

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL
PART NUMBER: TVR2G
MANUFACTURER: TOSHIBA

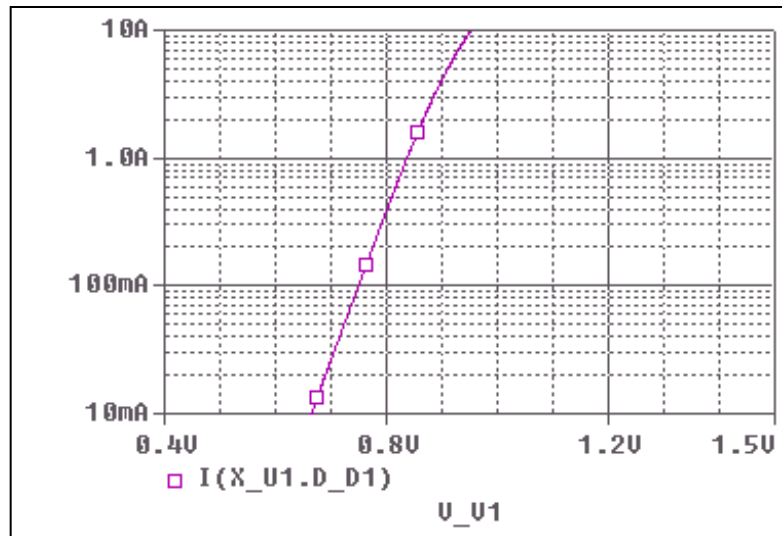


Bee Technologies Inc.

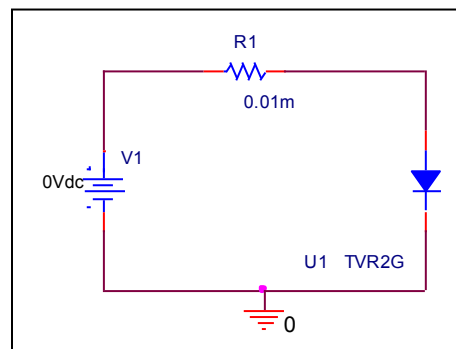
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

