

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / STANDARD
PART NUMBER: 1SR153-400
MANUFACTURER: ROHM
REMARK: TC=110C

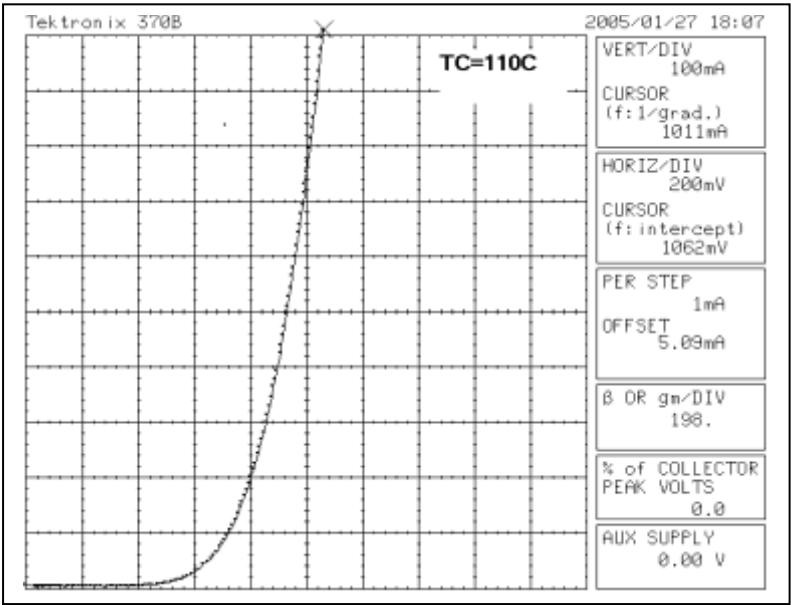


Bee Technologies Inc.

