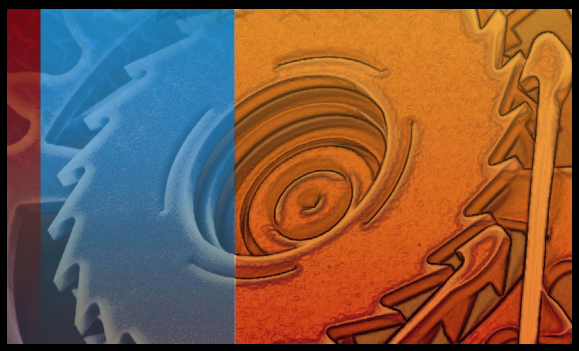
DESIGN.
FABRICATION.
TESTING.

SAMPLES Quarterly

ISSUE
04
January 2012



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SAMPLES Design Submission Requirements

As part of our SAMPLES program, Sandia provides MEMS Design Tools to help you mitigate potential design issues that could negatively impact your final product. These resources include the Design Rule Checker (DRC) and snl_chkent.

DRC and snl_chkent outputs will now be required to be included in every design submission package. We recommend that you run these checks often during the design process, and on each component or device, rather than waiting for full module assembly. This practice should help you avoid errors early on and save yourself time later when fixing those errors.

In order to submit your design for fabrication, you must be able to run your design through our online pre-submission checklist with **no errors**. This implies your final drawings have been successfully run through both the Design Rule Checker and snl_chkent. If you encounter any errors or warnings, please contact drt@drc.sandia.gov to address these potential problems.

The only way your submission will be accepted if it did not pass the DRC and snl_chkent is if requests for exceptions are included in the submission and approved. Consequences of non-compliances may include exclusion from a fabrication run, which ultimately delays the delivery of parts.

Attention: Be sure to download Sandia's MEMS Design Tools version 2.2.6 prior to starting your connectivity test.

- Design Tools
- Visualization Tools

Folded Self-Intersecting Polygons

One error we frequently encounter in design submission is the presence of folded self-intersecting polygons. This type of error is created in AutoCAD when a polyline is drawn back over itself before closing the polygon. Folded self-intersecting polylines result in GDS conversion errors that will interfere with the reticle (mask) manufacturing process. They are generally not visible to the designer and can only be detected with the Design Rule Checker (DRC).

When the DRC returns an ERR_GDSII_CUT result, it can indicate the presence of a folded self-intersection polyline in your design. The orange highlighted suspect polyline must be evaluated with the Pedit AutoCAD command in order to determine the exact location of the folded polyline. After selecting the "edit vertex" then "next" options, a "X" marker will navigate from one vertex point to another around the polyline. When the marker moves twice between two vertex points you have identified the polyline causing the error.

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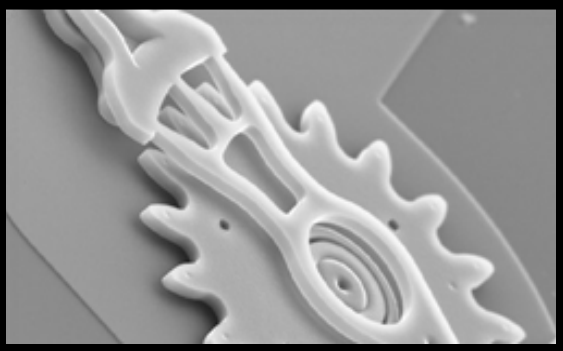

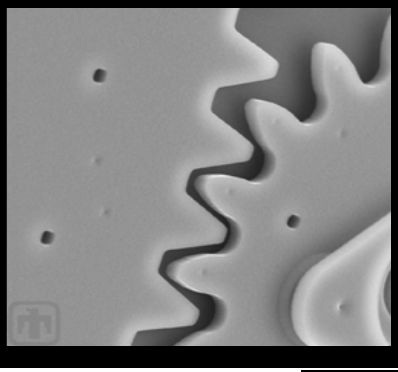

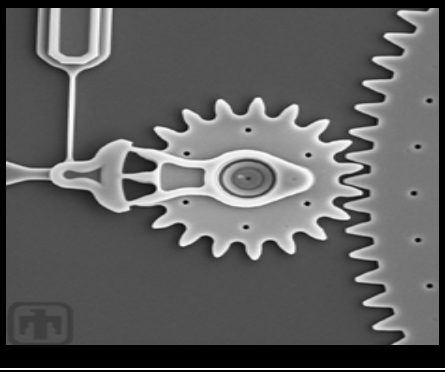

2012 University Alliance Design Competition

The Sandia MEMS University Alliance Design Competition offers participating universities the opportunity to take part in an exciting program geared around MEMS design, fabrication and testing.

Participants will design their own MEMS devices based on one of two design categories, then select one device to submit to Sandia for judging. A member school may submit a design to one or both categories.

Winning entries will be judged based on their adherence with category requirements, use of SUMMiT V specific strengths, and accurate description of the device to be judged.

Teams will also have the opportunity to receive fabricated devices of their selected design, once the competition has been completed.

2012 marks the 8th year of the Sandia MEMS University Alliance Design Competition, and we look forward to seeing the innovative designs of this years' competitors. There are several new schools that have joined the University Alliance this past year, making the competition even more exciting.

Please visit the competition web page for more information.

Competition Deadlines:

- Intent to submit and Participant form due: **February 1, 2012**
- MEMS Network Validation Process due: **February 20, 2012**
- Design Submission Package due: **April 5, 2012**
- Winners will be announced **April 30, 2012**

SPIE Travel Awards

We would like to thank SPIE for partnering with Sandia National Laboratories again this year to provide travel grants to schools participating in the 2012 Sandia MEMS University Alliance Design Competition. Please contact Stephanie Johnson for more information.

Future Short Course Plans

We are gauging interest in Sandia's MEMS Short Course. Please contact us at memscc@sandia.gov. if you are interested in attending this year.

University Alliance Members

Air Force Institute of Technology
Arizona State University
Austin Community College
Carnegie Mellon University
Central New Mexico Community College
Centro de Ingenieria y Desarrollo Industrial
Centro de Investigacion en Computacion del IPN
Centro de Investigacion y de Estudios Avanzados del Instituto Politecnico Nacional, Unidad Guadalajara
Chemeketa Community College
Chippewa Valley Technical College
Cornell University
Instituto Nacional de Astrofisica, Optica y Electronica/ Direccion de Formacion Academica
Instituto Technologico de Hermosillo/Metal-Mecanica
Instituto Tecnologico Superior de Cajeme/Sub Direccion Academica
Luna Community College
Montana State University
New Mexico State University
North Dakota State College of Science
Northwest Shoals Community College
Southwestern Indian Polytechnic Institute
Texas State University
Texas Tech University
Universidad Autonoma de Ciudad Juarez/Applied Science and Technology Research Center
Universidad de Guanajuato, Division de Ingenierias Campus
Universidad de la Sierra
Universidad de Sonora/Departmento de Investigacion en Fisica
Universidad nacional Autonoma de Mexico/Centro de Fisica Aplicada y Tecnologia Avanzada
Universidad Veracruzana/Center of Research for Micro and Nanotechnology
University of Guadalajara, Centro Unversitario de la Cienega
University of Arizona
University of Florida
University of Illinois at Urbana/Champaign
University of New Mexico
University of North Carolina-Charlotte
University of Oklahoma
University of Utah
University of Wisconsin-Platteville
Worcester Polytechnic Institute

For more information on the SAMPLES and University Alliance programs, contact Stephanie Johnson:
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