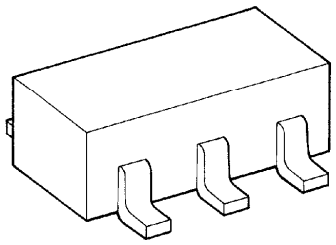
TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC7SZ04F, TC7SZ04FU

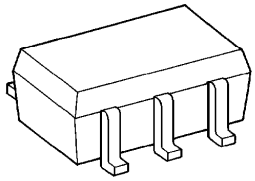
INVERTER

FEATURES

- High Output Drive : ±24mA (Typ.) @V_{CC} = 3V
- Super High Speed Operation : t_{PD} 2.4ns (Typ.) @V_{CC} = 5V, 50pF
- Operation Voltage Range : V_{CC} (opr) = 1.8~5.5V
- 5V Tolerant Function
- Matches the Performance of TC74LCX Series when Operated at 3.3V V_{CC}



SSOP5-P-0.95



SSOP5-P-0.65A

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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage Range	V_{CC}	−0.5~6	V
DC Input Voltage	V_{IN}	−0.5~6	V
DC Output Voltage	V_{OUT}	−0.5~6	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}	−65~150	°C
Lead Temperature (10s)	T_L	260	°C

DC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYM-BOL	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	0.88 × V_{CC}	—	—	0.88 × V_{CC}	—	V
				2.3 – 5.5	0.75 × V_{CC}	—	—	0.75 × V_{CC}	—	
Low-Level Input Voltage	V_{IL}			1.8	—	—	0.12 × V_{CC}	—	0.12 × V_{CC}	V
				2.3 – 5.5	—	—	0.25 × V_{CC}	—	0.25 × V_{CC}	
High-Level Output Voltage	V_{OH}	V_{IN} = V_{IL}	IOH = − 100 μA	1.8	1.7	1.8	—	1.7	—	V
				2.3	2.2	2.3	—	2.2	—	
				3.0	2.9	3.0	—	2.9	—	
				4.5	4.4	4.5	—	4.4	—	
			IOH = − 8mA	2.3	1.9	2.15	—	1.9	—	V
			IOH = − 16mA	3.0	2.4	2.8	—	2.4	—	
			IOH = − 24mA	3.0	2.3	2.68	—	2.3	—	
			IOH = − 32mA	4.5	3.8	4.2	—	3.8	—	
Low-Level Output Voltage	V_{OL}	V_{IN} = V_{IH}	IOH = 100 μA	1.8	—	0	0.1	—	0.1	V
				2.3	—	0	0.1	—	0.1	
				3.0	—	0	0.1	—	0.1	
				4.5	—	0	0.1	—	0.1	
			IOH = 8mA	2.3	—	0.1	0.3	—	0.3	V
			IOH = 16mA	3.0	—	0.15	0.4	—	0.4	
			IOH = 24mA	3.0	—	0.22	0.55	—	0.55	
			IOH = 32mA	4.5	—	0.22	0.55	—	0.55	
Input Leakage Current	I_{IN}	V_{IN} = 5.5V or GND		0 – 5.5	—	—	± 1	—	± 10	μA
Power Off Leakage Current	I_{OFF}	V_{IN} or V_{OUT} = 5.5V		0.0	—	—	1	—	10	μA
Quiescent Supply Current	I_{CC}	V_{IN} = V_{CC} or GND		5.5	—	—	2	—	20	μA

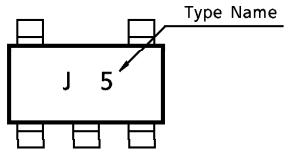
AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3ns$)

CHARACTERISTIC	SYM-BOL	TEST CONDITION	V_{CC} (V)	Ta = 25°C			Ta = −40~85°C		UNIT
				MIN.	TYP.	MAX.	MIN.	MAX.	
Propagation Delay Time	tPLH tPHL	CL = 15pF, RL = 1MΩ	1.8	2.0	4.4	9.5	2.0	10.0	ns
			2.5 ± 0.2	0.8	2.9	6.5	0.8	7.0	
			3.3 ± 0.3	0.5	2.1	4.5	0.5	4.7	
			5.0 ± 0.5	0.5	1.8	3.9	0.5	4.1	
		CL = 50pF, RL = 500Ω	3.3 ± 0.3	1.5	2.9	5.0	1.5	5.2	
			5.0 ± 0.5	0.8	2.4	4.3	0.8	4.5	
Input Capacitance	C_{IN}		0 – 5.5	—	4	—	—	—	pF
Power Dissipation Capacitance	C_{PD}	(Note 1)	3.3	—	20	—	—	—	pF
			5.5	—	26	—	—	—	

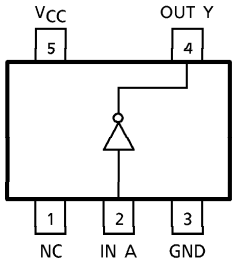
(Note 1) C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.
Average operating current can be obtained by the equation.

