

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ STANDARD
PART NUMBER: 1S1834
MANUFACTURER: TOSHIBA
REMARK: TC=25C

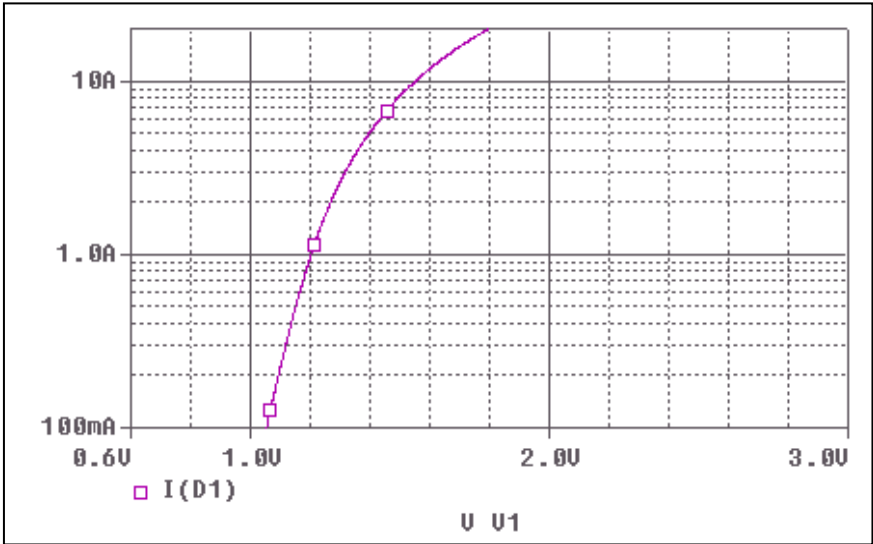


Bee Technologies Inc.

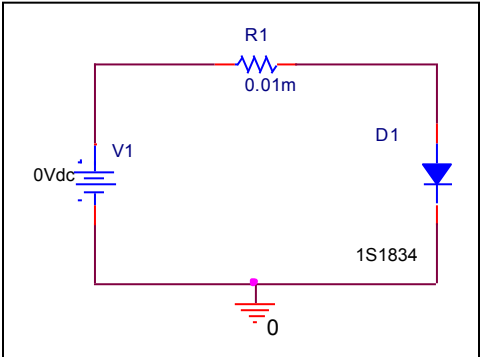
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a positive value)
IBV	Reverse Breakdown Current(a positive value)
TT	Transit Time
EG	Energy-band Gap

