

NEC
ELECTRON DEVICE

BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC1473HA

REMOTE CONTROL PREAMPLIFIER

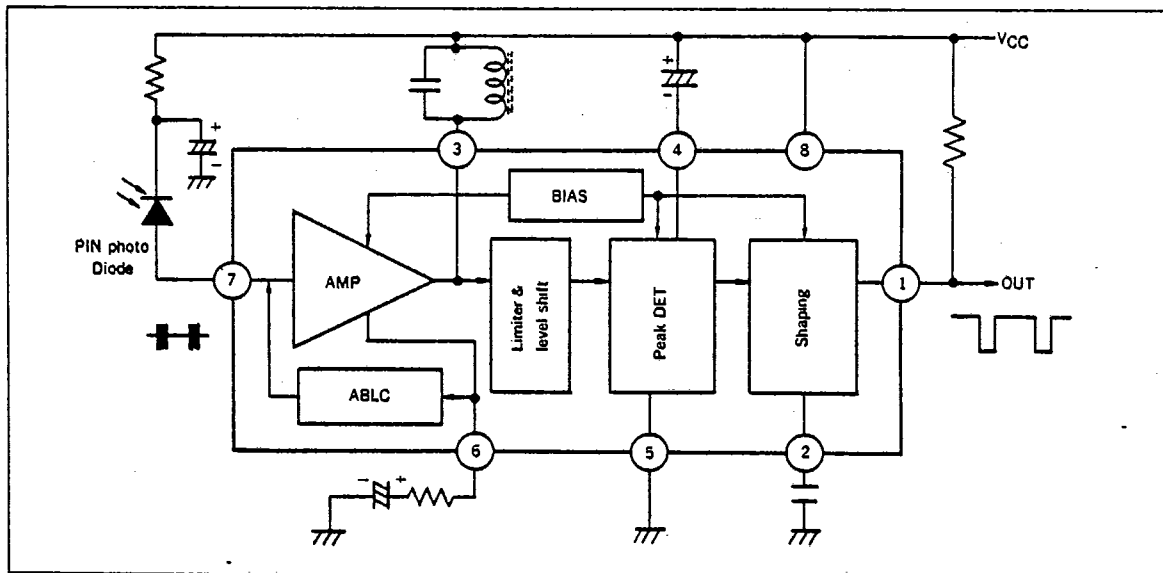
DESCRIPTION

The μ PC1473HA is a silicon monolithic integrated circuit designed for a remote control preamplifier of infrared signals. A PIN photo diode can be directly connected to the input terminal. The μ PC1473HA contains a high-gain amplifier, a peak detector and an output wave form shaper which are necessary for a remote control preamplifier.

FEATURES

- Operation Voltage: $V_{CC} = 5\text{ V} \pm 10\%$
- Low Power Consumption: $I_{CC} = 2.2\text{ mA TYP.}$
- High Input Sensitivity: $50\text{ } \mu\text{V}_{p-p}\text{ TYP.}$
- Peak Detector: The detector level is varied with the input signal level.
- Pin Connection: Pin compatible with the μ PC1373H, μ PC1373HA.
- OUT Terminal: Open collector output. Active "Low" output.
- Application: Designed for Use with the μ PD1913C, 1943G, 6102G Remote Control Transmitter IC.

BLOCK DIAGRAM



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

NEC Corporation

© 1985 NEC Corporation

9000-1139

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

Supply Voltage	V_{CC}	8.0	V
Power Dissipation	P_D	270	mW
Operating Temperature	T_{opt}	-20 to +75	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +125	$^\circ\text{C}$
Output Terminal Voltage	V_{out}	15.0	V

