



Programmable Rolling Code Encoder IC

PT2283

DESCRIPTION

PT2283 is a programmable rolling code encoder IC utilizing CMOS Technology specially designed for remote control applications. It supports up to 20 or 24 bits of programmable address codes, 8 or 4 data bits and 16 bits programmable rolling code. A total of 65,536 rolling code combinations as well as power saving feature and low battery warn mode (except PT2283L) are also provided.

PT2283 encodes the programmed codes into a coded waveform suitable for RF modulation. Pin assignments and application circuit are optimized for easy PCB Layout and cost saving advantage. Housed in either 8 pins or 16 pins DIP or SOP package.

FEATURES

- CMOS technology
- Low power consumption
- Least external components
- High noise immunity
- Operating voltage: 4V to 10V
- Up to 20 or 24 address codes
- Up to 8 or 4 data bits
- Up to 2^{43} output code combinations
- Power saving feature
- Low battery warn mode (except PT2283L)
- Available in 8 or 16 pins, SOP or DIP

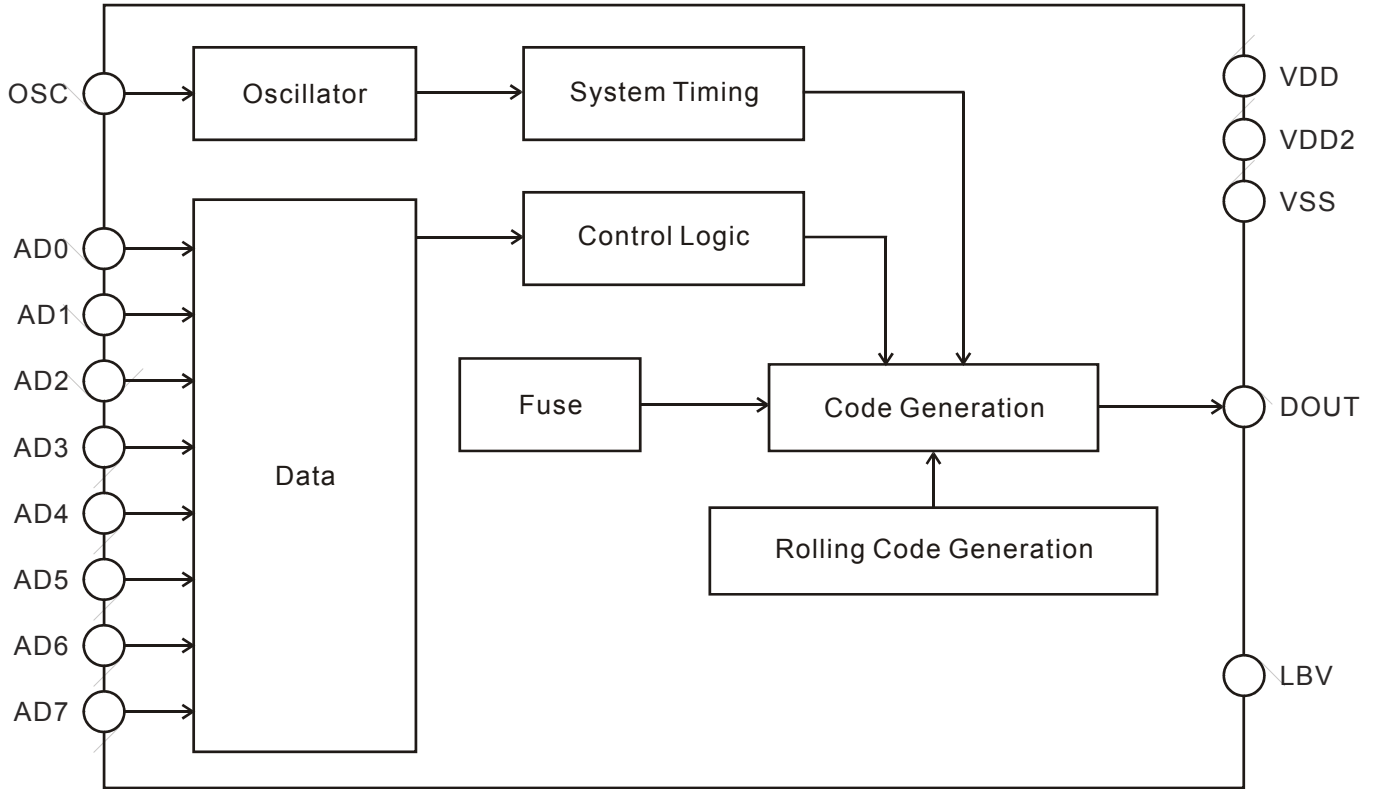
APPLICATIONS

- Burglar alarm system
- Car security system
- Car/Garage door controller
- Home/Office security system
- Personal alarm system



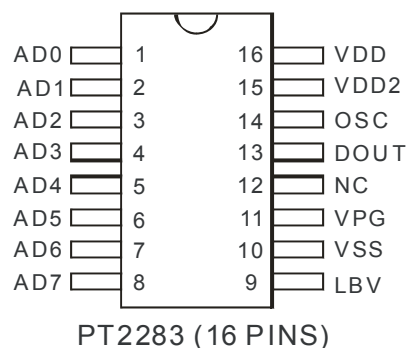
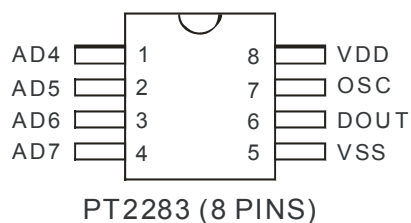


BLOCK DIAGRAM





PIN CONFIGURATION



PIN DESCRIPTION

| Pin Name | I/O | Description | Pin No. | |
|-----------|-----|---|---------|---------|
| | | | 8 Pins | 16 Pins |
| AD0 ~ AD3 | I | Address/Data Input Pins. Normal=Floating. These pins are used as address pins if they are connected to VSS (bit "1") and floating (bit "0"). | - | 1 ~ 4 |
| AD4 ~ AD7 | I | They are used as data pins if they are connected to VDD (bit "1") and floating (bit "0") | 1 ~ 4 | 5 ~ 8 |
| VSS | - | Negative Power Supply | 5 | 10 |
| LBV | I | Low Battery Voltage Level Control Pin | - | 9 |
| VPG | - | Voltage Program Pin. Normal=Floating | - | 11 |
| NC | - | No Connection | - | 12 |
| DOUT | O | Data Output Pin | 6 | 13 |
| OSC | I | Oscillation Input Pin | 7 | 14 |
| VDD2 | - | Power Supply (for Backup Function) | - | 15 |
| VDD | - | Power Supply | 8 | 16 |





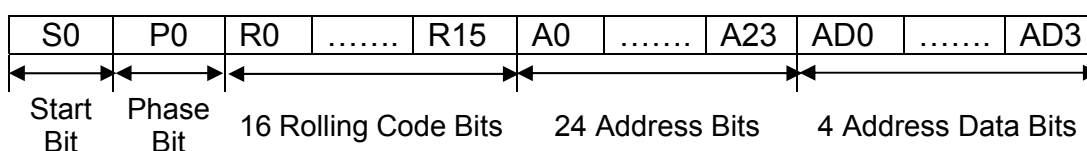
Programmable Rolling Code Encoder IC **PT2283**

FUNCTION DESCRIPTION

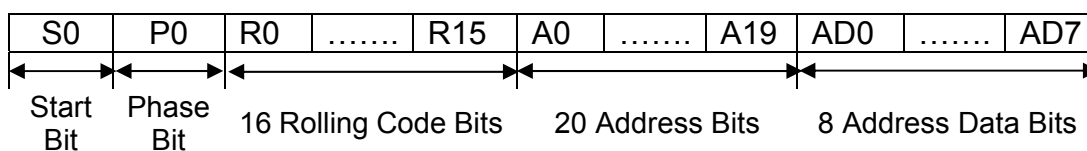
CODE WORD

The DOUT Code Word consist of a Start Bit, Phase Bit, Rolling Code Bits, Address Bits and Address/Data Bits. Please refer to the diagrams below.

