

DATA SHEET

NEC
ELECTRON DEVICE**BIPOLAR ANALOG INTEGRATED CIRCUIT**
 μ PC1474HA, μ PC1475HA**REMOTE CONTROL PREAMPLIFIER****DESCRIPTION**

The μ PC1474HA and μ PC1475HA are silicon monolithic integrated circuit designed for remote control preamplification of infrared signals. A PIN photo diode can be directly connected to the input terminal.

The μ PC1474HA and μ PC1475HA contain a high-gain amplifier, a peak detector and an output waveform shaper which are necessary for a remote control preamplifier.

The μ PC1474HA and μ PC1475HA have improved light interference-rejection characteristics, by use of a two-stage tuning circuit.

The μ PC1474HA's output polarity is active "Low" and the μ PC1475HA's output polarity is active "High".

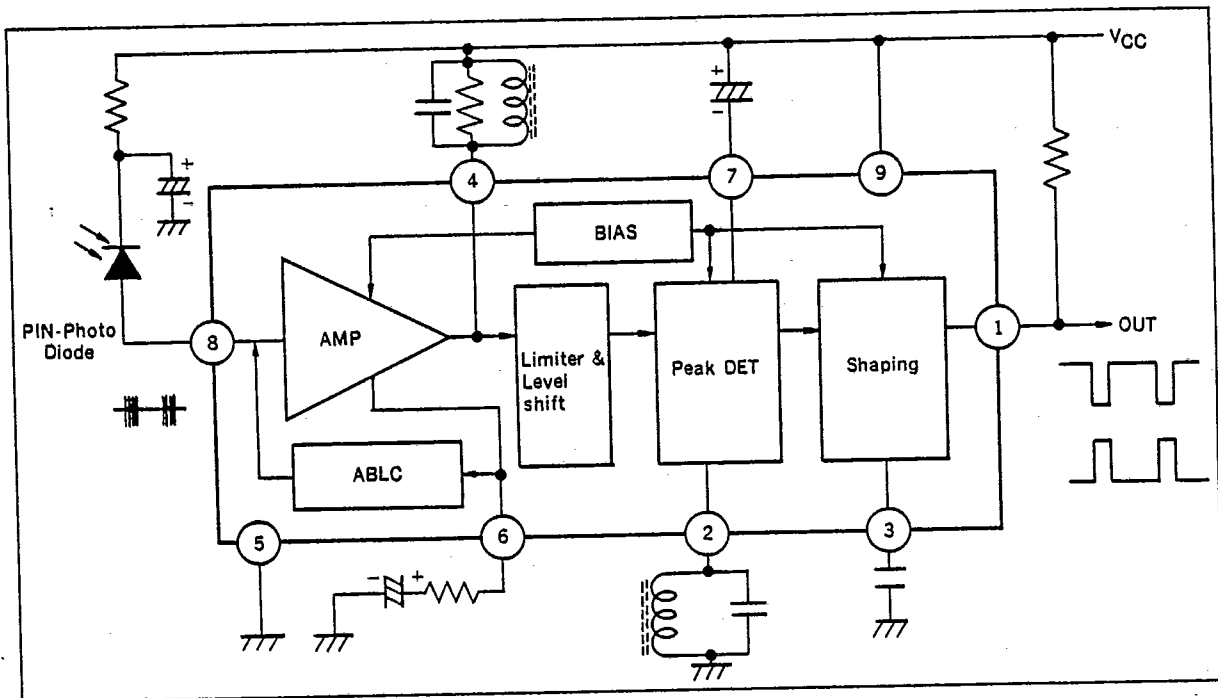
FEATURES

- Good immunity from light interference: Narrow band width: ± 1.3 kHz TYP.
- Operation voltage: 5 V ± 10 %
- Low power consumption: 2.4 mA TYP.
- High input sensitivity: 50 μ V_{p-p} TYP.
- Peak detector: The detector level is varied with the input signal level.
- Out terminal: Open collector output Easy to interface to other devices.
- Application: Designed for use with the μ PD1913C, μ PD1943G, μ PD6102G remote control transmitter IC.

