

Device Modeling Report

COMPONENTS: VOLTAGE COMPARATOR
PART NUMBER: uPC311G2
MANUFACTURER: NEC



Bee Technologies Inc.

BJT MODEL

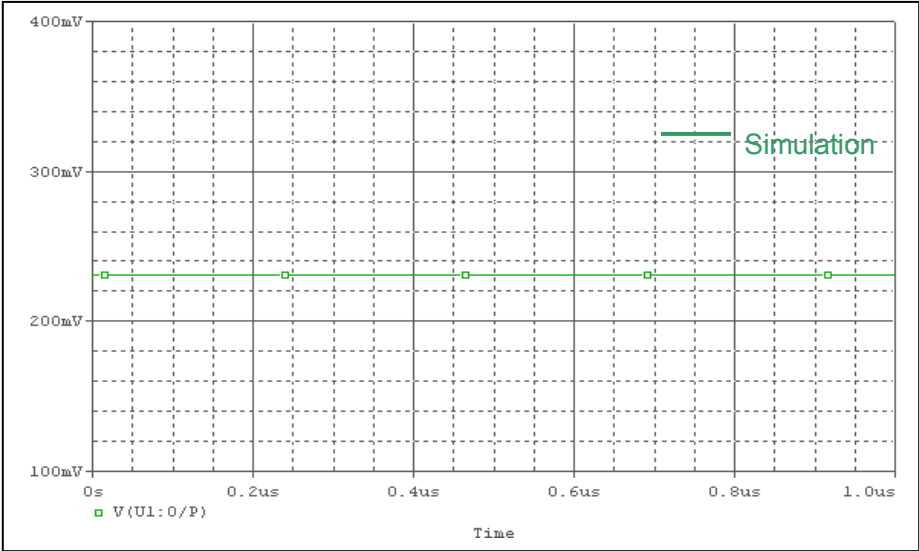
Pspice model parameter	Model description
IS	Saturation Current
BF	Ideal Maximum Forward Beta
CJC	Zero-bias Collector-Base Junction Capacitance
TF	Forward Transit Time
TR	Reverse Transit Time

DIODE MODEL

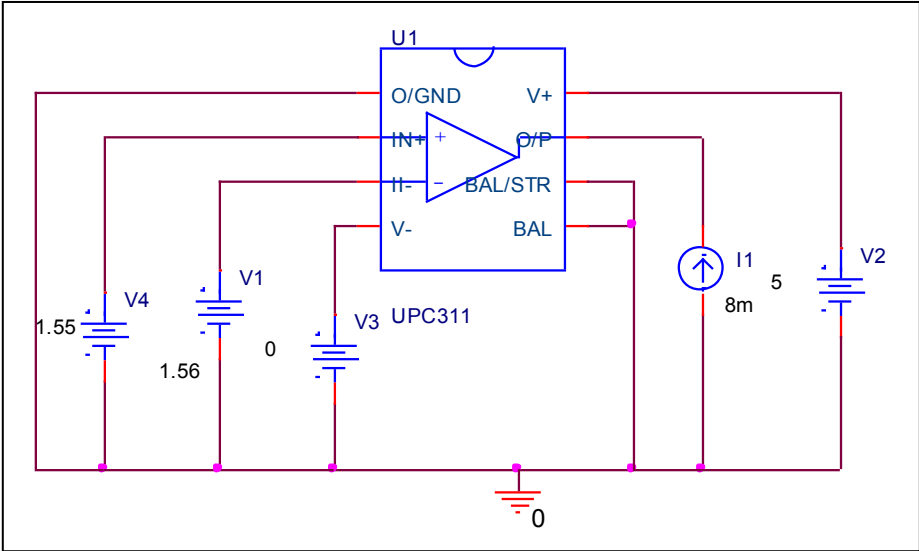
Pspice model parameter	Model description
IS	Saturation Current
RS	Series Resistance

