BIPOLAR ANALOG INTEGRATED CIRCUIT
μPC1373H

REMOTE CONTROL PREAMPLIFIER

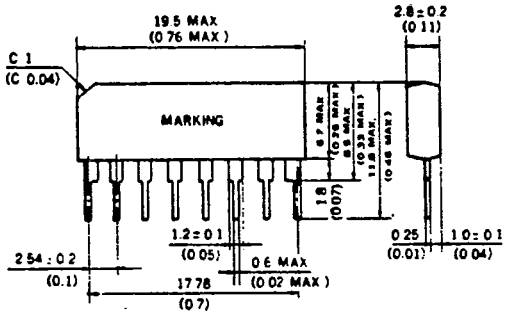
DESCRIPTION

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.

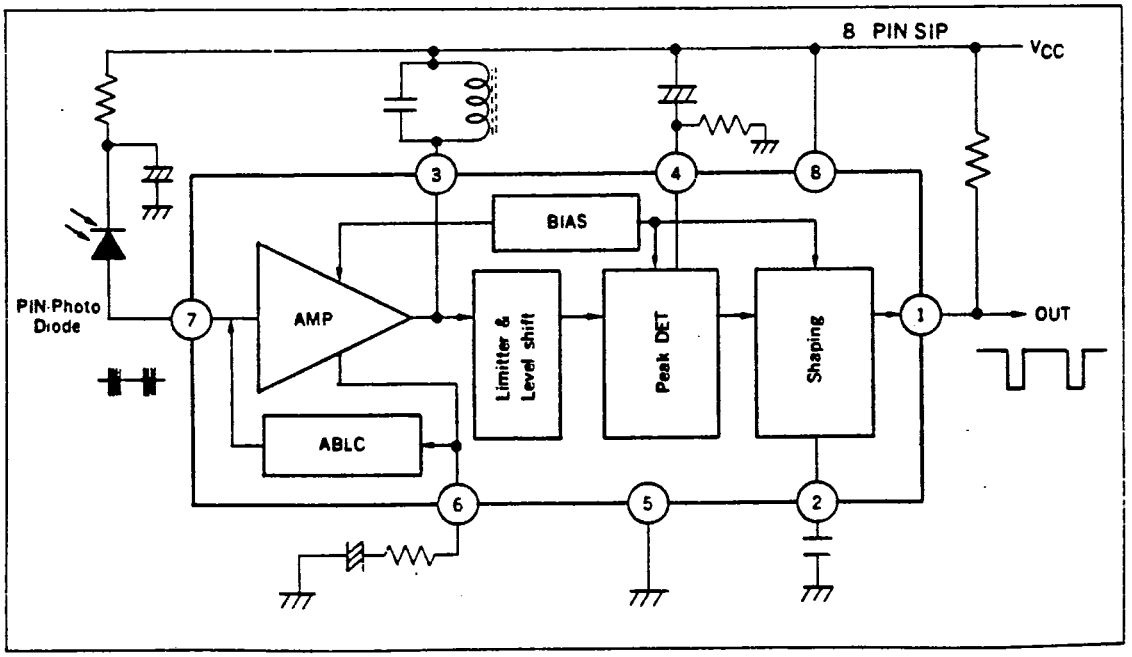
FEATURES

- Wide operation Voltage ..... V_{CC} = 6 to 14.4 V
- Low Power Consumption ..... I_{CC} = 2.5 mA TYP.
- High Input Sensitivity ..... 50 μVp-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 (Ta = 25 °C)

Supply Voltage	V_{CC}	15	V
Power Dissipation	P_d	270	mW
Operating Temperature	T_{opt}	−20 to +75	°C
Storage Temperature	T_{stg}	−40 to +125	°C

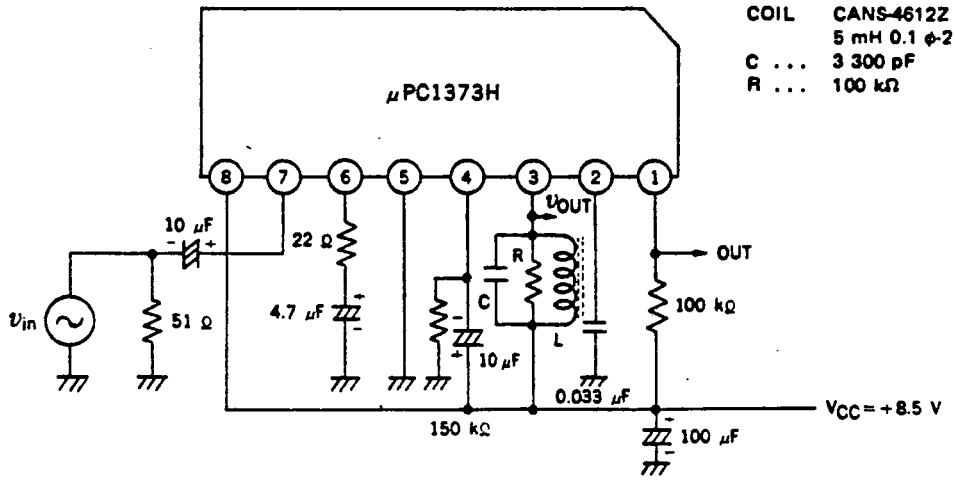
RECOMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Supply	V_{CC}	6.0	8.5	14.4	V
Input Frequency	f_{in}	30		50	kHz

