

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / STANDARD
PART NUMBER: 1SR159-200
MANUFACTURER: ROHM
REMARK: TC=150C

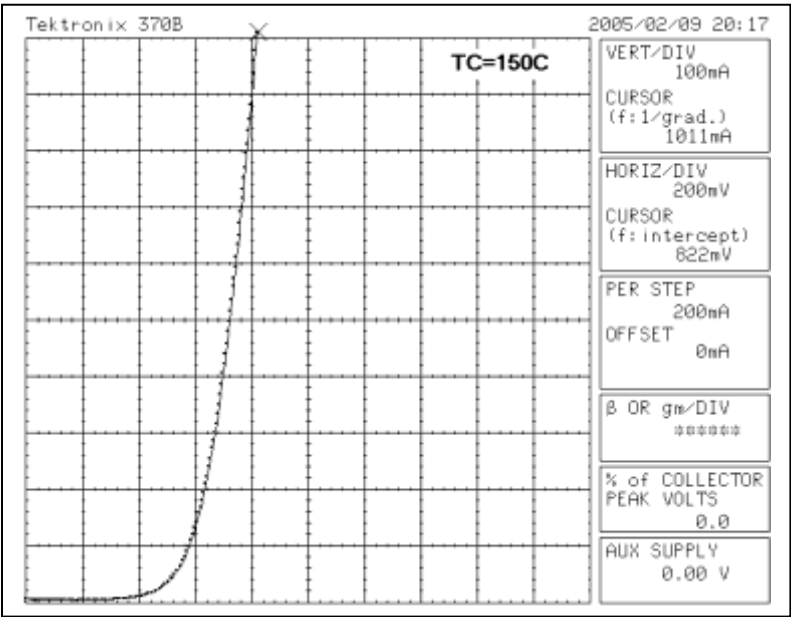


Bee Technologies Inc.

