



## DESCRIPTION

The PT2607 Encoder Series are tri-state remote control encoder ICs utilizing CMOS Technology. It encodes data and address pins into a serially encoded waveform suitable for RF modulation. PT2607 supports up to a maximum 12 address and 8 address/data bits. Housed in either 18, 20 or 24 pins, SOP or DIP Package, PT2607's pin assignments and application circuit are optimized for easy PCB Layout and cost saving benefits.

## FEATURES

- CMOS technology
- Low power consumption
- Operating voltage: 2.4 to 15V
- Low standby current
- Three words transmission
- Built-in oscillator
- Least external components
- Available in 18, 20 or 24 pins, DIP or SOP package
- Easy to use

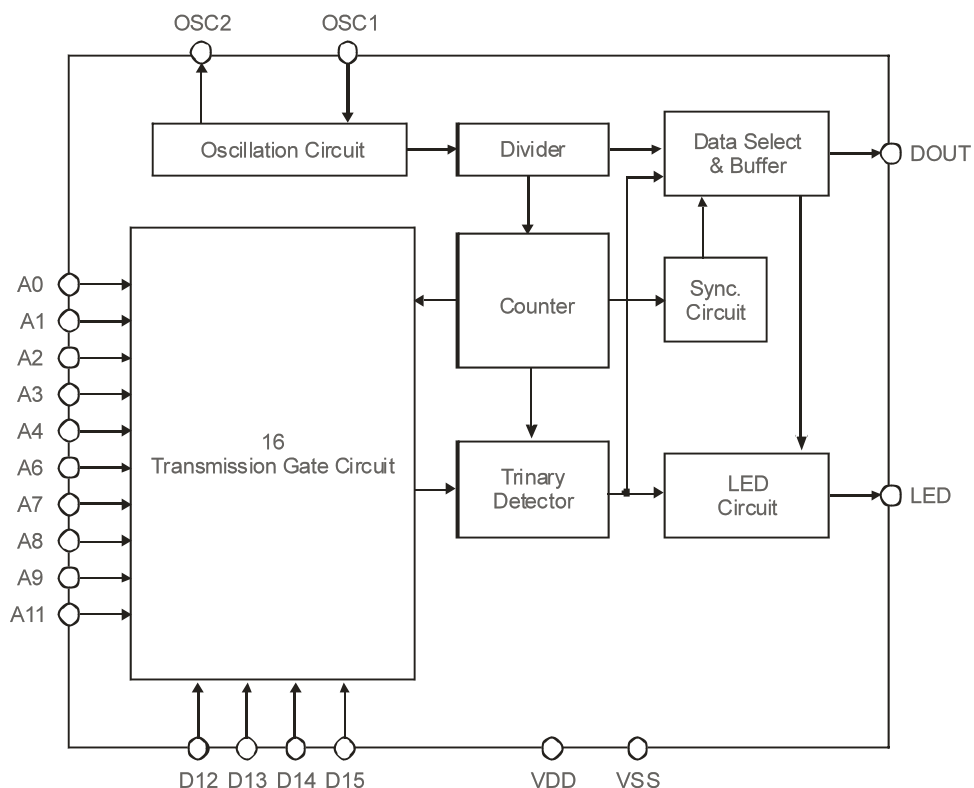
## APPLICATIONS

- Burglar alarm system
- Car/Motorcycle security system
- Home/Office security system
- Smoke & fire alarm system
- Toy/Garage door remote controller
- Cordless telephone
- Object finder
- Remote switch
- Remote control for industrial use
- Automation system



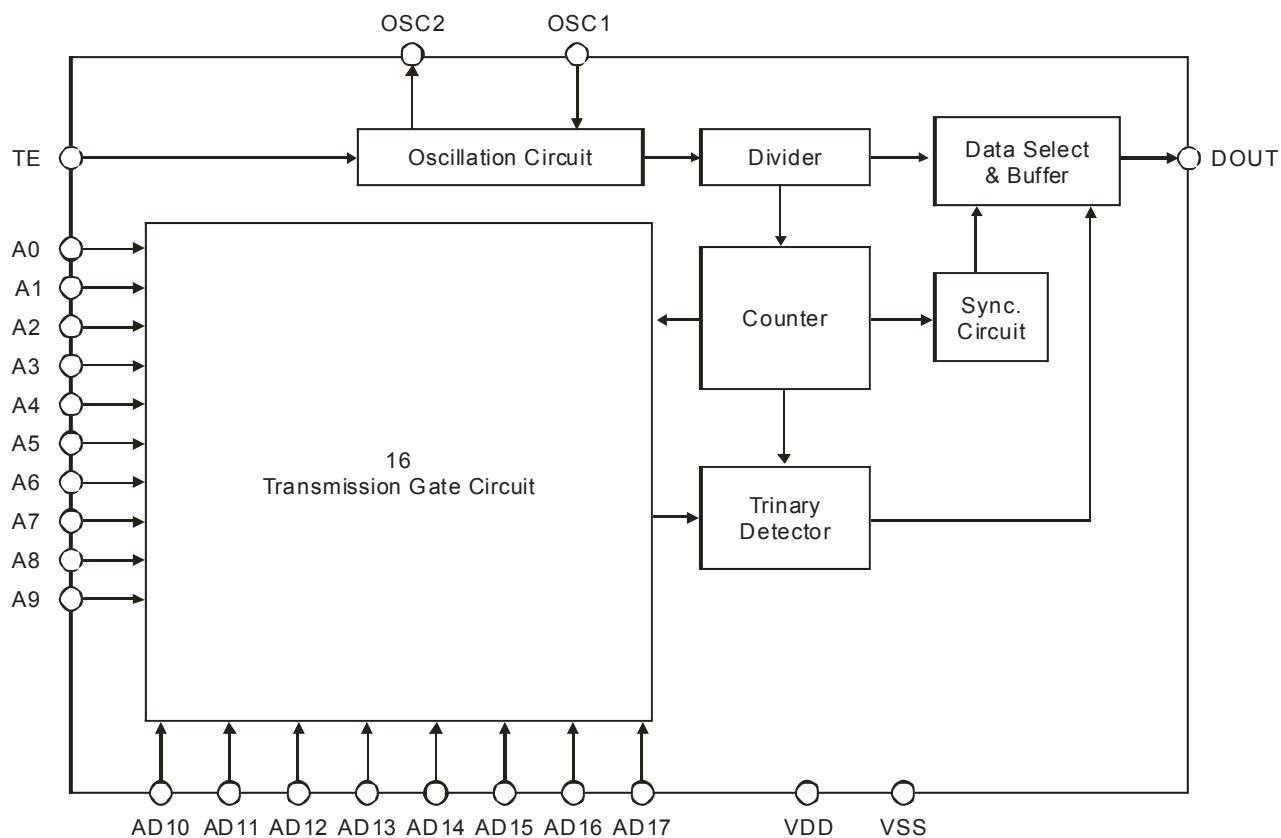
## BLOCK DIAGRAM

**DATA TRIGGER TYPE: PT2607, PT2607-S**



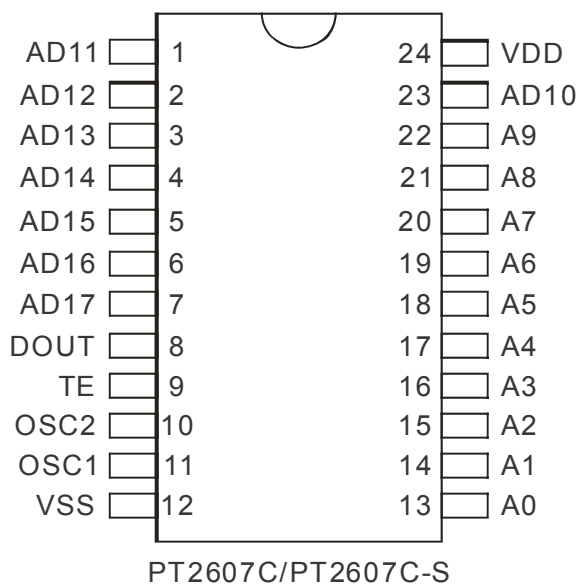
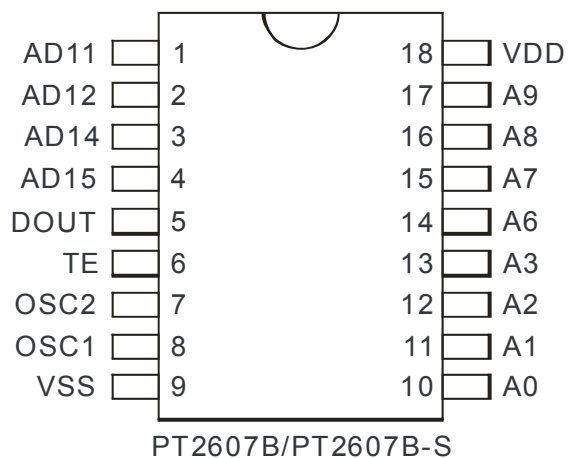
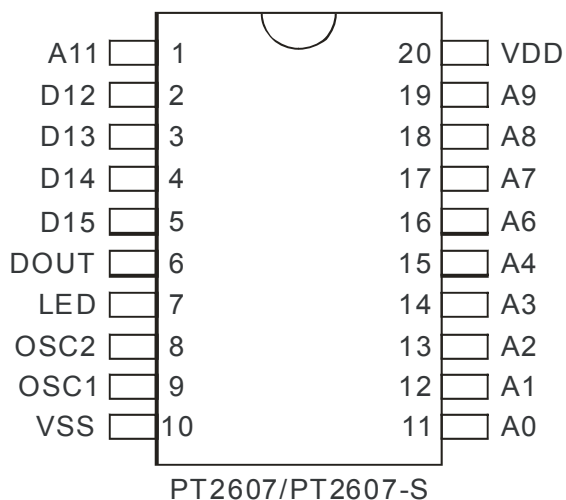


