

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL
PART NUMBER: CMH07
MANUFACTURER: TOSHIBA



Bee Technologies Inc.

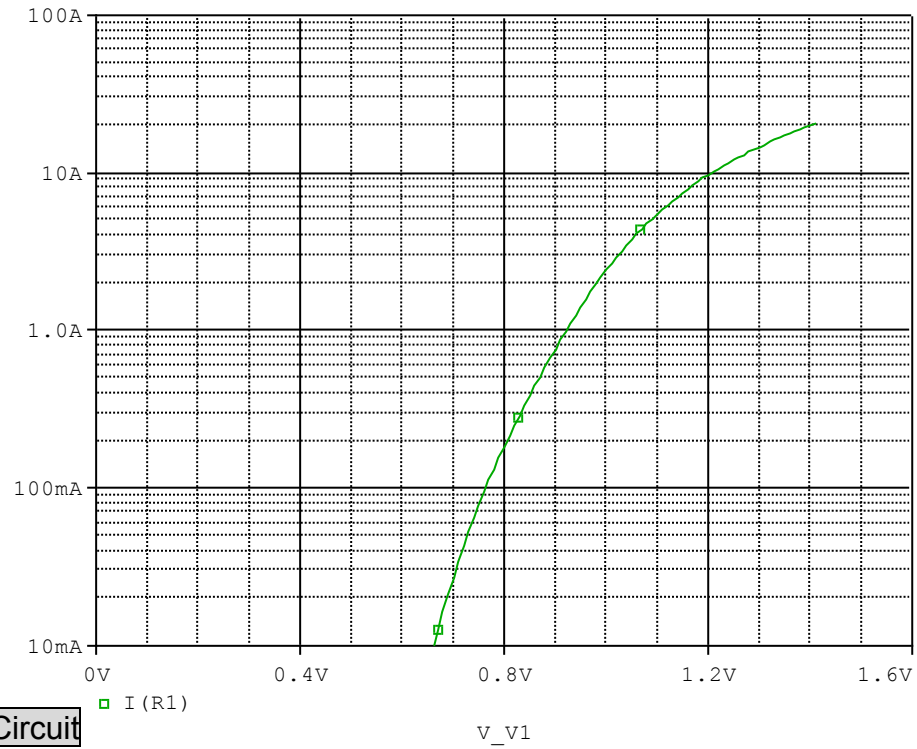
All Rights Reserved Copyright (C) Bee Technologies Inc. 2008

DIODE MODEL PARAMETERS

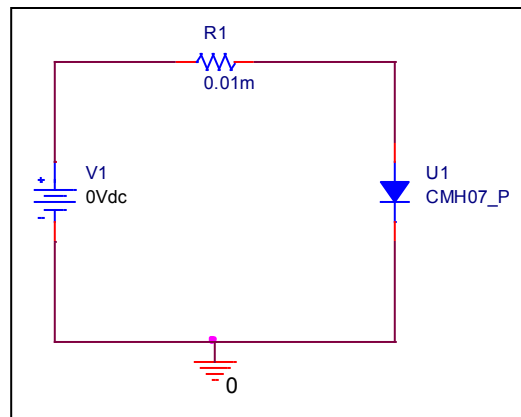
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

