Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ STANDARD
PART NUMBER: 20DL2C48A
MANUFACTURER: TOSHIBA

Bee Technologies Inc.

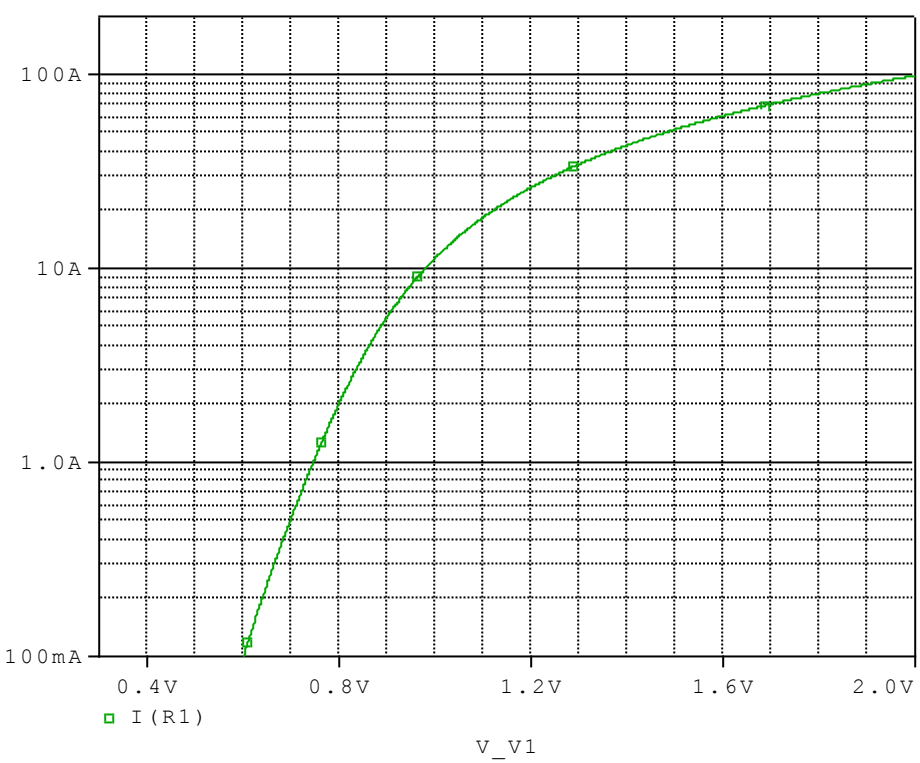
All Rights Reserved Copyright (C) Bee Technologies Inc. 2006

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

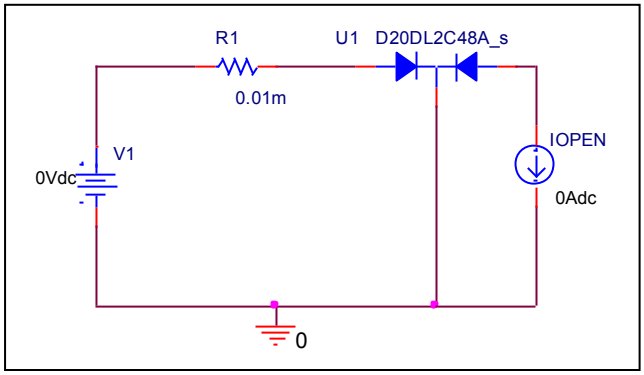
All Rights Reserved Copyright (C) Bee Technologies Inc. 2006

