Device Modeling Report
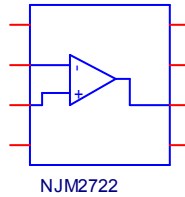
COMPONENTS: OPERATIONAL AMPLIFIER
PART NUMBER:NJM2722
MANUFACTURER: NEW JAPAN RADIO CO.,LTD

Bee Technologies

**Bee Technologies Inc.**

Spice Model

NJM2722

```
*$
* PART NUMBER:NJM2722
* MANUFACTURER: NEW JAPAN RADIO
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.Subckt NJM2722 OUT IN- IN+ V+ V-
X_U1    IN+ IN- V+ V- OUT NJM2722_ME
.ends  NJM2722
.subckt NJM2722_ME 1 2 3 4 5
 c1   11 12 14.434E-15
 c2    6  7 18.000E-15
 dc    5 53 dy
 de   54  5 dy
 dlp  90 91 dx
 dln  92 90 dx
 dp    4  3 dx
 egnd 99  0 poly(2) (3,0) (4,0) 0 .5 .5
 fb    7 99 poly(5) vb vc ve vlp vln 0 1.2483E3 -1E3 1E3 1E3 -1E3
 ga    6  0 11 12 32.044E-3
 gcm   0  6 10 99 3.2044E-6
 iee   3 10 dc 30.051E-3
 hlim 90  0 vlim 1K
 q1   11  2 13 qx1
 q2   12  1 14 qx2
 r2    6  9 100.00E3
 rc1   4 11 31.207
 rc2   4 12 31.207
 re1  13 10 29.433
 re2  14 10 29.433
 ree  10 99 6.6554E3
 ro1   8  5 50
 ro2   7 99 25
 rp    3  4 32.900
 vb    9  0 dc 0
 vc    3 53 dc 2.0979
 ve   54  4 dc 2.0979
 vlim  7  8 dc 0
 vlp  91  0 dc 20
 vln   0 92 dc 20
.model dx D(Is=800.00E-18)
.model dy D(Is=800.00E-18 Rs=1m Cjo=10p)
.model qx1 PNP(Is=800.00E-18 Bf=584.80)
.model qx2 PNP(Is=966.8700E-18 Bf=591.72)
.ends
*$
```
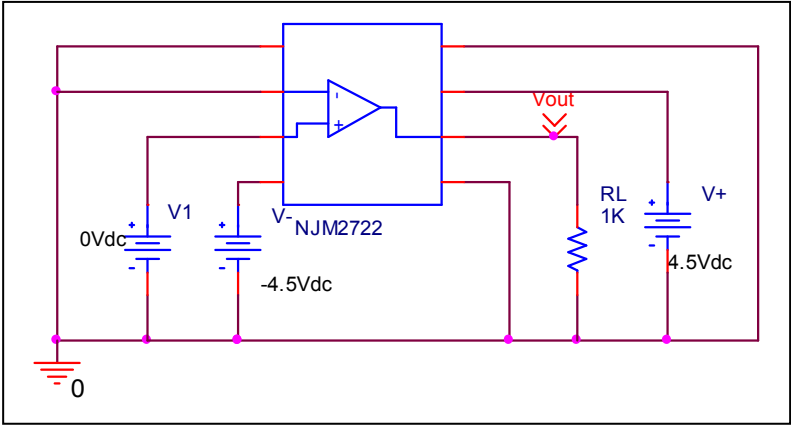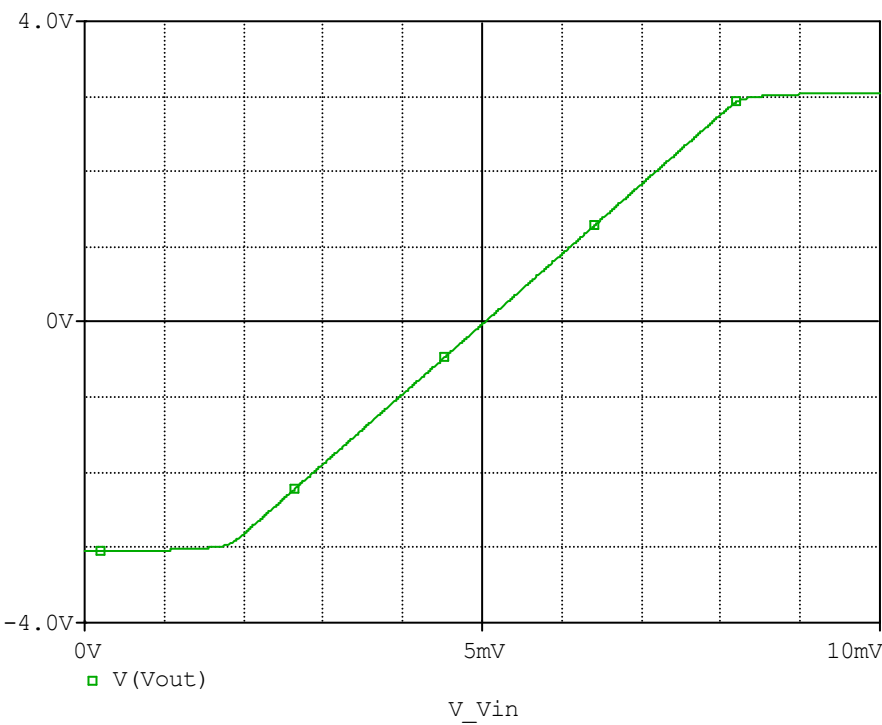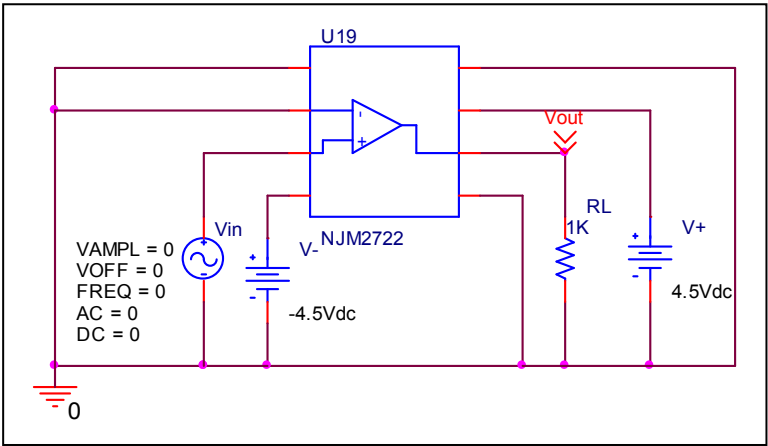
Output Voltage Swing

