

MOS DIGITAL INTEGRATED CIRCUIT

μ PD1987C

REMOTE CONTROL RECEIVER

P MOS LSI

DESCRIPTION

The μ PD1987C is P MOS IC for decoding the signal from receiver of remote control system for TV etc.

By using with μ PD1986C which is the transmitter control IC, this IC will provide direct channel selection signal.

When μ PC1360C is used as channel selection IC, complete remote control system can be realized. The package is 16 pins plastic dual in-line.

FEATURES

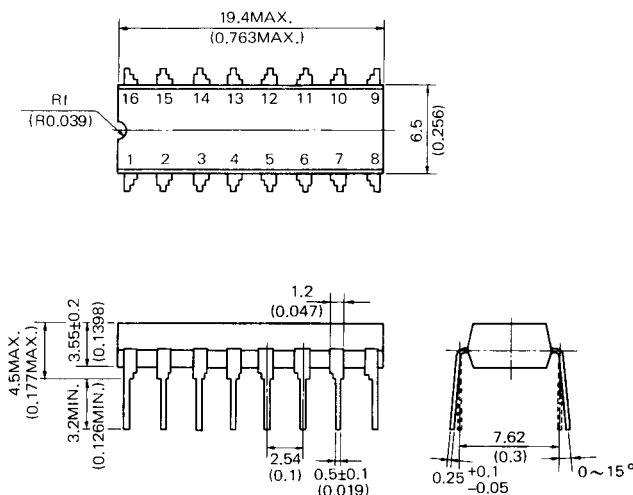
- Capable to receive 26 commands;

Channel 1 – 20	Channel up, down	
Volume up, down	Mute on/off	Power on/off
- Capable to control 5 commands directly;

Channel up, down	Volume up, down	Power on/off
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- Using with μ PC1360C, direct addressing is easily realized.
- Capable to control the volume for 32 steps.

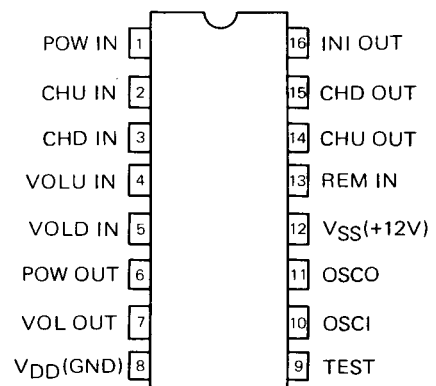
PACKAGE DIMENSIONS

in millimeters (inches)

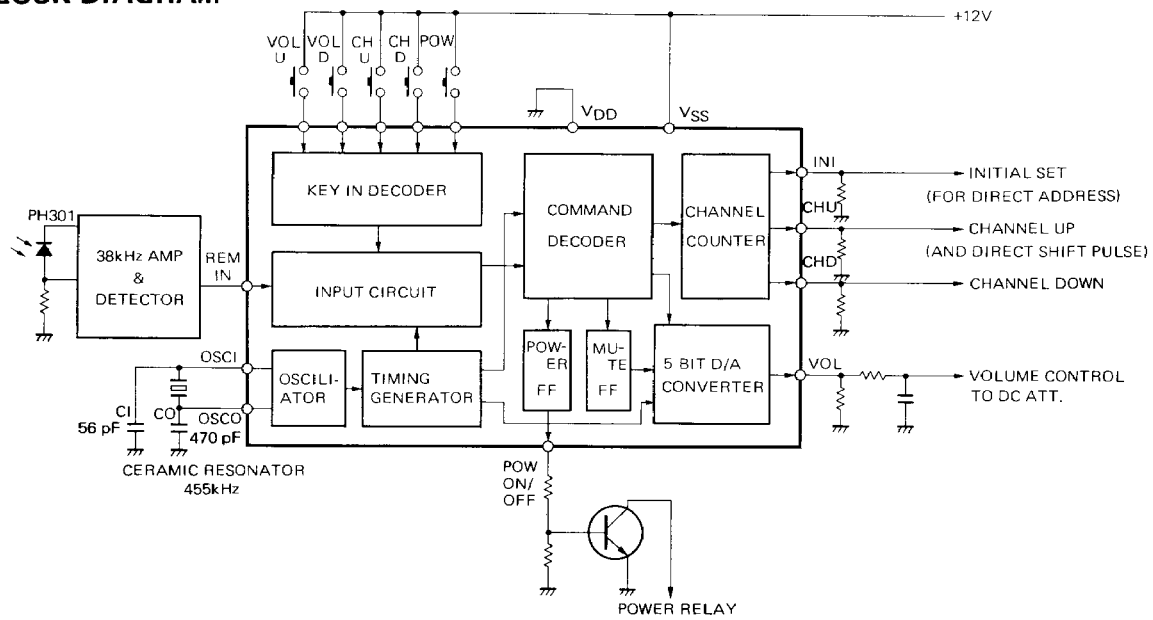


CONNECTION DIAGRAM

(Top View)



