

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL
PART NUMBER: 1SS400
MANUFACTURER: ROHM



Bee Technologies Inc.

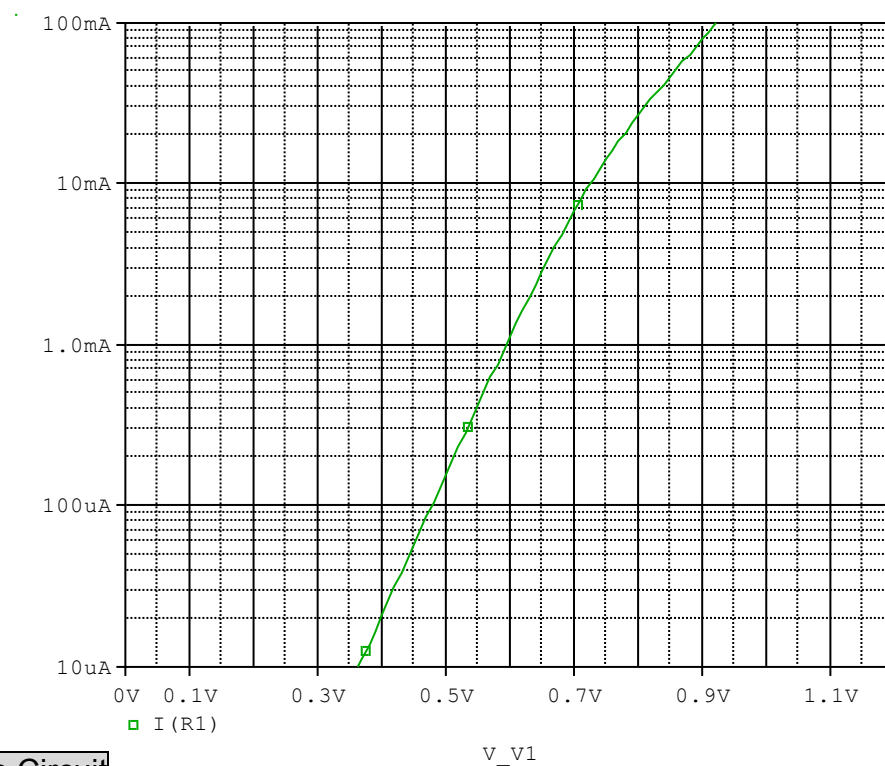
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DIODE MODEL PARAMETERS

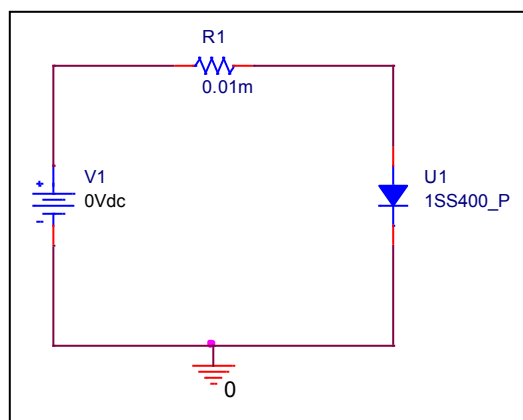
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

