Tel : 886-2-29162151
Fax : 886-2-29174598
URL: *http://www.princeton.com.tw*

Description

PT2262 is a remote control encoder paired with PT2272 utilizing CMOS Technology. It encodes data and address pins into a serial coded waveform suitable for RF or IR modulation. PT2262 has a maximum of 12 bits of tri-state address pins providing up to 531,441 (or 3^{12}) address codes; thereby, drastically reducing any code collision and unauthorized code scanning possibilities.

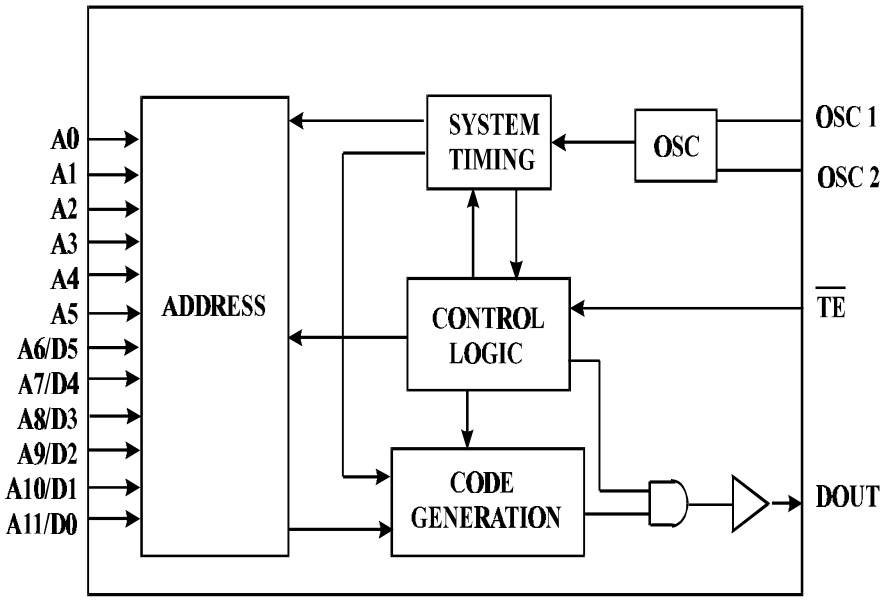
Features

- ❒ 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 = 4 ~ 15 Volts
- ❒ Single Resistor Oscillator
- ❒ Latch or Momentary Output Type
- ❒ Available in DIP and SO Package

Applications

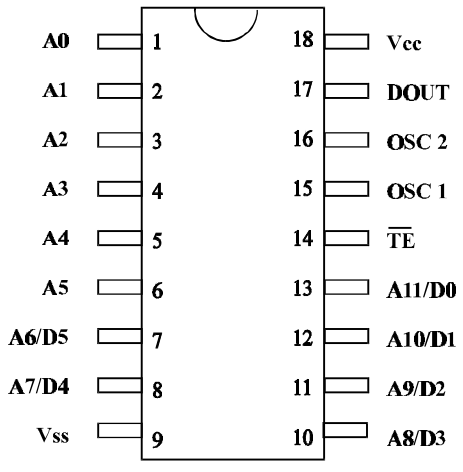
- ❒ Car Security System
- ❒ Garage Door Controller
- ❒ Remote Control Fan
- ❒ Home Security/Automation System
- ❒ Remote Control Toys
- ❒ Remote Control for Industrial Use

Block Diagram

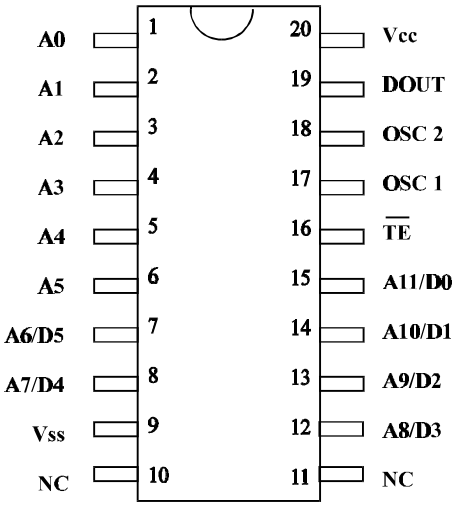


PT 2262

Pin Configuration



PT 2262
PT2262-S18
PT2262-IR



PT2262 S
PT2262 - IR - S

Pin Description

Pin Name	I/O	Description		Pin No. 18 Pins	Pin No. 20 Pins
A0 ~ A5	I	Code Address Pin Nos.0 ~ 5 These six tri-state pins are detected by PT2262 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	Code Address Pin Nos.6 ~ 11/Data Pin Nos.5 ~ 0. These six tri-state pins are detected by PT2262 to determine the encoded waveform bit 6 ~ bit 11. When these pins are used as address pins, they can be set to "0", "1", or "f" (floating). When these pins are used as data pins, they can be set only to "0" or "1".		7 ~ 8 10 ~ 13	7 ~ 8 12 ~ 15
$\overline{TE}$	I	Transmission Enable. Active Low Signal. PT2262 outputs the encoded waveform to DOUT when this pin is pulled to low.		14	16
OSC 1	O	Oscillator Pin No.1	A resistor connected between these two pins determine the fundamental frequency of the PT2262.	15	17
OSC 2	I	Oscillator Pin No.2		16	18
DOUT	O	Data Output Pin. The encoded waveform is serially outputted to this pin. When PT2262 is not transmitting, DOUT outputs low (Vss) voltage.		17	19
Vcc	-	Positive Power Supply		18	20
Vss	-	Negative Power Supply		9	9

Functional Description

PT2262 encodes the code address and data set at A0 ~ $\overline{A5}$ and A6/D5 ~ A11/D0 into a special waveform and outputs it to the DOUT when $\overline{TE}$ is pulled to "0" (Low State). This waveform is fed to either the RF modulator or the IR transmitter for transmission. The transmitted radio frequency or infrared ray is received by the RF demodulator or IR receiver and reshaped to the special waveform. PT2272 is then used to decode the waveform and set the corresponding output pin(s). Thus completing a remote control encoding and decoding function.

