

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / STANDARD
PART NUMBER: 1SR153-400
MANUFACTURER: ROHM
REMARK: TC=80C

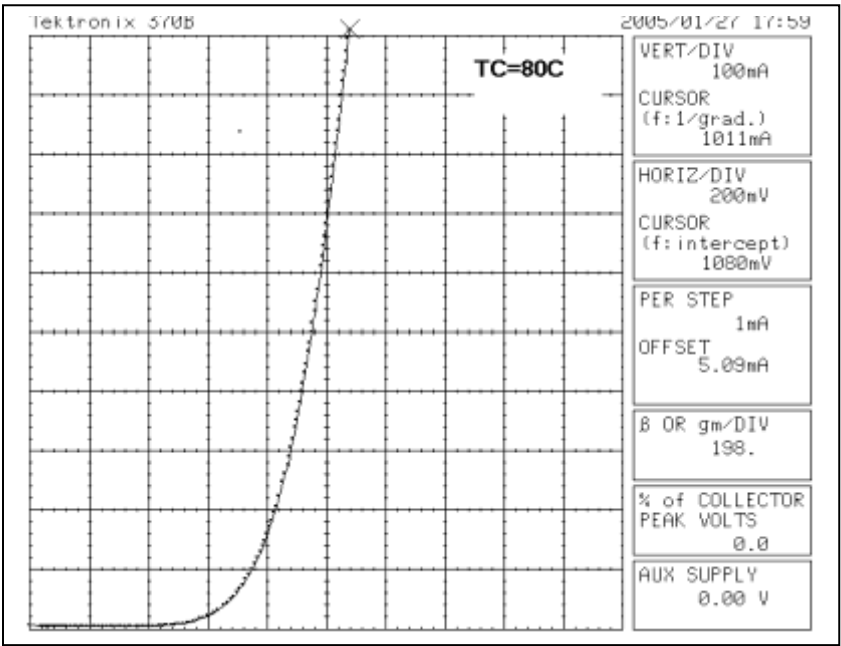


Bee Technologies Inc.

