



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

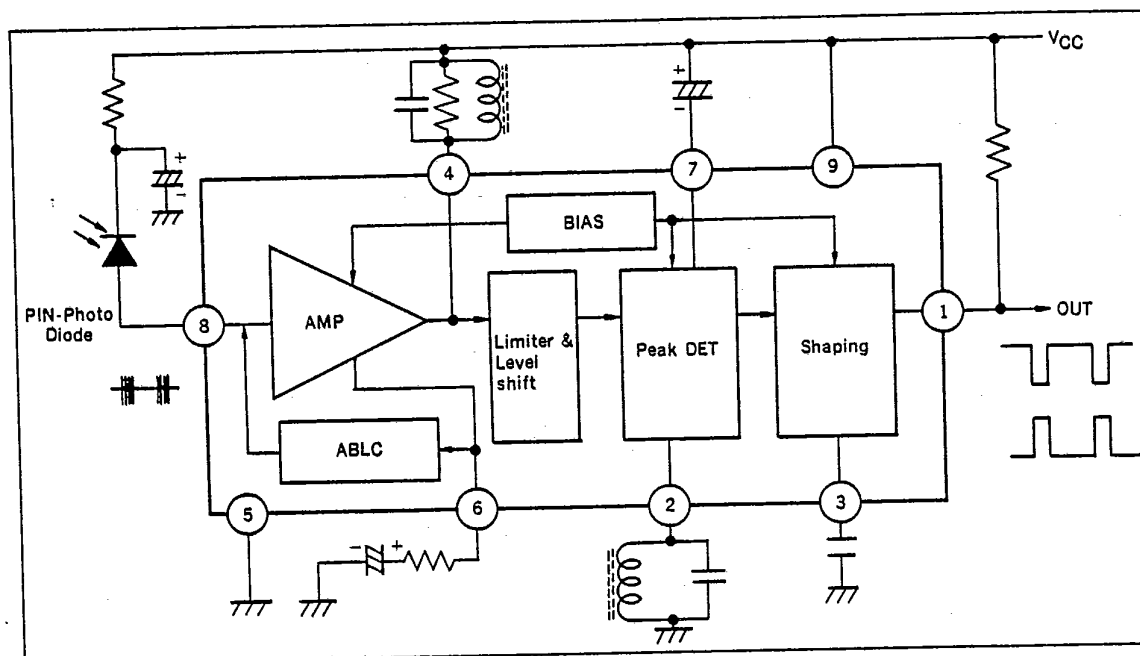
- Good immunity from light interference: Narrow band width: ± 1.3 kHz TYP.
- Operation voltage: 5 V ± 10 %
- Low power consumption: 2.4 mA TYP.
- High input sensitivity: 50 μ V_{p-p} TYP.
- Peak detector: The detector level is varied with the input signal level.
- Out terminal: Open collector output 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

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BLOCK DIAGRAM

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

Supply Voltage	V_{CC}	8	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

RECOMMENDED OPERATING CONDITION

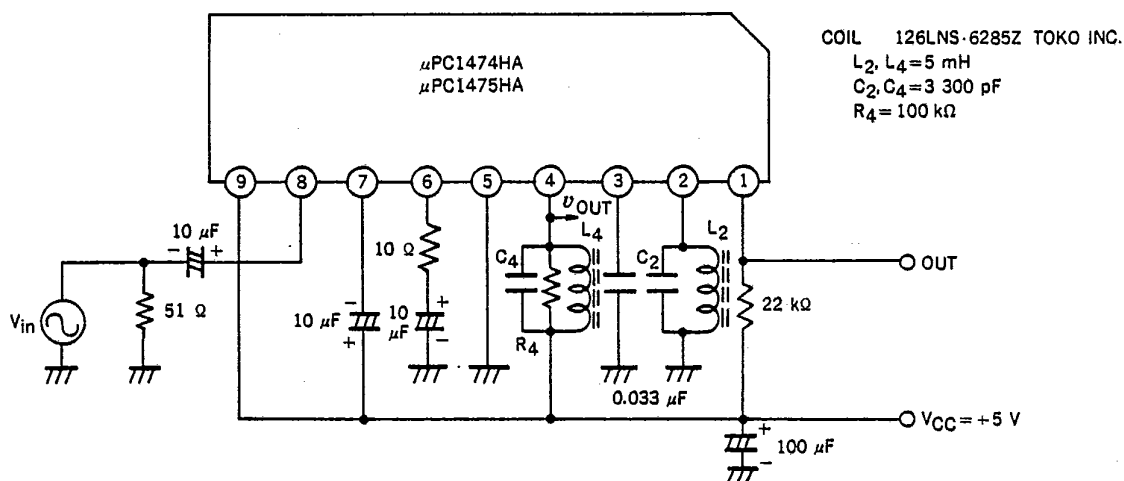
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Supply	V_{CC}	4.5	5.0	5.5	V
Input Frequency	f_{in}	30		60	kHz