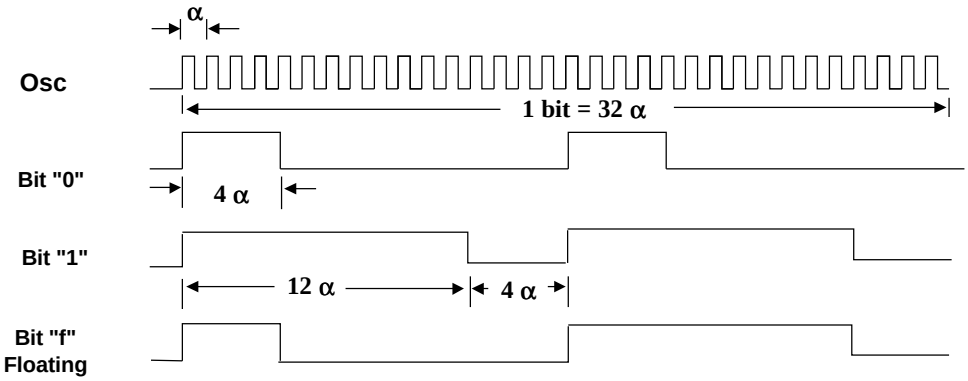
RF Operation

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

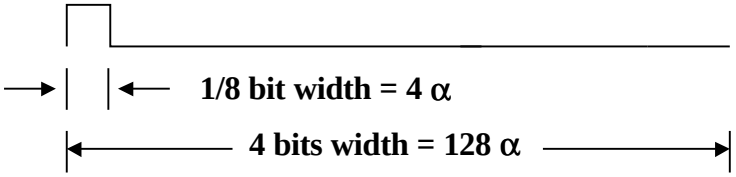
An AD Bit can be designated as Bit "0", "1" or "f" if it is in low, high or floating state respectively. One bit waveform consists of 2 pulse cycles. Each pulse cycle has 16 oscillating time periods. For further details, please refer to the diagram below:



where : α = Oscillating Clock Period

Synchronous (Sync.) Bit Waveform

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

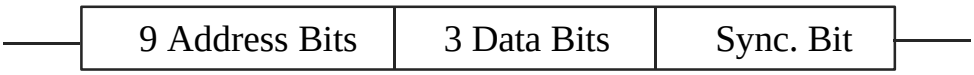


Note : 1 bit = 32 α

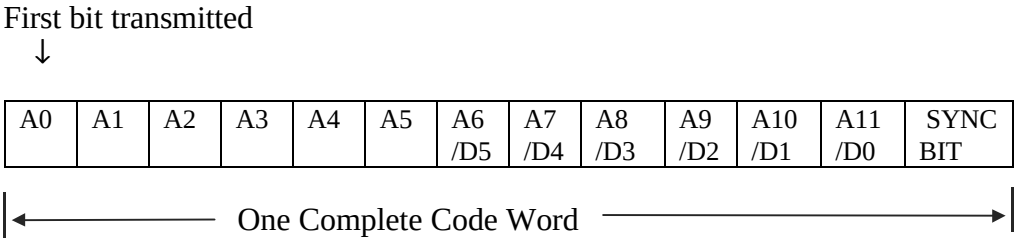
Code Word

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 determined by the corresponding states of A0 ~ A5 and A6/D5 ~ A11/D0 pins at the time of transmission. When Data Type of PT2262 is used, the address bits will decrease accordingly.

For example: In the 3 Data Type where the address has nine (9) bits, the transmitting format is:



PT2262 / PT2272 has a maximum of twelve (12) Address Bits including the six (6) Address/Data bits. The following diagram shows the code bits with their corresponding pins.

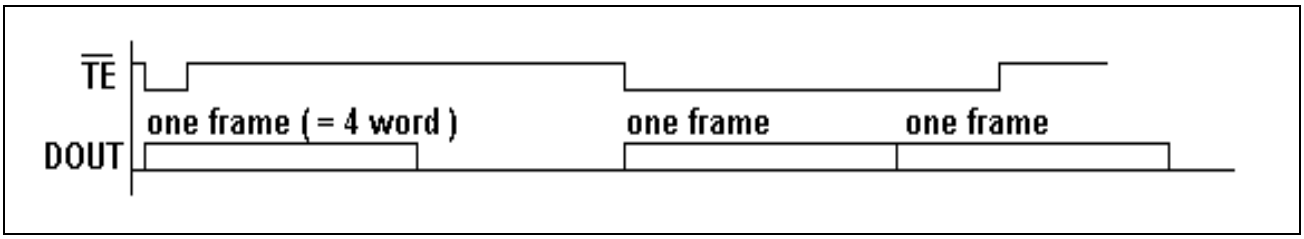


0	Data	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	Sync.Bit
1	Data	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	D0	Sync.Bit
2	Data	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	D1	D0	Sync.Bit
3	Data	A0	A1	A2	A3	A4	A5	A6	A7	A8	D2	D1	D0	Sync.Bit
4	Data	A0	A1	A2	A3	A4	A5	A6	A7	D3	D2	D1	D0	Sync.Bit
5	Data	A0	A1	A2	A3	A4	A5	A6	D4	D3	D2	D1	D0	Sync.Bit
6	Data	A0	A1	A2	A3	A4	A5	D5	D4	D3	D2	D1	D0	Sync.Bit

The Code Bits A0 ~ A5 and A6/D5 ~ A11/D0 are determined by the states of A0 ~ A5 and A6/D5 ~ A11/D0 pins. For example, when the A0 (Pin No. 1) is set to "1" (Vcc), the Code Bit A0 is synthesized as "1" bit. In the same manner, when it (A0 Pin) is set to "0" (Vss) or left floating, the Code Bit A0 is synthesized as a "0" or "f" bit respectively.

