

Device Modeling Report

COMPONENTS:

DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL

PART NUMBER: S5688J

MANUFACTURER: TOSHIBA

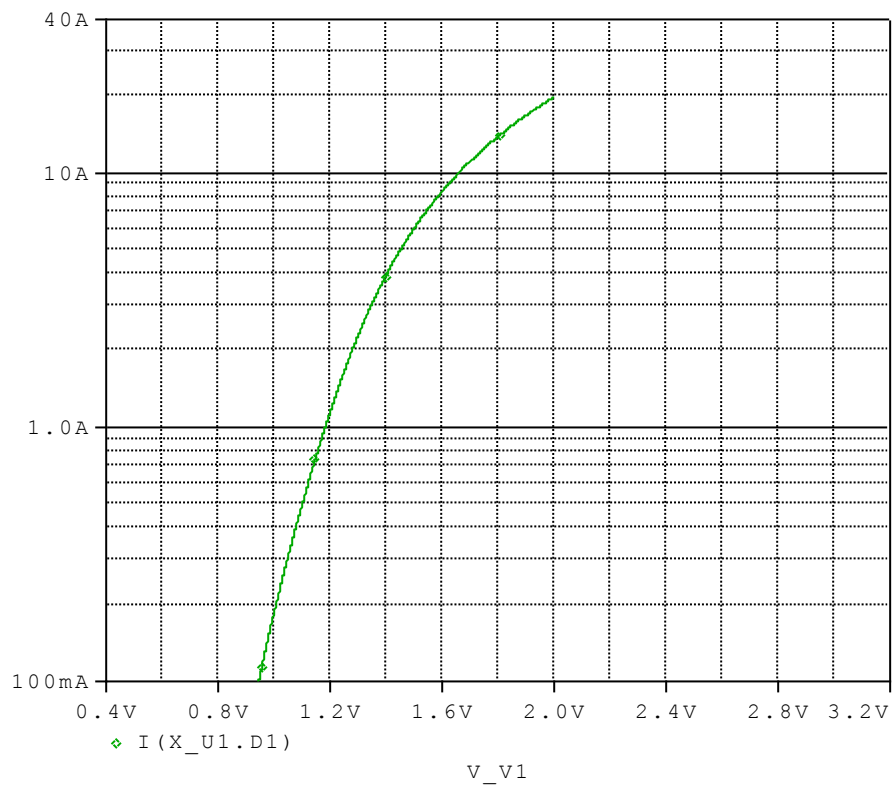


Bee Technologies Inc.

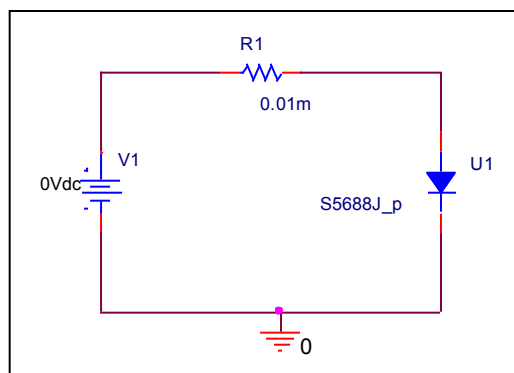
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

