

Device Modeling Report

COMPONENTS:

DIODE/ GENERAL PURPOSE RECTIFIER / PROFESSIONAL

PART NUMBER: 1SR154-400

MANUFACTURER: ROHM

REMARK: TC=25C

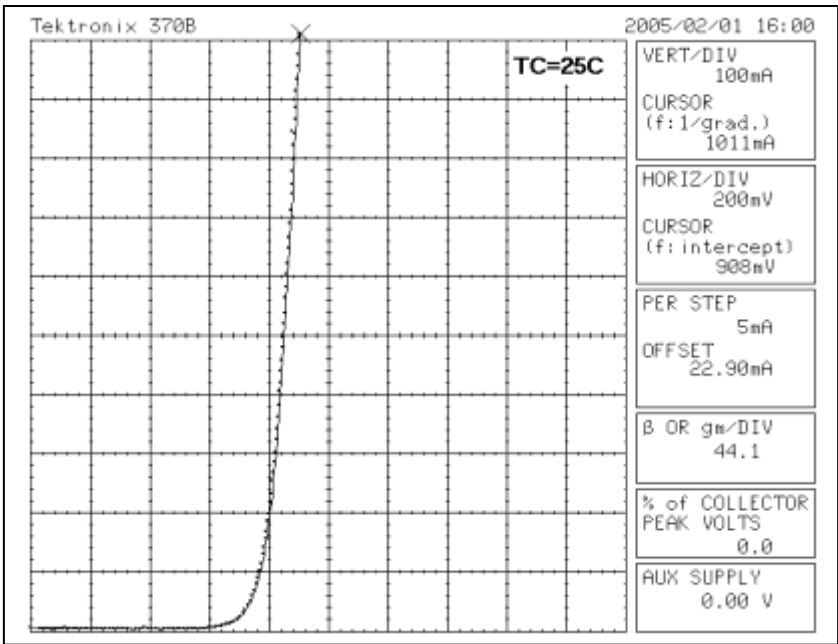


Bee Technologies Inc.

