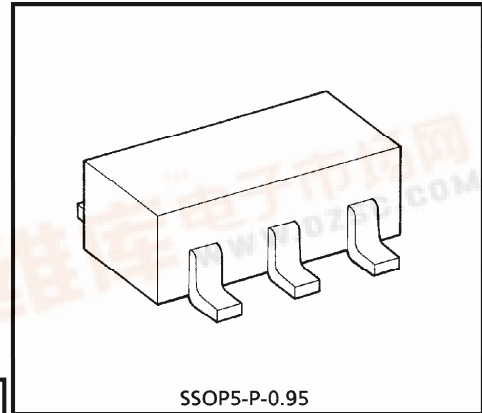


TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC4S30F

EXCLUSIVE-OR GATE

TC4S30F contains one circuit of exclusive OR gate. Since the buffers of two stage inverters are provided for all the outputs, the input/output voltage characteristic has been improved and the noise immunity has been also improved. And increase of transmission time due to load capacity increase is kept minimum. Wide variety of applications are offered, such as digital comparators and parity circuits.

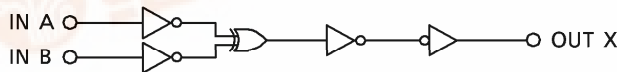


Weight : 0.016g (Typ.)

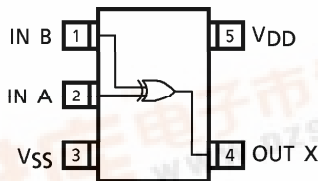
MAXIMUM RATINGS

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}	$-40 \sim 85$	$^{\circ}C$
Storage Temperature Range	T_{stg}	$-65 \sim 150$	$^{\circ}C$
Lead Temperature (10s)	T_L	260	$^{\circ}C$

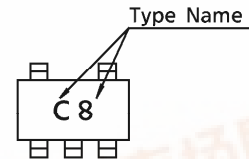
LOGIC DIAGRAM



PIN ASSIGNMENT (TOP VIEW)



MARKING



TRUTH TABLE

INPUT		OUTPUT
A	B	X
L	L	L
L	H	H
H	L	H
H	H	L

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} < 1μA 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} < 1μA V _{IN} = V _{SS} , V _{DD}	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 _{OH}	V _{OH} = 4.6V V _{OH} = 2.5V V _{OH} = 9.5V V _{OH} = 13.5V V _{IN} = V _{SS} , V _{DD}	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 _{OL}	V _{OL} = 0.4V V _{OL} = 0.5V V _{OL} = 1.5V V _{IN} = V _{SS} , V _{DD}	5	0.61	—	0.51	1.2	—	0.42	—	mA	
			10	1.5	—	1.3	3.2	—	1.1	—		
			15	4.0	—	3.4	12.0	—	2.8	—		
			5	3.5	—	3.5	2.75	—	3.5	—		
Input High Voltage	V _{IH}	V _{OUT} = 0.5V, 4.5V V _{OUT} = 1.0V, 9.0V V _{OUT} = 1.5V, 13.5V I _{OUT} < 1μA	10	7.0	—	7.0	5.5	—	7.0	—	V	
			15	11.0	—	11.0	8.25	—	11.0	—		
			5	—	1.5	—	2.25	1.5	—	1.5		—
Input Low Voltage	V _{IL}	V _{OUT} = 0.5V, 4.5V V _{OUT} = 1.0V, 9.0V V _{OUT} = 1.5V, 13.5V I _{OUT} < 1μA	10	—	3.0	—	4.5	3.0	—	3.0	V	
			15	—	4.0	—	6.75	4.0	—	4.0		
			5	—	1	—	0.001	1	—	7.5		—
Input Current	H Level	I _{IH}	V _{IH} = 18V	18	—	0.1	—	10 ⁻⁵	0.1	—	1.0	μA
	L Level	I _{IL}	V _{IL} = 0V	18	—	-0.1	—	-10 ⁻⁵	-0.1	—	-1.0	
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	—	0.002	4	—	30		