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

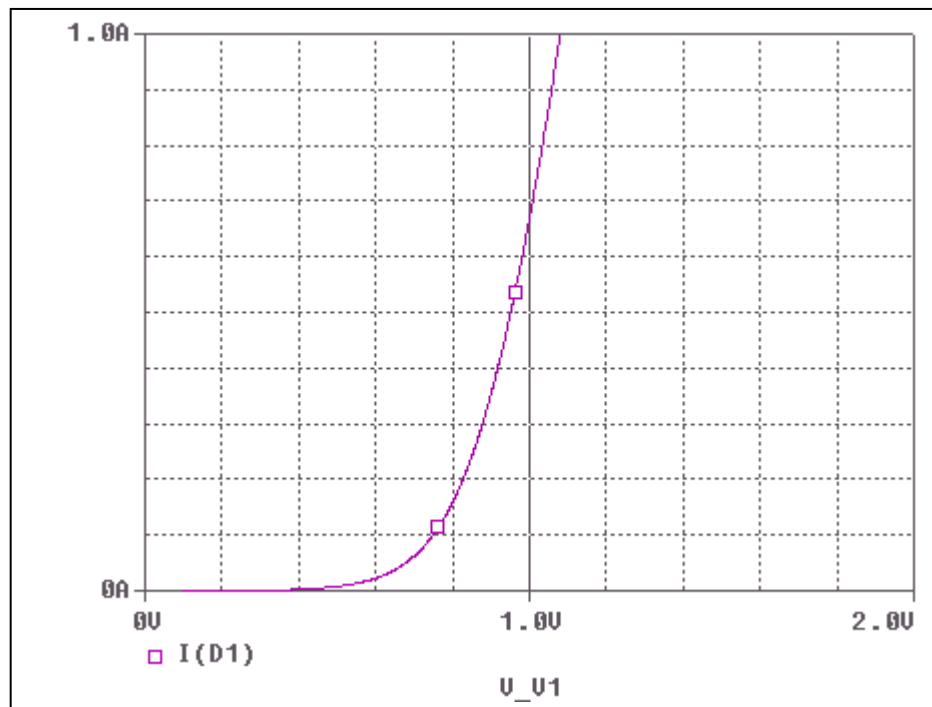
Forward Current Characteristic

Reference

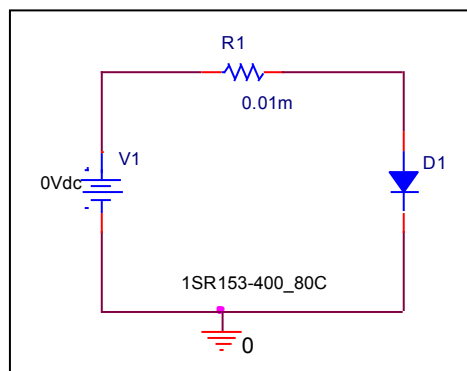


Forward Current Characteristic

Circuit Simulation Result

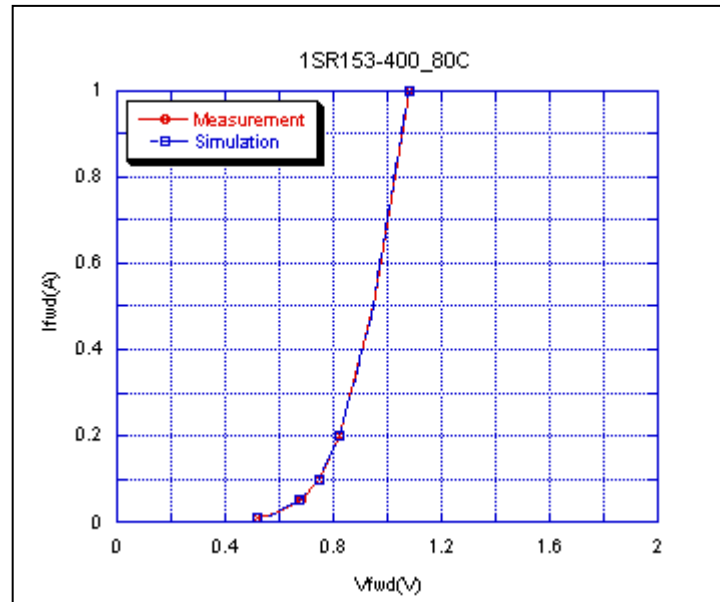


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

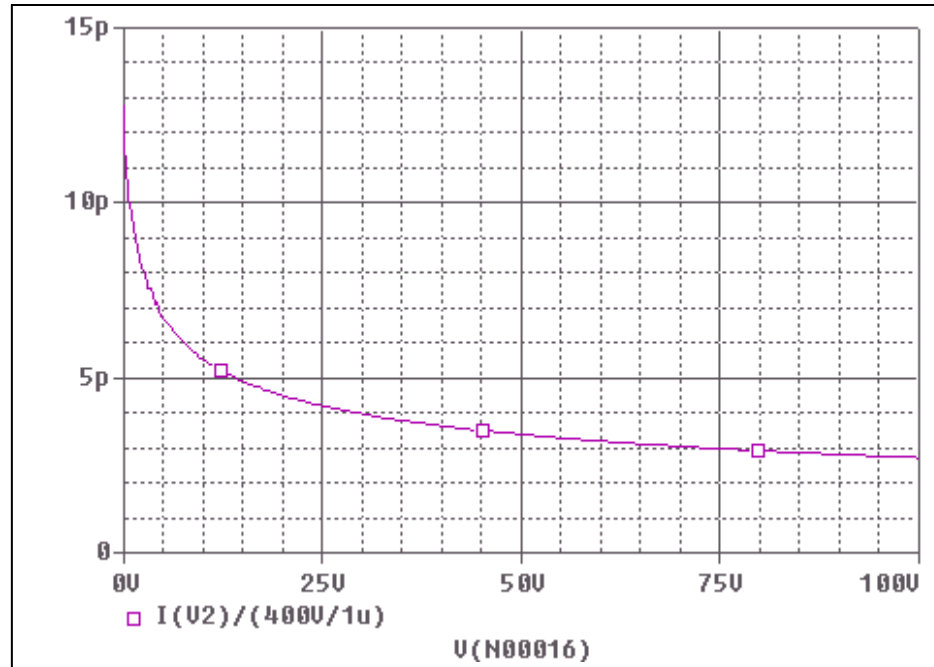


Simulation Result

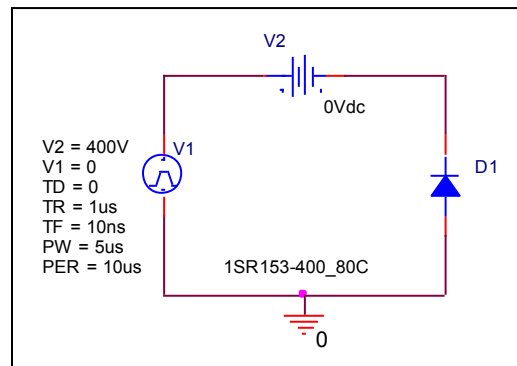
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.522	0.522	0.00
0.02	0.588	0.588	0.00
0.05	0.680	0.677	0.44
0.1	0.750	0.749	0.13
0.2	0.824	0.826	-0.24
0.5	0.952	0.951	0.11
1	1.080	1.081	-0.09

