

# BIPOLAR ANALOG INTEGRATED CIRCUIT

## μPC1373H

### REMOTE CONTROL PREAMPLIFIER

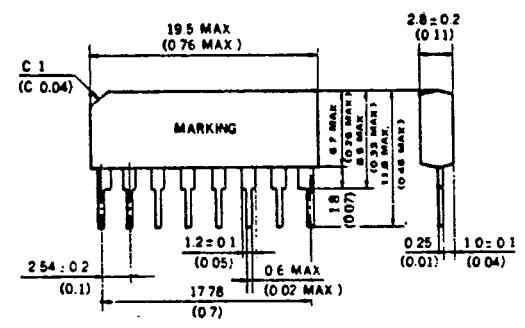
**DESCRIPTION**

The μPC1373H is a silicon monolithic integrated circuit designed for a remote control preamplifier of infrared signals. This device has features of low power, high sensitivity and wide supply voltage.

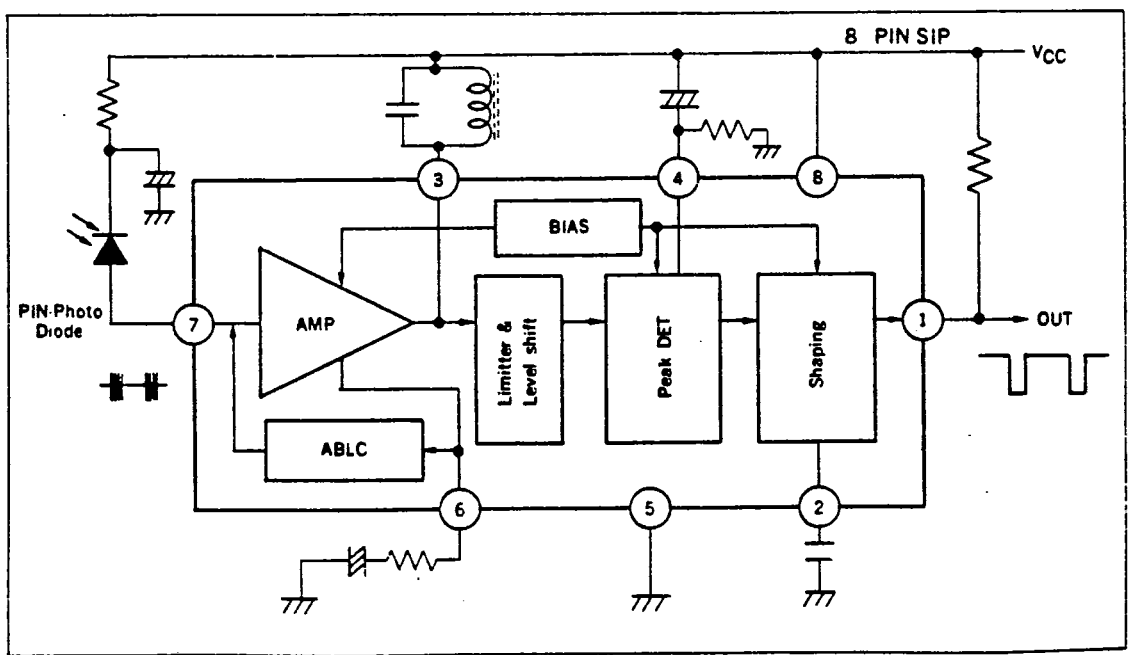
**FEATURES**

- Wide operation Voltage . . . . .  $V_{CC} = 6$  to  $14.4$  V
- Low Power Consumption . . . . .  $I_{CC} = 2.5$  mA TYP.
- High Input Sensitivity . . . . .  $50 \mu V_{p-p}$  TYP.
- Peak Detector
- Small Size Package 8 pin-SIP
- Minimum number of External parts required
- Designed for Use with the μPD1913C, 1943G Remote Control Transmitter IC.