**TE TRIGGER: PT2607B, PT2607B-S, PT2607C, PT2607C-S**





## PIN CONFIGURATION





## Remote Control Encoder IC

**PT2607**

## PIN DESCRIPTION

| Pin Name  | I/O | Description                                                                                                                                             | Pin No. |         |         |
|-----------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|---------|
|           |     |                                                                                                                                                         | 18 pins | 20 pins | 24 pins |
| A11       | I   | Address pin no. 11<br>This pin may be externally set to "0", "1" or "floating"                                                                          | -       | 1       | -       |
| A0~A3     | I   | Address pin no. 0~3<br>These pins may be externally set to "0", "1" or "floating"                                                                       | 10~13   | 11~14   | 13~16   |
| A4        | I   | Address pin no. 4<br>This pin may be externally set to "0", "1" or "floating"                                                                           | -       | 15      | 17      |
| A5        | I   | Address pin no. 5<br>This pin may be externally set to "0", "1" or "floating"                                                                           | -       | -       | 18      |
| A6~A9     | I   | Address pin no. 6~9<br>These pins may be externally set to "0", "1" or "floating"                                                                       | 14~17   | 16~19   | 19~22   |
| AD10      | I   | Address/Data Input & Transmission Enable Pins<br>Active high (Internal pull-low resistor)<br>These pins may be externally set to "0", "1" or "floating" | -       | -       | 23      |
| AD11~AD12 |     |                                                                                                                                                         | 1~2     | -       | 1~2     |
| AD13      |     |                                                                                                                                                         | -       | -       | 3       |
| AD14~AD15 |     |                                                                                                                                                         | 3~4     | -       | 4~5     |
| AD16~AD17 |     |                                                                                                                                                         | -       | -       | 6~7     |
| D12~D15   | I   | Data Input and Transmission Enable Pins<br>Active high (Internal pull-low resistor)<br>These pins may be externally set to "0", "1" or "floating"       | -       | 2~5     | -       |
| DOUT      | O   | Data Output Pin                                                                                                                                         | 5       | 6       | 8       |
| LED       | O   | LED Indicator Pin                                                                                                                                       | -       | 7       | -       |
| TE        | I   | Transmission Enable Pin (Active High)                                                                                                                   | 6       | -       | 9       |
| OSC2      | O   | Oscillator Input Pin                                                                                                                                    | 7       | 8       | 10      |
| OSC1      | I   | Oscillator Output Pin                                                                                                                                   | 8       | 9       | 11      |
| VSS       | -   | Negative Power Supply                                                                                                                                   | 9       | 10      | 12      |
| VDD       | -   | Positive Power Supply                                                                                                                                   | 18      | 20      | 24      |

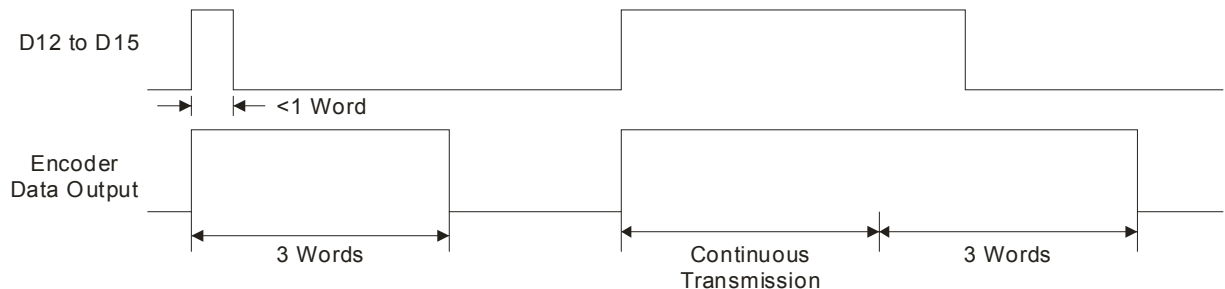


## FUNCTION DESCRIPTION

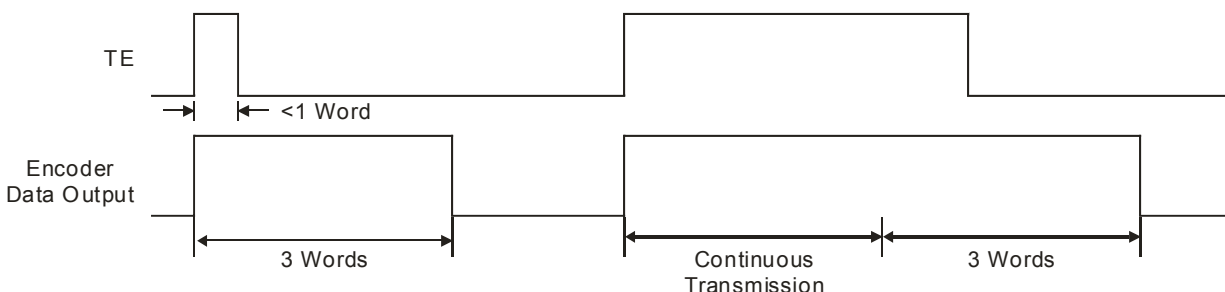
### OPERATION

Transmission is enabled by setting any one of the data pins -- D12 to D15 -- to “HIGH” (for PT2607 version) or by setting the TE (for PT2607B and PT2607C versions).

For PT2607 version, when transmission enable signals from Pins -- D12 to D15 -- are received, PT2607 begins a three-word transmission cycle. This three-word transmission cycle will continue as long as the transmission enable (D12 to D15) is held “HIGH”. When D12 to D15 goes to “LOW” (that is, the transmission enable become “LOW”), the encoder output completes its final three-word transmission cycle and then stops. Please refer to the diagram below.



For PT2607B & PT2607C versions, when transmission enable signals from TE is received, PT2607B/PT2607C begins a three-word transmission cycle. This three-word transmission cycle will continue as long as the transmission enable is held “HIGH”. When TE goes to “LOW” (that is, the transmission enable become “LOW”), the encoder output completes its final three-word transmission cycle and then stops. Please refer to the diagram below.



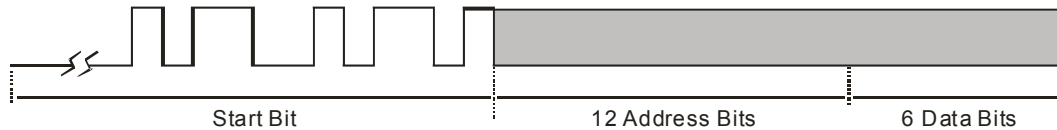


## Remote Control Encoder IC

**PT2607**

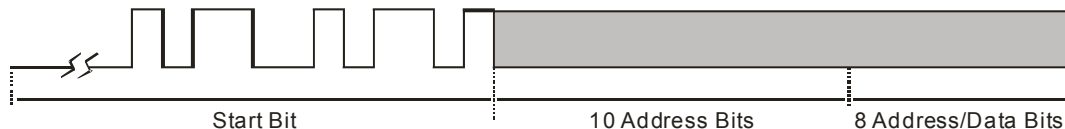
### PT2607 CODE WORD

A Code Word consists of a Start Bit, 12 Address Bits and 6 Data Bits. Please refer to the diagram below.

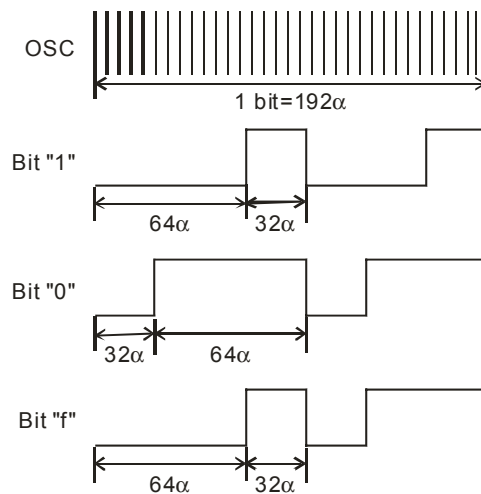


### PT2607B & PT2607C CODE WORD

A Code Word consists of a Start Bit, 10 Address Bits and 8 Address/ Data Bits. Please refer to the diagram below.



### ADDRESS BITS & DATA BITS WAVEFORM



where:

$\alpha$  = oscillating clock period

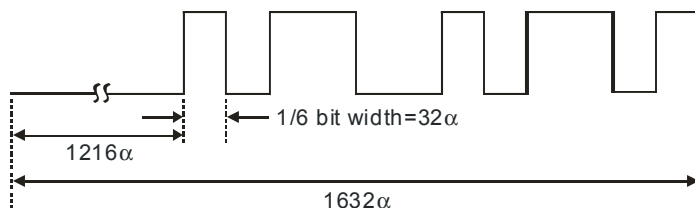
The Data Input Floating State is interpreted as "LOW" by the decoders since the decoder output only provides for two states.



