

# HK532A

## ENCODER/DECODER IC

## DECODER WITH 531441 SET CODE

### Features

- \* CMOS technology
- \* Low power consumption
- \* Very high noise immunity
- \* 12 address pins can be tri-state ( VDD ,VSS or Floating ) input  
Up to 6 data pins

- \* Wide range of operating voltage: Vcc = 3 ~12 Volts
- \* Single resistor oscillator
- \* Latch or Momentary for output data type
- \* Available in DIP and SOP

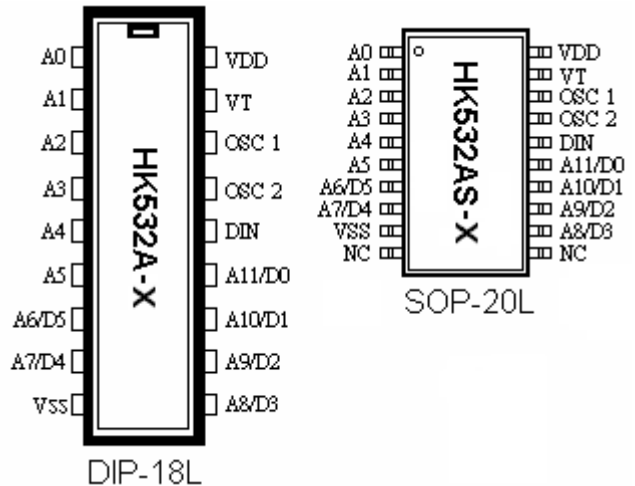
### General Description

HK532A is a remote control decoder paired with HK532 utilizing CMOS Technology. It has 12-bit tri-state address pins providing a maximum of 531,441 ( or  $3^{12}$  ) address codes; thereby, drastically reducing any code collision and unauthorized code scanning possibilities. HK532A is available in several options to suit every application needs : variable number of data output pins, latch or momentary output type.

### Application

- \* Car security system
- \* Garage door
- \* Home security/automation system
- \* Remote control for Industrial use

### PinOut Diagram



### Pin Assignment

PIN NAME	PIN NO( DIP form )	PIN NO ( SOP form )	FUNCTION
A0	1	1	Address input, each pin can be set to VDD , VSS , or floating.
A1	2	2	
A2	3	3	
A3	4	4	
A4	5	5	
A5	6	6	
A6/D5	7	7	Address input or data output.
A7/D4	8	8	Address input or data output.
Vss	9	9	
A8/D3	10	12	
A9/D2	11	13	
A10/D1	12	14	Data receive from RF module
A11/D0	13	15	
DIN	14	16	Resistor connected between these two pins determine the system clock.
OSC2	15	17	
OSC1	16	18	Valid transmit
VT	17	19	Positive power supply.
VDD	18	20	No Connecting
NC	X	10	No Connecting
NC	X	11	No Connecting

