

# Device Modeling Report

COMPONENTS : VOLTAGE COMPARATOR  
PART NUMBER : LM119W/883  
MANUFACTURER : NATIONAL



**Bee Technologies Inc.**

## BJT MODEL

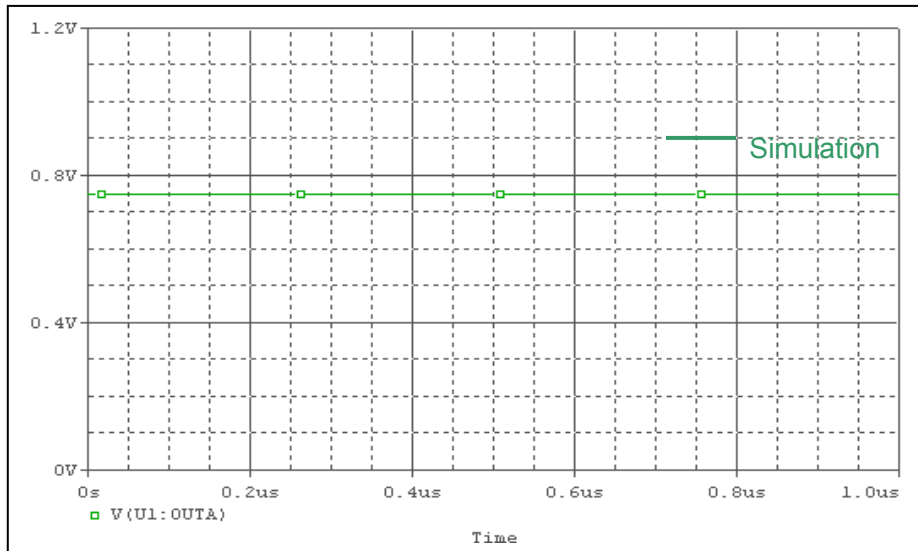
Pspice model parameter	Model description
IS	Saturation Current
BF	Ideal Maximum Forward Beta
CJC	Zero-bias Collector-Base Junction Capacitance
TF	Forward Transit Time
TR	Reverse Transit Time

## DIODE MODEL

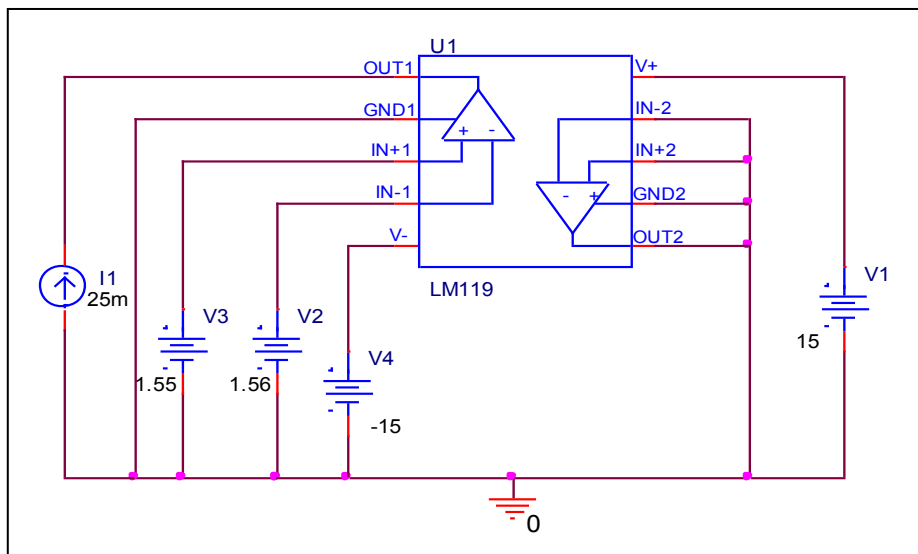
Pspice model parameter	Model description
IS	Saturation Current
RS	Series Resistance

