

# Device Modeling Report

COMPONENTS:  
DIODE/ SCHOTTKY RECTIFIER / STANDARD  
PART NUMBER: XBS203V17R  
MANUFACTURER: TOREX SEMICONDUCTOR

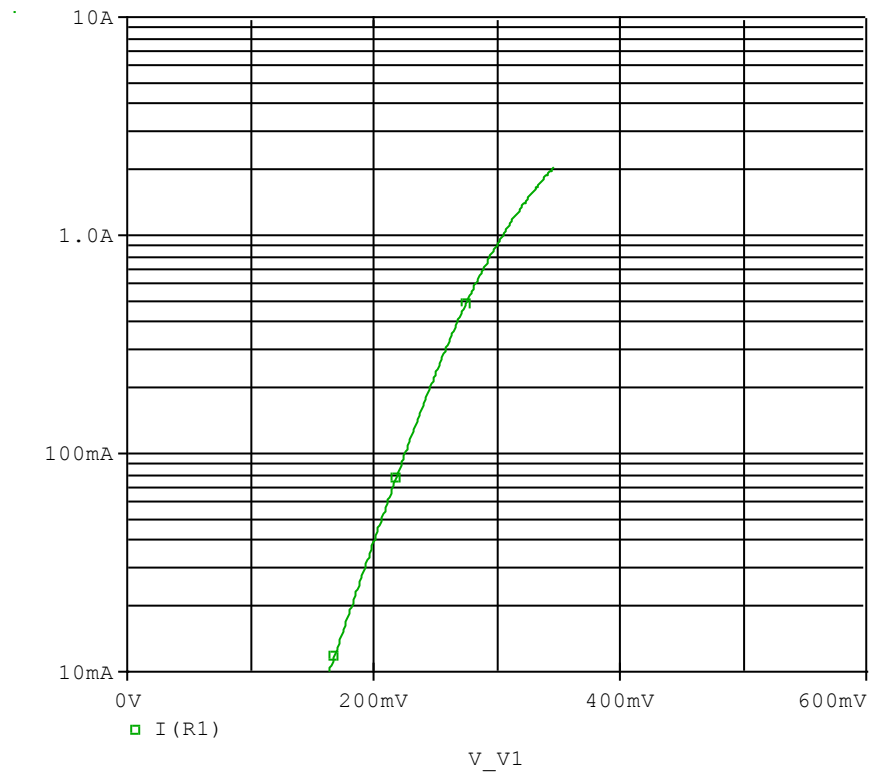


**Bee Technologies Inc.**

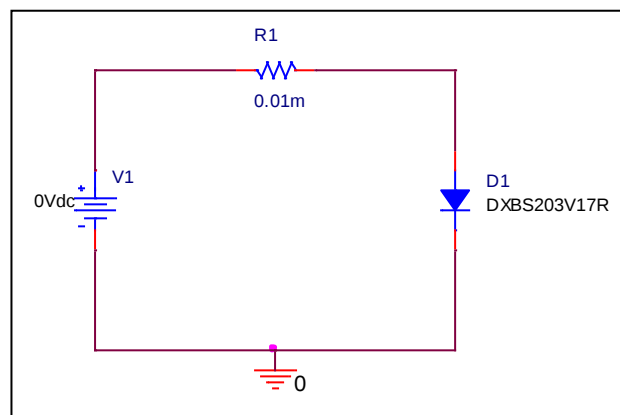
| PSpice model parameter | Model description                           |
|------------------------|---------------------------------------------|
| IS                     | Saturation Current                          |
| N                      | Emission Coefficient                        |
| RS    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

