

Device Modeling Report

COMPONENTS : VOLTAGE COMPARATOR
PART NUMBER : NJM311M
MANUFACTURER : NEW JAPAN RADIO



Bee Technologies Inc.

BJT MODEL

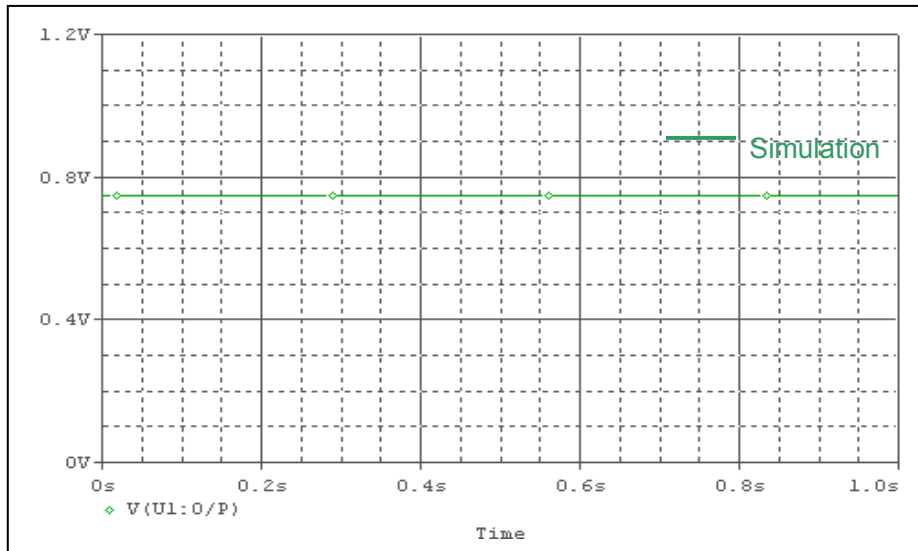
Pspice model parameter	Model description
IS	Saturation Current
BF	Ideal Maximum Forward Beta
CJC	Zero-bias Collector-Base Junction Capacitance
TF	Forward Transit Time
TR	Reverse Transit Time

DIODE MODEL

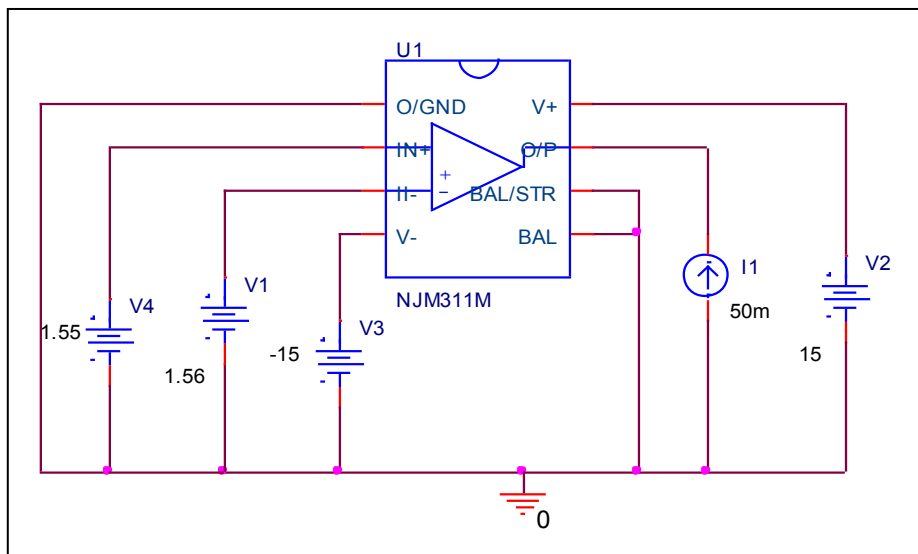
Pspice model parameter	Model description
IS	Saturation Current
RS	Series Resistance

