

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL
PART NUMBER: S3K60
MANUFACTURER: SHINDENGEN



Bee Technologies Inc.

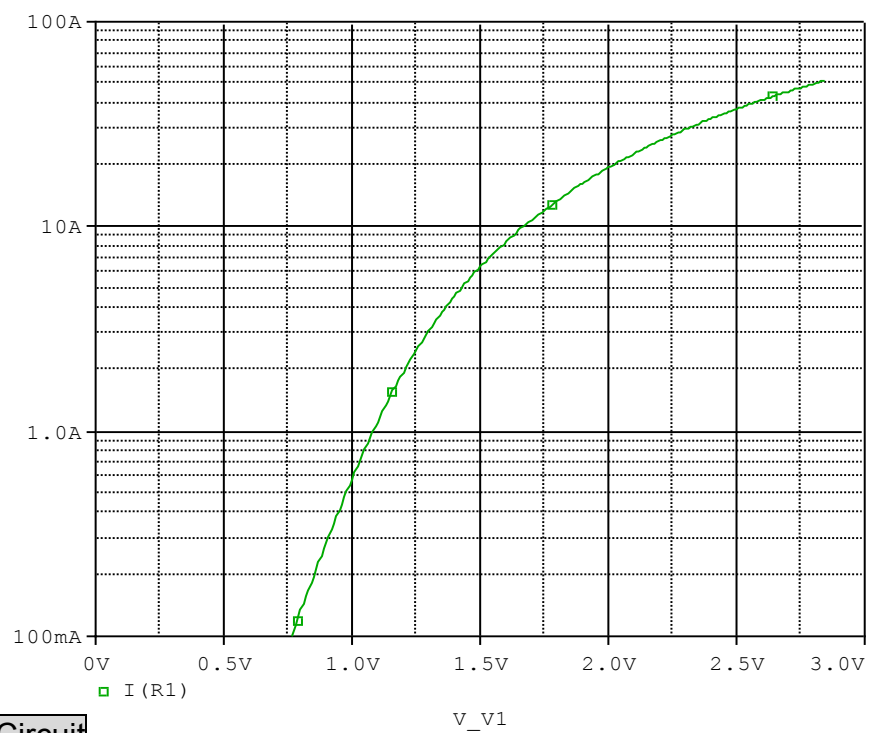
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DIODE MODEL PARAMETERS

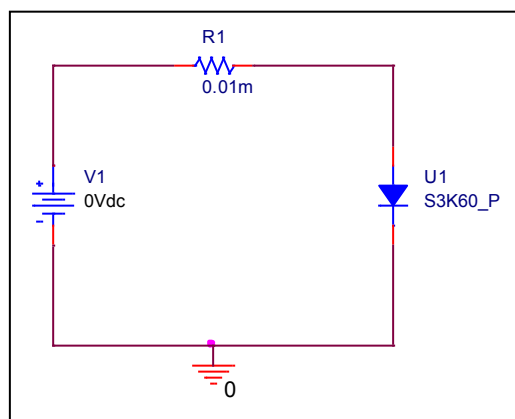
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

