

# DATA SHEET

For a complete data sheet, please also download:

- The IC04 LOCMOS HE4000B Logic Family Specifications HEF, HEC
- The IC04 LOCMOS HE4000B Logic Package Outlines/Information HEF, HEC

## **HEF4752V**

## **LSI**

## **A.C. motor control circuit**

Product specification  
File under Integrated Circuits, IC04

January 1995

# A.C. motor control circuit

# HEF4752V LSI

### DESCRIPTION

The HEF4752V is a circuit for a.c. motor speed control utilizing LOCMOS technology. The circuit synthesizes three 120° out of phase signals, of which the average voltage varies sinusoidally with time in the frequency range 0 to 200 Hz. The method employed is based upon the pulse width modulation principle, in order to achieve a sufficient accuracy of the output voltages over the whole frequency range. A pure digital waveform generation is used.

All outputs are of the push-pull type. Inputs and outputs are protected against electrostatic effects in a wide variety of device-handling situations. However, to be totally safe, it is desirable to take handling precautions into account.

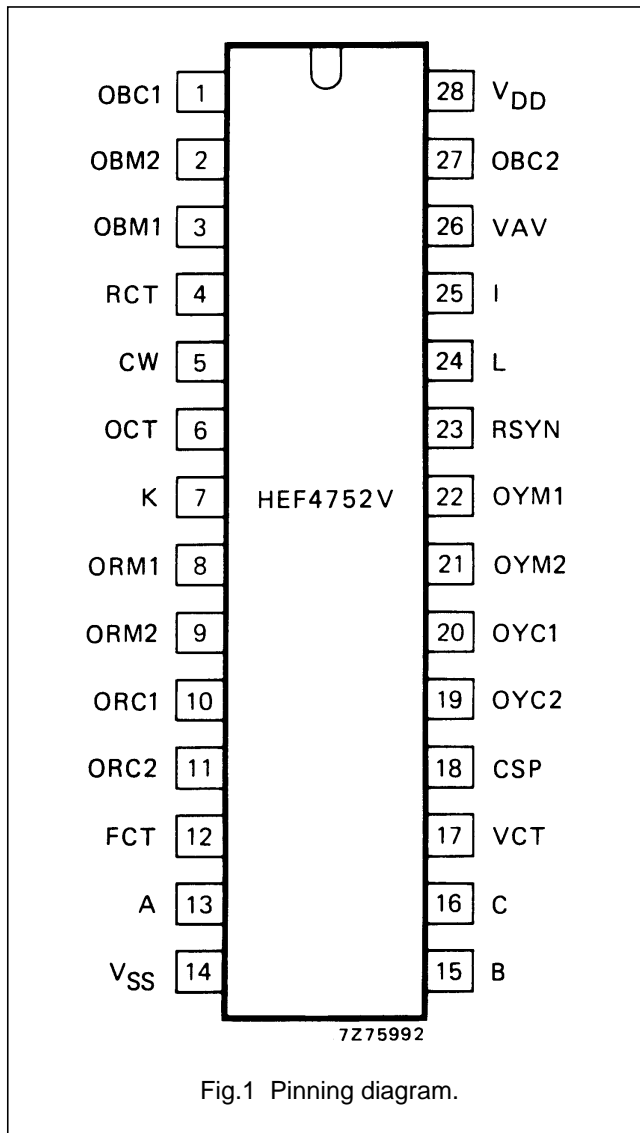


Fig.1 Pinning diagram.

### PINNING

#### Inputs; group I

24 = L	data
25 = I	data
7 = K	data
5 = CW	data
13 = A	data
15 = B	data
16 = C	data

#### Inputs; group II

12 = FCT	frequency clock
17 = VCT	voltage clock
4 = RCT	reference clock
6 = OCT	output delay clock

#### Outputs; group I

23 = RSYN	R-phase synchronization
26 = VAV	average voltage
18 = CSP	current sampling pulses