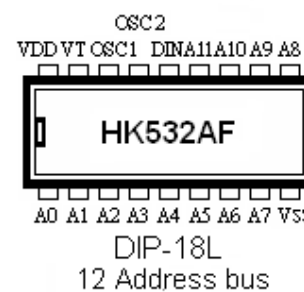
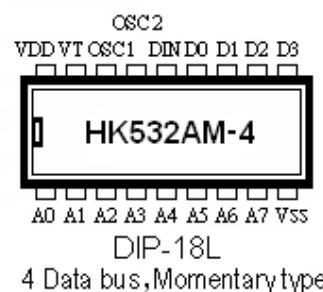
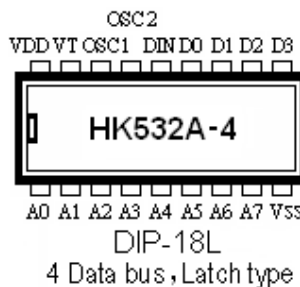
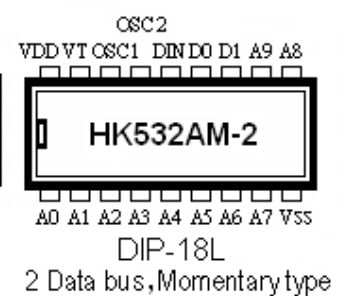
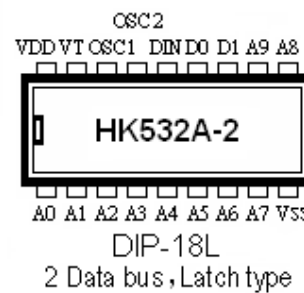
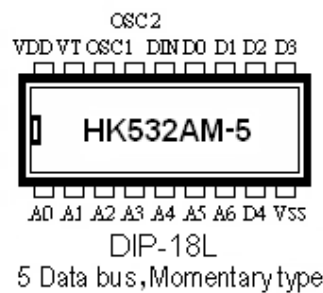
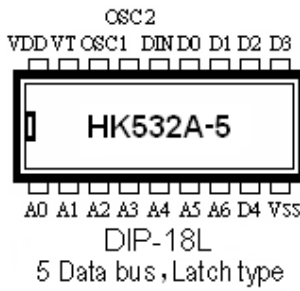
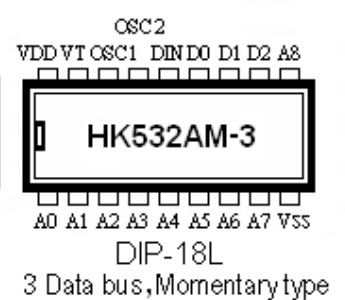
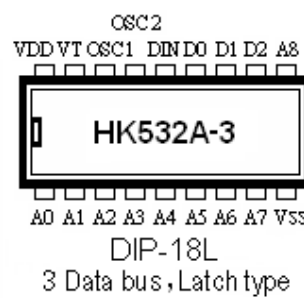
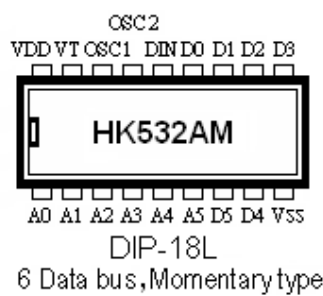
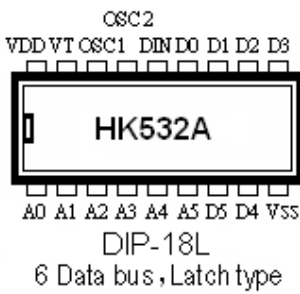
# HK532A

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### HK532A Series Family

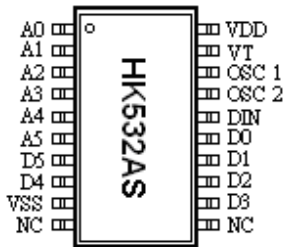
P/N NO	TYPE DESCRIPTION
HK532A	6 Address bus / 6 Data bus with Latch type
HK532AM	6 Address bus / 6 Data bus with Momentary type
HK532A-5	7 Address bus / 5 Data bus with Latch type
HK532AM-5	7 Address bus / 5 Data bus with Momentary type
HK532A-4	8 Address bus / 4 Data bus with Latch type
HK532AM-4	8 Address bus / 4 Data bus with Momentary type
HK532A-3	9 Address bus / 3 Data bus with Latch type
HK532AM-3	9 Address bus / 3 Data bus with Momentary type
HK532A-2	10 Address bus / 2 Data bus with Latch type
HK532AM-2	10 Address bus / 2 Data bus with Momentary type
HK532AF	12 Address bus type



