

BIPOLAR ANALOG INTEGRATED CIRCUIT

 μ PC1701C

ZERO VOLTAGE SWITCH

5 of 8

DESCRIPTION

The μ PC1701C is a triac controller providing a complete solution for temperature controlled electric panel heaters, cookers, film processing baths etc.

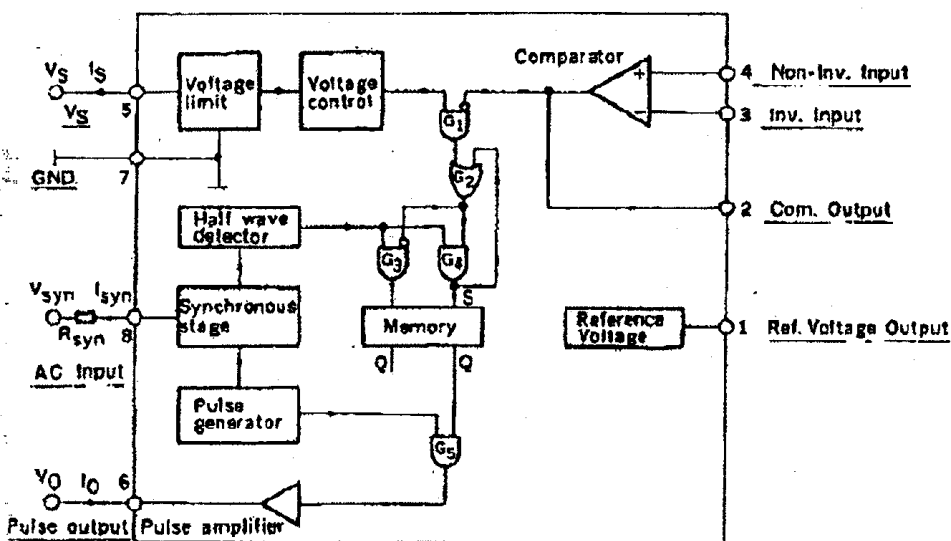
Switching occurs at the zero voltage point in order to minimize radio frequency interference.

The device is suitable for mains-on-line operation and requires minimal external components.

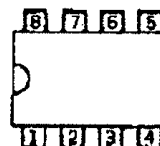
FEATURES

- Easy operation either through the AC line or a DC supply
- Supply voltage control
- Very few external components
- Symmetrical burst control – no DC current components in the load circuit
- Negative output current pulse up to 250 mA – short circuit protection
- Reference voltage output

BLOCK DIAGRAM



PIN CONNECTIONS (Top View)



Pin No.	Function
1	Ref. Voltage Output
2	Com. Output
3	Inv. Input
4	Non-Inv. Input
5	VS
6	Pulse Output
7	GND.
8	AC Input

NEC cannot assume any responsibility for any circuits shown or represent that they are free from patent infringement.

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Reference Point	Pin 7			
Supply Voltage (Fig. 1)	Pin 5	$-V_S$	8.0	V
Supply Current (Fig. 2, 3)	Pin 5	$-I_S(\text{AV})$	40	mA
Synchronous Current	Pin 8	I_{syn}	5.0	mA(RMS)
Input Voltage	Pins 1, 3, 4	V_i	$\leq V_S$	V
	Pin 8	V_{isyn}	$\leq \pm V_S$	V
Junction Temperature		T_j	125	$^\circ\text{C}$
Operating-ambient Temperature		T_{opt}	-20 to +70	$^\circ\text{C}$
Storage Temperature		T_{stg}	-40 to +125	$^\circ\text{C}$
Power Dissipation		P	350	mW

ELECTRICAL CHARACTERISTICS ($V_S = 8.0\text{ V}$, $T_a = 25^\circ\text{C}$ $V_{\text{syn}} = 100$ to $115\text{ V}_{\text{RMS}}$, $f = 50/60\text{ Hz}$)

