

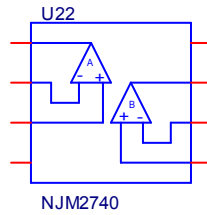
Device Modeling Report

COMPONENTS: OPERATIONAL AMPLIFIER
PART NUMBER: NJM2740
MANUFACTURER: NEW JAPAN RADIO CO., LTD



Bee Technologies Inc.

Spice Model



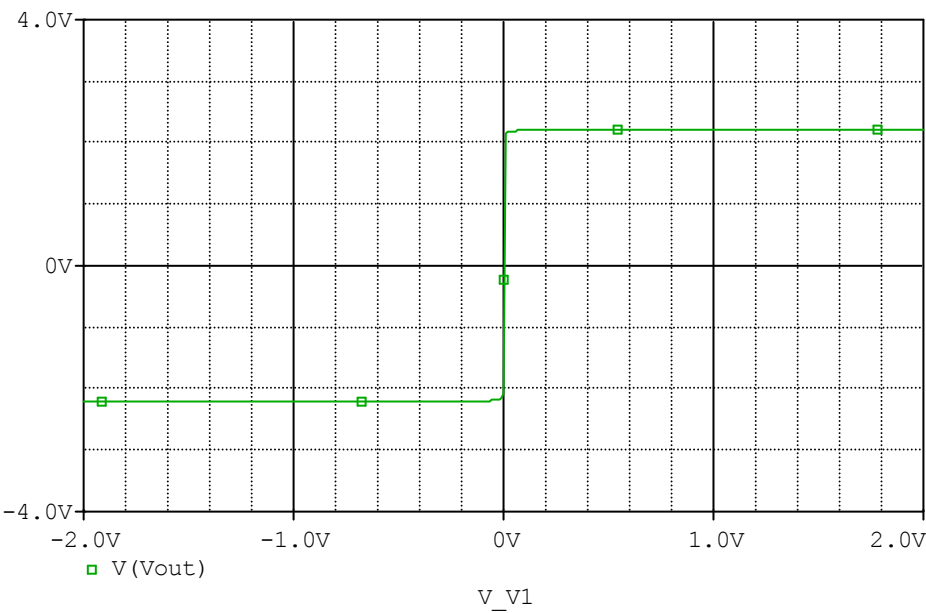
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*$
* PART NUMBER: NJM2740
* MANUFACTURER: NEW JAPAN RADIO
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.Subckt NJM2740 OUT1 -IN1 +IN1 V- +IN2 -IN2 OUT2 V+
X_U1  +IN1 -IN1 V+ V- OUT1 NJM2740_ME
X_U2  +IN2 -IN2 V+ V- OUT2 NJM2740_ME
.ends NJM2740
.subckt NJM2740_ME 1 2 3 4 5
c1  11 12 1.0000E-12
c2   6  7 26.000E-12
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 0 180.00E3 -1E3 1E3 180E3 -180E3
ga   6  0 11 12 2.1000E-3
gcm  0  6 10 99 451.32E-9
iee  3 10 dc 120.20E-6
hlim 90 0 vlim 1K
q1   11  2 13 qx1
q2   12  1 14 qx2
r2    6  9 100.00E3
rc1   4 11 442.10
rc2   4 12 442.10
re1  13 10 11.009
re2  14 10 11.009
ree  10 99 1.6639E6
ro1   8  5 50
ro2   7 99 25
rp    3  4 50.060
vb    9  0 dc 0
vc    3 53 dc 1.0979
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=594.06)
.model qx2 PNP(Is=827.3675E-18 Bf=606.06)
.ends
*$