# HK532A

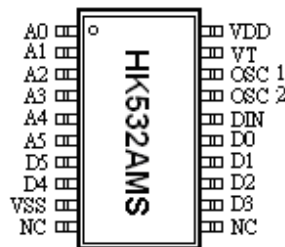
## ENCODER/DECODER IC

## DECODER WITH 531441 SET CODE



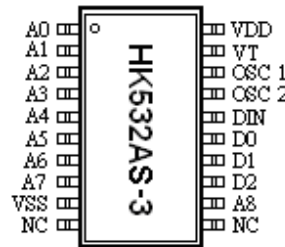
SOP-20L

6 Data bus, Latch type



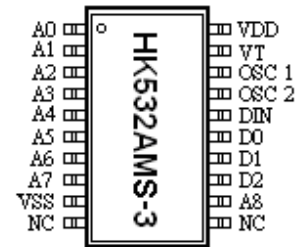
SOP-20L

6 Data bus, Momentary type



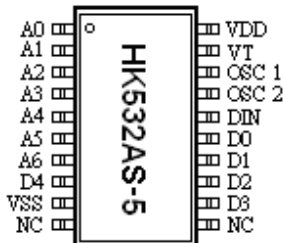
SOP-20L

3 Data bus, Latch type



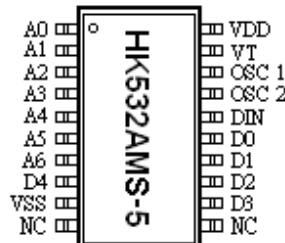
SOP-20L

3 Data bus, Momentary type



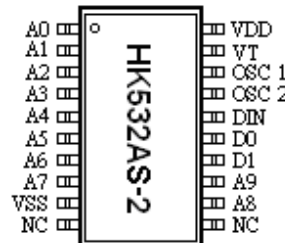
SOP-20L

5 Data bus, Latch type



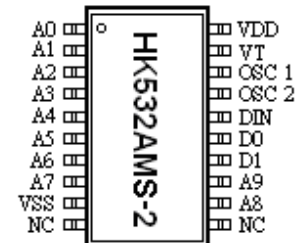
SOP-20L

5 Data bus, Momentary type



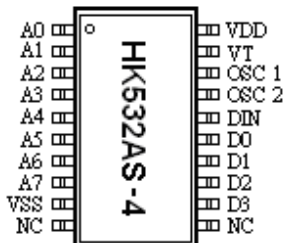
SOP-20L

2 Data bus, Latch type



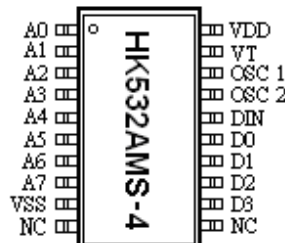
SOP-20L

2 Data bus, Momentary type



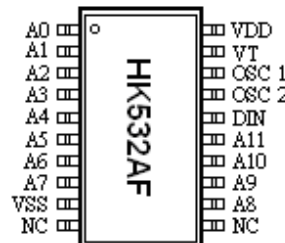
SOP-20L

4 Data bus, Latch type



SOP-20L

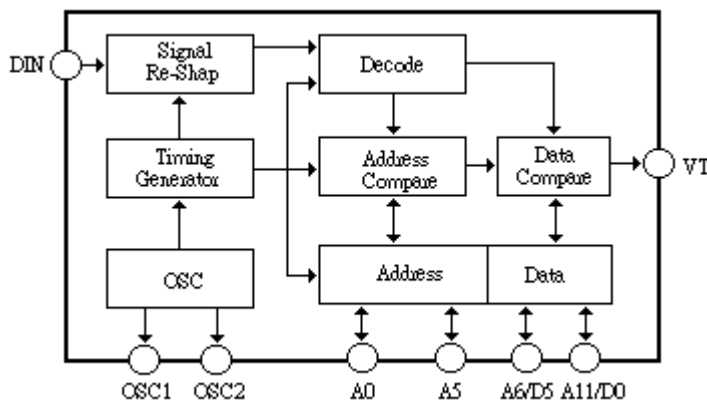
4 Data bus, Momentary type



SOP-20L

12 Address bus

## Block Diagram



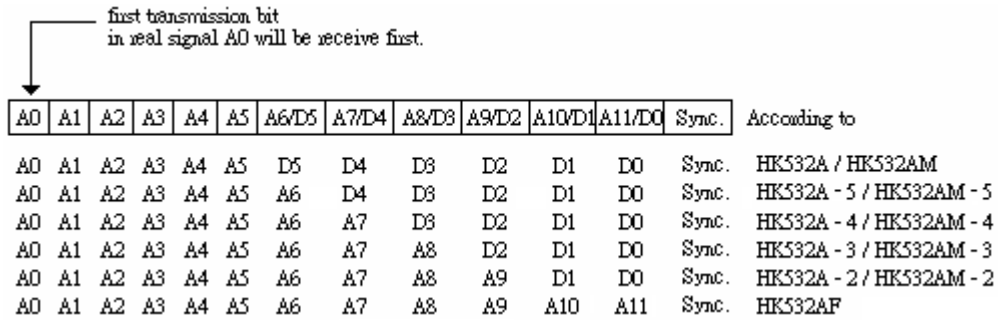
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### Code Word

