HK532

ENCODER/DECODER IC   ENCODER WITH 531441 SET CODE

Features

∗ CMOS technology
∗ 12 address pins can be tri-state (VDD ,VSS or Floating) input
∗ Latch and momentary two types be available

∗ Wide range operating voltage, Vcc = 3 -12V
∗ Up to six data bits
∗ High noise immunity

General Description

HK532 is a RF remote control encoder paired with HK532A. It utilizes CMOS technology.   The chip has 12 bits of 3-state address pins that provides 3^{12} codes.   HK532/HK532A pair is suitable for use on remote controller.

Application

∗ Car Security
∗ Garage Door
∗ Ceiling Fan
∗ Home Security/Automatic
∗ Toys

PinOut Diagram

DIP-18L

SOP-20L
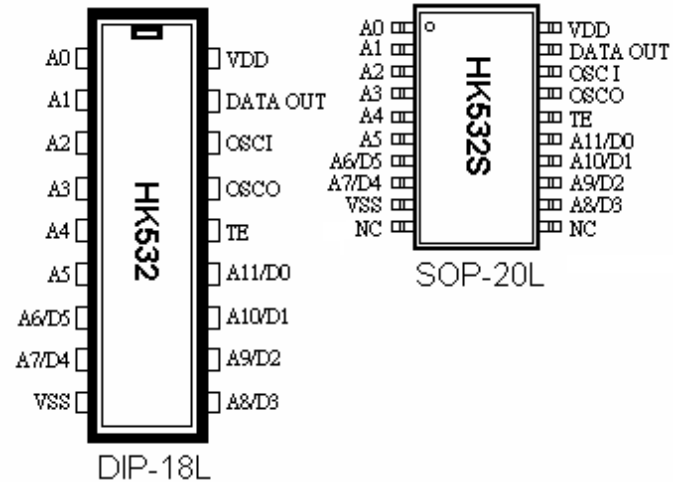
Pin Assignment

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/data input.
A7/D4	8	8	
VSS	9	9	Negative power supply.
A8 / D3	10	12	Address/data input.
A9 / D2	11	13	
A10 / D1	12	14	
A11 / D0	13	15	
TE	14	16	Enables transmission.
OSC2	15	17	Resistor connected between these two pins determine the system clock.
OSC1	16	18	
Dout	17	19	Serial output of encoded signals.
VDD	18	20	Positive power supply.
NC	X	10	No Connecting
NC	X	11	No Connecting

