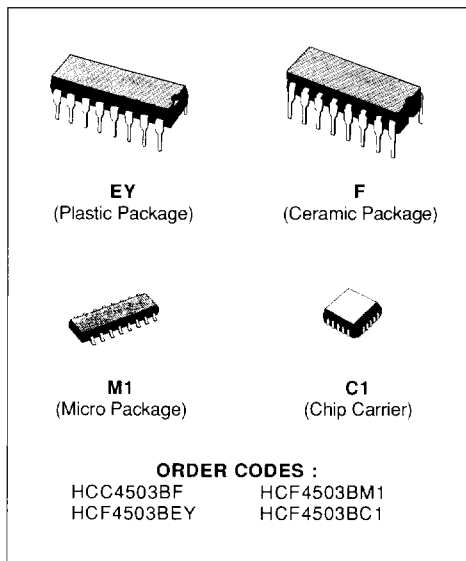


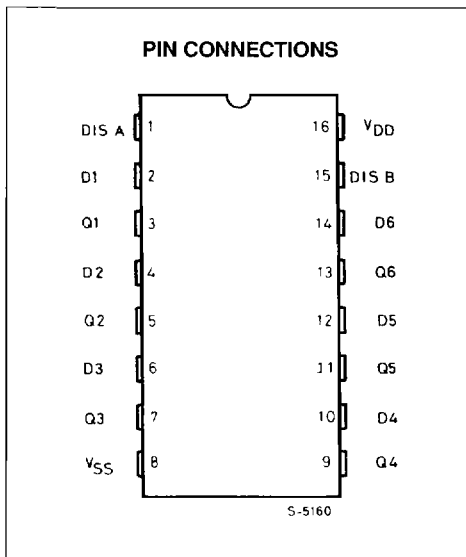
HEX BUFFER

- 1 TTL-LOAD OUTPUT DRIVE CAPABILITY
- 2 OUTPUT-DISABLE CONTROLS
- 3 STATE OUTPUTS
- 5V, 10V, AND 15V PARAMETRIC RATINGS
- QUIESCENT CURRENT SPECIFIED TO 20V FOR HCC DEVICE
- INPUT CURRENT OF 100nA AT 18V AND 25°C FOR HCC DEVICE
- 100% TESTED FOR QUIESCENT CURRENT
- MEETS ALL REQUIREMENTS OF JEDEC TENTATIVE STANDARD N⁰. 13A, "STANDARD SPECIFICATIONS FOR DESCRIPTION OF "B" SERIES CMOS DEVICES"

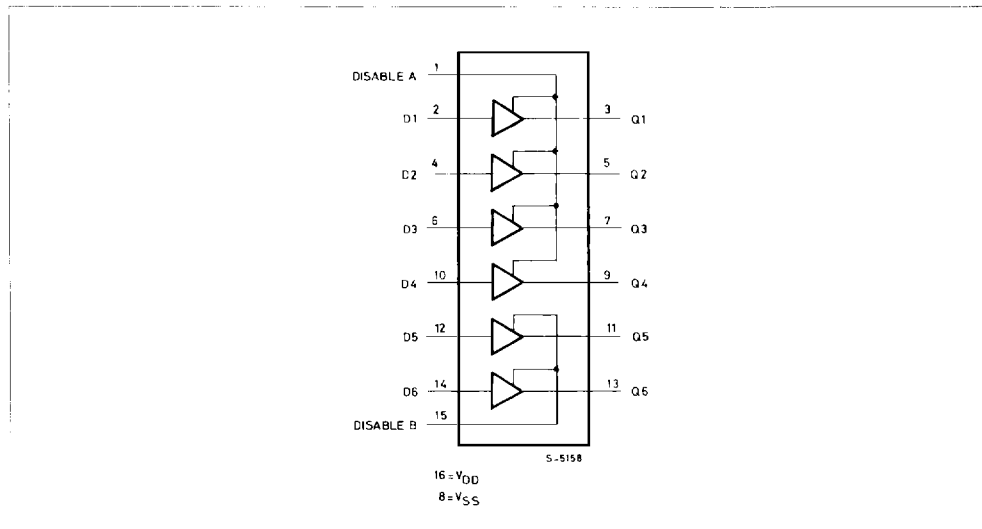

DESCRIPTION

The **HCC4503B** (extended temperature range) and **HCF4503B** (intermediate temperature range) are monolithic integrated circuits, available in 16-lead dual in-line plastic or ceramic package, and plastic micro package.

