

## FEATURES

- Wide operating voltage 2 – 6 volts
- Low standby power consumption
- On-chip R/C oscillator, no crystal required
- Four time transmission with polarity checking
- Maximum of 4,194,304 combinations encoding capability
- Minimize external components
- Easy interface with RF, Ultrasonic or Infrared transmission media
- Bonding option available to maximize encoding capacity with 4 possible addressing states. (0, 1, open and 4<sup>th</sup> state)

## GENERAL DESCRIPTION

The VD5026/7/8 are encoder / decoder chip set fabricated with low-power high performance CMOS LSI technology. The VD5026 is an encoder and VD5027/8 are decoders, which are designed to be used together for application in various digital code transmitter – receive systems.

The VD5026 will encode twelve bits of information and serially transmit this information upon receipt of a transmit enable, TE (active low) signal. Twelve inputs may be encoded in

- (i) two state addressing mode (0, 1),
- (ii) three state addressing mode (0, 1, open),
- (iii) four state addressing mode (0, 1, open and 4<sup>th</sup> state) allowing 2 (4096), 3 (531,441), 4 (4,194,304) different codes respectively.

The VD5027 interprets the first eight transmitted bits as address and the last four bits as data. The VD5028 interprets the twelve bits of information as address only.

If encoder's address matches to that of the decoder's after comparison together with error parity checking, a valid transmission output VT will go high on the decoder. For VD5027 the 4 bits data will also be transmitted to the outputs of D0 to D3 at the same time.

For two states and three state operations ICs with marking in the form of VD502x-3 should be used. For four state operation, however, use ICs with marking of VD502x-4. (x=6, 7 or 8)

The recommended external resistor  $R_{osc}$  is 100k ohm for frequency of oscillation  $F_{osc}$  of 100kHz ( $\pm 15\%$ ).

## DC ELECTRICAL CHARACTERISTICS

$V_{DD} = 5V$ ,  $T_A = 25^\circ C$ , unless otherwise stated

CHARACTERISTICS	SYMBOLS	MIN	TYP	MAX	UNIT
Operating Volt	$V_{DD}$	2	5	6	V
Operating Current	$I_{op}$	-	-	400	$\mu A$
Stand-by Current	$I_{stb}$	-	-	0.6	$\mu A$
Output Voltage Low	$V_{OL}$	-	-	0.19	V
Output Voltage High	$V_{OH}$	4.0	-	-	V
Frequency	FREQ	45	-	72	kHz
Source Current ( $V_{OH} = 4V$ )	$I_{oh}$	-2.0	-	-	mA
Sink Current ( $V_{OL} = 1V$ )	$I_{oi}$	2.0	-	-	mA
Input Current	$I_{in} (TE)$	-	-	25	$\mu A$

