# Device Modeling Report

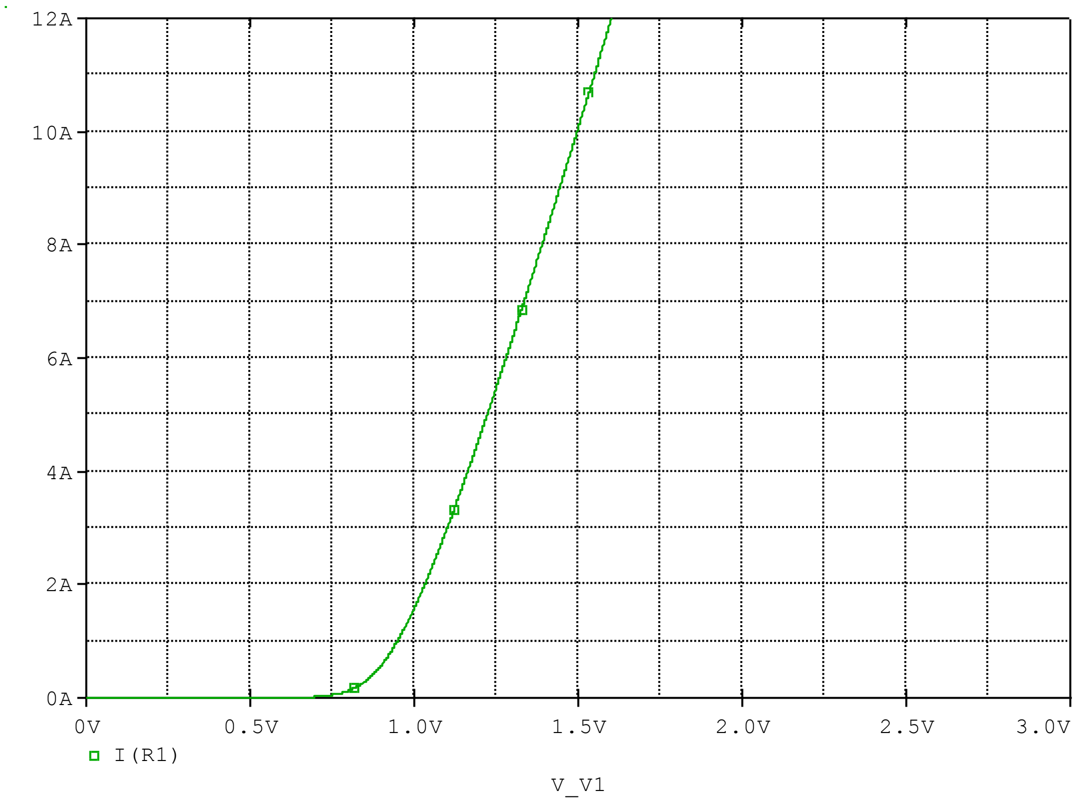
COMPONENTS: Silicon Carbide Schottky Diode
PART NUMBER: STPSC806
MANUFACTURER: STMicroelectronics
REMARK: Professional Model

**Bee Technologies Inc.**

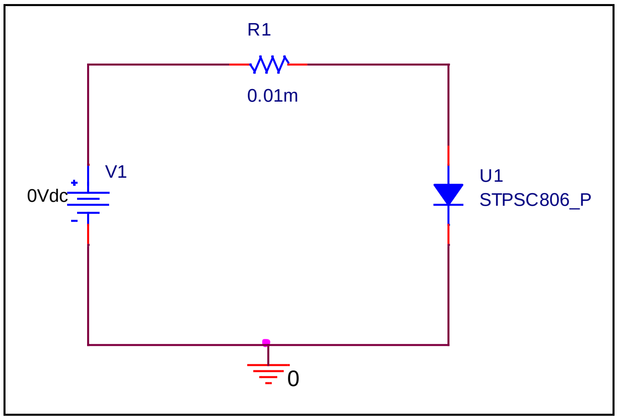
| PSpice model parameter | Model description |
|---|---|
| IS | Saturation Current |
| N | Emission Coefficient |
| RS | Series Resistance |
| IKF | High-injection Knee Current |
| CJO | Zero-bias Junction Capacitance |
| M | Junction Grading Coefficient |
| VJ | Junction Potential |
| ISR | Recombination 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

