

Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER/ PROFESSIONAL
PART NUMBER: 20DL2C48A
MANUFACTURER: TOSHIBA

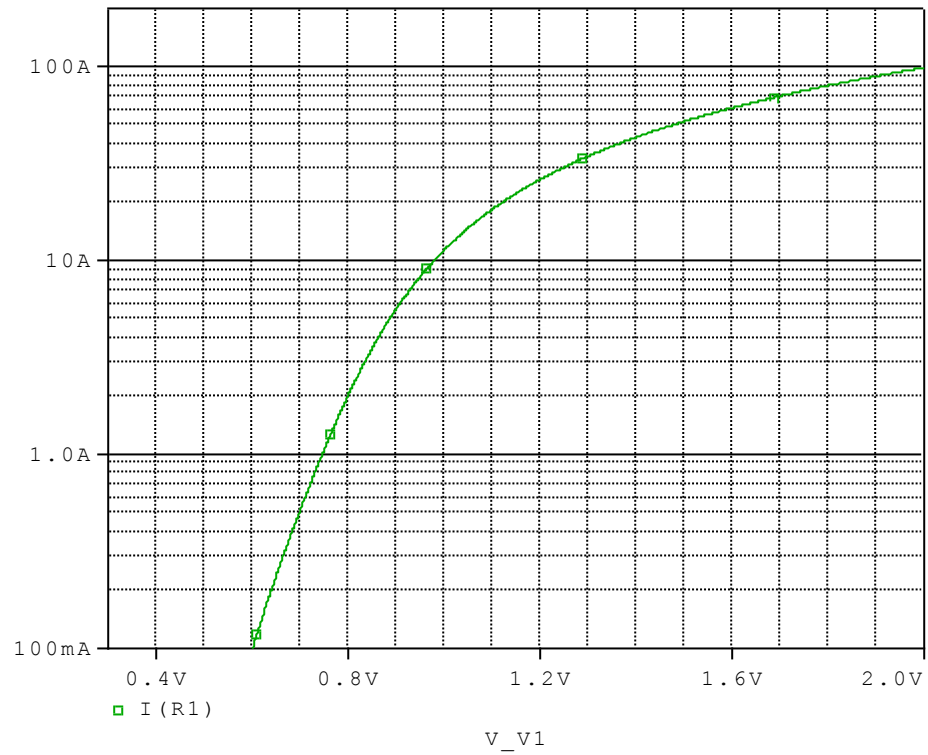


Bee Technologies Inc.

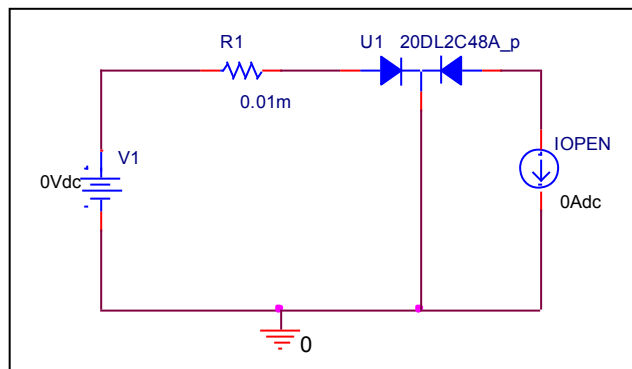
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

