TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

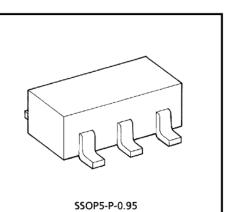
# T C 4 S 7 1 F

# **2 INPUT OR GATE**

The TC4S71F is 2-input positive logic OR gates. Gate output with inverter buffer improve the inputoutput characteristics and even if the load capacitance increases, it can be stopped the change of propagation time.

#### MAXIMUM RATINGS (Ta = 25°C)

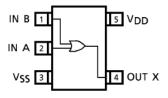
CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V <sub>DD</sub>	V <sub>SS</sub> – 0.5~V <sub>SS</sub> + 20	V
Input Voltage	VIN	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
Output Voltage	Vout	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
DC Input Current	IIN	± 10	mA
Power Dissipation	PD	200	mW
Operating Temperature Range	T <sub>opr</sub>	- 40~85	°C
Storage Temperature Range	T <sub>stg</sub>	- 65~150	°C
Lead Temperature (10s)	ТL	260	°C



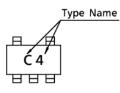
Weight : 0.016g (Typ.)

### LOGIC DIAGRAM

PIN CONFIGURATION (TOP VIEW)



MARKING



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

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 ( $V_{SS} = 0V$ )

CHARACTERISTIC SYM-		TEST CONDITION	V <sub>DD</sub>	– 40°C		25°C			85	UNIT	
CHARACTERISTIC	BOL	TEST CONDITION	(V)	MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
High-Level		l <sub>OUT</sub>  <1μΑ	5	4.95		4.95	5.00	—	4.95	Ι	
Output Voltage	∨он	$V_{IN} = V_{SS}, V_{DD}$	10	9.95		9.95	10.00	1	9.95		
output voltage			15	14.95		14.95			14.95		v
Low-Level		  Ι <sub>ΟUT</sub>  <1μΑ	5	-	0.05	-	0.00	1	—	0.05	
Output Voltage	VOL	$V_{IN} = V_{SS}$	10	-	0.05	—	0.00		—	0.05	
- alpar rollage		-111 33	15	_	0.05	—	0.00			0.05	
		V <sub>OH</sub> = 4.6V	5	- 0.61	—	- 0.51	- 1.0	1	- 0.42		
Output High	юн	V <sub>OH</sub> = 2.5V	5	- 2.5	—	- 2.1	- 4.0	1	- 1.7		
Current		V <sub>OH</sub> = 9.5V	10	- 1.5	—	- 1.3	- 2.2	1	- 1.1	—	
		V <sub>IN</sub> = V <sub>DD</sub> , V <sub>SS</sub>	15	- 4.0	—	- 3.4	- 9.0	—	- 2.8	—	
		V <sub>OL</sub> = 0.4V	5	0.61		0.51	1.2	—	0.42	—	mΑ
Output Low		V <sub>OL</sub> = 0.5V	10	1.5	—	1.3	3.2	—	1.1	—	
Current	IOL	V <sub>OL</sub> = 1.5V	15	4.0	—	3.4	12.0	—	2.8	—	
		$V_{IN} = V_{SS}$									
		V <sub>OUT</sub> = 4.5V	5	3.5	_	3.5	2.75	—	3.5	—	
Innut High Voltage	V	V <sub>OUT</sub> = 9.0V	10	7.0	—	7.0	5.5	—	7.0	—	
Input High Voltage	VIH	V <sub>OUT</sub> = 13.5V	15	11.0	—	11.0	8.25	—	11.0	—	
		I <sub>OUT</sub>  <1μΑ									
		V <sub>OUT</sub> = 4.5V, 0.5V	5	—	1.5	—	2.25	1.5	—	1.5	V
Input Low Voltage VIL	N	V <sub>OUT</sub> = 9.0V, 1.0V	10	—	3.0	—	4.5	3.0	_	3.0	
	<sup>v</sup> IL	V <sub>OUT</sub> = 13.5V, 1.5V	15	—	4.0	—	6.75	4.0	—	4.0	
		l <sub>OUT</sub>  <1μΑ	]								
Input H Level	ЧH	V <sub>IH</sub> = 18V	18	—	0.1	—	10-5	0.1	—	1.0	
Current L Level	ΙL	V <sub>IL</sub> = 0V	18	_	- 0.1	-	- 10-5	- 0.1	—	- 1.0	μA
Quiescent			5	_	0.25	—	0.001	0.25	—	7.5	
Device Current	IDD	$V_{IN} = V_{SS}, V_{DD}$	10	—	0.5	—	0.001	0.5	—	15	μA
			15		1.0	—	0.002	1.0		30	

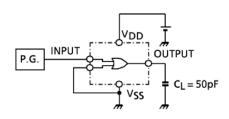
\* All valid input combinations.

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CHARACTERISTIC	SYMBOL	TEST CONDITION	V <sub>DD</sub> (V)	MIN.	TYP.	MAX.	UNIT
Output Transition Time			5	_	70	200	
(Low to High)	ttlh	—	10	—	35	100	
			15	—	30	80	
Output Transition Time			5	_	70	200	ns
Output Transition Time (High to Low)	ţтнг	_	10	—	35	100	
			15	—	30	80	
	t <sub>pLH</sub>		5	_	65	200	
Propagation Delay Time		_	10	—	30	100	
			15	_	25	80	
Propagation Delay Time	t <sub>pHL</sub>		5	_	65	200	ns
		_	10	_	30	100	
			15	_	25	80	
Input Capacitance	CIN	_		_	5	7.5	рF

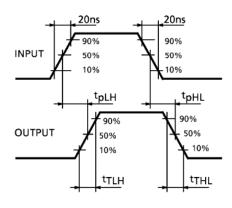
## **DYNAMIC ELECTRICAL CHARACTERISTICS** (Ta = $25^{\circ}$ C, V<sub>SS</sub> = 0V, C<sub>L</sub> = 50pF)

### CIRCUIT AND WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

TEST CIRCUIT

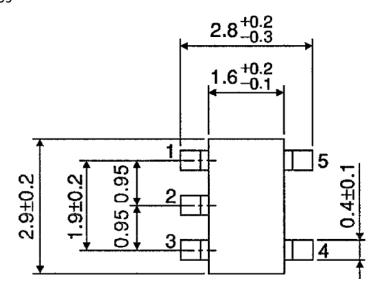


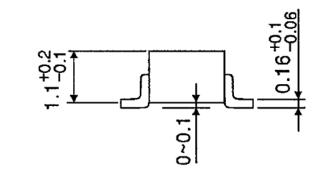




#### PACKAGE DIMENSIONS SSOP5-P-0.95

Unit : mm





Weight : 0.016g (Typ.)

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