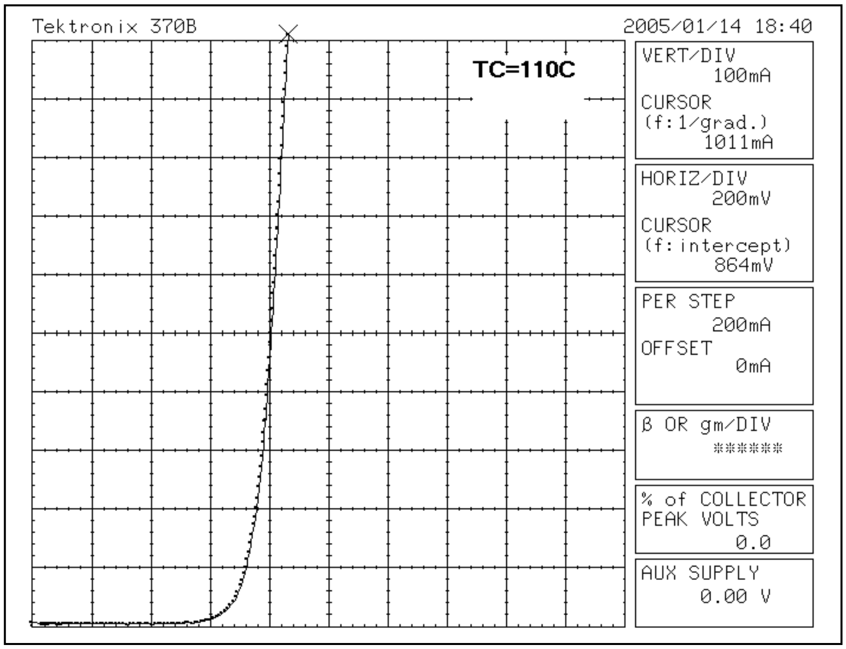
Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / STANDARD
PART NUMBER: 1SR139-400
MANUFACTURER: ROHM
REMARK: TC=110C

Bee Technologies Inc.

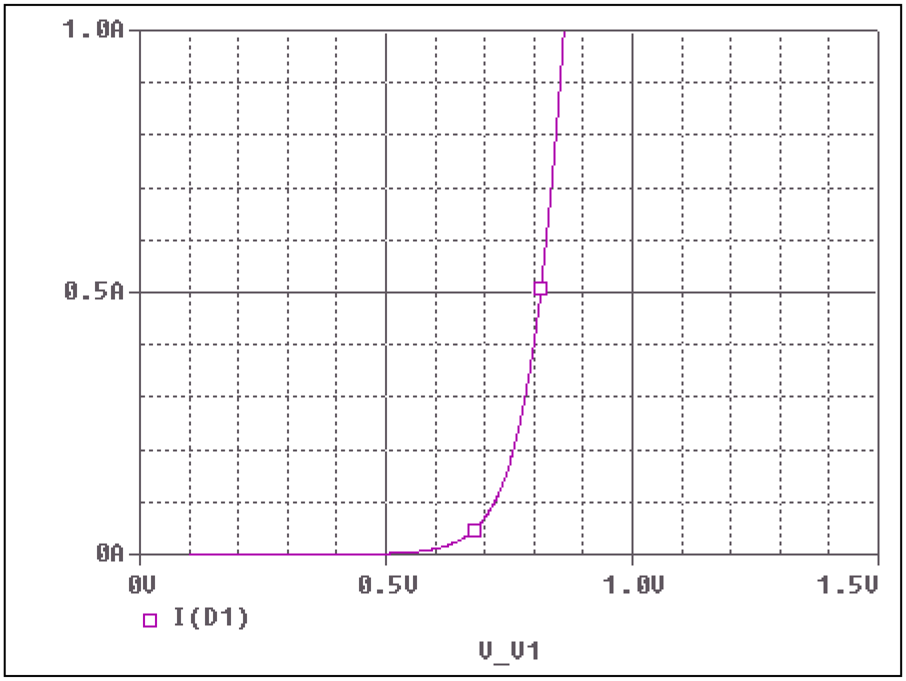
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic Reference

