BIPOLAR ANALOG INTEGRATED CIRCUIT
μPC1363C

ELECTRONIC CHANNEL SELECTOR

DESCRIPTION

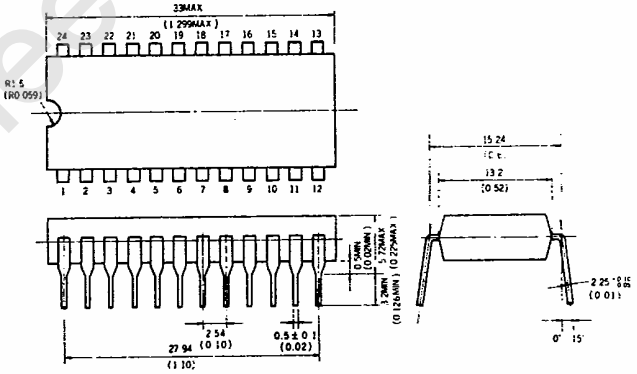
The μPC1363C is an electronic channel selector integrated circuit. It is capable of selecting up to 16 channels. The output terminals are design to permit the direct driving of LED lamps or neon tubes.

This IC consists of Clock Oscillator circuit, Channel Up and Down circuit, Channel skip circuit, 4 bit Up and Down Counter circuit, 1-16 Decoder circuit and 16 channel Output Buffer circuit, all of which are contained in a 24 pins dual in-line package.

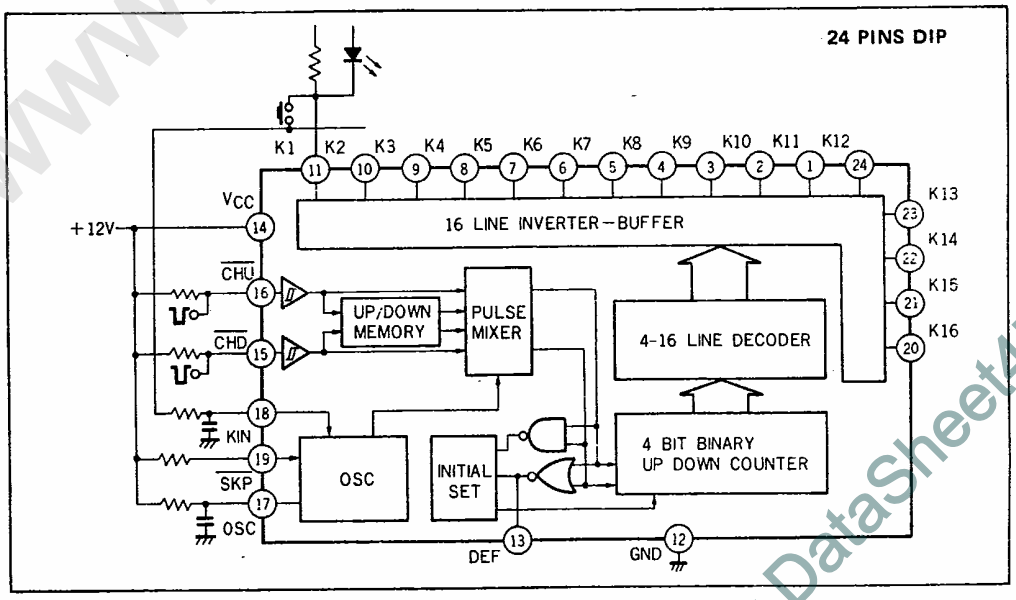
FEATURES

- LED direct drive.
  1k=15mA, V_{kSAT} 150mV MAX.
- Low power consumption.
  V_{CC}=12V, I_{CC}=15mA TYP.
- Up to 16 channel selection.
- Internal schmitt trigger circuit. (CHU, CHD INPUT)
- Power ON initial channel set.
- μPC1360C pin compatible. (V_{CC}=6V)
- TV, Radio etc. channel selection use.
- Using with μPD1986C (TX), μPD1937C (RX), direct address remote control system is realized.

