

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

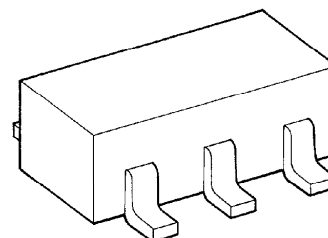
TC7SZ125F, TC7SZ125FU**BUS BUFFER****3-STATE OUTPUT****FEATURES**

- High Output Drive : ± 24 mA (Typ.)
($V_{CC} = 3$ V)
- Super High Speed Operation : $t_{pD} = 2.6$ ns (Typ.)
($V_{CC} = 5$ V, 50 pF)
- Operation Voltage Range : $V_{CC(opr)} = 1.8 \sim 5.5$ V
- Supply Voltage Data Retention : $V_{CC} = 1.5 \sim 5.5$ V
- 5 V Tolerant Function
- Matches the Performance of TC74LCX Series when
Operated at 3.3 V V_{CC}

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

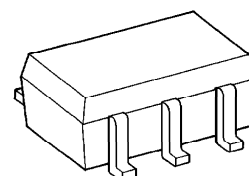
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage Range	V_{CC}	$-0.5 \sim 6$	V
DC Input Voltage	V_{IN}	$-0.5 \sim 6$	V
DC Output Voltage	V_{OUT}	$-0.5 \sim 6$	V
Input Diode Current	I_{IK}	± 20	mA
Output Diode Current	I_{OK}	± 20	mA
DC Output Current	I_{OUT}	± 50	mA
DC V_{CC} /Ground Current	I_{CC}	± 50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

TC7SZ125F



SSOP5-P-0.95

TC7SZ125FU



SSOP5-P-0.65A

Weight

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

980910EBA1

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DC ELECTRICAL CHARACTERISTICS

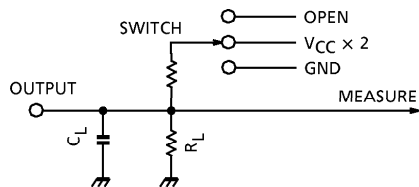
CHARACTERISTIC	SYMBOL	TEST CONDITION		V _{CC} (V)	Ta = 25°C			Ta = -40~85°C		UNIT
					MIN.	TYP.	MAX.	MIN.	MAX.	
High-Level Input Voltage	V _{IH}			1.8	0.88 × V _{CC}	—	—	0.88 × V _{CC}	—	V
				2.3~ 5.5	0.75 × V _{CC}	—	—	0.75 × V _{CC}	—	
Low-Level Input Voltage	V _{IL}			1.8	—	—	0.12 × V _{CC}	—	0.12 × V _{CC}	V
				2.3~ 5.5	—	—	0.25 × V _{CC}	—	0.25 × V _{CC}	
High-Level Output Voltage	V _{OH}	V _{IN} = V _{IH}	I _{OH} = -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	—	
			I _{OH} = -8 mA	2.3	1.9	2.15	—	1.9	—	
			I _{OH} = -16 mA	3.0	2.4	2.8	—	2.4	—	
			I _{OH} = -24 mA	3.0	2.3	2.68	—	2.3	—	
			I _{OH} = -32 mA	4.5	3.8	4.2	—	3.8	—	
Low-Level Output Voltage	V _{OL}	V _{IN} = V _{IL}	I _{OL} = 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	
			I _{OL} = 8 mA	2.3	—	0.1	0.3	—	0.3	
			I _{OL} = 16 mA	3.0	—	0.15	0.4	—	0.4	
			I _{OL} = 24 mA	3.0	—	0.22	0.55	—	0.55	
			I _{OL} = 32 mA	4.5	—	0.22	0.55	—	0.55	
Input Leakage Current	I _{IN}	V _{IN} = 5.5 V or GND		0~ 5.5	—	—	± 1	—	± 10	μA
Power Off Leakage Current	I _{OFF}	V _{IN} or V _{OUT} = 5.5 V		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 $t_r = t_f = 3\text{ ns}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta = 25°C			Ta = -40~85°C		UNIT
			VCC (V)	MIN.	TYP.	MAX.	MIN.	MAX.
Propagation Delay Time	tPLH tPHL	CL = 15 pF, RL = 1 MΩ (Figure 1)	1.8	2.0	5.3	11.0	2.0	11.5
			2.5 ± 0.2	0.8	3.4	7.5	0.8	8.0
			3.3 ± 0.3	0.5	2.5	5.2	0.5	5.5
			5.0 ± 0.5	0.5	2.1	4.5	0.5	4.8
		CL = 50 pF, RL = 500 Ω (Figure 1)	3.3 ± 0.3	1.5	3.2	5.7	1.5	6.0
			5.0 ± 0.5	0.8	2.6	5.0	0.8	5.3
Output Enable Time	tPZL tPZH	CL = 50 pF, RL = 500 Ω (Figure 1)	1.8	2.0	7.0	12.5	2.0	13.0
			2.5 ± 0.2	1.5	4.6	8.5	1.5	9.0
			3.3 ± 0.3	1.5	3.5	6.2	1.5	6.5
			5.0 ± 0.5	0.8	2.8	5.5	0.8	5.8
Output Disable Time	tPLZ tPHZ	CL = 50 pF, RL = 500 Ω (Figure 1)	1.8	2.0	5.4	11.0	2.0	12.0
			2.5 ± 0.2	1.5	3.5	8.0	1.5	8.5
			3.3 ± 0.3	1.0	2.8	5.7	1.0	6.0
			5.0 ± 0.5	0.5	2.1	4.7	0.5	5.0
Input Capacitance	CIN		0~5.5	—	4	—	—	pF
Power Dissipation Capacitance	CPD	(Note 1)	3.3	—	17	—	—	pF
			5.5	—	24	—	—	