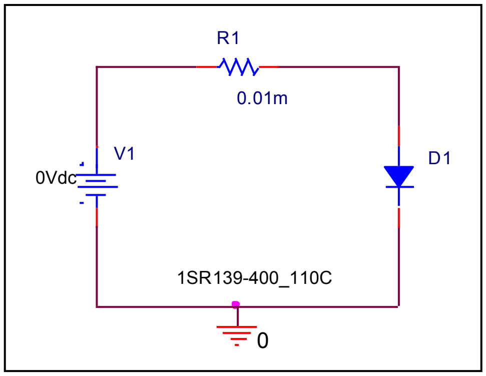


Forward Current Characteristic

Circuit Simulation Result

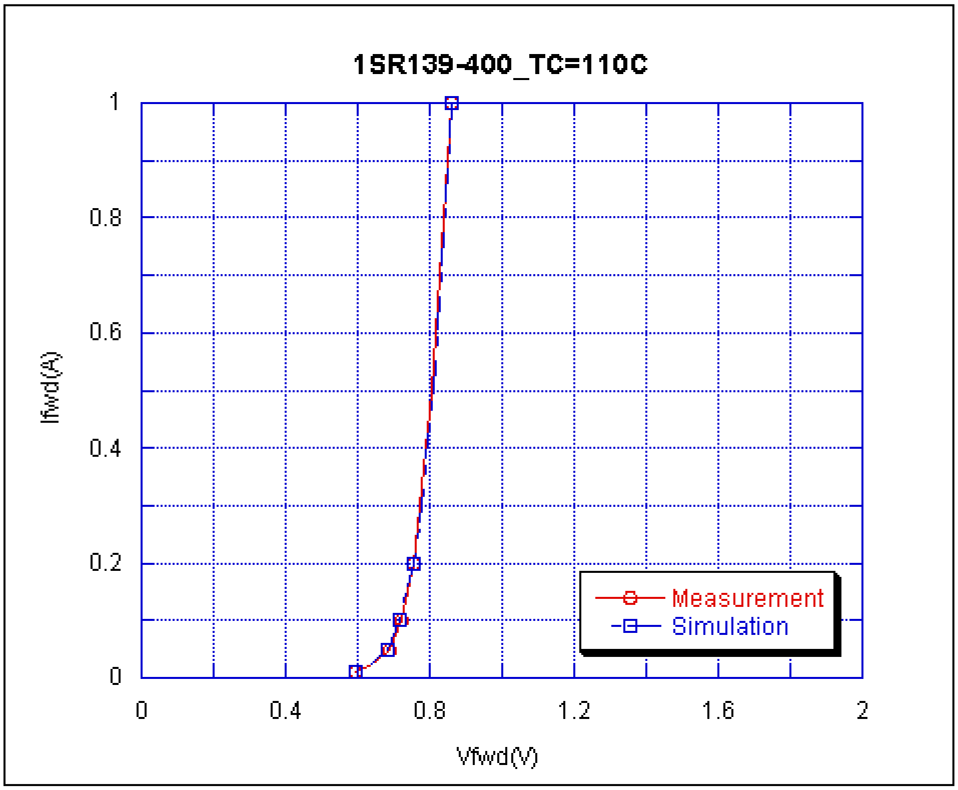


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

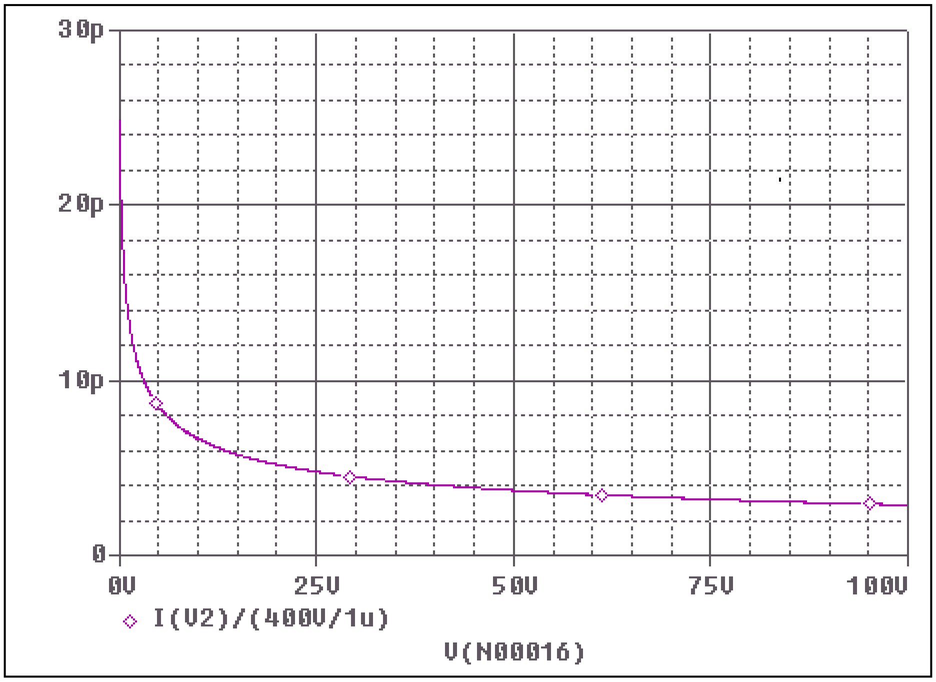


Simulation Result

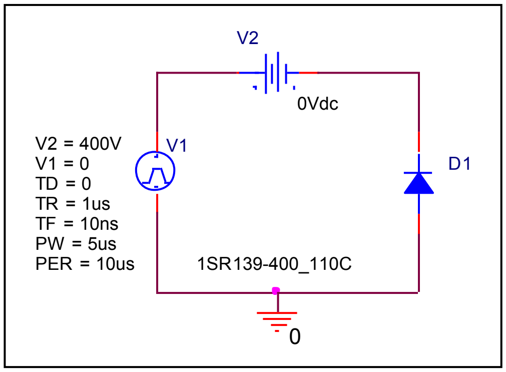
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.592	0.596	-0.68
0.02	0.634	0.633	0.16
0.05	0.688	0.682	0.87
0.1	0.724	0.719	0.69
0.2	0.756	0.758	-0.26
0.5	0.806	0.813	-0.87
1	0.864	0.860	0.46