Output Low Voltage

Simulation result



Evaluation Circuit

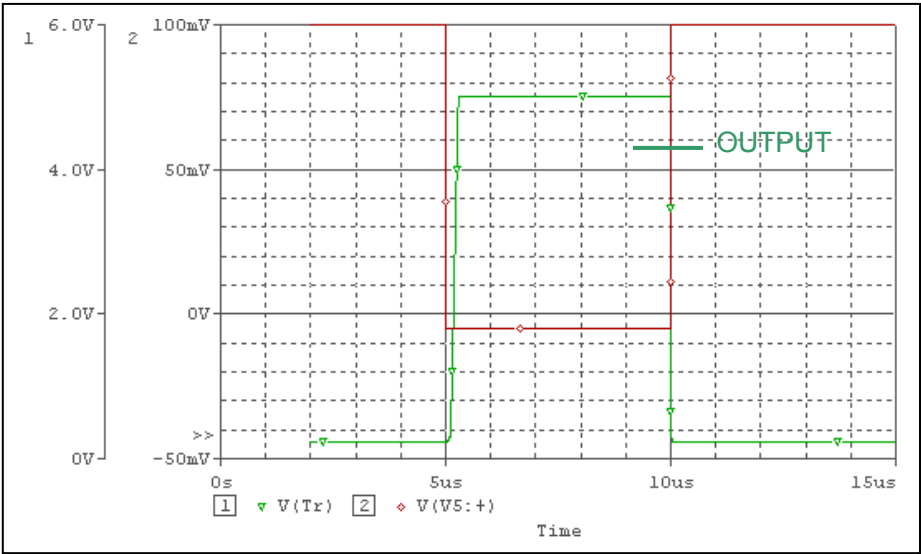


Compasion Table

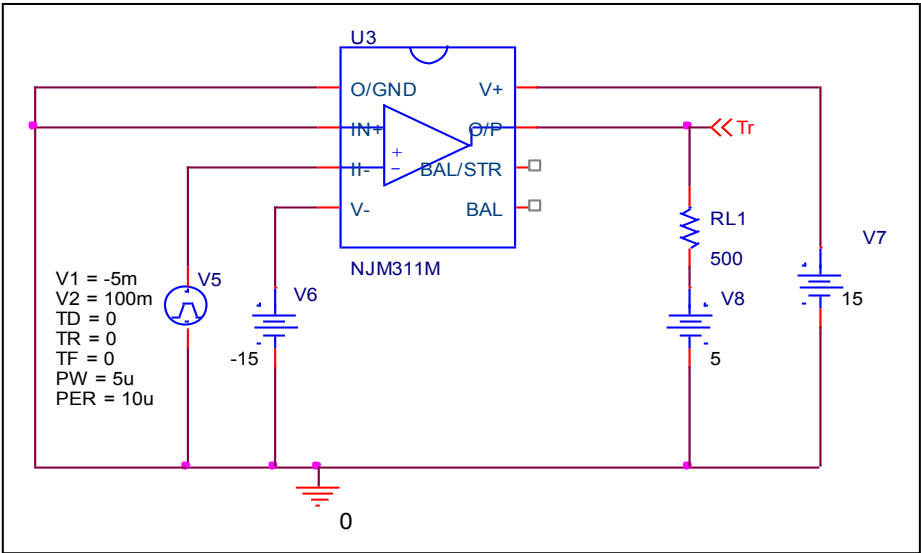
$I_o = 50\text{mA}$	Measurement	Simulation	%Error
$V_{ol} \text{ (V)}$	0.75	0.749735	-0.035

