

Device Modeling Report

COMPONENTS:

DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL

PART NUMBER: RURD460S

MANUFACTURER: FAIRCHILD

REMARK: TC=80 degree

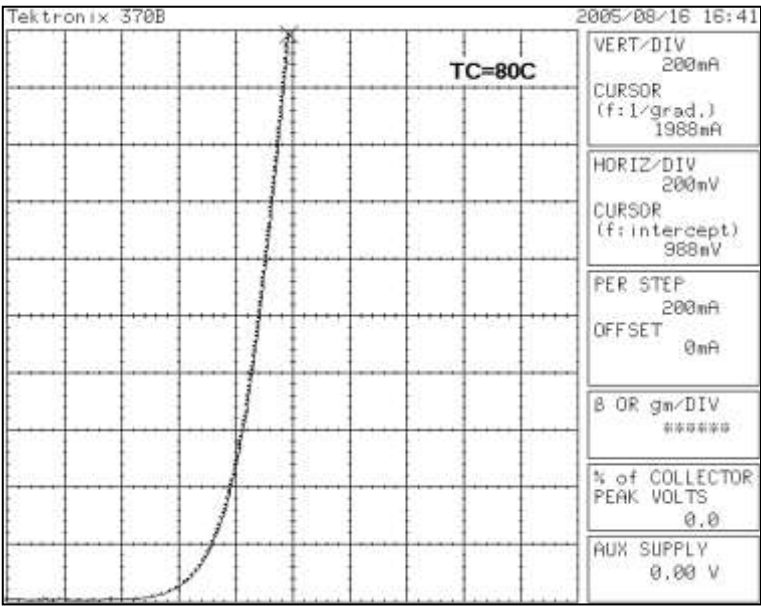


Bee Technologies Inc.

