Device Modeling Report

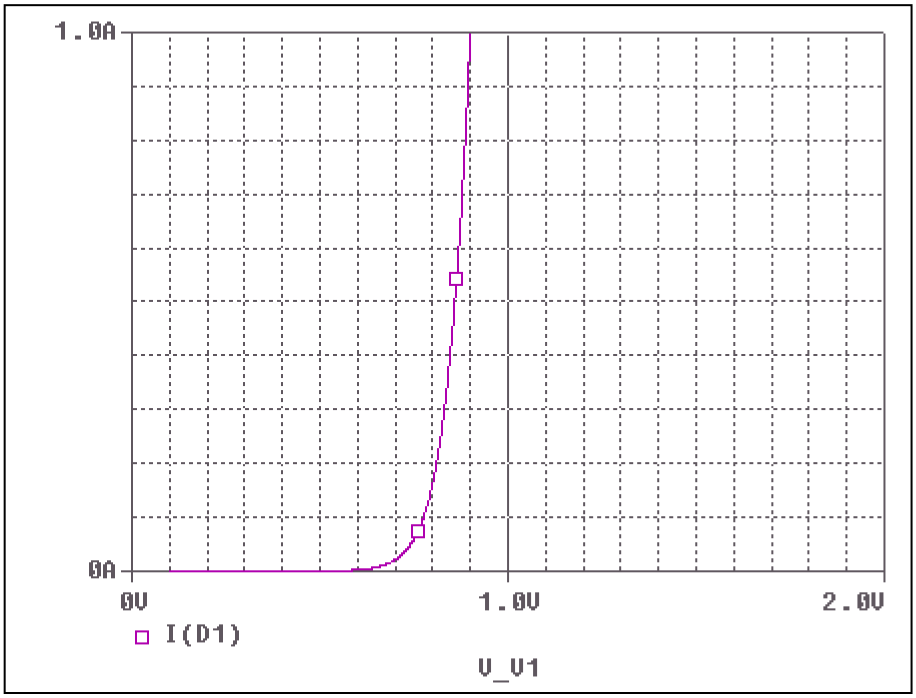
COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / STANDARD
PART NUMBER: 1SR139-400
MANUFACTURER: ROHM
REMARK: TC=25C

Bee Technologies Inc.

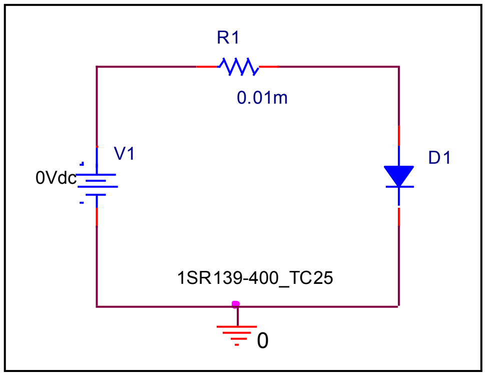
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