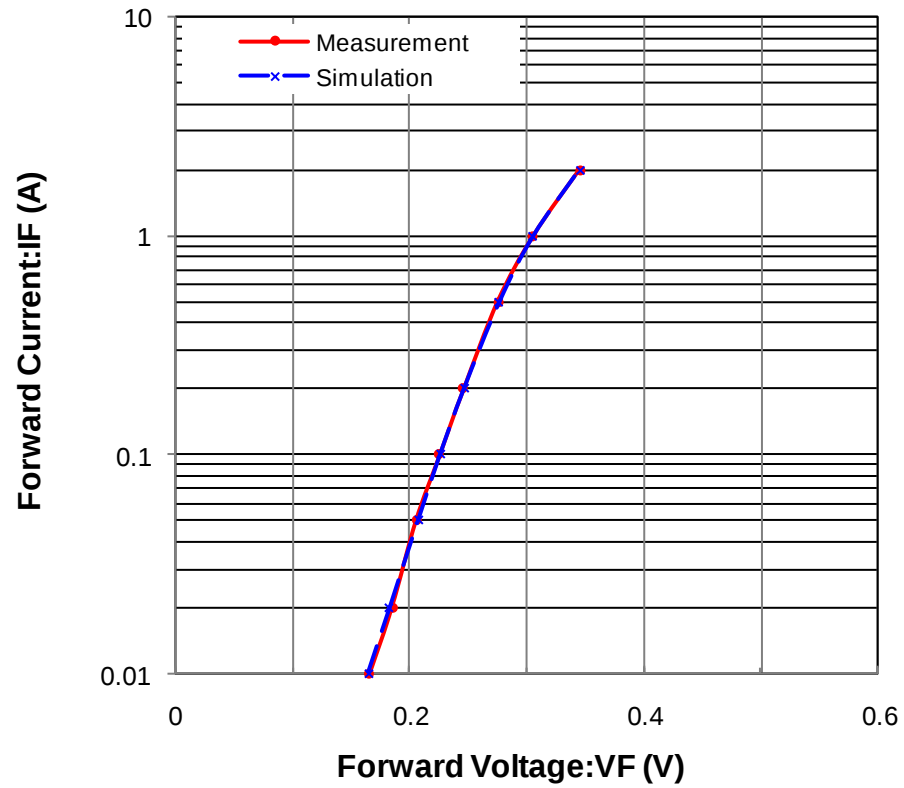


### Evaluation Circuit



## Comparison Graph

Circuit Simulation Result

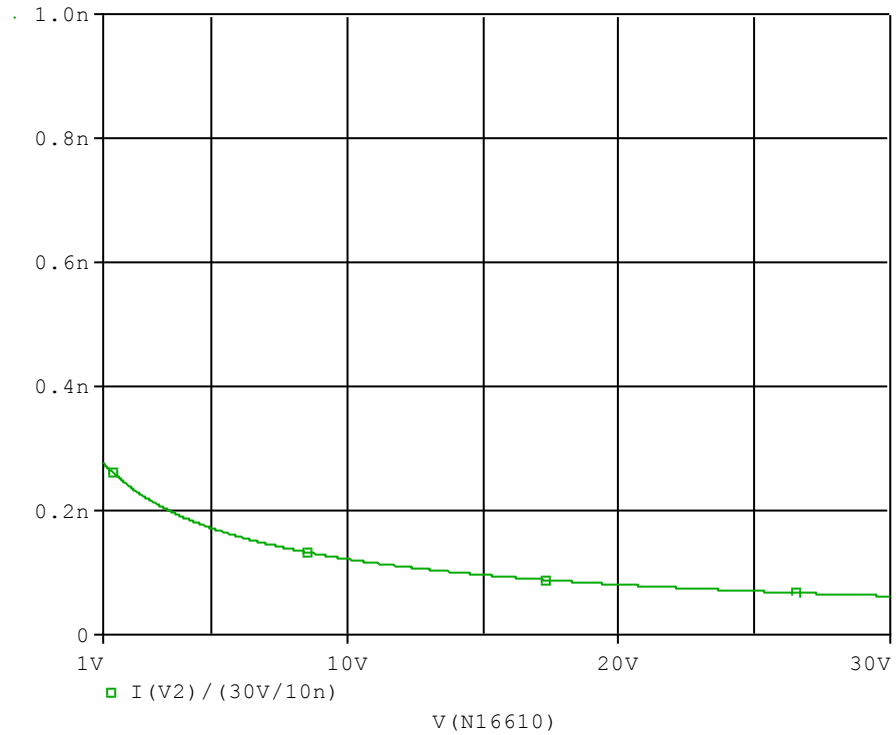


Simulation Result

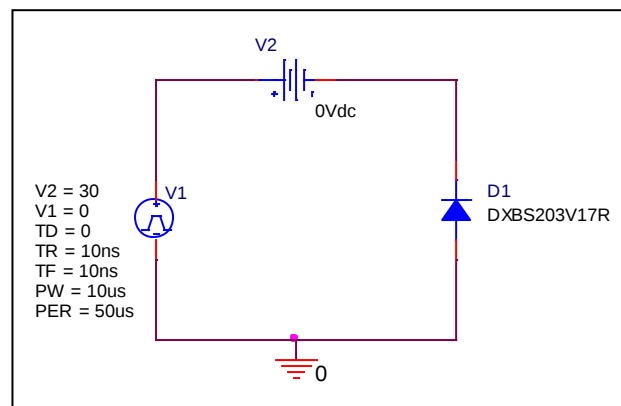
| $I_F$ (A) | $V_F$ (V)   |            | %Error |
|-----------|-------------|------------|--------|
|           | Measurement | Simulation |        |
| 0.01      | 0.165       | 0.164      | -0.518 |
| 0.02      | 0.185       | 0.182      | -1.476 |
| 0.05      | 0.205       | 0.207      | 0.785  |
| 0.1       | 0.225       | 0.226      | 0.280  |
| 0.2       | 0.245       | 0.246      | 0.304  |
| 0.5       | 0.275       | 0.276      | 0.369  |
| 1         | 0.305       | 0.305      | -0.036 |
| 2         | 0.345       | 0.345      | -0.083 |

