

27 MHz 3.3V VCXO for Set-Top Box Applications

Features

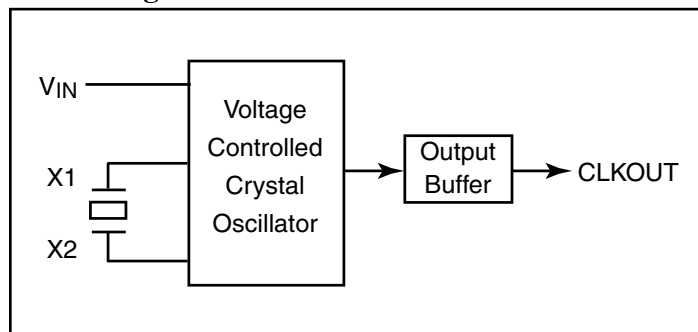
- 3.3V operating voltage
- Uses an inexpensive external crystal
- On-chip VCXO with pull range of 240ppm
- VCXO tuning voltage from 0 to 3.3V
- 10mA output drive at CMOS levels
- Available in SOIC package

Description

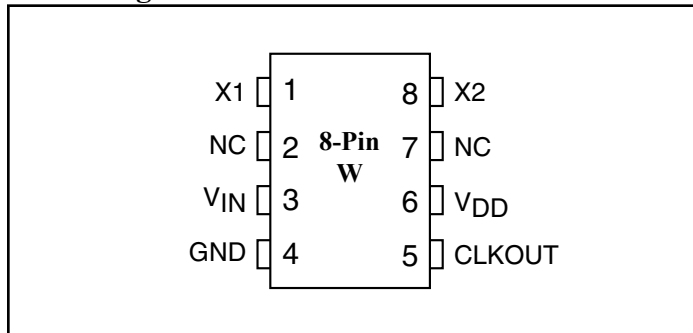
The PI6CX100-27 is a low-cost, high-performance 3.3V VCXO, designed to replace expensive VCXO modules. The on-chip Voltage Controlled Crystal Oscillator accepts a 0 to 3.3V input voltage to cause clocks to vary by ± 120 ppm. This device uses an inexpensive external pullable crystal at 27 MHz to produce the same output frequency.

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		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 ⁽²⁾

Note:

1. 0.1 μ F or 0.01 μ 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

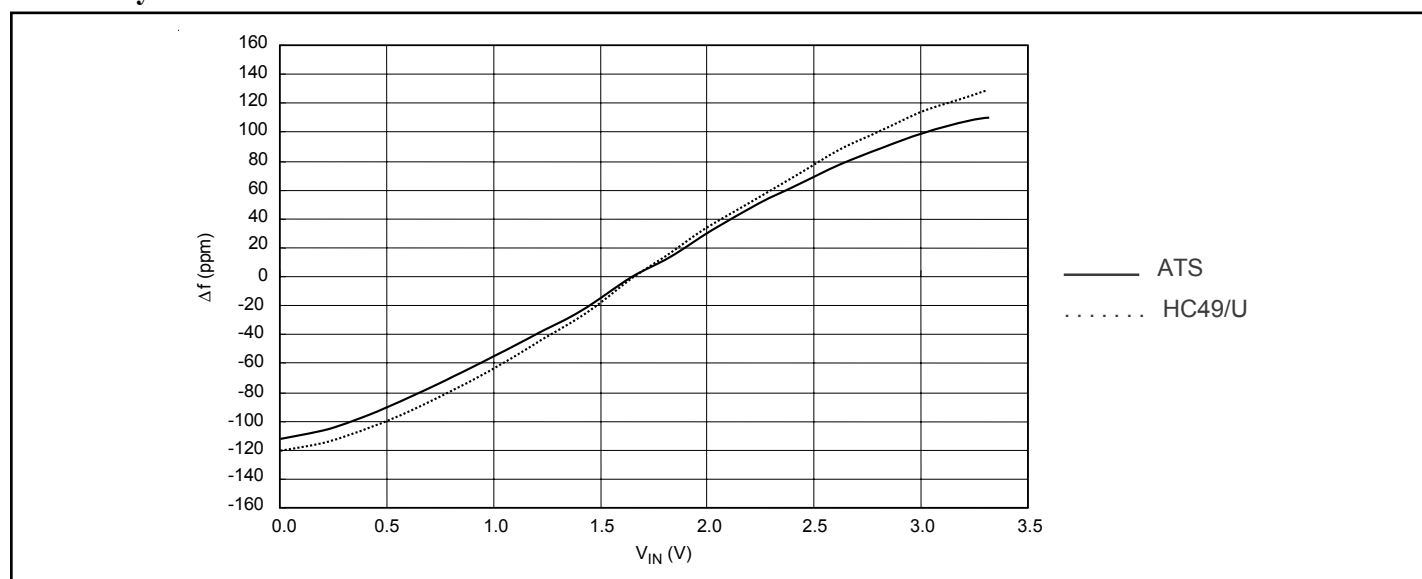
(Unless otherwise specified, $V_{DD} = 3.3V$, $f_O = 27\text{ MHz}$, $V_{IN} = 1.65V$, Load = 15pF, $T_A = 25^\circ\text{C}$)

