

Device Modeling Report

COMPONENTS:

DIODE/ GENERAL PURPOSE RECTIFIER / PROFESSIONAL

PART NUMBER: 1SR154-600

MANUFACTURER: ROHM

REMARK: TC=110C

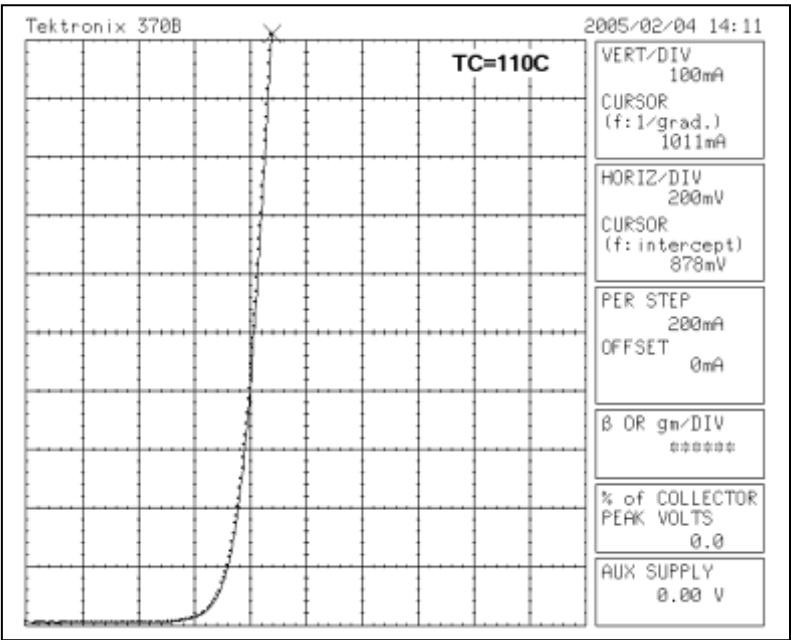


Bee Technologies Inc.

