

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL
PART NUMBER: CMH04
MANUFACTURER: TOSHIBA



Bee Technologies Inc.

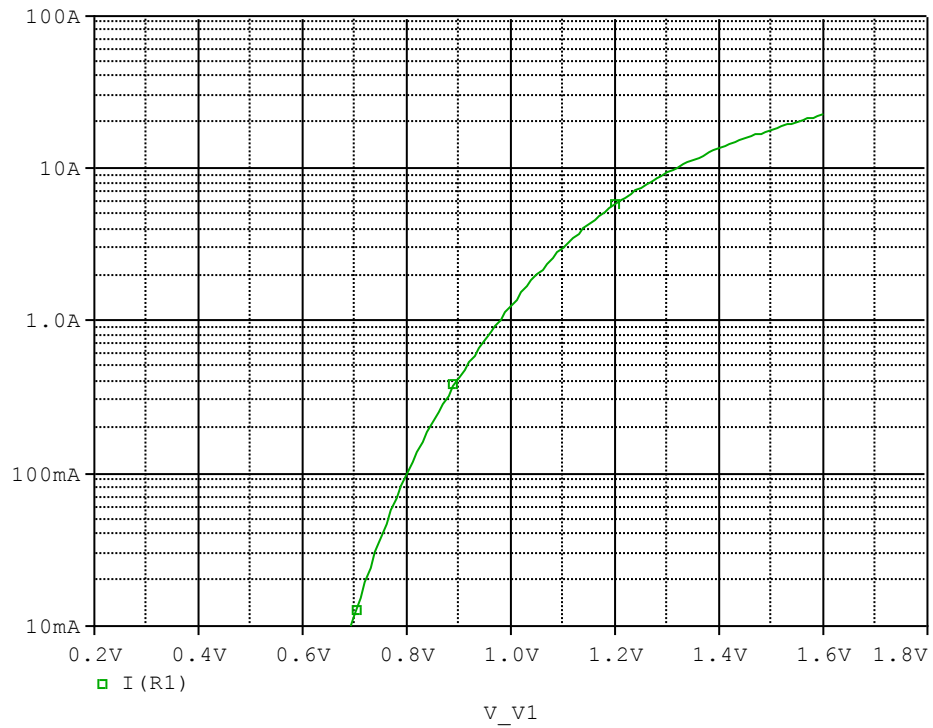
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DIODE MODEL PARAMETERS

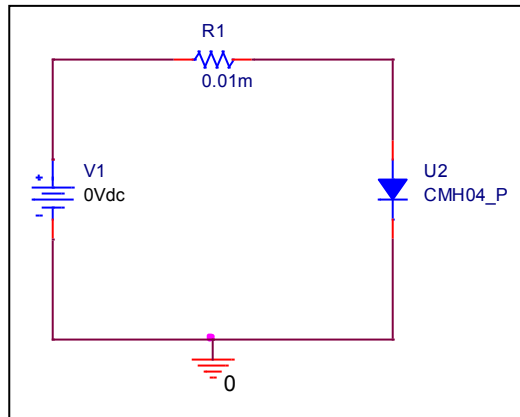
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

