Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ STANDARD
PART NUMBER: 1N5408
MANUFACTURER: FAIRCHILD SEMICONDUCTOR

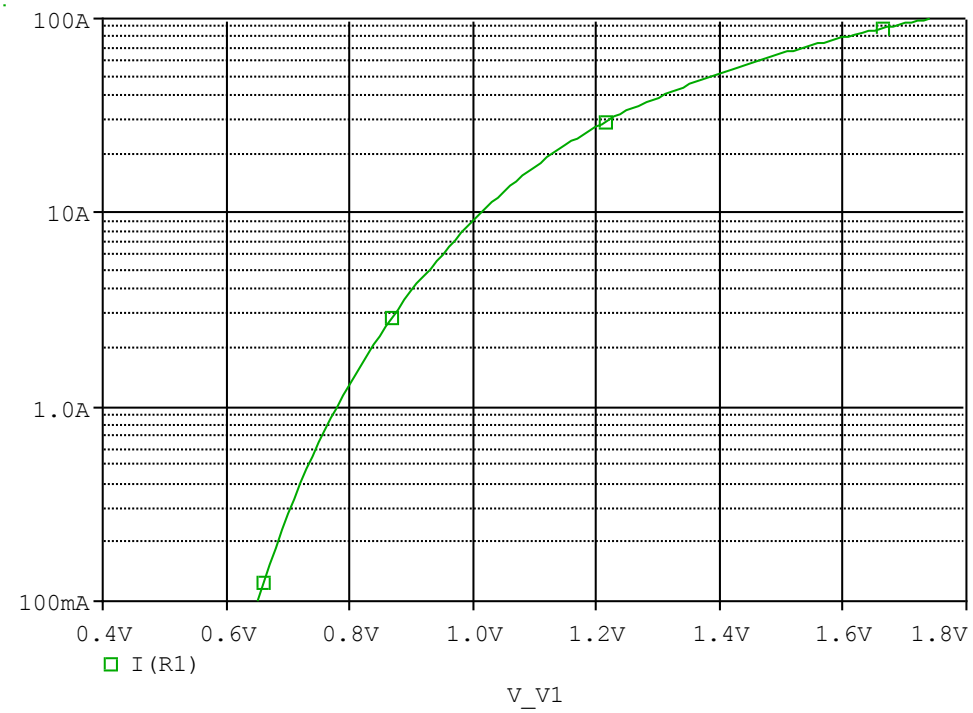
Bee Technologies Inc.

DIODE MODEL PARAMETERS

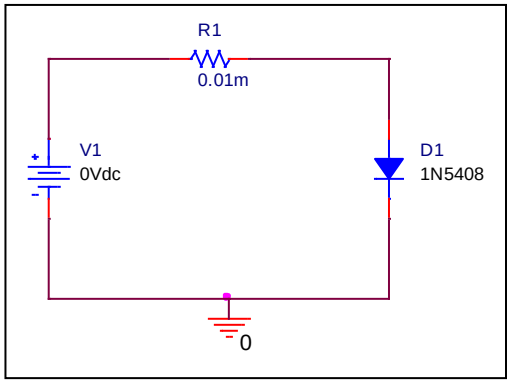
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a positive value)
IBV	Reverse Breakdown Current(a positive value)
TT	Transit Time
EG	Energy-band Gap