Response time

Simulation result



Evaluation Circuit

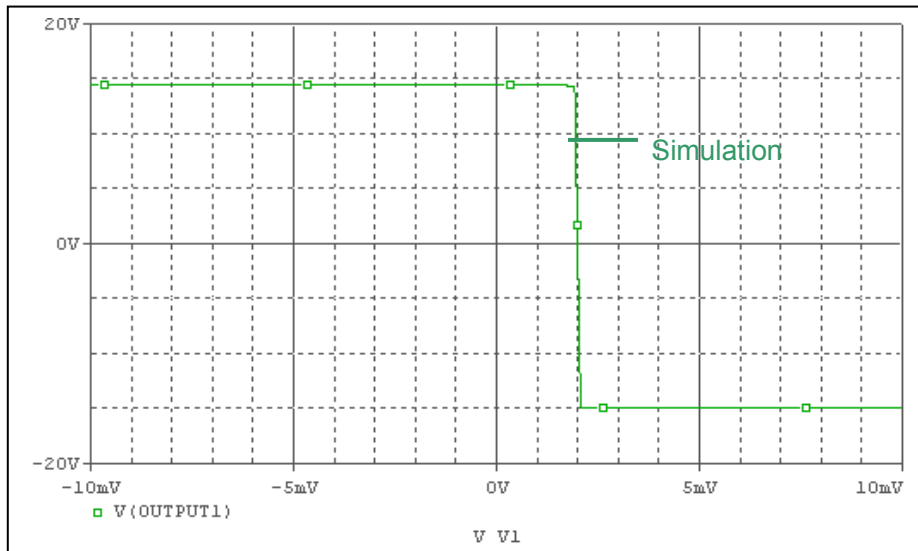


Compasion Table

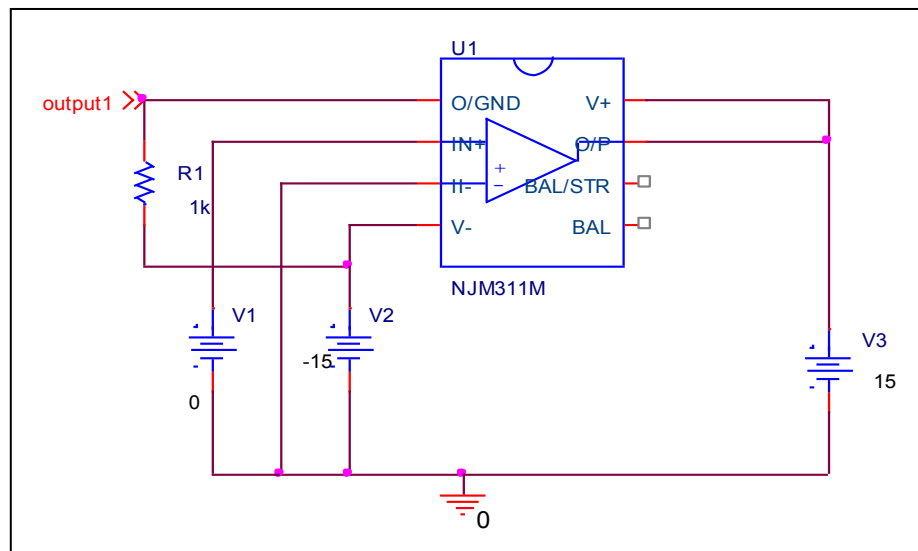
	Measurement	Simulation	% Error
Response time (ns)	200	193.370	-3.315

Input Offset Voltage Characteristics

Simulation result



Evaluation Circuit

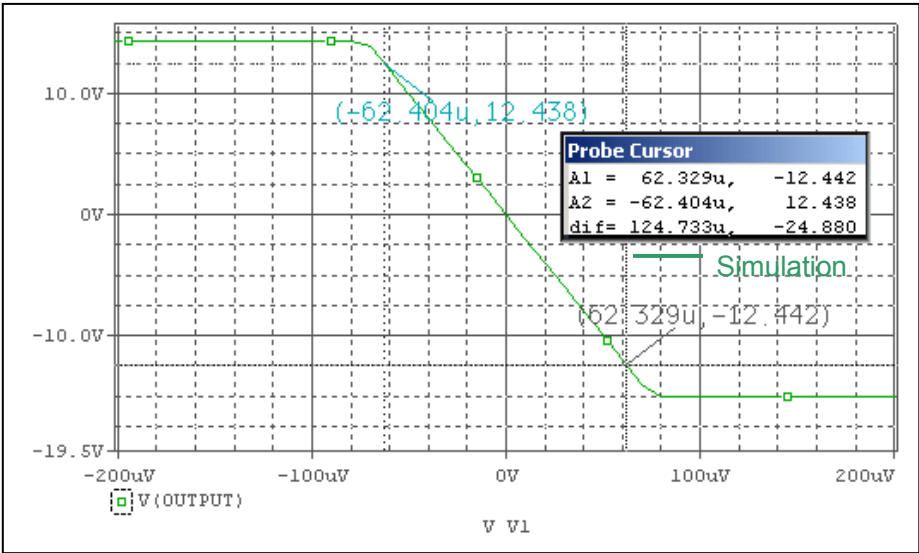


Compasion Table

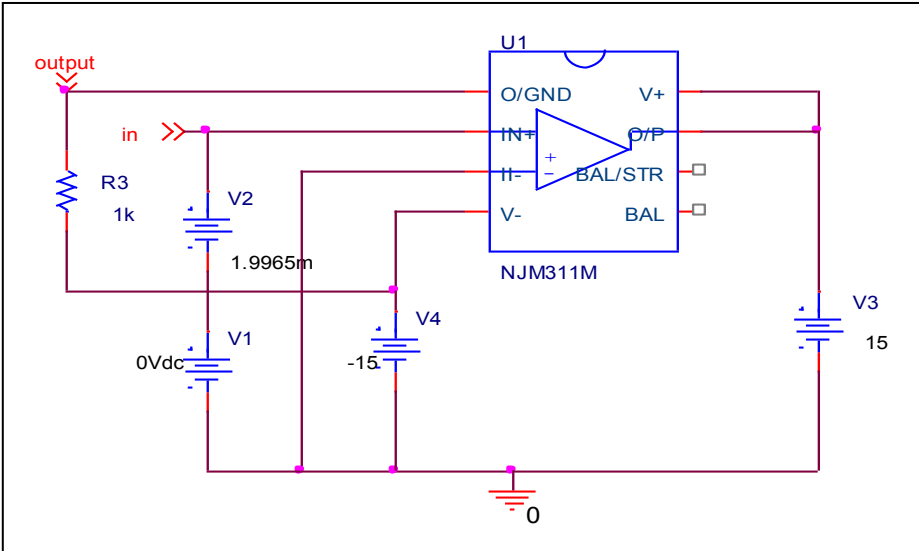
	Measurement	Simulation	%Error
$V_{io}(mV)$	2	1.9965	-0.175

