

# Device Modeling Report

COMPONENTS:  
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL  
PART NUMBER: 1SS272  
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**Bee Technologies Inc.**

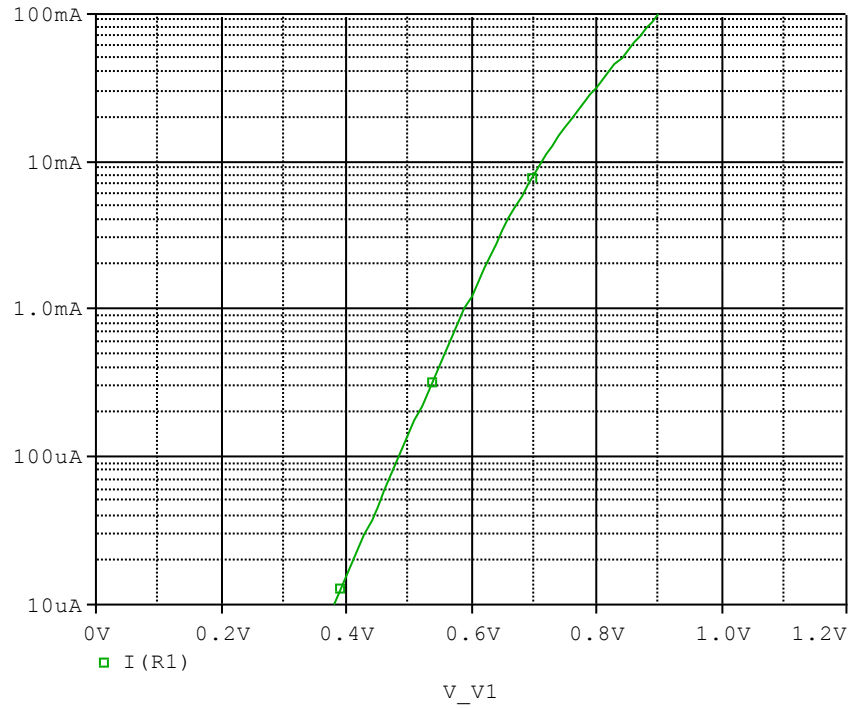
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## DIODE MODEL PARAMETERS

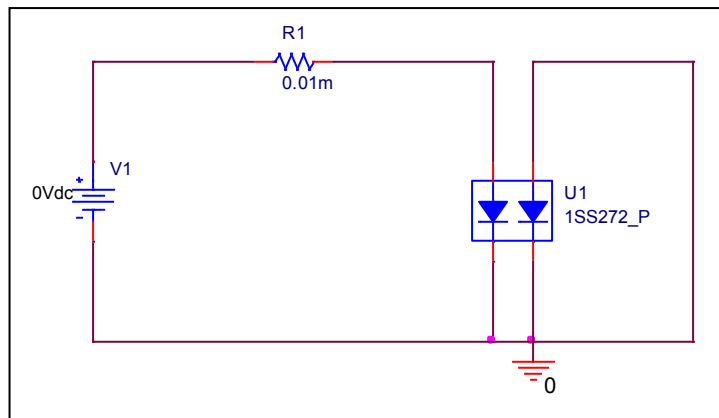
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