PACKAGE DIMENSIONS in millimeters (inches)



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Supply Voltage	V_{CC}	15.0	V
Input Current to Channel Selection Circuit	$I_{K1\sim11,\ 20\sim24}$	−5 to 50	mA
Input Current to Control Circuit	$I_{C15\sim19}$	−5 to 10	mA
Input Current to Control Circuit	I_{C13}	−5 to 20	mA
* Output Voltage to Channel Selection Circuit	$V_{K1\sim11,\ 20\sim24}$	−0.5 to 50	V
* Output Voltage to Control Circuit	V_{13}	−0.5 to 14.4	V
* Input Voltage to Control Circuit	V_{17}	−0.5 to V_{CC}	V
Power Dissipation	P_d	350	mW
Operating Temperature Range	T_{opt}	−20 to +75	°C
Storage Temperature Range	T_{stg}	−40 to +125	°C

* At V_{CC} = 12V

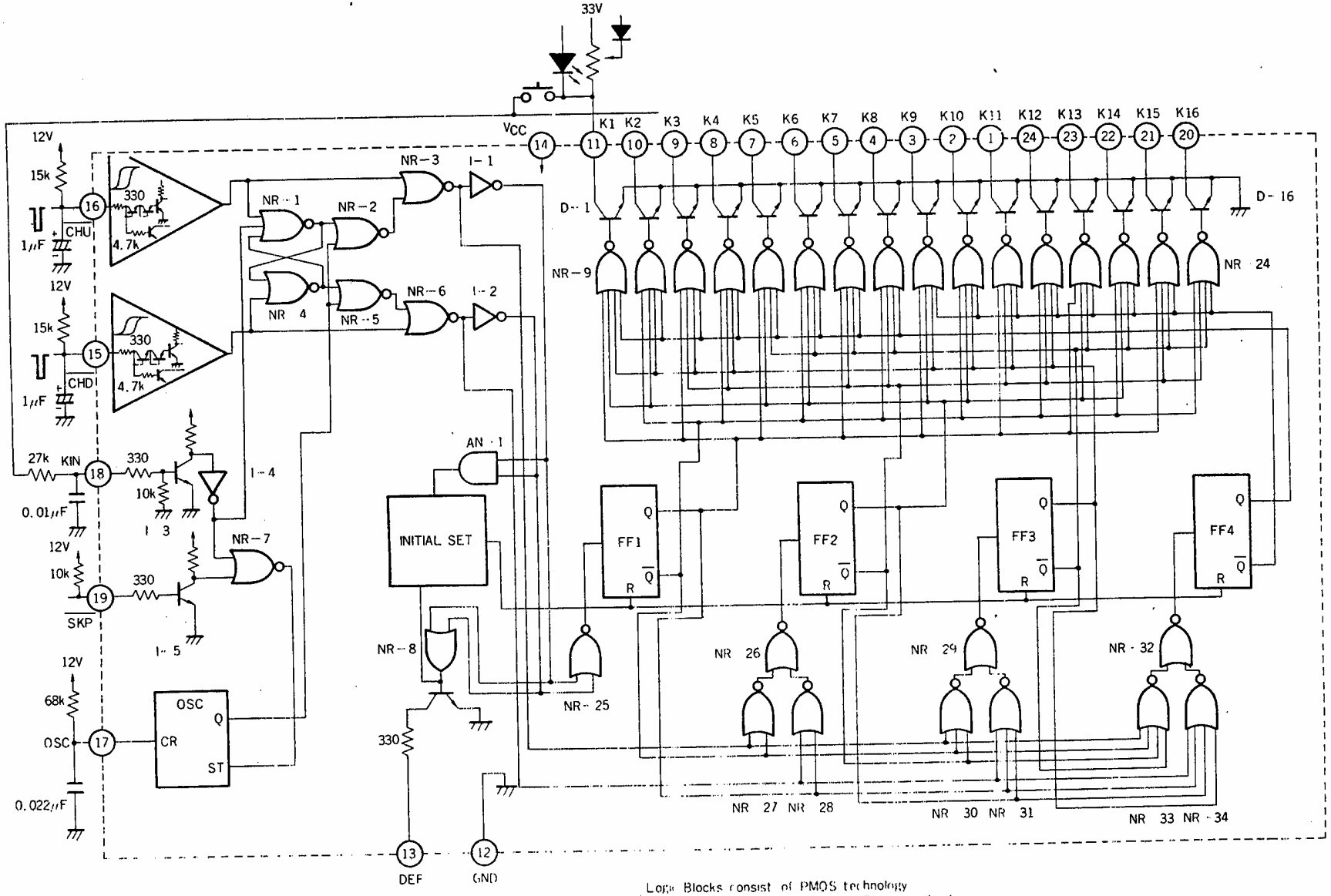
RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	9.6	12.0	14.4	V
Channel Selection Input Current	I_K		15.0		mA
Clock Oscillation Frequency	f_{OSC}		2.0	10.0	kHz