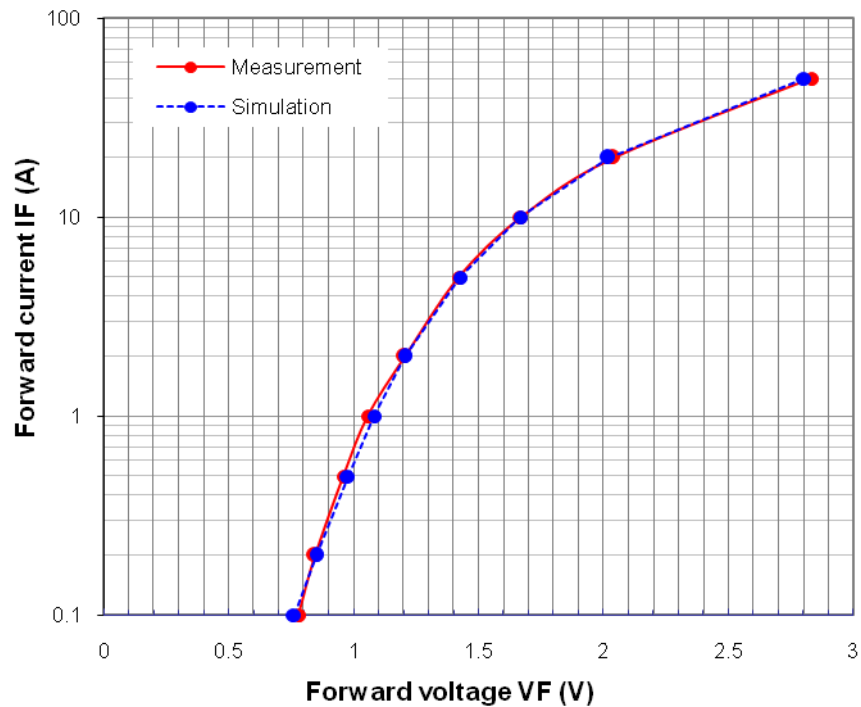


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

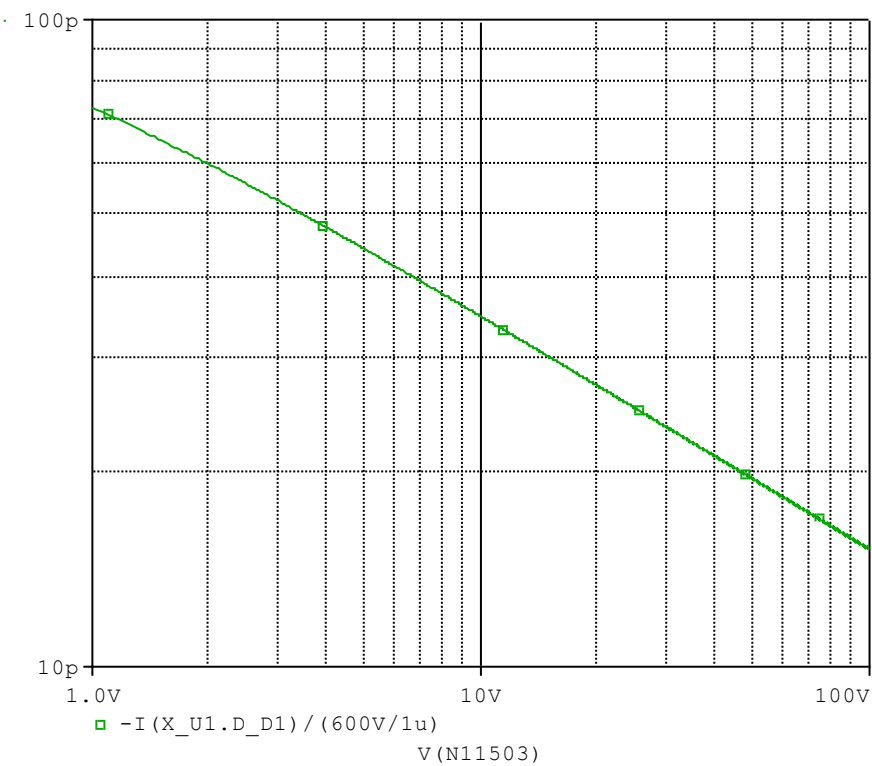


Simulation Result

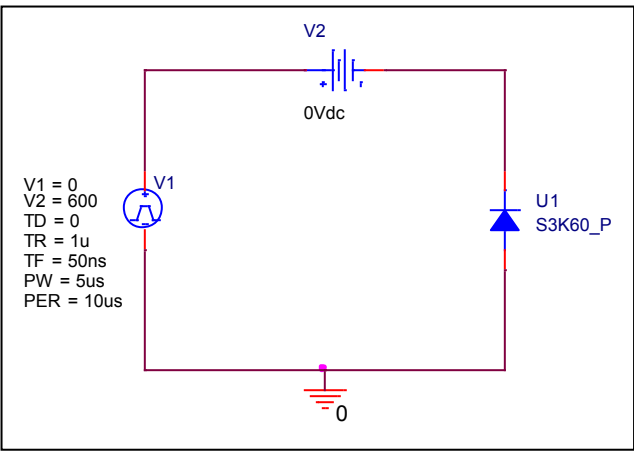
Ifwd (A)	Vfwd (V)		%Error
	Measurement	Simulation	
0.1	0.780	0.763	-2.21
0.2	0.845	0.852	0.83
0.5	0.960	0.977	1.77
1	1.058	1.082	2.27
2	1.204	1.205	0.08
5	1.421	1.426	0.32
10	1.670	1.668	-0.12
20	2.040	2.019	-1.03
50	2.834	2.806	-1.00

