

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ STANDARD
PART NUMBER: 10DL2CZ47A
MANUFACTURER: TOSHIBA

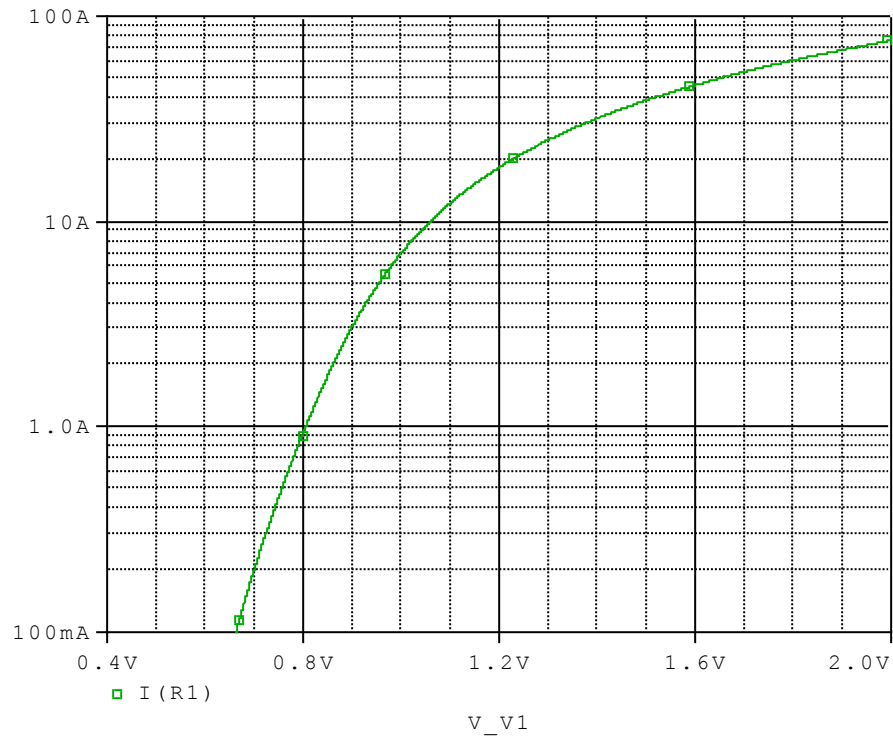


Bee Technologies Inc.

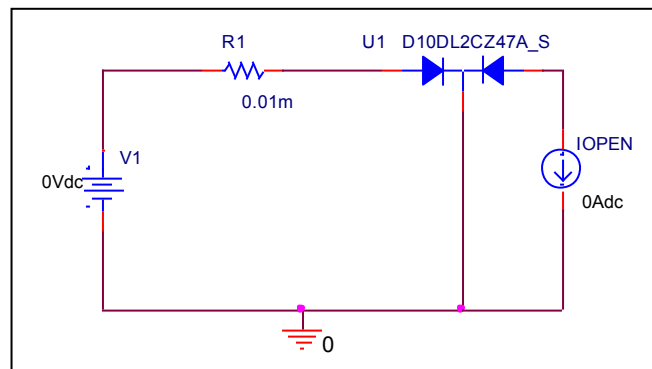
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

