

# TC4S584F

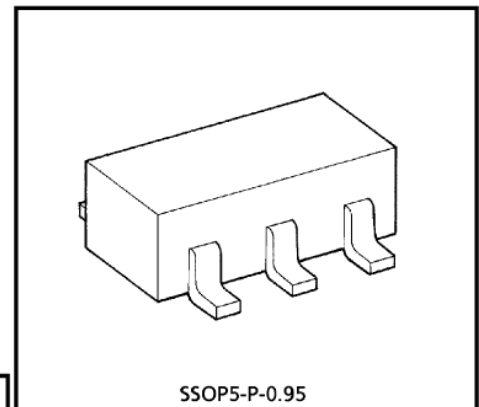
## SCHMITT TRIGGER

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.

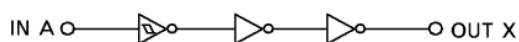
### ABSOLUTE MAXIMUM RATINGS

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	$I_{IN}$	$\pm 10$	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

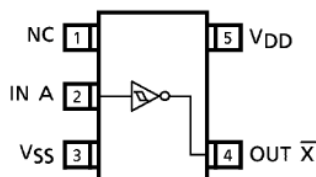


SSOP5-P-0.95  
Weight : 0.016g (Typ.)

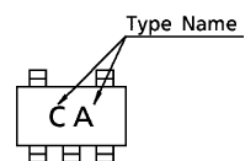
### LOGIC DIAGRAM



### PIN ASSIGNMENT (TOP VIEW)



### MARKING



Start of commercial production  
1988-05

**OPERATING RANGES (V<sub>SS</sub> = 0V)**

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
DC Supply Voltage	V <sub>DD</sub>	3	—	18	V
Input Voltage	V <sub>IN</sub>	0	—	V <sub>DD</sub>	V

**STATIC ELECTRICAL CHARACTERISTICS (V<sub>SS</sub> = 0V)**

CHARACTERISTIC	SYM-BOL	TEST CONDITION	V <sub>DD</sub> (V)	-40°C		25°C			85°C		UNIT	
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.		
High-Level Output Voltage	V <sub>OH</sub>	I <sub>OUT</sub>   < 1μA V <sub>IN</sub> = V <sub>SS</sub> , V <sub>DD</sub>	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 <sub>OL</sub>	I <sub>OUT</sub>   < 1μA V <sub>IN</sub> = V <sub>SS</sub> , V <sub>DD</sub>	5	—	0.05	—	0.00	0.05	—	0.05	V	
			10	—	0.05	—	0.00	0.05	—	0.05		
			15	—	0.05	—	0.00	0.05	—	0.05		
Output High Current	I <sub>OH</sub>	V <sub>OH</sub> = 4.6V V <sub>OH</sub> = 2.5V V <sub>OH</sub> = 9.5V V <sub>OH</sub> = 13.5V V <sub>IN</sub> = V <sub>SS</sub> , V <sub>DD</sub>	5	-0.61	—	-0.51	-1.0	—	-0.42	—	mA	
			5	-2.5	—	-2.1	-4.0	—	-1.7	—		
			10	-1.5	—	-1.3	-2.2	—	-1.1	—		
			15	-4.0	—	-3.4	-9.0	—	-2.8	—		
Output Low Current	I <sub>OL</sub>	V <sub>OL</sub> = 0.4V V <sub>OL</sub> = 0.5V V <sub>OL</sub> = 1.5V V <sub>IN</sub> = V <sub>SS</sub> , V <sub>DD</sub>	5	0.61	—	0.51	1.5	—	0.42	—	mA	
			10	1.5	—	1.3	3.8	—	1.1	—		
			15	4.0	—	3.4	15.0	—	2.8	—		
			—	—	—	—	—	—	—	—		
Positive Trigger Threshold Voltage*	V <sub>P</sub>	V <sub>OUT</sub> = 0.5V V <sub>OUT</sub> = 1.0V V <sub>OUT</sub> = 1.5V	5	1.95	3.65	2.05	2.9	3.35	2.05	3.75	V	
			10	4.3	7.1	4.5	5.9	7.1	4.7	7.2		
			15	6.9	10.7	7.1	9.0	10.6	7.1	10.8		
Negative Trigger Threshold Voltage*	V <sub>N</sub>	V <sub>OUT</sub> = 4.5V V <sub>OUT</sub> = 9.0V V <sub>OUT</sub> = 13.5V	5	1.05	2.75	1.1	2.1	2.6	0.95	2.65	V	
			10	2.1	4.9	2.2	3.5	4.7	2.0	4.8		
			15	3.2	7.0	3.3	5.0	6.8	3.1	6.9		
Hysteresis Voltage*	V <sub>H</sub>	—	5	0.1	1.35	0.4	0.75	1.3	0.4	1.50	V	
			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 <sub>IH</sub>	V <sub>IH</sub> = 18V	18	—	0.1	—	10 <sup>-5</sup>	0.1	—	1.0	μA
	L Level	I <sub>IL</sub>	V <sub>IL</sub> = 0V	18	—	-0.1	—	-10 <sup>-5</sup>	-0.1	—	-1.0	
Quiescent Device Current	I <sub>DD</sub>	V <sub>IN</sub> = V <sub>SS</sub> , V <sub>DD</sub>	5	—	1	—	0.001	1	—	7.5	μA	
			10	—	2	—	0.002	2	—	15		
			15	—	4	—	0.004	4	—	30		

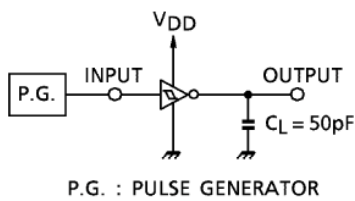
(Note) Values are different to TC4584BP, TC4584BF marked\* (V<sub>P</sub>, V<sub>N</sub>, V<sub>H</sub>).

