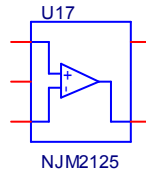# Device Modeling Report

COMPONENTS:MOSFET: OPERATIONAL AMPLIFIER
PART NUMBER:NJM2125
MANUFACTURER: NEW JAPAN RADIO CO.,LTD

Bee Technologies Inc.

Spice Model

U17

NJM2125

```
*$
* PART NUMBER:NJM2125
* MANUFACTURER: NEW JAPAN RADIO
* All Rights Reserved Copyright (c) Bee Technologies Inc. 2005
.Subckt NJM2125 +IN V- -IN OUT V+
X_U1    +IN -IN V+ V- OUT NJM2125_ME
.ends  NJM2125
.subckt NJM2125_ME 1 2 3 4 5
  c1   11 12 8.6603E-12
  c2    6  7 30.000E-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 15.158E6 -1E3 1E3 15E6 -15E6
  ga    6  0 11 12 263.89E-6
  gcm   0  6 10 99 8.3450E-9
  iee   3 10 dc 36.050E-6
  hlim 90  0 vlim 1K
  q1   11  2 13 qx1
  q2   12  1 14 qx2
  r2    6  9 100.00E3
  rc1   4 11 3.7894E3
  rc2   4 12 3.7894E3
  re1  13 10 2.3493E3
  re2  14 10 2.3493E3
  ree  10 99 5.5479E6
  ro1   8  5 50
  ro2   7 99 25
  rp    3  4 125.11
  vb    9  0 dc 0
  vc    3 53 dc 2.2979
  ve   54  4 dc .79791
  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=638.30)
.model qx2 PNP(Is=864.3162E-18 Bf=825.69)
.ends
*$
```

Output Voltage Swing, +Vout and –Vout

V(Vout)