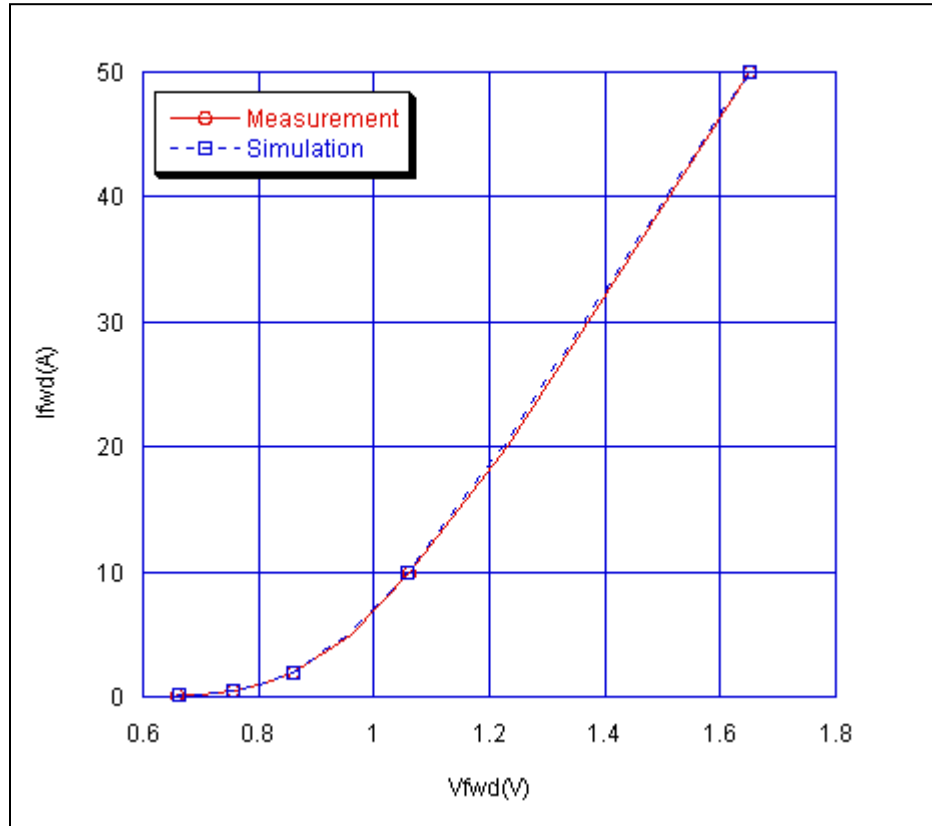


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

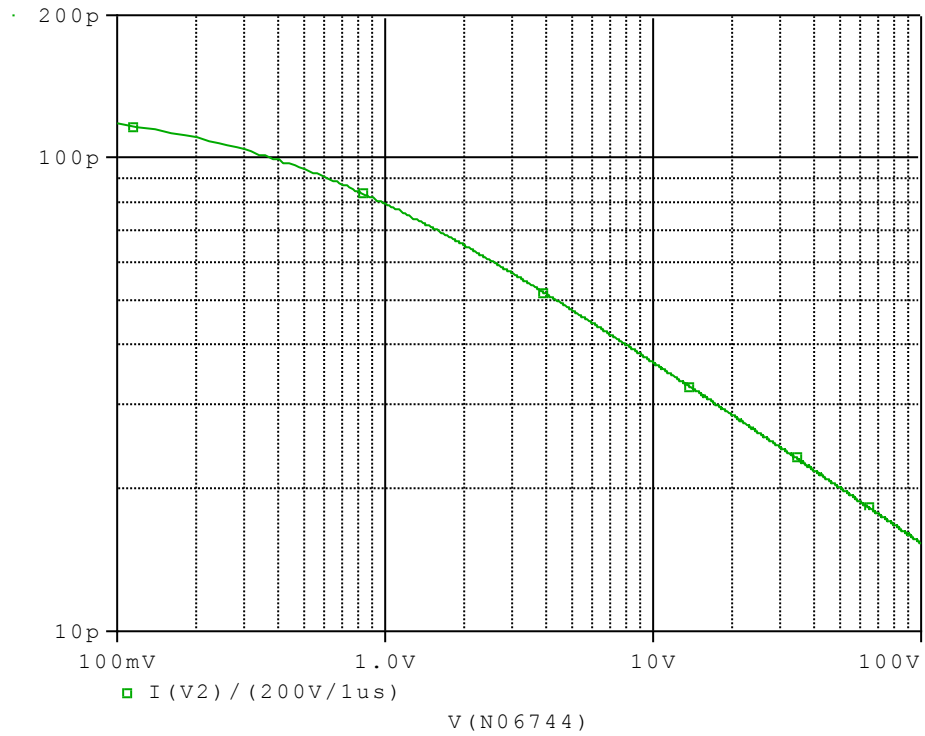


Simulation Result

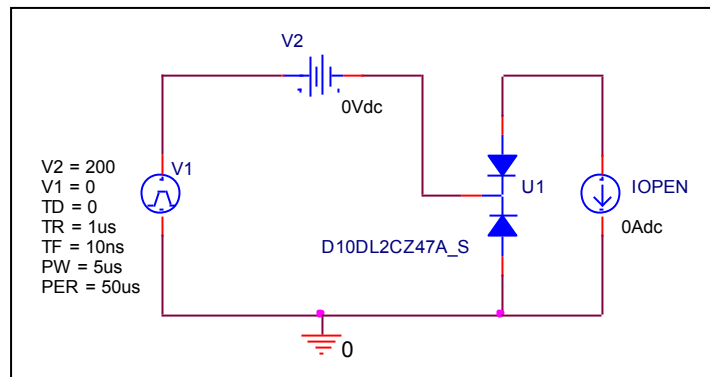
Ifwd(A)	Vfwd(V)		%Error
	Measurement	Simulation	
0.1	0.660	0.663	-0.455
0.2	0.700	0.699	0.143
0.5	0.755	0.756	-0.132
1	0.800	0.805	-0.625
2	0.860	0.858	0.233
5	0.960	0.954	0.625
10	1.060	1.059	0.094
20	1.230	1.226	0.325
50	1.650	1.652	-0.121