**PACKAGE DIMENSIONS**  
in millimeters (inches)



**BLOCK DIAGRAM**



# μPC1373H

## ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub> = 25 °C)

Supply Voltage	V <sub>CC</sub>	15	V
Power Dissipation	P <sub>d</sub>	270	mW
Operating Temperature	T <sub>opt</sub>	-20 to +75	°C
Storage Temperature	T <sub>stg</sub>	-40 to +125	°C

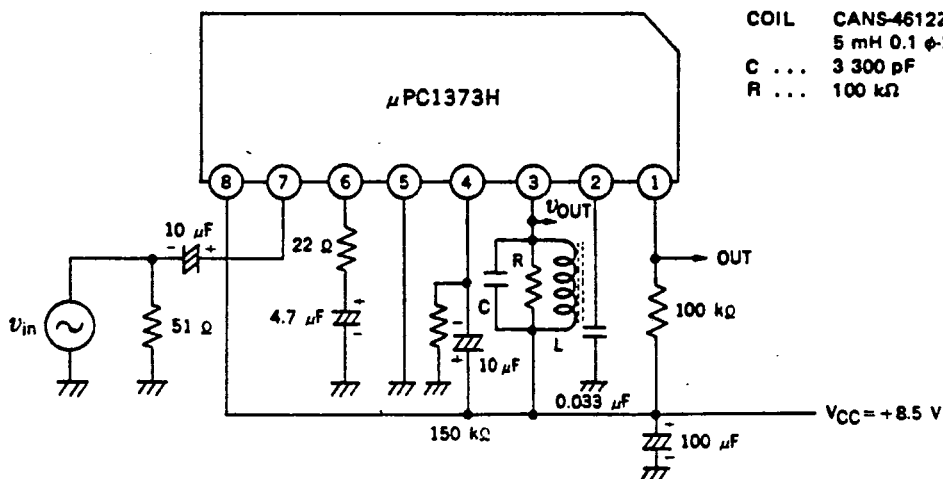
## RECOMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Supply	V <sub>CC</sub>	6.0	8.5	14.4	V
Input Frequency	f <sub>in</sub>	30		50	kHz

## ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C, V<sub>CC</sub> = 8.5 V, f<sub>in</sub> = 40 kHz)

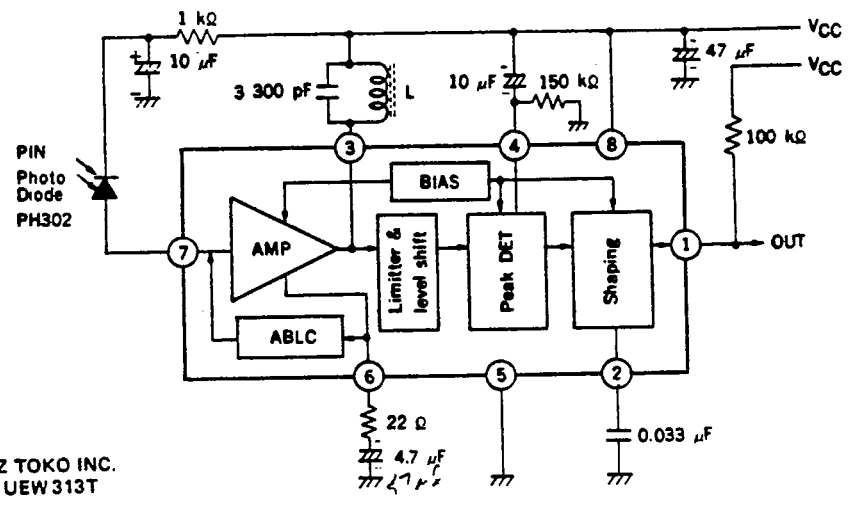
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Supply Current	I <sub>CC</sub>	1.5	2.5	3.5	mA	
Input Terminal Voltage	V <sub>IN 1</sub>	2.1	2.6	3.1	V	
Input Terminal Voltage	V <sub>IN 2</sub>	3.4	4.1	4.9	V	I <sub>in</sub> = 70 μA
1st Stage Voltage Gain	A <sub>VL</sub>		60		dB	#7 - #3, U <sub>OUT</sub> = 500 mVp-p
Detection Input Voltage	U <sub>in</sub>		50	100	μV	
Input Impedance	r <sub>in</sub>	40	60	80	kΩ	
Output Voltage	V <sub>OL</sub>			0.5	V	I <sub>OL</sub> = 0.1 mA, U <sub>in</sub> = 1 mVp-p
Output Leak Current	I <sub>OH</sub>			2	μA	V <sub>OH</sub> = 14.4 V
Noise		Output Terminal is not fall.				Input Open

