# Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / PROFESSIONAL
PART NUMBER: 1SR154-600
MANUFACTURER: ROHM
REMARK: TC=25C


**Bee Technologies Inc.**

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| 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 |

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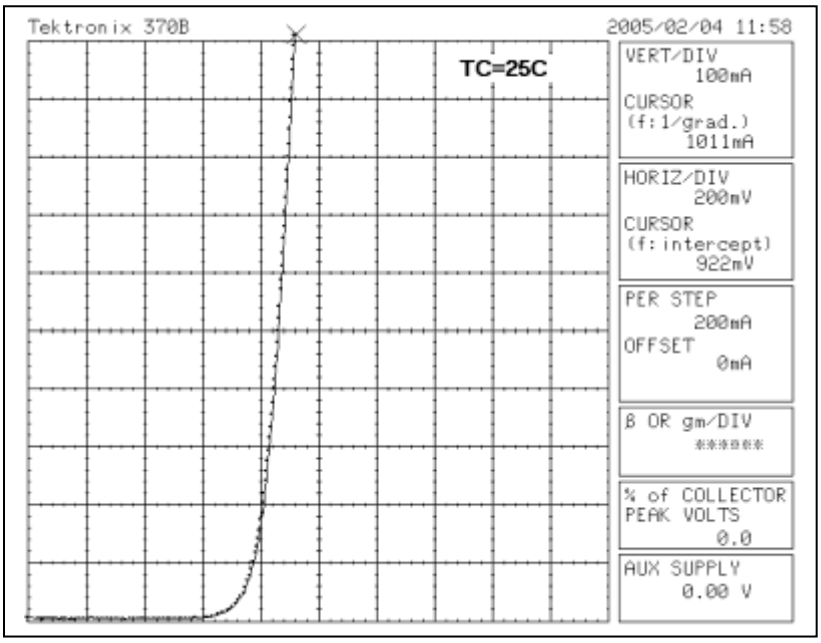
## Forward Current Characteristic Reference

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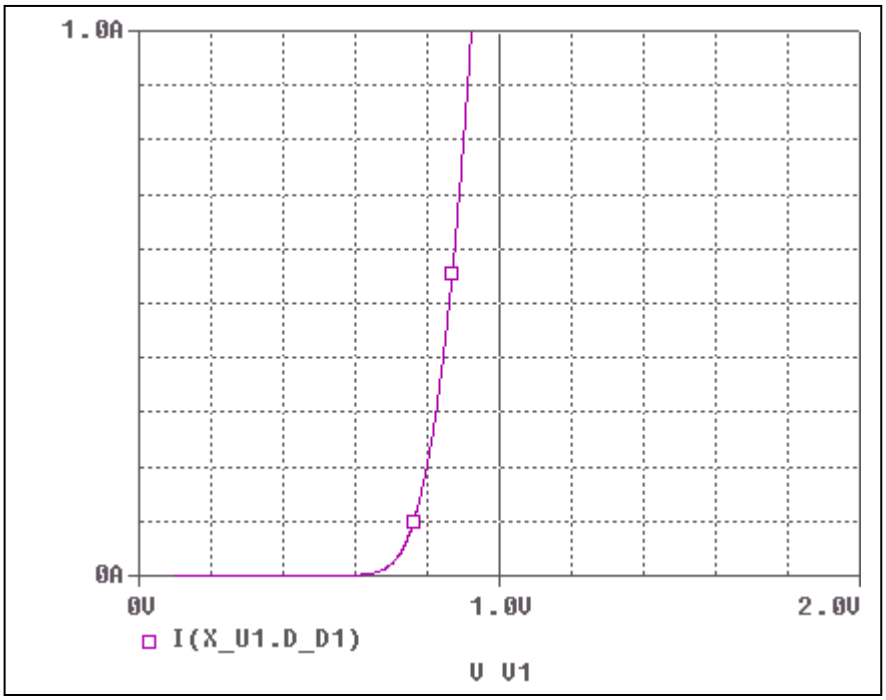
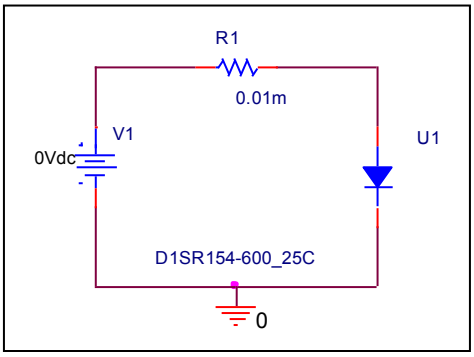
## Forward Current Characteristic

