Description

PT 2272 is a remote control decoder paired with PT 2262 utilizing CMOS Technology. It has 12 bits of 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. PT 2272 is available in several options to suit every application needs : variable number of data output pins, latch or momentary output type.

Features

- CMOS Technology
- Low Power Consumption
- Very High Noise Immunity
- Up to 12 Tri-State Code Address Pins
- Up to 6 Data Pins
- Wide Range of Operating Voltage: Vcc = 3 ~ 15 Volts
- Single Resistor Oscillator
- Latch or Momentary Output Type
- Available in DIP and SO Package

Applications

- Car Security System
- Garage Door Controller
- Remote Control Fan
- Home Security/Automation System
- Remote Control Toys
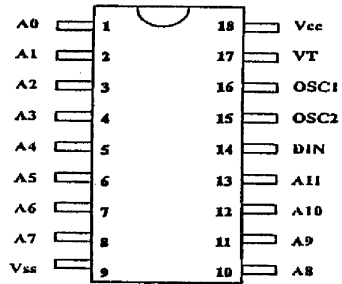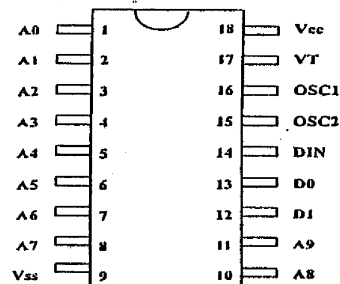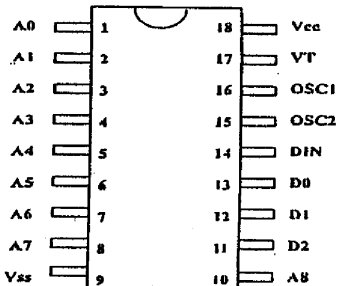- Remote Control for Industrial Use