# Forward Current Characteristic

## Circuit Simulation Result

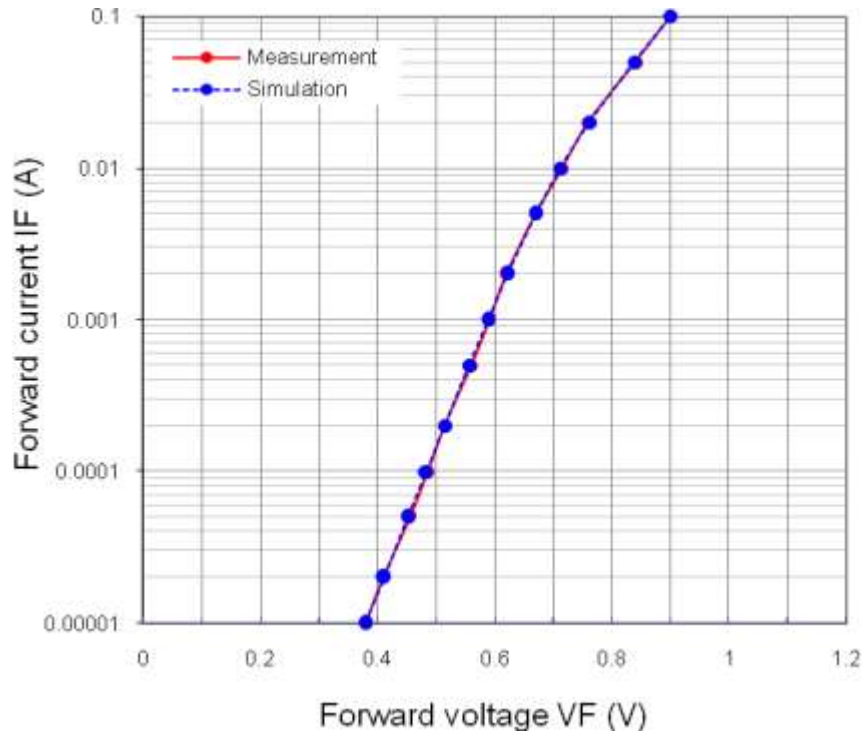


## Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

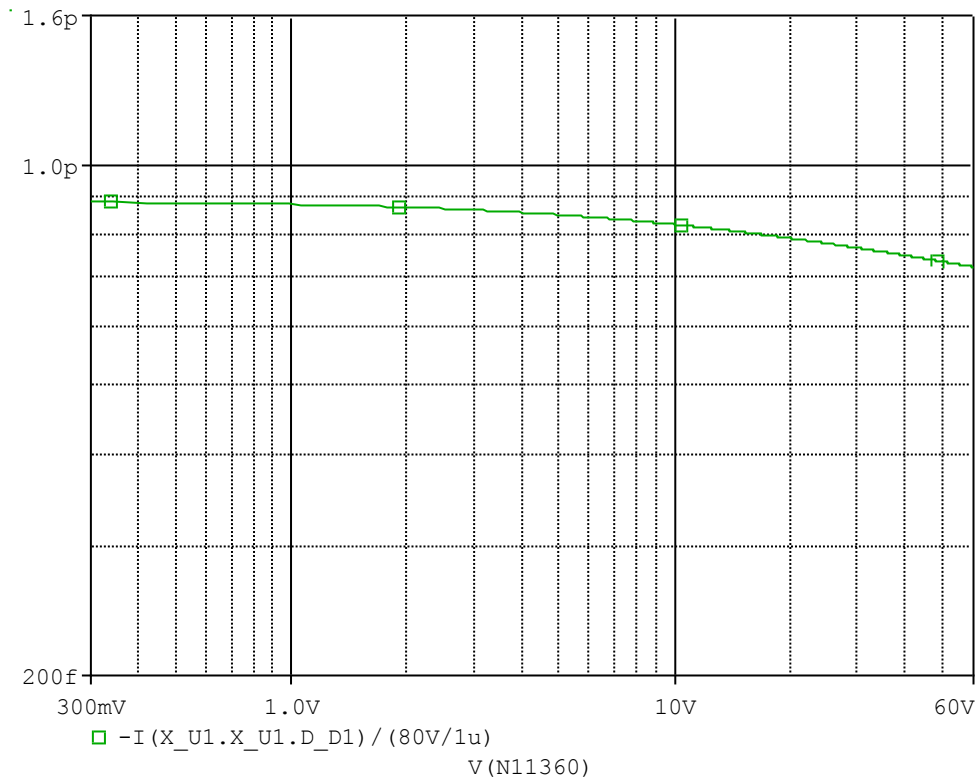


### Simulation Result

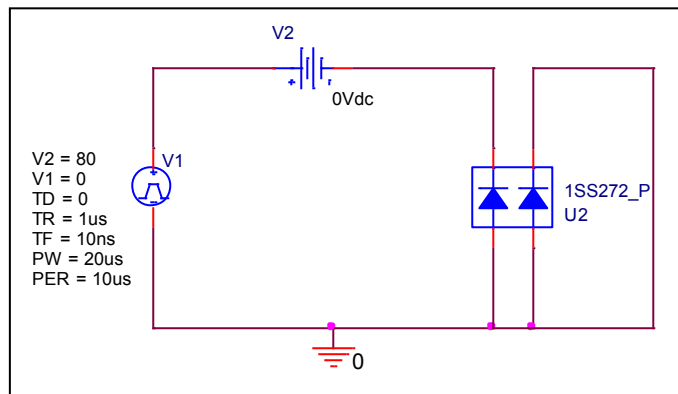
Ifwd (A)	Vfwd (V)		%Error
	Measurement	Simulation	
0.00001	0.380	0.381	0.15
0.00002	0.410	0.412	0.39
0.00005	0.455	0.453	-0.50
0.0001	0.485	0.484	-0.22
0.0002	0.515	0.515	0.00
0.0005	0.560	0.557	-0.54
0.001	0.590	0.589	-0.17
0.002	0.620	0.623	0.46
0.005	0.670	0.671	0.14
0.01	0.715	0.713	-0.33
0.02	0.760	0.762	0.26
0.05	0.840	0.838	-0.24
0.1	0.900	0.900	0.00

