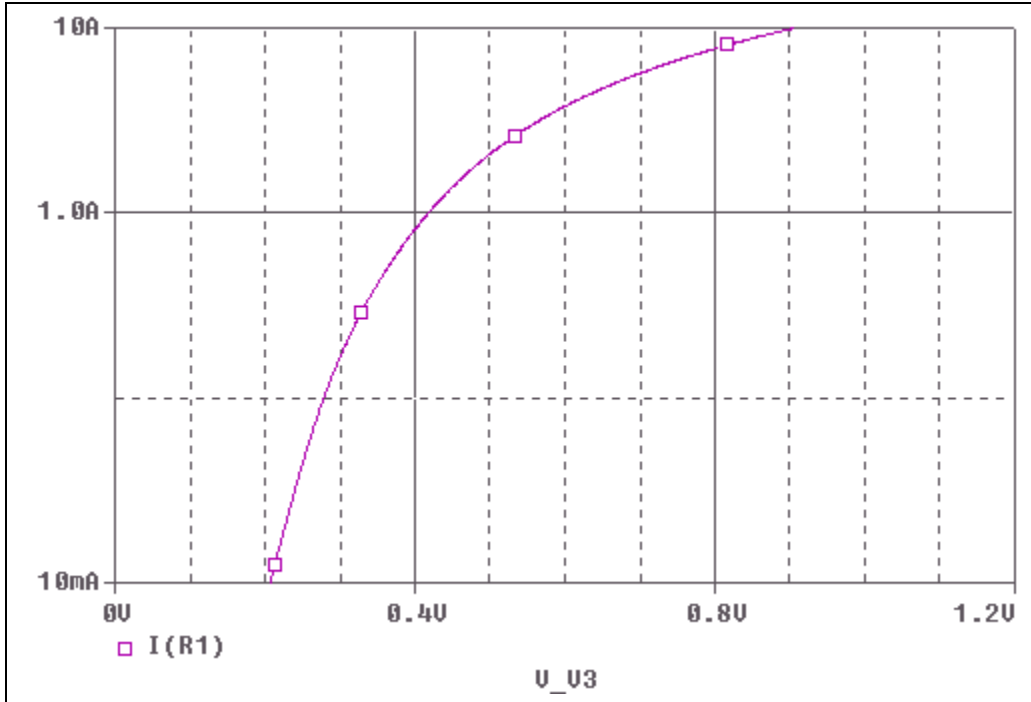# Device Modeling Report

COMPONENTS:
DIODE/ SCHOTTKY RECTIFIER/PROFESSIONAL
PART NUMBER: 1N5818
MANUFACTURER: ON SEMICONDUCTOR
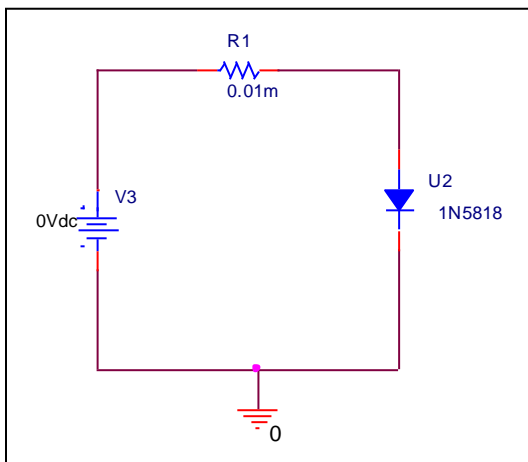
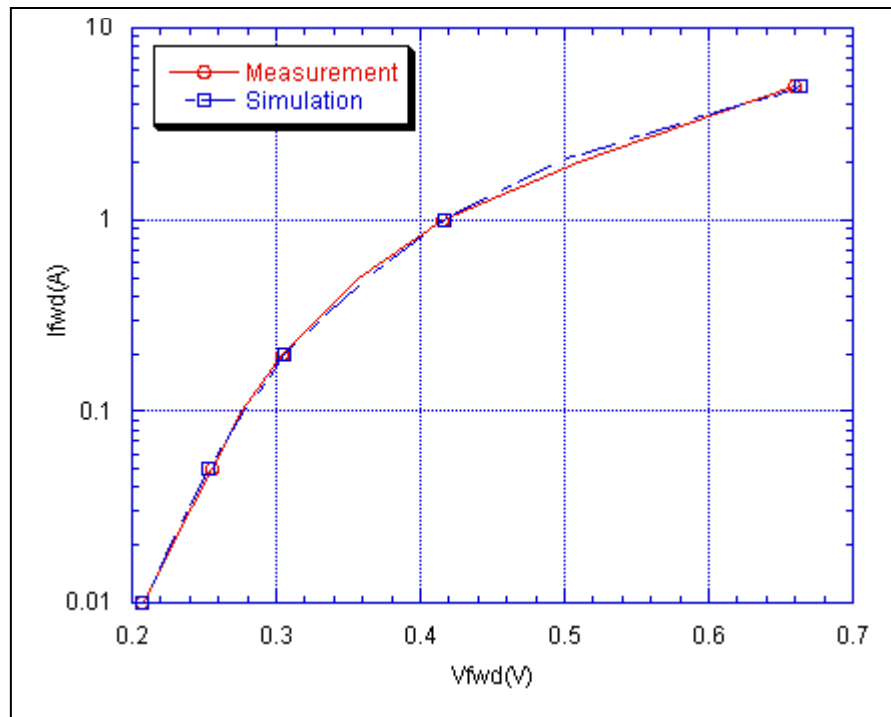**Bee Technologies Inc.**