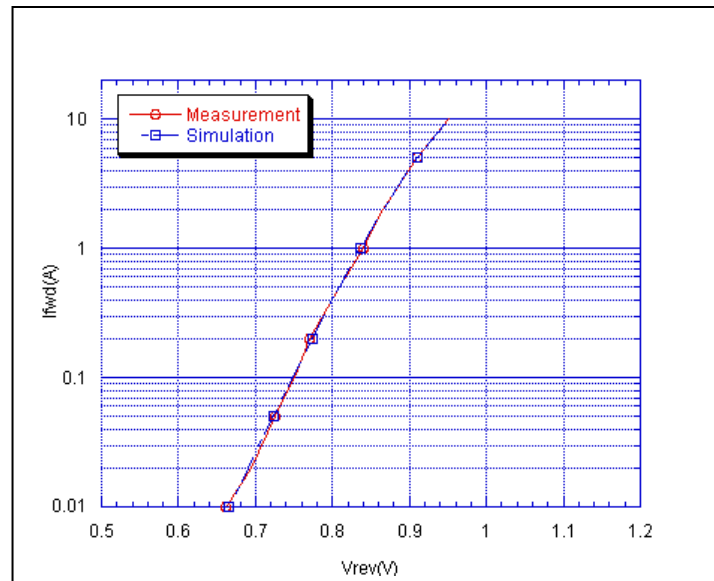


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

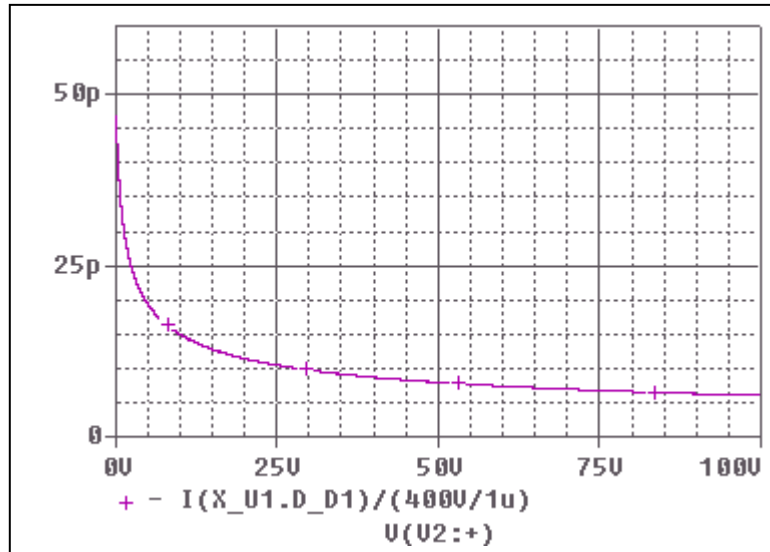


Simulation Result

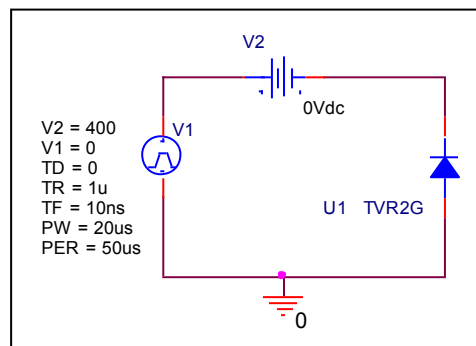
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.6620	0.6646	-0.393
0.02	0.6940	0.6901	0.562
0.05	0.7250	0.7238	0.166
0.1	0.7500	0.7494	0.080
0.2	0.7700	0.7752	-0.675
0.5	0.8100	0.8099	0.012
1	0.8400	0.8374	0.310
2	0.8660	0.8663	-0.035
5	0.9100	0.9103	-0.033
10	0.9520	0.9517	0.032

