



PI6CX100-35

35 MHz 3.3V VCXO for xDSL Applications

Product Features

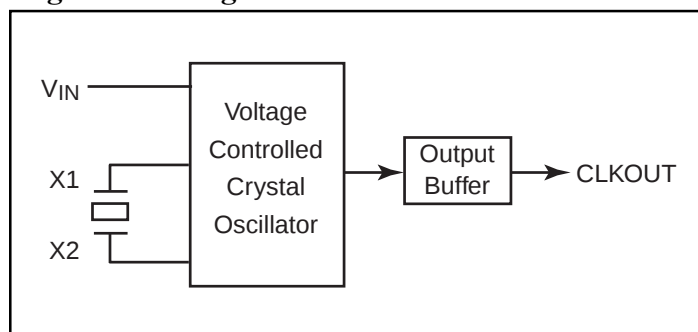
- 3.3V operating voltage
- Uses an inexpensive external crystal
- On-chip VCXO with pull range of 240ppm
- VCXO tuning voltage from 0 to 3.3V
- 10mA output drive at CMOS levels
- Available in SOIC package

Product Description

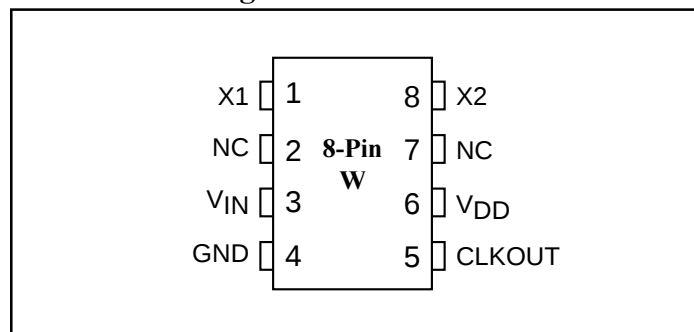
The PI6CX100-35 is a low-cost, high-performance 3.3V VCXO, designed to replace expensive VCXO modules. The on-chip Voltage Controlled Crystal Oscillator accepts a 0 to 3.3V input voltage to cause clocks to vary by ± 120 ppm. This device uses an inexpensive external pullable crystal at 35 MHz to produce the same output frequency.

The PI6CX100-35 is designed for xDSL applications.

Logic Block Diagram



Product Pin Configuration



Pin Description

Pin Name	Pin Number	Type	Description
X1, X2	1, 8	I	Crystal Connection
NC	2, 7		No Connect
V _{IN}	3	I	Voltage Input to VCXO
GND	4	PWR	Ground
CLKOUT	5	O	Clock Output
V _{DD}	6	PWR	Power Supply ⁽¹⁾

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, $V_{DD} = 3.3V$, $f_0 = 35.328\text{ MHz}$, $V_{IN} = 1.65V$, Load = 15pF, $T_A = 25^\circ\text{C}$)

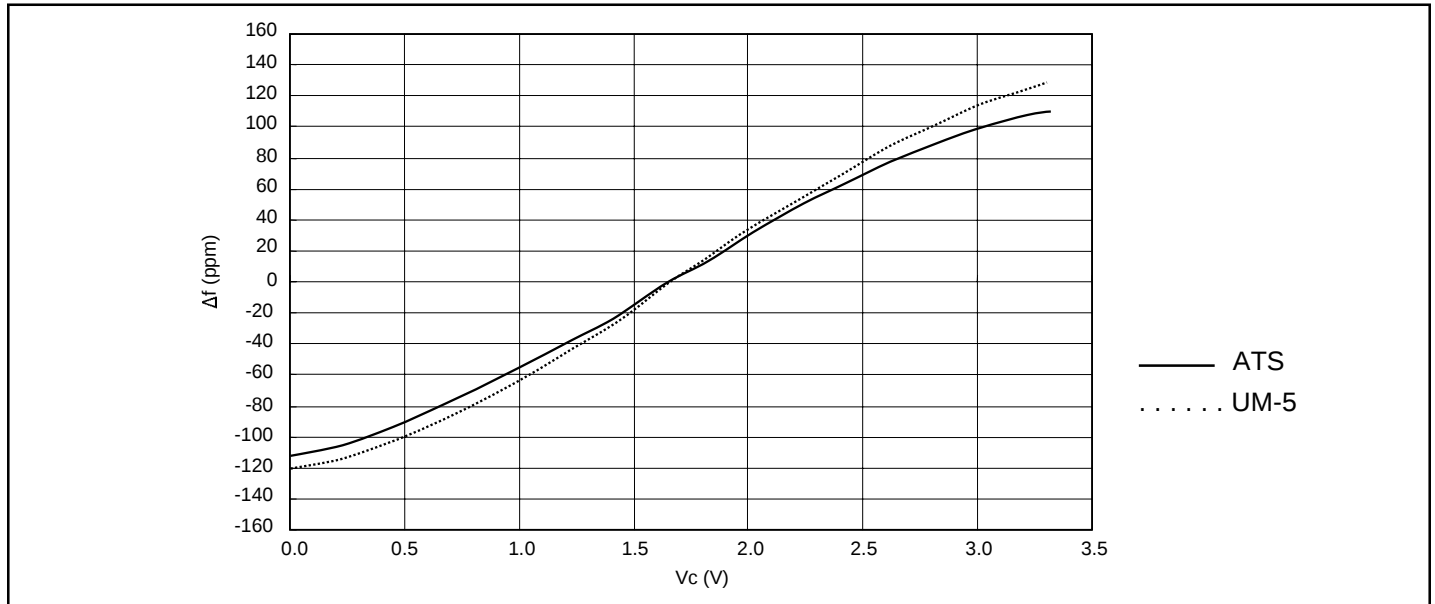
Symbol	Description	Test Condition	Min.	Typ.	Max.	Units
V_{DD}	Operating Voltage		3.135	3.3	3.465	V
V_{OH}	Output High Voltage	$I_{OH} = -12\text{mA}$	2.8			
V_{OL}	Output Low Voltage	$I_{OL} = 12\text{mA}$			0.5	
I_{OH}	Output High Current	$V_{OH} = V_{DD} - 0.5V$		–11	–4	mA
I_{OL}	Output Low Current	$V_{OL} = 0.5V$	4	12		
I_{DD}	Supply Current	$C_L = 15\text{pF}$		6		
I_{OZ}	Output Off-leakage				10	μA
R_S	Negative Resistance	$V_{IN} = 0V$		–80		Ω
f_0	Input Frequency			35		MHz
C_L	Output Load Capacitance			15	30	pF

