

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC7SZU04F, TC7SZU04FU

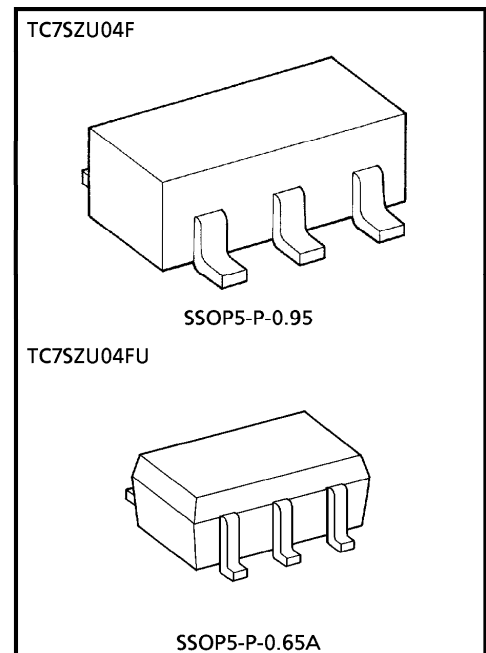
INVERTER (UNBUFFER)

FEATURES

- High Output Drive : $\pm 16\text{mA}$ (Typ.) @ $V_{CC} = 4.5\text{V}$
- Super High Speed Operation : $t_{pD} 2.4\text{ns}$ (Typ.)
@ $V_{CC} = 5\text{V}, 50\text{pF}$
- Operation Voltage Range : $V_{CC}(\text{opr}) = 1.8\sim 5.5\text{V}$

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage Range	V_{CC}	$-0.5\sim 6$	V
DC Input Voltage	V_{IN}	$-0.5\sim 6$	V
DC Output Voltage	V_{OUT}	$-0.5\sim V_{CC} + 0.5$	V
Input Diode Current	I_{IK}	± 20	mA
Output Diode Current	I_{OK}	± 20	mA
DC Output Current	I_{OUT}	± 50	mA
DC V_{CC} /Ground Current	I_{CC}	± 50	mA
Power Dissipation	P_D	200	mW
Storage Temperature	T_{stg}	$-65\sim 150$	$^\circ\text{C}$
Lead Temperature (10s)	T_L	260	$^\circ\text{C}$



Weight
 SSOP5-P-0.95 : 0.016g (Typ.)
 SSOP5-P-0.65A : 0.006g (Typ.)

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DC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	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}		1.8 - 2.7	0.85 × V _{CC}	—	—	0.85 × V _{CC}	—	V			
			3.0 - 5.5	0.8 × V _{CC}	—	—	0.8 × V _{CC}	—				
Low-Level Input Voltage	V _{IL}		1.8 - 2.7	—	—	0.15 × V _{CC}	—	0.15 × V _{CC}	V			
			3.0 - 5.5	—	—	0.2 × V _{CC}	—	0.2 × V _{CC}				
High-Level Output Voltage	V _{OH}	V _{IN} = V _{IL}	I _{OH} = -100 μA	1.8	1.6	1.8	—	1.6	V			
				2.3	2.1	2.3	—	2.1				
				3.0	2.7	3.0	—	2.7				
			I _{OH} = -4mA	4.5	4.0	4.4	—	4.0		—		
				I _{OH} = -8mA	2.3	1.9	2.14	—		1.9	—	
					I _{OH} = -12mA	3.0	2.4	2.75		—	2.4	—
						I _{OH} = -16mA	3.0	2.3		2.61	—	2.3
Low-Level Output Voltage	V _{OL}	V _{IN} = V _{IH}	I _{OH} = 100 μA	1.8	—	0	0.2	—	V			
				2.3	—	0	0.2	—		0.2		
				3.0	—	0	0.3	—		0.3		
			I _{OH} = 4mA	4.5	—	0	0.5	—		0.5		
				I _{OH} = 8mA	2.3	—	0.1	0.3		—	0.3	
					I _{OH} = 12mA	3.0	—	0.17		0.4	—	0.4
						I _{OH} = 16mA	3.0	—		0.25	0.55	—
Input Leakage Current	I _{IIN}	V _{IN} = 5.5V or GND	0 - 5.5	—	—	±1	—	±10	μA			
Quiescent Supply Current	I _{CC}	V _{IN} = V _{CC} or GND	5.5	—	—	2	—	20	μA			

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

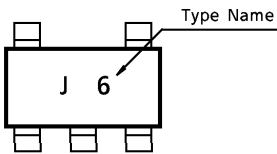
CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta = 25°C			Ta = -40~85°C		UNIT	
			V _{CC} (V)	MIN.	TYP.	MAX.	MIN.		MAX.
Propagation Delay Time	t _{PLH} t _{PHL}	C _L = 15pF, R _L = 1MΩ	1.8	1.0	—	8.5	1.0	9.0	ns
			2.5 ± 0.2	0.8	—	6.2	0.8	6.5	
			3.3 ± 0.3	0.5	—	4.5	0.5	4.8	
			5.0 ± 0.5	0.5	—	3.9	0.5	4.1	
		C _L = 50pF, R _L = 500Ω	3.3 ± 0.3	1.0	—	6.0	1.5	6.5	
			5.0 ± 0.5	0.8	—	5.0	0.8	5.5	
Input Capacitance	C _{IN}		0 - 5.5	—	4.5	—	—	pF	
Power Dissipation Capacitance	C _{PD}	(Note 1)	3.3	—	6.3	—	—	pF	
			5.5	—	9.5	—	—		

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

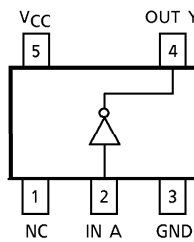
Average operating current can be obtained by the equation.