## Remote Control Encoder IC

**PT2607**

### START BIT



### PRESET ADDRESS/DATA PROGRAMMING

Each address or data pin can be preset to “High”, “Low” or “Floating”. When a transmission enable signal is applied, the encoder scans and transmits serially the status of the 18 bits of address/data in the order of A0 to D17.

### ADDRESS AND DATA SEQUENCE

PT2607 Address and Data Sequence is provided in the table below.

Address Bits:

|       |    |   |       |    |     |     |     |     |     |    |    |
|-------|----|---|-------|----|-----|-----|-----|-----|-----|----|----|
| 0~3   | 4  | 5 | 6~9   | 10 | 11  | 12  | 13  | 14  | 15  | 16 | 17 |
| A0~A3 | A4 | * | A6~A9 | *  | A11 | D12 | D13 | D14 | D15 | ** | ** |

Notes:

1. \*=Bit 5 and Bit 10 are “open” and internally bonded.
2. \*\*=Bit 16 and Bit 17 are set to “LOW” and are internally bonded.

PT2607B Address and Data Sequence is provided in the table below.

Address Bits:

|       |   |   |       |    |           |    |           |    |    |
|-------|---|---|-------|----|-----------|----|-----------|----|----|
| 0~3   | 4 | 5 | 6~9   | 10 | 11~12     | 13 | 14~15     | 16 | 17 |
| A0~A3 | * | * | A6~A9 | *  | AD11~AD12 | *  | AD14~AD15 | *  | *  |

Note: \*=Bits 4,5,10,13,16,17 are “open” and internally bonded.

PT2607C Address and Data Sequence is provided in the table below.

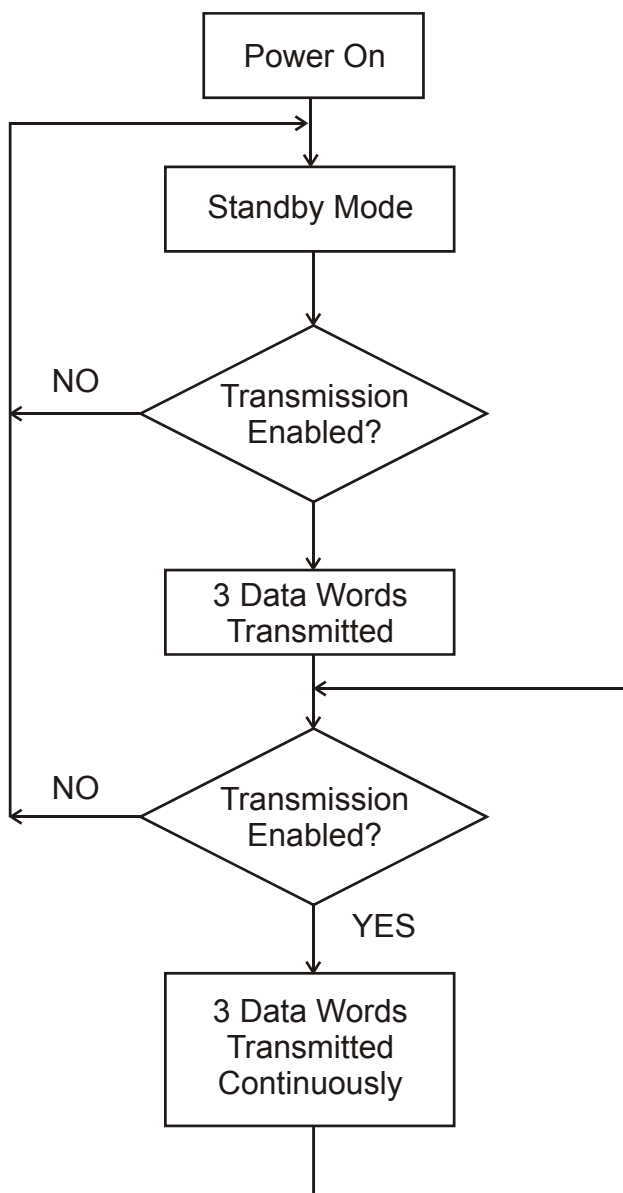
Address Bits:

|    |    |    |    |    |    |    |    |    |    |      |      |      |      |      |      |      |      |
|----|----|----|----|----|----|----|----|----|----|------|------|------|------|------|------|------|------|
| 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   |
| A0 | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | AD10 | AD11 | AD12 | AD13 | AD14 | AD15 | AD16 | AD17 |





## OPERATION FLOWCHART



### Notes:

1. D12 to D15 is transmission enable pins of PT2607 version.
2. TE is the transmission enable pin of PT2607B and PT2607C versions.

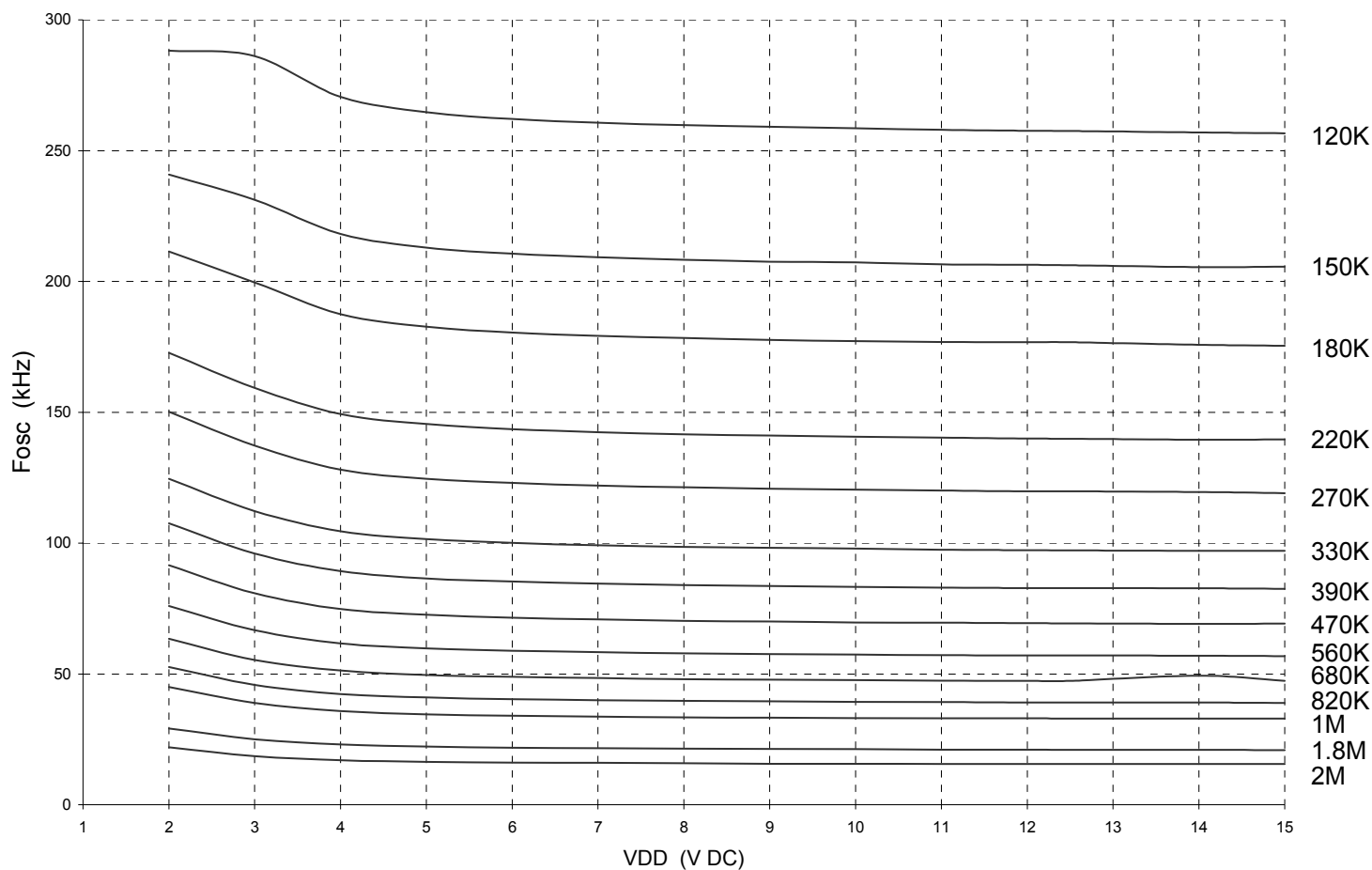


Remote Control Encoder IC

PT2607

## OSCILLATION FREQUENCY VS. SUPPLY VOLTAGE

The recommended oscillation frequency of PT2607 ICs must be equal to the oscillation frequency of the decoder. That is, Fosc (decoder) Fosc (encoder).