Circuit Simulation Result




Evaluation Circuit

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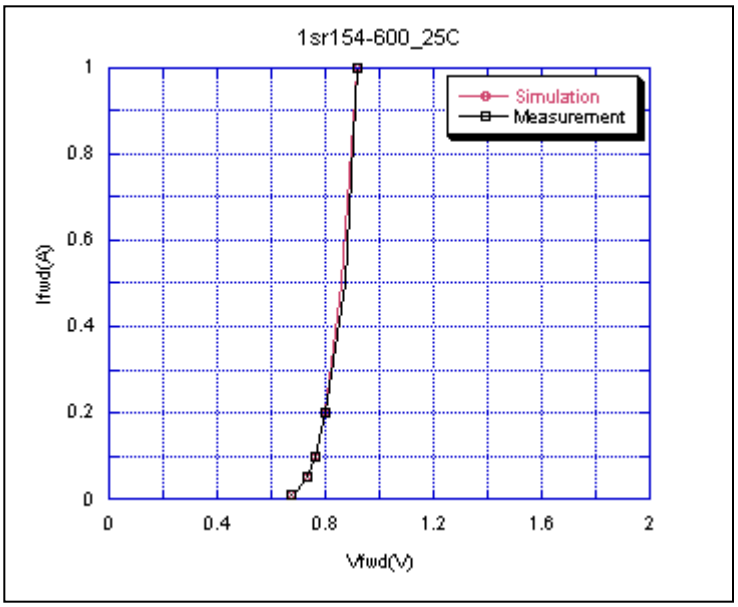
## Comparison Graph

Circuit Simulation Result




Simulation Result

| Ifwd(A) | Vfwd(V) Measurement | Vfwd(V) Simulation | %Error |
|---|---|---|---|
| 0.01 | 0.672 | 0.672 | 0.00 |
| 0.02 | 0.698 | 0.697 | 0.14 |
| 0.05 | 0.734 | 0.731 | 0.41 |
| 0.1 | 0.760 | 0.761 | -0.13 |
| 0.2 | 0.800 | 0.797 | 0.38 |
| 0.5 | 0.873 | 0.860 | 1.49 |
| 1 | 0.922 | 0.921 | 0.11 |

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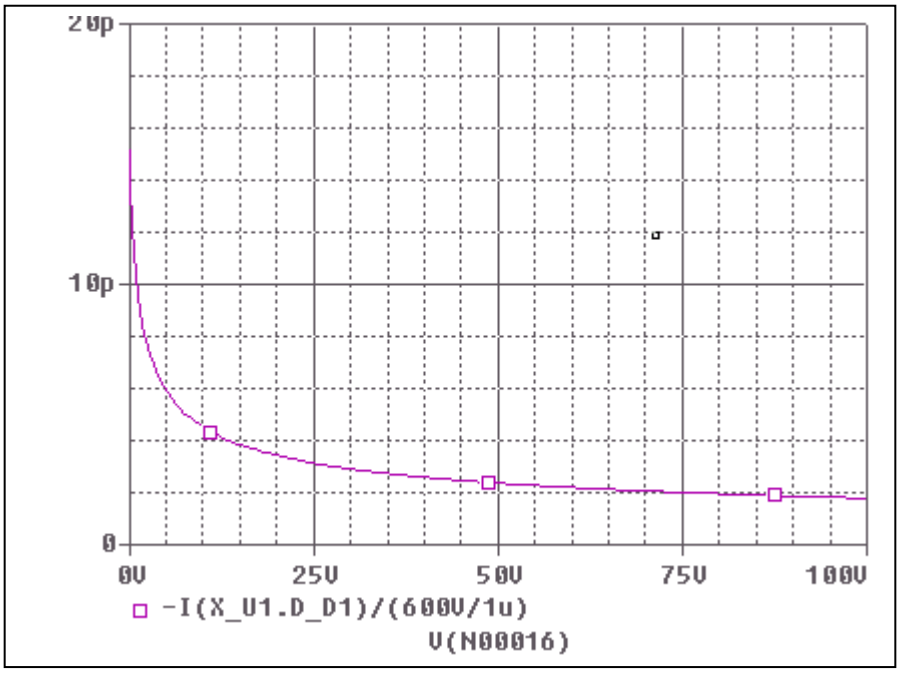
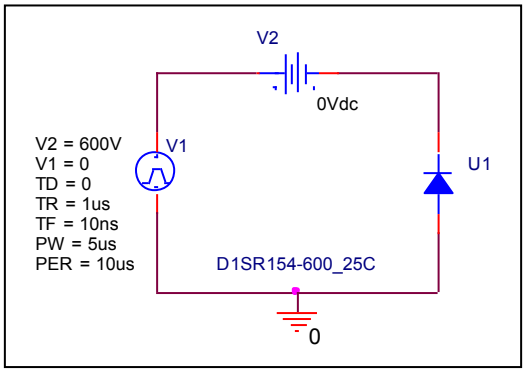
## Capacitance Characteristic