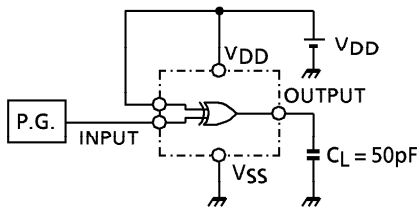
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DYNAMIC ELECTRICAL CHARACTERISTICS (Ta = 25°C, VSS = 0V, CL = 50pF)

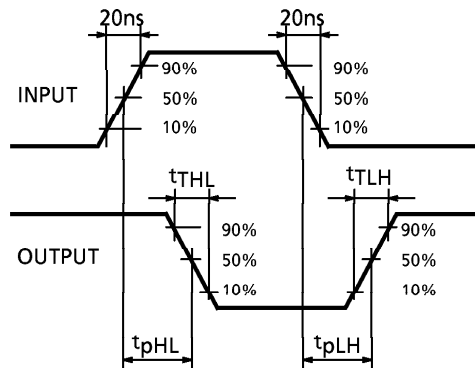
CHARACTERISTIC	SYMBOL	TEST CONDITION	VDD (V)	MIN.	TYP.	MAX.	UNIT
Output Transition Time (Low to High)	tTLH	—	5	—	70	200	ns
			10	—	35	100	
			15	—	30	80	
Output Transition Time (High to Low)	tTHL	—	5	—	70	200	ns
			10	—	35	100	
			15	—	30	80	
Propagation Delay Time	t _{pLH}	—	5	—	90	280	ns
	t _{pHL}		10		45	130	
			15		35	100	
Input Capacitance	CIN	—		—	5	7.5	pF

CIRCUIT AND WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

CIRCUIT

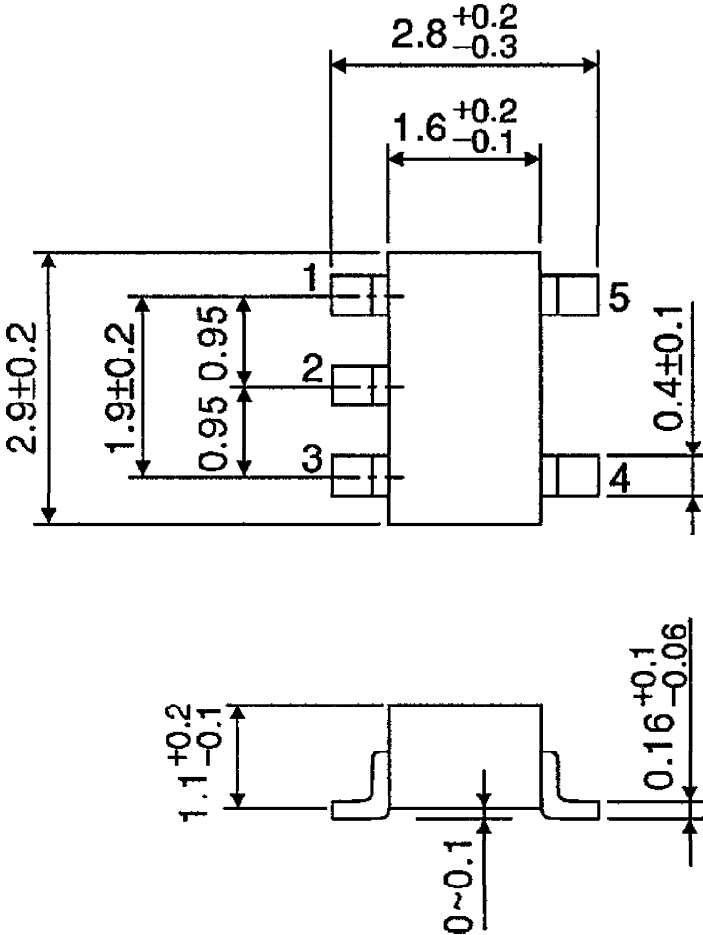


WAVEFORM



OUTLINE DRAWING
SSOP5-P-0.95

Unit : mm



Weight : 0.016g (Typ.)