

NEDERLANDS ELEKTROTECHNISCH
COMITE
POSTBOX 5059
2600 GB DELFT

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

CECC 90 104-036



ISSUE 2

Page 1

Total number of pages: 18

ELECTRONIC COMPONENTS OF ASSESSED
QUALITY IN ACCORDANCE WITH:

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

Detail Spec: NL-CECC 90 104-036

Issue: 2

Issued: December 1989

OUTLINE AND DIMENSIONS:

IEC 191-2 | 050 G04/A76 F1

TERMINAL CONNECTIONS:

See item 1.3 of this specification

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

HEC/HEF 4047B

Monostable/astable multivibrator

TYPICAL CONSTRUCTION:

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

CAUTION: STATIC SENSITIVE DEVICE

ASSESSMENT LEVELS: P, Y, L

REMARKS

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



Documents

Document Sharing Hub

Nederlands Elektrotechnisch Comité Postbox 5059 2600 GB Delft	Page 2	CECC 90 104-036
This specification is also available from Nederlandse Philips Bedrijven B.V.	of 18	ISSUE 2

1 TYPE DESCRIPTION

1.1 Function

The HEC/HEF4047B consist of gatable astable multivibrators with logic techniques incorporated to permit positive or negative edge-triggered monostable multivibrator action with retriggering and external counting options.

Inputs include + TRIGGER, – TRIGGER, ASTABLE, ASTABLE, RETRIGGER and MR (Master Reset). Buffered outputs are O, O and OSCILLATOR OUTPUT. In all modes of operation an external capacitor (C_T) must be connected between C_{TC} and RC_{TC} , and an external resistor (R_T) must be connected between RT_C and RC_{TC} .

Astable operation is enabled by a HIGH level on the ASTABLE input. The period of the square wave at O and O outputs is a function of the external components employed. 'True' input pulses on the ASTABLE or 'complement' pulses on the ASTABLE input, allow the circuit to be used as a gatable multivibrator. The OSCILLATOR OUTPUT period will be half of the O output in the astable mode. However, a 50% duty factor is not guaranteed at this output.

In the monostable mode, positive edge-triggering is accomplished by applying a leading-edge pulse to the + TRIGGER input and a LOW level to the – TRIGGER input. For negative edge-triggering, a trailing-edge pulse is applied to the – TRIGGER and a HIGH level to the + TRIGGER. Input pulses may be of any duration relative to the output pulse. The multivibrator can be retriggered (on the leading-edge only) by applying a common pulse to both the RETRIGGER and + TRIGGER inputs. In this mode the output pulse remains HIGH as long as the input pulse period is shorter than the period determined by the RC components.

An external count down option can be implemented by coupling O to an external 'N' counter and resetting the counter with the trigger pulse. The counter output pulse is fed back to the ASTABLE input and has a duration equal to N times the period of the multivibrator. A HIGH level on the MR input assures no output pulse during an ON-power condition. This input can also be activated to terminate the output pulse at any time. In the monostable mode, a HIGH level or power-ON reset pulse must be applied to MR, whenever V_{DD} is applied.

Nederlands Elektrotechnisch Comité Postbox 5059 2600 GB Delft	Page 3	CECC 90 104-036
This specification is also available from Nederlandse Philips Bedrijven B.V.	of 18	ISSUE 2

1.1.1 Functional connections

function	pins connected to			output pulse from pins	output period or pulse width
	V _{DD}	V _{SS}	input pulse		
astable multivibrator					
free running	4, 5, 6, 14	7, 8, 9, 12	—	10, 11, 13	at pins 10, 11: $t_A = 4,40 R_t C_t$
true gating	4, 6, 14	7, 8, 9, 12	5	10, 11, 13	at pin 13: $t_A = 2,20 R_t C_t$
complement gating	6, 14	5, 7, 8, 9, 12	4	10, 11, 13	
monostable multivibrator					
pos. edge-triggering	4, 14	5, 6, 7, 9, 12	8	10, 11	at pins 10, 11: $t_M = 2,48 R_t C_t$
neg. edge-triggering	4, 8, 14	5, 7, 9, 12	6	10, 11	
retriggerable	4, 14	5, 6, 7, 9	8, 12	10, 11	
external count down*	14	5, 6, 7, 8, 9, 12	—	10, 11	

* Input pulse to RESET of external counting chip; external counting chip output to pin 4.

Note

In all cases, external resistor between pins 2 and 3, external capacitor between pins 1 and 3.