V_V1
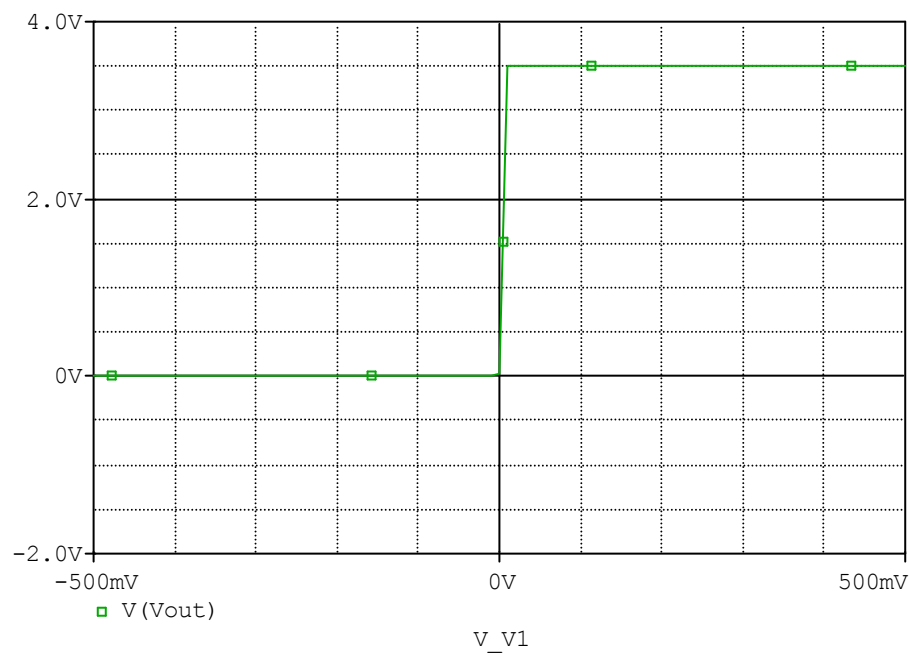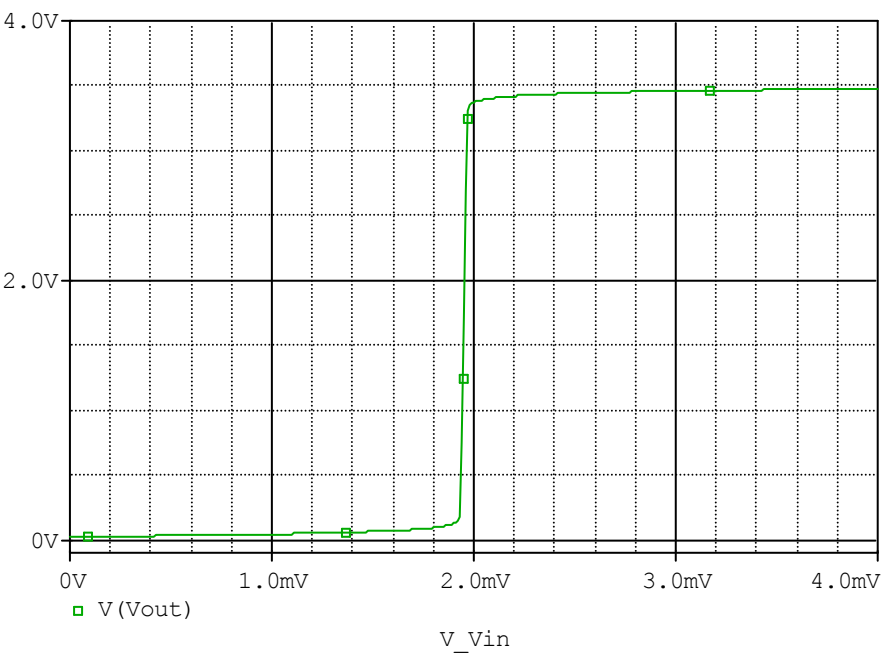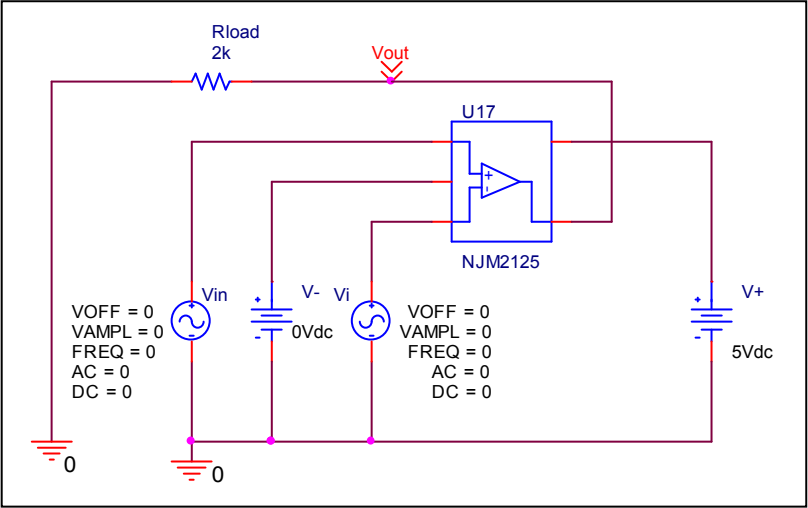
Evaluation circuit
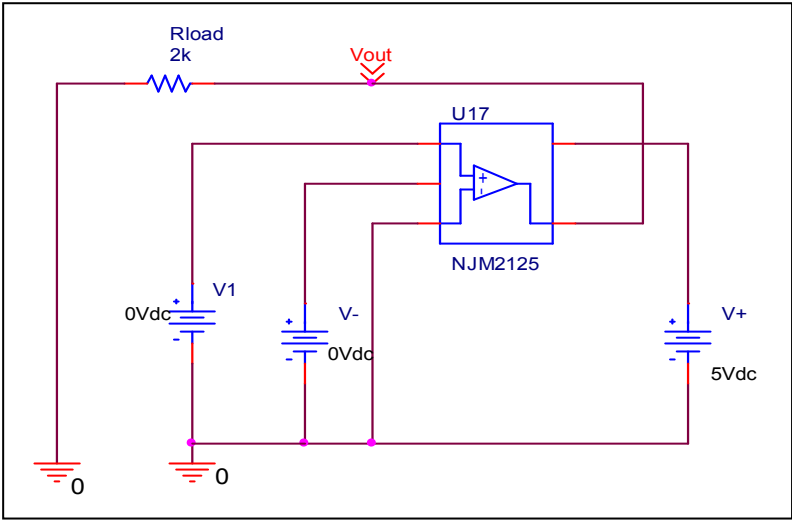
Output Voltage Swing	Data sheet	Simulation	%Error
+Vout(V)	3.500	3.498	-0.057