Forward Current Characteristic

Circuit Simulation Result

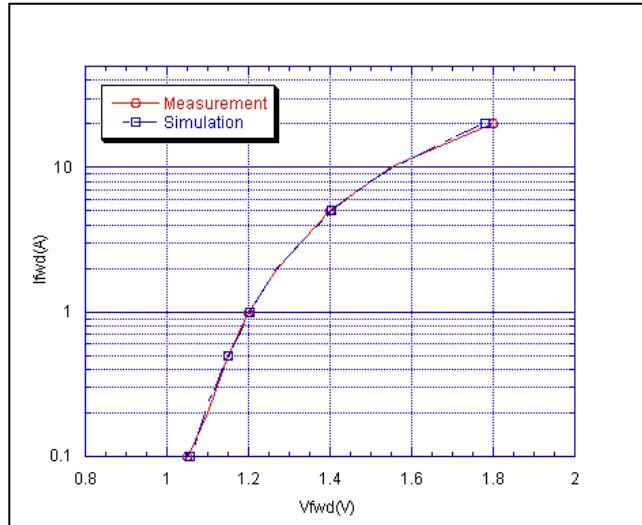


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

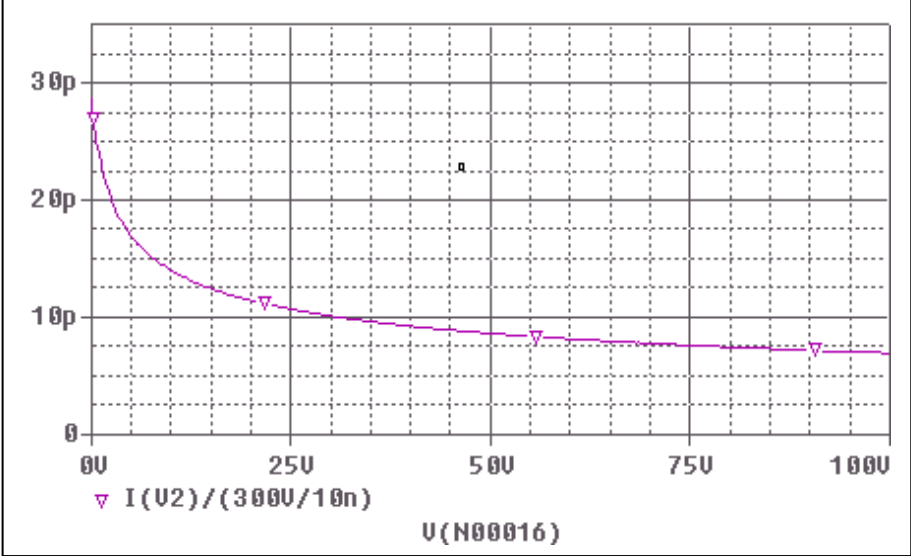


Simulation Result

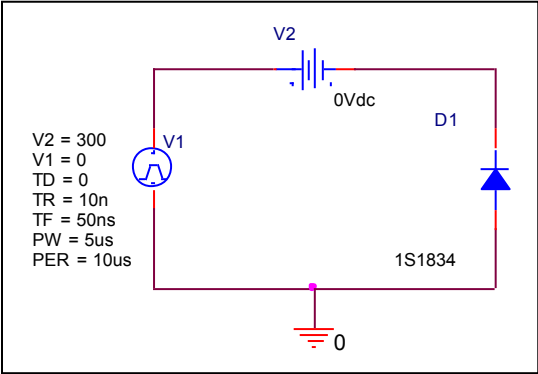
I_{fwd} (A)	V_{fwd} (V) Measurement	V_{fwd} (V) Simulation	%Error
0.1	1.050	1.055	-0.495
0.2	1.100	1.094	0.573
0.5	1.150	1.152	-0.148
1	1.200	1.203	-0.250
2	1.270	1.267	0.228
5	1.400	1.404	-0.293
10	1.550	1.553	-0.181
20	1.800	1.780	1.117