## ABSOLUTE MAXIMUM RATINGS

| Parameter             | Symbol | Rating     | Unit |
|-----------------------|--------|------------|------|
| Operating temperature | Topr   | -40 ~ +85  | °C   |
| Storage temperature   | Tstg   | -65 ~ +150 | °C   |

## ELECTRICAL CHARACTERISTICS

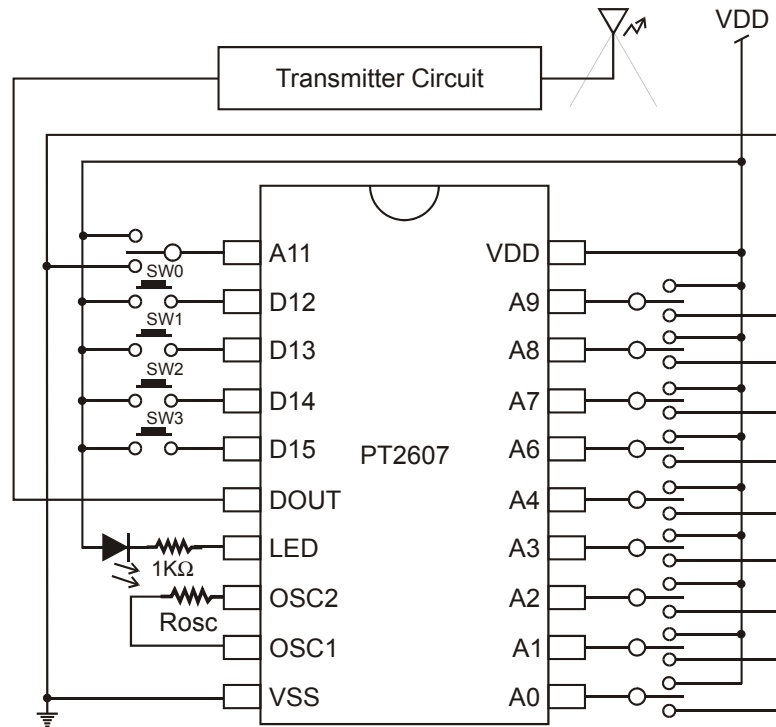
(Unless otherwise specified, Ta=25°C)

| Parameter                      | Symbol | Conditions                    | Min.   | Typ. | Max.   | Unit |
|--------------------------------|--------|-------------------------------|--------|------|--------|------|
| Operating voltage              | VDD    |                               | 2.4    | -    | 15     | V    |
| Standby current                | ISB    | VDD=3V, OSC stops             | -      | 0.1  | 1      | μA   |
|                                |        | VDD=12V, OSC stops            | -      | 2    | 4      |      |
| Operating current              | IDD    | VDD=5V, no load               | -      | 250  | 500    | μA   |
|                                |        | VDD=12V,<br>Fosc=100KHz       | -      | 1200 | 2400   |      |
| LED sink current               | ILED   | VDD=5V, VLED=0.5V             | 1.5    | 3    | -      | mA   |
| Output current                 | IDOUT  | VDD=5V, VOH=0.9VDD<br>(Drive) | -0.6   | -1.2 | -      | mA   |
|                                |        | VDD=5V, VOL=0.1VDD<br>(Sink)  | 0.6    | 1.2  | -      |      |
| High level input voltage       | VIH    |                               | 0.8VDD | -    | VDD    | V    |
| Low level input voltage        | VIL    |                               | 0      | -    | 0.2VDD | V    |
| Oscillator frequency           | Fosc   | VDD=10V, Rosc=330KΩ           | -      | 100  | -      | KHz  |
| D12 to D15 pull low resistance | RDATA  | VDD=5V, VDATA=5V              | -      | 1.5  | 3      | MΩ   |