Forward Current Characteristic

Circuit Simulation Result



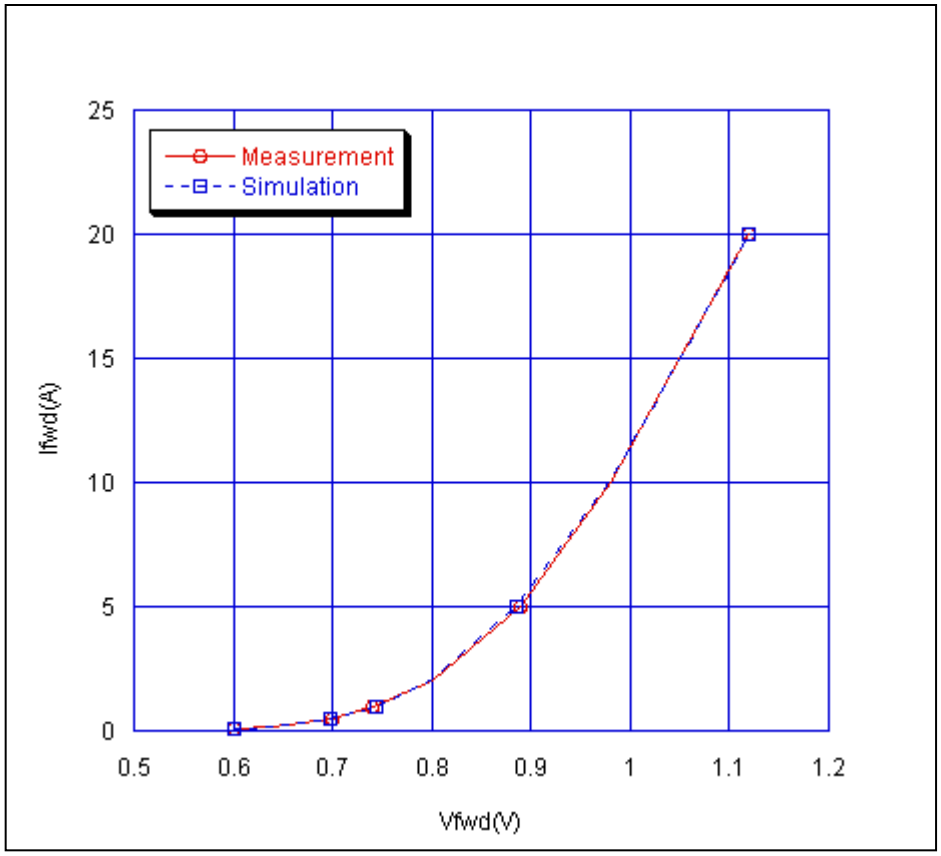
Evaluation Circuit



All Rights Reserved Copyright (C) Bee Technologies Inc. 2006

Comparison Graph

Circuit Simulation Result



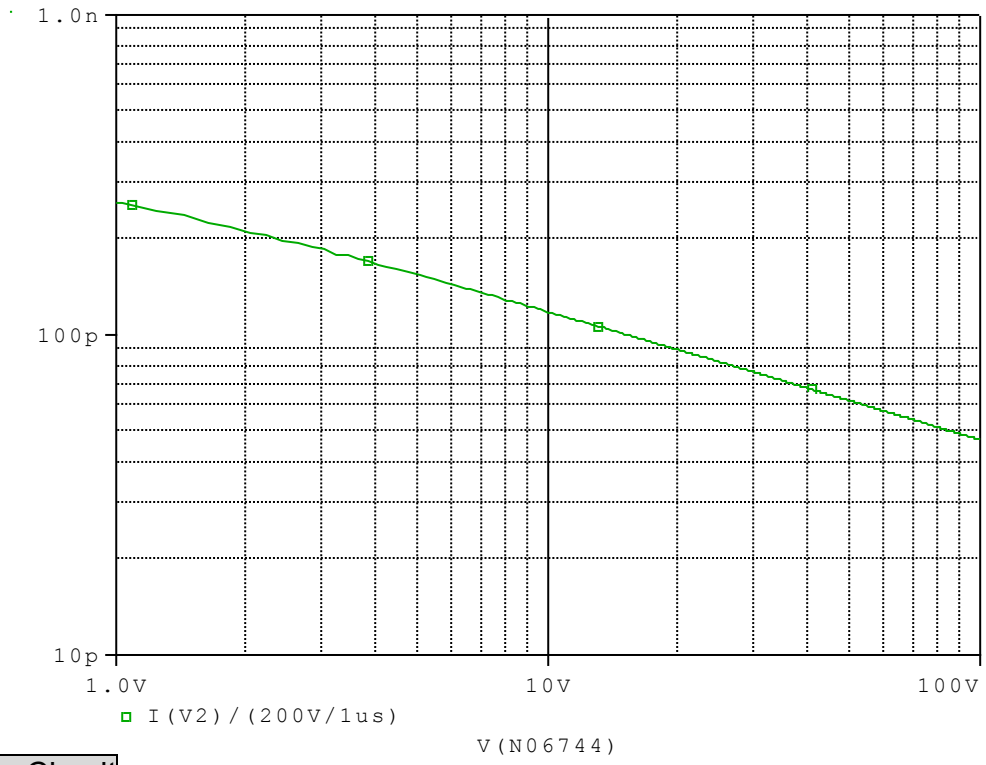
Simulation Result

Ifwd(A)	Vfwd(V)		%Error