Code Frame

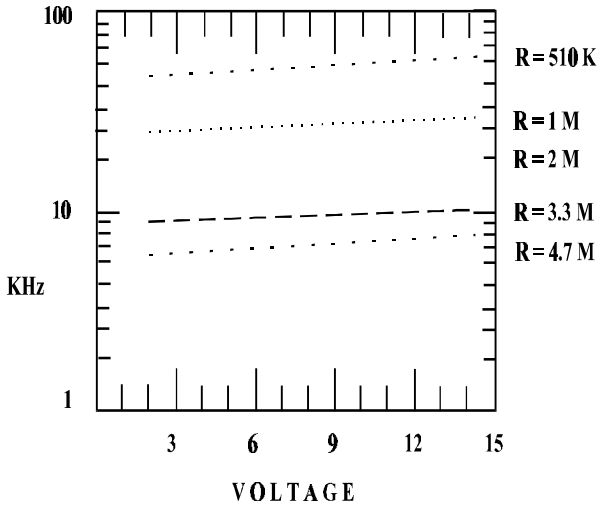
A Code Frame consists of four (4) continuous Code Words. When PT2262 detects "0" on the TE (meaning, the TE is active "low"), it outputs a Code Frame at DOUT. If TE is still active at the time the Code Frame transmission ends, PT2262 outputs another Code Frame. It should be noted that the Code Frame is synthesized at the time of transmission.



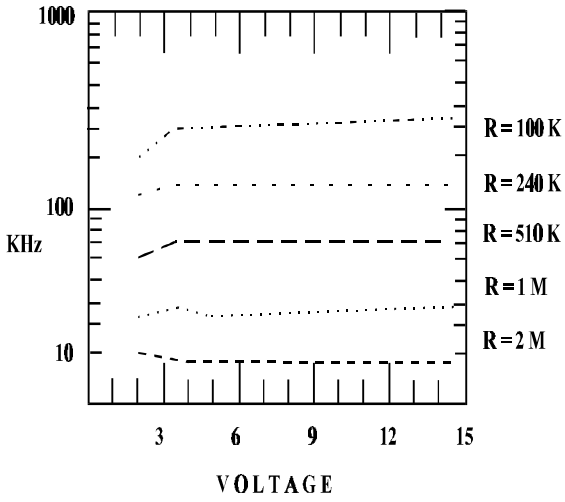
Single Resistor Oscillator

The built–in oscillator circuitry of PT2262 allows a precision oscillator to be constructed by connecting an external resistor between OSC1 and OSC2 pins. For PT2272 to decode correctly the received waveform, the oscillator frequency of PT2272 must be 2.5 ~ 8 times that of transmitting PT2262. The typical oscillator frequency with various resistor values for both PT2262 and PT2272 are shown below :

Encoder OSC Frequency



Decoder OSC Frequency



Suggested oscillator resistor values are shown below.

PT2262	PT2272
4.7 MΩ	820 KΩ*
3.3 MΩ	680 KΩ*
1.2 MΩ	200 KΩ**

Note: * -- Operates when PT2272 's Vcc=5V to 15V
** -- Operates when PT2272's Vcc=3V to 15V

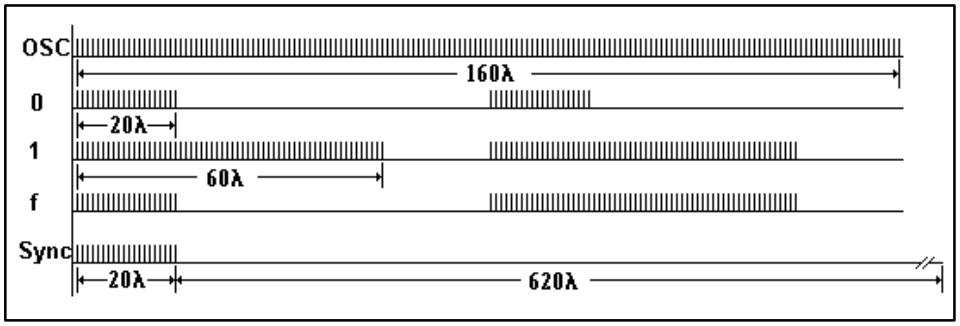
This means that if PT2272 supply voltage is lower than 5 Volts, you need to use a lower oscillator resistor value for both PT2262 and PT2272.

IR Operation

In the IR Type of Operation, the functions are similar to the above descriptions except for the output waveform that has a carrier 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 Word.

