

Device Modeling Report

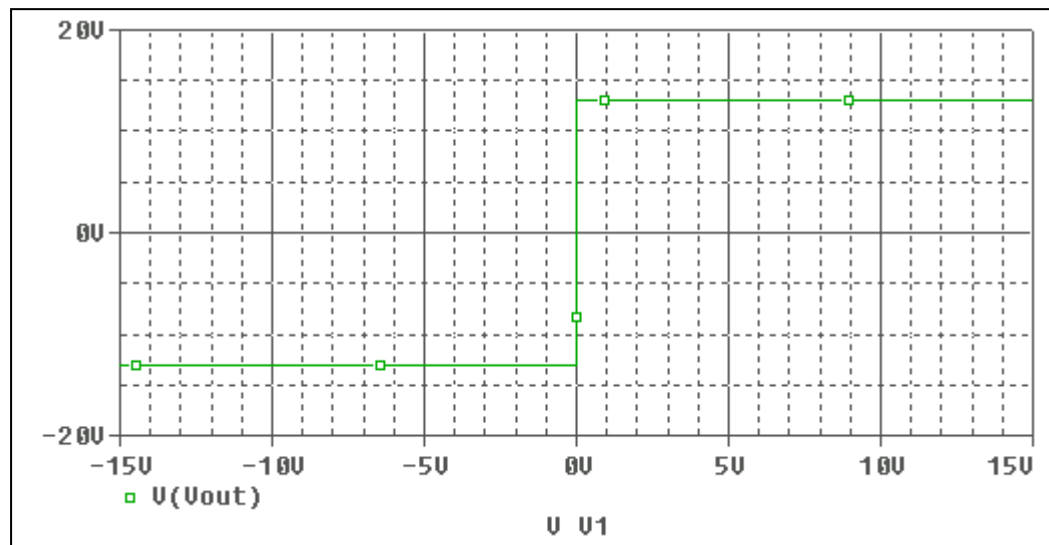
COMPONENTS: OPERATIONAL AMPLIFIER
PART NUMBER: NJM022BL
MANUFACTURER: NEW JAPAN RADIO CO.,LTD



Bee Technologies Inc.