Capacitance Characteristic

Circuit Simulation Result

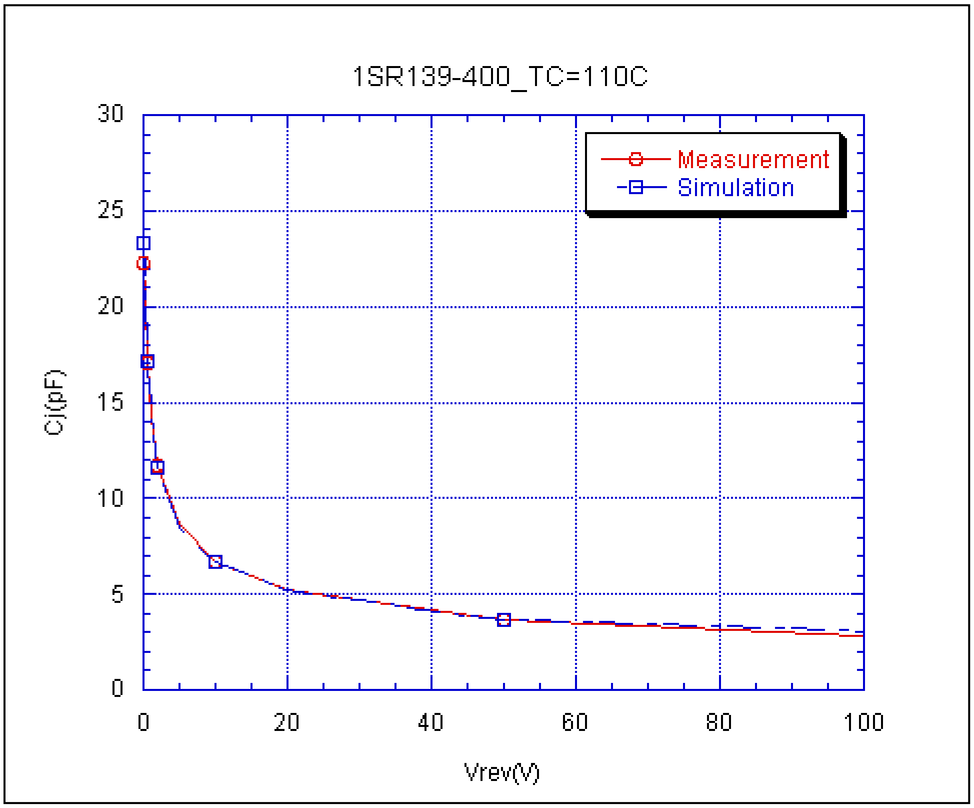


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

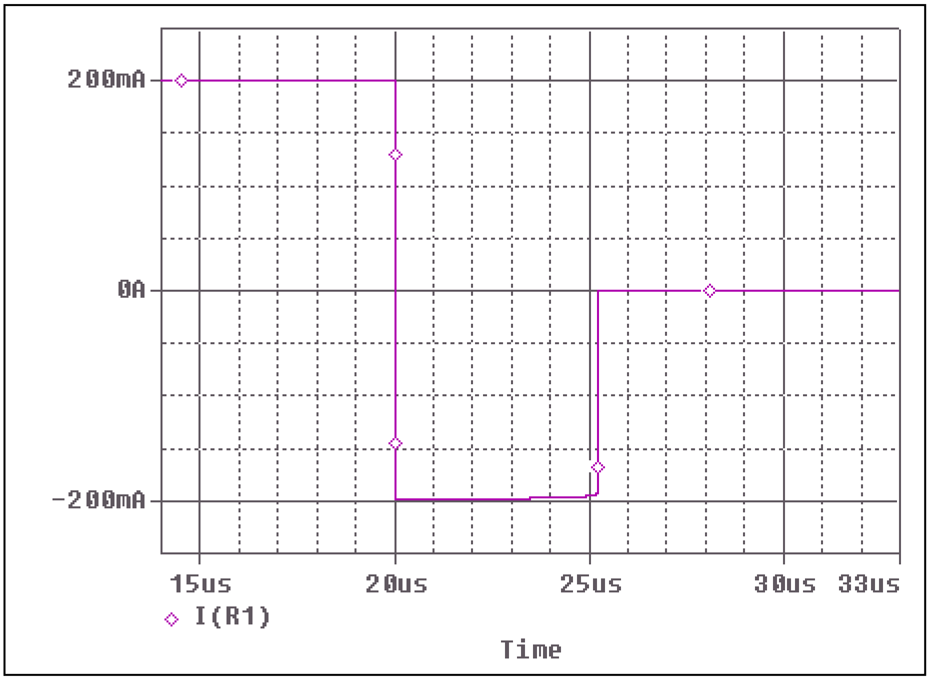


Simulation Result

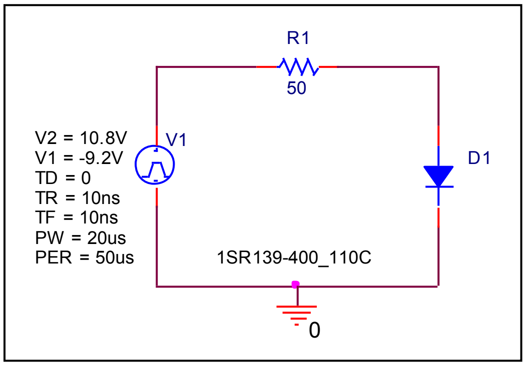
Vrev(V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0	24.952	24.952	0.00
0.1	22.302	23.280	-4.39
0.2	20.500	20.910	-2.00
0.5	17.091	17.180	-0.52
1	14.337	14.340	-0.02
2	11.664	11.600	0.55
5	8.641	8.520	1.40