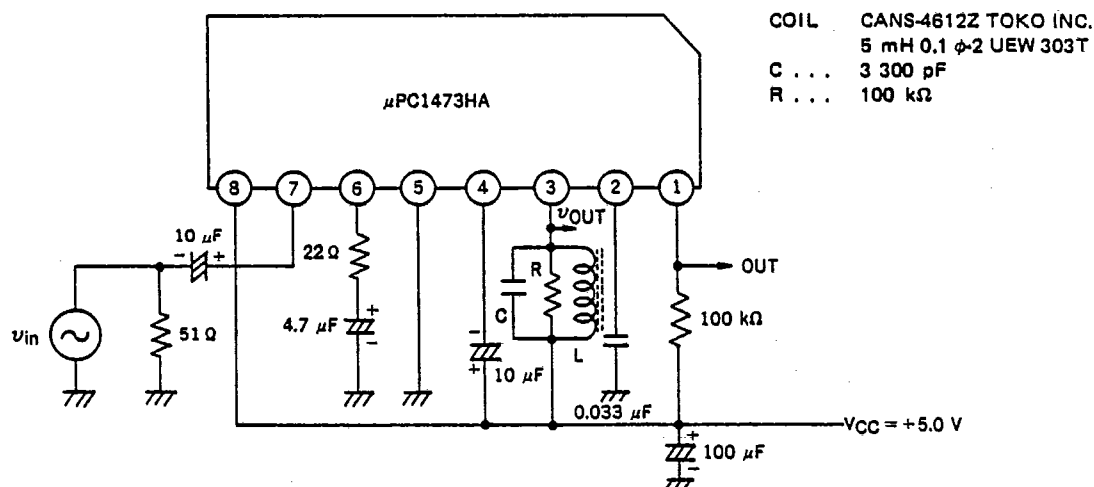
RECOMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Supply	V_{CC}	4.5	5.0	5.5	V
Input Frequency	f_{in}	30		60	kHz
Output Current	I_{OL}			0.1	mA

ELECTRICAL CHARACTERISTICS ($T_s = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$, $f_{in} = 40\text{ kHz}$)

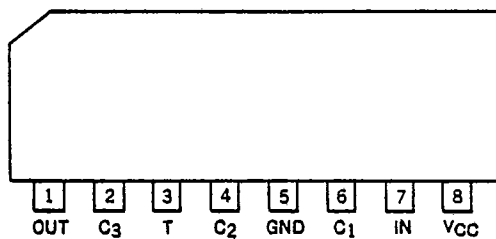
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Supply Current	I_{CC}	1.3	2.2	3.5	mA	
Input Terminal Voltage	V_{IN1}	0.95	1.25	1.80	V	
Input Terminal Voltage	V_{IN2}	1.7	2.2	2.7	V	$I_{in} = 40\text{ }\mu\text{A}$
1st Stage Voltage Gain	A_{vL}		60		dB	#7-#3, $v_{out} = 500\text{ mV}_{p-p}$
Detection Input Voltage	v_{in}		50	100	μV_{p-p}	
Input Impedance	r_{in}	40	60	80	$k\Omega$	
Output Voltage	V_{OL}			0.5	V	$I_{OL} = 0.1\text{ mA}$, $v_{in} = 1\text{ mV}_{p-p}$
Output Leak Current	I_{OH}			2	μA	$V_{OH} = 14.4\text{ V}$

TEST CIRCUITS



T-77-11

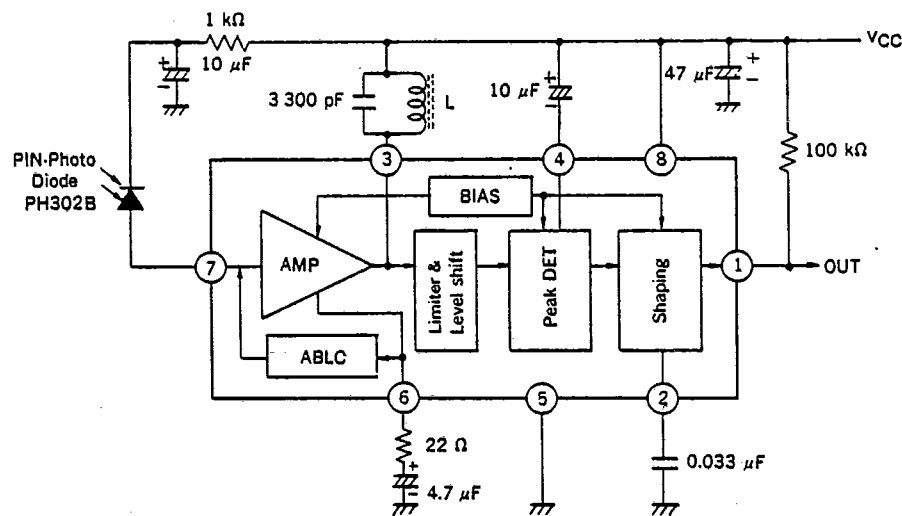
CONNECTION DIAGRAM



TERMINAL

1		OUT	Output
2		C ₃	Integral Capacitor
3		T	Tuning Coil
4		C ₂	Peak Hold Capacitor
5		GND	Ground
6		C ₁	By-pass Capacitor
7		IN	Input
8		VCC	Power Supply

STANDARD APPLICATION



COIL 126LNS-6285Z TOKO INC.
5 mH 0.08 ϕ -2 UEW 313T

PIN FUNCTION

T-77-11

- Power supply terminal (V_{CC}: 8 Pin, GND: 5 Pin)

Operation voltage is 5 V±10 %.

