

TENTATIVE TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TC7W34FU, TC7W34FK

(UNDER DEVELOPMENT)

## TRIPLE NON-INVERT BUFFER

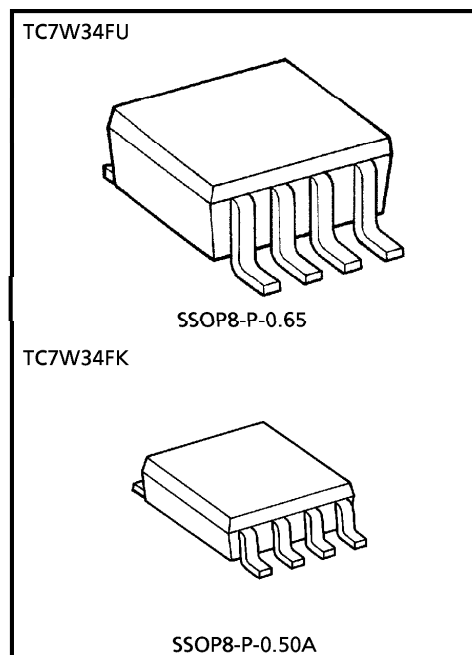
The TC7W34FU is high speed CMOS BUFFER fabricated with silicon gate CMOS technology.

The internal circuit is composed of 2 stage including buffer output, which enable high noise immunity and stable output.

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

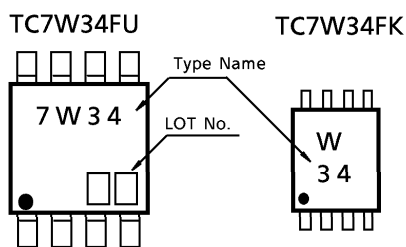
### FEATURES

- High Speed .....  $t_{pd} = 6ns$  (Typ.) at  $V_{CC} = 5V$
- Low Power Dissipation .....  $I_{CC} = 1\mu A$  (Max.) at  $T_a = 25^\circ C$
- High Noise Immunity .....  $V_{NIH} = V_{NIL} = 28\% V_{CC}$  (Min.)
- Output Drive Capability ..... 10 LSTTL Loads
- Symmetrical Output Impedance...  $|I_{OH}| = |I_{OL}| = 4mA$  (Min.)
- Balanced Propagation Delays.....  $t_{pLH} = t_{pHL}$
- Wide Operating Voltage Range...  $V_{CC} (opr) = 2\sim 6V$



Weight  
 SSOP8-P-0.65 : 0.02g (Typ.)  
 SSOP8-P-0.50A : 0.01g (Typ.)

### MARKING



### TRUTH TABLE

A	Y
L	L
H	H

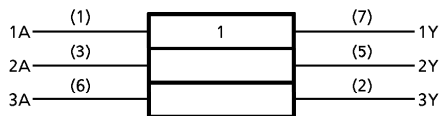
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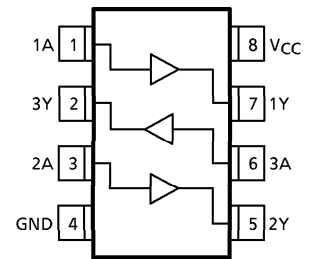
**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage Range	V <sub>CC</sub>	- 0.5~7	V
DC Input Voltage	V <sub>IN</sub>	- 0.5~V <sub>CC</sub> + 0.5	V
DC Output Voltage	V <sub>OUT</sub>	- 0.5~V <sub>CC</sub> + 0.5	V
Input Diode Current	I <sub>IK</sub>	± 20	mA
Output Diode Current	I <sub>OK</sub>	± 20	mA
DC Output Current	I <sub>OUT</sub>	± 25	mA
DC V <sub>CC</sub> / Ground Current	I <sub>CC</sub>	± 25	mA
Power Dissipation	P <sub>D</sub>	300	mW
Storage Temperature	T <sub>stg</sub>	- 65~150	°C
Lead Temperature (10 s)	T <sub>L</sub>	260	°C

