



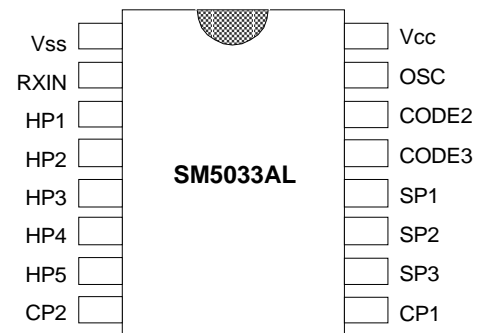
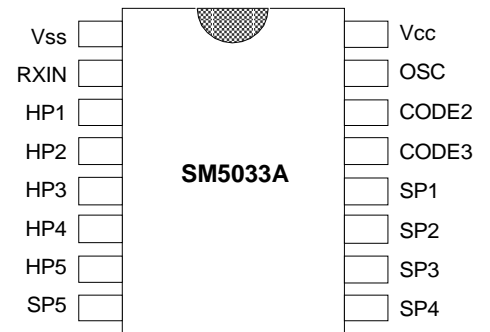
## FEATURES

- \* Paired with SM5022IR, SM5033A/AL provides 10-key IR remote control system.
- \* Multi-Key control signal  
SM5033A/AL provides up to 5 multi-key control signal.
- \* Output signal of single pulse (SP), hold pulse (HP) and cyclic pulse (CP)  
(only SM5033AL provides 2 CP function)
- \* Oscillator constructed by RC circuit
- \* Custom code prevents interference from other appliance.
- \* High noise immunity