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

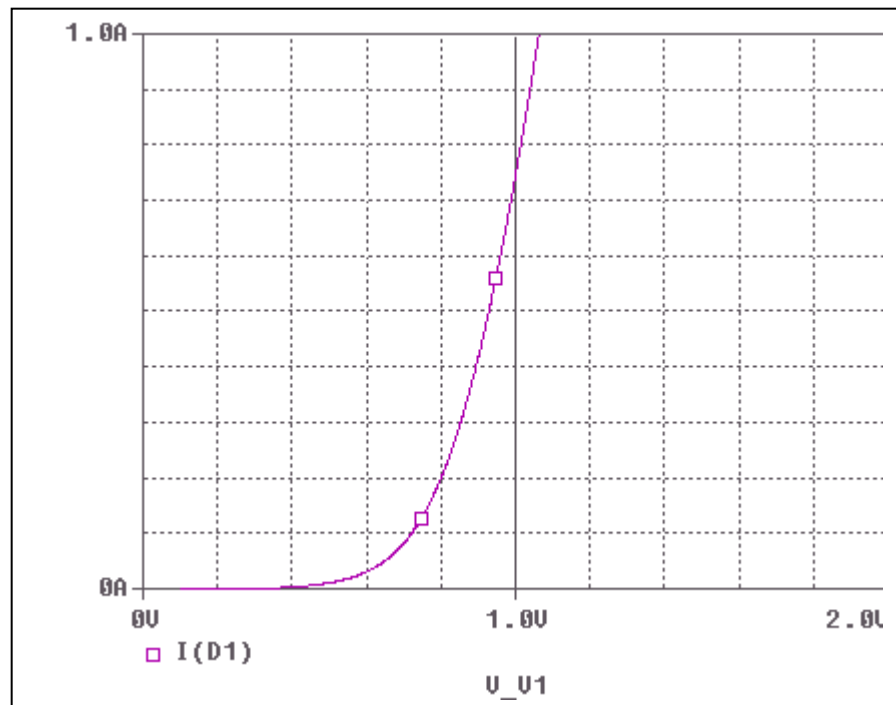
Forward Current Characteristic

Reference

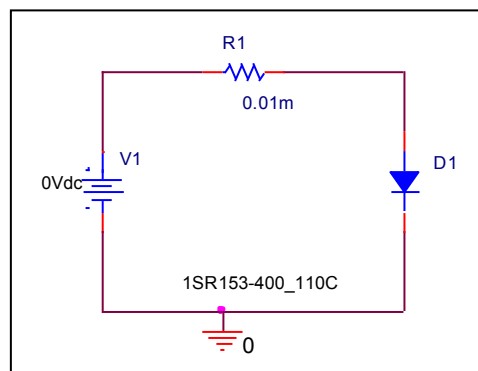


Forward Current Characteristic

Circuit Simulation Result

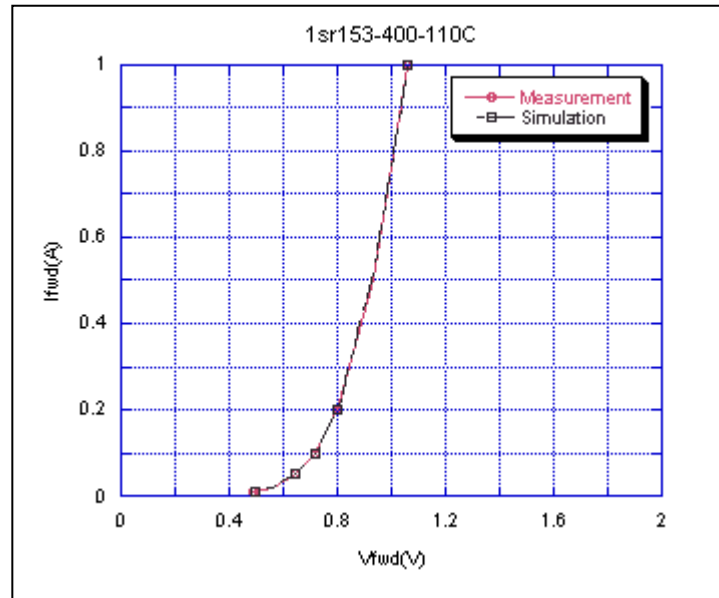


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

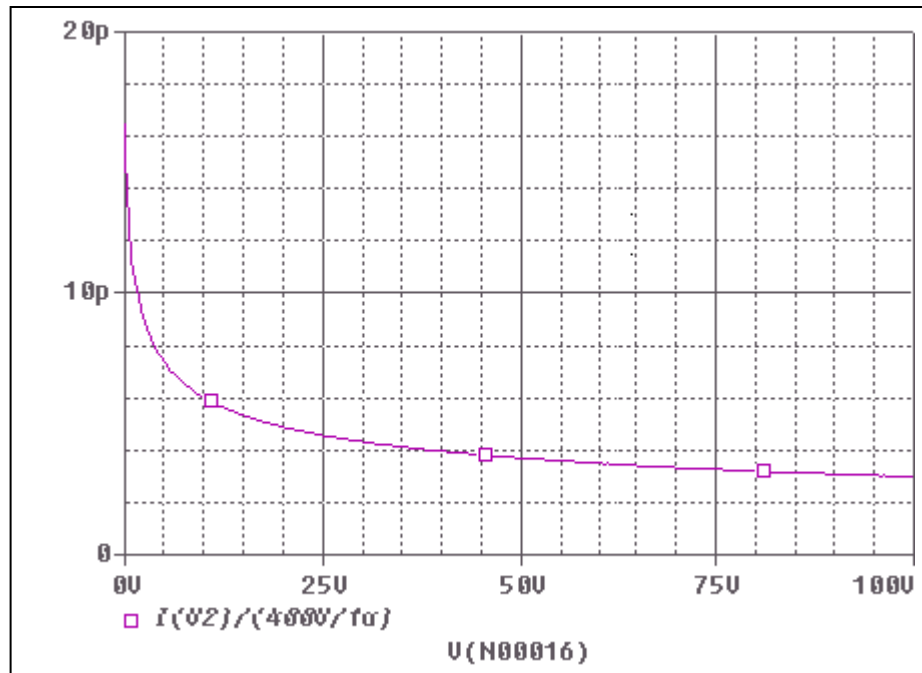


Simulation Result

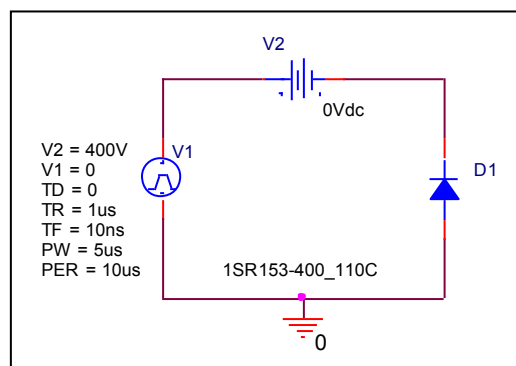
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.488	0.494	-1.23
0.02	0.566	0.558	1.41
0.05	0.648	0.648	0.00
0.1	0.718	0.721	-0.42
0.2	0.802	0.800	0.25
0.5	0.930	0.929	0.11
1	1.062	1.062	0.00

