

# Device Modeling Report

COMPONENTS: THYRISTOR  
PART NUMBER: BT152-400R  
MANUFACTURER: PHILIPS SEMICONDUCTOR



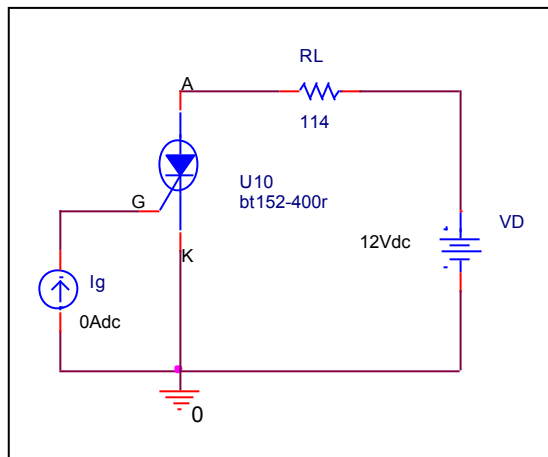
**Bee Technologies Inc.**

## DIODE MODEL

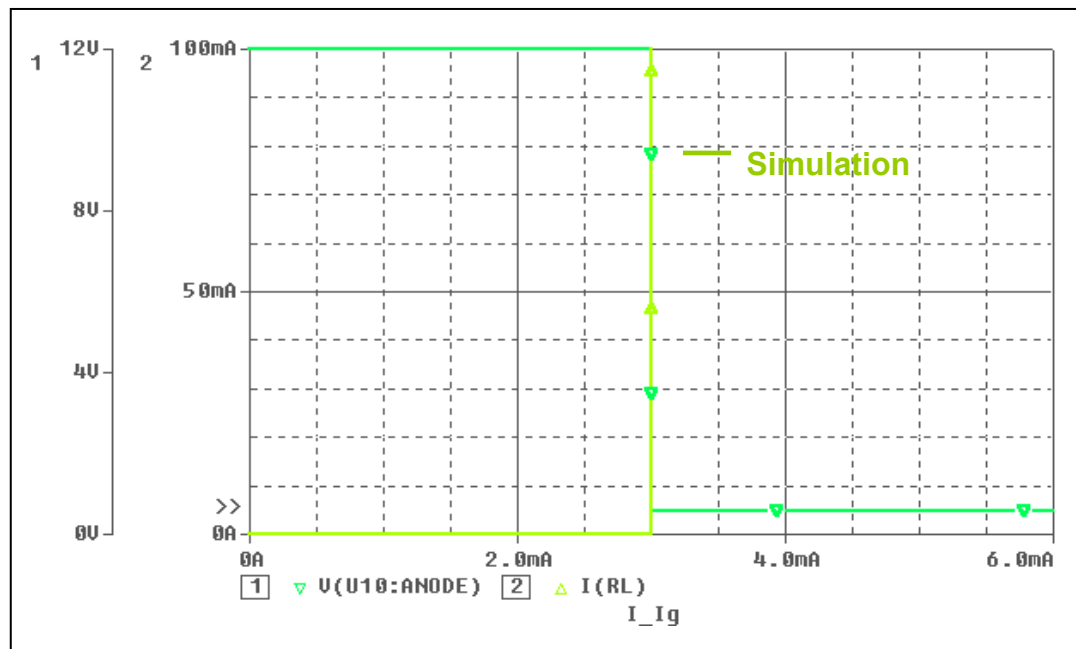
| Pspice model<br>Parameter | Model description                           |
|---------------------------|---------------------------------------------|
| IS                        | Saturation Current                          |
| N                         | Emission Coefficient                        |
| 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                                |

