

## PI6CX100-00

### 19.44 to 40 MHz, 3.3V, VCXO for General Purpose Applications

#### Features

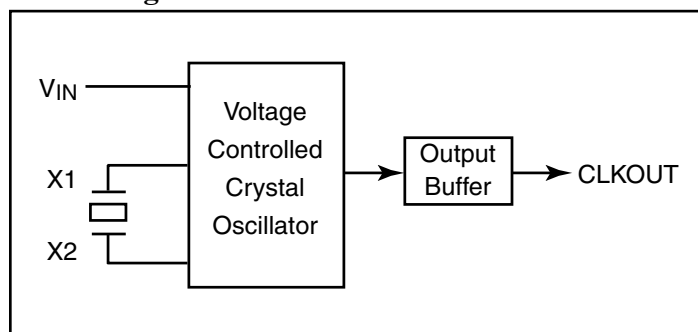
- 3.3V operating voltage
- Uses an external crystal
- On-chip VCXO with pull range of 240ppm
- VCXO tuning voltage from 0V to 3.3V
- 10mA output drive at CMOS levels
- Packaging (Pb-free & Green):
  - 8-pin SOIC (W)

#### Description

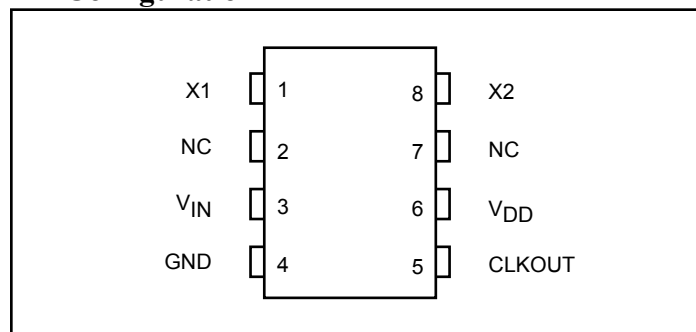
The PI6CX100-00 is a low-cost, high-performance, 3.3V, VCXO available in discrete IC form with external quartz crystal. The on-chip Voltage Controlled Crystal Oscillator accepts a 0V to 3.3V input voltage that pulls the output clock frequency by  $\pm 120$ ppm. This device operates with an external quartz crystal specified to achieve the desired performance.

The PI6CX100-00 is designed for General Purpose applications, supporting operating frequencies between 19.44 and 40 MHz.

#### Block Diagram



#### Pin Configuration



[www.DataSheet4U.com](http://www.DataSheet4U.com)

#### Pin Description

| Pin Name | Number | Type | Description                 |
|----------|--------|------|-----------------------------|
| X1, X2   | 1, 8   | I    | Crystal Connection          |
| NC       | 2, 7   |      | No Connection               |
| $V_{IN}$ | 3      | I    | Voltage Input to VCXO       |
| GND      | 4      | PWR  | Ground                      |
| CLKOUT   | 5      | O    | Clock Output                |
| $V_{DD}$ | 6      | PWR  | Power Supply <sup>(1)</sup> |

#### Note:

1. 0.1 $\mu$ F or 0.01 $\mu$ F bypass capacitor is required.

## Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

|                                       |                          |
|---------------------------------------|--------------------------|
| Storage Temperature .....             | -55°C to 125°C           |
| Ambient Temperature .....             | -40°C to 85°C            |
| Supply Voltage $V_{DD}$ .....         | -0.5V to 7V              |
| Inputs/Outputs Voltage.....           | -0.5V to $V_{DD} + 0.5V$ |
| Output Current .....                  | 10mA                     |
| Soldering Lead Temperature (10s)..... | 260°C                    |
| Junction Temperature .....            | -50°C to 150°C           |

### Note:

Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

## DC Electrical Characteristics

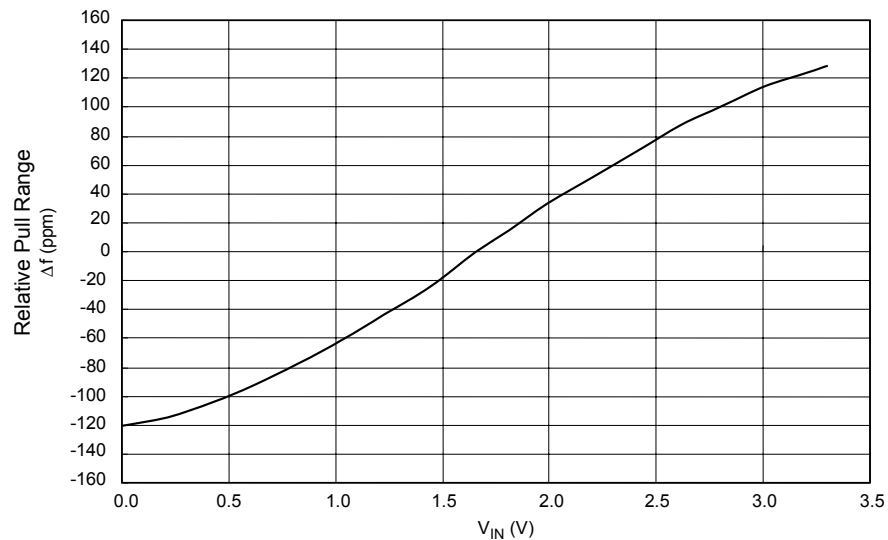
(Unless otherwise specified,  $V_{DD} = 3.3V$ ,  $f_O = 27\text{ MHz}$ ,  $V_{IN} = 1.65V$ , Load = 15pF,  $T_A = 25^\circ C$ )

