

# Device Modeling Report

COMPONENTS : VOLTAGE REGULATOR  
PART NUMBER : uPC78L10T  
MANUFACTURER : NEC Electronics Corporation



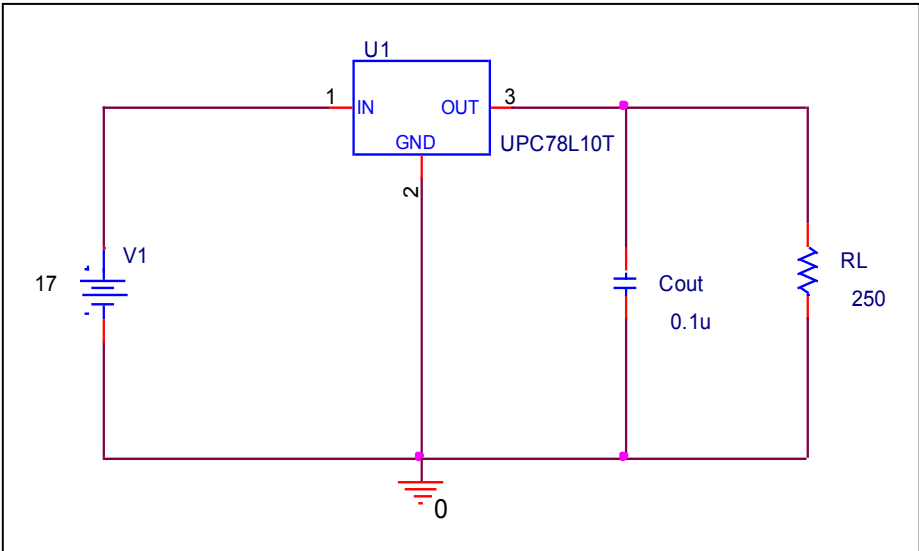
**Bee Technologies Inc.**

## MODEL PARAMETER

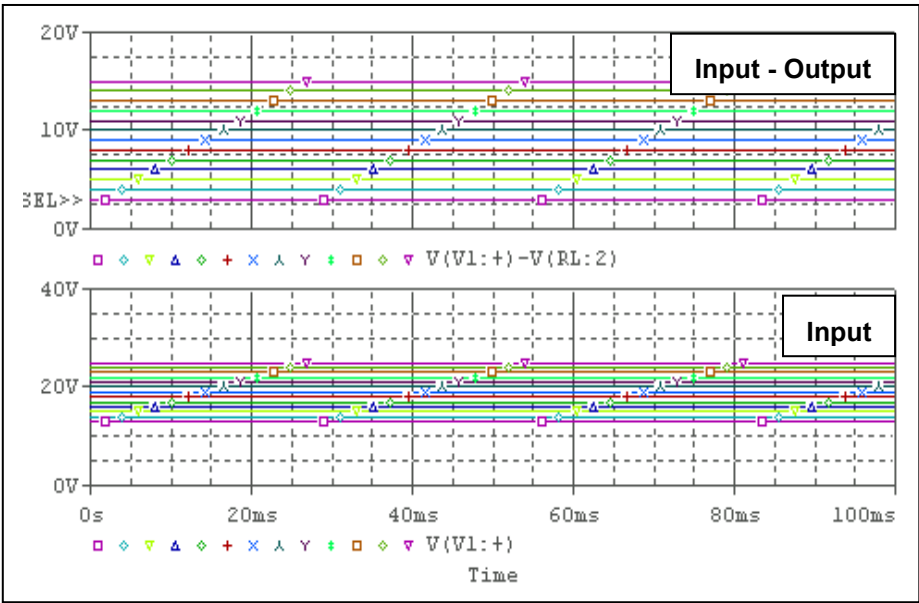
| Pspice model parameter | Model description                                 |
|------------------------|---------------------------------------------------|
| VREF                   | Reference Voltage                                 |
| N                      | Emission Coefficient                              |
| BETA                   | Tranconductance of JFET Transistor                |
| VAF                    | Early Voltage of Output Pass Transistor           |
| CPZ                    | Output Impedance Zero Capacitor                   |
| RB2                    | Base Resistance of Output Limit Voltage Source    |
| ESC1                   | Coefficient of Current Limit Voltage Source       |
| ESC2                   | Coefficient of Current Limit Voltage Source       |
| EFB1                   | Coefficient of Foldback Current Voltage Source    |
| EFB2                   | Coefficient of Foldback Current Voltage Source    |
| EFB3                   | Coefficient of Foldback Current Voltage Source    |
| EB                     | Non-ideal Base-Collector Diode Saturation Current |

