

# Device Modeling Report

COMPONENTS:  
DIODE/ GENERAL PURPOSE RECTIFIER/ STANDARD  
PART NUMBER: 10DL2C41A  
MANUFACTURER: TOSHIBA

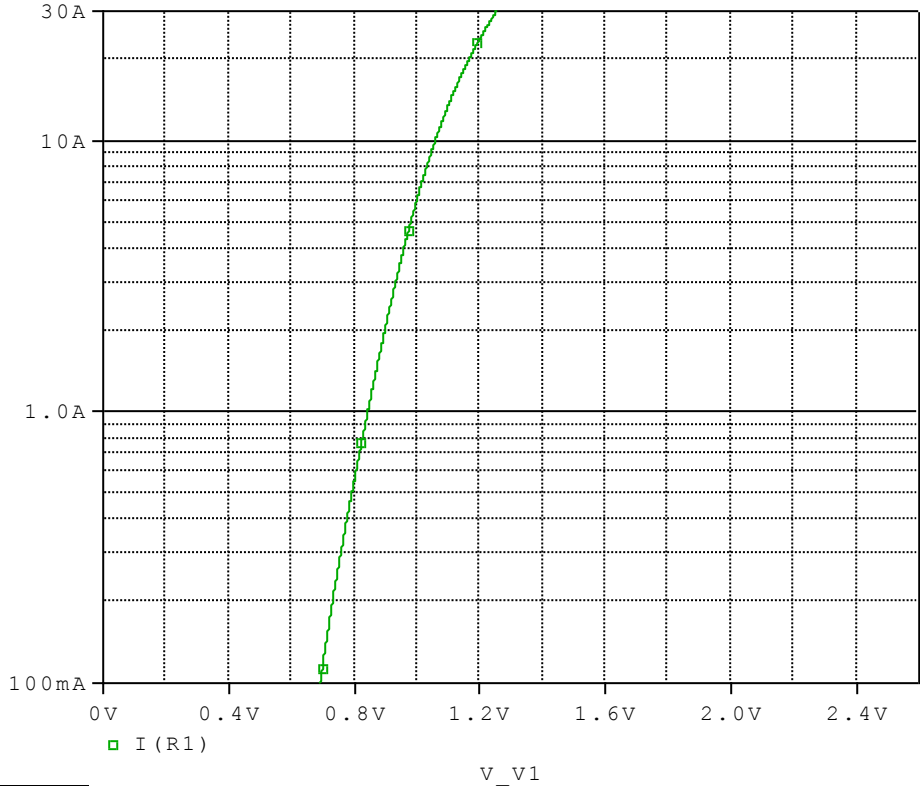


**Bee Technologies Inc.**

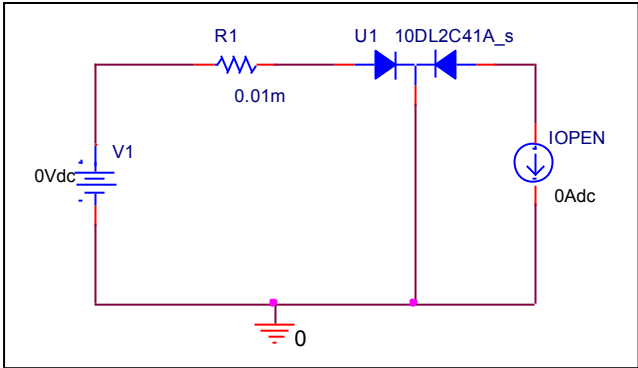
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

