

# Device Modeling Report

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

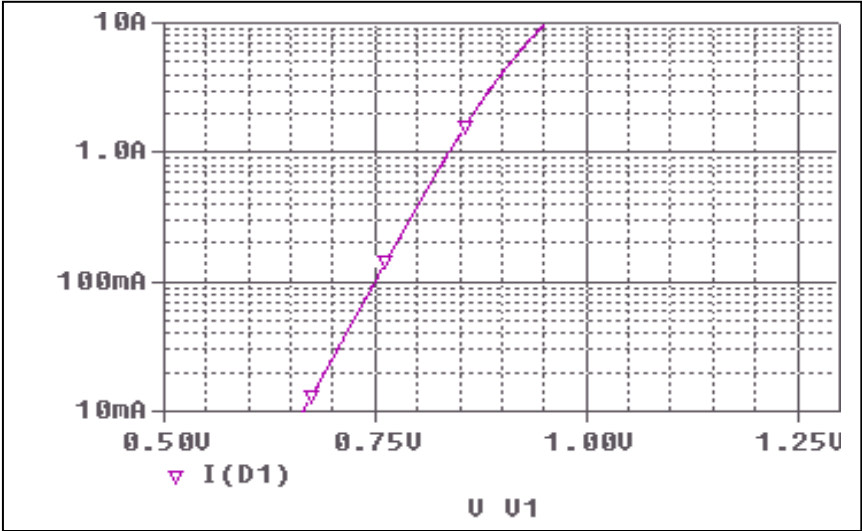


**Bee Technologies Inc.**

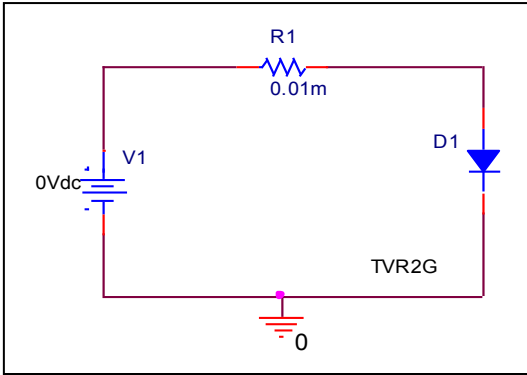
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