Nederlands Elektrotechnisch Comité Postbox 5059 2600 GB Delft This specification is also available from Nederlandse Philips Bedrijven B.V.	Page 4 of 18	CECC 90 104-036 ISSUE 2
--	-----------------------------	--

1.1.2 Functional diagram

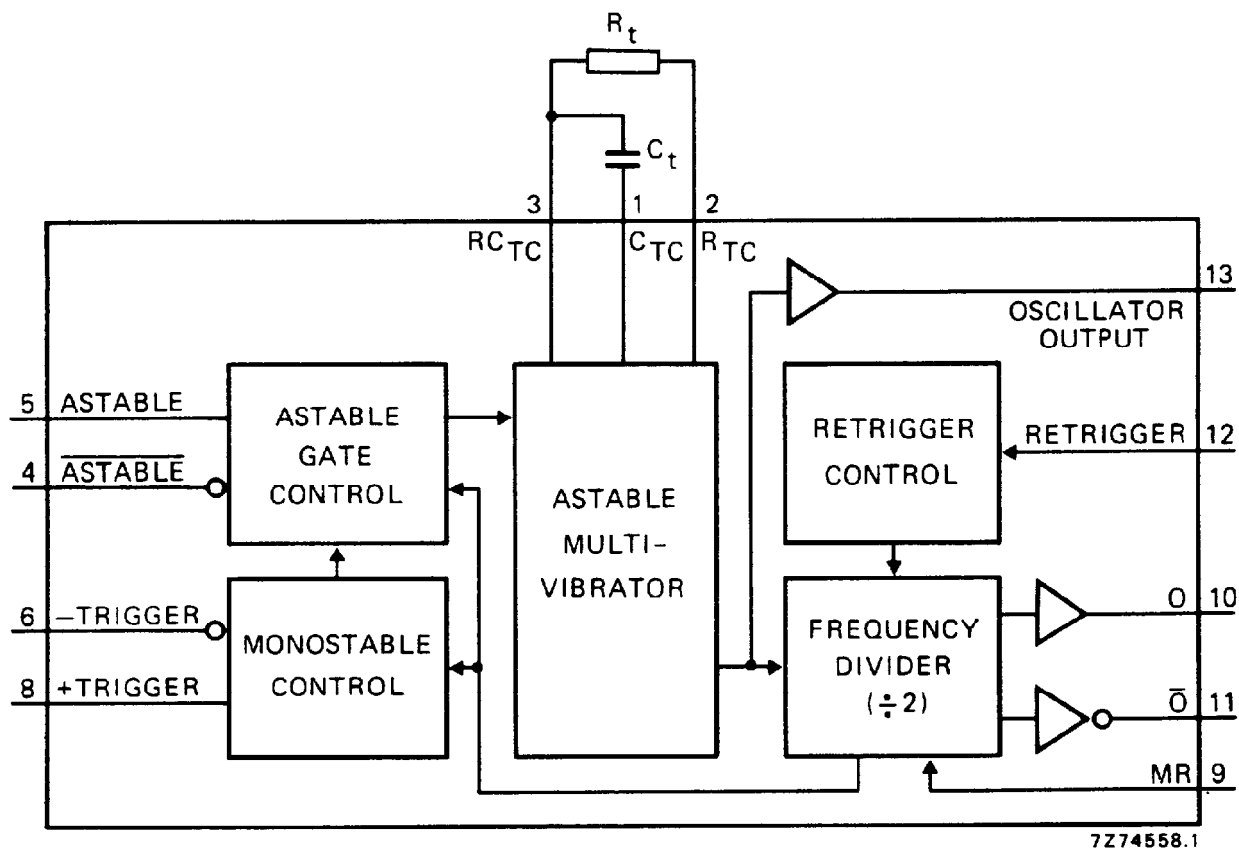


Fig. 1 Functional diagram.

