TOSHIBA CMOS Digital Integrated Circuit Silicon Monolithic

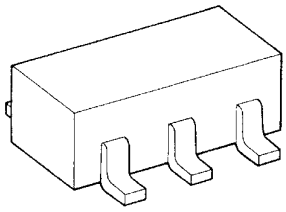
TC7SET14F,TC7SET14FU

Schmitt Inverter

Features

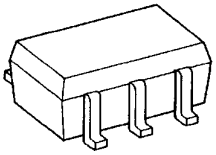
- High speed ..... t_{pd} = 5.0 ns (typ.) at V_{CC} = 5 V
- Low power dissipation ..... I_{CC} = 2 μA (max) at Ta = 25°C
- Compatible with TTL outputs.
- 5.5V tolerant input.

TC7SET14F



SSOP5-P-0.95

TC7SET14FU



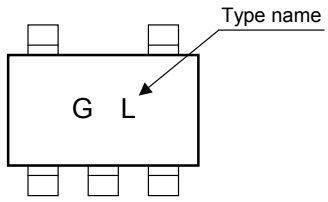
SSOP5-P-0.65A

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

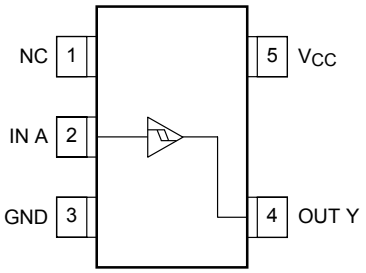
Maximum Ratings (Ta = 25°C)

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

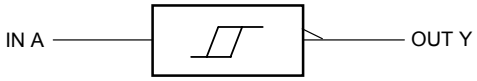
Marking



Pin Assignment (top view)



Logic Diagram



Truth Table

INPUT	OUTPUT
A	Y
L	H
H	L

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
Positive Threshold Voltage	V_P	—		4.5	—	—	1.90	—	1.90	V
				5.5	—		2.10	—	2.10	
Negative Threshold Voltage	V_N	—		4.5	0.50	—	—	0.50	—	
				5.5	0.60	—	—	0.60	—	
Hysteresis Voltage	V_H	—		4.5	0.40	—	1.40	0.40	1.40	
				5.5	0.40	—	1.50	0.40	1.50	
High-level output voltage	V_{OH}	$V_{IN} = V_{IL}$	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}	$V_{IN} = V_{IH}$	I_{OL} = 50 μA	4.5	—	0.0	0.10	—	0.10	
			I_{OL} = 8 mA	4.5	—	—	0.36	—	0.44	
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 :V_{IN} = 3.4 V Other Input :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	—	5.0	7.6	1.0	9.0	ns
				50	—	6.5	9.6	1.0	11.0	
Input capacitance	C_{IN}				—	4	10	—	10	pF
Power dissipation capacitance	C_{PD}			(Note)	—	18	—	—	—	pF

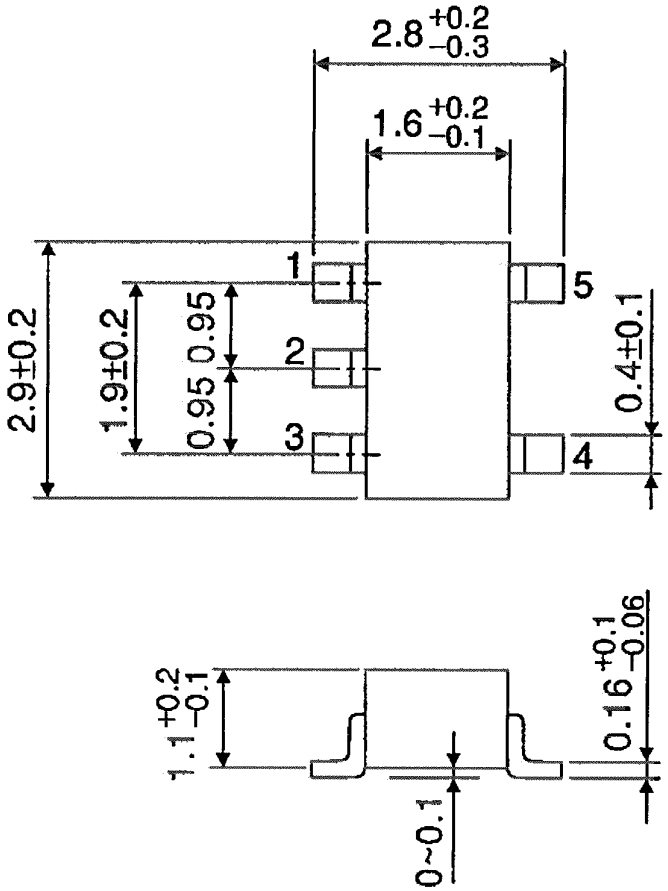
Note: C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

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

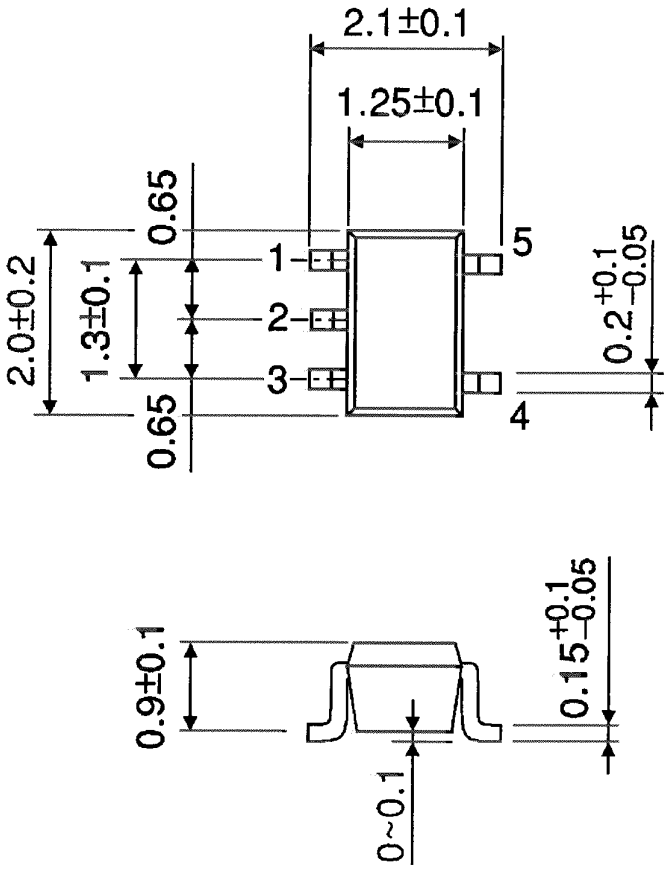


Weight: 0.016 g (typ.)

Package Dimensions

SSOP5-P-0.65A

Unit : mm



Weight: 0.006 g (typ.)

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