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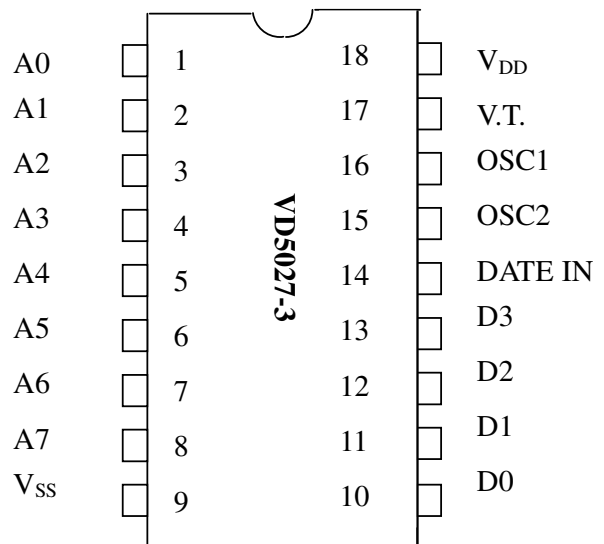
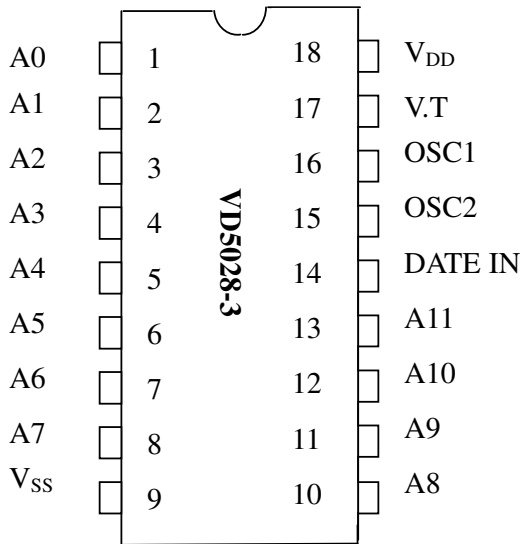
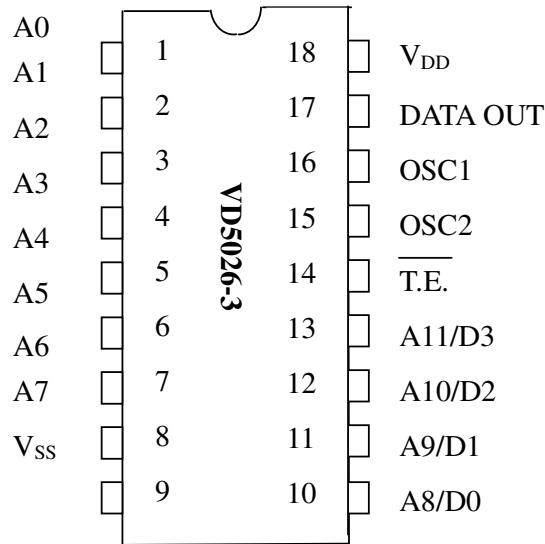
## APPLICATION

- Security systems
- Theft alarm systems
- Cordless telephone
- Smoke and fire alarm systems
- TV GAME remote controllers
- Garage door controller
- Any other remote control system (TOYS, TV ...)



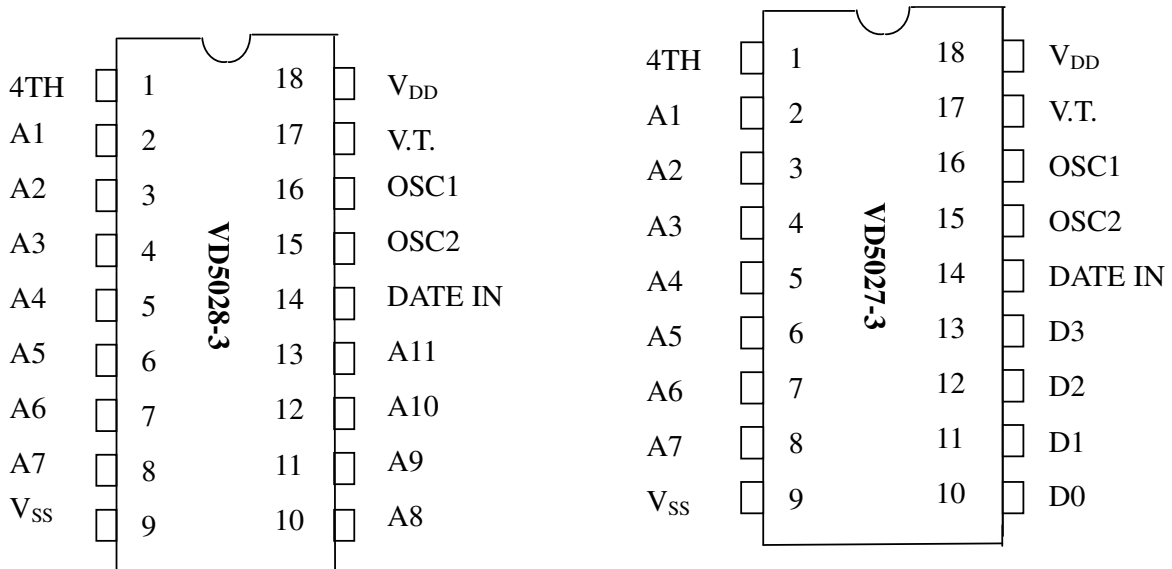
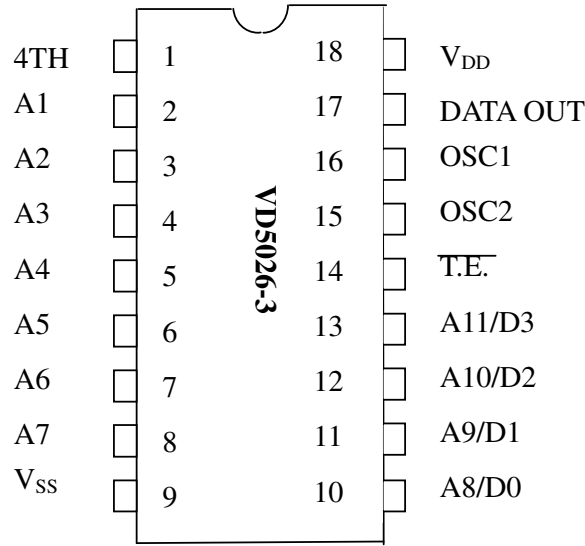
**PIN ASSIGNMENT**

