



ARCHITECT Model Library List

ARCHITECT offers numerous parameterized models of MEMS components, grouped into standard and optional libraries. Underlying each component is a sophisticated mathematical model that may have as many as 40 geometric and material properties. Users can customize a component by setting the values of any of its properties. The mechanical components have one or more connection points, known as knots, each having six degrees of freedom (3 translational and 3 rotational). Complex MEMS, such as moveable mirrors, accelerometers, gyroscopes, and switches, can be modeled by snapping together the components, like building blocks.

The ARCHITECT Parameterized MEMS Component Libraries are as follows:

[Electro-Mechanical Component Library](#)

Plates

- Rigid Plate (Enhanced)
- Rigid Plate Contact
- Flexible Rectangular Plate
- Electrode
- Straight Comb
- Curved Comb
- Radial Comb
- Straight Comb with Split Stator
- Radial Comb with Split Stator
- Four-Node Quadrilateral Plate
- Four-Node Quadrilateral Plate Contact
- Four-Node Quadrilateral Plate Electrode
- Nine-Node Quadrilateral Plate
- Nine-Node Quadrilateral Plate Contact
- Nine-Node Quadrilateral Plate Electrode

Beams and Suspensions

- Beam
- Beam Actuator
- Beam Contact
- Beam Piezo Actuator
- Beam Electrode
- Post
- L-Beam
- J-Beam
- Box Beam
- Serpentine
- Freeform Beam

Dampers

- Rigid Plate Damper
- Translational Damper (Squeezed Film)
- Rotational Damper (Squeezed Film)
- Translation Damper (Slide Film)
- Rotational Damper (Slide Film)

Hybrid Finite Elements with ARCHITECT

- Straight Piezoresistor
- Piezoresistor Voltage Taps
- Database Loop Variable
- Database Displacement Probe
- Database Stress Probe

Knot Boundary Conditions

- Fixed Knot
- Free Knot
- Pinned Knot
- Guided Knot
- Anchor

Fluidics Component Library

Inkjets (available with 2005.1 release)

- Nozzle Drop On Demand
- Nozzle Continuous Jetting
- Ink Chamber Piezoelectric driven Roof Shooter
- Ink Chamber Piezoelectric driven Side Shooter
- Ink Chamber Vapor Bubble driven Side Shooter
- PZE Driven Monomorph Diaphragm with Hydro Loading
- Two Phase Flow in Channel of Uniform Cross-section
- Two Phase Flow in Channel of Varying Cross-section
- Single Phase Flow in Channel of Uniform Cross-section
- Single Phase Flow in Channel of Varying Cross-section
- Two Phase Flow Connecting Single Phase Flow Block via Channel of Uniform Cross-section
- Two Phase Flow Connecting Single Phase Flow Block via Channel of Varying Cross-section
- Capillary Valve
- Ink Reservoir
- Air Source for Two Phase Flow

Internal Flow Components

- Active Valve
- Air Pocket
- Burst Valve
- Diodic Valve
- Elbow Channel
- Fluid Capacitance

- Generic Valve
- Latent Heat Boundary Condition
- Low Reynolds Number Orifice
- Meander
- Perfect Gas Bubble
- Rayleigh-Plesset Bubble
- Reference Resistor
- Reservoir
- Right-Angled Channel
- Straight Channel
- U-Bend Channel
- Volume to flow Rate Converter

Parametric - Actuators

- Two-Port Piston (Flow to Translation Transducer)
- Four-Port Piston
- Edge-Fixed Membrane
- Electrostatic Actuator
- Generic Pump
- Micropump/Micromotor (Flow to Torque Transducer)
- Parallel-Plate Capacitor
- Piezoelectric Actuator
- Thermal Bubble

Meniscus Components

- Spherical Droplet (One- and Two-Port)
- Head and Neck Component of Droplet (One- and Two-Port)
- Meniscus with Inertance (One- and Two-Port)

Macromodeling - FlowMM Components

- FlowMM Resistor
- FlowMM Resistor and Inertor
- Variable FlowMM Resistor
- Variable FlowMM Resistor and Inertor

Fluidics Component Library Continued

Electrokinetics Components

- Electrokinetic Injector
- Electrokinetic Straight Channel
- Electrokinetic Elbows
- Electrokinetic U-Bends
- Electrokinetic Detector
- Electrokinetic 2D Injectors
- Electrokinetic Two-Species Straight Channel
- Electrokinetic Two-Species Elbow
- Electrokinetic Two-Species U-Bend

Magneto-Mechanics Component Library

Movable Magnets and Coils

- Movable Bar Magnet
- Movable 3-Direction Magnet
- Movable Uniform Field Magnet
- Magnetizable Material
- Movable Magnetizable Uniform Field Magnet
- Movable Magnetizable 3-Direction Magnet
- Movable Magnetizable Bar Magnet
- Movable Coil

Fixed Sources of Field

- Fixed Two Pole Magnet
- Fixed Two-Pole Magnet For Bar
- Fixed Two-Pole Magnet for 3-Direction Magnet
- Fixed Planar Rectangular Coil
- Fixed Planar Rectangular Coil For Bar
- Fixed Planar Rectangular Coil For 3-Direction Magnet
- Uniform Magnetic Field Source

Utility Parts

- Two-Field Point Adder
- Uniform and Three-Direction Field Adder
- Magnetic Field Average, Two-Point
- Magnetic Field Average for Three-Direction Bus
- Three-Direction Bus to H Field
- H Field to Three-Direction Bus
- Magnetization Chooser

RF Component Library

- Coplanar Waveguide Transmission Line
- Microstrip Gap (Discontinuity)
- Microstrip Line
- Microstrip Step in Line width
- RF Port
- Variable Conductance
- Variable Capacitance
- Variable Inductance
- Variable Resistance

Optics Component Library

Active Components

- Detector
- Optical Power Source
- VCSEL (Vertical Cavity Surface Emitting Laser)

Passive Components

- Beam Splitter
- Aperture
- Collimated Fiber Emitter
- Collimated Fiber Receiver
- Fiber Emitter
- Fiber Receiver
- Lens (Thin Ideal Lens)
- Mirror
- Polarizer
- Raleigh Range Query
- Optical Bus to Wire
- Shutter

Other Libraries

Electrical Components

- Variable Capacitor
- Variable Conductor
- Variable Inductor
- Variable Resistor

Interface Components

- Bus Connector
- Position to Var Converter
- Var to Force Converter

Miscellaneous

- Reference Frame
- COVENTOR Symbol
- Declare Hierarchical Parameters
- Add Layout
- Pull-In Source