

# Device Modeling Report

COMPONENTS:  
DIODE/ SCHOTTKY RECTIFIER / STANDARD  
PART NUMBER: 1SS391  
MANUFACTURER: TOSHIBA

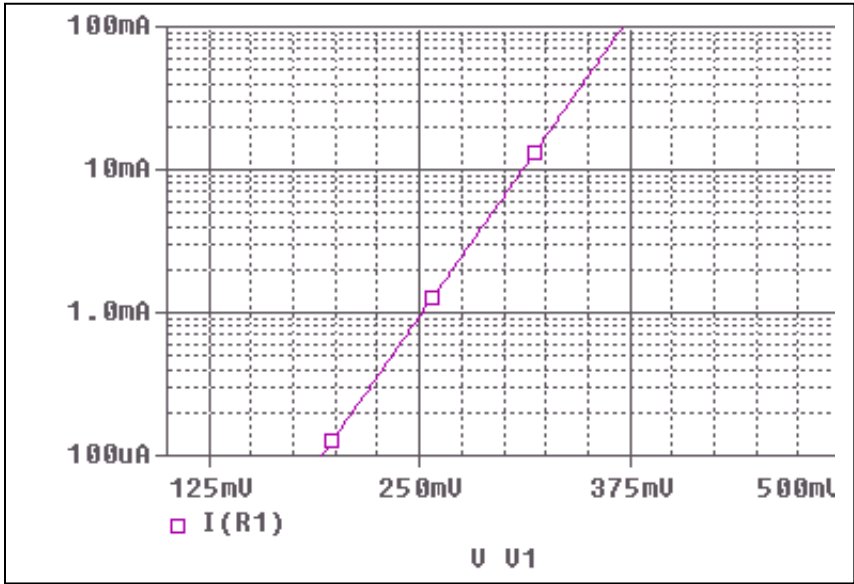


**Bee Technologies Inc.**

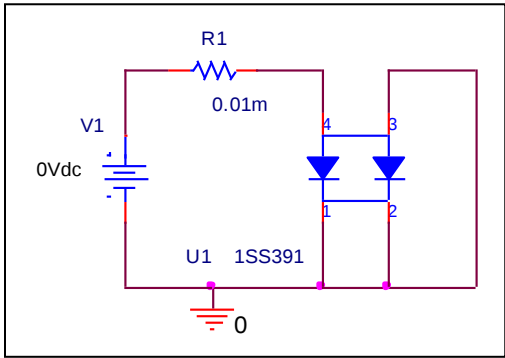
| PSpice model parameter | Model description                           |
|------------------------|---------------------------------------------|
| IS                     | Saturation Current                          |
| N                      | Emission Coefficient                        |
| RS                     | 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