ELECTRICAL CHARACTERISTICS (Ta=25 ±3°C)

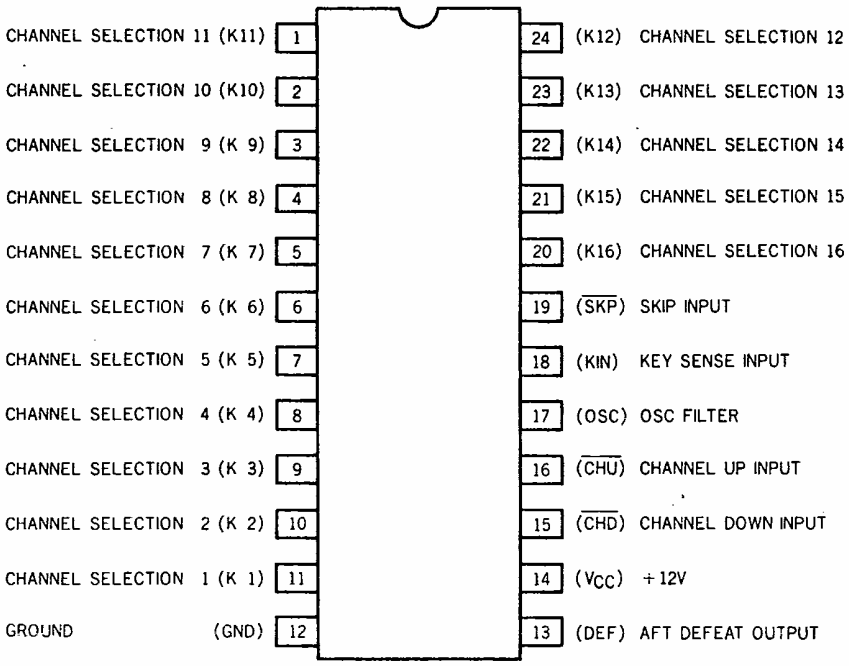
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Supply Current	I_{DD}	7.0	15.0	22.0	mA	V_{CC}=12V
Channel Selection Saturation Voltage	$V_{OL(K)}$			150	mV	V_{CC}=9.6V, I_{OL}=15mA
Channel Selection Leakage Current	$I_{OH(K)}$			10	μA	V_{CC}=14.4V, V_{OH}=35V
AFT Defeat Output Voltage	$V_{OL(D)}$			6	V	V_{CC}=9.6V, I_{OL}=12mA
AFT Defeat Leakage Current	$I_{OH(D)}$			10	μA	V_{CC}=14.4V, V_{OH}=14.4V
Channel Input High Threshold Voltage	$V_{TH(CH)}$	3.5		7.0	V	V_{CC}=12V, R_i=15kΩ
Channel Input Low Threshold Voltage	$V_{TL(CH)}$	1.5		2.5	V	V_{CC}=12V, R_i=15kΩ
Channel Input Leakage Current	$I_{CH(CH)}$	−5			μA	V_{CC}=14.4V, V_{IL}=0V
Key Input Current	$I_{IH(KI)}$	200			μA	V_{CC}=9.6V
Key Input Leakage Current	$I_{IL(KI)}$	−10			μA	V_{CC}=14.4V, V_{IL}=0V
Skip Input Current	$I_{IH(SK)}$	50			μA	V_{CC}=9.6V
Skip Input Leakage Current	$I_{IL(SK)}$	−5			μA	V_{CC}=14.4V, V_{IL}=0V
OSC Input Current	$I_{IH(OSC)}$	1.5		3.0	mA	V_{CC}=9.6V, V_{IH}=4V
OSC Leakage Current	$I_{IL(OSC)}$			10	μA	V_{CC}=14.4V, V_{IL}=1.0V
OSC Frequency	f_{OSC}	1.5		2.5	kHz	V_{CC}=12V, R=68kΩ, C=0.022μF

