

October 1987 Revised January 1999

CD4503BC

Hex Non-Inverting 3-STATE Buffer

General Description

The CD4503BC is a hex non-inverting 3-STATE buffer with high output current sink and source capability. 3-STATE outputs make it useful in bus-oriented applications. Two separate disable inputs are provided. Buffers 1 through 4 are controlled by the disable 4 input. Buffers 5 and 6 are controlled by the disable 2 input. A high level on either disable input will cause those gates on its control line to go into a high impedance state.

Features

- \blacksquare Wide supply voltage range: $\:$ 3.0 $\rm V_{DC}$ to 18 $\rm V_{DC}$
- 3-STATE outputs
- Symmetrical turn on/turn off delays
- Symmetrical output rise and fall times
- Pin-for-pin replacement for MM80C97 and MC14503

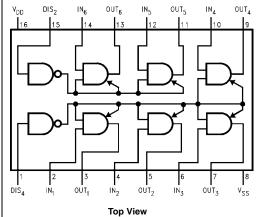
Ordering Code:

Order Number	Package Number	Package Description					
CD4503BCM	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow Body					
CD4503BCSJ	M16D	16-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide					
CD4503BCN	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide					

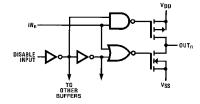
Devices also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

Connection Diagram

Pin Assignments for DIP, SOIC and SOP



Schematic Diagram



Truth Table

In)	Disable	Out
		Input	
0		0	0
1		0	1
Х		1	3-STATE

X = Don't Care

Absolute Maximum Ratings(Note 1)

(Note 2)

Supply Voltage (V_{DD}) -0.5V to +18V Input Voltage (V_{IN}) -0.5V to +0.5V Storage Temperature Range (T_S) $-65^{\circ}C$ to $+150^{\circ}C$

Power Dissipation (P_D)

700 mW Dual-In-Line Small Outline 500 mW

Lead Temperature (T_L)

(Soldering, 10 seconds) 260°C

Recommended Operating Conditions (Note 2)

Supply Voltage (V_{DD}) +3V to +15V-40°C to +85°C

Operating Temperature Range (T_A) Note 1: "Absolute Maximum Ratings" are those values beyond which the

that the device anonto be guaranteed. They are not meant to imply that the devices should be operated at these limits. The tables of "Recommended Operating Conditions" and "Electrical Characteristics" provide conditions for actual device operation.

Note 2: $V_{SS} = 0V$ unless otherwise specified.

DC Electrical Characteristics (Note 2)

Symbol	Parameter	Conditions	-40	-40°C		+25°C			+85°C	
		Conditions	Min	Max	Min	Тур	Max	Min	Max	Units
I _{DD}	Quiescent Device	$V_{DD} = 5V$,		4			4		30	μΑ
	Current	$V_{IN} = V_{DD}$ or V_{SS}								İ
		V _{DD} = 10V,		8			8		60	μΑ
		$V_{IN} = V_{DD}$ or V_{SS}								İ
		V _{DD} = 15V,		16			16		120	μΑ
		$V_{IN} = V_{DD}$ or V_{SS}								İ
V _{OL}	LOW Level	V _{IN} = V _{DD} or 0								
	Output Voltage	$V_{DD} = 5V$		0.05		0	0.05		0.05	V
		V _{DD} = 10V		0.05		0	0.05		0.05	V
		V _{DD} = 15V		0.05		0	0.05		0.05	V
V _{OH}	HIGH Level	V _{IN} = V _{DD} or 0								
	Output Voltage	$V_{DD} = 5V$	4.95		4.95			4.95		V
		V _{DD} = 10V	9.95		9.95			9.95		V
		V _{DD} = 15V	14.95		14.95			14.95		V
V _{IL}	LOW Level	$V_{DD} = 5V$,		1.5		2.25	1.5		1.5	V
	Input Voltage	V _O = 4.5V or 0.5V								İ
		V _{DD} = 10V,		3.0		4.50	3.0		3.0	V
		V _O = 9.0V or 1.0V								İ
		V _{DD} = 15V,		4.0		6.75	4.0		4.0	V
		V _O = 13.5V or 1.5V								İ
V _{IH}	HIGH Level	$V_{DD} = 5V$,	3.5		3.5	2.75		3.5		V
	Input Voltage	V _O = 0.5V or 4.5V								İ
		V _{DD} = 10V,	7.0		7.0	5.5		7.0		V
		V _O = 1.0V or 9.0V								İ
		V _{DD} = 15V,	11.0		11.0	8.25		11.0		V
		V _O = 1.5V or 13.5V								İ
I _{OL}	LOW Level Output	$V_{DD} = 4.5V, V_{OL} = 0.4V$	2.30		1.95	2.65		1.60		mA
	Current	$V_{DD} = 5.0V, V_{OL} = 0.4V$	2.5		2.10	2.75		1.75		mA
		$V_{DD} = 10V, V_{OL} = 0.5V$	6.5		5.45	7.0		4.45		mA
		$V_{DD} = 15V, V_{OL} = 1.5V$	16.50		13.80	25.00		11.30		mA
I _{OH}	HIGH Level Output	$V_{DD} = 5V, V_{OH} = 4.6V$	-1.04		-0.88	-1.76		-0.7		mA
	Current	$V_{DD} = 10V, V_{OH} = 9.5V$	-2.60		-2.2	-4.50		-1.8		mA
		$V_{DD} = 15V, V_{OH} = 13.5V$	-7.2		-6.0	-17.6		-4.8		mA
I _{TL}	3-STATE Leakage Current	V _{DD} = 15V		±0.3		±10 ⁻⁴	±0.3		±1.0	μΑ
I _{IN}	Input Current	V _{DD} = 15V		±0.3		±10 ⁻⁵	±0.3		±1.0	μΑ

