Device Modeling Report

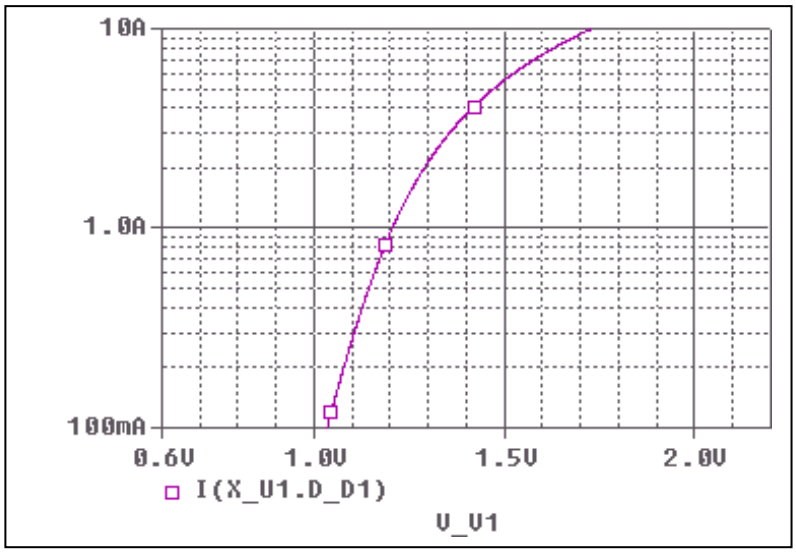
COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL
PART NUMBER: U1GC44
MANUFACTURER: TOSHIBA

Bee Technologies Inc.

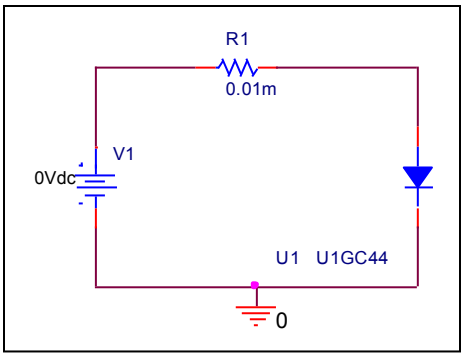
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