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

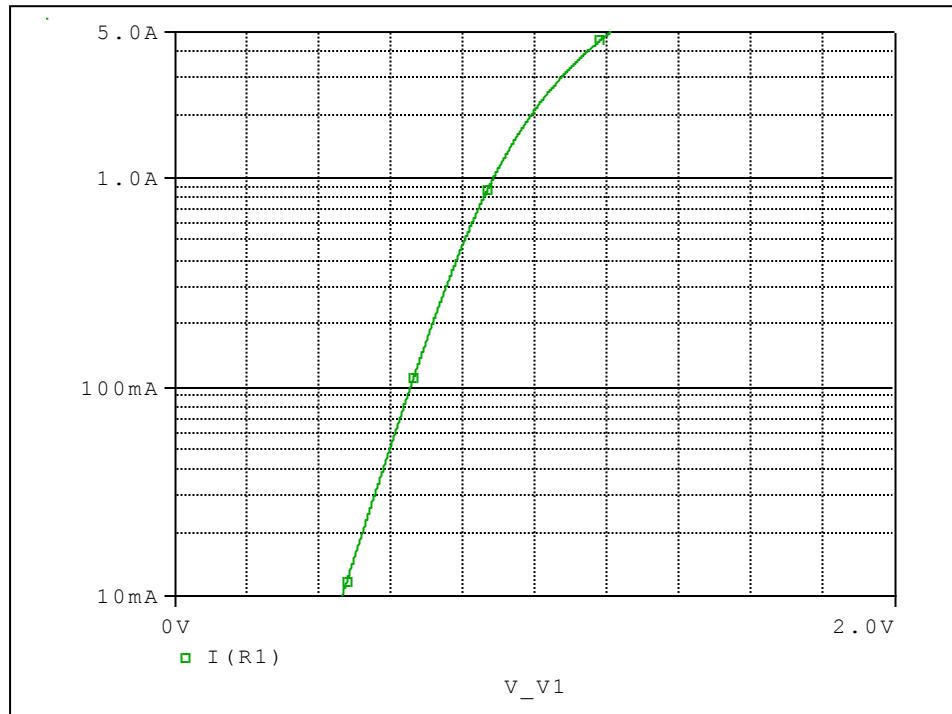
Forward Current Characteristic

Reference

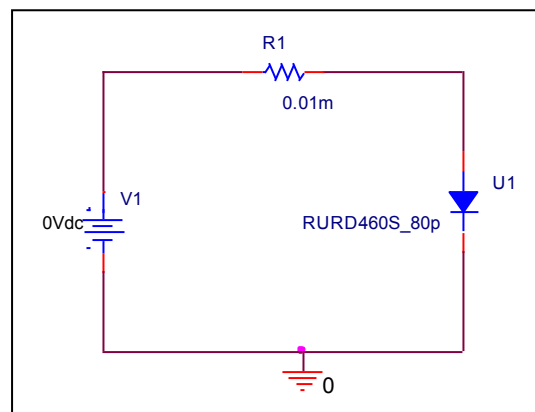


Forward Current Characteristic

Circuit Simulation Result

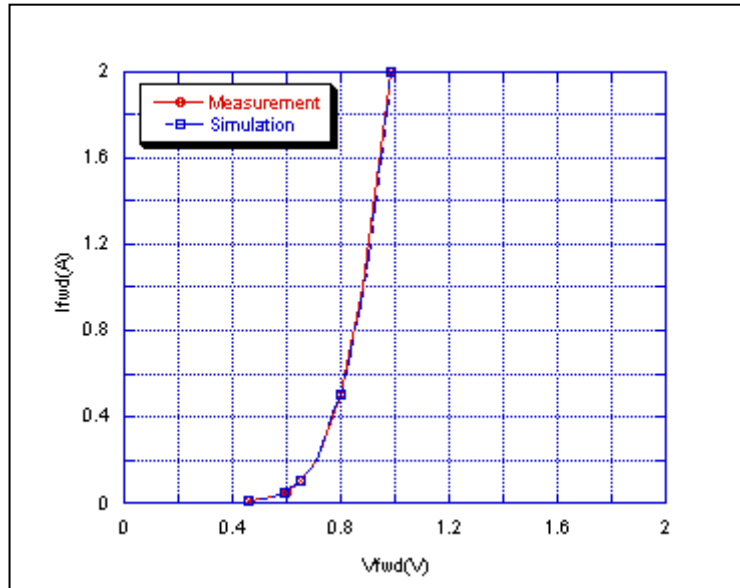


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

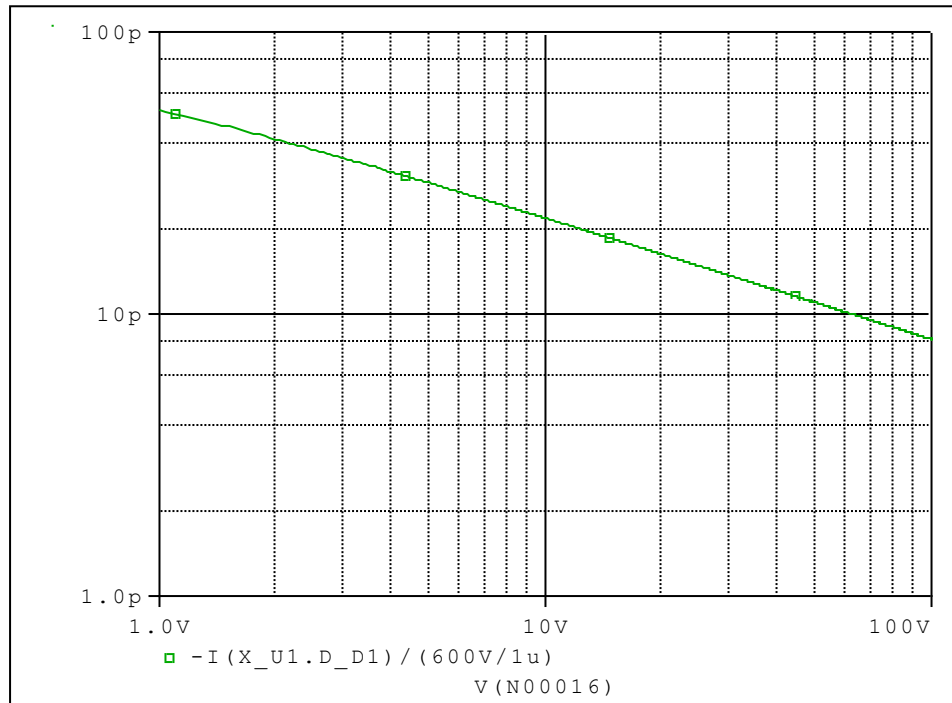


Simulation Result

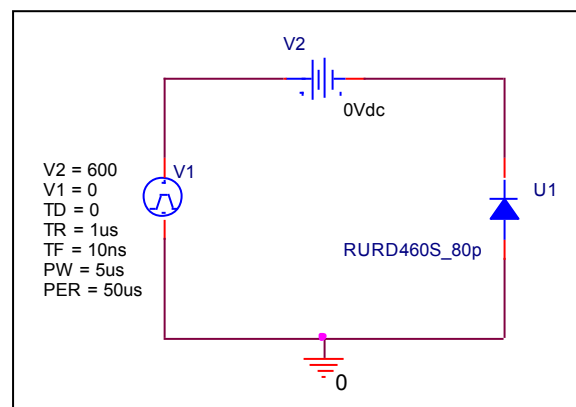
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.460	0.463	-0.652
0.02	0.520	0.518	0.385
0.05	0.598	0.596	0.334
0.1	0.654	0.652	0.306
0.2	0.712	0.713	-0.140
0.5	0.800	0.802	-0.250
1	0.884	0.886	-0.226
2	0.988	0.988	0.000