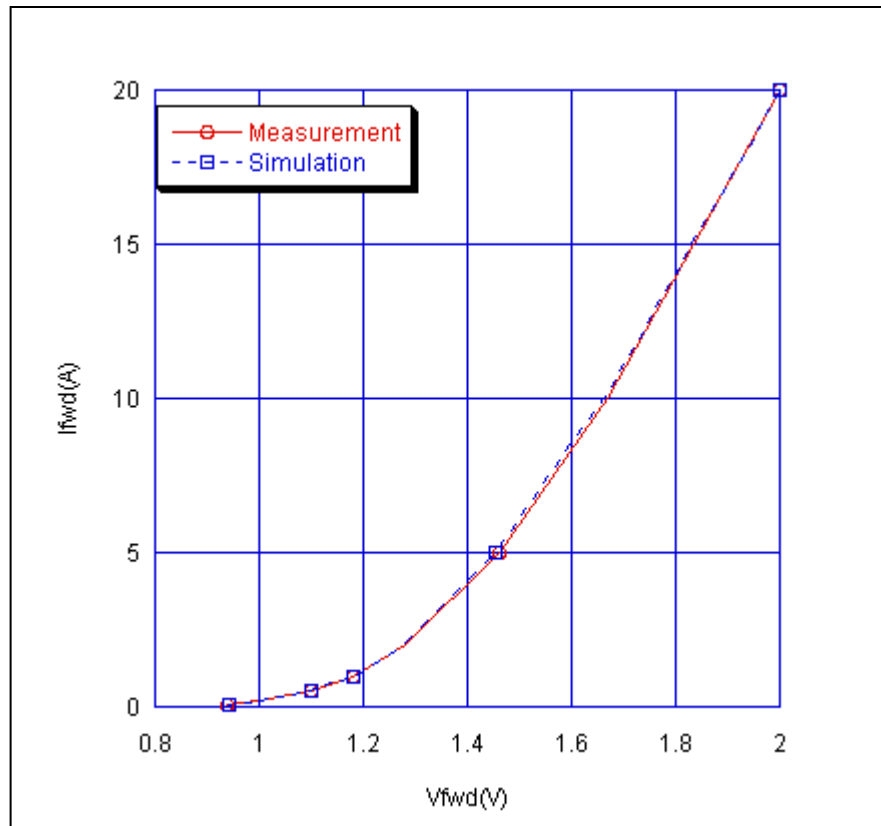


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

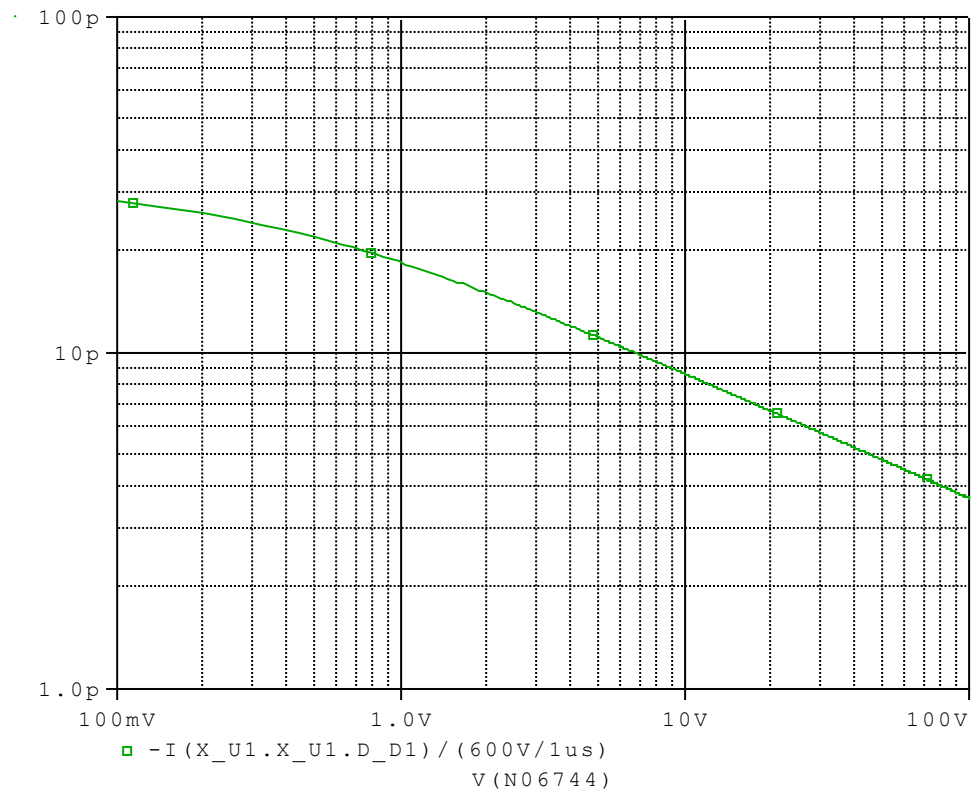


Simulation Result

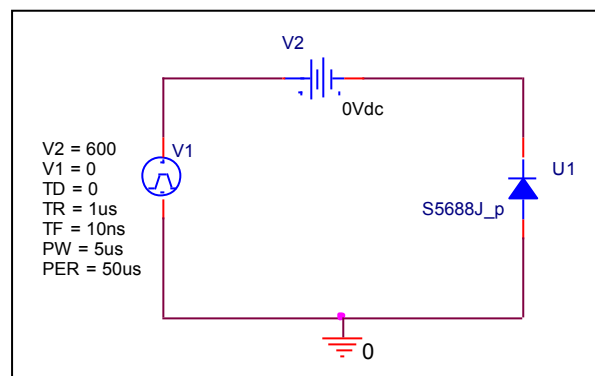
Ifwd(A)	Vfwd(V)		%Error
	Measurement	Simulation	
0.1	0.940	0.944	-0.426
0.2	1.000	1.000	0.000
0.5	1.100	1.100	0.000
1	1.180	1.180	0.000
2	1.280	1.278	0.156
5	1.460	1.455	0.342
10	1.670	1.661	0.539
20	2.000	1.990	0.500