Capacitance Characteristic

Circuit Simulation Result

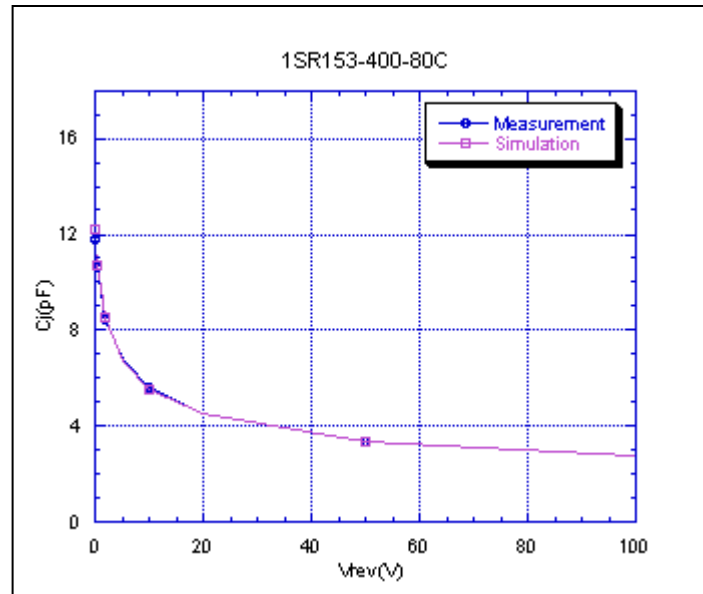


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

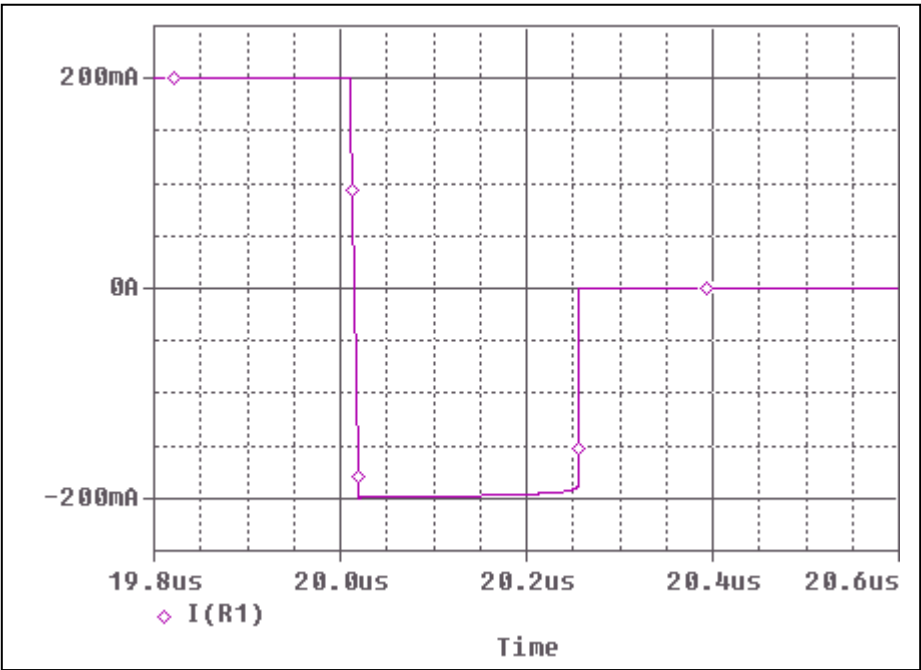


Simulation Result

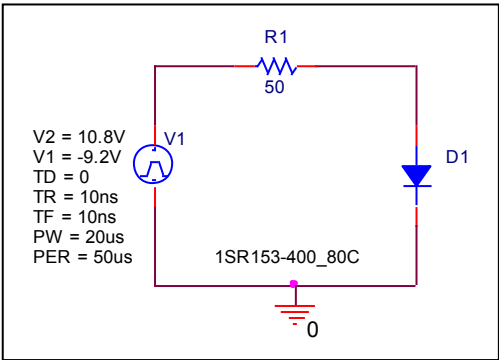
Vrev(V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0	12.316	12.316	0.00
0.1	11.822	12.200	-3.20
0.2	11.511	11.507	0.03
0.5	10.644	10.695	-0.48
1	9.663	9.760	-1.00
2	8.467	8.512	-0.53
5	6.789	6.727	0.91
10	5.579	5.542	0.66
