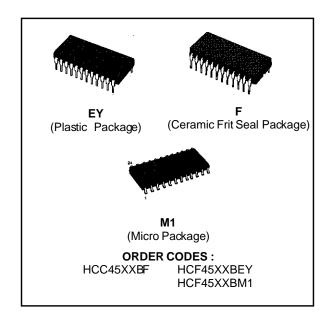


HCC/HCF4514B HCC/HCF4515B

4-BIT LATCH/4-TO-16 LINE DECODER

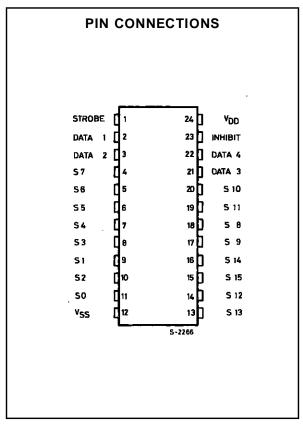
HCC/HCF4514B OUTPUT "HIGH" ON SELECT HCC/HCF4515B OUTPUT "LOW" ON SELECT

- QUIESCENT CURRENT SPECIFIED TO 20V FOR HCC DEVICE
- STROBED INPUT LATCH
- INHIBIT CONTROL
- 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"



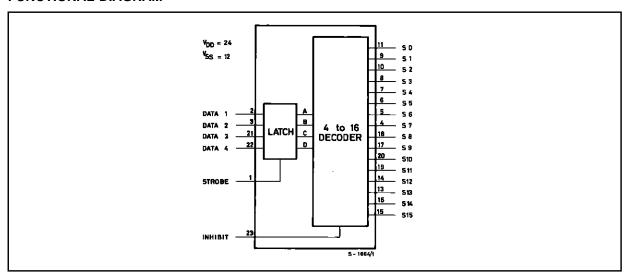
DESCRIPTION

The HCC 4514B/HCC 4515B (extended temperature range) and the HCF 4514B/HCF 4515B (intermediate temperature range) are monolithic integrated circuits available in 24-lead dual in-line plastic or ceramic package and plastic micro package. The HCC/HCF 4514B/4515B consisting of a 4-bit strobed latch and a 4 to 16 line decoder. The latches hold the last input data presented prior to the strobe transition from 1 to 0. Inhibit control allows all outputs to be placed at 0 (HCC/HCF 4514B) or 1 (HCC/HCF 4515B) regardless of the state of the data or strobe inputs. The decode truth table indicates all combinations of data inputs and appropriate selected outputs.



June 1989 1/11

FUNCTIONAL DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DD} *	Supply Voltage : HCC Types HCF Types	- 0.5 to + 20 - 0.5 to + 18	V V
Vi	Input Voltage	$-$ 0.5 to V_{DD} + 0.5	V
I_{1}	DC Input Current (any one input)	± 10	mA
P _{tot}	Total Power Dissipation (per package) Dissipation per Output Transistor for T _{op} = Full Package-temperature Range	200 100	mW mW
Top	Operating Temperature : HCC Types HCF Types	- 55 to + 125 - 40 to + 85	°C ℃
T _{stg}	Storage Temperature	- 65 to + 150	°C

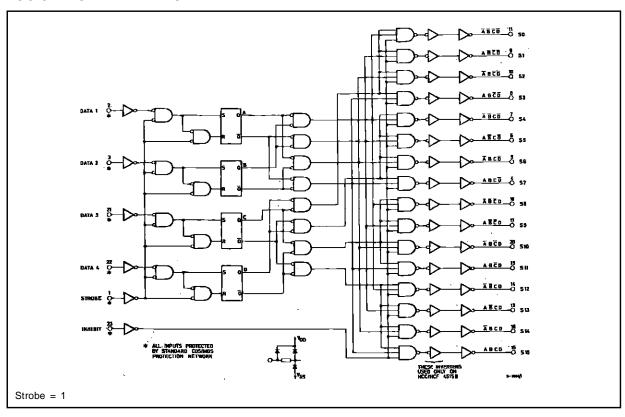
Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure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

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage: HCC Types	3 to 18	٧
	HCF Types	3 to 15	V
VI	Input Voltage	0 to V _{DD}	>
Top	Operating Temperature : HCC Types	- 55 to + 125	°C
	HCF Types	– 40 to + 85	°C