# Capacitance Characteristic

## Circuit Simulation Result

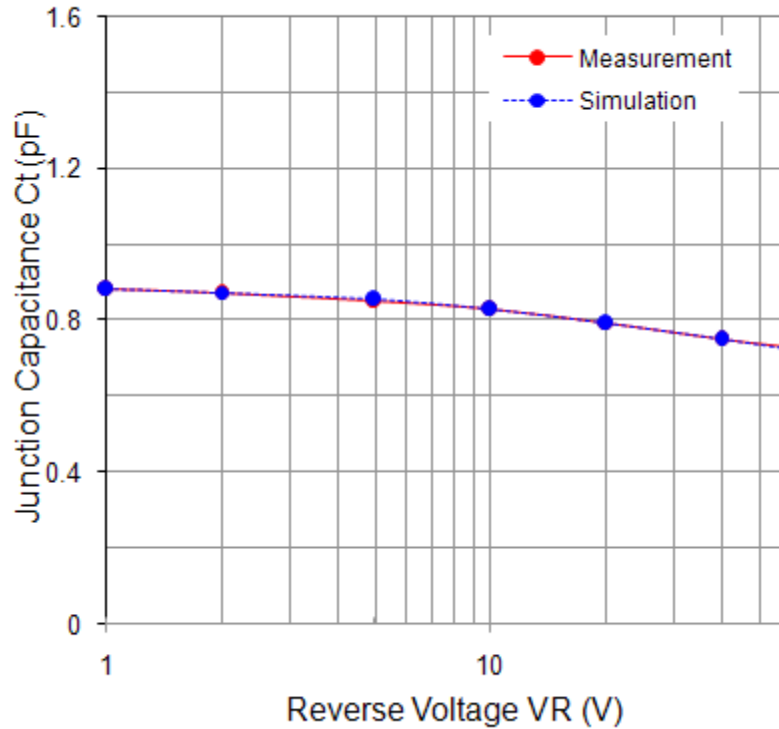


## Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

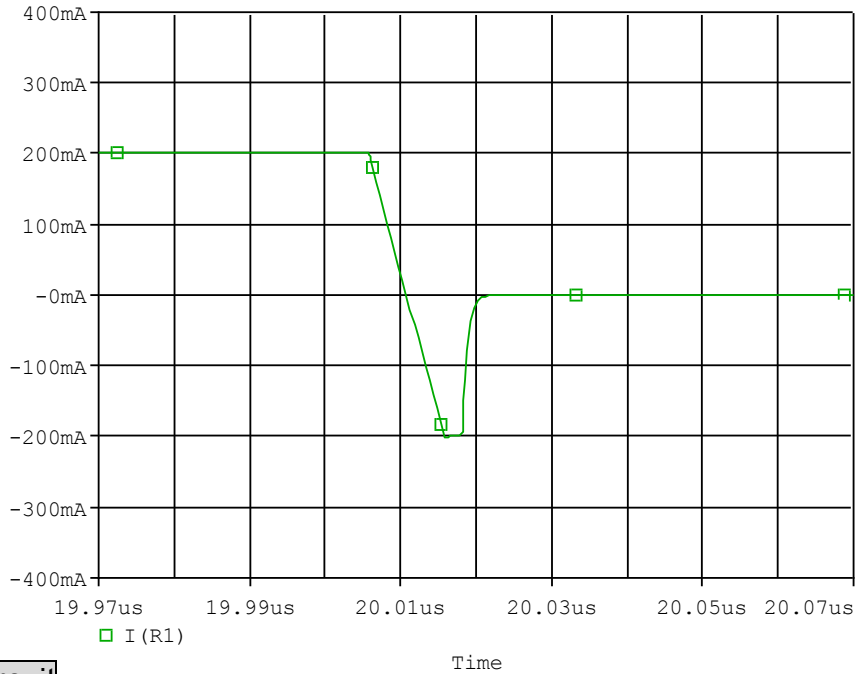


### Simulation Result

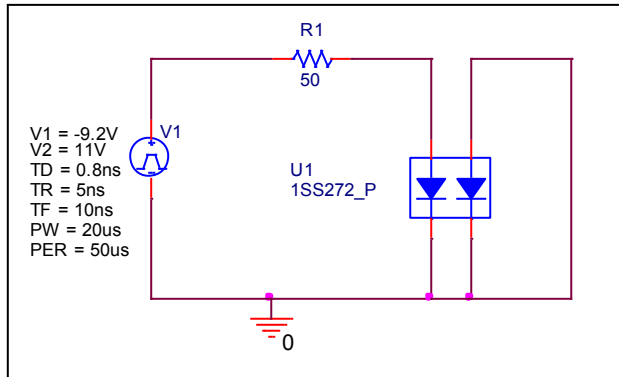
Vrev (V)	Ct (pF)		%Error
	Measurement	Simulation	
0.200	0.889	0.890	0.08
0.500	0.885	0.887	0.22
1.000	0.882	0.883	0.06
2.000	0.870	0.874	0.46
5.000	0.850	0.854	0.45
10.000	0.830	0.828	-0.24
20.000	0.795	0.793	-0.25
40.000	0.750	0.751	0.13
60.000	0.730	0.724	-0.82