EQUIVALENT CIRCUIT



Logic Blocks consist of PMOS technology
Output, Input and OSC consist of Bipolar technology

CONNECTION DIAGRAM (Top View)



PIN FUNCTION

K1~16 (#11~1, #24~20) CHANNEL SELECTION OUTPUT

These are the output terminals constructed of collector-opened transistors, so they can drive potentiometers and indicators, and key output. They have saturation voltage of 150mV at I_K = 15mA, so they can drive LEDs directly.

GND (#12) GROUND

DEF (#13) AFT DEFEAT OUTPUT

This terminal is made of open collector transistor output through a resistor of 330Ω. It is used for AFT (Automatic Fine Tuning ····· TV use) defeat, sound muting and LED indicate erasing.

V_{CC} (#14) +12V (9.6~12V)

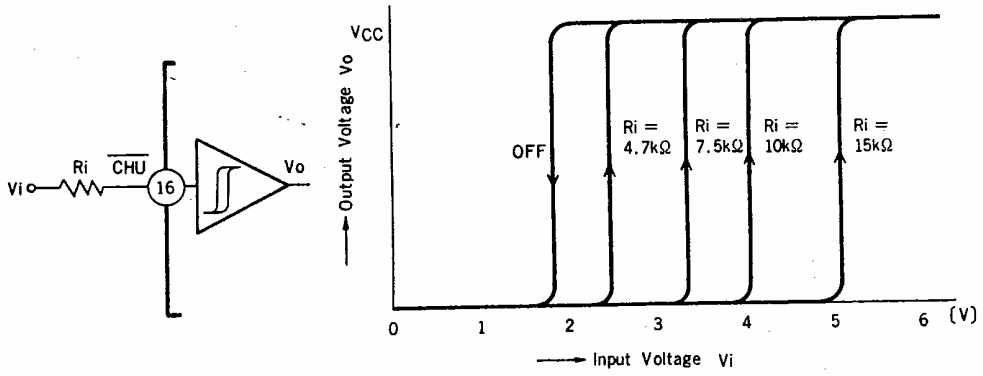
CHD (#15) CHANNEL DOWN INPUT

Usually pulled up to V_{CC} through a resistor, Channel selector changes at positive going edge of input signal of this terminal and the channel selector works orderly from K16 to K1.

CHU (#16) CHANNEL UP INPUT

Usually pull up to V_{CC} through a resistor, Channel selector changes at positive going edge of input signal of this terminal and the channel selector works orderly from K1 to K16. If CHU and CHD terminals put down to ground at same time, initial channel is selected. So, it is very useful to power on channel set or remote control operation use.

These terminals include schmitt trigger circuit and this hysteresis level is controled by external resistors.



