



OVERVIEW

The Modelithics Silicon Supplies MVP Library is a collection of highly accurate measurement-based nonlinear transistor models that can be simulated in popular Electronic Design Automation (EDA) software tools. These models are extracted from DC I-V and S-parameter measurements at different bias conditions. With the Silicon Supplies nonlinear transistor models, designers can perform S-parameter, noise-parameter, and power-sweep simulations. These state-of-the-art models install seamlessly into the EDA software, placing high accuracy models at your fingertips, which allow for first pass design success!

LIBRARY FEATURES

The Modelithics® Silicon Supplies MVP Library represents a collection of nonlinear transistor models that provide many advantages. Valuable features of the models include:

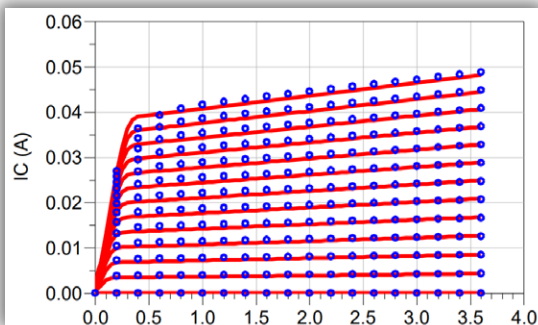
- **MEASUREMENT-BASED** — Each model is developed using highly accurate measurements across multiple bias conditions. By developing models using measurements, designers can have confidence that their simulations will represent real-world conditions.
- **VALIDATION OVER TEMPERATURE** — Designers can specify the backside ambient temperature of the models. Models are validated at +25°C, +75°C, and +115°C.
- **TEST-FIXTURE EFFECTS AND TOLERANCE PARAMETERS** — Die models let designers include or remove test-fixture effects. Various tolerance parameters are also included.
- **AVAILABLE FOR POPULAR EDA TOOLS** — Keysight Technologies' Advanced Design System (PathWave ADS), Cadence® AWR Design Environment®, and Keysight PathWave RF Synthesis (Genesys).
- **COMPLETE DOCUMENTATION** — Each model contains a comprehensive model datasheet that lists recommended model validity parameters, measurement and test fixture details, and model-to-measurement data comparisons.

BJT_DDV_2SC3356_001_MDLXNLT2
X1
Temp=25
TestFixture_removal=1
Keysight ADS

Device Image:
2SC3356 Silicon Bipolar Transistor Die

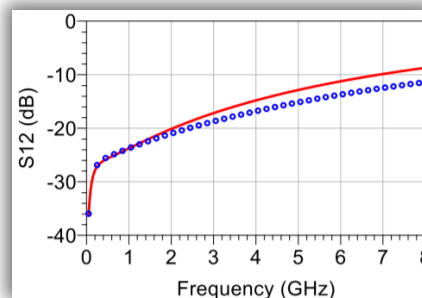
Reference planes at Adapter Substrate input launches, *TestFixture_removal = 0*
Reference planes at Base and Emitter bond pads, *TestFixture_removal = 1*

BJT-SSL-2SC3356-001: Modelithics Model for 2SC3356 Silicon Bipolar Transistor Die DC I-V Characteristics

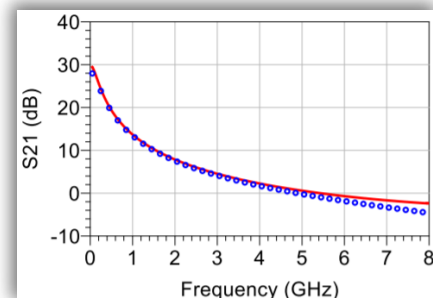


Legend: *Red Solid lines* - Model data, *O Symbols* - Measured data
Simulated at 25C with VCE varying from 0 to 3.6V,
Ib varying from 0uA to 300uA in steps of 25 uA
TestFixture_removal = 0. Display includes 2 Ohm external bias line resistance

S12



S21



BJT-SSL-2SC3356-001: Modelithics Model for 2SC3356 Silicon Bipolar Transistor Die S-Parameters Model vs. Measured: VCE = 3.5V, IC = 10mA, 25C
Legend: *Red Solid lines* - Model data, *O Symbols* - Measured data. Simulated at 25C with the frequency range from 0.05 – 8GHz. TestFixture_removal = 0. (Left: S12; Right: S21)