Forward Current Characteristics

Circuit Simulation Result

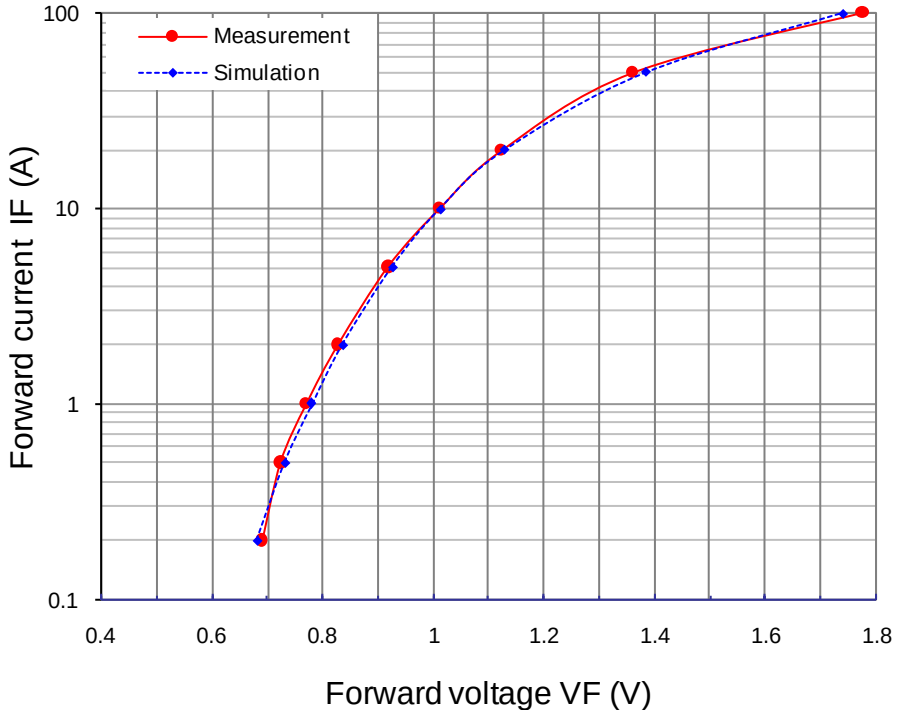


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

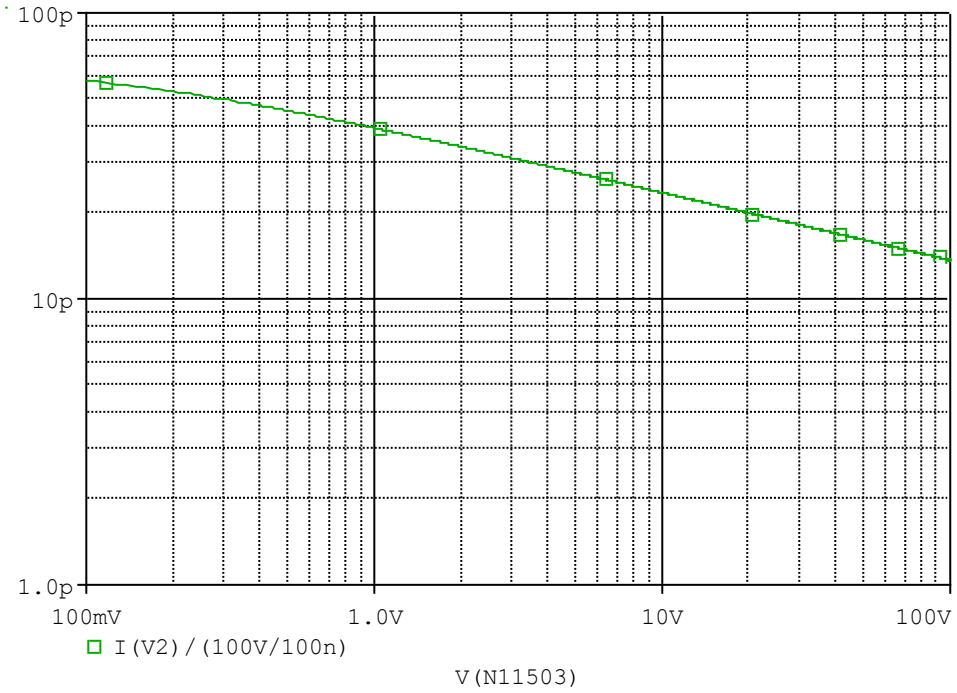


Simulation Result

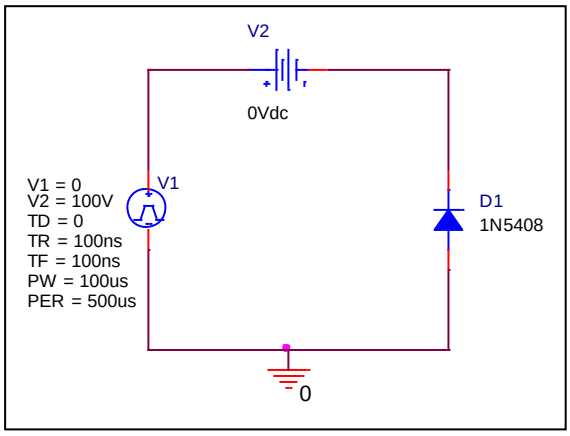
IF (A)	VF (V)		%Error
	Measurement	Simulation	
0.2	0.690	0.682	-1.16
0.5	0.725	0.733	1.08
1	0.770	0.780	1.29
2	0.828	0.836	1.01
5	0.920	0.927	0.71
10	1.010	1.012	0.23
20	1.123	1.128	0.48
50	1.360	1.383	1.67
100	1.775	1.739	-2.01