A group of Code Bits is called a Code Word. A code word consists of 12 Address plus Data bits followed by one Sync Bit. The 12 AD bits are interpreted as either address or data bits depending on the HK532A version used. Please refer to the diagrams below :

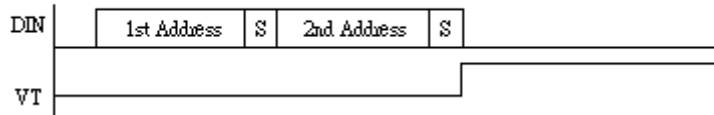


### Valid Transmission

After Power On HK532A enters the Search Address mode, if HK532A finds 2 consecutive Address that matches the Address Pin setting of HK532A then it will set VT high.

If VT is set high, HK532A is still in search Address. After 2 consecutive Address that do not match the setting on HK532A, HK532A will disable VT.

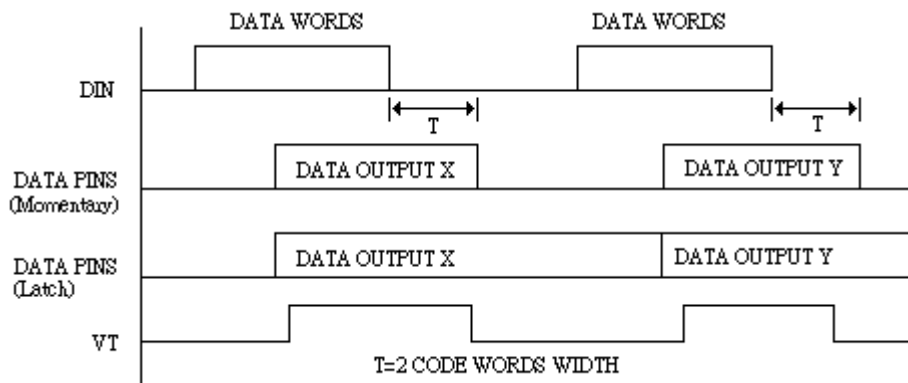
The timings are shown in the following diagram.



### Latch or Momentary Data Output Type

After Power On HK532A is set in Address search mode, If HK532A finds 2 consecutive Address that matches the Address setting of HK532A. HK532A will enter Data Compare mode. It will compare previously 2 receive data, if they match each then

HK532A will set VT high and send data O/P. HK532A re-enters Address search mode, after 2 consecutive Address that do not match the setting on HK532A will disable VT and momentary's data but keep Latch's data intact