1.1.3 Pinning information

Nederlands Elektrotechnisch Comité
Postbox 5059
2600 GB Delft

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

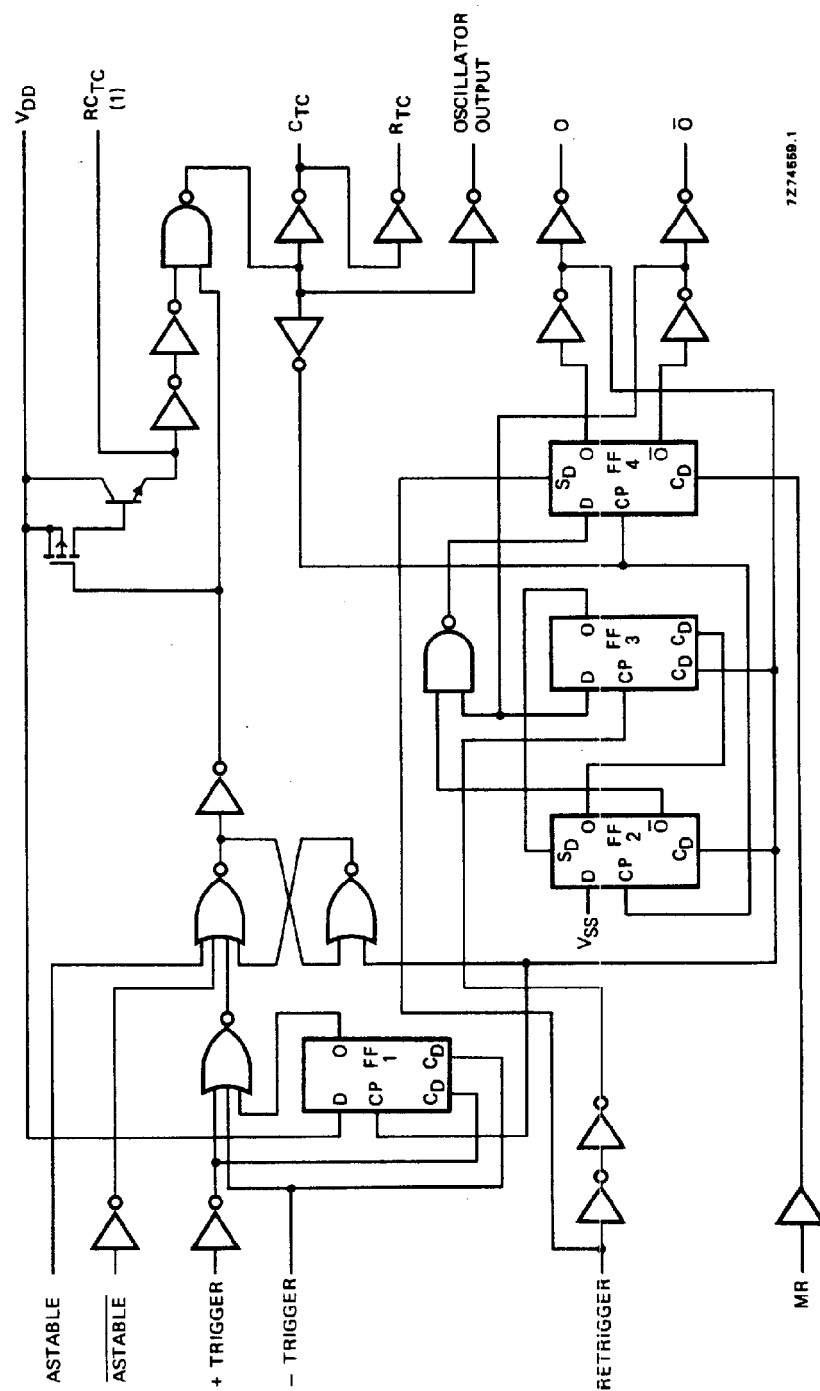
Page 5

of 18

CECC 90 104-036

ISSUE 2

1.2 Logic diagram



Special input protection that allows operating input voltages outside the supply voltage lines. Compared to the standard input protection pin 3 is more sensitive to static discharge; extra handling precautions are recommended.

Fig. 2 Logic diagram.

Nederlands Elektrotechnisch Comité Postbox 5059 2600 GB Delft This specification is also available from Nederlandse Philips Bedrijven B.V.	Page 6 of 18	CECC 90 104-036 ISSUE 2
--	-----------------------------	--

1.3 Terminal identification, type designation and marking

1.3.1 Terminal identification (top view)

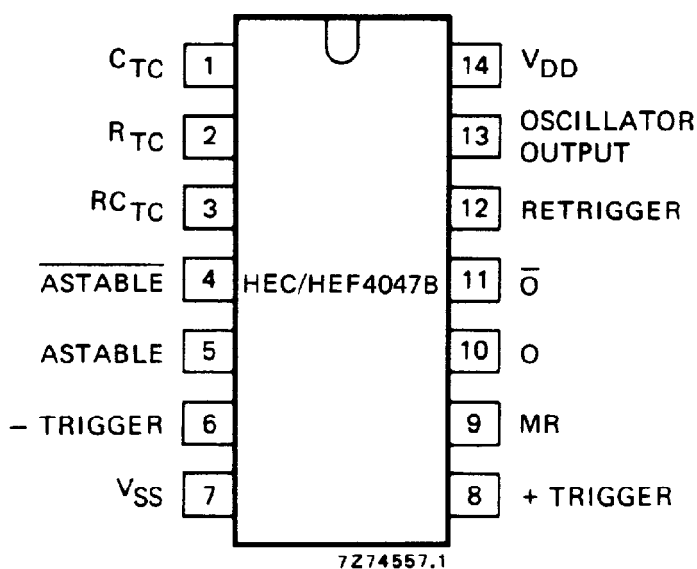


Fig. 3 Pinning diagram.

1.3.2 Type designation

HEF = limited temperature range

HEC = full temperature range.

1.3.3 Marking

See item 2.5 and 2.6 of CECC 90 000.