Capacitance Characteristic

Circuit Simulation Result

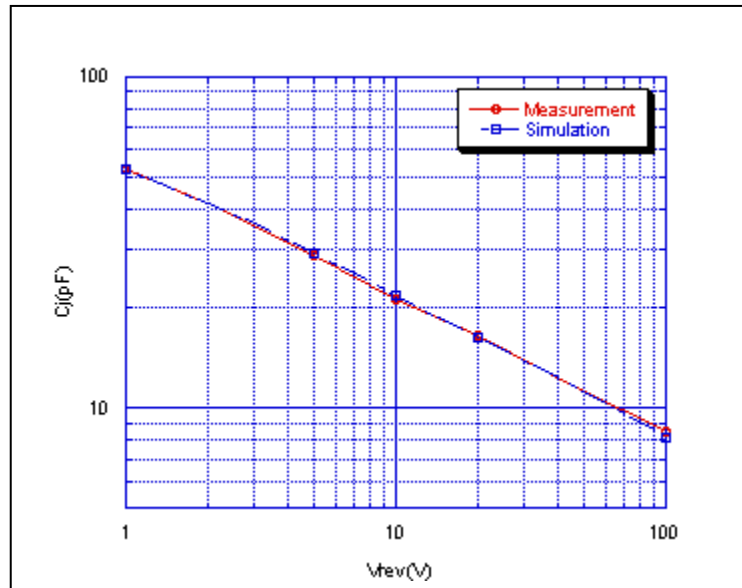


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

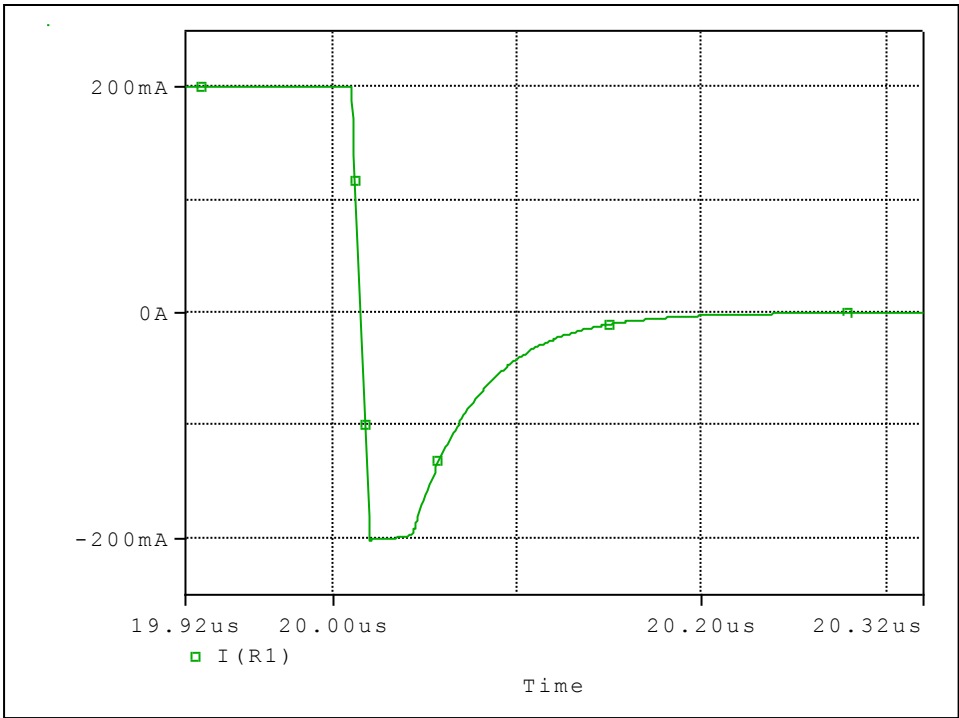


Simulation Result

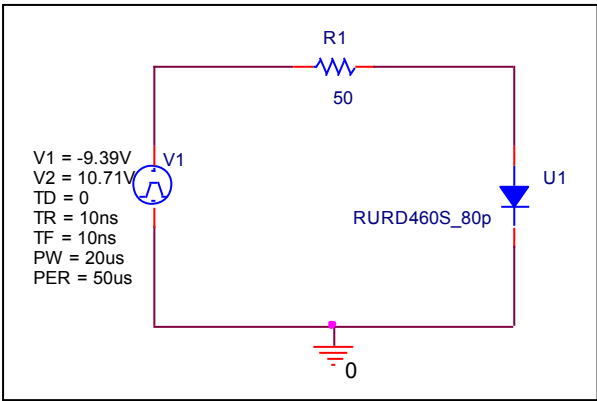
V_{rev} (V)	C_j (pF) Measurement	C_j (pF) Simulation	%Error
0	91.900	91.900	0.000
1	52.800	52.717	0.157
2	41.500	41.615	-0.277
5	28.700	29.155	-1.585
10	21.400	21.862	-2.159
20	16.500	16.304	1.188
50	11.300	11.207	0.823
