

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / PROFESSIONAL
PART NUMBER: 1SR159-200
MANUFACTURER: ROHM
REMARK: TC=25C

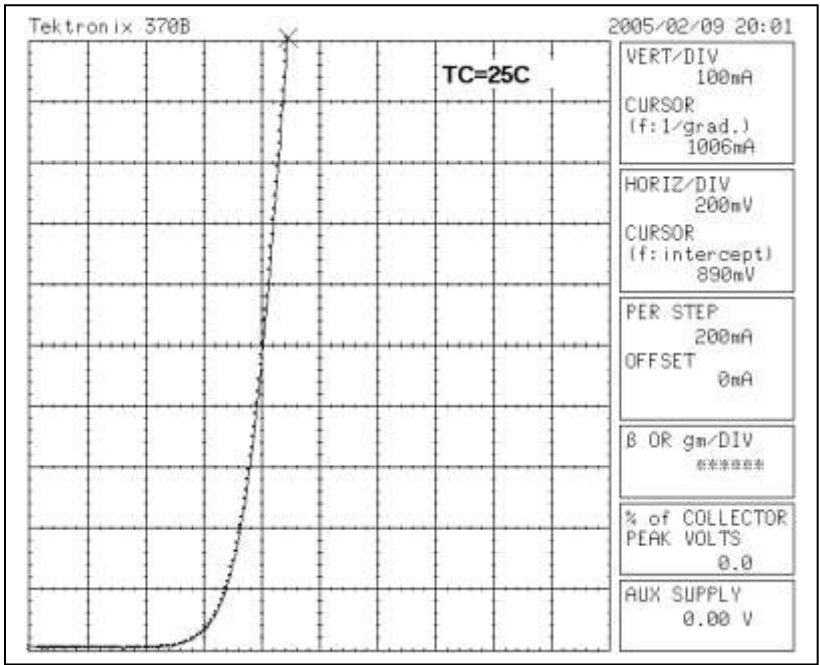


Bee Technologies Inc.