## Output Low Voltage

### Simulation result



### Evaluation Circuit

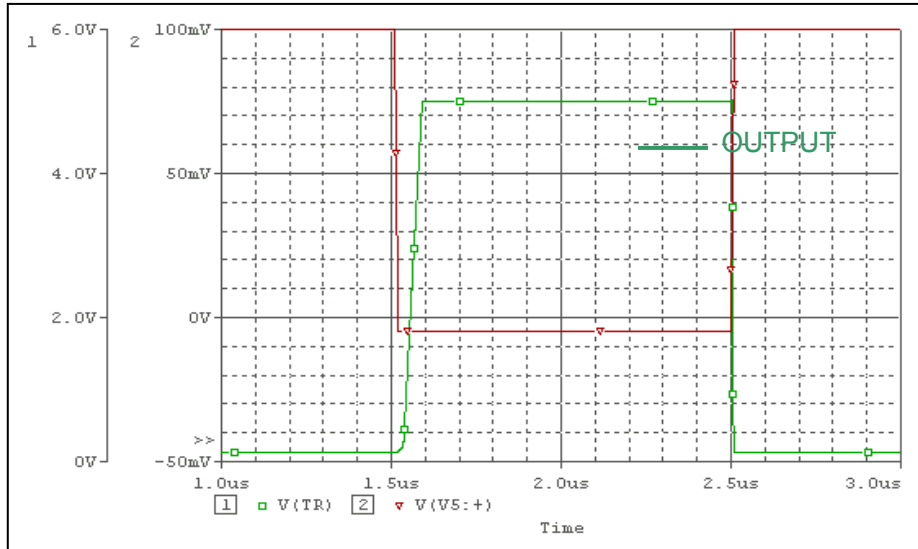


### Comparison Table

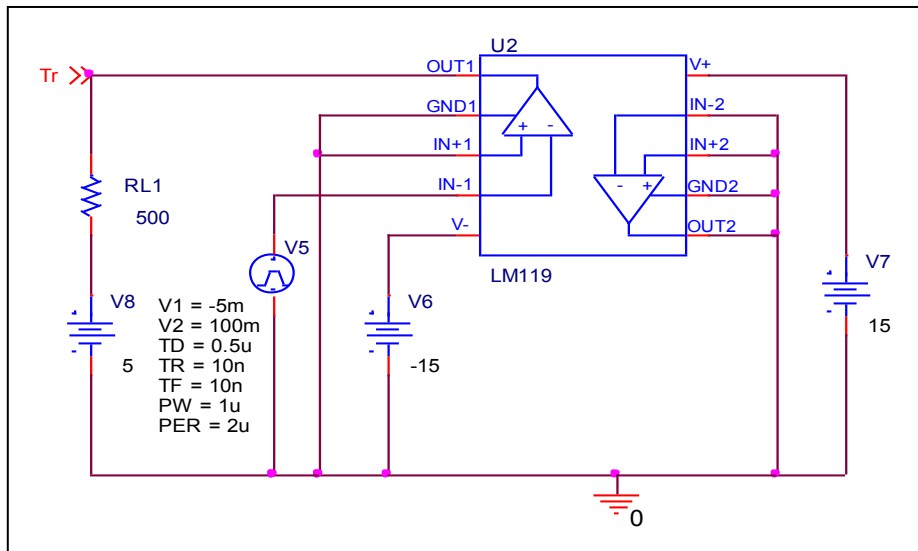
$I_o = 25\text{mA}$	Measurement	Simulation	%Error
$V_{ol}$ (V)	0.75	0.750342	0.046

