

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

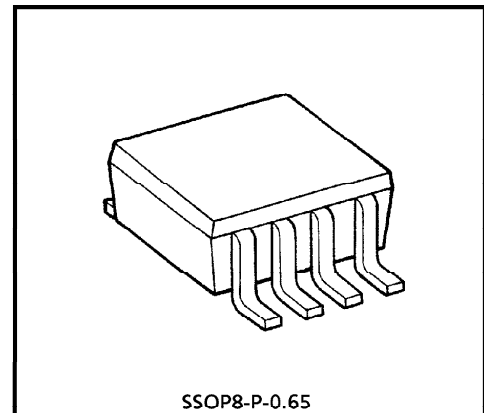
TC7W125FU

DUAL BUS BUFFER

The TC7W125FU is a high speed C²MOS DUAL BUS BUFFERS fabricated with silicon gate C²MOS technology. It achieve the high speed operation similar to equivalent LSTTL while maintaining the C²MOS low power dissipation.

The require 3-state control input \bar{G} to be set high to place the output into the high impedance.

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



SSOP8-P-0.65

Weight : 0.02g (Typ.)

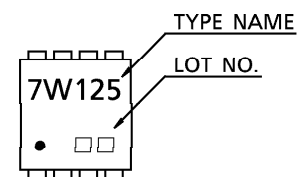
FEATURES

- High Speed $t_{pd} = 10\text{ns}$ (Typ.) at $V_{CC} = 5\text{V}$
- Low Power Dissipation $I_{CC} = 2\mu\text{A}$ (Max.) at $T_a = 25^\circ\text{C}$
- High Noise Immunity $V_{NIH} = V_{NIL} = 28\% V_{CC}$ (Min.)
- Output Drive Capability 15 LSTTL Loads
- Symmetrical Output Impedance $|I_{OH}| = I_{OL} = 6\text{mA}$ (Min.)
- Balanced Propagation Delays $t_{pLH} \cong t_{pHL}$
- Wide Operating Voltage Range $V_{CC}(\text{opr}) = 2\sim 6\text{V}$

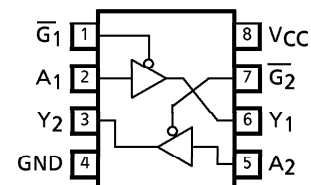
MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage Range	V_{CC}	-0.5~7	V
DC Input Voltage	V_{IN}	-0.5~ $V_{CC} + 0.5$	V
DC Output Voltage	V_{OUT}	-0.5~ $V_{CC} + 0.5$	V
Input Diode Current	I_{IK}	± 20	mA
Output Diode Current	I_{OK}	± 20	mA
DC Output Current	I_{OUT}	± 35	mA
DC V_{CC} / Ground Current	I_{CC}	± 37.5	mA
Power Dissipation	P_D	300	mW
Storage Temperature	T_{stg}	-65~150	$^\circ\text{C}$
Lead Temperature (10s)	T_L	260	$^\circ\text{C}$

MARKING



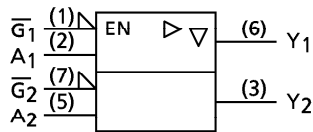
PIN ASSIGNMENT (TOP VIEW)



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LOGIC DIAGRAM



TRUTH TABLE

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

X : Don't Care
Z : High Impedance

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	V_{CC}	2~6	V
Input Voltage	V_{IN}	0~ V_{CC}	V
Output Voltage	V_{OUT}	0~ V_{CC}	V
Operating Temperature	T_{opr}	-40~85	°C
Input Rise and Fall Time	t_r, t_f	0~1000 ($V_{CC}=2.0V$) 0~500 ($V_{CC}=4.5V$) 0~400 ($V_{CC}=6.0V$)	ns

DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CIRCUIT	TEST CONDITION	Ta = 25°C			Ta = -40~85°C		UNIT		
				V_{CC}	MIN.	TYP.	MAX.	MIN.		MAX.	
High-Level Input Voltage	V_{IH}	—	—	2.0	1.5	—	—	1.5	—	V	
				4.5	3.15	—	—	3.15	—		
				6.0	4.2	—	—	4.2	—		
Low-Level Input Voltage	V_{IL}	—	—	2.0	—	—	0.5	—	0.5	V	
				4.5	—	—	1.35	—	1.35		
				6.0	—	—	1.8	—	1.8		
High-Level Output Voltage	V_{OH}	—	$V_{IN} = V_{IH}$ or V_{IL}	$I_{OH} = -20\mu A$	2.0	1.9	2.0	—	1.9	—	V
					4.5	4.4	4.5	—	4.4	—	
				$I_{OH} = -6mA$ $I_{OH} = -7.8mA$	4.5	4.18	4.31	—	4.13	—	
					6.0	5.68	5.80	—	5.63	—	
Low-Level Output Voltage	V_{OL}	—	$V_{IN} = V_{IL}$	$I_{OL} = 20\mu A$	2.0	—	0.0	0.1	—	0.1	V
					4.5	—	0.0	0.1	—	0.1	
				$I_{OL} = 6mA$ $I_{OL} = 7.8mA$	4.5	—	0.17	0.26	—	0.33	
					6.0	—	0.18	0.26	—	0.33	
3-State Output Off-State Current	I_{OZ}	—	$V_{IN} = V_{IH}$ or V_{IL} $V_{OUT} = V_{CC}$ or GND	6.0	—	—	± 0.5	—	± 5.0	μA	
Input Leakage Current	I_{IN}	—	$V_{IN} = V_{CC}$ or GND	6.0	—	—	± 0.1	—	± 1.0		
Quiescent Supply Current	I_{CC}	—	$V_{IN} = V_{CC}$ or GND	6.0	—	—	2.0	—	20.0		

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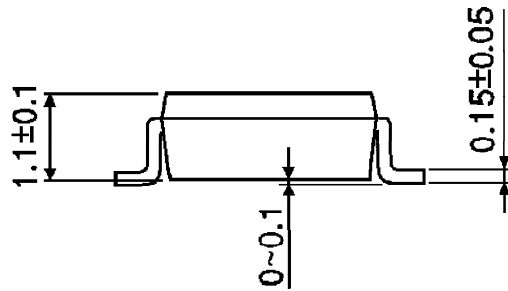
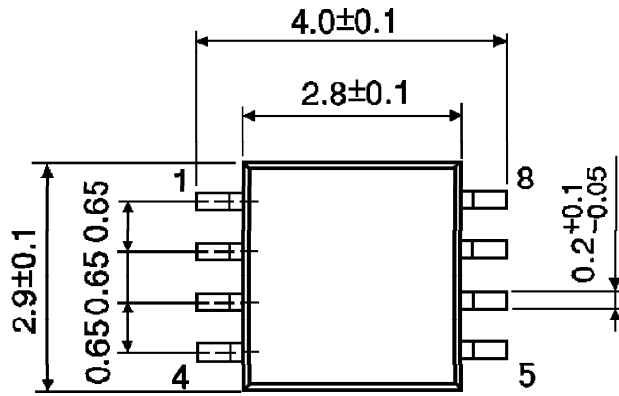
AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 6\text{ns}$)

PARAMETER	SYMBOL	TEST CIRCUIT	TEST CONDITION			Ta = 25°C			Ta = -40~85°C		UNIT
				CL	VCC	MIN.	TYP.	MAX.	MIN.	MAX.	
Output Transition Time	t _{TLH} t _{THL}	—	—	50	2.0	—	20	60	—	75	ns
					4.5	—	6	12	—	15	
					6.0	—	5	10	—	13	
Propagation Delay Time	t _{PLH} t _{pHL}	—	—	50	2.0	—	30	90	—	115	
					4.5	—	11	18	—	23	
					6.0	—	10	15	—	20	
				150	2.0	—	42	130	—	165	
					4.5	—	14	26	—	33	
					6.0	—	12	22	—	28	
Output Enable Time	t _{pZL} t _{pZH}	—	R _L = 1kΩ	50	2.0	—	30	90	—	115	
					4.5	—	11	18	—	23	
					6.0	—	10	15	—	20	
				150	2.0	—	42	130	—	165	
					4.5	—	14	26	—	33	
					6.0	—	12	22	—	28	
Output Disable Time	t _{pLZ} t _{pHZ}	—	R _L = 1kΩ	50	2.0	—	24	100	—	125	
					4.5	—	12	20	—	25	
					6.0	—	10	17	—	21	
Input Capacitance	C _{IN}	—	—	—	—	—	5	10	—	10	pF
Output Capacitance	C _{OUT}	—	—	—	—	—	10	—	—	—	
Power Dissipation Capacitance	C _{PD}	—	Note (1)	—	—	—	32	—	—	—	

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 :
 $I_{CC} (opr) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC} / 2$ (per Gate)

OUTLINE DRAWING
SSOP8-P-0.65

Unit : mm



Weight : 0.02g (Typ.)