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

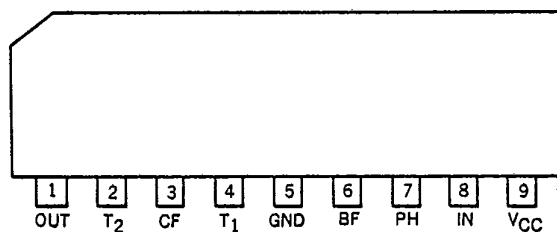
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Supply Current	I_{CC}	1.6	2.4	3.5	mA	
Input Terminal Voltage	V_{IN1}	1.0	1.25	1.45	V	
Input Terminal Voltage	V_{IN2}	2.0	2.35	2.5	V	$I_{in} = 30\text{ }\mu\text{A}$
1st Stage Voltage Gain	A_{vL}		66		dB	#8 - #4, $v_{out} = 500\text{ mV}_{p-p}$
Detection Input Voltage	v_{in}		50	100	μV	
Input Impedance	r_{in}	40	60	80	$k\Omega$	
Output Voltage	V_{OL}			0.5	V	$I_{OL} = 0.5\text{ mA}$, $v_{in} = 1\text{ mV}_{p-p}$
Output Leak Current	I_{OH}			2	μA	$V_{OH} = 14.4\text{ V}$

TEST CIRCUITS

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CONNECTION DIAGRAM DIMENSIONS

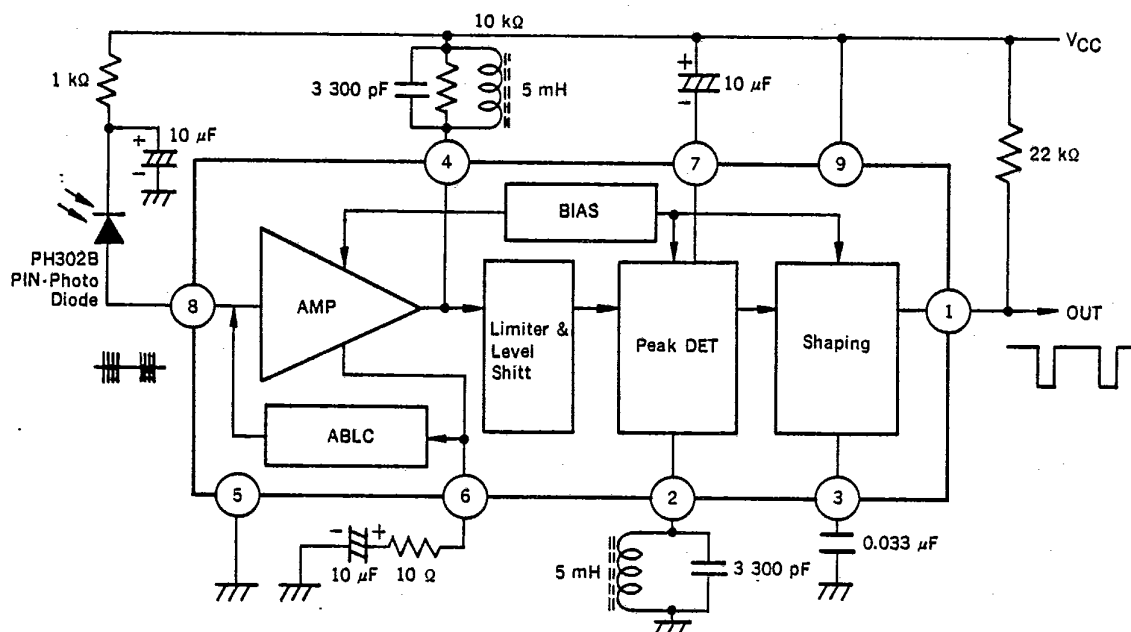


TERMINAL

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 $5\text{ V} \pm 10\%$.

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

- Input terminal (IN: 8 Pin)

This input impedance is $60\text{ k}\Omega$ 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 (T_1 : 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 R_6 .