Capacitance Characteristic

Circuit Simulation Result

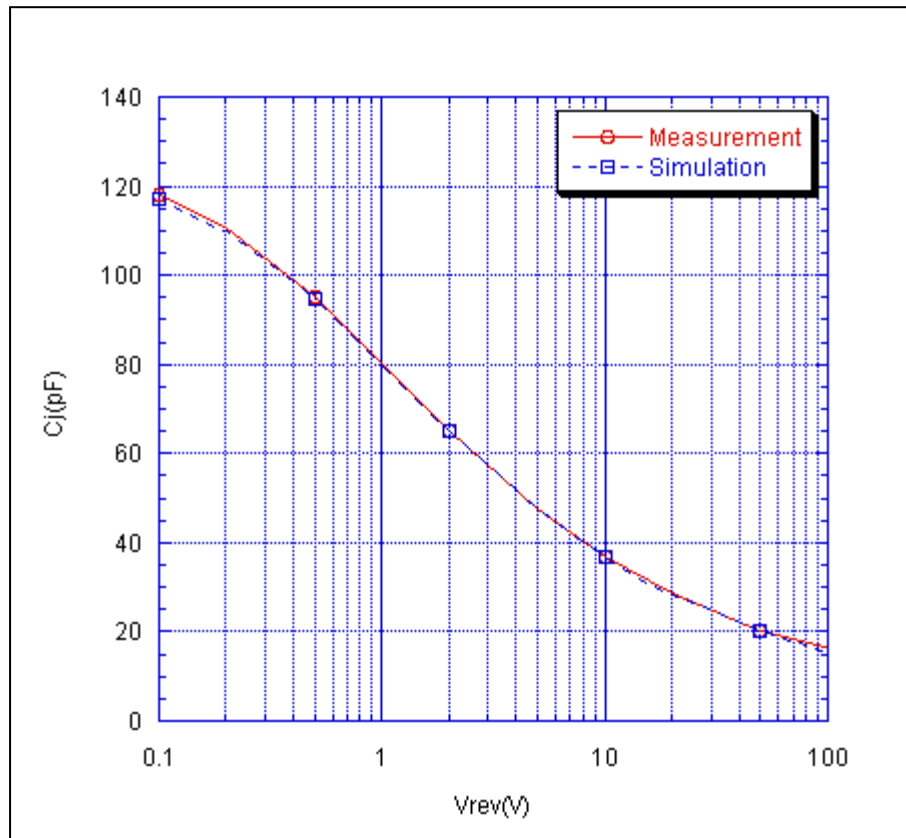


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

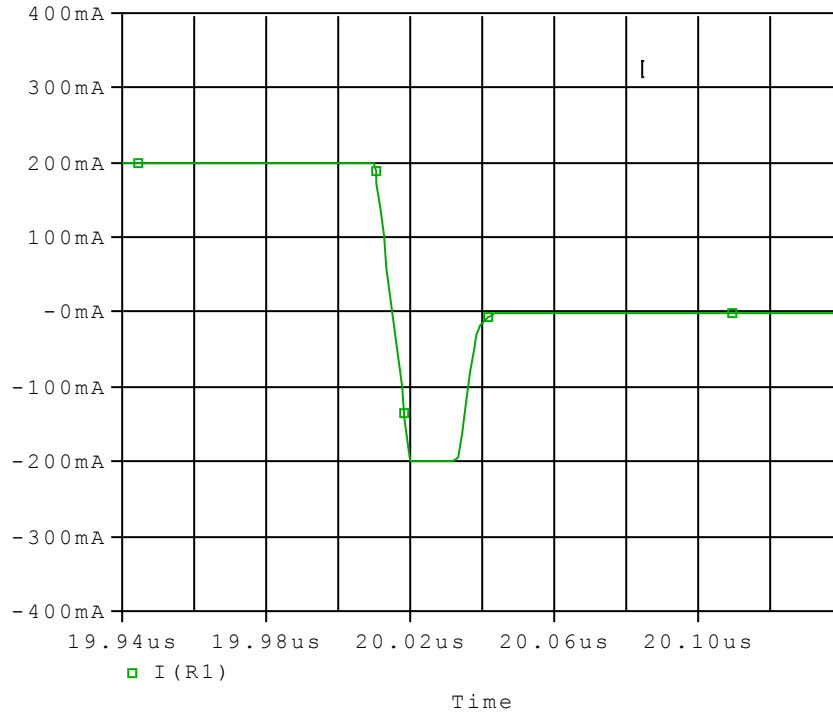


Simulation Result

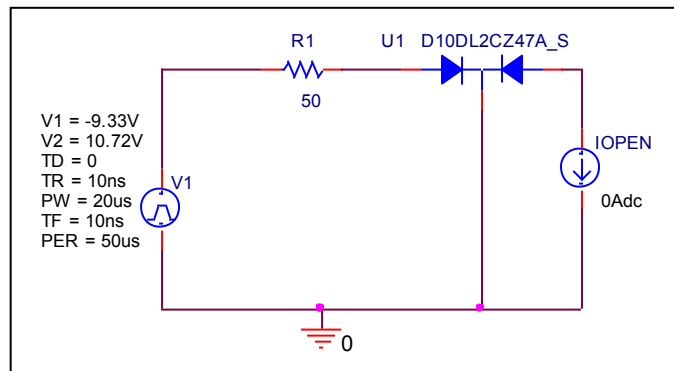
Vrev(V)	Cj(pF)		%Error
	Measurement	Simulation	
0	127.130	127.130	0.000
0.1	118.000	117.116	0.749
0.2	110.800	109.963	0.755
0.5	94.950	94.570	0.400
1	80.530	79.899	0.784
2	65.250	64.988	0.402
5	47.620	47.583	0.078
10	36.910	36.940	-0.081
