

Device Modeling Report

COMPONENTS: OPERATIONAL AMPLIFIER
PART NUMBER: NJM2726
MANUFACTURER: NEW JAPAN RADIO CO., LTD



Bee Technologies Inc.

SPice Model



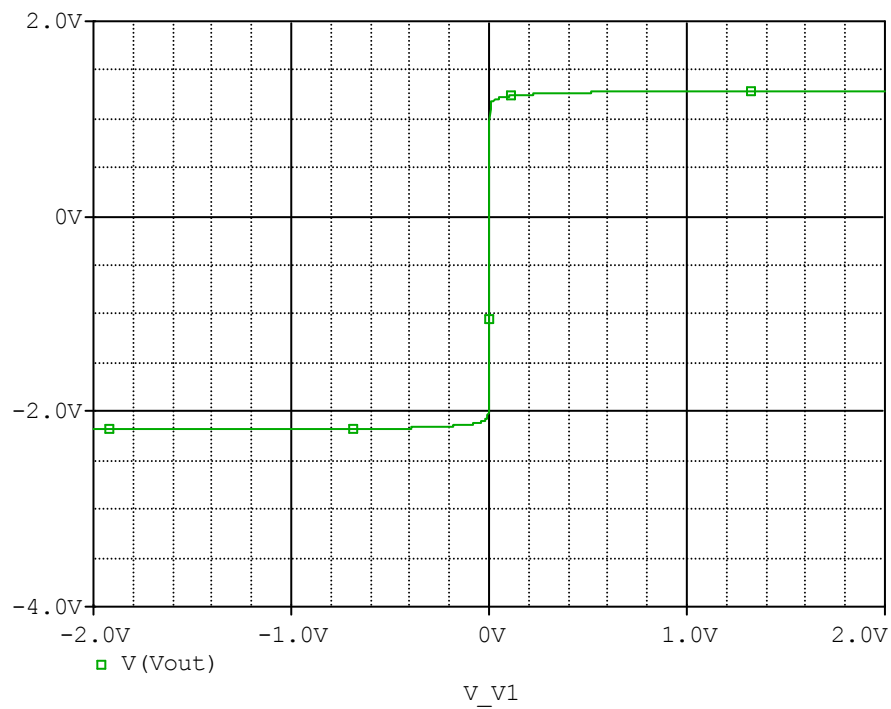
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* PART NUMBER:NJM2726
* MANUFACTURER: NEW JAPAN RADIO
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.Subckt NJM2726 OUT V- IN+ IN- V+
X_U1  IN+ IN- V+ V- OUT NJM2726_ME
.ends NJM2726
.subckt NJM2726_ME 1 2 3 4 5
c1 11 12 660.25E-15
c2 6 7 2.0000E-15
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 0 527.37 -1E3 1E3 530 -530
ga 6 0 11 12 28.274E-3
gcm 0 6 10 99 2.8274E-6
iee 3 10 dc 15.030E-3
hlim 90 0 vlim 1K
q1 11 2 13 qx1
q2 12 1 14 qx2
r2 6 9 100.00E3
rc1 4 11 35.368
rc2 4 12 35.368
re1 13 10 31.856
re2 14 10 31.856
ree 10 99 13.307E3
ro1 8 5 50
ro2 7 99 25
rp 3 4 61.740
vb 9 0 dc 0
vc 3 53 dc 1.9979
ve 54 4 dc 1.0979
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=493.10)
.model qx2 PNP(Is=860.9810E-18 Bf=507.10)
.ends
*$

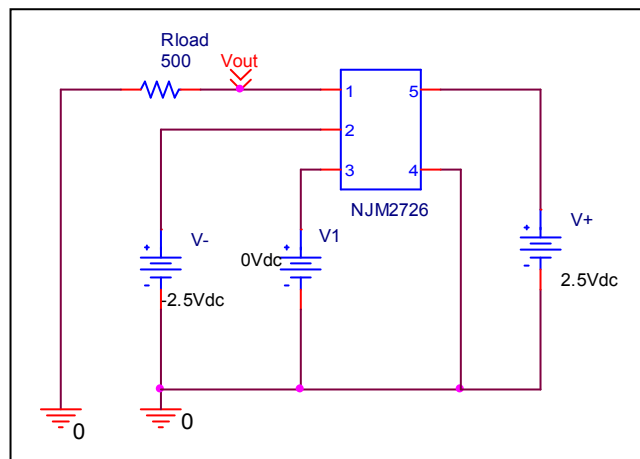
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Output Voltage Swing