## Response time (Rise time and Transition time)

### Simulation result



### Evaluation Circuit

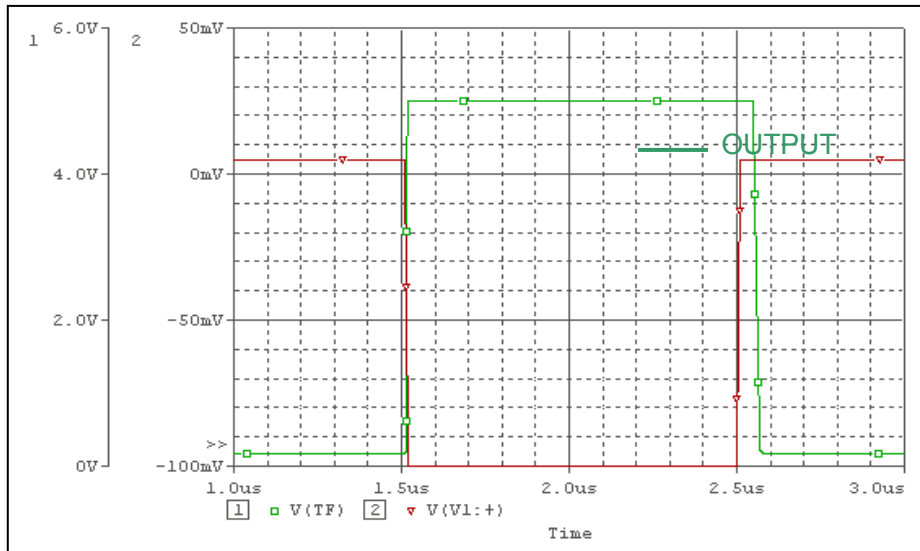


### Comparison Table

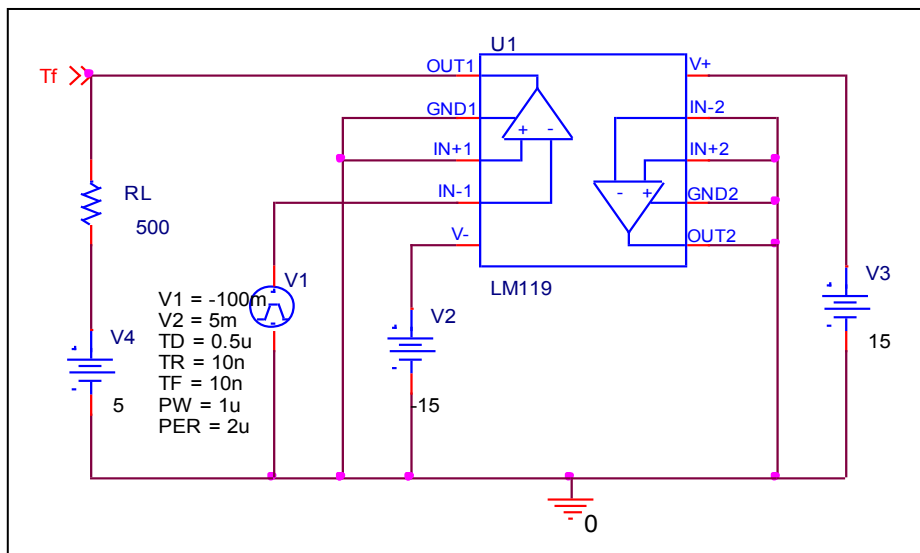
	Measurement	Simulation	% Error
<b>Rising delay time (ns)</b>	30	30.576	1.920
<b>Transition time (ns)</b>	45	45.115	0.256