Capacitance Characteristic

Circuit Simulation Result

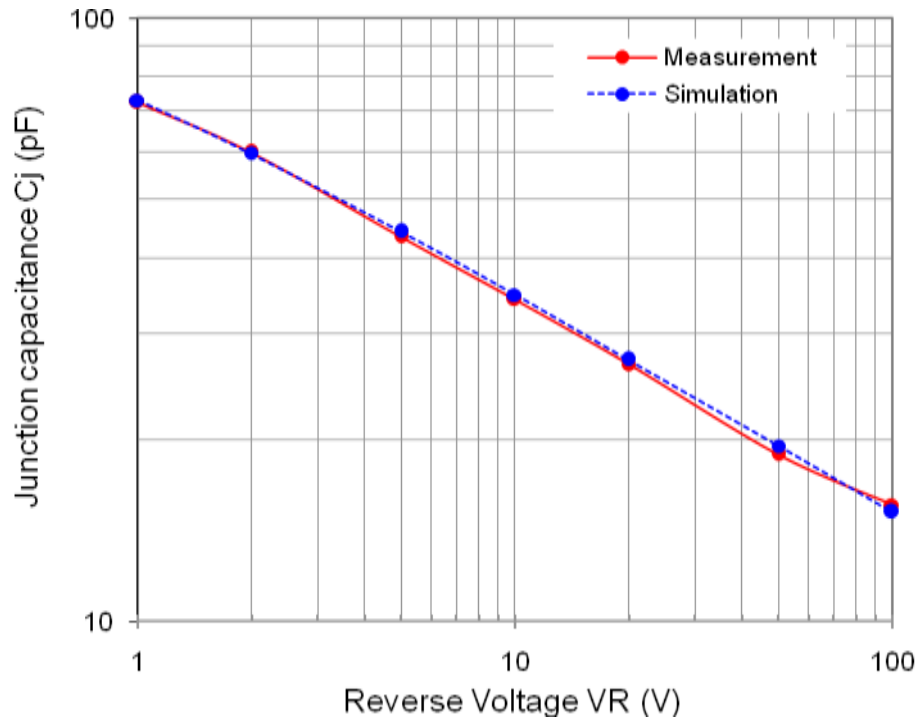


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

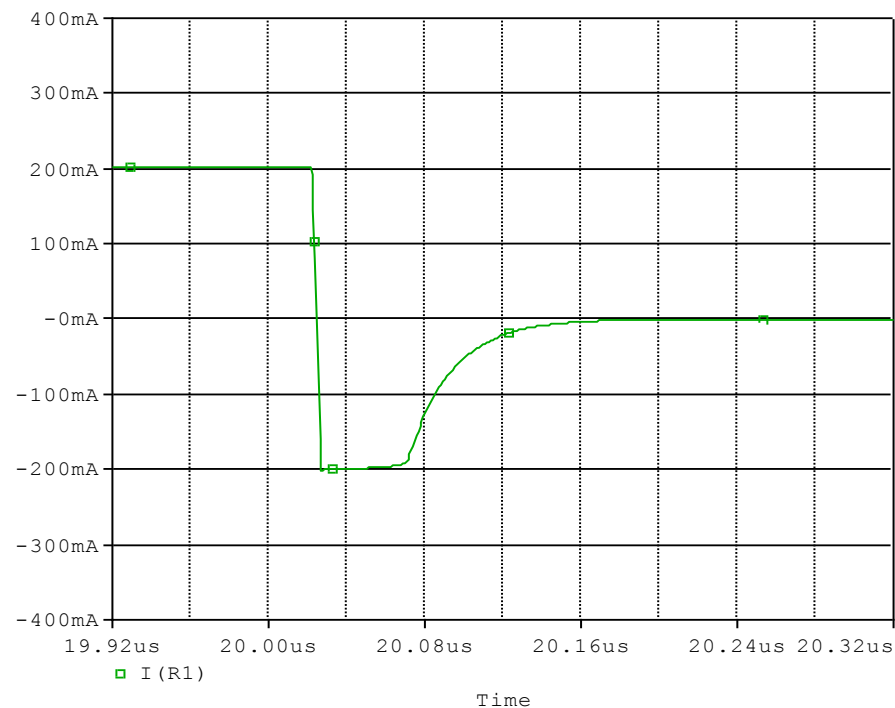


Simulation Result

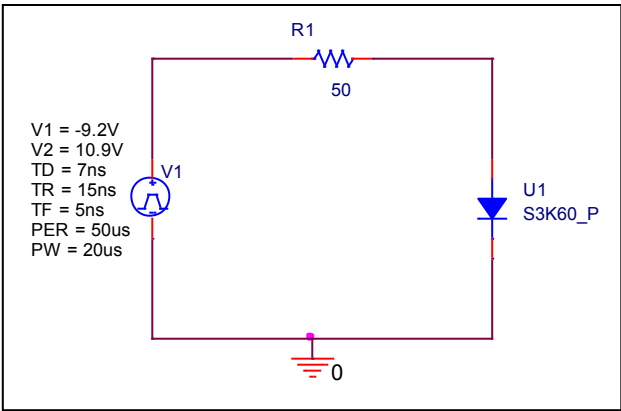
Vrev (V)	Cj (pF)		%Error
	Measurement	Simulation	
1	72.500	73.051	0.76
2	60.000	59.750	-0.42
5	43.400	44.307	2.09
10	34.200	34.786	1.71
20	26.700	27.156	1.71
50	18.900	19.520	3.28
100	15.600	15.177	-2.71

