

PRELIMINARY DATA

DUAL 2-WIDE 2-INPUT AND-OR-INVERTER GATE

- MEDIUM-SPEED OPERATION - $t_{pHL} = 90$ ns; $t_{pLH} = 125$ ns (TYP.) AT 10V
- INDIVIDUAL INHIBIT CONTROLS
- STANDARDIZED SYMMETRICAL OUTPUT CHARACTERISTICS
- QUIESCENT CURRENT SPECIFIED TO 20V
- MAXIMUM INPUT CURRENT OF 1 μ A AT 18V (FULL PACKAGE-TEMPERATURE RANGE)
- 5V, 10V, AND 15V PAFAMETRIC RATINGS

The **HCC 4085B** (extended temperature range) and **HCF 4085B** (intermediate temperature range) are monolithic integrated circuit, available in 14-lead dual in-line plastic or ceramic package and ceramic flat package.

The **HCC/HCF 4085B** contains a pair of AND-OR-INVERT gates, each consisting of two 2-input AND gates driving a 3-input NOR gate. Individual inhibit controls are provided for both A-O-I gates.

ABSOLUTE MAXIMUM RATINGS

V_{DD} *	Supply voltage	-0.5 to 20	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: for HCC types	-55 to 125	$^{\circ}$ C
	for HCF types	-40 to 85	$^{\circ}$ C
T_{stg}	Storage temperature	-65 to 150	$^{\circ}$ C

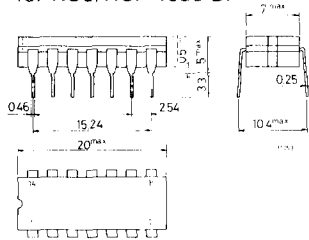
* All voltage values are referred to V_{SS} pin voltage

ORDERING NUMBERS:

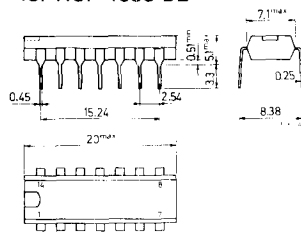
- HCC 4085 BD for dual in-line ceramic package
- HCC 4085 BF for dual in-line ceramic package, frit seal
- HCC 4085 BK for ceramic flat package
- HCF 4085 BE for dual in-line plastic package
- HCF 4085 BF for dual in-line ceramic package, frit seal

MECHANICAL DATA (dimensions in mm)

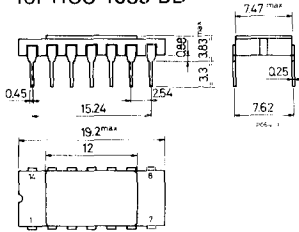
Dual in-line ceramic package for HCC/HCF 4085 BF



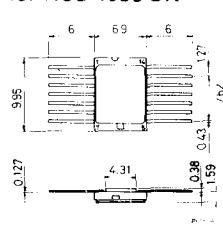
Dual in-line plastic package for HCF 4085 BE



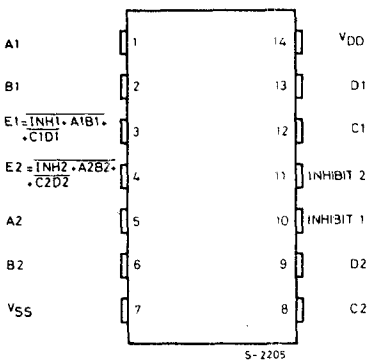
Dual in-line ceramic package for HCC 4085 BD



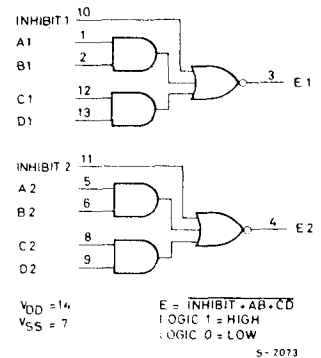
Ceramic flat package for HCC 4085 BK



CONNECTION DIAGRAM



LOGIC DIAGRAM

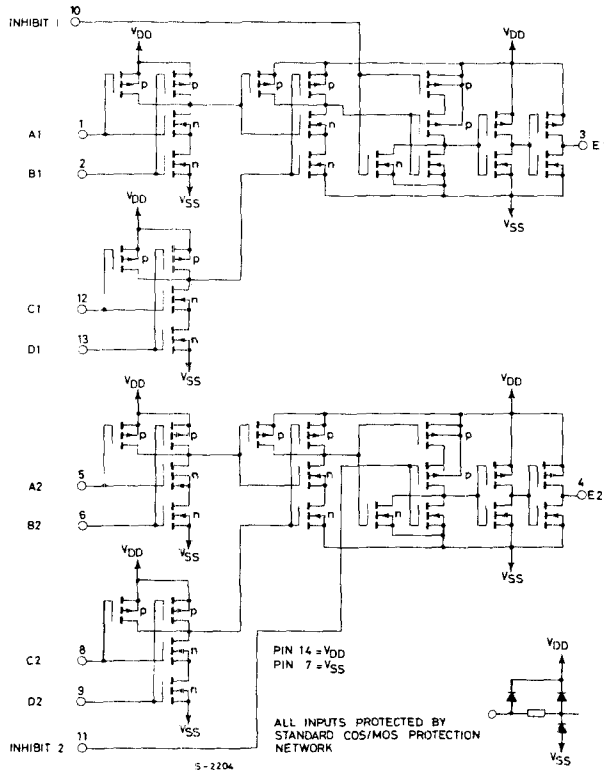


RECOMMENDED OPERATING CONDITIONS

V_{DD}	Supply voltage	3 to 18	V
V_I	Input voltage	0 to V_{DD}	V
T_{op}	Operating temperature: for HCC types for HCF types	-55 to 125 -40 to 85	°C °C