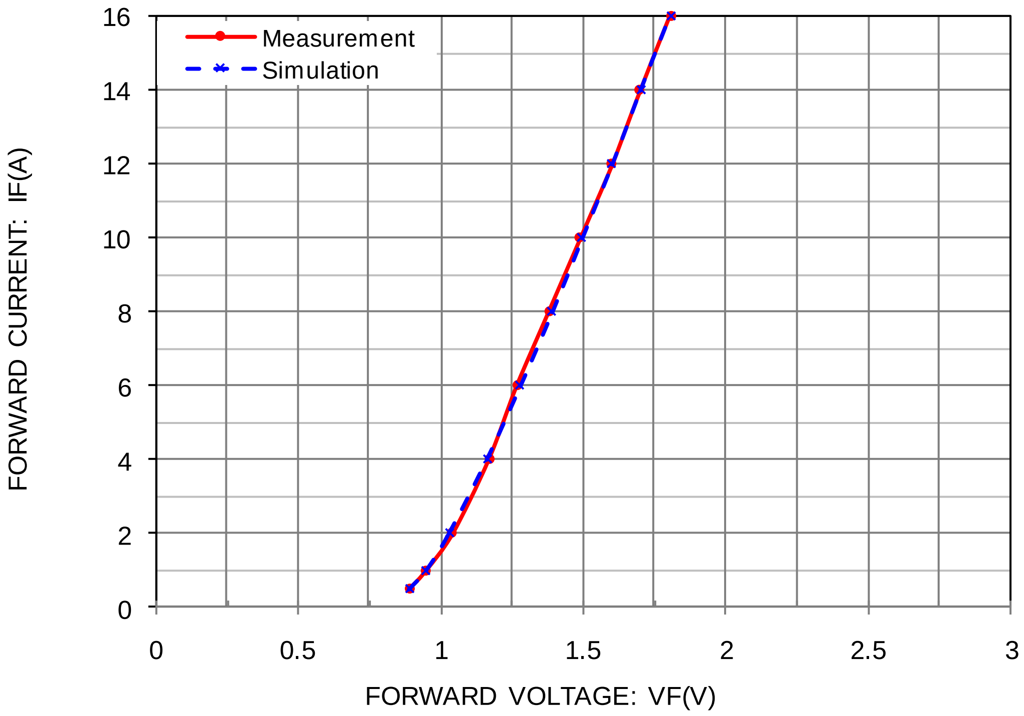


### Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

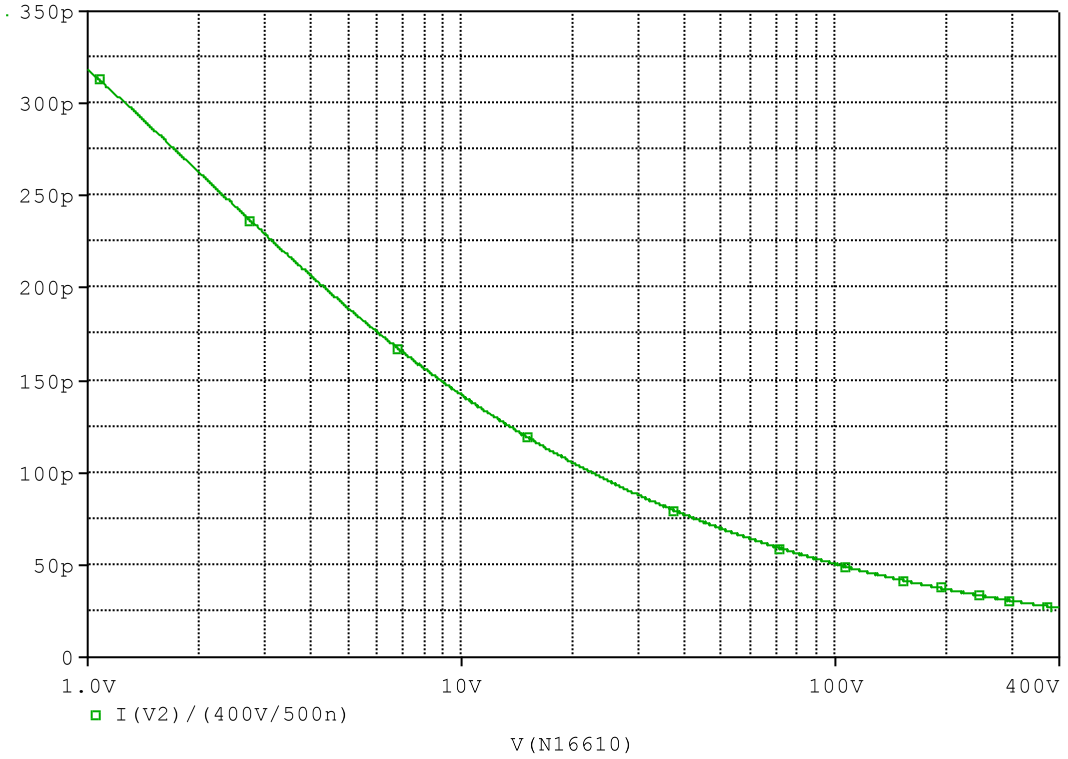


### Simulation Result

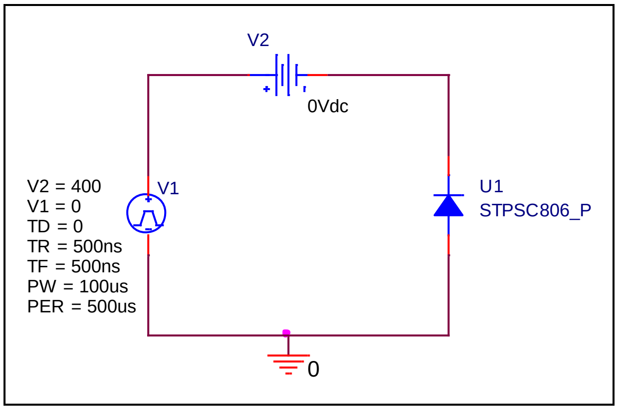
| $I_F$(A) | $V_F$(V) |  | Error (%) |
|---|---|---|---|
|  | Measurement | Simulation |  |
| 0.5 | 0.8900 | 0.8888 | -0.14 |
| 1 | 0.9500 | 0.9485 | -0.16 |
| 2 | 1.0400 | 1.0320 | -0.77 |
| 4 | 1.1700 | 1.1632 | -0.58 |
| 6 | 1.2700 | 1.2795 | 0.75 |
| 8 | 1.3800 | 1.3897 | 0.70 |
| 10 | 1.4900 | 1.4965 | 0.44 |
| 12 | 1.6000 | 1.6013 | 0.08 |
| 14 | 1.7000 | 1.7046 | 0.27 |
| 16 | 1.8100 | 1.8068 | -0.18 |