Simulation result



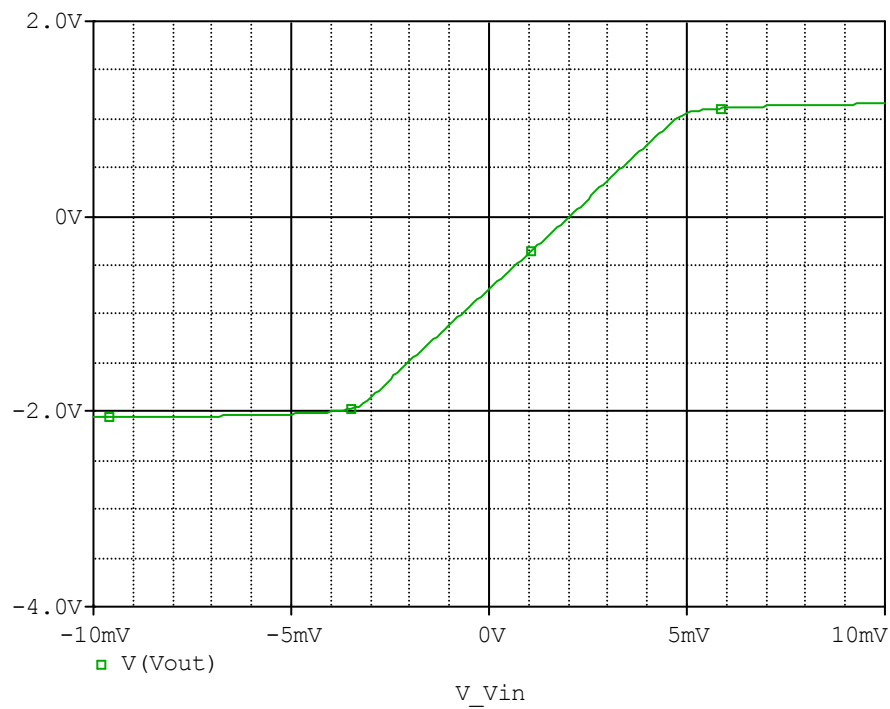
Evaluation circuit



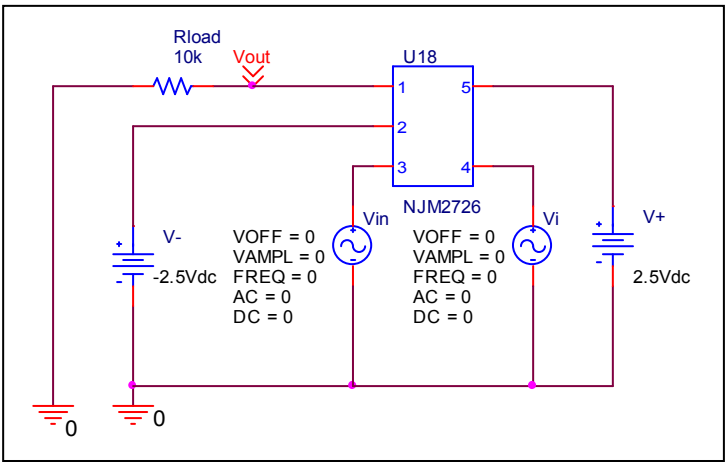
Output Voltage Swing	Data sheet	Simulation	%Error
Voh	1.300	1.275	-1.923
Vol	-2.200	-2.175	-1.136