V(Vout)

V_V1
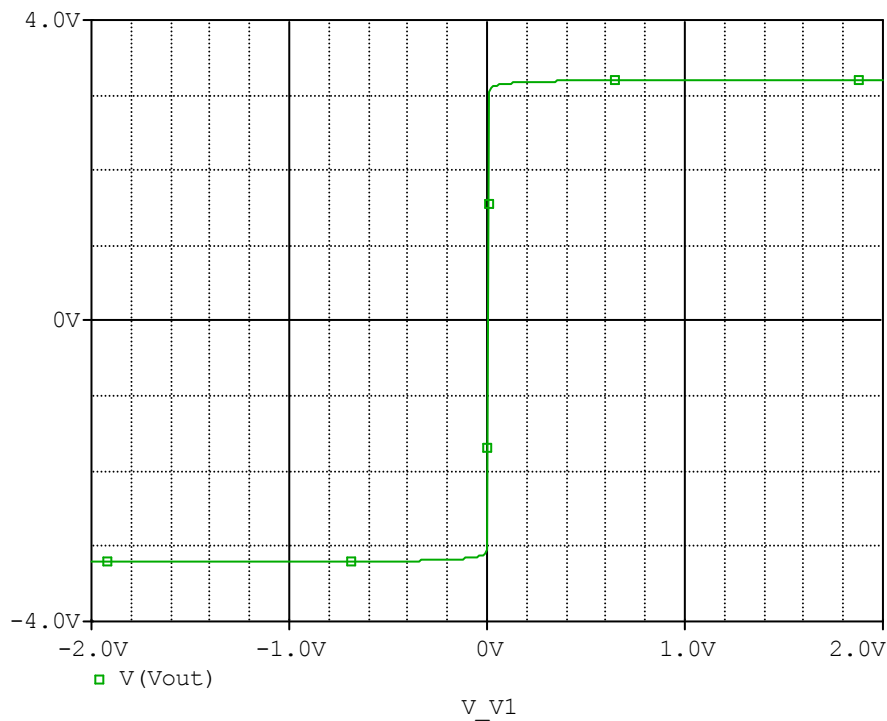
Output Voltage Swing	Data sheet	Simulation	%Error
+Vout(V)	3.200	3.196	-0.125
-Vout(V)	-3.200	-3.196	-0.125