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

MARKING



PIN ASSIGNMENT (TOP VIEW)



TRUTH TABLE

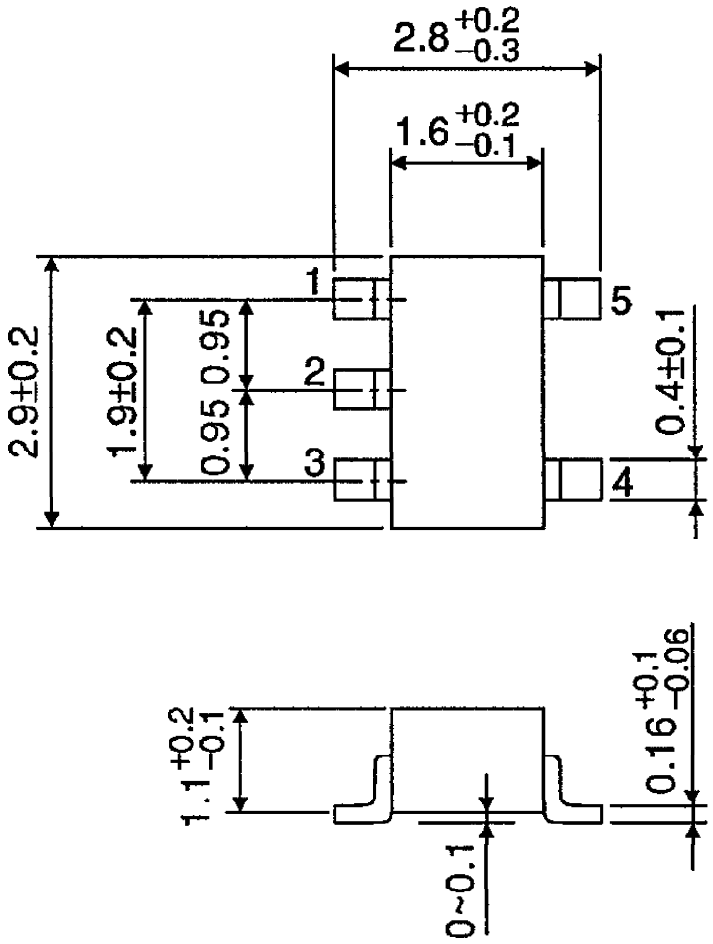
A	Y
L	H
H	L

LOGIC DIAGRAM

OUTLINE DRAWING

SSOP5-P-0.95

Unit : mm

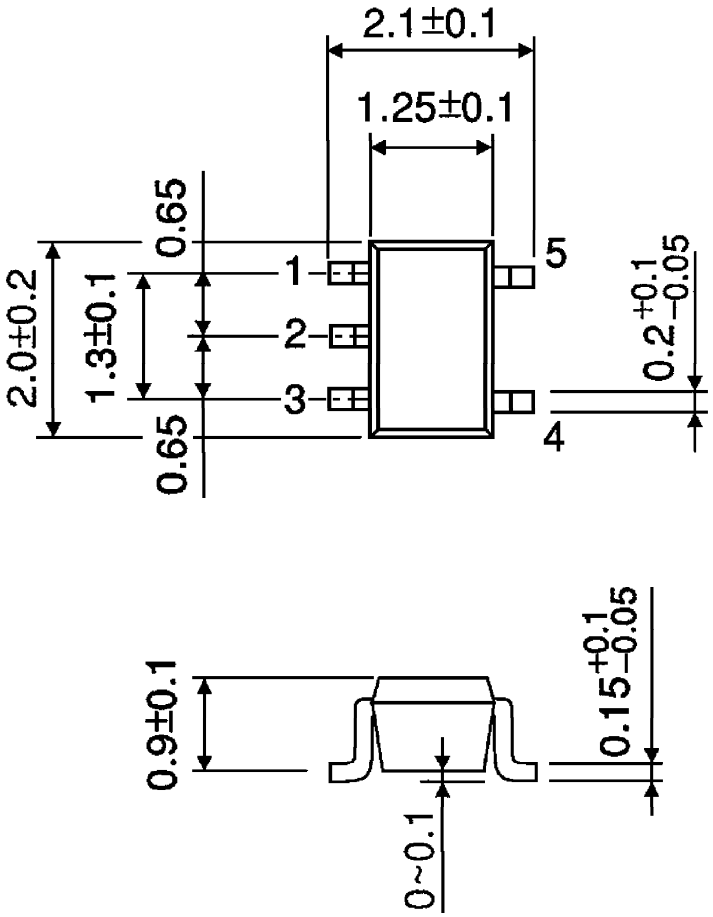


Weight : 0.016g (Typ.)

OUTLINE DRAWING

SSOP5-P-0.65A

Unit : mm



Weight : 0.006g (Typ.)