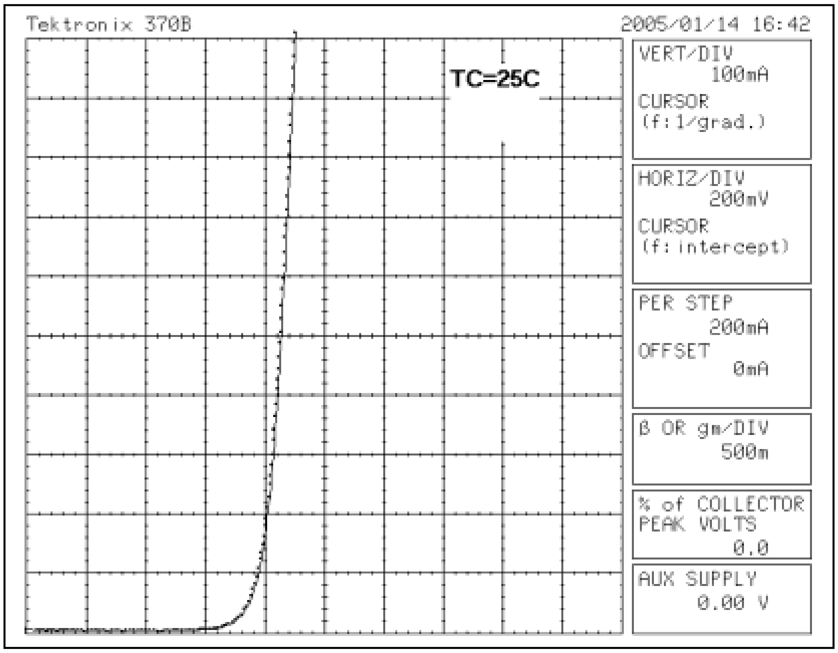
Circuit Simulation Result



Evaluation Circuit

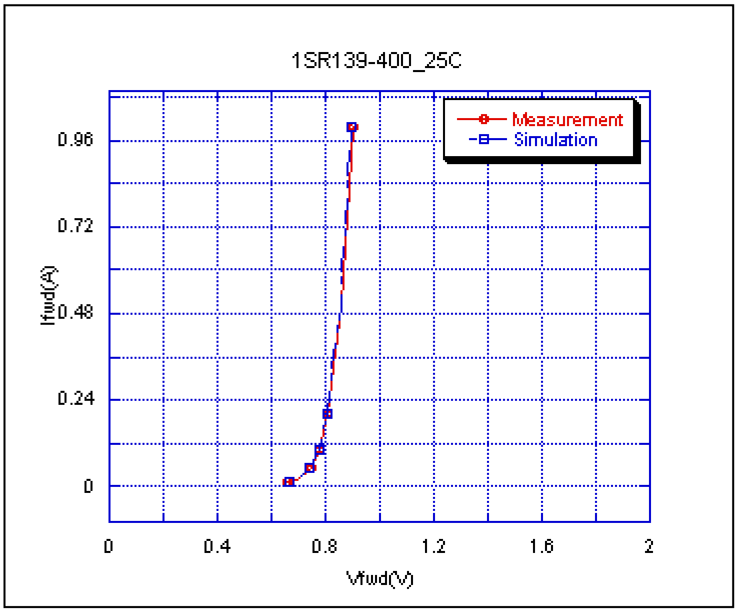


Forward Current Characteristic Reference



Comparison Graph

Circuit Simulation Result

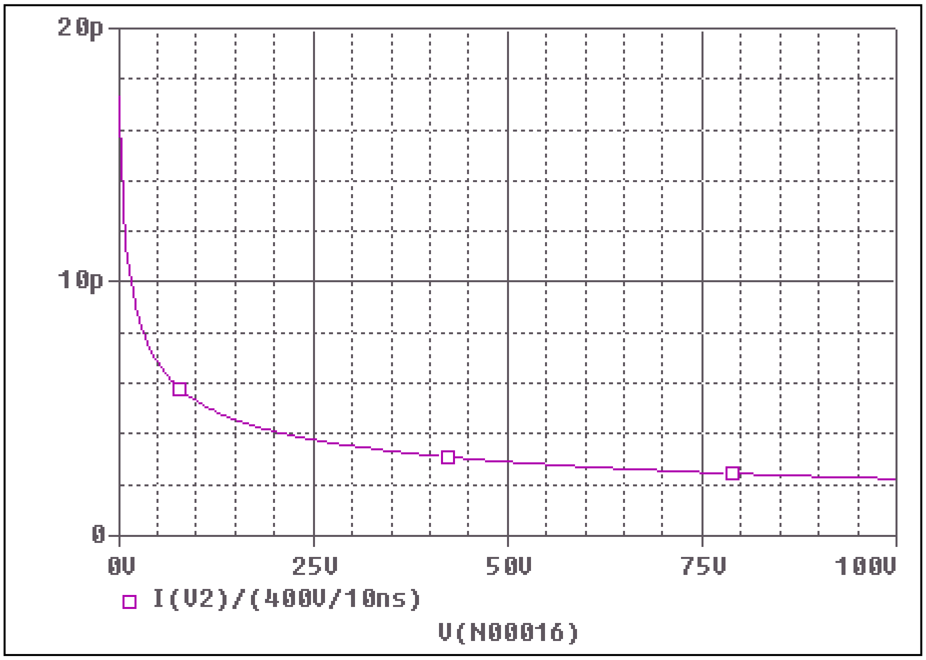


Simulation Result

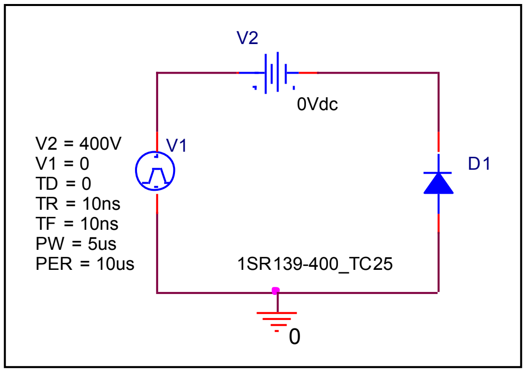
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.660	0.664	-0.61
0.02	0.698	0.697	0.14
0.05	0.750	0.741	1.20
0.1	0.776	0.775	0.13
0.2	0.806	0.810	-0.50
0.5	0.856	0.858	-0.23
1	0.902	0.900	0.22

