

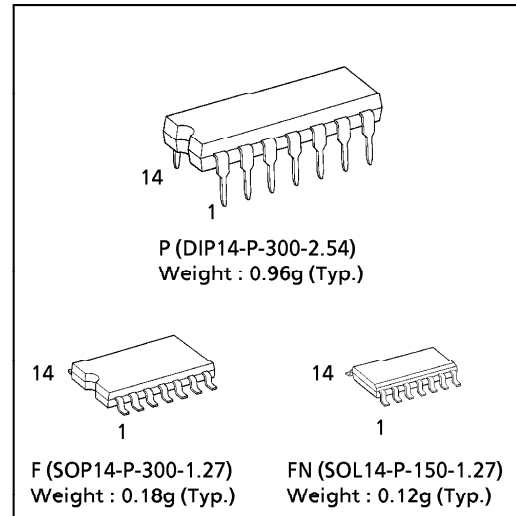
TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TC4584BP, TC4584BF, TC4584BFN

## TC4584B HEX SCHMITT TRIGGER

The TC4584B is the 6-circuit inverter having the Schmitt trigger function at the input terminal. That is, since the circuit threshold level voltages at the leading and trailing edges of input waveform are different ( $V_P, V_N$ ), the TC4584B can be used in the broad range application including line receiver, waveform shaping circuit, astable multivibrator, monostable multivibrator, etc. In addition to ordinary inverter. Since the pins are compatible with the TC4069UB, the substitution is also possible.

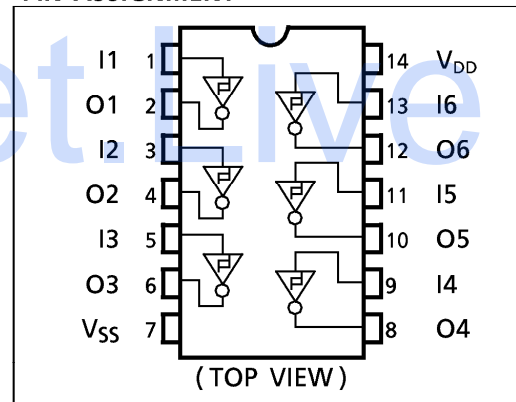
(Note) The JEDEC SOP (FN) is not available in Japan.



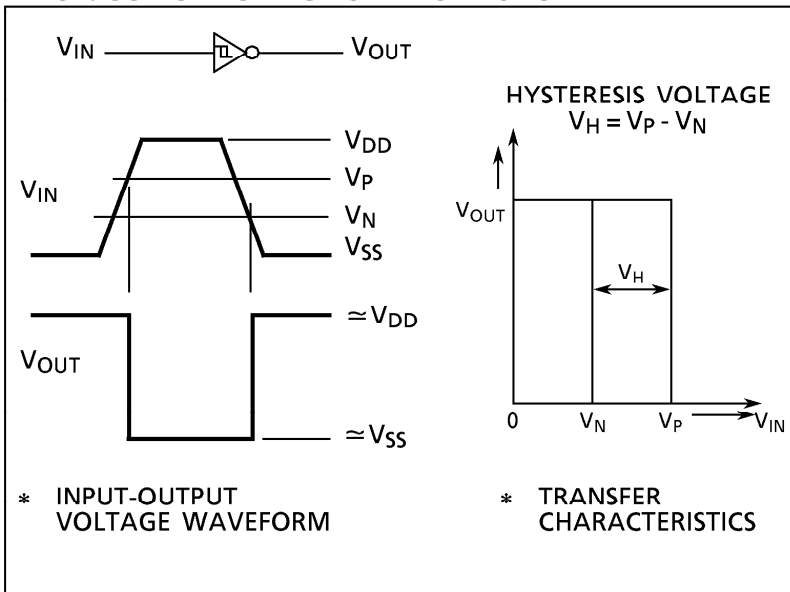
### MAXIMUM RATINGS

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	$I_{IN}$	$\pm 10$	mA
Power Dissipation	$P_D$	300 (DIP) / 180 (SOIC)	mW
Operating Temperature Range	$T_{opr}$	$-40 \sim 85$	$^{\circ}C$
Storage Temperature Range	$T_{stg}$	$-65 \sim 150$	$^{\circ}C$