**For Two State And three State Operations**





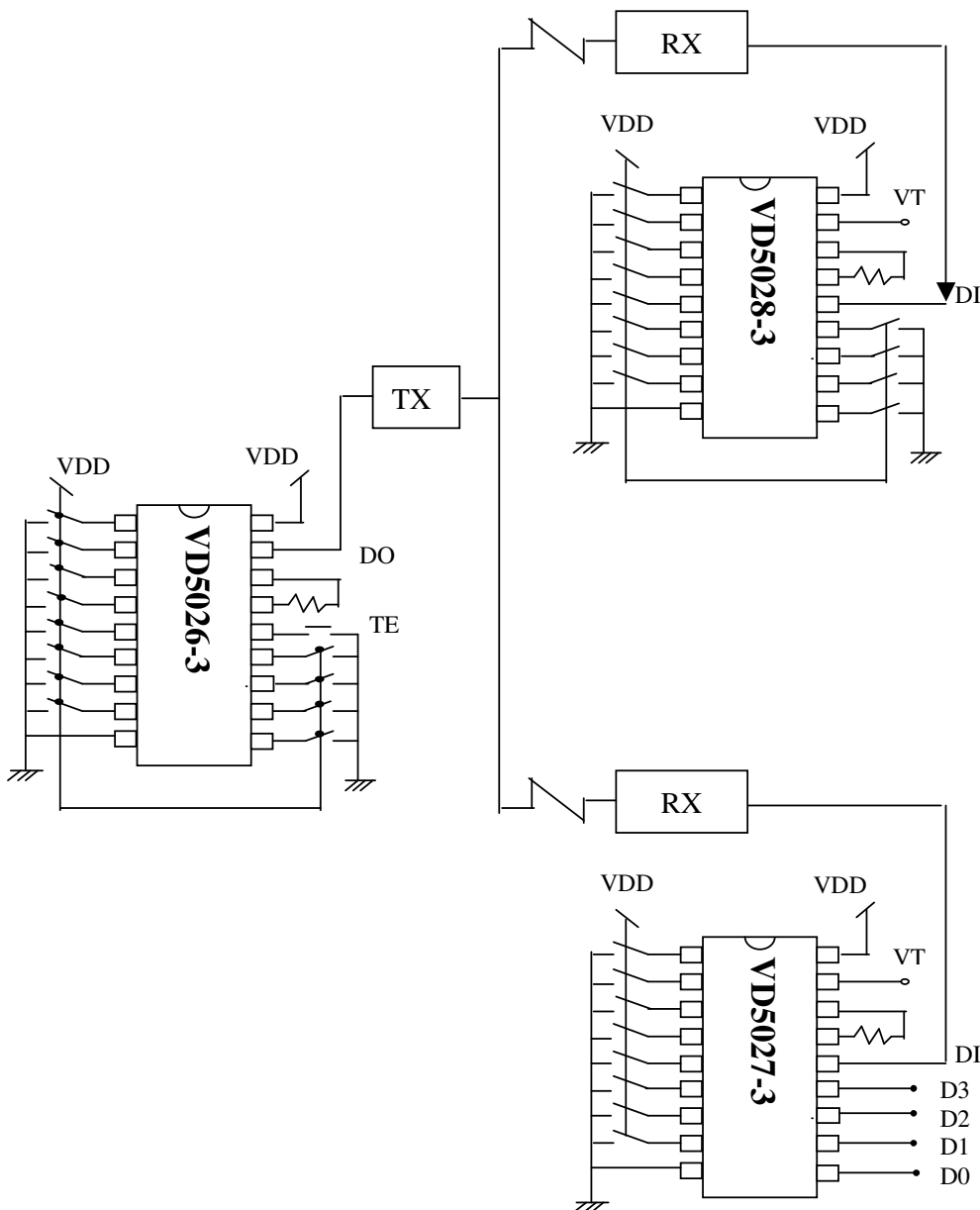
For Four State Operation





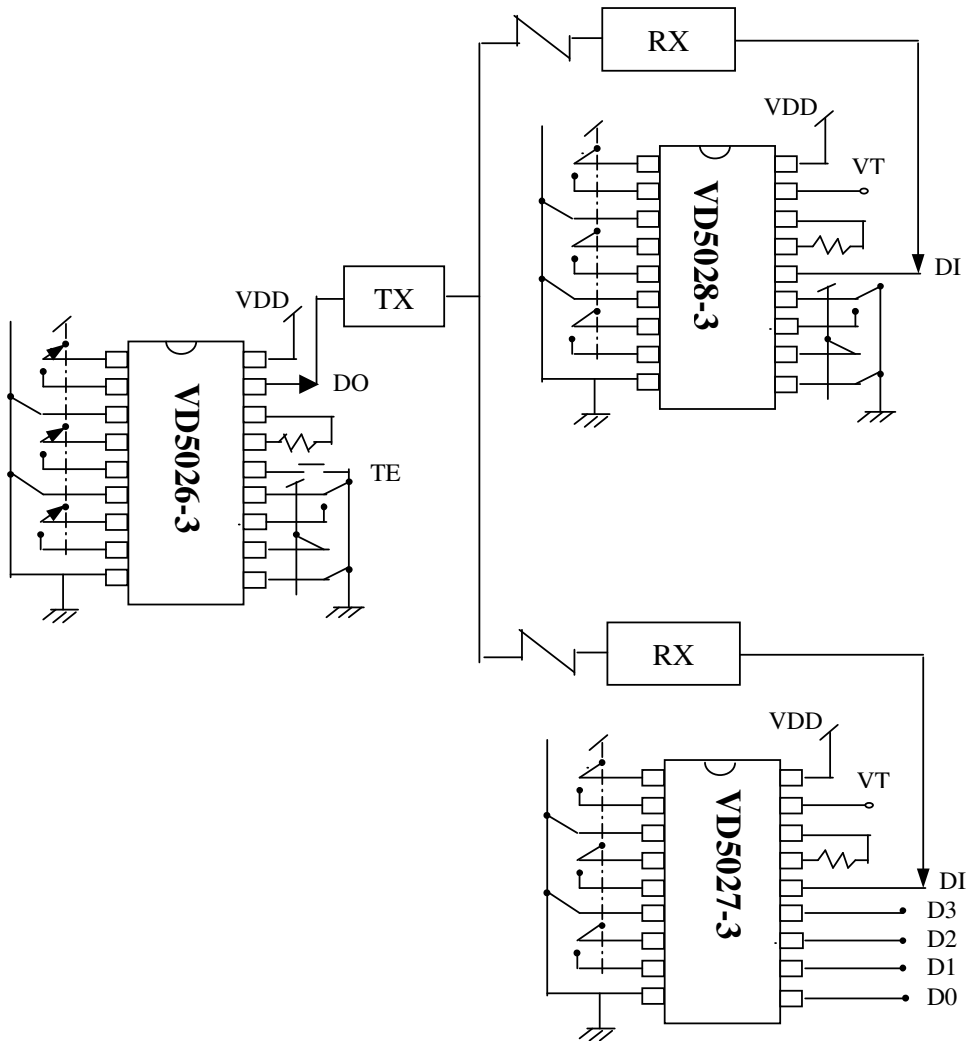