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

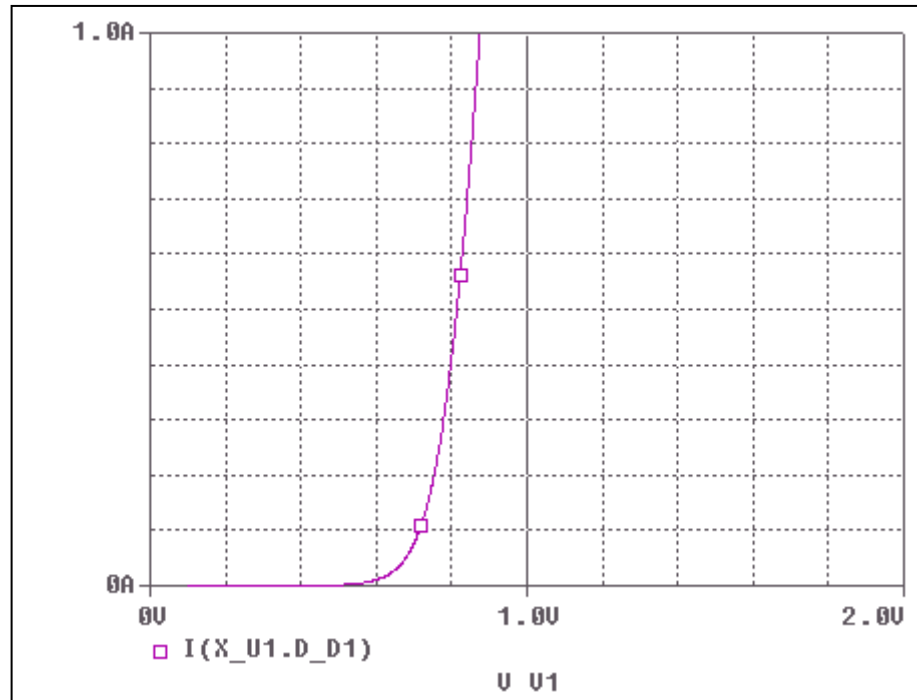
Forward Current Characteristic

Reference

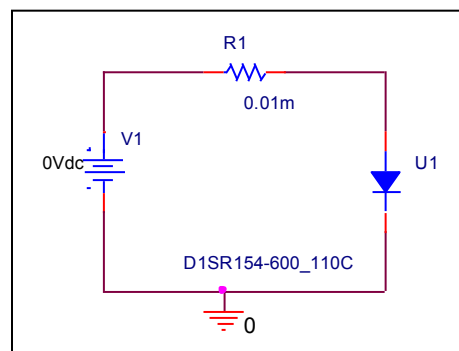


Forward Current Characteristic

Circuit Simulation Result

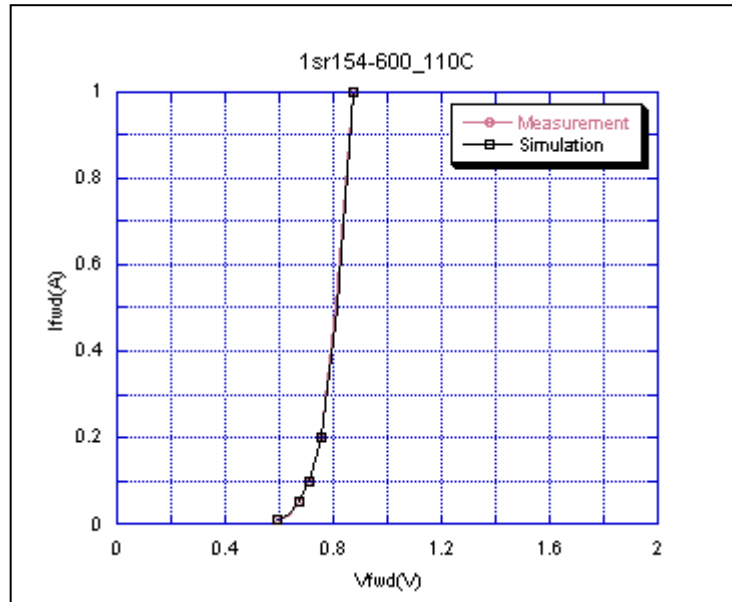


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

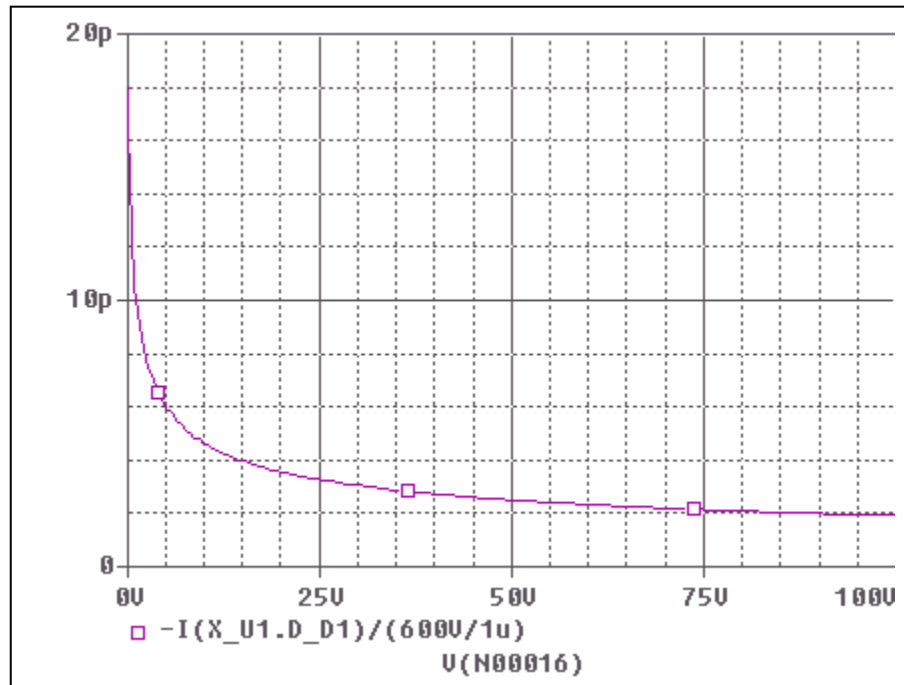


Simulation Result

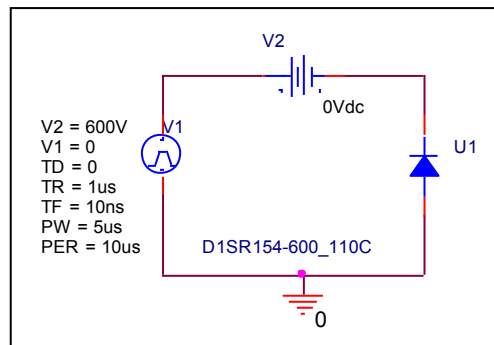
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.595	0.596	-0.17
0.02	0.634	0.631	0.47
0.05	0.676	0.677	-0.15
0.1	0.715	0.714	0.14
0.2	0.756	0.753	0.40
0.5	0.810	0.814	-0.49
1	0.876	0.874	0.23