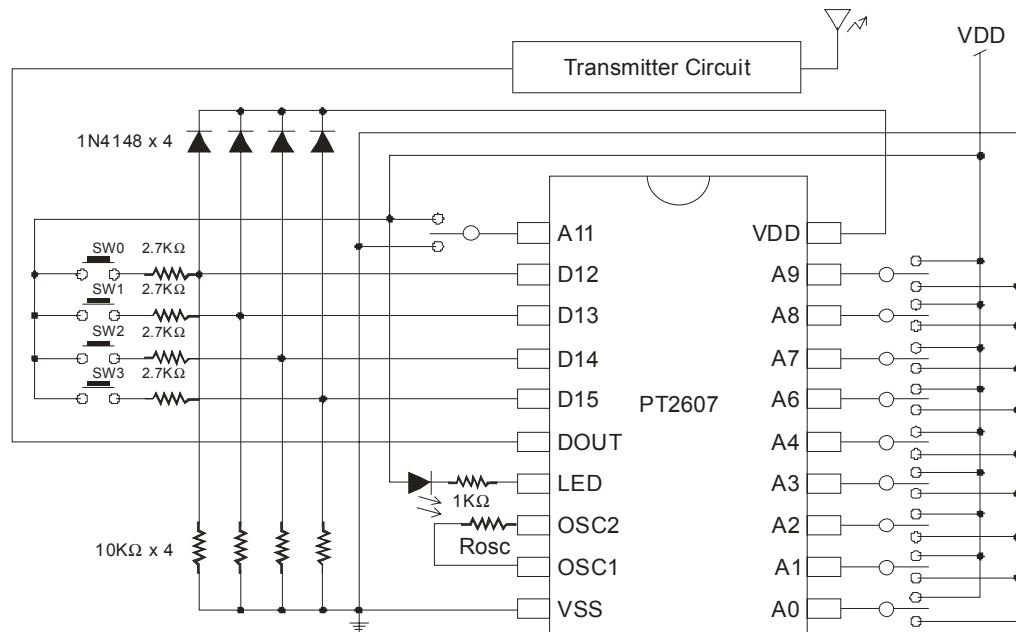


## APPLICATION CIRCUIT

### PT2607-1



### PT2607-2

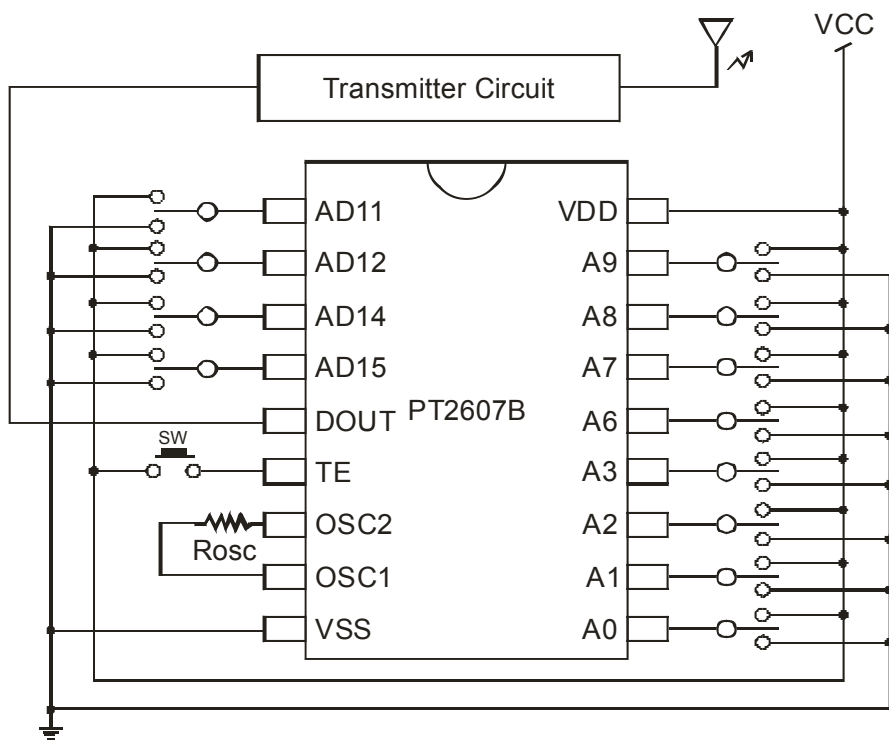




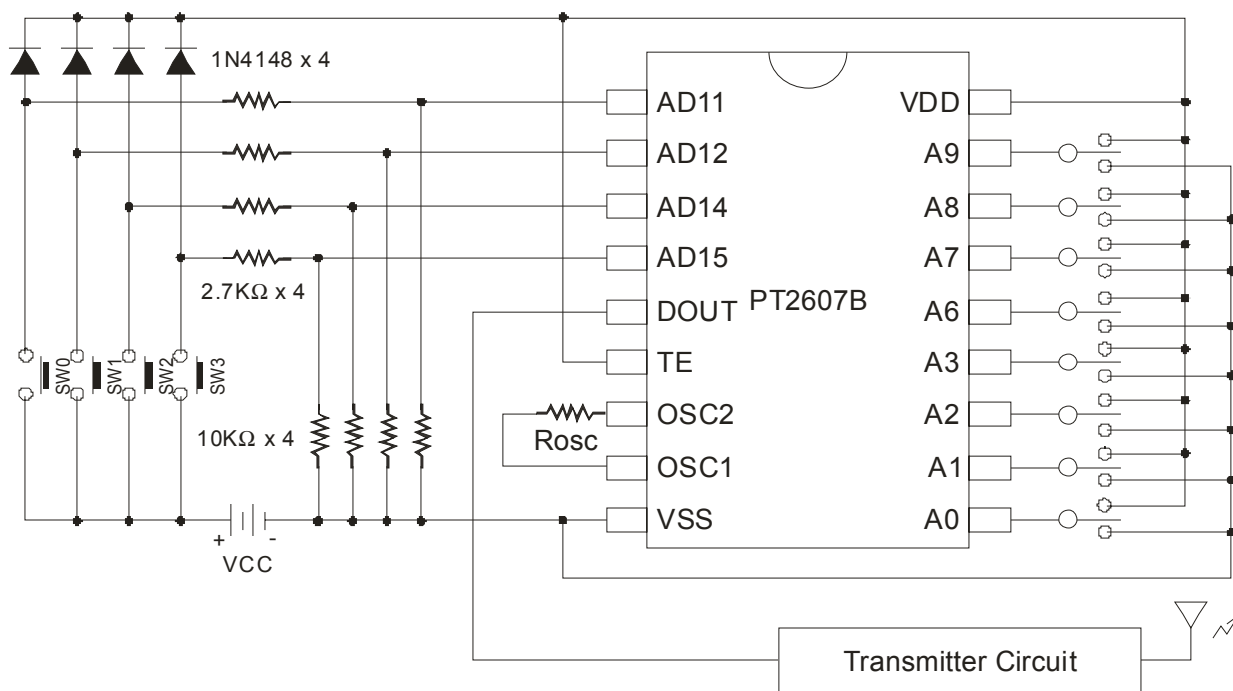
Remote Control Encoder IC

PT2607

PT2607B -1



PT2607B-2

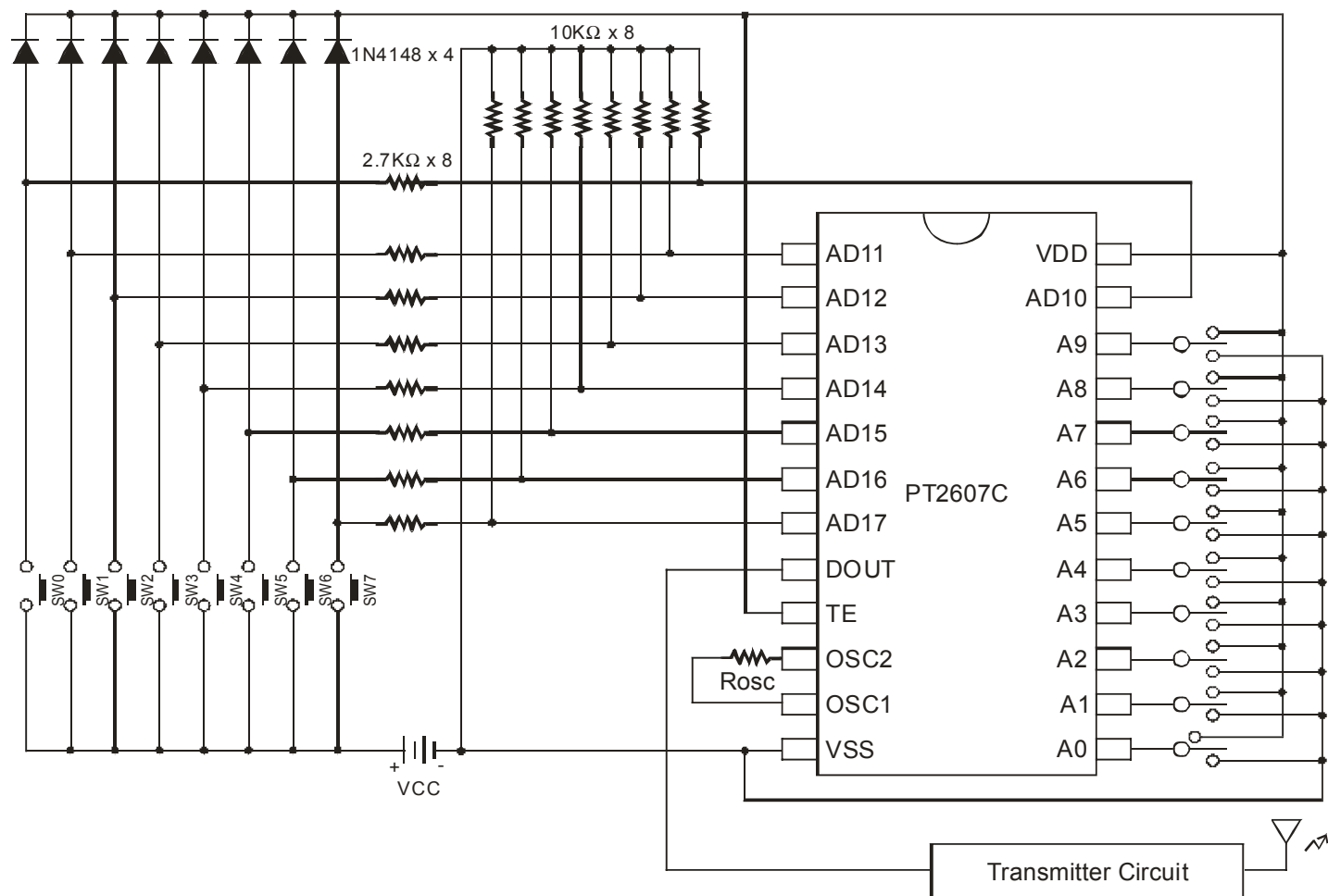




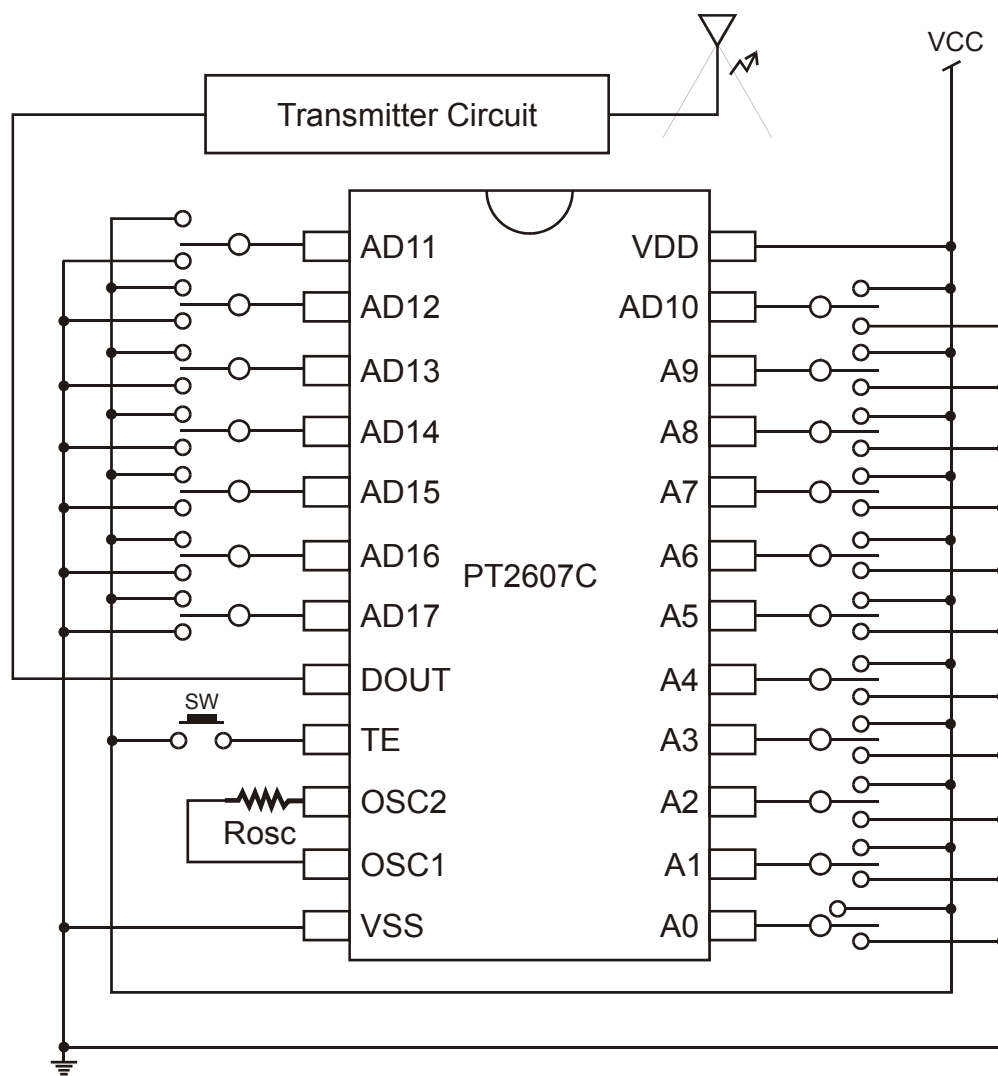
Remote Control Encoder IC

PT2607

PT2607C-1



***PT2607C-2***





## ORDER INFORMATION

| Valid Part Number | Package Type         | Top Code  |
|-------------------|----------------------|-----------|
| PT2607            | 20 Pins, DIP, 300mil | PT2607    |
| PT2607-S          | 20 Pins, SOP, 300mil | PT2607-S  |
| PT2607-B          | 18 Pins, DIP, 300mil | PT2607B   |
| PT2607B-S         | 18 Pins, SOP, 300mil | PT2607B-S |
| PT2607-C          | 24 Pins, DIP, 300mil | PT2607C   |
| PT2607C-S         | 24 Pins, SOP, 300mil | PT2607C-S |