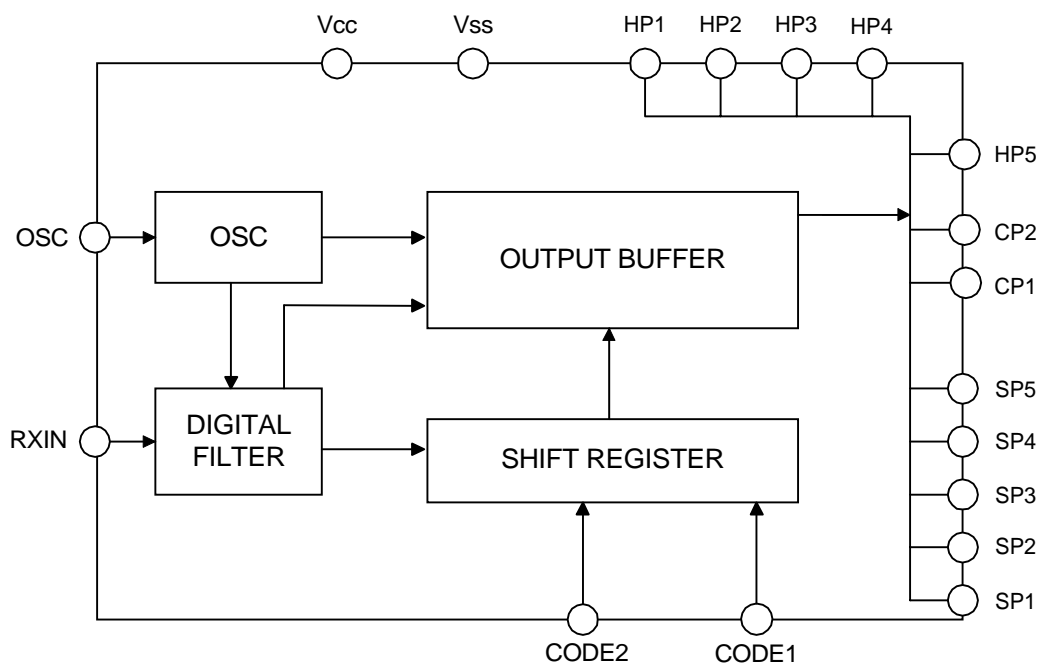
## APPLICATION

Remote control for TV, Hi-Fi, Toy and VCR

## PIN ASSIGNMENTS



## BLOCK DIAGRAM





## PIN DESCRIPTION

Symbol	Pin Number		I/O	Description
	SM5033A	SM5033AL		
VSS	1		-	Negative Power Supply
RXIN	2		I	Remote signal in
HP1 ~ HP5	3 ~ 7		O	HP Control signal output
CP1 ~ CP2		8 ~ 9	O	CP Control signal output
SP1 ~ SP5	8 ~ 12	10 ~ 12	O	SP Control signal output
CODE2	13		I	Custom code setting
CODE3	14		I	
OSC	15		I/O	RC oscillating circuit input port
VCC	16		-	Positive Power Supply

## FUNCTION DESCRIPTION

### (1) Oscillating Circuit

A stable oscillator is constructed by parallely connecting R and C between the built-in oscillating circuit and VSS.

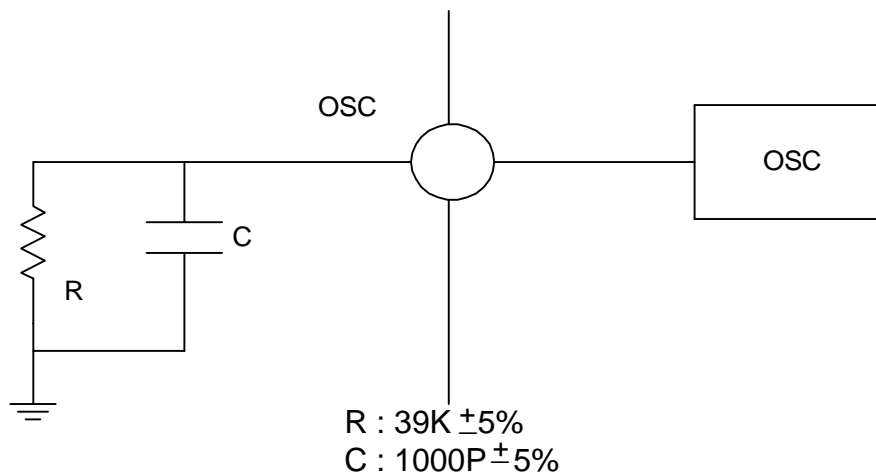
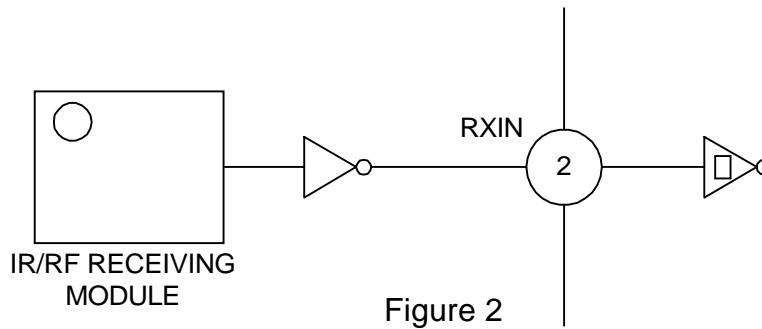


Figure 1



## (2) IR/RF Receiving

A Schmitt circuit for shaping receiving signal waveform is built-in to eliminate rounding.



## (3) Receiving Signal checking

The receiving signal is checked by means of storing the 1st frame of transmitting signal in a 12-bit shift register and then, when the second frame data is put into the shift register, 1st frame data in the shift register is forced out by out bit.

This bit is compared with the incoming bit to determine whether the receiving signal is correct or not.



Figure 3

## (4) Custom Code

C1, C2 and C3 provide custom code setting. When coding of transmitter and receiver is the same, internal latch strobe pulse is generated to latch received data and output is effected.



