

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL
PART NUMBER: CLH01
MANUFACTURER: TOSHIBA



Bee Technologies Inc.

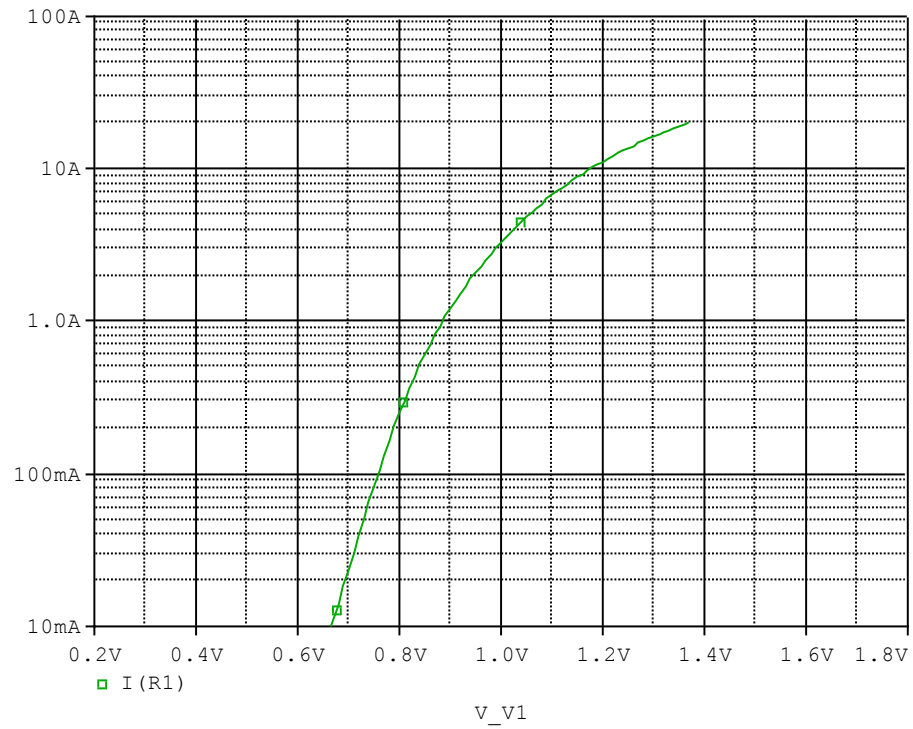
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DIODE MODEL PARAMETERS

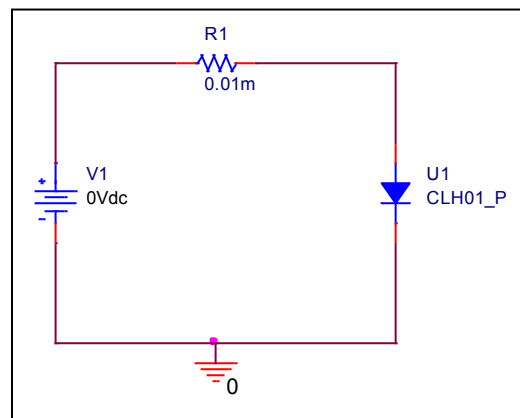
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

