



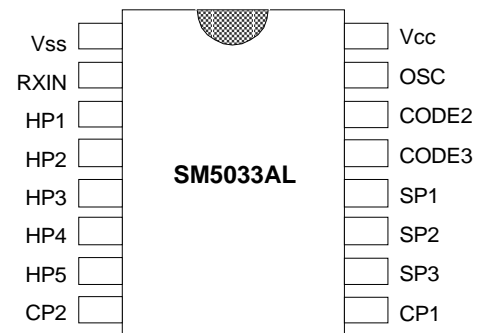
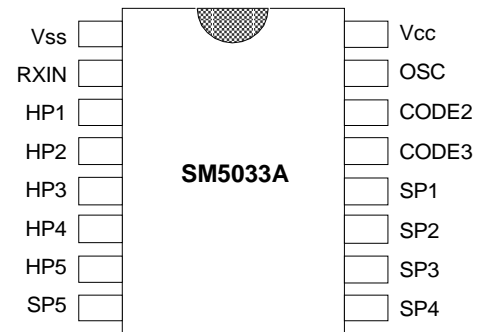
FEATURES

- * 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

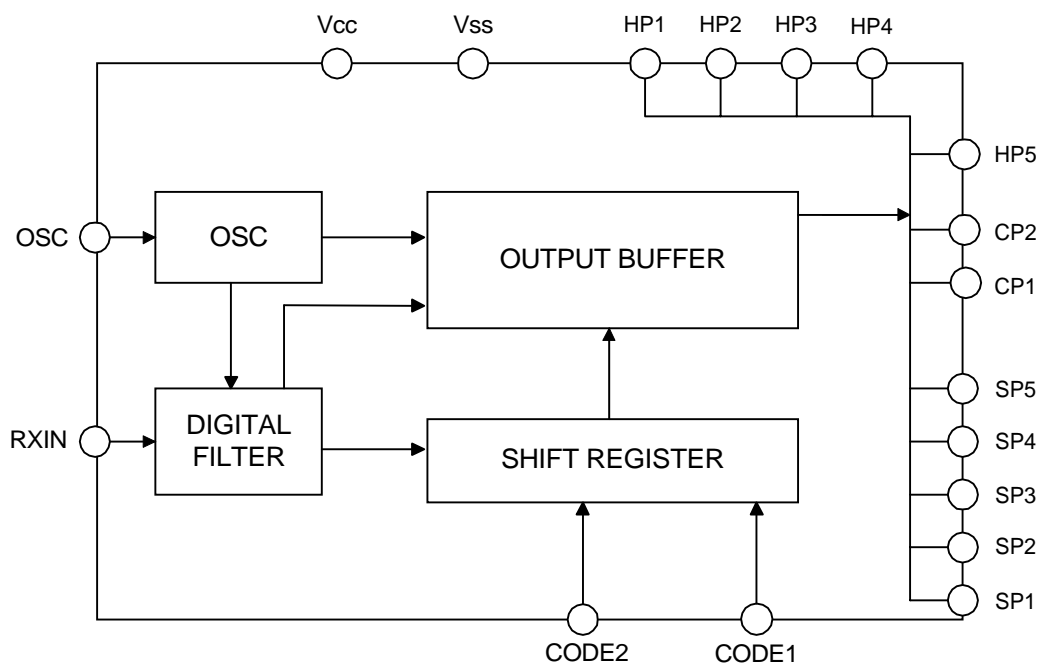
APPLICATION

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.

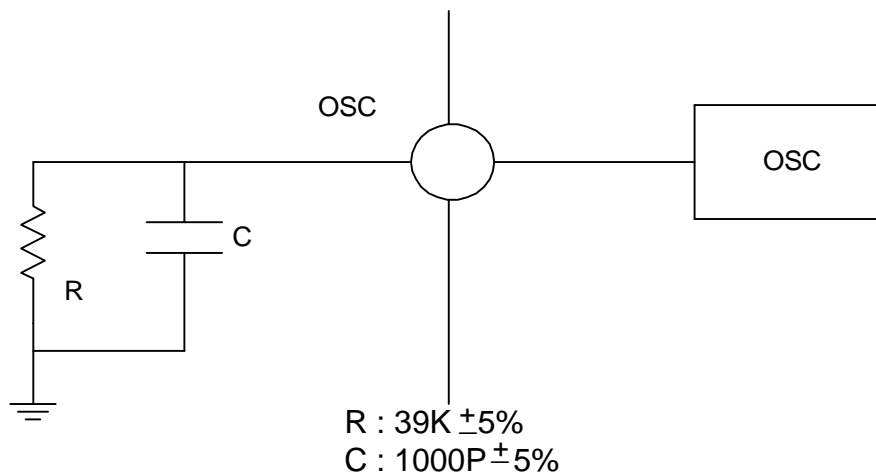
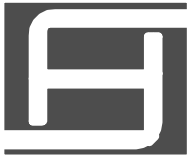


Figure 1



(2) IR/RF Receiving

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

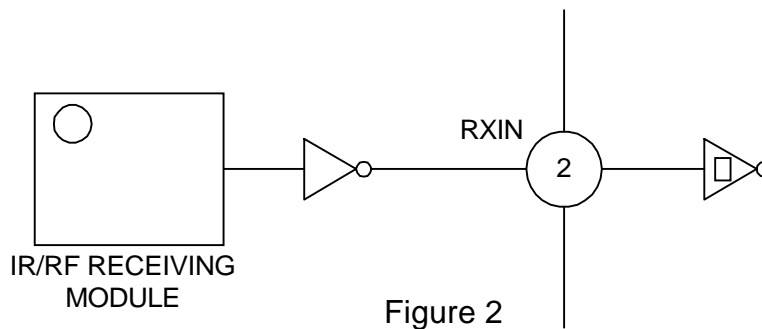


Figure 2

(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)

