

Design Report

Capture a ring oscillator circuit into a CAD tool and simulate its transient behavior. Use a tri-state inverter, as shown in the figure on page 2. Use transistor widths that are consistent with those we have been discussing, such as the ring oscillators used by MOSIS for the AMI05 process. Produce a design report that includes some hand calculations of the ring oscillator timing, and compare and contrast to your simulation results. Use layout design decisions to estimate capacitance values.

By using a tri-state inverter, you can vary the oscillation frequency with a control voltage, thus making a voltage controlled oscillator (VCO). Show the transient behavior for more than one control voltage.

Show the layout of a pair of tri-state inverters that would be part of the ring oscillator.

Write your report using the following guidelines:

1. The report should be in electronic form as much as possible.

A shorter report that meets the requirements is better than a longer report.

If a written section about something you worked on obscures what you are trying to communicate, leave it out.

The report should have the following sections:

Abstract – write this last, it's the main things the reader wants to know.

Short problem statement and its answers.

1 page that tells how the report is organized, this can include a table of contents.

Introduction – Problem context, requirements, and set up.

Results and Discussion – All the technical details.

Conclusion – Review your main results.