Junction Capacitance Characteristic

Circuit Simulation Result

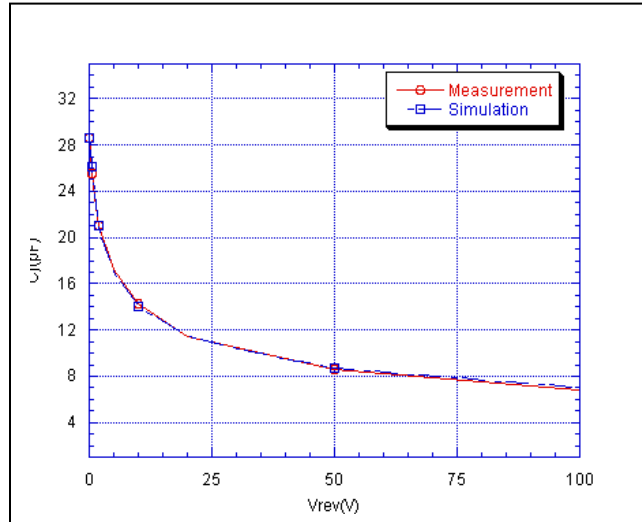


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

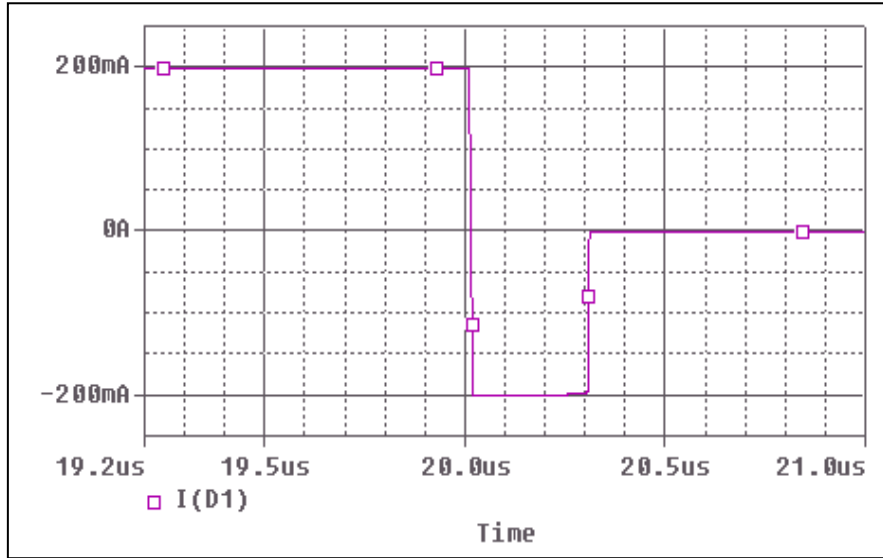


Simulation Result

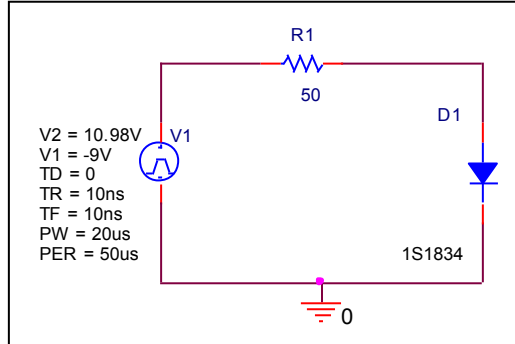
V_{rev} (V)	C_j (pF) Measurement	C_j (pF) Simulation	%Error
0	29.432	29.432	0.000
0.1	28.555	28.625	-0.245
0.2	27.555	27.879	-1.176
0.5	25.576	26.087	-1.998
1	23.567	23.874	-1.303
2	21.062	21.070	-0.038
5	17.285	16.953	1.921
10	14.272	14.009	1.843
20	11.399	11.448	-0.430
50	8.555	8.674	-1.398
100	6.735	6.958	-3.319

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

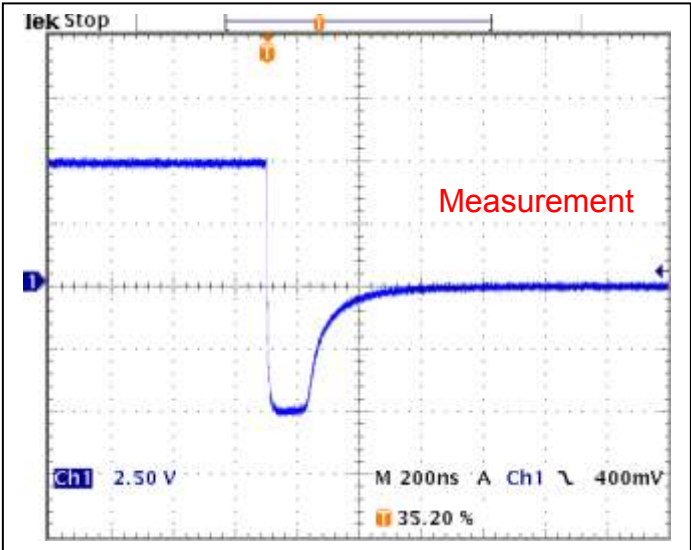


Compare Measurement vs. Simulation

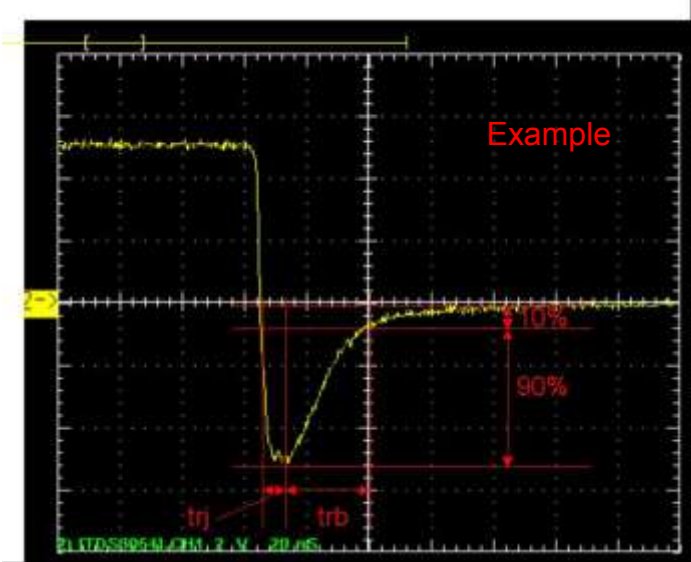
	Measurement		Simulation		%Error
trr	2960.00	ns	294.90	ns	0.37

Reverse Recovery Characteristic

Reference



$Trj = 108(ns)$
 $Trb = 188(ns)$
Conditions: $I_{fwd} = I_{rev} = 0.2(A)$, $R_I = 50$



Relation between trj and trb