

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL
PART NUMBER: SF10LC40
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Bee Technologies Inc.

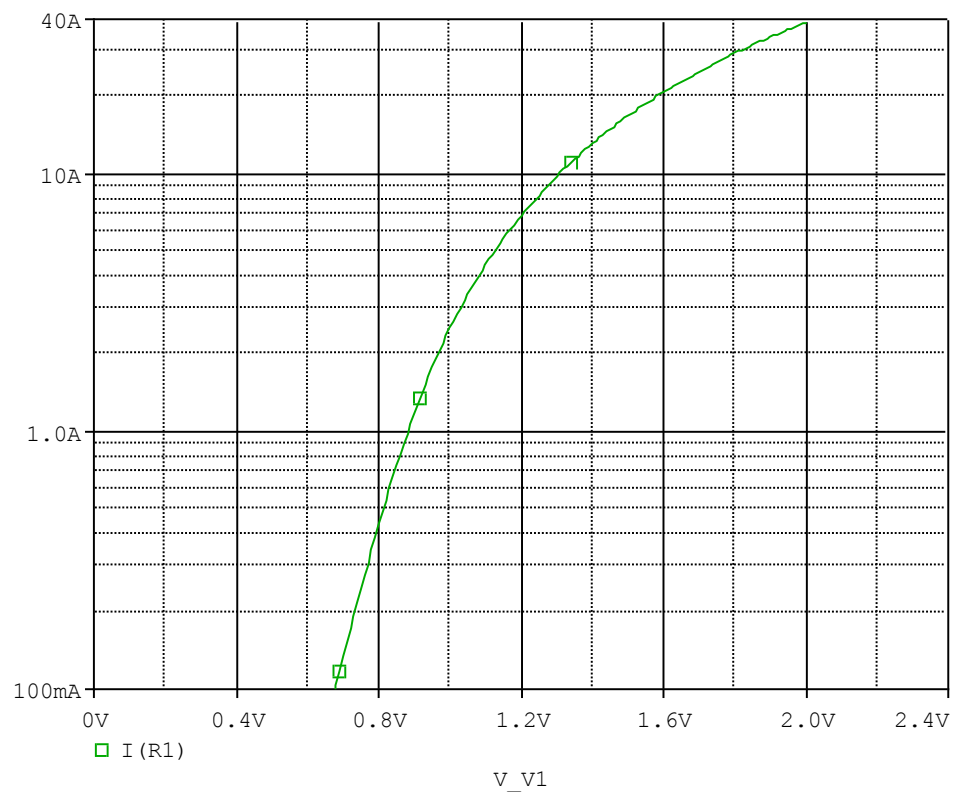
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DIODE MODEL PARAMETERS

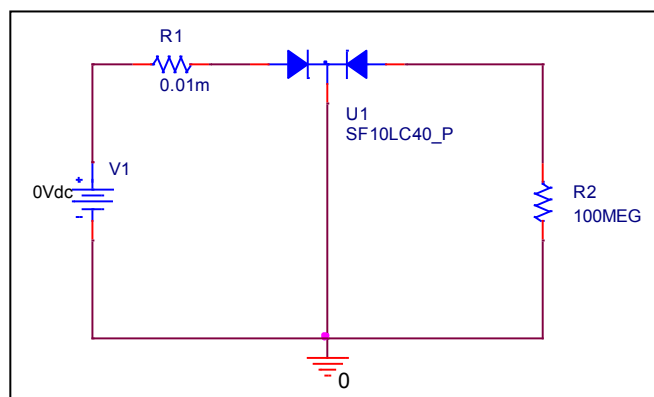
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

