TOSHIBA CMOS Digital Integrated Circuit Silicon Monolithic

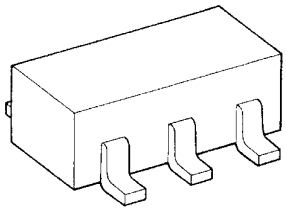
TC7SET125F,TC7SET125FU

Bus Buffer

Features

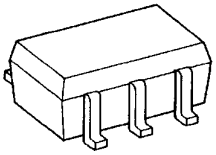
- High speed ..... t_{pd} = 3.7 ns (typ.) at V_{CC} = 5 V
- Low power dissipation ..... I_{CC} = 2 μA (max) at Ta = 25°C
- Compatible with TTL outputs...VIL = 0.8 V (max.) VIH = 2.0 V (min.)
- 5.5V tolerant input.

TC7SET125F



SSOP5-P-0.95

TC7SET125FU



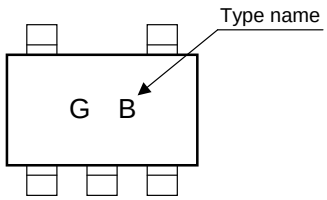
SSOP5-P-0.65A

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

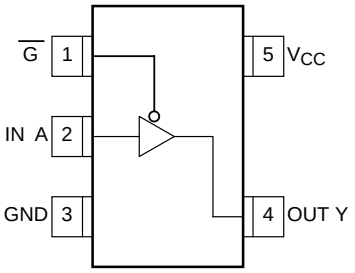
Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage range	V_{CC}	−0.5~7.0	V
DC input voltage	V_{IN}	−0.5~7.0	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}	±25	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 (10 s)	T_L	260	°C

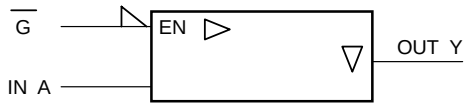
Marking



Pin Assignment (top view)



Logic Diagram



Truth Table

$\overline{G}$	A	Y
H	X	Z
L	L	L
L	H	H

Recommended Operating Conditions

Characteristics	Symbol	Rating	Unit
Supply voltage	V_{CC}	4.5~5.5	V
Input voltage	V_{IN}	0~5.5	V
Output voltage	V_{OUT}	0~Vcc	V
Operating temperature	T_{opr}	−40~85	°C
Input rise and fall time	dt/dv	0~20	ns/V

DC Electrical Characteristics

Characteristics	Symbol	Test Condition		V_{CC} (V)	Ta = 25°C Min	Ta = 25°C Typ.	Ta = 25°C Max	Ta = −40~85°C Min	Ta = −40~85°C Max	Unit
High-level input voltage	V_{IH}	—		4.5~5.5	2.0	—	—	2.0	—	V
Low-level input voltage	V_{IL}	—		4.5~5.5	—	—	0.8	—	0.8	V
High-level output voltage	V_{OH}	V_{IN} = V_{IH} or V_{IL}	I_{OH} = −50 μA	4.5	4.4	4.5	—	4.4	—	V
			I_{OH} = −8 mA	4.5	3.94	—	—	3.80	—	
Low-level output voltage	V_{OL}	V_{IN} = V_{IH} or V_{IL}	I_{OL} = 50 μA	4.5	—	0.0	0.10	—	0.10	V
			I_{OL} = 8 mA	4.5	—	—	0.36	—	0.44	
3-state output off-state current	I_{OZ}	V_{IN} = V_{IH} or V_{IL} V_{OUT} = V_{CC} or GND		5.5	—	—	±0.25	—	±2.5	μA
Input leakage current	I_{IN}	V_{IN} = 5.5 V or GND		0~5.5	—	—	±0.1	—	±1.0	μA
Quiescent supply current	I_{CC}	V_{IN} = V_{CC} or GND		5.5	—	—	2.0	—	20.0	μA
	I_{CCT}	Per Input Other Input	:V_{IN} = 3.4 V :V_{CC} or GND	5.5	—	—	1.35	—	1.50	mA

AC Characteristics (input: $t_r = t_f = 3$ ns)

Characteristics	Symbol	Test Condition			Ta = 25°C			Ta = −40~85°C		Unit
			V_{CC} (V)	C_L (pF)	Min	Typ.	Max	Min	Max	
Propagation delay time	t_{pLH} t_{pHL}		5.0 ± 0.5	15	—	3.7	6.0	1.0	6.9	ns
				50	—	6.0	10.4	1.0	11.9	
3-state output enable time	t_{pZL} t_{pZH}		5.0 ± 0.5	15	—	3.6	5.6	1.0	6.5	ns
				50	—	6.0	10.3	1.0	11.9	
3-state output disable time	t_{pLZ} t_{pHZ}		5.0 ± 0.5	50	—	7.3	10.0	1.0	11.5	ns
Input capacitance	C_{IN}				—	4	10	—	—	pF
Output capacitance	C_{OUT}				—	6	—	—	—	pF
Power dissipation capacitance	C_{PD}	(Note)			—	15	—	—	—	pF