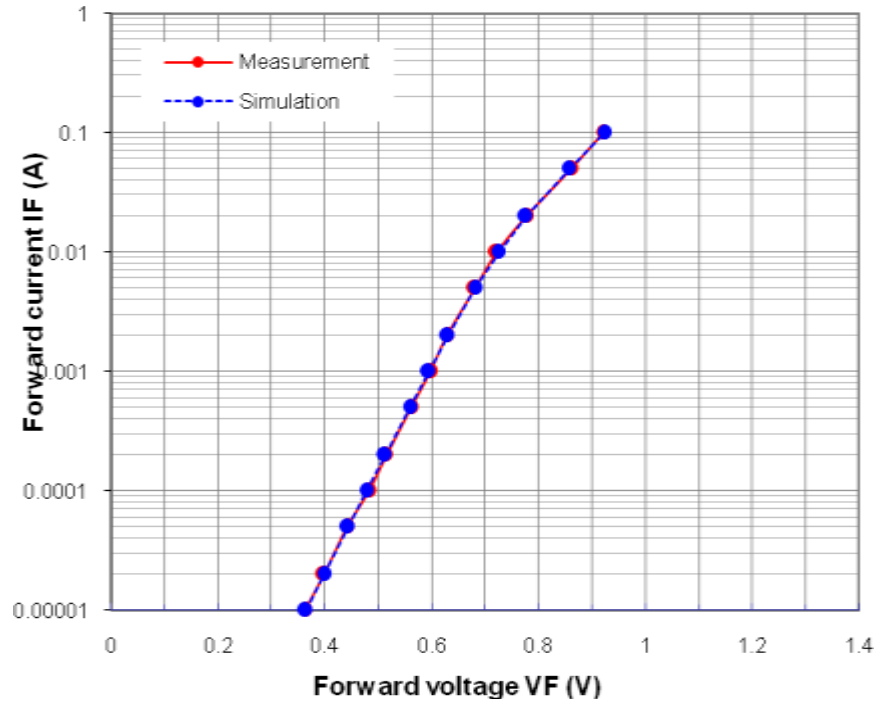


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

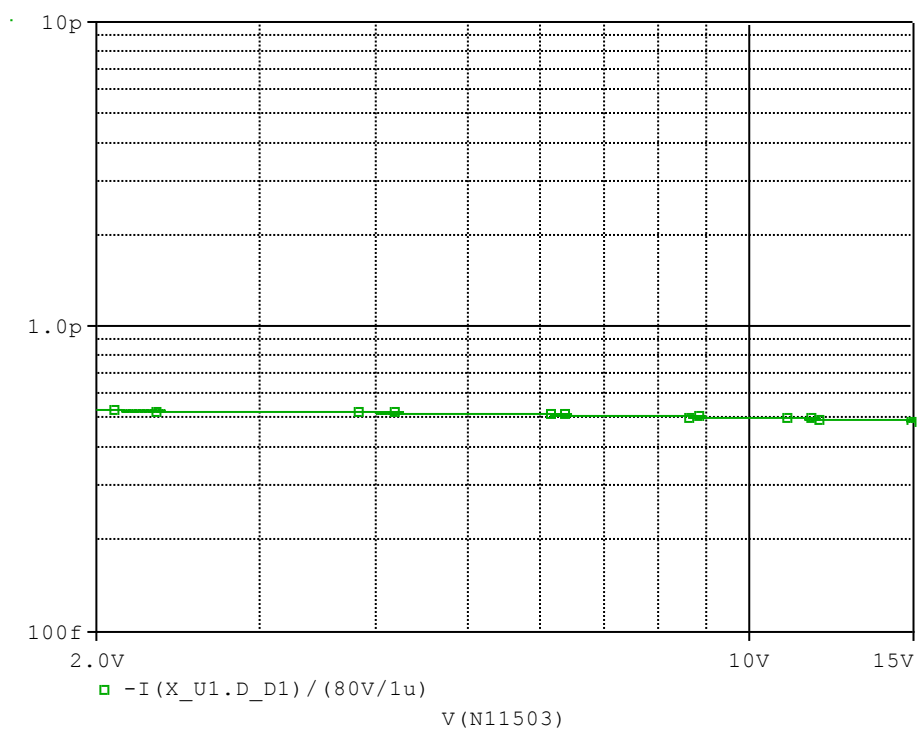


Simulation Result

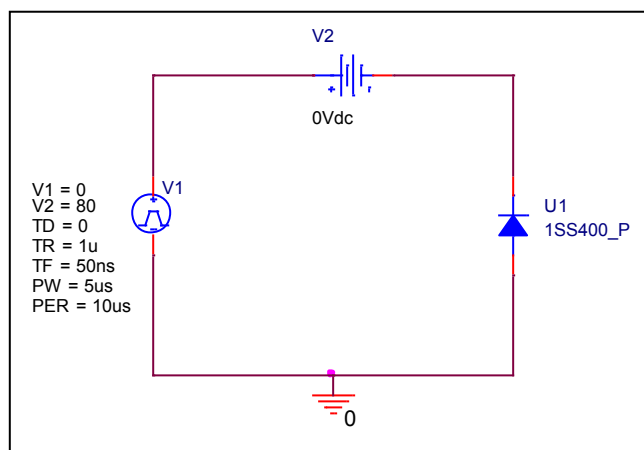
Ifwd (A)	Vfwd (V)		%Error
	Measurement	Simulation	
0.00001	0.362	0.364	0.33
0.00002	0.397	0.398	0.25
0.00005	0.441	0.443	0.45
0.0001	0.482	0.478	-0.83
0.0002	0.515	0.513	-0.48
0.0005	0.561	0.559	-0.43
0.001	0.597	0.594	-0.52
0.002	0.628	0.630	0.32
0.005	0.680	0.681	0.15
0.01	0.721	0.725	0.55
0.02	0.777	0.776	-0.13
0.05	0.861	0.857	-0.50
0.1	0.921	0.923	0.22