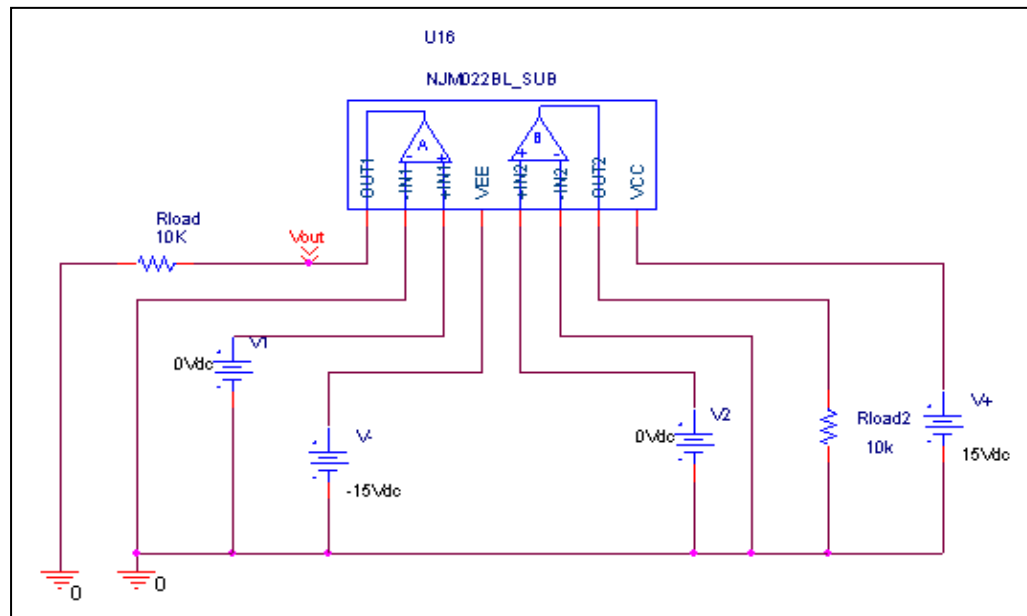
Output Voltage Swing, +Vout and -Vout

Simulation result



These simulation results are compared with $\pm V_{out}$

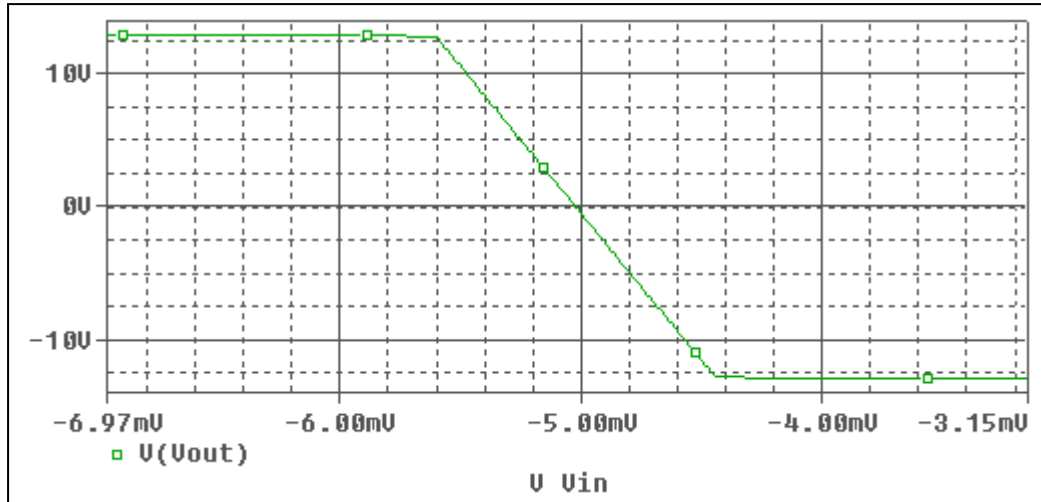
Evaluation circuit



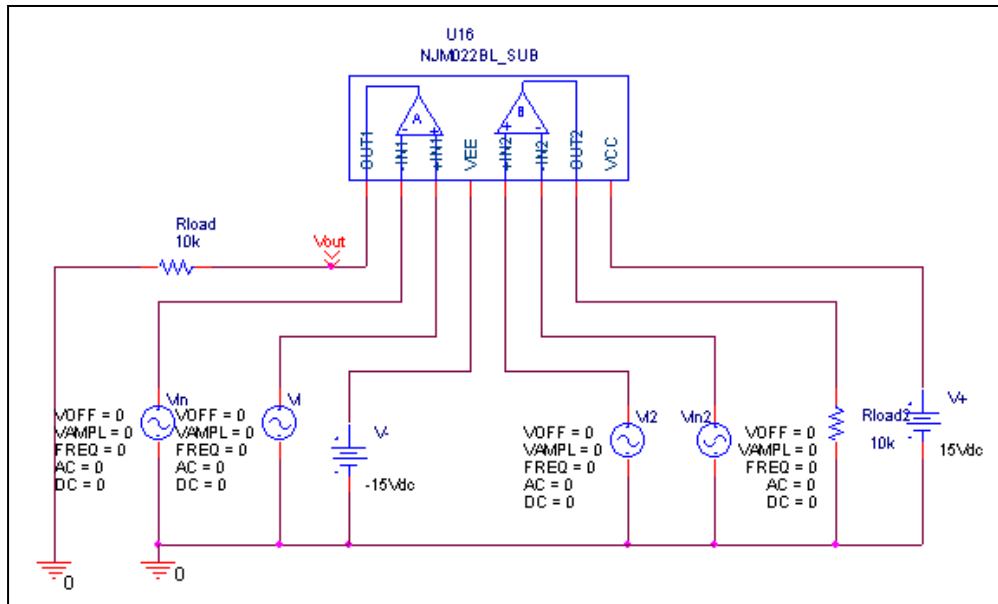
Output Voltage Swing	Data sheet	Simulation	%Error
+Vout(V)	+13	+12.972	0.215
-Vout(V)	-13	-12.972	0.215