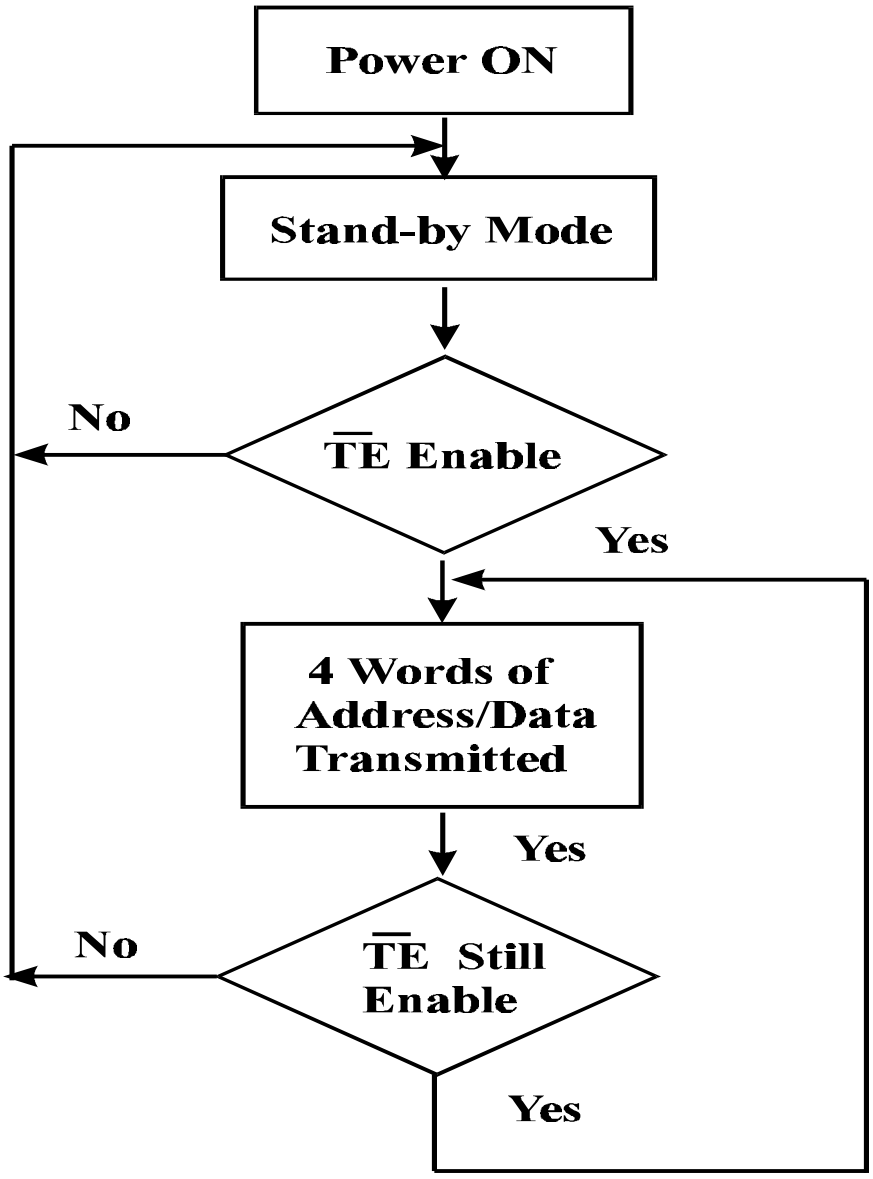
Code Frame

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

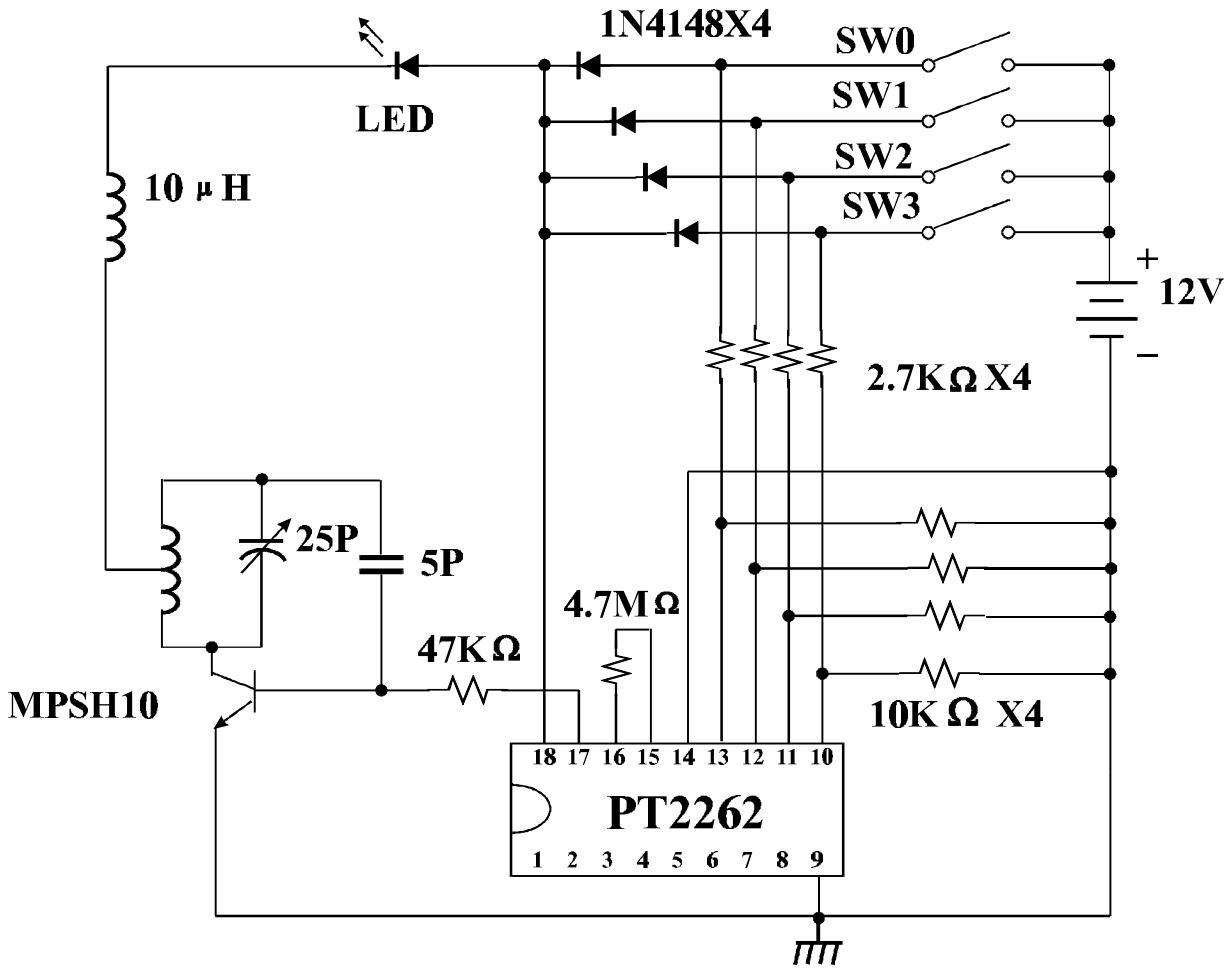
Oscillator

The Oscillator Frequency for the IR Type of Operation is twice the carrier frequency. Thus, the oscillator frequency should be kept at 76 kHz. A 430K ~ 470KΩ oscillator resistor between OSC 1 and OSC 2 pins is recommended. It should be noted that the carrier is a 50% duty cycle frequency.