# Forward Current Characteristic

## Circuit Simulation Result

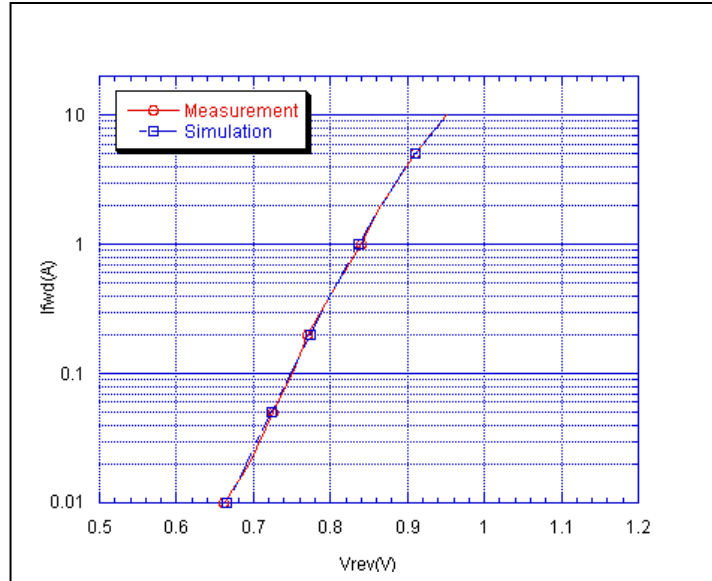


## Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

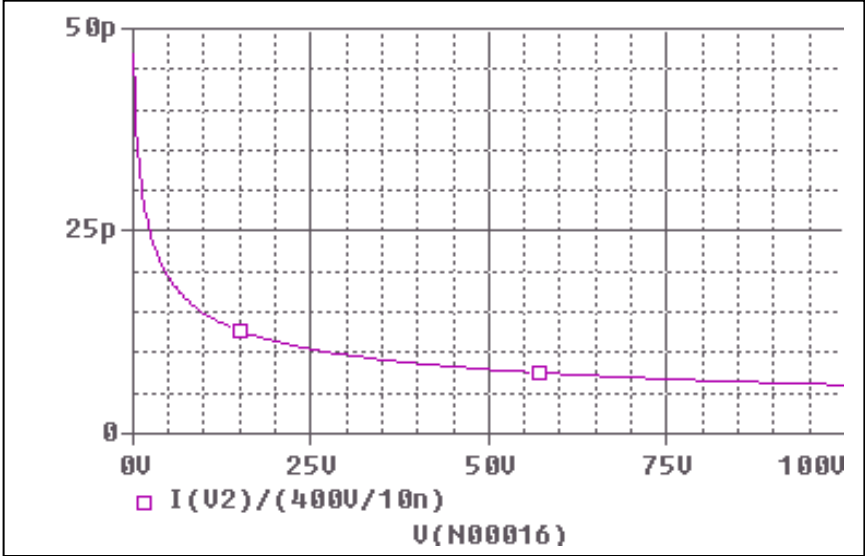


### Simulation Result

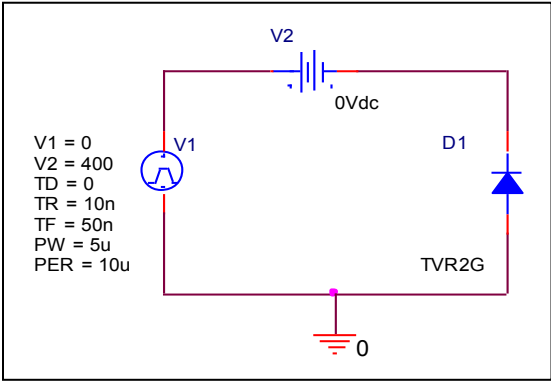
$I_{fwd}$ (A)	$V_{fwd}$ (V) Measurement	$V_{fwd}$ (V) Simulation	%Error
0.01	0.662	0.665	-0.393
0.02	0.694	0.690	0.562
0.05	0.725	0.724	0.166
0.1	0.750	0.749	0.080
0.2	0.770	0.775	-0.675
0.5	0.810	0.810	0.012
1	0.840	0.837	0.310
2	0.866	0.866	-0.035
5	0.910	0.910	-0.033
10	0.952	0.952	0.000