Input Offset Voltage

Simulation result

V(Vout)

V_Vin

Evaluation circuit

Vos	Measurement		Simulation		Error	
	5.000	mV	5.000	mV	0.000	%

Slew Rate

Simulation result

◇ V(Vout)

Time
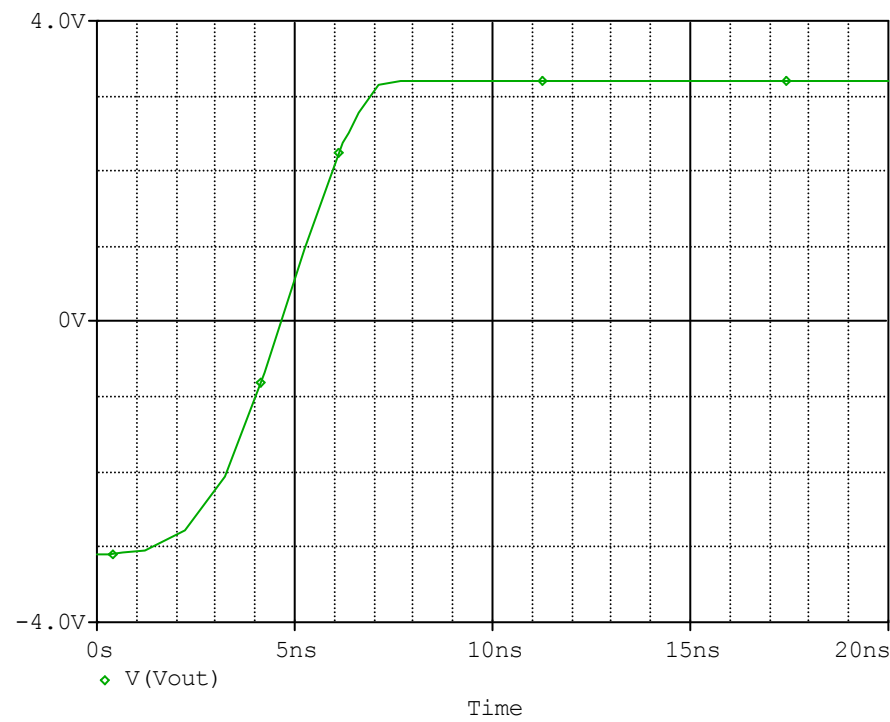
Evaluation circuit
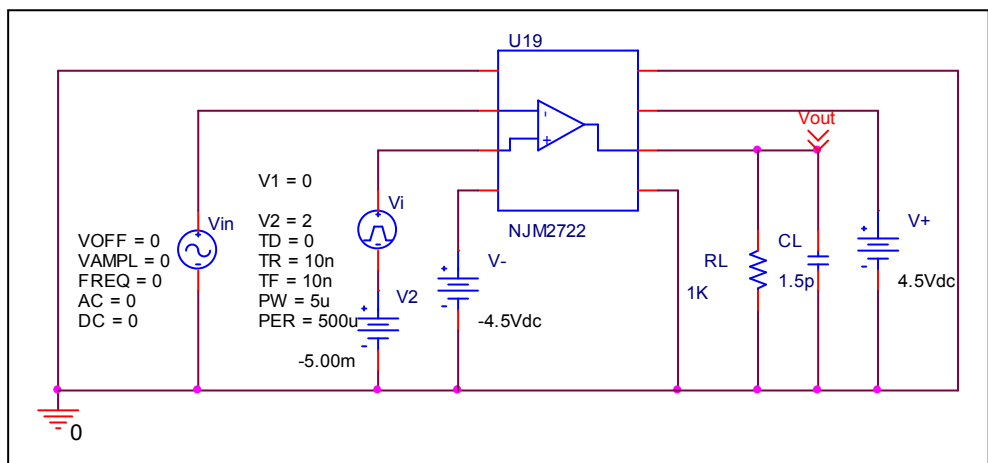
Slew Rate(v/us)	Data sheet	Simulation	%Error
	1000.000	1009.500	0.905

