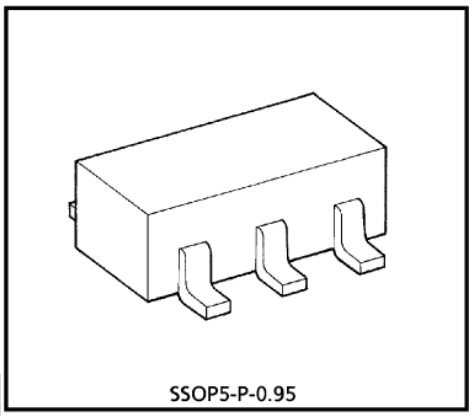
TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC4S584F

SCHMITT TRIGGER

TC4S584F is the one circuit inverter having the schmitt trigger function at the input terminal.
That is, since the circuit threshold level voltage at the leading and trailing edges of input waveform are different (V_P, V_N), the TC4S584F can be used in the broad range application, including line receiver, waveform shaping circuit, astable multivibrator, etc.
In addition to ordinary inverter.



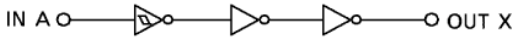
SSOP5-P-0.95

Weight : 0.016g (Typ.)

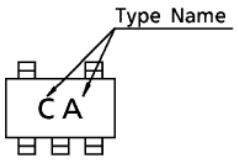
MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V_{DD}	$V_{SS}-0.5\sim V_{SS}+20$	V
Input Voltage	V_{IN}	$V_{SS}-0.5\sim V_{DD}+0.5$	V
Output Voltage	V_{OUT}	$V_{SS}-0.5\sim V_{DD}+0.5$	V
DC Input Current	I_{IN}	±10	mA
Power Dissipation	P_D	200	mW
Operating Temperature Range	T_{opr}	−40~85	°C
Storage Temperature Range	T_{stg}	−65~150	°C
Lead Temperature (10s)	T_L	260	°C

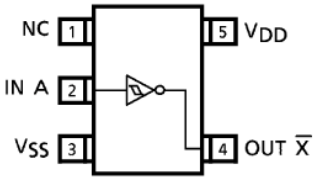
LOGIC DIAGRAM



MARKING



PIN ASSIGNMENT (TOP VIEW)



RECOMMENDED OPERATING CONDITIONS (V_{SS} = 0V)

CHARACTERISTIC	SYMBOL		MIN.	TYP.	MAX.	UNIT
DC Supply Voltage	V_{DD}	—	3	—	18	V
Input Voltage	V_{IN}	—	0	—	V_{DD}	V

STATIC ELECTRICAL CHARACTERISTICS (V_{SS} = 0V)

CHARACTERISTIC	SYM-BOL	TEST CONDITION	V_{DD} (V)	−40°C		25°C			85°C		UNIT
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
High-Level Output Voltage	V_{OH}	$\|I_{OUT}\| < 1\mu A$ $V_{IN} = V_{SS}$, V_{DD}	5	4.95	—	4.95	5.00	—	4.95	—	V
			10	9.95	—	9.95	10.00	—	9.95	—	
			15	14.95	—	14.95	15.00	—	14.95	—	
Low-Level Output Voltage	V_{OL}	$\|I_{OUT}\| < 1\mu A$ $V_{IN} = V_{SS}$, V_{DD}	5	—	0.05	—	0.00	0.05	—	0.05	
			10	—	0.05	—	0.00	0.05	—	0.05	
			15	—	0.05	—	0.00	0.05	—	0.05	
Output High Current	I_{OH}	V_{OH} = 4.6V	5	−0.61	—	−0.51	−1.0	—	−0.42	—	mA
		V_{OH} = 2.5V	5	−2.5	—	−2.1	−4.0	—	−1.7	—	
		V_{OH} = 9.5V	10	−1.5	—	−1.3	−2.2	—	−1.1	—	
		V_{OH} = 13.5V	15	−4.0	—	−3.4	−9.0	—	−2.8	—	
		$V_{IN} = V_{SS}$, V_{DD}									
Output Low Current	I_{OL}	V_{OL} = 0.4V	5	0.61	—	0.51	1.5	—	0.42	—	
		V_{OL} = 0.5V	10	1.5	—	1.3	3.8	—	1.1	—	
		V_{OL} = 1.5V	15	4.0	—	3.4	15.0	—	2.8	—	
		$V_{IN} = V_{SS}$, V_{DD}									
Positive Trigger Threshold Voltage*	V_P	V_{OUT} = 0.5V	5	1.95	3.65	2.05	2.9	3.35	2.05	3.75	V
		V_{OUT} = 1.0V	10	4.3	7.1	4.5	5.9	7.1	4.7	7.2	
		V_{OUT} = 1.5V	15	6.9	10.7	7.1	9.0	10.6	7.1	10.8	
Negative Trigger Threshold Voltage*	V_N	V_{OUT} = 4.5V	5	1.05	2.75	1.1	2.1	2.6	0.95	2.65	
		V_{OUT} = 9.0V	10	2.1	4.9	2.2	3.5	4.7	2.0	4.8	
		V_{OUT} = 13.5V	15	3.2	7.0	3.3	5.0	6.8	3.1	6.9	
Hystersis Voltage*	V_H	—	5	0.1	1.35	0.4	0.75	1.3	0.4	1.50	
			10	1.7	3.2	1.8	2.4	3.2	1.7	3.4	
			15	3.1	4.8	3.2	4.0	4.8	3.2	4.9	
Input Current H Level	I_{IH}	V_{IH} = 18V	18	—	0.1	—	10^{-5}	0.1	—	1.0	μA
Input Current L Level	I_{IL}	V_{IL} = 0V	18	—	−0.1	—	-10^{-5}	−0.1	—	−1.0	μA
Quiescent Device Current	I_{DD}	$V_{IN} = V_{SS}$, V_{DD}	5	—	1	—	0.001	1	—	7.5	μA
			10	—	2	—	0.002	2	—	15	
			15	—	4	—	0.004	4	—	30	