# Junction Capacitance Characteristic

## Circuit Simulation Result

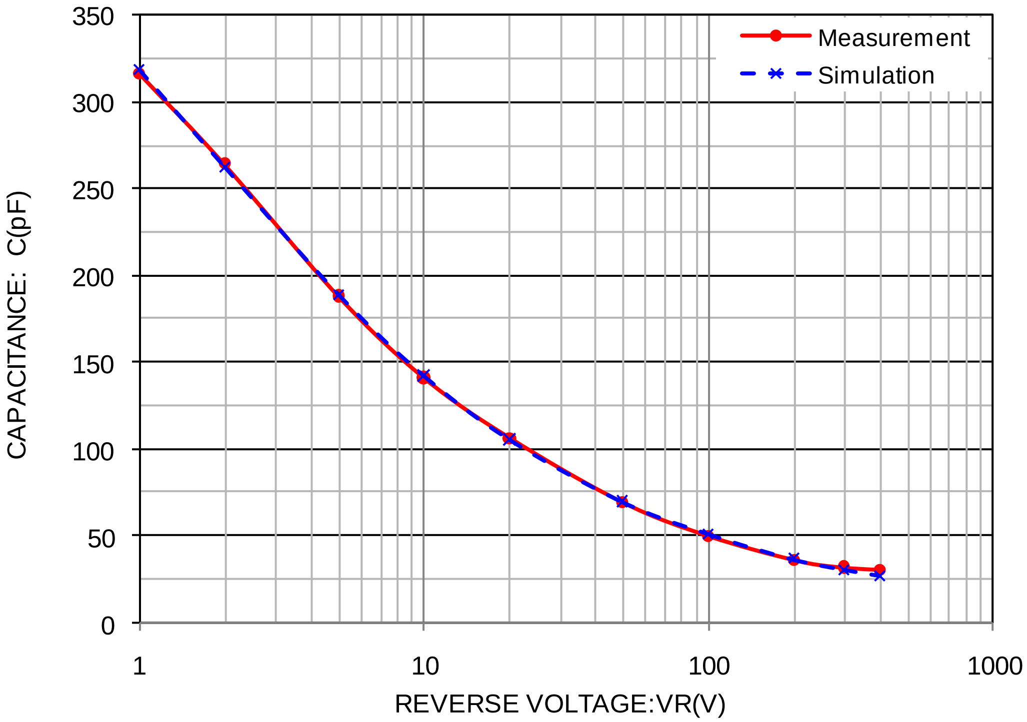


## Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result

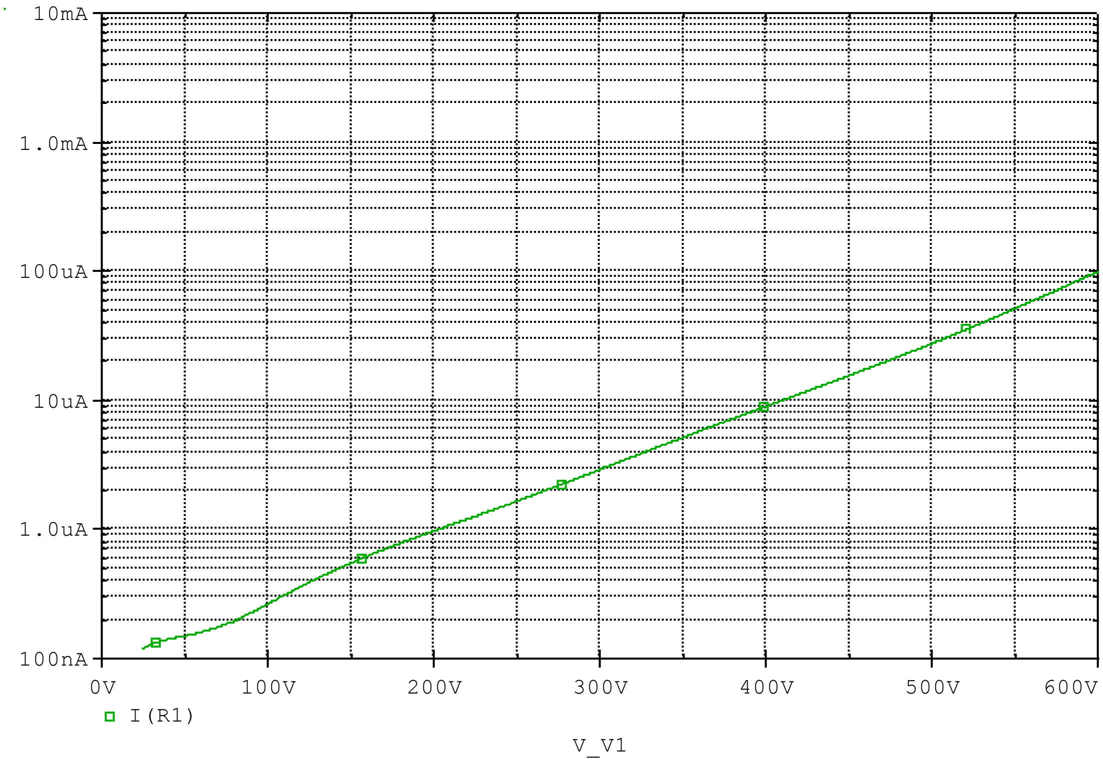


### Simulation Result

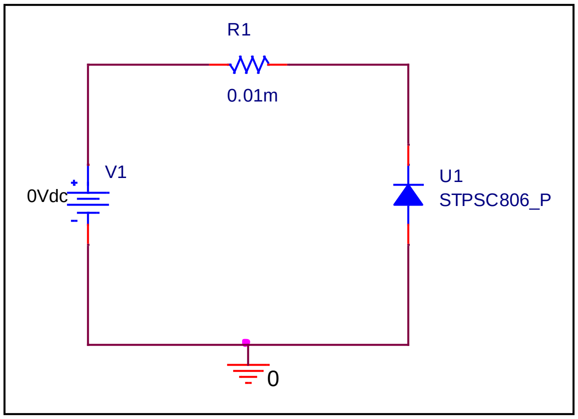
| $V_R$(V) | C (pF) |  | Error (%) |
|---|---|---|---|
|  | Measurement | Simulation |  |
| 1 | 316.000 | 318.455 | 0.78 |
| 2 | 264.000 | 261.941 | -0.78 |
| 5 | 188.000 | 188.931 | 0.50 |
| 10 | 141.000 | 142.230 | 0.87 |
| 20 | 106.000 | 105.249 | -0.71 |
| 50 | 69.000 | 69.621 | 0.90 |
| 100 | 50.000 | 50.668 | 1.34 |