## IG-VT Characteristic

### Evaluation Circuit



### Simulation result

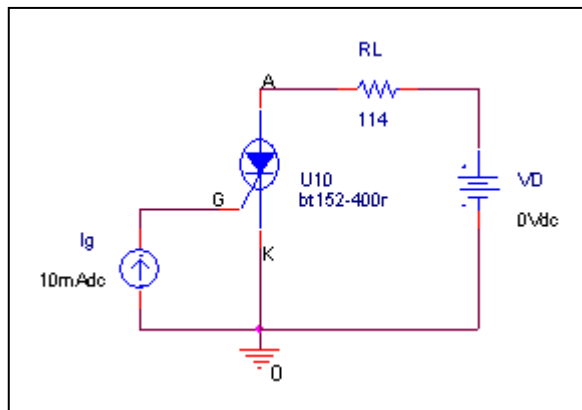


### Comparison Table

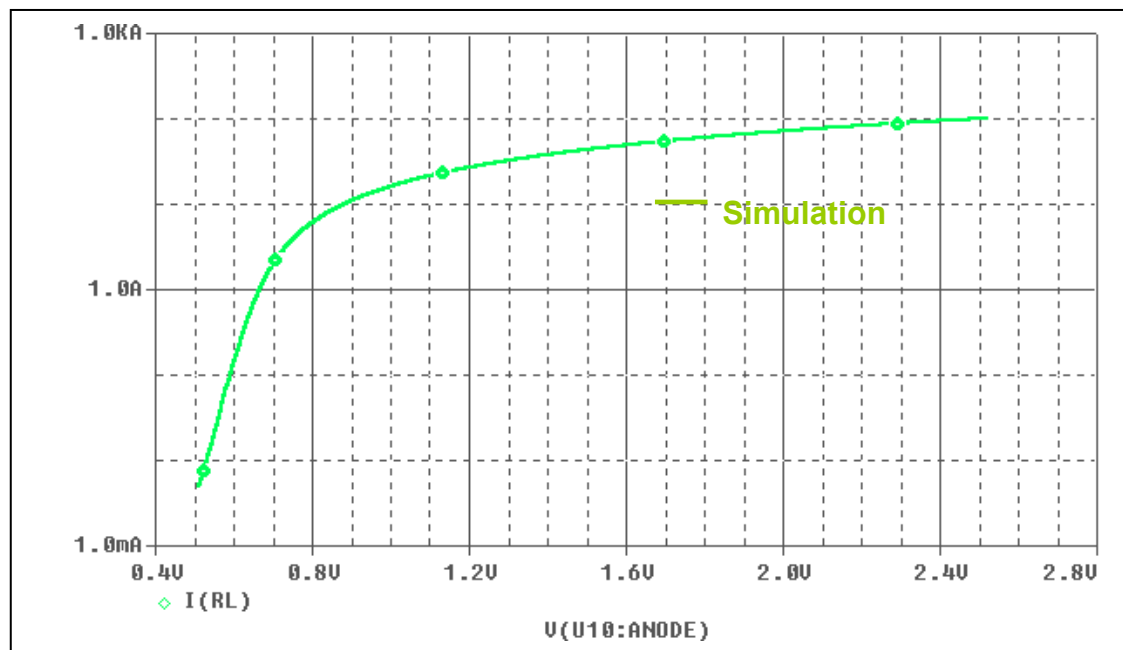
|               | Measurement | Simulation | % Error |
|---------------|-------------|------------|---------|
| $I_{GT}$ (mA) | 3           | 2.9923     | -0.2567 |
| $V_{GT}$ (V)  | 0.6         | 0.591460   | -1.4233 |

## ITM-VTM Characteristic

### Evaluation Circuit



### Simulation result

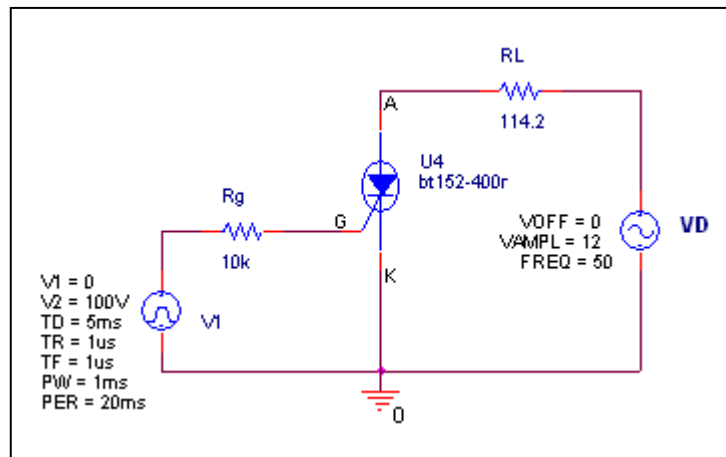


### Comparison Table

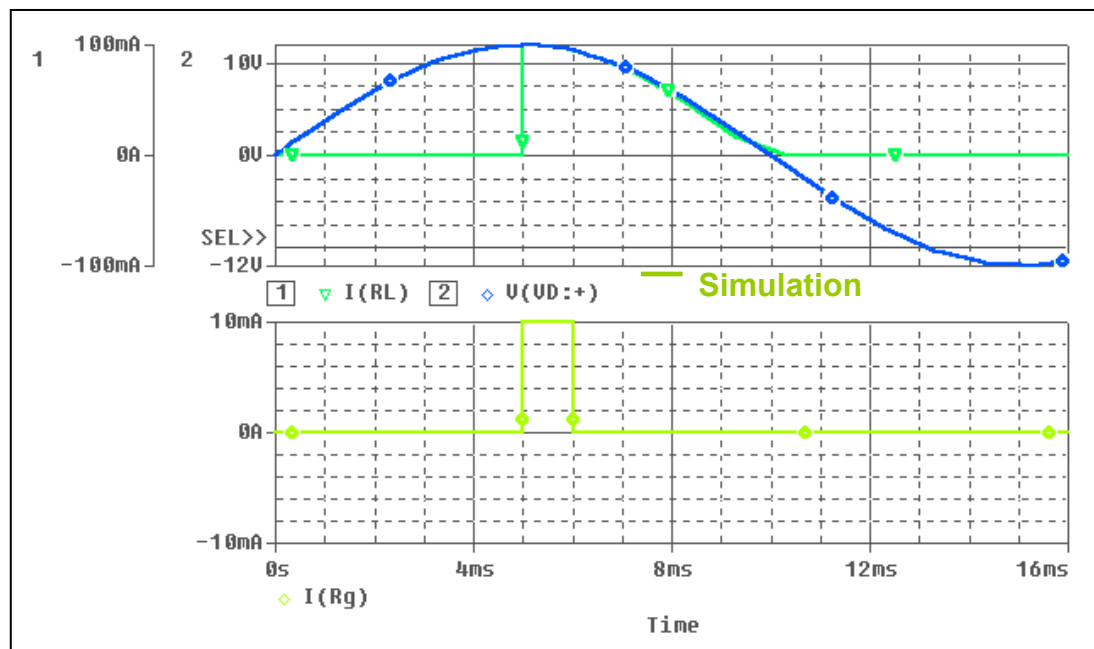
| At ITM=40A | Measurement | Simulation | % Error |
|------------|-------------|------------|---------|
| VTM(V)     | 1.4         | 1.4527     | 3.7643  |