Capacitance Characteristics

Circuit Simulation Result

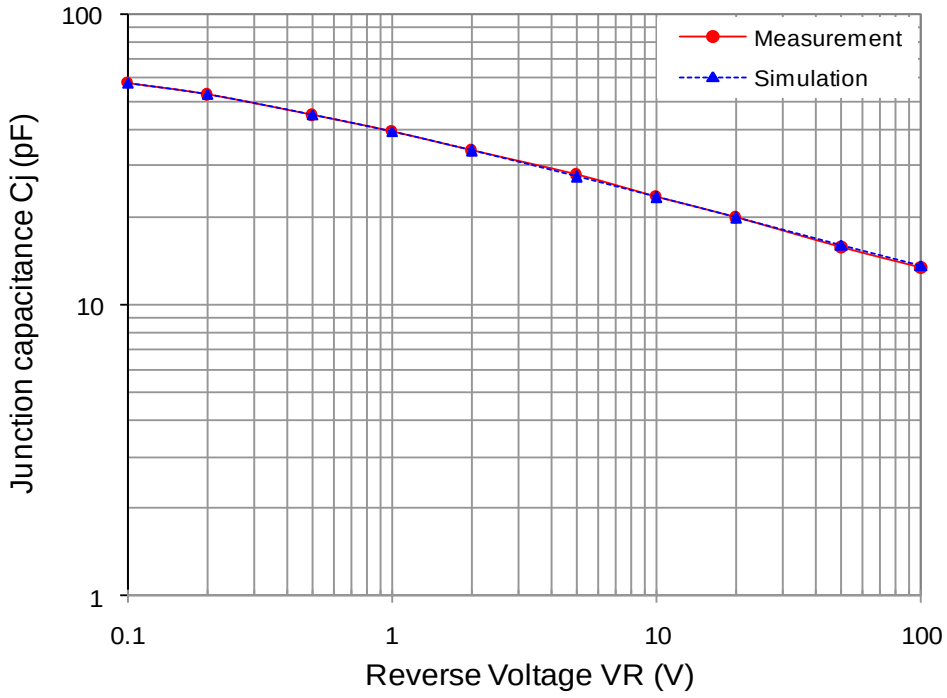


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

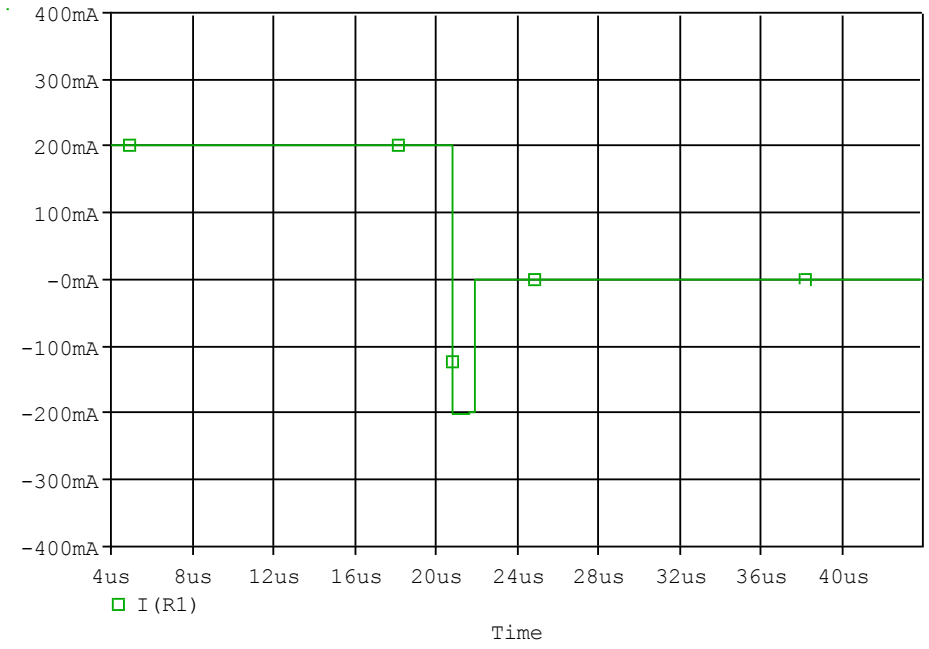


Simulation Result

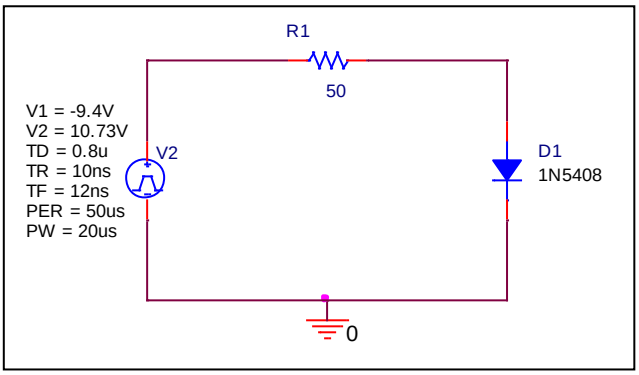
VR (V)	Cj (pF)		%Error
	Measurement	Simulation	
0.1	58.000	57.973	-0.05
0.2	53.000	53.073	0.14
0.5	45.000	45.415	0.92
1	39.750	39.572	-0.45
2	34.000	34.012	0.04
5	28.000	27.625	-1.34
10	23.700	23.525	-0.74
