

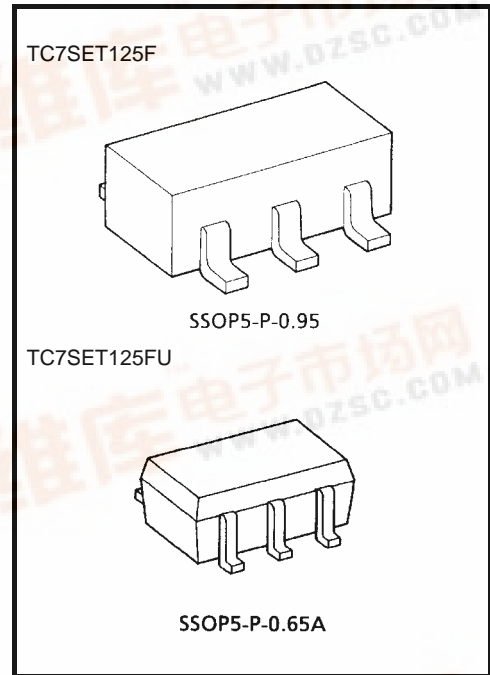
TOSHIBA CMOS Digital Integrated Circuit Silicon Monolithic

# TC7SET125F, TC7SET125FU

Bus Buffer

## Features

- High speed .....  $t_{pd} = 3.7 \text{ ns (typ.)}$   
at  $V_{CC} = 5 \text{ V}$
- Low power dissipation .....  $I_{CC} = 2 \mu\text{A (max)}$   
at  $T_a = 25^\circ\text{C}$
- Compatible with TTL outputs...  $V_{IL} = 0.8 \text{ V (max.)}$   
 $V_{IH} = 2.0 \text{ V (min.)}$
- 5.5V tolerant input.

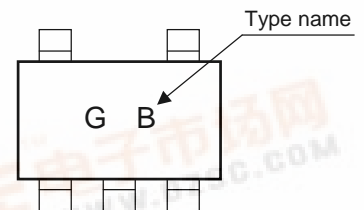


Weight  
 SSOP5-P-0.95 : 0.016 g (typ.)  
 SSOP5-P-0.65A : 0.006 g (typ.)

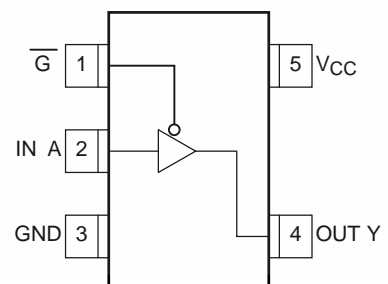
## Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

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	$I_{OK}$	$\pm 20$	mA
DC output current	$I_{OUT}$	$\pm 25$	mA
DC $V_{CC}$ /ground current	$I_{CC}$	$\pm 50$	mA
Power dissipation	$P_D$	200	mW
Storage temperature	$T_{stg}$	-65~150	$^\circ\text{C}$
Lead temperature (10 s)	$T_L$	260	$^\circ\text{C}$

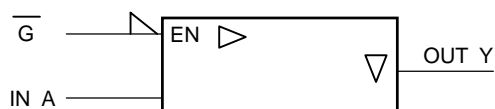
## Marking



## 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~ $V_{CC}$	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)	$T_a = 25^\circ\text{C}$			$T_a = -40\sim 85^\circ\text{C}$		Unit	
				Min	Typ.	Max	Min	Max		
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 $V_{IL}$	$I_{OH} = -50 \mu\text{A}$	4.5	4.4	4.5	—	4.4	—	V
			$I_{OH} = -8 \text{ mA}$	4.5	3.94	—	—	3.80	—	
Low-level output voltage	$V_{OL}$	$V_{IN} = V_{IH}$ or $V_{IL}$	$I_{OL} = 50 \mu\text{A}$	4.5	—	0.0	0.10	—	0.10	V
			$I_{OL} = 8 \text{ mA}$	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	—	—	$\pm 0.25$	—	$\pm 2.5$	$\mu\text{A}$	
Input leakage current	$I_{IN}$	$V_{IN} = 5.5 \text{ V}$ or GND	0~5.5	—	—	$\pm 0.1$	—	$\pm 1.0$	$\mu\text{A}$	
Quiescent supply current	$I_{CC}$	$V_{IN} = V_{CC}$ or GND	5.5	—	—	2.0	—	20.0	$\mu\text{A}$	
	$I_{CCT}$	Per Input : $V_{IN} = 3.4 \text{ V}$ Other Input : $V_{CC}$ or GND	5.5	—	—	1.35	—	1.50	mA	