# Reverse Recovery Characteristic

## Circuit Simulation Result



## Evaluation Circuit

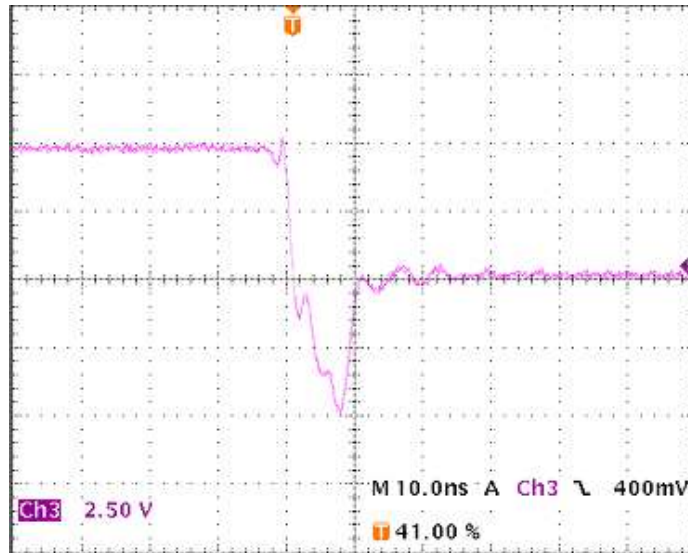


## Compare Measurement vs. Simulation

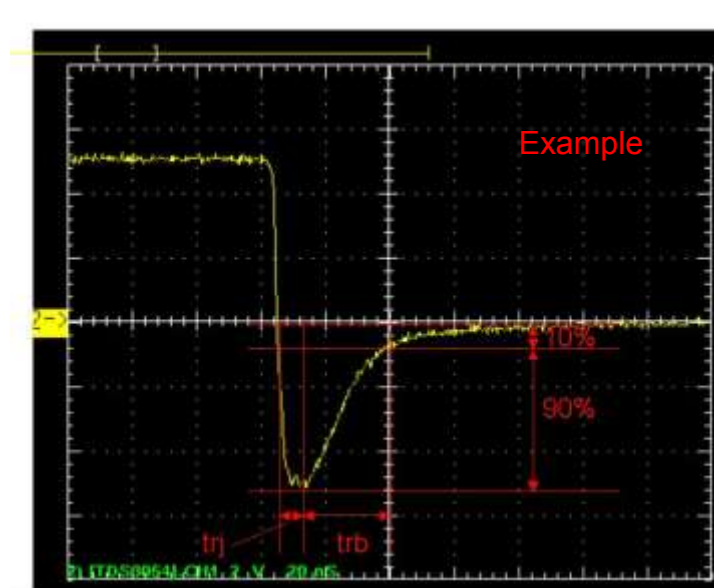
		Measurement	Simulation	%Error
<b>Trj</b>	<b>ns</b>	<b>6.800</b>	<b>6.540</b>	<b>-3.82</b>
<b>Trb</b>	<b>ns</b>	<b>2.200</b>	<b>2.128</b>	<b>-3.28</b>
<b>Trr</b>	<b>ns</b>	<b>9.000</b>	<b>8.668</b>	<b>-3.69</b>

# Reverse Recovery Characteristic

# Reference



$T_{rj} = 6.80(\text{ns})$   
 $T_{rb} = 2.20(\text{ns})$   
Conditions:  $I_{fwd} = 0.2\text{A}$ ,  $I_{rev} = 0.2\text{A}$ ,  $R_I = 50$



Relation between  $t_{rj}$  and  $t_{rb}$