Capacitance Characteristic

Circuit Simulation Result

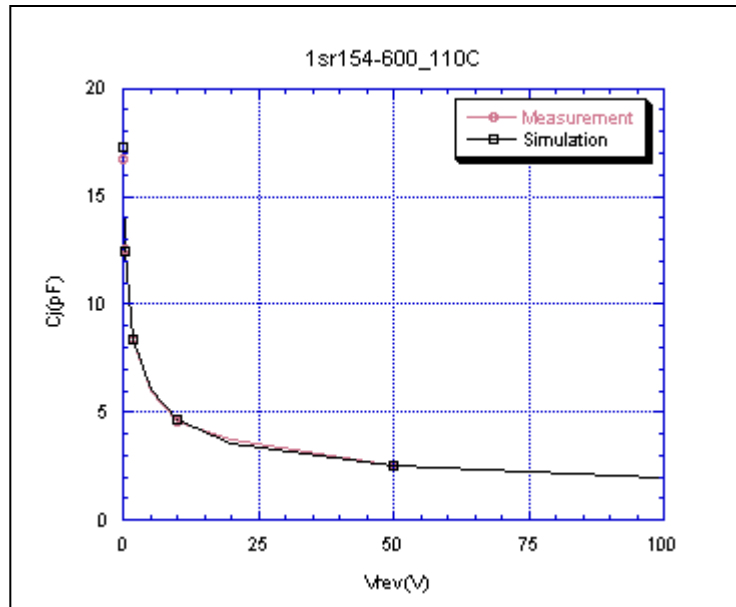


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

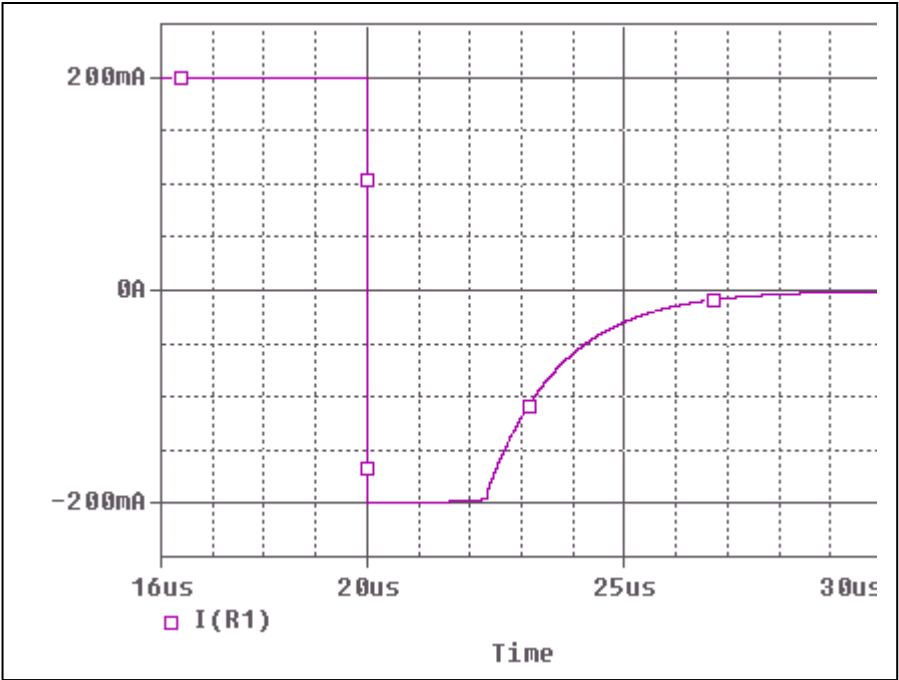


Simulation Result

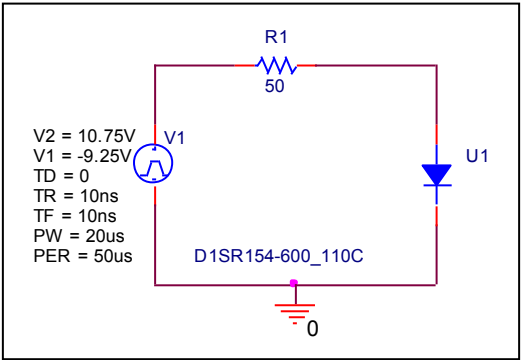
$V_{\text{rev}}(\text{V})$	$C_j(\text{pF})$ Measurement	$C_j(\text{pF})$ Simulation	%Error
0	18.668	18.668	0.00
0.1	16.730	17.253	-3.13
0.2	15.302	15.464	-1.06
0.5	12.577	12.497	0.64
1	10.452	10.401	0.49
2	8.356	8.383	-0.32
5	5.999	6.018	-0.32
