

NEDERLANDS ELEKTROTECHNISCH
COMITE
POSTBOX 5059
2600 GB DELFT

This specification is also available from
Nederlandse Philips Bedrijven B.V.

CECC 90 104-088



ISSUE 3

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ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH:

GS: CECC 90 000 Issue 4.
SS: CECC 90 100 Issue 3.
FS: CECC 90 104 Issue 2.

Detail Spec: NL-CECC 90 104-088

Issue: 3

Issued: 1-9-1991

OUTLINE AND DIMENSIONS:

IEC 191-2 } 050 G09/A76 G1

TERMINAL CONNECTIONS:

See item 1.2 of this specification

DETAIL SPECIFICATION FOR DIGITAL INTEGRATED CIRCUITS IN ACCORDANCE WITH FS 90 104

HEC/HEF4720B

HEC/HEF4720V

256-bit, 1-bit per word
random access memory

TYPICAL CONSTRUCTION:

Silicon monolithic local oxidation
CMOS integrated circuit, cavity/non-
cavity packages.

CAUTION: STATIC SENSITIVE DEVICE

ASSESSMENT LEVELS: P, Y, L

REMARKS

HEF4720B operates at 3 V to 15 V

HEF4720V operates at 4.5 V to 12.5 V

Information about manufacturers who have components qualified to this detail specification is
available in the current CECC 00 200: Qualified Products List.



Documents

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1 TYPE DESCRIPTION

1.1 Function

The HEC/HEF4720B are 256-bit, 1-bit per word random access memories with 3-state outputs. The memories are fully decoded and completely static.

Recommended supply voltage range for HEF4720B is 3 to 15 V and for HEF4720V is 4.5 to 12.5 V; minimum stand-by voltage for both types is 3 V.

The use of LOCMOS gives the added advantage of very low stand-by power. The circuits can be directly interfaced with standard bipolar devices (TTL) without using special interface circuits. The memory operates from a single power supply. The separate chip select input ($\overline{CS}$) allows simple memory expansion when the outputs are wire-ORed. If $\overline{CS}$ is HIGH, the outputs are floating and no new information can be written into the memory. The signal at O has the same polarity as the data input D, while the signal at $\overline{O}$ is the complement of the signal at O. The write control W must be HIGH for writing into the memory.

1.1.1 Function table

$\overline{CS}$	W	O	$\overline{O}$	mode
L	H	data written into memory	complement of data written into memory	write
L	L	data written into memory	complement of data written into memory	read
H	X	Z	Z	inhibit

H = HIGH state (the more positive voltage)

L = LOW state (the less positive voltage)

X = state is immaterial

Z = high impedance OFF-state

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1.1.2 Functional block diagram

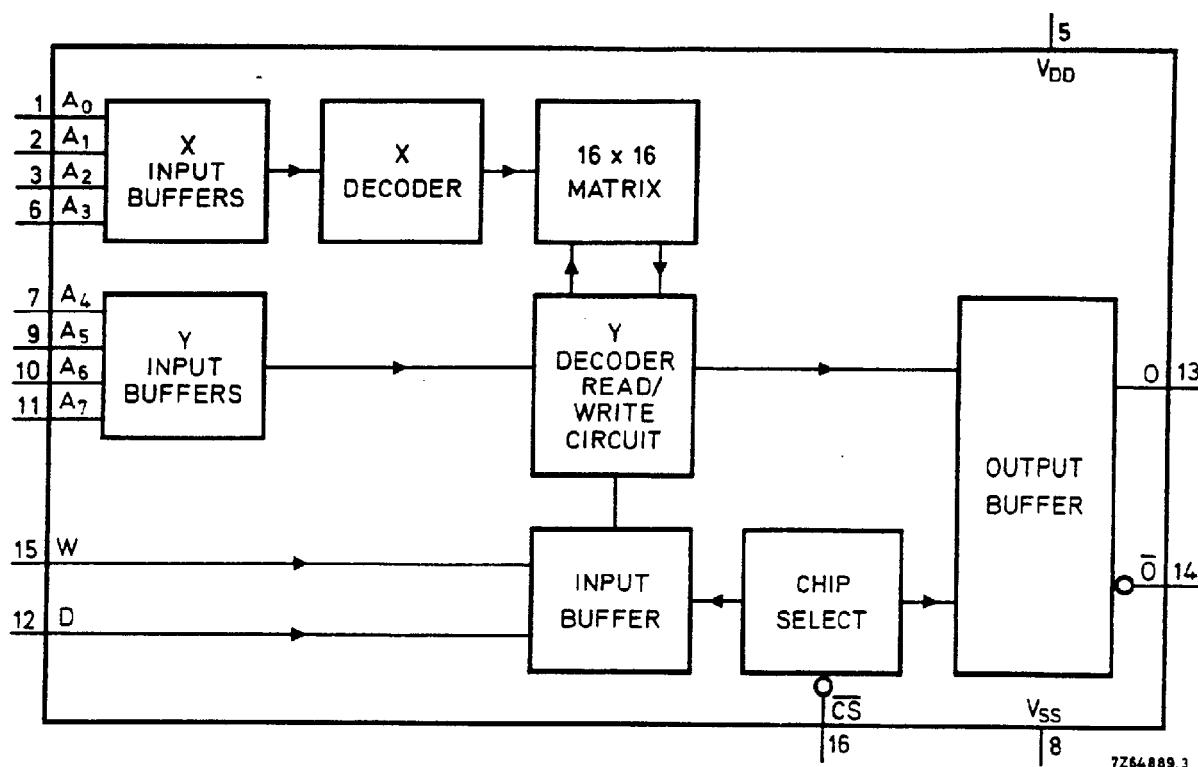


Fig. 1 Functional block diagram.

