub>OLV</sub>	C <sub>L</sub> = 50pF	5.0	-0.6	-0.8	V
Minimum High Level Dynamic Input Voltage	V <sub>IHD</sub>	C <sub>L</sub> = 50pF	5.0	—	2.0	V
Maximum Low Level Dynamic Input Voltage	V <sub>ILD</sub>	C <sub>L</sub> = 50pF	5.0	—	0.8	V

**SOP 16PIN (200mil BODY) OUTLINE DRAWING (SOP16-P-300-1.27)**

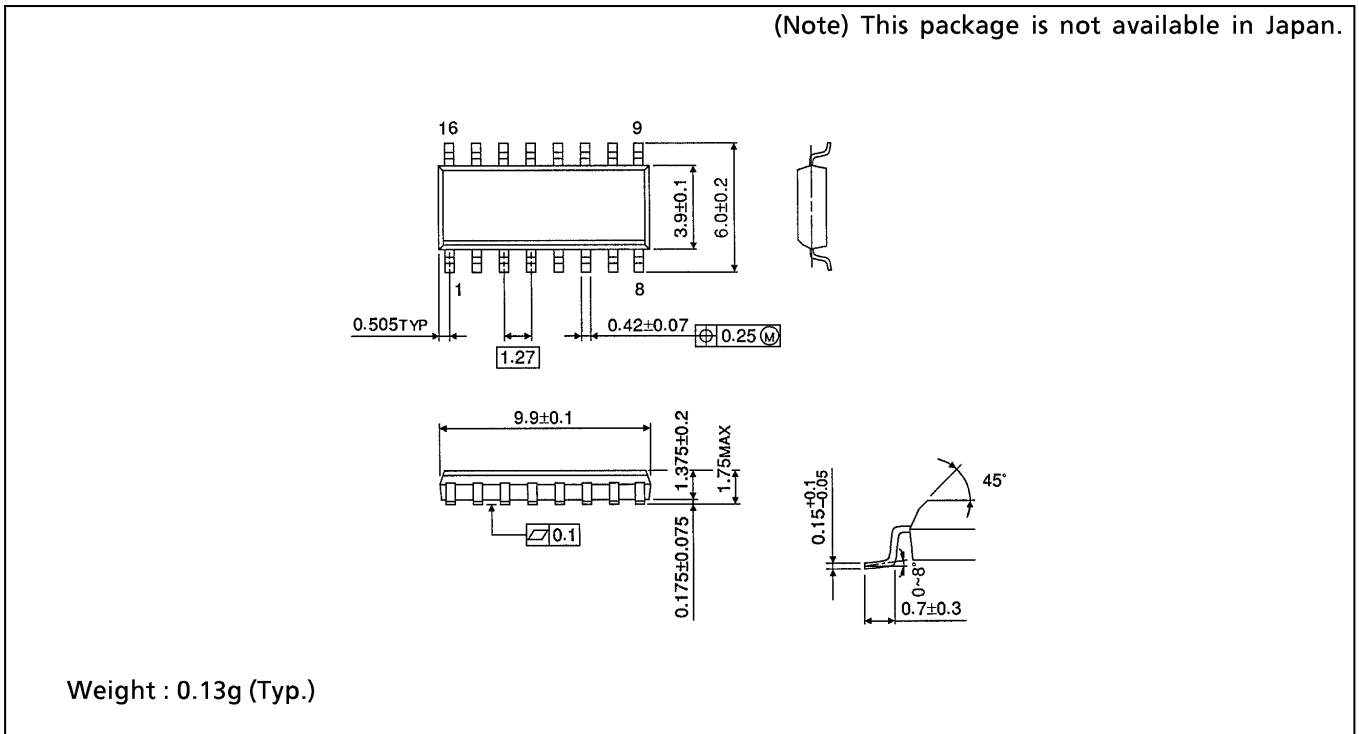
Unit in mm



**SOP 16PIN (150mil BODY) OUTLINE DRAWING (SOP16-P-150-1.27)**

Unit in mm

(Note) This package is not available in Japan.



**TSSOP 16PIN OUTLINE DRAWING (TSSOP16-P-0044-0.65)**

Unit in mm