	Measurement	Simulation	
0.1	0.600	0.601	-0.167
0.2	0.640	0.639	0.156
0.5	0.700	0.698	0.286
1	0.740	0.745	-0.676
2	0.800	0.799	0.125
5	0.890	0.886	0.449
10	0.980	0.979	0.102
20	1.120	1.117	0.268

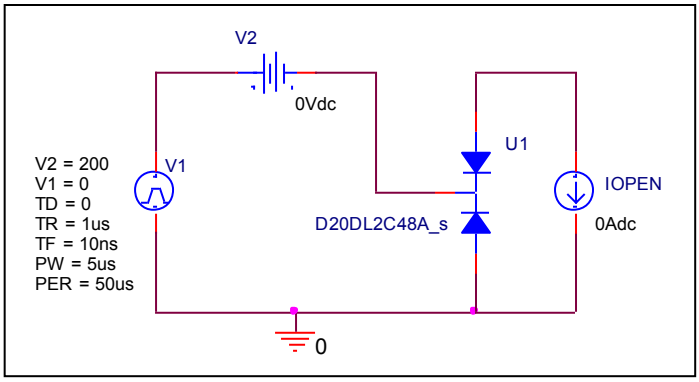
All Rights Reserved Copyright (C) Bee Technologies Inc. 2006