Input Offset Voltage

V(Vout)

V_Vin

Vos	Measurement		Simulation		Error	
	2.000	mV	1.950	mV	-2.500	%

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Slew Rate, +SR, -SR

◇ V(Vout)

Time
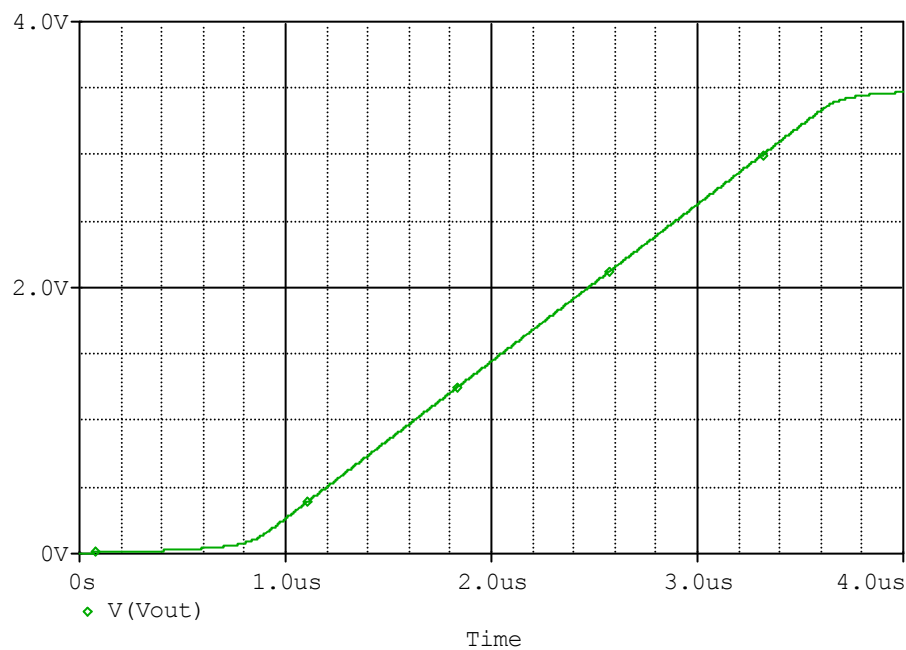
Evaluation circuit
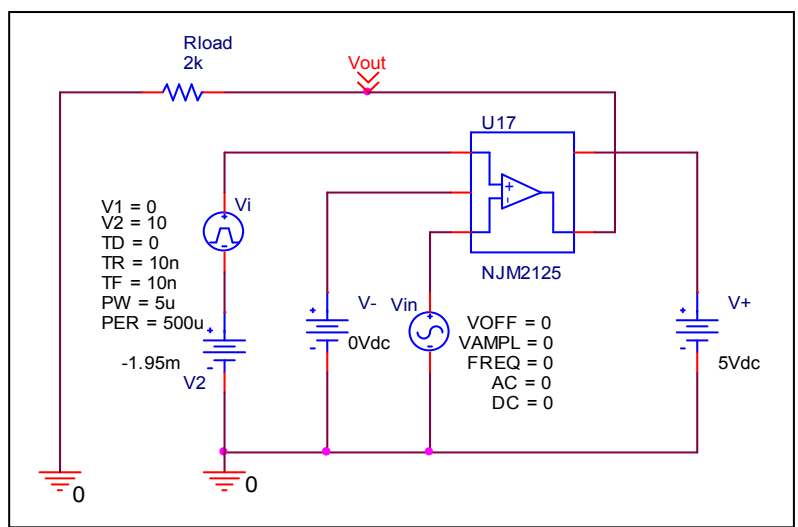
Slew Rate(v/us)	Data sheet	Simulation	%Error
	1.200V/us	1.181V/us	-1.583