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

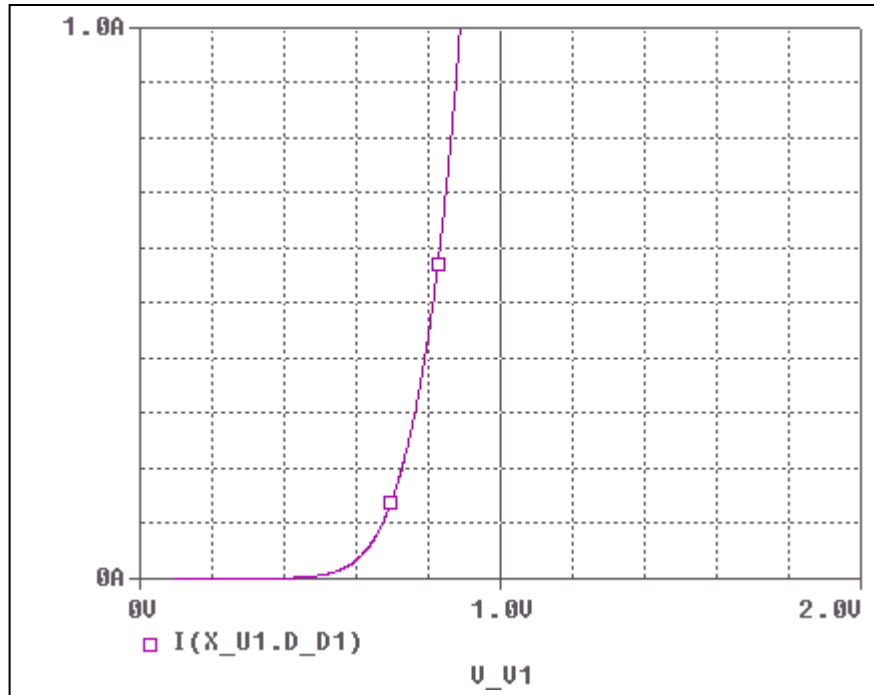
Forward Current Characteristic

Reference

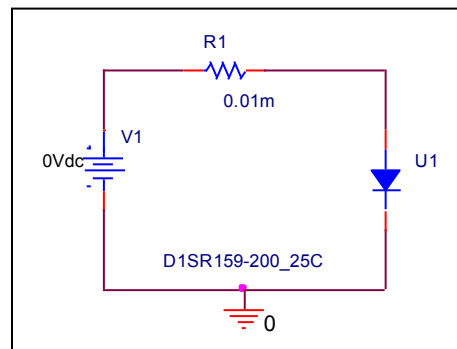


Forward Current Characteristic

Circuit Simulation Result

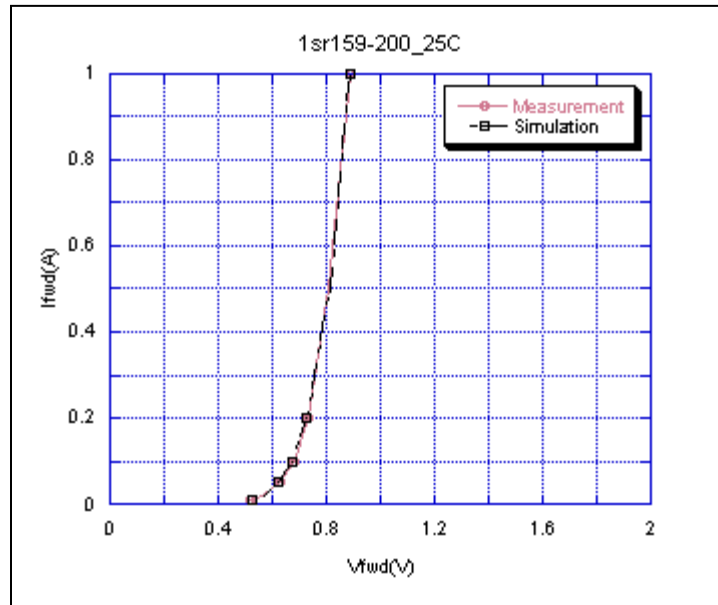


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

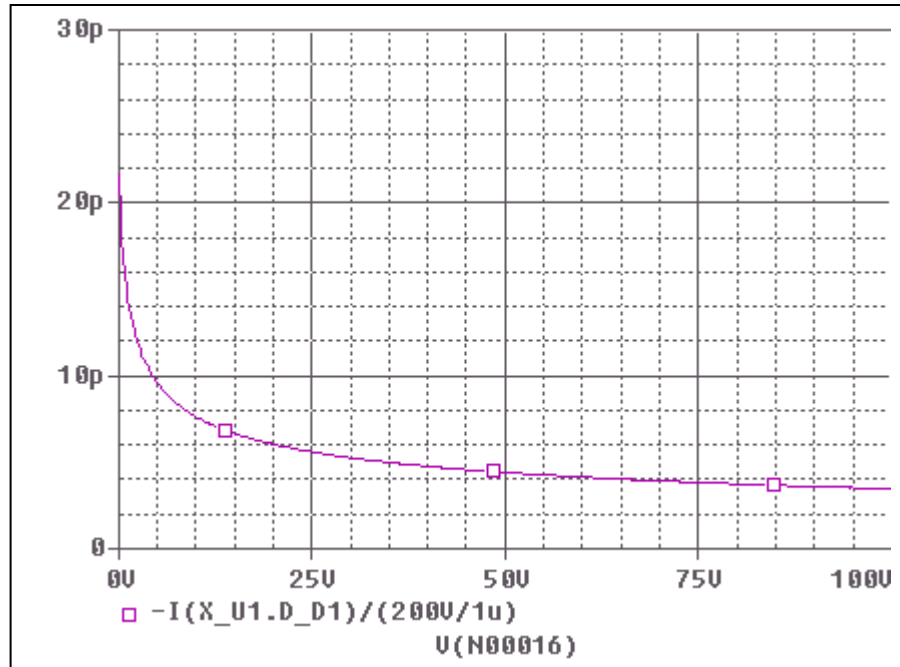


Simulation Result

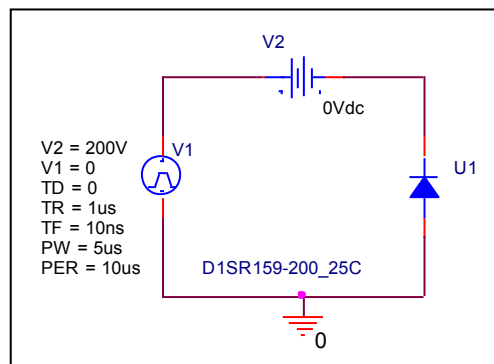
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.520	0.527	-1.35
0.02	0.566	0.568	-0.35
0.05	0.628	0.625	0.48
0.1	0.678	0.672	0.88
0.2	0.730	0.724	0.82
0.5	0.806	0.812	-0.74
1	0.890	0.888	0.22