#### Outputs; group II

8 = ORM1	R-phase main
9 = ORM2	R-phase main
10 = ORC1	R-phase commutation
11 = ORC2	R-phase commutation
22 = OYM1	Y-phase main
21 = OYM2	Y-phase main
20 = OYC1	Y-phase commutation
19 = OYC2	Y-phase commutation
3 = OBM1	B-phase main
2 = OBM2	B-phase main
1 = OBC1	B-phase commutation
27 = OBC2	B-phase commutation

### SUPPLY VOLTAGE

	RATING	RECOMMENDED OPERATING
HEF4752V	-0,5 to 18	4,5 to 12,5 V

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HEF4752VP(N): 28-lead DIL; plastic (SOT117-2)

HEF4752VD(F): 28-lead DIL; ceramic (cerdip) (SOT135)

( ): Package Designator North America

**FAMILY DATA**

See Family Specifications

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## DC CHARACTERISTICS

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

PARAMETER	$V_{DD}$ V	SYMBOL	$T_{amb}$ (°C)						UNIT	CONDITIONS	
			-40		+ 25		+ 85				
			MIN.	MAX.	MIN.	MAX.	MIN.	MAX.			
Quiescent device current	5	$I_{DD}$	-	50	-	50	-	375	$\mu\text{A}$	all valid input combinations; $V_I = V_{SS}$ or $V_{DD}$	
	10		-	100	-	100	-	750	$\mu\text{A}$		
Input leakage current	10	$\pm I_{IN}$	-	-	-	0,3	-	1	$\mu\text{A}$	$V_I = 0$ or $10\text{ V}$	
Input voltage HIGH	5	$V_{IH}$	3,5	-	3,5	-	3,5	-	V	inputs: group I	
	10		7,0	-	7,0	-	7,0	-	V		
Input voltage LOW	5	$V_{IL}$	-	1,5	-	1,5	-	1,5	V	inputs: group I	
	10		-	3,0	-	3,0	-	3,0	V		
Output voltage HIGH	5	$V_{OH}$	4,95	-	4,95	-	4,95	-	V	$V_I = V_{SS}$ or $V_{DD}$ ; $ I_O  < 1\ \mu\text{A}$	
	10		9,95	-	9,95	-	9,95	-	V		
Output voltage LOW	5	$V_{OL}$	-	0,05	-	0,05	-	0,05	V	$V_I = V_{SS}$ or $V_{DD}$ ; $ I_O  < 1\ \mu\text{A}$	
	10		-	0,05	-	0,05	-	0,05	V		
Input tripping level; input voltage increasing	5	$V_{ti}$	1,5	4,0	1,5	4,0	1,5	4,0	V	inputs: group II	
	10		3,0	8,0	3,0	8,0	3,0	8,0	V		
Input tripping level; input voltage decreasing	5	$V_{td}$	1,0	3,5	1,0	3,5	1,0	3,5	V	inputs: group II	
	10		2,0	7,0	2,0	7,0	2,0	7,0	V		
Output current LOW	5	$I_{OL}$	0,45	-	0,38	-	0,3	-	mA	$V_{OL} = 0,4\text{ V}$ $V_{OL} = 0,5\text{ V}$	outputs: groups I and II
	10		1,4	-	1,17	-	0,9	-	mA		
Output current HIGH	5	$-I_{OH}$	0,3	-	0,25	-	0,2	-	mA	$V_{OH} = 4,6\text{ V}$ $V_{OH} = 9,5\text{ V}$	outputs: group I
	10		0,9	-	0,75	-	0,6	-	mA		
Output current HIGH	5	$-I_{OH}$	0,9	-	0,75	-	0,6	-	mA	$V_{OH} = 2,5\text{ V}$	outputs: group I
Output current HIGH	5	$-I_{OH}$	0,6	-	0,5	-	0,4	-	mA	$V_{OH} = 4,6\text{ V}$ $V_{OH} = 9,5\text{ V}$	outputs: groups II
	10		1,8	-	1,5	-	1,2	-	mA		
Output current HIGH	5	$-I_{OH}$	1,8	-	1,5	-	1,2	-	mA	$V_{OH} = 2,5\text{ V}$	outputs: group II
Total supply current	10	$I_{tot}$	-	-	typ. 2	-	-	-	mA	$I_{OL} = I_{OH} = 0$ ; frequency applied to inputs; FCT = 700 kHz; VCT = 400 kHz; RCT = 400 kHz	