Input Offset Voltage

Simulation result



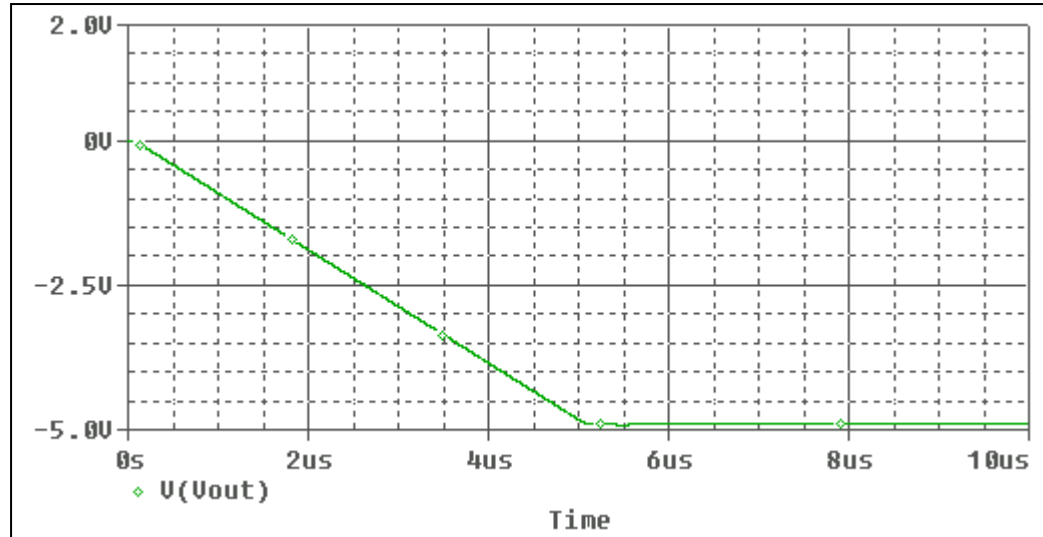
Evaluation circuit



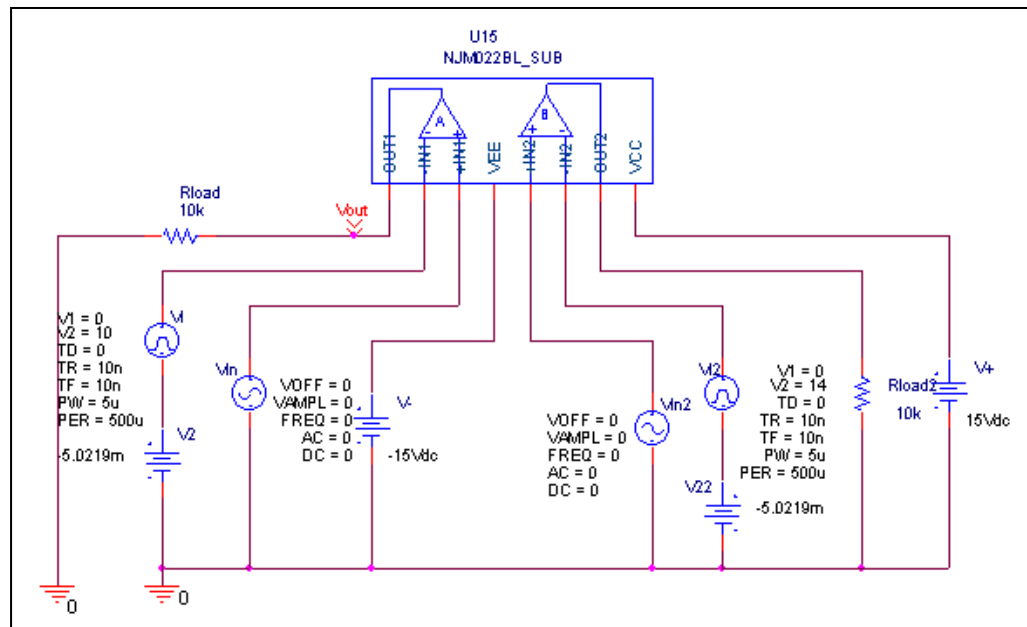
Vos	Measurement		Simulation		Error	
	5	mV	5.0219	mV	0.438	%