Capacitance Characteristic

Circuit Simulation Result

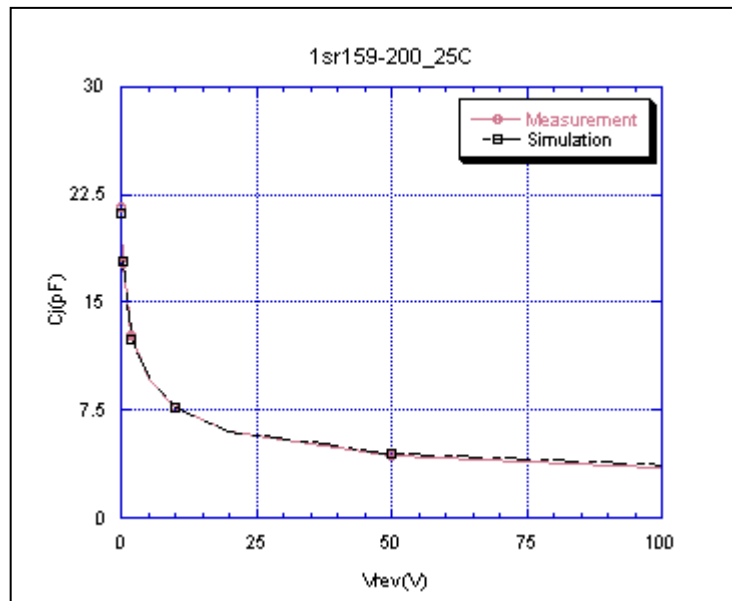


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

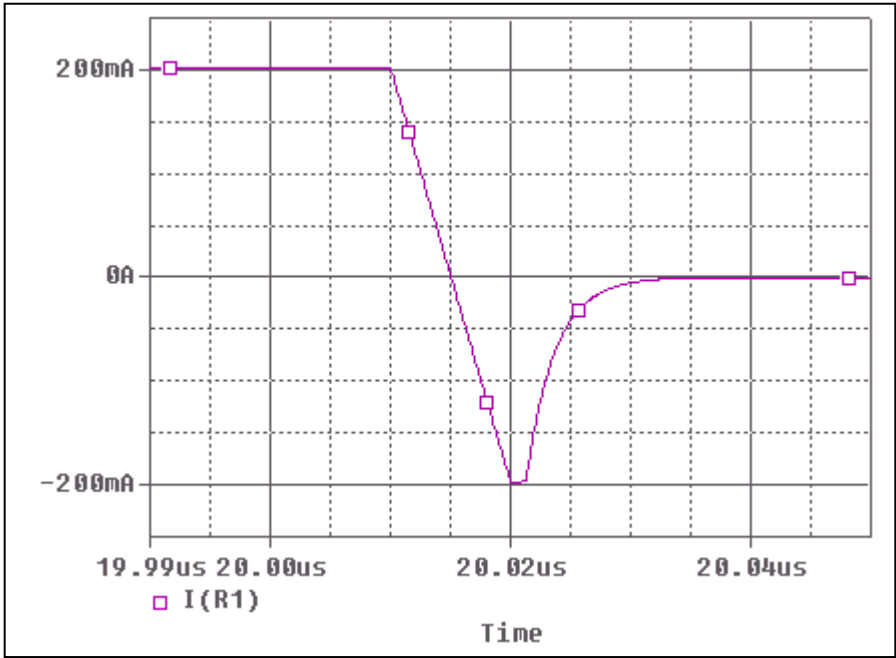


Simulation Result

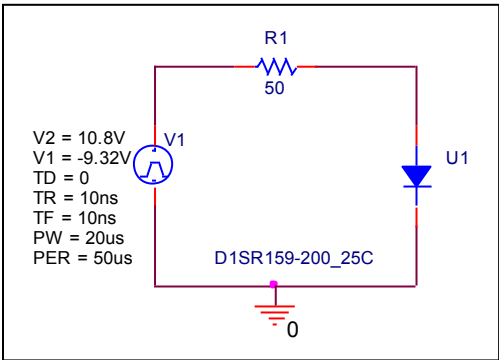
$V_{\text{rev}}(\text{V})$	$C_j(\text{pF})$ Measurement	$C_j(\text{pF})$ Simulation	%Error
0	23.185	23.185	0.00
0.1	21.588	21.146	2.05
0.2	20.365	20.350	0.07
0.5	17.681	17.782	-0.57
1	15.275	15.287	-0.08
2	12.705	12.374	2.61
5	9.674	9.607	0.69
10	7.672	7.651	0.27