Symbol	Description	Test Condition	Min.	Typ.	Max.	Units
V_{DD}	Operating Voltage		3.135	3.3	3.465	V
V_{OH}	Output High Voltage	$I_{OH} = -12\text{mA}$	2.8			
V_{OL}	Output Low Voltage	$I_{OL} = -12\text{mA}$			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	$C_L = 15\text{pF}$		5		
I_{OZ}	Output Off-leakage				10	μA
R_S	Negative Resistance	$V_{IN} = 0V$		-150		Ω
f_O	Input Frequency		20	27	30	MHz
C_L	Output load Capacitance			15	30	pF

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

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

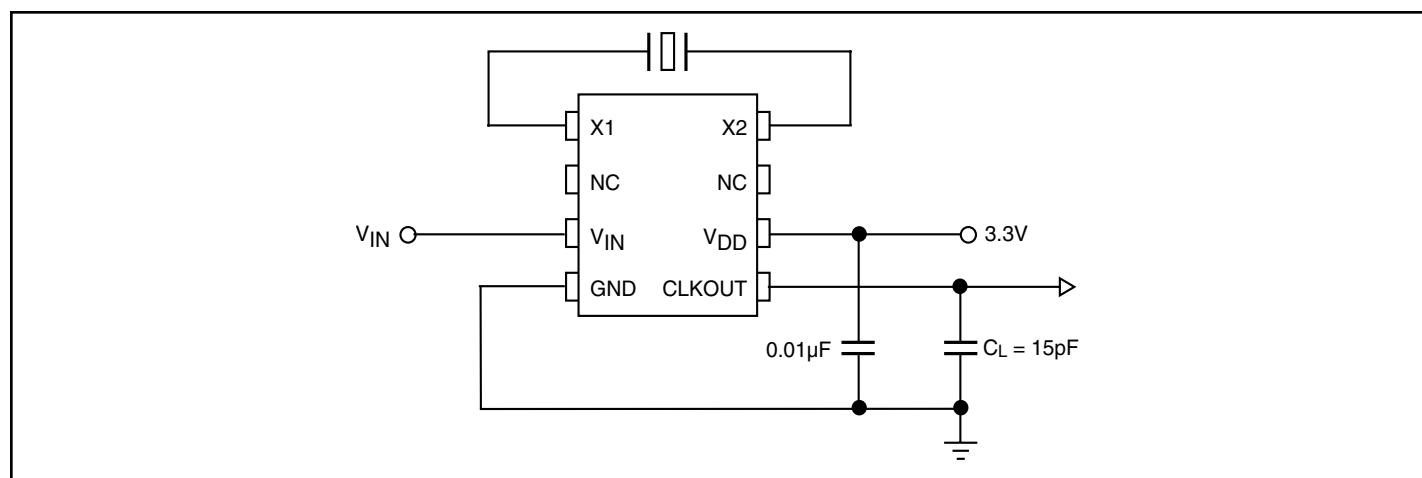
Pullability Characteristics