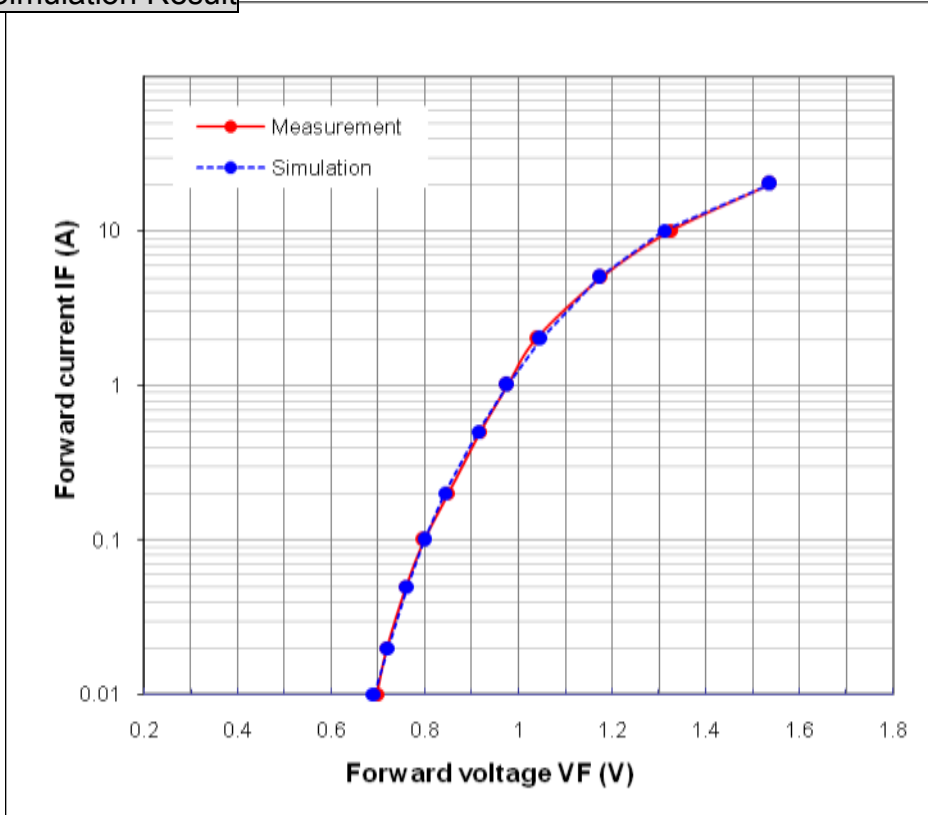


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

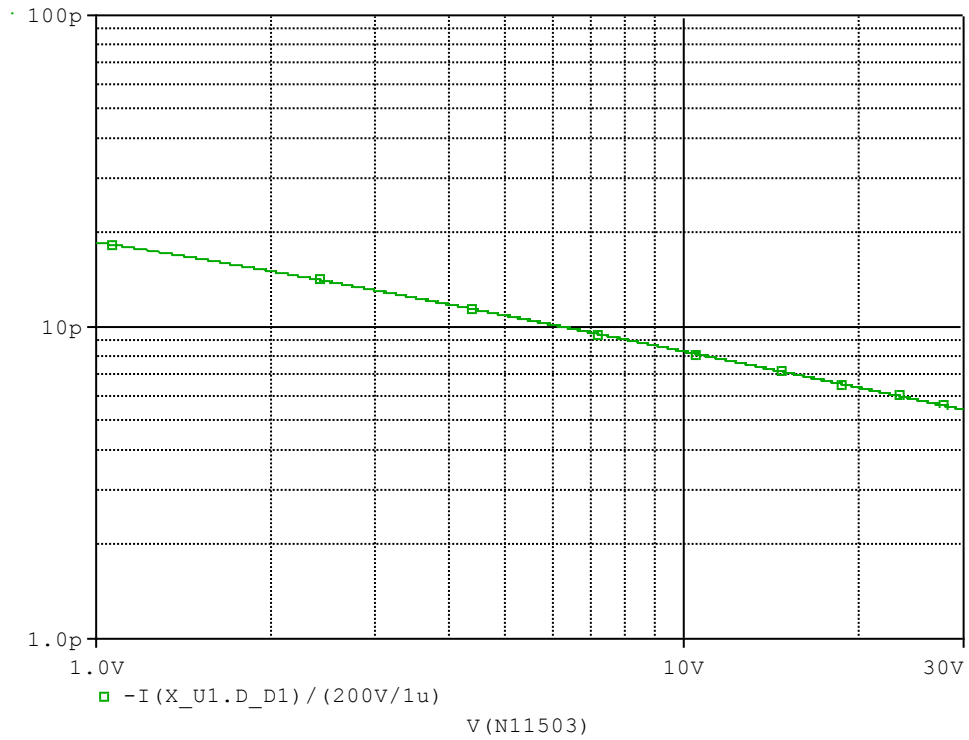


Simulation Result

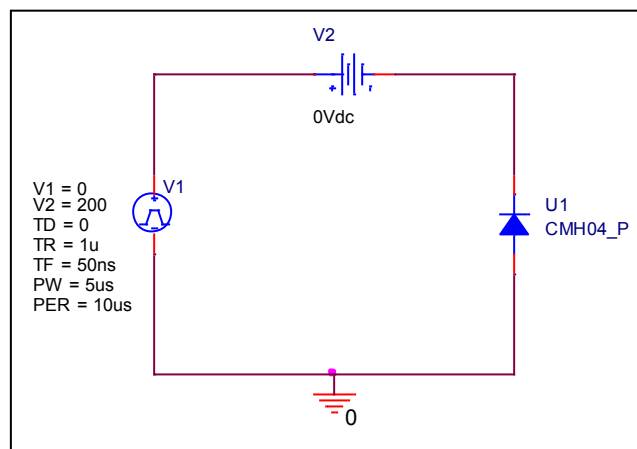
Ifwd (A)	Vfwd (V)		%Error
	Measurement	Simulation	
0.01	0.698	0.692	-0.93
0.02	0.718	0.721	0.42
0.05	0.759	0.763	0.53
0.1	0.798	0.800	0.24
0.2	0.850	0.843	-0.82
0.5	0.918	0.914	-0.47
1	0.976	0.976	0.00
2	1.037	1.048	1.04
5	1.176	1.172	-0.37
10	1.327	1.312	-1.15
20	1.538	1.537	-0.07