Output Low Voltage

Simulation result



Evaluation Circuit

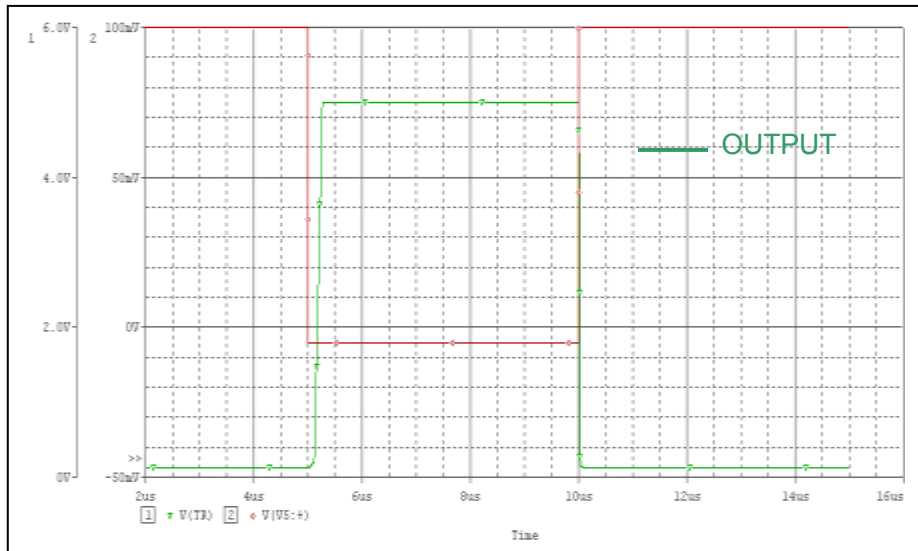


Comparision Table

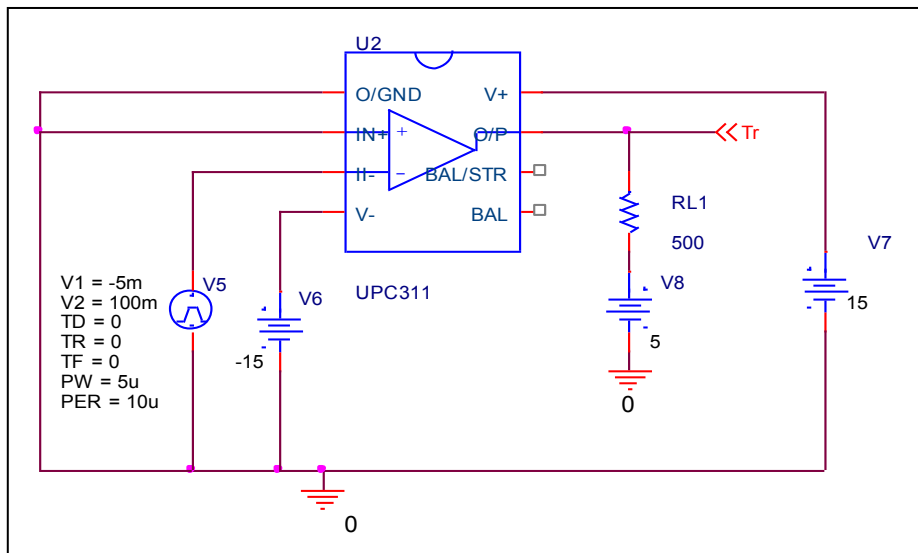
$I_O = 8\text{mA}$	Measurement	Simulation	%Error
$V_{ol} \text{ (V)}$	0.23	0.22944	-0.243

Response time (Rise time and Transition time)

