

# Device Modeling Report

COMPONENTS:

DIODE/ SCHOTTKY RECTIFIER / STANDARD

PART NUMBER: U30QWK2C53

MANUFACTURER: TOSHIBA

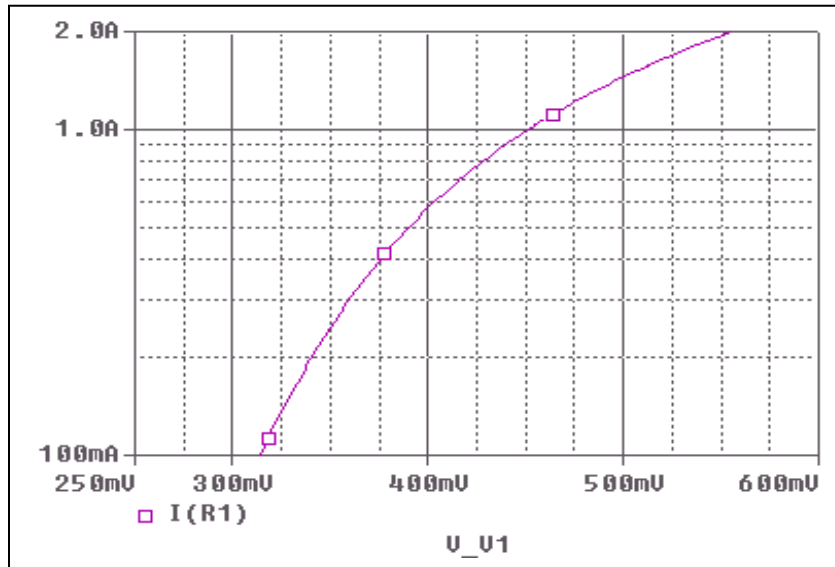


**Bee Technologies Inc.**

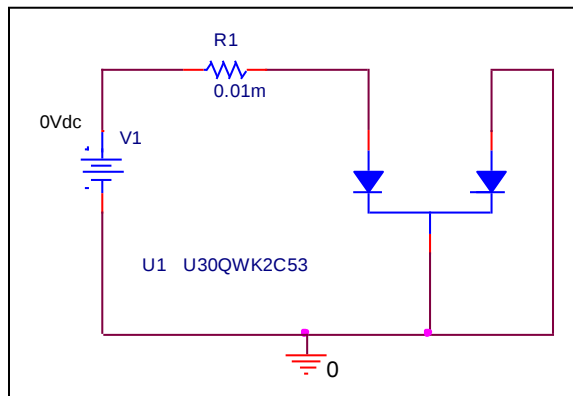
| PSpice model parameter | Model description                           |
|------------------------|---------------------------------------------|
| IS                     | Saturation Current                          |
| N                      | Emission Coefficient                        |
| RS    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