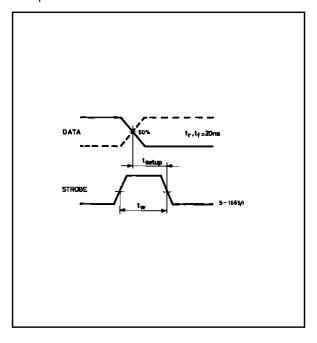
LOGIC DIAGRAM AND TRUTH TABLE



l l- : l- : 4	ı	Da Inp	ıta uts		Selected Output HCC/HCF 4514B = Logic 1			
Inhibit	D	C	В	Α	(High) HCC/HCF 4515B = Logic 0 (Low)			
0 0	0	0	0	0	S0 S1			
0		0	1	0	S2			
0	0	0	1	1	S3			
0	0	1	0	0	S4			
0	0	1	0	1	S5			
0	0	1	1	0	S6			
0	0	1	1	1	S7			
0	1	0	0	0	S8			
0	1	0	0	1	S9			
0	1	0	1	0	S10			
0	1	0	1	1	S11			
0	1	1	0	0	S12			
0	1	1	0	1	S13			
0	1	1	1	0	S14			
0	1	1	1	1	S15			
1	Х	Х	Х	х	All Outputs = 0, HCC/HCF 4514B All Outputs = 1, HCC/HCF 4515B			

WAVEFORMS

Setup Time and Strobe Pulse Width.



X = Don't Care 1 = high

STATIC ELECTRICAL CHARACTERISTICS (over recommended operating conditions)

			Т	est Con	dition	s	Value							
Symbol	Parame	ter	٧ı	۷o	I ₀	IIoI V _{DD}		T _{Low} * 25°C T _{High} *					igh*	Unit
			(V)	(V) (μA)	(V)	Min.	Max.	Min.	Тур.	Max.	Min.	Max.		
ΙL	Quiescent		0/ 5			5		5		0.04	5		150	
	Current HCC Types	нсс	0/10			10		10		0.04	10		300	
		Types	0/15			15		20		0.04	20		600	
			0/20			20		100		0.08	100		3000	μΑ
			0/ 5			5		20		0.04	20		150	
		HCF Types	0/10			10		40		0.04	40		300	
		Турсз	0/15			15		80		0.04	80		600	
V _{OH}	Output High	h	0/ 5		< 1	5	4.95		4.95			4.95		
	Voltage		0/10		< 1	10	9.95		9.95			9.95		V
			0/15		< 1	15	14.95		14.95			14.95		
V _{OL}	Output Low	1	5/0		< 1	5		0.05			0.05		0.05	
	Voltage		10/0		< 1	10		0.05			0.05		0.05	V
			15/0		< 1	15		0.05			0.05		0.05	
V_{IH}	Input High			0.5/4.5	< 1	5	3.5		3.5			3.5		
	Voltage		1/9	< 1	10	7		7			7		V	
				1.5/13.5	< 1	15	11		11			11		
V_{IL}	Input Low			4.5/0.5	< 1	5		1.5			1.5		1.5	
	Voltage			9/1	< 1	10		3			3		3	V
				13.5/1.5	< 1	15		4			4		4	
I _{OH}	Output		0/ 5	2.5		5	- 2		- 1.6	- 3.2		- 1.15		
	Drive Current	HCC	0/ 5	4.6		5	- 0.64		- 0.51	- 1		- 0.36		
	Current	Types	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		mA
			0/ 5	2.5		5	- 1.53		- 1.36	- 3.2		- 1.1		1117 \
		HCF	0/ 5	4.6		5	- 0.52		- 0.44	- 1		- 0.36		
		Types	0/10	9.5		10	- 1.3		- 1.1	- 2.6		- 0.9		
			0/15	13.5		15	- 3.6		- 3.0	- 6.8		- 2.4		
I_{OL}	Output	HCC	0/ 5	0.4		5	0.64		0.51	1		0.36		
	Sink Current	Types	0/10	0.5		10	1.6		1.3	2.6		0.9		
	Odifont	71	0/15	1.5		15	4.2		3.4	6.8		2.4		mA
		HCF	0/ 5	0.4		5	0.52		0.44	1		0.36		,
		Types	0/10	0.5		10	1.3		1.1	2.6		0.9		
			0/15	1.5		15	3.6		3.0	6.8		2.4		
I _{IH} , I _{IL}	Input HCC Leakage Types		0/18	Any In	put	18		± 0.1		±10 ⁻⁵	± 0.1		± 1	μΑ
	Current	HCF Types	0/15	, wiy iii	Put	15		± 0.3		±10 ⁻⁵	± 0.3		± 1	μι
Cı	Input Capa	citance		Any In	put					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, 2.5 V min. with V_{DD} = 15V.