| Symbol   | Description             | Test Condition           | Min.  | Typ. | Max.  | Units    |
|----------|-------------------------|--------------------------|-------|------|-------|----------|
| $V_{DD}$ | Operating Voltage       |                          | 3.135 | 3.3  | 3.465 | V        |
| $V_{OH}$ | Output High Voltage     | $I_{OH} = -12mA$         | 2.8   |      |       |          |
| $V_{OL}$ | Output Low Voltage      | $I_{OL} = 12mA$          |       |      | 0.5   |          |
| $I_{OH}$ | Output High Current     | $V_{OH} = V_{DD} - 0.5V$ |       | -11  | -4    | mA       |
| $I_{OL}$ | Output Low Current      | $V_{OL} = 0.5V$          | 4     | 12   |       |          |
| $I_{DD}$ | Supply Current          | $C_L = 15pF$             |       | 5    |       |          |
| $I_{OZ}$ | Output Off-leakage      |                          |       |      | 10    | $\mu A$  |
| $R_S$    | Negative Resistance     | $V_{IN} = 0V$            |       | -150 |       | $\Omega$ |
| $f_O$    | Input Frequency         |                          | 19.44 |      | 40    | MHz      |
| $C_L$    | Output load Capacitance |                          |       | 15   | 30    | pF       |

## AC Electrical Characteristics (Unless otherwise specified, $f_O = 27\text{ MHz}$ , Load = 15pF, $T_A = 25^\circ C$ )

| Symbol     | Description           | Test Condition                      | Min. | Typ.      | Max. | Units |
|------------|-----------------------|-------------------------------------|------|-----------|------|-------|
| $T_R/T_F$  | Rise / Fall Time      | $0.1V_{DD}$ to $0.9V_{DD}$          |      | 1.5       | 6    | ns    |
| $T_d$      | Duty Cycle            | $0.5V_{DD}$                         | 45   |           | 55   | %     |
| $\Delta f$ | Pull Range            | $V_{IN} = 0$ to $V_{DD}$            |      | $\pm 120$ |      | ppm   |
| $T_j$      | Cycle-to-Cycle Jitter | $C_L = 15pF$                        |      | 50        |      | ps    |
| $Lin$      | Linearity             | $V_{IN} = 0.1V_{DD}$ to $0.9V_{DD}$ |      | $\pm 10$  |      | %     |
|            | Oscillator Start Time | $V_{DD} = 0.9V_{DD}$ Trigger        |      | 1.5       | 10   | ms    |

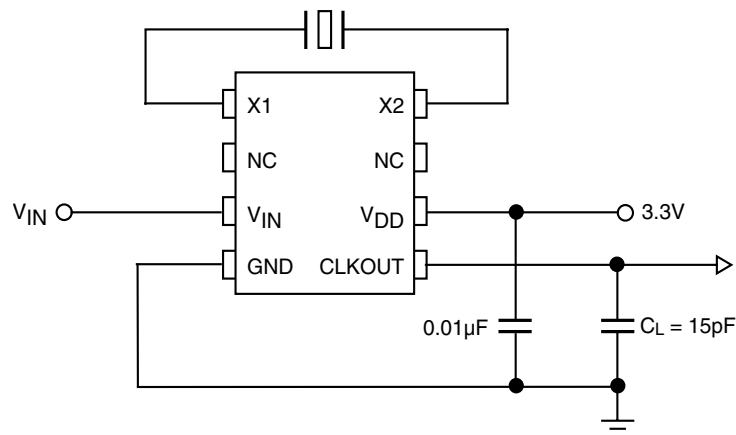
## Pullability Characteristics



## Recommended Crystal Specifications

| Description                        | Crystal         |
|------------------------------------|-----------------|
| Mode of Oscillation and Cut        | Fundamental AT  |
| Frequency (as specified)           | 19.44 to 40 MHz |
| Frequency Tolerance                | ±20ppm          |
| Temperature plus Aging Stability   | ±30ppm          |
| Operating Temperature              | -20°C to +70°C  |
| C0 /C1                             | 240 (max.)      |
| Load Capacitance (C <sub>L</sub> ) | 18pF            |
| Equivalent Series Resistance (ESR) | 35Ω (max.)      |