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

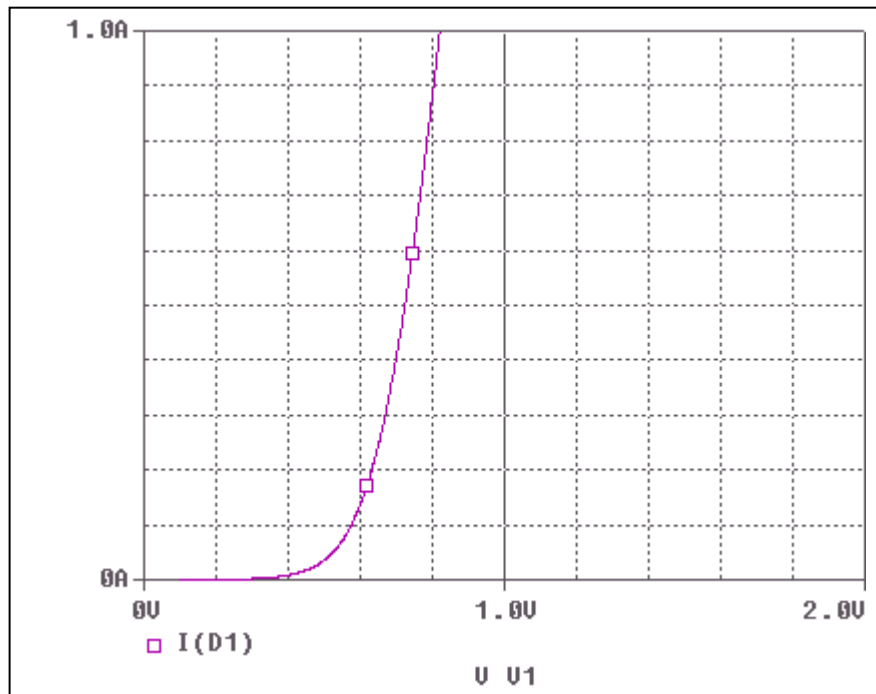
Forward Current Characteristic

Reference

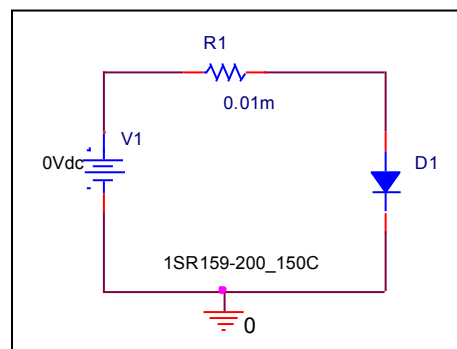


Forward Current Characteristic

Circuit Simulation Result

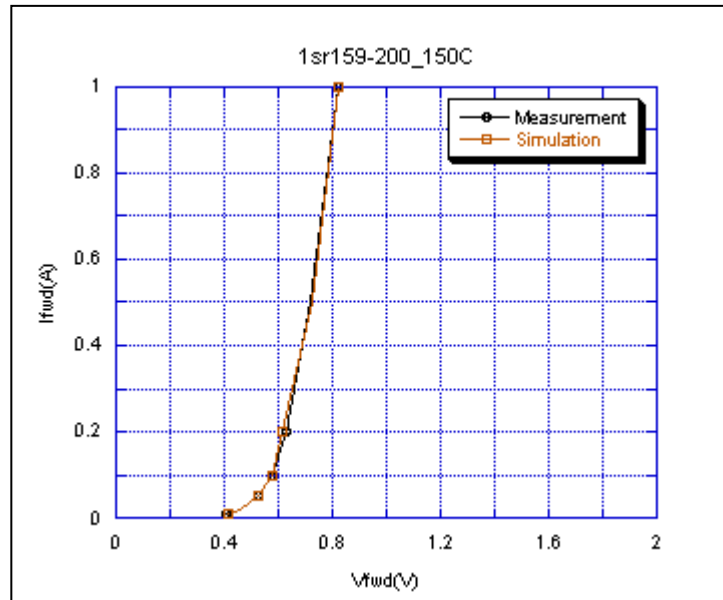


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

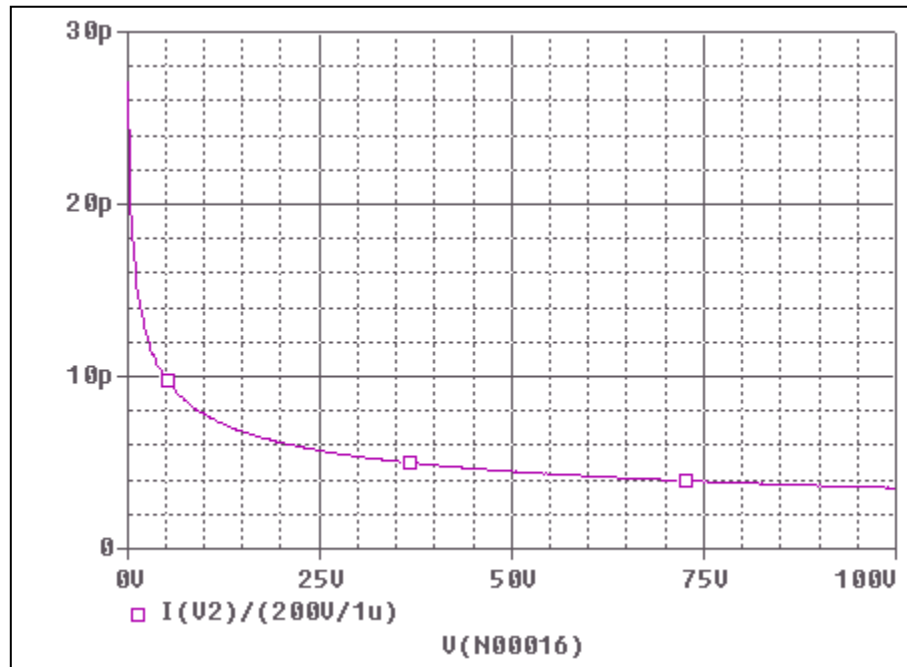


Simulation Result

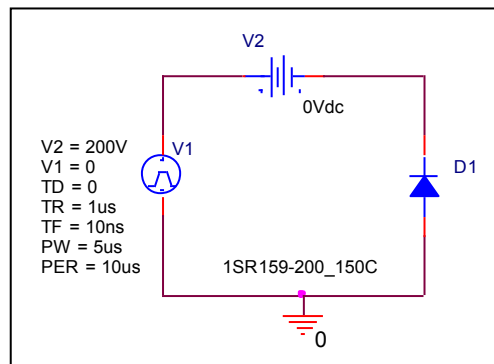
$I_{fwd}(A)$	$V_{fwd}(V)$ Measurement	$V_{fwd}(V)$ Simulation	%Error
0.01	0.41	0.412	0.4878
0.02	0.46	0.459	0.2173
0.05	0.526	0.523	0.5703
0.1	0.578	0.575	0.5190
0.2	0.63	0.613	2.6984
0.5	0.72	0.723	0.4166
1	0.822	0.82	0.2433