ORDERING INFORMATION

| Order Code | Package | Output Data |
|----------------|-------------------|-------------|
| μ PC1474HA | 8-pin plastic SIP | active low |
| μ PC1475HA | 8-pin plastic SIP | active high |

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

| | | | |
|-------------------------|------------------|-------------|----|
| Supply Voltage | V _{CC} | 8 | V |
| Power Dissipation | P _D | 270 | mW |
| Operating Temperature | T _{opt} | -20 to +75 | °C |
| Storage Temperature | T _{stg} | -40 to +125 | °C |
| Output Terminal Voltage | V _{out} | 15.0 | V |

RECOMMENDED OPERATING CONDITION

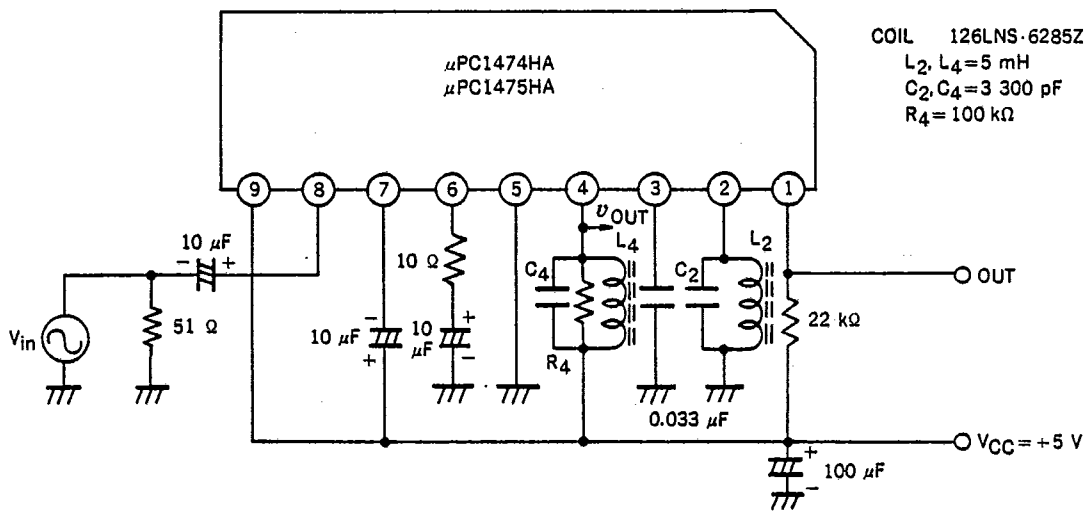
| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------|-----------------|------|------|------|------|
| Power Supply | V _{CC} | 4.5 | 5.0 | 5.5 | V |
| Input Frequency | f _{in} | 30 | | 60 | kHz |

ELECTRICAL CHARACTERISTICS (T_a = 25 °C, V_{CC} = 5.0 V, f_{in} = 40 kHz)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|-------------------------|-------------------|------|------|------|------|---|
| Supply Current | I _{CC} | 1.6 | 2.4 | 3.5 | mA | |
| Input Terminal Voltage | V _{IN 1} | 1.0 | 1.25 | 1.45 | V | |
| Input Terminal Voltage | V _{IN 2} | 2.0 | 2.35 | 2.5 | V | I _{in} = 30 μA |
| 1st Stage Voltage Gain | A _{vL} | | 66 | | dB | #8 - #4, v _{out} = 500 mV _{p-p} |
| Detection Input Voltage | v _{in} | | 50 | 100 | μV | |
| Input Impedance | r _{in} | 40 | 60 | 80 | kΩ | |
| Output Voltage | V _{OL} | | | 0.5 | V | I _{OL} = 0.5 mA, v _{in} = 1 mV _{p-p} |
| Output Leak Current | I _{OH} | | | 2 | μA | V _{OH} = 14.4 V |