In case of using a low frequency ripple voltage contained in the power supply, insert a series resistor 100 Ω between V_{CC} and power supply.

- Input terminal (IN: 7 Pin)

This input impedance is 60 kΩ TYP.

A PIN photo diode can be directly connected to this terminal.

This input has ABLC (Automatic Bias Level Control) circuit for non-saturated by violent light, so this terminal voltage is always fixed.

- Tuning coil terminal (T: 3 Pin)

- By-pass capacitor terminal (C₁: 6 Pin)

This amplifier has 60 dB gain in this application circuit and the gain is determined by tuning coil impedance (Z_L) and external resistor R6.

$$A_{vL} \approx \frac{Z_L}{R_{\#6}}$$

- Peak hold capacitor terminal (C₂: 4 Pin)

The signal of tuning coil terminal is detected by peak detector circuit.

In this case, detecting level depend on input signal strength, so noise wave is suppressed.

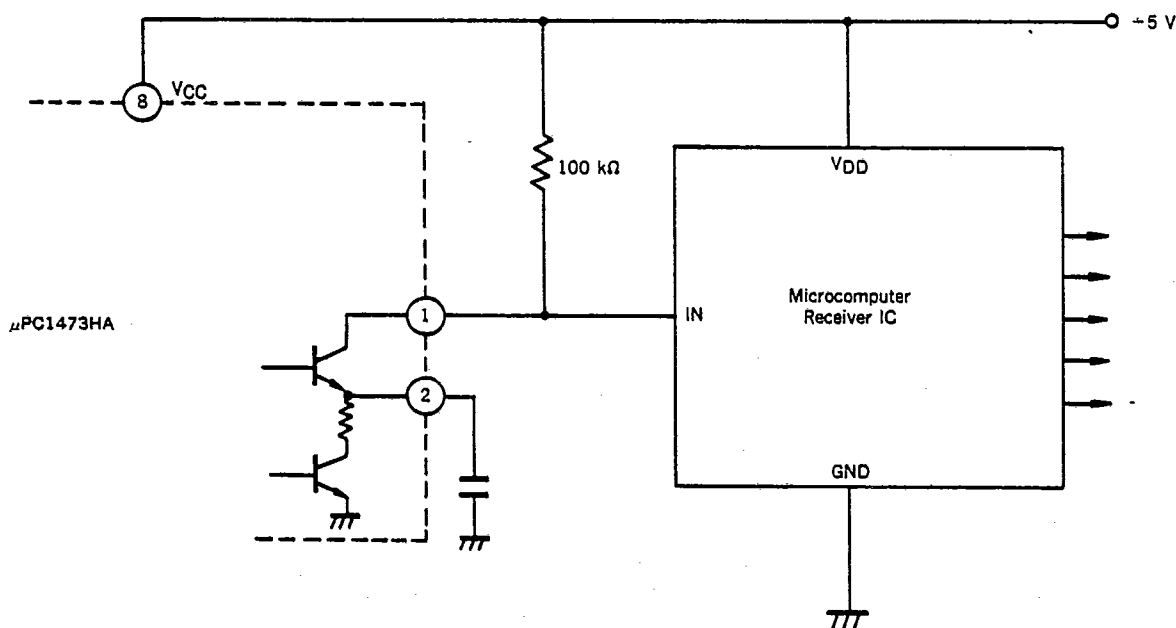
Time constant of peak hold is changed by capacitor C₂.