10	4.600	4.617	-0.37
20	3.688	3.570	3.20
50	2.508	2.508	0.00
100	1.900	1.916	-0.84

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

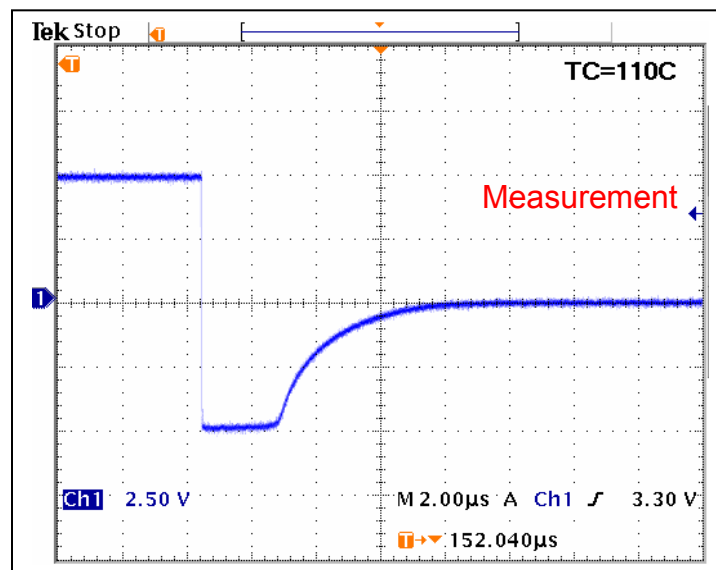


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trj	2.32	us	2.32	us	0.000
trb	3.20	us	3.22	us	0.625

Reverse Recovery Characteristic

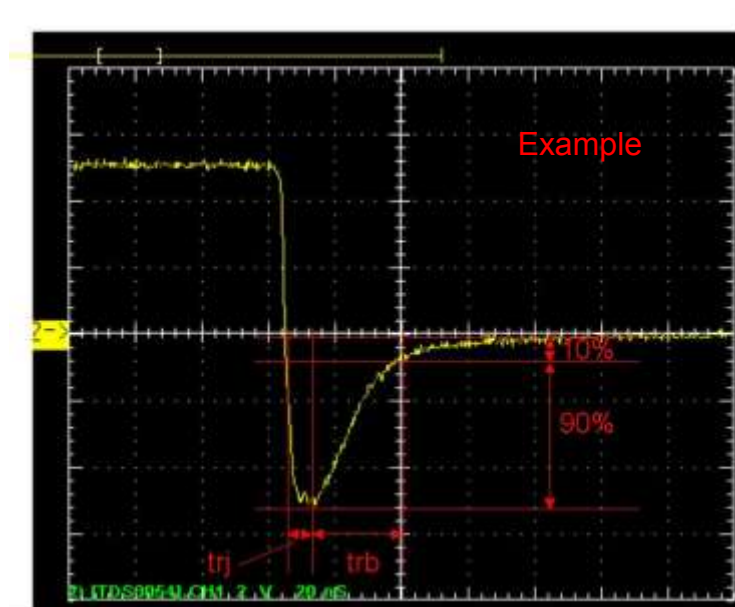
Reference



$T_{rj} = 2.32(\mu s)$

$T_{rb} = 3.20(\mu s)$

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



Relation between t_{rj} and t_{rb}