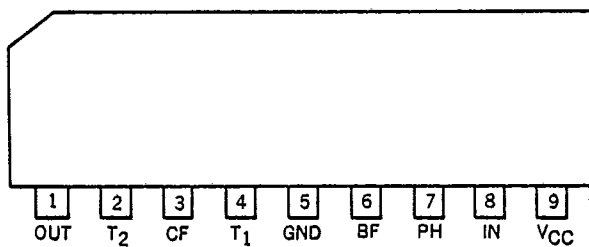
TEST CIRCUITS

T-77-11



COIL 126LNS-6285Z TOKO INC.
 L₂, L₄=5 mH
 C₂, C₄=3 300 pF
 R₄=100 kΩ

CONNECTION DIAGRAM DIMENSIONS

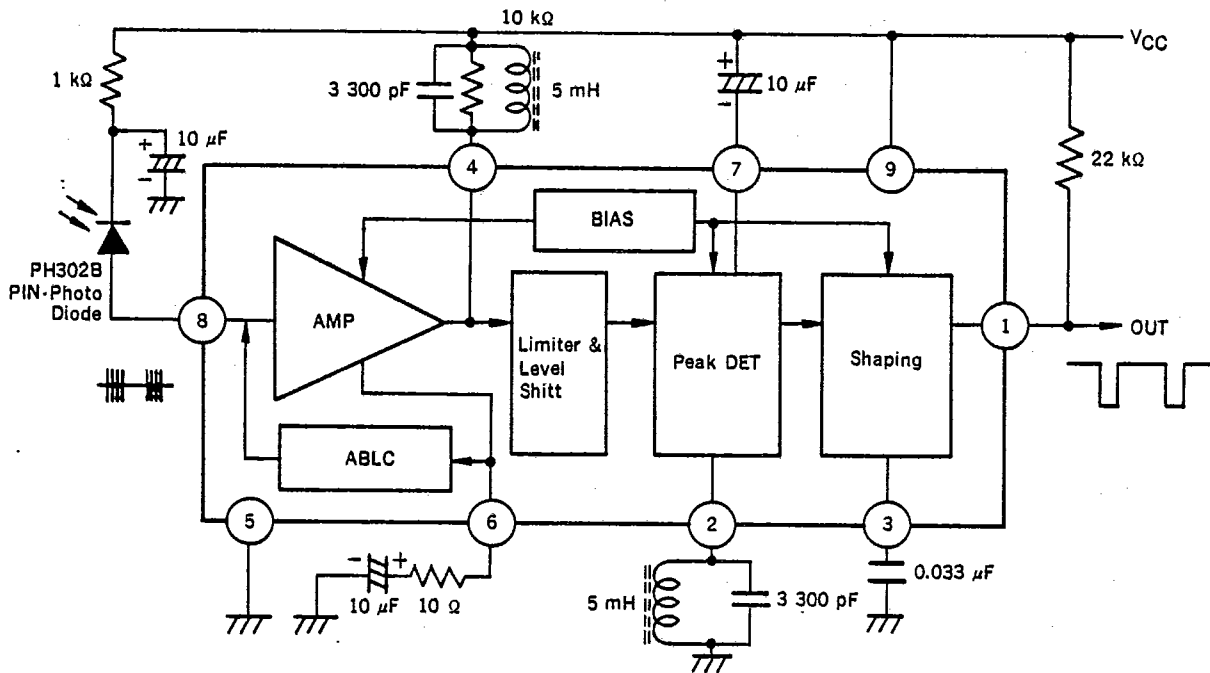


TERMINAL

- | | | |
|---------|-----------------|-----------------------|
| 1 | OUT | Output |
| 2 | T ₂ | 2nd stage tuning coil |
| 3 | CF | Carrier filter |
| 4 | T ₁ | 1st stage tuning coil |
| 5 | GND | Ground |
| 6 | BF | Bias filter |
| 7 | PH | Peak hold |
| 8 | IN | Input |
| 9 | V _{CC} | Power supply |

STANDARD APPLICATION

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COIL 126LNS-6285Z TOKO INC.
5 mH 0.08 φ-2 UEW313T

PIN FUNCTION

- **Power supply terminal (V_{CC}: 9 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: 8 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.
- **1st Stage tuning coil terminal (T₁: 4 Pin)**
- **Bias filter terminal (BF: 6 Pin)**
This front amplifier has 52 dB gain in this application circuit and this gain is determined by tuning coil impedance (Z_L) and external resistor R₆.