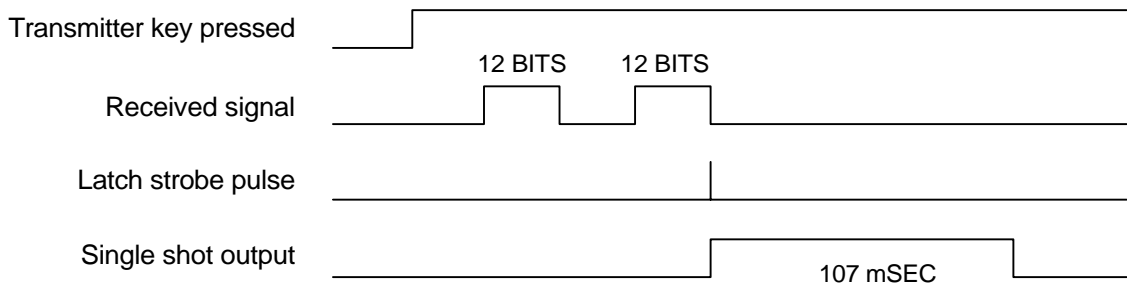


Figure 4

(b) HP1~HP5 (Hold Pulse)

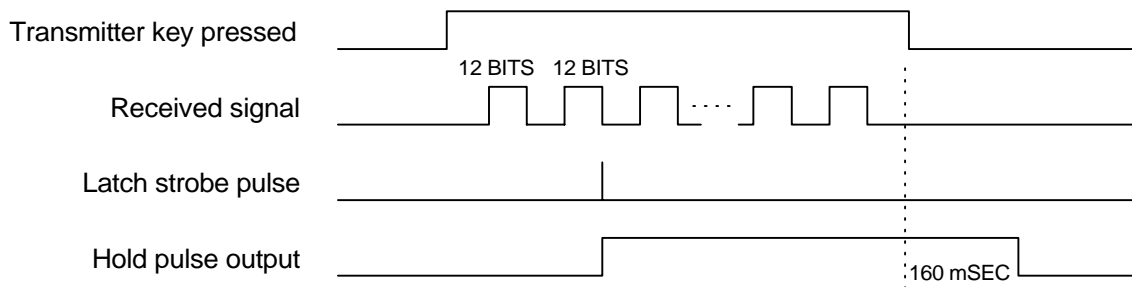


Figure 5

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)

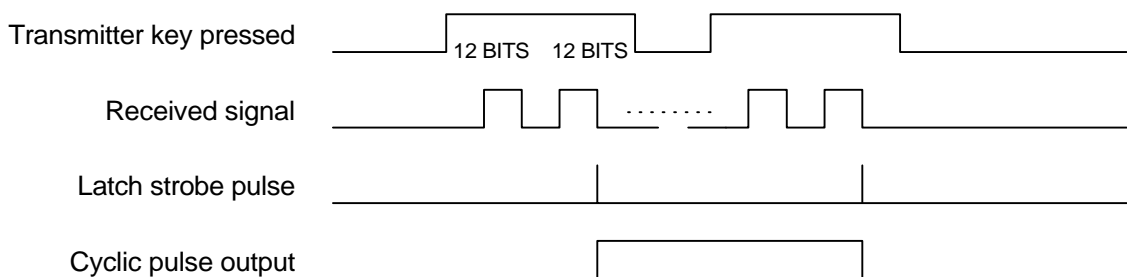


Figure 6

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



(6) Code Allocation

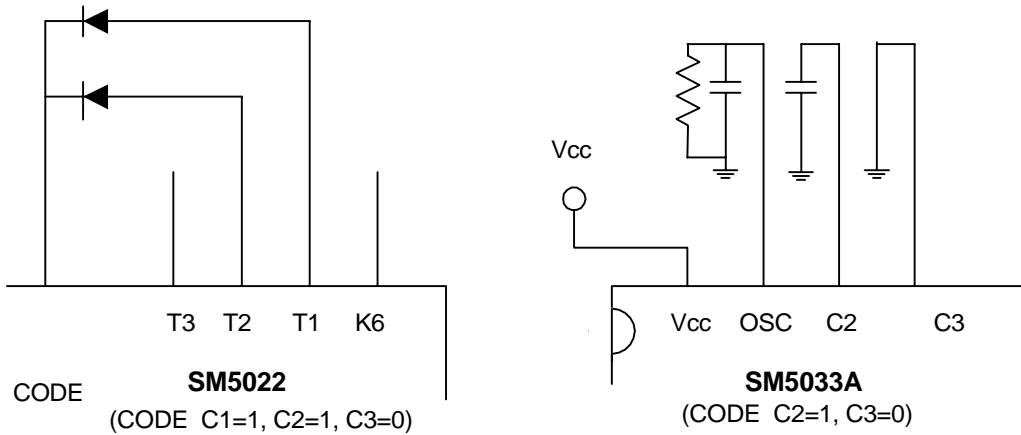
| Key no. of SM5022 | Data Bit | | | | | | | | | Output signal SM5033A and SM5033B |
|-------------------------|----------|----|----|----|----|----|----|----|----|--------------------------------------|
| | T1 | T2 | T3 | K1 | K2 | K3 | K4 | K5 | K6 | |
| 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | Continuous 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 | 0 | 1 | 0 | 1 |
| | 1 | 1 | 0 | 1 | 0 |
| | 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