Slew Rate, +SR, -SR

Simulation result



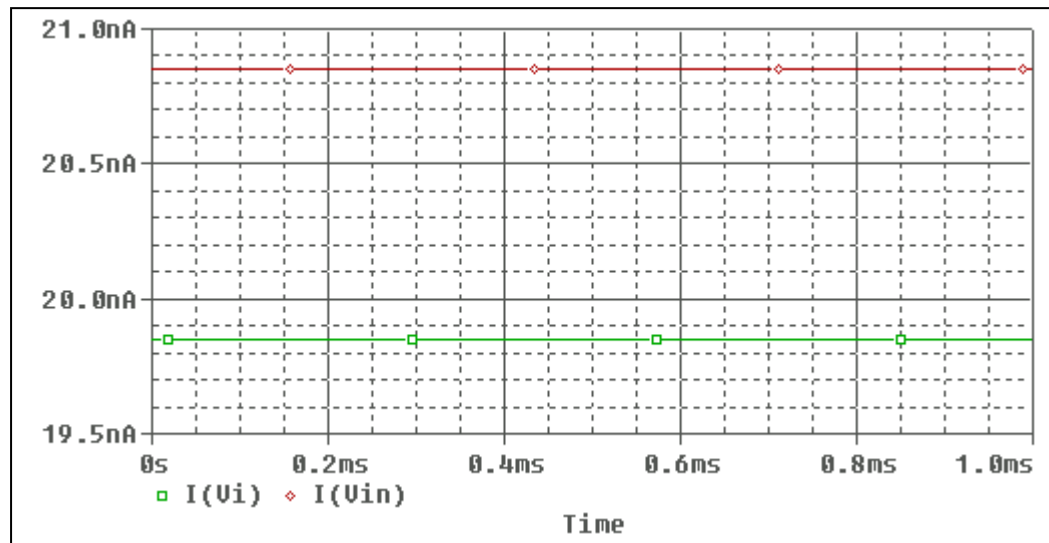
Evaluation circuit



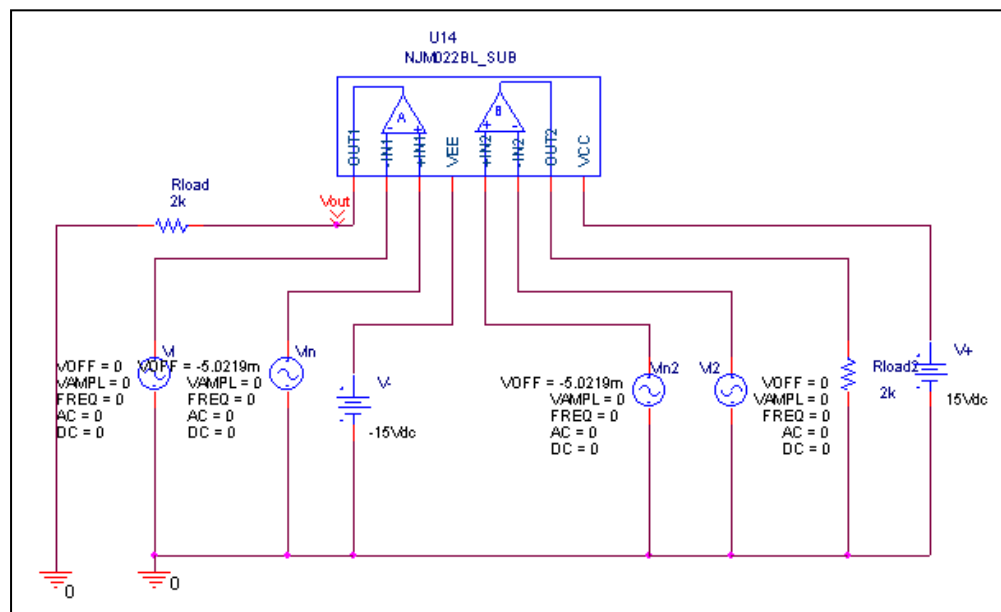
Slew Rate(v/us)	Data sheet	Simulation	%Error
		1V/us	0.979V/us