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

When there are much impulse noise, it is better to change 10 kΩ damping resistor (4 Pin) to small one. (ex. 5 kΩ)

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● **Peak hold terminal (PH: 7 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 C7.

● **2nd Stage tuning coil terminal (T₂: 2 Pin)**

The peak detection signal is tuned again by this 2nd stage tuning circuit, so the band width is narrow.

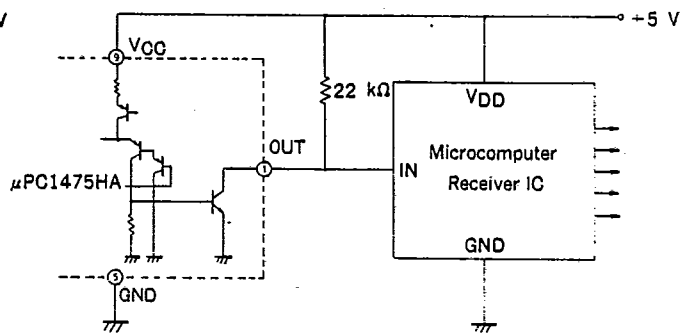
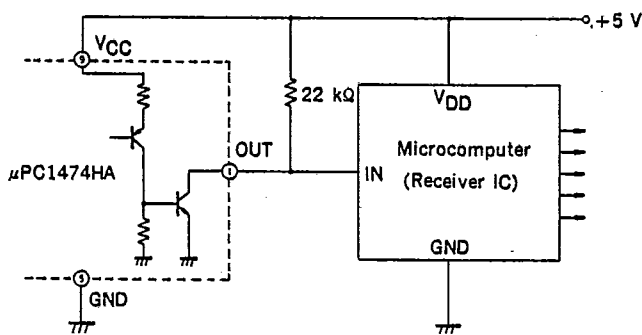
● **Carrier filter terminal (CF: 3 Pin)**

The carrier waveform is deleted by this capacitor C3.

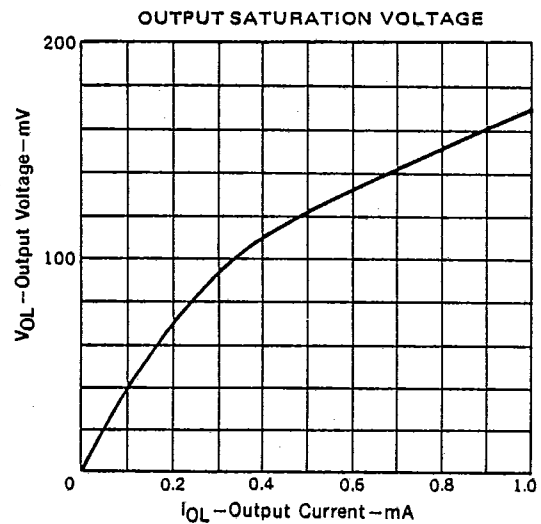
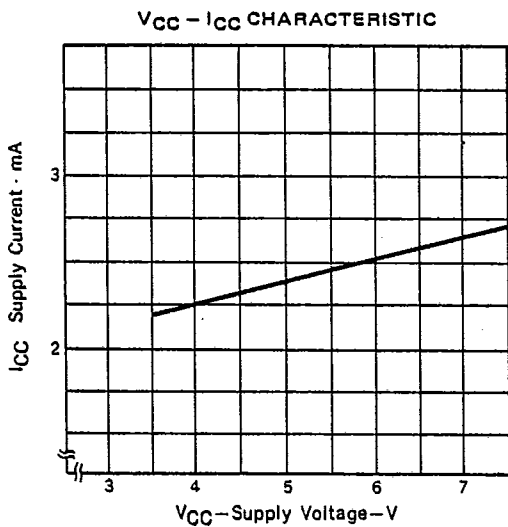
● **Output terminal (OUT: 1 Pin)**

This Output terminal is open collector transistor.