Capacitance Characteristic

Circuit Simulation Result

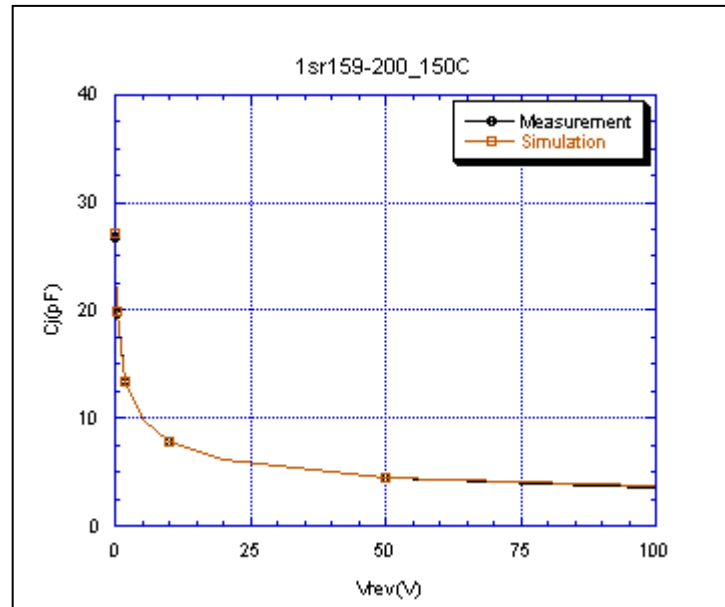


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

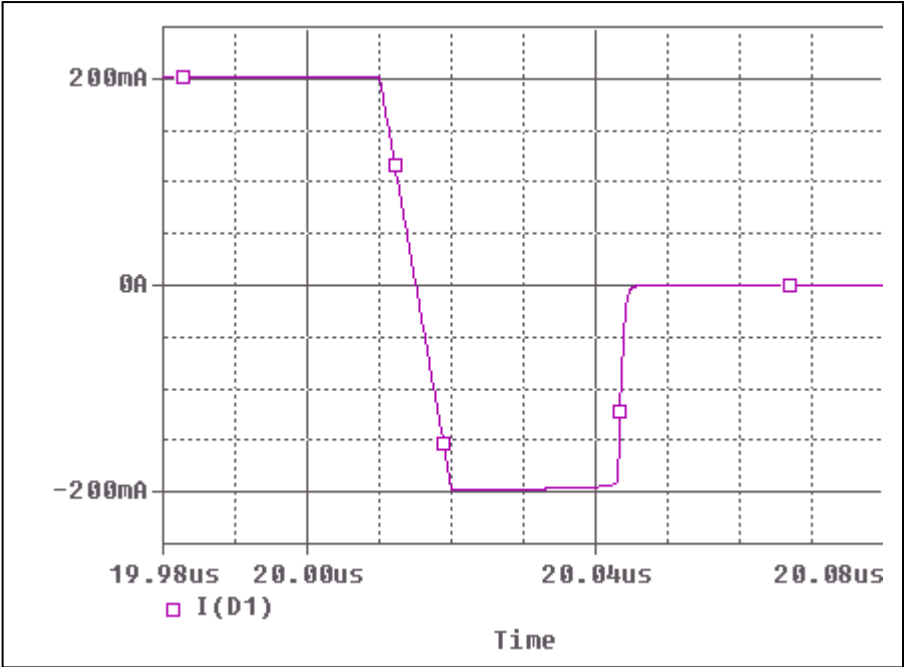


Simulation Result

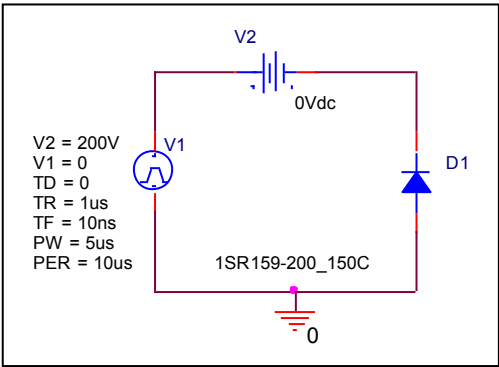
$V_{rev}(V)$	$C_j(pF)$ Measurement	$C_j(pF)$ Simulation	%Error
0	31.291	31.291	0.00
0.1	26.679	27.044	-1.37
0.2	24.313	24.368	-0.23
0.5	19.791	19.844	-0.27
1	16.740	16.531	1.25
2	13.327	13.308	0.14
5	9.918	9.886	0.32
10	7.816	7.812	0.05