- Integral capacitor terminal (C₃: 2 Pin)

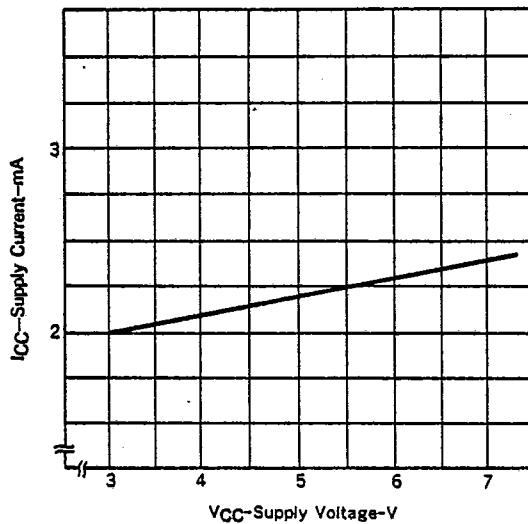
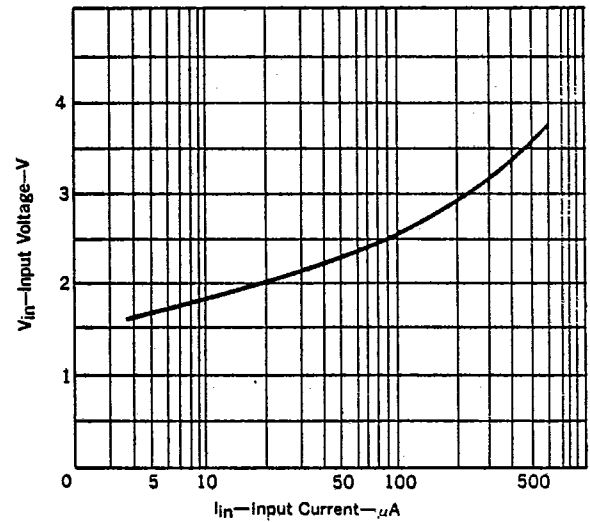
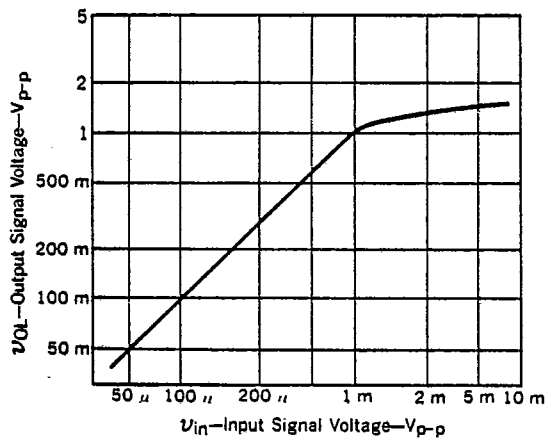
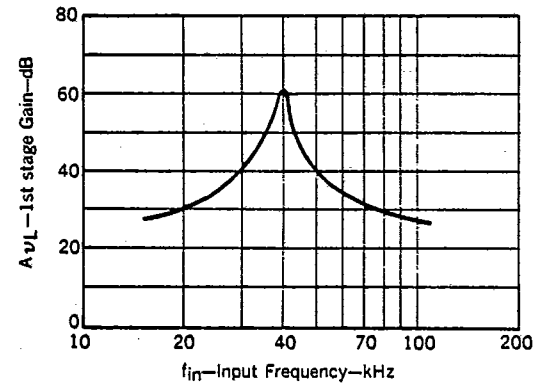
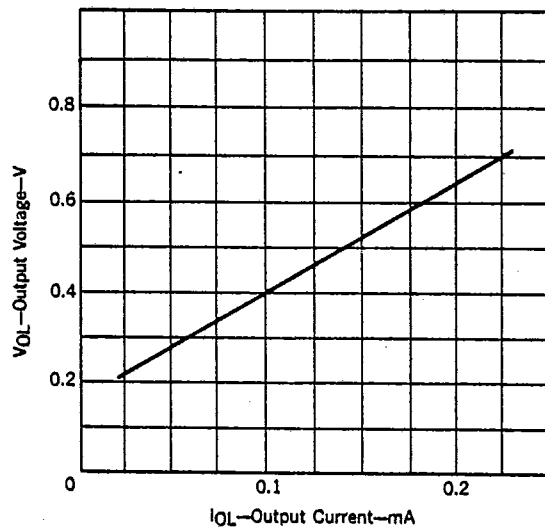
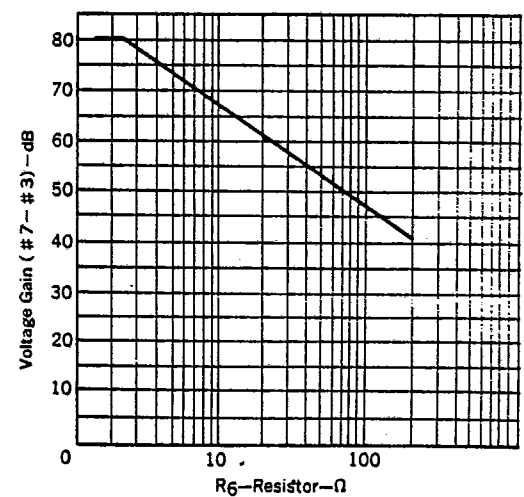
The carrier waveform is deleted by this capacitor C3.