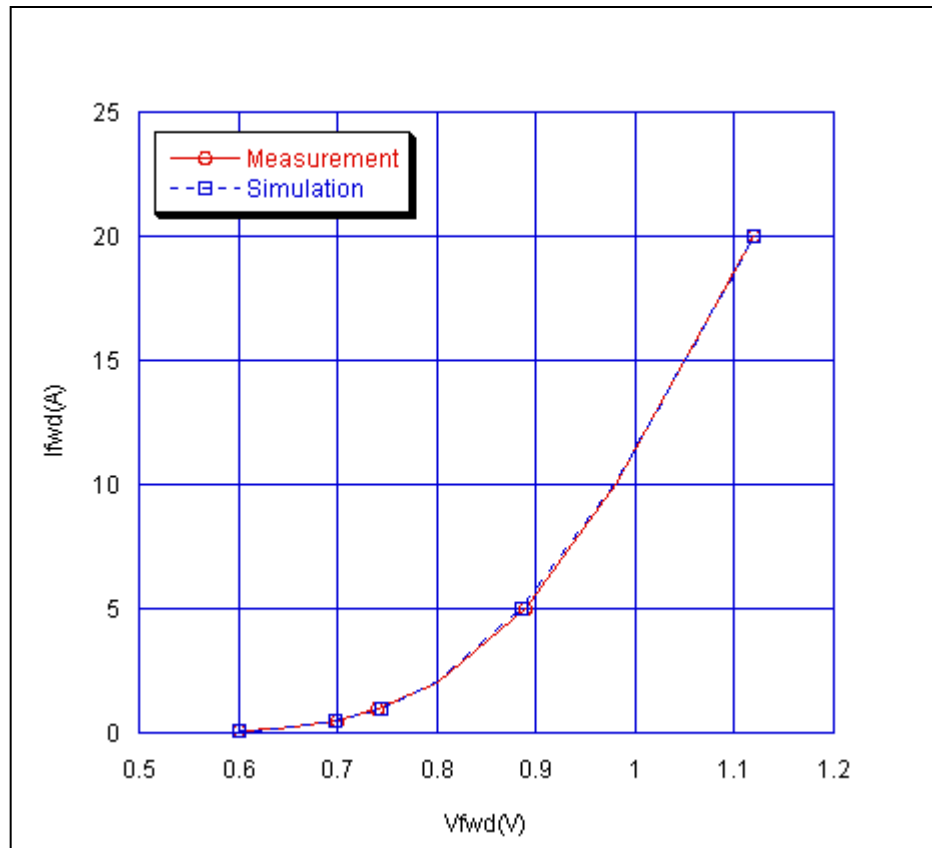


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

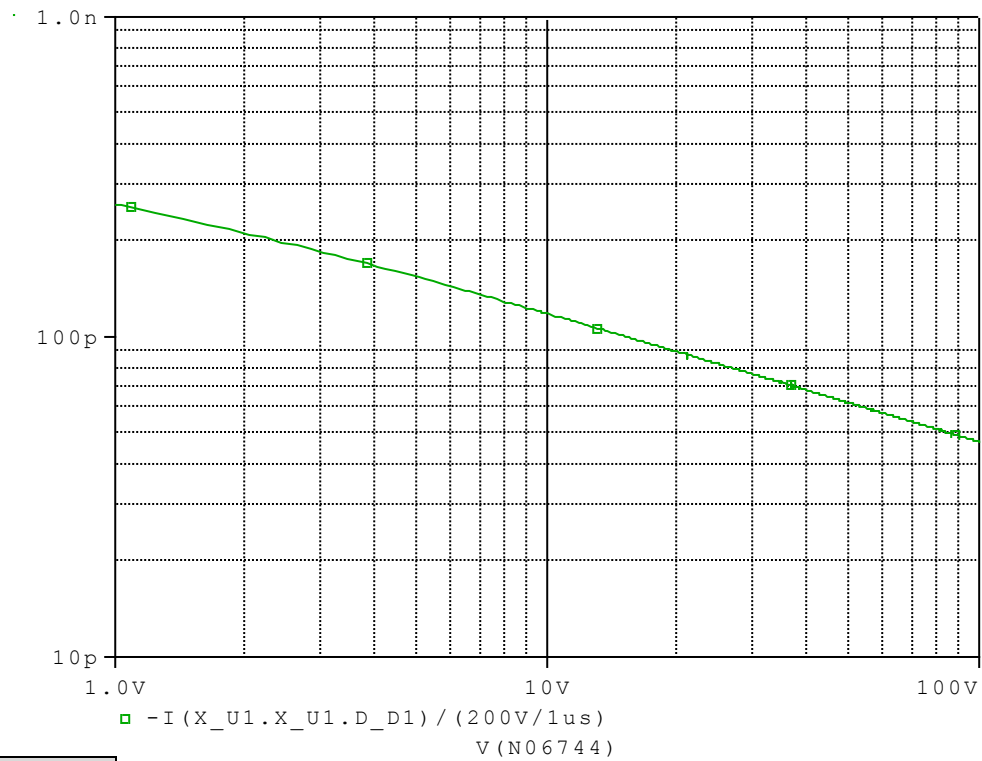


Simulation Result

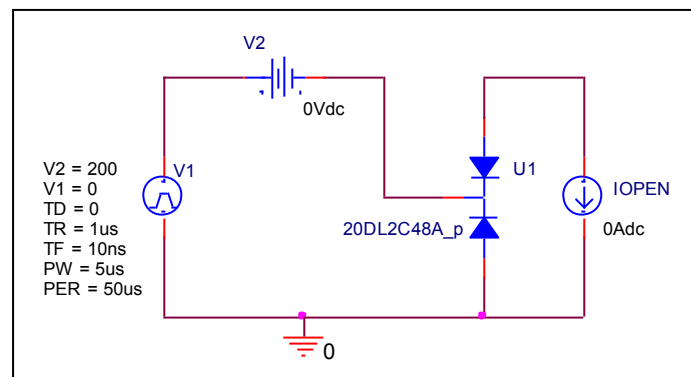
Ifwd(A)	Vfwd(V)		%Error
	Measurement	Simulation	
0.1	0.600	0.601	-0.167
0.2	0.640	0.639	0.156
0.5	0.700	0.698	0.286
1	0.740	0.745	-0.676
2	0.800	0.799	0.125
5	0.890	0.886	0.449
10	0.980	0.979	0.102
20	1.120	1.117	0.268