ELECTRICAL CHARACTERISTICS (Ta = 25 °C, V_{CC} = 8.5 V, f_{in} = 40 kHz)

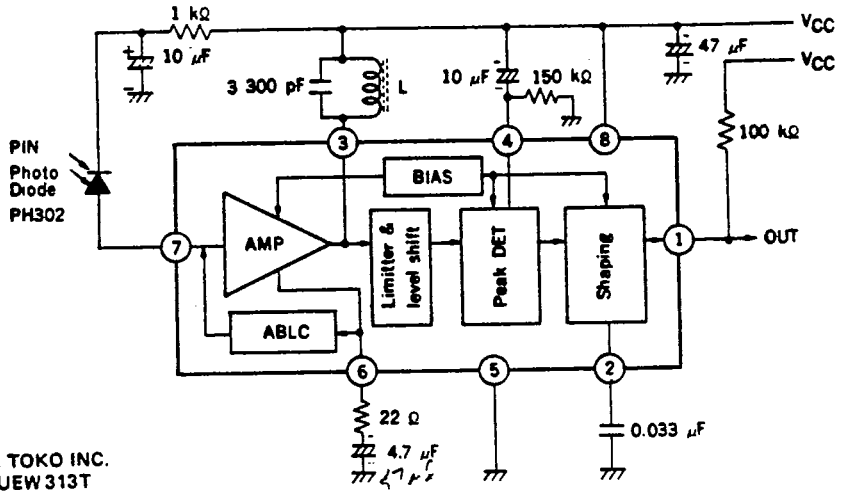
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Supply Current	I_{CC}	1.5	2.5	3.5	mA	
Input Terminal Voltage	$V_{IN\,1}$	2.1	2.6	3.1	V	
Input Terminal Voltage	$V_{IN\,2}$	3.4	4.1	4.9	V	I_{in} = 70 μA
1st Stage Voltage Gain	A_{VL}		60		dB	#7 − #3, v_{out} = 500 mVp-p
Detection Input Voltage	v_{in}		50	100	μV	
Input Impedance	r_{in}	40	60	80	kΩ	
Output Voltage	V_{OL}			0.5	V	I_{OL} = 0.1 mA, v_{in} = 1 mVp-p
Output Leak Current	I_{OH}			2	μA	V_{OH} = 14.4 V
Noise		Output Terminal is not fall.				Input Open

TEST CIRCUITS



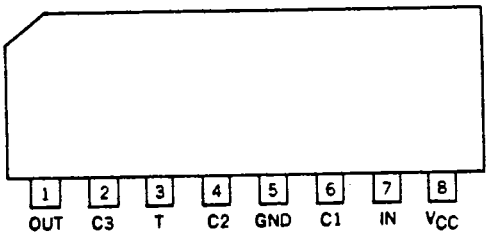
COIL CANS-4612Z TOKO INC.
5 mH 0.1 φ-2 UEW 303T
C ... 3 300 pF
R ... 100 kΩ

STANDARD APPLICATION



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

CONNECTION DIAGRAM



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

PIN FUNCTION

○ V_{CC} 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 $R_{\#6}$

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

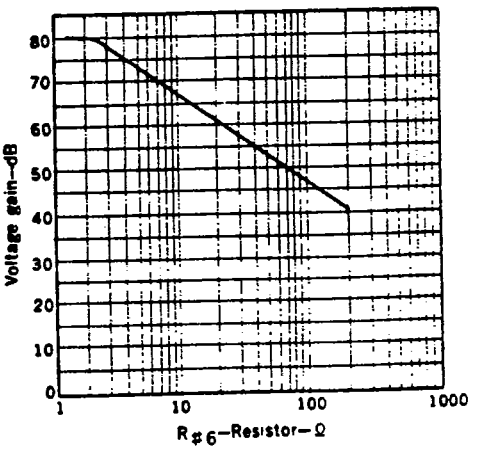


Fig. 1 1st stage amplitude gain

○ 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 V . . . 220 kΩ
= 10 V . . . 160 kΩ
= 8.5 V . . . 150 kΩ