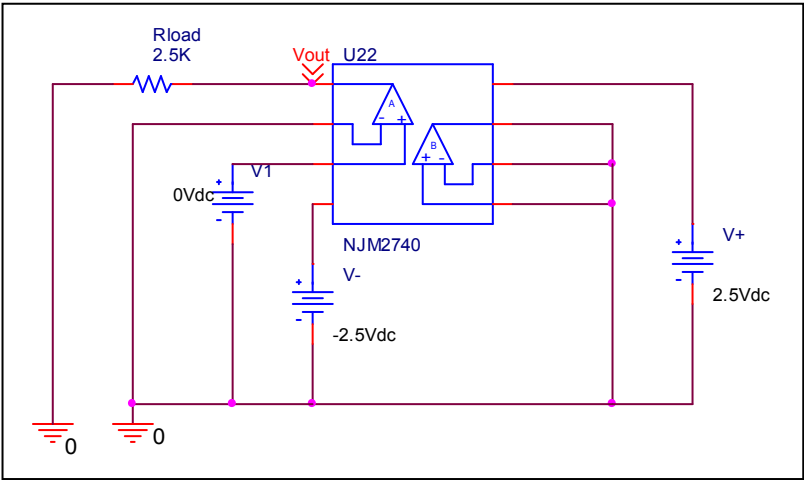
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Output Voltage Swing