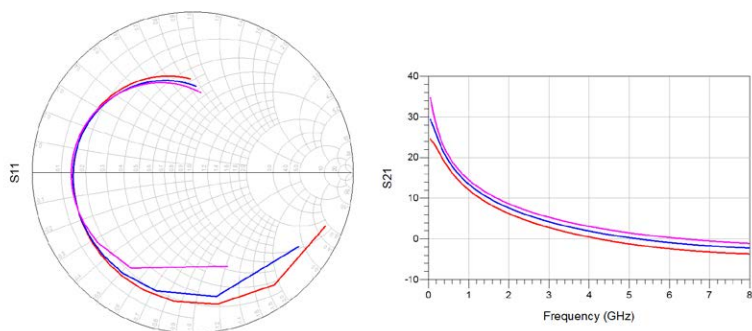
Transistors

2SC3356

****Visit our website for an updated complete list.
(www.Modelithics.com/MVP/SIS)**

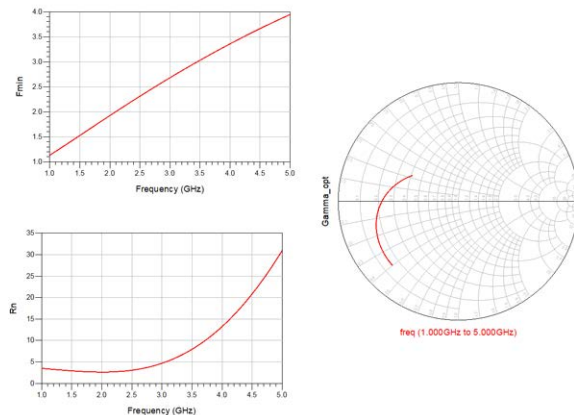
Advanced Model Features for More Accurate High Frequency Design

Bias Scalability



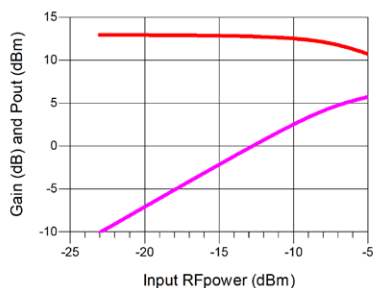
S11 and S21 of the BJT-SSL-2SC3356-002 model over three bias conditions. Red: VCE = 3.5 V and IC = 5 mA; Blue: VCE = 3.5 V and IC = 10 mA; Magenta: VCE = 3.5 V and IC = 30 mA.

Noise Parameters



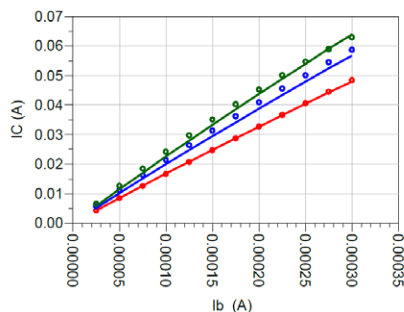
Measurement validations include noise parameters. Shown are simulated Fmin, Rn, and Gamma_Opt. VCE = 3.5 V and IC = 10 mA.

Power-Sweep Simulations



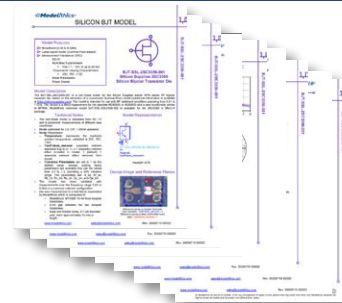
Simulated gain (red trace) and output power (magenta trace) of the BJT-SSL-2SC3356-002 model at 1 GHz. VCE = 3.5 V and IC = 10 mA.

Temperature Scaling



DC I-V temperature varying characteristics. Solid lines show modeled data, while symbols show measured data. Red: +25°C; Blue: +75°C; Green: +115°C. VCE = 3.5 V.

Datasheets



Each Modelithics model has a datasheet that provides detailed information about the model, such as the validation frequencies, reference planes, part value / pad scalability / substrate scalability ranges, model performance, and details about other features and model parameters.

What's in YOUR
DREAM
LIBRARY?

Help us build **YOUR** dream library! Pre-Release models are added based on customer demand. Share your desired models with sales@modelithics.com!

Visit the Silicon Supplies MVP Page on the Modelithics website to:

- Explore the current list of available Silicon Supplies component models
- View model datasheets
- Browse literature collection for application notes, presentations, etc.
- Request a FREE* 30 day trial of the Modelithics Silicon Supplies model library:

www.Modelithics.com/MVP/SIS

*with approval and/or valid registration

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