The **HCC/HCF4503B** is a hex noninverting buffer with 3-state outputs having high sink and source-current capability. Two disable controls are provided, one of which controls four buffers and the other controls the remaining two buffers.



FUNCTIONAL DIAGRAM



ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Unit
V _{DD} *	Supply Voltage: HCC Types	-0.5 to +20	V
	HCF Types	-0.5 to +18	V
V _i	Input Voltage	-0.5 to V _{DD} + 0.5	V
I _i	DC Input Current (any one input)	± 10	mA
P _{tot}	Total Power Dissipation (per package)	200	mW
	Dissipation per Output Transistor		
	for T _{op} = Full Package Temperature Range	100	mW
T _{op}	Operating Temperature: HCC Types	-55 to +125	°C
	HCF Types	-40 to +85	°C
T _{stg}	Storage Temperature	-65 to +150	°C

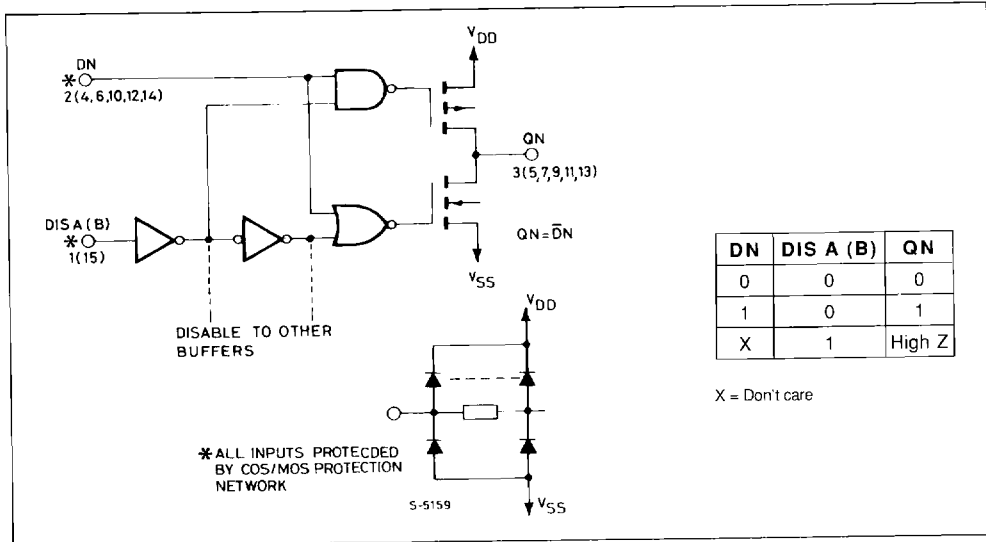
Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for external periods may affect device reliability.

* All voltage values are referred to V_{SS} pin voltage.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V _{DD}	Supply Voltage: HCC Types	3 to 18	V
	HCF Types	3 to 15	V
V _i	Input Voltage	0 to V _{DD}	V
T _{op}	Operating Temperature: HCC Types	-55 to +125	°C
	HCF Types	-40 to +85	°C

LOGIC DIAGRAM AND TRUTH TABLE



STATIC ELECTRICAL CHARACTERISTICS (over recommended operating conditions)

