

# TC4503BP/BF

C<sup>2</sup>MOS DIGITAL INTEGRATED CIRCUIT  
SILICON MONOLITHIC

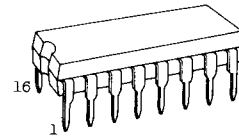
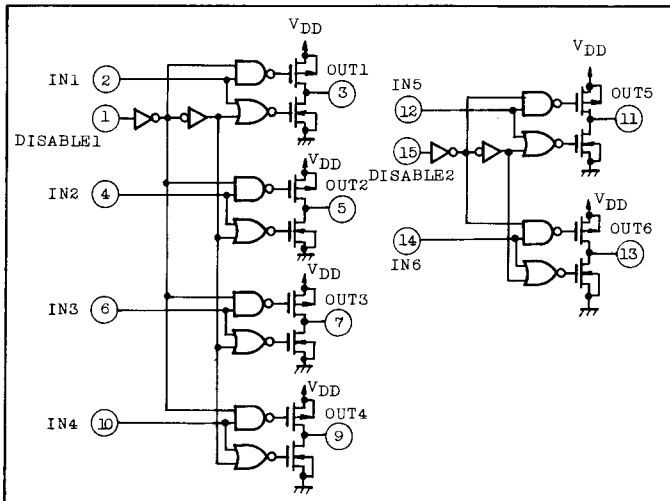
## TC4503BP/TC4503BF HEX NON-INVERTING 3-STATE BUFFER

TC4503BP/BF contains six circuits of non-inverting buffers having three state output. Since DISABLE inputs to disable the outputs are provided separately, one common for four circuits and another common for other two circuits, this is suitable for controlling four bit data lines. Large output current enables to directly control one TTL input.

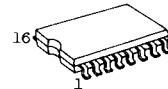
### ABSOLUTE MAXIMUM RATINGS

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	V <sub>IN</sub>	V <sub>SS</sub> -0.5 ~ V <sub>DD</sub> +0.5	V
Output Voltage	V <sub>OUT</sub>	V <sub>SS</sub> -0.5 ~ V <sub>DD</sub> +0.5	V
DC Input Current	I <sub>IN</sub>	±10	mA
Power Dissipation	P <sub>D</sub>	300 (DIP)/180 (MFP)	mW
Operating Temperature Range	T <sub>A</sub>	-40 ~ 85	°C
Storage Temperature Range	T <sub>stg</sub>	-65 ~ 150	°C
Lead Temp./Time	T <sub>sol</sub>	260°C • 10 sec	

### CIRCUIT DIAGRAM

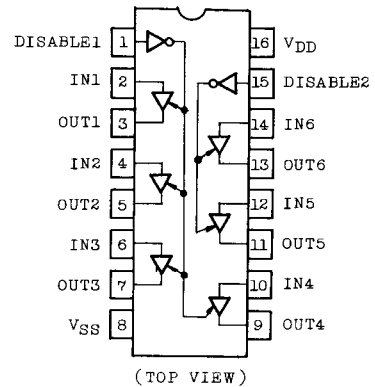


DIP16 (3D16A-P)



MFP16 (F16GC-P)

### PIN ASSIGNMENT



### TRUTH TABLE

DISABLE INPUT	INPUT	OUTPUT
L	L	L
L	H	H
H	*	HZ

\* : Don't care

HZ: High Impedance

RECOMMENDED OPERATING CONDITIONS (V<sub>SS</sub>=0V)

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

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	V <sub>DD</sub> (V)	-40°C		25°C			85°C		UNITS	
				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	-1.16	-	-1.02	-2.4	-	-0.7	-	mA	
			5	-5.7	-	-4.8	-10.0	-	-3.4	-		
			10	-3	-	-2.6	-5.5	-	-1.9	-		
			15	-8	-	-6.8	-20.0	-	-4.9	-		
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	2.5	-	2.1	3.8	-	1.4	-	mA	
			10	6.4	-	5.5	9.8	-	3.9	-		
			15	18.9	-	16.1	37.8	-	11.4	-		
			15	18.9	-	16.1	37.8	-	11.4	-		
Input High Voltage	V <sub>IH</sub>	V <sub>OUT</sub> =0.5V, 4.5V V <sub>OUT</sub> =1.0V, 9.0V V <sub>OUT</sub> =1.5V, 13.5V  I <sub>OUT</sub>   < 1μA	5	3.5	-	3.5	2.75	-	3.5	-	V	
			10	7.0	-	7.0	5.5	-	7.0	-		
			15	11.0	-	11.0	8.25	-	11.0	-		
			15	11.0	-	11.0	8.25	-	11.0	-		
Input Low Voltage	V <sub>IL</sub>	V <sub>OUT</sub> =0.5V, 4.5V V <sub>OUT</sub> =1.0V, 9.0V V <sub>OUT</sub> =1.5V, 13.5V  I <sub>OUT</sub>   < 1μA	5	-	1.5	-	2.25	1.5	-	1.5	V	
			10	-	3.0	-	4.5	3.0	-	3.0		
			15	-	4.0	-	6.75	4.0	-	4.0		
			15	-	4.0	-	6.75	4.0	-	4.0		
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	
3-State Output Leakage Current	"H" Level	I <sub>DH</sub>	V <sub>OUT</sub> =18V	18	-	0.4	-	10 <sup>-4</sup>	0.4	-	12	
	"L" Level	I <sub>DL</sub>	V <sub>OUT</sub> =0V	18	-	-0.4	-	-10 <sup>-4</sup>	-0.4	-	-12	
Quiescent Device Current	I <sub>DD</sub>	V <sub>IN</sub> =V <sub>DD</sub> , V <sub>SS</sub> *	5	-	1.0	-	0.002	1.0	-	30	μA	
			10	-	2.0	-	0.004	2.0	-	60		
			15	-	4.0	-	0.008	4.0	-	120		

\* All valid input combinations.

# TC4503BP/BF

## DYNAMIC ELECTRICAL CHARACTERISTICS (Ta=25°C, V<sub>SS</sub>=0V, C<sub>L</sub>=50pF)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V <sub>DD</sub> (V)	MIN.	TYP.	MAX.	UNITS
Output Transition Time (Low to High)	t <sub>TLH</sub>		5	-	30	90	ns
			10	-	20	45	
			15	-	15	35	
Output Transition Time (High to Low)	t <sub>THL</sub>		5	-	25	70	
			10	-	13	40	
			15	-	10	25	
Propagation Delay Time (IN - OUT)	t <sub>pLH</sub>		5	-	45	150	
			10	-	25	70	
			15	-	20	50	
Propagation Delay Time (IN - OUT)	t <sub>pHL</sub>		5	-	43	110	
			10	-	23	50	
			15	-	18	35	
Three State Disable Time (DISABLE - OUT)	t <sub>pHZ</sub>	R <sub>L</sub> =1kΩ	5	-	50	140	
			10	-	30	60	
			15	-	25	50	
Three State Disable Time (DISABLE - OUT)	t <sub>pLZ</sub>	R <sub>L</sub> =1kΩ	5	-	60	140	
			10	-	35	60	
			15	-	30	50	
Three State Disable Time (DISABLE - OUT)	t <sub>pZH</sub>	R <sub>L</sub> =1kΩ	5	-	65	130	
			10	-	35	50	
			15	-	30	40	
Three State Disable Time (DISABLE - OUT)	t <sub>pZL</sub>	R <sub>L</sub> =1kΩ	5	-	70	130	
			10	-	35	50	
			15	-	30	40	
Input Capacitance	C <sub>IN</sub>			-	7.5	15	pF

## WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