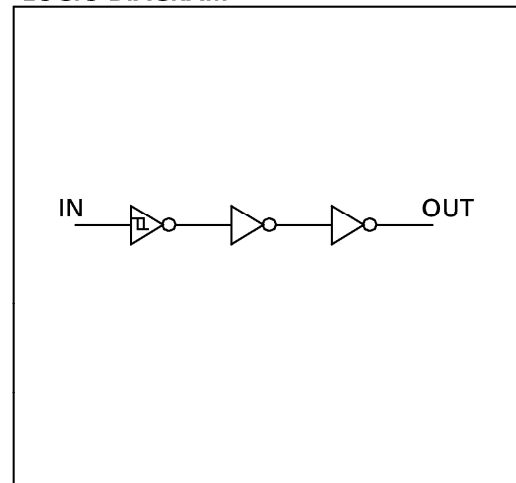
### PIN ASSIGNMENT



### INPUT / OUTPUT VOLTAGE CHARACTERISTIC



### LOGIC DIAGRAM



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

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

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

CHARACTERISTIC	SYMBOL	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	V	
			10	—	0.05	—	0.00	0.05	—	0.05		
			15	—	0.05	—	0.00	0.05	—	0.05		
Output High Current	$I_{OH}$	$V_{IN} = V_{SS}, V_{DD}$	$V_{OH} = 4.6V$	5	-0.61	—	-0.51	-1.0	—	-0.42	—	mA
			$V_{OH} = 2.5V$	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	—	
Output Low Current	$I_{OL}$	$V_{IN} = V_{SS}, V_{DD}$	$V_{OL} = 0.4V$	5	0.61	—	0.51	1.5	—	0.42	—	mA
			$V_{OL} = 0.5V$	10	1.50	—	1.30	3.8	—	1.10	—	
			$V_{OL} = 1.5V$	15	4.00	—	3.40	15.0	—	2.80	—	
Positive Trigger Threshold Voltage	$V_P$	$V_{OUT} = 0.5V$ $V_{OUT} = 1.0V$ $V_{OUT} = 1.5V$	5	2.05	3.75	2.15	3.0	3.75	2.15	3.85	V	
			10	4.80	7.60	4.90	6.4	7.60	4.90	7.70		
			15	7.80	11.60	7.90	9.9	11.60	7.90	11.70		
Negative Trigger Threshold Voltage	$V_N$	$V_{OUT} = 4.5V$ $V_{OUT} = 9.0V$ $V_{OUT} = 13.5V$	5	1.25	2.95	1.25	2.3	2.85	1.15	2.85	V	
			10	2.40	5.20	2.40	3.8	5.10	2.30	5.10		
			15	3.40	7.20	3.40	5.2	7.10	3.30	7.10		
Hysteresis Voltage	$V_H$		5	0.10	1.25	0.25	0.65	1.25	0.25	1.40	V	
			10	1.80	3.50	1.90	2.60	3.50	1.90	3.60		
			15	3.70	5.60	3.80	4.70	5.60	3.80	5.70		
Input Current	"H" Level	$I_{IH}$	$V_{IH} = 18V$	18	—	0.1	—	$10^{-5}$	0.1	—	1.0	$\mu A$
	"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	—	1	—	0.001	1	—	7.5	$\mu A$	
			10	—	2	—	0.002	2	—	15.0		
			15	—	4	—	0.004	4	—	30.0		

\* All valid input combinations.

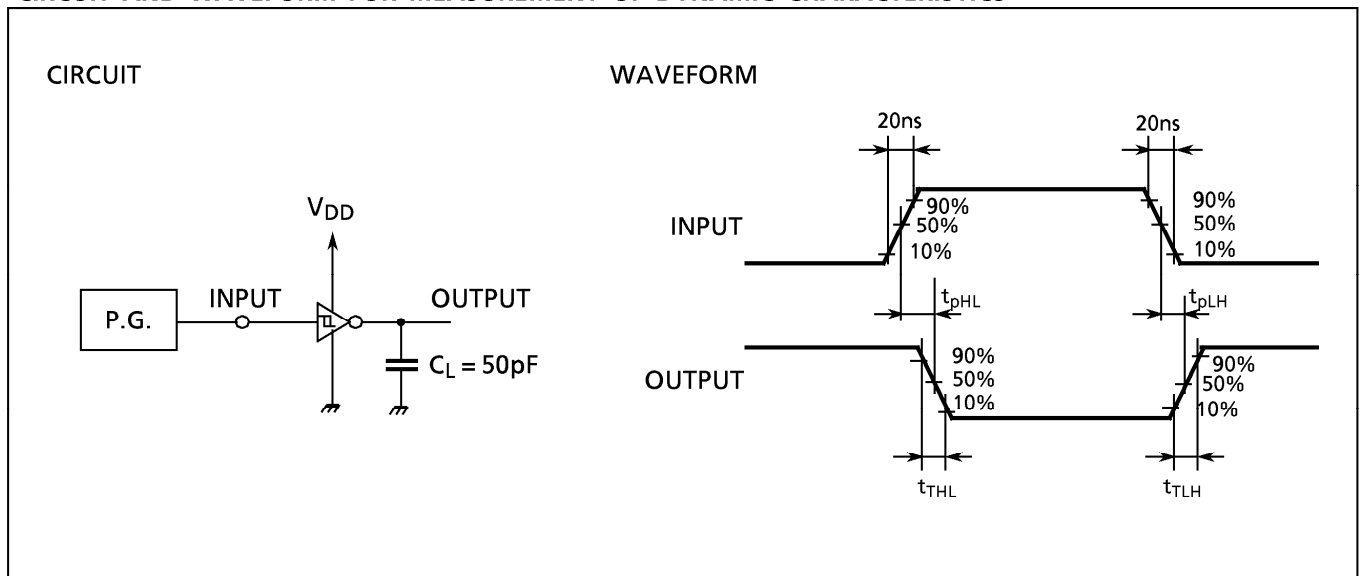
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**DYNAMIC ELECTRICAL CHARACTERISTICS (Ta = 25°C, Vss = 0V, CL = 50pF)**