The μPC1474HA is active "Low" output. The μPC1475HA is active "High" output.



TYPICAL CHARACTERISTICS (T_a = 25 °C)



μ PC1474HA, μ PC1475HA

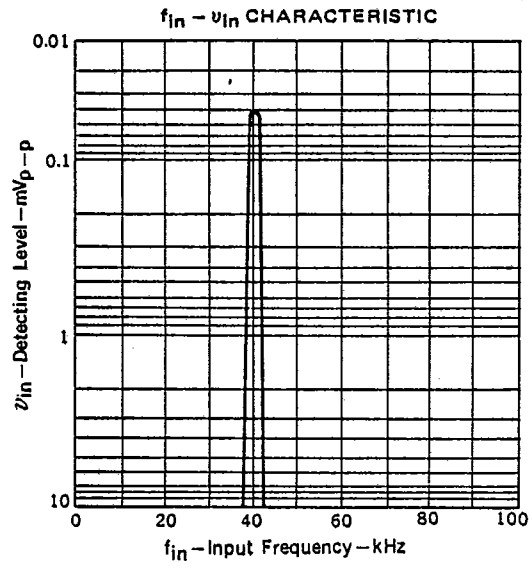
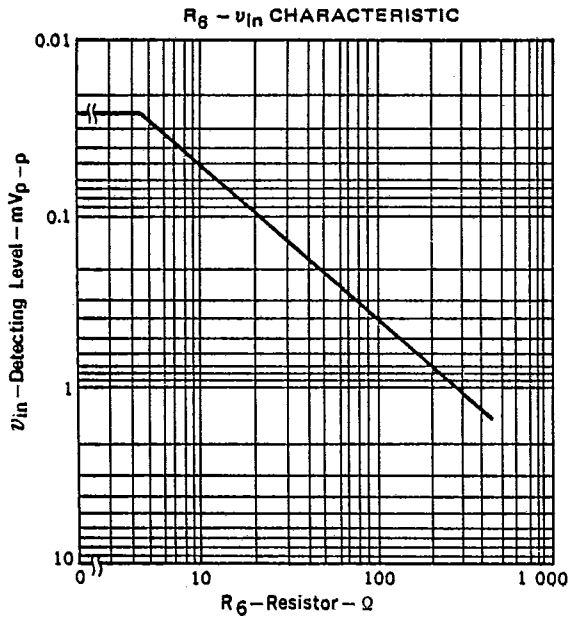
