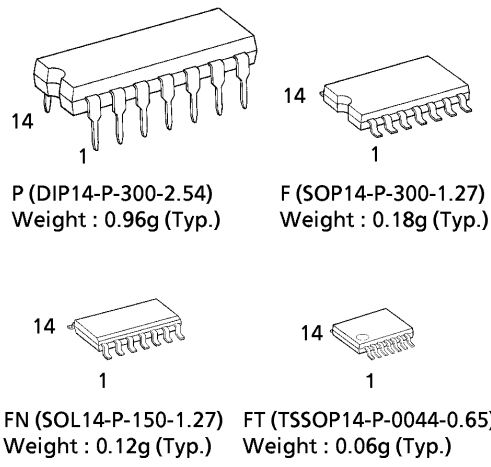


TC4001BP, TC4001BF, TC4001BFN, TC4001BFT

TC4001B QUAD 2 INPUT NOR GATE

The TC4001B is 2-input positive NOR gate, respectively. Since the outputs of these gates are equipped with the buffers, the input / output transmission characteristics have been improved and the variation of transmission time due to an increase in the load capacity is kept minimum.

(Note) The JEDEC SOP (FN) is not available in Japan.

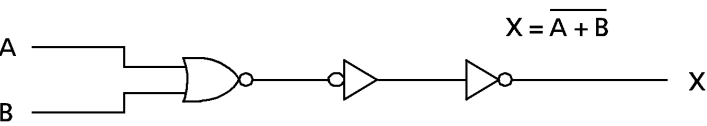


MAXIMUM RATINGS

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	300 (DIP) / 180 (SOIC)	mW
Operating Temperature Range	T_{opr}	$- 40 \sim 85$	$^{\circ}C$
Storage Temperature Range	T_{stg}	$- 65 \sim 150$	$^{\circ}C$

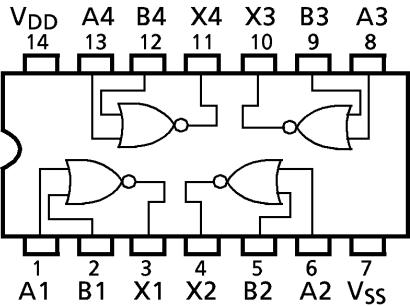
LOGIC DIAGRAM

1 / 4 TC4001B



PIN ASSIGNMENT (TOP VIEW)