# Input-Output Voltage Differential Characteristic

## Evaluation Circuit



## Simulation result

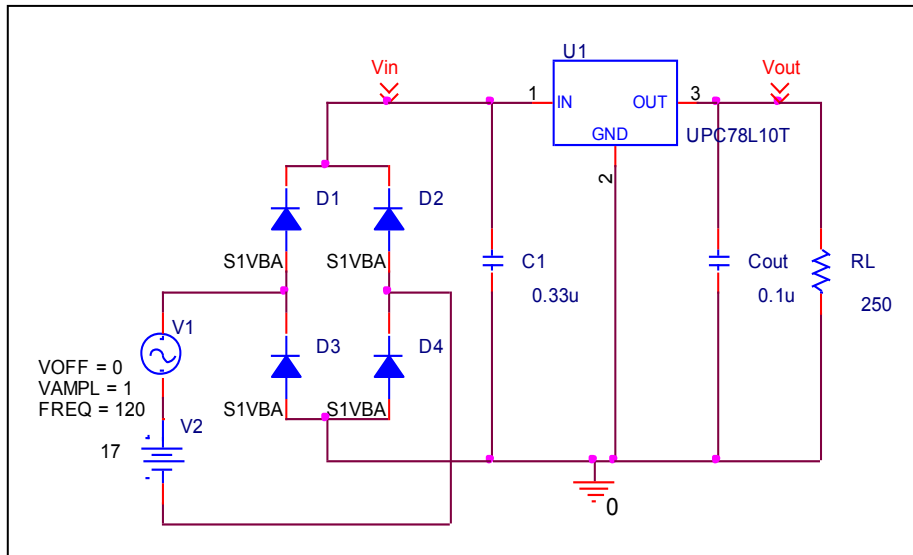


## Example

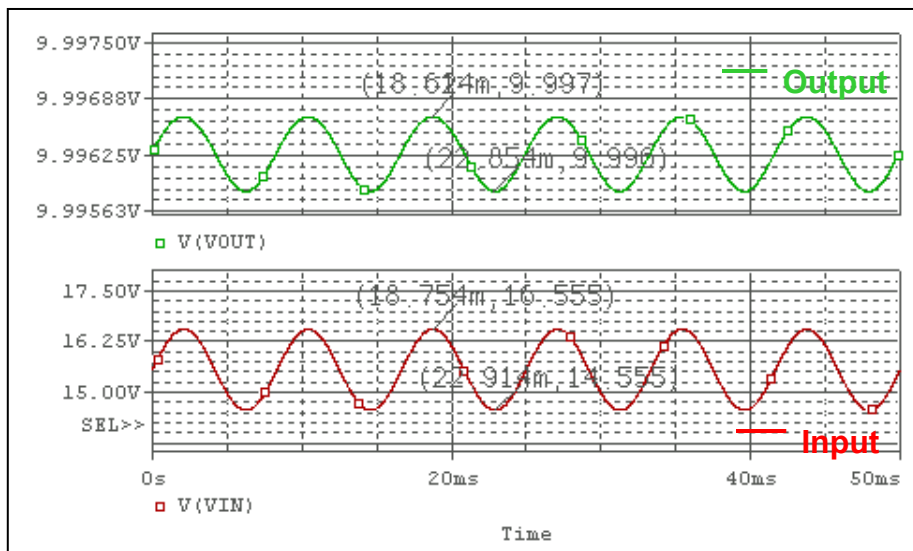
| $V_{IN} - V_{OUT}$ | Measurement | Simulation | % Error |
|--------------------|-------------|------------|---------|
| 17 (V) – 10 (V)    | 7 (V)       | 7.0032 (V) | 0.046   |