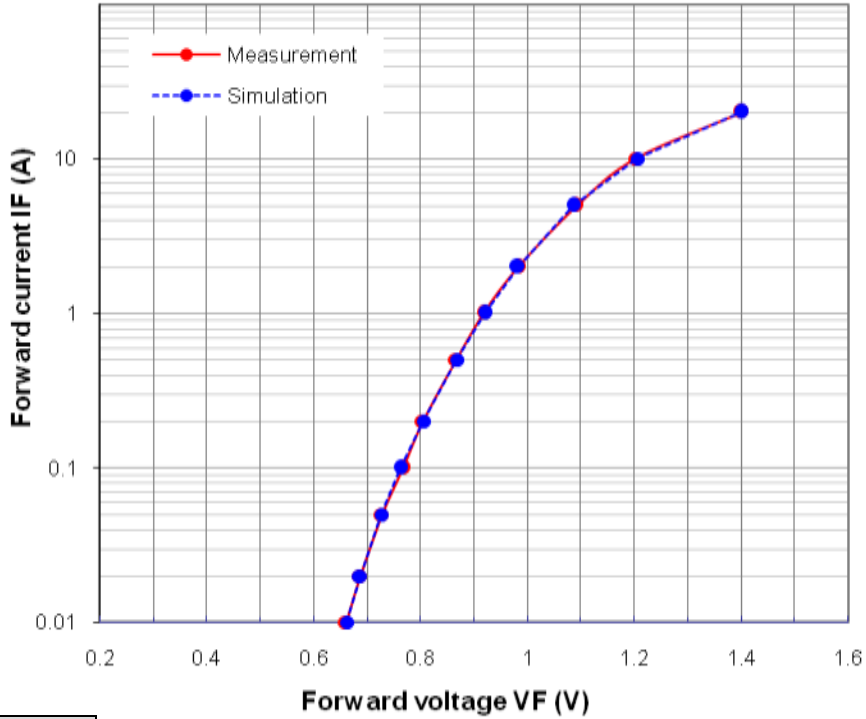


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

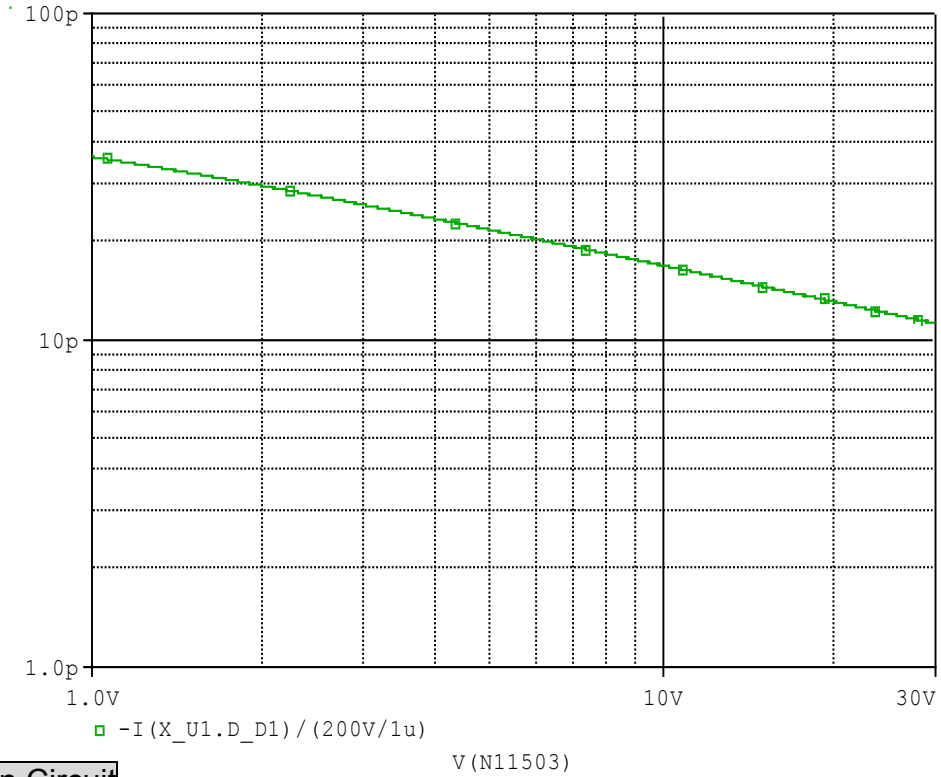


Simulation Result

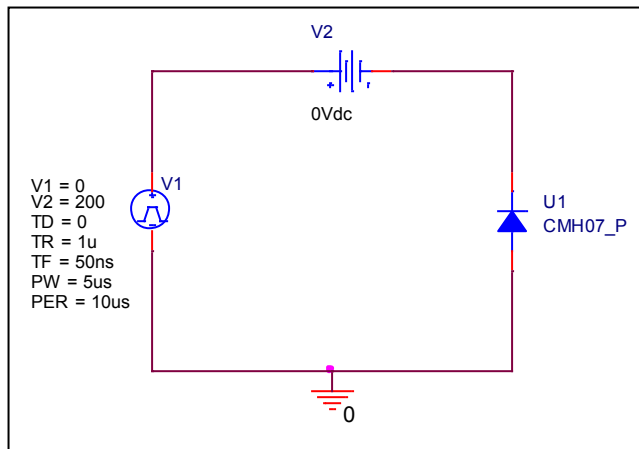
Ifwd (A)	Vfwd (V)		%Error
	Measurement	Simulation	
0.01	0.661	0.662	0.11
0.02	0.687	0.688	0.11
0.05	0.728	0.727	-0.12
0.1	0.768	0.763	-0.60
0.2	0.805	0.806	0.09
0.5	0.867	0.869	0.21
1	0.918	0.921	0.38
2	0.983	0.982	-0.12
5	1.092	1.087	-0.49
10	1.202	1.206	0.36
20	1.401	1.400	-0.05

