

# Device Modeling Report

COMPONENTS:  
DIODE/ SCHOTTKY RECTIFIER / STANDARD  
PART NUMBER: CMS15  
MANUFACTURER: TOSHIBA

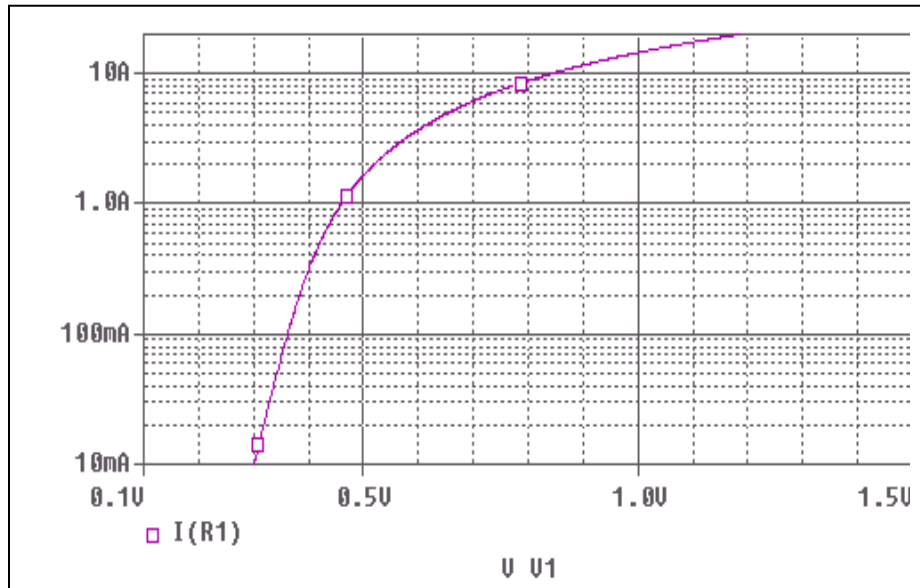


**Bee Technologies Inc.**

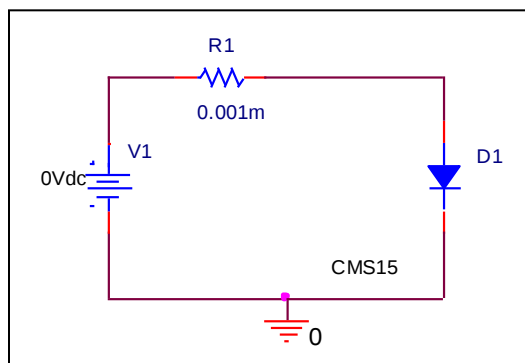
| PSpice model parameter | Model description                           |
|------------------------|---------------------------------------------|
| IS                     | Saturation Current                          |
| N                      | Emission Coefficient                        |
| RS    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