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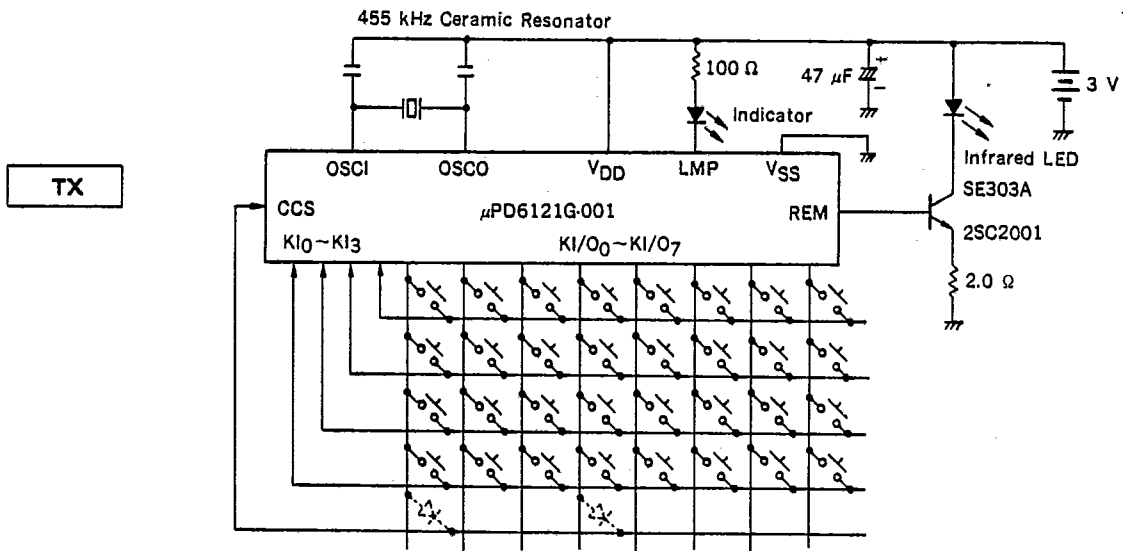
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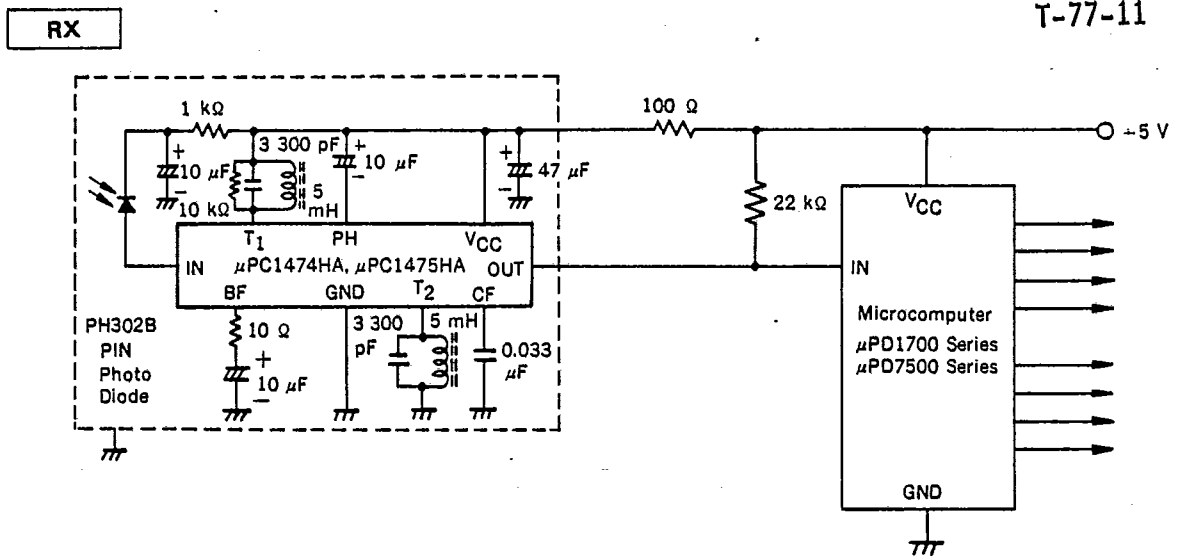
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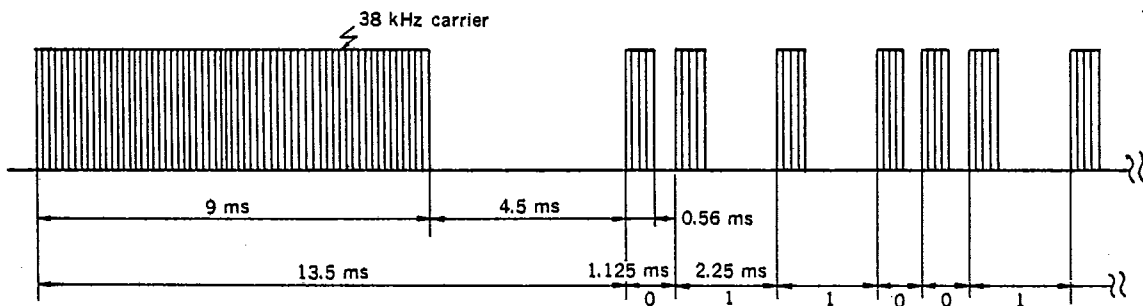
APPLICATION