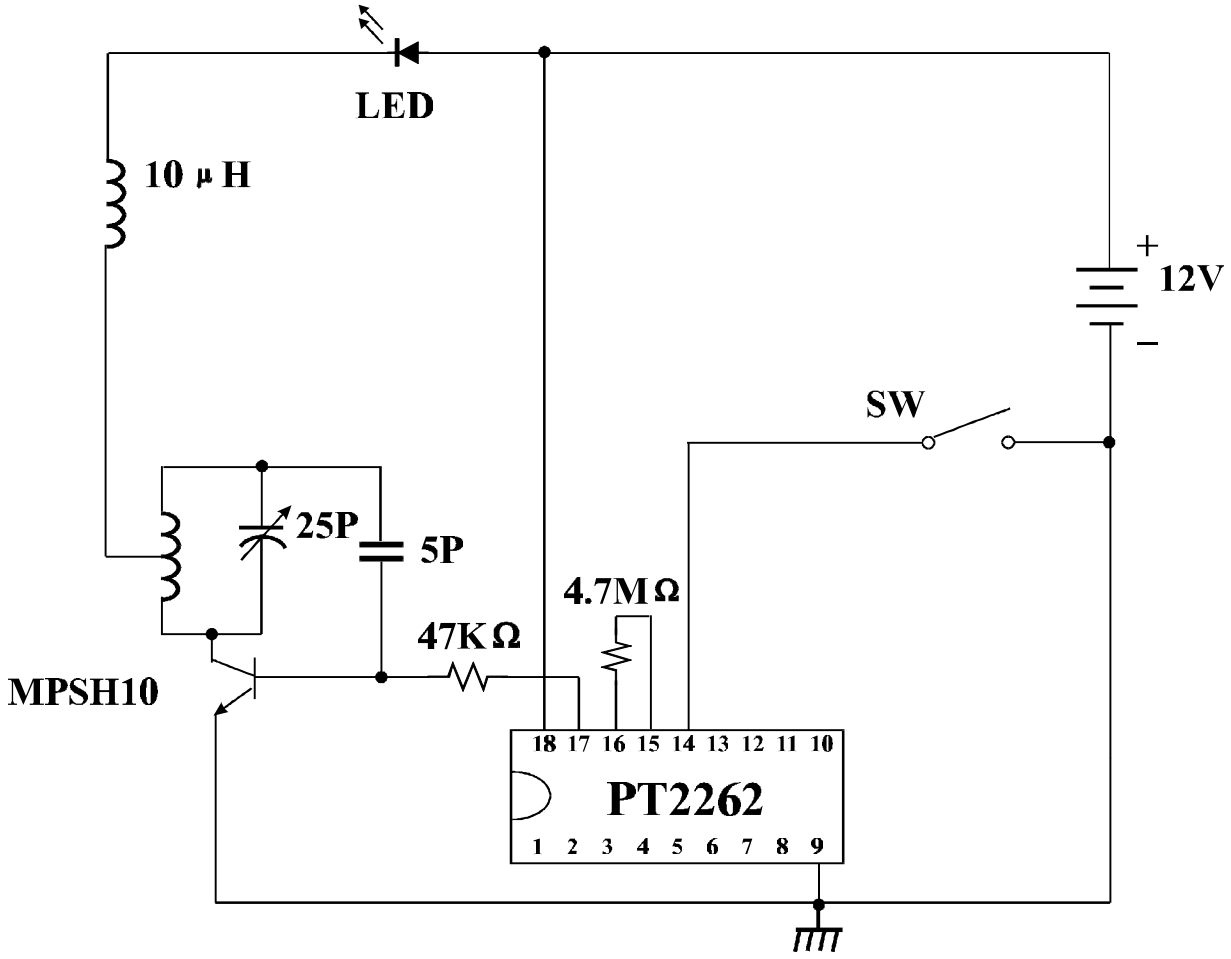
Operation Flow Chart



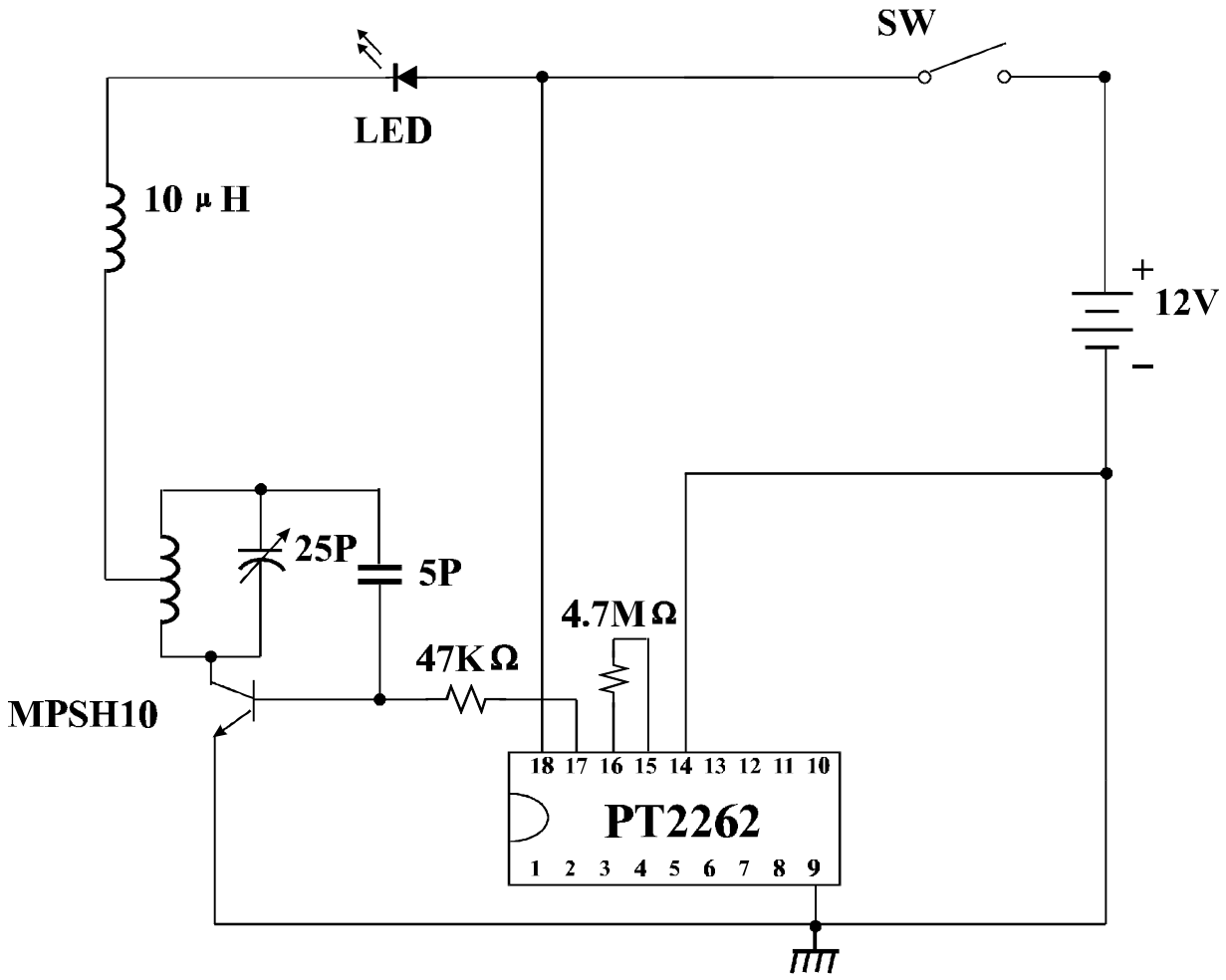