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

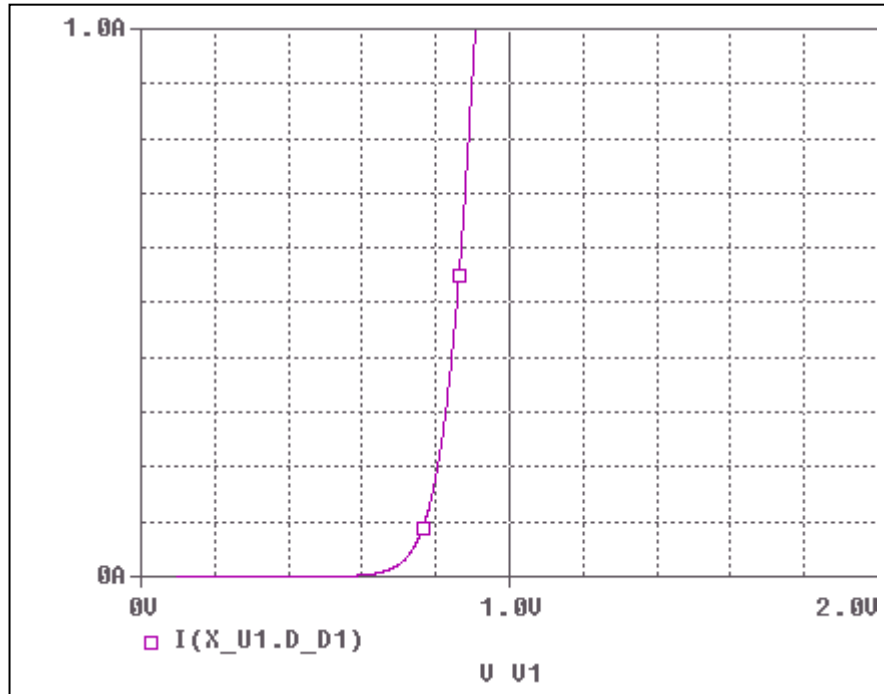
Forward Current Characteristic

Reference

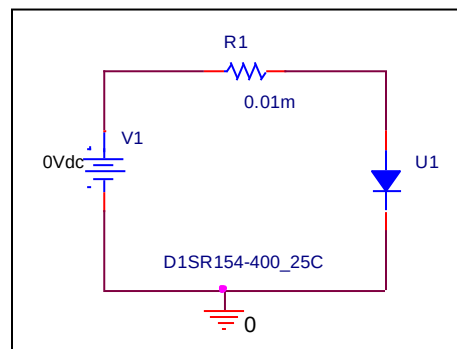


Forward Current Characteristic

Circuit Simulation Result

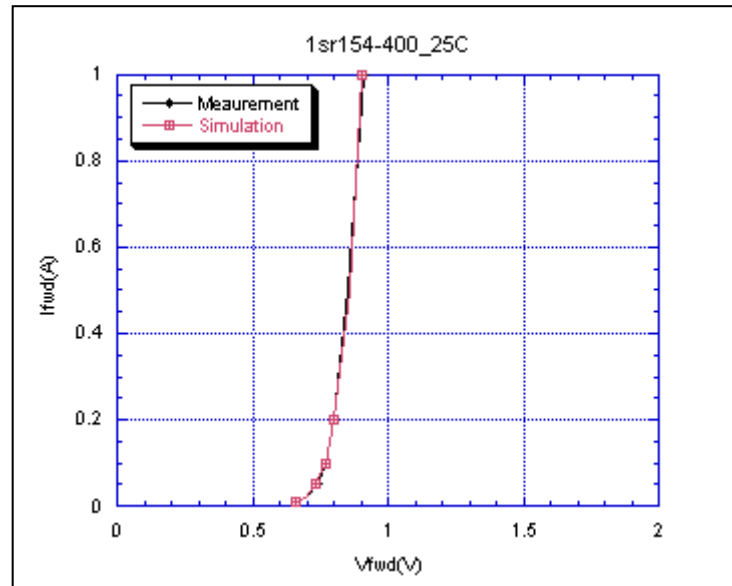


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

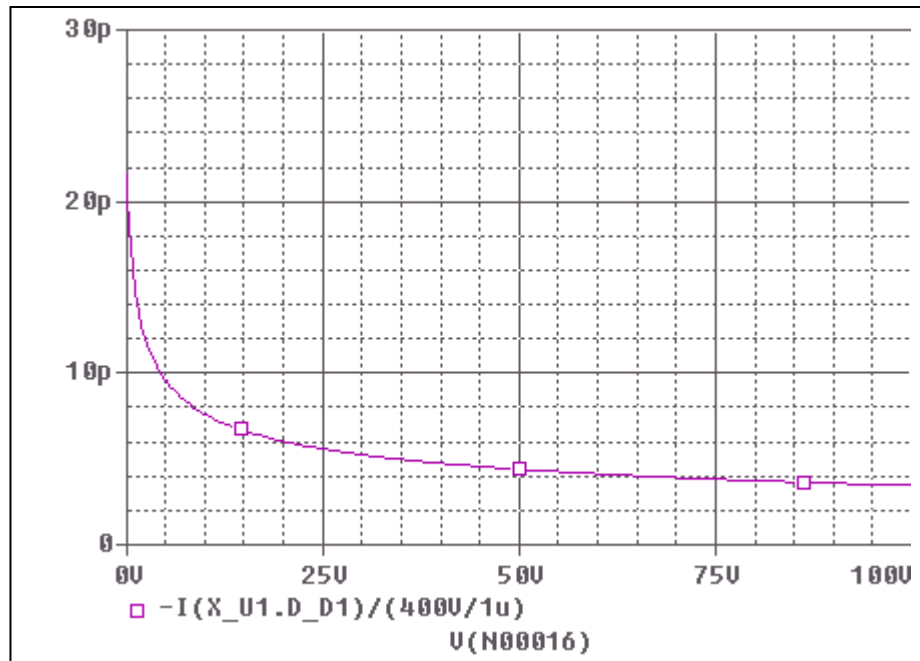


Simulation Result

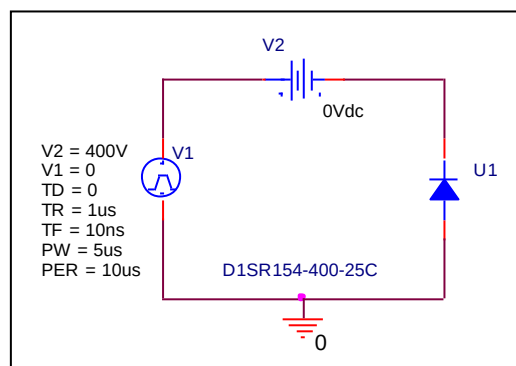
I_{fwd} (A)	V_{fwd} (V) Measurement	V_{fwd} (V) Simulation	%Error
0.01	0.660	0.663	-0.45
0.02	0.698	0.695	0.43
0.05	0.740	0.737	0.41
0.1	0.772	0.770	0.26
0.2	0.802	0.804	-0.25
0.5	0.855	0.857	-0.23
1	0.908	0.906	0.22