CHARACTERISTIC	PIN NO.	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Circuit Current	Pin 5	$-I_S$	—	2.0	2.5	mA	$R_{\text{syn}} = 56\text{ k}\Omega$
Supply Voltage 1	Pin 5	$-V_{S1}$	8.3	—	9.6	V	$I_S = 2.5\text{ mA}$, $R_{\text{syn}} = 56\text{ k}\Omega$
Supply Voltage 2	Pin 5	$-V_{S2}$	8.3	—	9.6	V	$I_S = 20\text{ mA}$, $R_{\text{syn}} = 56\text{ k}\Omega$
Synchronous Current	Pin 8	I_{syn}	0.3	—	—	mA	
Output Pulse Width	Pin 6	t_p	—	200	—	μs	$R_{\text{syn}} = 56\text{ k}\Omega$
Output Voltage	Pin 6	V_O	5.0	6.0	—	V	$I_O \leq 200\text{ mA}$
Output Current	Pin 6	I_O	200	250	—	mA	$R_O \leq 25\text{ }\Omega$
Output Leakage Current	Pin 6	I_{LO}	—	—	2.0	μA	
Input Offset Voltage	Pin 3, 4	V_{IO}	—	2.0	5.0	mV	
Input Bias Current	Pin 3, 4	I_I	—	0.1	1.0	μA	
Common Mode Input Voltage Range	Pin 3, 4	$-V_{\text{ICM}}$	0	—	6.5	V	
Output Leakage Current	Pin 2	I_{LC}	—	—	0.2	μA	
Reference Voltage	Pin 1	$-V_R$	3.7	4.0	4.2	V	$I_R \leq 1\text{ }\mu\text{A}$