## APPLICATION DIAGRAM

### (i) TWO STATE OPERATION



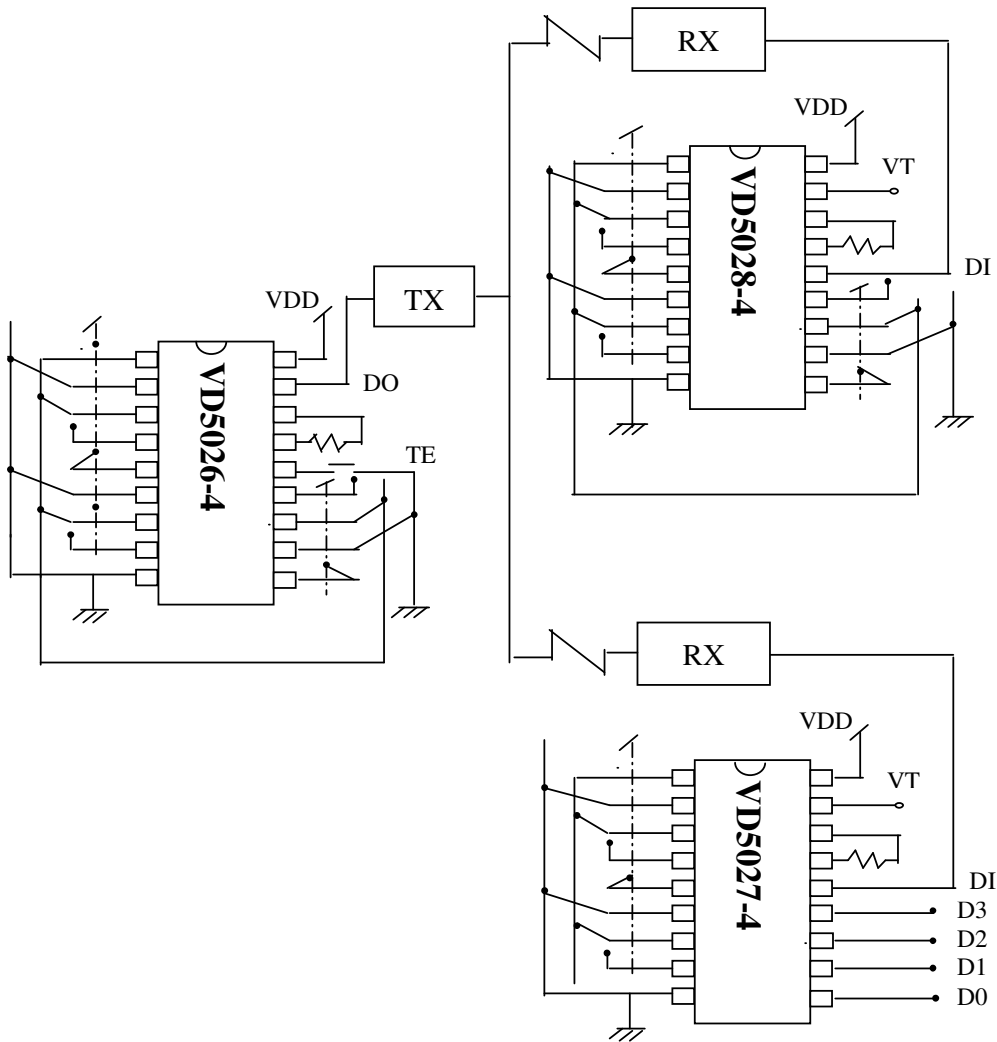


(ii) THREE STATE OPERATION





(iii) FOUR STATE OPERATION





### TIMING DESCRIPTION

For  $f = 100 \text{ kHz}$   $T = 10 \mu\text{s}$  ( $R_{\text{osc}} = 100\text{k}\Omega$ )