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

MARKING



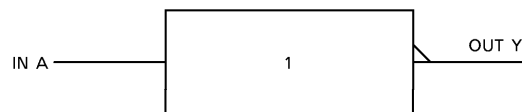
PIN ASSIGNMENT (TOP VIEW)



TRUTH TABLE

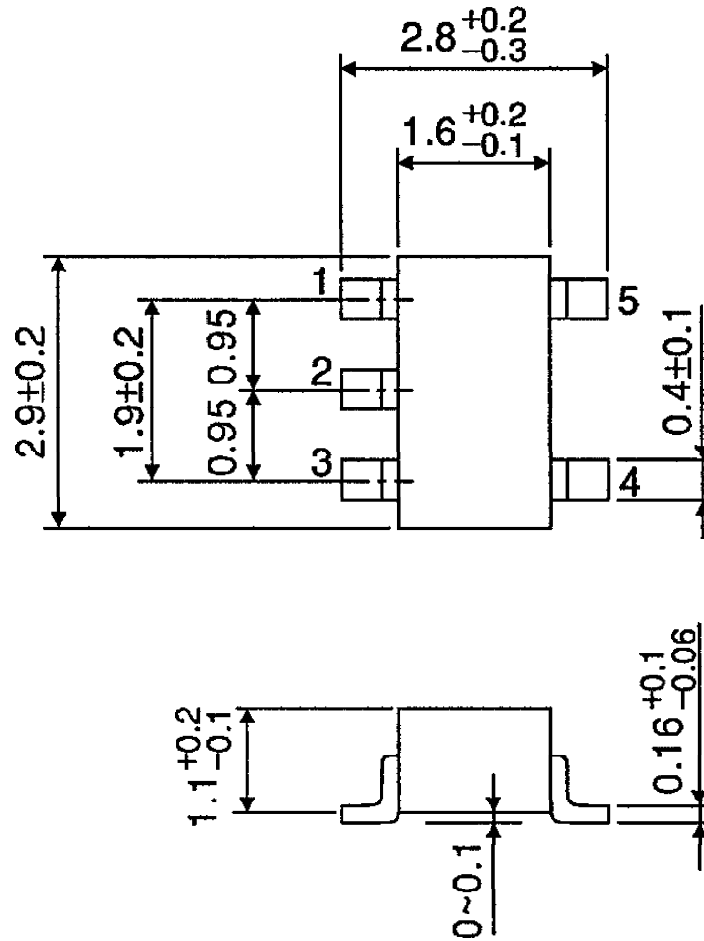
A	Y
L	H
H	L

LOGIC DIAGRAM



OUTLINE DRAWING
SSOP5-P-0.95

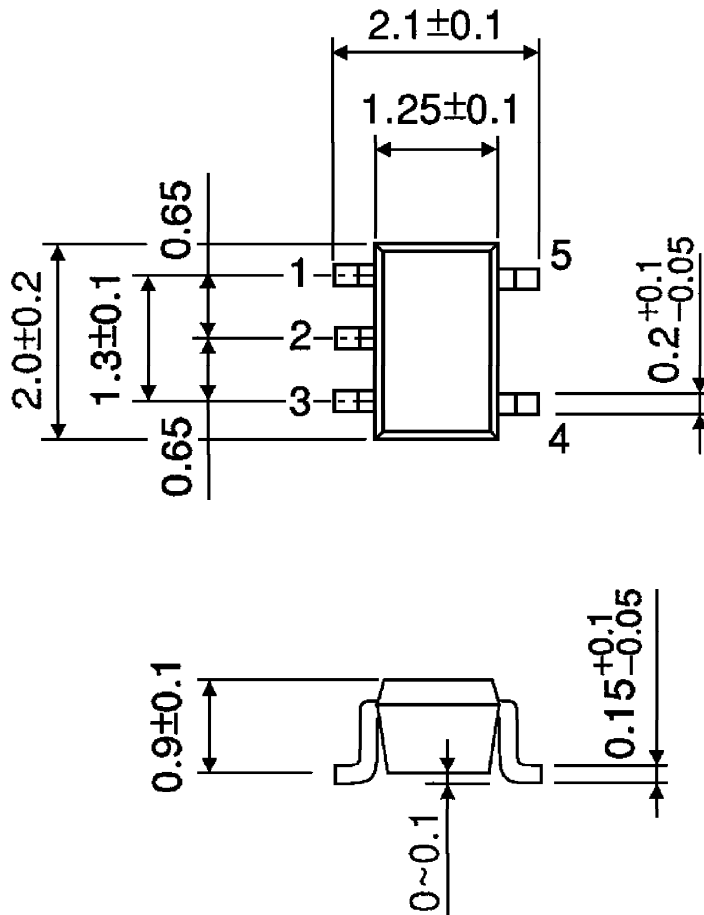
Unit : mm



Weight : 0.016g (Typ.)

OUTLINE DRAWING
SSOP5-P-0.65A

Unit : mm



Weight : 0.006g (Typ.)