**(5) Output Signal**

**(a) SP1~SP5 (Single pulse)**

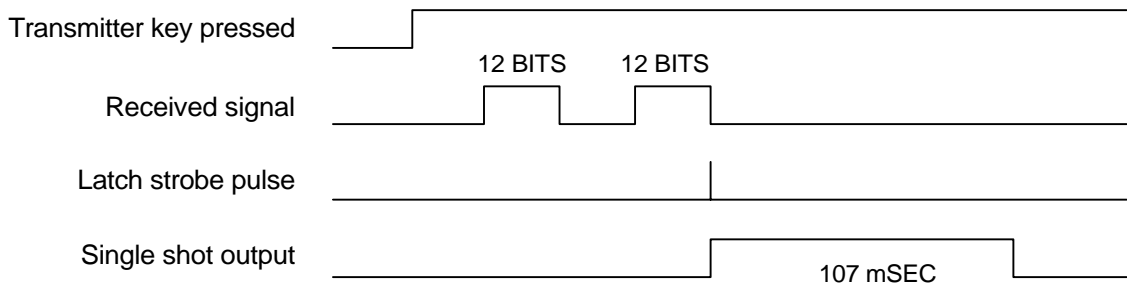


Figure 4

**(b) HP1~HP5 (Hold Pulse)**

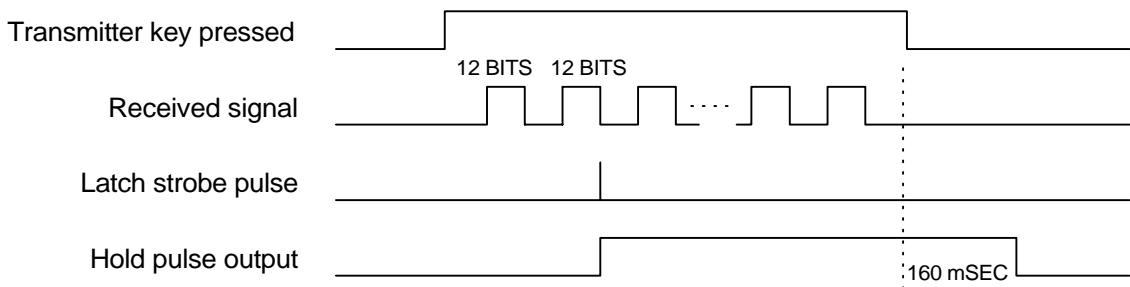


Figure 5

HP signal is specially used in volume control.

Multi-key signal generated by HP key can be used in REC-PLAY, REC-PAUSE and CUE/REVIEW function.

**(c) CP1, CP2 (Cyclic Pulse)**

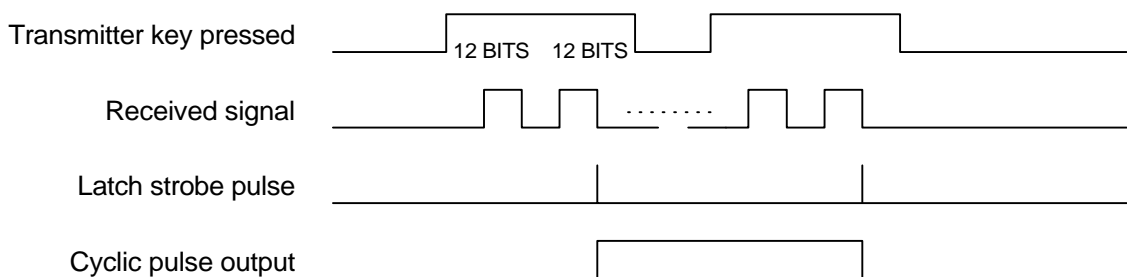


Figure 6

Cyclic pulse signal is specially used for ON/OFF, MUTE control.