**LOGIC DIAGRAM**



**PIN ASSIGNMENT (TOP VIEW)**



**RECOMMENDED OPERATING CONDITIONS**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage Range	V <sub>CC</sub>	2~6	V
Input Voltage	V <sub>IN</sub>	0~V <sub>CC</sub>	V
Output Voltage	V <sub>OUT</sub>	0~V <sub>CC</sub>	V
Operating Temperature	T <sub>opr</sub>	- 40~85	°C
Input Rise and Fall Time	t <sub>r</sub> , t <sub>f</sub>	0~1000 (V <sub>CC</sub> = 2.0V)	ns
		0~500 (V <sub>CC</sub> = 4.5V)	
		0~400 (V <sub>CC</sub> = 6.0V)	

**DC ELECTRICAL CHARACTERISTICS**

CHARACTERISTIC	SYMBOL	TEST CONDITION		Ta = 25°C			Ta = -40~85°C		UNIT	
				V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.
High-Level Input Voltage	V <sub>IH</sub>			2.0	1.5	—	—	1.5	—	V
				4.5	3.15	—	—	3.15	—	
				6.0	4.2	—	—	4.2	—	
Low-Level Input Voltage	V <sub>IL</sub>			2.0	—	—	0.5	—	0.5	V
				4.5	—	—	1.35	—	1.35	
				6.0	—	—	1.8	—	1.8	
High-Level Output Voltage	V <sub>OH</sub>	V <sub>IN</sub> = V <sub>IH</sub>	I <sub>OH</sub> = -20μA	2.0	1.9	2.0	—	1.9	—	V
				4.5	4.4	4.5	—	4.4	—	
				6.0	5.9	6.0	—	5.9	—	
				I <sub>OH</sub> = -4mA	4.5	4.18	4.31	—	4.13	
I <sub>OH</sub> = -5.2mA	6.0	5.68	5.80	—	5.63	—				
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>IN</sub> = V <sub>IL</sub>	I <sub>OL</sub> = 20μA	2.0	—	0.0	0.1	—	0.1	V
				4.5	—	0.0	0.1	—	0.1	
				6.0	—	0.0	0.1	—	0.1	
				I <sub>OL</sub> = 4mA	4.5	—	0.17	0.26	—	
I <sub>OL</sub> = 5.2mA	6.0	—	0.18	0.26	—	0.33				
Input Leakage Current	I <sub>IN</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND		6.0	—	—	±0.1	—	±1.0	μA
Quiescent Supply Current	I <sub>CC</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND		6.0	—	—	1.0	—	10.0	μA

**AC ELECTRICAL CHARACTERISTICS (C<sub>L</sub> = 15pF, V<sub>CC</sub> = 5V, Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta = 25°C			UNIT
			MIN.	TYP.	MAX.	
Output Transition Time	t <sub>TLH</sub> t <sub>THL</sub>	—	—	4	8	ns
Propagation Delay Time	t <sub>pLH</sub> t <sub>pHL</sub>	—	—	6	12	ns

**AC ELECTRICAL CHARACTERISTICS (C<sub>L</sub> = 50pF, Input t<sub>r</sub> = t<sub>f</sub> = 6ns)**

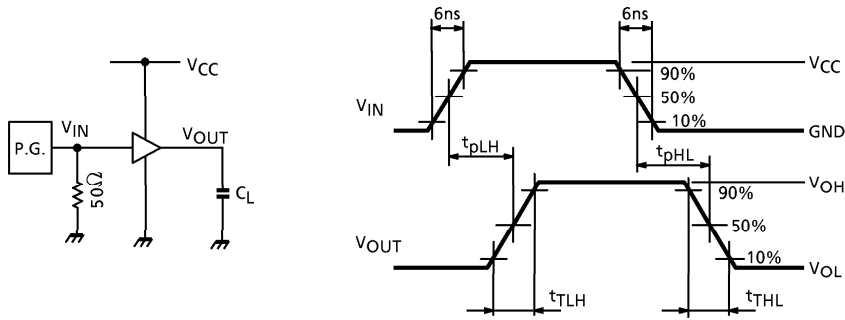
CHARACTERISTIC	SYMBOL	TEST CONDITION		Ta = 25°C			Ta = -40~85°C		UNIT	
				V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.
Output Transition Time	t <sub>TLH</sub> t <sub>THL</sub>	—		2.0	—	30	75	—	95	ns
				4.5	—	8	15	—	19	
				6.0	—	7	13	—	16	
Propagation Delay Time	t <sub>pLH</sub> t <sub>pHL</sub>	—		2.0	—	27	75	—	95	ns
				4.5	—	9	15	—	19	
				6.0	—	8	13	—	16	
Input Capacitance	C <sub>IN</sub>	—		—	5	10	—	10	pF	
Power Dissipation Capacitance	C <sub>PD</sub>	(Note 1)		—	20	—	—	—	pF	