Simulation result



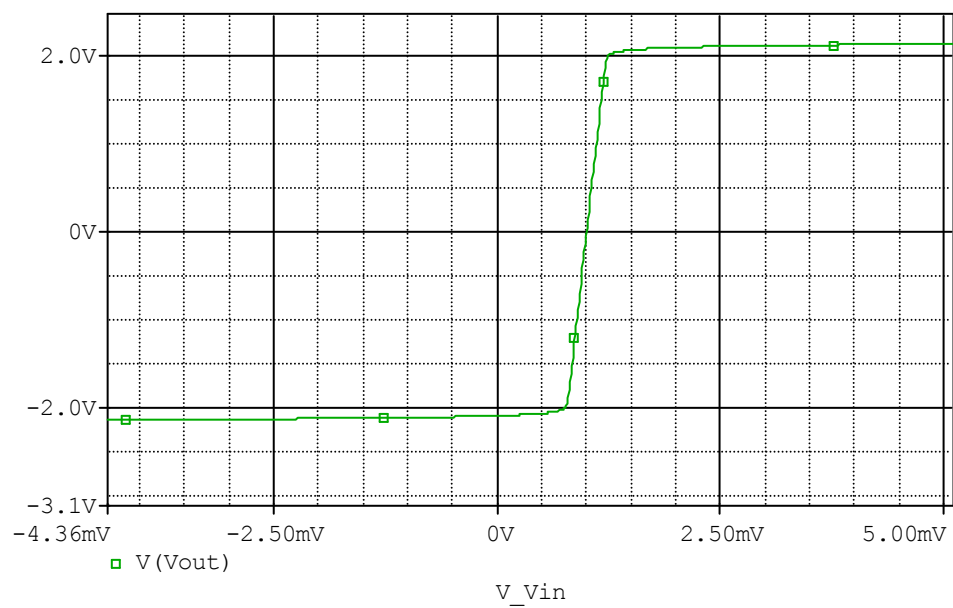
Evaluation circuit



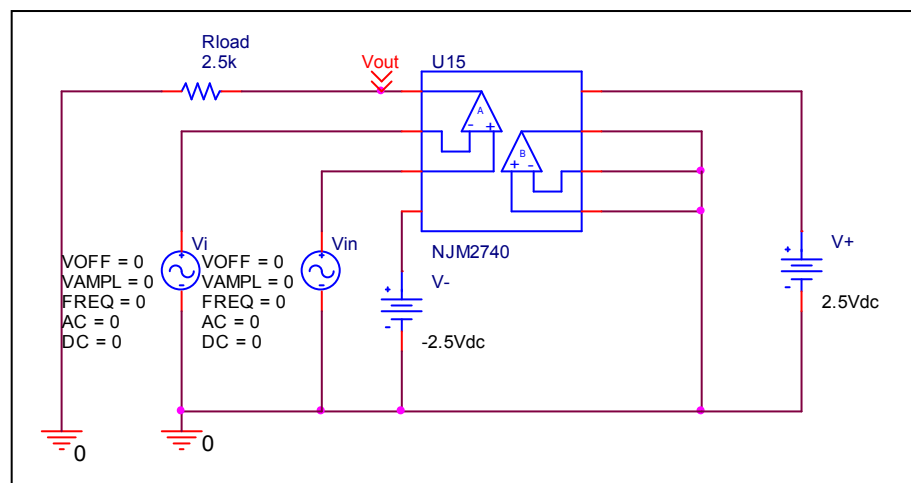
Output Voltage Swing	Data sheet	Simulation	%Error
+Vout(V)	2.200	2.199	-0.045
-Vout(V)	-2.200	-2.199	-0.045

Input Offset Voltage

Simulation result



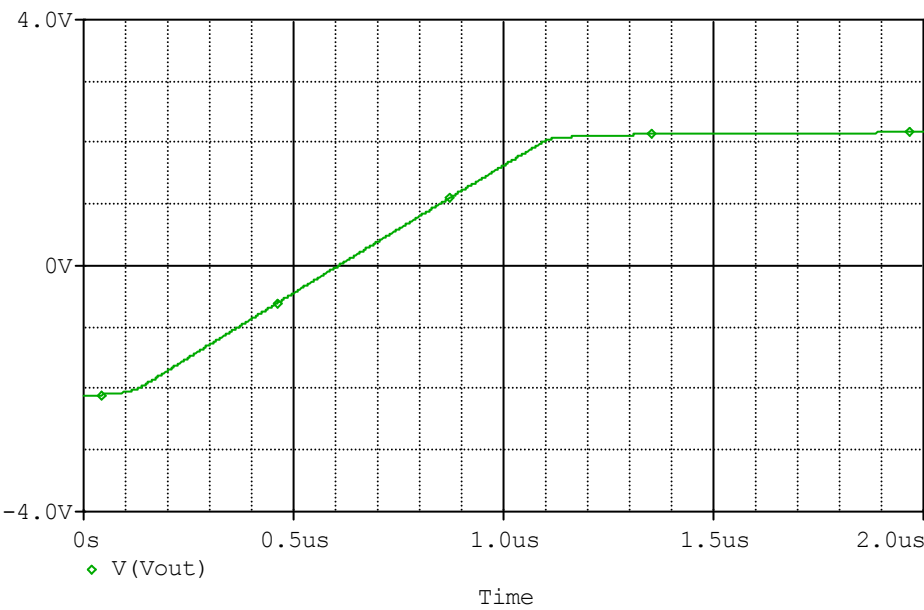
Evaluation circuit



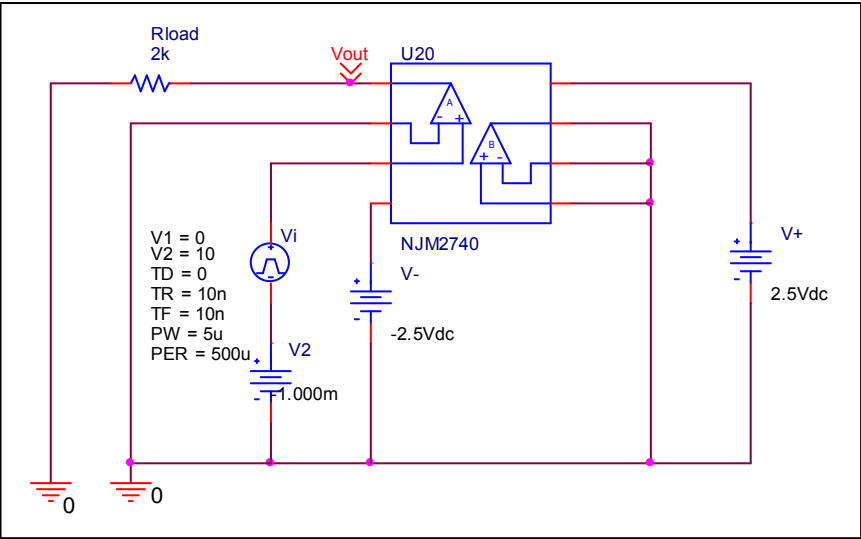
Vos	Measurement		Simulation		Error	
	1.000	mV	1.000	mV	0.000	%