## Holding Characteristic (IH)

### Evaluation Circuit



### Simulation result

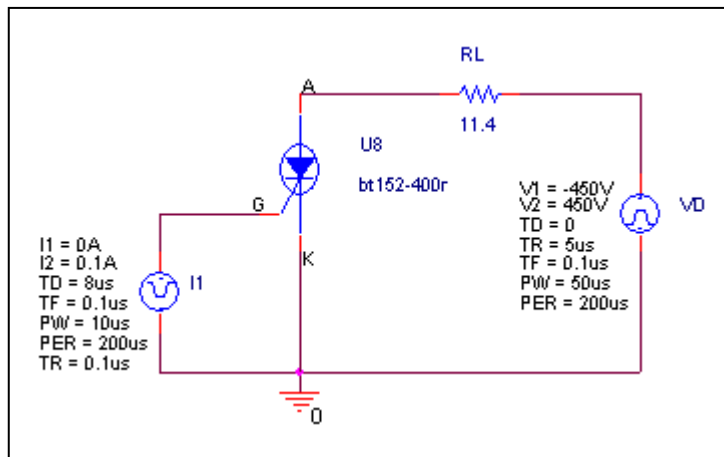


### Comparison Table

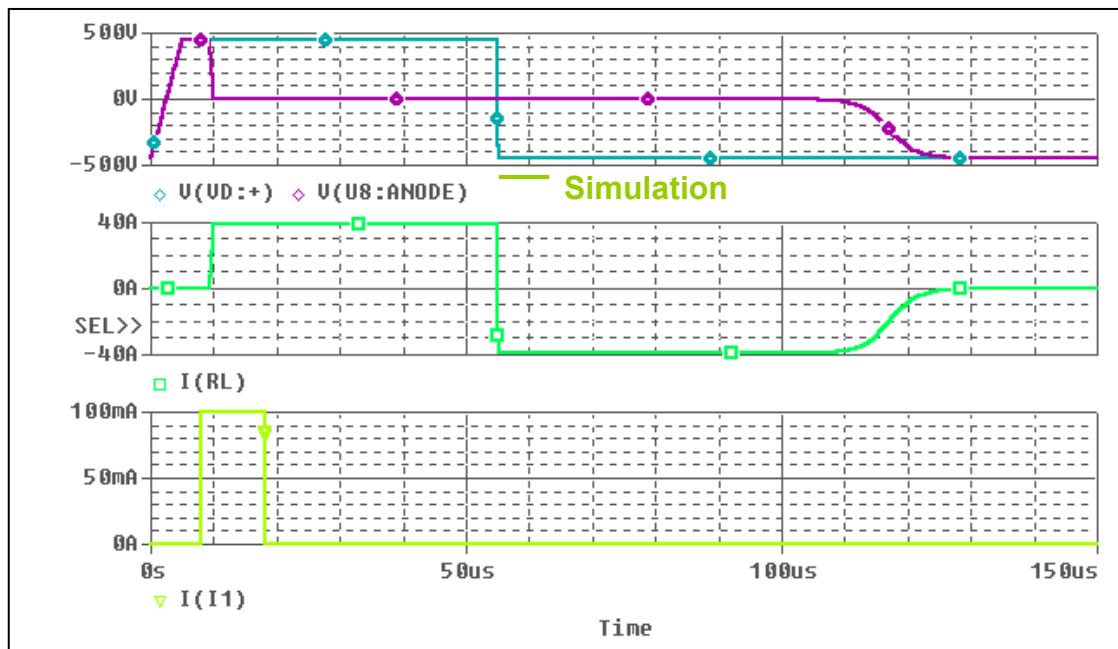
| VD=12V | Measurement | Simulation | % Error |
|--------|-------------|------------|---------|
| IH(mA) | 15          | 15.059     | 0.3933  |

## Switching Time Characteristic

### Evaluation Circuit



### Simulation result



### Comparison Table

|          | Measurement | Simulation | %Error  |
|----------|-------------|------------|---------|
| Ton(us)  | 2           | 2.0195     | 0.9750  |
| Toff(us) | 70          | 69.956     | -0.0629 |