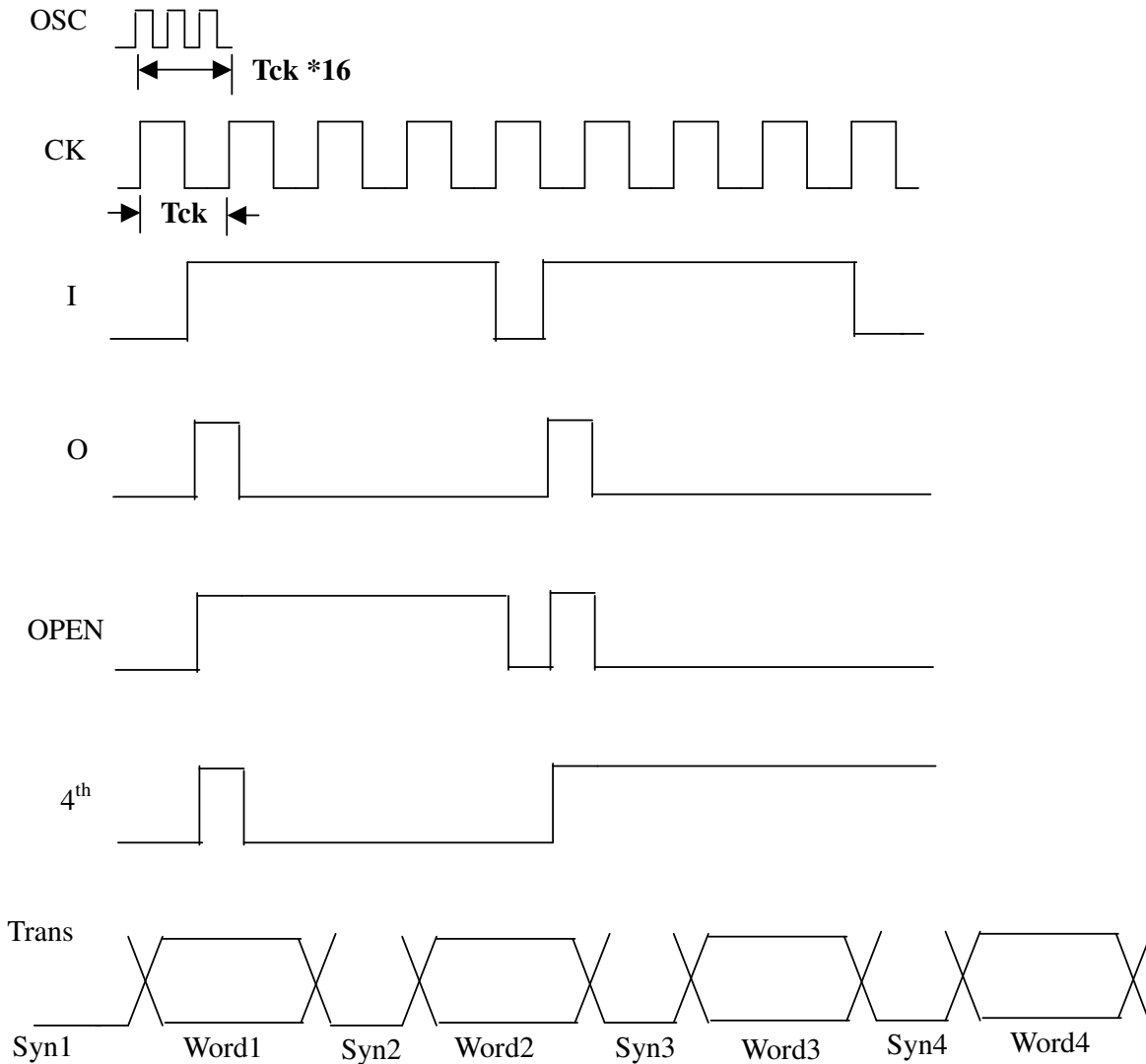
Syn  $24 \times 16 \times 10 \mu\text{s} = 3.84 \text{ ms}$

Word  $8 \times 13 \times 16 \times 10 = 16.64 \text{ ms}$

Total = 20.48 ms

4 (word + sync) = 81.92 ms

That is 13 Times Transmit per second. User can choose the proper resistor to define the  $f(\text{osc})$  for his application.







### TYPICAL CHARACTERISTICS OF VD5026/7/8

