Device Modeling Report

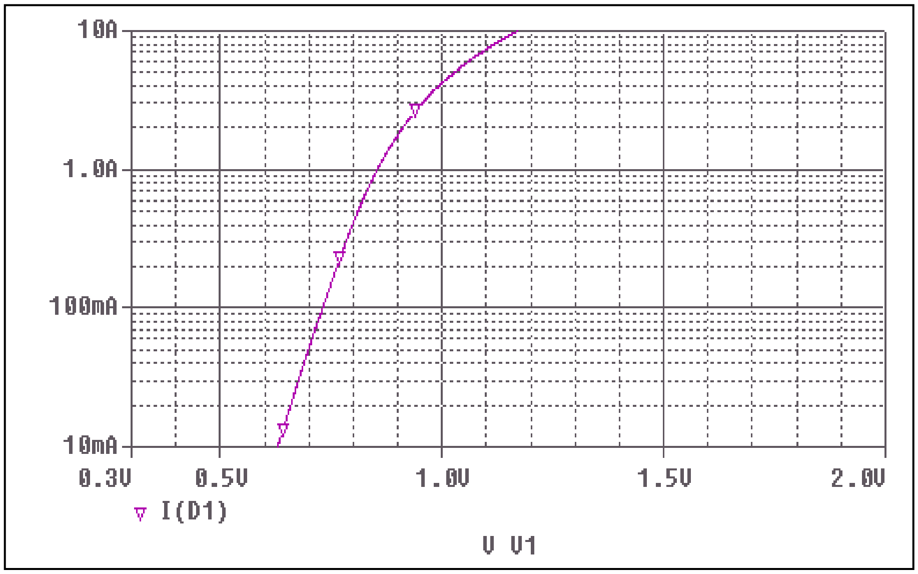
COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ STANDARD
PART NUMBER: 1S1887
MANUFACTURER: TOSHIBA
REMARK: TC=25C

Bee Technologies Inc.

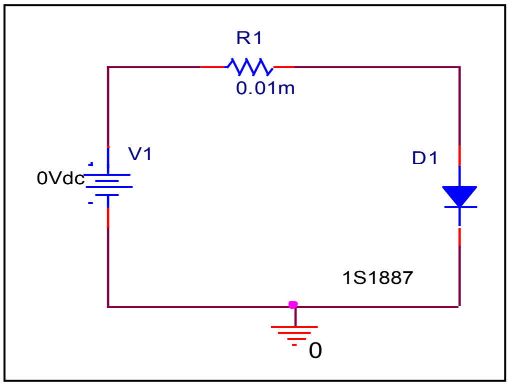
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