Input Offset Voltage

Simulation result



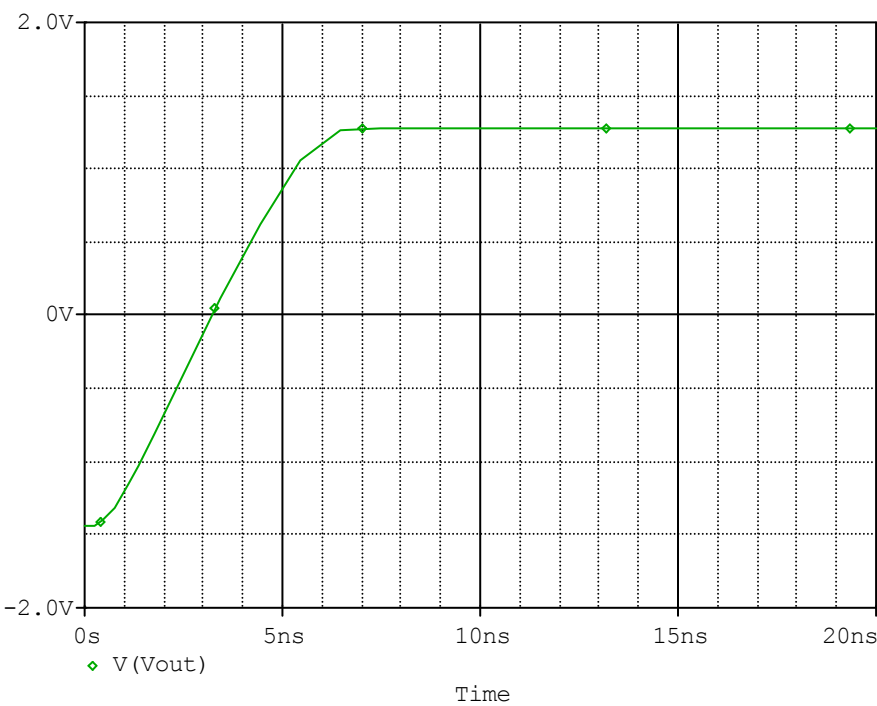
Evaluation circuit



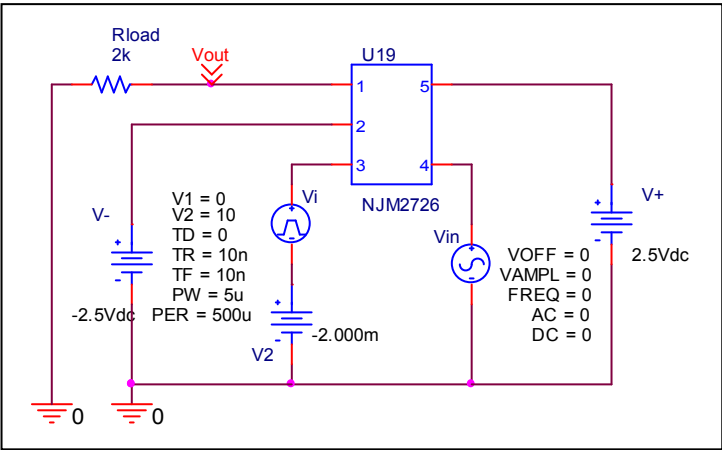
Vos(mV)	Measurement	Simulation	Error
	2.000	2.000	0.000