CHU, CHD Input Schmitt Characteristic

OSC (#17) OSC FILTER

When a Channel key is pushed or skip function is operated, oscillator contained in this IC oscillate with C, R connected to this terminal. Typical oscillation frequency is 2kHz. (R = 68k, C = 0.022μF)

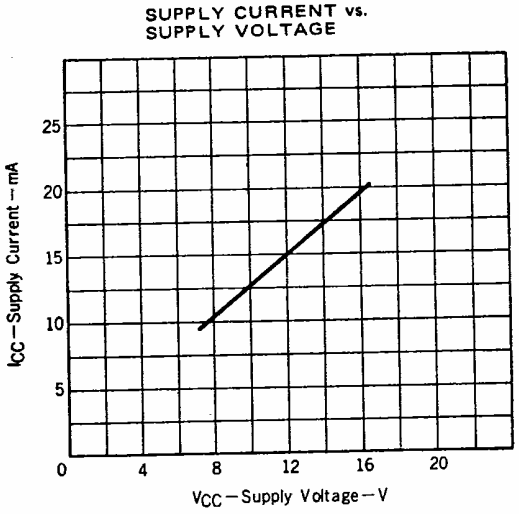
KIN (#18) KEY INPUT

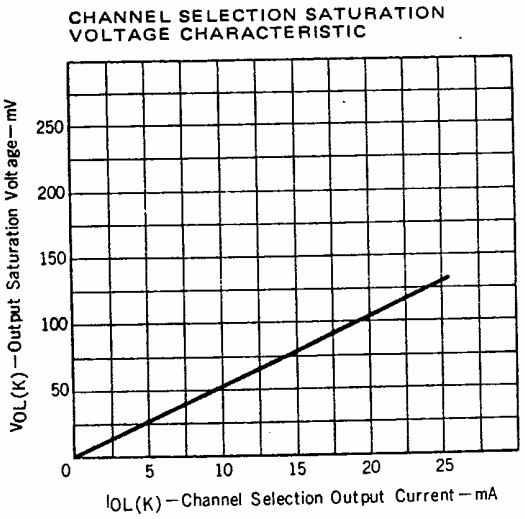
When channel selection key is pushed, as pushed channel is not selected, "High" level of signal is applied to this terminal through a potentiometer. Then channel selector scans terminals of K1 ~ K16. And when sense up this terminal, it pull down the voltage of this terminal and stop the scanning.

SKP (#19) SKIP INPUT

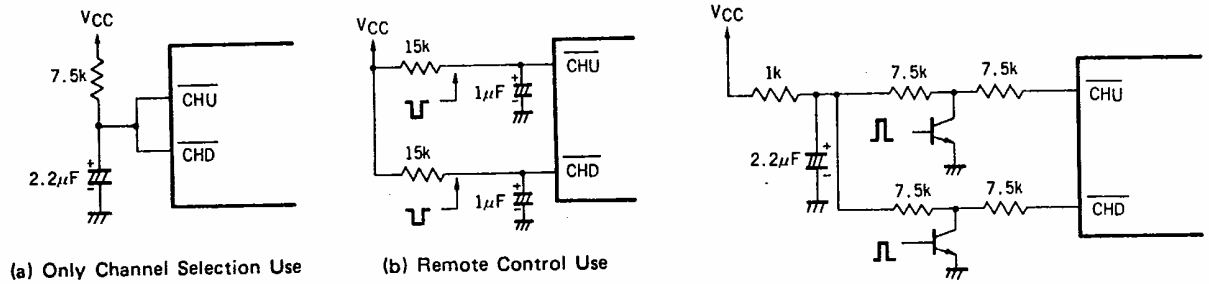
Usually pull up to V_{CC} through resistor. When only 12 channels are used, conect terminals (K13 ~ K16) to this terminal.