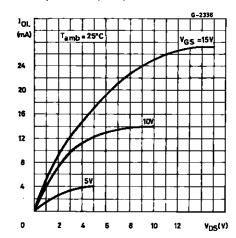


DYNAMIC ELECTRICAL CHARACTERISTICS

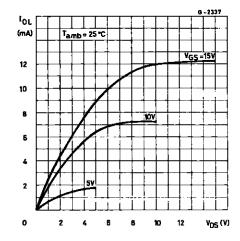
 $(T_{amb} = 25^{\circ}C, C_L = 50pF, R_L = 200k\Omega, all input rise and fall time = 20ns)$

Symbol	Parameter	Test Conditions			Unit			
Symbol	Parameter		V_{DD} (V)	Min.	Тур.	Max.	Oilit	
t _{PHL} ,	Propagation Delay Time		5		485	970		
t _{PLH}		Strobe or Data	10		185	370	ns	
			15		135	270		
			5		250	500		
		Inhibit	10		110	220	ns	
			15		85	170		
t _{THL} ,	Transition Time		5		100	200		
t _{THL}			10		50	100	ns	
			15		40	80		
t _W	Strobe Pulse Width		5	250	125			
			10	100	50		ns	
			15	75	40			
t _{setup}	Setup Time		5	150	75			
			10	70	35		ns	
			15	40	20			

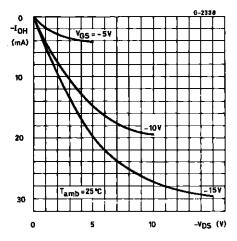
Typical Output Low (sink) Current Characteristics.



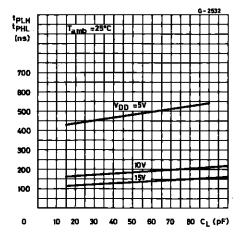
Minimum Output Low (sink) Current Characteristics.



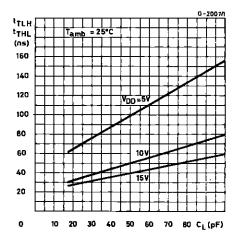
Typical Output High (source) Current Characteristics.



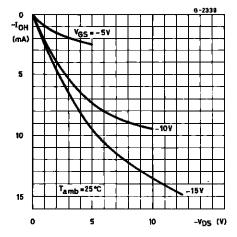
Typical Strobe or Data Propagation Delay Time vs. Load Capacitance.



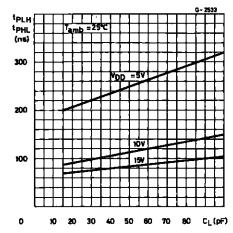
Typical Transition Time vs. Load Capacitance.



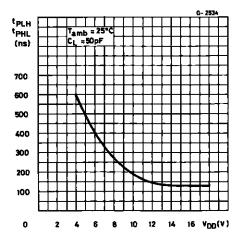
Minimum Output High (source) Current Characteristics.



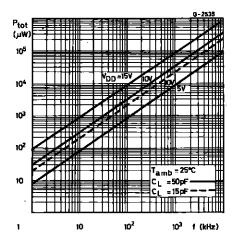
Typical Inhibit Propagation Delay Time vs. Load Capacitance.



Typical Strobe or Data Propagation Delay Time vs. Supply Voltage.

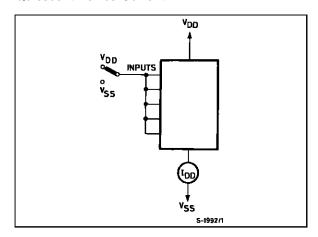


Typical Power Dissipation vs. Frequency.

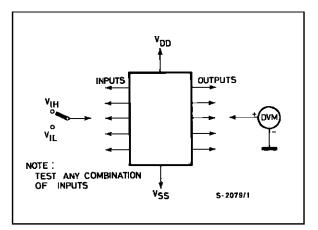


TEST CIRCUITS

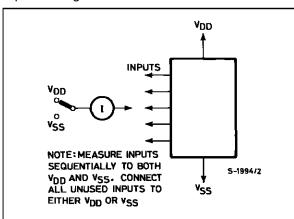
Quiescent Device Current.



Noise Immunity.