For 8 pins version:



For 16 pins version:



START BIT

The Start Bit is designated as S0 and is always set to “1”.

PHASE CODE BITS

The Phase Code Bit is designated as P0. Under a low battery conditions, P0 is always set to “0”. Under normal conditions, P0 toggles between “0” and “1”, whereby P0 is always set to “0” at the first code word.

ROLLING CODE BITS

The Rolling Code Bits, namely: R0 to R15 are programmable.

ADDRESS BITS

The Address Bits, namely: A0 to A19 (for 16 pins version) or A0 to A 23 (for 8 pins version) may be programmed to either “0” or “1”.

ADDRESS/DATA BITS

The Address/Data Bits, namely AD0 to AD7 (for 16 pins version) or AD4 to AD7 (for 8 pins version) may be set as either Address or Data bits and are programmable to either “0” or “1”.

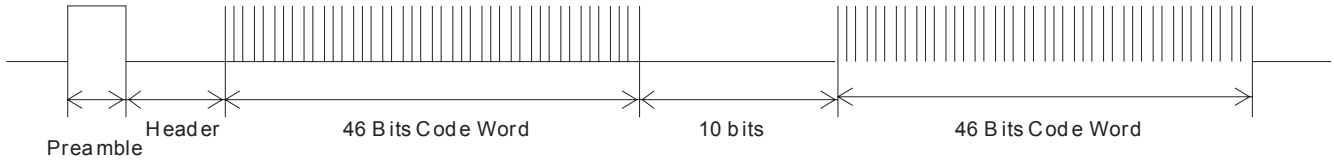


Programmable Rolling Code Encoder IC

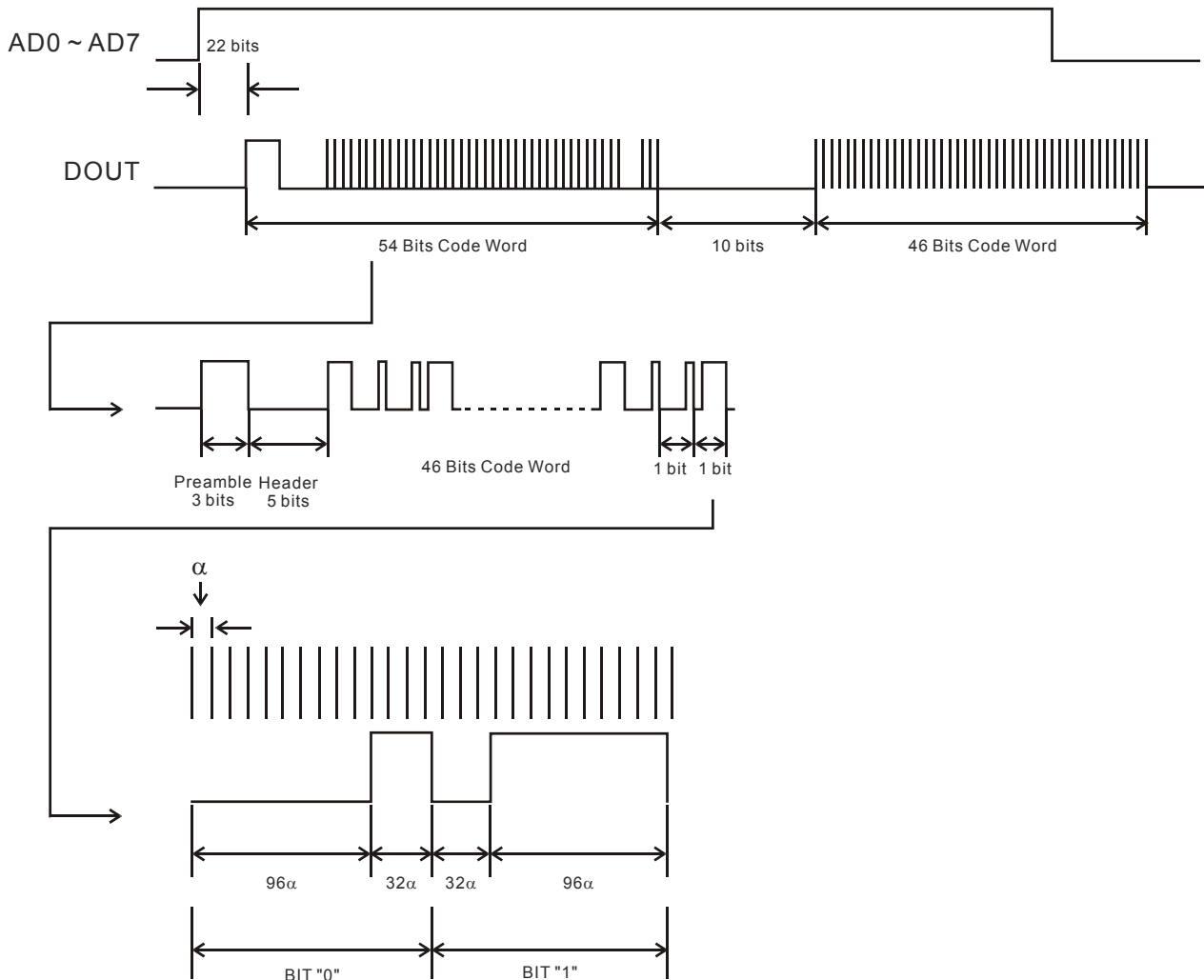
PT2283

DOUT TRANSFER SIGNAL

The PT2283 DOUT Waveform is given below. It must be noted however that a Preamble and Header are transmitted before the Code Word in the following manner depending on the bonding option.