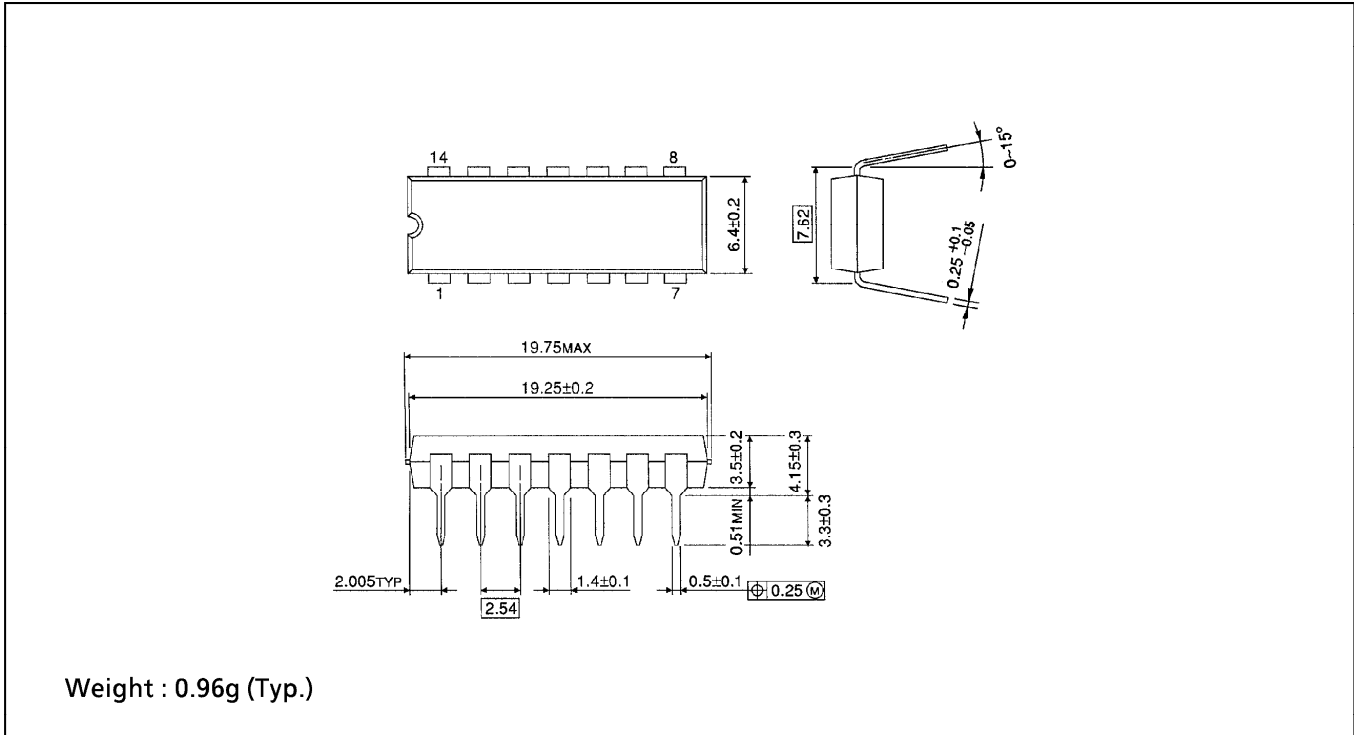
CHARACTERISTIC	SYMBOL	TEST CONDITION	V <sub>DD</sub> (V)	MIN.	TYP.	MAX.	UNIT
Output Transition Time (Low to High)	t <sub>TLH</sub>		5	—	80	200	ns
			10	—	50	100	
			15	—	40	80	
Output Transition Time (High to Low)	t <sub>THL</sub>		5	—	80	200	
			10	—	50	100	
			15	—	40	80	
Propagation Delay Time	t 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