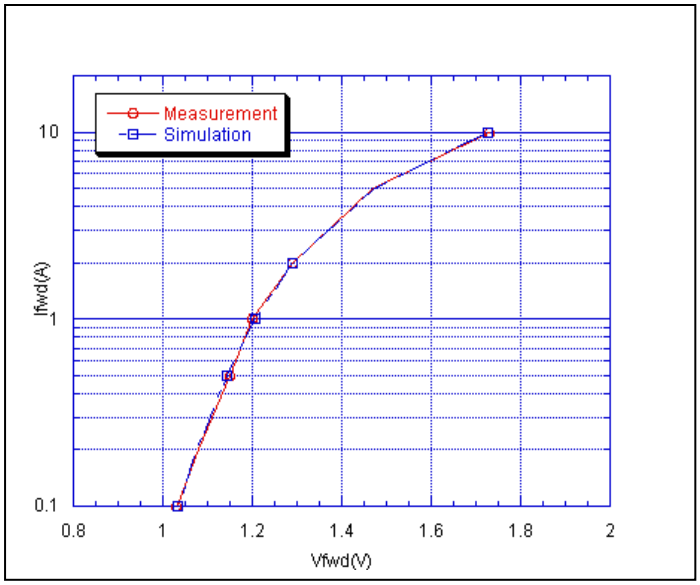


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

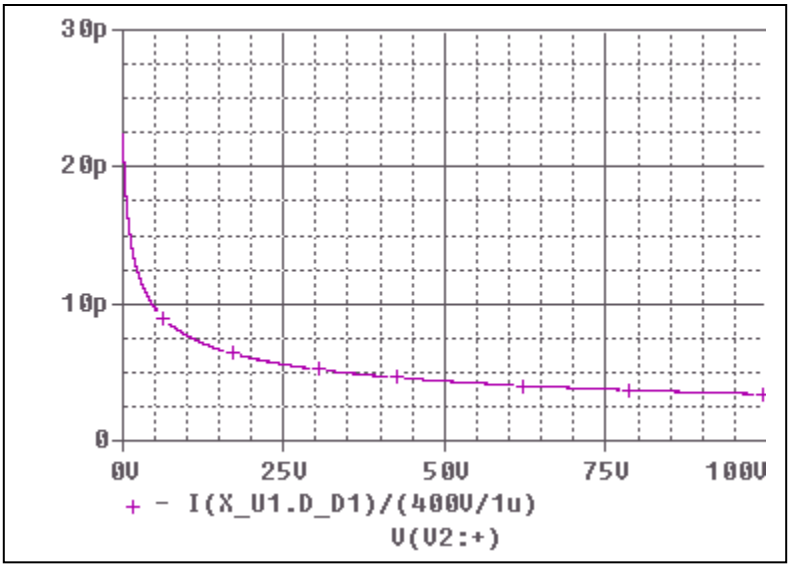


Simulation Result

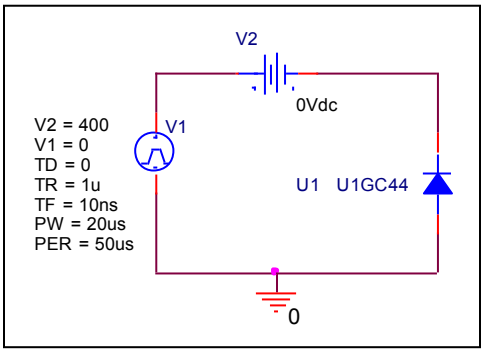
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.1	1.030	1.034	-0.340
0.2	1.080	1.078	0.204
0.5	1.150	1.144	0.539
1	1.200	1.205	-0.442
2	1.290	1.289	0.054
5	1.470	1.472	-0.143
10	1.730	1.728	0.098