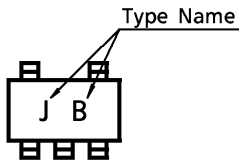
(Note 1) CPD is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.
Average operating current can be obtained by the equation.
 $I_{CC (opr)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$

Figure 1 AC Characteristics Measurement Circuit



CHARACTERISTICS	SWITCH
tPLH, tPHL	OPEN
tPLZ, tPZL	VCC × 2
tPHZ, tPZH	GND

MARKING

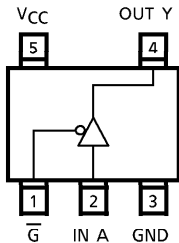


TRUTH TABLE

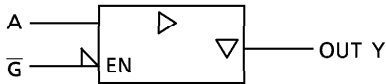
INPUT		OUTPUT
A	$\overline{G}$	Y
x	H	Z
L	L	L
H	L	H

x : Don't Care
Z : High Impedance

PIN ASSIGNMENT (TOP VIEW)

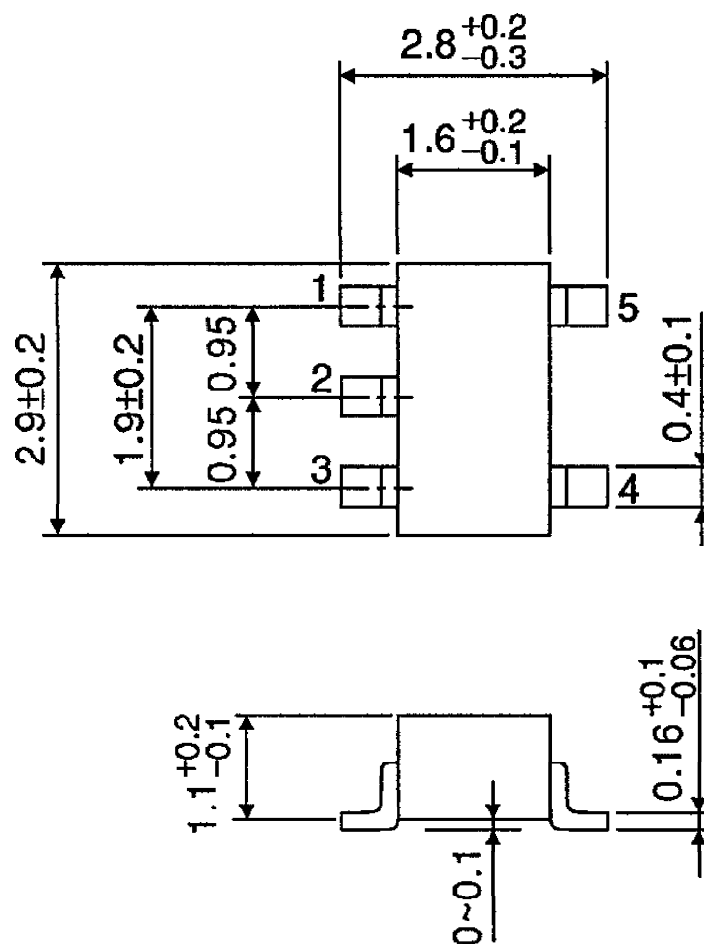


LOGIC DIAGRAM



OUTLINE DRAWING
SSOP5-P-0.95

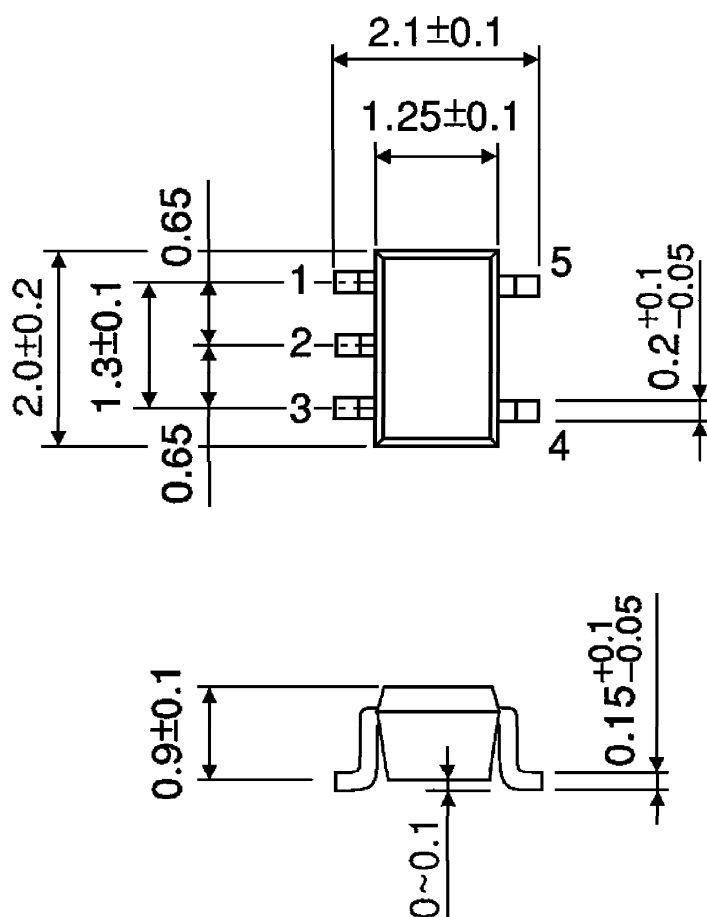
Unit : mm



Weight : 0.016 g (Typ.)

OUTLINE DRAWING
SSOP5-P-0.65A

Unit : mm



Weight : 0.006 g (Typ.)