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

When there are much impulse noise, it is better to change $10\text{ k}\Omega$ damping resistor (4 Pin) to small one. (ex. $5\text{ k}\Omega$)

- Peak hold terminal (PH: 7 Pin)

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

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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 (T_2 : 2 Pin)

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

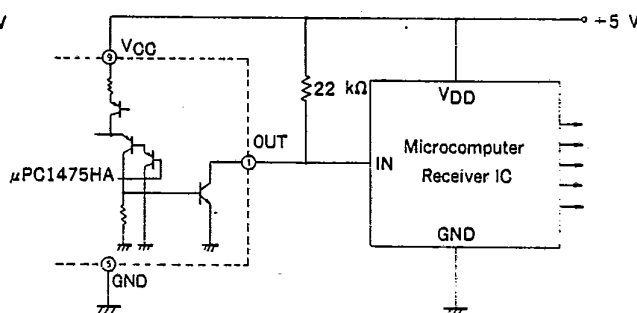
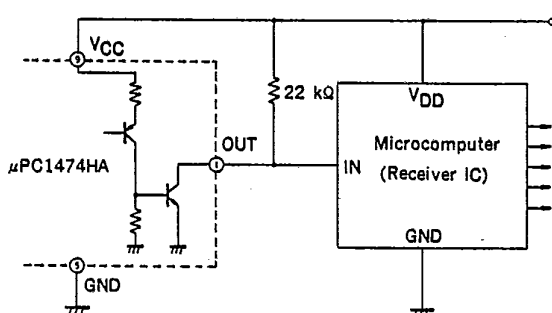
- Carrier filter terminal (CF: 3 Pin)

The carrier waveform is deleted by this capacitor C3.

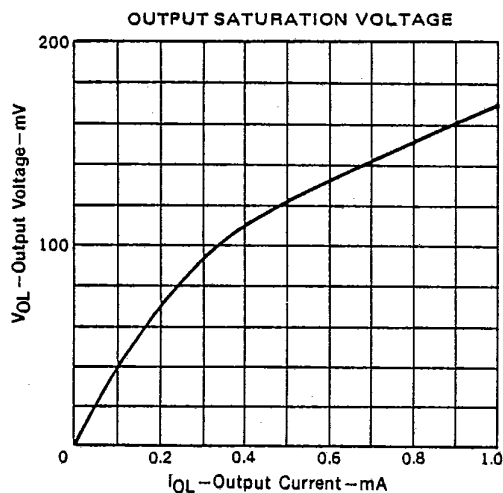
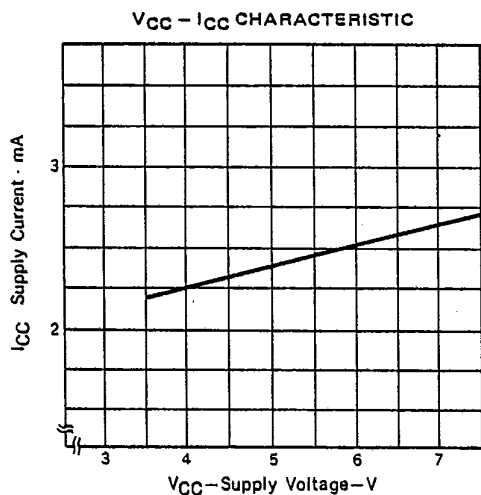
- Output terminal (OUT: 1 Pin)