Application Circuit



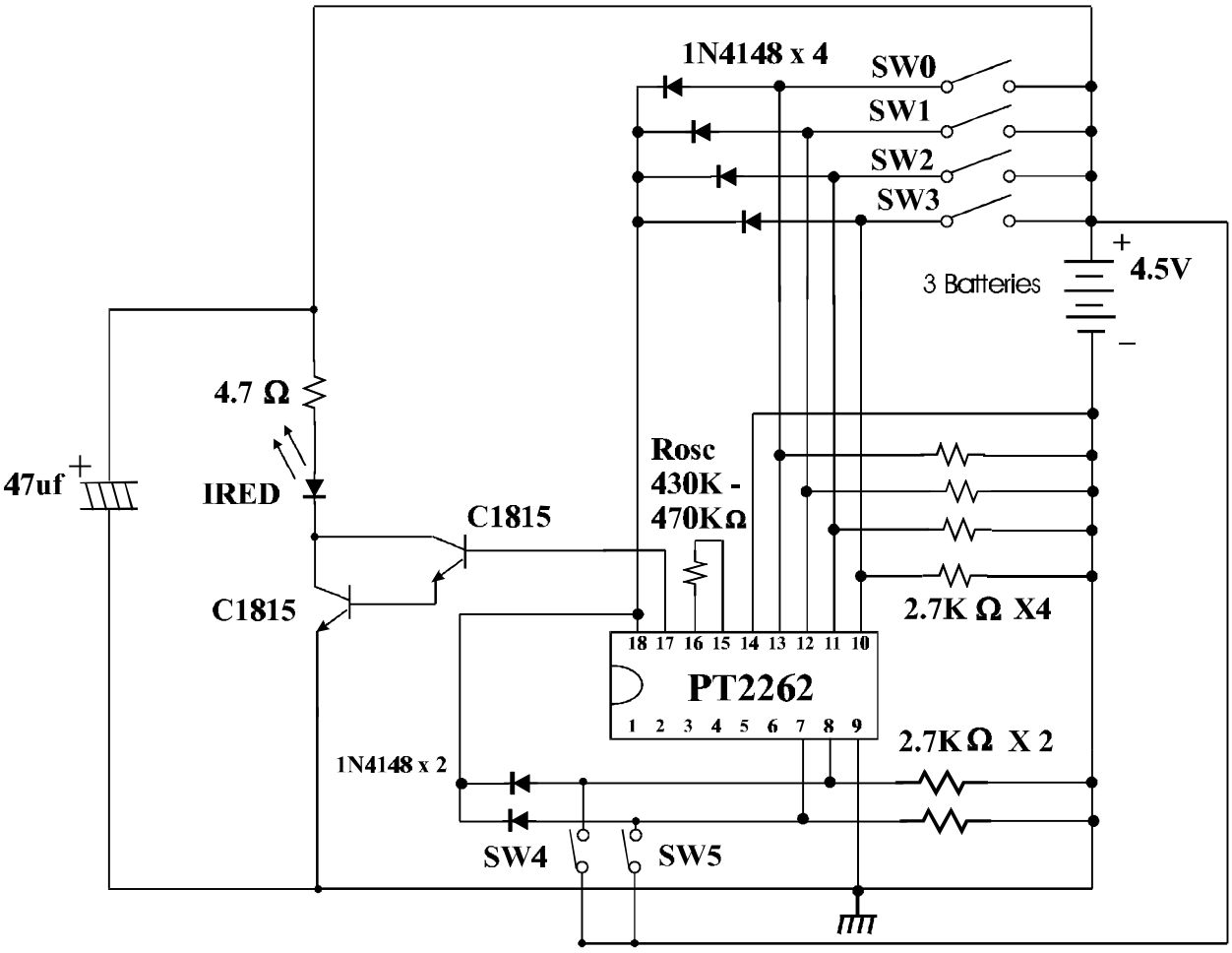
UHF Band 4 Data Transmitter Circuit is recommended.



