

## 27 MHz 3.3V VCXO for Set-Top Box Applications

### Features

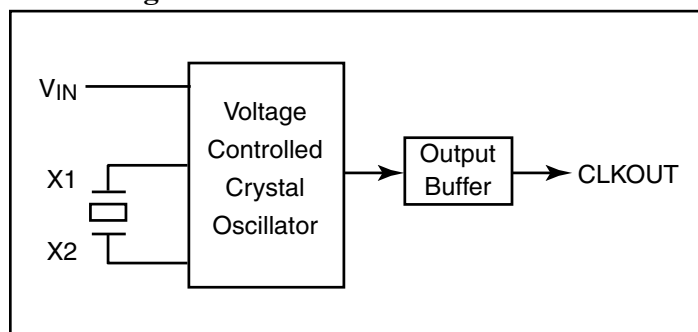
- 3.3V operating voltage
- Uses an external crystal
- On-chip VCXO with pull range of 240ppm
- VCXO tuning voltage from 0 to 3.3V
- 10mA output drive at CMOS levels
- Packaging (Pb-free & Green):
  - 8-pin SOIC (W)

### Description

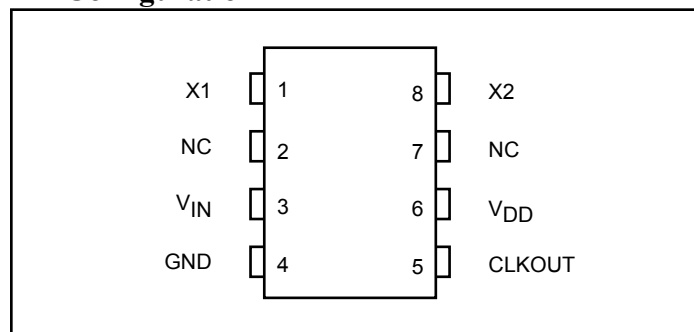
The PI6CX100-27 is a low-cost, high-performance 3.3V VCXO, available in discrete IC form with external quartz crystal. The on-chip Voltage Controlled Crystal Oscillator accepts a 0 to 3.3V input voltage that pulls the output clock frequency by  $\pm 120$ ppm. This device operates with an external 27 MHz quartz crystal specified to achieve the desired performance.

The PI6CX100-27 is designed for Set-Top Box applications.

### Block Diagram



### Pin Configuration



### Pin Description

Pin Name	Number	Type	Description
X1, X2	1, 8	I	Crystal Connection
NC	2, 7		No Connection
V <sub>IN</sub>	3	I	Voltage Input to VCXO
GND	4	PWR	Ground
CLKOUT	5	O	Clock Output
V <sub>DD</sub>	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

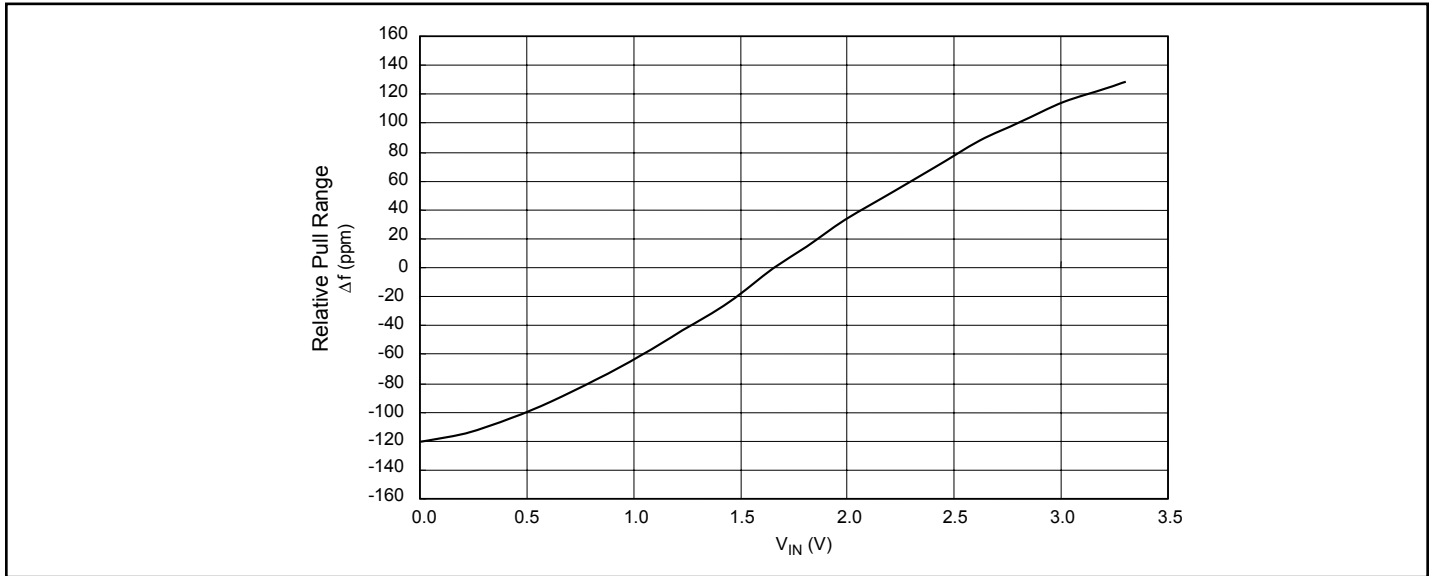
(Unless otherwise specified,  $V_{DD} = 3.3V$ ,  $f_O = 27$  MHz,  $V_{IN} = 1.65V$ , Load = 15pF,  $T_A = 25^\circ C$ )