## Ripple Rejection (R•R) Characteristic

### Evaluation Circuit



### Simulation result

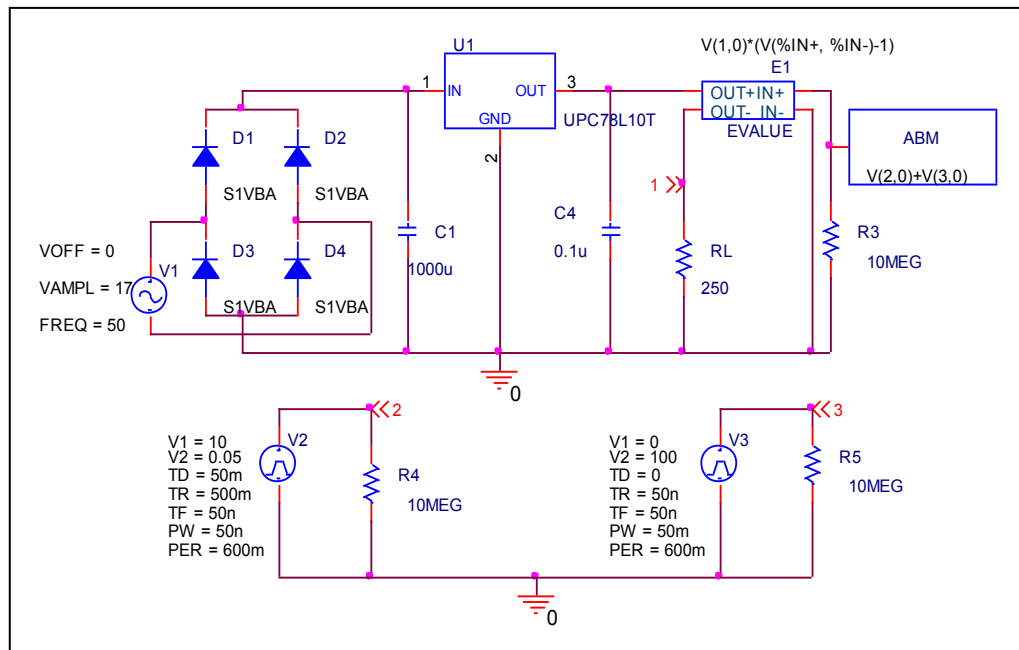


### Comparison Table

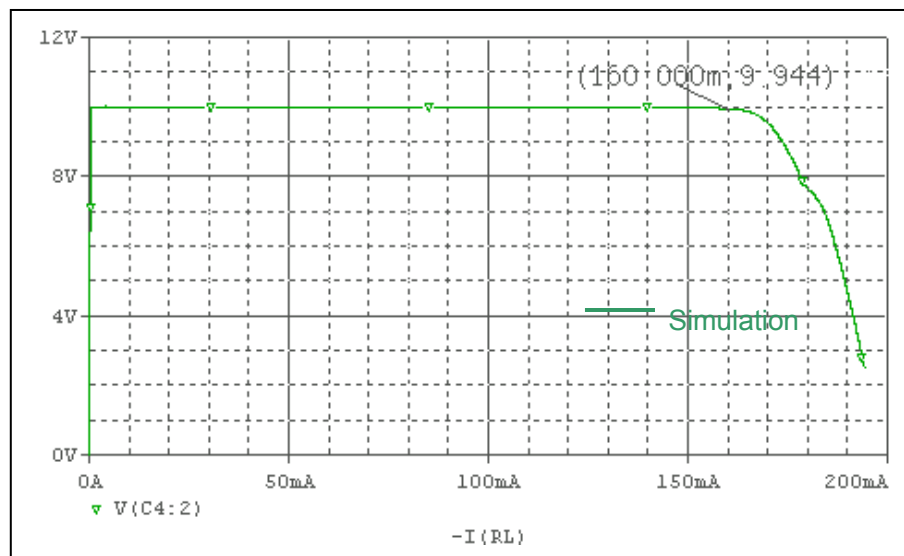
| Ripple rejection ratio (dB) | Measurement | Simulation | % Error |
|-----------------------------|-------------|------------|---------|
|                             | 69          | 66.021     | -4.317  |

# Output Characteristic

## Evaluation Circuit



## Simulation result



## Comparison Table

| Output Voltage (V) | Measurement | Simulation | % Error |
|--------------------|-------------|------------|---------|
|                    | 10          | 9.944      | -0.56   |