Slew Rate

Simulation result



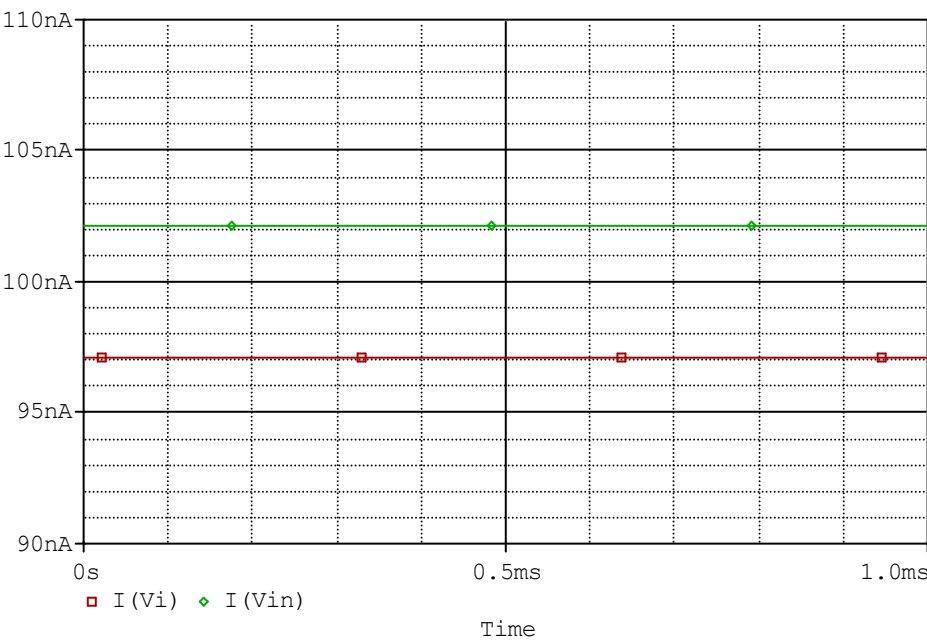
Evaluation circuit



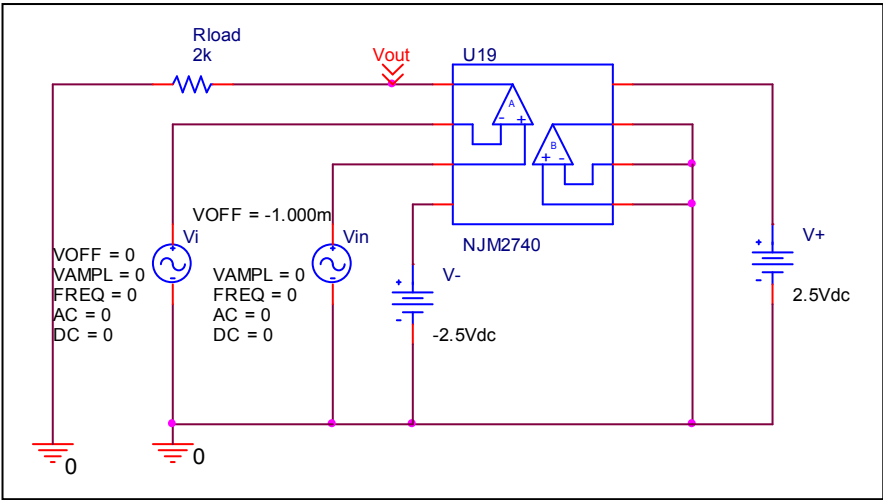
Slew Rate(v/us)	Data sheet	Simulation	%Error
	4.000	4.140	3.500