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

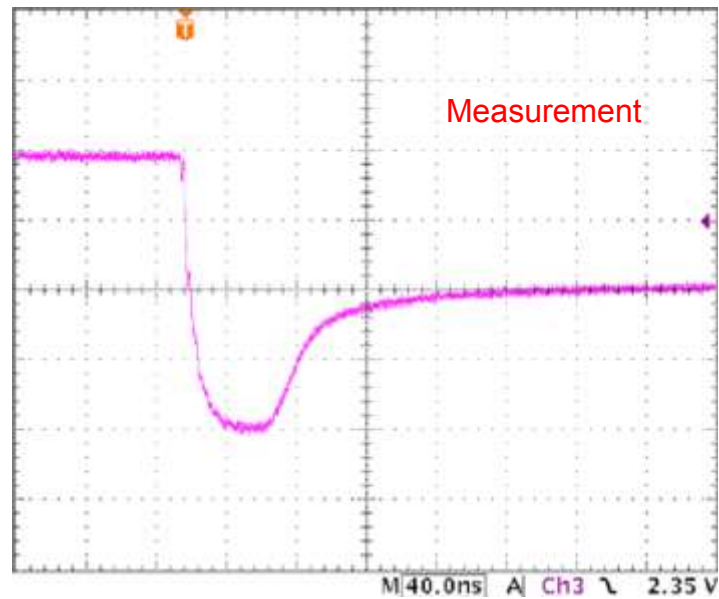


Compare Measurement vs. Simulation

		Measurement	Simulation	%Error
Trj	ns	29.60	28.48	-3.78
Trb	ns	68.80	68.77	-0.04
Trr	ns	98.40	97.25	-1.16

Reverse Recovery Characteristic

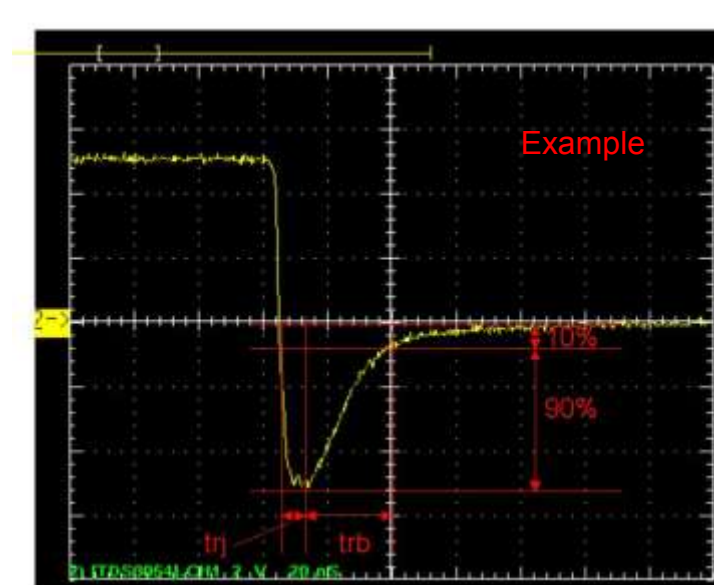
Reference



$T_{rj} = 29.60(\text{ns})$

$T_{rb} = 68.80(\text{ns})$

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



Relation between t_{rj} and t_{rb}