20	28.567	28.497	0.245
50	20.055	20.060	-0.025
100	16.081	15.336	4.633

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

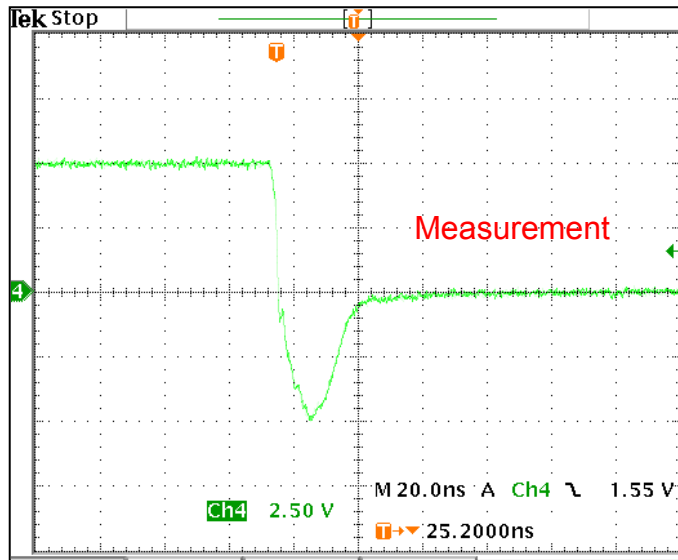


Compare Measurement vs. Simulation

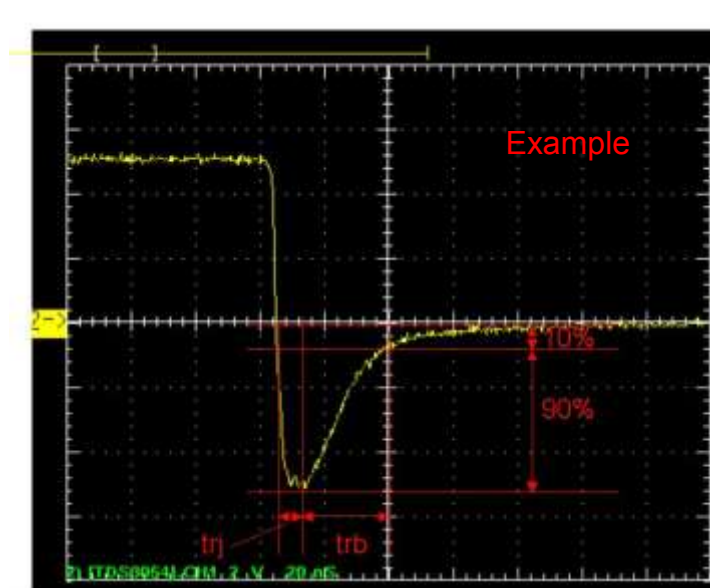
	Measurement		Simulation		%Error
trr	24.00	ns	23.84	ns	0.667

Reverse Recovery Characteristic

Reference



$Trj = 9.6(ns)$
 $Trb = 14.4(ns)$
Conditions: $I_{fwd} = I_{rev} = 0.2(A)$, $R_I = 50$



Relation between trj and trb