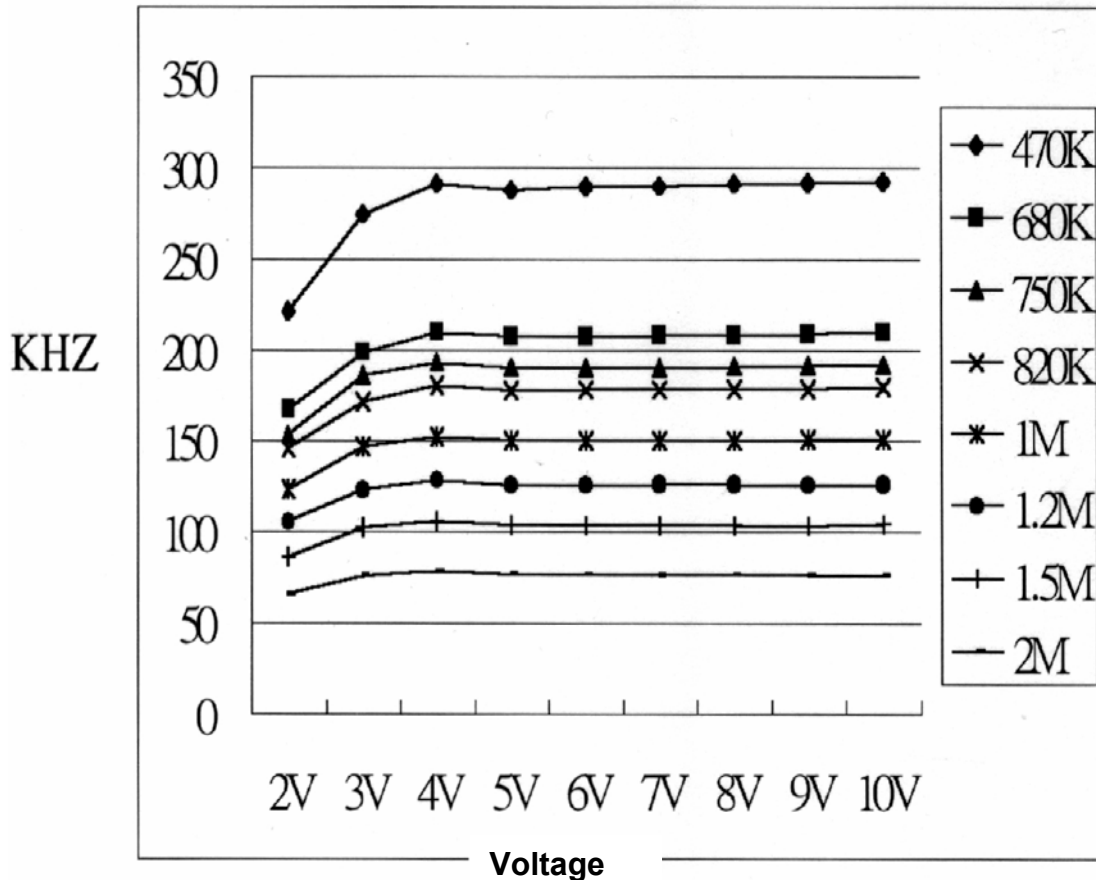
PT2283 DOUT WAVEFORM





SINGLE RESISTOR OSCILLATOR

The built-in oscillator circuit of PT2283 allows precision oscillator to be constructed by connecting an external resistor (R_{osc}) to the OSC Pin. The typical oscillator frequency with the various resistor values for PT2283 is given below.



POWER SAVING FEATURE

PT2283 continuously transmits the code for a period of 5 seconds. After 5 seconds, the code transmission stops. The power consumption is therefore reduced.

LOW BATTERY WARN MODE (EXCEPT PT2283L)

When battery power down to 6.6V, PT2283 will into low battery warn mode(except PT2283L). DOUT pin will transmit 4 words and stop 4 words in cycles until key release. This function is to notify user power low.





ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------|--------|------------|-------------------|------|
| Operating voltage | VDD | | 1.8 ~ 10 | V |
| Input voltage | VIN | VDD=10V | VSS-0.3 ~ VDD+0.3 | V |
| Operating temperature | Topr | | -40 ~ +85 | °C |
| Storage temperature | Tstg | | -65 ~ +150 | °C |

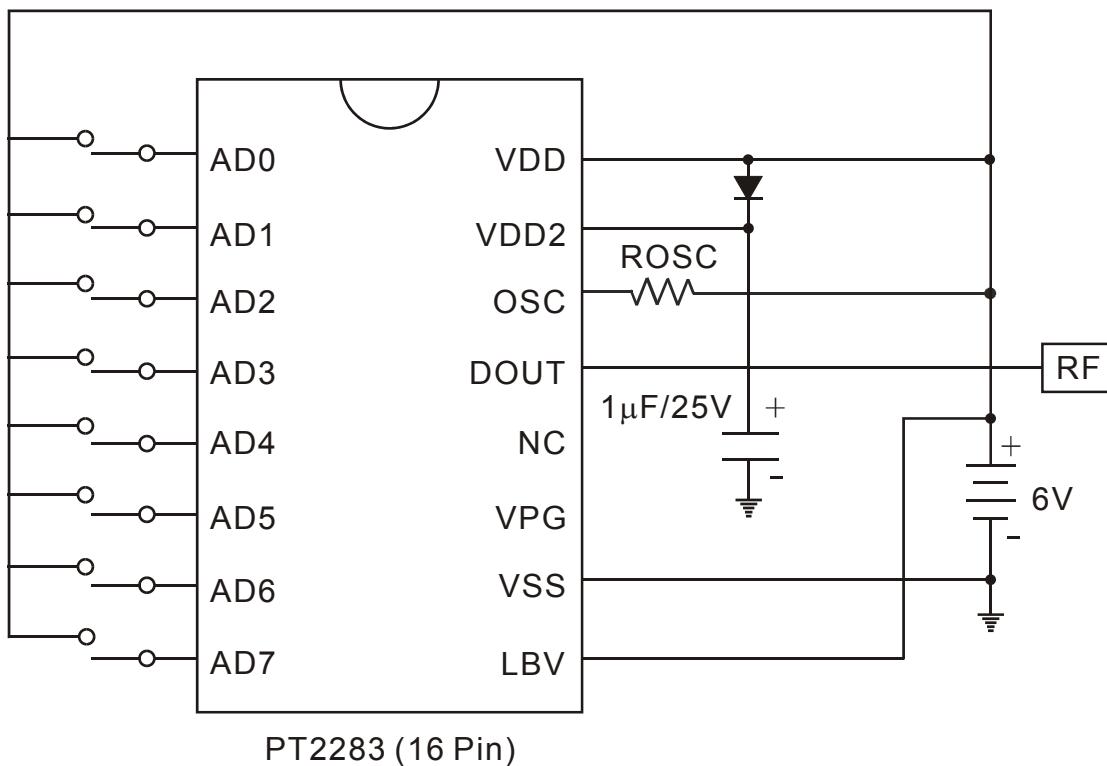
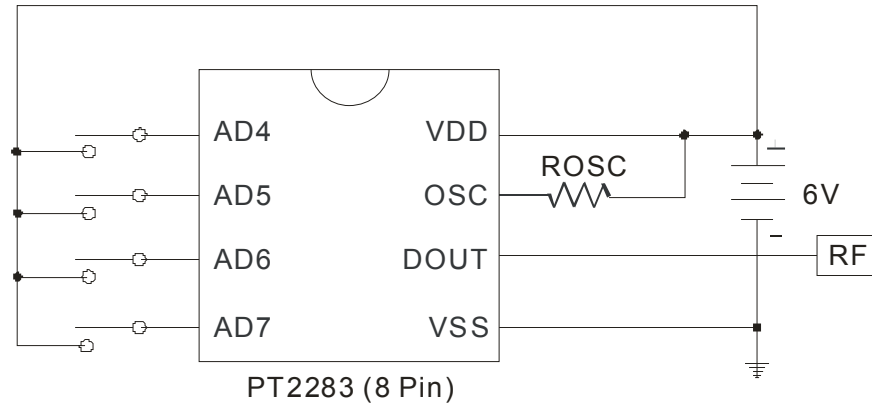
DC ELECTRICAL CHARACTERISTICS