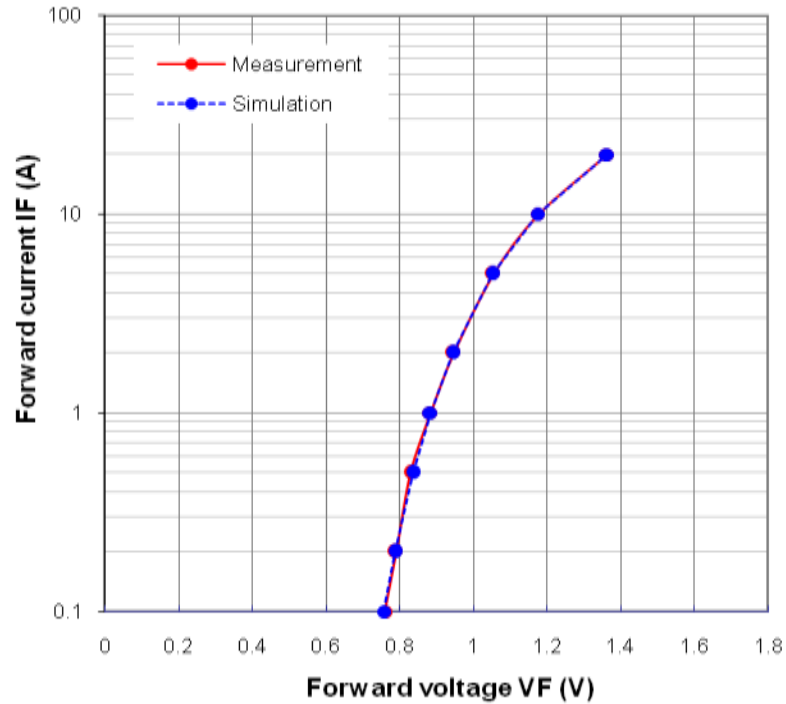


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

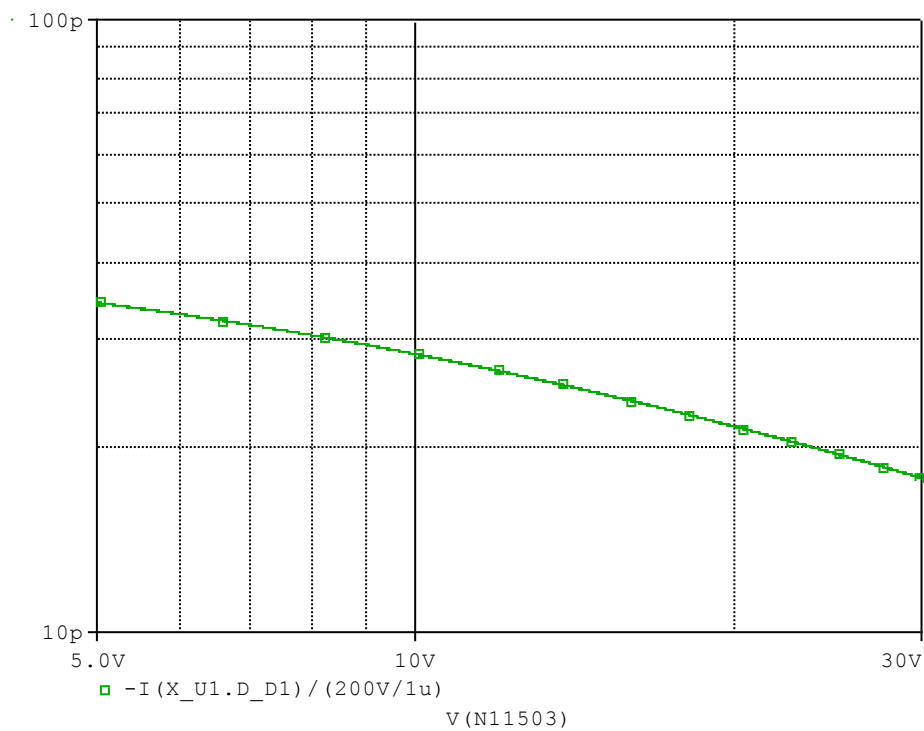


Simulation Result

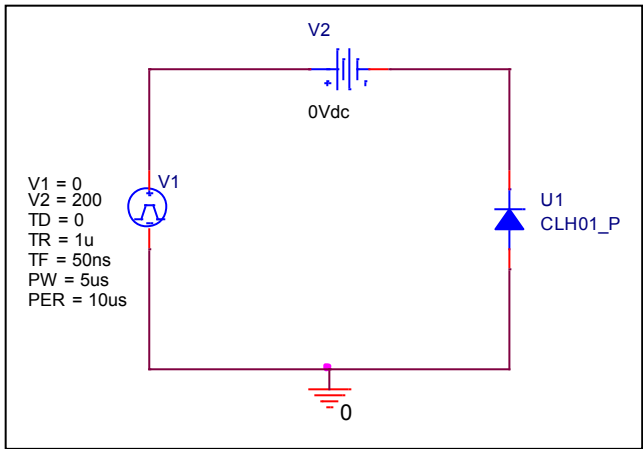
Ifwd (A)	Vfwd (V)		%Error
	Measurement	Simulation	
0.1	0.761	0.758	-0.39
0.2	0.791	0.789	-0.25
0.5	0.831	0.837	0.72
1	0.885	0.885	0.00
2	0.947	0.945	-0.21
5	1.055	1.054	-0.09
10	1.176	1.175	-0.09
20	1.364	1.3650	0.07