Input current

Simulation result



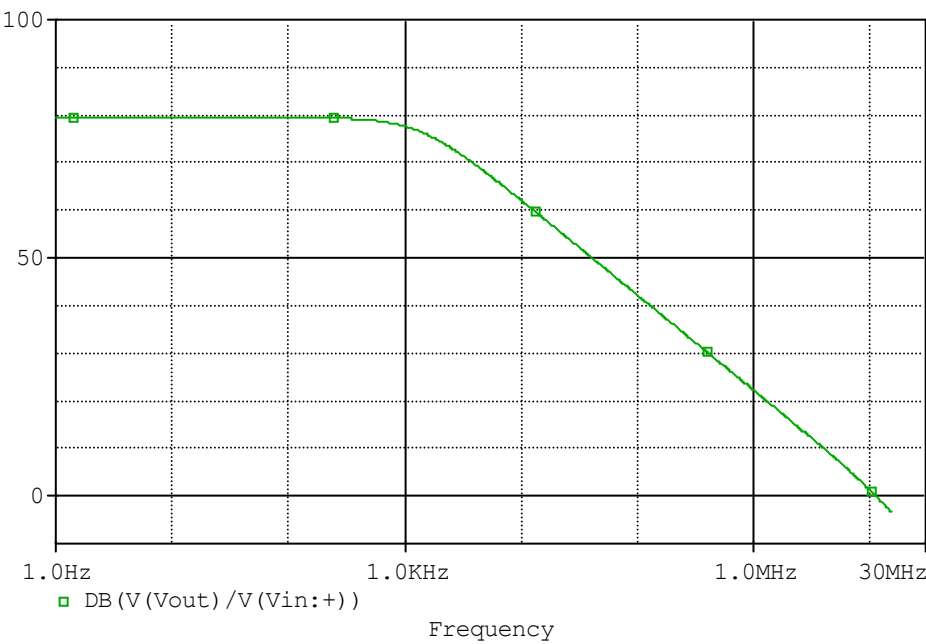
Evaluation circuit



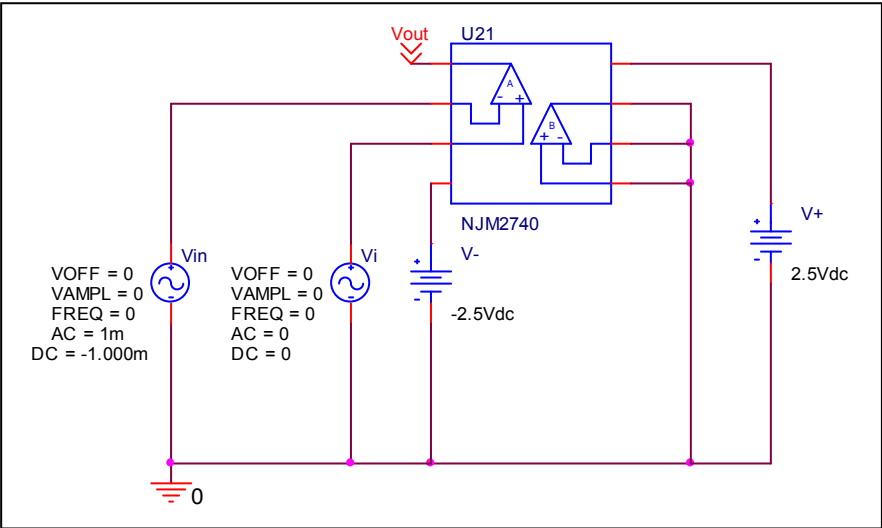
	Data sheet	Simulation	%Error
Ib(nA)	100.000	99.650	-0.350
Ibos(nA)	5.000	5.031	0.620