Capacitance Characteristic

Circuit Simulation Result

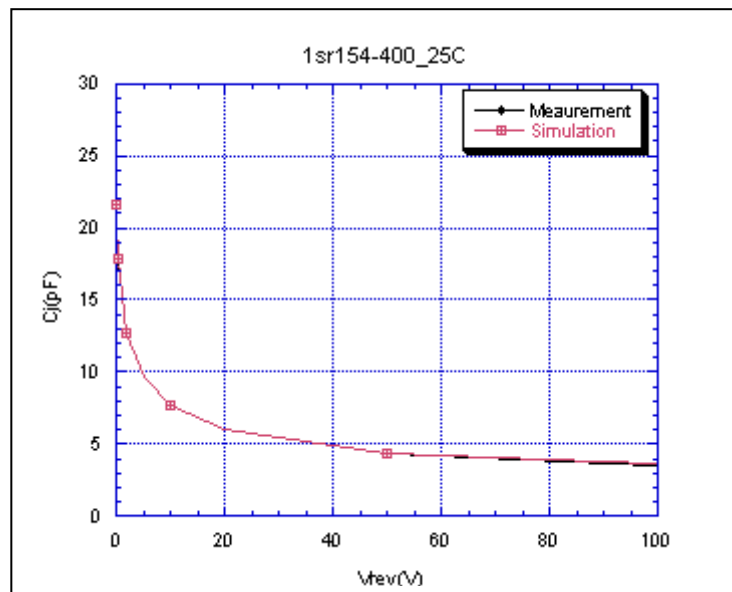


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

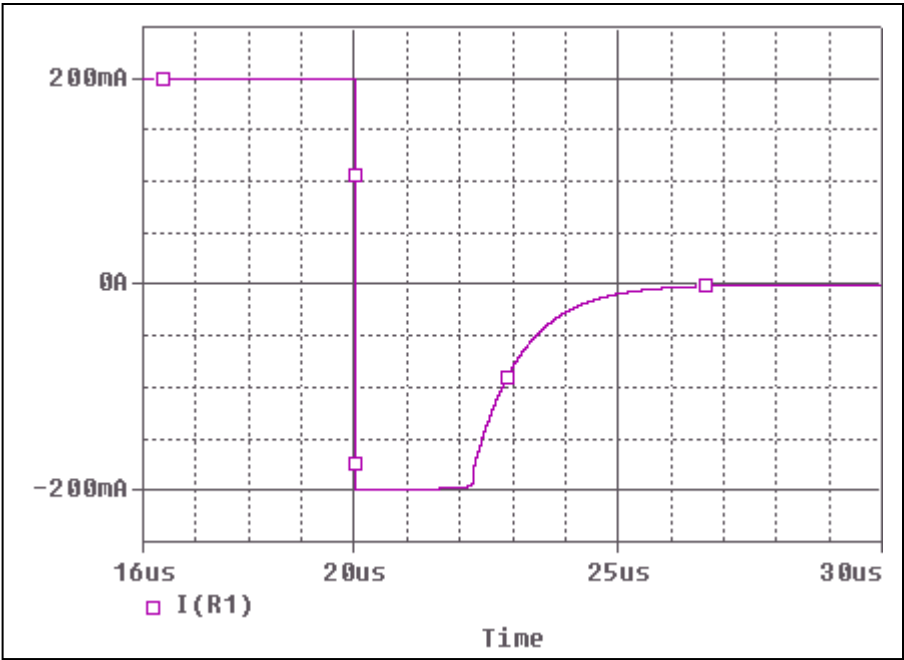


Simulation Result

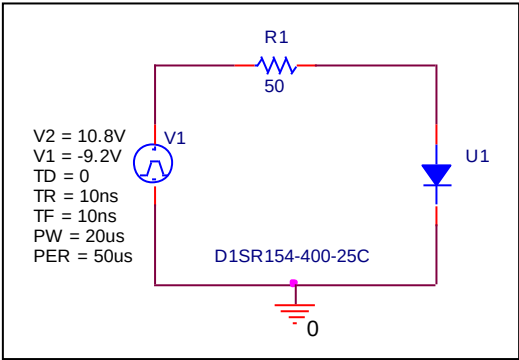
$V_{rev}(V)$	$C_j(pF)$ Measurement	$C_j(pF)$ Simulation	%Error
0	23.185	23.185	0.00
0.1	21.588	21.577	0.05
0.2	20.365	20.320	0.22
0.5	17.681	17.777	-0.54
1	15.275	15.326	-0.33
2	12.705	12.710	-0.04
5	9.647	9.599	0.50
10	7.672	7.624	0.63