10	6.735	6.660	1.11
20	5.183	5.190	-0.14
50	3.624	3.710	-2.37
100	2.764	2.880	-4.20

Reverse Recovery Characteristic

Circuit Simulation Result



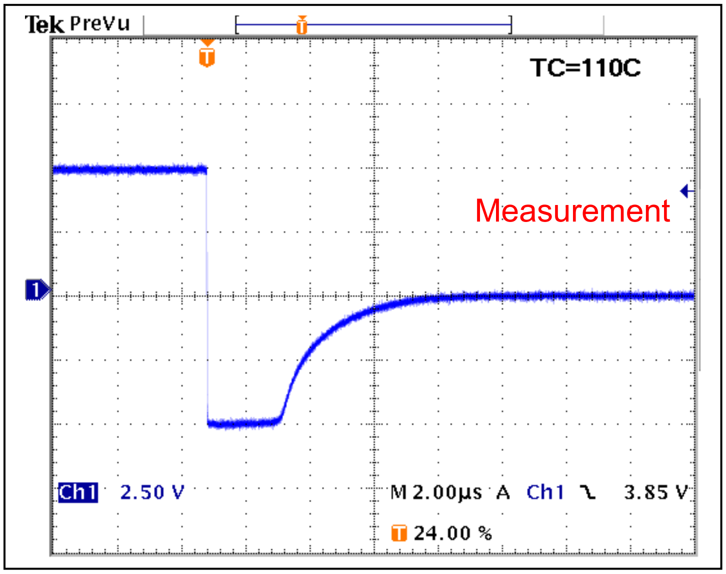
Evaluation Circuit



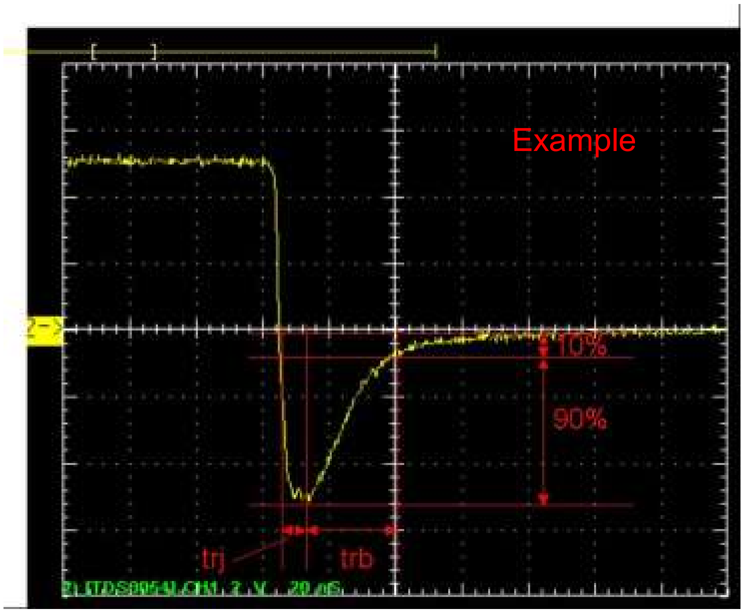
Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trr	**5.20**	**us**	**5.23**	**us**	**0.576**

Reverse Recovery Characteristic Reference



Trj =2.24(us)
Trb=2.96(us)
Conditions: Ifwd=Irev=0.2(A), Rl=50



Relation between trj and trb