Input current

Legend: □ I(Vi) ◇ I(Vin)

Time
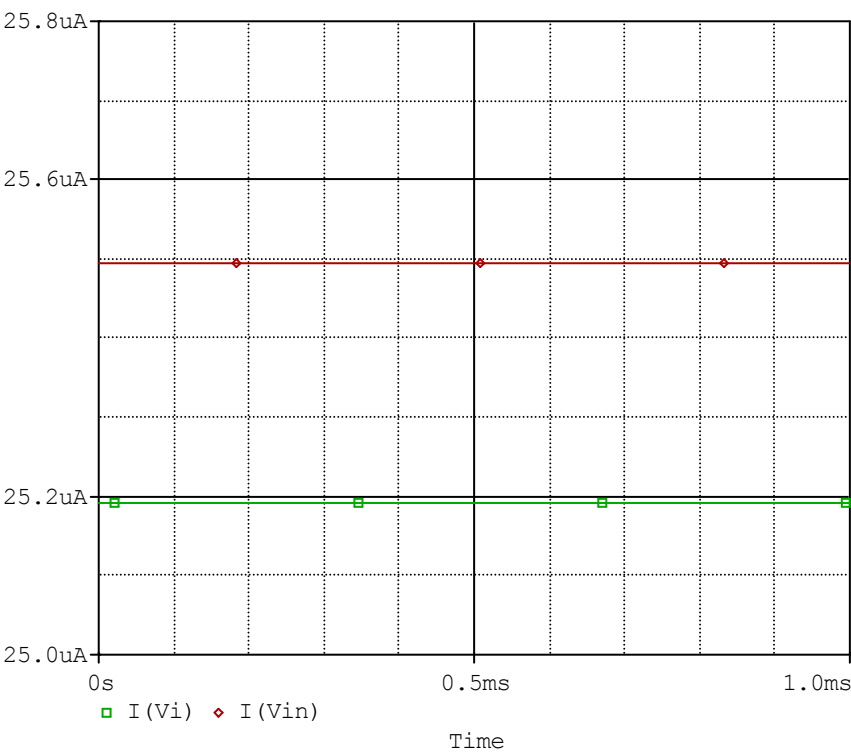
Evaluation circuit
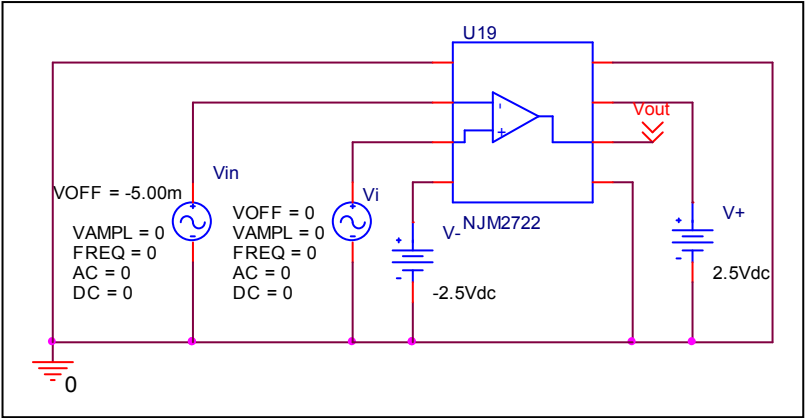
	Data sheet	Simulation	%Error
Ib(uA)	25.500	25.343	-0.616
Ibos(uA)	0.300	0.303	1.000