AC Electrical Characteristics

(Unless otherwise specified, $f_0 = 35.328\text{ MHz}$, 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	%
T_j	Cycle-to-Cycle Jitter	$C_L = 15\text{pF}$		50		ps
Δf	Pull Range	$V_{IN} = 0 - V_{DD}$		± 120		ppm
Lin	Linearity	$V_{IN} = 0.1V_{DD} - 0.9V_{DD}$		± 10		%
	Oscillator start time	$V_{DD} = 0.9V_{DD}$ trigger		1.5	10	ms

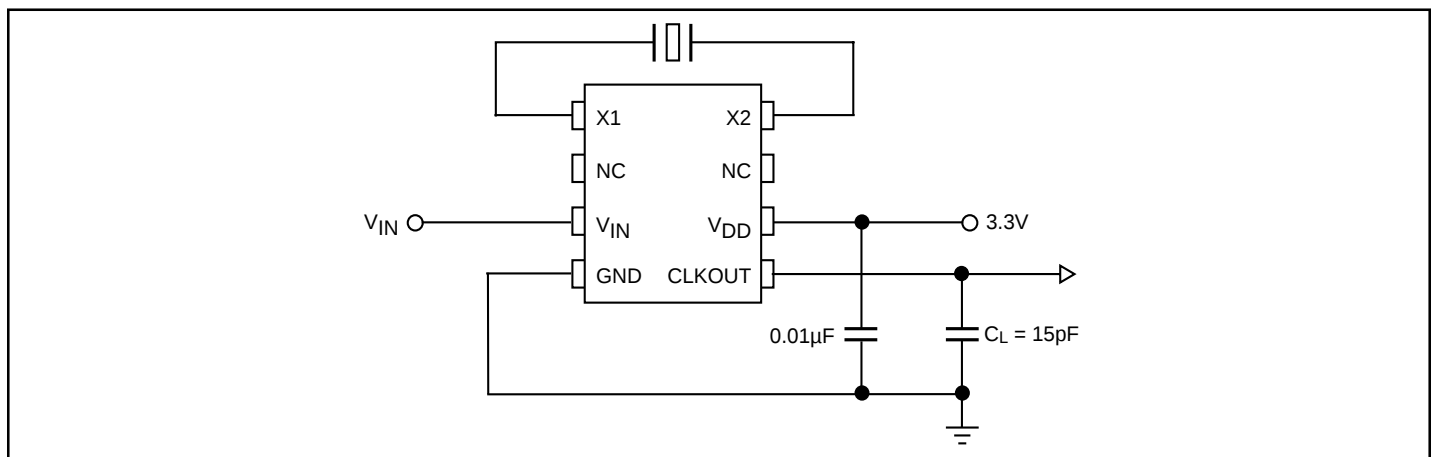
Pullability Characteristics



Recommended Crystal Specifications

Description	Crystal
Mode of Oscillation	Fundamental
Frequency Range	35.328 MHz
Frequency Tolerance	±20ppm
Temperature plus Aging Stability	±50ppm
Operating Temperature	-20°C to +70°C
C0 / C1	240 (max.)
Load Capacitance (C _L)	17pF
Equivalent Series Resistance (ESR)	35 ohms (max.)

Measurement Circuit



Note:

1. 0.1μF or 0.01μF bypass capacitor is required.
2. Crystal frequency is 35.328 MHz.

The image displays three mechanical drawings of a 16-pin DIP package:

- Top View:** Shows the package footprint with dimensions: width .149 to .157 inches (3.78 to 3.99 mm), length 4.80 to 5.00 inches (121.92 to 127.00 mm), and pin pitch .189 to .196 inches (4.80 to 5.00 mm). A center mark and a notch are indicated.
- Side View:** Shows the package height with dimensions: total height .053 to .068 inches (1.35 to 1.75 mm), seating plane to top .016 to .026 inches (0.406 to 0.660 mm), and seating plane to bottom .0040 to .0098 inches (0.10 to 0.25 mm). The seating plane is defined as the plane of the pins.
- End View:** Shows the package profile with dimensions: pin height .0075 to .0098 inches (0.19 to 0.25 mm), pin width .0099 to .0196 inches (0.25 to 0.50 mm) at a 45° angle, and pin spacing .016 to .050 inches (0.40 to 1.27 mm). The package body width is .2284 to .2440 inches (5.80 to 6.20 mm).

Legend: X.XX DENOTES DIMENSIONS IN MILLIMETERS

Ordering Code	Package Name	Package Type	Operating Range
PI6CX100-35W	W8	8-pin 150-mil SOIC	Industrial