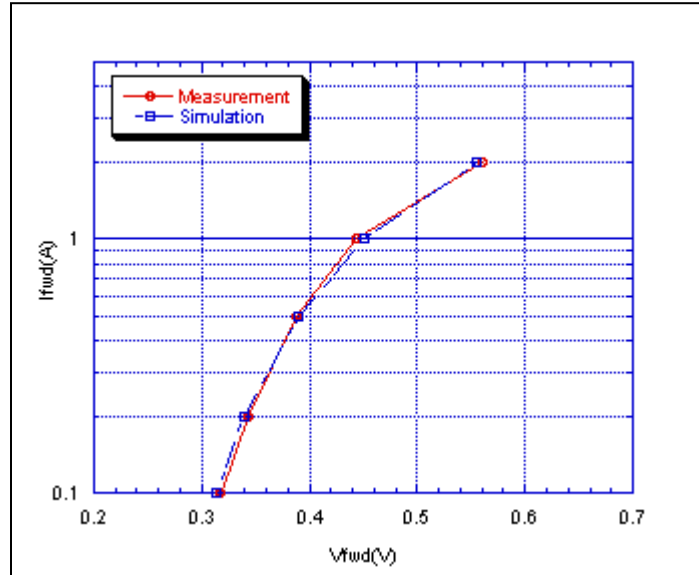


### Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

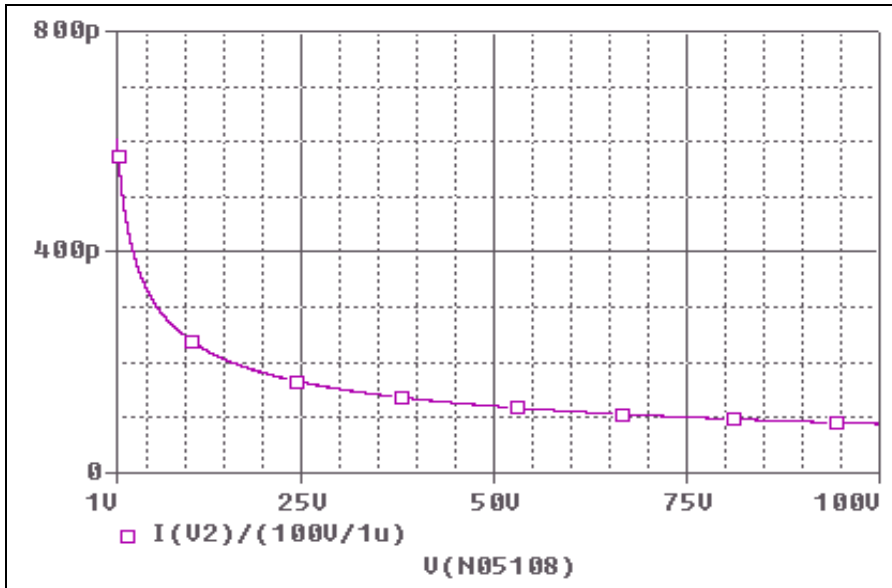


### Simulation Result

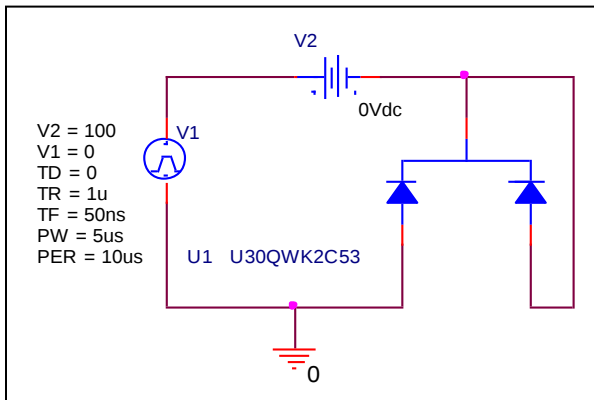
| $I_{fwd}$ (A) | $V_{fwd}$ (V)<br>Measurement | $V_{fwd}$ (V)<br>Simulation | %Error |
|---------------|------------------------------|-----------------------------|--------|
| 0.1           | 0.318                        | 0.314                       | -1.35  |
| 0.2           | 0.343                        | 0.340                       | -0.79  |
| 0.5           | 0.387                        | 0.390                       | 0.78   |
| 1             | 0.443                        | 0.451                       | 1.78   |
| 2             | 0.560                        | 0.556                       | -0.79  |

# Junction Capacitance Characteristic

## Circuit Simulation Result

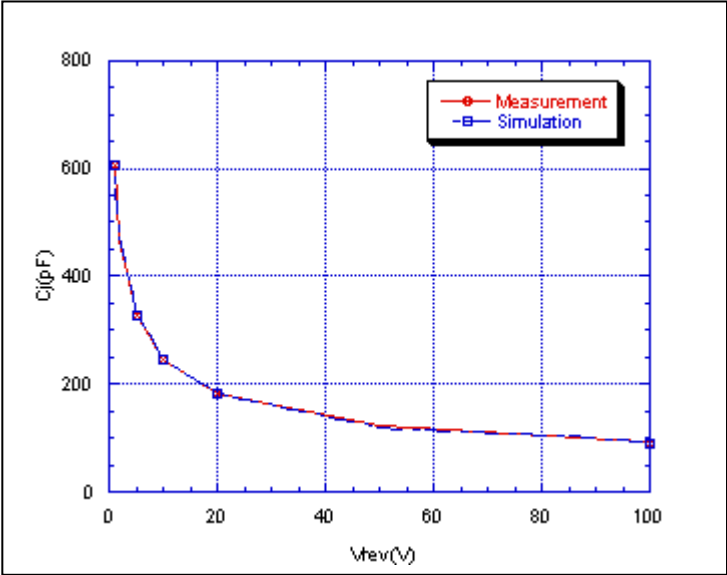


## Evaluation Circuit



# Comparison Graph

## Circuit Simulation Result



## Simulation Result

| $V_{rev}$ (V) | $C_j$ (pF)<br>Measurement | $C_j$ (pF)<br>Simulation | %Error |
|---------------|---------------------------|--------------------------|--------|
| 1             | 605.00                    | 604.90                   | -0.02  |
| 2             | 470.00                    | 473.70                   | 0.79   |
| 5             | 328.00                    | 329.00                   | 0.30   |
| 10            | 245.00                    | 245.10                   | 0.04   |
| 20            | 182.00                    | 181.40                   | -0.33  |
| 50            | 122.00                    | 120.80                   | -0.98  |
| 100           | 90.00                     | 88.90                    | -1.22  |