Open Loop Voltage Gain vs. Frequency

Simulation result

DB(V(Vout)/V(Vin:+))

Frequency
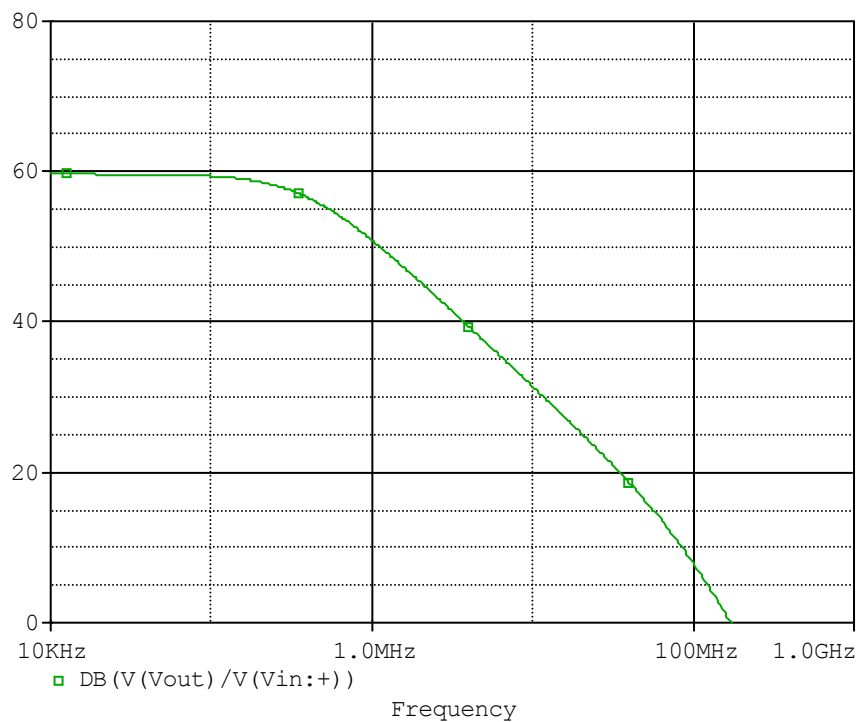
Evaluation circuit
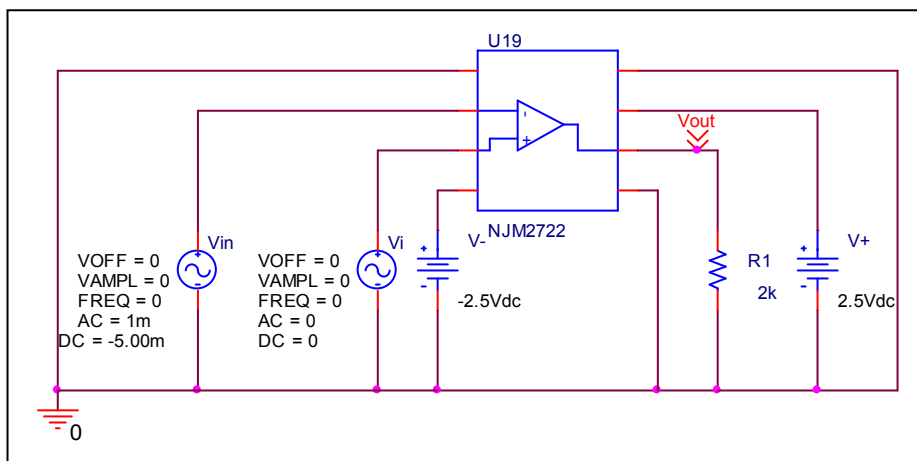
	Data sheet	Simulation	%Error
f-0dB(MHz)	170.000	171.782	1.048
Av-dc	60.000	59.699	-0.502