Recommended Crystal Specifications

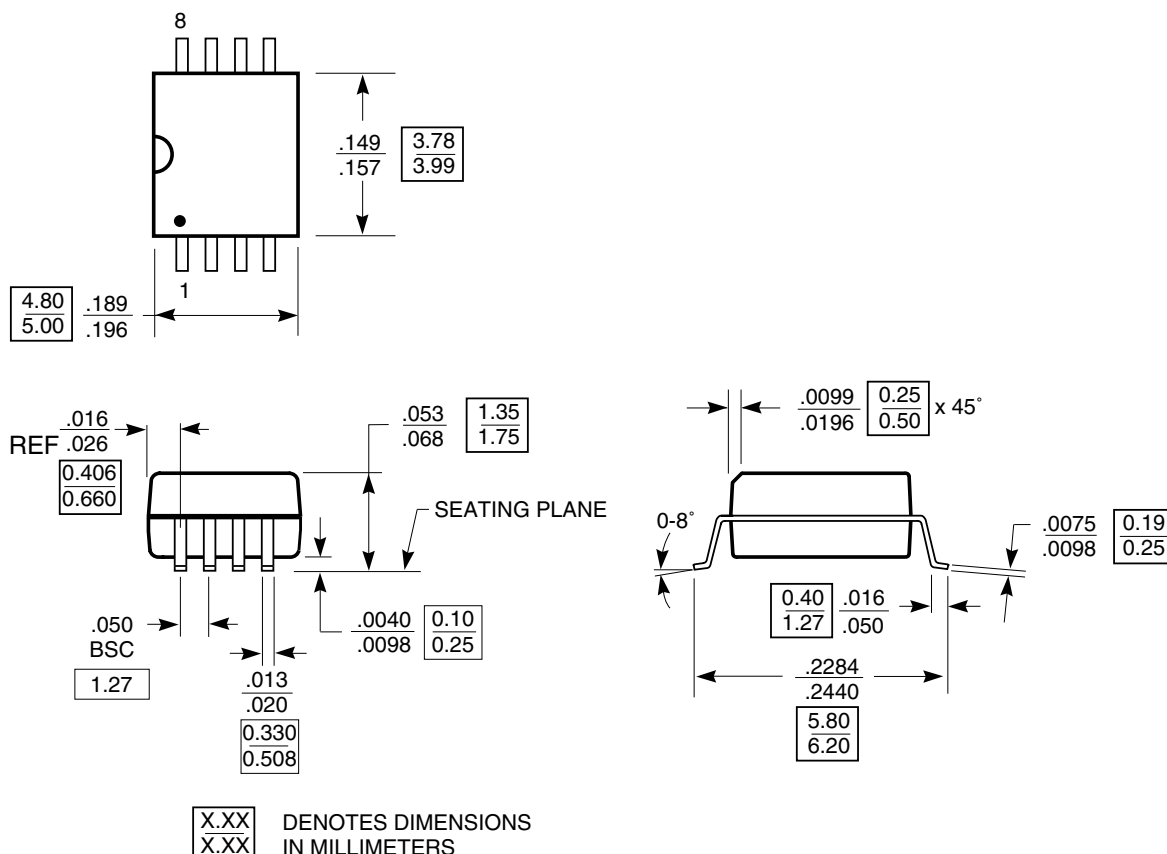
Description	Crystal
Mode of Oscillation	Fundamental
Frequency Range	27.000 MHz
Frequency Tolerance	± 30 ppm
Temperature plus Aging Stability	± 50 ppm
Operating Temperature	-20°C to +70°C
C0 /C1	240 (max.)
Load Capacitance (C_L)	18pF
Equivalent Series Resistance (ESR)	35 Ω (max.)

Measurement Circuit



Note:

1. 0.1 μ F or 0.01 μ F bypass capacitor is required.
2. Crystal frequency is 27.000 MHz.

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:

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- Number of Transistors = TBD