

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ STANDARD
PART NUMBER: S2L20U
MANUFACTURER: SHINDENGEN



Bee Technologies Inc.

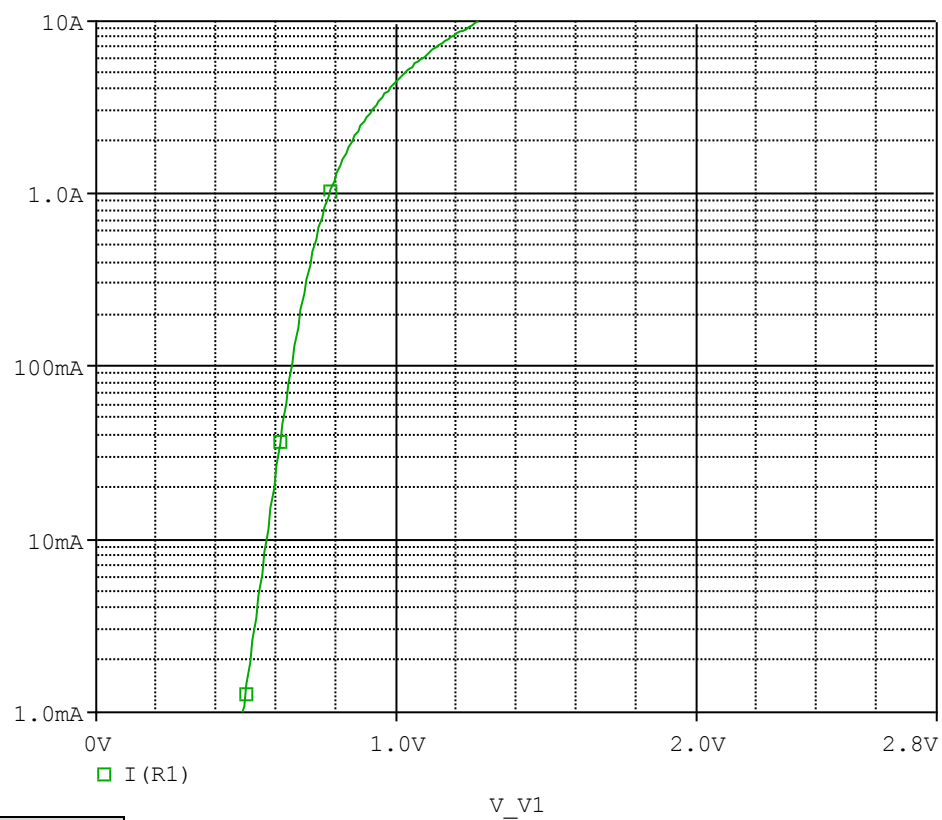
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DIODE MODEL PARAMETERS

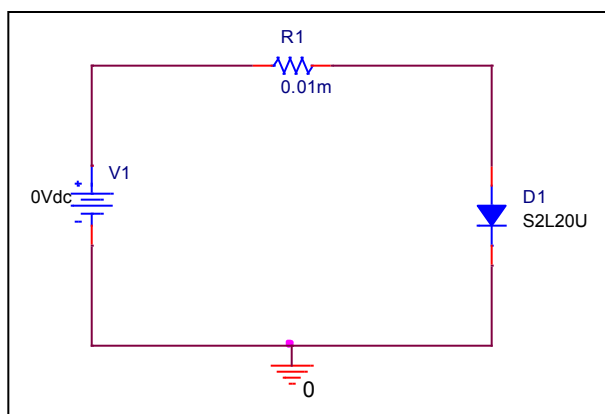
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