Common-Mode Rejection Voltage gain

Simulation result

- □ V(Vout)

Time
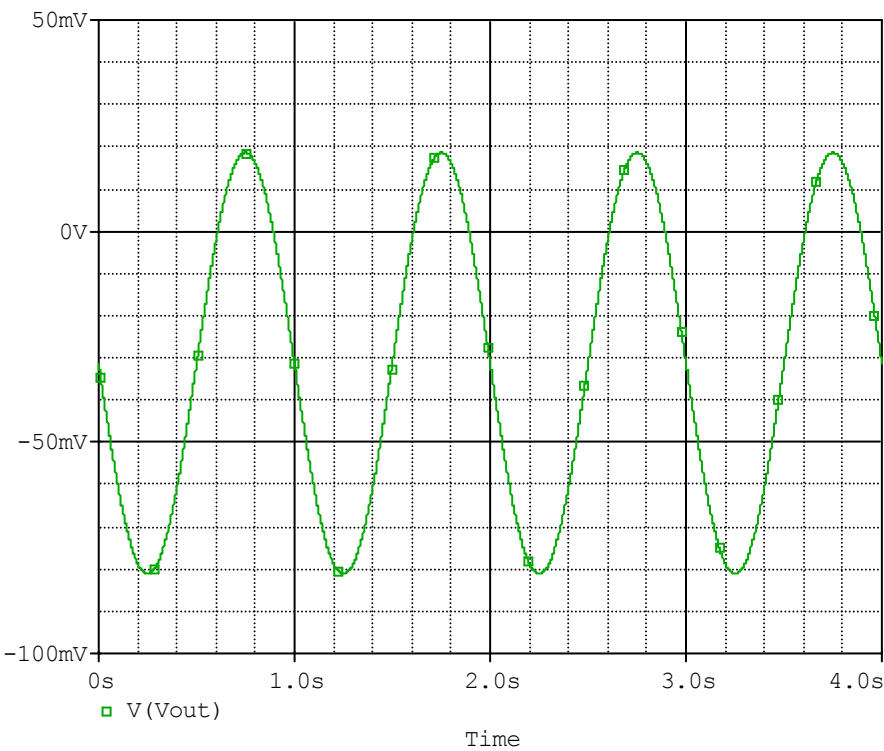
Evaluation circuit
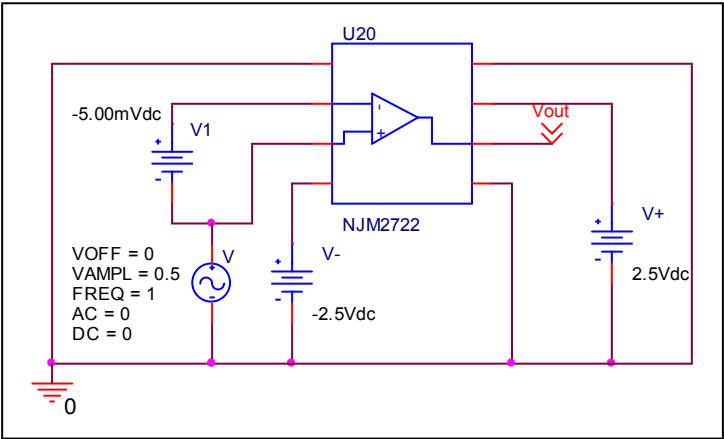
Common Mode Reject Ratio=965.939/0.099=9756.966

CMRR	Data sheet	Simulation	%Error
	80.000	79.786	-0.267