## TEST CIRCUITS



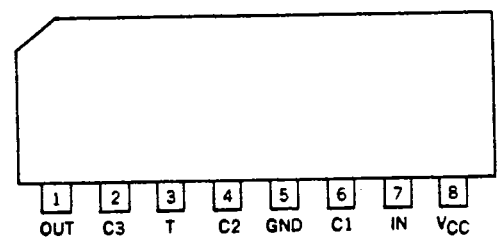
**μPC1373H**

**STANDARD APPLICATION**



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

**CONNECTION DIAGRAM**



TERMINAL	1	2	3	4	5	6	7	8
	OUT	C3	T	C2	GND	C1	IN	VCC
	Output	Integral Capacitor	Tuning Coil	Peak Hold Capacitor	Ground	By-pass Capacitor	Input	Power Supply

**PIN FUNCTION**

- VCC Power Supply ..... (#8)  
Operation voltage is 6.0 to 14.4 V.
- IN Input ..... (#7)  
This input impedance is 60 kΩ typical.  
This input has ABLC (Automatic Bias Level Control) circuit for not saturated by violent light, so this terminal voltage is always fixed.
- T Tuning coil ..... (#3)
- C1 By-pass capacitor ... (#6)  
This 1st amplifier has gain of 60 dB and this gain is determined of impedance of coil and external resistor R#6

Handwritten notes and formula:

$$A_{VL} = \frac{Z_L}{R_{\#6}} \times \text{Log } 20$$

Additional handwritten notes:  $Z_L = 200 \Omega$ ,  $A_{VL} = 40 \times \text{Log } 20$

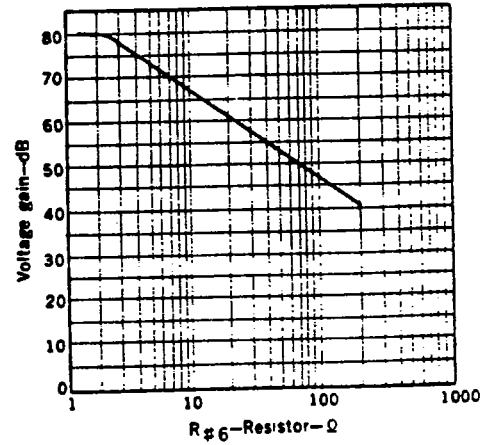


Fig. 1 1st stage amplitude gain

# μPC1373H

○ C2 Peak hold capacitor ... (#4)

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  $C_{\#4}$ , and sensitivity is adjusted by resistor  $R_{\#4}$ . (see Fig. 2)

external resistor  $R_{\#4}$

- $V_{CC}=12\text{ V} \dots 220\text{ k}\Omega$
- $=10\text{ V} \dots 180\text{ k}\Omega$
- $=8.5\text{ V} \dots 150\text{ k}\Omega$

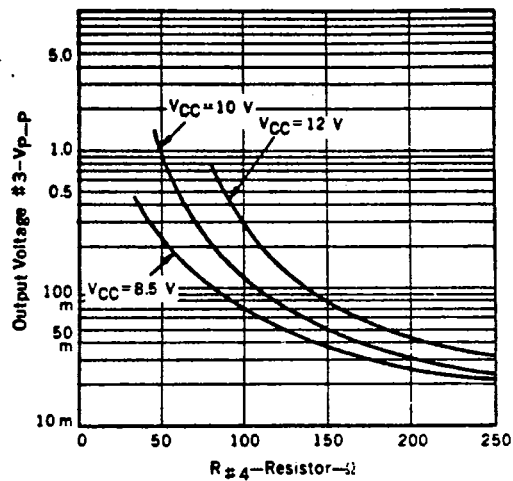


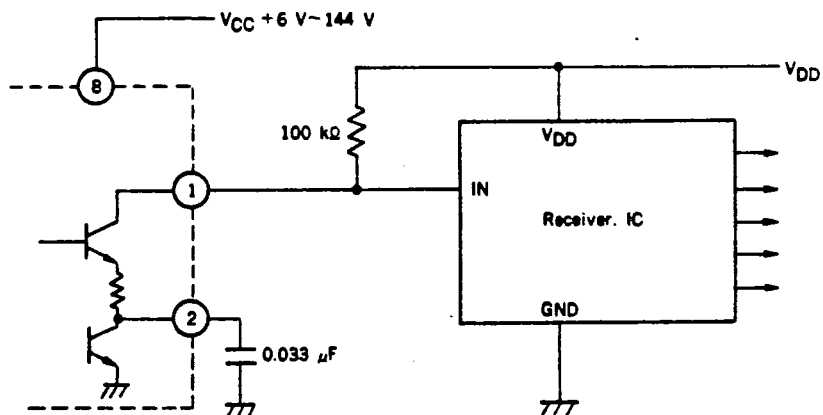
Fig. 2 Sensitivity of peak detector characteristic

○ C3 Integral Capacitor ... (#2)

Carrier wave through peak detector is integrated by this capacitor. This time constant is determined of external resistor  $R_{\#1}$  and this capacitor  $C_{\#2}$ .