Capacitance Characteristic

Circuit Simulation Result

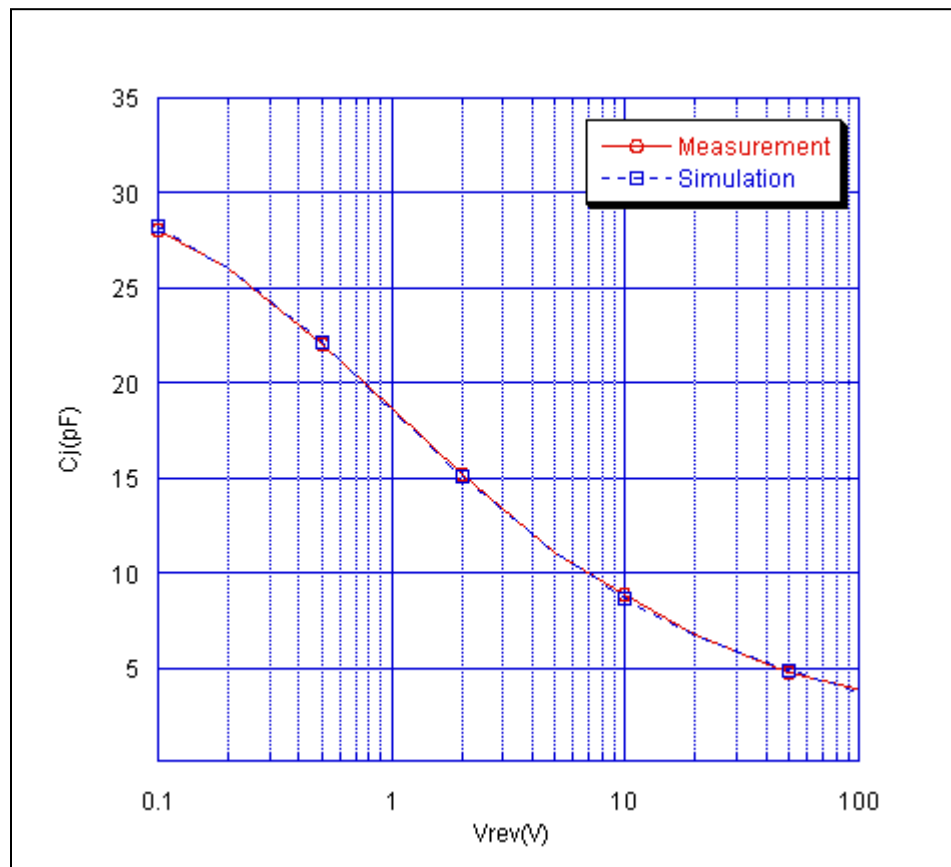


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

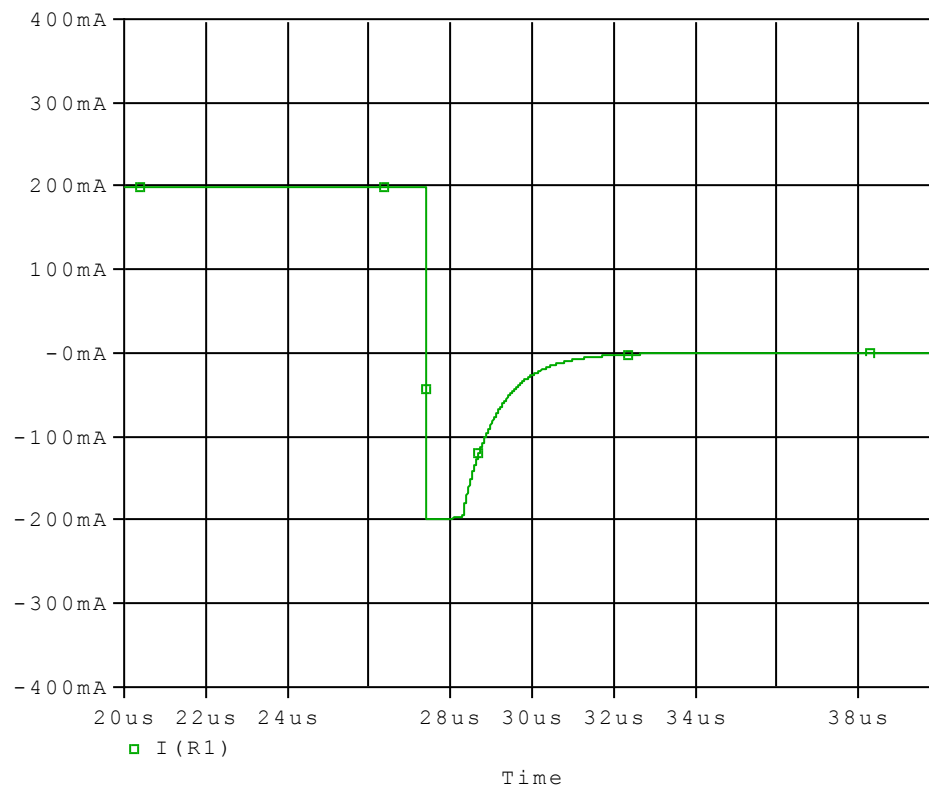


Simulation Result

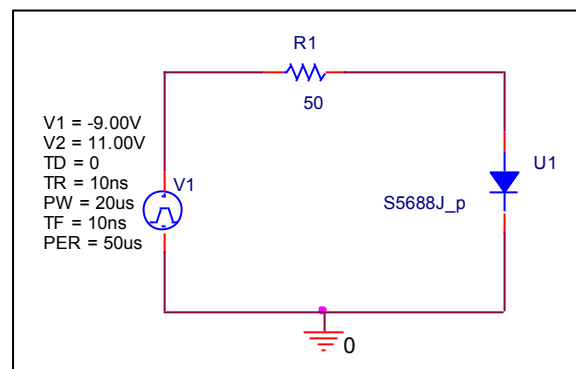
Vrev(V)	Cj(pF)		%Error
	Measurement	Simulation	
0	31.160	31.160	0.000
0.1	28.066	28.244	-0.634
0.2	26.000	26.093	-0.358
0.5	22.000	22.148	-0.673
1	18.617	18.560	0.306
2	15.188	15.115	0.481
5	11.031	11.086	-0.499
10	8.815	8.660	1.758
