Bipolar Device SPICE Modeling Service Questionnaire

Please fill out the following questionnaire. The data you provide in this form is necessary for Silvaco to supply you with high quality SPICE models.

Contact Person in Your Company

(for technical questions)

NAME: _____

COMPANY: _____

PHONE: _____

FAX: _____

EMAIL: _____

Package Part or Wafer Information:

For packaged parts please specify package type:

For wafer, please specify:

How many wafers will be supplied?: _____

Wafer #: _____

Lot#: _____

Are the devices in a scribeline or in a drop-in test die?:

Model Type

Please specify the SPICE model type (For example: Gummel Poon, VBIC95, Mextram)

Please specify the circuit simulator(including the version number) for which the models are generated.

Bias Conditions

Please specify the typical operating and maximum to apply for MODELING purposes. (Make sure the specified maximum bias conditions are not destructive over the temperature.)

	NPN	Vertical PNP	Lateral PNP
Operating VCE (V):	_____	_____	_____
Operating IC_{max} (A):	_____	_____	_____
Operating IC_{min} (A):	_____	_____	_____
Maximum VCE (V):	_____	_____	_____

Please include measured data plots of: IC/VCE (5 IB steps), Gummel-Plot (IC, IB vs. VBE) and BF vs. IC.

Temperature Conditions

Please specify the temperature points for devices to be characterized?
(For example: 0 C, 27 C, 85 C):

Please specify the temperature range for model validation

Test Chip Information

Please specify the Emitter, Base, Collector areas and RSH for the specified regions.

	NPN	Vertical PNP	Lateral PNP
	○E ○B ○C	○E ○B ○C	○E ○B ○C
Area	_____	_____	_____
RSH	_____	_____	_____

AC Modeling

AC modeling of Bipolar devices requires the s-parameters to be measured and FT to be extracted. Silvaco can provide s-parameter measurements on packaged part or on wafer. On wafer measurements provide more accurate results and are necessary for devices with FT greater than 1GHZ. For on wafer FT measurements the bipolar devices should be layed out as common emitter configuration (Figure 1). In addition to the actual device an open device structure should be layed out for proper calibration (Figure 2). Base to Emitter and Collector to Emitter pad distance should be 150 µm. (from middle of pad to middle of pad)

Are there special structures (as described above) to measure FT on wafer? (If yes, please indicate the location of these structures on the test chip.)

What is the expected range for FT?

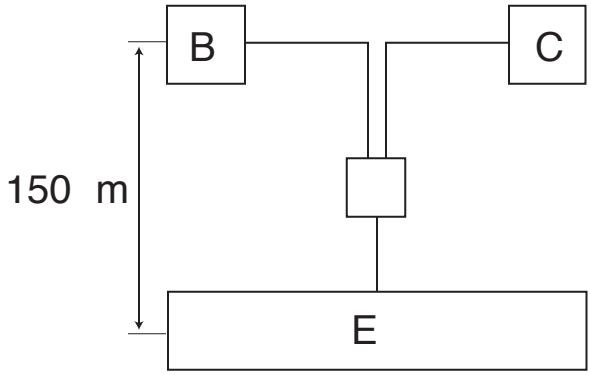

Figure 1. Device layout for FT measurements.

Deliverables

In addition to the SPICE model parameter set and project report the following measured vs simulated data plots are provided:

BF vs IC _____

IC vs VCE _____

IC and IB vs VBE (gummel) _____

FT vs IC (If AC modeling is requested) _____

CJE vs VEB (Emitter to Base Junction Cap_____

CJC vs VCB (Collector to Base Junction Cap) _____

CJS vs VCS (Collector to Substrate Junction Cap)_____

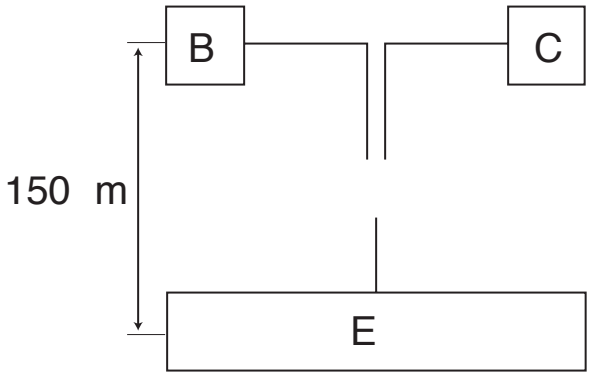

Figure 2. Device open for calibration.

If you have any questions please contact:

SPICE Modeling Group
email: spicemodeling@silvaco.com

SUBMIT

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