## AC Characteristics (input: $t_r = t_f = 3 \text{ ns}$ )

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

Note: C<sub>PD</sub> is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

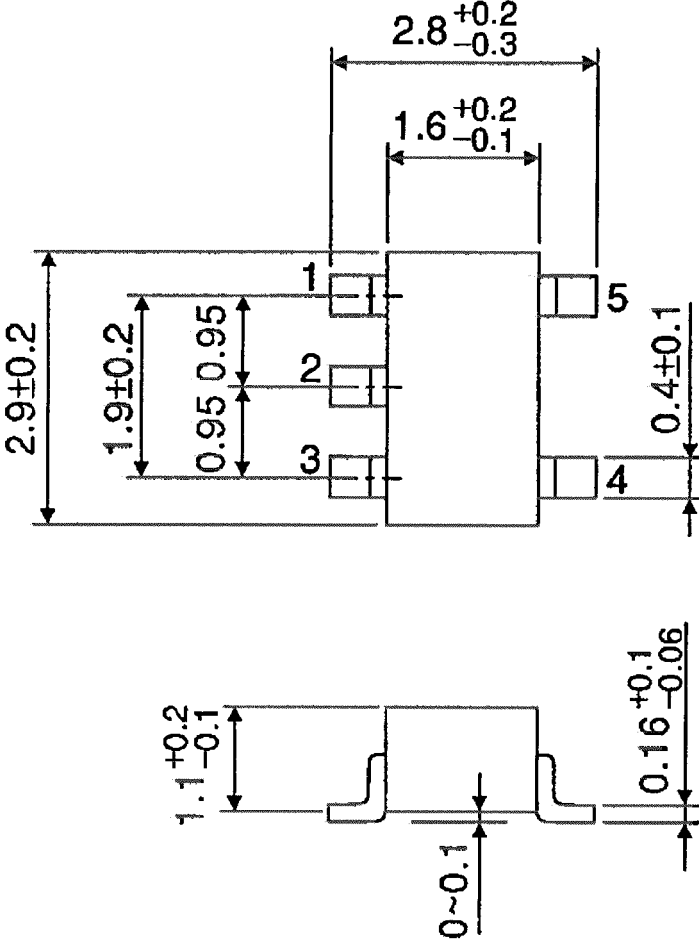
Average operating current can be obtained by the equation:

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

Package Dimensions

SSOP5-P-0.95

Unit : mm

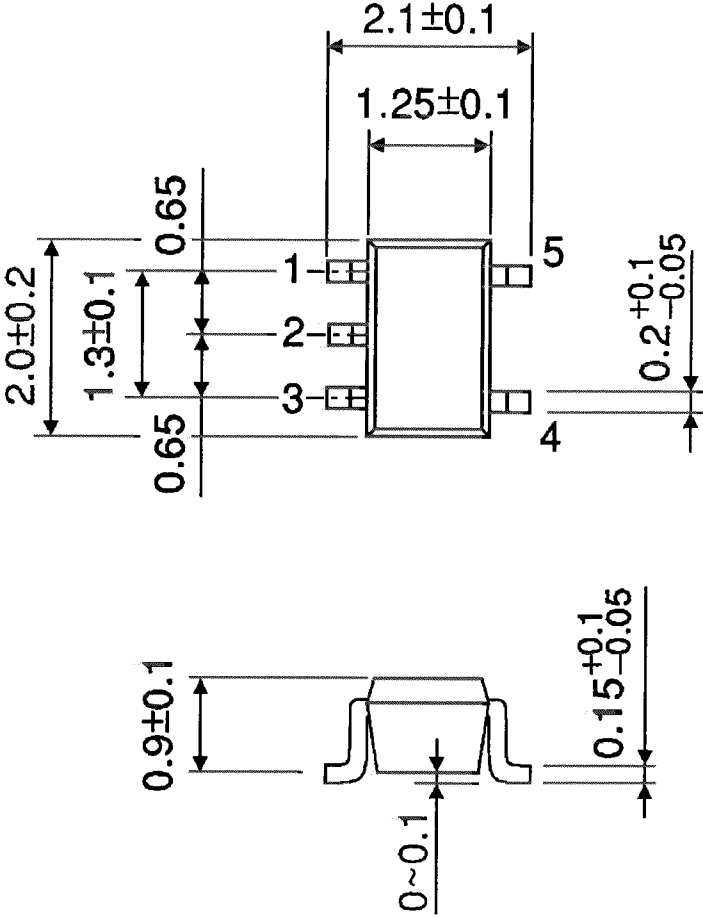


Weight: 0.016 g (typ.)

Package Dimensions

SSOP5-P-0.65A

Unit : mm



Weight: 0.006 g (typ.)

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