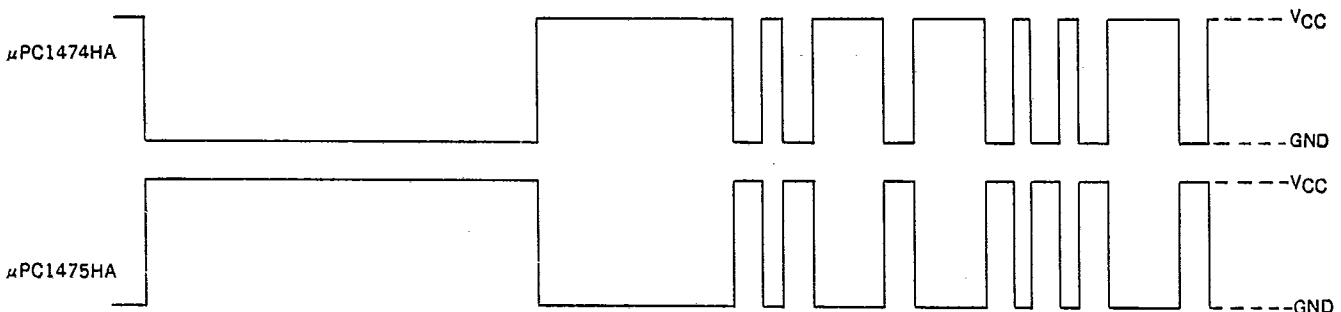
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Transmitter Waveform



Output Waveform



μPC1474HA, μPC1475HA

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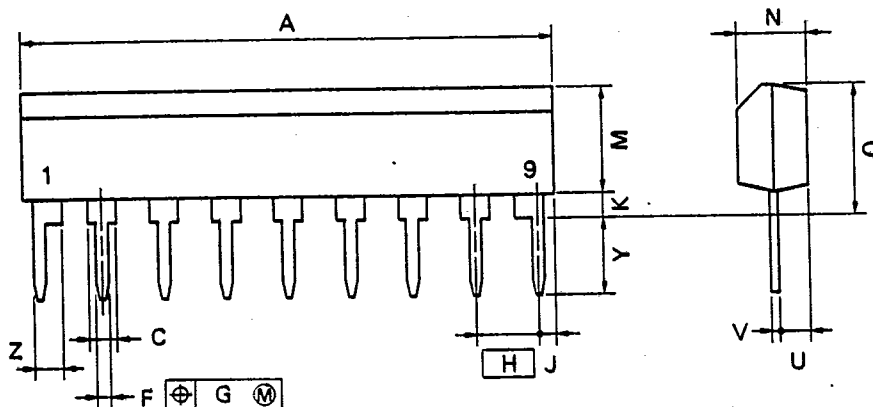
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NEC ELECTRON DEVICE

9 PIN SIP PACKAGE DIMENSIONS

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NOTE

Each lead centerline is located within 0.25 mm (0.01 inch) of its true position (T.P.) at maximum material condition.

P9HA-254B

| ITEM | MILLIMETERS | INCHES |
|------|----------------------|------------------------|
| A | 22.86 MAX. | 0.9 MAX. |
| C | 1.1 MIN. | 0.043 MIN. |
| F | 0.5 ^{-0.1} | 0.02 ⁸⁸⁸⁸ |
| G | 0.25 | 0.01 |
| H | 2.54 | 0.1 |
| J | 1.27 MAX. | 0.05 MAX. |
| K | 0.51 MIN. | 0.02 MIN. |
| M | 5.08 MAX. | 0.2 MAX. |
| N | 2.8 ^{-0.2} | 0.11 ⁸⁸⁸⁸ |
| Q | 5.75 MAX. | 0.227 MAX. |
| U | 1.5 MAX. | 0.059 MAX. |
| V | 0.25 ⁸⁸⁸⁸ | 0.01 ⁸⁸⁸⁸ |
| Y | 3.2 ^{-0.5} | 0.126 ^{-0.02} |
| Z | 1.1 MIN. | 0.043 MIN. |