Simulation result



Evaluation Circuit

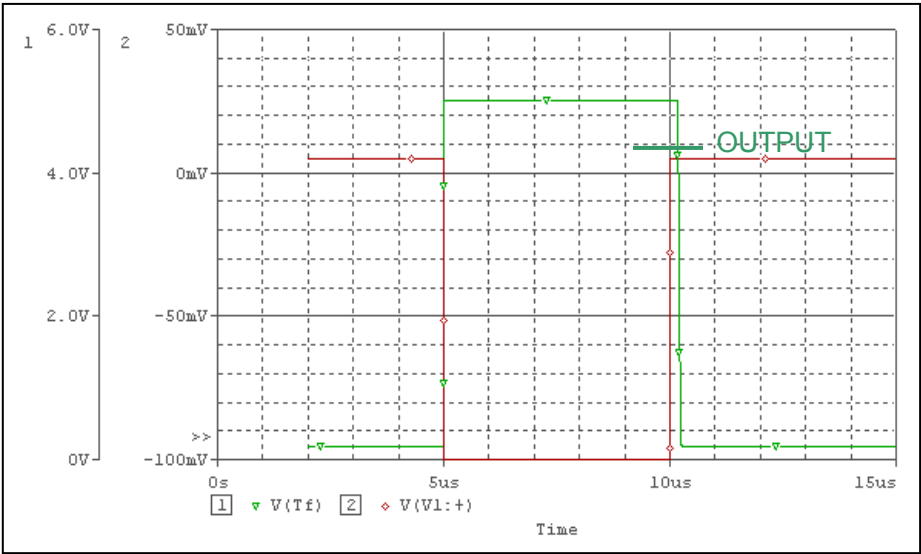


Comparison Table

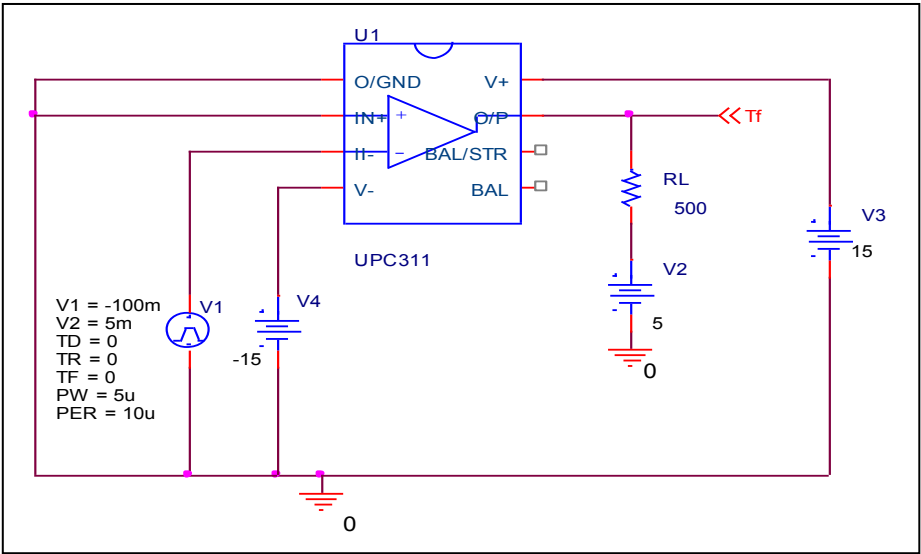
	Measurement	Simulation	% Error
Rising delay time (us)	0.13	0.131465	1.127
Transition time (us)	0.12	0.119992	-0.007

Response time (Falling time)