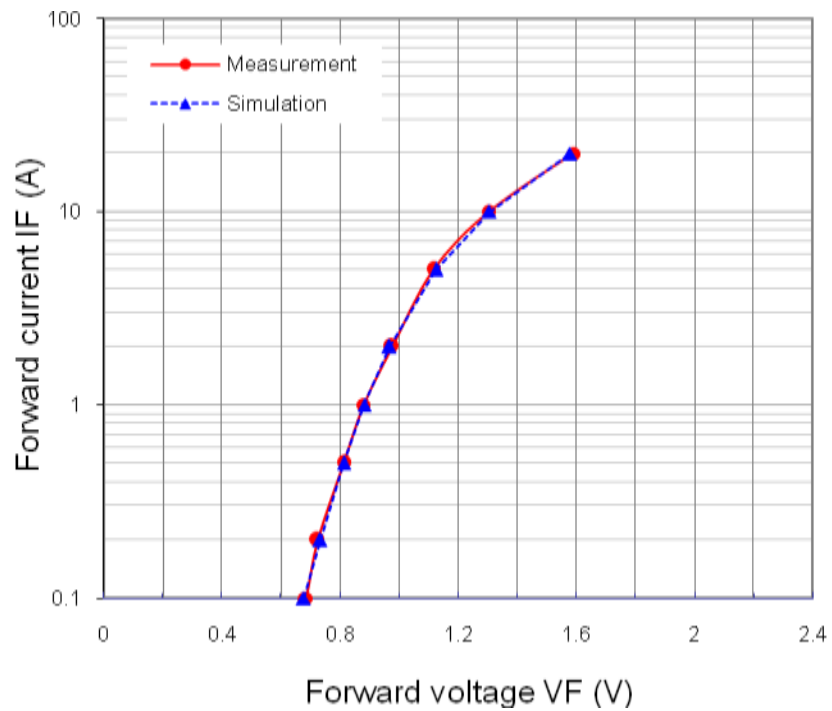


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

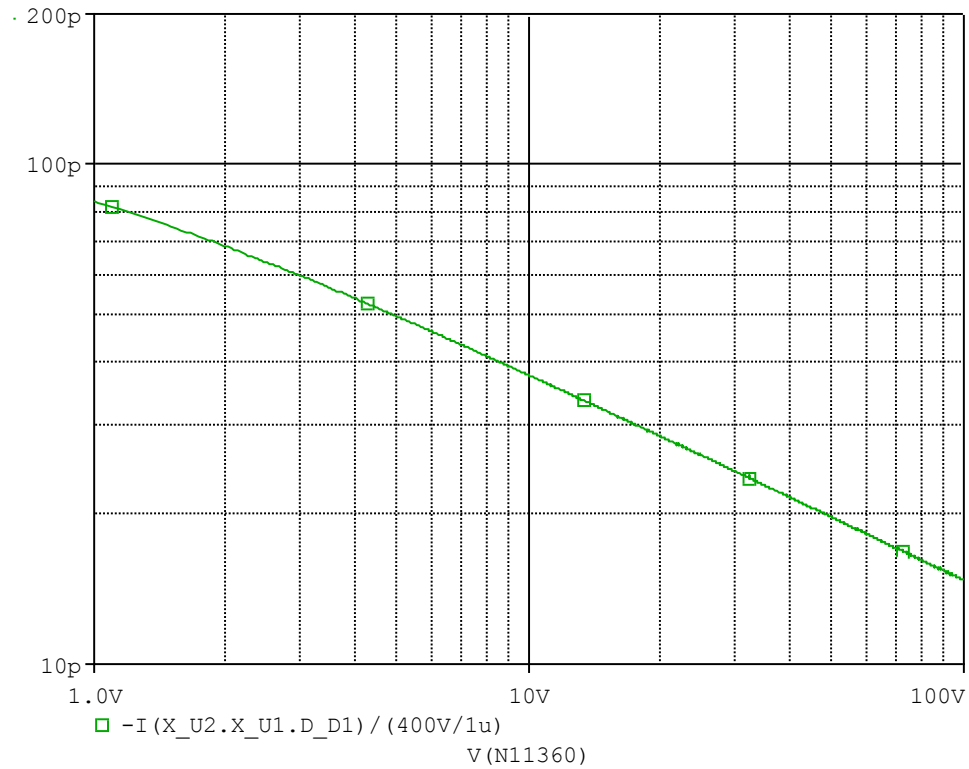


Simulation Result

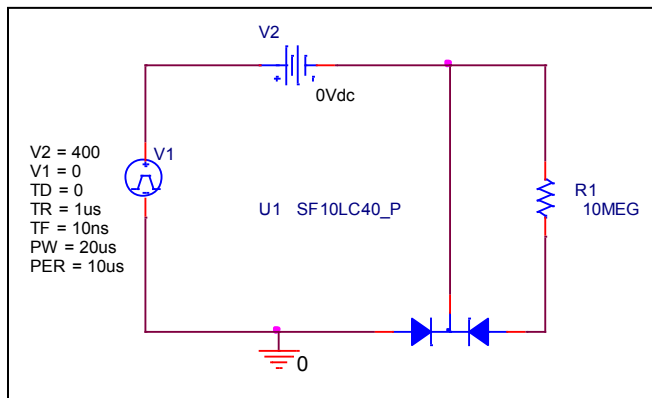
Ifwd (A)	Vfwd (V)		%Error
	Measurement	Simulation	
0.1	0.685	0.676	-1.31
0.2	0.724	0.732	1.10
0.5	0.812	0.812	0.00
1	0.879	0.881	0.23
2	0.976	0.966	-1.02
5	1.117	1.124	0.63
10	1.302	1.306	0.31
20	1.589	1.579	-0.63