Block Diagram
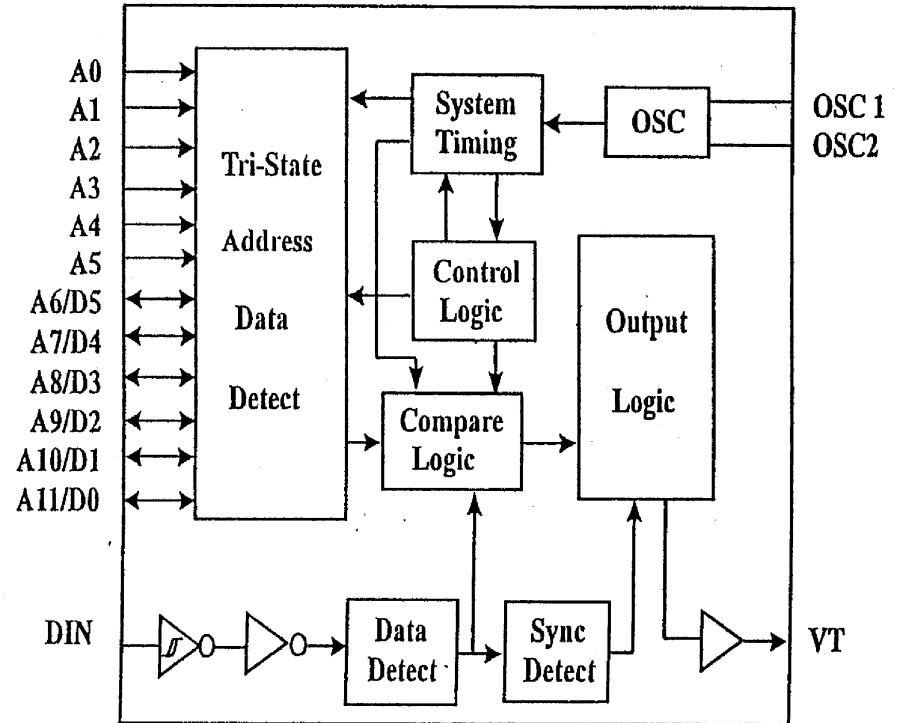
Pin Configuration

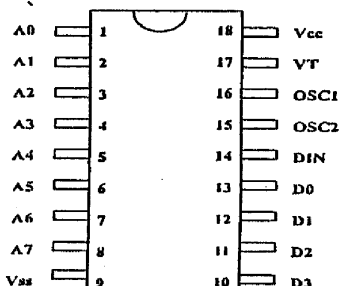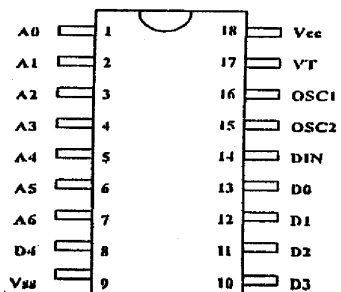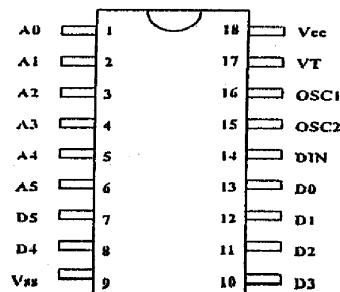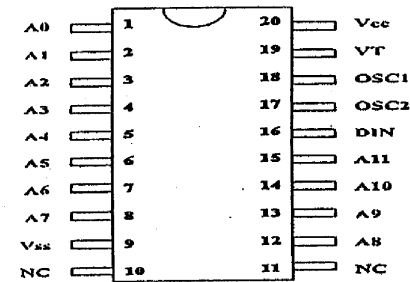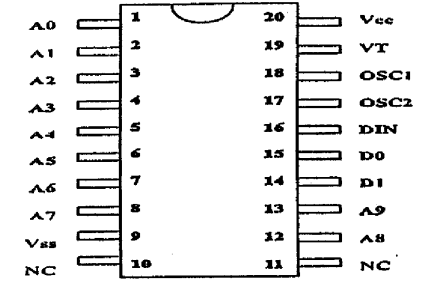PT 2272

PT 2272A - M2/L2

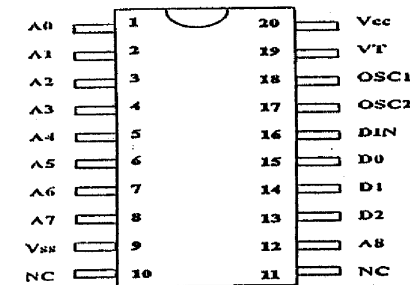PT 2272 - M3/L3

PT 2272 - M4/L4

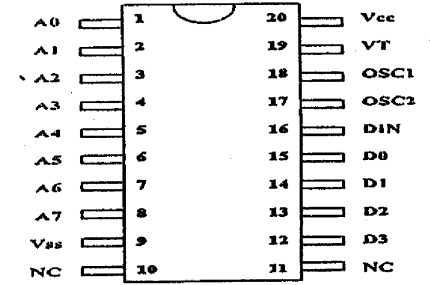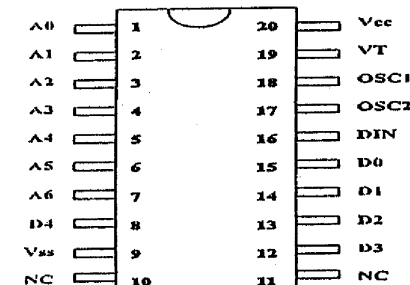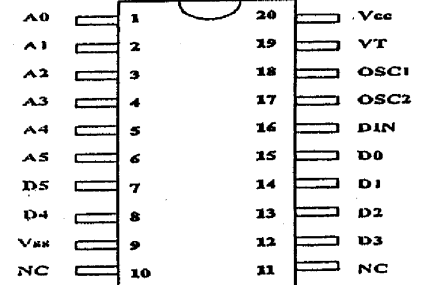PT 2272 - M5/L5

PT 2272 - M6/L6

PT 2272 (20 Pins)

PT 2272A - M2/L2 (20 Pins)

PT 2272 - M3/L3 (20 Pins)

PT 2272 - M4/L4 (20 Pins)

PT 2272 - M5/L5 (20 Pins)

PT 2272 - M6/L6 (20 Pins)