20	6.730	6.721	0.134
50	4.796	4.799	-0.063
100	3.800	3.720	2.105

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

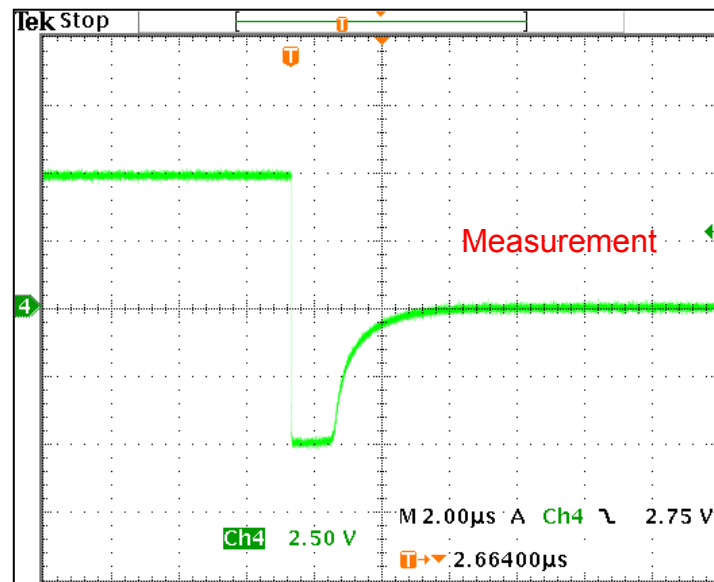


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trj	0.900	us	0.908	us	0.889
trb	1.800	us	1.870	us	3.889

Reverse Recovery Characteristic

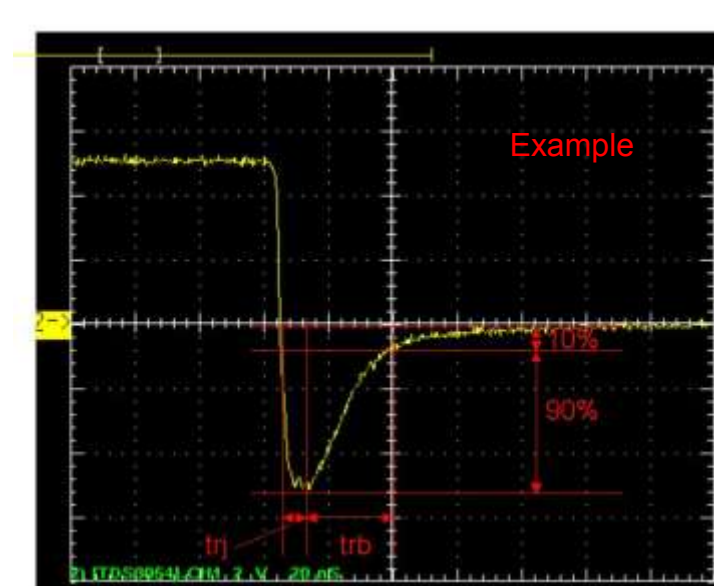
Reference



$T_{rj} = 0.9(\mu s)$

$T_{rb} = 1.8(\mu s)$

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



Relation between t_{rj} and t_{rb}