(6) Code Allocation

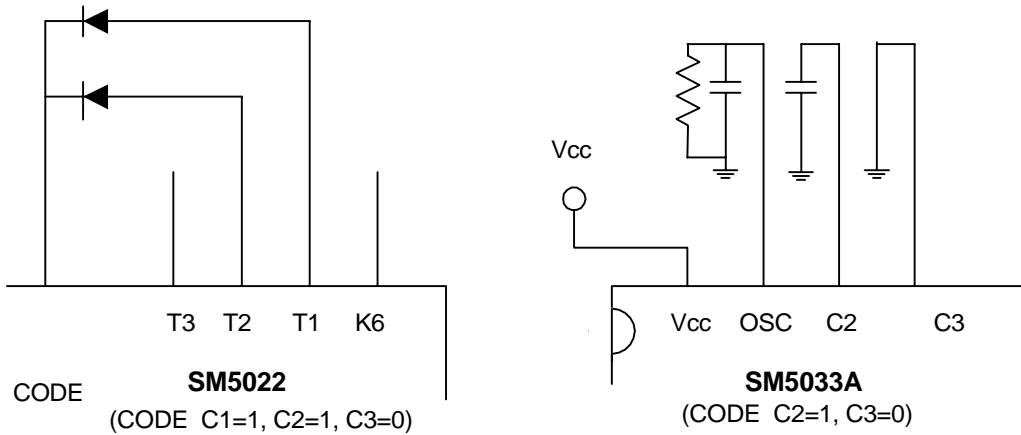
Key no. of SM5022	Data Bit									Output signal SM5033A and SM5033B
	T1	T2	T3	K1	K2	K3	K4	K5	K6	
1	1	0	0	1	0	0	0	0	0	Continuous Signal HP1
2	1	0	0	0	1	0	0	0	0	Continuous Signal HP2
3	1	0	0	0	0	1	0	0	0	Continuous Signal HP3
4	1	0	0	0	0	0	1	0	0	Continuous Signal HP4
5	1	0	0	0	0	0	0	1	0	Continuous Signal HP5
6	1	0	0	0	0	0	0	0	1	Continuous Signal HP6
7	0	1	0	1	0	0	0	0	0	Single shot signal SP1
8	0	1	0	0	1	0	0	0	0	Single shot signal SP2
9	0	1	0	0	0	1	0	0	0	Single shot signal SP3
10	0	1	0	0	0	0	1	0	0	Single shot signal SP4
11	0	1	0	0	0	0	0	1	0	Single shot signal SP5
17	0	0	1	0	0	0	0	1	0	Cyclic signal CP1
18	0	0	1	0	0	0	0	0	1	Cyclic signal CP2



(7) Custom code setting

(a) SM5022/SM5033A code setting

Example :



Code set	SM5022			SM5033A	
	C1	C2	C3	C2	C3
1	1	0	1	0	1
1	1	1	0	1	0
1	1	1	1	1	1

Figure 7

SM5022 uses connecting diode to set ' 1 ', opens the circuit to set ' 0 '.  
SM5033A uses connecting a 1000P capacitor to ground to set ' 1 ', direct short to ground to set ' 0 '. C1 in SM5033A is internally set to ' 1 '.



**ABSOLUTE MAXIMUM RATING (Ta = 25 )**

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	6.5	V
I/O Voltage	Vin	Vss-0.5 TO Vcc+0.5	V
Power Dissipation	Pd	200	mW
Operating Temperature	Topr	0~+70	
Storage Temperature	Tstg	-40~+125	

**DC Characteristic (Unless specified, Vcc=5V, Ta= 25 )**

Parameter	Symbol	Condition	Min.	Type	Max.	Unit	
Supply Voltage	Vcc		1.5	-	6.0	V	
Supply Current	Icc		-	-	1.0	mA	
Oscillating Frequency	fosc	Vcc=4.5-6.0V Ta= -10 - 70	27	-	57	KHz	
Standard OSC Frequency	sfosc		-	38	-	KHz	
Output Current	"H" level	IOH	VOH=4V	-	-	-1.0	mA
	"L" level	IOL	VOL=1V	1.0	-	-	mA
Input Current	"H" level	IIH	VIH=5V	-1.0	-	1.0	mA
Pull-up resistor	Rup		10	20	40	K	
IR Input threshold Voltage	VIV	RXIN terminal	2.0	2.5	3.0	V	
Hysteresis width	VHIS	RXIN terminal	-	0.6	-	V	



## APPLICATION CIRCUIT