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|----------------------------|--------|---|--------|------|--------|------|
| Operating voltage | VDD | | 1.8 | 6 | 10 | V |
| Standby current | ISB | VDD=10V, OSC=0V, Other pin to floating | - | - | 1 | μA |
| Operating current | IOP | | - | - | 2.5 | mA |
| DOUT output drive current | IOH | VDD=10V VOH=8V | - | - | -7 | mA |
| | | VDD=6V VOH=4V | - | - | -4 | |
| | | VDD=3V VOH=2.2V | - | - | -0.9 | |
| DOUT output sink current | IOL | VDD=10V VOH=8V | 20 | - | - | mA |
| | | VDD=6V VOH=4V | 10 | - | - | |
| | | VDD=3V VOH=2.2V | 2.5 | - | - | |
| “High” level input voltage | VIH | VDD=10V | 0.7VDD | - | VDD | V |
| | | VDD=6V | 0.7VDD | - | VDD | |
| “Low” level input voltage | VIL | VDD=10V | 0 | - | 0.3VDD | V |
| | | VDD=6V | 0 | - | 0.3VDD | |
| Pull low resistor | RPL | VDD=10V, VI=5V | - | 10 | - | KΩ |
| | | VDD=6V, VI=3V | - | 16 | - | |



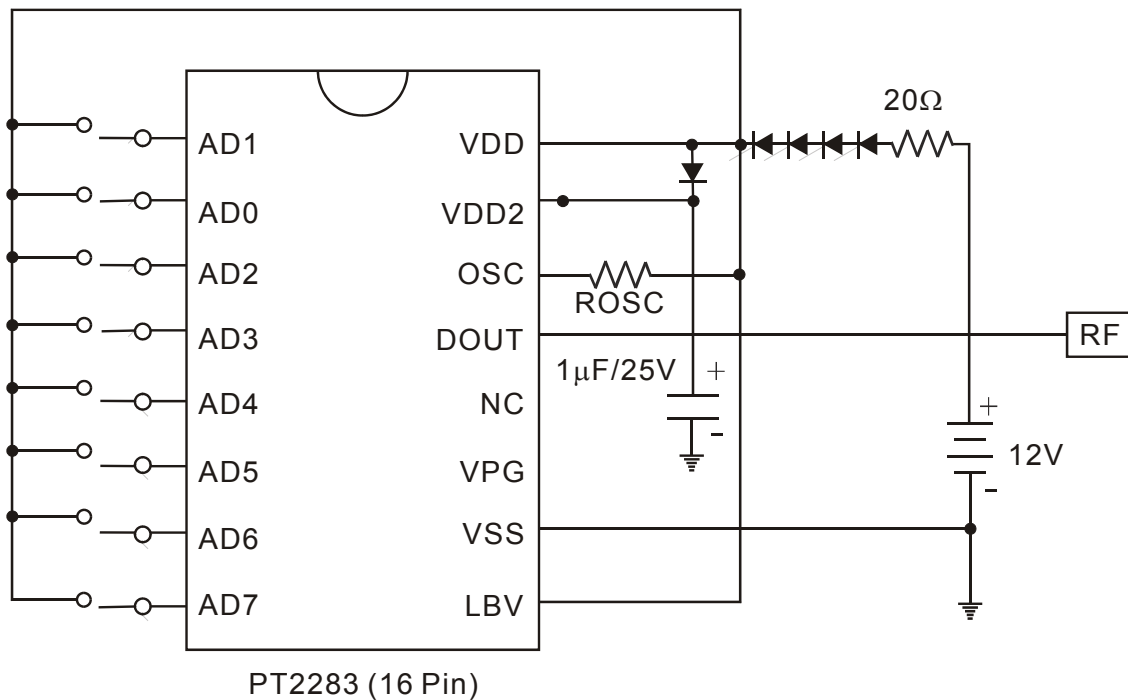
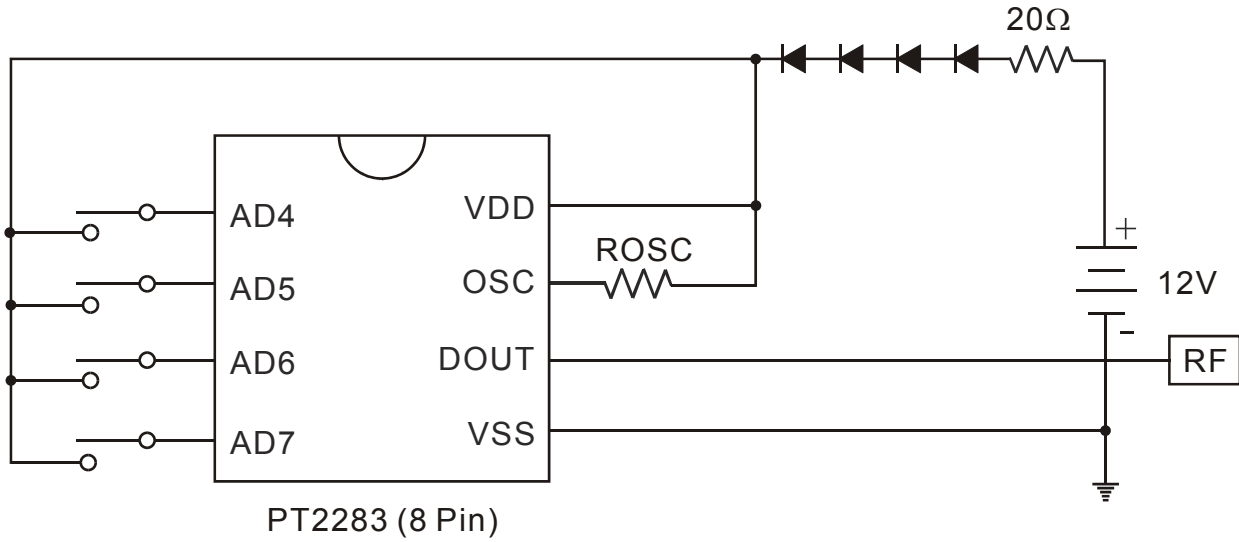


APPLICATION CIRCUIT 1





APPLICATION CIRCUIT 2





ORDER INFORMATION

| Valid Part Number | Package Type | Top Code | Address Code |
|-------------------|---|-------------|--------------|
| PT2283 | 8 Pins, DIP, 300mil | PT2283 | Programmable |
| PT2283-S | 8 Pins, SOP, 150mil | PT2283-S | Programmable |
| PT2283-16 | 16 Pins, DIP, 300mil | PT2283-16 | Programmable |
| PT2283-16S | 16 Pins, SOP, 150mil | PT2283-16S | Programmable |
| PT2283P | 8 Pins, DIP, 300mil | PT2283P | Programmed |
| PT2283P-S | 8 Pins, SOP, 150mil | PT2283P-S | Programmed |
| PT2283LP-S | 8 Pins, SOP, 150mil No Battery Warn Mode | PT2283LP-S | Programmable |
| PT2283P-16 | 16 Pins, DIP, 300mil | PT2283P-16 | Programmed |
| PT2283P-16S | 16 Pins, SOP, 150mil | PT2283P-16S | Programmed |
| PT2283 (L) | 8 Pins, DIP, 300mil | PT2283 | Programmable |
| PT2283-S (L) | 8 Pins, SOP, 150mil | PT2283-S | Programmable |
| PT2283-16 (L) | 16 Pins, DIP, 300mil | PT2283-16 | Programmable |
| PT2283-16S (L) | 16 Pins, SOP, 150mil | PT2283-16S | Programmable |
| PT2283P (L) | 8 Pins, DIP, 300mil | PT2283P | Programmed |
| PT2283P-S (L) | 8 Pins, SOP, 150mil | PT2283P-S | Programmed |
| PT2283LP-S (L) | 8 Pins, SOP, 150mil No Battery Warn Mode | PT2283LP-S | Programmable |
| PT2283P-16 (L) | 16 Pins, DIP, 300mil | PT2283P-16 | Programmed |
| PT2283P-16S (L) | 16 Pins, SOP, 150mil | PT2283P-16S | Programmed |