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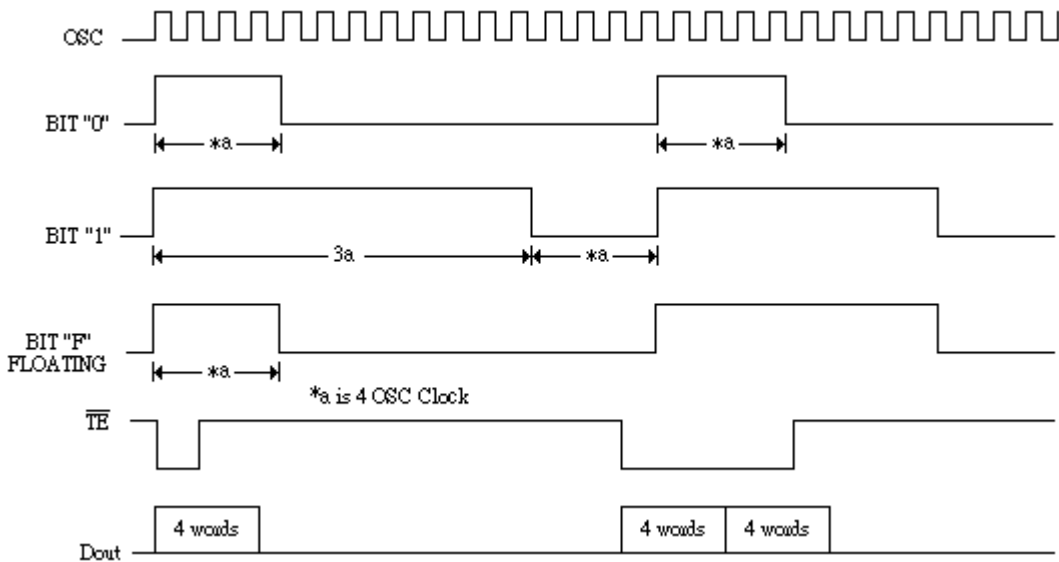## ENCODER/DECODER IC   ENCODER WITH 531441 SET CODE
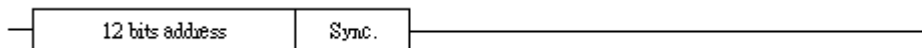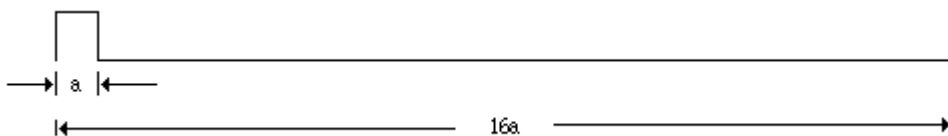
Block Diagram
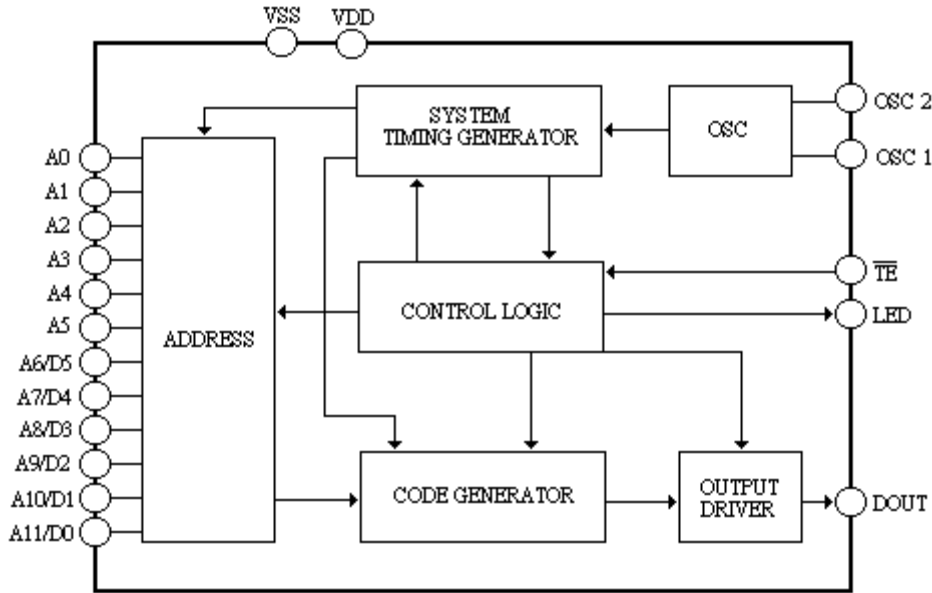
Function Description
1.Data Format

TE is active low signal.   When TE is "low", Dout will output 4 words.   If time in "low" is longer than the 4 words transmission time, Dout will continuously output a second 4 words data .
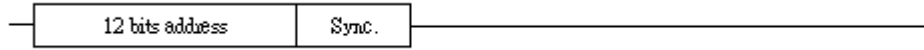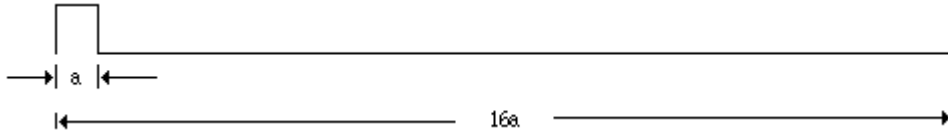

Synchronization Bit waveform is :

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2.Frame Format

When HK532 is used for no data, transmitting format is:

12 bits address	Sync.