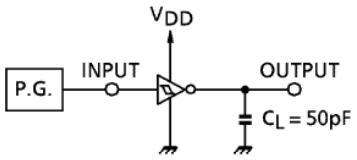
(Note) Values are different to TC4584BP, TC4584BF marked* (V_P, V_N, V_H).

DYNAMIC ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{SS} = 0V, C_L = 50pF)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{DD} (V)	MIN.	TYP.	MAX.	UNIT
Output Transition Time (Low to High)	t_{TLH}	—	5	—	80	200	ns
			10	—	50	100	
			15	—	40	80	
Output Transition Time (High to Low)	t_{THL}	—	5	—	80	200	
			10	—	50	100	
			15	—	40	80	
Propagation Delay Time	t_{pLH} t_{pHL}	—	5	—	170	340	ns
			10	—	80	160	
			15	—	60	120	
Input Capacitance	C_{IN}	—		—	5	7.5	pF

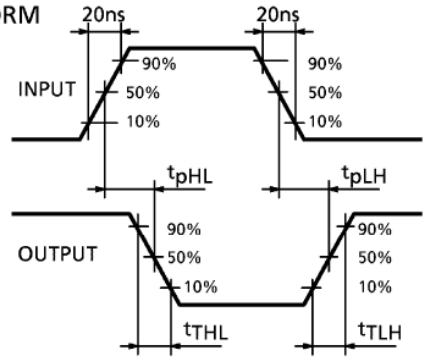
CIRCUIT AND WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

CIRCUIT

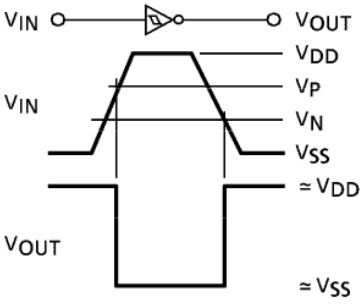


P.G. : PULSE GENERATOR

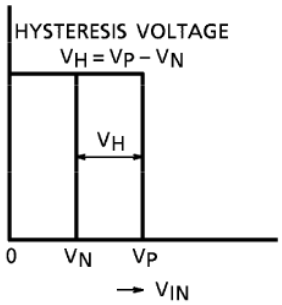
WAVEFORM



INPUT-OUTPUT VOLTAGE CHARACTERISTICS



● INPUT-OUTPUT VOLTAGE WAVEFORM

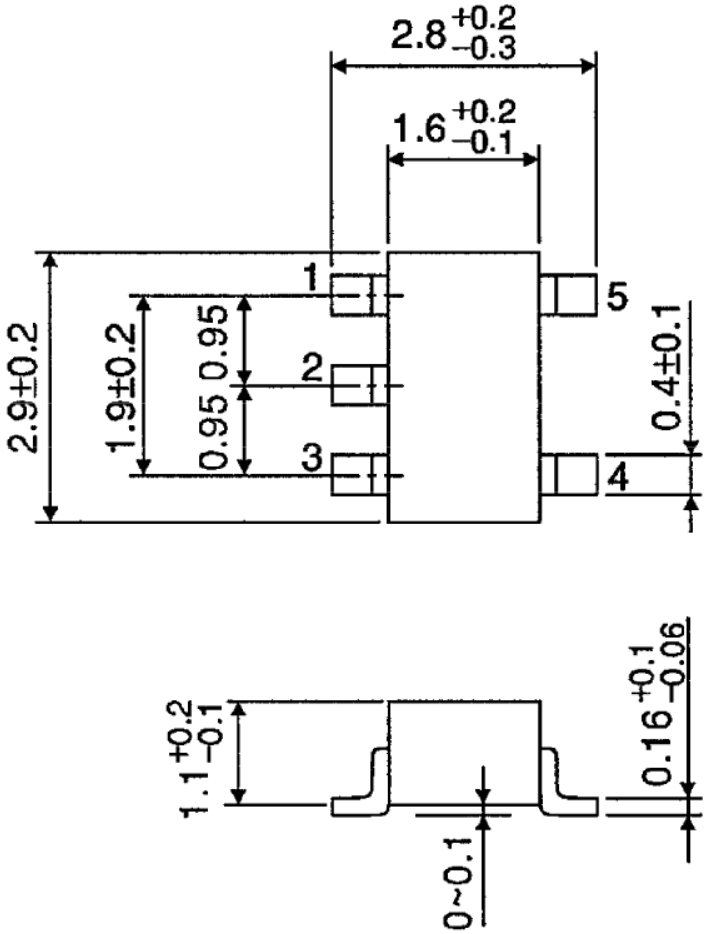


● TRANSFER CHARACTERISTICS

PACKAGE DIMENSIONS

SSOP5-P-0.95

Unit : mm



Weight : 0.016g (Typ.)

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