BLOCK DIAGRAM



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

Supply Voltage	$V_{DD}-V_{SS}$	-15.0 to +0.3	V
Input Voltage	$V_{IN}-V_{SS}$	$-V_{DD}$ to +0.3	V
Output Current	I_{OH} (CHU, CHD, INI)	-5.0	mA
	I_{OH} (VOL, POW)	-10.0	mA
Power Dissipation	P_d	360	mW
Operating Temperature Range	T_{opt}	-20 to +75	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to +125	$^\circ\text{C}$

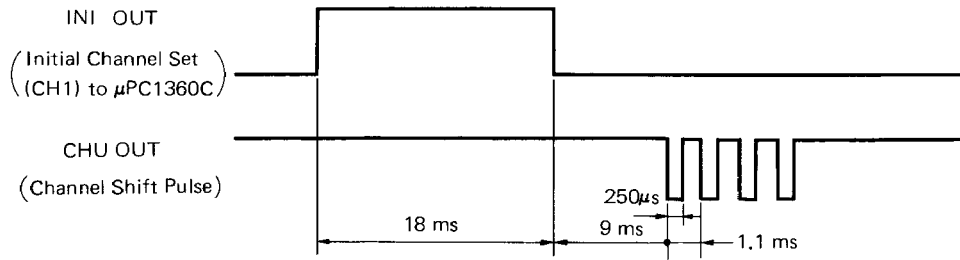
ELECTRICAL CHARACTERISTICS ($T_a=-20$ to 75°C , $V_{DD}=-9.6$ to 14.4V)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Supply Voltage	V_{DD}	-9.6	-12.0	-14.4	V	
Supply Current	I_{DD}	-4.0	-10.0	-20.0	mA	$T_a=25^\circ\text{C}$, $OSCI=V_{SS}$ $V_{DD}=-12\text{V}$
Input High Voltage	V_{IH} (1~5,13)	0		-1.5	V	
Input Low Voltage	V_{IL} (1~5,13)	-5.0		V_{DD}	V	
Input Pull Down Current	I_{IL} (1~5,13)	5.0		50	μA	$T_a=25^\circ\text{C}$, $V_{IN}=V_{SS}$ $V_{DD}=-12\text{V}$
Output High Voltage	V_{OH} (CHU)			-2.5	V	$I_{OH}=-1.0\text{mA}$
Output High Voltage	V_{OH} (CHD)			-2.5	V	$I_{OH}=-1.0\text{mA}$
Output High Voltage	V_{OH} (INI)			-2.5	V	$I_{OH}=-1.0\text{mA}$
Output High Voltage	V_{OH} (VOL)			-2.5	V	$I_{OH}=-5.0\text{mA}$
Output High Voltage	V_{OH} (POW)			-2.5	V	$I_{OH}=-5.0\text{mA}$
Output Low Current	I_{OL} (1~5,13)	0		100	μA	$T_a=25^\circ\text{C}$, $V_{OL}=-11.5\text{V}$ $V_{DD}=-12\text{V}$

PIN	FUNCTION		
8	VDD	Negative supply GND normal	
12	VSS	Positive supply +12V normal (9.6~14.4V)	
10	OSCI	Oscillator Input	} 455kHz Ceramic Resonator CSB455A (MURATA JAPAN) is connected to these pins.
11	OSCO	Oscillator Output	
13	REM IN	Remote Signal Input	
1	POW IN	Power ON/OFF Key Input	
2	CHU IN	Channel Up Key Input	
3	CHD IN	Channel Down Key Input	
4	VOLU IN	Volume Up Key Input	
5	VOLD IN	Volume Down Key Input	
6	VOL OUT	Volume Output	This output is in the form of a pulse. Connect to CR filter.
7	POW OUT	Power ON/OFF Output	
14	CHU OUT	Channel Up Pulse Output and Direct Channel Shift Pulse	
15	CHD OUT	Channel Down Pulse Output	
16	INI OUT	Initial Channel Output For Direct Channel	