Capacitance Characteristic

Circuit Simulation Result

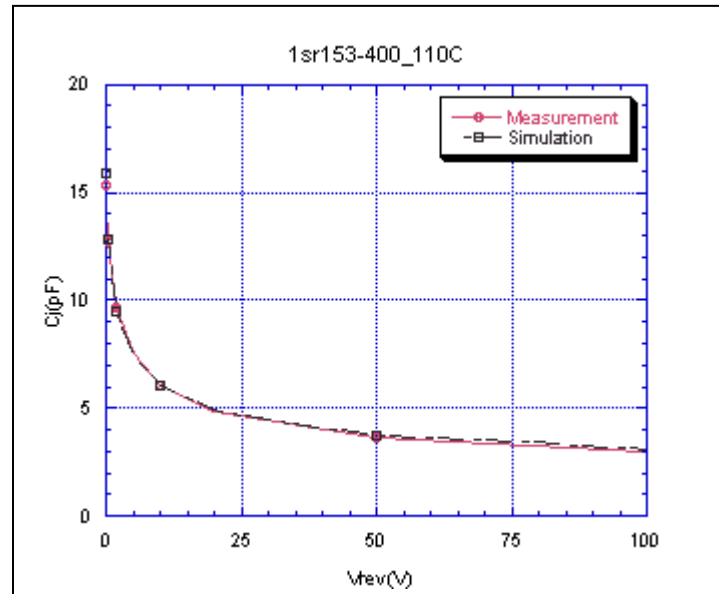


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

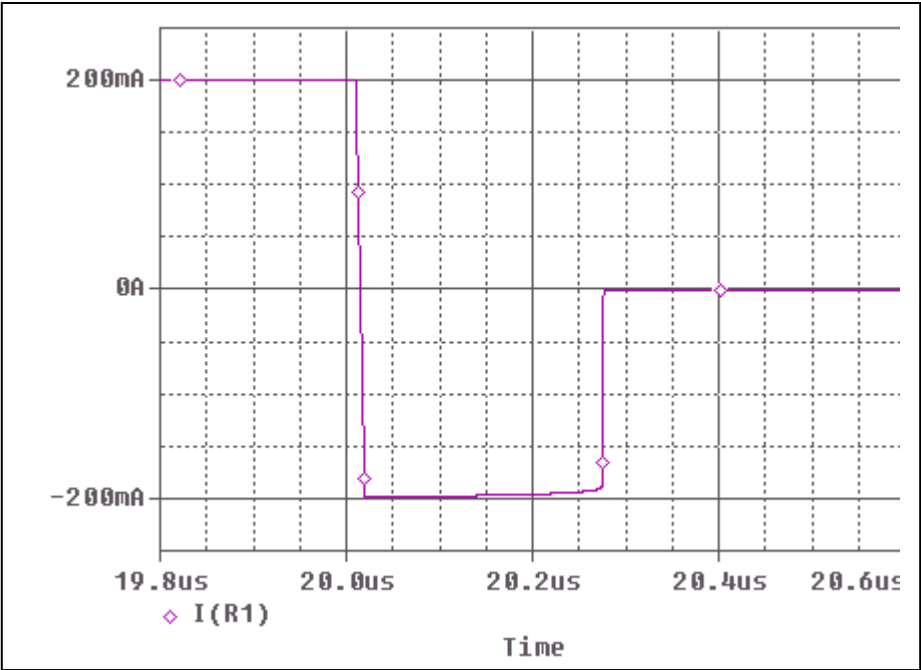


Simulation Result

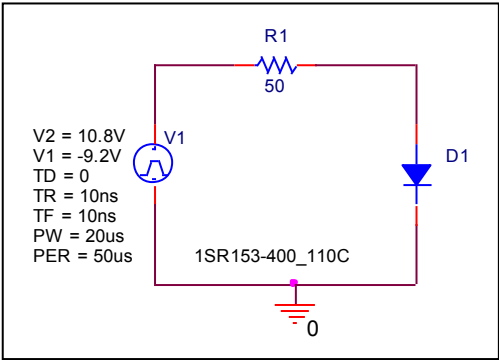
$V_{rev}(\text{V})$	$C_j(\text{pF})$ Measurement	$C_j(\text{pF})$ Simulation	%Error
0	16.520	16.520	0.00
0.1	15.361	15.850	-3.18
0.2	14.417	14.709	-2.03
0.5	12.695	12.842	-1.16
1	11.251	11.178	0.65
2	9.625	9.519	1.10
5	7.513	7.381	1.76