### DYNAMIC ELECTRICAL CHARACTERISTICS (Ta = 25°C, VSS = 0V, CL = 50pF)

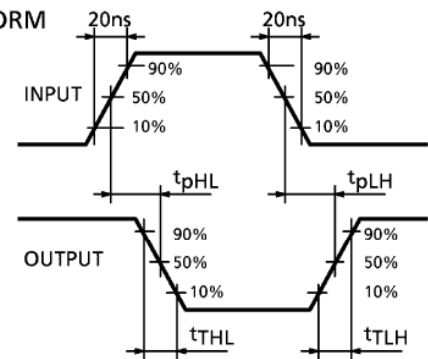
CHARACTERISTIC	SYMBOL	TEST CONDITION	VDD (V)	MIN.	TYP.	MAX.	UNIT
			5				
Output Transition Time (Low to High)	tTLH	—	5	—	80	200	ns
			10	—	50	100	
			15	—	40	80	
Output Transition Time (High to Low)	tTHL	—	5	—	80	200	ns
			10	—	50	100	
			15	—	40	80	
Propagation Delay Time	tpLH tpHL	—	5	—	170	340	ns
			10	—	80	160	
			15	—	60	120	
Input Capacitance	CIN	—	—	5	7.5	pF	

### CIRCUIT AND WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

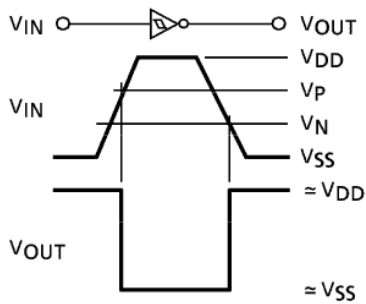
#### CIRCUIT



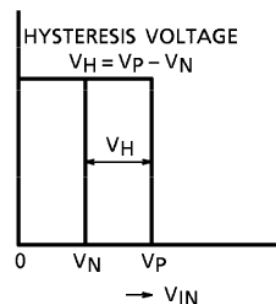
#### WAVEFORM



### INPUT-OUTPUT VOLTAGE CHARACTERISTICS



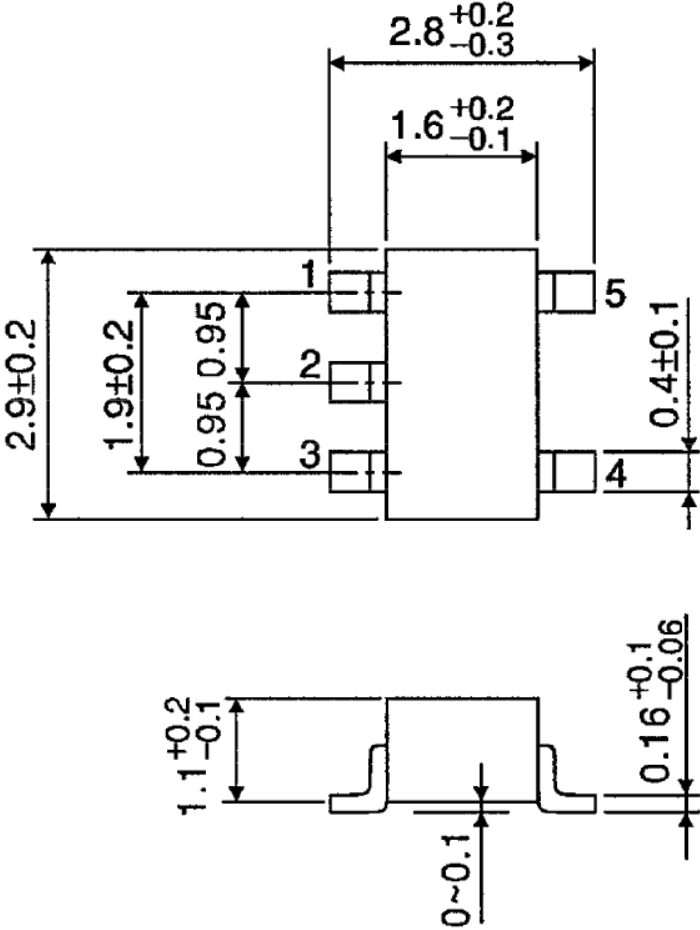
• INPUT-OUTPUT VOLTAGE WAVEFORM



• TRANSFER CHARACTERISTICS

PACKAGE DIMENSIONS  
SSOP5-P-0.95

Unit : mm



Weight : 0.016g (Typ.)

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