

## CTC-023 SPICE Modeling

### SPICE Modeling Background

SPICE modeling of JFETs can be tricky. Using typical values for parameters like  $V_{to}$  and  $I_{dss}$  can sometimes be misleading. The InterFET SPICE models listed in Table 1 are recommended as a starting point for your designs. They can be modified as needed. Once the model is generated you should verify the model outputs with actual measure values.

InterFET is working on providing SPICE modeling for all of their offered and specialized products. Table 1 below is a list of completed SPICE models to date. Additional SPICE models for InterFET product are presently in work.

**Table 1: InterFET JFET Part SPICE Models**

Geometry	JFET Part	Model <sup>(1)</sup>
N0001H	2N4117A	$V_{to} = -1.00$ $BETA = 0.58E-4$ $LAMBDA = 0.90E-3$ $RS = 500$ $CGS = 1.1P$ $CGD = 1.1P$
N0001H	2N4118A	$V_{to} = -1.73$ $BETA = 0.44E-4$ $LAMBDA = 1.24E-3$ $RS = 1000$ $CGS = 1.1P$ $CGD = 1.1P$
N0001H	2N4119A	$V_{to} = -3.9$ $BETA = 0.36E-4$ $LAMBDA = 1.5E-3$ $RS = 1840$ $CGS = 1.1P$ $CGD = 1.1P$
N0014EU	IFD89	$V_{to} = -0.746$ $BETA = 2.126E-3$ $LAMBDA = 9.71E-3$ $RS = 43$ $CGS = 1.6P$ $CGD = 0.3P$ $IS = 5P$ Diode 1 $BV = 40$ $IBV = 1E-16$ $VJ = 0.6$ $EG = 1.11$ $+N = 1.15$ $RS = 23$ $IS = 1E-16$ Diode 2 $BV = 40$ $IBV = 1E-16$ $VJ = 0.6$ $EG = 1.11$ $+N = 1.1$ $RS = 10$ $IS = 2E-17$
N0016H	2N4339	$V_{to} = -1.1$ $BETA = 1.01E-3$ $LAMBDA = 1.77E-3$ $RS = 51$ $CGS = 7P$ $CGD = 3.5P$
N0016H	2N4340	$V_{to} = -1.8$ $BETA = 1E-3$ $LAMBDA = 0.38E-3$ $RS = 90$ $CGS = 7P$ $CGD = 7P$
N0032H	2N3821	$V_{to} = -1.2$ $BETA = 1.67E-3$ $LAMBDA = 1.76E-3$ $RS = 56$ $CGS = 6P$ $CGD = 6P$
N0450L	2N6550	$V_{to} = -1.38$ $BETA = 70E-3$ $LAMBDA = 0.77E-3$ $RS = 2.4$ $IS = 50E-12$ $CGS = 38.5P$ $CGD = 37P$ $ALPHA = 1.2$

1. SPICE models presented as a reference only. It is the Buyers responsibility for designing, validating and testing the end application under all field use cases and extreme use conditions.



**Disclaimer:** It is the Buyers responsibility for designing, validating and testing the end application under all field use cases and extreme use conditions. Guaranteeing the application meets required standards, regulatory compliance, and all safety and security requirements is the responsibility of the Buyer. These resources are subject to change without notice.