**CIRCUIT AND WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS**



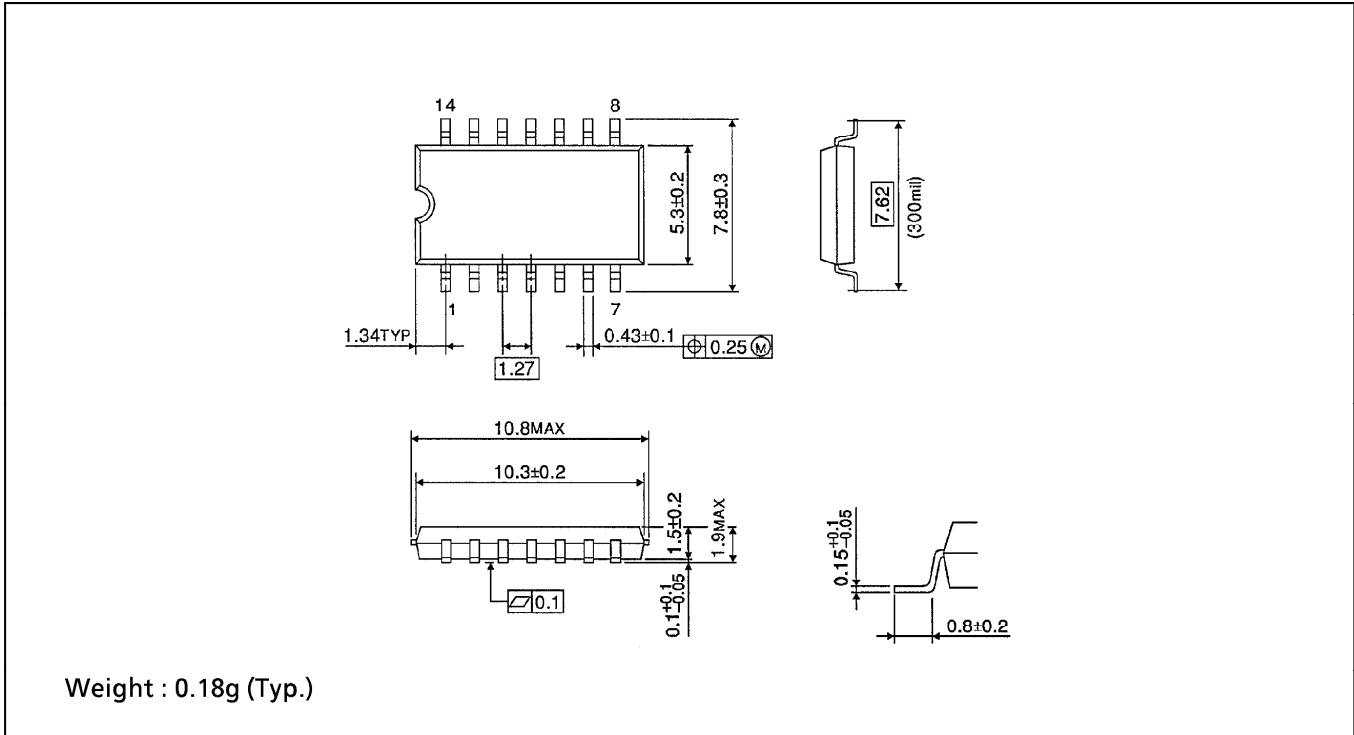
DIP 14PIN OUTLINE DRAWING (DIP14-P-300-2.54)

Unit in mm



SOP 14PIN (200mil BODY) OUTLINE DRAWING (SOP14-P-300-1.27)

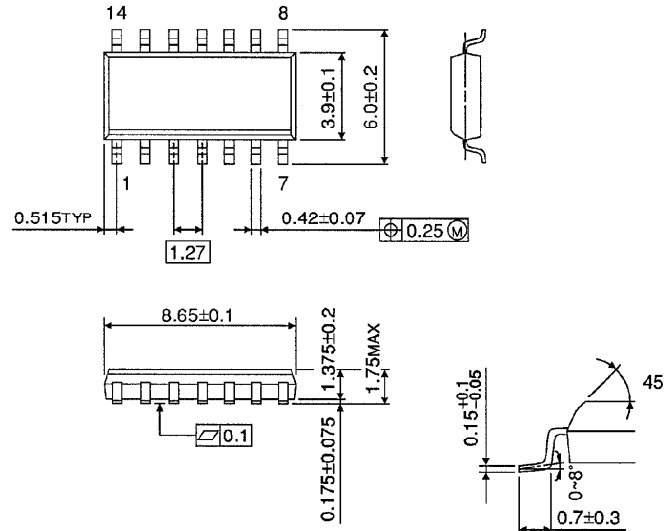
Unit in mm



SOP 14PIN (150mil BODY) OUTLINE DRAWING (SOL14-P-150-1.27)

Unit in mm

(Note) This package is not available in Japan.



Weight : 0.12g (Typ.)