CHARACTERISTICS





INITIAL CHANNEL SET and REMOTE CONTROL CIRCUIT

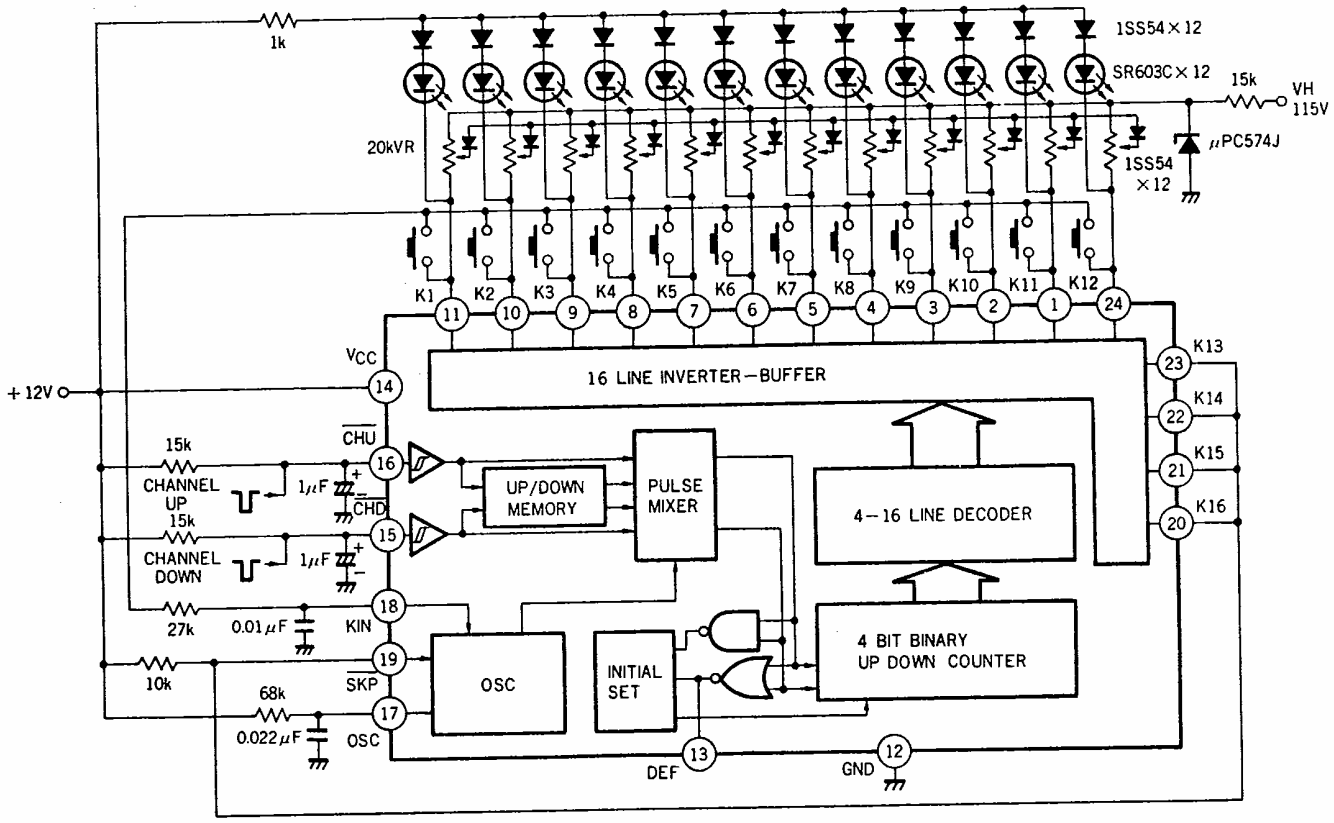


(a) Only Channel Selection Use

(b) Remote Control Use

(c) Remote Control Use (Short Pulse Width)

APPLICATION CIRCUIT 1



APPLICATION CIRCUIT 2

EXAMPLE OF TV CHANNEL SELECTION
12 POSITION SELECTION CIRCUIT (4 POSITION IS SKIPED)