Notes:

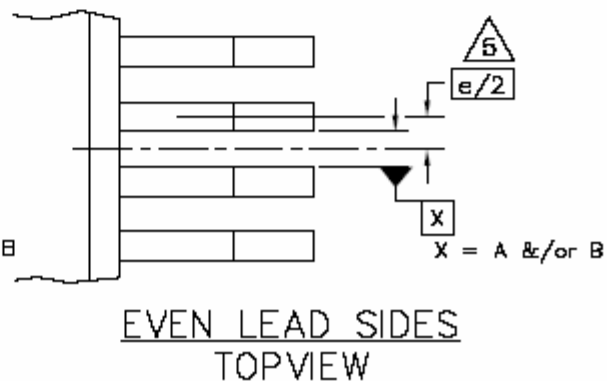
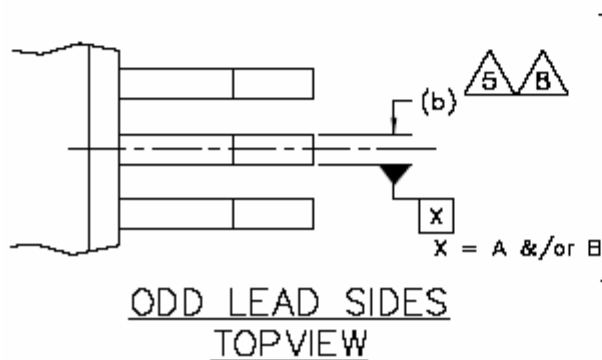
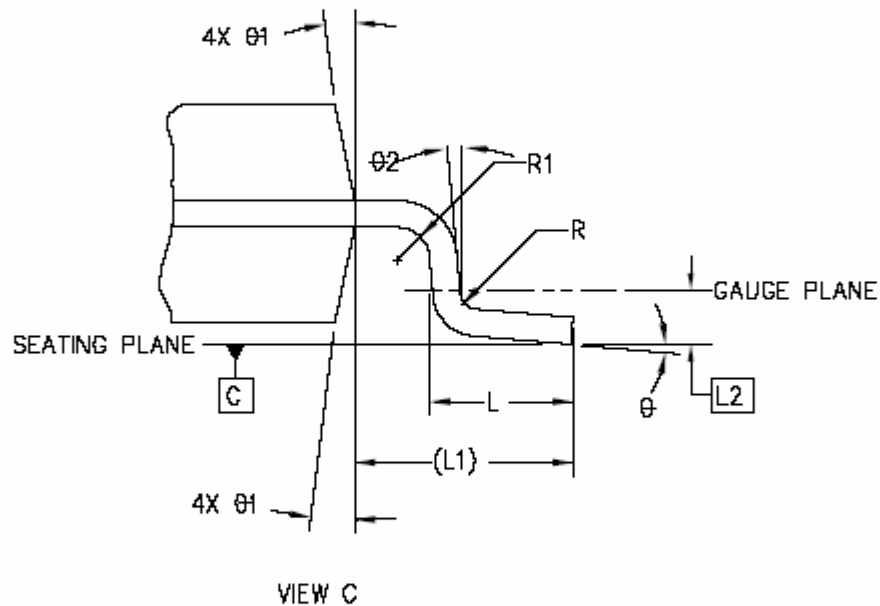
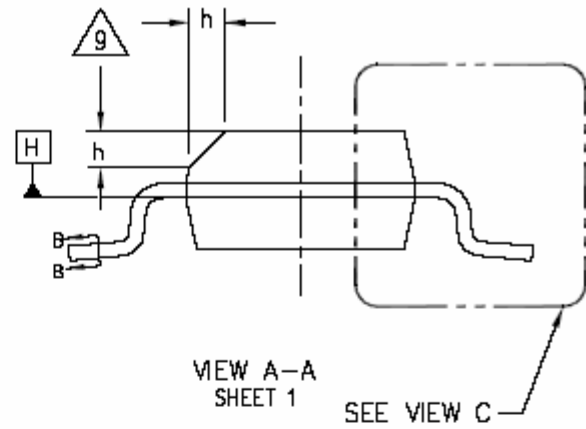
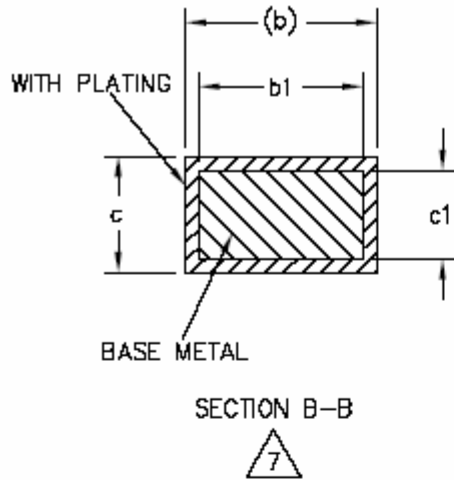
1. (L), (C) or (S) = Lead Free.
2. The Lead Free mark is put in front of the date code.





Programmable Rolling Code Encoder IC

PT2283





| Symbol | Min. | Typ. | Max. |
|------------|-----------|------|------|
| A | 1.35 | - | 1.75 |
| A1 | 0.10 | - | 0.25 |
| A2 | 1.25 | - | 1.65 |
| b | 0.31 | - | 0.51 |
| b1 | 0.28 | - | 0.48 |
| c | 0.17 | - | 0.25 |
| c1 | 0.17 | - | 0.23 |
| D | 4.90 BSC. | | |
| E | 6.00 BSC. | | |
| E1 | 3.90 BSC. | | |
| e | 1.27 BSC. | | |
| L | 0.40 | - | 1.27 |
| L1 | 1.04 REF. | | |
| L2 | 0.25 BSC. | | |
| R | 0.07 | - | - |
| R1 | 0.07 | - | - |
| h | 0.25 | - | 0.50 |
| θ | 0° | - | 8° |
| $\theta 1$ | 5° | - | 15° |
| $\theta 2$ | 0° | - | - |

Notes:

1. Dimensioning and tolerancing per ANSI Y 14.5M-1994
 2. Controlling Dimension: MILLIMETERS.
 3. Dimension D does not include mold flash protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.15 mm (0.006 in) per end. Dimension E1 does not include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.25mm per side. D and E1 dimensions are determined at datum H.
 4. The package top may be smaller than the package bottom. Dimensions D and E1 are determined at the outermost extremes of the plastic body exclusive of mold flash, tie bar burrs, gate burrs and interlead flash, but including any mismatch between the top and bottom of the plastic body.
 5. Datums A & B to be determined at datum H.
 6. N is the number of terminal positions. (N=8)
 7. The dimensions apply to the flat section of the lead between 0.10 to 0.25mm from the lead tip.
 8. Dimension "b" does not include dambar protrusion. Allowable dambar protrusion shall be 0.10mm total in excess of the "b" dimension at maximum material condition. The dambar cannot be located on the lower radius of the foot.
 9. This chamfer feature is optional. If it is not present, then a pin 1 identifier must be located within the index area indicated.
 10. Refer to JEDEC MS-012, Variation AA.
- JEDEC is the registered trademark of JEDEC SOLID STATE TECHNOLOGY ASSOCIATION.