Capacitance Characteristic

Circuit Simulation Result

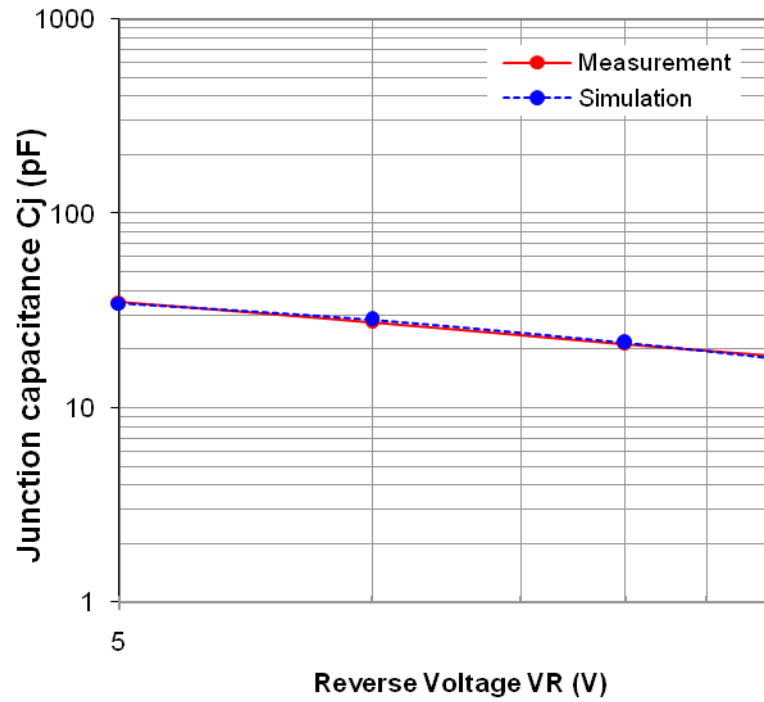


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

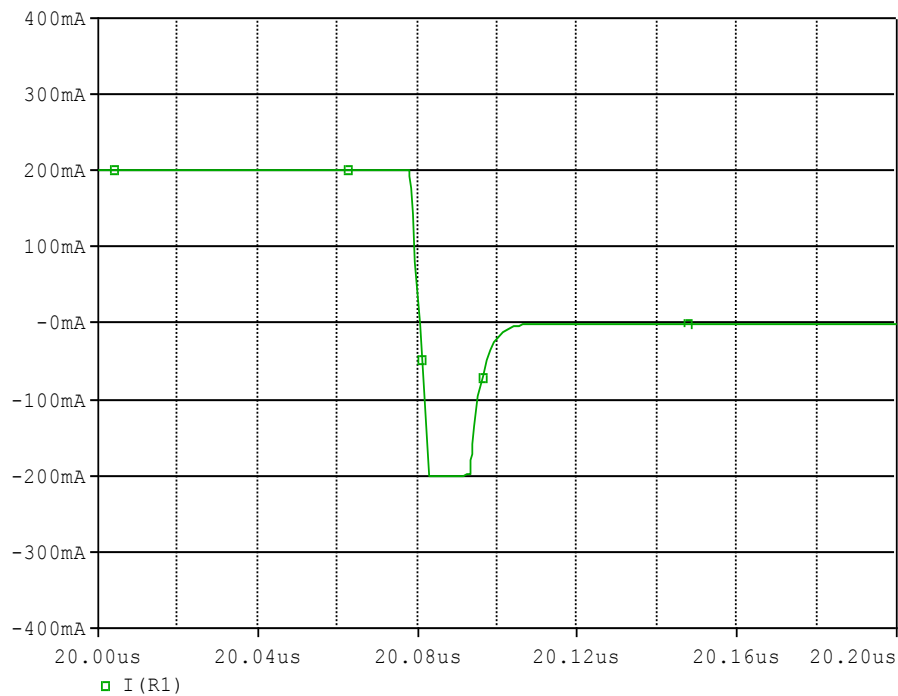


Simulation Result

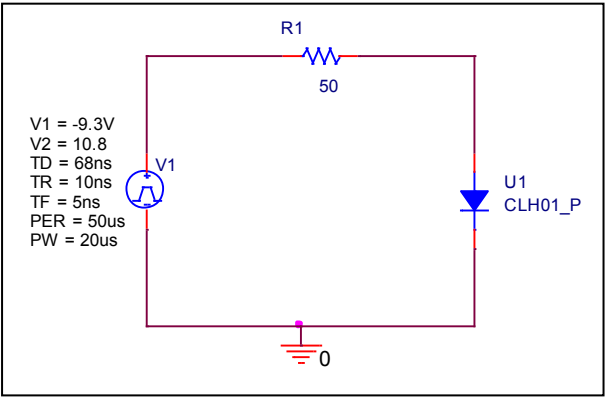
Vrev (V)	Cj (pF)		%Error
	Measurement	Simulation	
5	35.000	34.495	-1.44
10	27.700	28.444	2.69
20	21.300	21.657	1.68
30	18.500	17.854	-3.49

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit



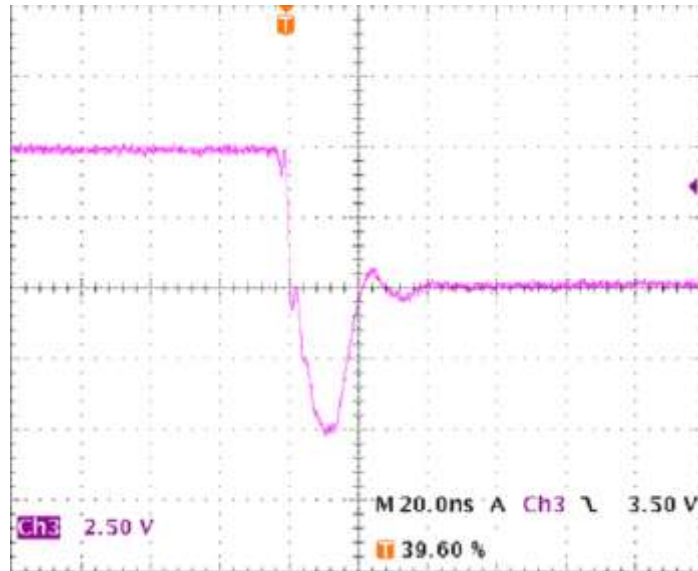
Compare Measurement vs. Simulation

		Measurement	Simulation	%Error
Trj	ns	11.20	11.16	-0.40
Trb	ns	8.00	8.11	1.35
Trr	ns	19.20	19.26	0.33

Reverse Recovery Characteristic

Reference

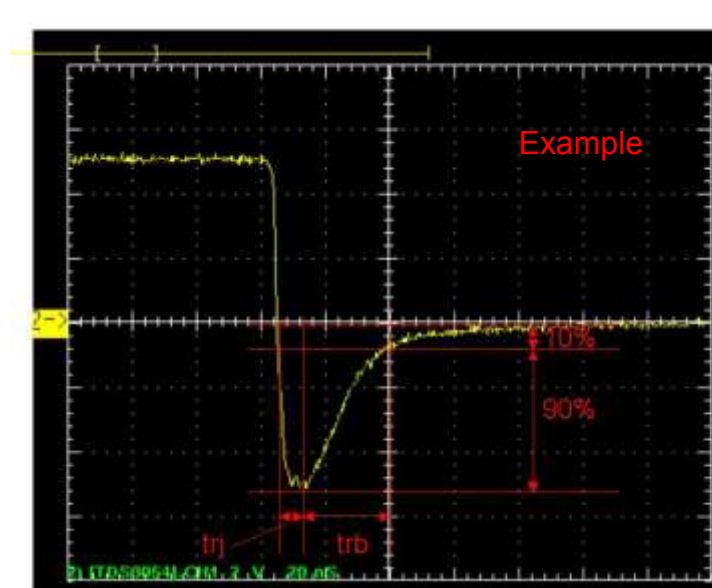
Measurement



$T_{rj} = 11.20(\text{ns})$

$T_{rb} = 8.00(\text{ns})$

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



Relation between t_{rj} and t_{rb}