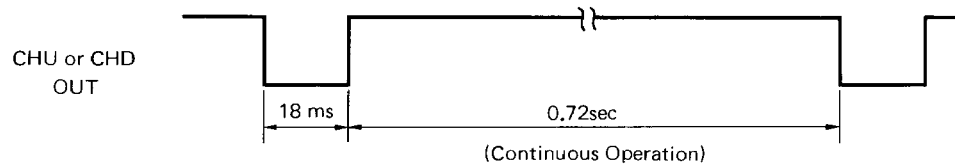
1) CHANNEL SELECTION OUTPUT

- Direct Channel Operation

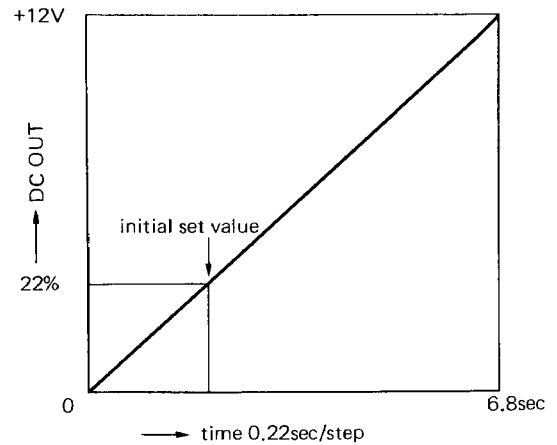
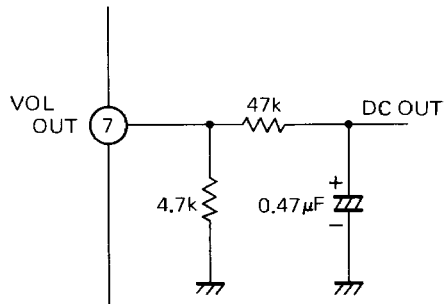


shift pulse = CH number - 1 MAX. 19

- UP, DOWN Channel Operation

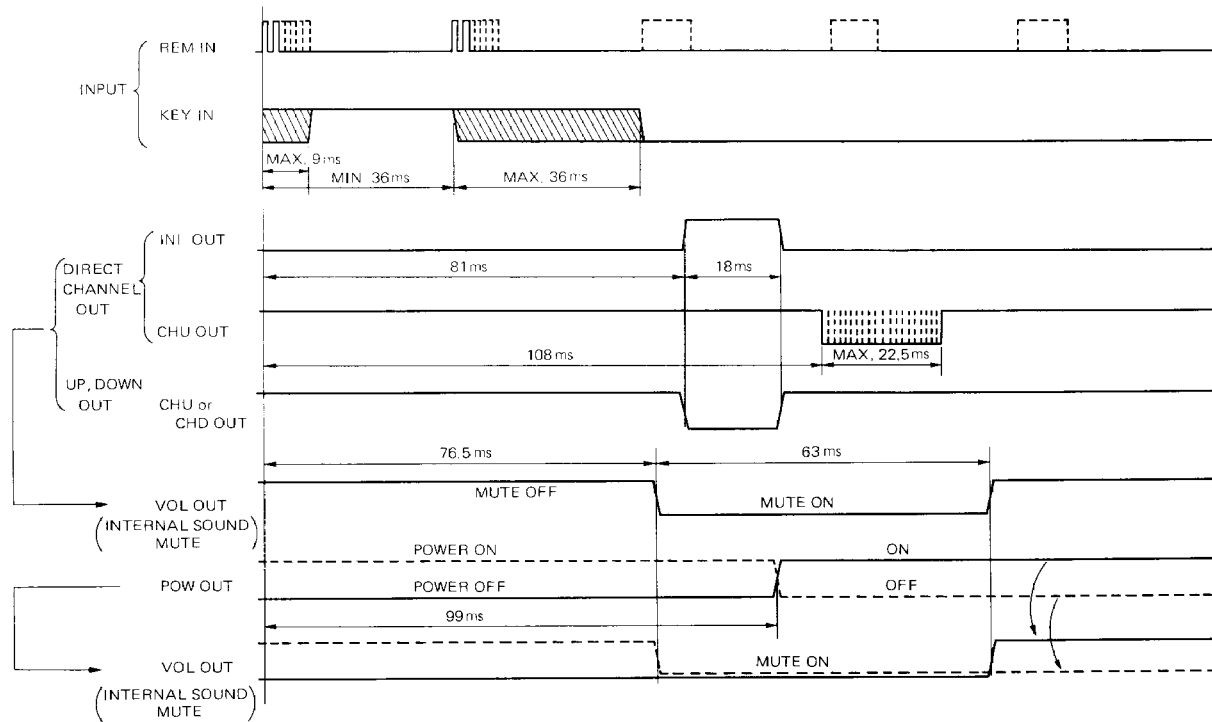


2) VOLUME OUTPUT



Repetition frequency 3.6kHz
 VOL Steps 31
 MIN. to MAX. time 6.8 sec

OUTPUT WAVE FORM



APPLICATION CIRCUIT

EXAMPLE OF TV REMOTE CONTROL TUNNING SYSTEM USING PH301, μ PD1987C and μ PC1360C.