# Forward Current Characteristic

## Circuit Simulation Result

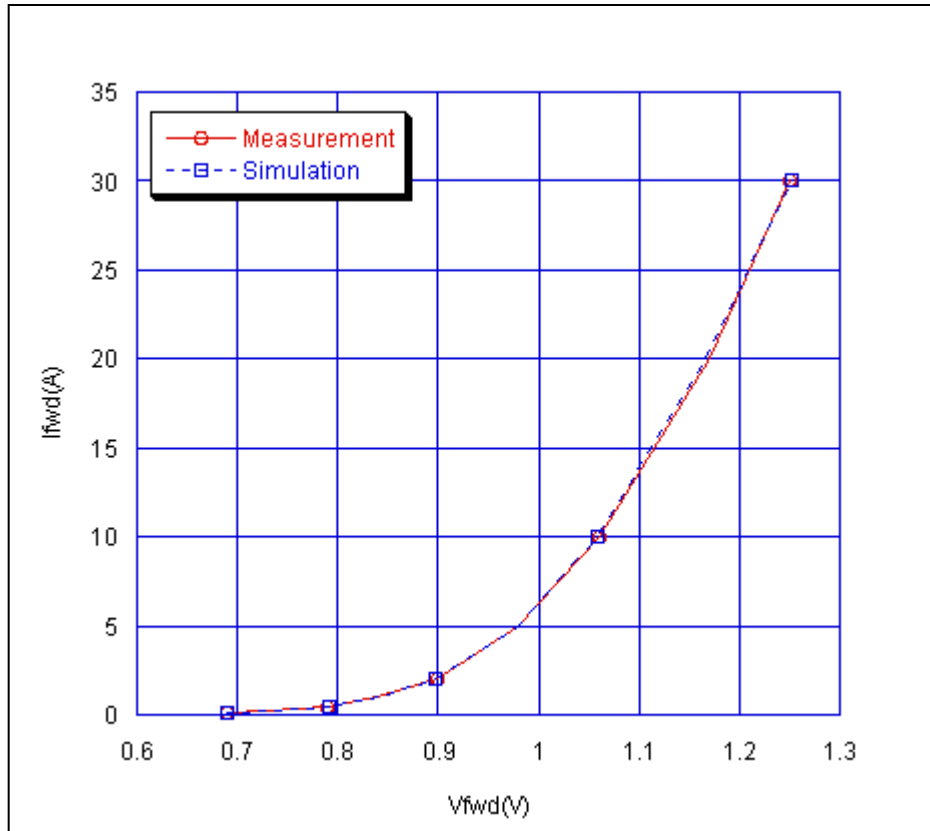


## Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

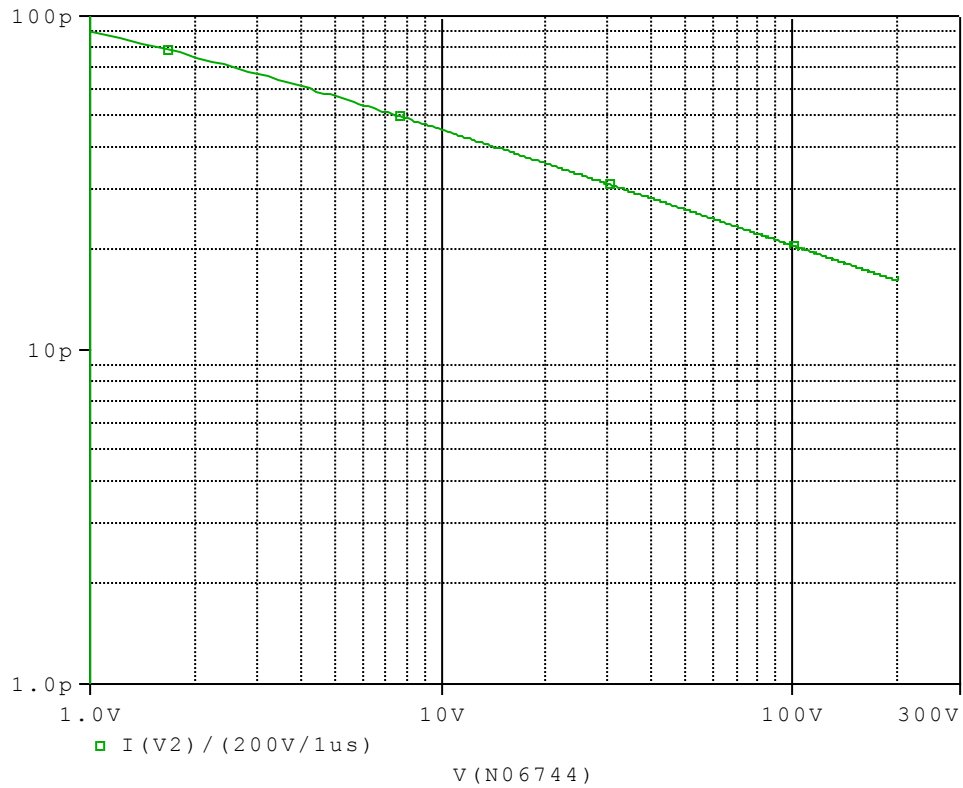


### Simulation Result

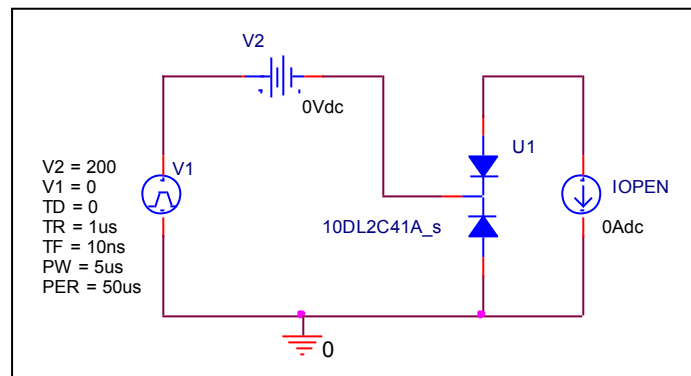
Ifwd(A)	Vfwd(V)		%Error
	Measurement	Simulation	
0.1	0.690	0.690	0.000
0.2	0.730	0.731	-0.137
0.5	0.790	0.792	-0.253
1	0.840	0.844	-0.476
2	0.900	0.898	0.222
5	0.980	0.980	0.000
10	1.060	1.058	0.189
20	1.170	1.166	0.342
30	1.250	1.253	-0.240