Capacitance Characteristic

Circuit Simulation Result

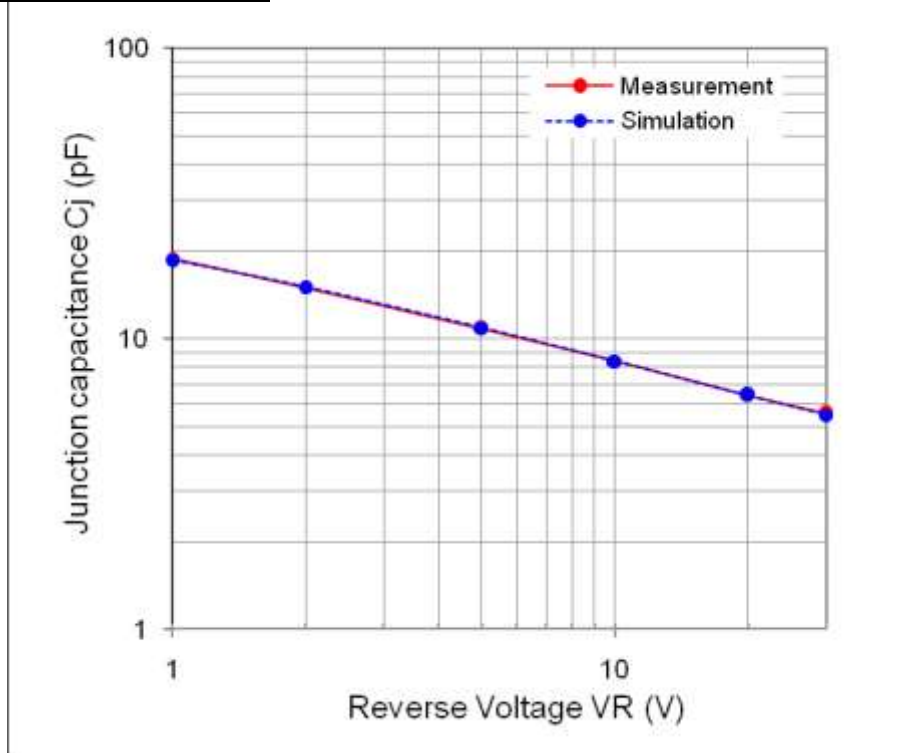


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

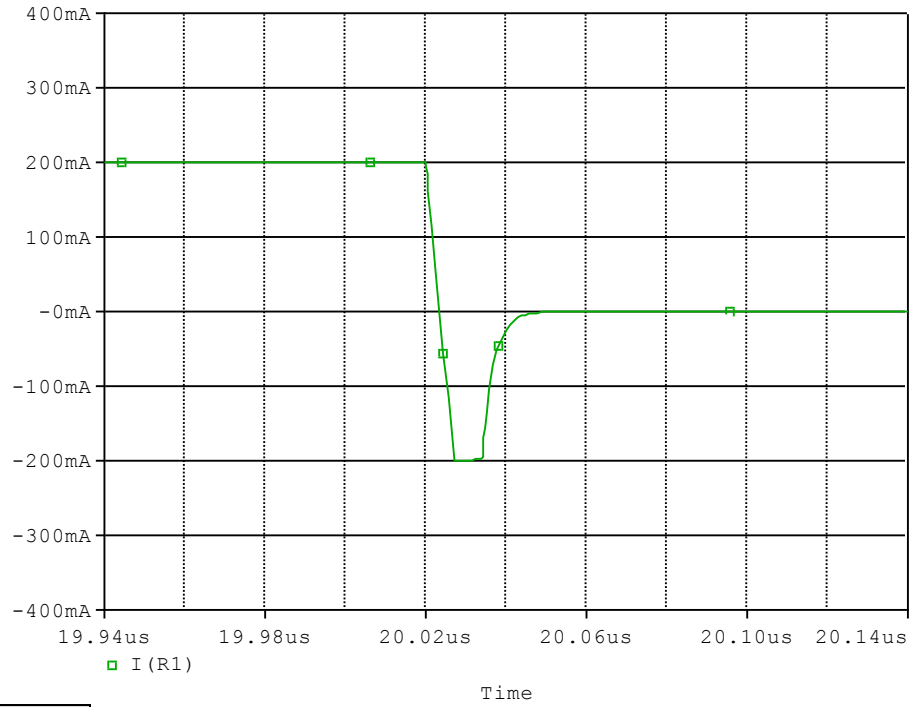


Simulation Result

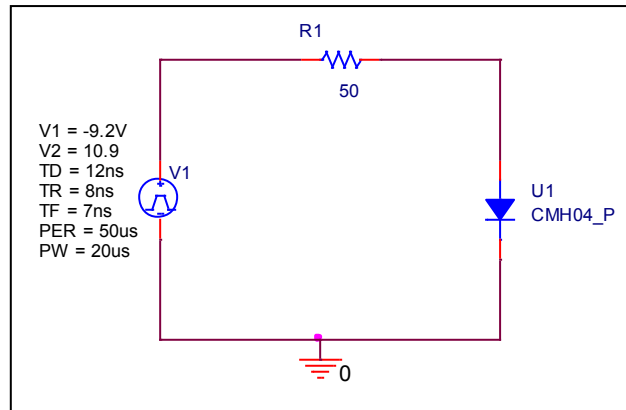
Vrev (V)	Cj (pF)		%Error
	Measurement	Simulation	
1	18.800	18.721	-0.42
2	15.000	15.062	0.41
5	10.800	10.873	0.68
10	8.360	8.359	-0.01
20	6.380	6.384	0.06
30	5.540	5.435	-1.89

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit



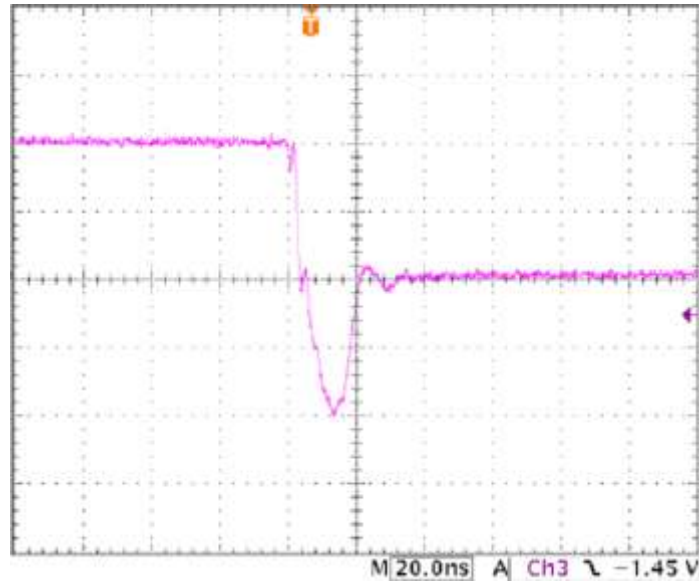
Compare Measurement vs. Simulation

		Measurement	Simulation	%Error
Trj	ns	9.60	9.47	-1.36
Trb	ns	7.20	7.05	-2.12
Trr	ns	16.80	16.52	-1.68

Reverse Recovery Characteristic

Reference'

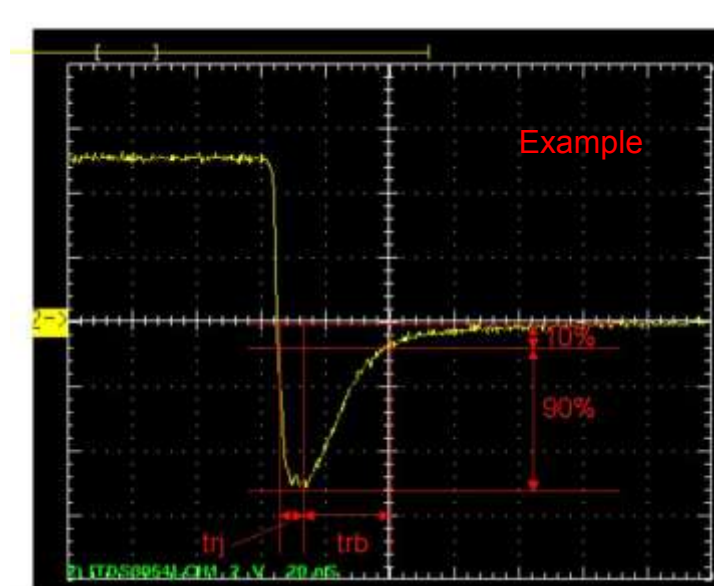
Measurement



$T_{rj} = 9.60(\text{ns})$

$T_{rb} = 7.20(\text{ns})$

Conditions: $I_{fwd} = 0.2\text{A}$, $I_{rev} = 0.2\text{A}$, $R_I = 50$



Relation between t_{rj} and t_{rb}