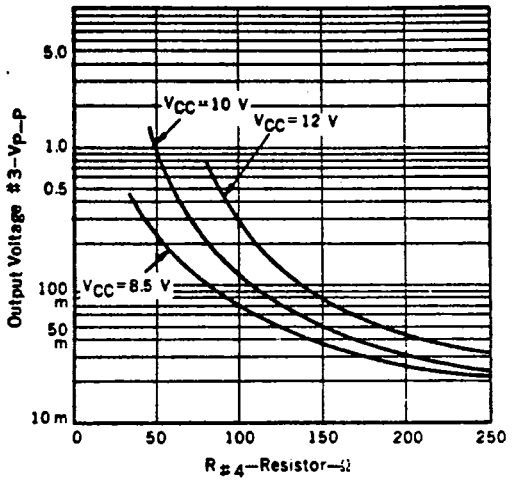


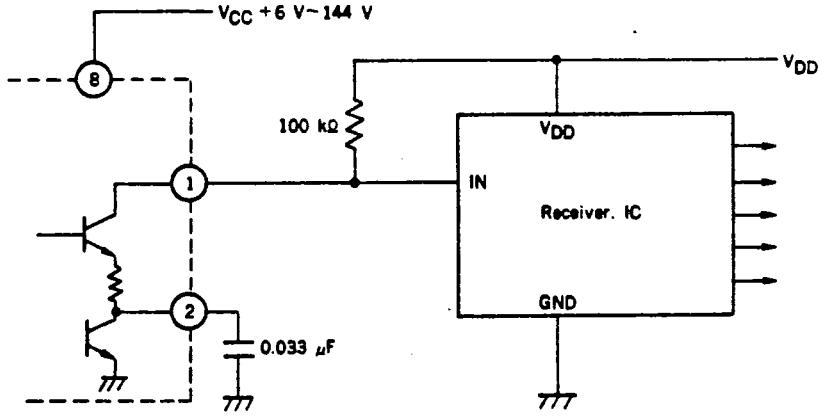
Fig. 2 Sensitivity of peak detector characteristic

○ 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)

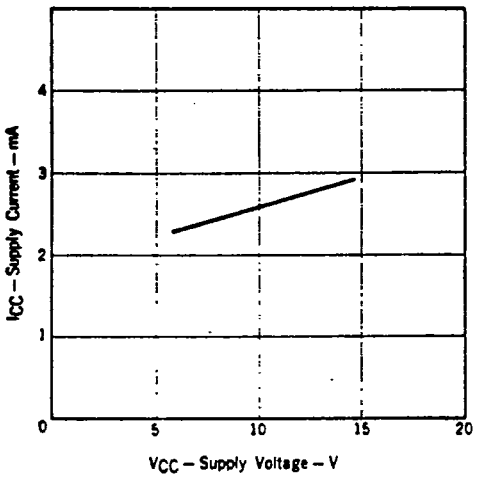
Active Low output. This terminal is made of open collector transistor.