Input current Ib, Ibos

Simulation result



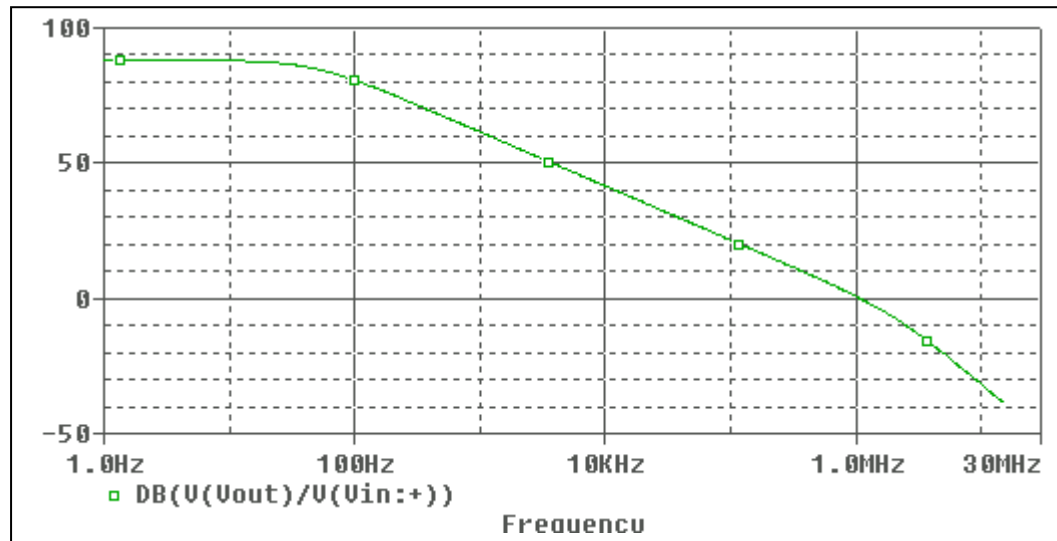
Evaluation circuit



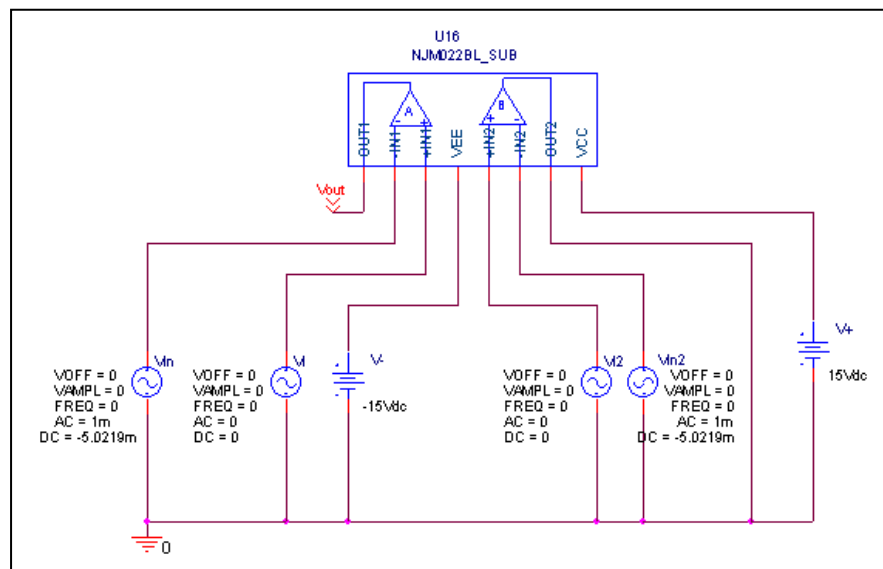
	Data sheet	Simulation	%Error
Ib(nA)	20	20.34	1.7
Ibos(nA)	1	1.001	0.1