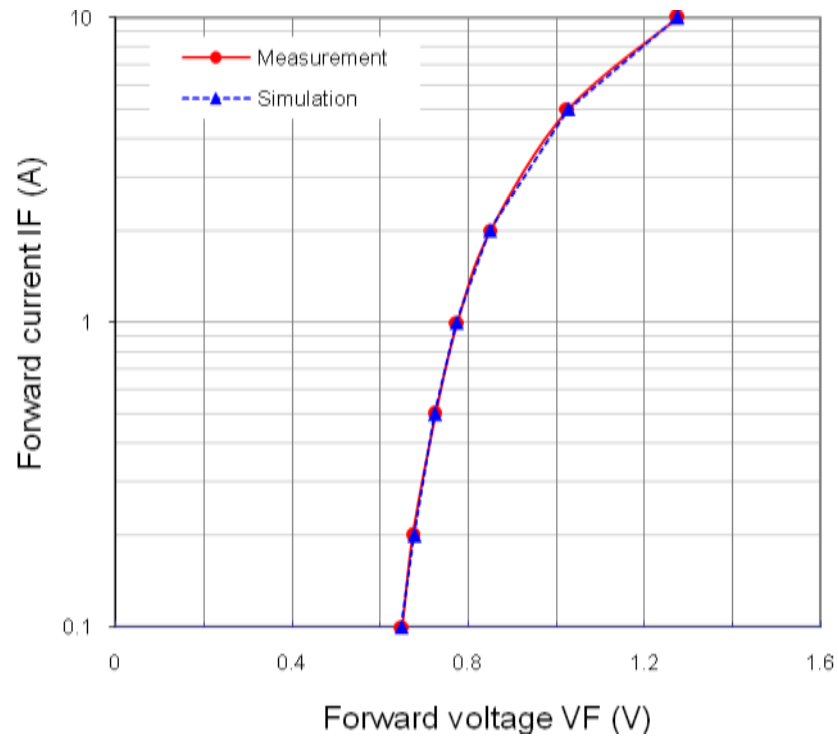


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

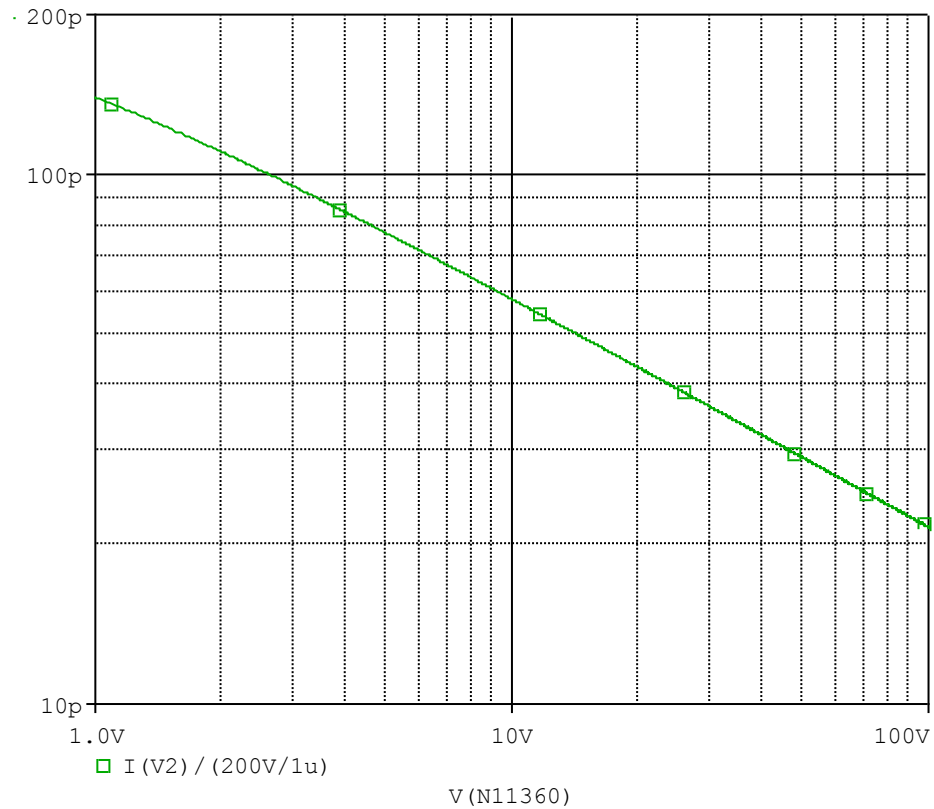


Simulation Result

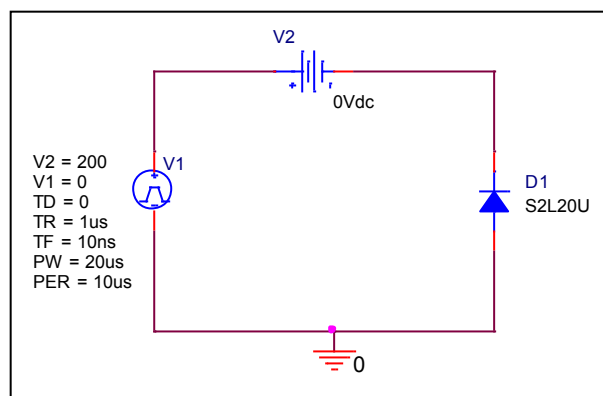
Ifwd (A)	Vfwd (V)		%Error
	Measurement	Simulation	
0.1	0.650	0.648	-0.31
0.2	0.675	0.677	0.30
0.5	0.725	0.724	-0.14
1	0.775	0.774	-0.13
2	0.850	0.849	-0.12
5	1.025	1.026	0.10
10	1.275	1.274	-0.08