20	6.120	6.163	-0.70
50	4.409	4.480	-1.61
100	3.460	3.530	-2.02

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

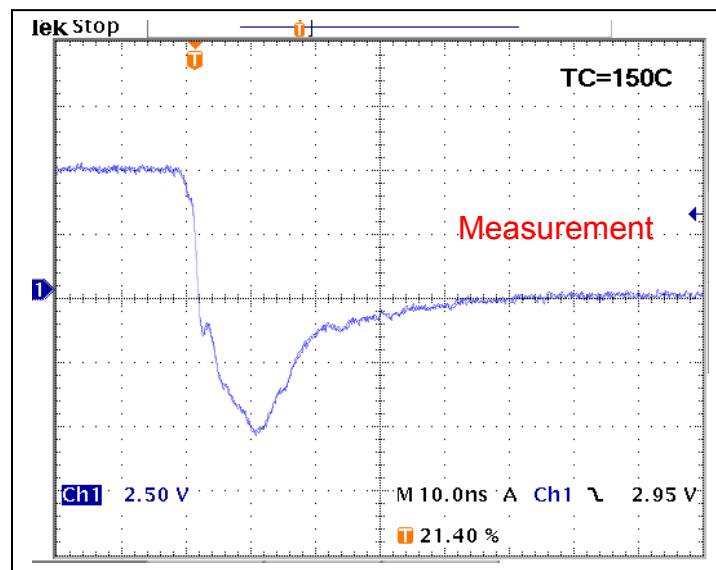


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trr	28.0	ns	28.5	ns	1.785

Reverse Recovery Characteristic

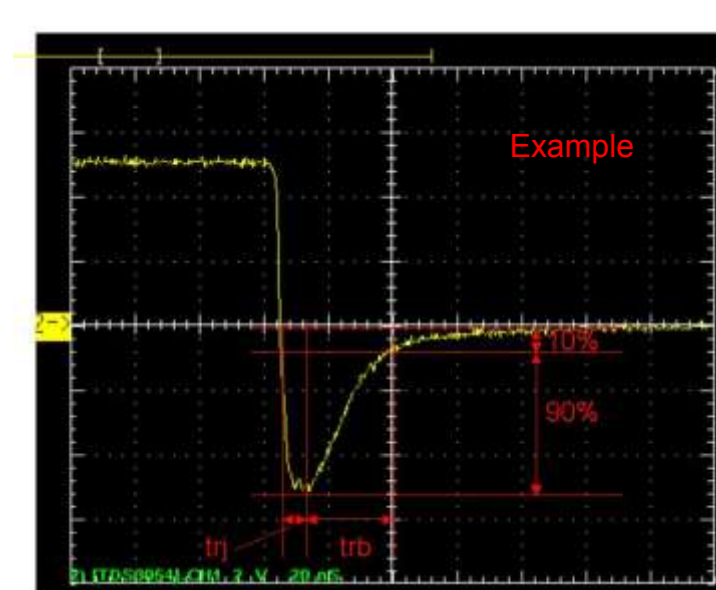
Reference



$T_{rj} = 9.8(\text{ns})$

$T_{rb} = 18.2(\text{ns})$

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



Relation between t_{rj} and t_{rb}