20	6.033	6.036	-0.05
50	4.362	4.391	-0.66
100	3.428	3.459	-0.90

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

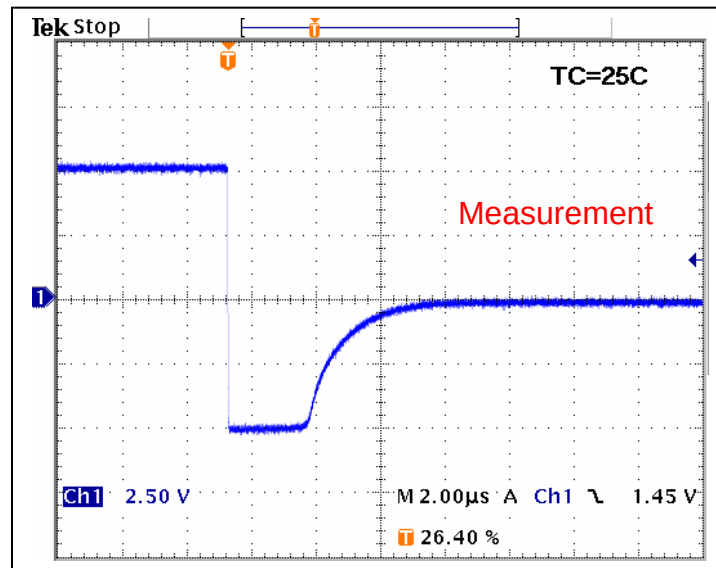


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trj	2.26	us	2.23	us	1.32
trb	2.04	us	2.05	us	0.49

Reverse Recovery Characteristic

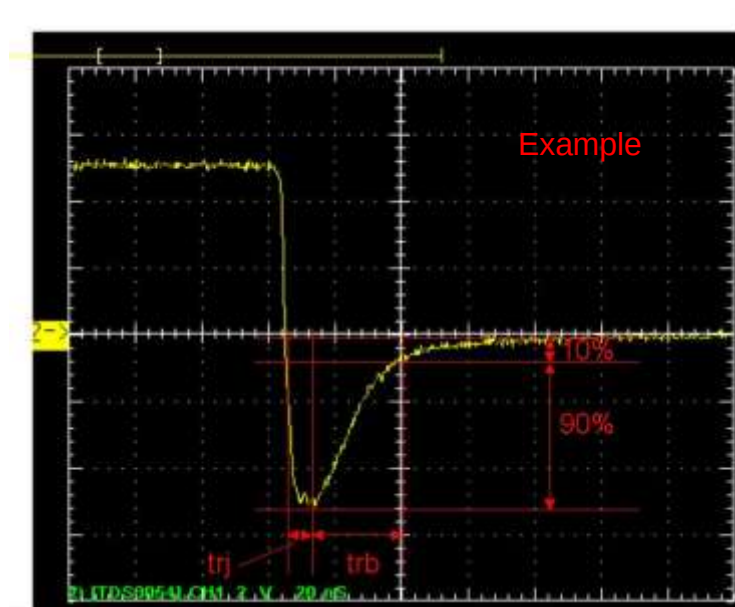
Reference



$T_{rj} = 2.26(\mu s)$

$T_{rb} = 2.04(\mu s)$

Conditions: $I_{fwd} = I_{rev} = 0.2(A)$, $R_L = 50$



Relation between t_{rj} and t_{rb}