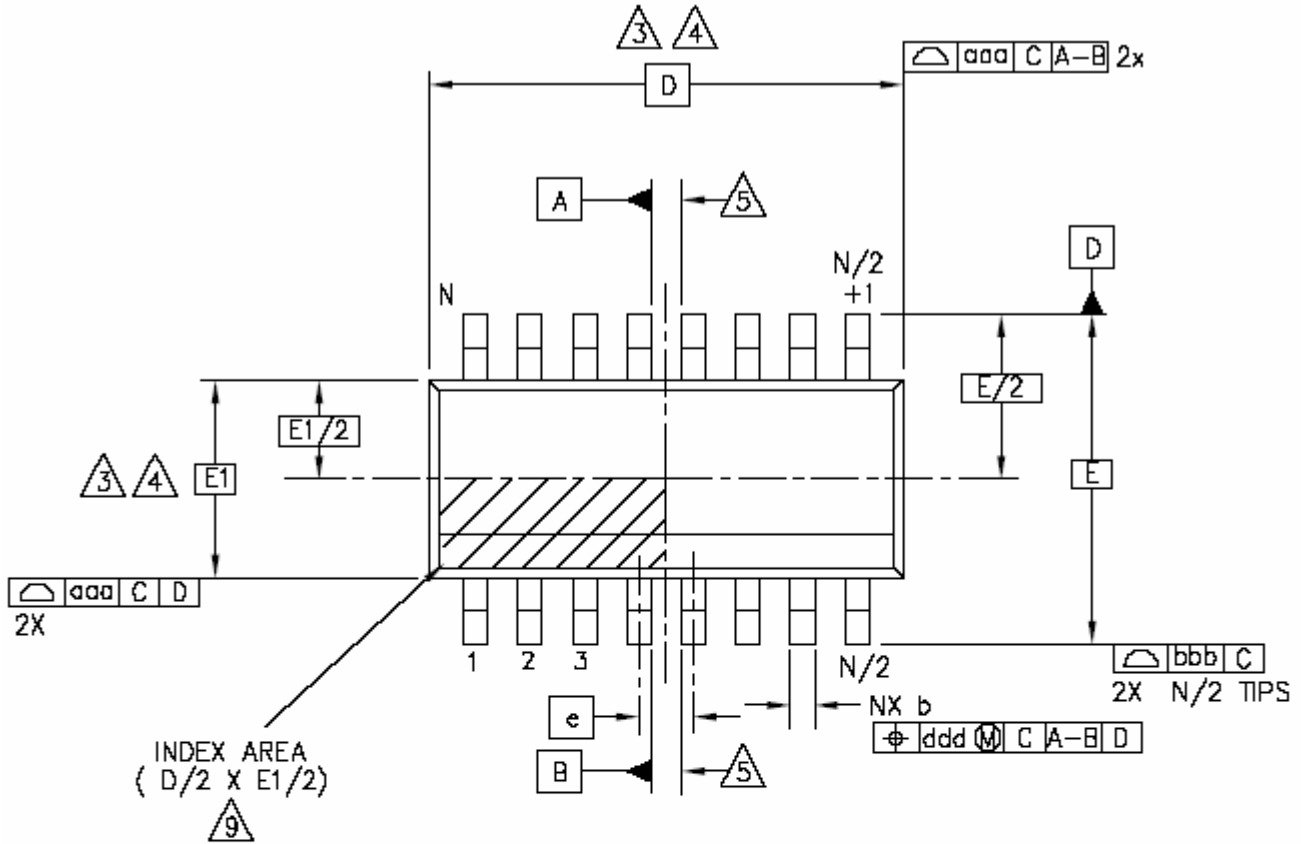




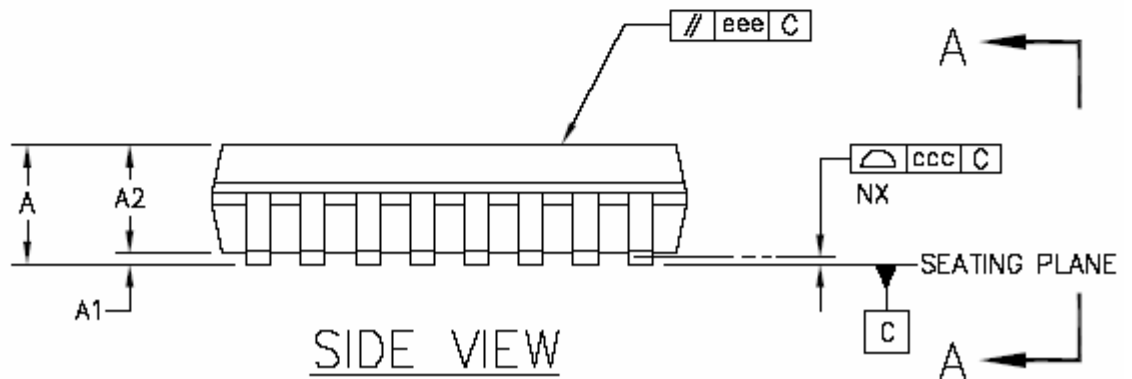
Programmable Rolling Code Encoder IC

PT2283

16 PINS, SOP, 150MIL



TOP VIEW



SIDE VIEW

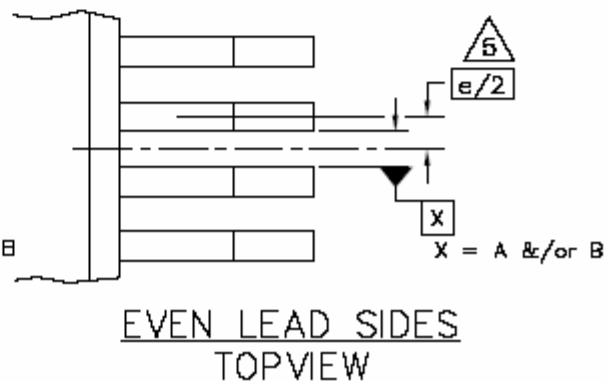
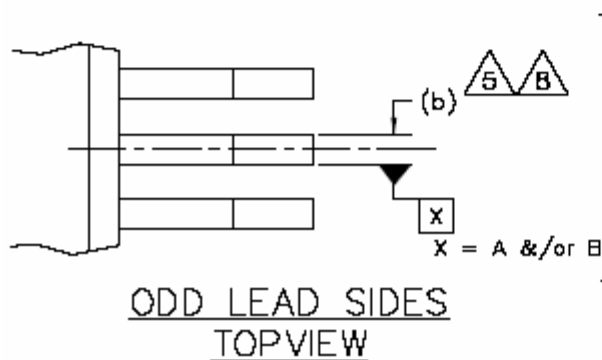
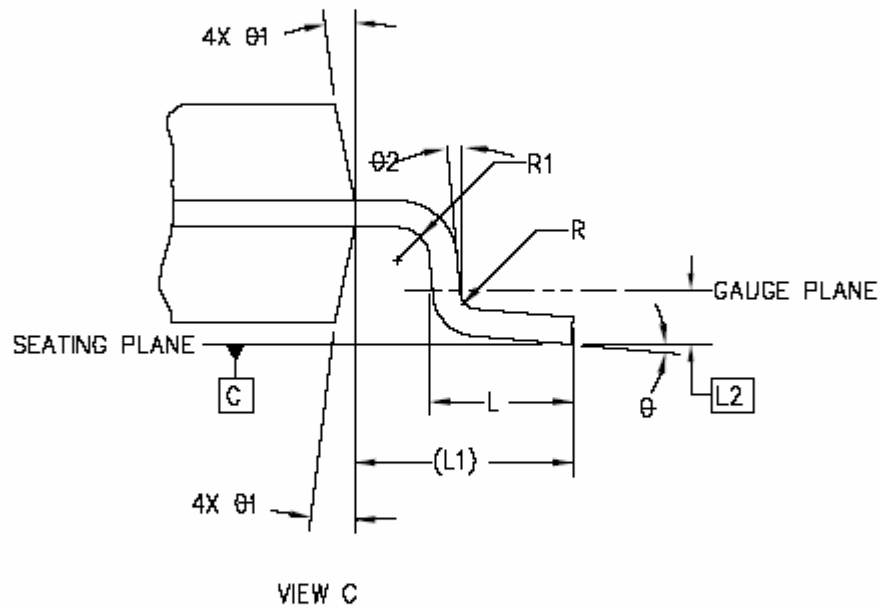
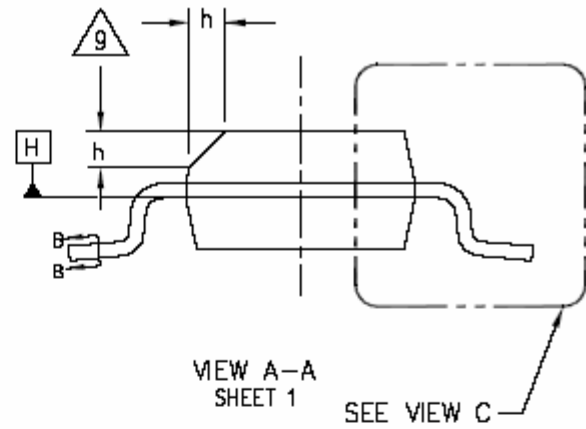
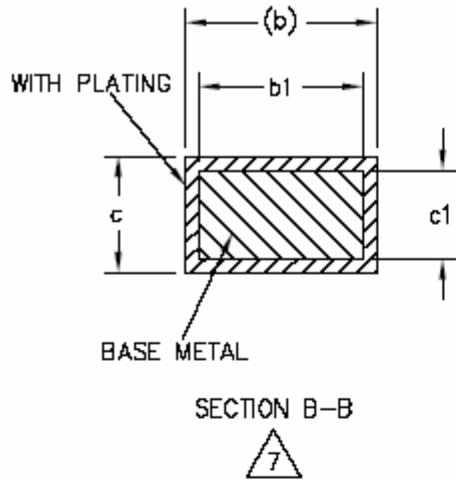
SEE SHEET 2





Programmable Rolling Code Encoder IC

PT2283





Programmable Rolling Code Encoder IC

PT2283

| Symbol | Min. | Typ. | Max. |
|------------|-----------|------|------|
| A | 1.35 | - | 1.75 |
| A1 | 0.10 | - | 0.25 |
| A2 | 1.25 | - | 1.65 |
| b | 0.31 | - | 0.51 |
| b1 | 0.28 | - | 0.48 |
| c | 0.17 | - | 0.25 |
| c1 | 0.17 | - | 0.23 |
| D | 9.90 BSC. | | |
| E | 6.00 BSC. | | |
| E1 | 3.90 BSC. | | |
| e | 1.27 BSC. | | |
| L | 0.40 | - | 1.27 |
| L1 | 1.04 REF. | | |
| L2 | 0.25 BSC. | | |
| R | 0.07 | - | - |
| R1 | 0.07 | - | - |
| h | 0.25 | - | 0.50 |
| θ | 0° | - | 8° |
| $\theta 1$ | 5° | - | 15° |
| $\theta 2$ | 0° | - | - |

Notes:

1. Dimensioning and tolerancing per ANSI Y 14.5M-1994
 2. Controlling Dimension: MILLIMETERS.
 3. Dimension D does not include mold flash protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.15 mm (0.006 in) per end. Dimension E1 does not include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.25mm per side. D and E1 dimensions are determined at datum H.
 4. The package top may be smaller than the package bottom. Dimensions D and E1 are determined at the outermost extremes of the plastic body exclusive of mold flash, tie bar burrs, gate burrs and interlead flash, but including any mismatch between the top and bottom of the plastic body.
 5. Datums A & B to be determined at datum H.
 6. N is the number of terminal positions. (N=8)
 7. The dimensions apply to the flat section of the lead between 0.10 to 0.25mm from the lead tip.
 8. Dimension "b" does not include dambar protrusion. Allowable dambar protrusion shall be 0.10mm total in excess of the "b" dimension at maximum material condition. The dambar cannot be located on the lower radius of the foot.
 9. This chamfer feature is optional. If it is not present, then a pin 1 identifier must be located within the index area indicated.
 10. Refer to JEDEC MS-012, Variation AC.
- JEDEC is the registered trademark of JEDEC SOLID STATE TECHNOLOGY ASSOCIATION.