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			27		MHz
$C_L$	Output load Capacitance			15	30	pF

### AC Electrical Characteristics (Unless otherwise specified, $f_O = 27$ 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	%
$\Delta f$	Rull 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 $0.9 V_{DD}$		$\pm 10$		%
	Oscillator Start Time	$V_{DD} = 0.9V_{DD}$ Trigger		1.5	10	ms

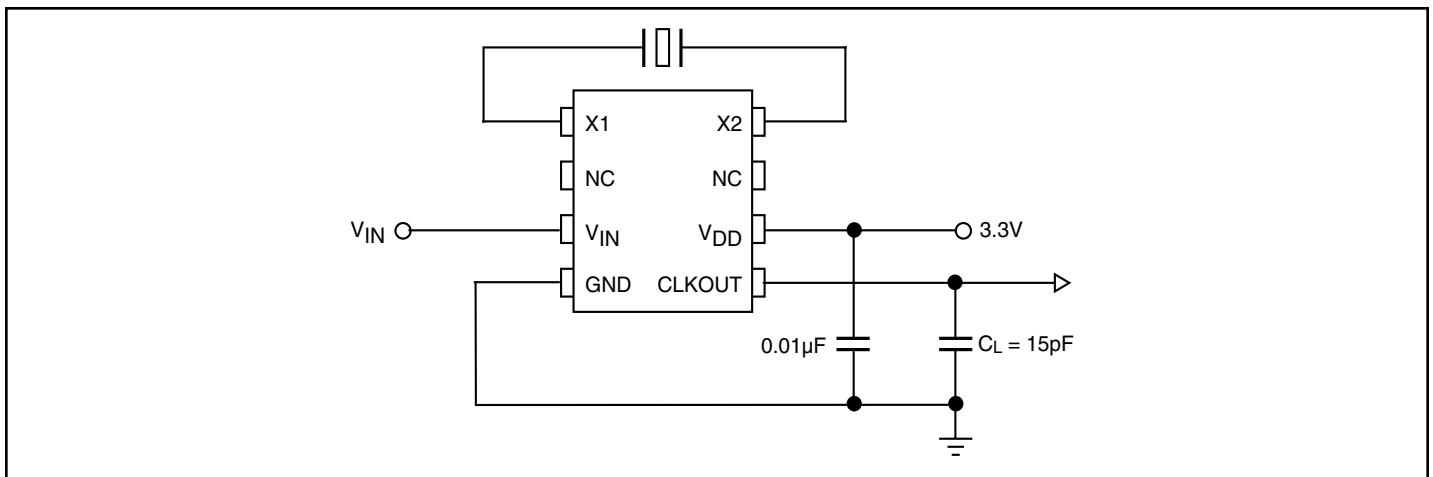
### Pullability Characteristics



### Recommended Crystal Specifications

Description	Crystal
Mode of Oscillation and Cut	Fundamental AT
Frequency	27.000 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.)