10	6.034	6.042	-0.13
20	4.844	4.896	-1.07
50	3.652	3.703	-1.40
100	2.918	2.989	-2.43

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

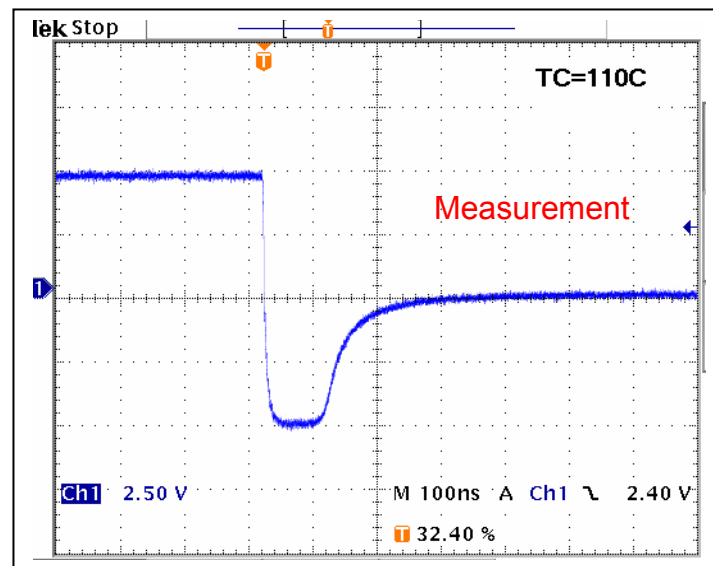


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trr	260.00	ns	260.40	ns	0.15

Reverse Recovery Characteristic

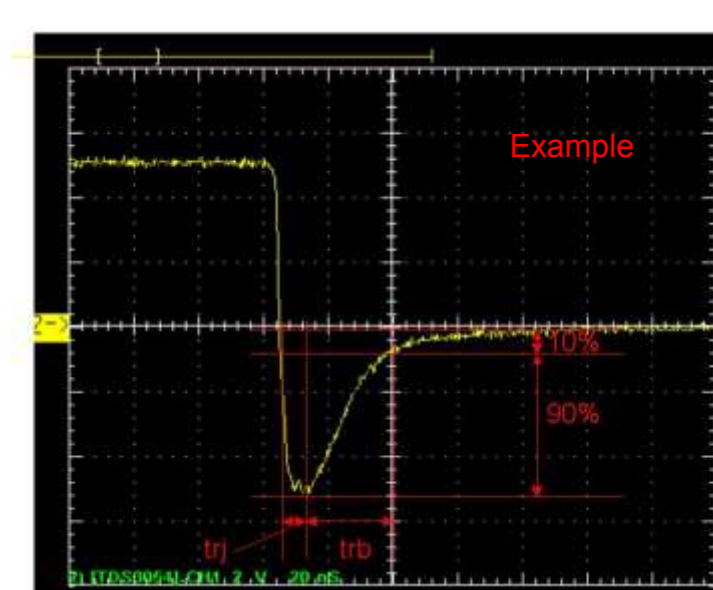
Reference



$T_{rj} = 84(\text{ns})$

$T_{rb} = 176(\text{ns})$

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



Relation between t_{rj} and t_{rb}