Synchronization Bit waveform is :

When data type of HK532 is used, address bits will decrease accordingly.   For example, in 3 data type where address is 9 bits, transmitting format is:

9 address bits	3 data bits	Sync.
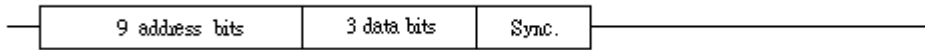
HK532/HK532A has 12 bits including a maximum of 6 data bits.

first transmission bit
in real signal A0 will be receive first.

A0	A1	A2	A3	A4	A5	A6/D5	A7/D4	A8/D3	A9/D2	A10/D1	A11/D0	Sync.	According to
A0	A1	A2	A3	A4	A5	D5	D4	D3	D2	D1	D0	Sync.	HK532A / HK532AM
A0	A1	A2	A3	A4	A5	A6	D4	D3	D2	D1	D0	Sync.	HK532A - 5 / HK532AM - 5
A0	A1	A2	A3	A4	A5	A6	A7	D3	D2	D1	D0	Sync.	HK532A - 4 / HK532AM - 4
A0	A1	A2	A3	A4	A5	A6	A7	A8	D2	D1	D0	Sync.	HK532A - 3 / HK532AM - 3
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	D1	D0	Sync.	HK532A - 2 / HK532AM - 2
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	Sync.	HK532AF

※ HK532A - x (Latch Type) , HK532AM - x (Momentary Type)
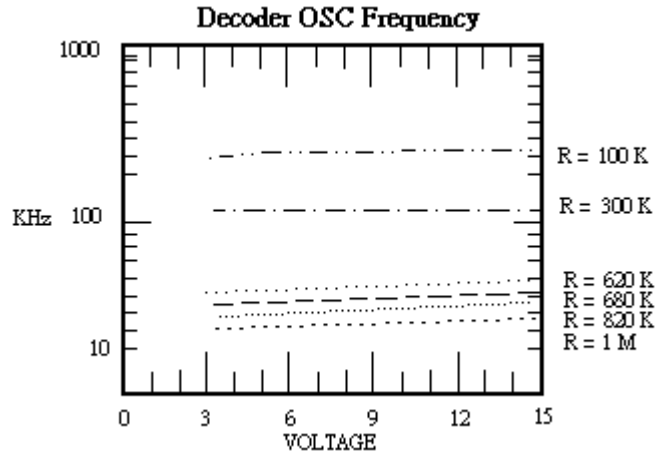
4.OSC Frequency

HK532'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.

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Decoder OSC Frequency

R = 100 K
R = 300 K
R = 620 K
R = 680 K
R = 820 K
R = 1 M
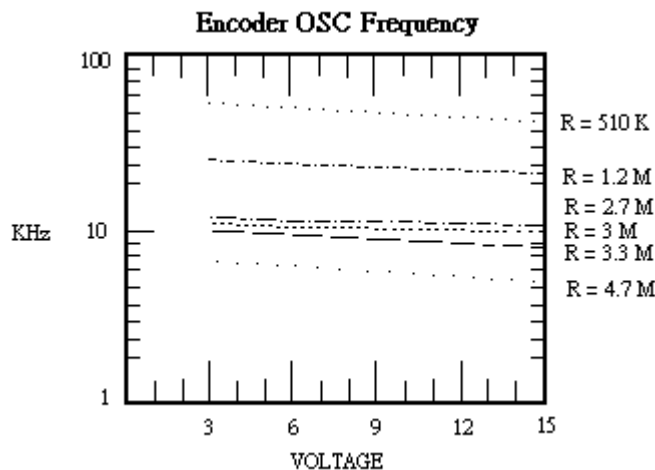
Suggested oscillator resistor of HK532 & HK532A-x (HK532AM-x) series :

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

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Ratings	Unit
Supply Voltage	$V_{DD} - V_{SS}$		-0.3~16	V
Input Voltage	$V_I - V_{SS}$		$V_{SS} - 0.3 \sim V_{DD} + 0.3$	V
Output Voltage	$V_O - V_{SS}$		$V_{SS} - 0.3 \sim V_{DD} + 0.3$	V
Maximum power disspation	Pa	$V_{DD} - V_{SS} = 12V$	500	mW
Operating Temperature	Topr		-20~70	℃
Storage Temperature	Tstg		-40~125	℃