- Output terminal (OUT: 1 Pin)

This Output terminal is open collector transistor. (Active Low output)



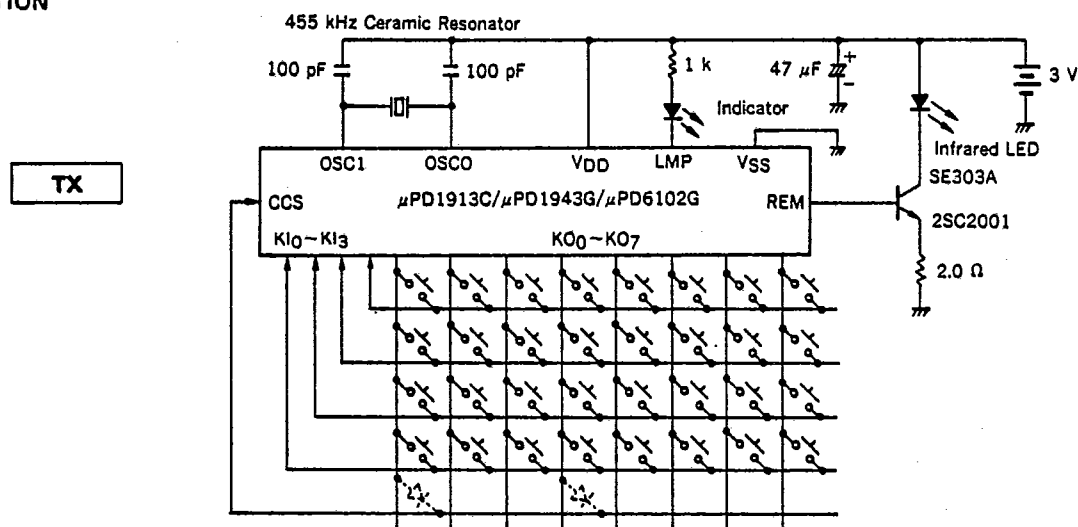
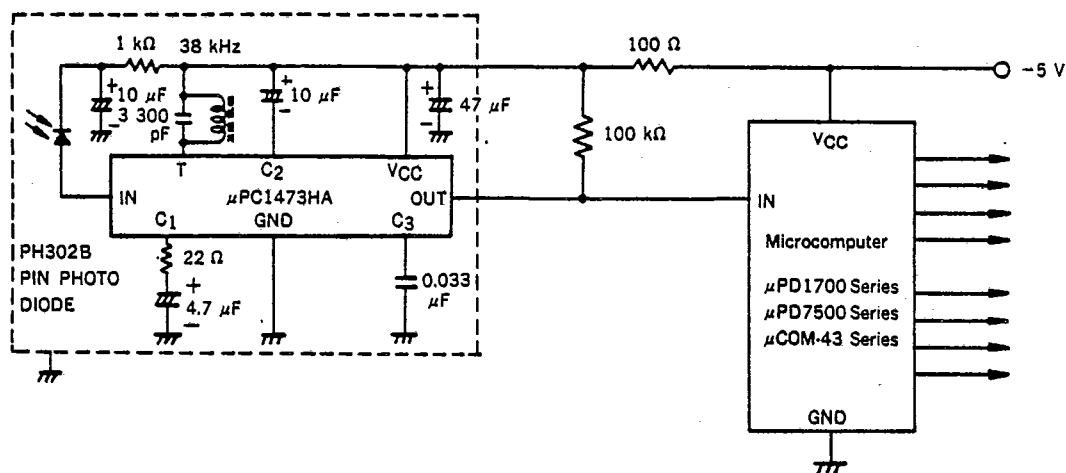
T-77-11