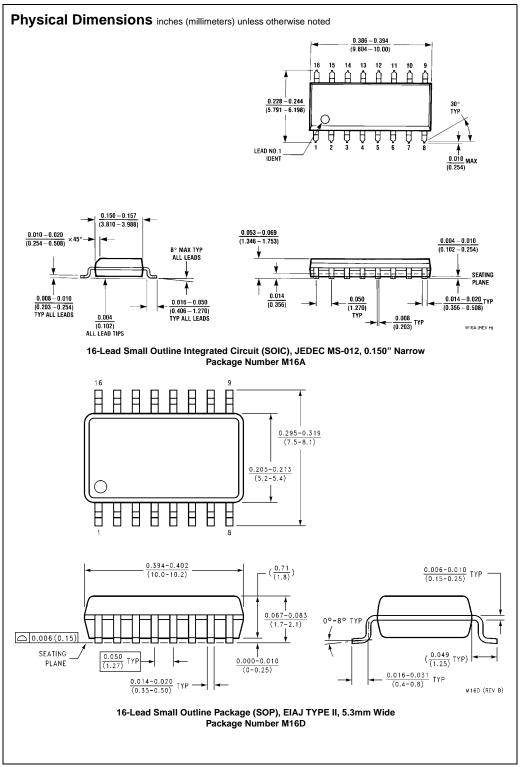
Note 3: I_{OH} and I_{OL} are tested one output at a time.

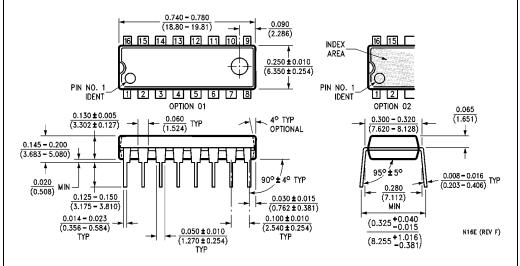
AC Electrical Characteristics (Note 4) $T_A=25^{\circ}C,\,C_L=50\text{ pF},\,R_L=200\text{ k}\Omega,\,\text{Input }t_r=t_f=20\text{ ns, unless otherwise specified}$

Symbol	Parameter	Conditions	Min	Тур	Max	Units
t _{PHL} , t _{PLH}	Propagation Delay Time	$V_{DD} = 5V$		75	100	ns
		V _{DD} = 10V		35	40	ns
		V _{DD} = 15V		25	30	ns
t _{PLZ} , t _{PHZ}	Propagation Delay Time,	V _{DD} = 5V		80	125	ns
	Logical Level to HIGH	V _{DD} = 10V		40	90	ns
	Impedance State	V _{DD} = 15V		35	70	ns
t _{PZL} , t _{PZH}	Propagation Delay Time,	V _{DD} = 5V		95	175	ns
	High Impedance State to	$V_{DD} = 10V$		40	80	ns
	Logical Level	V _{DD} = 15V		35	70	ns
t _{TLH}	Output Rise Time	V _{DD} = 5V		45	80	ns
		$V_{DD} = 10V$		23	40	ns
		V _{DD} = 15V		18	35	ns
t _{THL}	Output Fall Time	V _{DD} = 5V		45	80	ns
		$V_{DD} = 10V$		23	40	ns
		$V_{DD} = 15V$		18	35	ns

Note 4: AC Parameters are guaranteed by DC correlated testing.

AC Test Circuits and Switching Time Waveforms VIN ► tPHZ VDD VOUT $t_{\mbox{\footnotesize{PHZ}}}$ and $t_{\mbox{\footnotesize{PZH}}}$ t_{PLZ} and t_{PZL} DISABLE DISABLE $\mathsf{t}_{\mathsf{PHZ}}$ t_{PLZ} DISABLE 50% DISABLE OUTPUT OUTPUT t_{PZL} DISABLE DISABLE | ₹PZH t_{PZL} |- OUTPUT OUTPUT 0٧ v_{oL} Note: Delays measured with input $t_{\text{f}},\,t_{\text{f}}\leq 20\,\,\text{ns}.$



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16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide Package Number N16E

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