| 200 | 36.000 | 36.762 | 2.12 |
| 300 | 32.000 | 30.483 | -4.74 |

## Reverse Characteristic

### Circuit Simulation Result

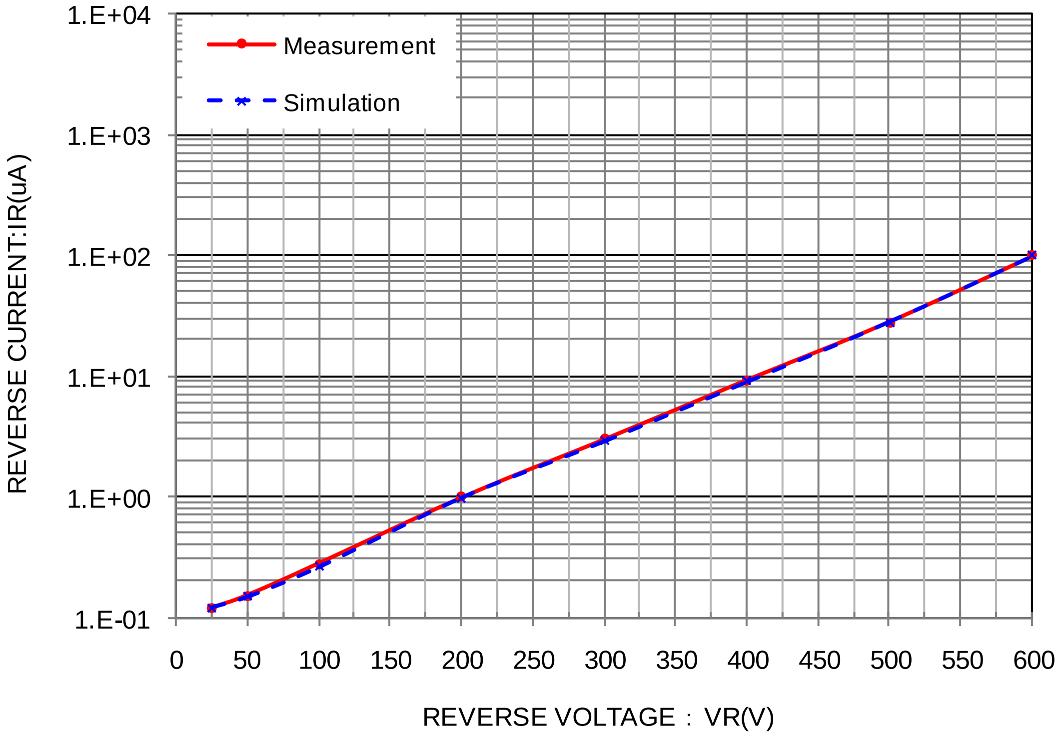


### Evaluation Circuit



## Comparison Graph

### Circuit Simulation Result



### Simulation Result

| $V_R$(V) | $I_R$(uA) | | Error (%) |
|---|---|---|---|
| | Measurement | Simulation | |
| 25 | 0.120 | 0.120 | -0.23 |
| 50 | 0.150 | 0.149 | -0.52 |
| 100 | 0.275 | 0.264 | -3.88 |
| 200 | 1.000 | 0.972 | -2.80 |
| 300 | 3.000 | 2.910 | -2.99 |
| 400 | 9.200 | 8.987 | -2.32 |
| 500 | 28.000 | 27.569 | -1.54 |
| 600 | 100.000 | 99.226 | -0.77 |