Simulation result



Evaluation Circuit

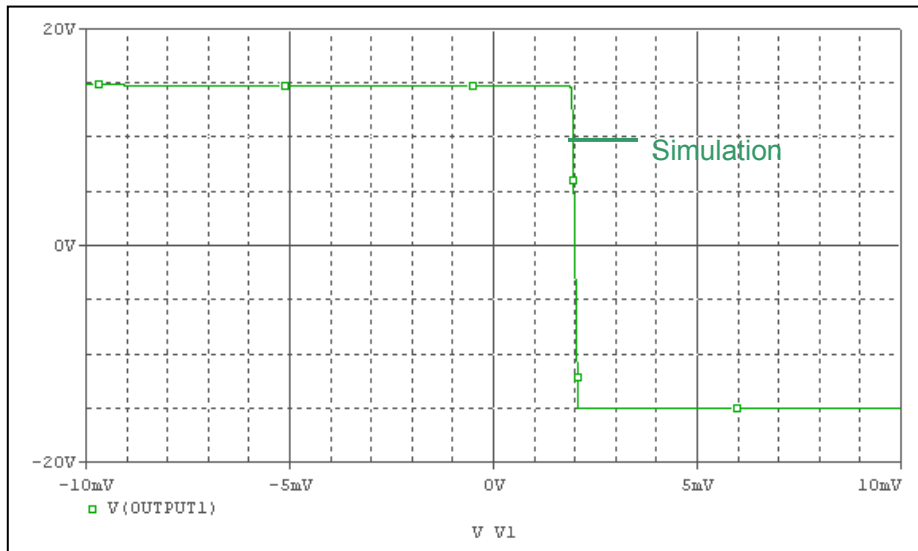


Comparision Table

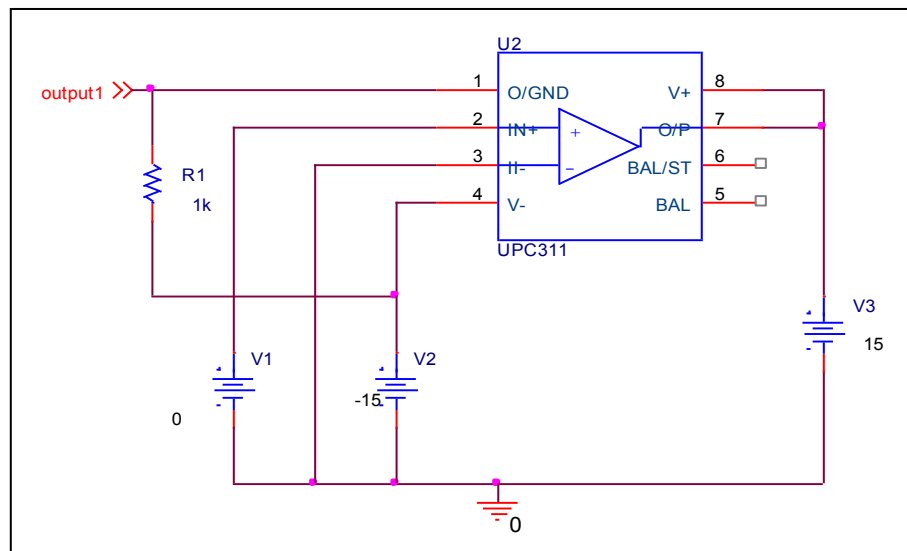
	Measurement	Simulation	% Error
Falling delay time (us)	0.18	0.180730	0.406

Input Offset Voltage Characteristics

Simulation result



Evaluation Circuit

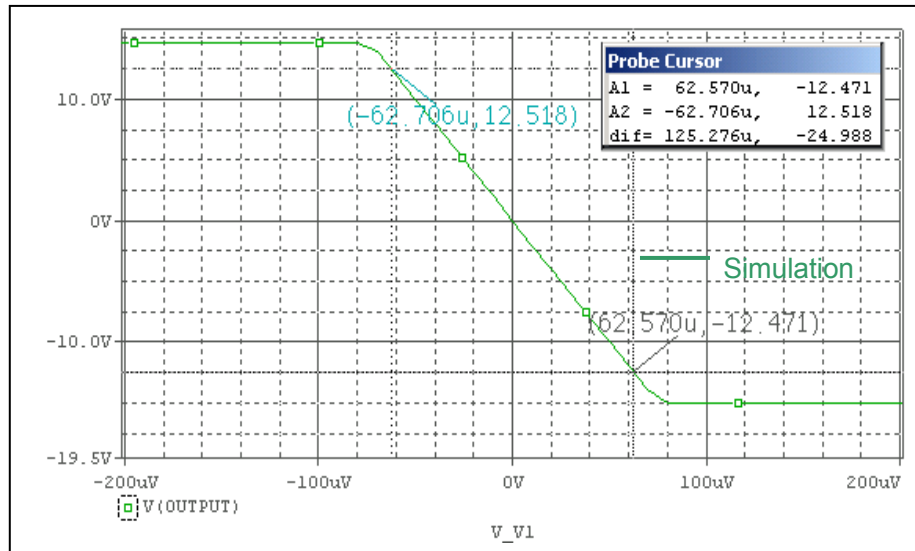


Comparison Table

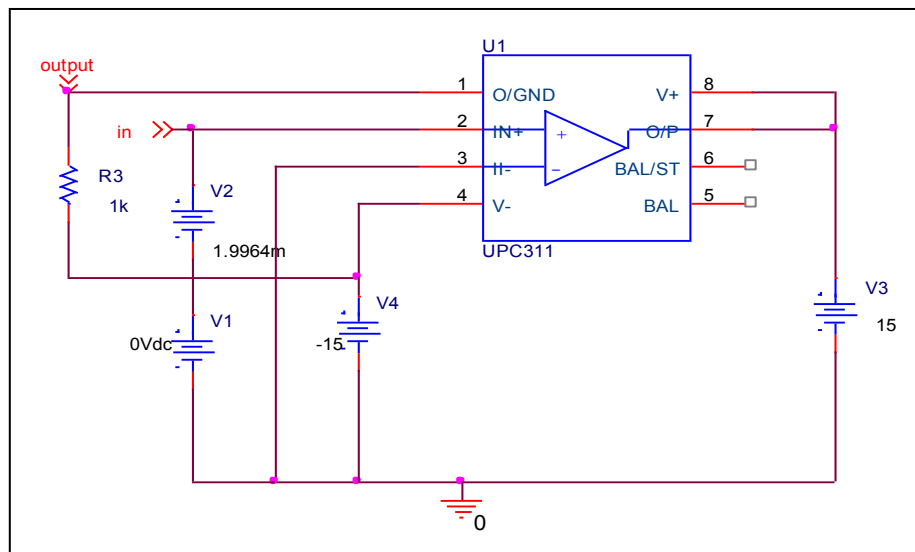
	Measurement	Simulation	%Error
$V_{io}(mV)$	2	1.9964	-0.18