Input current Ib, Ibos

```
28nA
26nA
24nA
22nA
    0s              0.5ms            1.0ms
      □ I(Vi)   ◇ I(Vin)
                  Time
```
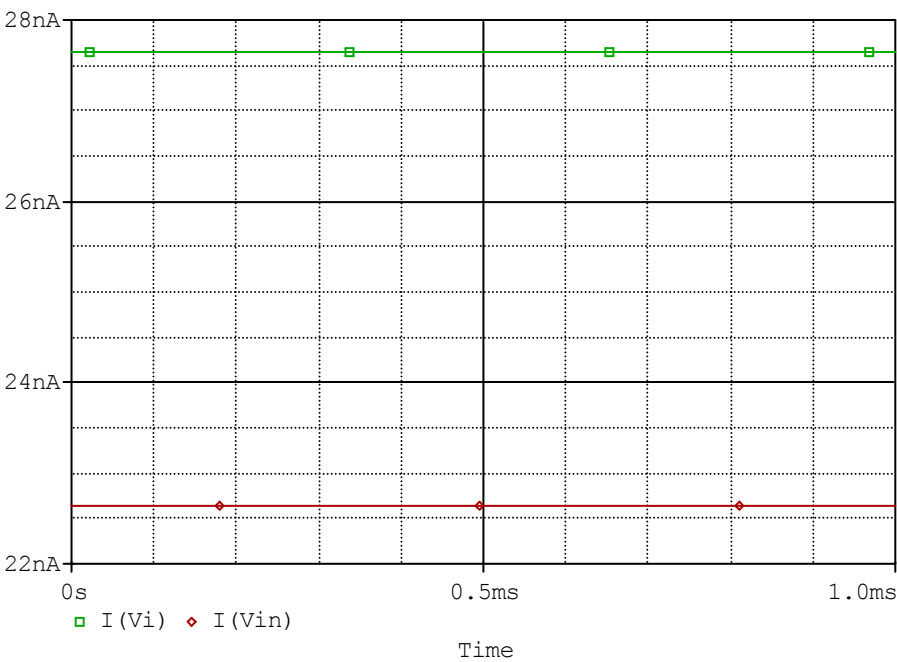
Evaluation circuit

	Data sheet	Simulation	%Error
Ib(nA)	25.000	25.100	0.400
Ibos(nA)	5.000	5.000	0.000

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

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

Frequency
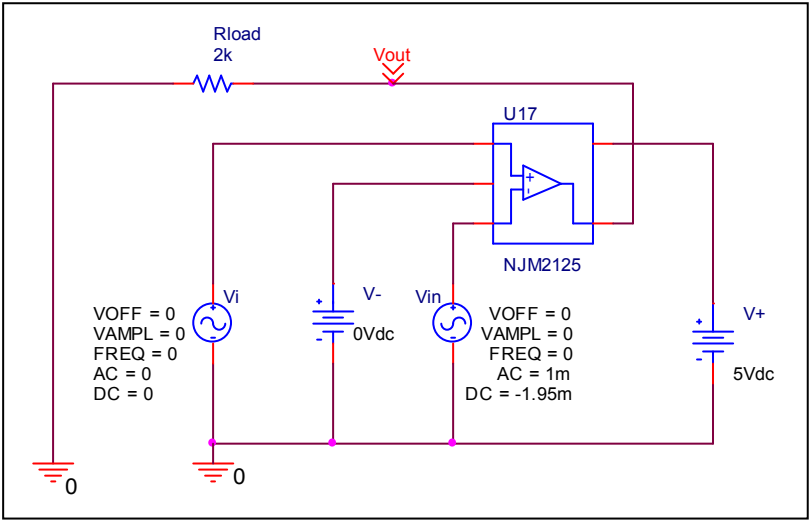
	Data sheet	Simulation	%Error
f-0dB(MHz)	1.200	1.180	-1.667
Av-dc(dB)	100.000	99.382	-0.618