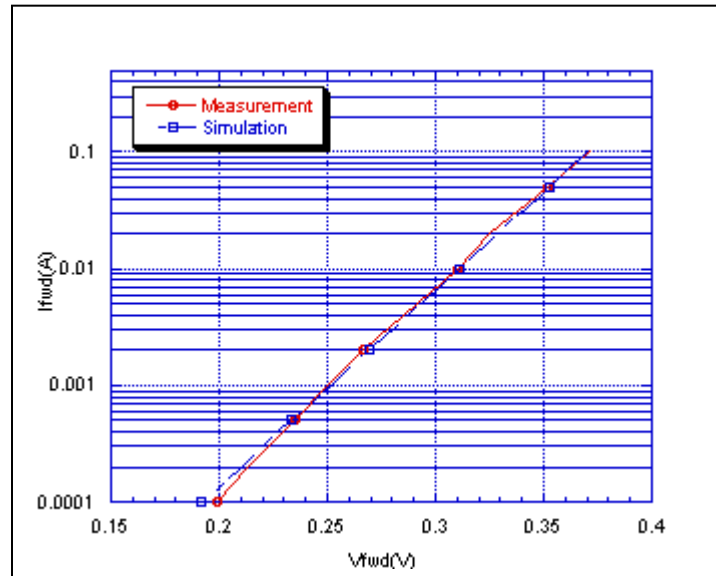


## Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

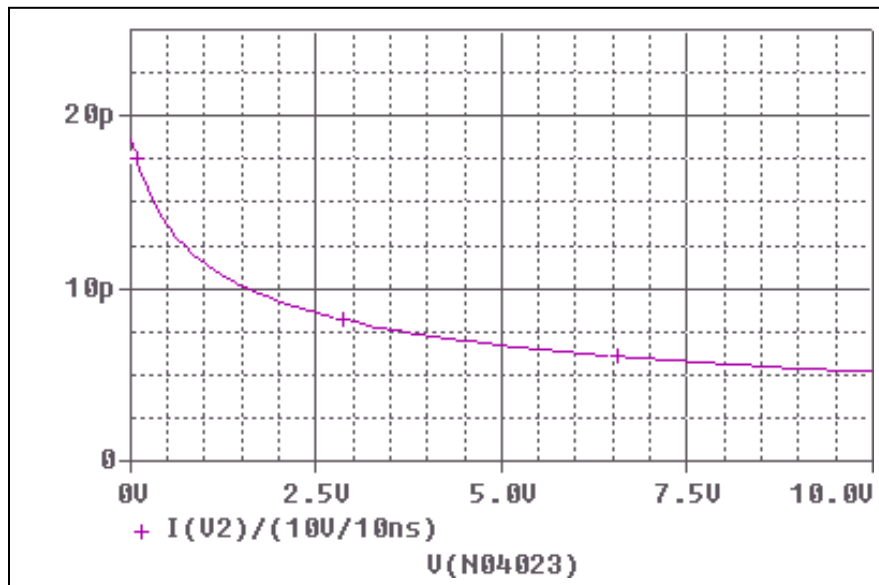


### Simulation Result

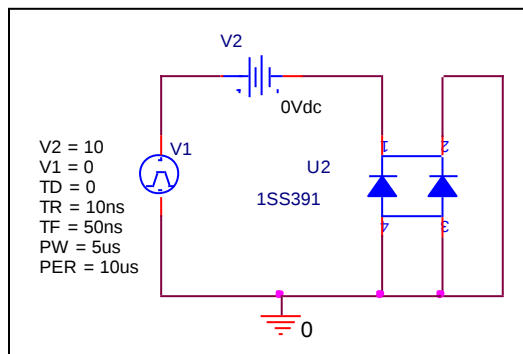
| $I_{fwd}$ (A) | $V_{fwd}$ (V)<br>Measurement | $V_{fwd}$ (V)<br>Simulation | %Error |
|---------------|------------------------------|-----------------------------|--------|
| 0.0001        | 0.199                        | 0.192                       | -3.52  |
| 0.0002        | 0.213                        | 0.210                       | -1.41  |
| 0.0005        | 0.235                        | 0.234                       | -0.55  |
| 0.001         | 0.250                        | 0.252                       | 0.64   |
| 0.002         | 0.267                        | 0.270                       | 0.94   |
| 0.005         | 0.292                        | 0.293                       | 0.41   |
| 0.01          | 0.310                        | 0.311                       | 0.35   |
| 0.02          | 0.325                        | 0.329                       | 1.26   |
| 0.05          | 0.352                        | 0.353                       | 0.20   |
| 0.1           | 0.371                        | 0.371                       | -0.08  |

# Junction Capacitance Characteristic

## Circuit Simulation Result

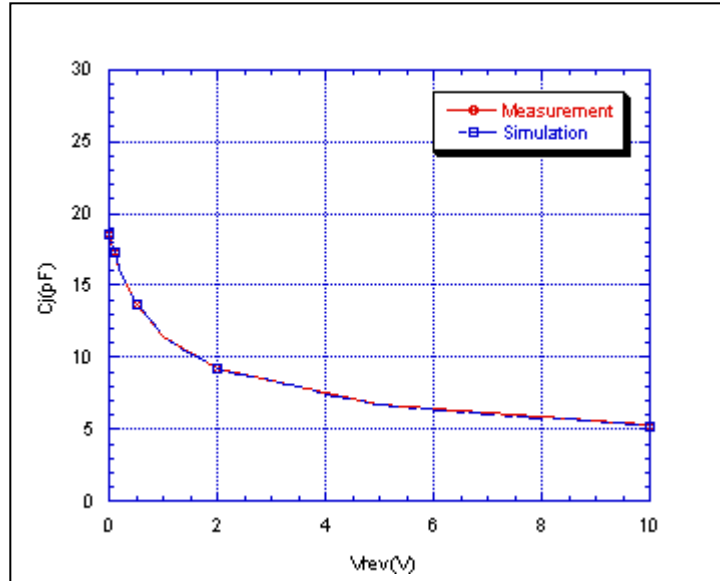


## Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result



### Simulation Result

| $V_{rev}$ (V) | $C_j$ (pF)<br>Measurement | $C_j$ (pF)<br>Simulation | %Error |
|---------------|---------------------------|--------------------------|--------|
| 0.02          | 18.500                    | 18.520                   | 0.11   |
| 0.05          | 18.090                    | 18.000                   | -0.50  |
| 0.1           | 17.300                    | 17.280                   | -0.12  |
| 0.2           | 16.100                    | 16.070                   | -0.19  |
| 0.5           | 13.700                    | 13.690                   | -0.07  |
| 1             | 11.500                    | 11.470                   | -0.26  |
| 2             | 9.200                     | 9.260                    | 0.65   |
| 5             | 6.710                     | 6.700                    | -0.15  |
| 10            | 5.200                     | 5.170                    | -0.58  |