Capacitance Characteristic

Circuit Simulation Result

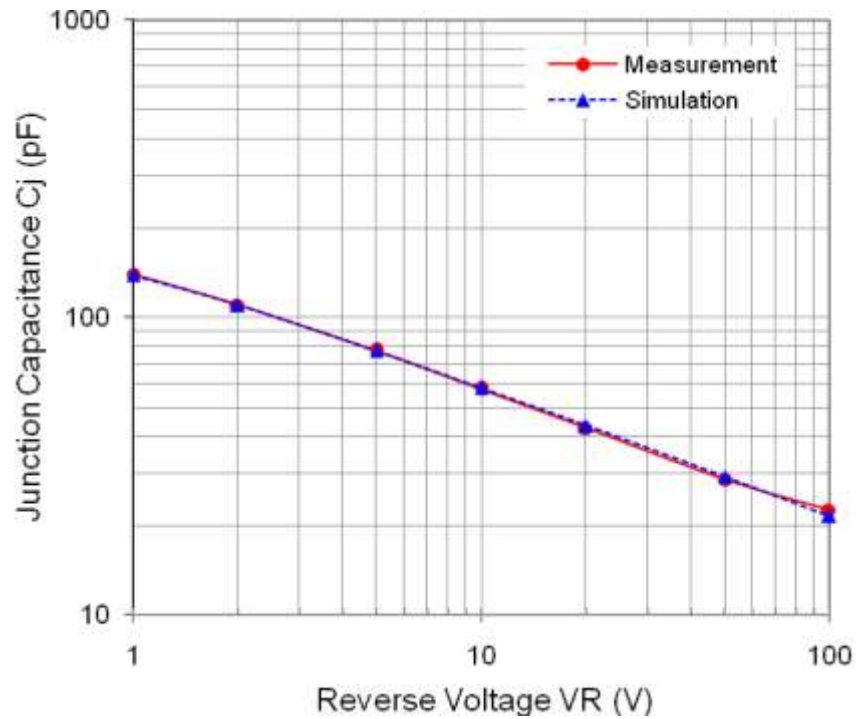


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

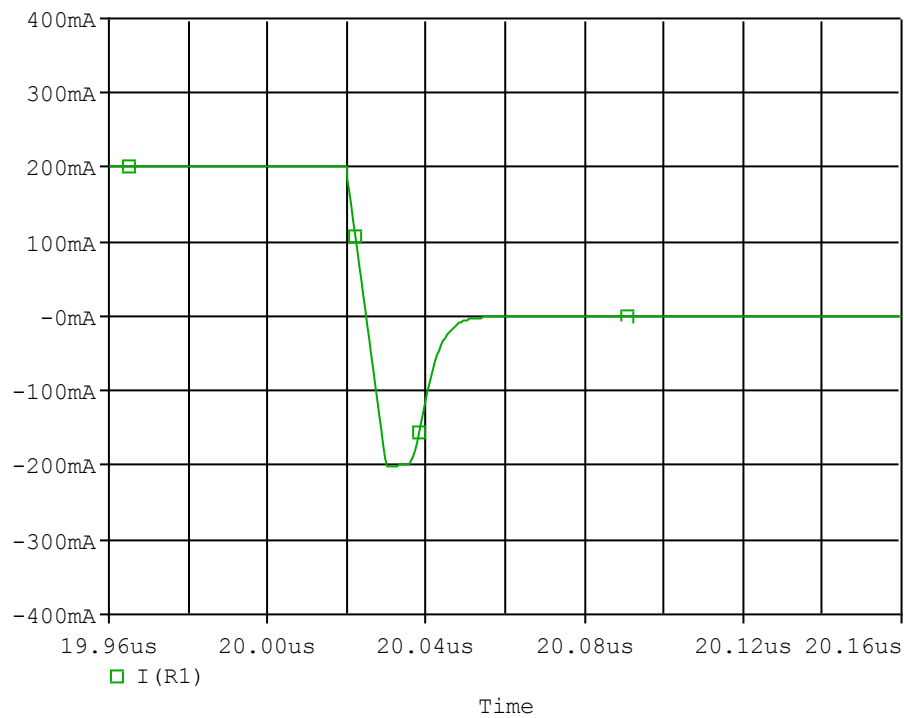


Simulation Result

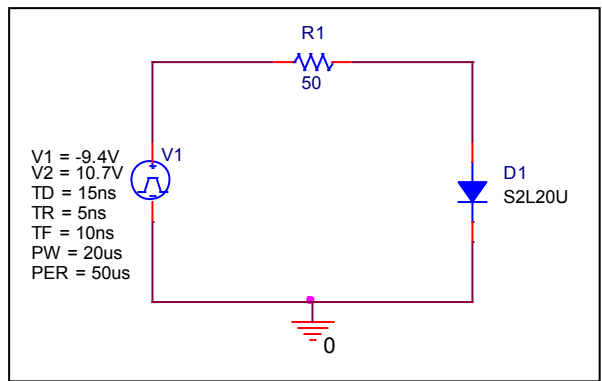
Vrev (V)	Cj (pF)		%Error
	Measurement	Simulation	
1	140.000	139.135	-0.62
2	110.000	110.217	0.20
5	77.500	77.258	-0.31
10	57.500	58.066	0.98
20	42.500	43.285	1.85
50	28.500	29.153	2.29