Common-Mode Rejection Voltage gain

V(Vout)

Time
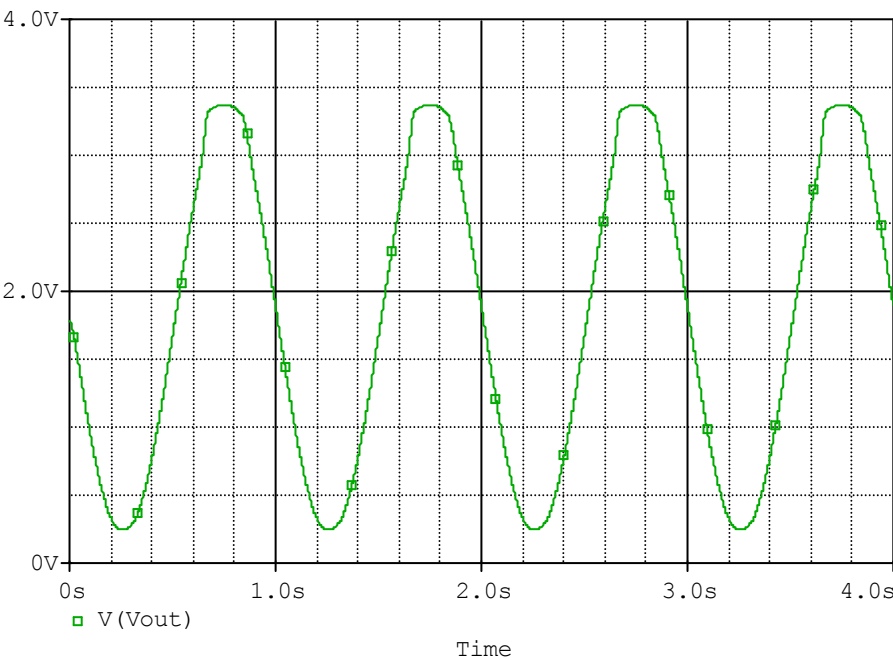
Evaluation circuit
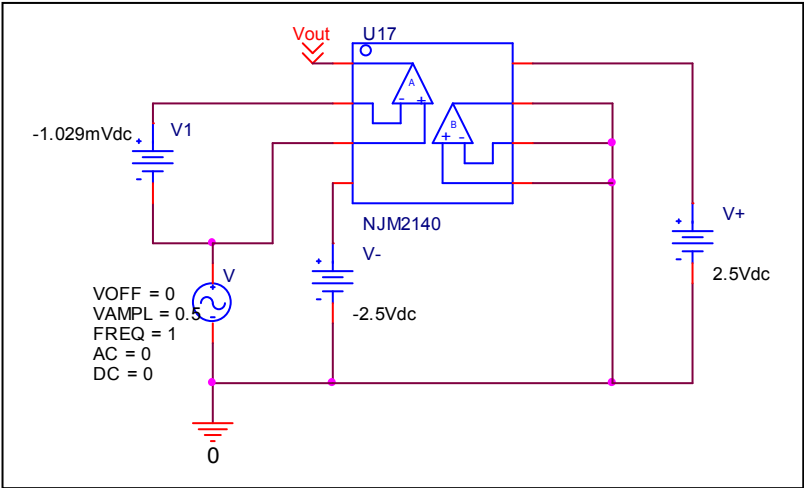
Common Mode Reject Ratio=93132.229/3.121=29840.509

	Data sheet	Simulation	%Error
CMRR	90.000	89.496	-0.560