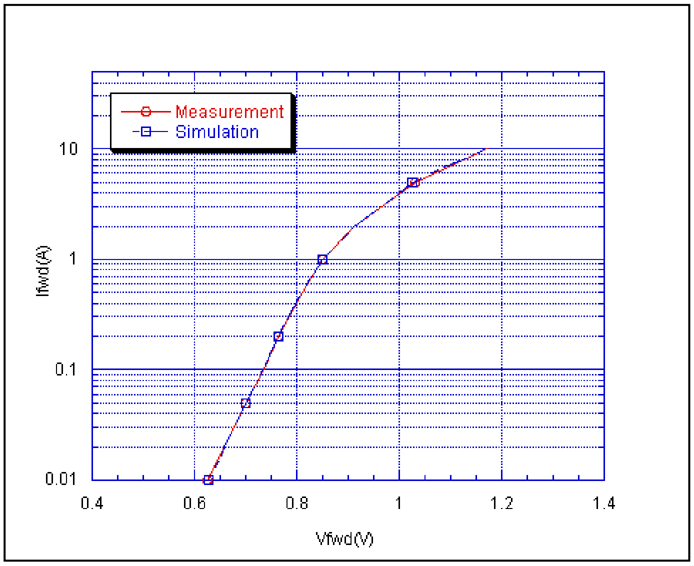


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

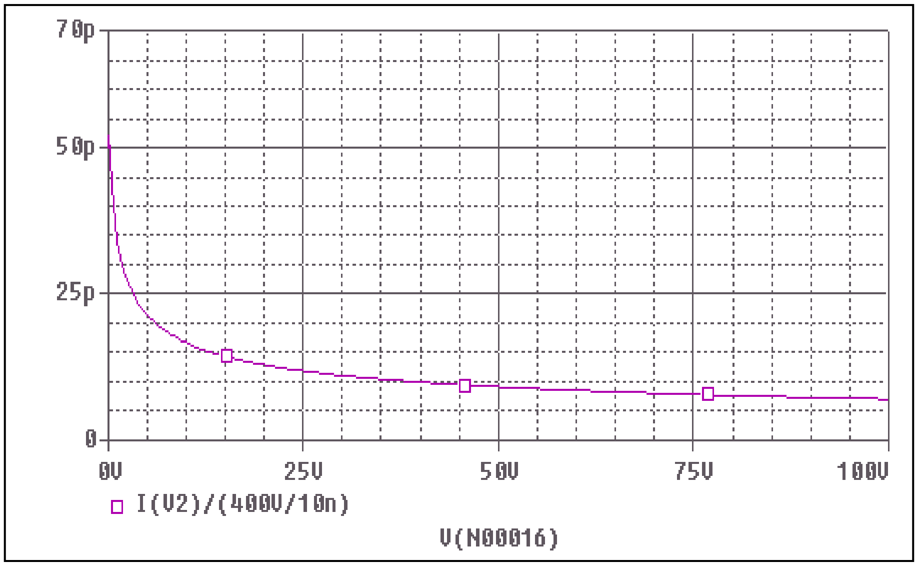


Simulation Result

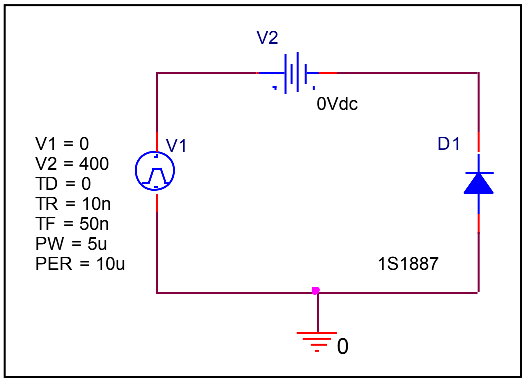
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.626	0.629	-0.399
0.02	0.658	0.657	0.137
0.05	0.701	0.701	-0.014
0.1	0.735	0.736	-0.082
0.2	0.765	0.764	0.092
0.5	0.810	0.810	-0.037
1	0.850	0.851	-0.165
2	0.910	0.911	-0.132
5	1.030	1.026	0.408
10	1.171	1.171	-0.034