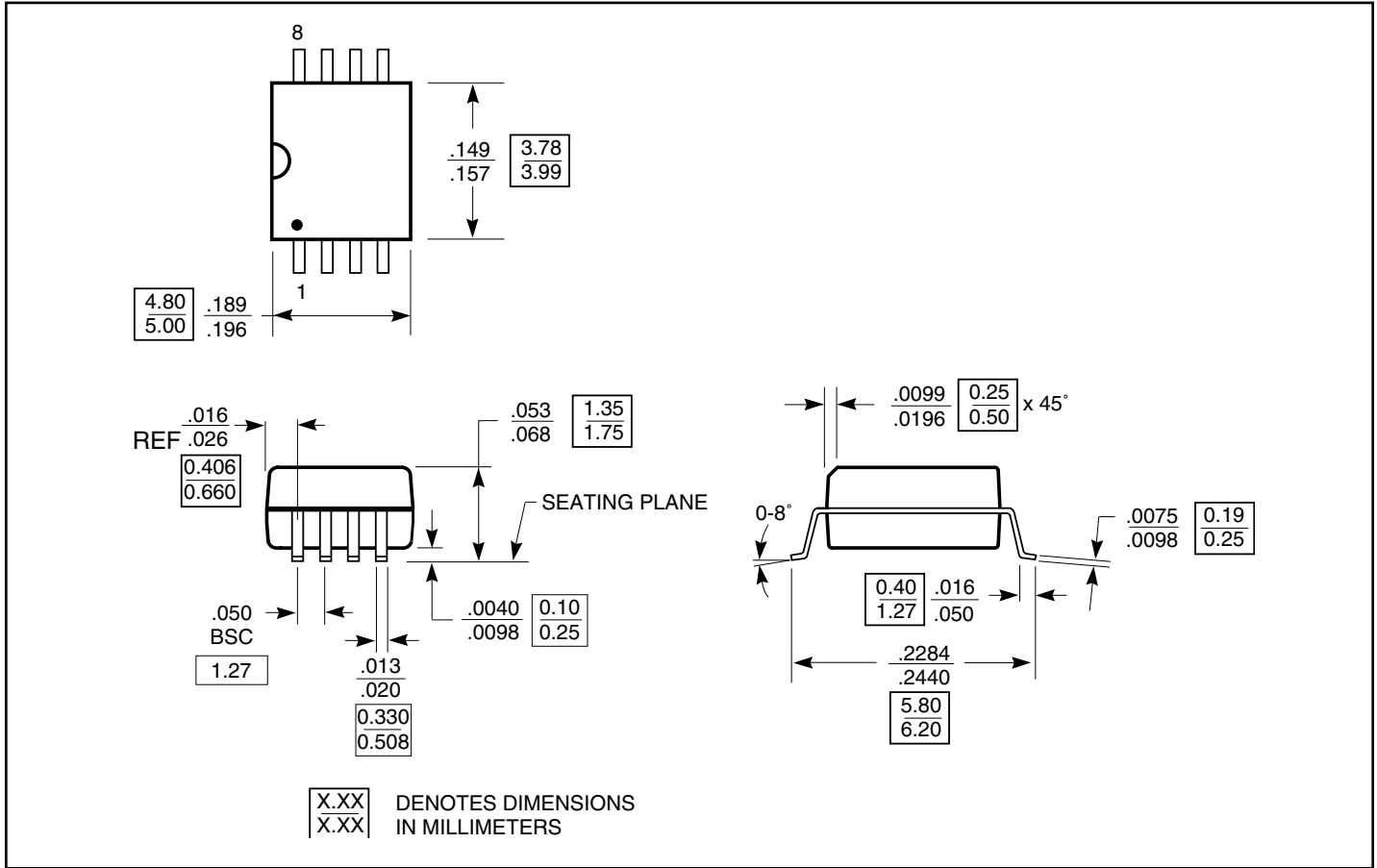
### Measurement Circuit



**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
PI6CX100-27W	W	8-pin, 150-mil SOIC	Industrial
PI6CX100-27WE	W	Pb-free & Green 8-pin, 150-mil SOIC	

**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