Capacitance Characteristic

Circuit Simulation Result

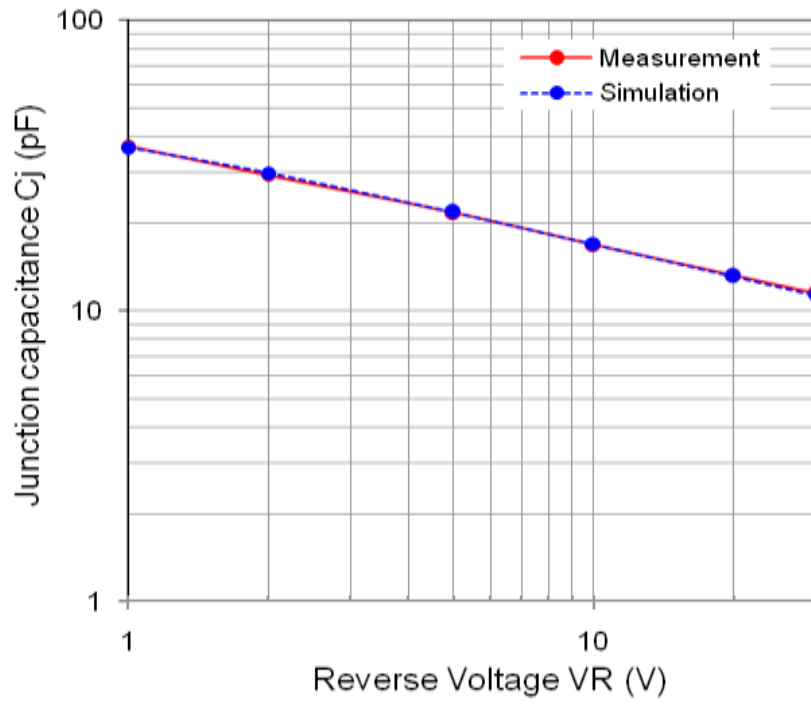


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

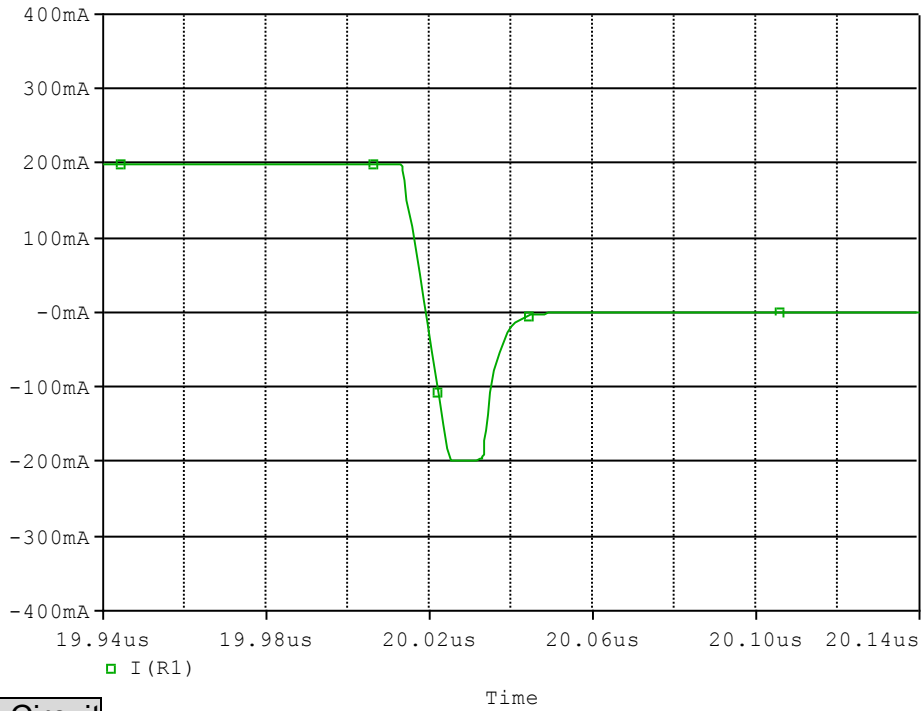


Simulation Result

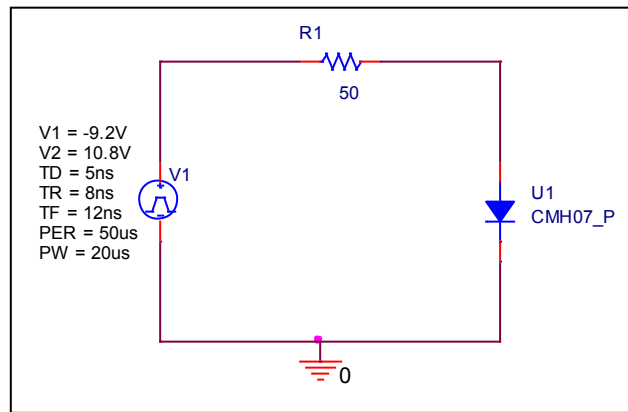
Vrev (V)	Cj (pF)		%Error
	Measurement	Simulation	
1	36.700	36.458	-0.66
2	29.300	29.651	1.20
5	21.700	21.755	0.25
10	16.800	16.948	0.88
20	13.200	13.102	-0.74
30	11.500	11.261	-2.08