TYPICAL CHARACTERISTIC ($T_a = 25^\circ\text{C}$) $I_{CC} - V_{CC}$ CHARACTERISTICSABLC $I_{in} - V_{in}$ CHARACTERISTICS1st Stage $v_{in} - v_{OL}$ CHARACTERISTICS1st Stage $f_{in} - A_{vL}$ CHARACTERISTICSOutput $v_{OL} - I_{OL}$ CHARACTERISTICS $R_6 - A_{vL}$ CHARACTERISTICS

μPC1473HA**NEC** ELECTRON DEVICE

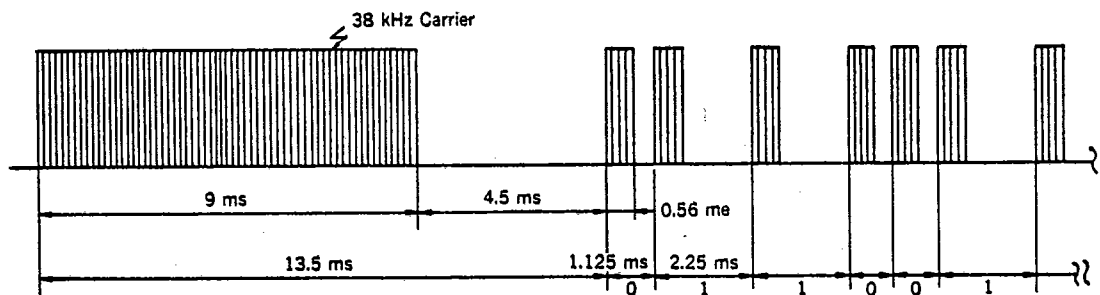
T-77-11

APPLICATION

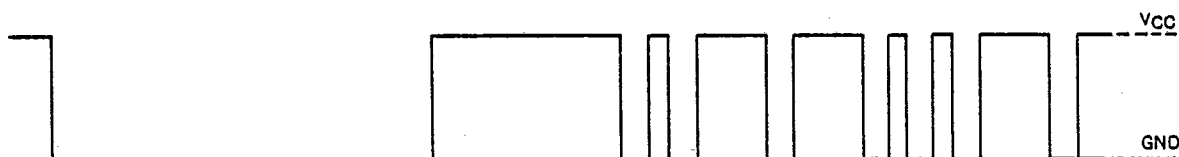
**RX**

T-77-11

Transmitter Waveform

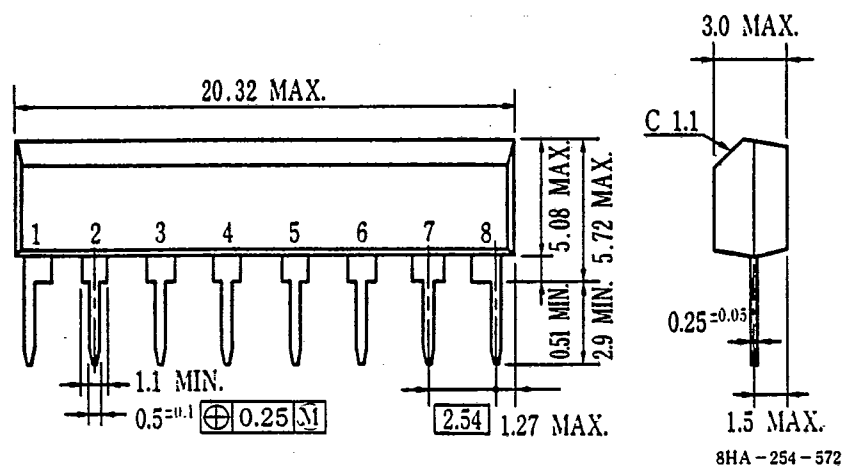


Output Waveform



8 PIN SIP PACKAGE DIMENSIONS (Unit : mm)

T-77-11



NEC Corporation

INTERNATIONAL ELECTRON DEVICES DIV.
 SUMITOMO MITA Building, 37-8,
 Shiba Gochome, Minato-ku, Tokyo 108, Japan
 Tel: Tokyo 456-3111
 Telex Address: NECTOK J22686
 Cable Address: NEC TOKYO

IC-1562
 JULY-28-85M
 Printed in Japan

6