Circuit Simulation Result




Evaluation Circuit

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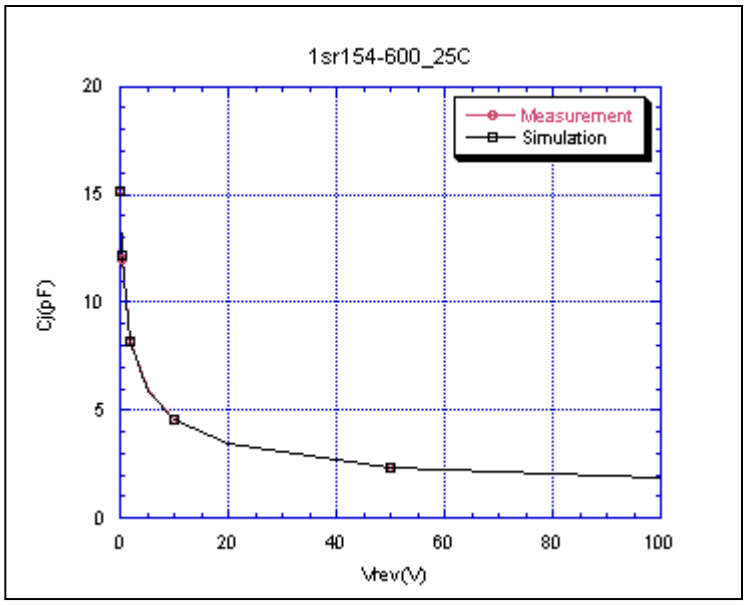
## Comparison Graph

Circuit Simulation Result




Simulation Result

| Vrev(V) | Cj(pF) Measurement | Cj(pF) Simulation | %Error |
|---|---|---|---|
| 0 | 16.450 | 16.450 | 0.00 |
| 0.1 | 15.117 | 15.135 | -0.12 |
| 0.2 | 14.138 | 14.170 | -0.23 |
| 0.5 | 12.014 | 12.128 | -0.95 |
| 1 | 10.244 | 10.124 | 1.17 |
| 2 | 8.221 | 8.213 | 0.10 |
| 5 | 5.942 | 5.885 | 0.96 |
| 10 | 4.531 | 4.525 | 0.13 |
| 20 | 3.416 | 3.432 | -0.47 |
| 50 | 2.342 | 2.371 | -1.24 |
| 100 | 1.781 | 1.784 | -0.17 |

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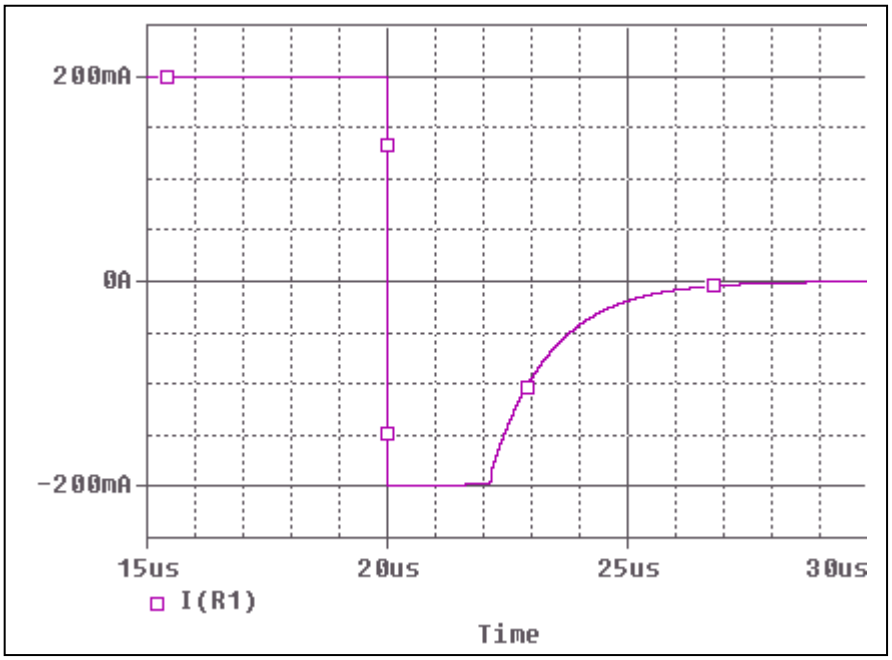
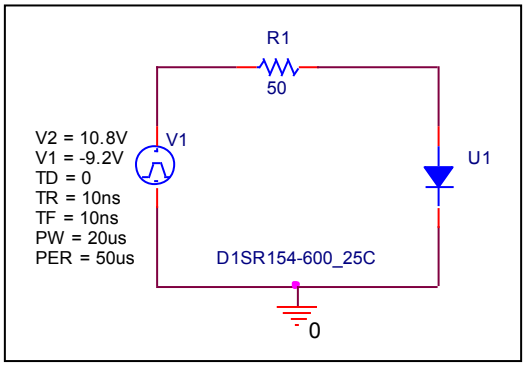
## Reverse Recovery Characteristic