Capacitance Characteristic

Circuit Simulation Result

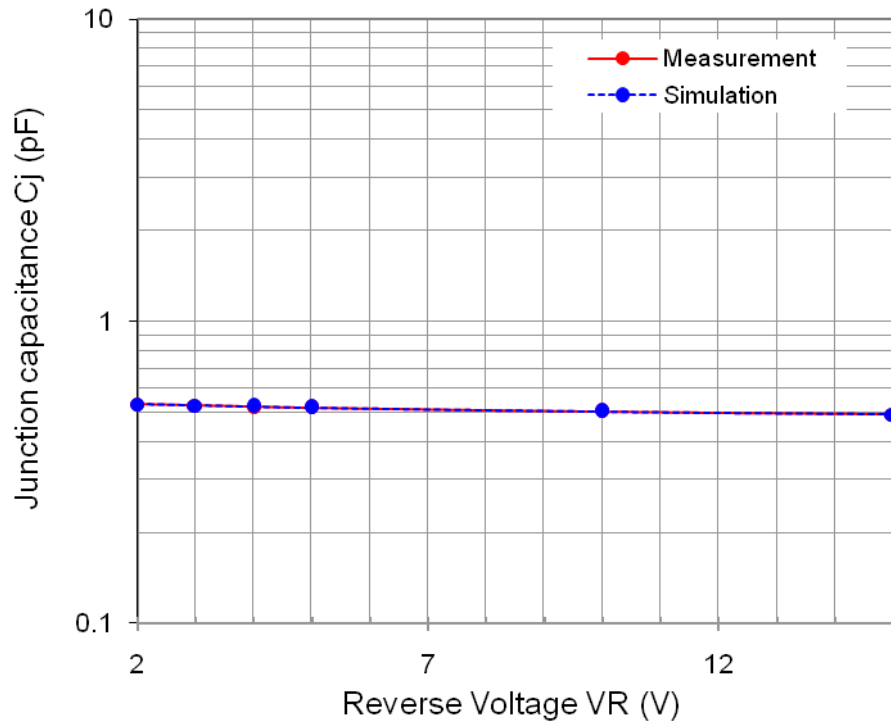


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

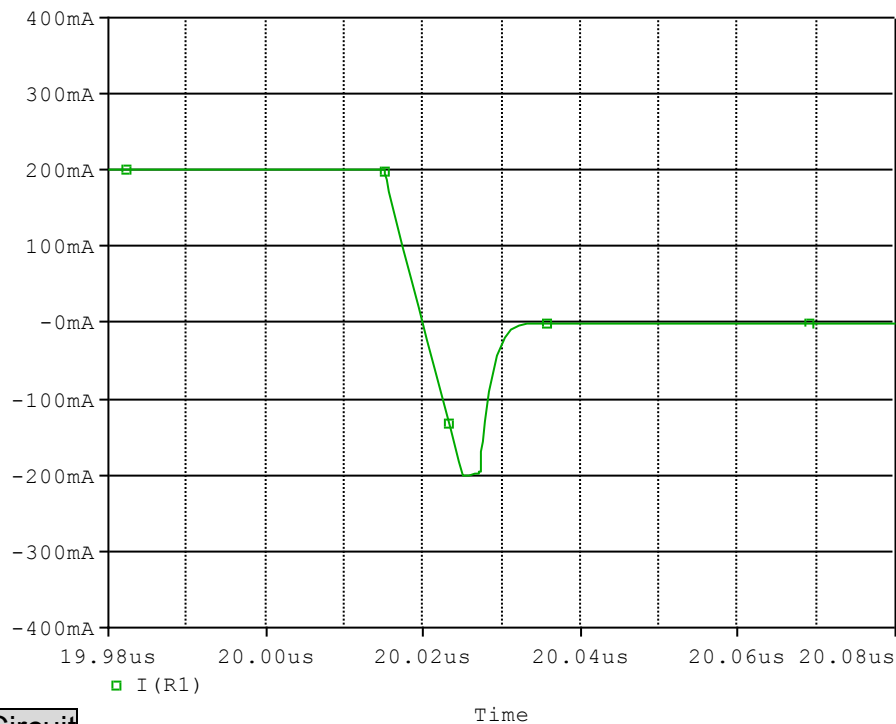


Simulation Result

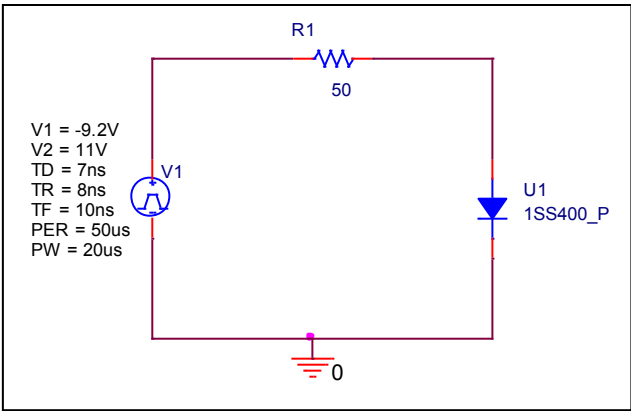
Vrev (V)	Cj (pF)		%Error
	Measurement	Simulation	
2	0.532	0.531	-0.19
3	0.527	0.526	-0.19
4	0.522	0.523	0.18
5	0.518	0.518	0.00
10	0.503	0.504	0.11
15	0.492	0.491	-0.20

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit



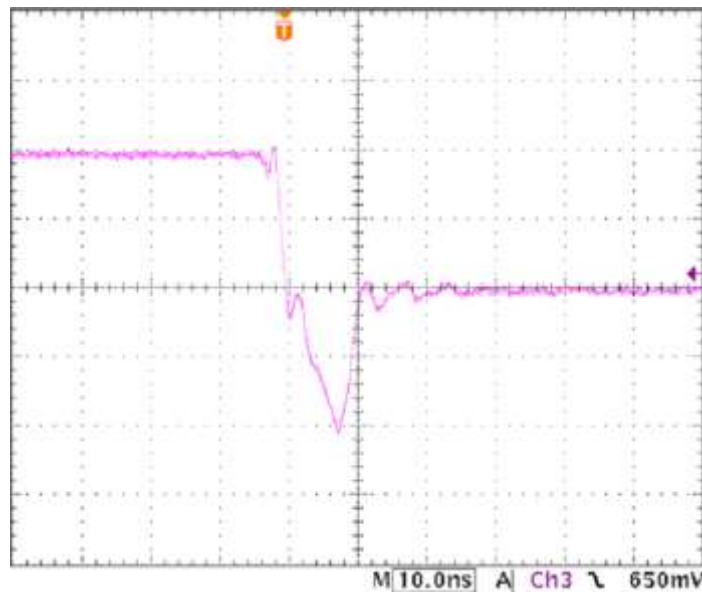
Compare Measurement vs. Simulation

		Measurement	Simulation	%Error
Trj	ns	7.40	7.14	-3.54
Trb	ns	3.20	3.25	1.43
Trr	ns	10.60	10.38	-2.04

Reverse Recovery Characteristic

Reference

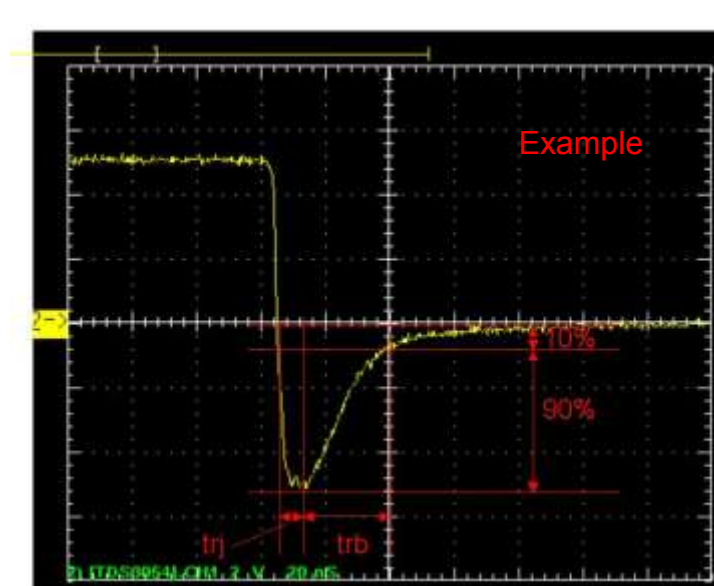
Measurement



$T_{rr} = 7.40(\text{ns})$

$T_{rb} = 3.20(\text{ns})$

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



Relation between t_{rr} and t_{rb}