Junction Capacitance Characteristic

Circuit Simulation Result

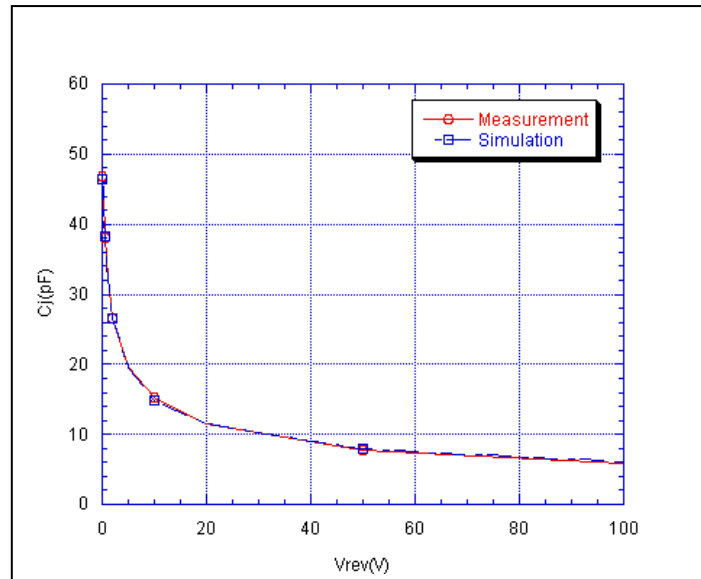


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

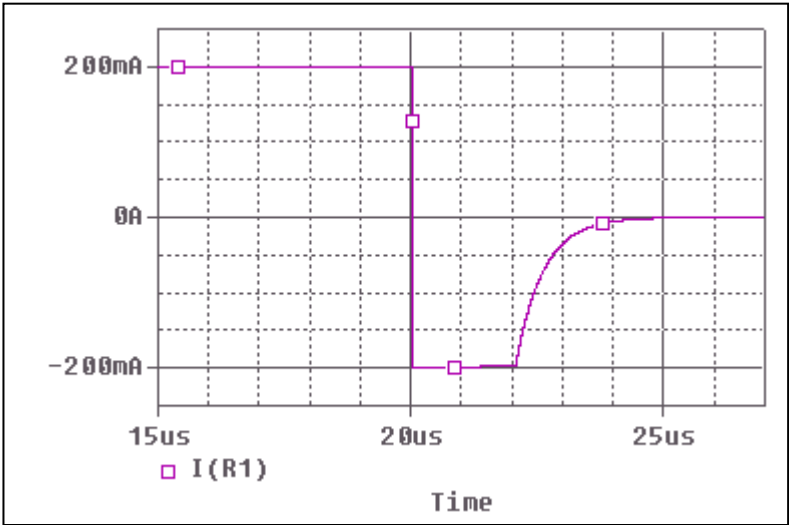


Simulation Result

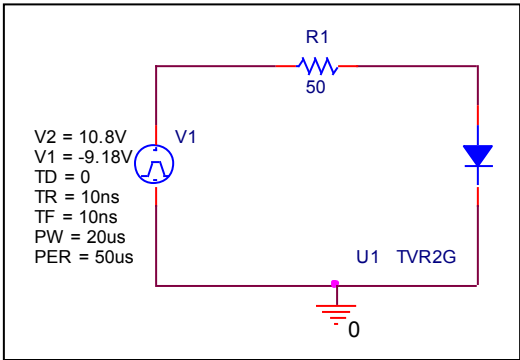
V_{rev} (V)	C_j (pF) Measurement	C_j (pF) Simulation	%Error
0	50.495	50.495	0.000
0.1	46.835	46.339	1.059
0.2	44.109	44.330	-0.501
0.5	38.096	38.170	-0.194
1	32.505	32.411	0.289
2	26.642	26.652	-0.038
5	19.664	19.371	1.490
10	15.185	14.953	1.528
20	11.482	11.415	0.584
50	7.723	7.941	-2.825
100	5.640	5.902	-4.637

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

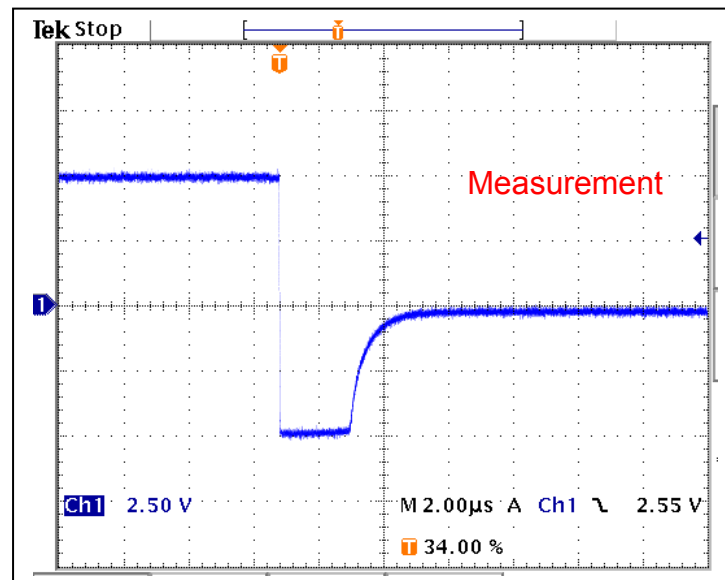


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trj	2.04	us	2.06	us	0.98
trb	1.20	us	1.21	us	0.83

Reverse Recovery Characteristic

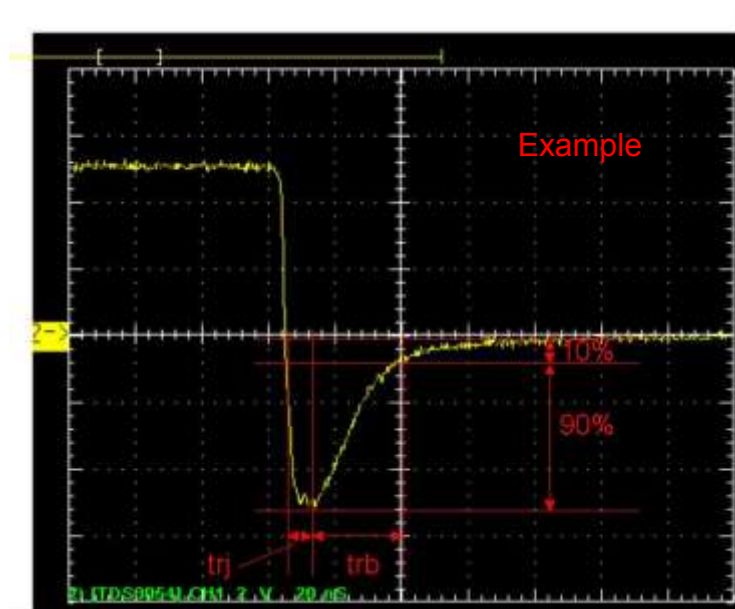
Reference



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

$T_{rb} = 1.20(\mu s)$

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



Relation between t_{rj} and t_{rb}