

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / STANDARD
PART NUMBER: 1SR156-400
MANUFACTURER: ROHM
REMARK: TC=150 C

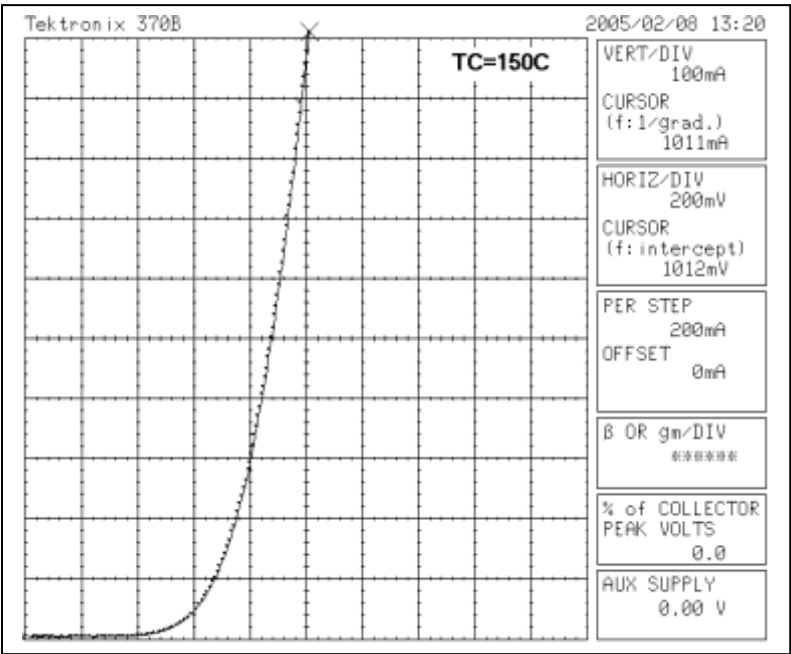


Bee Technologies Inc.