## Response time (Falling time)

### Simulation result



### Evaluation Circuit

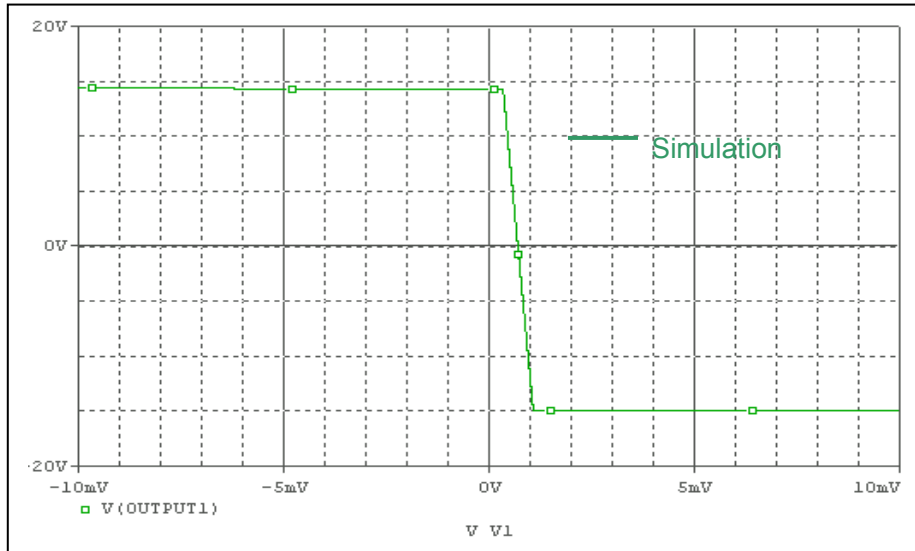


### Comparison Table

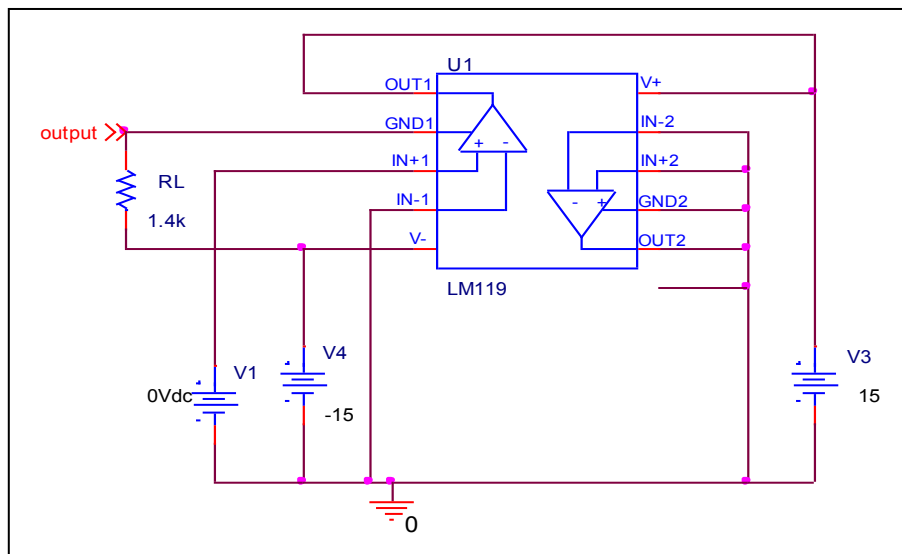
	Measurement	Simulation	% Error
<b>Falling delay time (ns)</b>	50	49.233	-1.534

# Input Offset Voltage Characteristics

## Simulation result



## Evaluation Circuit

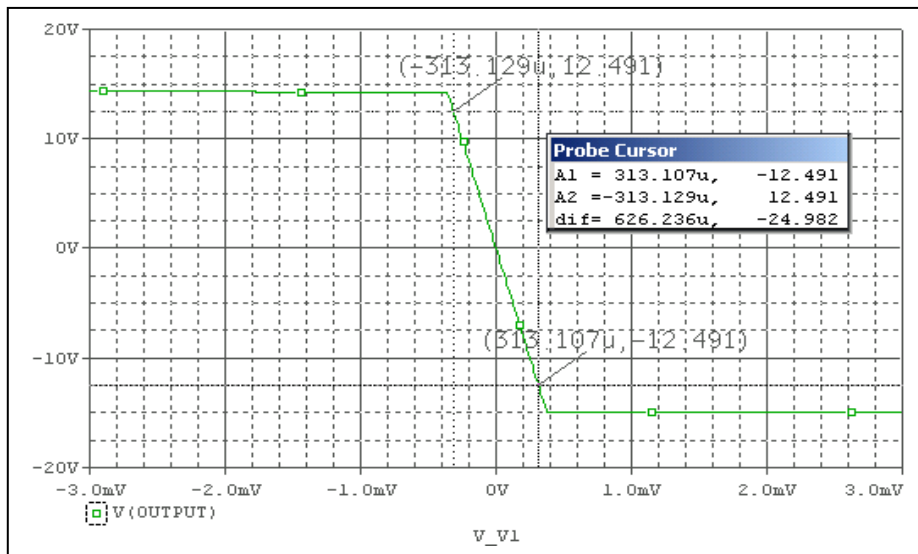


## Comparison Table

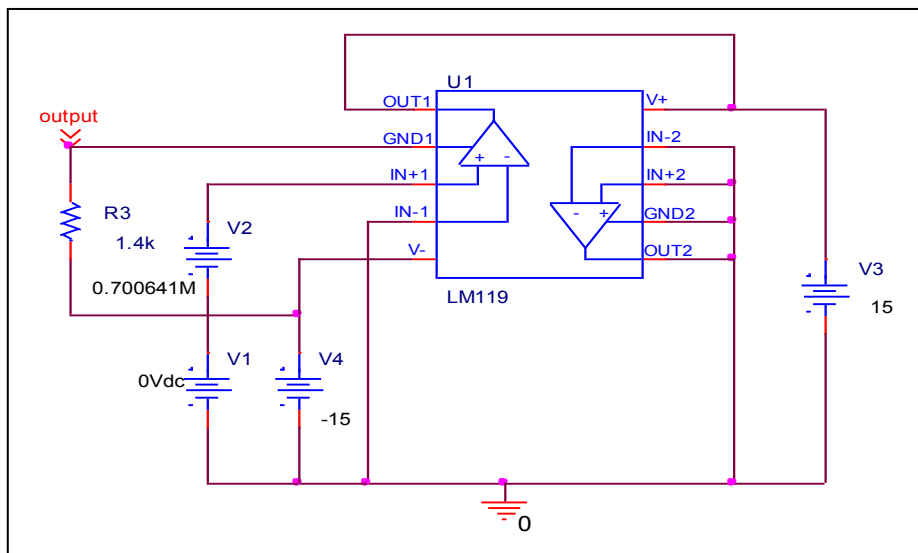
	Measurement	Simulation	%Error
$V_{io}(mV)$	0.7	0.700641	0.092