20	6.033	6.038	-0.08
50	4.362	4.412	-1.15
100	3.428	3.462	-0.99

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

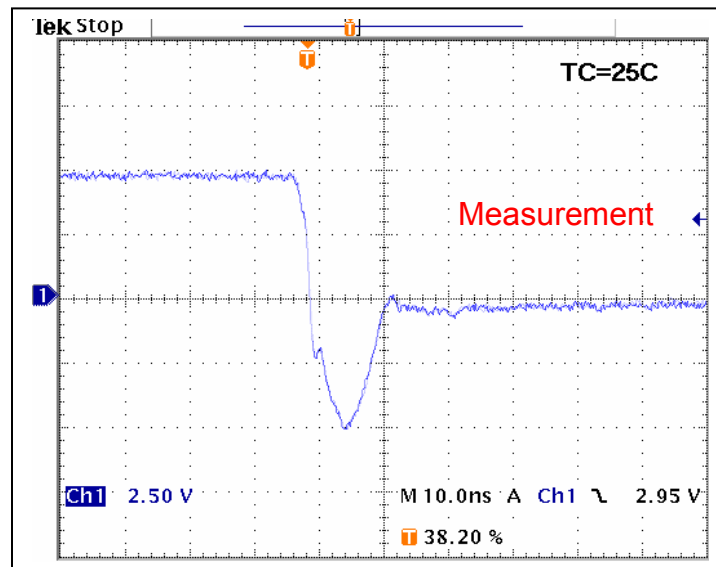


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trj	5.80	ns	5.78	ns	0.34
trb	5.40	ns	5.42	ns	0.37

Reverse Recovery Characteristic

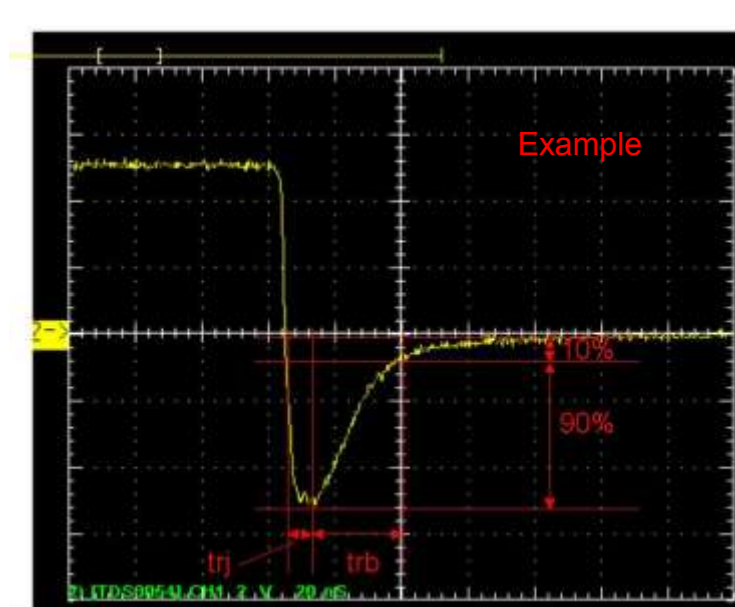
Reference



$T_{rj} = 5.80(\text{ns})$

$T_{rb} = 5.40(\text{ns})$

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



Relation between t_{rj} and t_{rb}