Pin Description

Pin Name	I/O	Description		Pin No.	
				18 Pins	20 Pins
A0 ~ A5	I	Code Address Pin Nos. 0 ~ 5. These six tri-state pins are detected by PT 2272 to determine the encoded waveform bit 0 ~ bit 5. Each pin can be set to "0", "1", or "f" (floating).		1 ~ 6	1~6
A6/D5 ~ A11/D0	I/O	Code Address Pin Nos. 6 ~ 11/Data Pin Nos. 5 ~ 0 . These six pins are used as higher address input bits or data output pins depending on the version (type) of PT 2272 used. When used as address inputs, these pins are tri-state input pins and each pin can be set to "0", "1", or "f" (floating). When used as output pins, these pins are driven to Vcc if (1) the address decoded from the waveform that was received matches the address setting at the address input pins, and (2) the corresponding data bits received is a "1" bit. Otherwise, they are driven to Vss.		7 ~ 8 10 ~ 13	7 ~ 8 12 ~ 15
DIN	I	Data Input Pin. The encoded waveform received is serially fed to PT 2272 at this pin.		14	16
OSC 1	I	Oscillator Pin No.1	A resistor connected between these two pins determine the	15	17
OSC 2	O	Oscillator Pin No. 2	fundamental frequency of PT 2272.	16	18
VT	O	Valid Transmission. Active High Signal. VT in high state signifies that PT 2272 receives valid transmission waveform.		17	19
Vcc	–	Positive Power Supply		18	20
Vss	–	Negative Power Supply		9	9
NC	–	No Connection		–	10 ~ 11

Functional Description

PT 2272 decodes the waveform received and fed into the DIN pin. The Waveform is decoded into code word that contains the address, data and sync bits. The decoded address bits are compared with the address set at the address input pins. If both addresses match for 2 consecutive code words, PT 2272 drives -- (1) the data output pin(s) whose corresponding data bit(s) is then decoded to be a "1" bit, and (2) the VT output -- to high voltage (high state).

RF Operation

Code Bits

A Code Bit is the basic component of the encoded waveform, and can be classified as either an *AD (Address/Data) Bit* or a *SYNC (Synchronous) Bit*.

Address/Data (AD) Bit Waveform

An AD Bit can be designated as Bit "0", "1" or "f" if it is in low, high or floating state respectively. One bit waveform consists of 2 pulse cycles. Each pulse cycle has 16 oscillating time periods. For further details, please refer to the diagram below:
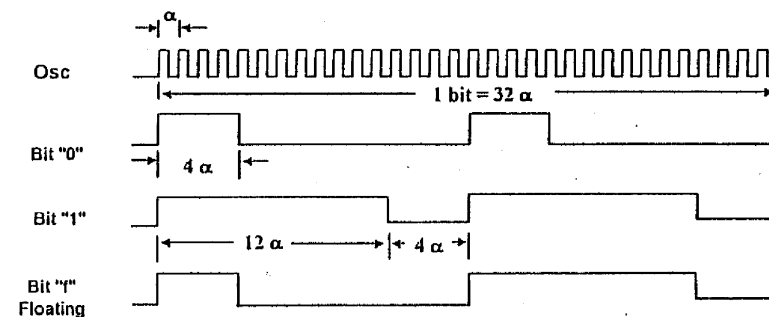
where : α = Oscillating Clock Period
Bit "f" is only available for Address Bits

Synchronous (Sync.) Bit Waveform

The Synchronous Bit Waveform is 4 bits long with 1/8 bit width pulse.
Please refer to the diagram below:

```
   ┌─┐_____
   │ │
 →│ │←─  1/8 bit width = 4 α
   │←──────── 4 bits width = 128 α ──────→│
```

Note : 1 bit = 32 α

Code Word

A group of Code Bits is called a Code·Word. A Code Word consists of
12 AD bits followed by one Sync Bit. The 12 AD bits are interpreted as
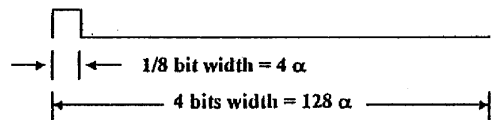either address or data bits depending on the PT 2272 version used. Please
refer to the diagrams below:

PT2272:

A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	SYNC

PT2272A–M2/L2:

A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	D1	D0	SYNC

PT2272–M3/L3:

A0	A1	A2	A3	A4	A5	A6	A7	A8	D2	D1	D0	SYNC

PT2272–M4/L4:

A0	A1	A2	A3	A4	A5	A6	A7	D3	D2	D1	D0	SYNC

PT2272–M5/L5:

A0	A1	A2	A3	A4	A5	A6	D4	D3	D2	D1	D0	SYNC

PT2272–M6/L6:

A0	A1	A2	A3	A4	A5	D5	D4	D3	D2	D1	D0	SYNC

|←──→|

One Complete Code Word

Single Resistor Oscillator

The built-in oscillator circuitry of PT 2272 allows a precision oscillator to be
constructed with only an external resistor. For the PT 2272 to decode
correctly the waveform that was received, the oscillator frequency of PT 2272
must be 2.5 ~ 8 times that of the transmitting PT 2262. It is a good practice
to center the PT 2272 oscillator frequency in this window to gain best
window margin at both sides. The typical oscillator with various resistor
values is shown below for both PT 2262 and PT 2272.

Encoder OSC Frequency   Decoder OSC Frequency
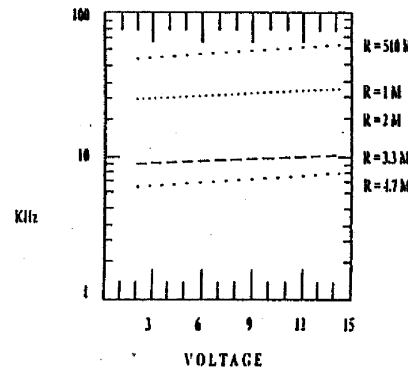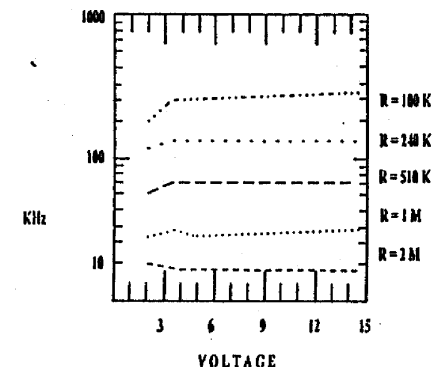
Suggested oscillator resistor values are shown below.

| PT 2262	PT 2272
4.7 MΩ	820 KΩ
3.3 MΩ	680 KΩ
1.2 MΩ	200 KΩ

IR Operation

· In the IR Type of Operation, the functions are similar to the above descriptions, except that the output waveform carried by PT 2262-IR has a frequency of 38 KHz. Details are as follows:

Code Bits

The Code Bits are further modulated with a 38 KHz carrier frequency and can be "0" , "1" or "f" bit. Their waveforms are shown in the diagram below.
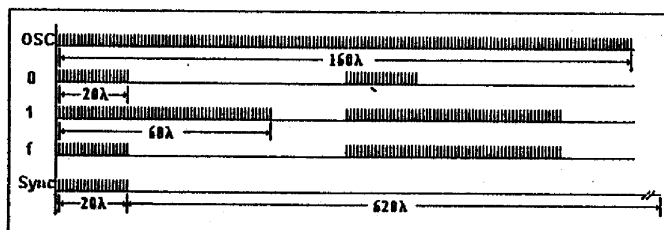
Note : λ = 2 clock lengths

Code Word

A Code Word is made up of code bits and the format is the same as that of the RF Code Frame.

Code Frame

Likewise, a Code Frame is made up of Code Words and the format is the same as that of RF Type of Operation.

Oscillator

PT 2262 - IR is specially designed for infrared remote control applications and its output waveform carries 38 KHz frequency. To get the 38 KHz carrier frequency at the data output, the oscillator frequency must be 76 KHz. A 440 K Ohms resistor connected between OSC 1 and OSC 2 pins of PT 2262 - IR is recommended. Moreover, for a matching decoder frequency,

1 Meg Ohm resistor connected between the OSC1 and OSC2 pins of PT2272 is also recommended.

Valid Transmission

When PT 2272 receives a transmission code word, it initially checks whether this is a valid transmission. For a transmission to be valid, (1) it must be a Complete Code Word, and (2) the Address Bits must match the Address Setting at the Address Pins. After two consecutive valid transmissions, PT 2272 (1) drives the data pins according to the data bits received, and (2) raises VT to high voltage (high state).