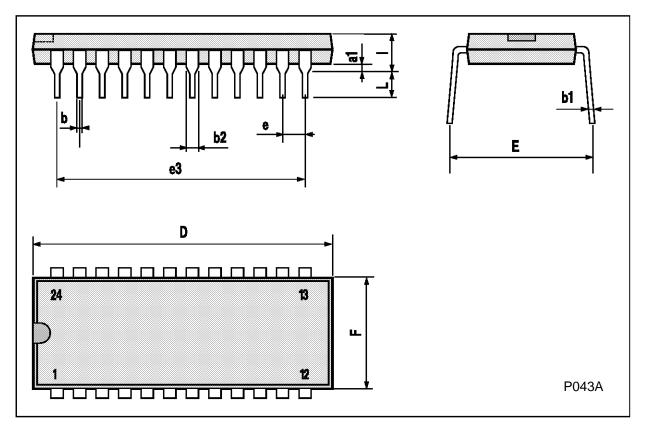


Input Leakage Current.



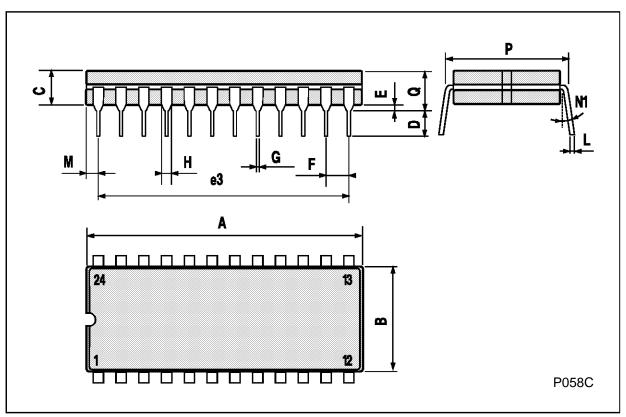
Plastic DIP24 (0.25) MECHANICAL DATA

DIM.		mm		inch			
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
a1		0.63			0.025		
b		0.45			0.018		
b1	0.23		0.31	0.009		0.012	
b2		1.27			0.050		
D			32.2			1.268	
E	15.2		16.68	0.598		0.657	
е		2.54			0.100		
e3		27.94			1.100		
F			14.1			0.555	
I		4.445			0.175		
L		3.3			0.130		



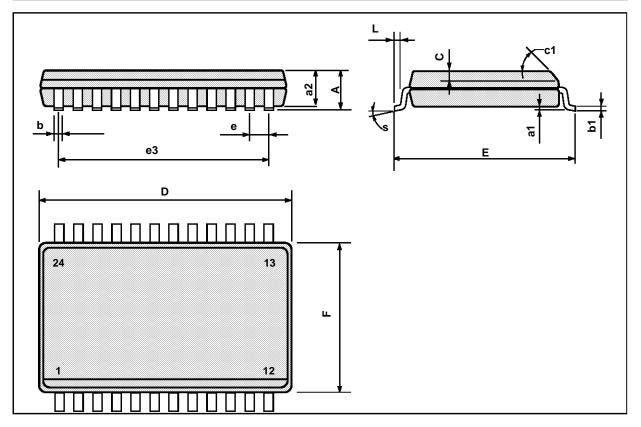
Ceramic DIP24 MECHANICAL DATA

DIM.		mm		inch		
Dilvi.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
Α			32.3			1.272
В	13.05		13.36	0.514		0.526
С	3.9		5.08	0.154		0.200
D	3			0.118		
Е	0.5		1.78	0.020		0.070
e3		27.94			1.100	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
I	1.17		1.52	0.046		0.060
L	0.22		0.31	0.009		0.012
M	1.52		2.49	0.060		0.098
N1	4° (min.), 15°	(max.)				
Р	15.4		15.8	0.606		0.622
Q			5.71			0.225



SO24 MECHANICAL DATA

DIM.		mm		inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
А			2.65			0.104
a1	0.10		0.20	0.004		0.007
a2			2.45			0.096
b	0.35		0.49	0.013		0.019
b1	0.23		0.32	0.009		0.012
С		0.50			0.020	
c1		•	45° ((typ.)	•	
D	15.20		15.60	0.598		0.614
E	10.00		10.65	0.393		0.420
е		1.27			0.05	
e3		13.97			0.55	
F	7.40		7.60	0.291		0.299
L	0.50		1.27	0.19		0.050
S			8° (r	nax.)		



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