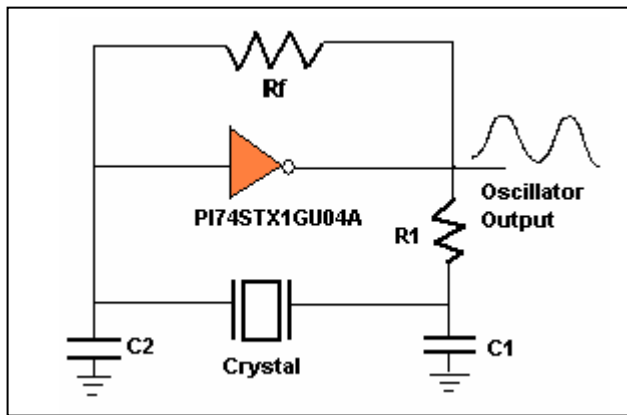


Application: Crystal Oscillator
Pericom Device: PI74STX1GU04A Single Unbuffered Inverter

Overview

Due to its stable electromechanical-resonance characteristics (with respect to time and temperature) and high selectivity (high Q factor), piezoelectric crystal (such as quartz) has been an indispensable element in the crystal oscillator designs. Nearly all today's electronic applications utilize crystal oscillators as a source for generating clock and timing signals. These applications range from computing to networking, and from handheld systems to large industrial equipment. There are many integrated crystal oscillator products available in the market. This paper will present an easy way in designing a low cost crystal oscillator using a crystal ([SaRonix](#)) along with Pericom's single unbuffered inverter device.



Crystal Oscillator using PI74STG1GU04A

Pericom Solution

Pericom's PI74STX1GU04A Single Unbuffered Inverter is used in the basic crystal oscillator (**Pierce oscillator**) design shown in Figure 2. The unbuffered (single stage) inverter device acts as an amplifier and the feedback resistor R_f determines the dc operating point in the high-gain region of the inverter. Resistor R_1 together with capacitor C_1 provides a low-pass filter that prevents the circuit from oscillating at a higher harmonic of the crystal frequency. The values of R_f , R_1 , C_1 and C_2 are tunable to achieve the desired and accurate frequencies. The crystals oscillators designed this way can achieve frequencies ranging from dozens of KHz to dozens of MHz.

Key Features & Specifications

PI74STX1GU04A

<http://www.pericom.com/specs/PI74STX1GU04A.pdf>

- Single power supply operation 1.65V – 5.5V
- High-Speed: $T_{pd} = 1.8ns$ typical into 50pF @ 5V
- High Output Drive: +/-12mA @ 3.3V
- Low Standby Current: 2uA typical
- SOTiny 5-pin Packaging:
 - [SOT-23 Package Outline Drawing](#)
 - [SC70 Package Outline Drawing](#)

Key Benefits

- Supports wider voltage range than others in the market
- Miniature footprint
- Easy placement in space constrained designs
- Simplifies layout complexity

Product Status and Pricing

- Samples Now
- Production Now
- Budgetary Pricing \$0.08 in 10k quantities

Competitive Cross-Reference

Pericom	Competitor
PI74STX1GU04A	NC7SZU04 (Fairchild)
PI74STX1GU04A	TC7SHU04 (Toshiba)
PI74STX1GU04A	SN74LVC1GU04 (TI)

Typical Applications

- Computing (PC)
- Networking (Switches, Routers)
- Handheld Systems (PDA, Cell Phone, Digital Camera)
- Medical Equipment
- Consumer Electronics (Set-Top-Box)
- Industrial Computers
- Printers and Copiers
- Many Other Applications

Additional Information

- Website
 - <http://www.pericom.com/logic/psempart.php?productID=PI74STX1GU04A>
 - Datasheets, Product Presentations, IBIS, Application Notes, Quality & Package data
- Order Literature Online
 - <http://www.onfulfillment.com/pericom/>
 - Product Selection Guide and Cross Reference
 - SOTiny Sample Kits
 - Databook CD
 - Presentation with Navigation
 - Order the Databook CD

Contact Information

Please contact your local Pericom Sales Representative or franchised distributor. Contact list provided on the web:

<http://www.pericom.com/partners/index.php>

Or

Application Support:

<http://www.pericom.com/support/apps.php>

Product Marketing

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