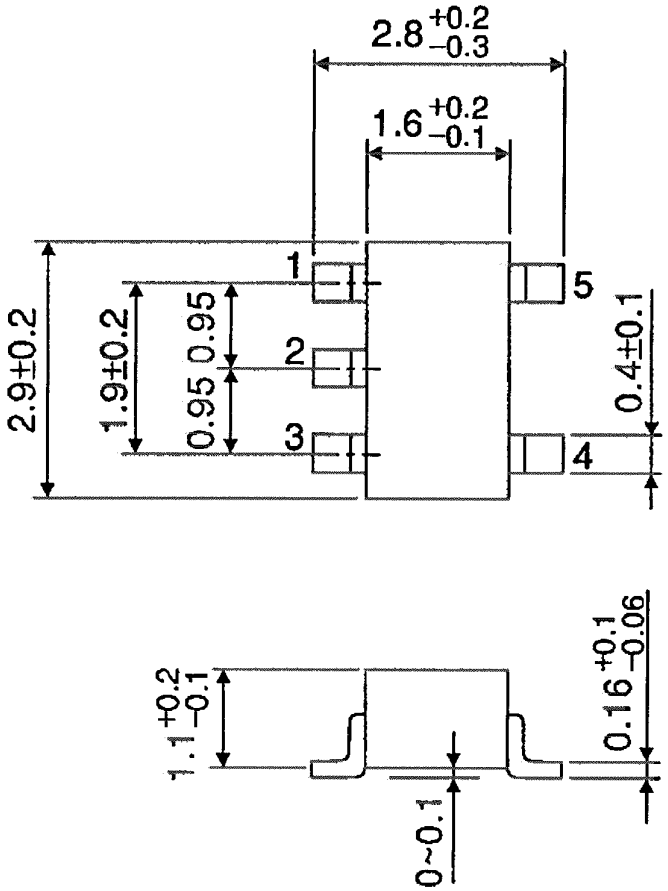
Note: C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation:

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

Package Dimensions

SSOP5-P-0.95 Unit : mm

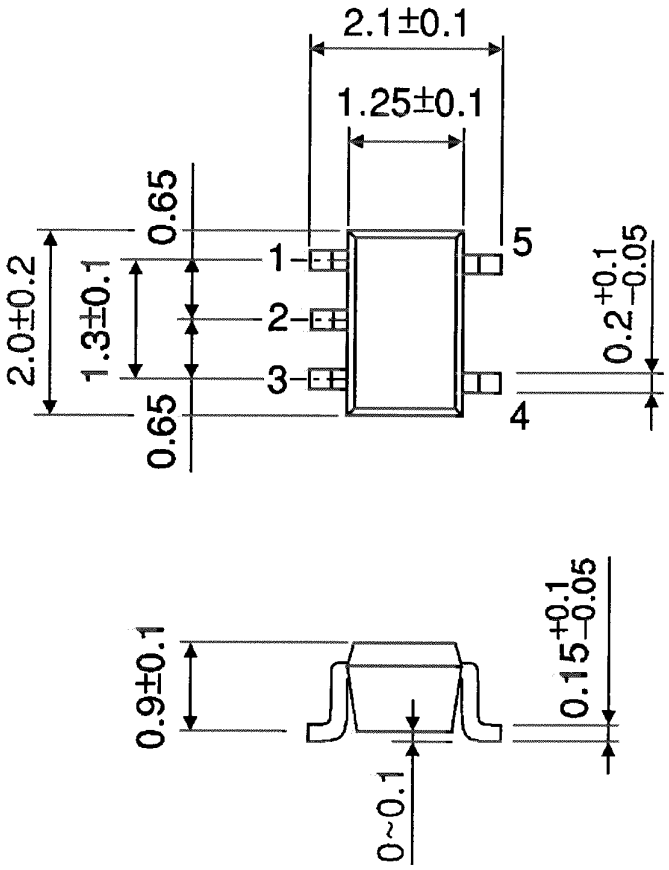


Weight: 0.016 g (typ.)

Package Dimensions

SSOP5-P-0.65A

Unit : mm



Weight: 0.006 g (typ.)

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