TC4001B



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

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

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

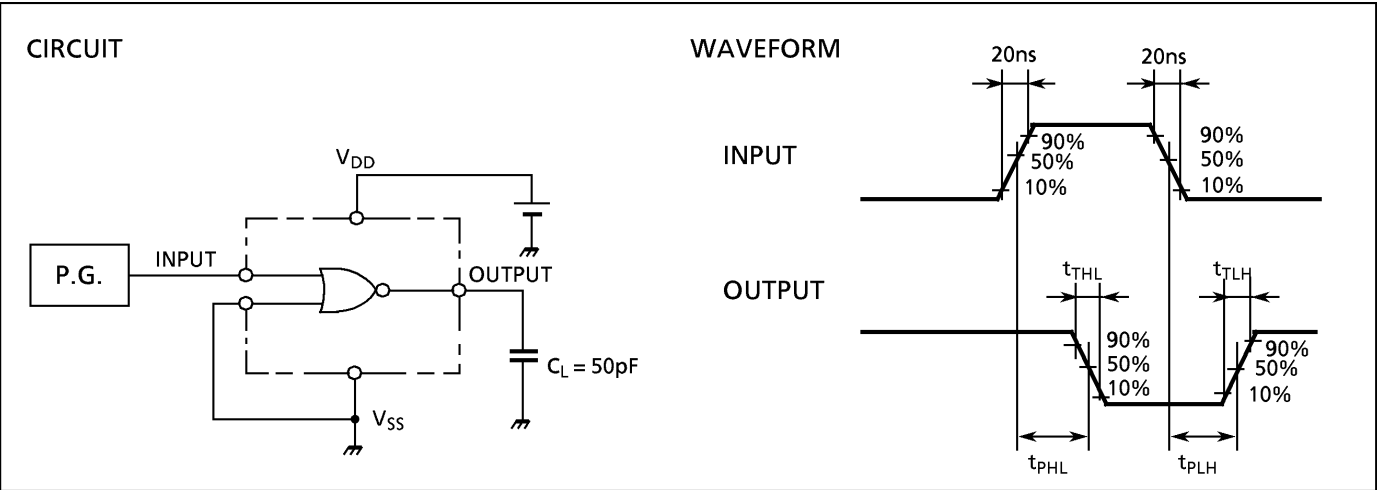
CHARACTERISTIC		SYM- BOL	TEST CONDITION	V _{DD} (V)	- 40°C		25°C			85°C		UNIT
					MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
High-Level Output Voltage		V _{OH}	I _{OUT} < 1 μA V _{IN} = V _{SS} , V _{DD}	5 10 15	4.95 9.95 14.95	— — —	4.95 9.95 14.95	5.00 10.00 15.00	— — —	4.95 9.95 14.95	— — —	V
Low-Level Output Voltage		V _{OL}	I _{OUT} < 1 μA V _{IN} = V _{SS} , V _{DD}	5 10 15	— — —	0.05 0.05 0.05	— — —	0.00 0.00 0.00	0.05 0.05 0.05	— — —	0.05 0.05 0.05	
Output High Current		I _{OH}	V _{OH} = 4.6V	5	- 0.61	—	- 0.51	- 1.0	—	- 0.42	—	
			V _{OH} = 2.5V	5	- 2.50	—	- 2.10	- 4.0	—	- 1.70	—	
			V _{OH} = 9.5V	10	- 1.50	—	- 1.30	- 2.2	—	- 1.10	—	
			V _{OH} = 13.5V	15	- 4.00	—	- 3.40	- 9.0	—	- 2.80	—	
			V _{IN} = V _{SS}									
Output Low Current		I _{OL}	V _{OL} = 0.4V	5	0.61	—	0.51	1.2	—	0.42	—	
			V _{OL} = 0.5V	10	1.50	—	1.30	3.2	—	1.10	—	
			V _{OL} = 1.5V	15	4.00	—	3.40	12.0	—	2.80	—	
			V _{IN} = V _{SS} , V _{DD}									
Input High Voltage		V _{IH}	V _{OUT} = 0.5V	5	3.5	—	3.5	2.75	—	3.5	—	V
			V _{OUT} = 1.0V	10	7.0	—	7.0	5.50	—	7.0	—	
			V _{OUT} = 1.5V	15	11.0	—	11.0	8.25	—	11.0	—	
			I _{OUT} < 1 μA									
Input Low Voltage		V _{IL}	V _{OUT} = 4.5V	5	—	1.5	—	2.25	1.5	—	1.5	
			V _{OUT} = 9.0V	10	—	3.0	—	4.50	3.0	—	3.0	
			V _{OUT} = 13.5V	15	—	4.0	—	6.75	4.0	—	4.0	
			I _{OUT} < 1 μA									
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 Supply Current		I _{DD}	V _{IN} = V _{SS} , V _{DD} *	5 10 15	— — —	0.25 0.50 1.00	— — —	0.001 0.001 0.002	0.25 0.50 1.00	— — —	7.5 15.0 30.0	μA

* All valid input combinations.

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	VDD(V)	MIN.	TYP.	MAX.	UNIT
Output Transition Time	tTLH		5	—	70	200	ns
			10	—	35	100	
			15	—	30	80	
Output Transition Time	tTHL		5	—	70	200	
			10	—	35	100	
			15	—	30	80	
Propagation Delay Time	tPLH		5	—	65	200	ns
			10	—	30	100	
			15	—	25	80	
Propagation Delay Time	tPHL		5	—	65	200	
			10	—	30	100	
			15	—	25	80	
Input Capacitance	CIN			—	5	7.5	pF

CIRCUIT A D WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS



DIP 14PIN PACKAGE DIMENSIONS (DIP14-P-300-2.54)

Unit in mm



Weight : 0.96g (Typ.)