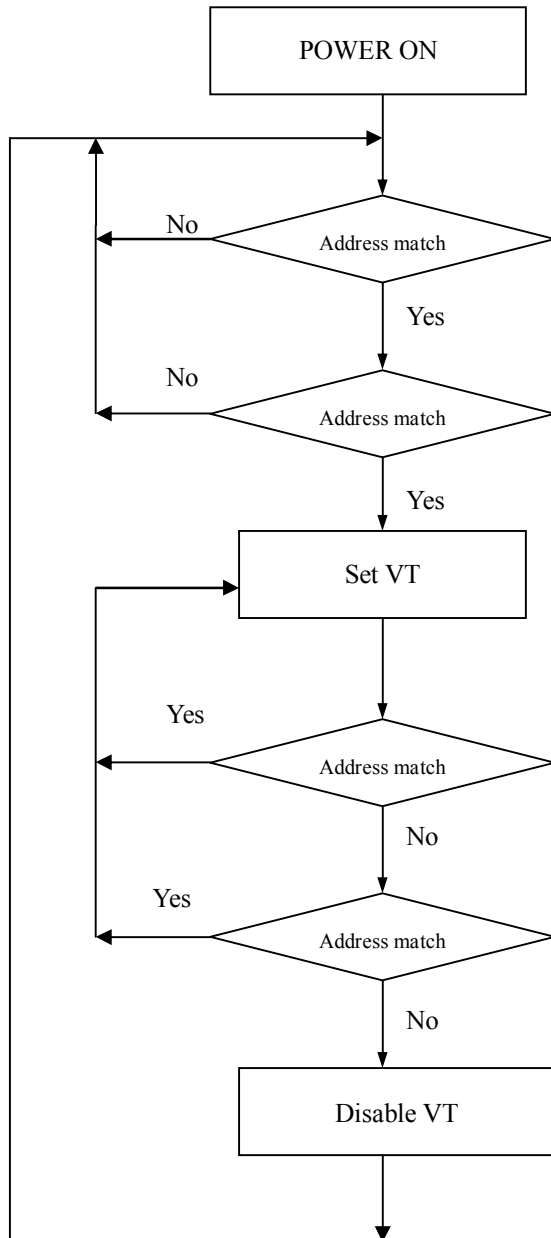
# HK532A

## ENCODER/DECODER IC

## DECODER WITH 531441 SET CODE

### Operation Flowchart

Decoder without Data Output Pins



After Power On HK532AF enters the Search Address mode, if HK532AF finds 2 consecutive Address that matches the Address Pin setting of HK532AF, it will set VT high.

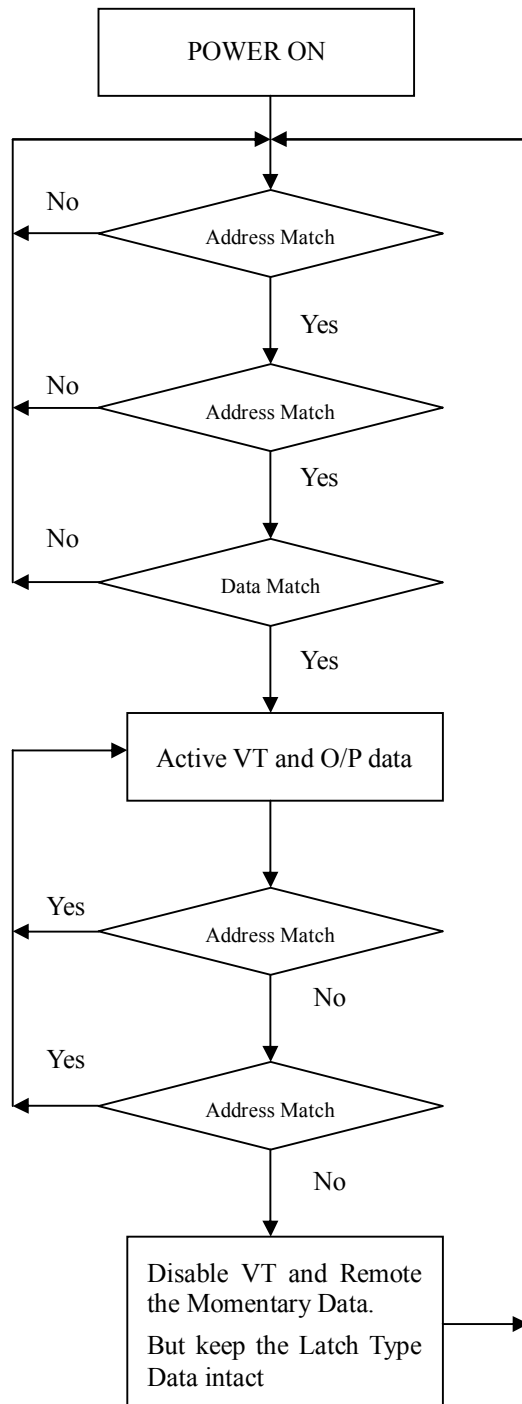
If VT is set high, HK532AF is still in search Address. After 2 consecutive Address that do not match the setting on HK532AF, HK532AF will disable VT.

# HK532A

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### Decoder with Data Output Pins



After Power On HK532A is set in Address search mode, if HK532A finds 2 consecutive Address that matches the Address setting of HK532A. HK532A will enter Data Compare mode. It will compare previously 2 received data, if they match then HK532A will set VT High and send data O/P .

HK532A re-enters Address search mode, after 2 consecutive Address that do not match setting on HK532A will disable VT and momentary's data but keep Latch's data intact.