Av Characteristics

Simulation result



Evaluation Circuit



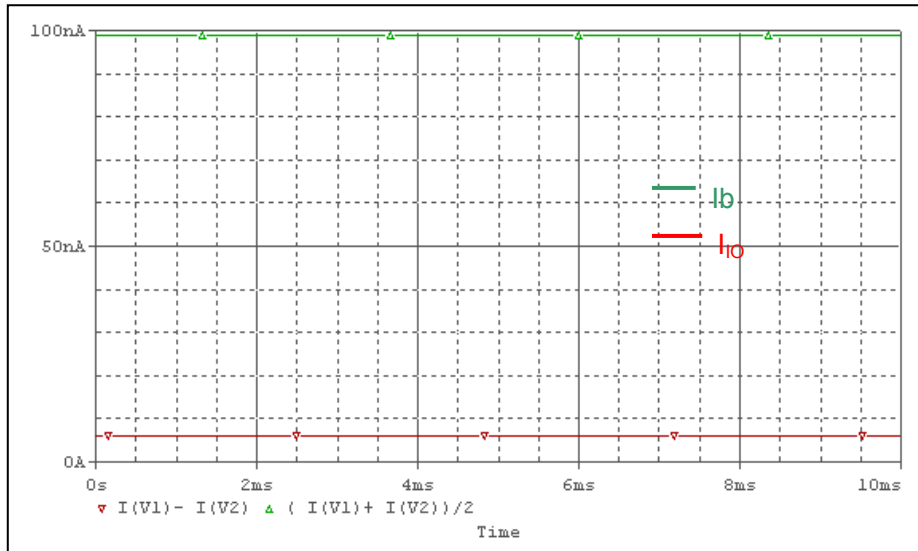
$$A_v = 24.988 / 125.276u$$

Comparison Table

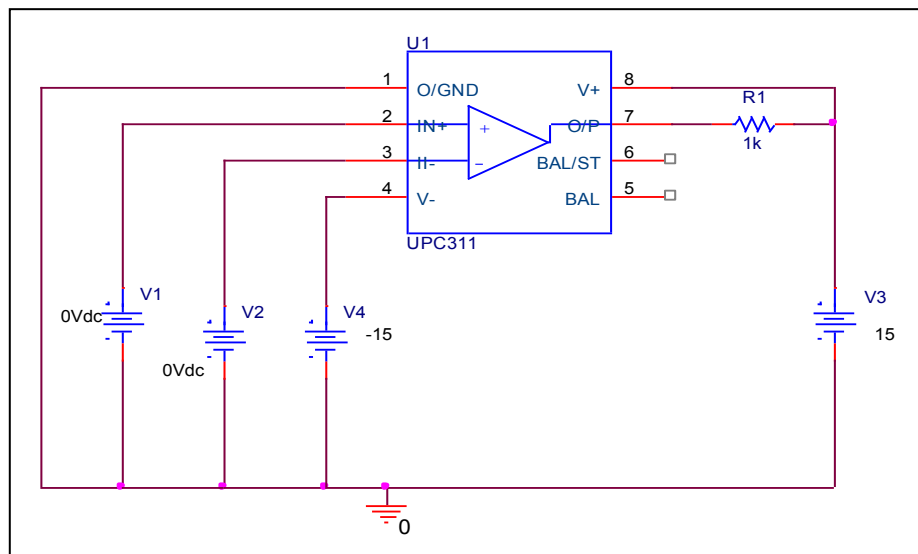
RL = 1kΩ	Measurement	Simulation	%Error
Av	200,000	199,464	-0.268

Input Bias Current Characteristics

Simulation result



Evaluation Circuit



Comparision Table

	Measurement	Simulation	% Error
I_b (nA)	100	98.872	-1.128
I_{IO} (nA)	6	5.9586	-0.690