## Capacitance Characteristic

### Circuit Simulation Result

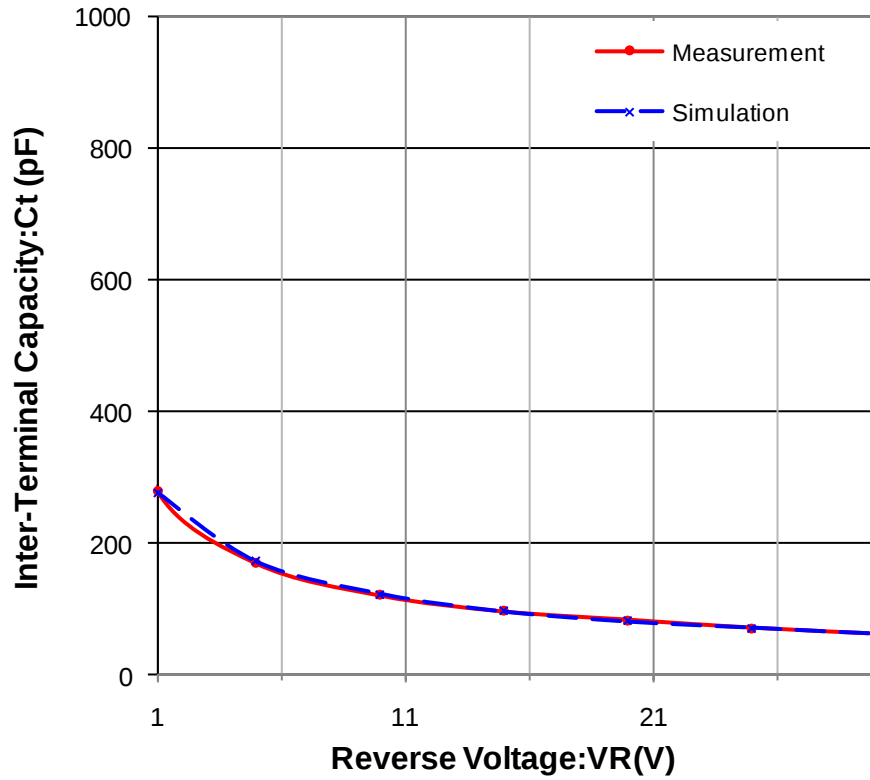


### Evaluation Circuit



## Comparison Graph

Circuit Simulation Result

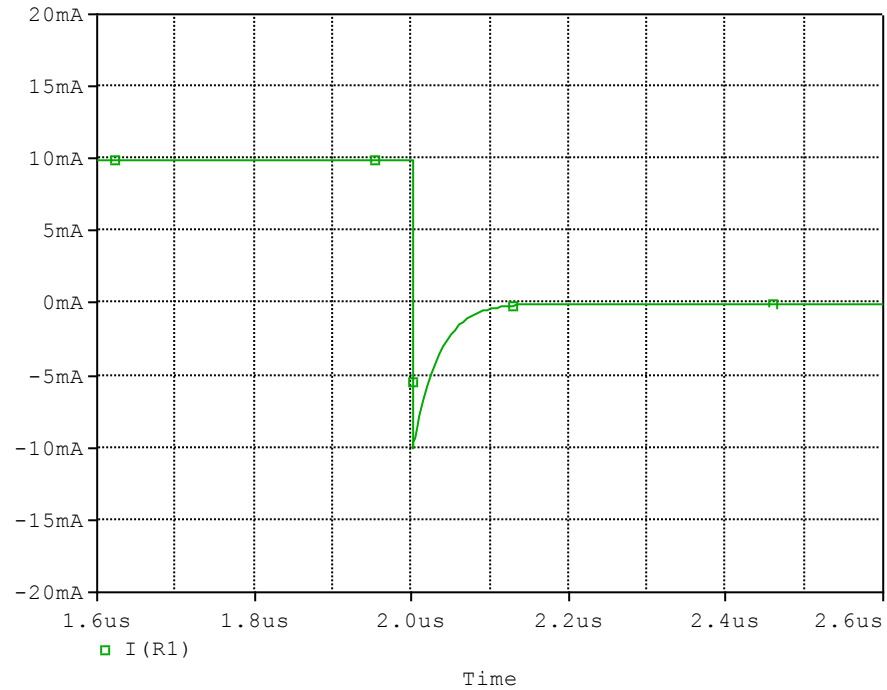


Simulation Result

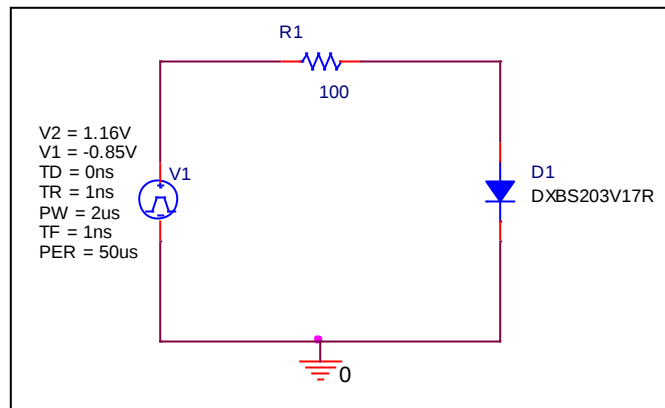
| V <sub>R</sub> (V) | C <sub>t</sub> (pF) |            | %Error |
|--------------------|---------------------|------------|--------|
|                    | Measurement         | Simulation |        |
| 1                  | 280.000             | 276.991    | -1.07  |
| 5                  | 169.000             | 171.675    | 1.58   |
| 10                 | 120.000             | 121.779    | 1.48   |
| 15                 | 96.000              | 96.423     | 0.44   |
| 20                 | 82.000              | 80.664     | -1.63  |
| 25                 | 71.000              | 69.983     | -1.43  |
| 30                 | 63.000              | 62.033     | -1.53  |

## Reverse Recovery Characteristic

### Circuit Simulation Result



### Evaluation Circuit



### Compare Measurement vs. Simulation

| Parameter | Unit | Measurement | Simulation | %Error |
|-----------|------|-------------|------------|--------|
| trr       | ns   | 70.000      | 70.927     | 1.32   |