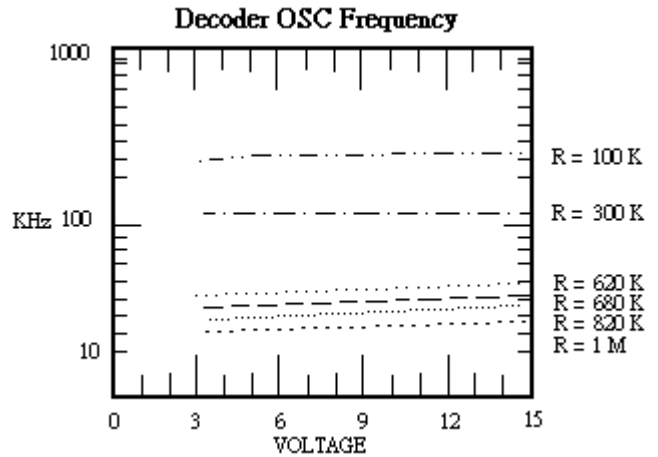
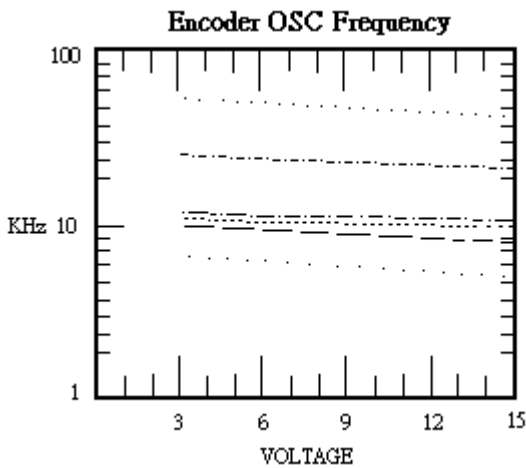
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### Single Resistor Oscillator

HK532A's oscillator can be constructed by connecting a resistor between OSC1 and OSC2 pin. HK532A's OSC frequency must be 2.5 to 8 times more than HK532.



Suggested oscillator resistor of HK532 & HK532A-x ( HK532AM-x ) series :

HK532	HK532A-x series
4.7 M	820K
3.0M	620K
2.2M	300K
1.2M	180K

### DC Electrical Characteristics

Parameter	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Supply Voltage	V <sub>CC</sub>		3	5	13.6	Volt
Supply Current	I <sub>CC</sub>	V <sub>CC</sub> = 12 Volt OSC stop A0 ~ A11 Open		0.02	0.3	μ A
DOUT Output Driving Current	I <sub>OH</sub>	V <sub>CC</sub> = 5 Volt V <sub>OH</sub> = 3 Volt	-3			mA
		V <sub>CC</sub> = 8 Volt V <sub>OH</sub> = 4 Volt	-6			mA
		V <sub>CC</sub> = 12 Volt V <sub>OH</sub> = 6 Volt	-1			mA
DOUT Output Sinking Current	I <sub>OL</sub>	V <sub>CC</sub> = 5 Volt V <sub>OH</sub> = 3 Volt	2			mA
		V <sub>CC</sub> = 8 Volt V <sub>OH</sub> = 4 Volt	5			mA
		V <sub>CC</sub> = 12 Volt V <sub>OH</sub> = 6 Volt	9			mA

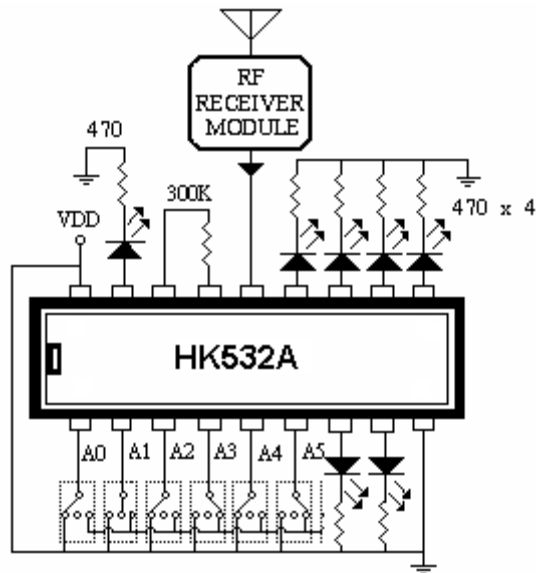
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### Application Circuit

(A) 6 Data receiving circuit ( HK532A )



(B) Full address transmitter circuit with zero data ( HK532AF )