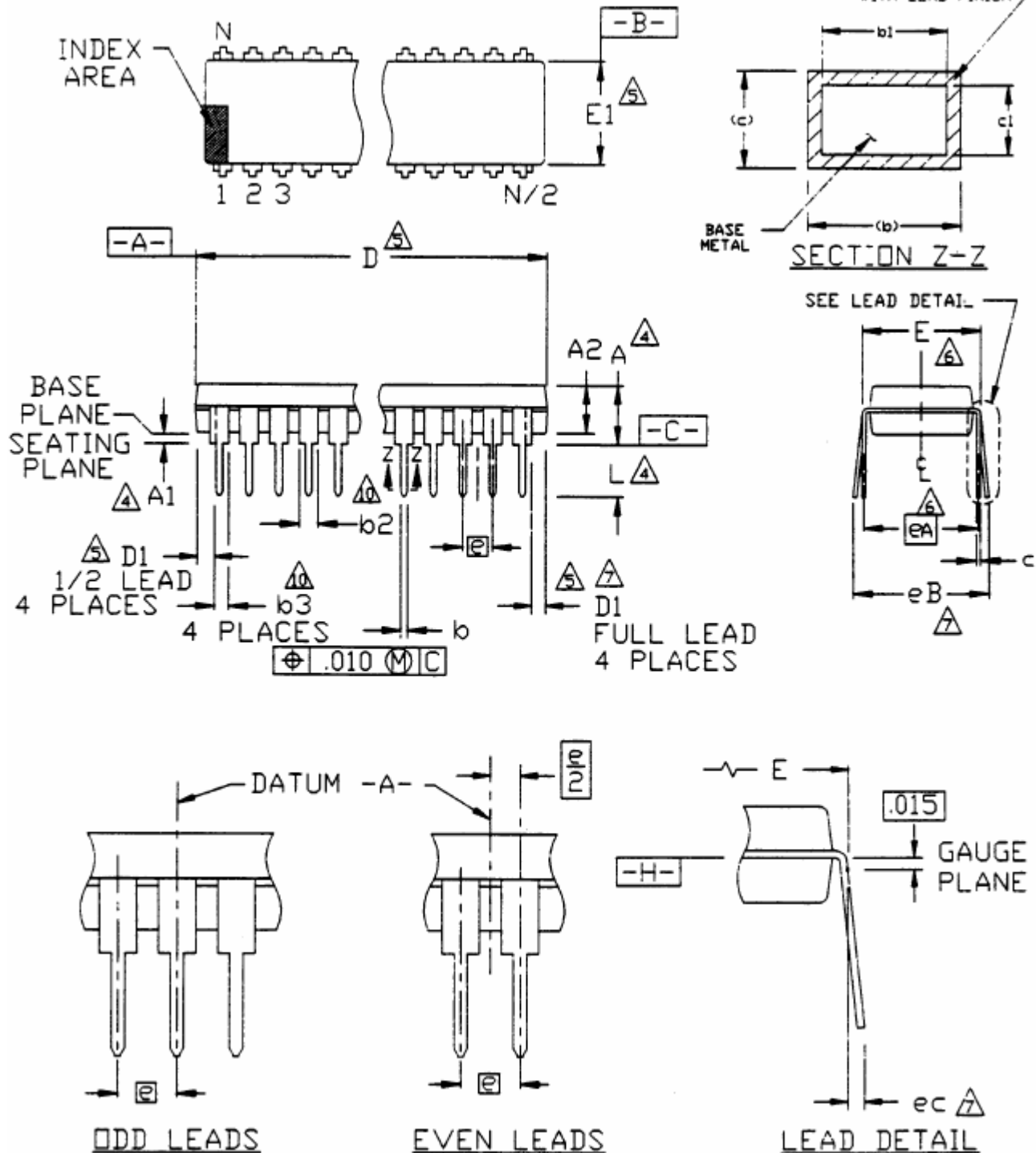




Programmable Rolling Code Encoder IC

PT2283

8 PINS, DIP, 300MIL





Programmable Rolling Code Encoder IC

PT2283

| Symbol | Dimensions in Inches | | |
|--------|----------------------|-------|-------|
| | 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 | 0.355 | 0.365 | 0.400 |
| 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 INCHS.
 - Dimensioning and tolerancing per ANSI Y14.5M-1982.
 - Dimensions "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 \square_{-C-} .
 - "eB" and "eC" are measured at the lead tips with the loads unconstrained.
 - "N" is the number of terminal positions. (N=8)
 - 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 (0.25 mm).
 - Variation BA has a b3 dimension and is 1/2 lead package.
 - Distance between leads including dambar protrusions to be 0.005 inch minimum.
 - Datum plane \square_{-H-} coincident with the bottom of lead, where lead exits body.
 - Refer to JEDEC MS-001 Variation BA.
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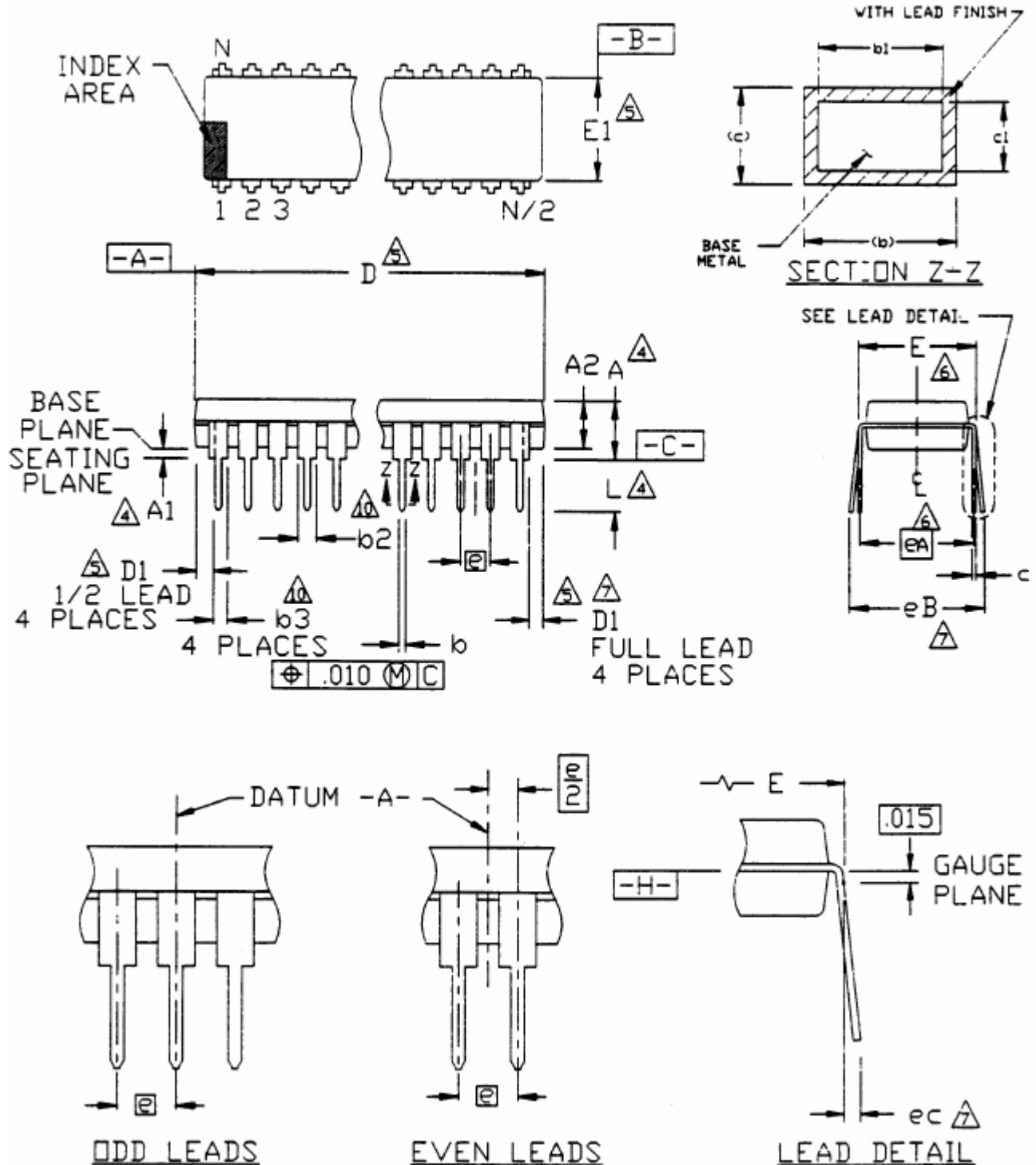




Programmable Rolling Code Encoder IC

PT2283

16 PINS, DIP, 300MIL





Programmable Rolling Code Encoder IC

PT2283

| Symbol | Dimensions in Inches | | |
|--------|----------------------|-------|-------|
| | 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 | 0.735 | 0.755 | 0.775 |
| 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 INCHS.
 - Dimensioning and tolerancing per ANSI Y14.5M-1982.
 - Dimensions "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 \square_{-C-} .
 - "eB" and "eC" are measured at the lead tips with the loads unconstrained.
 - "N" is the number of terminal positions. (N=16)
 - 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 (0.25 mm).
 - Variation BA has a b3 dimension and is 1/2 lead package.
 - Distance between leads including dambar protrusions to be 0.005 inch minimum.
 - Datum plane \square_{-H-} coincident with the bottom of lead, where lead exits body.
 - Refer to JEDEC MS-001 Variation BB.
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