Circuit Simulation Result




Evaluation Circuit




Compare Measurement vs. Simulation

| | Measurement | | Simulation | | %Error |
|---|---|---|---|---|---|
| **trj** | **2.12** | **us** | **2.12** | **us** | **0.141** |
| **trb** | **2.80** | **us** | **2.81** | **us** | **0.392** |

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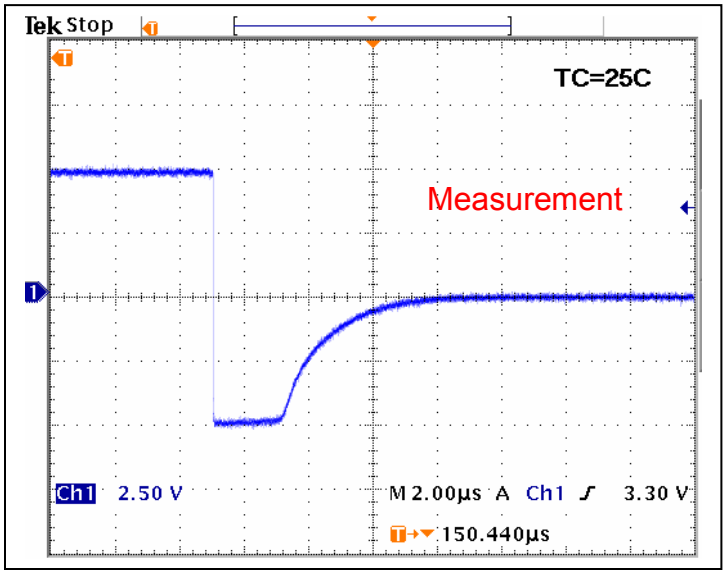
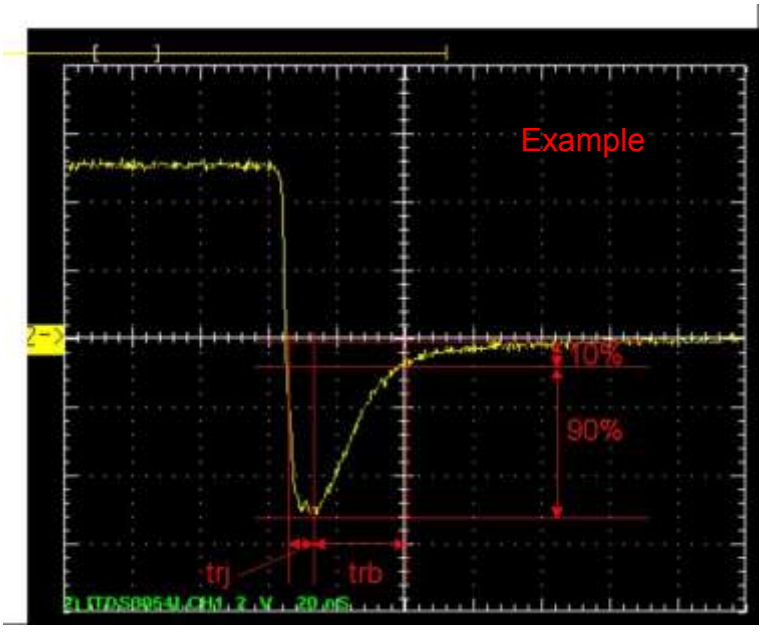
## Reverse Recovery Characteristic Reference




**Trj =2.12(us)**
**Trb=2.80(us)**
**Conditions: Ifwd=Irev=0.2(A), Rl=50**




Relation between trj and trb

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