The timings are shown in the following diagram.

t_a=8 OSC clock width
t_b=1 OSC clock width
t_c=2 code word width
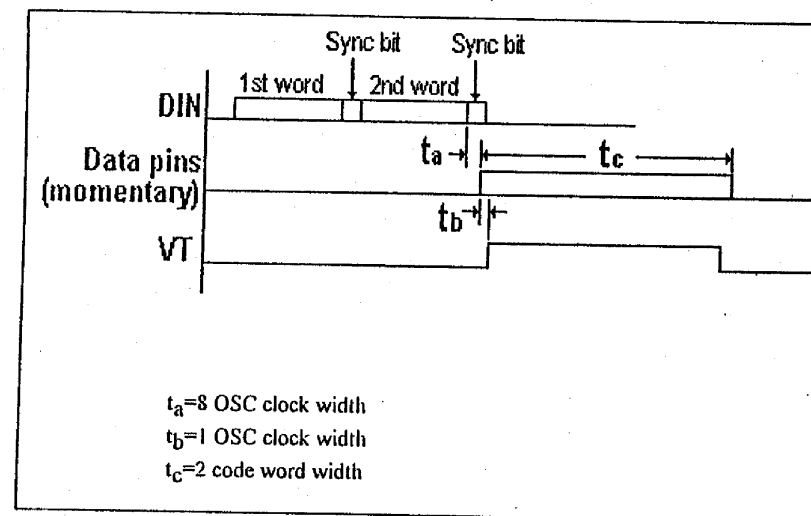
Latch or Momentary Data Output Type

PT 2272 uses either the latch or the momentary data output type depending on the PT 2272 version used. The latch type (PT 2272-Lx) activates the data out during

transmission and this data is sustained in the memory until another data is inputted or entered. A momentary type (PT 2272-Mx), on the other hand, activates the data out only during transmission. In the momentary type, the data does not remain in the memory after the transmission is completed. Please refer to the diagram below:
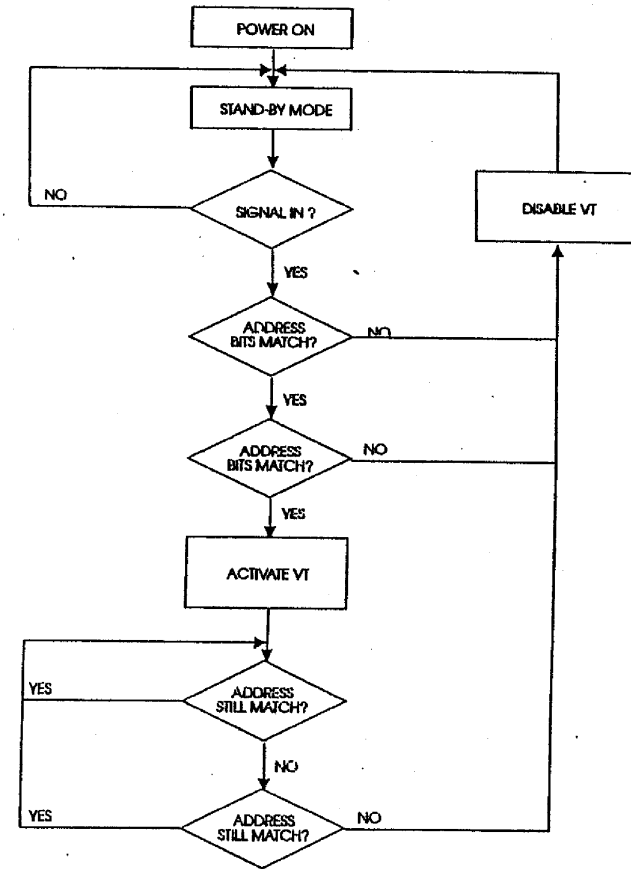

T = 2 CODE WORDS WIDTH
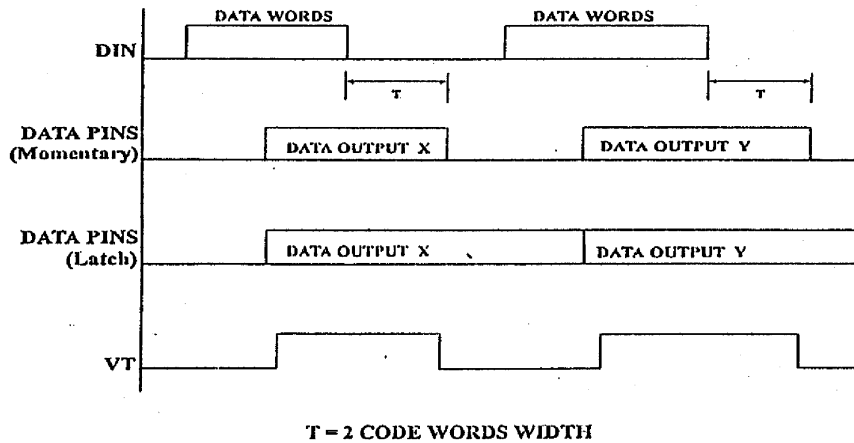
Operation Flowchart