DESIGN EXAMPLE

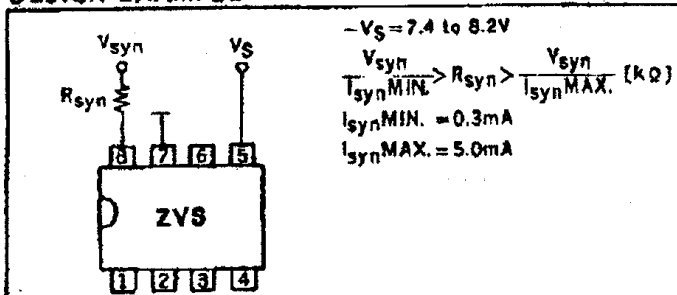


Fig. 1 DC Operation

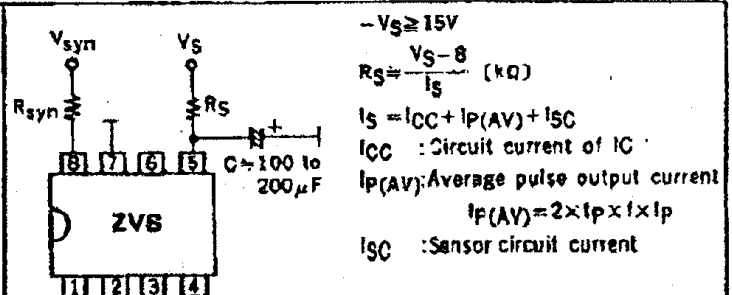


Fig. 2 DC Operation

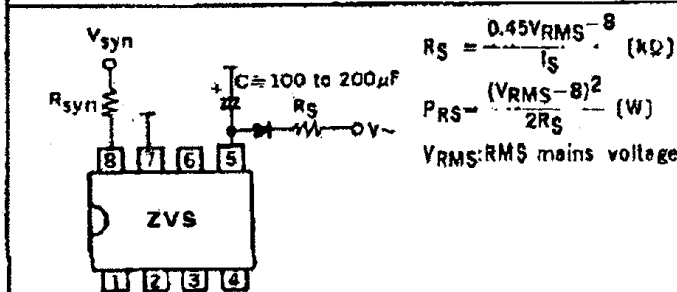


Fig. 3 AC Operation

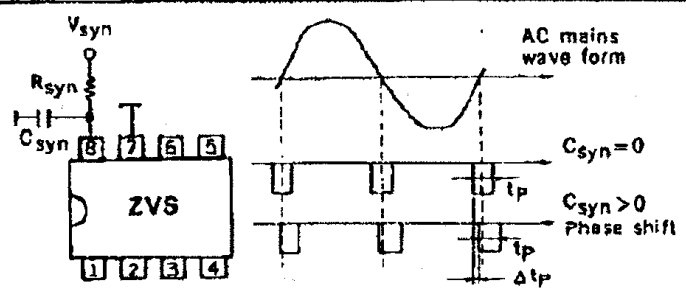


Fig. 4 Phase shift of the trigger pulse from the zero voltage position

APPLICATIONS

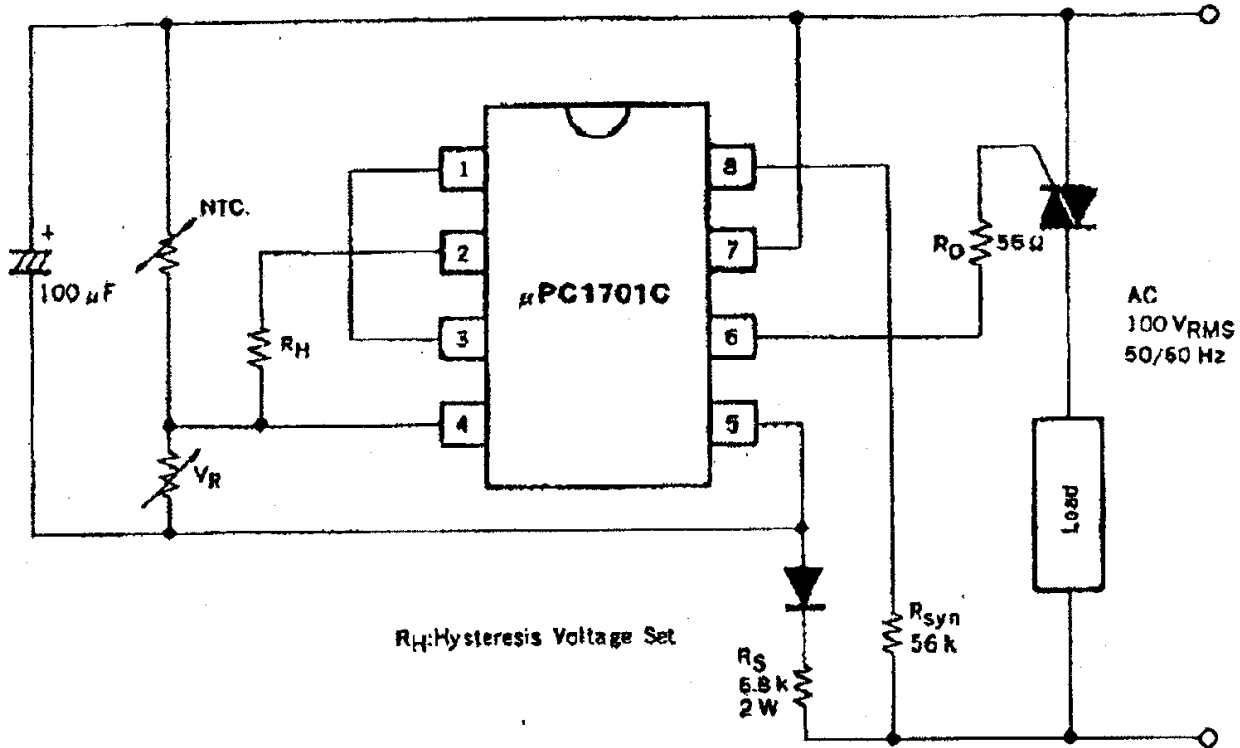


Fig. 5 ON OFF Temperature Control

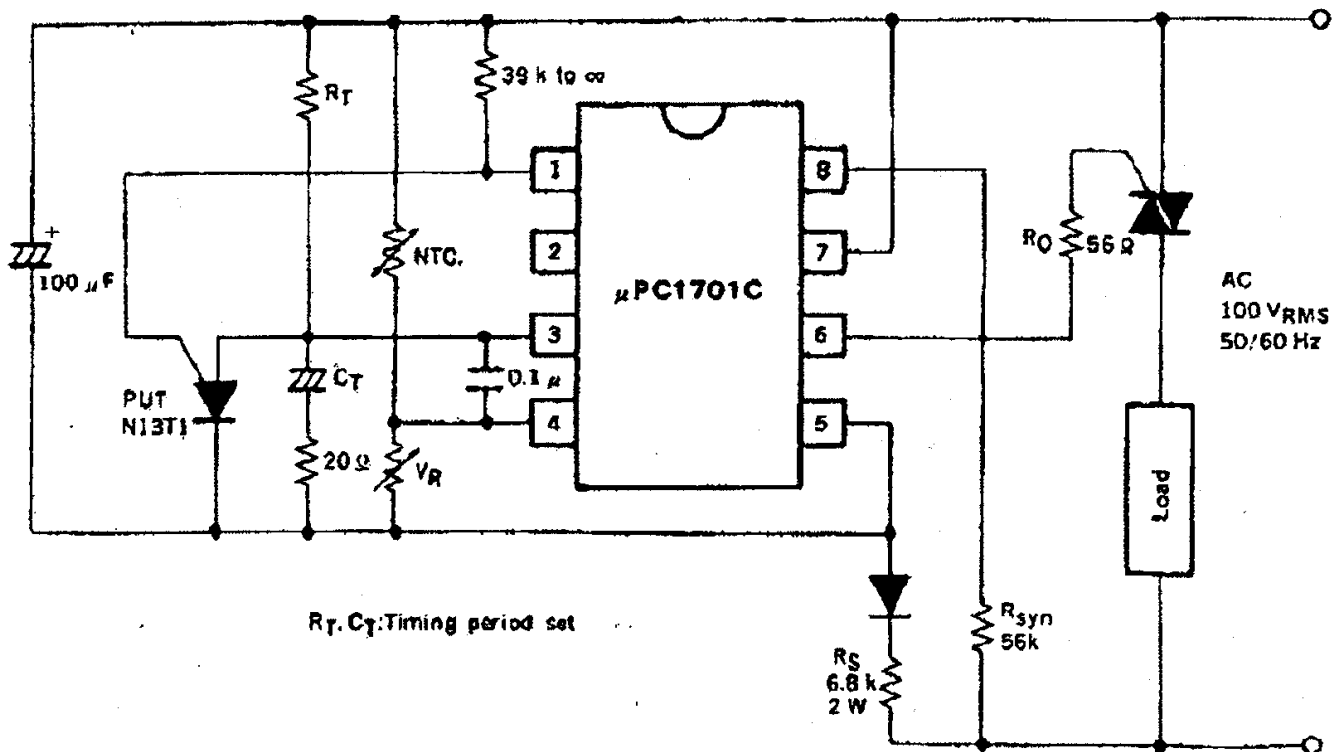
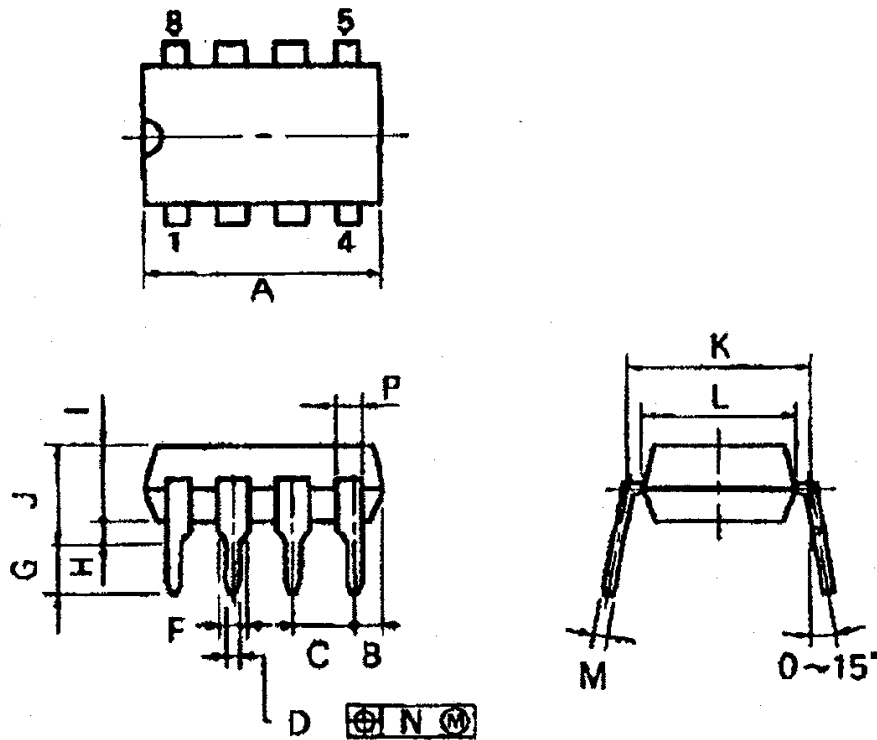


Fig. 6 Time Proportional Temperature Control

8PIN PLASTIC DIP (300 mil)



PBC-100-300B.C

NOTES

- 1) Each lead centerline is located within 0.25 mm (0.01 inch) of its true position (T.P.) at maximum material condition.
- 2) Item "K" to center of leads when formed parallel.

ITEM	MILLIMETERS	INCHES
A	10.16 MAX.	0.400 MAX.
B	1.27 MAX.	0.050 MAX.
C	2.54 (T.P.)	0.100 (T.P.)
D	0.50 ± 0.10	0.020 ± 0.004
F	1.4 MIN.	0.055 MIN.
G	3.2 ± 0.2	0.126 ± 0.012
H	0.51 MIN.	0.020 MIN.
I	4.31 MAX.	0.170 MAX.
J	5.08 MAX.	0.200 MAX.
K	7.62 (T.P.)	0.300 (T.P.)
L	6.4	0.252
M	0.25 ± 0.08	0.010 ± 0.003
N	0.25	0.01
P	0.9 MIN.	0.035 MIN.