Capacitance Characteristic

Circuit Simulation Result

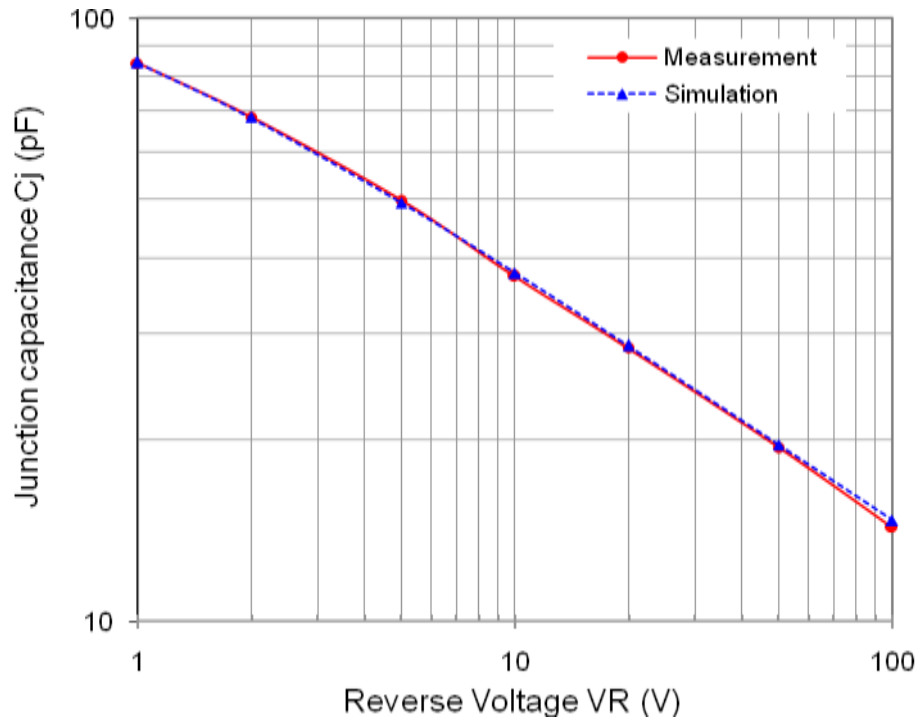


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

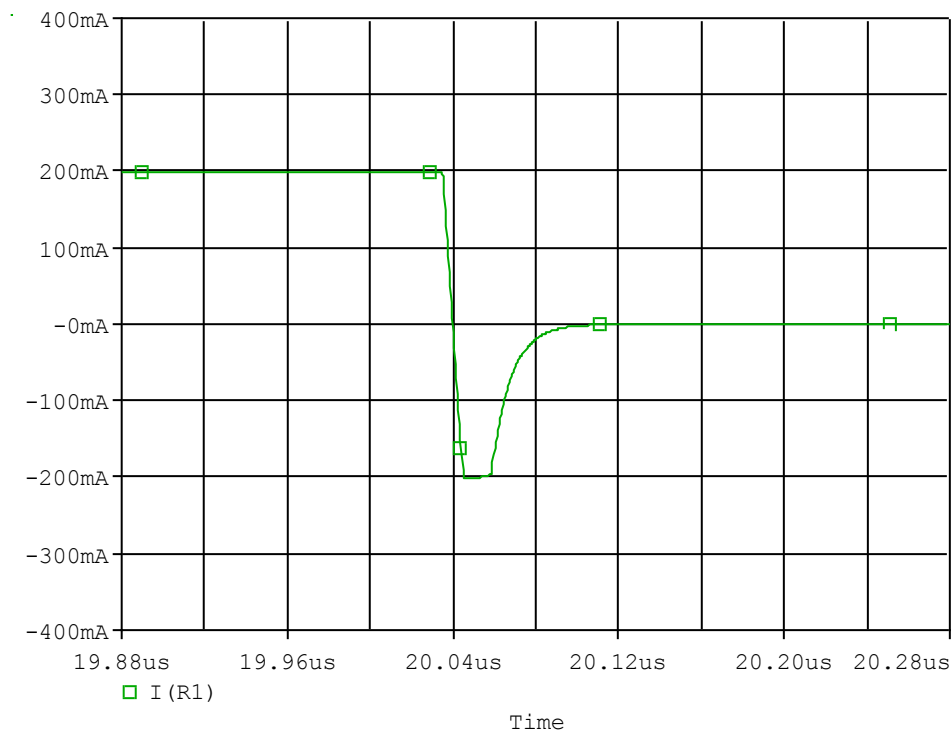


Simulation Result

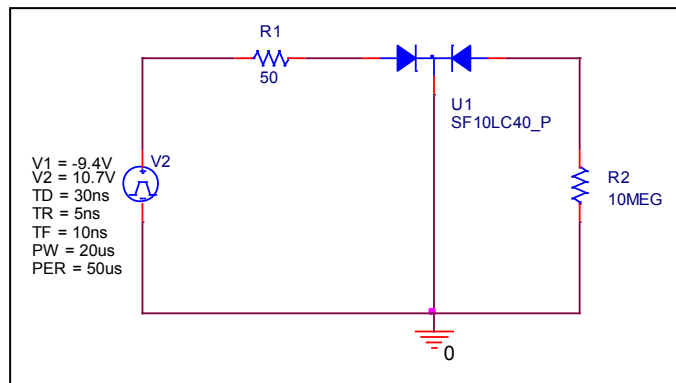
Vrev (V)	Cj (pF)		%Error
	Measurement	Simulation	
1	84.231	84.693	0.55
2	68.537	68.614	0.11
5	49.954	49.647	-0.61
10	37.314	37.97	1.76
20	28.411	28.588	0.62
50	19.421	19.534	0.58
100	14.327	14.712	2.69