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

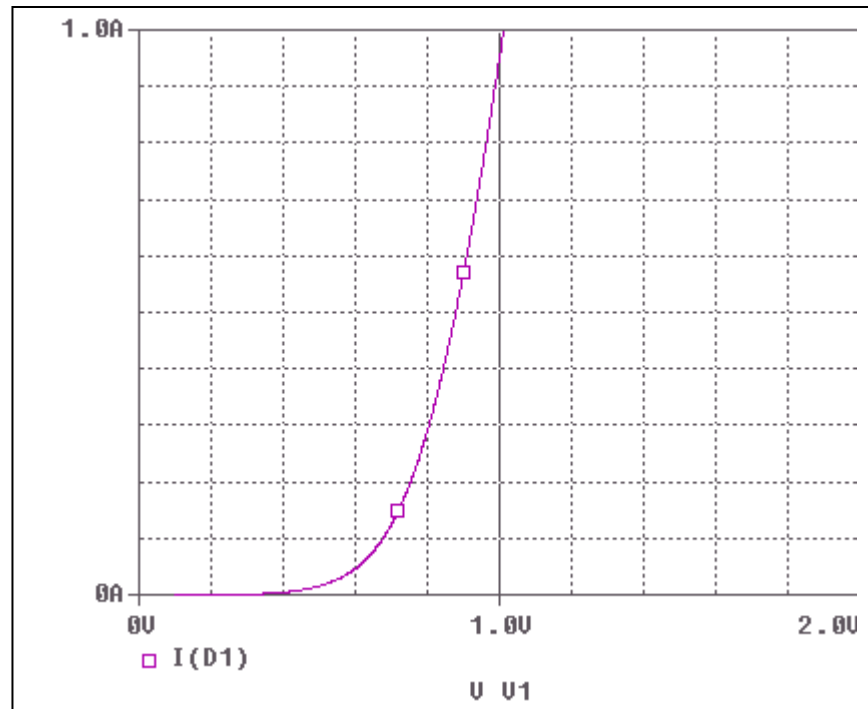
Forward Current Characteristic

Reference

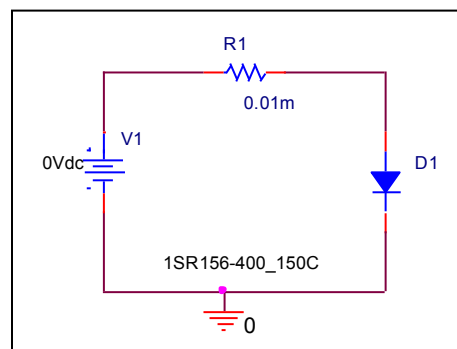


Forward Current Characteristic

Circuit Simulation Result

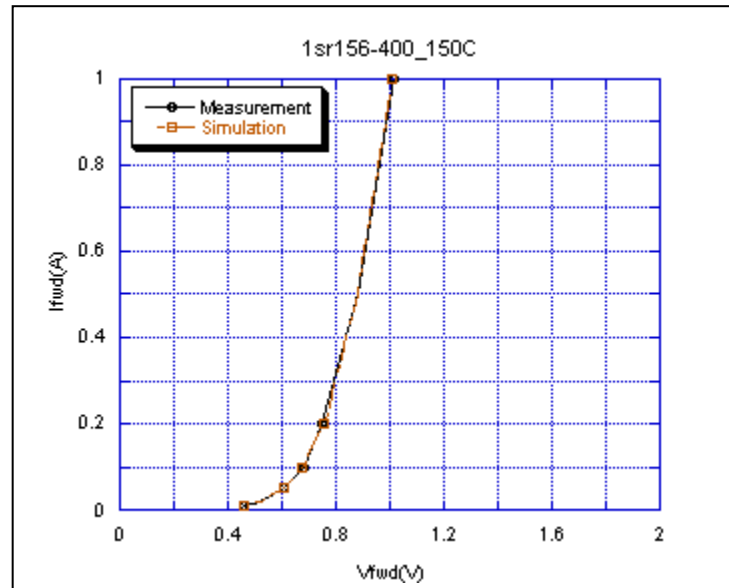


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

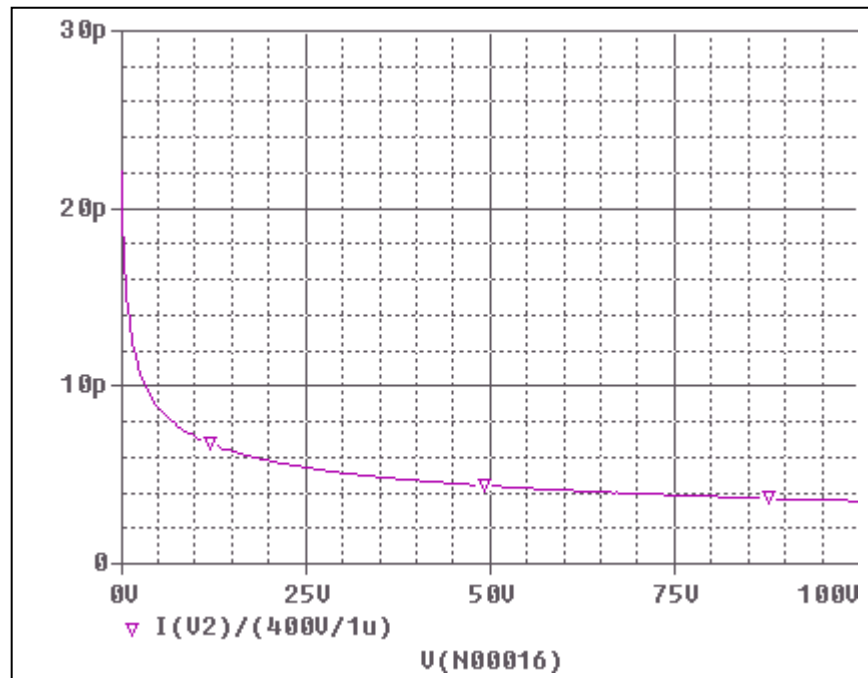


Simulation Result

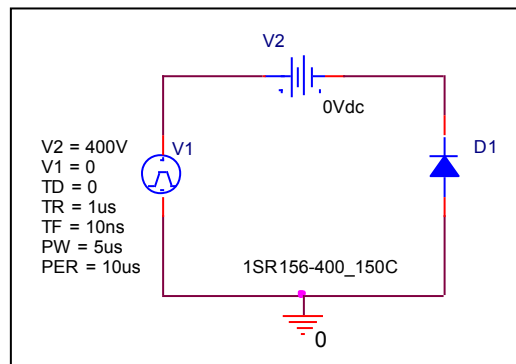
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.462	0.462	0.00
0.02	0.520	0.522	-0.38
0.05	0.610	0.607	0.49
0.1	0.678	0.676	0.29
0.2	0.752	0.753	-0.13
0.5	0.878	0.878	0.00
1	1.012	1.011	0.10