Open Loop Voltage Gain vs. Frequency , Av-dc, f-0dB

Simulation result



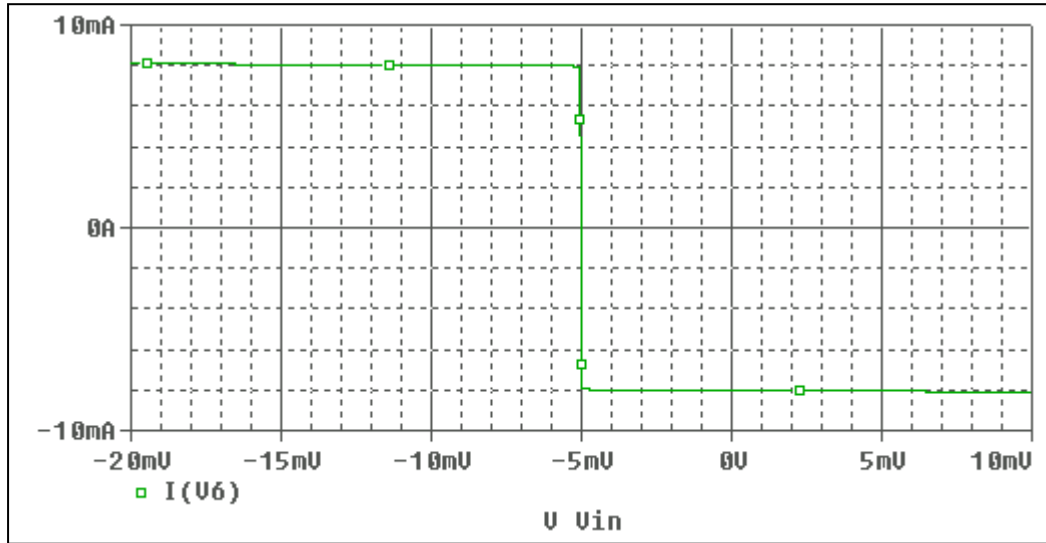
Evaluation circuit



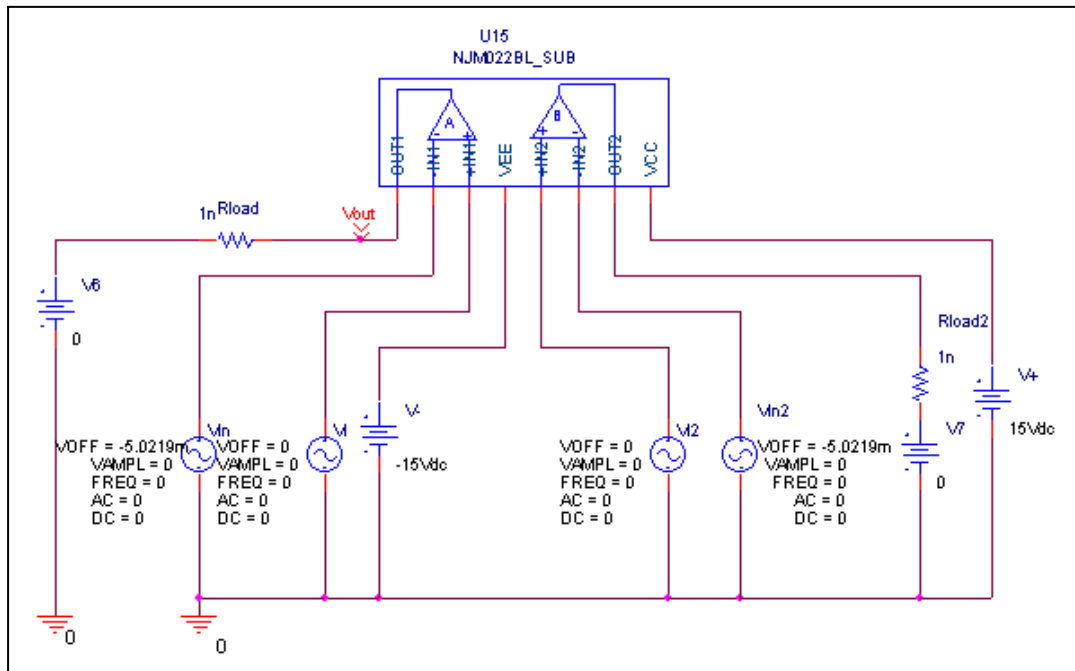
	Data sheet	Simulation	%Error
f-0dB(MHz)	1	1.05	5
Av-dc	88	88.079	0.089