Junction Capacitance Characteristic

Circuit Simulation Result

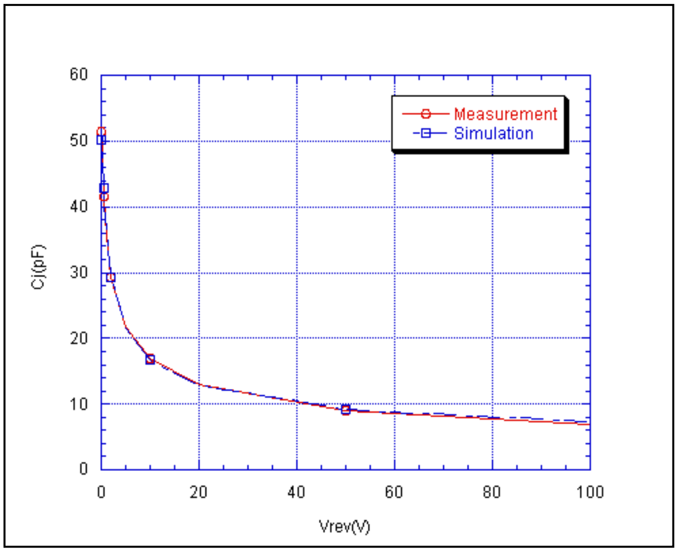


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

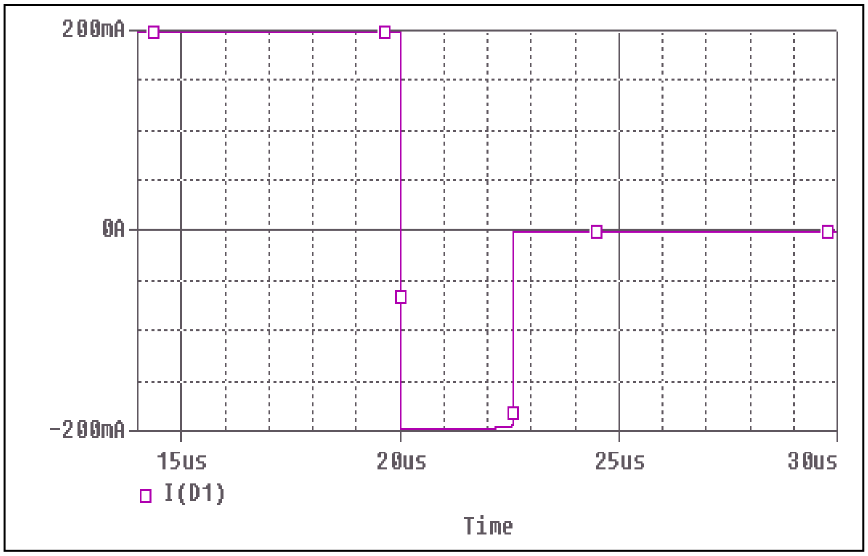


Simulation Result

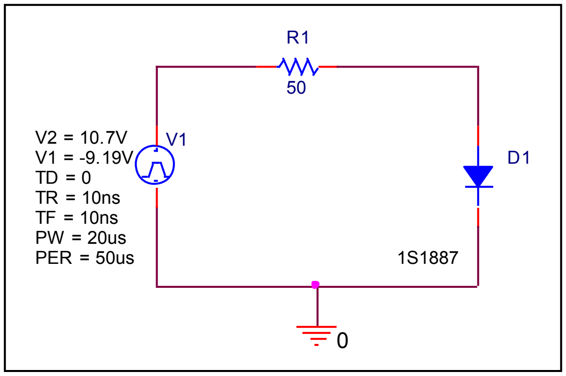
Vrev(V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0	55.832	55.832	0.000
0.1	51.537	50.127	2.736
0.2	48.403	50.617	-4.574
0.5	41.632	42.862	-2.954
1	35.607	36.107	-1.404
2	29.252	29.375	-0.420
5	21.729	21.492	1.091
10	16.895	16.773	0.722
20	12.887	12.950	-0.489
50	8.986	9.158	-1.912
100	6.778	7.034	-3.769

Reverse Recovery Characteristic

Circuit Simulation Result



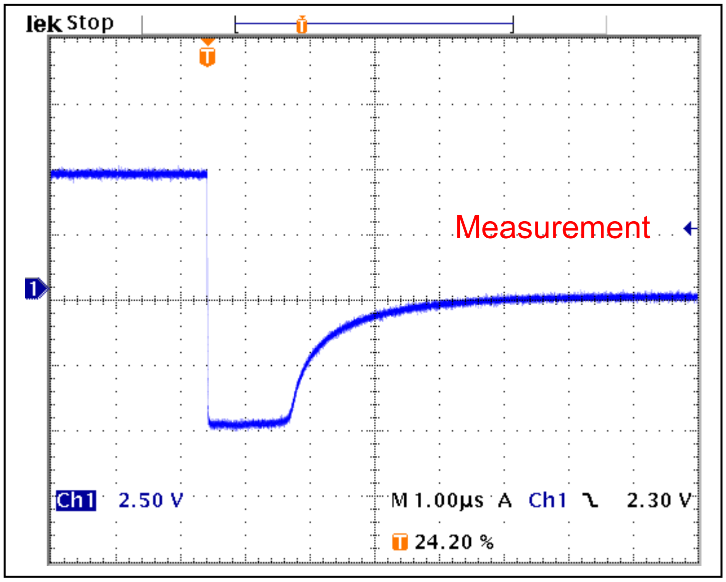
Evaluation Circuit



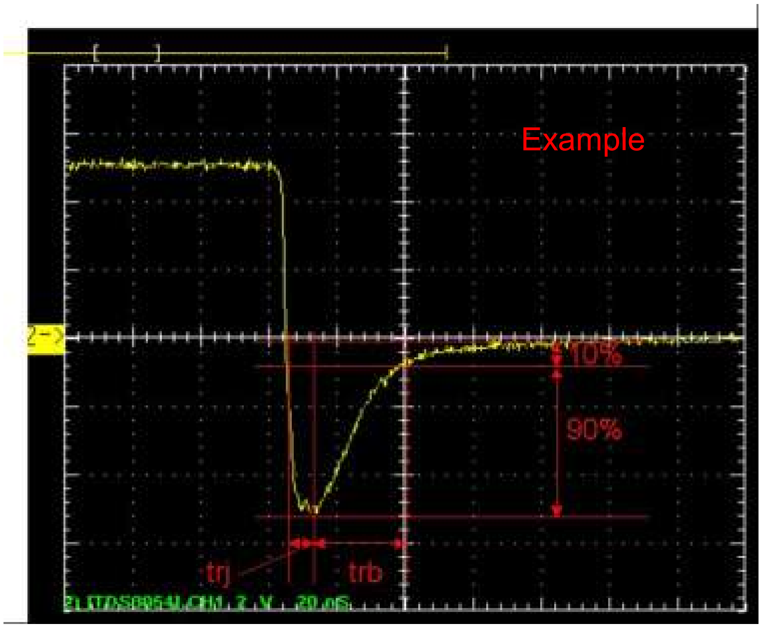
Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trr	**2.58**	**us**	**2.58**	**us**	**0.19**

Reverse Recovery Characteristic Reference



Trj =1.24(us)
Trb=1.34(us)
Conditions: Ifwd=Irev=0.2(A), Rl=50



Relation between trj and trb