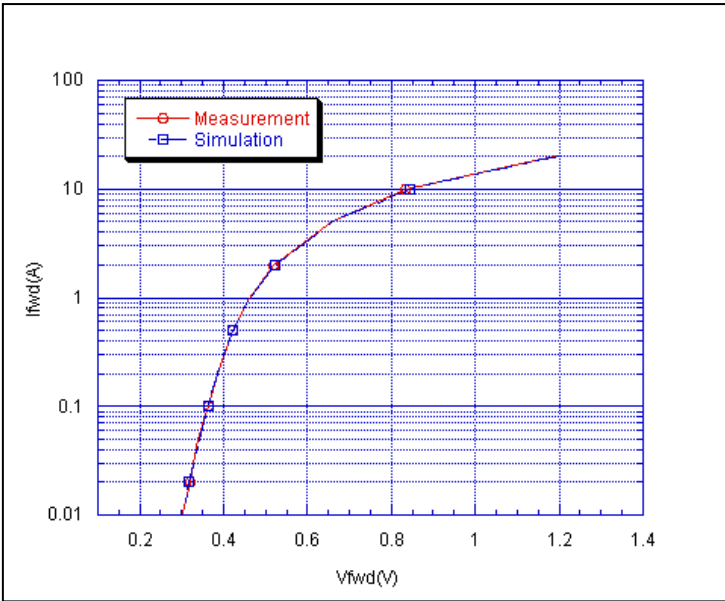


### Evaluation Circuit



# Comparison Graph

## Circuit Simulation Result

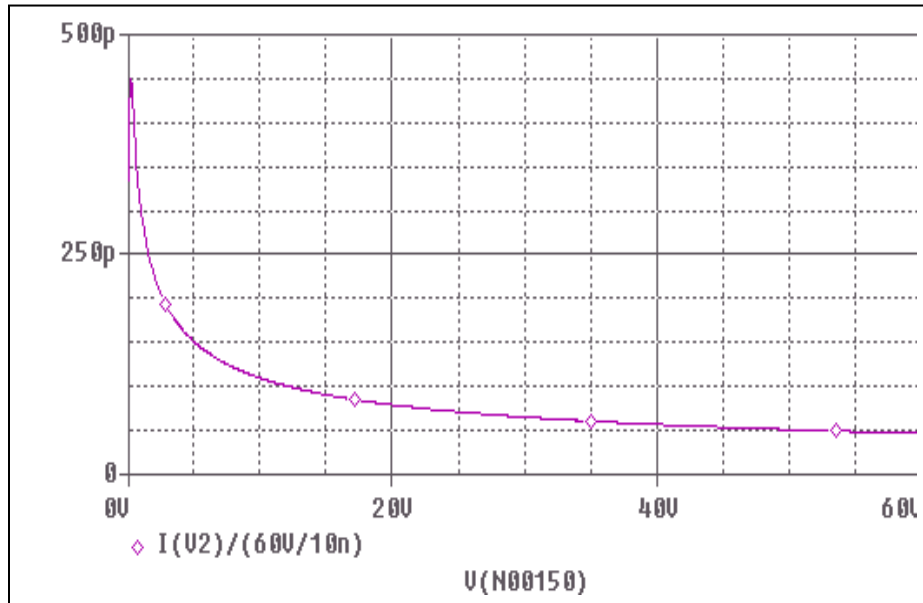


## Simulation Result

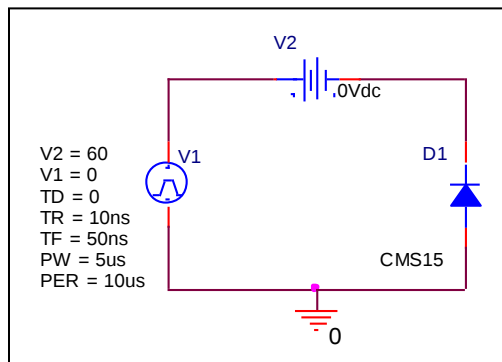
| $I_{fwd}(A)$ | $V_{fwd}(V)$<br>Measurement | $V_{fwd}(V)$<br>Simulation | %Error |
|--------------|-----------------------------|----------------------------|--------|
| 0.01         | 0.305                       | 0.300                      | -1.64  |
| 0.02         | 0.320                       | 0.318                      | -0.63  |
| 0.05         | 0.340                       | 0.342                      | 0.59   |
| 0.1          | 0.363                       | 0.362                      | -0.28  |
| 0.2          | 0.385                       | 0.384                      | -0.26  |
| 0.5          | 0.422                       | 0.420                      | -0.47  |
| 1            | 0.461                       | 0.460                      | -0.22  |
| 2            | 0.520                       | 0.521                      | 0.19   |
| 5            | 0.660                       | 0.659                      | -0.15  |
| 10           | 0.835                       | 0.843                      | 0.96   |
| 20           | 1.190                       | 1.207                      | 1.45   |

# Junction Capacitance Characteristic

## Circuit Simulation Result

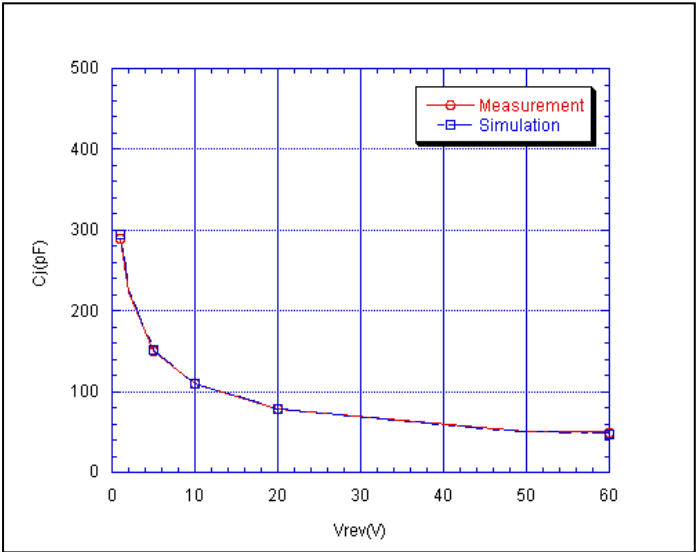


## Evaluation Circuit



# Comparison Graph

## Circuit Simulation Result



## Simulation Result

| Vrev(V) | Cj(pF)<br>Measurement | Cj(pF)<br>Simulation | %Error |
|---------|-----------------------|----------------------|--------|
| 1       | 290.00                | 295.00               | 1.72   |
| 2       | 222.50                | 226.13               | 1.63   |
| 5       | 150.00                | 151.13               | 0.75   |
| 10      | 110.00                | 109.81               | -0.17  |
| 20      | 78.50                 | 79.09                | 0.76   |
| 50      | 51.00                 | 51.09                | 0.18   |
| 60      | 48.00                 | 47.00                | -2.08  |