# Forward Current Characteristic

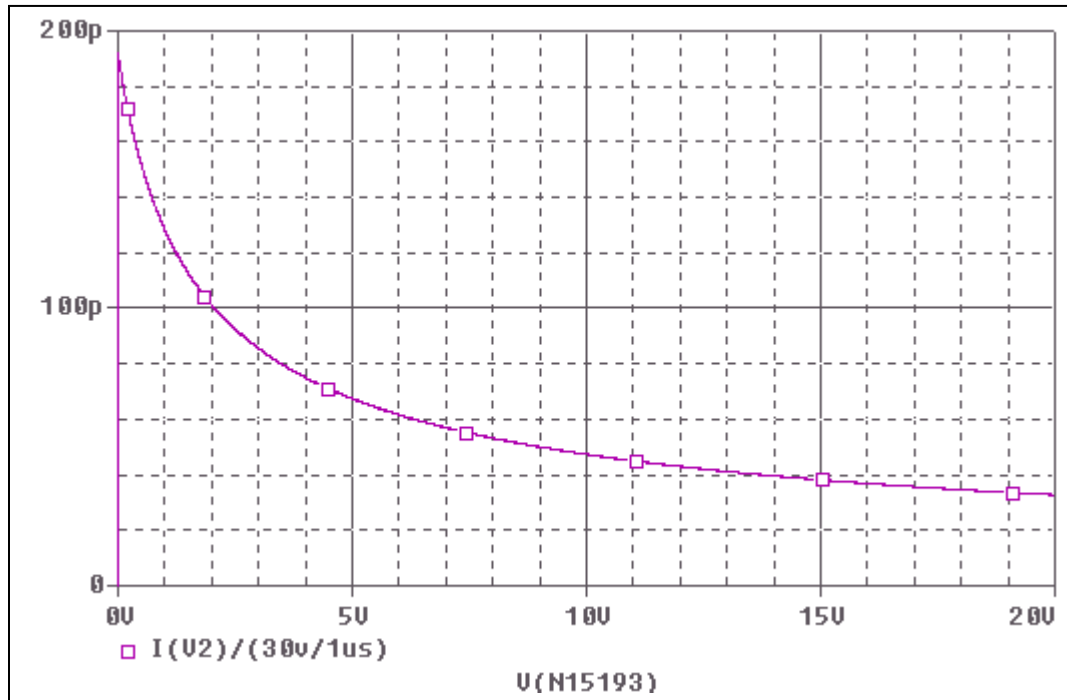Evaluation Circuit

# Comparison Graph

Circuit Simulation Result



Simulation Result

| Ifwd(A) | Vfwd(V) Measurement | Vfwd(V) Simulation | %Error |
|---|---|---|---|
| 0.01 | 0.21 | 0.21 | -0.98 |
| 0.02 | 0.23 | 0.23 | -0.88 |
| 0.05 | 0.26 | 0.25 | -1.19 |
| 0.1 | 0.28 | 0.28 | 0.36 |
| 0.2 | 0.30 | 0.31 | 1.30 |
| 0.5 | 0.36 | 0.36 | 1.38 |
| 1 | 0.42 | 0.42 | 0.48 |
| 2 | 0.51 | 0.50 | -3.03 |
| 5 | 0.66 | 0.66 | 0.60 |

# Junction Capacitance Characteristic

Circuit Simulation Result



□ I(V2)/(30v/1us)

V(N15193)

Evaluation Circuit



V2

0Vdc

V1 = 0
V2 = 30
TD = 0
TR = 1us
TF = 1us
PW = 5s
PER = 10s

V1

U4

1N5818

0

# Comparison Graph

Simulation Result

| Vrev(V) | Cj(pF) Measurement | Cj(pF) Simulation | %Error |
|---|---|---|---|
| 0 | 183.51 | 183.51 | 0.00 |
| 0.1 | 181.78 | 181.36 | -0.24 |
| 0.2 | 179.31 | 172.34 | -4.04 |
| 0.5 | 157.97 | 151.62 | -4.19 |
| 1 | 126.08 | 128.33 | 1.75 |
| 2 | 98.43 | 101.27 | 2.81 |
| 5 | 64.20 | 67.41 | 4.76 |
| 10 | 46.66 | 47.37 | 1.49 |
| 20 | 33.55 | 32.78 | -2.36 |