# Capacitance Characteristic

## Circuit Simulation Result

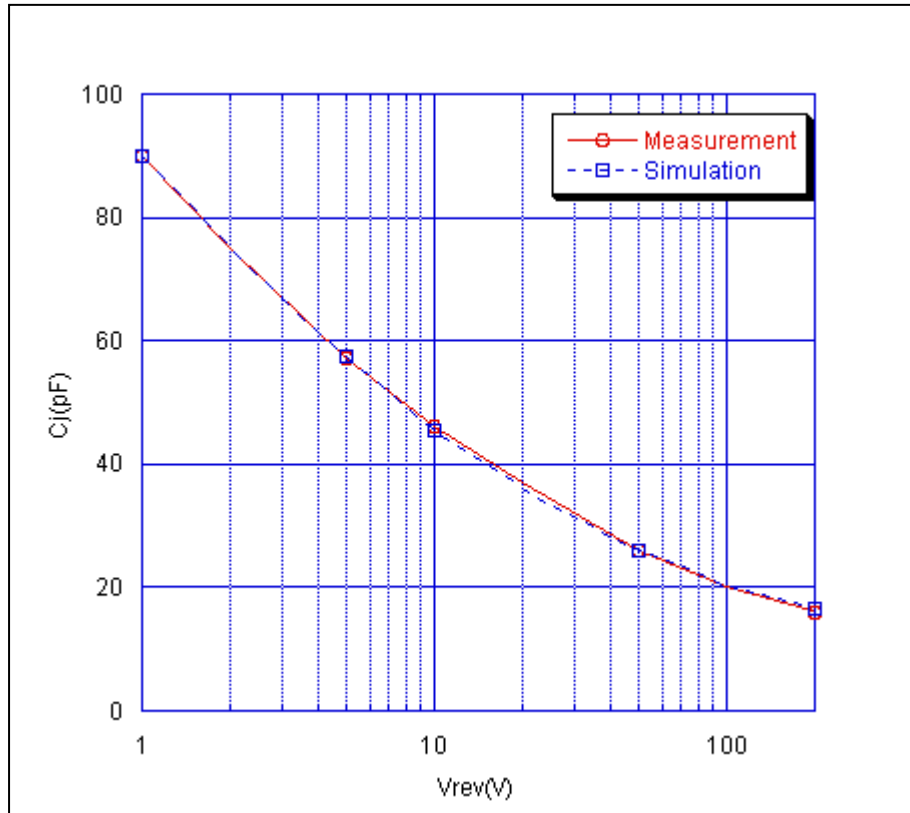


## Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

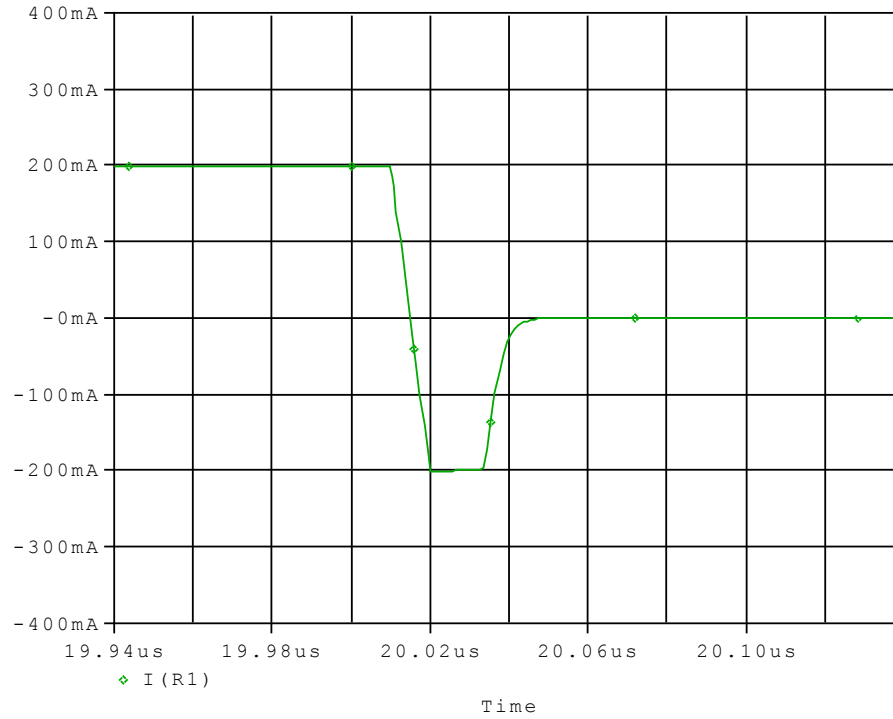


### Simulation Result

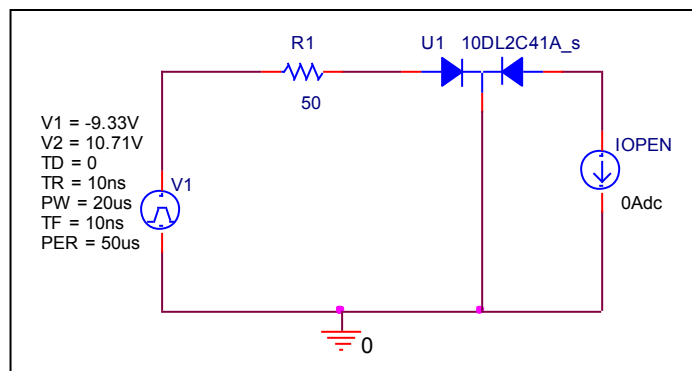
Vrev(V)	Cj(pF)		%Error
	Measurement	Simulation	
1	90.000	90.000	0.000
2	75.000	74.866	0.179
5	57.000	57.417	-0.732
10	46.000	45.613	0.841
20	37.000	36.149	2.300
50	26.000	26.123	-0.473
100	20.000	20.261	-1.305