Junction Capacitance Characteristic

Circuit Simulation Result

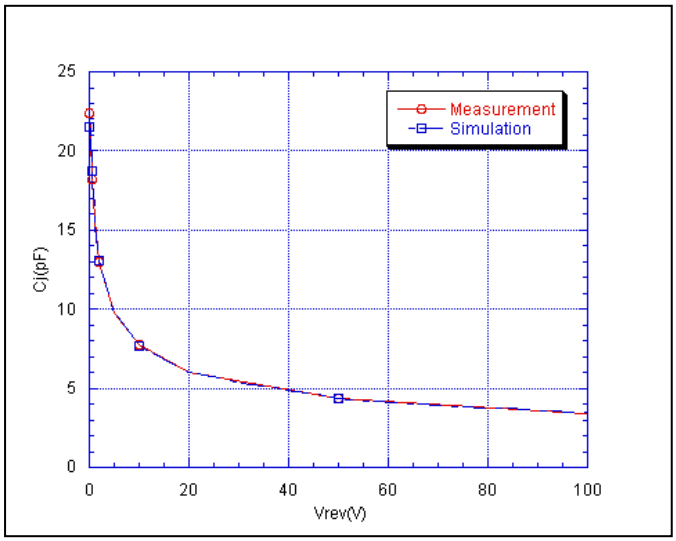


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

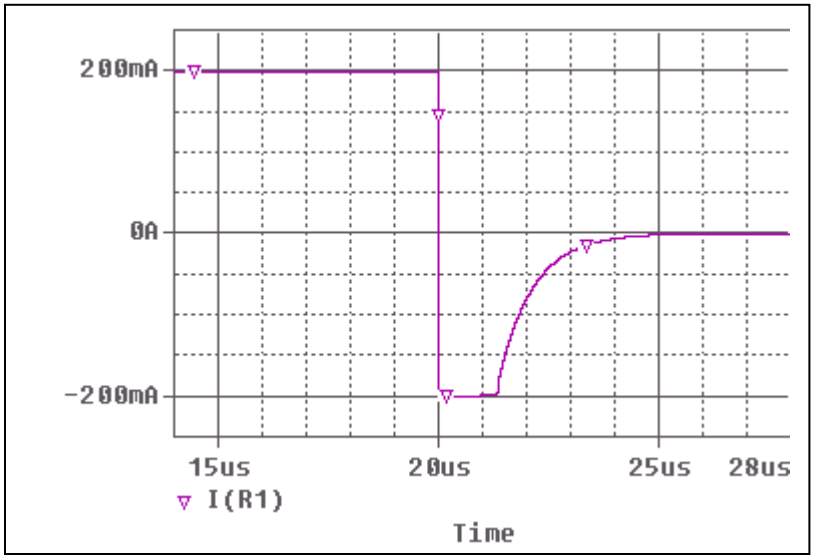


Simulation Result

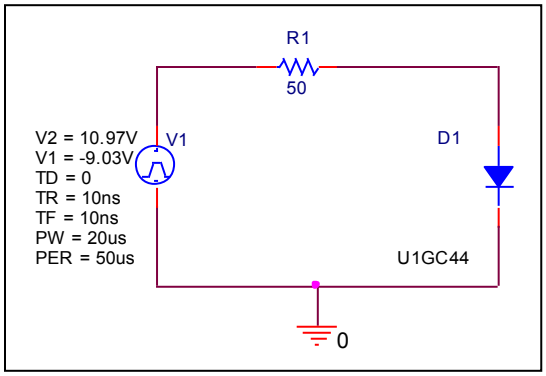
Vrev(V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0	24.058	24.058	0.000
0.1	22.361	21.524	3.743
0.2	21.065	21.755	-3.276
0.5	18.226	18.738	-2.809
1	15.671	15.913	-1.544
2	13.005	13.081	-0.584
5	9.802	9.738	0.649
10	7.725	7.679	0.599
20	5.982	6.031	-0.819
50	4.366	4.357	0.213
100	3.327	3.398	-2.158

Reverse Recovery Characteristic

Circuit Simulation Result



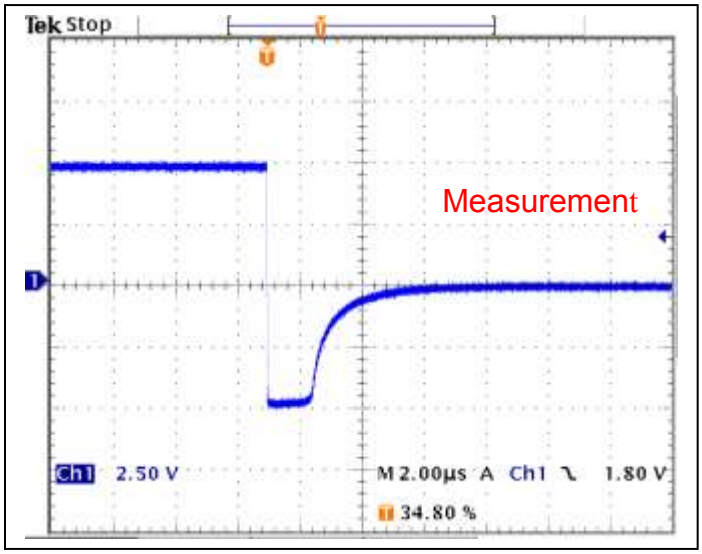
Evaluation Circuit



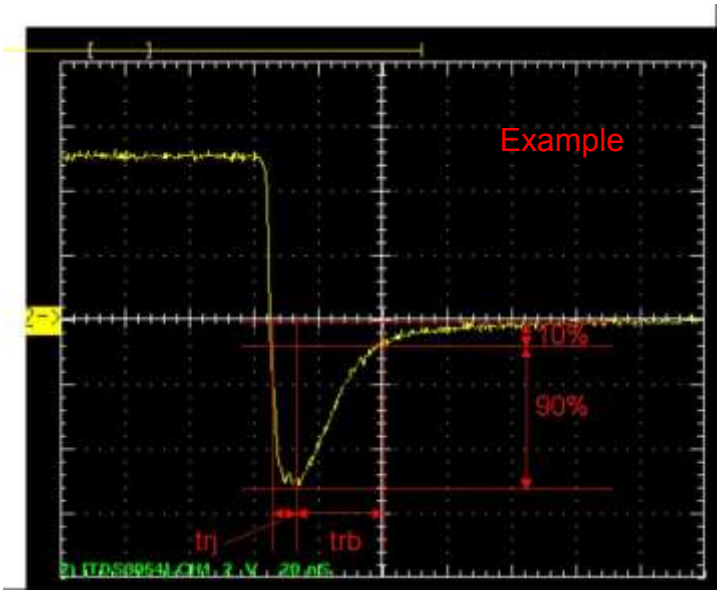
Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trj	1.320	us	1.317	us	0.227
trb	1.760	us	1.755	us	0.284

Reverse Recovery Characteristic Reference



Trj =1.32(us)
Trb=1.76(us)
Conditions: Ifwd=Irev=0.2(A), Rl=50



Relation between trj and trb