Capacitance Characteristic

Circuit Simulation Result



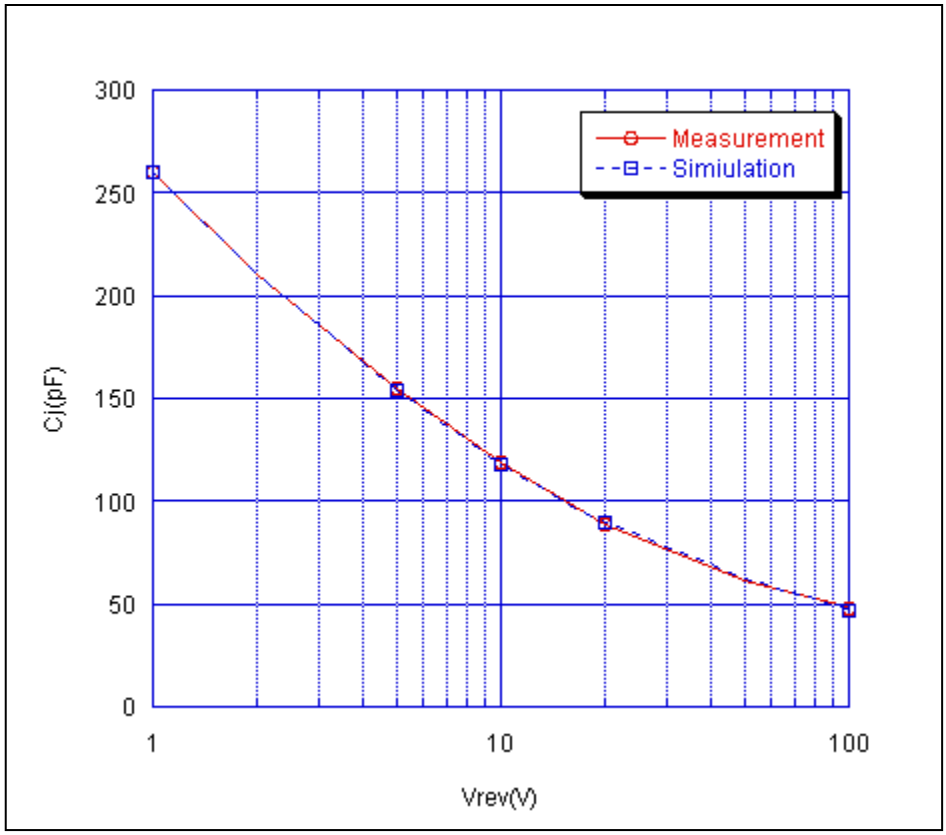
Evaluation Circuit



All Rights Reserved Copyright (C) Bee Technologies Inc. 2006

Comparison Graph

Circuit Simulation Result



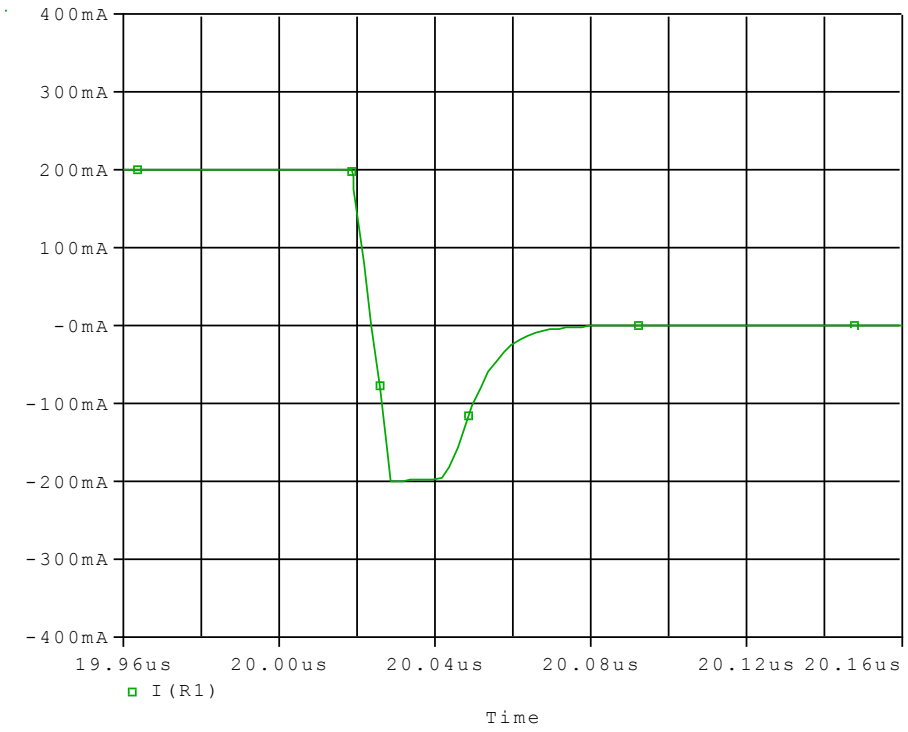
Simulation Result

Vrev(V)	Cj(pF)		%Error
	Measurement	Simulation	
1	260.000	260.027	-0.010
2	210.000	210.729	-0.347
5	155.000	153.655	0.868
10	119.000	118.148	0.716
20	89.000	90.000	-1.124
50	61.000	62.271	-2.084
100	48.000	47.000	2.083