20	4.509	4.499	0.22
50	3.355	3.382	-0.80
100	2.681	2.714	-1.23

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

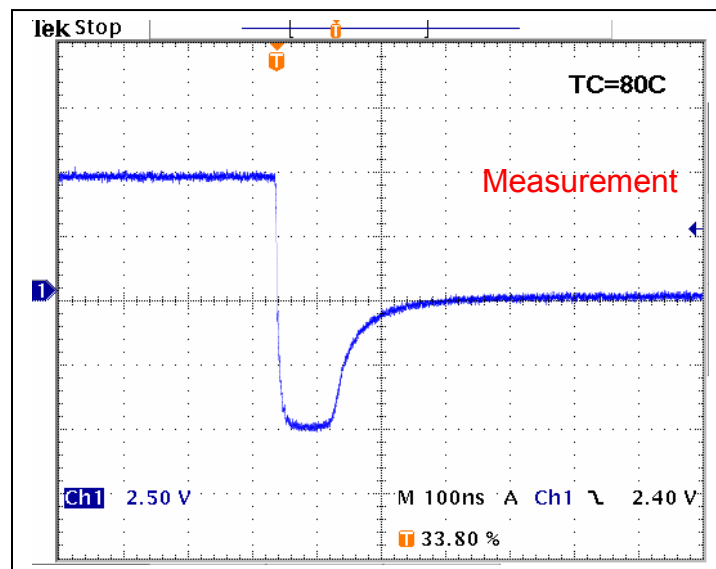


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trr	240.00	ns	240.49	ns	0.71

Reverse Recovery Characteristic

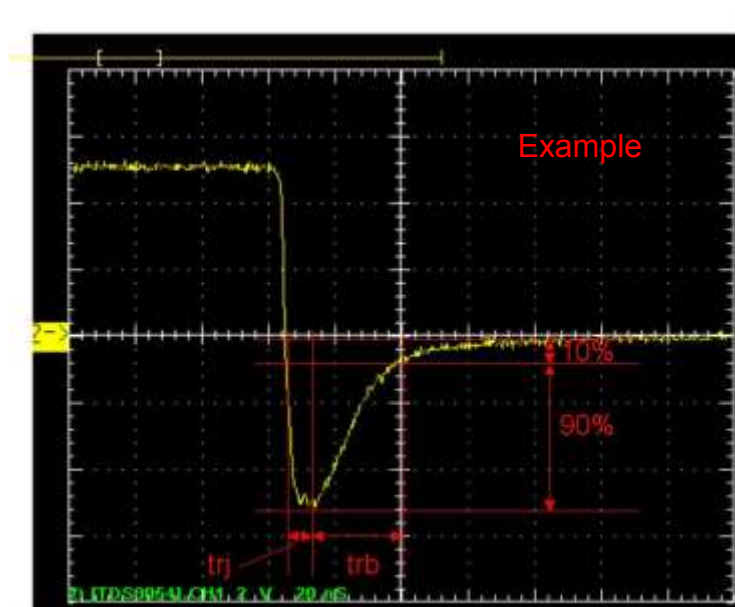
Reference



$T_{rj} = 78(\text{ns})$

$T_{rb} = 162(\text{ns})$

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



Relation between t_{rj} and t_{rb}