## Remote Control Encoder IC

**PT2607**

| Symbol | Min.  | Nom.       | Max.  |
|--------|-------|------------|-------|
| A      | -     | -          | 0.210 |
| A1     | 0.015 | -          | -     |
| A2     | 0.115 | 0.130      | 0.195 |
| b      | 0.014 | 0.018      | 0.022 |
| b1     | 0.014 | 0.018      | 0.020 |
| b2     | 0.045 | 0.060      | 0.070 |
| b3     | 0.030 | 0.039      | 0.045 |
| c      | 0.008 | 0.010      | 0.014 |
| c1     | 0.008 | 0.010      | 0.011 |
| D      | 0.980 | 1.030      | 1.060 |
| D1     | 0.005 | -          | -     |
| E      | 0.300 | 0.310      | 0.325 |
| E1     | 0.240 | 0.250      | 0.280 |
| e      | -     | 0.100 bsc. | -     |
| eA     | -     | 0.300 bsc. | -     |
| eB     | -     | -          | 0.430 |
| eC     | 0.000 | -          | 0.060 |
| L      | 0.115 | 0.130      | 0.150 |

### Notes:

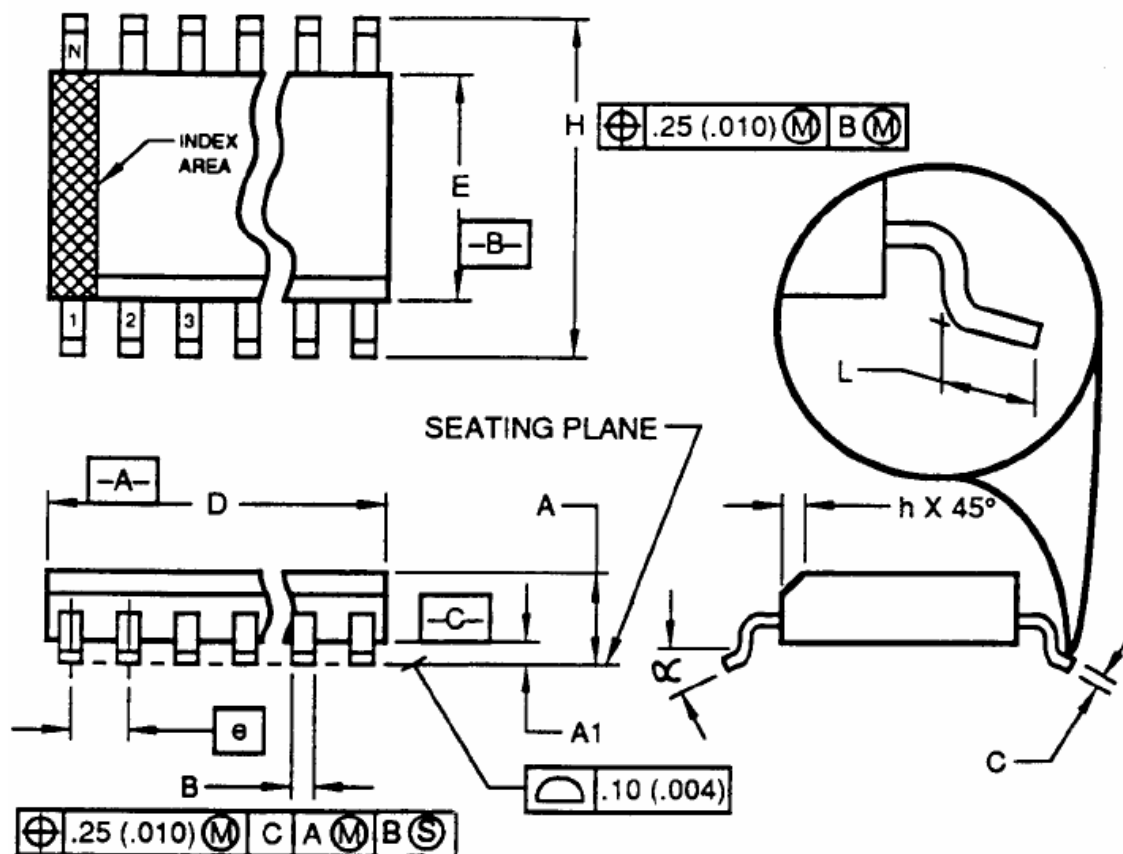
- All dimensions are in INCHES.
  - Dimensioning and tolerancing per ANSI Y14.5M-1982.
  - Dimension "A", "A1" and "L" are measured with the package seated in JEDEC Seating Plane Gauge GS-3
  - "D", "D1" and "E1" dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch.
  - "E" and "eA" measured with the leads constrained to be perpendicular to datum  $\boxed{-C-}$ .
  - "eB" and "eC" are measured at the lead tips with the leads unconstrained.
  - N is the number of the terminal positions (N=20)
  - Pointed or rounded lead tips are preferred to ease insertion.
  - "b2" and "b3" maximum dimensions are not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm)
  - Distance between leads including dambar protrusions to be 0.005 inch minimum.
  - Datum plane  $\boxed{-H-}$  coincident with the bottom of lead, where lead exits body.
  - Refer to JEDEC MS-001, Variation AD.
- JEDEC is the trademark of JEDEC SOLID STATE TECHNOLOGY ASSOCIATION.



Remote Control Encoder IC

PT2607

20 PINS, SOP, 300MIL





## Remote Control Encoder IC

**PT2607**

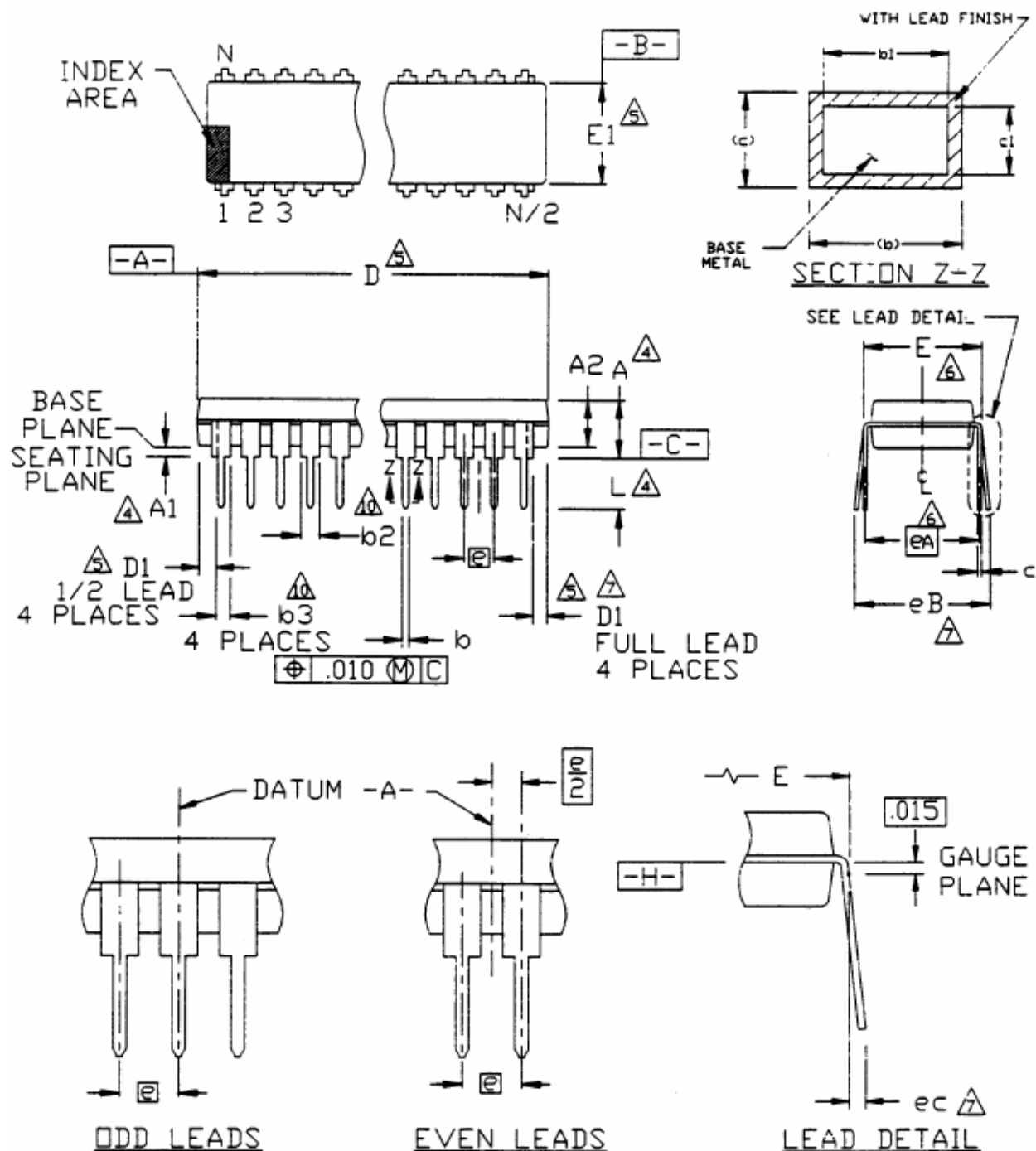
### Notes:

1. Dimensioning and tolerancing per ANSI Y14.5M-1982.
  2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold Flash, protrusion or gate burrs shall not exceed 0.15 mm (0.006 in) per side.
  3. Dimension "E" does not include interlead flash or protrusions. Interlead flash or protrusions shall not exceed 0.25 mm (0.010 in) per side.
  4. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
  5. "L" is the length of the terminal for soldering to a substrate.
  6. N is the number of the terminal positions (N=20)
  7. The lead width "B" as measured 0.36 mm (0.014 in) or greater above the seating plane, shall not exceed a maximum value of 0.61 mm (0.24 in).
  8. Controlling dimension: MILLIMETER.
  9. Refer to JEDEC MS-013, Variation AC.
- JEDEC is the trademark of JEDEC SOLID STATE TECHNOLOGY ASSOCIATION.