# Junction Capacitance Characteristic

## Circuit Simulation Result

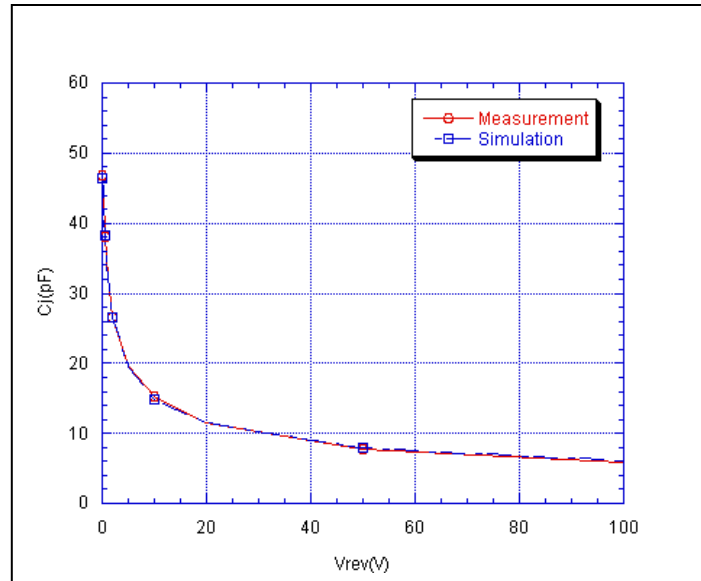


## Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

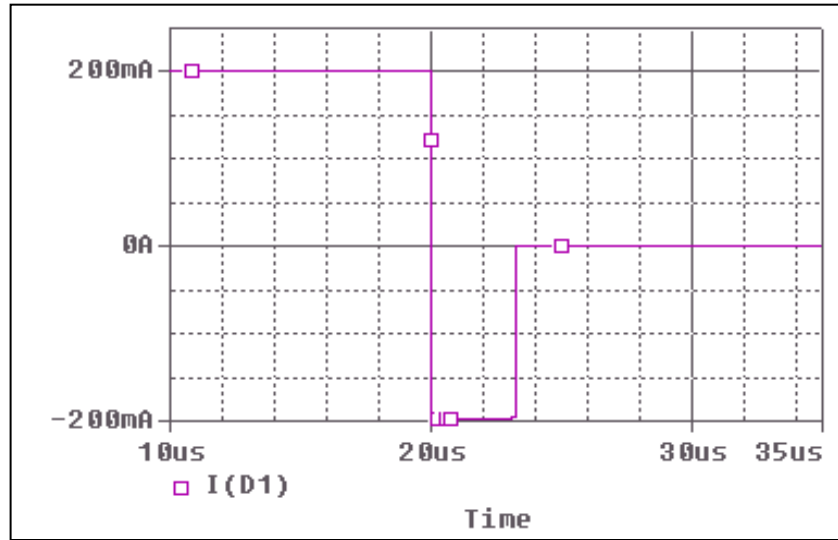


### Simulation Result

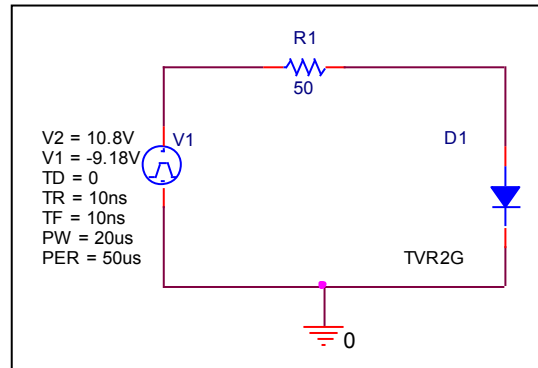
Vrev(V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0	50.495	50.495	0.000
0.1	46.835	46.339	1.059
0.2	44.109	44.330	-0.501
0.5	38.096	38.170	-0.194
1	32.505	32.411	0.289
2	26.642	26.652	-0.038
5	19.664	19.371	1.490
10	15.185	14.953	1.528
20	11.482	11.415	0.584
50	7.723	7.941	-2.825
100	5.640	5.902	-4.637

# Reverse Recovery Characteristic

## Circuit Simulation Result



## Evaluation Circuit

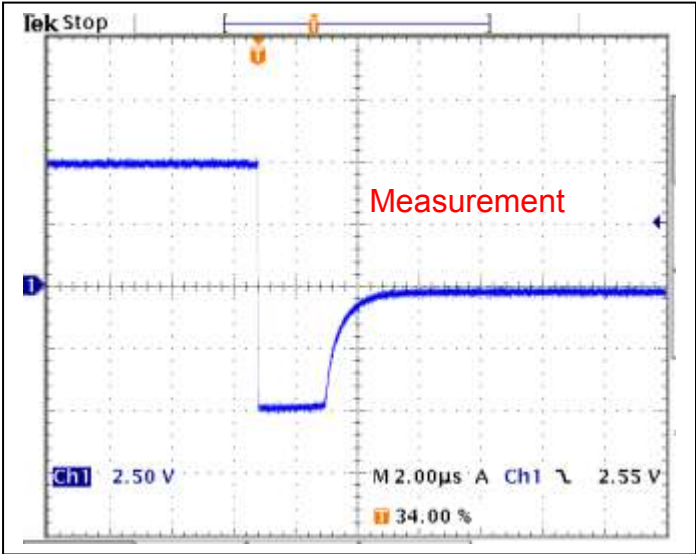


## Compare Measurement vs. Simulation

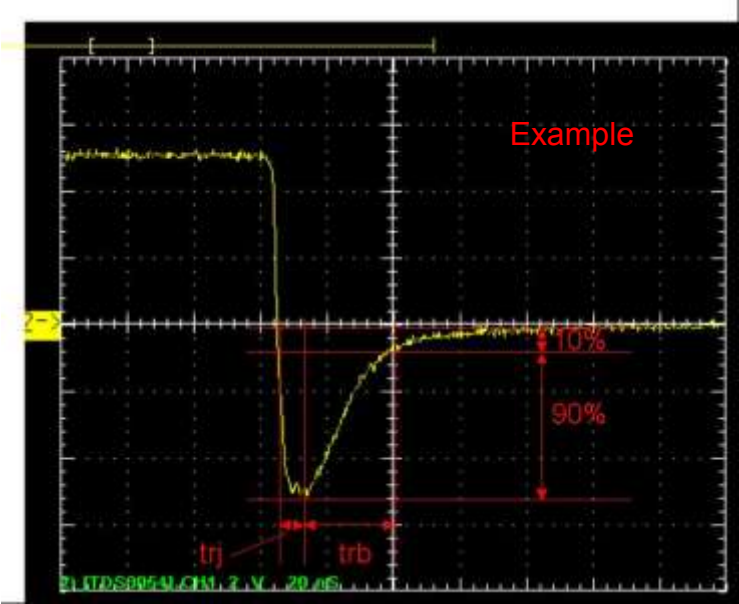
	Measurement		Simulation		%Error
trr	3.240	us	3.241	us	0.046

# Reverse Recovery Characteristic

# Reference



$Trj = 2.04(\mu s)$   
 $Trb = 1.20(\mu s)$   
Conditions:  $I_{fwd} = I_{rev} = 0.2(A)$ ,  $R_I = 50$



Relation between  $trj$  and  $trb$