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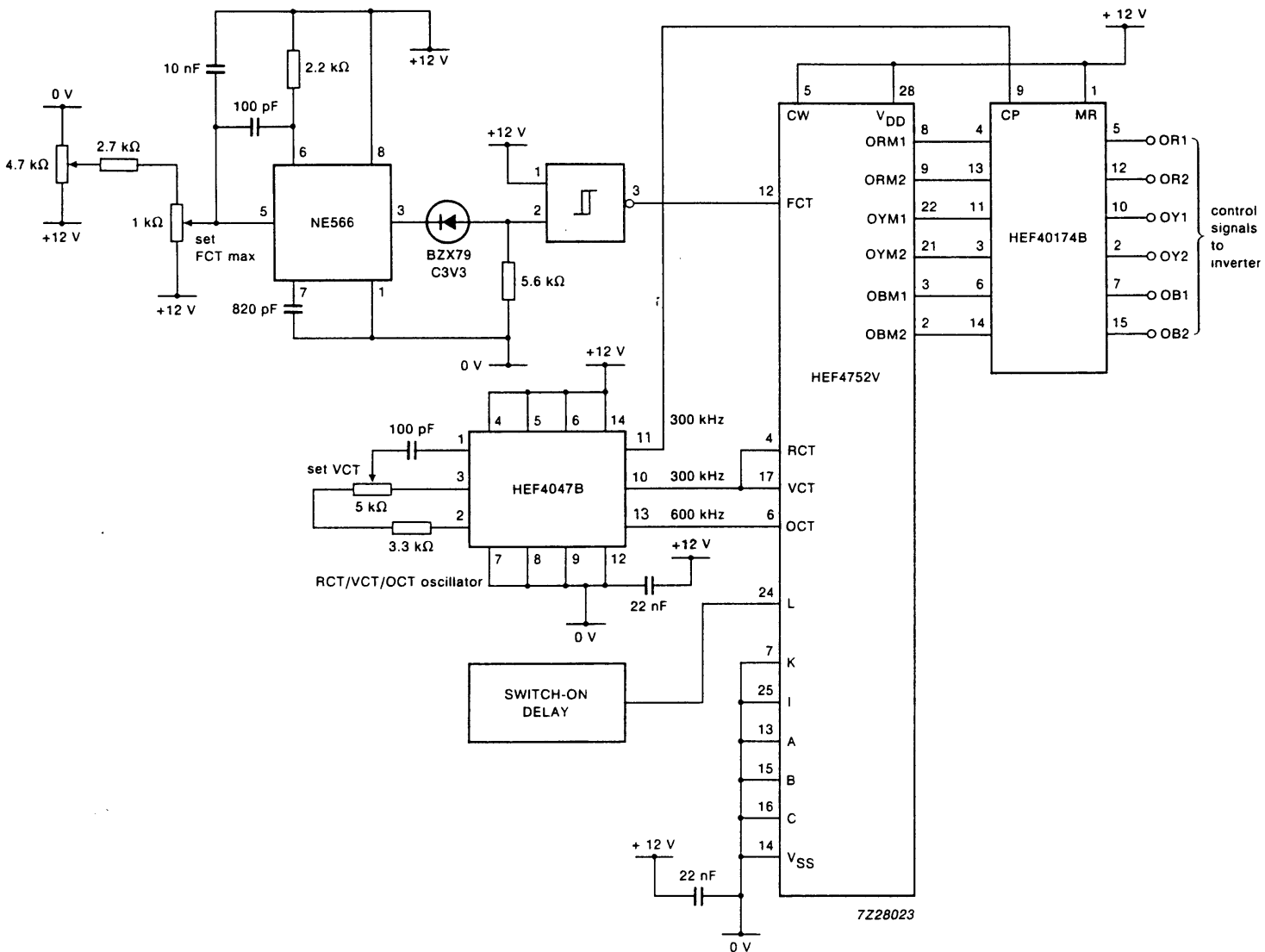


Fig.3 Application of HEF4752V in a basic circuit configuration for AC motor control.