Capacitance Characteristic

Circuit Simulation Result

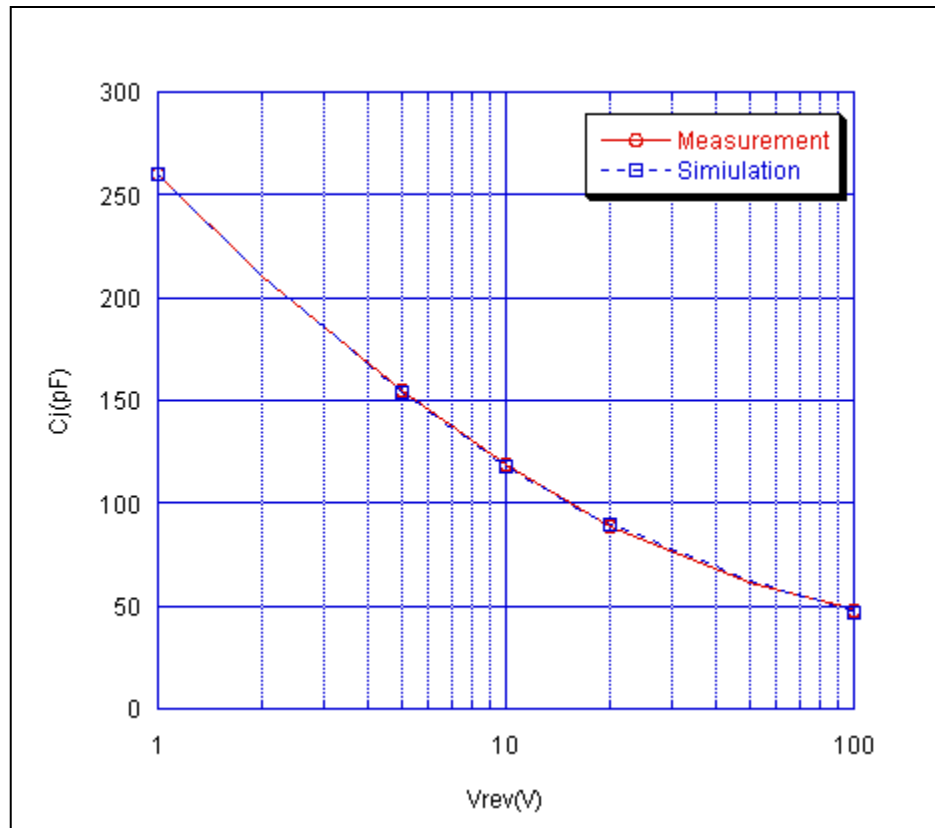


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

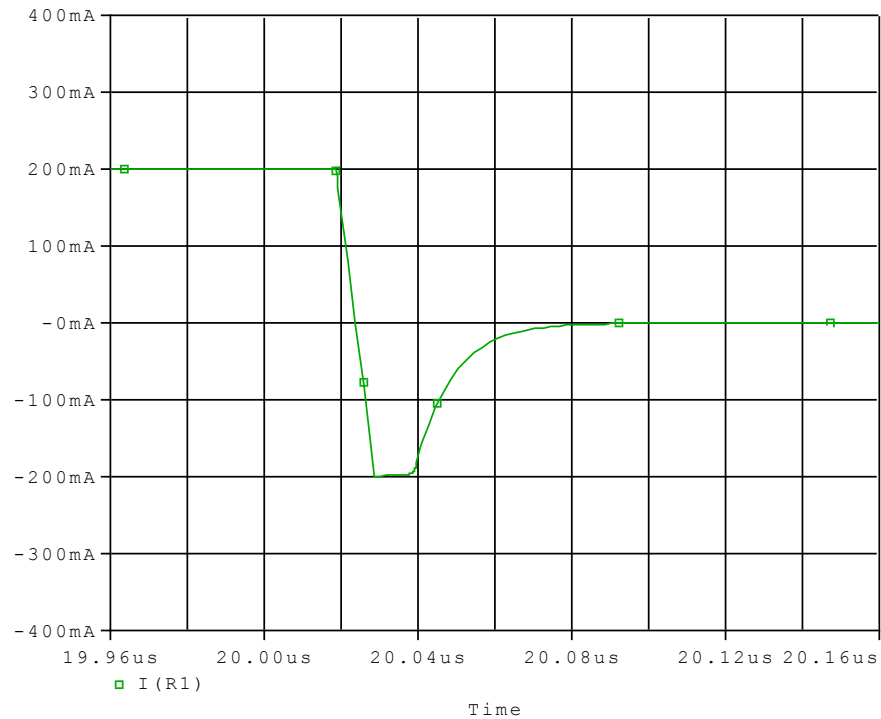


Simulation Result

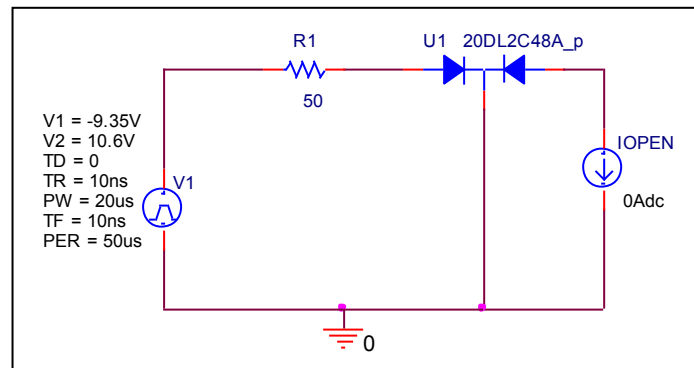
Vrev(V)	Cj(pF)		%Error
	Measurement	Simulation	
1	260.000	260.027	-0.010
2	210.000	210.729	-0.347
5	155.000	153.655	0.868
10	119.000	118.148	0.716
20	89.000	90.000	-1.124
50	61.000	62.271	-2.084