100	8.500	8.129	4.365

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

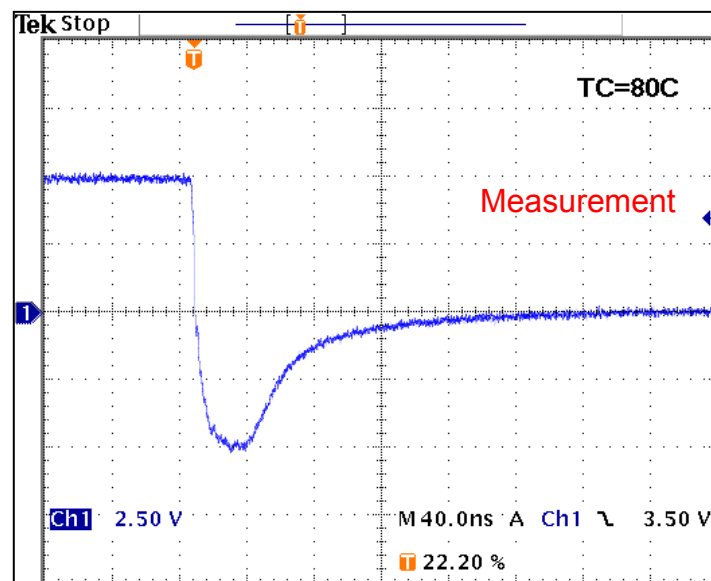


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trj	28	ns	28.08	ns	0.285
trb	82.4	ns	82.22	ns	0.218

Reverse Recovery Characteristic

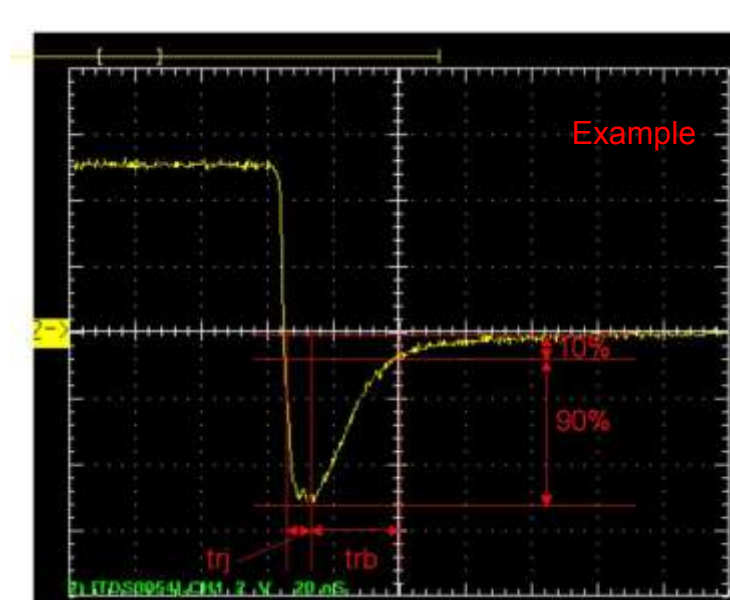
Reference



$T_{rj} = 28 \text{ (ns)}$

$T_{rb} = 82.4 \text{ (ns)}$

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



Relation between t_{rj} and t_{rb}