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

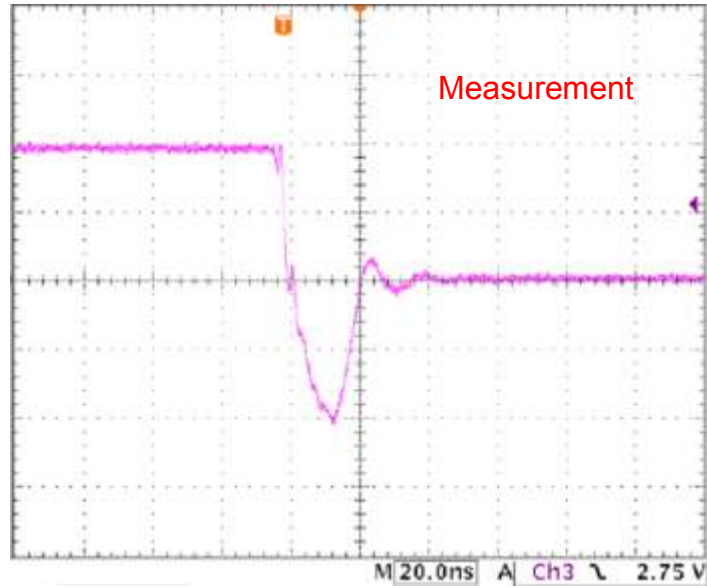


Compare Measurement vs. Simulation

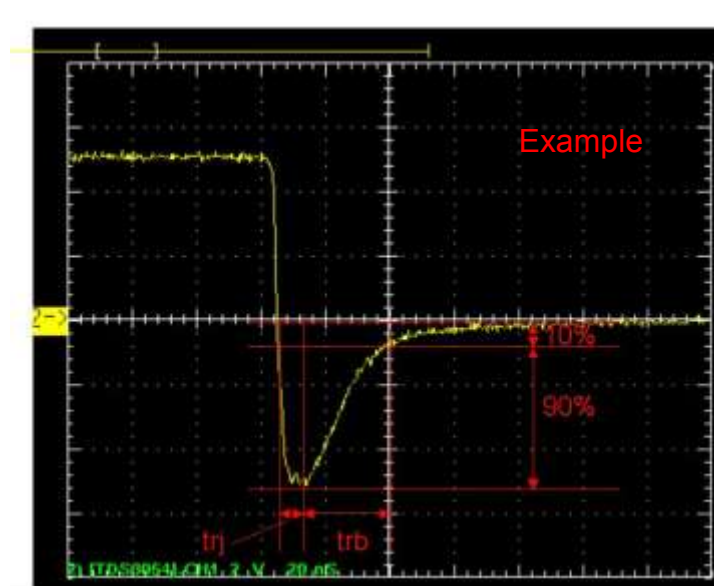
		Measurement	Simulation	%Error
Trj	ns	13.20	12.86	-2.55
Trb	ns	7.60	7.52	-1.03
Trr	ns	20.80	20.38	-2.00

Reverse Recovery Characteristic

Reference



$T_{rj} = 13.20(\text{ns})$
 $T_{rb} = 7.60 (\text{ns})$
Conditions: $I_{fwd}=0.2\text{A}$, $I_{rev}=0.2\text{A}$, $R_I=50$



Relation between t_{rj} and t_{rb}