Open Loop Voltage Gain vs. Frequency

Simulation result



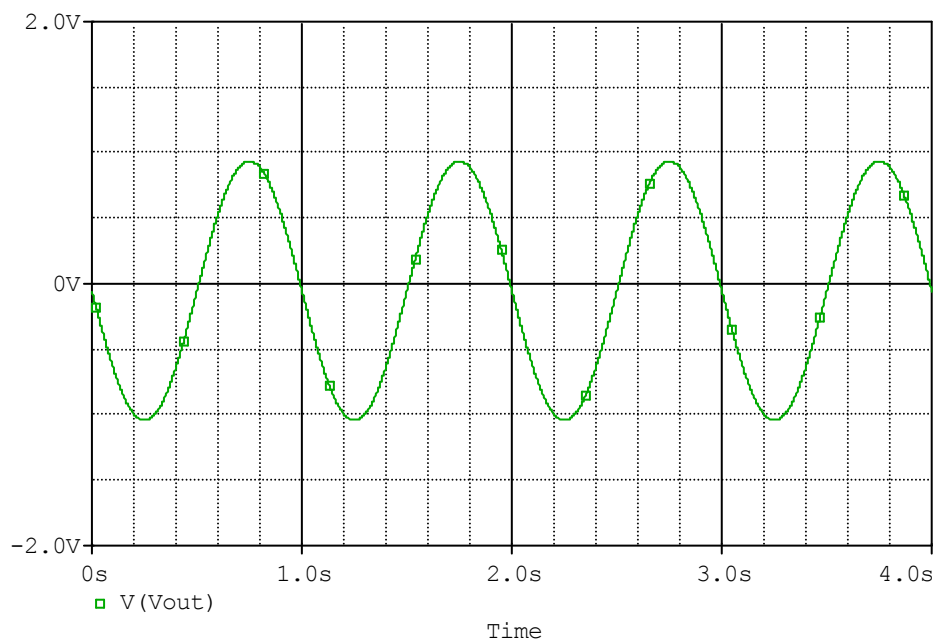
Evaluation circuit



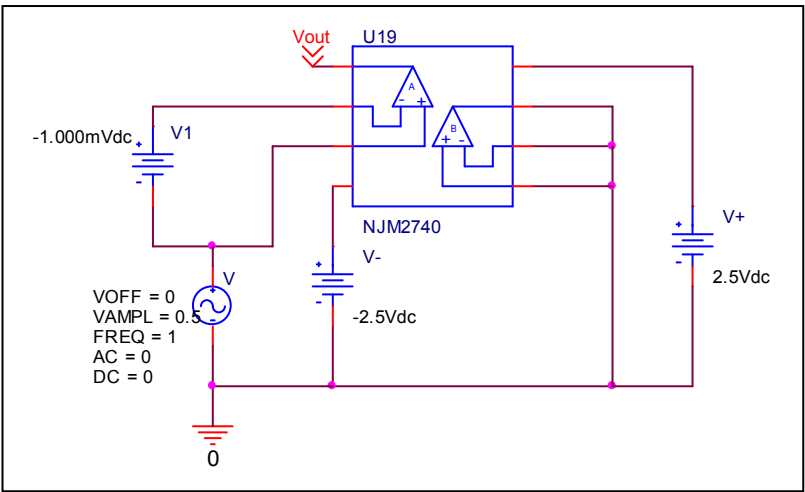
	Data sheet	Simulation	%Error
f-0dB(MHz)	12.000	11.576	-3.533
Av-dc(dB)	80.000	79.490	-0.638

Common-Mode Rejection Voltage gain

Simulation result



Evaluation circuit



Common Mode Reject Ratio= $9429.746/2.036=4631.505$

CMRR	Data sheet	Simulation	%Error
	74.000	73.314	-0.927