Capacitance Characteristic

Circuit Simulation Result

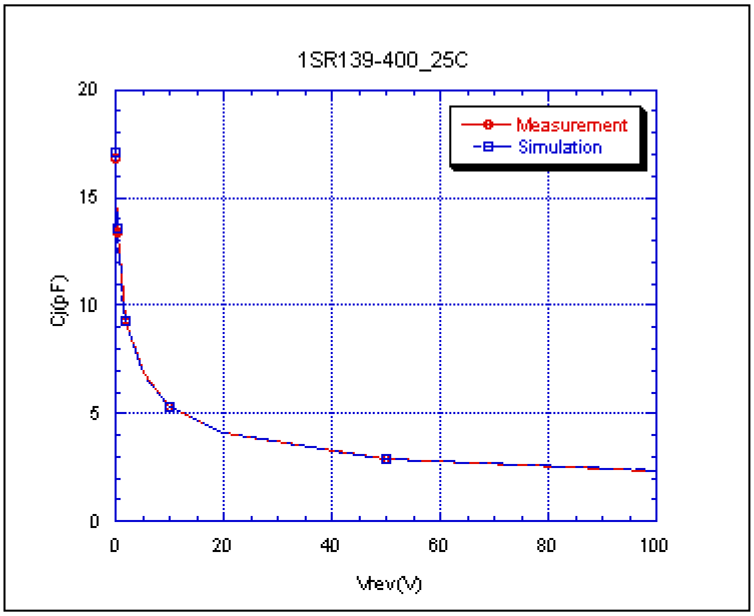


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

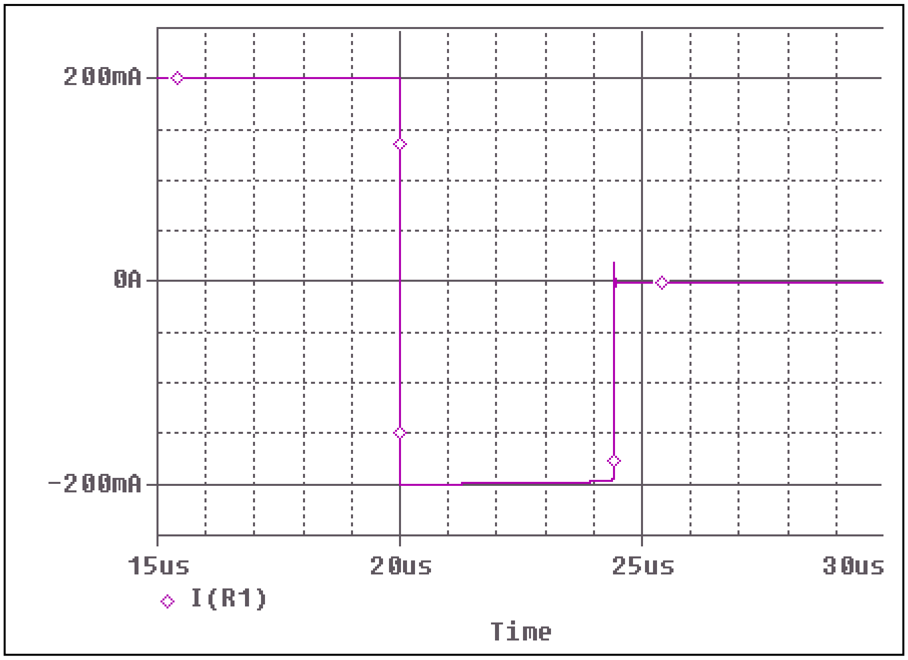


Simulation Result

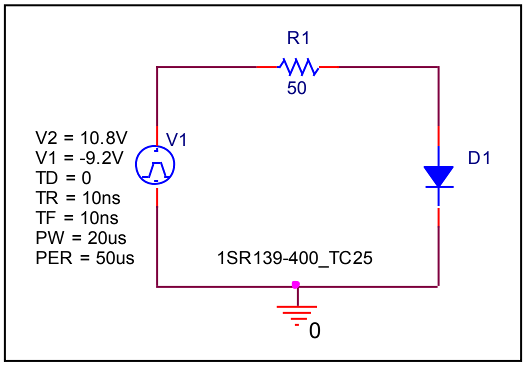
Vrev(V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0	18.214	18.214	0.00
0.1	16.790	17.134	-2.05
0.2	15.729	15.929	-1.27
0.5	13.413	13.557	-1.07
1	11.402	11.438	-0.32
2	9.321	9.325	-0.04
5	6.880	6.829	0.74
10	5.336	5.314	0.41