100	22.500	21.559	-4.18

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

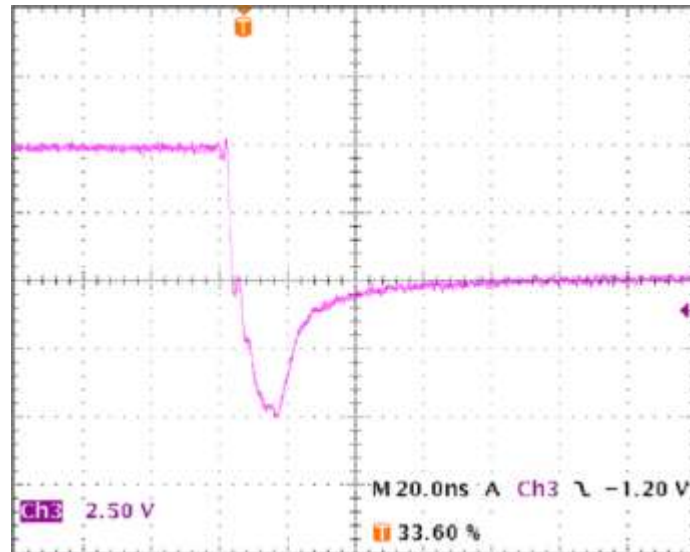


Compare Measurement vs. Simulation

		Measurement	Simulation	%Error
trj	ns	12.00	11.84	-1.33

Reverse Recovery Characteristic

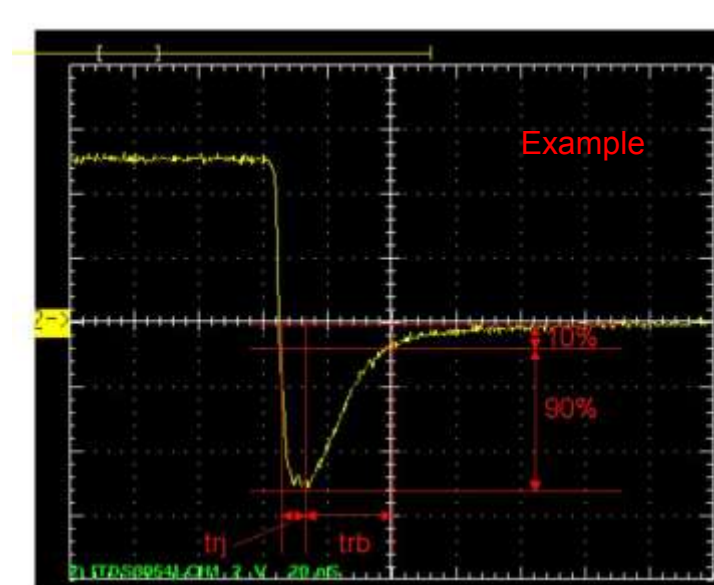
Reference



$T_{rj} = 12.00(\text{ns})$

$T_{rb} = 22.00(\text{ns})$

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



Relation between t_{rj} and t_{rb}