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

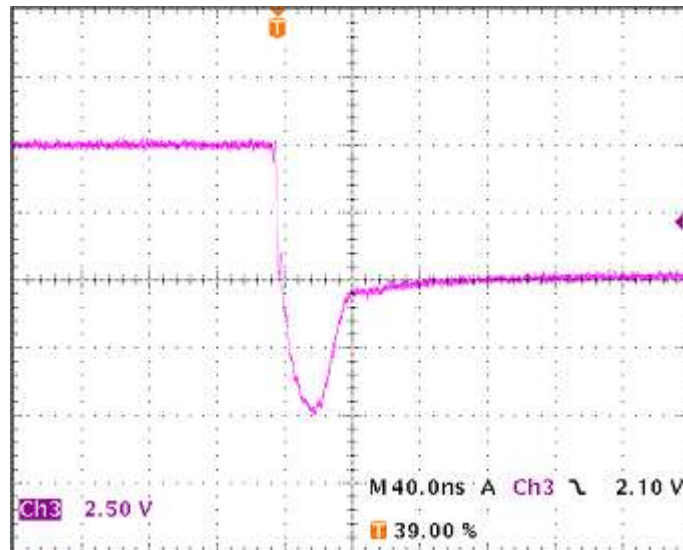


Compare Measurement vs. Simulation

		Measurement	Simulation	%Error
trj	ns	18.00	17.94	-0.33
trb	ns	22.40	22.20	-0.89
trr	ns	40.40	40.14	-0.64

Reverse Recovery Characteristic

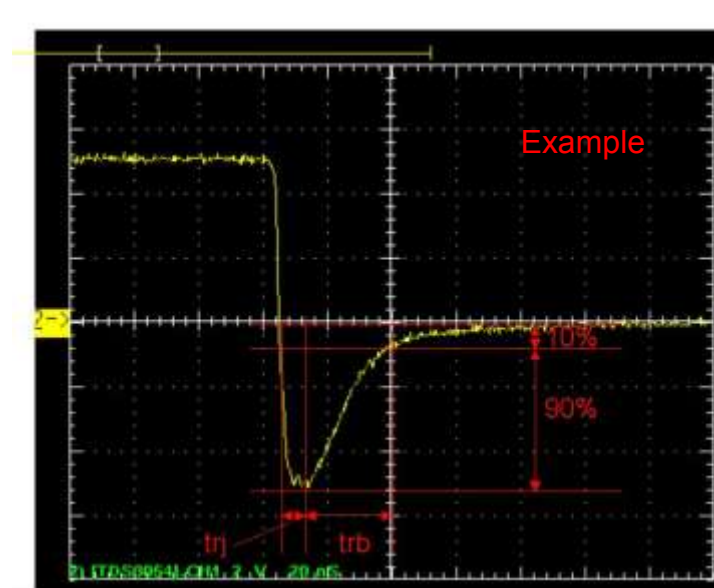
Reference



$T_{rj} = 18.00(\text{ns})$

$T_{rb} = 22.4(\text{ns})$

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



Relation between t_{rj} and t_{rb}