Output Short Circuit Current - Ios

Simulation result



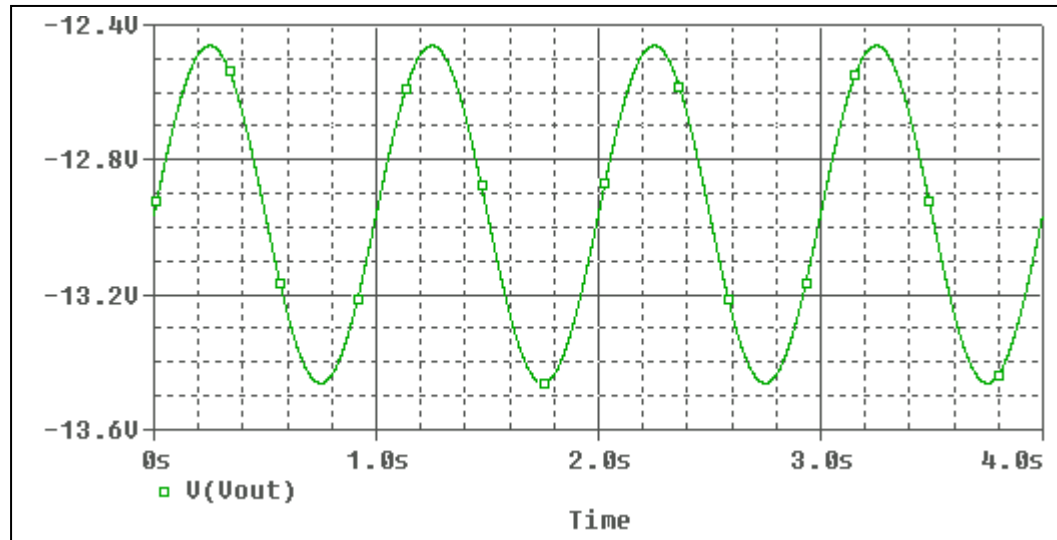
Evaluation circuit



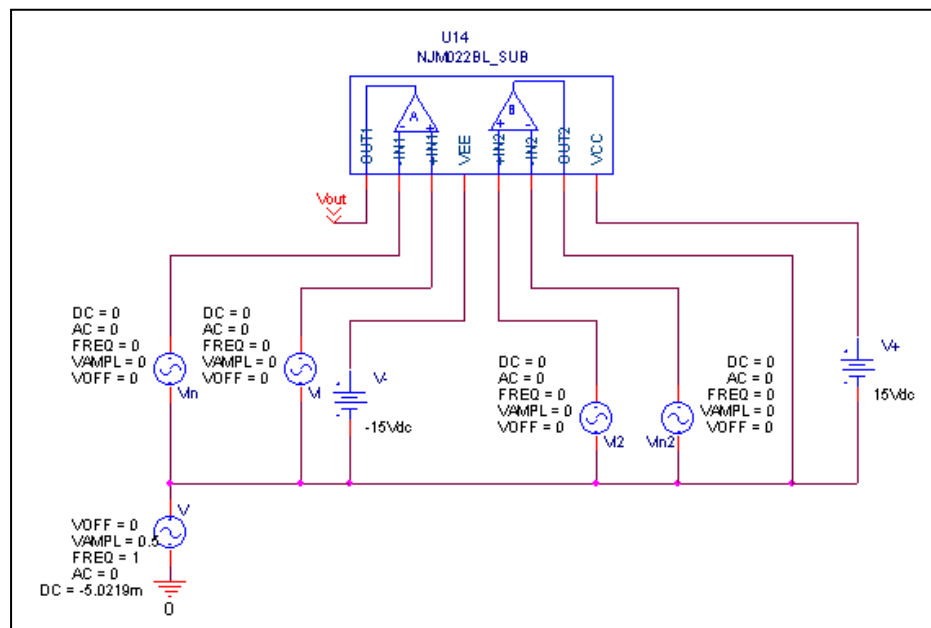
Short Circuit Current	Data sheet	Simulation	%Error
		8mA	8.015mA

Common-Mode Rejection Voltage gain

Simulation result



Evaluation circuit



Common mode gain= $0.079432/1=0.079432$

Common Mode Reject Ratio= $25348/0.079432=319115$

CMRR	Data sheet	Simulation	%Error
		316227	319115