SOP 14PIN (200mil BODY) PACKAGE DIMENSIONS (SOP14-P-300-1.27)

Unit in mm

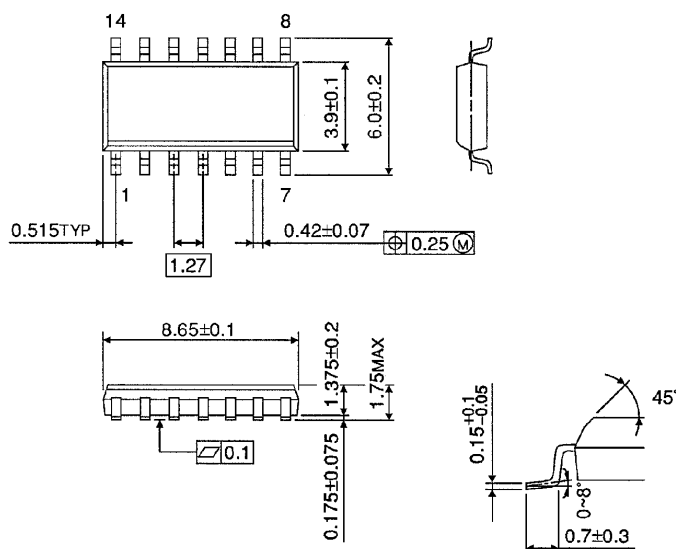


Weight : 0.18g (Typ.)

SOP 14PIN (150mil BODY) PACKAGE DIMENSIONS (SOL14-P-150 -1.27)

Unit in mm

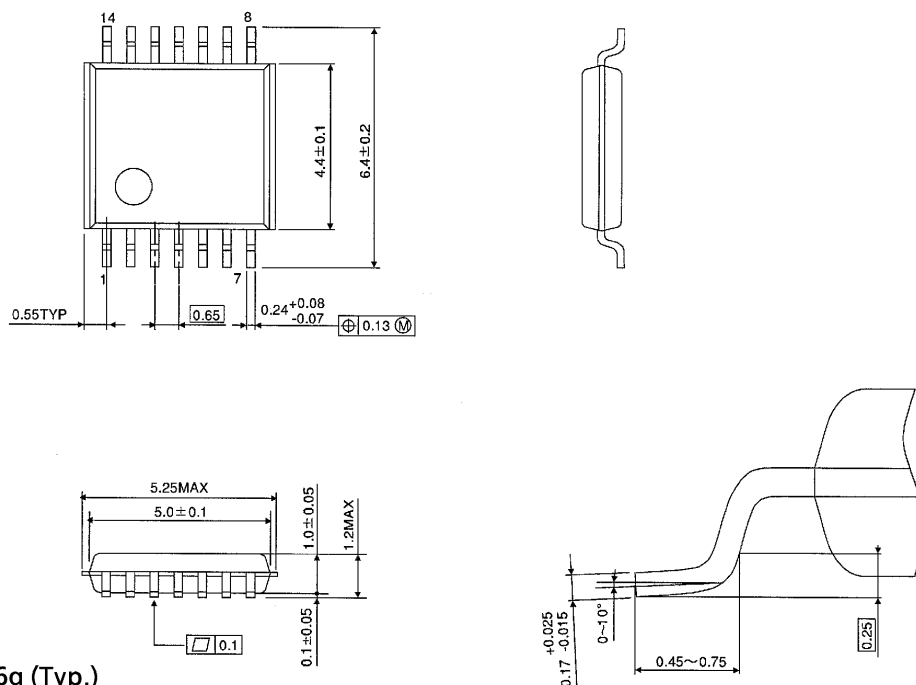
(Note) This package is not available in Japan.



Weight : 0.12g (Typ.)

TSSOP 14PIN (170mil BODY) PACKAGE DIMENSIONS (TSSOP14-P-0044-0.65)

Unit in mm



Weight : 0.06g (Typ.)

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000707EBA

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