1.1.3 Pinning information

$\overline{CS}$	chip select input (active LOW)
W	write enable input
D	data input
A ₀ to A ₇	address inputs
O	3-state output (active HIGH)
$\overline{O}$	3-state output (active LOW)

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1.2 Terminal identification, type designation and marking

1.2.1 Terminal identification (top view)

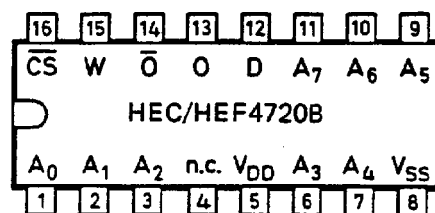


Fig. 2 Pinning diagram.

1.2.2 Type designation

HEF = limited temperature range

HEC = full temperature range.

1.2.3 Marking

See item 2.5 and 2.6 of CECC 90 000.

1.3 Ordering information

When ordering please state the following:

- a : Quantity
- b : Manufacturer
- c : Operating ambient temperature range (HEC or HEF) and device number
- d : Quality assessment level (P, Y or L)
- e : Optional, screening class (refer to CECC 90 000)
- f : Package code (P = plastic, D = ceramic and T = mini-pack).

1.3.1 Ordering information example

- a : N (N = quantity required)
- b : Philips
- c : HEFXXX (XXX = device number)
- d : P
- e : B
- f : T.

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2 LIMITING CONDITIONS (not for inspection purposes)

Additional to clause 1 of FS 90 104.

2.1 Maximum continuous current into any output

$I = 10 \text{ mA}$.

2.2 Maximum power dissipation per output

$P_{\text{max}} = 100 \text{ mW}$.

2.3 Maximum power dissipation per package

Temperature range: limited (for plastic and ceramic DIL)

for $T_{\text{amb}} = -40$ to $+70$ °C

for $T_{\text{amb}} = +70$ to $+85$ °C

$P_{\text{tot}}(\text{max}) = 500 \text{ mW}$.

Derate linearly with 8 mW/K .

Temperature range: full (ceramic DIL only)

for $T_{\text{amb}} = -55$ to $+70$ °C

for $T_{\text{amb}} = +70$ to $+125$ °C

$P_{\text{tot}}(\text{max}) = 500 \text{ mW}$.

Derate linearly with 8 mW/K .

Temperature range: limited (for plastic SO)

for $T_{\text{amb}} = -40$ to $+70$ °C

for $T_{\text{amb}} = +70$ to $+85$ °C

$P_{\text{tot}}(\text{max}) = 400 \text{ mW}$.

Derate linearly with 6 mW/K .

2.4 Transient energy rating

400 V .

3 RECOMMENDED OPERATING CONDITIONS AND ASSOCIATED CHARACTERISTICS

Additional to clause 2 of FS 90 104.

3.1 Recommended operating conditions

Applicable IDDA category (item 2.1) : MSI/LSI.

3.2 Static and dynamic characteristics.

3.2.1a Static characteristics

In compliance with item 2.6, note 3 of FS 90 104.

SUPPLY VOLTAGE

	rating	recommended operating	stand-by min.	
HEF4720B	-0,5 to 18	3,0 to 15,0	3	V
HEF4720V	-0,5 to 18	4,5 to 12,5	3	V



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3.2 Static and dynamic characteristics

3.2.1b Static characteristics

In compliance with item 2.6, note 3 of FS 90 104.

The values given at $V_{DD} = 15\text{ V}$ in the following d.c. and a.c. characteristics, are not applicable to the HEF4720V, because of its lower supply voltage range.

parameter	V_{DD} V	symbol	T_{amb} (°C)			unit	conditions
			low min.	+25 min.	high min.		
Output (source) current HIGH	5	I_{OHB}	-0,64	-0,50	-0,36	mA	$V_O = 4,6\text{ V}; V_I = 0\text{ or }5\text{ V}$ $V_O = 9,5\text{ V}; V_I = 0\text{ or }10\text{ V}$ $V_O = 13,5\text{ V}; V_I = 0\text{ or }15\text{ V}$
	10		-1,6	-1,3	-0,9	mA	
	15		-4,2	-3,4	-2,4	mA	
Output (source) current HIGH	5	I_{OHB}	-0,52	-0,44	-0,36	mA	$V_O = 4,6\text{ V}; V_I = 0\text{ or }5\text{ V}$ $V_O = 9,5\text{ V}; V_I = 0\text{ or }10\text{ V}$ $V_O = 13,5\text{ V}; V_I = 0\text{ or }15\text{ V}$
	10		-1,3	-1,1	-0,9	mA	
	15		-3,6	-3,0	-2,4	mA	

3.2.1c Static characteristics

$V_{SS} = 0\text{ V}$

parameter	V _{DD} V	V _{OL} V	symbol	T _{amb} (°C)						unit
				low		+25		high		
				min.	max.	min.	max.	min.	max.	
Output current LOW	4,75	0,4	I _{OL}	2,4		2		1,6		mA
	10	0,5		4,8		4		3,2		mA
	15	1,5		10,0		10		7,5		mA
Quiescent device current	5		I _{DD}		25		25		200	μA
	10				50		50		400	μA
	15				100		100		800	μA
Input leakage current HEF4720V	10		±I _{IN}		0,3		0,3		1	μA
	15		±I _{IN}		0,3		0,3		1	μA