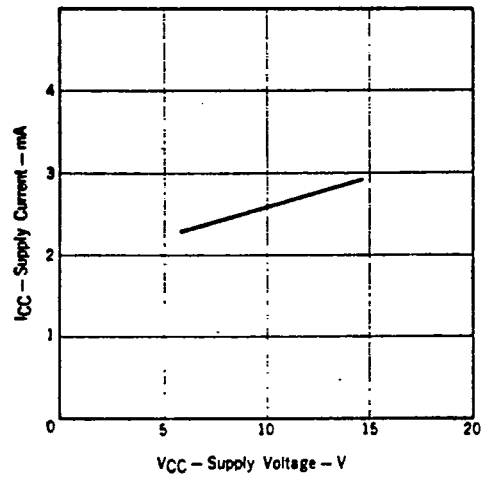
○ OUT Output ..... (#1)

Active Low output. This terminal is made of open collector transistor.

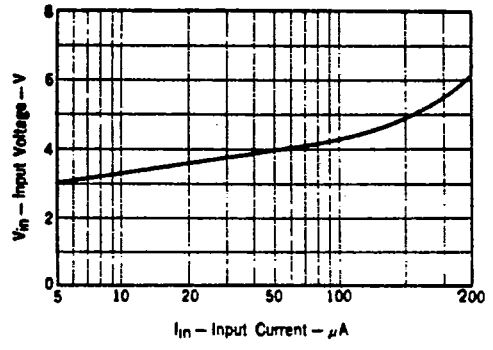


CHARACTERISTIC

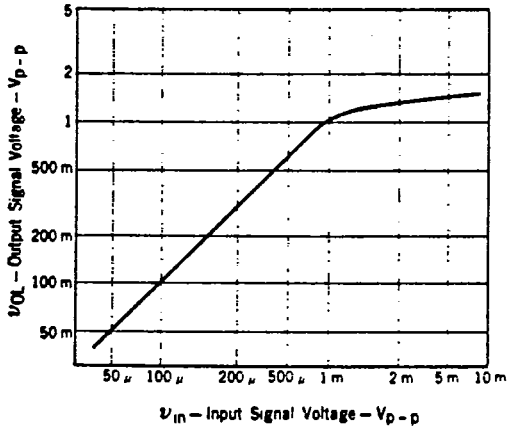
VCC - ICC Characteristic



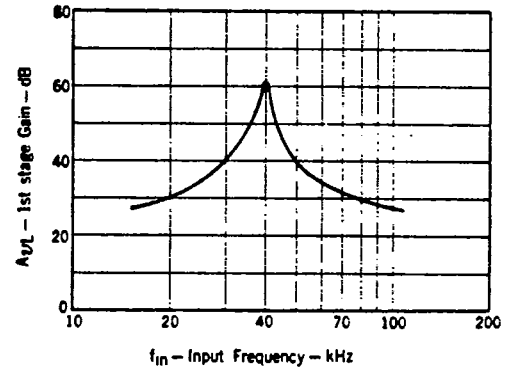
ABLC  $I_{in} - V_{in}$  Characteristic



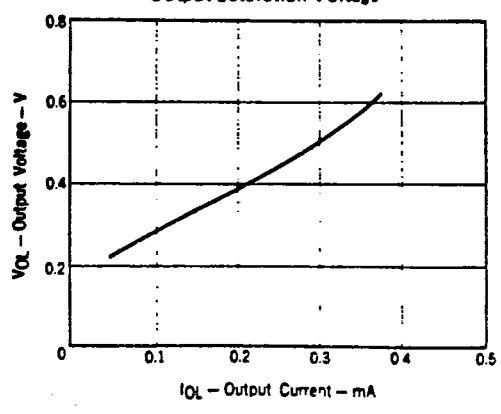
1st Stage  $V_{in} - V_{OL}$  Characteristic



1st Stage  $f_{in} - A_{VL}$  Characteristic



Output Saturation Voltage



5

# μPC1373H

## APPLICATION