UHF Band Address-only (Zero Data) Transmitter Circuit is recommended.



UHF Band Address-only (Zero Data) Zero-Stand-by Transmitter Circuit is recommended.



Infrared Ray 6-Data Circuit. Adjust Rosc to get 38 KHz Carrier Pulse at DOUT Pin is recommended.

Absolute Maximum Rating

SYMBOL	PARAMETER	CONDITION	RATING	UNIT
Vcc	Supply Voltage		–0.3 ~ 16.0	Volt
VI	Input Voltage		–0.3 ~ Vcc+0.3	Volt
VO	Output Voltage		–0.3 ~ Vcc+0.3	Volt
Pa	Maximum Power Dissipation	Vcc = 12 Volt	300	mW
Topr	Operating Temperature		–20 ~ 70	°C
Tstg	Storage Temperature		–40 ~ 125	°C

DC Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	Vcc		4		15	Volt
Stand-by Current	I_{SB}	Vcc=12 Volt OSC2=12 Volts A0 ~ A11 Open		0.1	1	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_{OL}=3 Volt	2			mA
		Vcc = 8 Volt V_{OL} = 4 Volt	5			mA
		Vcc = 12 Volt V_{OL} = 6 Volt	9			mA

Ordering Information

Valid Product No.	Package
PT2262	18 Pins, DIP
PT2262-S18	18 Pins, SO
PT2262-IR	18 Pins, DIP
PT2262-S	20 Pins, SO
PT2262-IR-S	20 Pins, SO

PT 2262 - XX - X

Package Code :

P : Plastic DIP (this code can be omitted)
S : Small Outline, 20 Pins
S18 : Small Outline, 18 Pins

Output Type :

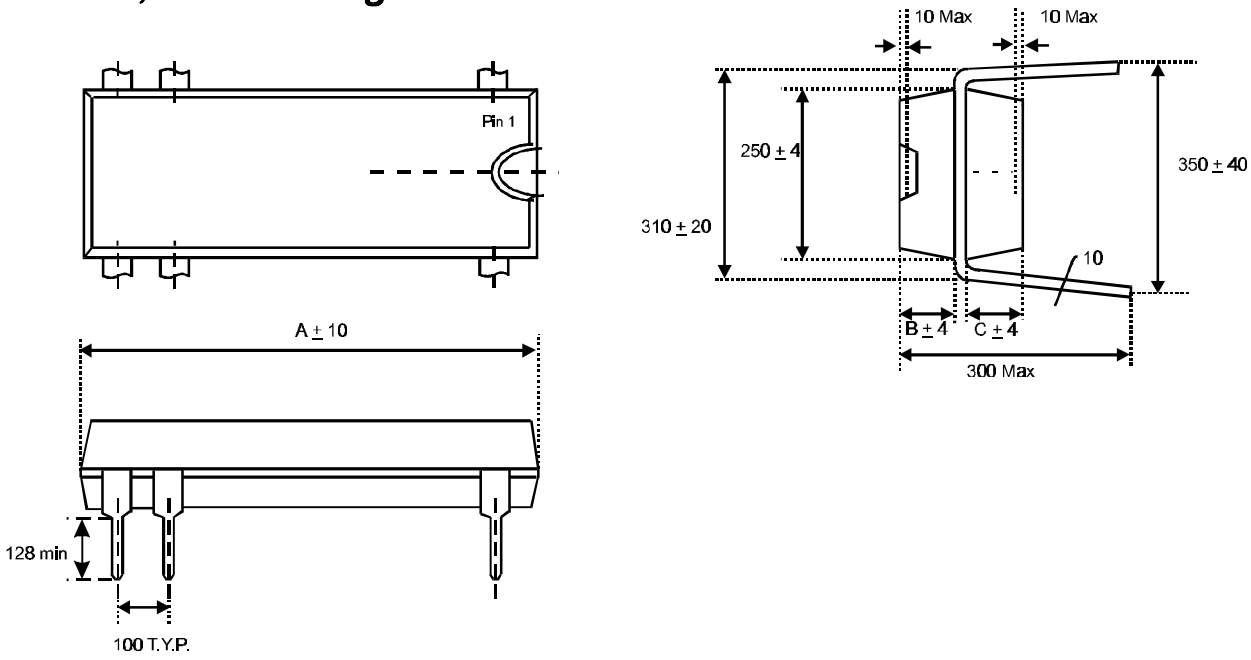
RF : RF Application (can be omitted)
IR : IR Application