20	20.000	19.983	-0.08
50	15.750	16.079	2.09
100	13.400	13.692	2.18

Reverse Recovery Characteristics

Circuit Simulation Result



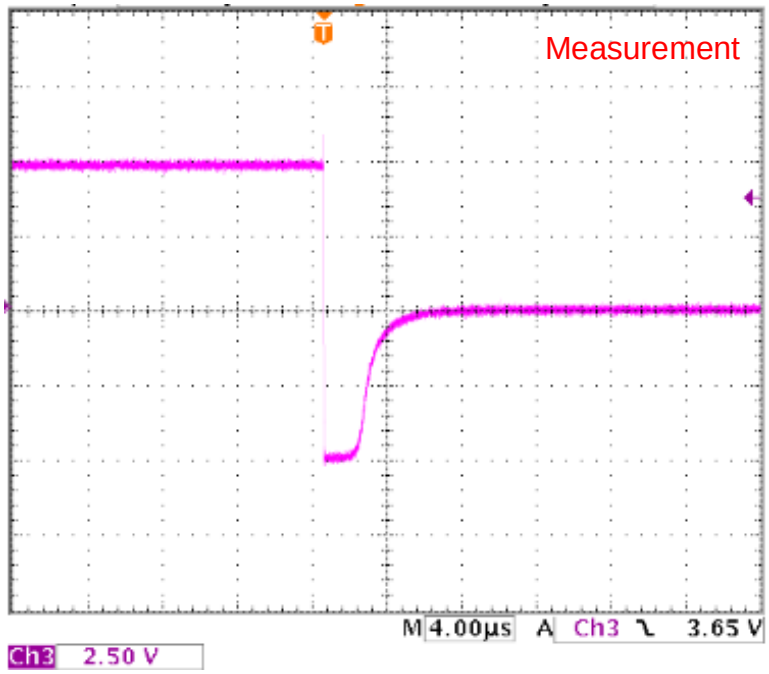
Evaluation Circuit



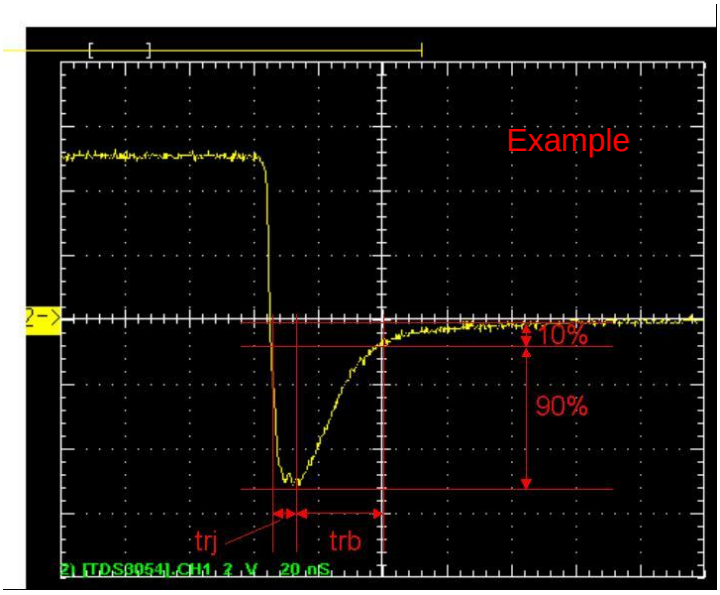
Compare Measurement vs. Simulation

Parameter		Measurement	Simulation	%Error
trj	µs	1.120	1.110	-0.56

Reverse Recovery Characteristics Reference



Trj = 1.12 (µs)
Trb= 2.00 (µs)
Conditions: Ifwd=0.2A,Irev=0.2A, Rl=50



Relation between trj and trb