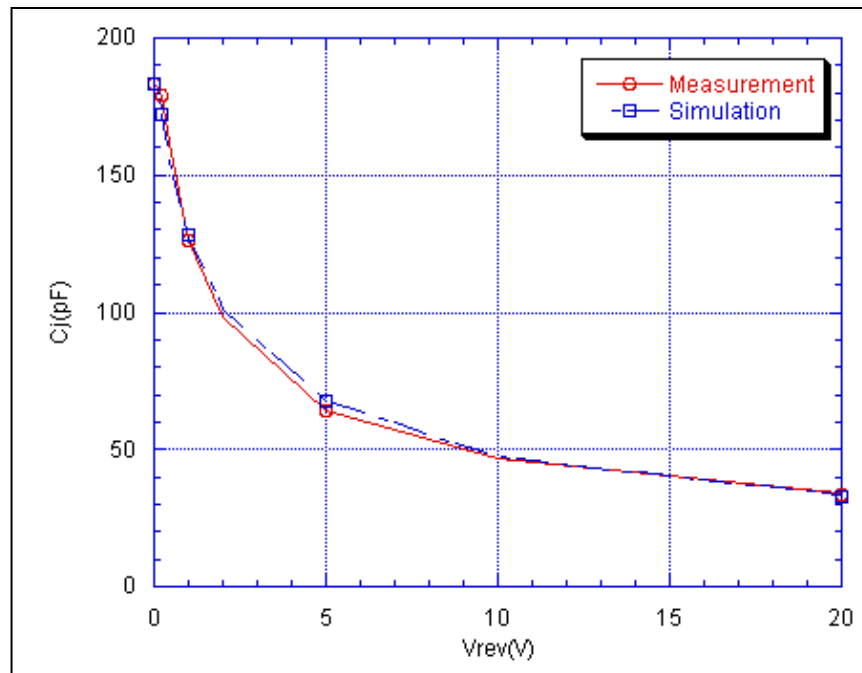# Reverse Characteristic

## Circuit Simulation Result



## Evaluation Circuit

# Comparison Graph

Circuit Simulation Result



Simulation Result
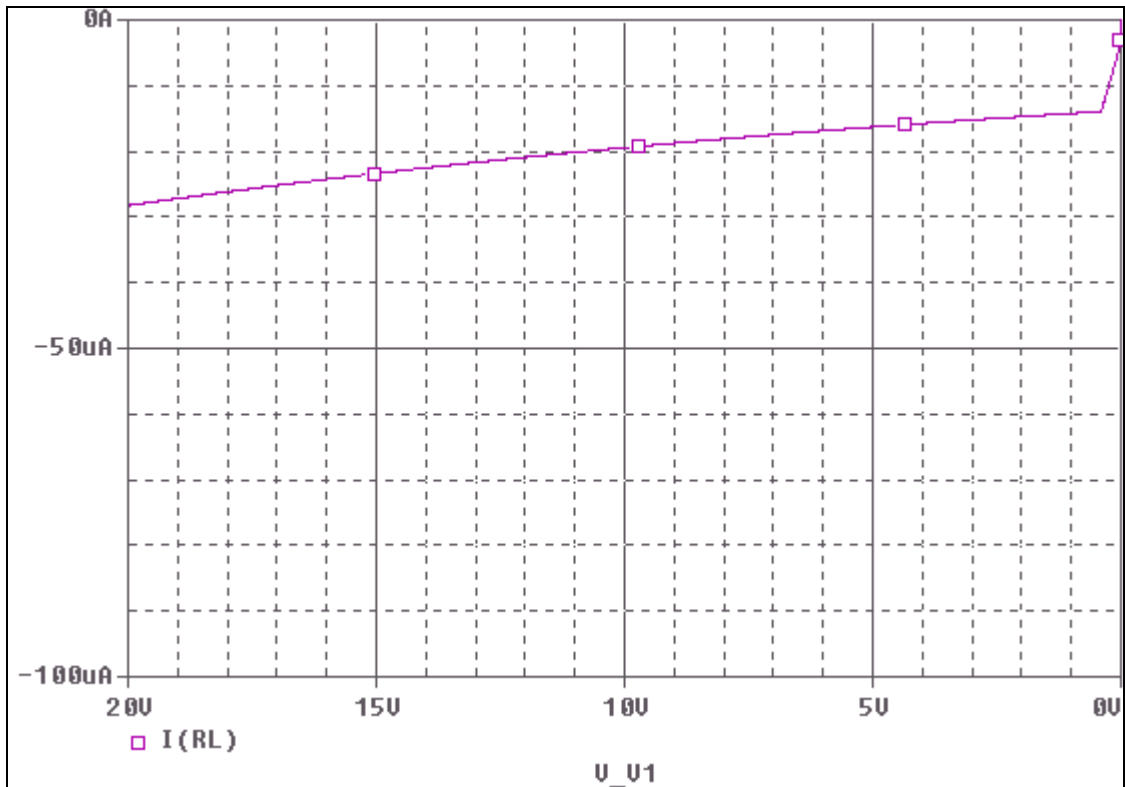
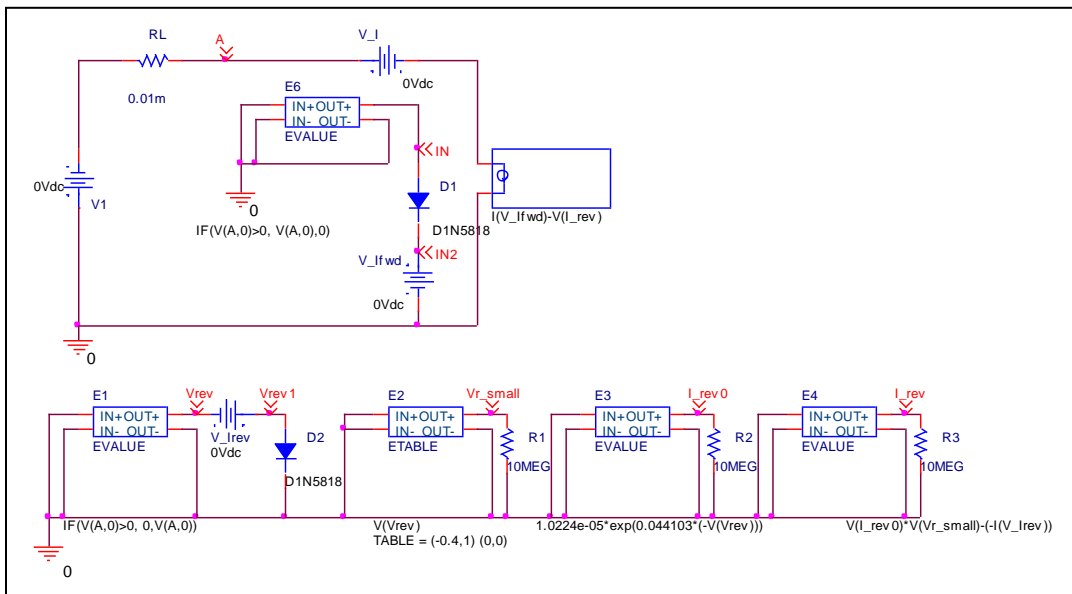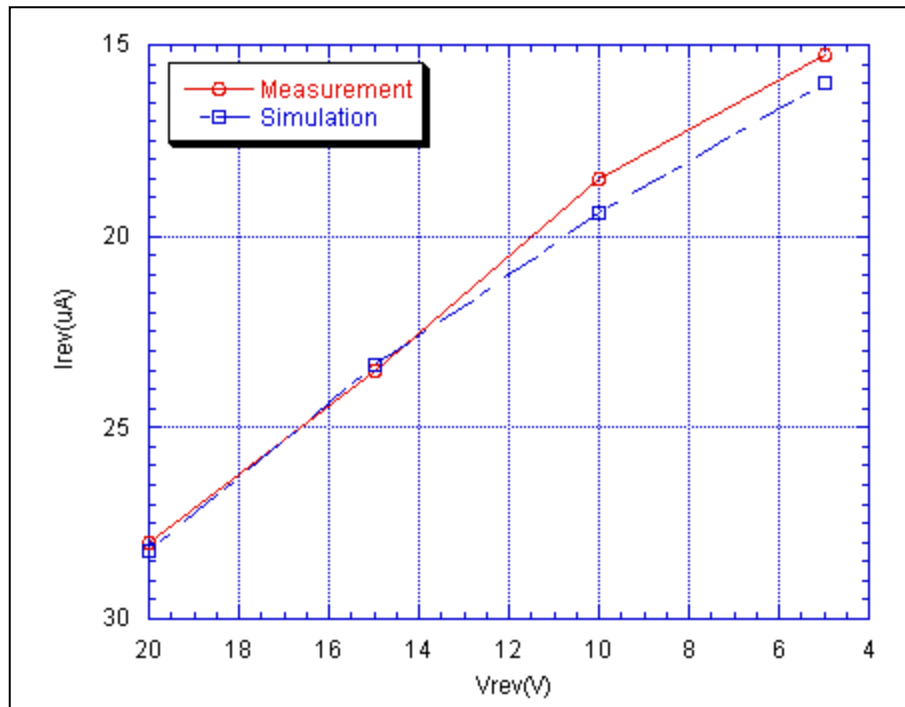| Vrev(V) | Irev(uA) Measurement | Irev(uA) Simulation | %Error |
|---------|---------------------|---------------------|--------|
| 5 | 15.25 | 16 | 4.918 |
| 10 | 18.5 | 19.4 | 4.864 |
| 15 | 23.5 | 23.35 | 0.638 |
| 20 | 28 | 28.2 | 0.714 |

**Reverse Characteristic**                                    **Reference**

| | |
|---|---|
| | VERT/DIV<br>        10μA<br>CURSOR<br>(f:1/grad.)<br>      -29.3μA |
| | HORIZ/DIV<br>        2 V<br>CURSOR<br>(f:intercept)<br>    -20.02 V |
| | PER STEP<br>       200mA<br>OFFSET<br>         0mA |
| | β OR gm/DIV<br>      ****** |
| | % of COLLECTOR<br>PEAK VOLTS<br>         0.0 |
| | AUX SUPPLY<br>      0.00 V |