100	48.000	47.000	2.083

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

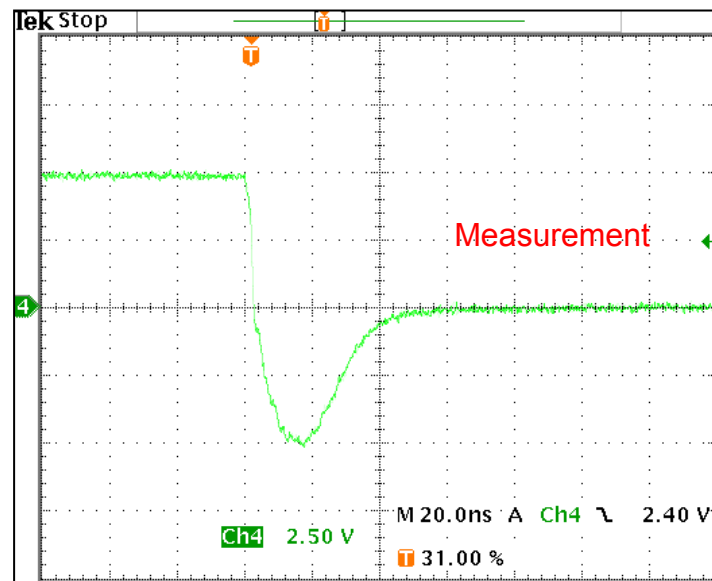


Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trj	14.800	ns	14.700	ns	- 0.676
trb	22.000	ns	21.880	ns	0.454

Reverse Recovery Characteristic

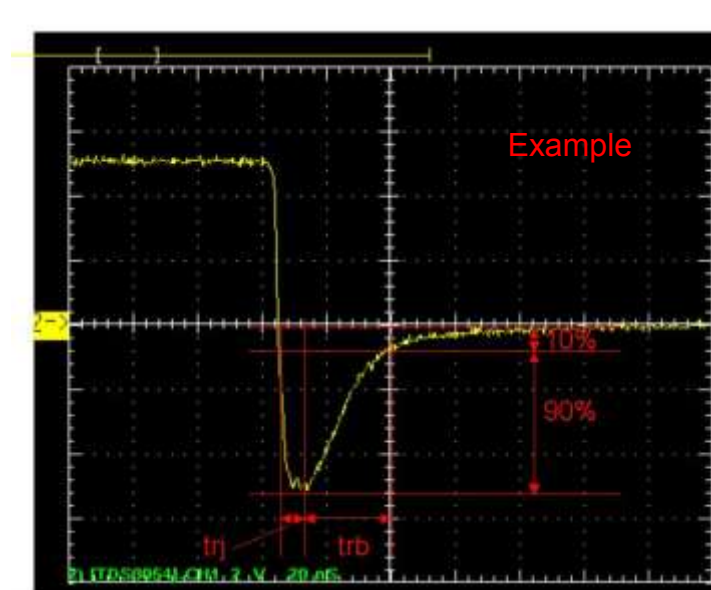
Reference



$T_{rj} = 14.8(\text{ns})$

$T_{rb} = 22(\text{ns})$

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



Relation between t_{rj} and t_{rb}