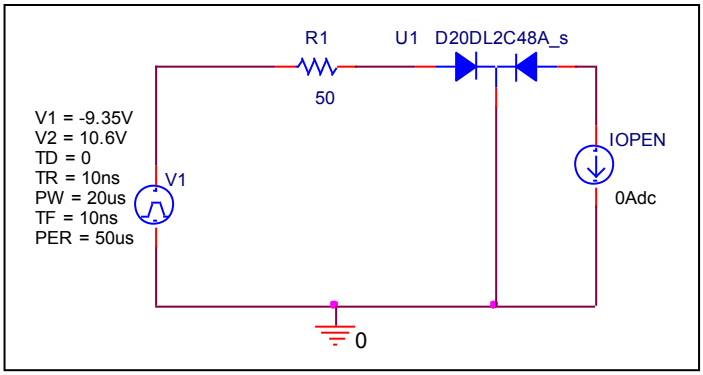
All Rights Reserved Copyright (C) Bee Technologies Inc. 2006

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

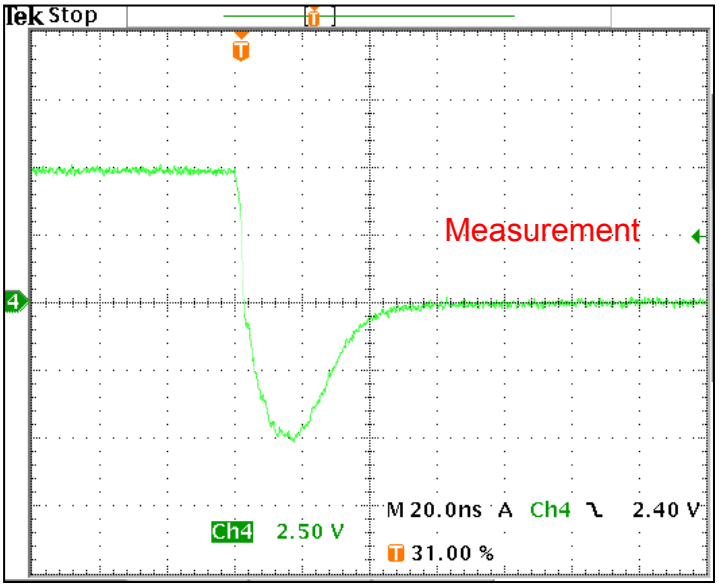


Compare Measurement vs. Simulation

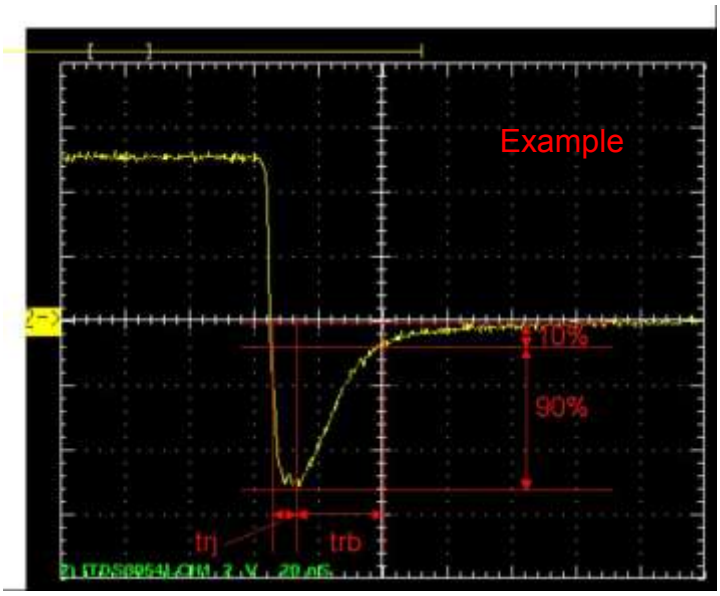
	Measurement		Simulation		%Error
trr	**36.800**	**ns**	**36.870**	**ns**	**0.190**

All Rights Reserved Copyright (C) Bee Technologies Inc. 2006

Reverse Recovery Characteristic Reference



Trj =14.8(ns)
Trb=22(ns)
Conditions: Ifwd=Irev=0.2(A), Rl=50



Relation between trj and trb

All Rights Reserved Copyright (C) Bee Technologies Inc. 2006