## Remote Control Encoder IC

PT2607

**18 PINS, DIP, 300MIL**





## Remote Control Encoder IC

**PT2607**

| Symbol | Min.       | Nom.  | Max.  |
|--------|------------|-------|-------|
| A      |            |       | 0.210 |
| A1     | 0.015      |       |       |
| A2     | 0.115      | 0.130 | 0.195 |
| b      | 0.014      | 0.018 | 0.022 |
| b1     | 0.014      | 0.018 | 0.020 |
| b2     | 0.045      | 0.060 | 0.070 |
| b3     | 0.030      | 0.039 | 0.045 |
| c      | 0.008      | 0.010 | 0.014 |
| c1     | 0.008      | 0.010 | 0.011 |
| D      | 0.880      | 0.900 | 0.920 |
| D1     | 0.005      |       |       |
| E      | 0.300      | 0.310 | 0.325 |
| E1     | 0.240      | 0.250 | 0.280 |
| e      | 0.100 bsc. |       |       |
| eA     | 0.300 bsc. |       |       |
| eB     |            |       | 0.430 |
| eC     | 0.000      |       | 0.060 |
| L      | 0.115      | 0.130 | 0.150 |

### Notes:

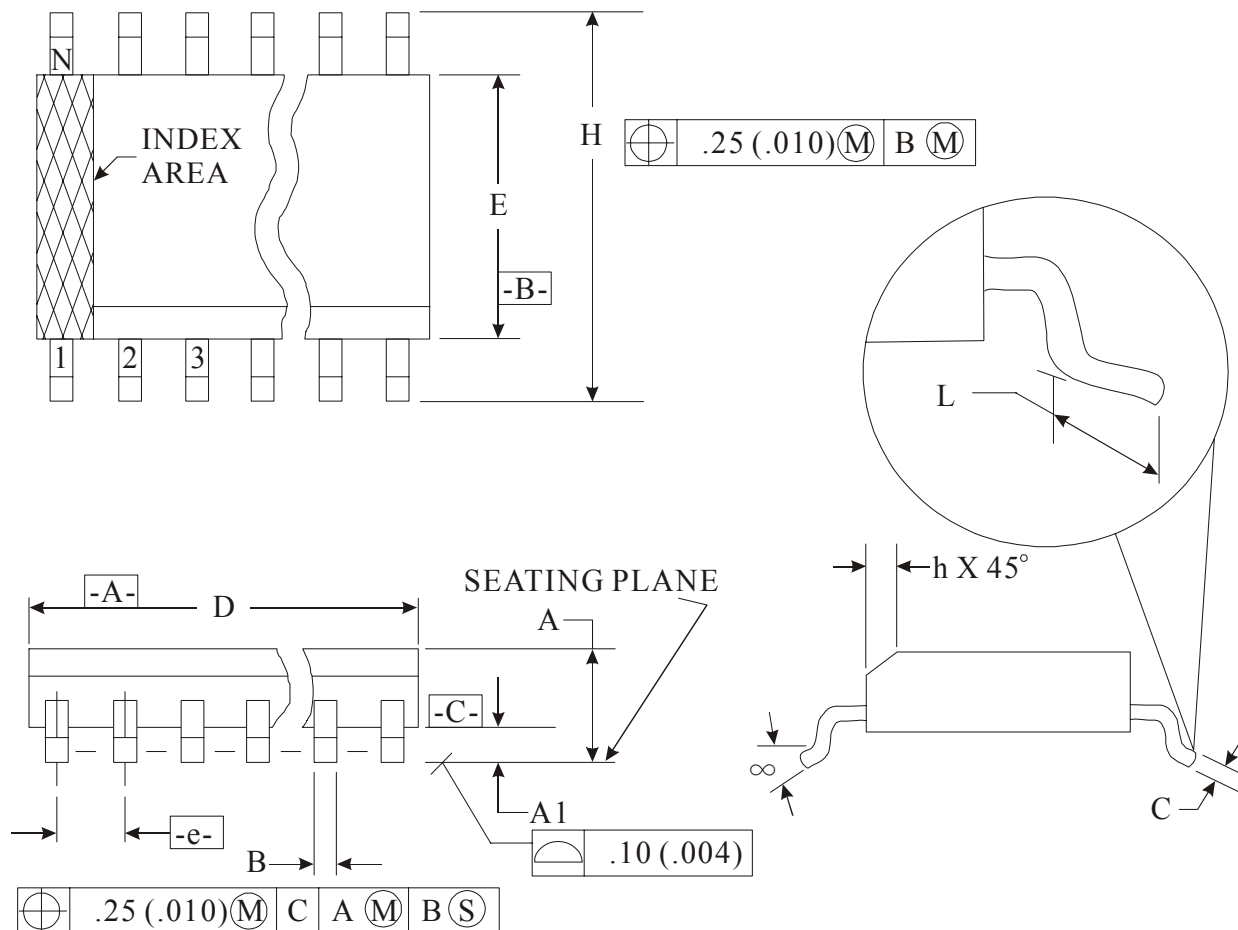
1. All dimensions are in INCHS.
  2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
  3. Dimensions "A", "A1" and "L" are measured with the package seated in JEDEC Seating Plane Gauge GS-3.
  4. "D", "D1" and "E1" dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch.
  5. "E" and "eA" measured with the leads constrained to be perpendicular to datum  $\square C$ .
  6. "eB" and "eC" are measured at the lead tips with the loads unconstrained.
  7. "N" is the number of terminal positions. (N=18)
  8. Pointed or rounded lead tips are preferred to ease insertion.
  9. "b2" and "b3" maximum dimensions are not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25 mm).
  10. Distance between leads including Dambar protrusions to be 0.005 inch minimum.
  11. Datum plane  $\square H$  coincident with the bottom of lead, where lead exits body.
  12. Refer to JEDEC MS-001 Variation AC.
- JEDEC is the trademark of JEDEC SOLID STATE TECHNOLOGY ASSOCIATION.



Remote Control Encoder IC

PT2607

18 PINS, SOP, 300MIL





## Remote Control Encoder IC

**PT2607**

### Notes:

1. Dimensioning and tolerancing per ANSI Y14.5M-1982.
  2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold Flash, protrusion or gate burrs shall not exceed 0.15 mm (0.006 in) per side.
  3. Dimension "E" does not include interlead flash or protrusions. Interlead flash or protrusions shall not exceed 0.25 mm (0.010 in) per side.
  4. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
  5. "L" is the length of the terminal for soldering to a substrate.
  6. N is the number of the terminal positions (N=18)
  7. The lead width "B" as measured 0.36 mm (0.014 in) or greater above the seating plane, shall not exceed a maximum value of 0.61 mm (0.24 in).
  8. Controlling dimension: MILLIMETER.
  9. Refer to JEDEC MS-013, Variation AB.
- JEDEC is the trademark of JEDEC SOLID STATE TECHNOLOGY ASSOCIATION.