## Av Characteristics

### Simulation result



### Evaluation Circuit



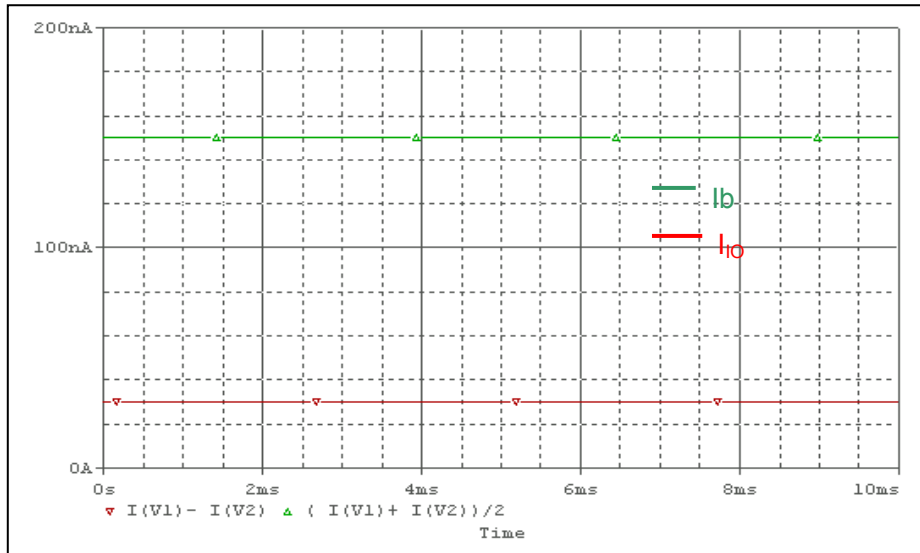
$$A_v = 24.982 / 626.236\mu$$

### Comparison Table

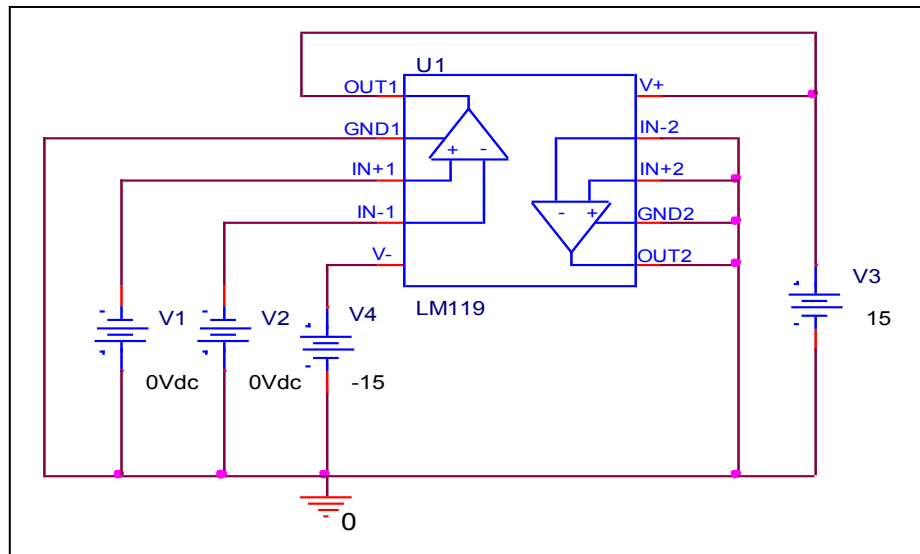
	Measurement	Simulation	%Error
<b>Av (V/mV)</b>	40	39.892	-0.270

# Input Bias Current Characteristics

## Simulation result



## Evaluation Circuit



## Comparison Table

	Measurement	Simulation	% Error
<b>I<sub>b</sub> (nA)</b>	150	150.009	0.006
<b>I<sub>io</sub> (nA)</b>	30	29.992	-0.027