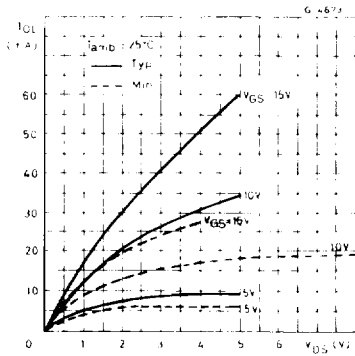
Symbol	Parameter	Test Conditions					Value						Unit
		V _I (V)	V _O (V)	I _o (μ A)	V _{DD} (V)	T _{LOW} *		25 °C			T _{HIGH} *		
						Min.	Max.	Min.	Typ.	Max.	Min.	Max.	
I _L	Quiescent Current	HCC Types	0/5			5		1	0.02	1		30	μ A
			0/10			10		2	0.02	2		60	
			0/15			15		4	0.02	4		120	
			0/20			20		20	0.04	20		600	
		HCF Types	0/5			5		4	0.02	4		30	
			0/10			10		8	0.02	8		60	
			0/15			15		16	0.02	16		120	
V _{OH}	Output High Voltage	0/5		< 1	5	4.95		4.95			4.95	V	
		0/10		< 1	10	9.95		9.95			9.95		
		0/15		< 1	15	14.95		14.95			14.95		
V _{OL}	Output Low Voltage	5/0		< 1	5		0.05		0.05		0.05	V	
		10/0		< 1	10		0.05		0.05		0.05		
		15/0		< 1	15		0.05		0.05		0.05		
V _{IH}	Input High Voltage		0.5/4.5	< 1	5	3.5		3.5			3.5	V	
			1/9	< 1	10	7		7			7		
			1.5/13.5	< 1	15	11		11			11		
V _{IL}	Input Low Voltage		4.5/0.5	< 1	5		1.5			1.5		V	
			9/1	< 1	10		3			3	3		
			13.5/1.5	< 1	15		4			4	4		
I _{OH}	Output Drive Current	HCC Types	0/5	2.5		5	-5.8		-4.8	-6.1		-3	mA
			0/5	4.6		5	-1.2		-1.02	-1.9		-0.7	
			0/10	9.5		10	-3.1		-2.6	-3.7		-1.8	
			0/15	13.5		15	-8.2		-6.8	-14.1		-4.8	
		HCF Types	0/5	2.5		5	-4.8		-4.1	-5.2		-2.9	
			0/5	4.6		5	-1		-0.8	-1.6		-0.6	
			0/10	9.5		10	-2.5		-2.2	-3.1		-1.6	
			0/15	13.5		15	-6.8		-5.8	-11.9		-4.2	
I _{OL}	Output Sink Current	HCC Types	0/5	0.4		5	2.6		2.1	2.3		1.3	mA
			0/10	0.5		10	6.5		5.5	2.6		3.8	
			0/15	1.5		15	19.2		16.1	23		11.2	
		HCF Types	0/5	0.4		5	2.1		1.8	1.9		1.2	
			0/10	0.5		10	5.4		4.7	5.3		3.3	
			0/15	1.5		15	16		13.7	19.5		9.7	
I _{IH} , I _{IL}	Input Leakage Current	0/18		Any Input	18		± 0.1	$\pm 10^{-5}$	± 0.1		± 1	μ A	
		0/15		Any Input	15		± 0.3	$\pm 10^{-5}$	± 0.3		± 1		
I _{OH}	Input Leakage Current	0/18		Any Input	18		± 0.4	$\pm 10^{-4}$	± 0.4		± 12	μ A	
		0/15		Any Input	15		± 1.0	$\pm 10^{-4}$	± 1.0		± 7.5		
C _I	Input Capacitance			Any Input				5	7.5			pF	

* T_{LOW} = -55 °C for HCC device; -40 °C for HCF device.* T_{HIGH} = +125 °C for HCC device; +85 °C for HCF device.The Noise Margin for both "1" and "0" level is: 1V min. with V_{DD} = 5 V, 2 V min. with V_{DD} = 10 V, 2.5 V min. with V_{DD} = 15 V

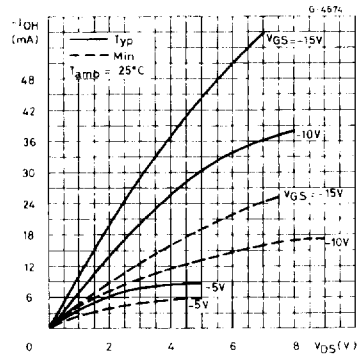
DYNAMIC ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, $C_L = 50\text{ pF}$, $R_L = 200\text{ K}\Omega$, typical temperature coefficient for all V_{DD} values is $03\% / ^{\circ}\text{C}$, all input rise and fall times = 20 ns)