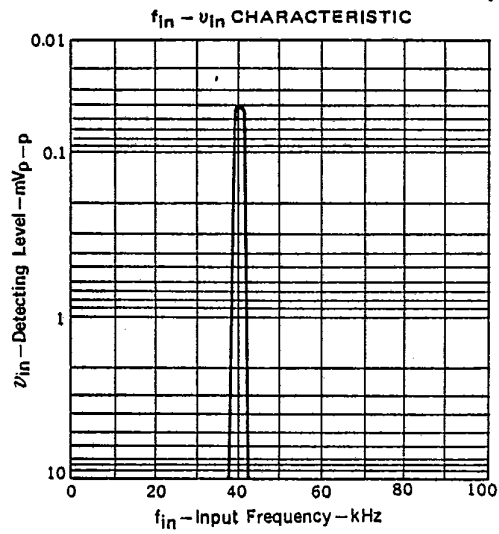
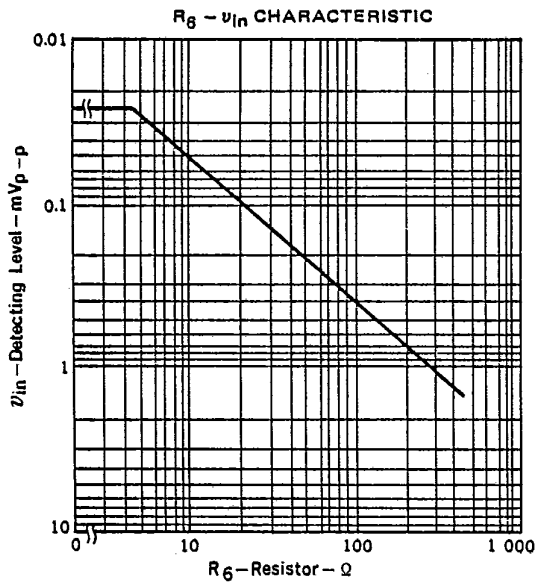
This Output terminal is open collector transistor.

The μ PC1474HA is active "Low" output. The μ PC1475HA is active "High" output.

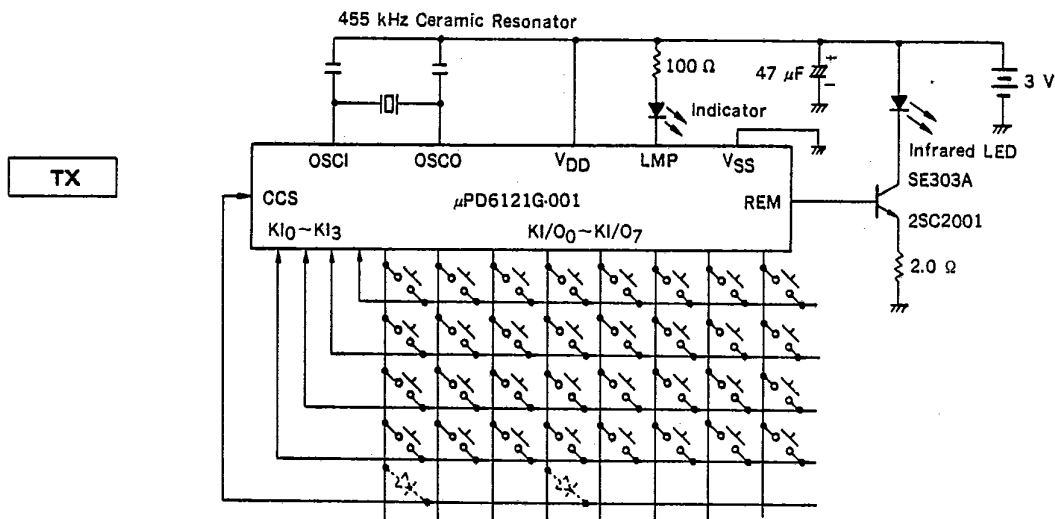


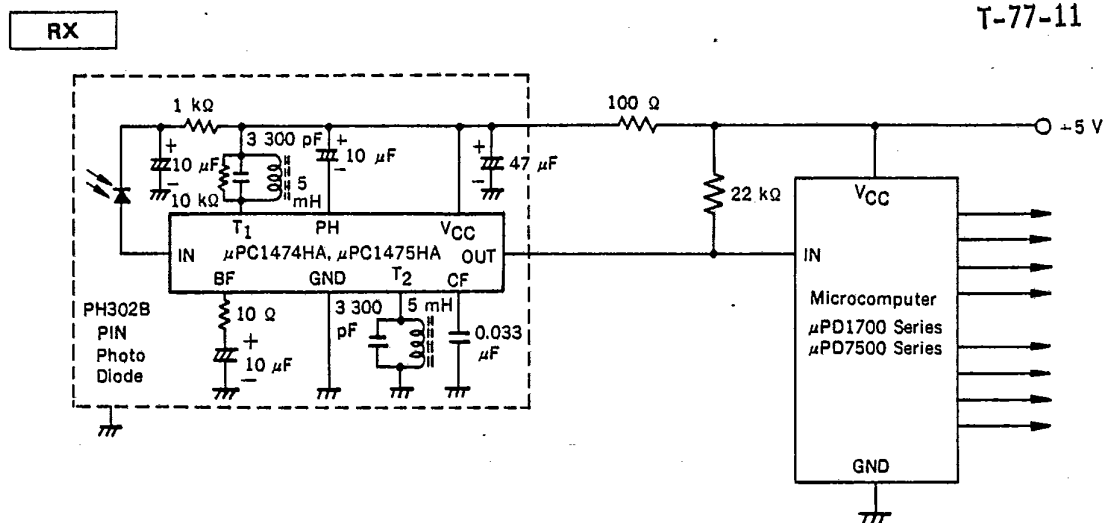
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