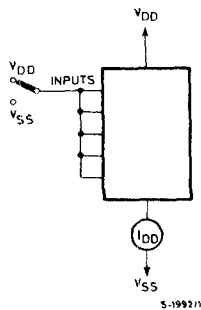


SCHEMATIC DIAGRAM

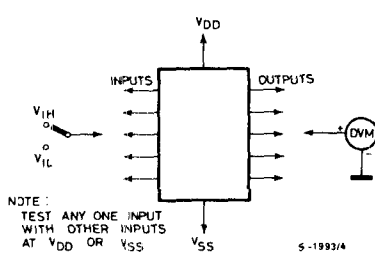


TEST CIRCUITS

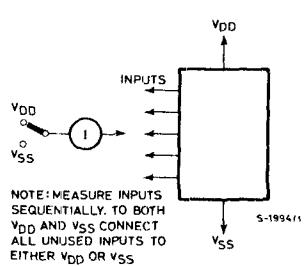
Quiescent device current



Input voltage



Input current



STATIC ELECTRICAL CHARACTERISTICS (over recommended operating conditions)

Parameter	Test conditions				Values							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 supply current	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	
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		
		15/13.5	< 1	15	11		11			11		
V _{IL} Input low voltage		4.5/0.5	< 1	5		1.5			1.5		1.5	V
		9/1	< 1	10		3			3		3	
		13.5/15	< 1	15		4			4		4	
I _{OH} Output drive current	HCC types	0/ 5	2.5		5	-2		-1.6	-3.2		-1.15	V
		0/ 5	4.6		5	-0.64		-0.51	-1		-0.36	
		0/10	9.5		10	-1.6		-1.3	-2.6		-0.9	
	0/15	13.5		15	-4.2		-3.4	-6.8		-2.4		
	HCF types	0/ 5	2.5		5	-1.8		-1.6	-3.2		-1.3	
		0/ 5	4.6		5	-0.61		-0.51	-1		-0.42	
0/10		9.5		10	-1.5		-1.3	-2.6		-1.1		
0/15	13.5		15	-4		-3.4	-6.8		-2.8			
I _{OL} Output sink current	HCC types	0/ 5	0.4		5	0.64		0.51	1		0.36	V
		0/10	0.5		10	1.6		1.3	2.6		0.9	
		0/15	1.5		15	4.2		3.4	6.8		2.4	
	HCF types	0/ 5	0.4		5	0.61		0.51	1		0.42	
		0/10	0.5		10	1.5		1.3	2.6		1.1	
		0/15	1.5		15	4		3.4	6.8		2.8	
I _{IH} , I _{IL} Input leakage current	0/18	Any input	18		± 0.1		$\pm 10^{-5}$	± 0.1		± 1	μ A	
C _I Input capacitance		Any input					5	7.5			pF	

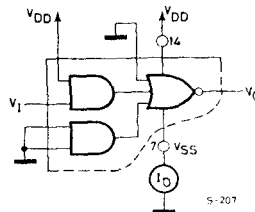
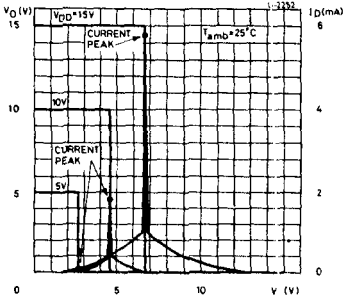
* T_{Low} = - 55°C for HCC device; - 40°C for HCF device.
 * T_{High} = +125°C for HCC device; + 85°C for HCF device.
 The Noise Margin for both "1" and "0" level is: 1V min. with V_{DD}= 5V
 2V min. with V_{DD}= 10V
 2.5V min. with V_{DD}= 15V



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 $0.3\%/^{\circ}\text{C}$, all input rise and fall times = 20 ns)

Parameter	Test conditions	Values			Unit	
		V_{DD} (V)	Min.	Typ.		Max.
t_{PHL} Propagation delay time (Data)		5		225	450	ns
		10		90	180	
		15		65	130	
t_{PLH} Propagation delay time (Data)		5		310	620	
		10		125	250	
		15		90	180	
t_{PHL} Propagation delay time (Inhibit)		5		150	300	ns
		10		60	120	
		15		40	80	
t_{PLH} Propagation delay time (Inhibit)		5		250	500	
		10		100	200	
		15		70	140	
t_{TLH} , t_{THL} Transition time		5		100	200	ns
		10		50	100	
		15		40	80	

Typical voltage and current transfer characteristics with test circuit



Minimum and maximum voltage transfer characteristics with test circuit