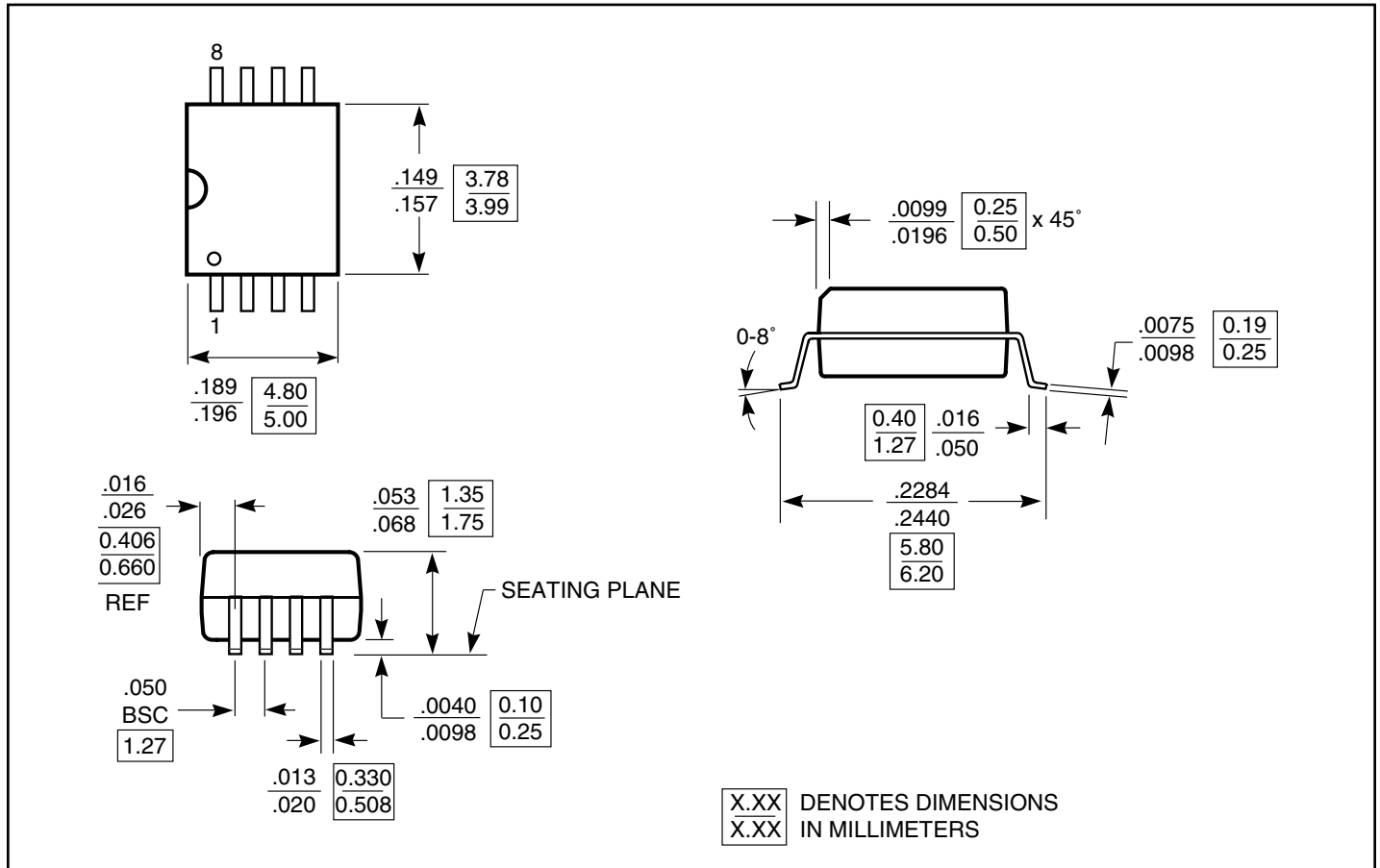
## Measurement Circuit



### Note:

1. 0.1μF or 0.01μF bypass capacitor is required.

## Packaging Mechanical: Plastic 8-pin SOIC (W)



## Ordering Information

| Ordering Code | Package Code | Package Type                        | Operating Range |
|---------------|--------------|-------------------------------------|-----------------|
| PI6CX100-00WE | W            | Pb-free & Green 8-pin, 150-mil SOIC | Industrial      |

### Notes:

1. Thermal characteristics can be found on the company web site at [www.pericom.com/packaging/](http://www.pericom.com/packaging/)
2. Use Suffix "X" for tape and reel
3. Number of Transistors = TBD