Symbol	Parameter	Test Conditions		Value			Unit
		V_{DD} (V)	Min.	Typ.	Max.		
t_{PLH}	Propagation Delay Time	5		75	150	ns	
		10		35	70		
		15		25	50		
t_{PHL}	Propagation Delay Time	5		55	110	ns	
		10		25	50		
		15		17	35		
t_{PHZ} t_{PZH}	3-State Propagation Delay Time	5		70	140	ns	
		10		30	60		
		15		25	50		
t_{PZL} t_{PLZ}	3-State Propagation Delay Time	5		90	180	ns	
		10		40	80		
		15		35	70		
t_{LH}	Transition Time	5		50	90	ns	
		10		30	45		
		15		25	35		
t_{HL}	Transition Time	5		35	70	ns	
		10		20	40		
		15		13	25		

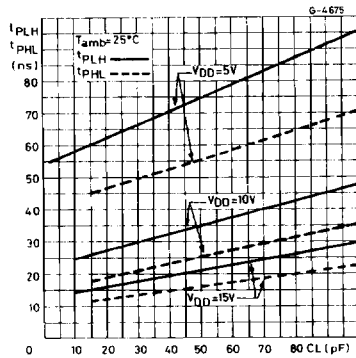
N Channel Output Low (sink) Current Characteristics.



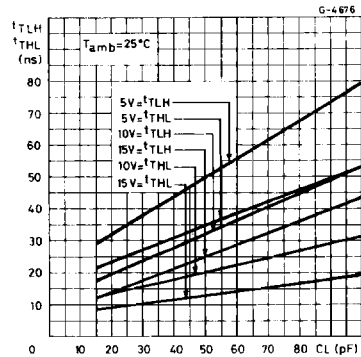
P Channel Output High (source) Current Characteristics.



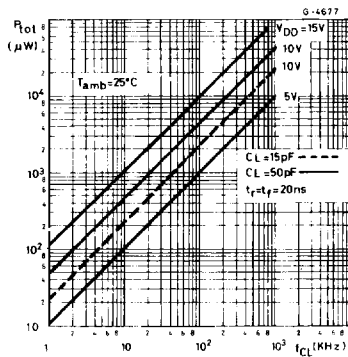
Typical Propagation Delay Time vs. Load Capacitance.



Typical Transition Time vs. Load Capacitance.

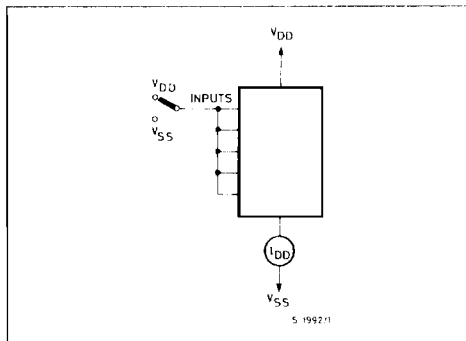


Typical Dynamic Power Dissipation vs. Frequency.

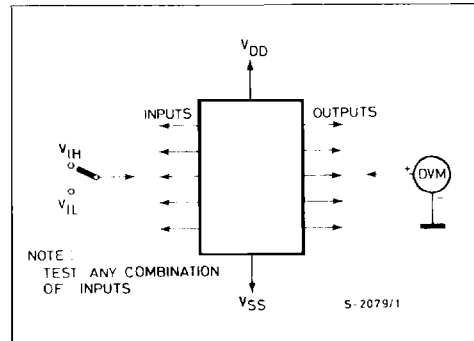


TEST CIRCUITS

Quiescent Device Current.

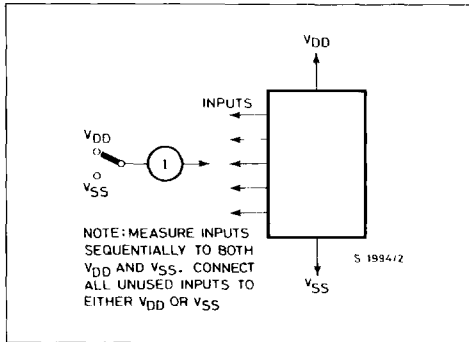


Input Voltage.



TEST CIRCUIT (continued)

Input Leakage Current.



Dynamic Power Dissipation.