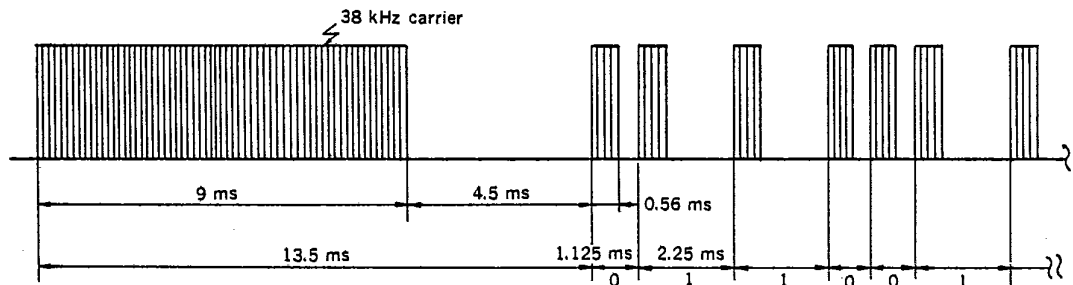


APPLICATION

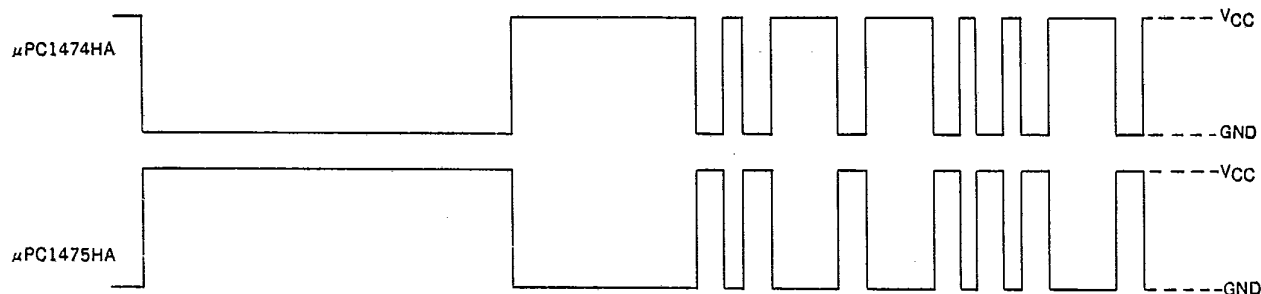




Transmitter Waveform



Output Waveform



μ PC1474HA, μ PC1475HA

N E C ELECTRONICS INC

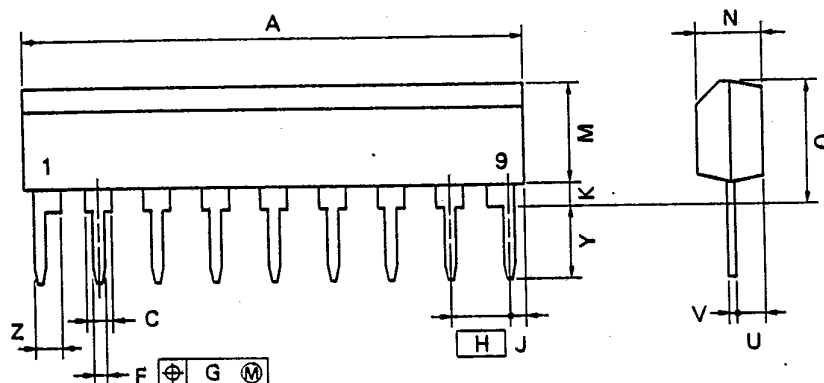
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NEC ELECTRON DEVICE

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 \pm 0.1	0.02 \pm 0.004
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 \pm 0.2	0.11 \pm 0.008
Q	5.75 MAX.	0.227 MAX.
U	1.5 MAX.	0.059 MAX.
V	0.25 \pm 0.02	0.01 \pm 0.001
Y	3.2 \pm 0.5	0.126 \pm 0.02
Z	1.1 MIN.	0.043 MIN.