Decoder Without Data Output Pin

1. When Power is turned on, PT 2272 activates the Stand-By Mode.

2. It then searches for signals. If there is no signal received, it remains in the Stand-By Mode; otherwise, the address bits received are compared with the address configuration of the pins.

3. The VT goes high signifying the validation of transmission only when there are two (2) continuous frames that contain matched address bits; otherwise, VT will not be activated and the Stand-By Mode remains active.

4. Then, the Address Bits are again checked. Two continuous mismatches of the address bits would disable the VT and make the Stand-By Mode active; otherwise, the address bits are continuously checked.

DECODER WITHOUT DATA OUTPUT PIN

Decoder with Data Output Pins

1. When Power is turned ON, PT 2272 activates the Stand-By Mode.

2. It then searches for signals. If there is no signal received, it remains in the Stand-By Mode; otherwise, the address bits are compared with the address configuration of the pins.

3. Whenever the Address Bits in a Frame match with that of the Address Configuration of the Pin, the data bits are stored into the memory. Also, when this IC finds two (2) continuous and identical data having the same address bits, the data output(s) is activated and the VT is enabled. The VT is disabled when there are 2 continuous mismatched addresses. For the momentary type, the data output is reset; while for the latch type, the data output is sustained.
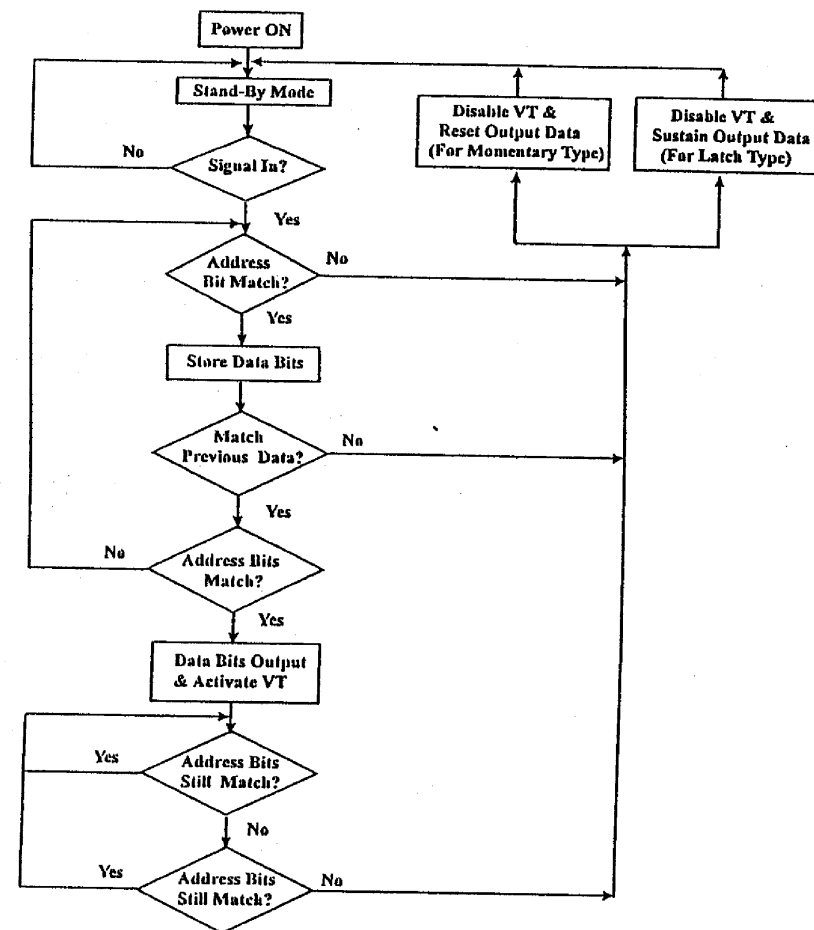
Decoder with Data Output Pins