Av Characteristics

Simulation result



Evaluation Circuit



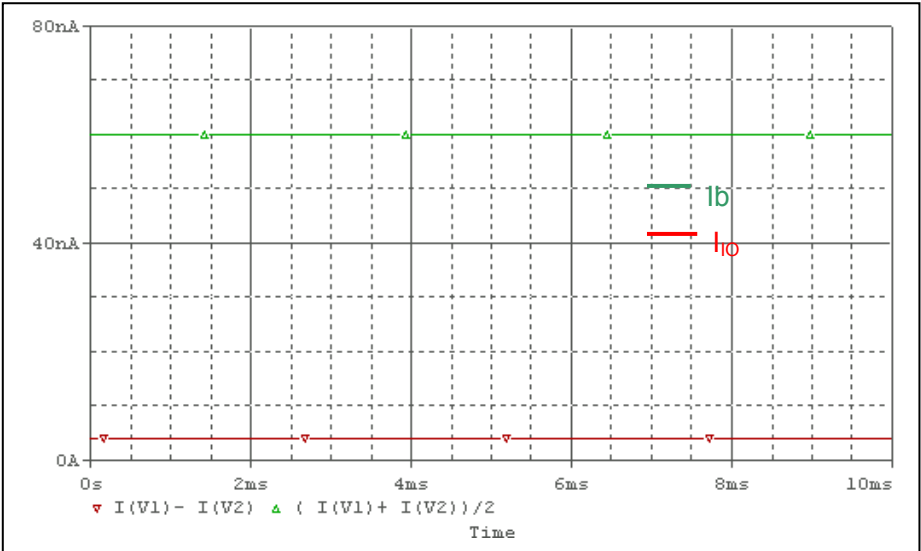
$$A_v = 20 \cdot \text{LOG}(24.880/124.733\text{u}) \quad \text{dB}$$

Compason Table

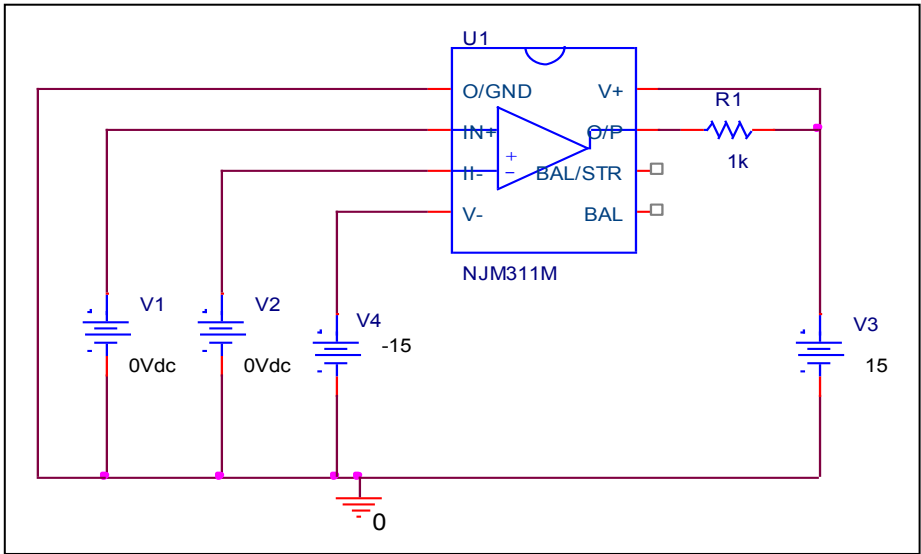
$R_L = 1\text{k}\Omega$	Measurement	Simulation	%Error
Av (dB)	106	106	0

Input Bias Current Characteristics

Simulation result



Evaluation Circuit



Compasion Table

	Measurement	Simulation	% Error
I_b (nA)	100	100.059	0.059
I_{IO} (nA)	6	6.0075	0.125