Product Number

PTC Prefix

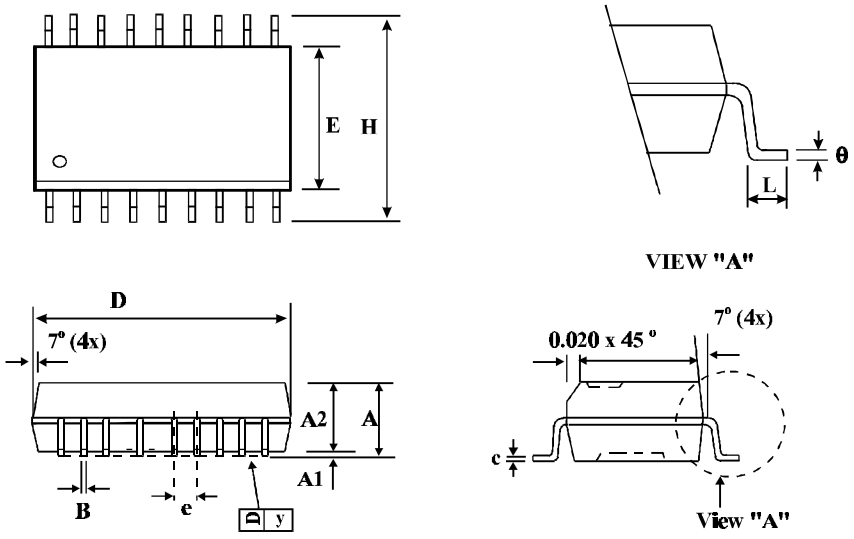
Package Information

18 Pins, DIP Package



Symbol	Dimension in Mil
A	900
B	60
C	60

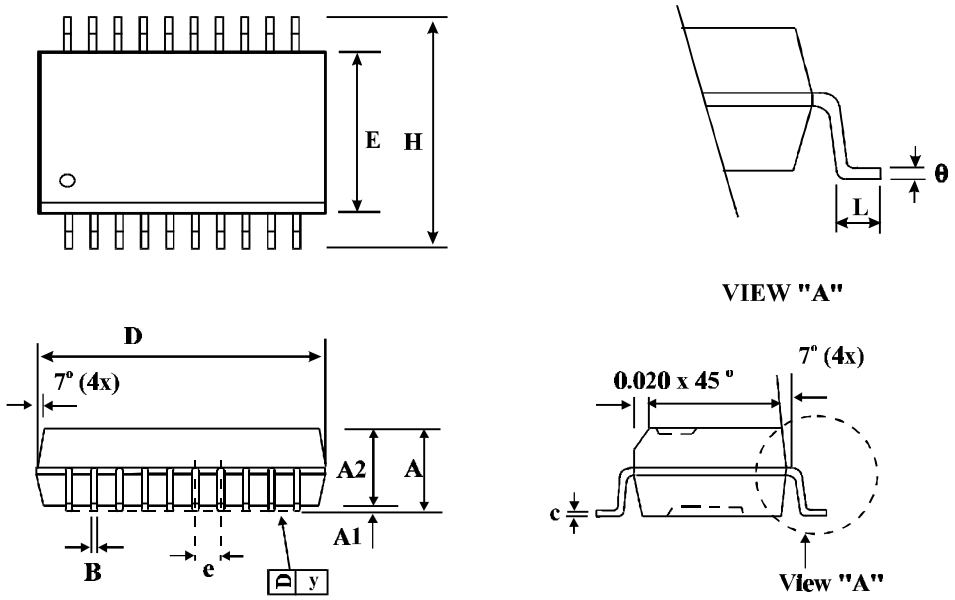
18 Pins, SO Package



Symbol	Dimensions in Inches		
	Min	Nom	Max
A	0.095	0.100	0.105
A1	0.004	-	0.011
A2	-	0.092	-
B	-	0.016 REF	-
C	-	0.010 REF	-
D	0.452	0.455	0.458
E (Bottom)	0.292	0.295	0.298
E (Top)	-	0.293	-
e	-	0.050 BSC	-
H	0.396	0.406	0.416
L	-	0.03	-
S	0.0225	0.0275	0.0325

Note: 1. Controlling Dimension: Inch
2. Tolerance: .x ±
.xx ± .01
.xxx ± .002
Angular ± 3°
3. Otherwise dimensions follow acceptable spec.

20 Pins, SO Package



Symbol	Dimensions in Millimeter			Dimensions in Inches		
	Min	Nom	Max	Min	Nom	Max
A	2.36	2.49	2.64	0.093	0.098	0.104
A1	0.10	-	0.30	0.004	-	0.012
A2	-	2.31	-	-	0.091	-
B	0.33	0.41	0.51	0.013	0.016	0.020
C	0.18	0.23	0.28	0.007	0.009	0.011
D	12.60	12.80	12.90	0.496	0.504	0.508
E	7.39	7.49	7.59	0.291	0.295	0.299
e	-	1.27	-	-	0.050	-
H	10.01	10.31	10.64	0.394	0.406	0.419
L	0.38	0.81	1.27	0.015	0.032	0.050
y	-	-	0.10	-	-	0.004
θ	0°	-	8°	0°	-	8°

Note:
1. Controlling Dimension : Inch
2. Lead Frame Material : Copper 194
3. After solder plating lead thickness will be 0.015” max.
4. Dimension “D” does not include mold flash, protrusions or gate burrs.
5. Dimension “E” does not include interlead flash or protrusions.
6. Tolerance : ± 0.010” unless otherwise specified.
7. Otherwise dimensions follow acceptable spec.