Slew Rate

Simulation result



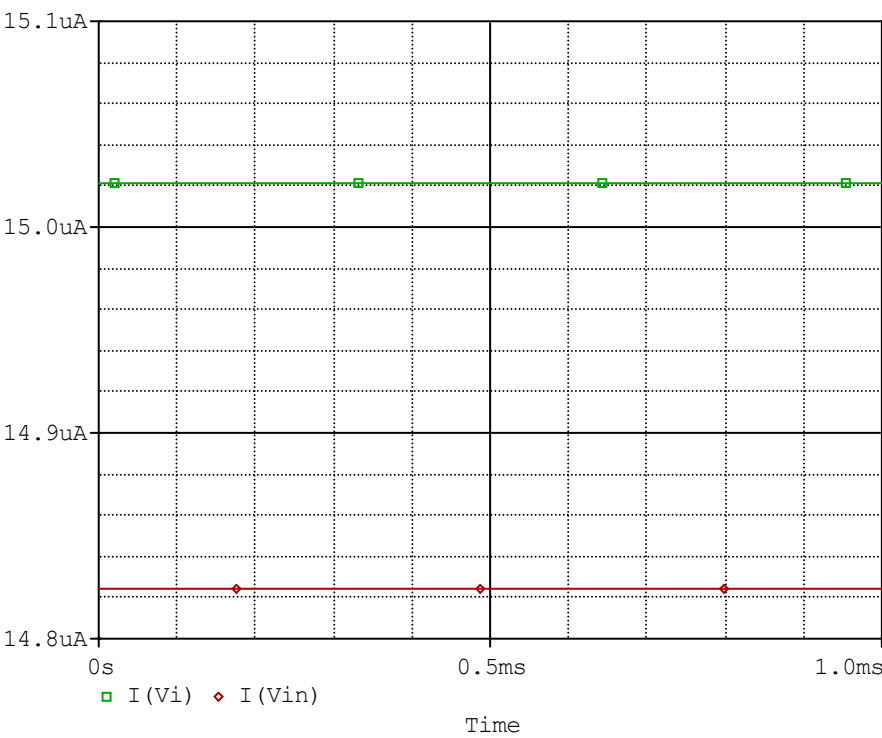
Evaluation circuit



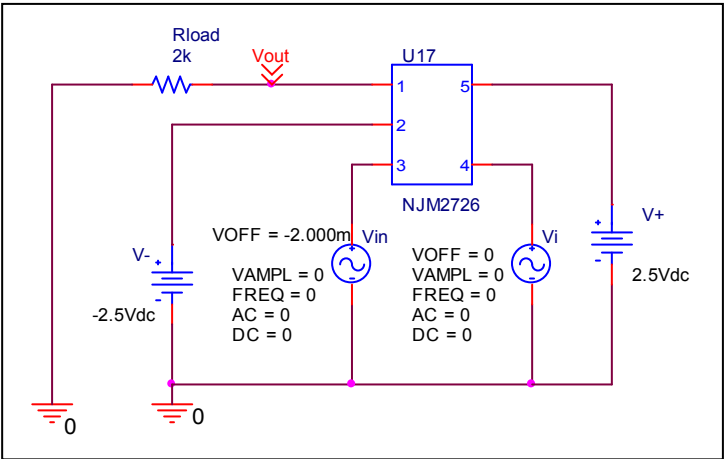
Slew Rate(v/us)	Data sheet	Simulation	%Error
	500.000	488.2	-2.360

Input current

Simulation result



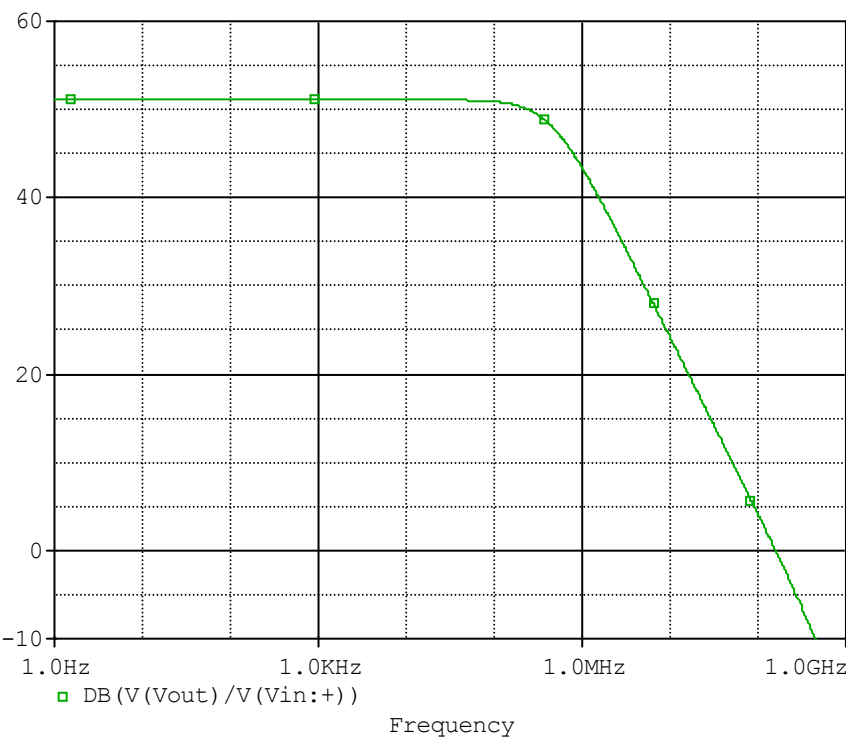
Evaluation circuit



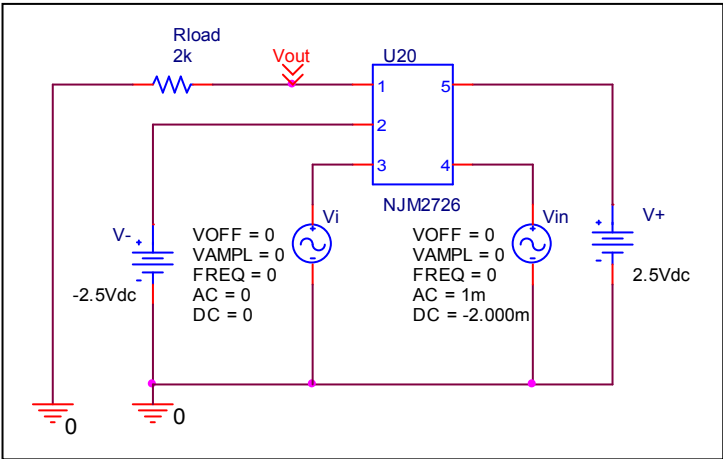
	Data sheet	Simulation	%Error
Ib(uA)	15.000	14.922	-0.520
Ibos(uA)	0.200	0.196	-2.000