Capacitance Characteristic

Circuit Simulation Result

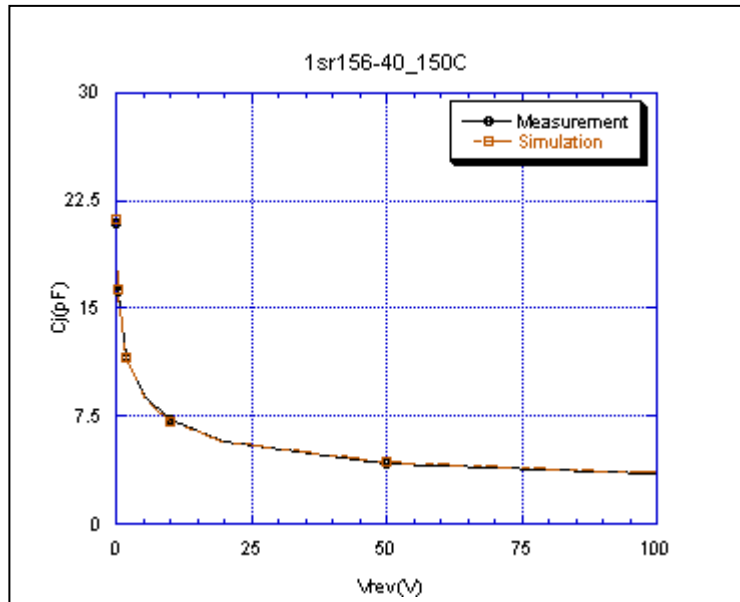


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

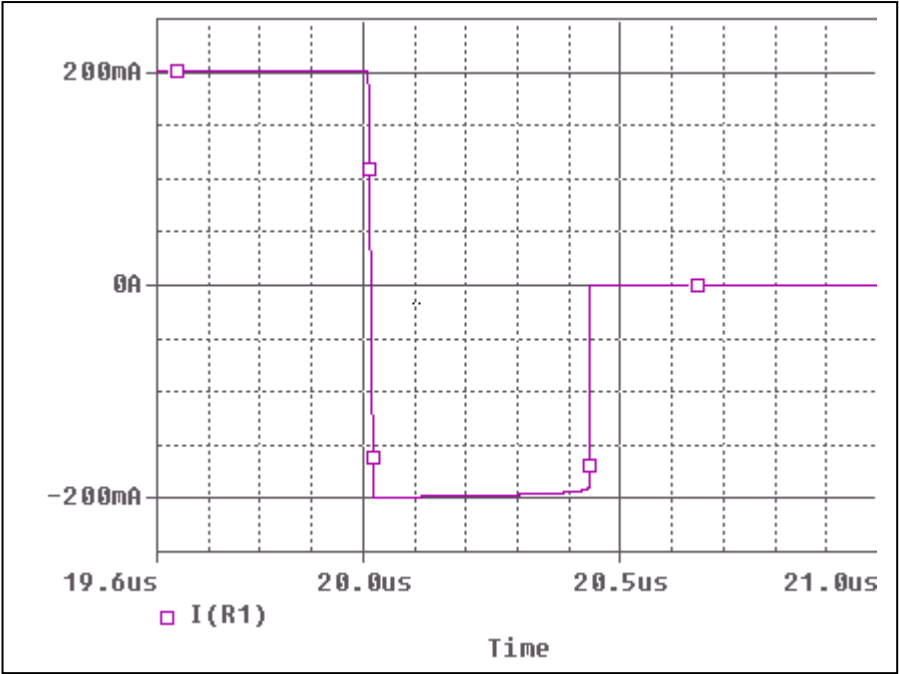


Simulation Result

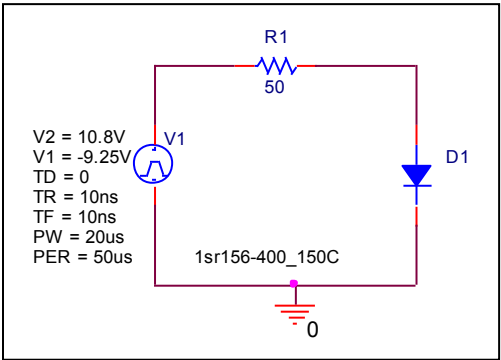
V_{rev} (V)	C_j (pF) Measurement	C_j (pF) Simulation	%Error
0	23.423	23.423	0.00
0.1	20.911	21.130	-1.05
0.2	19.117	19.270	-0.80
0.5	16.109	16.344	-1.46
1	13.865	13.868	-0.02
2	11.618	11.526	0.79
5	8.977	8.865	1.25