200	16.000	16.716	-4.475

# Reverse Recovery Characteristic

## Circuit Simulation Result



## Evaluation Circuit

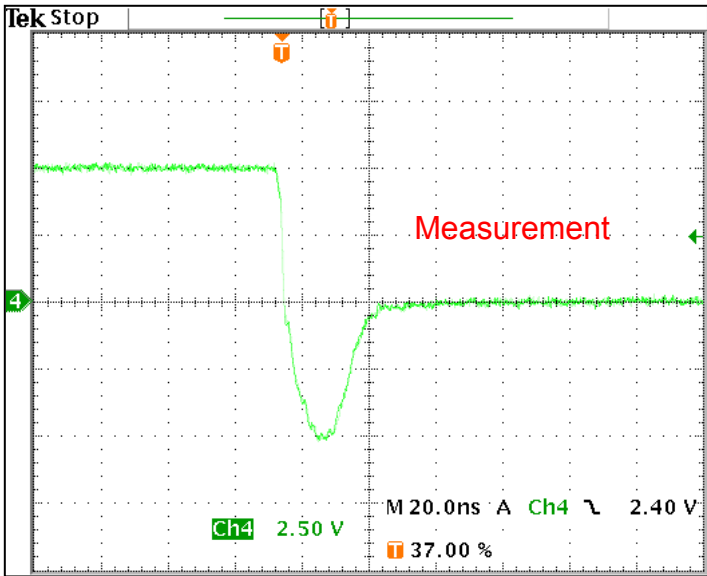


## Compare Measurement vs. Simulation

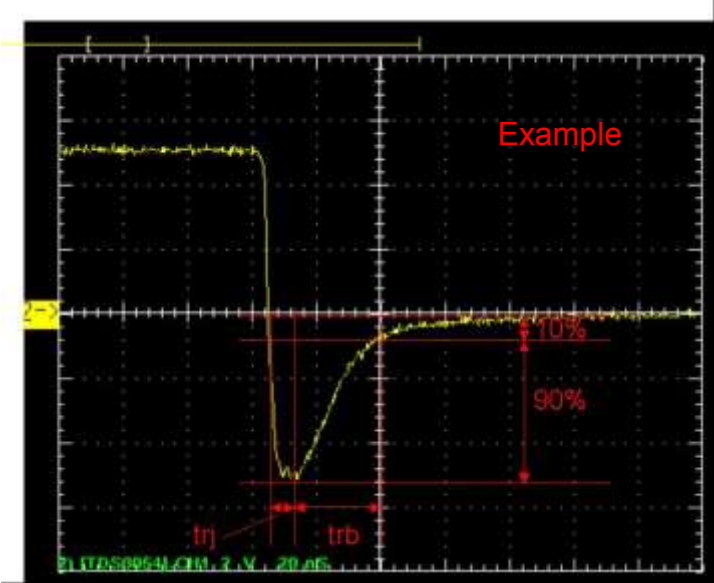
	Measurement		Simulation		%Error
trr	25.200	ns	25.230	ns	0.119

# Reverse Recovery Characteristic

# Reference



$Trj = 12.4(ns)$   
 $Trb = 12.8(ns)$   
Conditions:  $I_{fwd} = I_{rev} = 0.2(A)$ ,  $RI = 50$



Relation between  $trj$  and  $trb$