20	4.091	4.109	-0.44
50	2.870	2.910	-1.39
100	2.224	2.233	-0.40

Reverse Recovery Characteristic

Circuit Simulation Result



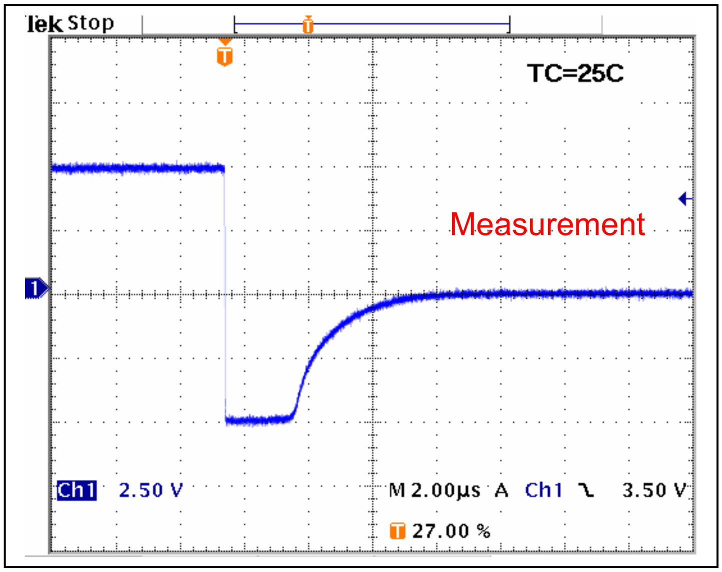
Evaluation Circuit



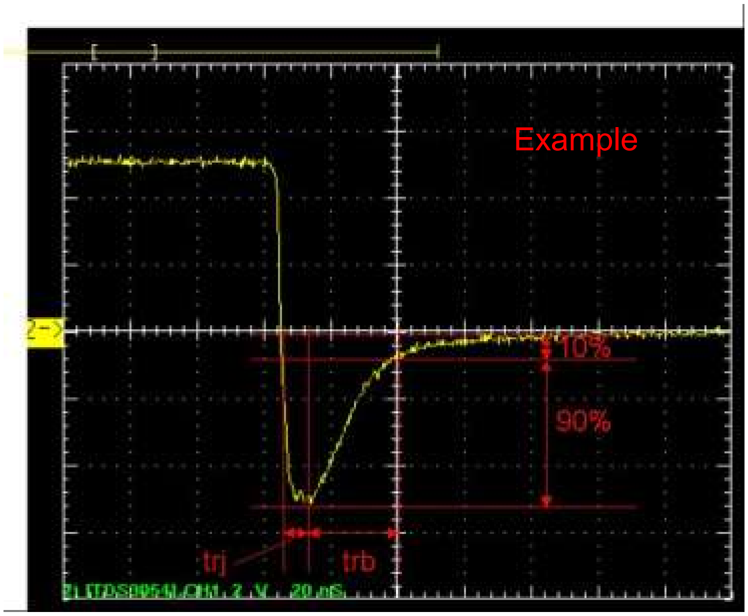
Compare Measurement vs. Simulation

	Measurement		**Simulation**		**%Error**
trr	**4.56**	**us**	**4.42**	**us**	**3.07**

Reverse Recovery Characteristic Reference



Trj =2.04(us)
Trb=2.52(us)
Conditions: Ifwd=Irev=0.2(A), Rl=50



Relation between trj and trb