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

Average operating current can be obtained by the equation hereunder.

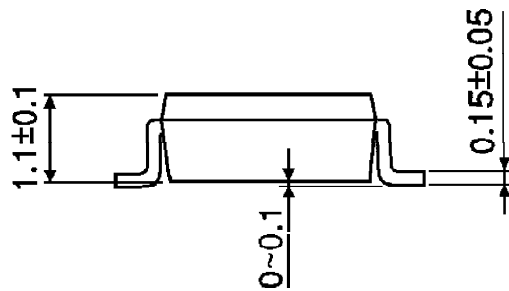
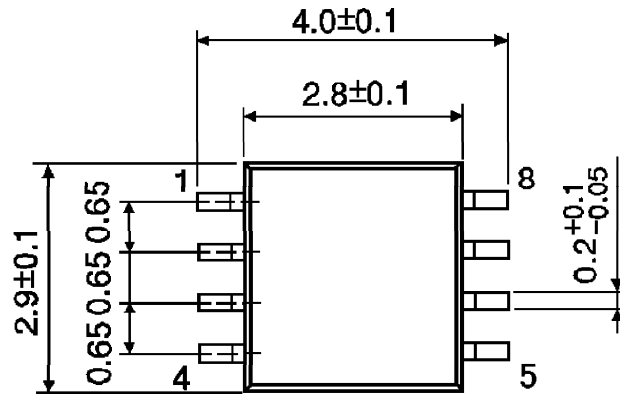
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC} / 3 \text{ (per gate)}$$

SWITCHING CHARACTERISTICS TEST CIRCUIT



**OUTLINE DRAWING**  
SSOP8-P-0.65

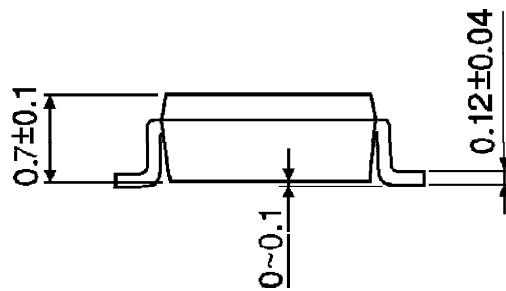
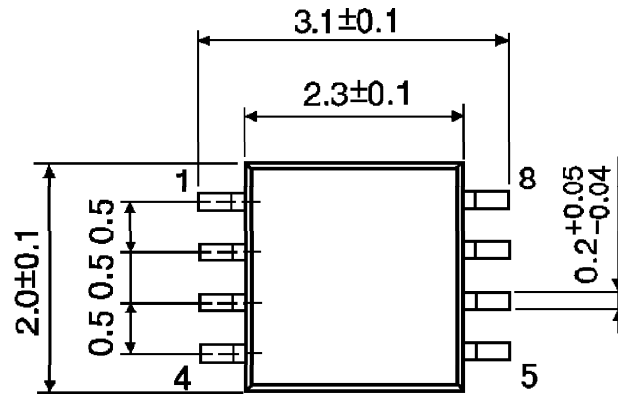
Unit : mm



Weight : 0.02g (Typ.)

OUTLINE DRAWING  
SSOP8-P-0.50A

Unit : mm



Weight : 0.01g (Typ.)