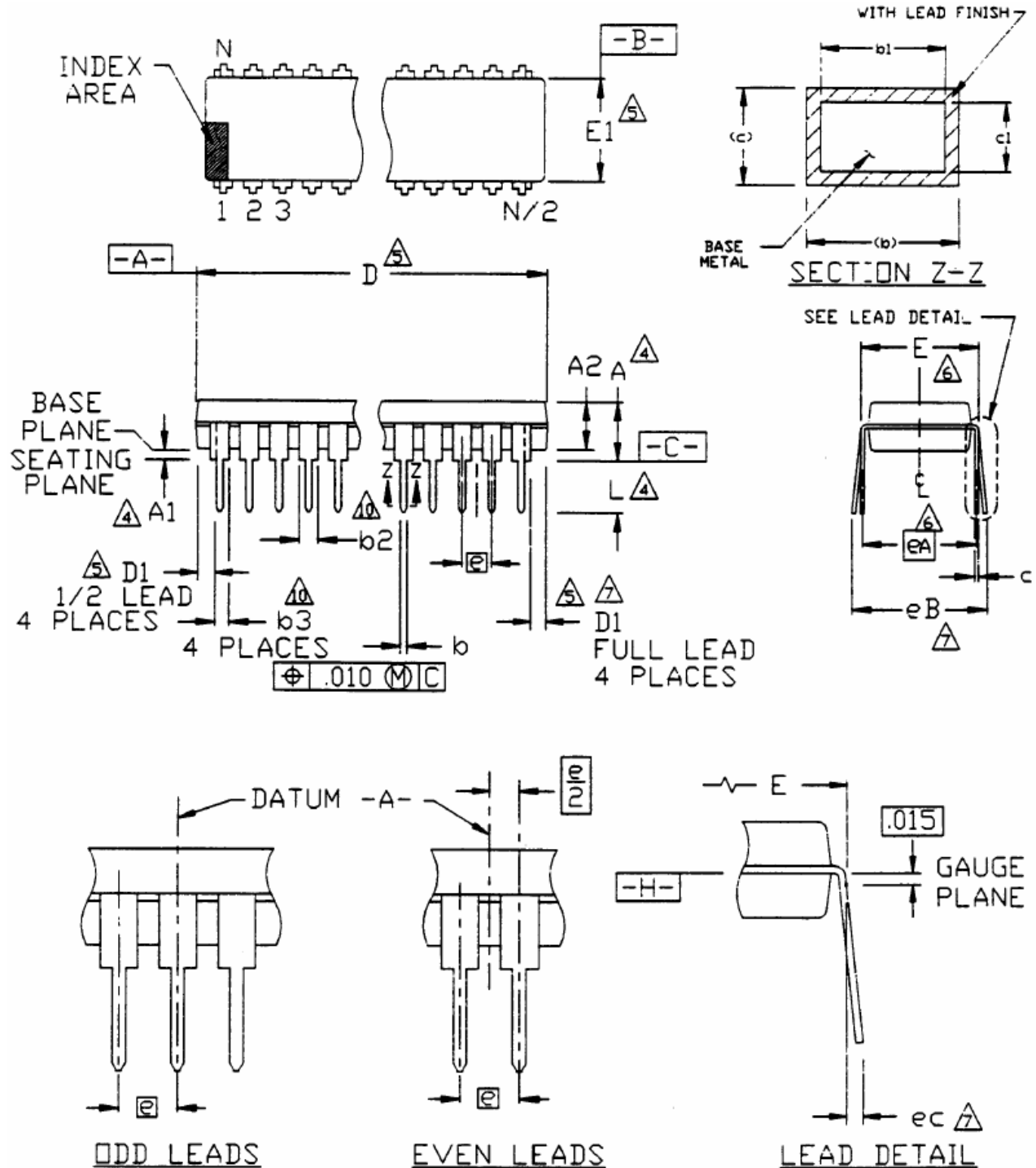




Remote Control Encoder IC

PT2607

24 PINS, DIP, 300MIL





# Remote Control Encoder IC

**PT2607**

| Symbols | Dimensions |       |       |
|---------|------------|-------|-------|
|         | Min.       | Nom.  | Max.  |
| A       |            |       | 0.210 |
| A1      | 0.015      |       |       |
| A2      | 0.115      | 0.130 | 0.195 |
| b       | 0.014      | 0.018 | 0.022 |
| b1      | 0.014      | 0.018 | 0.020 |
| b2      | 0.045      | 0.060 | 0.070 |
| b3      | 0.030      | 0.039 | 0.045 |
| c       | 0.008      | 0.010 | 0.014 |
| c1      | 0.008      | 0.010 | 0.011 |
| D       | 1.160      | 1.185 | 1.195 |
| D1      | 0.005      |       |       |
| E       | 0.300      | 0.310 | 0.325 |
| E1      | 0.240      | 0.250 | 0.280 |
| e       | 0.100 bsc. |       |       |
| eA      | 0.300 bsc. |       |       |
| eB      |            |       | 0.430 |
| eC      | 0.000      |       | 0.060 |
| L       | 0.115      | 0.130 | 0.150 |

## Notes:

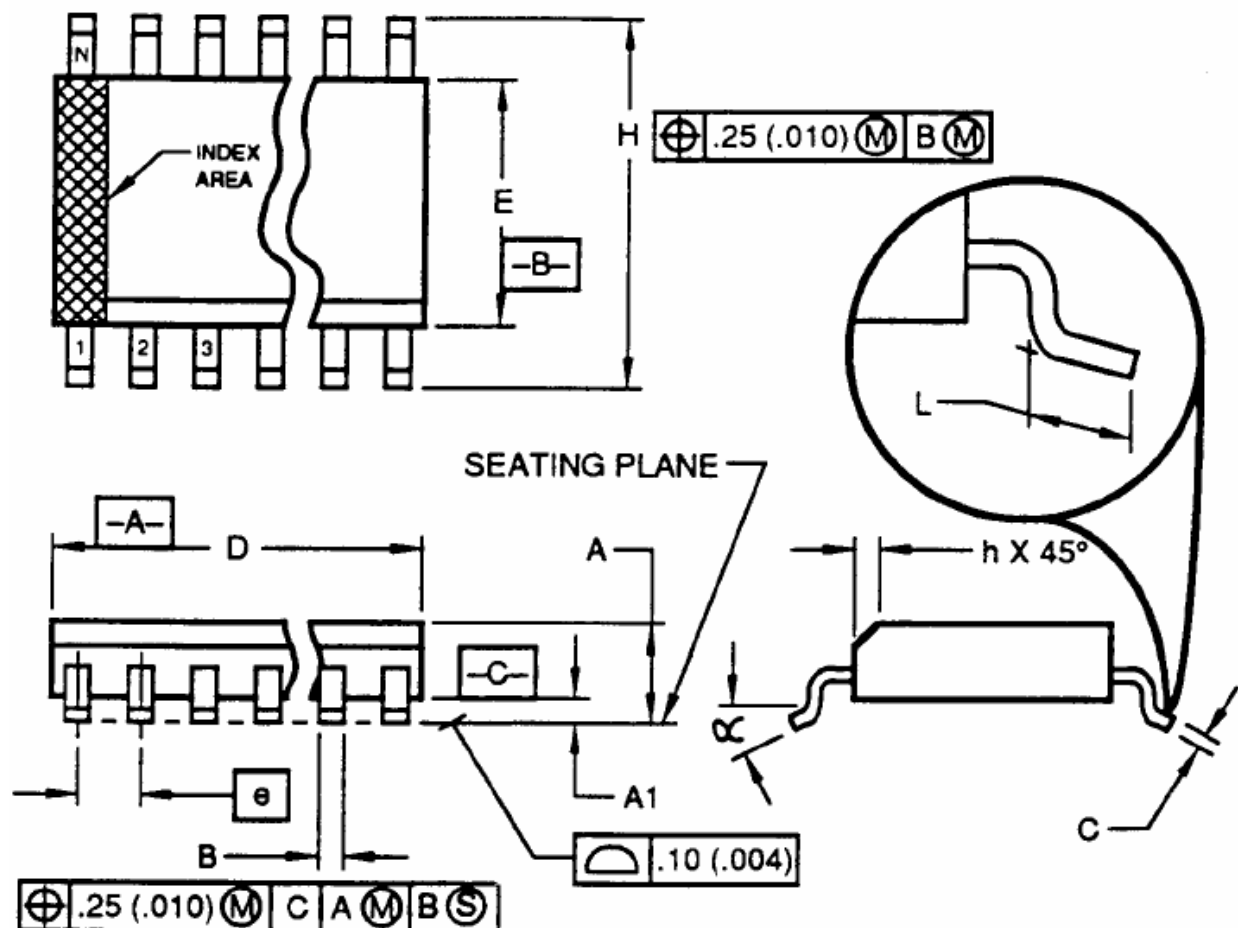
1. All dimensions are in INCHES.
  2. Dimensioning and tolerancing per ANSI Y 14.5-1982.
  3. Dimension "A", "A1" and "L" are measured with the package seated in JEDEC Seating Plane Gauge GS-3.
  4. "D", "D1" and "E1" dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch.
  5. "E" and "eA" measured with the leads constrained to be perpendicular to datum -C-.
  6. "eB" and "eC" are measured at the lead tips with the leads unconstrained.
  7. N is the number of terminal positions. (N=24)
  8. Pointed or rounded lead tips are preferred to ease insertion.
  9. "b2" and "b3" maximum dimensions are not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm)
  10. Distance between leads including Dambar protrusions to be 0.005 inch. minimum.
  11. Datum plane -H- coincident with the bottom of lead, where lead exits body.
  12. Refer to JEDEC MS-001, Variation BE.
- JEDEC is the trademark of JEDEC SOLID STATE TECHNOLOGY ASSOCIATION.



Remote Control Encoder IC

PT2607

24 PINS, SOP, 300MIL



| Symbols  | Min.      | Nom. | Max.  |
|----------|-----------|------|-------|
| A        | 2.35      |      | 2.65  |
| A1       | 0.10      |      | 0.30  |
| B        | 0.33      |      | 0.51  |
| C        | 0.23      |      | 0.32  |
| D        | 15.20     |      | 15.60 |
| E        | 7.40      |      | 7.60  |
| e        | 1.27 bsc. |      |       |
| H        | 10.00     |      | 10.65 |
| h        | 0.25      |      | 0.75  |
| L        | 0.40      |      | 1.27  |
| $\alpha$ | 0°        |      | 8°    |



## Remote Control Encoder IC

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### Notes:

1. Dimensioning and tolerancing per ANSI Y 14.5-1982.
  2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold Flash, protrusion or gate burrs shall not exceed 0.15mm (0.006 in) per side.
  3. Dimension "E" does not include interlead flash protrusions. Interlead flash or protrusions shall not exceed 0.25 mm (0.010 in) per side.
  4. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
  5. "L" is the length of the terminal for soldering to a substrate.
  6. "N" is the number of terminal position. (N=24)
  7. The lead width "B" as measured 0.36 mm (0.014 in) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.24 in).
  8. Controlling dimension: MILLIMETER.
  9. Refer to JEDEC MS-013, Variation AD.
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