Open Loop Voltage Gain vs. Frequency

Simulation result



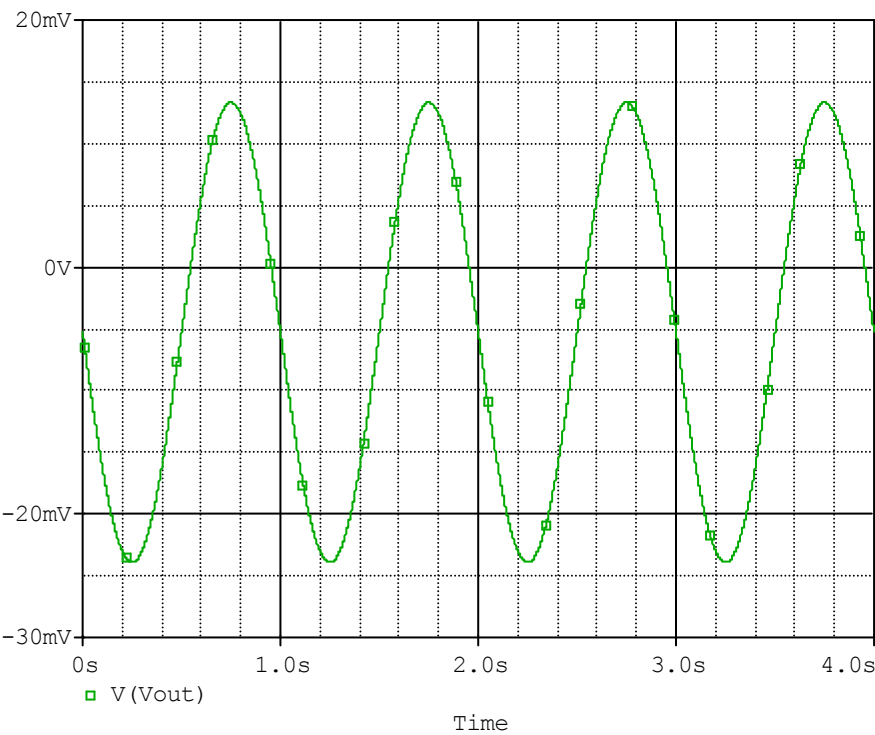
Evaluation circuit



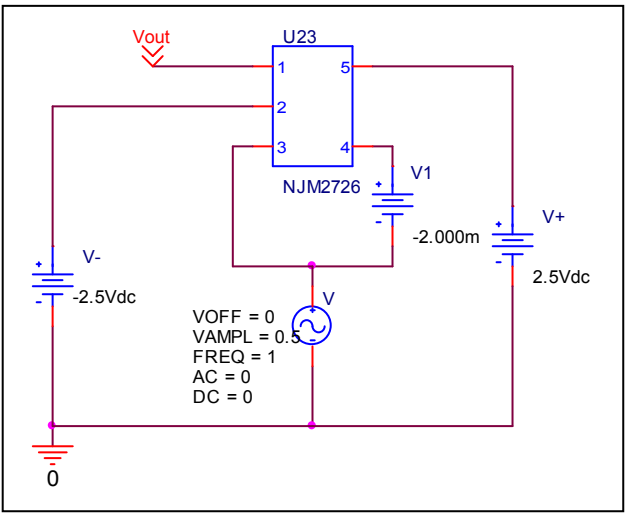
	Data sheet	Simulation	%Error
f-0dB(MHz)	150.000	155.251	3.501
Av-dc(dB)	50.000	51.105	2.210

Common-Mode Rejection Voltage gain

Simulation result



Evaluation circuit



Common Mode Reject Ratio=359.128/0.037=9706.162

CMRR	Data sheet	Simulation	%Error
	80.000	79.740	-0.325