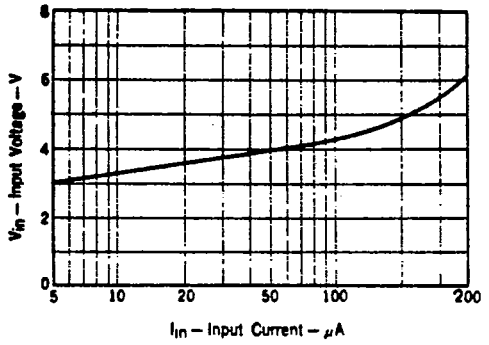
4

CHARACTERISTIC

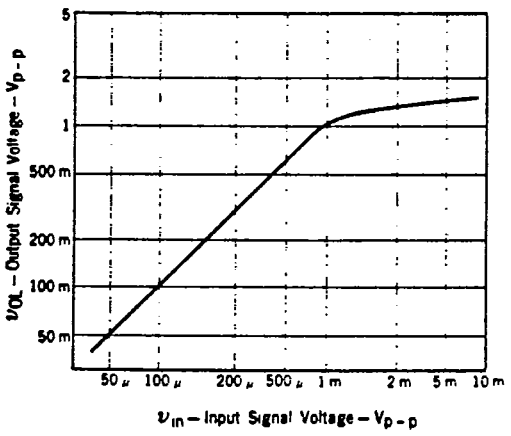
V_{CC} – I_{CC} Characteristic



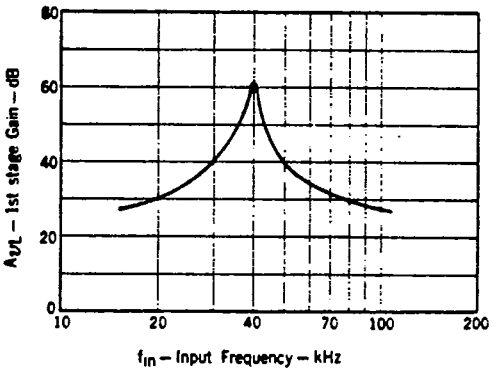
ABLC I_{in} – V_{in} Characteristic



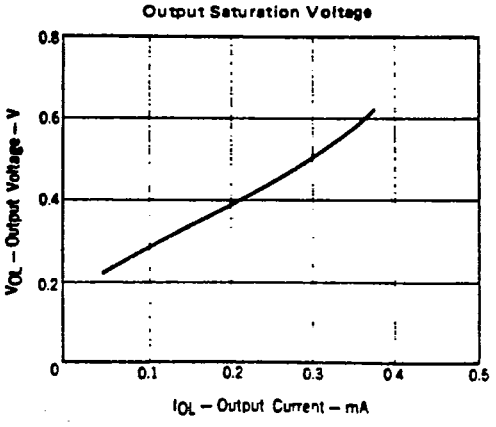
1st Stage U_{in} – U_{OL} Characteristic



1st Stage f_{in} – A_{UL} Characteristic



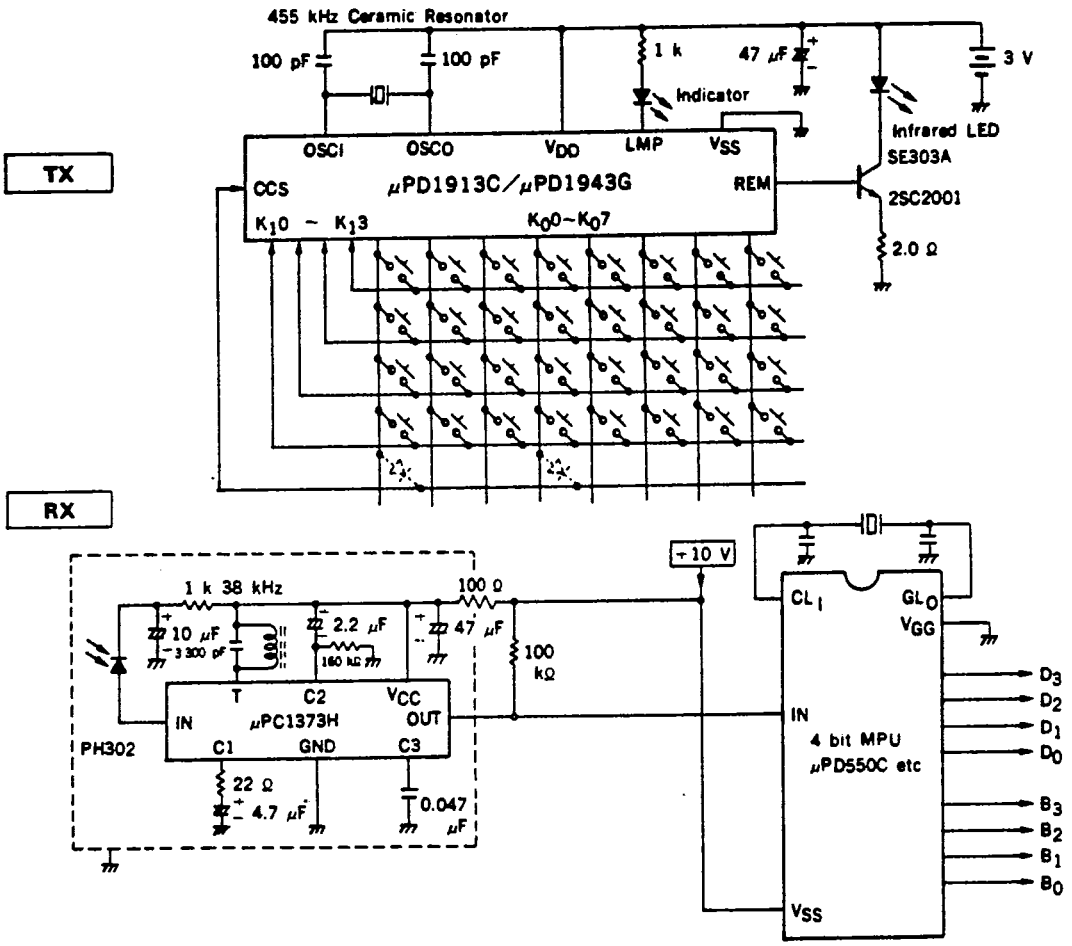
Output Saturation Voltage



5

μPC1373H

APPLICATION



6