Application Circuit
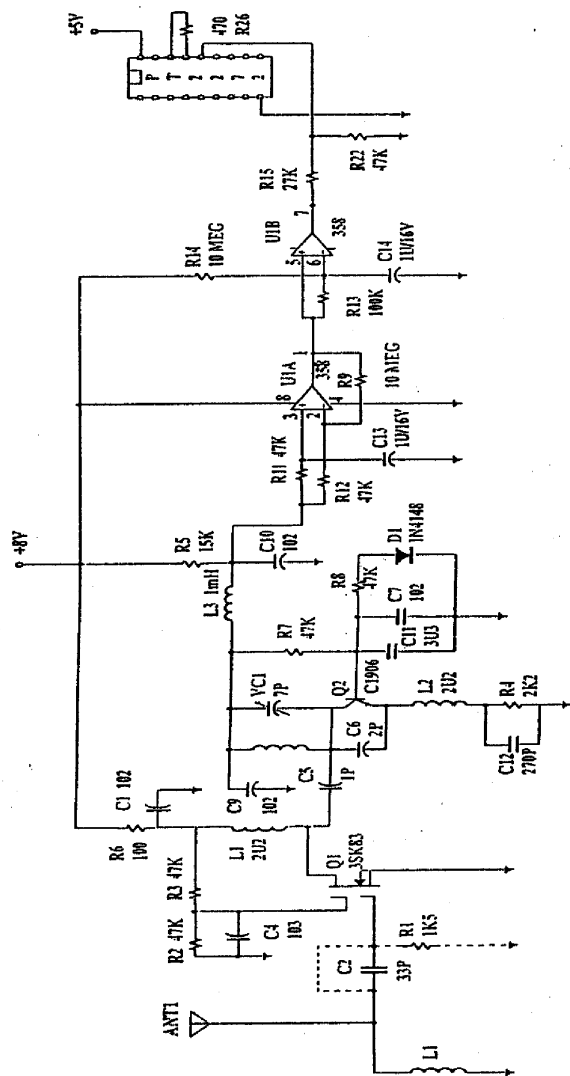
DC Electrical Characteristics

PARAMETER	SYMBOL	CONDITION	LIMIT			UNIT
			MIN.	TYP.	MAX.	
Supply Voltage	Vcc		3		15	Volt
Supply Current	Icc	Vcc=12 Volt OSC stop A0 ~ A11 Open		0.02	0.3	μA
DOUT Output Driving Current	I_{OH}	Vcc = 5 Volt V_{OH}=3 Volt	-3			mA
		Vcc = 8 Volt V_{OH} = 4 Volt	-6			mA
		Vcc = 12 Volt V_{OH} = 6 Volt	-10			mA
DOUT Output Sinking Current	I_{OL}	Vcc = 5 Volt V_{OH}=3 Volt	2			mA
		Vcc = 8 Volt V_{OH} = 4 Volt	5			mA
		Vcc = 12 Volt V_{OH} = 6 Volt	9			mA

?ring Information

?alid Part No	Package
PT 2272 (-S)	18 (18/20) Pins DIP (SO)
PT 2272A-L2 (-S)	18 (18/20) Pins DIP (SO)
PT 2272A-M2 (-S)	18 (18/20) Pins DIP (SO)
PT 2272-L3 (-S)	18 (18/20) Pins DIP (SO)
PT 2272-M3 (-S)	18 (18/20) Pins DIP (SO)
PT 2272-L4 (-S)	18 (18/20) Pins DIP (SO)
PT 2272-M4 (-S)	18 (18/20) Pins DIP (SO)
PT 2272-L5 (-S)	18 (18/20) Pins DIP (SO)
PT 2272-M5 (-S)	18 (18/20) Pins DIP (SO)
PT 2272-L6 (-S)	18 (18/20) Pins DIP (SO)
PT 2272-M6 (-S)	18 (18/20) Pins DIP (SO)

PT 2272 X - XX - X

Package Code:
P   : Plastic DIP, 18 Pins (may be omitted)
S   : Small Outline, 18 Pins
S20 : Small Outline, 20 Pins

Data Bits: 0,2,3,4,5,6

Output Type:
L : Latch Type
M: Momentary Type

Version:
A: New Version

Product Number

PTC Prefix