10	7.242	7.171	0.98
20	5.774	5.799	-0.43
50	4.246	4.370	-2.92
100	3.407	3.500	-2.73

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

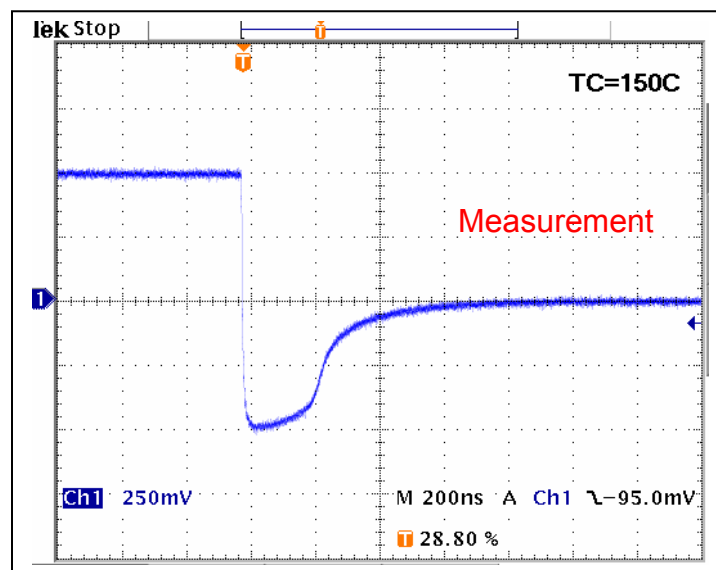


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trr	424	ns	424	ns	0.00

Reverse Recovery Characteristic

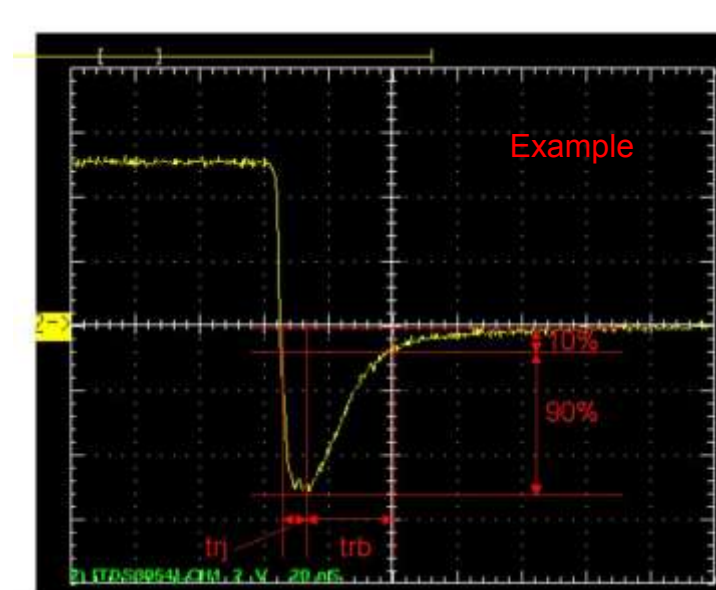
Reference



$T_{rj} = 80(\text{ns})$

$T_{rb} = 344(\text{ns})$

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



Relation between t_{rj} and t_{rb}