DC Electrical Characteristics

| Parameter	Symbol	Test Condition	Limits			Unit
			Min.	Typ.	Max.	
Supply Voltage	V_{DD}		3	12	13.6	V
Supply Current	I_{SB}	$V_{DD} = 12V$ OSC STOP A0 – A11 Open		0.02	0.3	mA
Output Drive Current (Dout)	I_{OH}	$V_{DD} = 5V$ $V_{OH} = 3V$ $V_{DD} = 8V$ $V_{OH} = 4V$ $V_{DD} = 12V$ $V_{OH} = 6V$	3 6 10			mA
	I_{OH}	$V_{DD} = 5V$ $V_{OL} = 3V$ $V_{DD} = 8V$ $V_{OL} = 4V$ $V_{DD} = 12V$ $V_{OL} = 6V$	2 5 9			mA

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Application Circuit

(A) 6 Data transmitter circuit
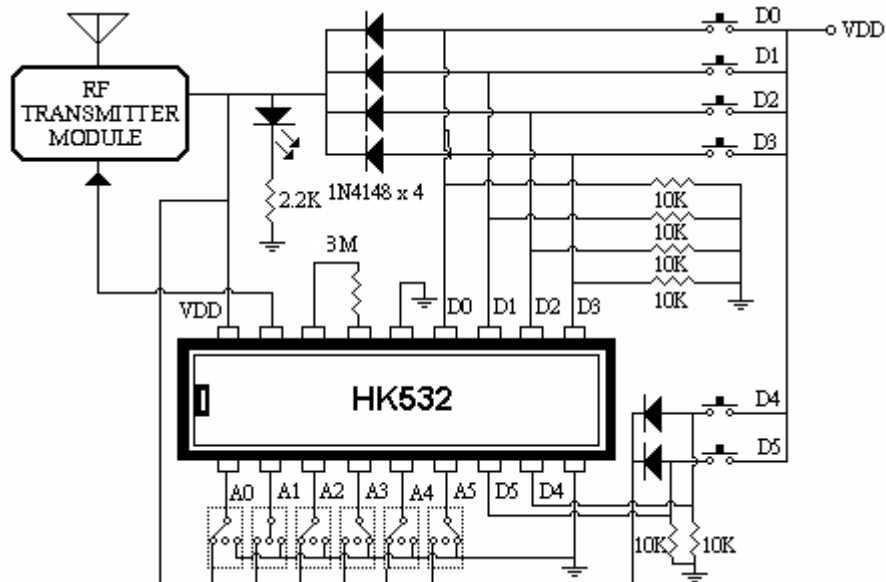
(B) Full address transmitter circuit with zero data
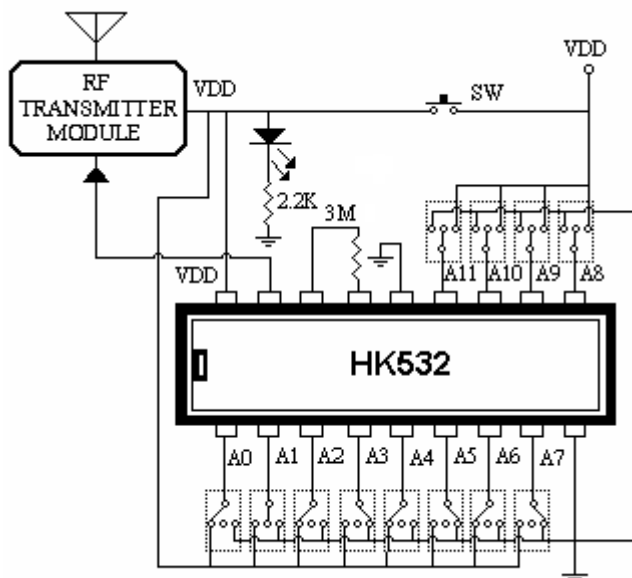
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RF module application circuit for reference only